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PROPOSED MOKOLO AND CROCODILE RIVER (WEST) WATER AUGMENTATION PROJECT (PHASE 2A) (MCWAP-2A):

BORROW PITS

SCOPING REPORT

DRAFT

September 2018

mineral resources

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Mineral Resources
REPUBLIC OF SOUTH AFRICA

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PROPOSED MOKOLO AND CROCODILE RIVER (WEST) WATER AUGMENTATION PROJECT (PHASE 2A) (MCWAP-2A):

BORROW PITS

FOR LISTED ACTIVITIES ASSOCIATED WITH MINING RIGHT AND/OR BULK SAMPLING ACTIVITIES INCLUDING TRENCHING IN CASES OF ALLUVIAL DIAMOND PROSPECTING.

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

NAME OF APPLICANT: Department of Water and Sanitation (DWS)

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EXECUTIVE SUMMARY

PROJECT BACKGROUND

Major developments are planned for the Waterberg coalfields that are located in the Lephalale area. As a direct result of the aforementioned developments, the demand for water in the Lephalale area is expected to significantly increase into the future. Due to the limited availability of water in the Lephalale area, the Department of Water and Sanitation conducted a feasibility study (completed in 2010) of the Mokolo Crocodile River (West) Water Augmentation Project to establish how the future water demands could be met. The phases of the proposed project include the following:

- Mokolo Crocodile River (West) Water Augmentation Project (Phase 1) (MCWAP-1): Augment the supply from Mokolo Dam to supply in the growing water use requirement for the interim period until a transfer pipeline from the Crocodile River West can be implemented. The solution must over the long term optimally utilise the full yield from Mokolo Dam and will be operated as a system together with Mokolo Crocodile River (West) Water Augmentation Project Phase 2A. Phase 1 is operational since June 2015.
- **Mokolo Crocodile River (West) Water Augmentation Project (Phase 2A) (MCWAP-2A)**: Transfer water from the Crocodile River (West) to the Steenbokpan and Lephalale areas, including the implementation of the River Management System in the Crocodile River (West) and certain tributaries. Phase 2A is the focus of this Environmental Impact Assessment.

The overall Mokolo Crocodile River (West) Water Augmentation Project Phase 2A consists of the following components:

- Water Transfer Infrastructure - transfer of water from Crocodile River (West) to Lephalale;
- **Borrow Pits** - sourcing of construction material; and
- River Management System - manage abstractions from, and the river flow in, the Crocodile River (West) between Hartbeespoort Dam and Vlieëpoort Weir, the Moretele River from Klipvoor Dam to the confluence with the Crocodile River (West), the stretch of Elands River from Vaalkop Dam to the confluence with the Crocodile River (West) confluence, and also the required flow past Vlieëpoort.

This Scoping Report specifically deals with the Borrow Pits component.

PROJECT LOCATION

The project is located within the western part of the Limpopo Province. The footprint of the borrow pits required for the MCWAP-2A project, are situated within Thabazimbi Local Municipality and Lephalale LM, which fall within the jurisdiction of the Waterberg District Municipality. The proposed borrow pits commence in the south-western point of the project area, from the Vlieëpoort Mountains at BP SS1 situated in the Crocodile River (West). From there, the borrow pits are situated at approximately 5 km intervals in a predominantly northern direction along existing roads, farm boundaries and a railway line until ending near Steenbokpan at the last borrow pit, BP 51.

The surrounding areas to the proposed borrow pits include Thabazimbi, which is situated approximately 10 km to the north-east of the first borrow pit, BP SS1. Lephalale is situated approximately 20 km to the east of the last borrow pit, BP 51.

PROJECT DESCRIPTION

The proposed borrow pits consist of the following:

- Mining areas;
- Topsoil/overburden stockpiles;
- Access/haul roads;
- Mining equipment (screener, delivery vehicles, etc.); and
- Site offices/stores.

The proposed borrow pits are required for the sourcing of suitable material to be utilised during the construction phase of the MCWAP-2A project. 23 borrow pits will be required to source the necessary quantities of material and are located at approximately 5 km intervals along the central pipeline route, in order to limit haul distances and eliminate the need to source material from commercial sources, such as from the towns of Thabazimbi or Lephalale.

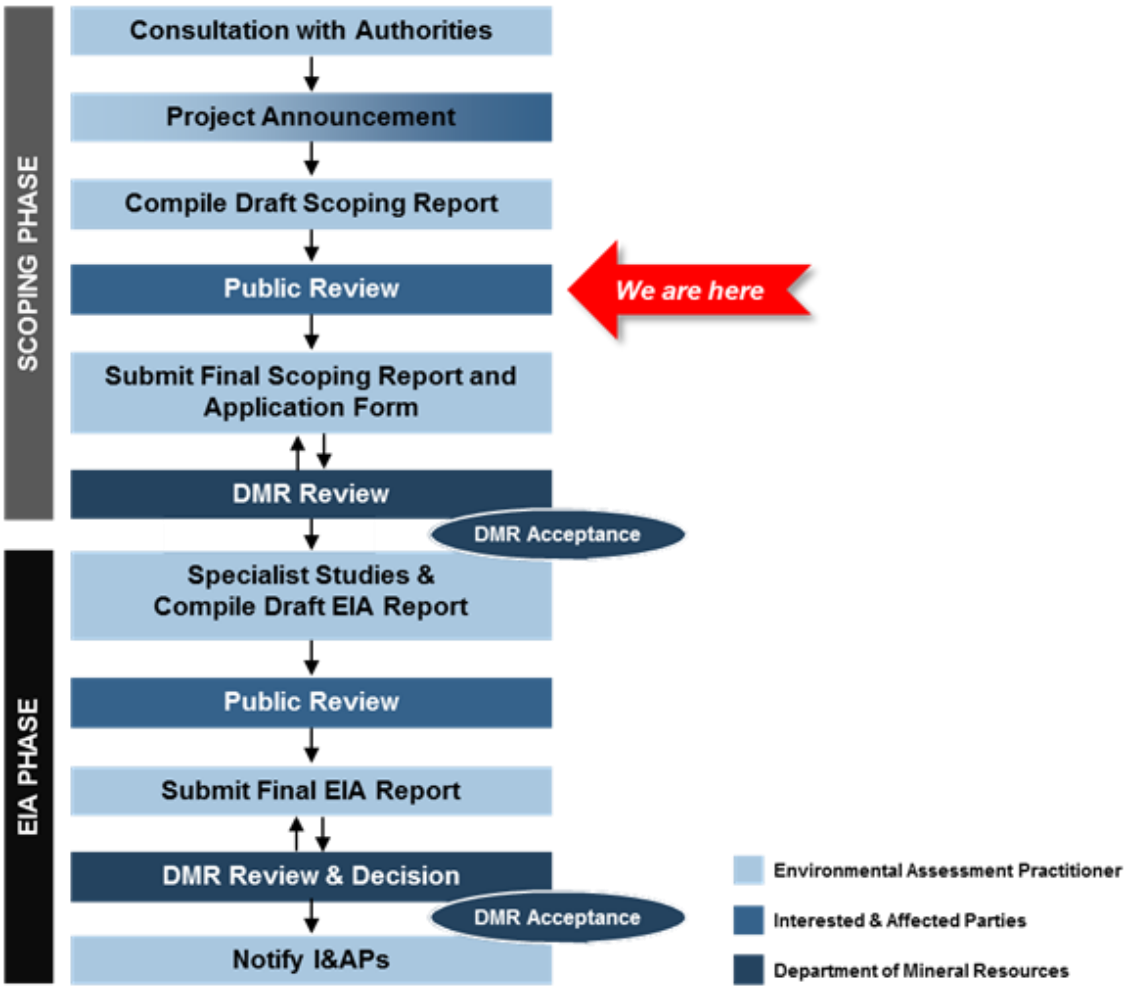
ENVIRONMENTAL STATUTORY FRAMEWORK

The Scoping Report provides and overview of the statutory framework for the proposed Mokolo Crocodile River (West) Water Augmentation Project (Phase 2A) Borrow Pits. The relationship between the proposed project and the key pieces of environmental legislation is also discussed.

SCOPING AND EIA PROCESS

The process for seeking authorisation under the National Environmental Management Act (No. 107 of 1998) is undertaken in accordance with Government Notice No. R. 982 of 4 December 2014 (as amended), promulgated in terms of Chapter 5 of this Act. Based on the types of activities involved the requisite environmental assessment for the project is a Scoping and Environmental Impact Assessment process. An outline of the process is provided in the diagram to follow.

In terms of the National Environmental Management Act (No. 107 of 1998) the lead decision-making authority for the environmental assessment is the Department of Mineral Resources, as the project proponent (Department of Water and Sanitation) is a national department. Nemai Consulting was appointed by the Department of Water and Sanitation and Trans Caledon Tunnel Authority (implementing agent) as the independent Environmental Assessment Practitioner to undertake the environmental assessment for the proposed Mokolo Crocodile River (West) Water Augmentation Project (Phase 2A) Borrow Pits.



Outline of Scoping and Environmental Impact Assessment process

PROFILE OF THE RECEIVING ENVIRONMENT

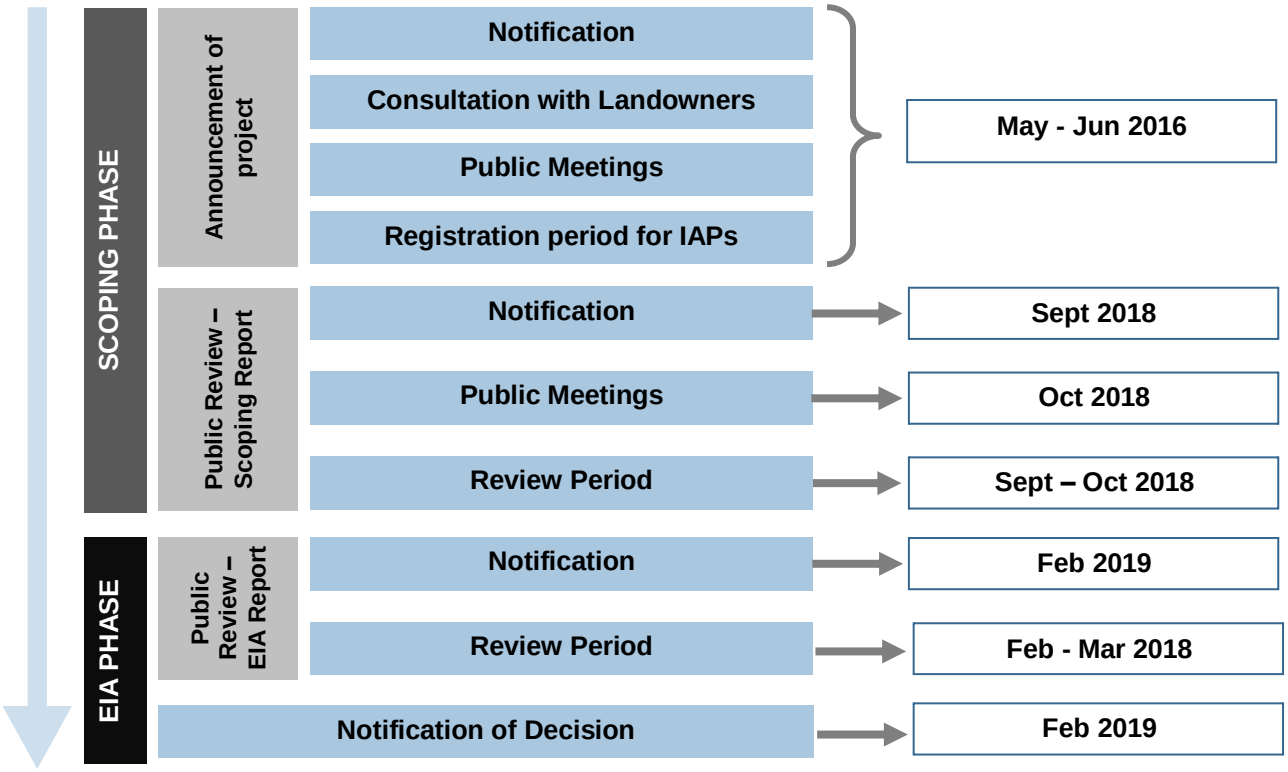
The Scoping Report provides a general description of the status quo of the receiving environment in the project area. This serves to provide the context within which the Scoping exercise was conducted. It also allows for an appreciation of sensitive environmental features and possible receptors of the effects of the proposed project. A brief overview is also provided of the manner in which the environmental features may be affected (positively or negatively) by the proposed project.

The receiving environment is assessed and discussed in terms of the following:

- Land Use and Land Cover
- Climate
- Geology
- Geohydrology
- Soils
- Topography
- Surface Water
- Terrestrial Ecology
- Socio-Economic Environment
- Agriculture
- Air quality
- Noise
- Historical and Cultural Features
- Planning
- Existing Structures and Infrastructure
- Transportation
- Aesthetic Qualities
- Tourism

PUBLIC PARTICIPATION

The diagram to follow outlines the public participation process for the Scoping (current) and Environmental Impact Assessment (pending) phases.



Outline of Public Participation Process

POTENTIALLY SIGNIFICANT ENVIRONMENTAL ISSUES

In accordance with the purpose of the Scoping exercise as part of the overall environmental assessment, the Scoping Report identifies potentially significant environmental issues for further consideration and prioritisation during the Environmental Impact Assessment phase. This allows for a more efficient and focused impact assessment going forward, where the analysis is largely limited to significant issues and reasonable alternatives.

Pertinent environmental issues, which will receive specific attention during the Environmental Impact Assessment phase through a detailed quantitative assessment and relevant specialist and technical studies (where deemed necessary), are discussed in the Scoping Report. A methodology to quantitatively assess the potential impacts is also provided, which will be employed during the Environmental Impact Assessment phase.

PLAN OF STUDY FOR EIA

The Scoping Report is concluded with a Plan of Study, which explains the approach to be adopted to conduct the Environmental Impact Assessment for the proposed project in accordance with the following pertinent tasks and considerations:

- Potentially significant environmental issues identified during the Scoping Phase to be investigated further;
- Feasible alternatives to be assessed during Environmental Impact Assessment Phase;
- Specialist studies to be undertaken, which include –
  1. Aquatic and Wetland Impact Assessment;
  2. Terrestrial Ecological Impact Assessment;
  3. Heritage Impact Assessment;
  4. Agricultural Impact Assessment;
  5. Socio-Economic Impact Assessment;
  6. Wildlife Impact Assessment; and
  7. Consideration of specialist studies conducted for previous Environmental Impact Assessment;
- Public Participation process to be followed;
- Contents of the Environmental Impact Assessment Report; and
- Consultation with Authorities.

BESTUURSOPSOMMING

PROJEK AGTERGROND

Groot ontwikkelings word beplan vir die Waterberg Steenkool velde in die Lephalale area. As 'n direkte gevolg van die voorgenoemde ontwikkelings sal die water aanvraag in die Lephalale area noemenswaardig toeneem in die toekoms. Weens die beperkte beskikbaarheid van water in die Lephalale area het die Departement van Water en Sanitasie die Mokolo en Krokodilrivier (Wes) Wateraanvullingsprojek Uitvoerbaarheid Studie van stapel gestuur om opsies vir die voorsiening in die water behoeftes te ondersoek. Die fases vir die voorgestelde infrastruktuur behels die volgende:

- Mokolo en Krokodilrivier (Wes) Wateraanvullingsprojek (Fase 1): Aanvulling vanaf Mokolodam om aan die groeiende water behoeftes te voldoen vir die interim periode totdat die oordragpyplyne vanaf die Krokodilrivier (Wes) geïmplementeer kan word. Die oplossing moet die volle lewering vanaf Mokolodam oor die langtermyn optimaal benut en sal as 'n stelsel bedryf word tesame met die Mokolo en Krokodilrivier (Wes) Wateraanvullingsprojek Fase 2A. Fase 1 word al bedryf vanaf Junie 2015.
- **Mokolo en Krokodilrivier (Wes) Wateraanvullingsprojek (Fase 2A)**: Oordrag van water vanaf Krokodilrivier (Wes) tot by die Steenbokpan en Lephalale gebiede, insluitend die implementering van die rivierbedryfstelsel in die Krokodilrivier (Wes) en sy sytakke. Fase 2A is die fokus van die Omgewingsimpakbepaling.

Die algehele Mokolo en Krokodilrivier (Wes) Wateraanvullingsprojek (Fase 2A) bestaan uit die volgende komponente:

- Water oordrag infrastruktuur (hoofonderwerp van hierdie Omgewingsimpakbepaling) – oordrag van water van die Krokodilrivier (Wes) na Lephalale;
- **Leengroewe** – verkryging van konstruksiemateriaal; en
- Rivierbedryfstelsel – bestuur ontrekkings vanaf, asook die riviervloei in, die Krokodilrivier (Wes) tussen Hartbeespoortdam en die stuwal by Vlieëpoort, die Moretelerivier vanaf Klipvoordam tot by die samevloei met die Krokodilrivier (Wes), die Elandsrivier vanaf Vaalkopdam tot by die samevloei met die Krokodilrivier (Wes), asook die vereiste vloei verby Vlieëpoort.

Die Omvangsbepalingsverslag handel spesifiek oor die voorgestelde Leengroewe.

PROJEK LIGGING

Die projekgebied is geleë in die westelike gedeelte van die Limpopo-provinsie. Die voorgestelde leengroewe oorkruis die Thabazimbi en Lephalale Plaaslike Munisipaliteite, wat beide in die jurisdiksie van die Waterbergdistriksmunisipaliteit val. Die voorgestelde leengroewe begin in die suid-westelike gedeelte van die projek area, in die Vlieëpoortberge by BP SS1 in die Krokodilrivier (Wes). Van daar af volg die leengroewe in 'n noordelike rigting, teen ongeveer 5km tussenposes langsaan bestaande paaie, plaasgrense en 'n spoorlyn en eindig naby Steenbokpan by die laaste leengroef, BP 51.

Thabazimbi is ongeveer 10 km noord-oos van die eerste voorgestelde leengroef, BP SS1. Lephalale is ongeveer 30 km oos van die laaste voorgestelde leengroef, BP 51.

PROJEKBESKRYWING

Die voorgestelde leengroewe behels die volgende:

- Mynbou area;
- Bogrond/deklaag hope;
- Paaie vir toegang en vervoer van materiaal;
- Mynbou-toerusting; en
- Terreinkantore/werkswinkels.

Die voorgestelde leengroewe word benodig as die bron van geskikte materiaal wat tydens die konstruksiefase van die MCWAP-2A-projek gebruik sal word. 23 leengroewe sal benodig word om die nodige hoeveelheid materiaal te kry, en is ongeveer 5 km langsaan die sentrale pyplynroete geleë om die afstand te beperk en die behoefte aan materiaal uit kommersiële bronne te elimineer, soos van die dorpe Thabazimbi of Lephalale.

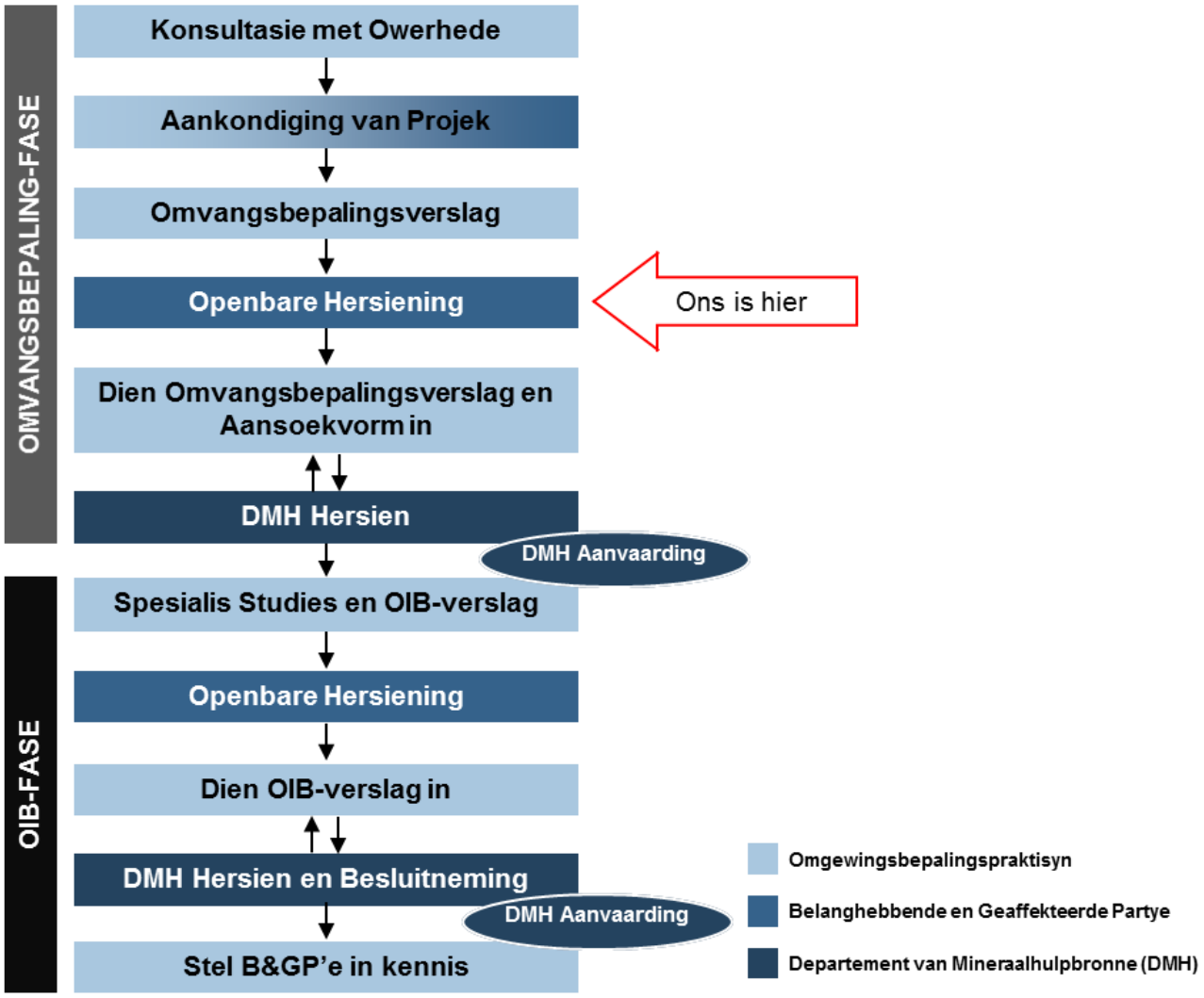
OMGEWINGSREGSRAAMWERK

Die Omwangsbepalingsverslag voorsien 'n oorsig van die omgewingsregsraamwerk vir die voorgestelde Mokolo en Krokodilrivier (Wes) (Fase 2A) Leengroewe. Dit sluit in 'n bespreking van die verhouding tussen die voorgestelde projek en die omgewingswetgewing.

OMVANGSBEPALING EN OMGEWINGSIMPAKBEPALING-PROSES

Die aansoekproses vir magtiging van die Wet op Nasionale Omgewingsbestuur (Wet Nr. 107 van 1998) word onderneem ingevolge die Omgewingsimpakbepalingsregulasies (Goewermentskennisgewing Nr. R. 982 van 4 Desember 2014, soos gewysig). Op grond van die gelyste aktiwiteite wat deur die voorgestelde leengroewe genoodsaak word, sal 'n Omvangsbepaling en Omgewingsimpakbepaling-proses uitgevoer word.

Kragtens die Wet op Nasionale Omgewingsbestuur (Wet Nr. 107 van 1998) is die besluitnemende owerheid die Departement van Mineraalhulpbronne, aangesien die projekvoorsteller (Departement van Water en Sanitasie) 'n nasionale Departement is. Nemai Consulting is deur die Departement van Water en Sanitasie en die Trans-Caledon Tonnel Owerheid (Implementeringsagent) aangestel as die onafhanklike Omgewingsimpakbepalingspraktisyn om die Omgewingsimpakbepaling-proses uit te voer vir die voorgestelde Mokolo en Krokodilrivier (Wes) Wateraanvullingsprojek (Fase 2A): Leengroewe.



Oorsig van Omvangsbepaling en Omgewingsimpakbepaling-proses

OORSIG VAN GEAFFEKTEERDE OMGEWING

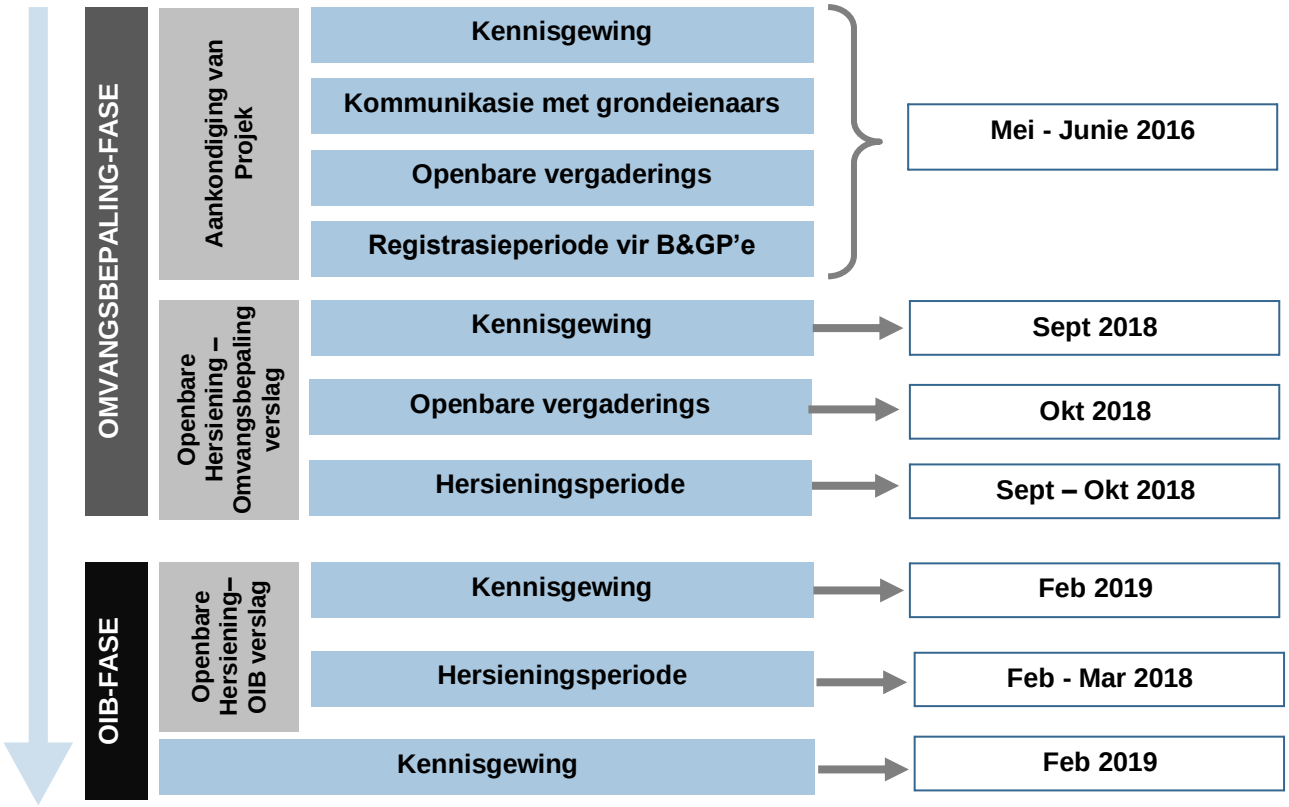
Die Omvangsbepalingsverslag gee 'n algemene beskrywing van die stand van die omgewing in die projek area, wat vir die inagneming van sensitiewe omgewingskenmerke en moontlike geaffekteerde partye van die voorgestelde projek voorsiening maak.

Die moontlike gevolge van die projek op die volgende kenmerke word bespreek op 'n kwalitatiewe vlak:

- Grondgebruik en dekking;
- Klimaat;
- Geologie;
- Geohidrologie;
- Grond;
- Topografie;
- Oppervlak water;
- Fauna en flora;
- Sosio-ekonomiese omgewing;
- Landbou;
- Lug kwaliteit;
- Geraas;
- Historiese en kulturele kenmerke;
- Beplanning;
- Bestaande strukture en infrastruktuur;
- Vervoer;
- Visuele kwaliteit; en
- Toerisme.

OPENBARE DEELNAME

Die gepaargaande diagram voorsien 'n oorsig van die openbare deelname proses vir die Omvangsbepaling en Omgewingsimpakbepaling fases.



Openbare Deelname Proses

MOONTLIKE BEDUIDENDE OMGEWINGSIMPAKTE

Volgens die doel van die Omvangsbepaling word die moontlike betekenisvolle omgewingsimpakte geïdentifiseer vir verdere ondersoek tydens die Omgewingsimpakbepaling-fase. Dit bevorder 'n meer effektiewe impak-assessering wat fokus op beduidende kwessies en uitvoerbare alternatiewe.

Daar sal aandag geskenk sal word aan die pertinente omgewingskwessies tydens die Omgewingsimpakbepaling-fase deur middel van 'n gedetailleerde kwantitatiewe assessering en relevante spesialis en tegniese studies (waar nodig geag).

PLAN VAN STUDIE VIR OMGEWINGSIMPAKBEPALING

Die Omvangsbepalingsverslag sluit in 'n Plan van Studie wat die benadering tot die Omgewingsimpakbepaling verduidelik in terme van die volgende:

- Moontlike betekenisvolle omgewingsimpakte geïdentifiseer tydens die Omvangsbepaling wat verder ondersoek gaan word;
- Uitvoerbare alternatiewe wat geassesseer sal word tydens die Omgewingsimpakbepaling-fase;
- Spesialis-studies wat uitgevoer gaan word -
  1. Terrestriële Ekologiese Impakassessering;

2. Akwatiese en vleiland Impakassessering;
3. Erfenis Impakassessering;
4. Landbou Impakassessering;
5. Sosio-ekonomiese Impakassessering;
6. Wild Impakassessering;
7. Inagneming van spesialis-studies wat uitgevoer was as deel van die vorige Omgewingsimpakbepaling;

- Die Openbare Deelname proses wat gevolg gaan word;
- Inhoud van die Omgewingsimpakbepalingsverslag; en
- Konsultasie met Owerhede.

TABLE OF CONTENTS

IMPORTANT NOTICE 1

OBJECTIVE OF THE SCOPING PROCESS 2

1) The objective of the scoping process is to, through a consultative process 2

SCOPING REPORT 3

2) Contact Person and correspondence address 3

a) Details of: 3

i) The EAP who prepared the report 3

ii) Expertise of the EAP 3

b) Description of the property: 4

c) Locality map 10

d) Description of the scope of the proposed overall activity 11

i) Listed and specified activities 11

ii) Description of the activities to be undertaken 13

e) Policy and Legislative Context 18

f) Need and desirability of the proposed activities 22

g) Period for which the environmental authorisation is required 25

h) Description of the process followed to reach the proposed preferred site 25

i) Details of all alternatives considered 25

ii) Details of the Public Participation Process Followed 26

iii) Summary of issues raised by I&APs 29

iv) The Environmental attributes associated with the sites 31

(1) Baseline Environment 31

(a) Type of environment affected by the proposed activity 31

(b) Description of the current land uses 79

(c) Description of specific environmental features and infrastructure on the site 80

(d) Environmental and current land use map 81

v) Impacts identified (based on desktop screening) 82

vi) Methodology used in determining the significance of environmental impacts 84

vii) The positive and negative impacts on the environment and the community that may be affected 84

viii) The possible mitigation measures that could be applied and the level of risk 84

ix) The outcome of the site selection Matrix, Final Site Layout Plan 84

x) Motivation where no alternative sites were considered 84
xi) Statement motivating the preferred site 84
i) Plan of study for the Environmental Impact Assessment Process 85
i) Description of alternatives to be considered including the option of not going ahead 85
ii) Description of the aspects to be assessed as part of the environmental impact assessment 85
iii) Description of aspects to be assessed by specialists 88
iv) Proposed method of assessing the environmental aspects 97
v) The proposed method of assessing duration significance 97
vi) The stages at which the competent authority will be consulted 99
vii) Particulars of the public participation process regard to the Impact Assessment to be conducted 100
(1) Steps to be taken to notify interested and affected parties 100
(2) Details of the engagement process to be followed 100
(3) Description of the information to be provided to Interested and Affected Parties 102
viii) Description of the tasks that will be undertaken during the environmental impact assessment 102
ix) Measures to avoid, reverse, mitigate, or manage identified impacts 105
j) Other Information required by the competent Authority 107
i) Compliance with the provisions of sections 24(4)(a) and (b) 107
(1) Impact on the socio-economic conditions of any directly affected person 107
(2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act 107
k) Other matters required in terms of sections 24(4)(a) and (b) of the Act 107
l) UNDERTAKING REGARDING CORRECTNESS OF INFORMATION 108
m) UNDERTAKING REGARDING LEVEL OF AGREEMENT 108

LIST OF FIGURES

FIGURE 1: LOCALITY MAP OF PROPOSED BORROW PITS IN RELATION TO MAJOR TOWNS AND ROADS 10
FIGURE 2: MCWAP-2A COMPONENTS 13
FIGURE 3: OUTLINE OF PUBLIC PARTICIPATION PROCESS 26
FIGURE 4: GEOLOGY MAP 34
FIGURE 5: SOIL CLASSES 35
FIGURE 6: CONTOUR MAP (20M INTERVAL) 37
FIGURE 7: BP SS1 SITE BY VLIEËPOORT MOUNTAINS 37
FIGURE 8: LIMPOPO WATER MANAGEMENT AREA 38
FIGURE 9: PERENNIAL AND NON-PERENNIAL MAP 39
FIGURE 10: DIRECTLY AFFECTED WATERCOURSE 40
FIGURE 11: INDICATION OF IRRIGATION AREAS IN THE CROCODILE RIVER (WEST) (DOWNSTREAM OF BP SS1) 41
FIGURE 12: EWR SITES APPLICABLE TO THE STUDY AREA (DWA, 2012A) 43
FIGURE 13: RIPARIAN VEGETATION ALONG THE CROCODILE RIVER (WEST) 46

FIGURE 14: WETLANDS FOUND DOWNSTREAM OF BP SS1 47
FIGURE 15: SAVANNA BIOME 48
FIGURE 16: VEGETATION TYPES 49
FIGURE 17: TERRESTRIAL THREATENED ECOSYSTEMS 51
FIGURE 18: LIMPOPO CONSERVATION PLAN (CBAS AND ESAS) 52
FIGURE 19: PROTECTED AREAS IN PROXIMITY TO THE PROPOSED BORROW PITS 53
FIGURE 20: WATERBERG BIOSPHERE (WATERBERG DM, 213) 54
FIGURE 21: IMPORTANT BIRD AREAS 58
FIGURE 22: DOMINANT ECONOMIC SECTORS IN WATERBERG DM (WATERBERG DM, 213) 59
FIGURE 23: STRUCTURES IMPACTED BY THE CLOSE PROXIMITY OF BORROW PITS (BP 38 AND BP 49) 60
FIGURE 24: LAND CLAIMS IN DISTRICT (WATERBERG DM, 2013) 65
FIGURE 25: AGRICULTURAL PRACTICES ALONGSIDE THE CROCODILE RIVER (WEST) DOWNSTREAM OF BP SS1 66
FIGURE 26: LAND CAPABILITY MAP 67
FIGURE 27: AGRICULTURAL ACTIVITIES AFFECTED BY BP 33 68
FIGURE 28: EXAMPLE OF AN OLD STRUCTURE IN THE STUDY AREA 69
FIGURE 29: PALAEONTOLOGICAL SENSITIVITY MAP (SAHRIS) 70
FIGURE 30: MAJOR TRANSPORTATION NETWORK 71
FIGURE 31: LIMPOPO PROVINCE SDF 73
FIGURE 32: WATERBERG DM SDF 74
FIGURE 33: LEPHALALE LM SDF 75
FIGURE 34: THABAZIMBI LM SDF 76
FIGURE 35: WATERBERG DM EMF 77
FIGURE 36: ROADS, RAILWAY LINES AND TRANSMISSION LINES IN THE STUDY AREA 78
FIGURE 37: CURRENT LAND USE AND LAND COVER 80
FIGURE 38: PRELIMINARY SENSITIVITY MAP (SCOPING PHASE) 81

LIST OF TABLES

TABLE 1: BORROW PITS DESCRIPTION 14
TABLE 2: NEED AND DESIRABILITY OF MCWAP-2A 22
TABLE 3: AVERAGE DAILY MAXIMUM TEMPERATURE (°C) BY MONTH– THABAZIMBI STATION 31
TABLE 4: AVERAGE DAILY MINIMUM TEMPERATURE (°C) BY MONTH– THABAZIMBI STATION 31
TABLE 5: AVERAGE DAILY MAXIMUM TEMPERATURE (°C) BY MONTH– LEPHALALE STATION 32
TABLE 6: AVERAGE DAILY MINIMUM TEMPERATURE (°C) BY MONTH– LEPHALALE STATION 32
TABLE 7: MONTHLY DAILY RAIN (MM) BY MONTH– THABAZIMBI STATION 32
TABLE 8: MONTHLY DAILY RAIN (MM) BY MONTH– LEPHALALE STATION 33
TABLE 9: SUMMARY OF PES, EIS AND REC PER RESOURCE UNIT FOR THE CROCODILE (WEST) (DWA, 2012A) 42
TABLE 10: ALL FISH SPECIES RECORDED IN THE CROCODILE WEST AND MATLABAS CATCHMENTS (RHP, 2008) 44
TABLE 11: DWS WATER QUALITY SITES RELATED TO THE CROCODILE (WEST) EWR SITES (DWA, 2012A) 45
TABLE 12: THREATENED PLANT SPECIES RECORDED IN GRID CELLS 2427AD AND 2427CB 54
TABLE 13: DEFINITIONS OF RED DATA STATUS (RAIMONDO ET AL. 1999) 55
TABLE 14: RED DATA MAMMAL SPECIES RECORDED IN THE GRID CELLS (ADU, 2016) 55
TABLE 15: RED DATA BIRD SPECIES RECORDED IN THE GRID CELLS (ADU, 2016) 57
TABLE 16: GEO TYPE FOR PERSON WEIGHTED (STATISTICS SOUTH AFRICA, 2013) 61
TABLE 17: POPULATION GROUP FOR PERSON WEIGHTED (STATISTICS SOUTH AFRICA, 2013) 61
TABLE 18: GENDER FOR PERSON WEIGHTED (STATISTICS SOUTH AFRICA, 2013) 61
TABLE 19: LANGUAGE FOR PERSON WEIGHTED (STATISTICS SOUTH AFRICA, 2013) 61

TABLE 20: HIGHEST EDUCATIONAL LEVEL (GROUPED) FOR PERSON WEIGHTED (STATISTICS SOUTH AFRICA, 2013) ...62
TABLE 21: OFFICIAL EMPLOYMENT STATUS FOR PERSON WEIGHTED (STATISTICS SOUTH AFRICA, 2013) ...62
TABLE 22: TYPE OF MAIN DWELLING FOR HOUSEHOLD WEIGHTED (STATISTICS SOUTH AFRICA, 2013) ...62
TABLE 23: ANNUAL HOUSEHOLD INCOME FOR HOUSEHOLD WEIGHTED (STATISTICS SOUTH AFRICA, 2013) ...62
TABLE 24: PIPED WATER FOR PERSON WEIGHTED (STATISTICS SOUTH AFRICA, 2013) ...63
TABLE 25: SOURCE OF WATER FOR PERSON WEIGHTED (STATISTICS SOUTH AFRICA, 2013) ...63
TABLE 26: TOILET FACILITIES FOR PERSON WEIGHTED (STATISTICS SOUTH AFRICA, 2013) ...64
TABLE 27: ENERGY OR FUEL FOR COOKING FOR PERSON WEIGHTED (STATISTICS SOUTH AFRICA, 2013) ...64
TABLE 28: ENERGY OR FUEL FOR HEATING FOR PERSON WEIGHTED (STATISTICS SOUTH AFRICA, 2013) ...64
TABLE 29: ENERGY OR FUEL FOR LIGHTING FOR PERSON WEIGHTED (STATISTICS SOUTH AFRICA, 2013) ...64
TABLE 30: REFUSE DISPOSAL FOR PERSON WEIGHTED (STATISTICS SOUTH AFRICA, 2013) ...65
TABLE 31: PALAEONTOLOGY SENSITIVITY INDEX ...69
TABLE 32: LAND COVER IN THE STUDY AREA ...79
TABLE 33: POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACT/ISSUES ...82
TABLE 34: ENVIRONMENTAL ASPECTS TO BE ASSESSED IN EIA PHASE ...85
TABLE 35: IMPACT METHODOLOGY ...98
TABLE 36: RANKING OF OVERALL IMPACT SCORE ...99
TABLE 37: LOCATIONS FOR REVIEW OF DRAFT SCOPING REPORT ...101
TABLE 38: DETAILS OF PUBLIC MEETINGS – DRAFT SCOPING PHASE ...102
TABLE 39: LOCATIONS FOR REVIEW OF DRAFT EIA REPORT ...103

LIST OF APPENDICES

APPENDIX A : CURRICULA VITAE OF PROJECT TEAM

APPENDIX B : LOCALITY MAPS

APPENDIX C : SITE PLAN

APPENDIX D : PUBLIC PARTICIPATION – PROJECT ANNOUNCEMENT PHASE

- APPENDIX D1 : BACKGROUND INFORMATION DOCUMENT
- APPENDIX D2 : PROOF OF ONSITE NOTICES
- APPENDIX D3 : PROOF OF NOTIFICATION TO LANDOWNERS
- APPENDIX D4 : COPIES OF NEWSPAPER ADVERTISEMENTS
- APPENDIX D5 : MINUTES OF MEETINGS
- APPENDIX D6 : IAP DATABASE

APPENDIX E : PUBLIC PARTICIPATION – SCOPING PHASE

APPENDIX F : COMMENTS AND RESPONSES REPORT

APPENDIX G : DMR CORRESPONDANCE

APPENDIX H : DMR APPLICATION FORM

APPENDIX I : COMMENT SHEET

LIST OF ACRONYMS & ABBREVIATIONS

BID	Background Information Document
BP	Borrow Pit
BPR	Break Pressure Reservoir
DEA	Department of Environmental Affairs
DME	Department of Mineral and Energy
DMR	Department of Mineral Resources
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EWR	Ecological Water Requirements
FGD	Flue-Gas Desulphurisation
GIS	Geographical Information System
GN	Government Notice
IAPs	Interested and Affected Parties
IDP	Integrated Development Plan
IPP	Independent Power Producer
IRP	Integrated Resource Plan
LDEDET	Limpopo Department of Economic Development, Environment and Tourism
MAR	Mean Annual Runoff
MCWAP	Mokolo Crocodile (West) Water Augmentation Project
MCWAP-2A	Mokolo Crocodile (West) Water Augmentation Project (Phase 2A)
NEMA	National Environmental Management Act (No. 107 of 1998)
OHS	Occupational Health and Safety
PGDS	Provincial Growth and Development Strategy
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework
SIPs	Strategic Integrated Projects
TCTA	Trans-Caledon Tunnel Authority
ToR	Terms of Reference
WMA	Water Management Area
WRC	Water Research Commission
WWTW	Wastewater Treatment Works

UNITS OF MEASUREMENT

°C	Degrees Celsius
ha	Hectare
km	Kilometre
km²	Square kilometre
kV	Kilovolt
l	Litres
l/s	Litres per second
m	Metre
m³	Cubic metre
m³/a	Cubic metre per annum
mm	Millimetre
Mm³	Million m^3
Mm³/a	Million m^3/a
MVA	Megavolt-ampere
%	Percentage

IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining "will not result in unacceptable pollution, ecological degradation or damage to the environment".

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

OBJECTIVE OF THE SCOPING PROCESS

1) The objective of the scoping process is to, through a consultative process—

(a) identify the relevant policies and legislation relevant to the activity;

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

(c) identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;

(d) identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;

(e) identify the key issues to be addressed in the assessment phase;

(f) agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and

(g) identify suitable measures to avoid, manage, or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

_____

SCOPING REPORT

Water requirements will increase in the Lephalale area due to various planned and anticipated developments associated with the Waterberg coalfields. The Department of Water and Sanitation (DWS) thus commissioned the Proposed Mokolo and Crocodile River (West) Water Augmentation Project (MCWAP) Feasibility Study to investigate the options for meeting the aforementioned water requirements.

Nemai Consulting was appointed by DWS and the Trans-Caledon Tunnel Authority (TCTA) (Implementing Agent) to conduct the Environmental Impact Assessment (EIA) for MCWAP Phase 2A (MCWAP-2A) in terms of Government Notice (GN) No. R. 982 of 04 December 2014 (as amended). This document serves as the **Draft Scoping Report** for the proposed **Borrow Pits**, required for the sourcing of material to be used for the construction of the **MCWAP-2A** project.

2) Contact Person and correspondence address

a) Details of:

i) The EAP who prepared the report

Name of The Practitioner:	Donavan Henning
Tel No:	(011) 781 1730
Fax No:	(011) 781 1731
E-mail address:	DonavanH@nemai.co.za

ii) Expertise of the EAP

(1) **The qualifications of the EAP**

- MSc (River Ecology) from the University of Johannesburg
- Registered Professional Natural Scientist (Pr.Sci.Nat, Reg no: 400108/17)
- Refer to **Appendix A** for CVs of the project team.

(2) **Summary of the EAP's past experience**.

- 17 years experience in Environmental Consulting
- Refer to **Appendix A** for CVs of the project team.

b) Description of the property:

(Based on 2017 cadastral information)

Borrow Pit SS1

Farm Name:	HANNOVER RE/341 KQ; MOOIVALEI RE/342 KQ
Application area (Ha)	0,3
Magisterial district:	THABAZIMBI
Distance and direction from nearest town	8,5 KM NORTH-EAST FROM THABAZIMBI
21 digit Surveyor General Code for each farm portion	T0KQ00000000034100000; T0KQ00000000034200000

Borrow Pit 25

Farm Name:	MECKLENBURG RE/1/310 KQ
Application area (Ha)	14,8
Magisterial district:	THABAZIMBI
Distance and direction from nearest town	14,2 KM SOUTH-EAST FROM THABAZIMBI
21 digit Surveyor General Code for each farm portion	T0KQ00000000031000001

Borrow Pit 30

Farm Name:	KAROOBULT 126 KQ
Application area (Ha)	7,2
Magisterial district:	THABAZIMBI
Distance and direction from nearest town	16,6 KM SOUTH FROM THABAZIMBI
21 digit Surveyor General Code for each farm portion	T0KQ00000000012600000

Borrow Pit 35

Farm Name:	LEEUWBOSCH RE/1/129 KQ
Application area (Ha)	4,3
Magisterial district:	THABAZIMBI
Distance and direction from nearest town	17 KM SOUTH FROM THABAZIMBI
21 digit Surveyor General Code for each farm portion	T0KQ00000000012900001

Borrow Pit 28

Farm Name:	TARANTAALPAN RE/132 KQ
Application area (Ha)	4,6
Magisterial district:	THABAZIMBI
Distance and direction from nearest town	24 KM SOUTH FROM THABAZIMBI
21 digit Surveyor General Code for each farm portion	T0KQ00000000013200000

Borrow Pit 33

Farm Name:	RUIGTEVLEY 5/97 KQ
Application area (Ha)	7,6
Magisterial district:	THABAZIMBI
Distance and direction from nearest town	33 KM SOUTH FROM THABAZIMBI
21 digit Surveyor General Code for each farm portion	T0KQ00000000009700005

Borrow Pit 41

Farm Name:	GROENRIVIER RE/37/95 KQ; MATSULAN RE/98 KQ; KALABASPAN 1/92 KQ
Application area (Ha)	5,3
Magisterial district:	THABAZIMBI
Distance and direction from nearest town	39 KM SOUTH FROM THABAZIMBI
21 digit Surveyor General Code for each farm portion	T0KQ00000000009500037; T0KQ00000000009800000; T0KQ00000000009200001

Borrow Pit 38

Farm Name:	HAARLEM OOST 16/51 KQ
Application area (Ha)	7,0
Magisterial district:	THABAZIMBI
Distance and direction from nearest town	44 KM SOUTH FROM THABAZIMBI
21 digit Surveyor General Code for each farm portion	T0KQ00000000005100016

Borrow Pit 39

Farm Name:	RIETFONTEIN RE/15 KQ; SCHOONWATER 1/14 KQ
Application area (Ha)	4,5
Magisterial district:	THABAZIMBI
Distance and direction from nearest town	49 KM SOUTH FROM THABAZIMBI
21 digit Surveyor General Code for each farm portion	T0KQ00000000001500000; T0KQ00000000001400001

Borrow Pit 42

Farm Name:	INKERMANN RE/819 KQ
Application area (Ha)	3,3
Magisterial district:	THABAZIMBI
Distance and direction from nearest town	63 KM SOUTH FROM THABAZIMBI
21 digit Surveyor General Code for each farm portion	T0KQ00000000081900000

Borrow Pit 44

Farm Name:	DIEPSPRUIT 386 LQ
Application area (Ha)	5,1
Magisterial district:	LEPHALALE
Distance and direction from nearest town	48 KM NORTH-EAST FROM LEPHALALE
21 digit Surveyor General Code for each farm portion	T0LQ00000000038600000

Borrow Pit 43

Farm Name:	ZANDFONTEIN 2/382 LQ
Application area (Ha)	4,3
Magisterial district:	LEPHALALE
Distance and direction from nearest town	46 KM NORTH-EAST FROM LEPHALALE
21 digit Surveyor General Code for each farm portion	T0LQ00000000038200002

Borrow Pit 53

Farm Name:	ROOIPAN 4/357 LQ
Application area (Ha)	2,3
Magisterial district:	LEPHALALE
Distance and direction from nearest town	45 KM EAST FROM LEPHALALE
21 digit Surveyor General Code for each farm portion	T0LQ00000000035700004

Borrow Pit 52

Farm Name:	GROOTLAAGTE RE/354 LQ
Application area (Ha)	7,2
Magisterial district:	LEPHALALE
Distance and direction from nearest town	44 KM EAST FROM LEPHALALE
21 digit Surveyor General Code for each farm portion	T0LQ00000000035400000

Borrow Pit 50

Farm Name:	LELIEFONTEIN 1/672 LQ
Application area (Ha)	4,4
Magisterial district:	LEPHALALE
Distance and direction from nearest town	43 KM EAST FROM LEPHALALE
21 digit Surveyor General Code for each farm portion	T0LQ00000000067200001

Borrow Pit 48

Farm Name:	ZANDHEUVEL 1/356 LQ; ZANDHEUVEL RE/356 LQ
Application area (Ha)	10,7
Magisterial district:	LEPHALALE
Distance and direction from nearest town	44 KM EAST FROM LEPHALALE
21 digit Surveyor General Code for each farm portion	T0LQ00000000035600001; T0LQ00000000035600000

Borrow Pit 49

Farm Name:	SCHULDPADFONTEIN RE/328 LQ
Application area (Ha)	5,2
Magisterial district:	LEPHALALE
Distance and direction from nearest town	44 KM EAST FROM LEPHALALE
21 digit Surveyor General Code for each farm portion	T0LQ00000000032800000

Borrow Pit 15

Farm Name:	VANGPAN 1/294 LQ
Application area (Ha)	3,3
Magisterial district:	LEPHALALE
Distance and direction from nearest town	46 KM EAST FROM LEPHALALE
21 digit Surveyor General Code for each farm portion	T0LQ00000000029400001

Borrow Pit 46

Farm Name:	ZANDBULT 300 LQ
Application area (Ha)	2,5
Magisterial district:	LEPHALALE
Distance and direction from nearest town	40 KM EAST FROM LEPHALALE
21 digit Surveyor General Code for each farm portion	T0LQ00000000030000000

Borrow Pit 59

Farm Name:	PONTES ESTATES 712 LQ
Application area (Ha)	3,0
Magisterial district:	LEPHALALE
Distance and direction from nearest town	34 KM EAST FROM LEPHALALE
21 digit Surveyor General Code for each farm portion	T0LQ00000000071200000

Borrow Pit 13

Farm Name:	PONTES ESTATE 744 LQ
Application area (Ha)	7,7
Magisterial district:	LEPHALALE
Distance and direction from nearest town	28 KM EAST FROM LEPHALALE
21 digit Surveyor General Code for each farm portion	T0LQ00000000074400000

Borrow Pit 14

Farm Name:	VERGULDE HELM 321 LQ
Application area (Ha)	12,6
Magisterial district:	LEPHALALE
Distance and direction from nearest town	24 KM EAST FROM LEPHALALE
21 digit Surveyor General Code for each farm portion	T0LQ00000000032100000

Borrow Pit 51

Farm Name:	NAAUW ONTKOMEN 509 LQ
Application area (Ha)	3,8
Magisterial district:	LEPHALALE
Distance and direction from nearest town	17 KM EAST FROM LEPHALALE
21 digit Surveyor General Code for each farm portion	T0LQ00000000050900000

c) Locality map

(Refer to **Appendix B** for locality maps of each proposed borrow pit and their associated infrastructure**).**

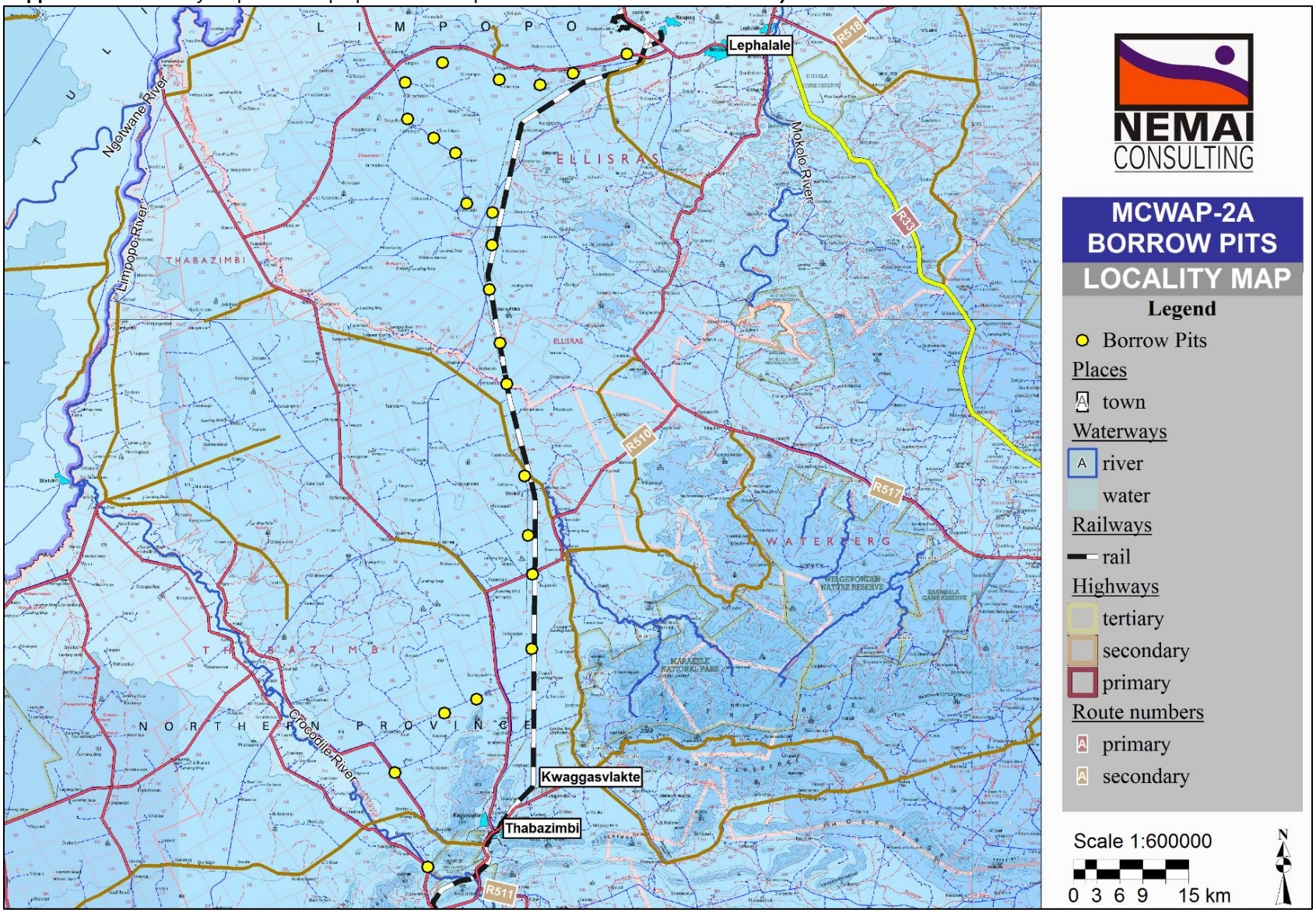


Figure 1: Locality map of proposed borrow pits in relation to major towns and roads

d) Description of the scope of the proposed overall activity

i) Listed and specified activities

Provide a plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site and attach as **Appendix C**

<table>
<tr><th>NAME OF ACTIVITY

(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc…etc…etc
E.g. for mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)</th><th>AERIAL EXTENT OF THE ACTIVITY
Ha or m²</th><th>LISTED ACTIVITY
(Mark with an X where applicable or affected).</th><th>APPLICABLE LISTING NOTICE
(GNR 983, GNR 985 or GNR 985)</th></tr>
<tr><td rowspan="2">Mining - sourcing construction material for borrow areas.

The primary activities related to the mining of suitable construction material include the following:
• Complete detailed geotechnical investigations;
• Complete negotiations with affected landowners;
• Contractor to confirm the mining process and to develop a mining method statement;
• Contractor to develop Mining Plan, which includes the layout of mining activities and features such as fencing, access arrangements, aggregate stockpiles, topsoil stockpiles, container stores, crushing and screening area, office and support facilities, haul roads, overburden placement, etc.;
• Understand site drainage and manage stormwater (e.g. construct sediment holding basins and divert up-slope water around the mining area);
• Construction of access and haul roads;
• Site preparation, including clearing and grubbing;
• Remove and safe storage (temporary stockpiles) of topsoil and remaining</td><td rowspan="2"><table>
<tr><th>Borrow Pit Name</th><th>Borrow Pit Area (ha)*</th><th>Management Area (ha)**</th></tr>
<tr><td>BP 25</td><td>14,8</td><td>17,3</td></tr>
<tr><td>BP 30</td><td>7,2</td><td>8,9</td></tr>
<tr><td>BP 35</td><td>4,3</td><td>5,7</td></tr>
<tr><td>BP 28</td><td>4,6</td><td>6,1</td></tr>
<tr><td>BP 33</td><td>7,6</td><td>9,4</td></tr>
<tr><td>BP 41</td><td>5,3</td><td>6,8</td></tr>
<tr><td>BP 38</td><td>7,0</td><td>8,7</td></tr>
<tr><td>BP 39</td><td>4,5</td><td>6,0</td></tr>
<tr><td>BP 42</td><td>3,3</td><td>4,6</td></tr>
<tr><td>BP 44</td><td>5,1</td><td>6,6</td></tr>
<tr><td>BP 43</td><td>4,3</td><td>5,7</td></tr>
<tr><td>BP 53</td><td>2,3</td><td>3,5</td></tr>
<tr><td>BP 52</td><td>7,2</td><td>8,9</td></tr>
<tr><td>BP 50</td><td>4,4</td><td>5,8</td></tr>
<tr><td>BP 48</td><td>10,7</td><td>12,8</td></tr>
<tr><td>BP 49</td><td>5,2</td><td>6,7</td></tr>
<tr><td>BP 15</td><td>3,3</td><td>4,6</td></tr>
<tr><td>BP 46</td><td>2,5</td><td>3,8</td></tr>
<tr><td>BP 59</td><td>3,0</td><td>4,3</td></tr>
<tr><td>BP 13</td><td>7,7</td><td>9,5</td></tr>
<tr><td>BP 14</td><td>12,6</td><td>14,9</td></tr>
<tr><td>BP 51</td><td>3,8</td><td>5,2</td></tr>
<tr><td>BP SS1</td><td>0,3</td><td>1,3</td></tr>
</table></td><td>Activity No.12(ii)(a)
X</td><td>G.N. R 983</td></tr>
<tr><td>Activity No.14
X</td><td>G.N. R 983</td></tr>
<tr><td></td><td>Activity No.19
X</td><td>G.N. R 983</td></tr>
<tr><td></td><td>Activity No. 24(ii)
X</td><td>G.N. R 983</td></tr>
<tr><td></td><td>Activity No. 27
X</td><td>G.N. R 983</td></tr>
<tr><td></td><td>Activity No. 30
X</td><td>G.N. R 983</td></tr>
<tr><td></td><td>Activity No. 56(ii)
X</td><td>G.N. R 983</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td></td><td></td><td>Activity No. 4
X</td><td>G.N. R 984</td></tr>
<tr><td></td><td></td><td>Activity No. 15
X</td><td>G.N. R 984</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td></td><td></td><td>Activity No.4 (e)(i)(ee)(gg)
X</td><td>G.N. R 985</td></tr>
<tr><td></td><td></td><td>Activity No.10 (e)(i)
X</td><td>G.N. R 985</td></tr>
<tr><td></td><td></td><td>Activity No.12 (e)(ii)
X</td><td>G.N. R 985</td></tr>
<tr><td></td><td></td><td>Activity No.14 (ii)(a)(e)(i)(ff)
X</td><td>G.N. R 985</td></tr>
</table>

NAME OF ACTIVITY **(E.g. For prospecting -** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc** **E.g. for mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	AERIAL EXTENT OF THE ACTIVITY **Ha or m²**	LISTED ACTIVITY (Mark with an **X** where applicable or affected).	APPLICABLE LISTING NOTICE ***(GNR 983, GNR 985 or GNR 985)***
overburden material for post-mining rehabilitation; • Manage borrow pits, including side slopes and floor of mined area; • Process the borrowed material (crushing and screening) for use in earthworks; • Load the borrow material into tipper trucks and haul material to pipeline trench, as well as other areas where the material is required; • Inert and spoil material to be used to old fill borrow area (as necessary); • Post-mining – ▪ Grading of site; ▪ Removal of all facilities associated with mining activities; and ▪ Stabilise, reinstate and rehabilitate borrow areas. The mining equipment to be used includes the following: • Excavators • Bull-dozers, front-end loaders, backactors; • Tipper trucks; • Graders • Water trucks; and • Lowbed truck (transporting machines on and off site).		Activity No.18(e)(i)(ee)(gg) **X**	**G.N. R 985**

ii) Description of the activities to be undertaken

MCWAP-2A Scope:

The overall MCWAP-2A consists of the following components (refer to **Figure 2**):

- Water Transfer Infrastructure (WTI) - transfer of water from the Crocodile River to Lephalale;
- **Borrow Pits** - sourcing of construction material; and
- River Management System - manage abstractions from, and the river flow in, the Crocodile River (West) between Hartbeespoort Dam and Vlieëpoort Weir, the Moretele River from Klipvoor Dam to the confluence with the Crocodile River (West), the stretch of Elands River from Vaalkop Dam to Crocodile confluence, and also the required flow past Vlieëpoort.

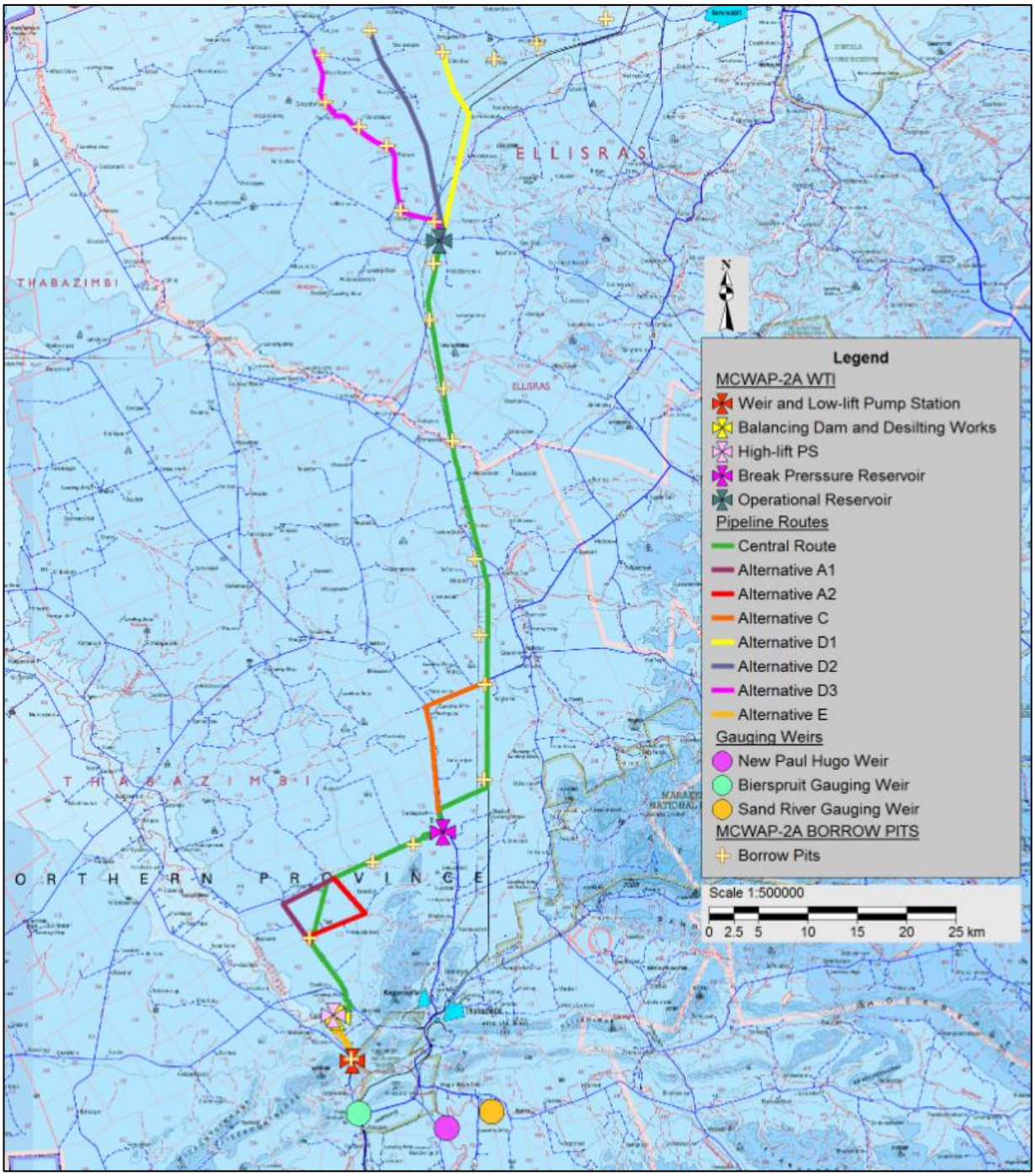


Figure 2: MCWAP-2A Components

The Draft Scoping Report deals specifically with the proposed Borrow Pits (BPs) component, which is required for the sourcing of suitable material to be utilised during the construction phase of the MCWAP-2A. 23 BPs will be required to source the necessary quantities of material and they are located at approximately 5 km intervals along the central pipeline route in order to limit haul distances. The close proximity of the BPs to the pipeline is also to eliminate the need to source material from commercial sources, such as from the towns of Thabazimbi or Lephalale.

Borrow Pits:

The 23 proposed BPs and associated infrastructure (refer to the locality maps contained in **Appendix B**) required for MCWAP-2A are described in the subsections to follow. **Table 1** below provides a description of the 23 proposed BP in terms of the size, volume and depth required.

Table 1: Borrow Pits Description

Name	Borrow Pit Area (ha)	Management Area (ha)**	Volume (m^3)	Average Depth (m)
BP SS1	0,3	1,3	8 000	2,7
BP 25	14,8	17,3	370 000	2,5
BP 30	7,2	8,9	170 000	2,4
BP 35	4,3	5,7	65 000	1,5
BP 28	4,6	6,1	105 000	2,3
BP 33	7,6	9,4	223 500	2,9
BP 41	5,3	6,8	180 000	3,4
BP 38	7,0	8,7	100 000	1,4
BP 39	4,5	6,0	105 000	2,3
BP 42	3,3	4,6	150 000	4,5
BP 44	5,1	6,6	140 000	2,7
BP 43	4,3	5,7	110 000	2,6
BP 53	2,3	3,5	60 000	2,6
BP 52	7,2	8,9	100 000	1,4
BP 50	4,4	5,8	100 000	2,3
BP 48	10,7	12,8	100 000	0,9
BP 49	5,2	6,7	100 000	1,9
BP 15	3,3	4,6	100 000	3,0
BP 46	2,5	3,8	100 000	4,0
BP 59	3,0	4,3	100 000	3,3
BP 13	7,7	9,5	100 000	1,3
BP 14	12,6	14,9	100 000	0,8
BP 51	3,8	5,2	100 000	2,6

** *Management area = the allowance of 10% of Borrow Pit area for topsoil stockpile and 1ha for working space.*

Access Roads:

Access/haul roads will be required to gain access to BPs and the pipeline construction servitude of the MCWAP-2A WTI. The access/haul roads primarily follow existing farm roads or dirt roads, or the sites will be accessed from the pipeline servitude. However, due to the remote location of some BPs, access/haul roads will have to be constructed to allow the transportation of required construction material from the BPs to the necessary construction sites along the pipeline.

Management Area:

The management area (1ha) of all BPs, includes associated mining infrastructure and equipment listed below:

- Topsoil stockpile (10% of the borrow area);
- Screeners (if necessary);
- Site office/store;
- Waste storage facilities (hazardous and general waste); and
- Excavators, dozer, tipper trucks, front-end loader.

Pre-Mining Phase:

The activities associated with the pre-mining phase of the borrow pit (ASPASA, 2013) include amongst others:

- Determine pre-existing drainage patterns and concentration of flow on the potential site;
  - Surface-water flow;
  - Groundwater conditions;
- Site preparation;
  - Construction of access and haul roads,
  - Fencing of borrow pit and associated management area and access/haul road,
- Land Clearing;
- Stripping of topsoil/overburden and temporary stockpiling.

Mining Phase:

Activities associated with the mining phase of the borrow areas, are described below:

- Excavation of required material:
  - The material will be excavated from the borrow area by the use of an excavator in order to remove required volumes of construction material.
- Processing of material (screener):
  - Excavated material will be placed in a screener (if necessary), where the processed material will be stockpiled.
- Stockpiling of material:
  - All material will have demarcated stockpiling sites, to be used during mining operations at the borrow area. Specific stockpiles for overburden and topsoil removed during the pre-mining and mining phase, will be stored separately and used a backfilling during the rehabilitation and closure of the borrow area.
- Transferring of material to tipper trucks:
  - All required material for construction, will be loaded onto haul vehicles (i.e. tipper trucks) by a front end loader, where the material will then be transported to the necessary construction sites within the pipeline servitude.
- Haul roads:
  - Existing farm roads will be used as far as possible to transport required material to the construction sites. Where the borrow area is situated in close proximity to the pipeline

servitude, access will be via the servitude. Dust suppression will be undertaken via a water tanker.

- Stormwater management:
  - Due to the borrow areas falling on relatively flat terrain, ponding of water during summer rainfall events is probable. A stormwater management procedure will thus be required on site. Measures to manage stormwater will be provided in the EMPr.

Post-Mining Phase:

The following activities will occur during the post-mining phase of the borrow areas:

- All fences, infrastructure (site office/store), mining equipment (screener, haul vehicles), and waste/rubble on site will be removed;
- Overburden stockpiles from the mining phase will be used for the filling of old borrow pits; and
- Site stabilisation:
  - Borrow areas will be graded, revegetated and grassed in order to blend with surrounding environment. Hydro-seeding and fertilisation will be applied to the borrow areas.
- Closure of borrow area:
  - A closure plan will also be required for the proposed borrow pits. The closure plan will ensure that the borrow area is rehabilitated, and that after closure of the area, vegetation establishes effectively. Measures for rehabilitation of the borrow areas during closure will be provided in the EMPr.

Resources Required for Pre-mining and Mining Phase:

Water

During the mining stage, water will be required for various purposes, such as washing of plant and equipment in dedicated areas, dust suppression, potable use by construction workers, etc. Water for construction purposes will be sourced directly from watercourses on site and groundwater (boreholes) will also be utilised. Water tankers will also supply water to the site and be used for dust suppression. Water for operational purposes will include domestic supply. All water uses triggered in terms of Section 21 of the NWA will comply with DWS' requirements. Further provisions for water uses will be included in the EMPr, as part of the EIA Report.

Sanitation

Sanitation services will be required for construction labourers in the form of chemical toilets, which will be serviced at regular intervals by the supplier. Conservancy tanks will be provided at the residential labour camps and site offices. Further provisions will be included in the EMPr as part of the EIA Report.

Waste

Solid waste generated during the mining phase will be temporarily stored at suitable locations (e.g. demarcated stockpiles) and will be removed at regular intervals and disposed of at approved waste disposal sites within each of the local municipalities that are affected by the project. All the waste disposed of will be recorded. Based on the Integrated Waste Management Plan for the Thabazimbi LM (2016), the Thabazimbi landfill and the Northam landfill are both licenced. According to the IDP for the Lephalale LM (2016), there is a permitted landfill within the municipality. All storage of general or hazardous waste in a waste storage facility (e.g. onsite waste containers, skips) will comply with

the national norms and standards (GN R. 926 of 29 November 2013). The waste storage facility will be established at the camp where waste from site will be collected, sorted, weighed and placed in skips and recycling containers for removal to service providers and appropriate registered landfill sites (hazardous and general sites, as required). Wastewater, which refers to any water adversely affected in quality through mining-related activities and human influence, will include the following:

- Sewage;
- Water used for washing purposes (e.g. equipment, staff); and
- Drainage over contaminated areas (e.g. cement batching / mixing areas, workshop, equipment storage areas).

All wastewater discharges will comply with legal requirements associated with the NWA, including the General Authorisation that specifically deals with Section 21(f) and Section 21(g) water uses. Suitable measures will be implemented to manage all wastewater generated during the mining phase. Further provisions for the handling of waste, will be included in the EMPr as part of the EIA Report.

Roads

Temporary access and haul roads will need to be constructed for the mining phase of the borrow pits which are remote with no existing roads. Where the borrow pits fall next to the MCWAP-2A pipeline servitude or have existing dirt or farm roads, those roads will be used as far as possible.

Fencing

All the proposed borrow areas, and associated access/haul roads will be temporarily fenced off until the project is complete, and the sites have been completely rehabilitated.

Electricity

The power requirements during the pre-mining and mining phases of the project, will be sourced from the proposed substation and transformer yard which all MCWAP-2A power requirements will be serviced from. Eskom will submit a separate application to DEA to seek approval for the bulk power required for MCWAP-2A. Other sources of electricity on site will be in the form of generators.

Associated Facilities

It is anticipated that provision will be made for the following facilities within the management area of the borrow pits:

- Site offices;
- Workshops and stores;
- Demarcated topsoil, sand and crushed stone stockpile areas;
- Areas for the handling of hazardous substances;
- An explosives storage magazine;
- Wash bays for machinery and vehicles; and
- Ablution facilities.

Labour

The appointed Contractor will make use of skilled labour where necessary. In those instances where casual labour is required, DWS will request that such persons are sourced from local communities within each affected municipality, as far as possible.

e) Policy and Legislative Context

LEGISLATION	REFERENCE WHERE APPLIED
Constitution of the Republic of South Africa, (No. 108 of 1996) • Chapter 2 – Bill of Rights. • Everyone has the right: o to an environment that is not harmful to their health or well-being; and o to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that i. prevent pollution and ecological degradation; ii. promote conservation; and iii. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social • Section 24 – Environmental Rights.	The EIA Process for the proposed BPs focusses on the minimisation of environmental impacts resulting from the pre-mining, mining and closure phases of the proposed project, in order to fulfil the requirements stipulated in Section 24 of the Constitution.
National Environmental Management Act (NEMA) (No. 107 of 1998) • Section 24 – Environmental Authorisation (control of activities which may have a detrimental effect on the environment). • Section 28 – Duty of care and remediation of environmental damage. • Environmental management principles. • Authorities – Department of Mineral Resources (DMR) due to proposed mining activities.	An application and EIA Process for Environmental Authorisation (EA) is being undertaken in terms of Section 24 of NEMA. Environmental management principles were also used as guidelines for the impact assessment.
GN No. R 982 of 4 December 2014, as amended • Purpose - regulate the procedure and criteria as contemplated in Chapter 5 of NEMA relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for environmental authorisations for the commencement of activities, subjected to EIA, in order to avoid or mitigate detrimental impacts on the environment, and to optimise positive environmental impacts, and for matters pertaining thereto.	A Scoping and EIA Process is required in terms of the 2014 EIA Regulations, as amended, GNR 982 to 985. This report forms part of the scoping phase of the EIA Process currently being undertaken.
GN No. R. 983 of 4 December 2014, as amended (Listing Notice 1) • Purpose - identify activities that would require environmental authorisations prior to commencement of that activity and to identify competent authorities in terms of sections 24(2) and 24D of NEMA. • The investigation, assessment and communication of potential impact of activities must follow a Basic Assessment Process, as prescribed in regulations 19 and 20 of GN No. R 982 of 4 December 2014. However,	

LEGISLATION	REFERENCE WHERE APPLIED
according to Regulation 15(3) of GN No. R 982, S&EIR must be applied to an application if the application is for two or more activities as part of the same development for which S&EIR must already be applied in respect of any of the activities.	
GN No. R. 984 of 4 December 2014, as amended (Listing Notice 2) • Purpose - identify activities that would require environmental authorisations prior to commencement of that activity and to identify competent authorities in terms of sections 24(2) and 24D of NEMA. • The investigation, assessment and communication of potential impact of activities must follow a Scoping and EIA Process, as prescribed in regulations 21 - 24 of GN No. R 982 of 4 December 2014.	
GN No. R. 985 of 4 December 2014, as amended (Listing Notice 3) • Purpose - list activities and identify competent authorities under sections 24(2), 24(5) and 24D of NEMA, where environmental authorisation is required prior to commencement of that activity in specific identified geographical areas only. • The investigation, assessment and communication of potential impact of activities must follow a Basic Assessment Process, as prescribed in regulations 19 and 20 of GN No. R 982 of 4 December 2014. However, according to Regulation 15(3) of GN No. R 982, S&EIR must be applied to an application if the application is for two or more activities as part of the same development for which S&EIR must already be applied in respect of any of the activities.	
National Water Act (Act No. 36 of 1998) • Chapter 3 – Protection of water resources. • Section 19 – Prevention and remedying effects of pollution. • Section 20 – Control of emergency incidents. • Chapter 4 – Water use. • Authority – Department of Water and Sanitation (DWS).	The proposed BP SS1 falls within a watercourse/500m from a wetland (Crocodile River West) therefore a Water Use Licence will be required for Sections 21 (c) and (i) water uses.
National Environmental Management Air Quality Act (Act No. 39 of 2004) • Air quality management • Section 32 – Dust control. • Section 34 – Noise control. • Authority – Department of Environmental Affairs (DEA).	The principles and measures provided in Section 23 and 34 of NEMA:QA, will be incorporated into the EMPr in order to manage and minimise dust and noise activities generated by the pre-mining and mining phases of the project.
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) • Management and conservation of the country's biodiversity. • Protection of species and ecosystems.	All threatened terrestrial ecosystems were consulted at a desktop level in order to assess the possible impacts and baseline

LEGISLATION	REFERENCE WHERE APPLIED
• Authority – DEA.	conditions of project area. Due to the proposed borrow pits requiring clearance of vegetation, a terrestrial ecological impact assessment will be required in order to confirm the status of fauna and flora and indigenous vegetation on-site.
National Environmental Management: Protected Areas Act (Act No. 57 of 2003) • Protection and conservation of ecologically viable areas representative of South Africa's biological diversity and natural landscapes.	This Act was considered when completing the desktop baseline environmental screening for protected areas/reserves in the study area. No proposed borrow pits are situated within any identified protected areas in the study area.
National Environmental Management: Waste Act (Act No. 59 of 2008) • Chapter 5 – licensing requirements for listed waste activities - GN No. R. 921 of 29 November 2013. • Authority – Minister (DEA) or MEC (provincial authority).	No waste licence is required, however the Environmental Management Programme (EMPr) will make suitable provisions for waste management, including the storage, handling and disposal of general and hazardous waste;
National Forests Act (No. 84 of 1998) • Section 15 – Authorisation required for impacts to protected trees. • Authority – Department of Agriculture, Forestry and Fisheries (DAFF).	Depending on the findings of the terrestrial ecological impact assessment, if protected trees occur on site, then the principles provided in this Act, and mitigation measures stipulated in the terrestrial study will be incorporated in the EMPr, in order to ensure the protection of protected trees on site during the pre-mining and mining phase.
Minerals and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA) • The MPRDA makes provision for equitable access to and sustainable development of the nation's mineral and petroleum resources. The recent amendment MPRDA resulted in changes to align specific environmental legislation associated with mining activities and aligned sections of NEMA and MPRDA to provide for one environmental management system. • Approval of all 23 proposed borrow pits and associated infrastructure. • Authority – DMR.	DWS is exempted from applying for a Mining Right, however is not exempted from applying for an EA, as confirmed in the DMR pre-application meeting. An application has therefore been lodged for EA in terms of the NEMA, in respect of listed activities that have been triggered by applications in terms of the MPRDA (as amended).
Occupational Health & Safety Act (Act No. 85 of 1993) • Provisions for Occupational Health & Safety. • Authority – Department of Labour.	Principles provided in this Act will be incorporated in the EMPr during the EIA phase, in order to manage activities that can impact health and safety on-site.
National Heritage Resources Act (Act No. 25 of 1999) • Section 34 – protection of structure older than 60 years. • Section 35 – protection of heritage resources.	The proposed development exceeds 5000 m^2 in extent and thus a Heritage Impact Assessment will be required. All principles

LEGISLATION	REFERENCE WHERE APPLIED
• Section 36 – protection of graves and burial grounds. • Section 38 – Heritage Impact Assessment for linear development exceeding 300 m in length; development exceeding 5 000 m^2 in extent, etc. • Authority – Limpopo Provincial Heritage Resources Authority (LIHRA); and South African Heritage Resources Agency (SAHRA)	regarding the protection of heritage resources will be applied in the EMPr during the EIA phase. Should the proposed project impact on any heritage resources, an application to LIHRA/SAHRA will be required to obtain the necessary permits.
National Road Traffic Act (Act No. 93 of 1996) • Authority – Limpopo Department of Public Works, Roads and Infrastructure.	Access roads might require the use of existing road servitudes.
GUIDELINES	
• Integrated Environmental Management Information Series, in particular Series 2 – Scoping (DEAT, 2002); • Guideline on Alternatives, EIA Guideline and Information Document Series (DEA&DP, 2010a); • Guideline on Need and Desirability, EIA Guideline and Information Document Series (DEA&DP, 2010b); • Integrated Environmental Management Guideline Series 5: Companion to the EIA Regulations 2010 (DEA, 2010a); • Integrated Environmental Management Guideline Series 7: Public Participation in the EIA Process (DEA, 2010b); and • Guidelines for Involving Specialists in the EIA Processes Series (Brownlie, 2005).	All guidelines were considered when compiling need and desirability of proposed project (Section f) and the EIA Plan of Study in order to identify the need for specialist studies. The guidelines were used in identifying the necessary public participation process required for the proposed project.
NATIONAL AND REGIONAL PLANS	
• Municipal Spatial Development Frameworks (SDFs) (where available); • Municipal Integrated Development Plans (IDPs); • Relevant national, provincial, district and local policies, strategies, plans and programmes; • Environmental Management Framework (EMF) for the Waterberg District Municipality (2010); • Limpopo Provincial Conservation Plan version 2, September 2013; • Limpopo Environmental Management Act (Act 7 of 2003) • Limpopo Provincial Growth and Development Strategy (PGDS); • Department of Energy's Integrated Resource Plan (IRP) 2010-30; • Lephalale LM Water Services Development Plan (WSDP); and • Crocodile River (West) Water Supply System Reconciliation Strategy.	All national and regional plans were considered when completing the baseline environmental, physical, socio-economic and existing infrastructure conditions, as well as providing input in the impact assessment.

f) Need and desirability of the proposed activities

The format contained in the Guideline on Need and Desirability (Department of Environmental Affairs, 2017) was used for **Table 2**. Need (time) and desirability (place) relates to, amongst others, the nature, scale and location of development being proposed, as well as the wise use of land.

Table 2: Need and Desirability of MCWAP-2A

No.	Question	Response
NEED ('timing')		
1.	Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved Spatial Development Framework (SDF) agreed to by the relevant environmental authority? (i.e. is the proposed development in line with the projects and programmes identified as priorities within the IDP).	The IDP for the Lephalale LM (2016) acknowledges the need for MCWAP and specifically states the following: "*It is imperative to note that the outcome of the MCWAP project need to be implemented to address expected water shortages before any development in node area 1 will be viable, as currently the area does not have sufficient water resources to sustain any new development*". MCWAP-2A is also included as one of the strategic projects in terms of Key Performance Area 2: Basic Services and Infrastructure investment. It is noted that Thabazimbi LM's water supply is from Magalies Water. According to the spatial vision presented in the IDP for the Thabazimbi LM (2017), the proposed footprint of MCWAP-2A falls primarily within the activity and government corridor, which extends northwards from the town of Thabazimbi (similar to Zone 11 of the Waterberg DM EMF).
2.	Should development, or if applicable, expansion of the town/area concerned in terms of this land use (associated with the activity being applied for) occur here at this point in time?	• The timing of the project is driven by the water demands associated with the development of the Waterberg Coalfields, where the water users include power generation, coal mining to support power generation, other industrial / mining activities and urban use by the Lephalale LM. • Several possible weir sites along the Crocodile River (West) were evaluated for suitability with respect to topography, access, founding conditions and river morphology. This led to the selection of two possible sites, namely the Vlieëpoort Upper Site and the Boschkop Lower Site. The choice of the final abstraction point was largely determined by the extent of river losses and additional costs associated with river management actions, as well as the need for and benefit of implementing a phased approach to deliver water to the end users. • To minimise impacts, the proposed pipeline route attempts to remain alongside existing linear-type infrastructure, such as roads (main roads and dirt roads), the railway line (i.e. section of approximately 56km), transmission lines, industrial corridors and farm boundaries where the environment is regarded as less sensitive.

No.	Question	Response
3.	Does the community/area need the activity and the associated land use concerned (is it a societal priority)? This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate)	• MCWAP-2A features prominently on SIP 1, which aims to unlock SA's northern mineral belt in one of the poorest provinces (Limpopo). • The assurance of water supply to the current power stations near Lephalale is not acceptable and places the country's power supply at risk. • The concerns raised by IAPs with regards to the proposed project primarily fall into the following categories: • Concerns related to the footprint of the physical infrastructure and associated impacts to land use as well as existing structures and infrastructure; • Concerns related to water availability in the Crocodile River (West); and • Concerns related to the cumulative impacts associated with the various developments that are linked to the Waterberg Coalfields.
4.	Are the necessary services with appropriate capacity currently available (at the time of application), or must additional capacity be created to cater for the development?	• Water for construction purposes will be sourced directly from watercourses on site and groundwater (boreholes) will also be utilised. Water tankers will also supply water to the site. Water for operational purposes will include domestic supply to the operational control centre. All water uses triggered in terms of Section 21 of the NWA will comply with DWS' requirements; • Conservancy tanks will be provided at the residential labour camps and site offices. Ablution facilities will also be provided as part of the permanent infrastructure for the operational control centre. The locations of the tanks will be selected to minimise environmental impacts. The tanks will be properly maintained by the operator; • Solid waste generated during the construction phase will be temporarily stored at suitable locations (e.g. at construction camps) and will be removed at regular intervals and disposed of at approved waste disposal sites within each of the local municipalities that are affected by the project. All the waste disposed of will be recorded; • All wastewater discharges will comply with legal requirements associated with the NWA, including the General Authorisation that specifically deals with Section 21(f) and Section 21(g) water uses. Suitable measures will be implemented to manage all wastewater generated during the construction period. • Eskom has confirmed that the proposed MCWAP-2A substation can be accommodated into the network without any capacity constraints. The proposed substation will be supplied from the new planned Thabatshipi – Thabazimbi Combined 132kV Power Line. A separate application will be submitted by Eskom to seek approval for the bulk power required for MCWAP-2A.

No.	Question	Response
5.	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 services)?	The project aims to supply bulk water to a number of strategic end users. The Lephalale LM, as one of the intended water users, will need to ensure that it is able to optimally utilise this water as part of infrastructure planning. See the response in item no. 1 above in terms of the reference to MCWAP-2A contained in the IDP for the Lephalale LM.
6.	Is this project part of a national programme to address an issue of national concern or importance?	MCWAP-2A features prominently on SIP 1, which aims to unlock SA's northern mineral belt in one of the poorest provinces (Limpopo).
DESIRABILITY ('placing')		
7.	Is the development the best practicable environmental option (BPEO) for this land/site?	Geotechnical investigations (Mokolo Crocodile Consultants, 2012) confirmed the locations of the required borrow pits with the use of an on-site test pit investigation. The proposed sites were identified for suitability of material and provide the required volumes that would have to be excavated and used as construction material for MCWAP-2A. The environmental sensitivities that occur on site will be assessed by specialist investigations, and will be evaluated in the EIA phase
8.	Would the approval of this application compromise the integrity of the existing approved municipal IDP and SDF as agreed to by the relevant authorities?	It is not anticipated that the proposed project will contradict or be in conflict with the municipal IDPs and SDFs (refer to response provided above to item no. 1).
9.	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?	In terms of the EMF for the Waterberg DM (Environomics & NRM Consulting, 2010b), the project falls within the following Environmental Management Zones: Zone 4: Game and cattle farming (including hunting) areas with commercial focus; Zone 5: Mining and industrial development focus areas; Zone 6: Restricted mining focus areas in aesthetic and/or ecological resource areas; and Zone 11: Major infrastructure corridors. It is noted that Zone 11 facilitates the routing of bulk infrastructure, such as the pipeline associated with MCWAP-2A.
10.	Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context).	All proposed borrow pits fall in close proximity to the MCWAP-2A pipeline servitude, in order to minimise the need for new access/haul roads. Most borrow pits fall on fallow/grazing land. Specialist studies will further investigate the location based on sensitive environmental features and receptors.
11.	How will the activity or the land use associated with the activity applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?	Refer to the significant environmental impacts and issues associated with the proposed project, contained in Section h (v).
12.	How will the development impact on people's health and wellbeing (e.g. in terms of noise, odours, visual character and sense of place, etc.)?	Refer to Section h (iv) (1) for a status quo environmental features within the project areas, as well as a description of the environmental sensitivities and land use on site. Refer to the sensitivity map in Section h (iv) (c).

No.	Question	Response
13	Will the proposed activity or the land use associated with the activity applied for, result in unacceptable opportunity costs?	The affected land is rural in nature and primarily used for agricultural and game farming purposes. Opportunity costs, which are associated with the net benefits forgone for the development alternative, will be considered in the Socio-economic and Agricultural Impact Assessment during the EIA phase.
14	Will the proposed land use result in unacceptable cumulative impacts?	All cumulative impacts that occur from the proposed project, will be evaluated in the impact assessment in the EIA Phase.

g) Period for which the environmental authorisation is required

The indicative implementation dates for the construction phase of MCWAP-2A are as follows:

(i) Commencement of construction : Fourth Quarter 2019
(ii) Construction duration : 42 months
(iii) Commissioning : Third Quarter 2023
(iv) Site Closure & Rehabilitation : Fourth Quarter 2025

h) Description of the process followed to reach the proposed preferred site

i) Details of all alternatives considered

(a) The property on which or location where it is proposed to undertake the activity;
(b) The type of activity to be undertaken;
(c) The design or layout of the activity;
(d) The technology to be used in the activity;
(e) The operational aspects of the activity; and

No alternatives have been assessed for the proposed BPs, as previous geotechnical investigations (Mokolo Crocodile Consultants, 2012) confirmed the location and layout of the required BPs with the use of an on-site test pit investigations. The proposed sites were identified for suitability of material and provide the required volumes that would have to be excavated and used as construction material for MCWAP-2A. The proposed BP sites can be altered where technically feasible in order to accommodate landowner requirements/input or to avoid sensitive environmental features identified during specialist investigations in the EIA phase.

(f) The option of not implementing the activity

As MCWAP-2A cannot proceed without the proposed BPs, the 'no-go' option will be the same as for the Water Transfer Infrastructure (WTI) component, which will have the following implications:

- If no material is sourced for construction, then no required MCWAP-2A infrastructure can be constructed. If no construction occurs, then the development of new power stations, which is of high strategic importance, cannot proceed. Without a suitable source of water, the new power stations will not be possible, with potential future energy shortages;

- Without BPs, there will be no construction of the water pipeline. This causes the absence of water which will ultimately suppress development, with associated socio-economic implications on a national scale; and
- Without MCWAP-2A, Eskom will not be able to implement the Flue-Gas Desulphurisation (FGD) technology at the Medupi Power Station to reduce sulphur emissions, which will violate the related condition in Eskom's World Bank loan. In addition, Eskom will be disallowed to generate any electricity from Medupi, endangering the RSA economy.

In contrast, should the proposed MCWAP-2A and the required borrow pits not go ahead, any potentially significant environmental issues associated with the project would be irrelevant and the status quo of the local receiving environment would not be affected by the borrow pits. The objectives of the project would, however, not be met.

ii) Details of the Public Participation Process Followed

The purpose of public participation includes:

1. Providing IAPs with an opportunity to obtain information about the project;
2. Allowing IAPs to express their views, issues and concerns with regard to the project;
3. Granting IAPs an opportunity to recommend measures to avoid or reduce adverse impacts and enhance positive impacts associated with the project; and
4. Enabling DWS, TCTA and the project team to incorporate the needs, concerns and recommendations of IAPs into the project, where feasible.

The public participation process that was followed for the proposed MCWAP-2A BPs is governed by NEMA and GN No. R 982 of 4 December 2014 (as amended). **Figure 3** outlines the public participation process for the Scoping Phase (current) and EIA phase. Note that the dates may change due to the dynamic nature of the EIA process.

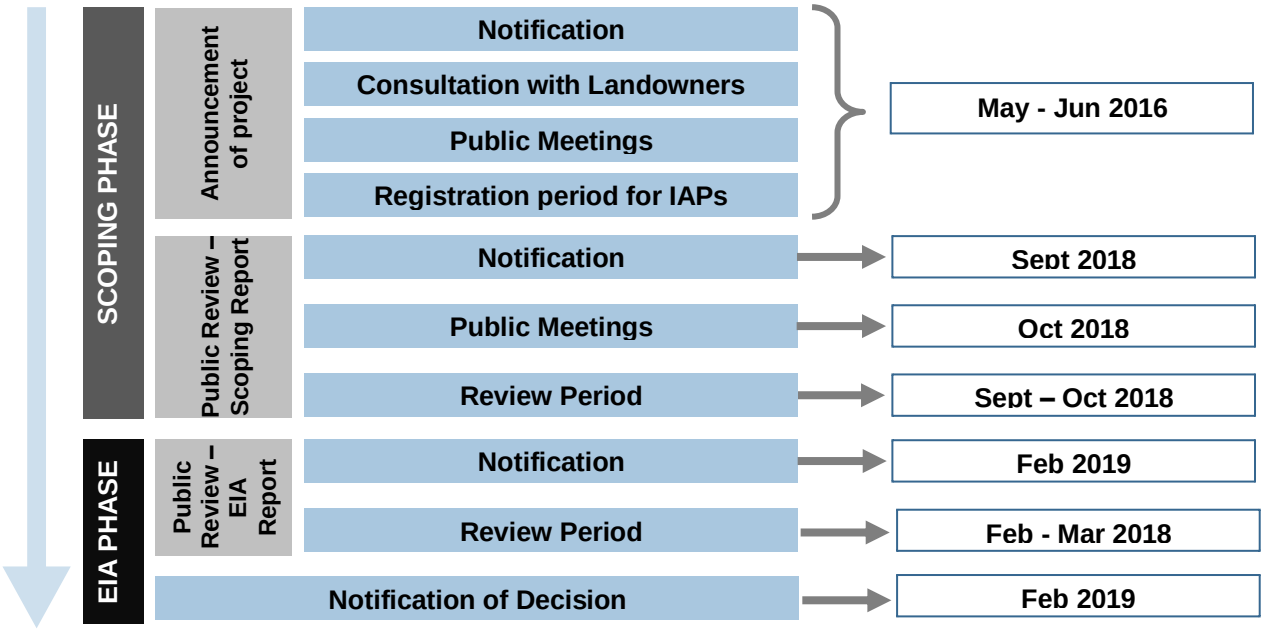


Figure 3: Outline of Public Participation Process

The Public Participation Process for MCWAP-2A BPs will consist of the following three phases:

1. Announcement Phase;
2. Scoping Phase; and
3. EIA Phase.

As part of the project announcement phase for the MCWAP-2A EIA Process, the following tasks were undertaken (**Appendix D**):

1. Compiled a database of potential Interested and Affected Parties (IAPs), which included –

a. Landowners, occupiers and/or persons in control of land affected by or adjacent to the footprint of the project's physical infrastructure;
b. Organs of state having jurisdiction in respect of any aspect of the activity;
c. The municipality which has jurisdiction in the area (Waterberg District Municipality, Thabazimbi Local Municipality and Lephalale Local Municipality);
d. The municipal councillors of the wards in which the project footprint site is situated;
e. Ratepayers Associations (as relevant);
f. Custodians of infrastructure that will be affected by the project components (including inter alia Eskom and Transnet);
g. Formal agricultural groups,
h. Specific interest groups (e.g. environmental, socio-economic; education); and
i. Other.

2. Placed legal notices in the following newspapers –

a. Beeld (Afrikaans; regional);
b. The Star (English; regional);
c. The Daily Sun (English; regional);
d. Die Kwêvoël (Afrikaans, local); and
e. Mogol Pos (English; local).

3. Distributed a Background Information Document (BID) and Reply Form to all IAPs identified and included in the project database.

4. Erected onsite notices (reflecting English and, Afrikaans) at various locations along the project footprint. The sites were chosen to be conspicuous to and accessible by the public at the boundary or along the project components.

5. Placed public notices at the following locations -

a. Thabazimbi Municipal Office;
b. Thabazimbi Library;
c. Agri-SA Ellisras;
d. Steenbokpan Shop;
e. Koedoeskop Shop; and
f. Sentrum Agricultural Union Auctioning Kraals.

6. Notified IAPs via bulk SMS.

7. Notified directly affected landowners and adjacent properties (refer to Notification Letter, emails and registered mail contained in Appendix D3)

8. Convened the following public meetings in:

a. Thabazimbi;
b. Lephalale; and
c. Steenbokpan

9. Convened an Environmental Authorities meeting.

10. Maintain a Comments and Responses Report (CRR).

Public Participation tasks during the Scoping Phase for the MCWAP-2A BP included the following (proof to be included in the Final Scoping Report):

1. The Draft Scoping Report was placed in the public domain (including an electronic copy on the project website and hardcopies at public venues such as Thabazimbi, Lephalale and Marapong Public Libraries);
2. Notification of IAPs of review of draft Scoping Report (Emails, SMS, On site notices, Newspaper adverts);
3. Public Meetings and Environmental Authorities Meeting will be held in order to present the Draft Scoping Report; and
4. The Comments and Response Report will be updated based on all comments received during the review period of the Draft Scoping Report (all comments received from IAPs and an updated CRR will be included in the Final Scoping Report, which will be submitted to DMR for review).

Public Participation tasks during the EIA Phase for the MCWAP-2A BP will include the following (but not limited to):

1. Lodge the draft Environmental Impact Assessment Report (EIAR) in the public domain;
2. Notify all registered IAPs and Commenting Authorities of the 30-day review period of the Draft EIAR;
3. Update Comments and Response Report based on all comments received during the review period of the Draft EIAR;
4. Notify all registered IAPs and Commenting Authorities of DMR's decision; and
5. Notify all registered IAPs and Commenting Authorities of the Appeal Process.

iii)Summary of issues raised by I&APs

Please note that all comments received from Interested and Affected Parties (IAP) will be included in the Final Scoping Report (FSR), as the 30-day public review period process only commenced after the submission of this Draft Scoping Report. All relevant comments and issues raised by IAPs, will be included in the FSR which will be submitted to the DMR for review. .

Interested and Affected Parties **List the names of persons consulted in this column, and** **Mark with an X where those who must be consulted were in fact consulted.**		**Date Comments Received**	**Issues raised**	**EAPs response to issues as mandated by the applicant**	**Consultation Status (consensus dispute, not finalised,etc)**
AFFECTED PARTIES					
Landowner/s	**X**				
Lawful occupier/s of the land					
Landowners or lawful occupiers on adjacent properties	**X**				
Municipal councillor	**X**				
Municipality	**X**				
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e					

Communities					
Dept. Land Affairs					
Traditional Leaders					
Dept. Environmental Affairs					
Other Competent Authorities affected					
OTHER AFFECTED PARTIES					
INTERESTED PARTIES					

iv) The Environmental attributes associated with the sites

(1) Baseline Environment

(a) Type of environment affected by the proposed activity

CLIMATE

The information to follow, was obtained from the South African Weather Service for the weather stations situated in Thabazimbi and Lephalale.

Temperature

Thabazimbi

Average daily maximum and minimum temperatures for the last ten years measured at the weather station in Thabazimbi, are shown in **Tables 3** and **4**, respectively.

Table 3: Average Daily Maximum Temperature (°C) by month– Thabazimbi station

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2006	29,8	29,5	27,2	27	23,2	22,6	24,8	24,7	29,5	32,9	30,8	33,6
2007	33,9	35,5	34,1	29,2	24,4=	23,7	22,9	27	32,2	29,2	31,3	29,6
2008	29,2	31	28,8	27,6	26,2	24,2	23,8	28,2	31,6	34,7	32,1=	33,2=
2009	31,9	30,5=	28,8	29,1	26	23,4	21,6	25,6	31,3	30,8=	31,5	33,3
2010	31,6	32,7	32,6	26,2	25,7	22,6	22,8	27,1	32,6	34,5	32,9	31,9
2011		31,4	31,5	26,4	25,3	23	22	26,5	31	29,6=	33,1=	31,1
2012	32,2	34	31,9	28,4	27,9	23,7	24,7	27,9	29,9	31,9	33,2	31
2013	32,9	34	32,1	28,4	26,4	24,9	23,8	26,6	31,4	31,8	34,4	31
2014	33,3	32,2	28,1	27	26,4	23,8	23,4	26,6	31,5	32,1	31,3	31,9
2015	33	35,3	32,9	29	29,1	23,4	24,4	29,4	31,1	35,3	34,8	37,5

= indicates that the average is unreliable due to missing daily values

Table 4: Average Daily Minimum Temperature (°C) by month– Thabazimbi station

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2006	20,2	19,1	16,8	11,5	4,5	1,6	2,4	6,3	10,3	16,5	17,6	20,1
2007	18,6	18,5	17,9	13,4	2,7=	3,6	1,9	5,4	14	16,1	17,5	18,1
2008	19	18,2	17	9,5	7,4	3,2	2,8	7,1	11,7	18,6	19,9=	21,1=
2009	20,7	19,6=	16,1	11,3	7,8	5,6	1,1	5,2	13,1	16,8=	18,3	19,3
2010	20,6	19,2	18,8	15,4	9,5	2,3	4,9	5,3	11,3	18,1	19,1	19,1
2011		19,1	17,9	14,5	7,8	2	1,3	5,5	13	13,1=	17,5=	20,2
2012	19,8	20,1	16,9	11,5	7	3,5	3,7	7,4	12,3	16,6	18,4	18,5
2013	20,4	20	18	12,5	6	3,2	4,6	6,4	14,1	17,6	19,4	20,2
2014	20,6	20,5	18,8	12,4	6,9	2,8	3,1	8	13,1	17,2	18,9	20,5
2015	20,4	20,2	19,3	14,4	7,8	4,3	5,6	8	15,4	19,6	19,3	21,9

= indicates that the average is unreliable due to missing daily values

Lephalale

Average daily maximum and minimum temperatures for the last ten years measured at the weather station in Lephalale are shown in **Tables 5** and **6**, respectively.

Table 5: Average Daily Maximum Temperature (°C) by month– Lephalale station

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2006	31,1	30,9	27,2	27,6	24,5	23,9	25,3	25,2	29,4	33	31,9	34,1
2007	32,6	35,3	33,2	28,5	26,1	24	23,2	27,3	31,9	28,8	30,3	28,8
2008	29,7	33,4	30,6	29,2	27,4	25,3	24,1	28,4	31,5	33,9	31,5	32,4
2009	31,6	30,8	28,9	29,4	26,5	24,3	22,5	26,3	31,2	31,9	33,3	35,8
2010	35,5	36,6	36,3	29,3	28,5	23,8	24	27,5	32,4	35,1	32,8	33,1
2011	31,2	32,5	34,1	28,2	27,9	24,8	23,7	27	32,6	32,7	33,5	31,2
2012	33,2	35	33,8	29,6	28,9	25,3	25,6	28,3	30,2	31	32,4	31,3
2013	32,1	33,8	31,3	28,8	27	26	24,9	27,1	32,1	32,1	34,8	30,8
2014	32,4	31,9	28,7	27,3	26,7	24,8	24,3	27,4	31,6	32,2	31,4	31,3
2015	33	35,2	33,3	29,8	30,6	25,3	26,2	30,5	31,7	36,3	34,9	36,7

Table 6: Average Daily Minimum Temperature (°C) by month– Lephalale station

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2006	20,3	20	17,2	13,1	6,9	5,4	5,7	7,1	11,5	17,1	18,1	19,8
2007	18,6	19	17,6	13,4	6,1	4,4	2,7	6,4	13,6	15,2	15,8	17,3
2008	19,2	18,7	17,9	11,8	10,4	6,4	5,8	8,9	12	17,6	19,3	19,9
2009	20,5	19,3	17	12,3	9,8	6,8	4,1	6,9	13,9	17,6	19,5	21,9
2010	22,9	23	22,3	19,2	14,2	6,5	7,3	8,4	13,6	18,3	19,8	20,2
2011	20,7	19,6	20,1	16,4	11,3	5,1	4,8	8,1	13,3	17,3	19,7	20,2
2012	20,6	21	18,9	13,9	10,3	7,1	6,6	8,8	14,2	17,5	18,5	19,9
2013	21	20,3	18,2	14,4	9,2	6,4	7,4	8,7	14,8	17	20	20,3
2014	21,1	20,6	19,3	14,7	9,9	6,3	5,9	9,1	14	16,7	18,9	20
2015	20,7	22	20,4	16,7	11,7	8,5	9	11,3	16,3	20,3	20,1	23

Precipitation

The study area is classified as semi-arid. Precipitation occurs mainly in the summer, where the maximum rainfall is normally experienced between the months of November - March.

Thabazimbi

The monthly daily rainfall for the last ten years for Thabazimbi is shown in **Table 7**.

Table 7: Monthly Daily Rain (mm) by month– Thabazimbi station

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2006	23	239,8	96,2	2	3,6	0,8	0	3,6	0	55,6	71,6	64,8
2007	32,4	11,4	0,4	22,2	0	17,8	4,4	0	58	65,4	42,2	83,2
2008	186,4	6,4=	79,0=	2,4	11,2	2,4	3,6	0	0	0,2	63,6=	24,2=
2009	50,6	0,0=	16,8	0	5,2	41	0	0	0	5,6=	0,4	9,4
2010	1,2	0	26,6	71	39,2	0	0	0	0	0	0	0,0=
2011				0,2	0,2	0,0=	0,0=	0,0=	0	0,0=	0,2=	0
2012	36,8	11	1	0	0	0	0	0	0	24	5,4	19
2013	14,2	12,8	92	22,6	0	0	0	0,6	29,4	41,2	11,8	89,4
2014	36,6	31,2	146,6	12,2	2,2	0	0	0	1,4	15,8	36,4	95,4
2015	75,6	40,6	54,2	37,8	0	0	0,6	0	16,2	12,4	46,4	67,4

= indicates that the average is unreliable due to missing daily values

Lephalale

The monthly daily rainfall for the last ten years for Lephalale is shown in **Table 8**.

Table 8: Monthly Daily Rain (mm) by month– Lephalale station

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2006	143,6	68,8	52,2	12,4	11	0	0	2	1,6	3,2	42	81,4
2007	11,8	24,2	47,4	36,6	0	0,2	1,4	0	30,2	90,2	113,4	74,6
2008	142,4	0	60,8	1,2	11	0	1	0	0	15,2	166,2	80,8
2009	116,8	62	69,8	0,6	4,8	8,4	0,2	0	0	42,6	74,6	85,4
2010	77,8	19,6	18,8	75,2	51	0	0	0	0	36	52,4	61,4
2011	150,4	3,4	3,6	2,4	0	0	0	0	0	73	51,8	82,8
2012	66	52	29,2	0	0	0	0	0	4	93,6	61,4	167,2
2013	118	9,2	21	55	0	0	0	0	0	21,2	19,2	122,8
2014	29,8	20,6	218,8	27,4	0,4	0,2	0	0	0	23,4	24,6	162,4
2015	24,6	48	29,4	21,6	0	1,6	2,2	0	12,2	29,8	57,6	63,8

GEOLOGY

The information to follow is a summary taken from the Geotechnical Investigations (Mokolo Crocodile Consultants, 2012), which was conducted in July 2012. Test pits were excavated at a nominal 200 m spacing along the pipeline route and at a nominal spacing of 30 m at proposed borrow pit locations. This was the basis of the geotechnical investigation for the MCWAP-2A project. Due to the amount of borrow areas required, geotechnical investigations for the borrow areas were conducted at different stages (Stage 1 - 4).

The specific stages and borrow areas which fall within each stage, are shown in the **Figure 4** below, and their findings are provided in the subsections to follow. The findings for the borrow areas are presented in order, starting from the first borrow area, BP SS1 in the south, moving in a north easterly direction up to the last borrow area, BP 15 in the north-east.

BP SS1 to BP 35

The geology of the pipeline route commences in the south on Pretoria Group strata (dolomite, chert, shale, quartzite and andesite), passes onto Ventersdorp Supergroup strata (lava, quartzite, conglomerate), then onto Basement Granite (1G). The route then swings north-eastwards and passes back onto Pretoria Group strata before crossing onto the Lebowa Granite Suite (3G1), which has been intruded by diabase (probably in the form of sills), with patches of Waterberg sandstone. Deposits of Quaternary sand occur to the north and west of Thabazimbi, blanketing the older rocks (Mokolo Crocodile Consultants, 2012a).

BP 28 to BP 43

The geology of the area comprises Waterberg sandstone over most of the route, with limited exposures of granite in the south. Diabase is intruded into the Waterberg and granite over the southern half (essentially south of the Matlabas River). North of the Matlabas River, extensive occurrences of Quaternary sand occur, blanketing the sandstone. Calcrete and ferricrete (with occasional silcrete) occur at the base of the sand (Mokolo Crocodile Consultants, 2012b).

BP 43 to BP 15

The geology of the area comprises Waterberg sandstone, which occurs over the whole of the route. Extensive deposits of Quaternary sand are present, blanketing the sandstone. Calcrete and ferricrete (with occasional silcrete) occur at the base of the sand (Mokolo Crocodile Consultants, 2012c).

BP 15 to BP 51

Karoo sediments (sandstone, mud rocks, coal) are present to the north of the east-west trending Eenzaamheid Fault. The Karoo sediments are downthrown into contact with older Waterberg sandstone, which are present along the southern side of the fault. Extensive deposits of Quaternary sand are present, blanketing the underlying geology, particularly in the west. Calcrete and ferricrete frequently occur at the base of the sand (Mokolo Crocodile Consultants, 2012d).

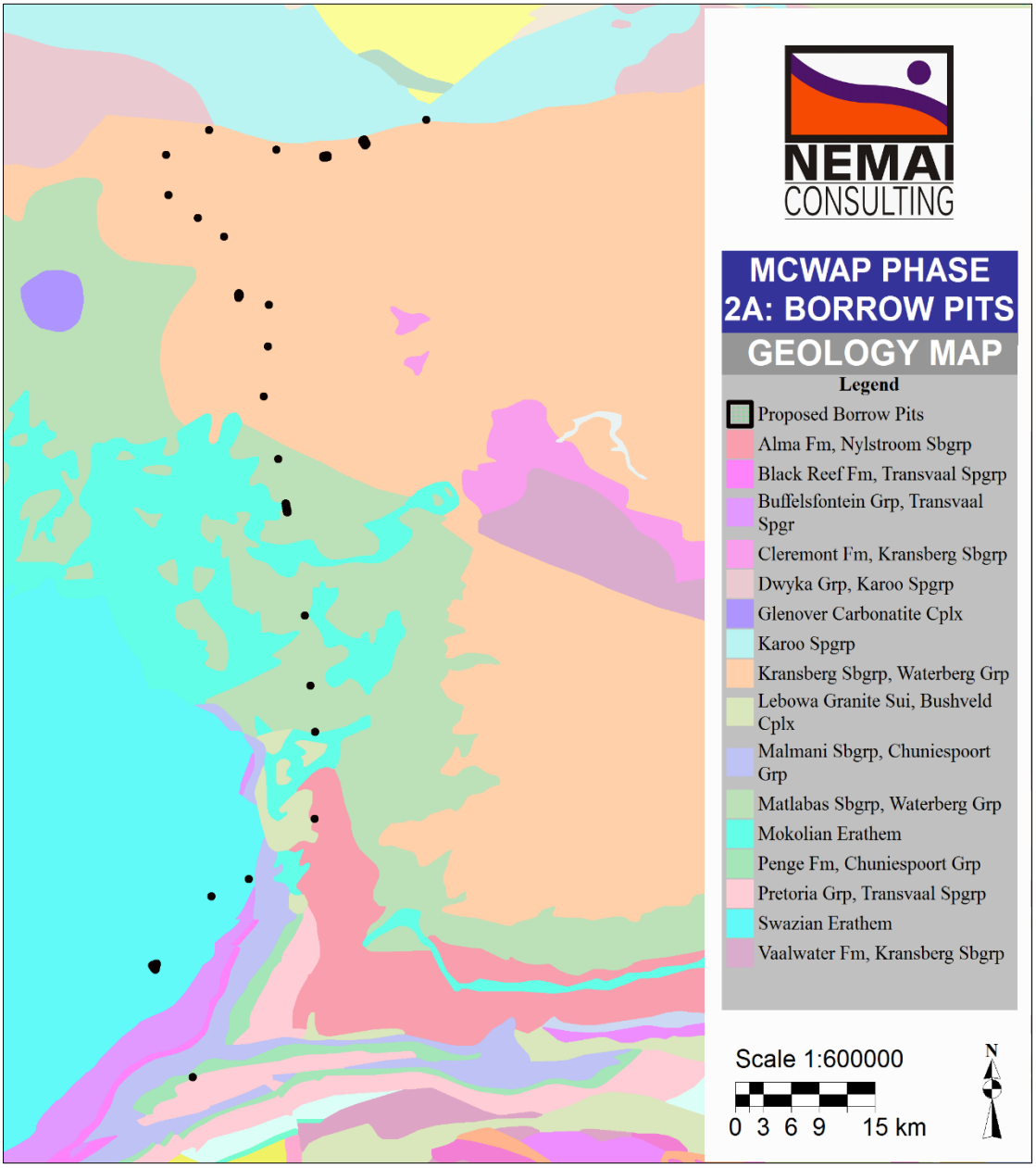


Figure 4: Geology map

SOILS

The soil classes encountered in the project area are shown in **Figure 5**. The majority of the borrow pits fall within areas characterised by freely drained, structure less soils. However, some borrow areas fall within red or yellow structureless soils and lithosols, which are shallow soils found on hard or weathering rock.

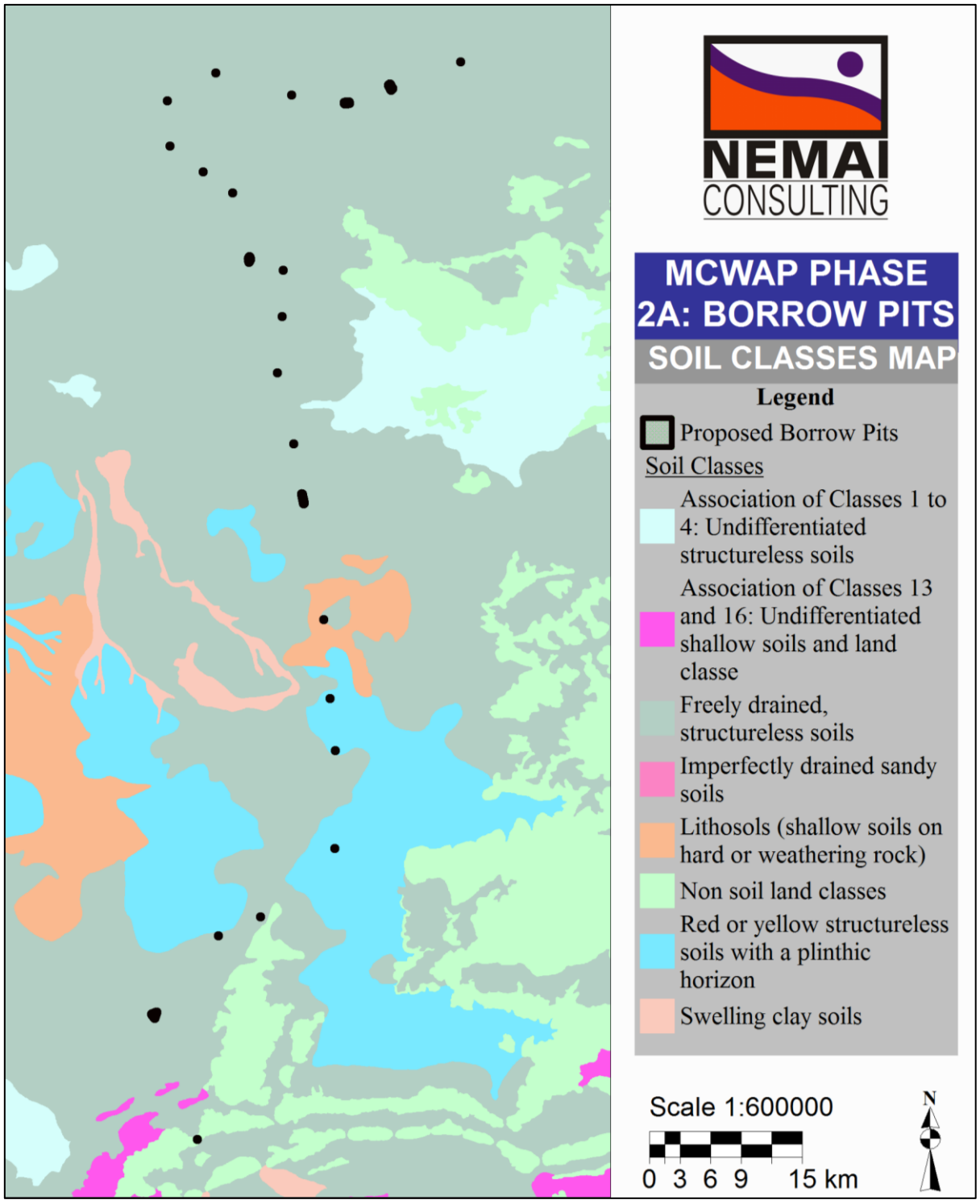


Figure 5: Soil classes

GEOHYDROLOGY

The main findings from the 2012 Geotechnical Investigations (Mokolo Crocodile Consultants, 2012) with regards to groundwater found beneath the borrow areas, follow:

BP SS1 to BP 35:

No seepage was encountered in any test pits, even though some were dug in the vicinity of the Crocodile River (The investigation was carried out during February and July - August 2010) (Mokolo Crocodile Consultants, 2012a).

BP 28 to BP 43:

A total of 269 test pits were dug along the pipeline route and in only one was groundwater encountered – slight seepage at 2,1 m depth in test pit CC/202. Caving of the sides of the test pit occurred, preventing measurement of an overnight water rest level. No significant occurrences of hydrophilic vegetation, which might be indicative of shallow groundwater conditions, were observed along the route (Mokolo Crocodile Consultants, 2012b).

BP 43 to BP 15:

A total of 163 test pits were dug along the two pipeline routes and in only 3 was groundwater encountered - slight seepage at between 2 and 3 m depth in test pits CN/01, CN/12 and CN/94. None of these test pits showed signs of instability. A number of non-perennial pans occur along the route and elevated water tables may be found in their vicinity, when they contain water. No occurrence of hydrophilic vegetation, which might be indicative of shallow groundwater conditions, was observed along the route (Mokolo Crocodile Consultants, 2012c).

BP 15 to BP 51:

A total of 196 test pits were dug along the pipeline route. Seepage was encountered in 5 test pits, all north of the Medupi construction site. No occurrence of hydrophilic vegetation, which might be indicative of shallow groundwater conditions, was observed along the route (Mokolo Crocodile Consultants, 2012d).

TOPOGRAPHY

The terrain in the first section of the project footprint in the Vlieëpoort region (i.e. south-western part of project area) consists of low mountains. From there the terrain transforms to plains for the remainder of the project area, which comprises flat and undulating topography. Refer to **Figure 6** for the contours in the greater area.

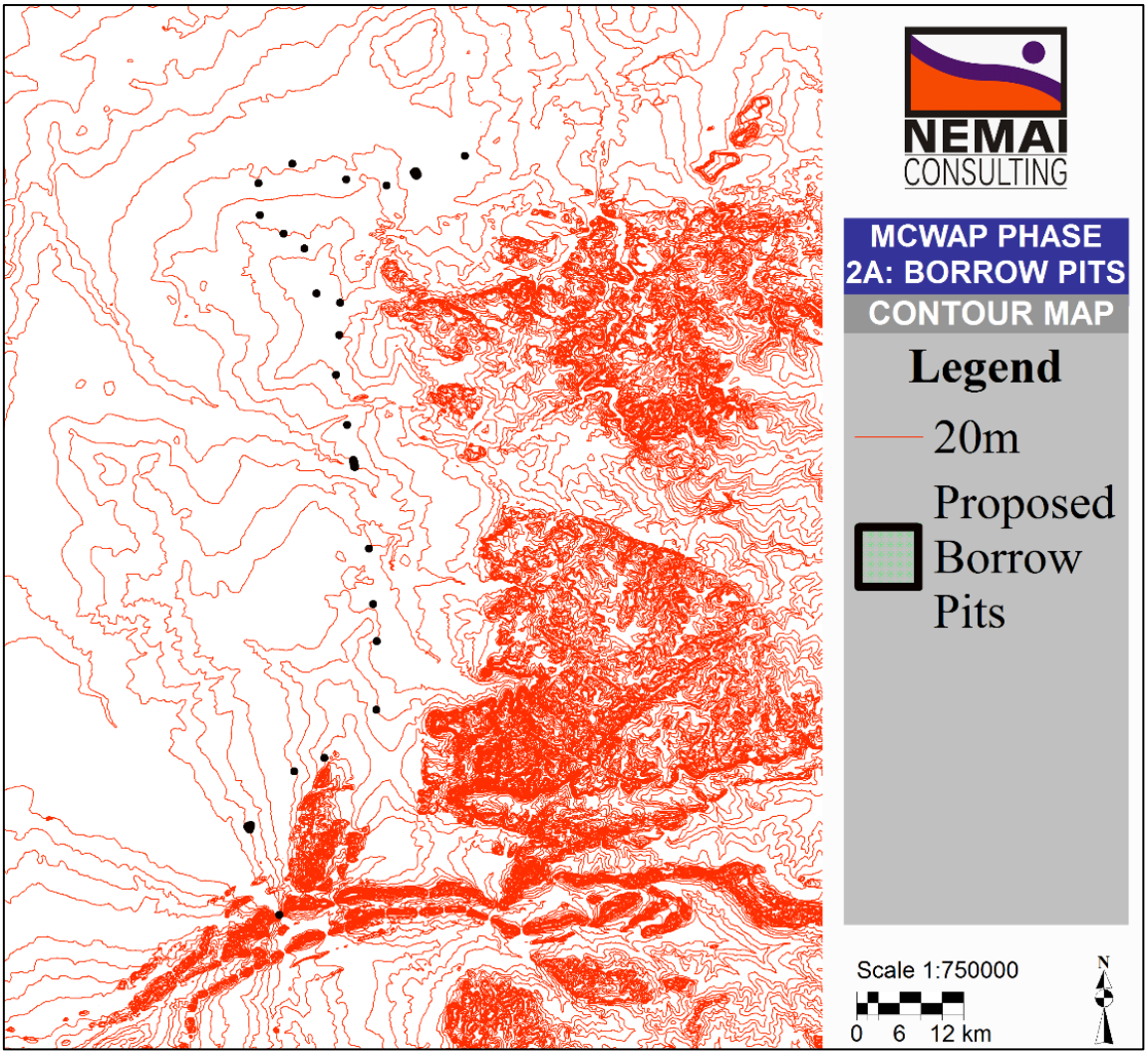


Figure 6: Contour map (20m interval)

The first borrow area, BP SS1, is located in a narrowing valley where the Crocodile River (West) cuts through the Vlieëpoort mountains, below the proposed weir site (see **Figure 7**). The site is characterised by a relatively wide river section, estimated in the order of 350 m.

Figure 7: BP SS1 site by Vlieëpoort Mountains

SURFACE WATER

According to the G.N. 1056 (16 September 2017) "New Nine (9) Water Management Areas of South Africa", the study area is situated within the Limpopo Water Management Area (WMA). As seen in the **Figure 8**, the proposed BPs also fall within Quaternary Catchments within the Limpopo WMA.

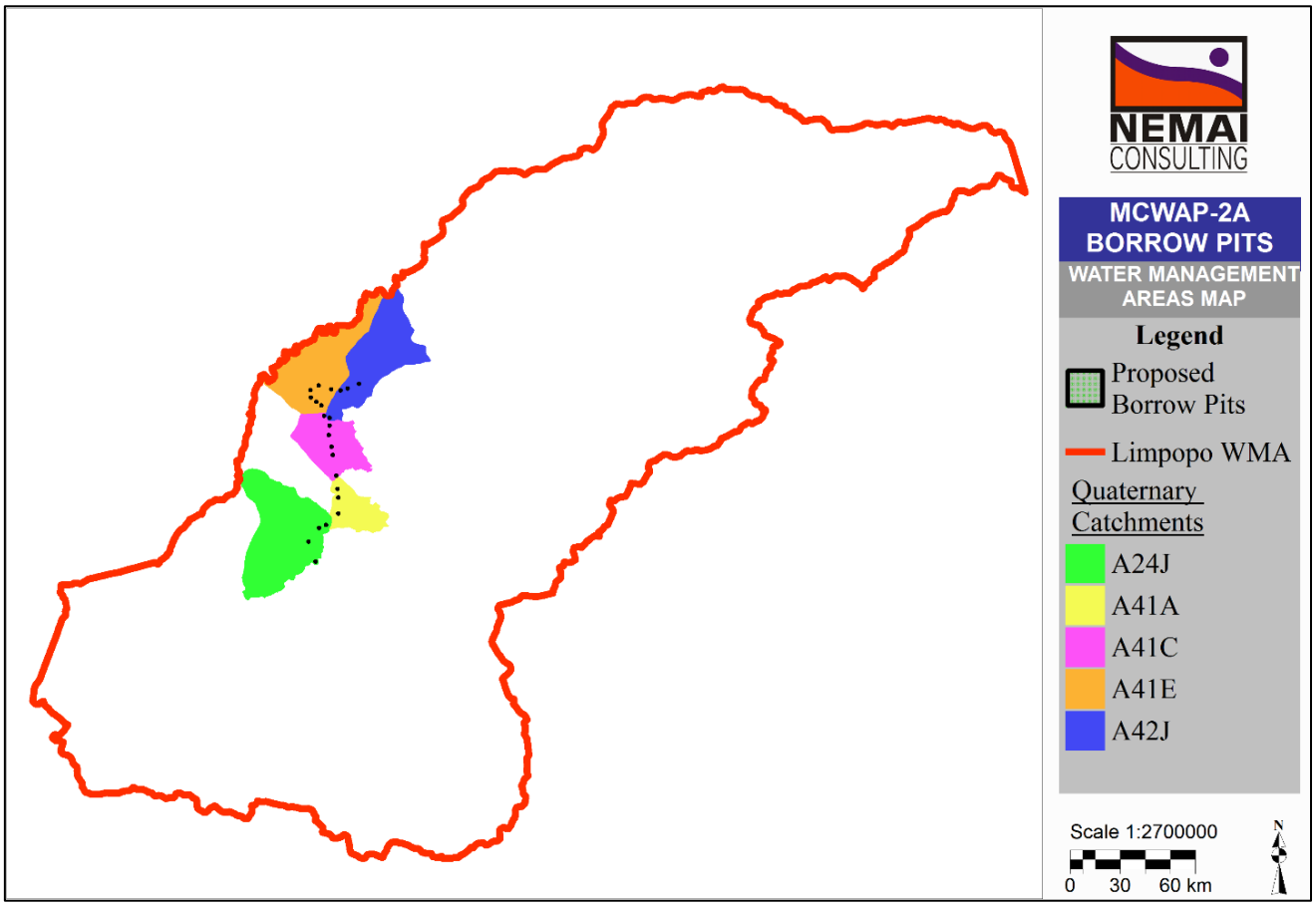


Figure 8: Limpopo Water Management Area

The southern sections of the proposed BPs fall within the A24J quaternary catchment area, whereas the middle section falls within the A41A, A41C quaternary catchments. The northern section of proposed BPs fall within two quaternary catchments, namely A41E and A42J. The Crocodile River, which is a major tributary of the Limpopo River, is primarily fed by the Pienaars, Apies, Moretele, Hennops, Jukskei, Magalies and Elands Rivers. The total area of the Crocodile River Catchment is 29 400 km^2 (DWAF, 2004b). The major watercourses in the region are shown in **Figure 9.**

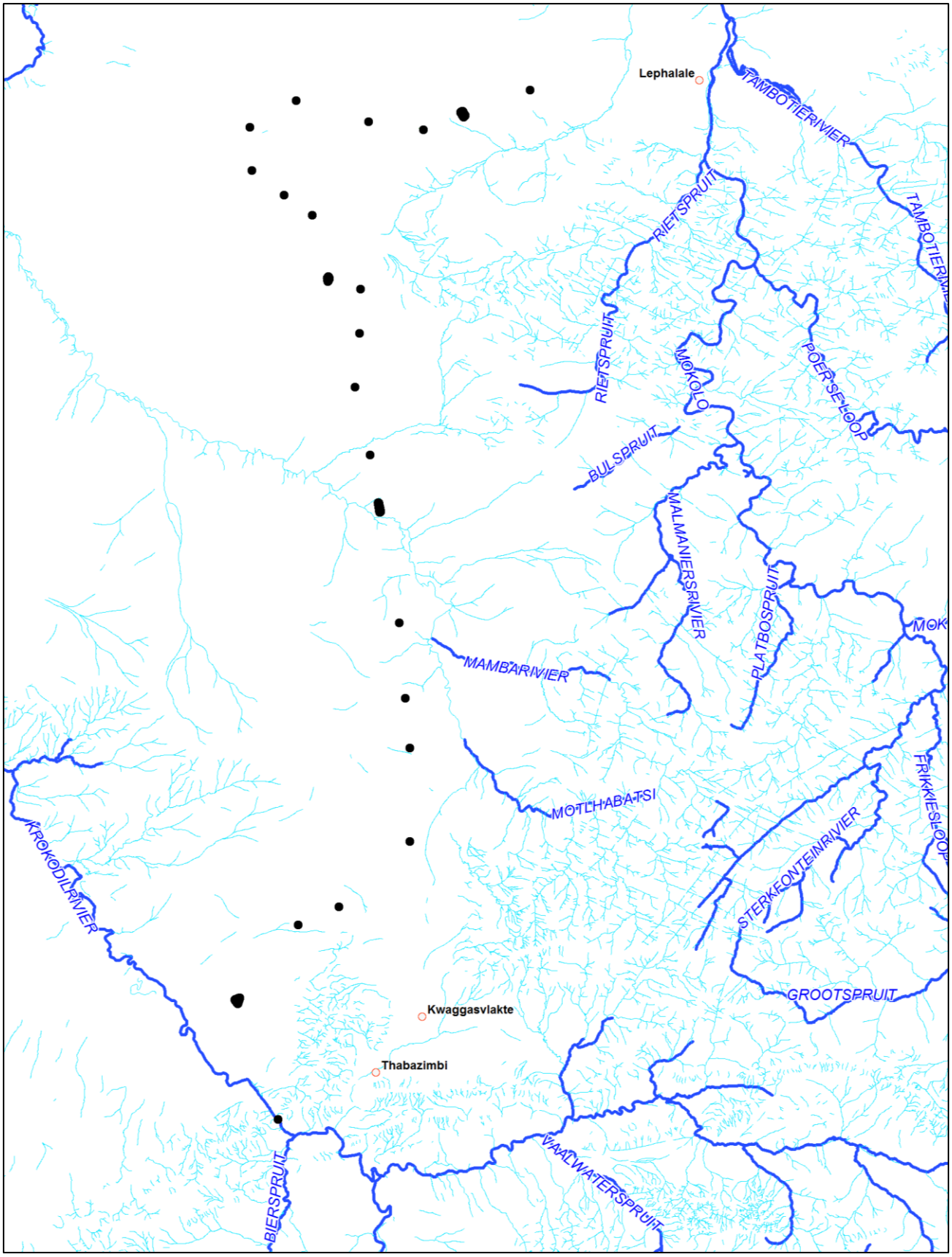


Figure 9: Perennial and non-perennial map

The natural Mean Annual Runoff (MAR) of the Limpopo River is 5 067 million m³ per annum, which mainly occurs during large floods. According to the Water Research Commission (WRC) (2004), some key features of the Limpopo River catchment include the following:

- Parts of Johannesburg and Pretoria are situated in the upper reaches of the Crocodile River (in the Crocodile (West) Marico WMA) and are supplied with 650 million m³ per annum of water transferred from Vaal Dam (in Upper Vaal WMA);
- Some 340 million m³ per annum of this imported water is returned to the upper tributaries of the Crocodile River as treated but nutrient rich effluent, which has resulted in eutrophication of dams, whereas the natural runoffs of the Crocodile and Marico Rivers (in the Crocodile West/Marico WMA) together equal only 202 million m³ per annum. Dolomitic aquifers supply 111 million m³ per annum; and
- The demand for water in all the South African tributaries of the Limpopo River is dominated by the irrigation requirements, followed by urban usage.

Africa has international agreements and obligations with each of these countries that need to be adhered to in terms of any new water resource developments within the catchment. The Crocodile River system is regulated by the following 9 major dams:

- Rietvlei, Hartbeespoort and Roodekopjes Dams in the Crocodile River (West);
- Roodeplaat and Klipvoor Dams in the Apies/Pienaars River; and
- Olifantsnek, Bospoort, Lindleyspoort and Vaalkop Dams in the Elands River area.

Affected Rivers and Streams

The Crocodile River (West) is directly affected by first proposed borrow area known as BP SS1, and associated infrastructure that will fall within the management area of the borrow pit (refer to **Figure 10** below). BP SS1 is approximately 2,2km downstream of the confluence of the Bierspruit and is situated downstream of the proposed Vlieëpoort Weir Site.

Figure 10: Directly affected watercourse

Water Use

Existing water users from the portion of the Crocodile River (West) catchment downstream of the borrow area BP SS1 are mainly irrigators (see **Figure 11**) that fall within the Mooivalei and Makoppa areas.

Figure 11: Indication of irrigation areas in the Crocodile River (West) (downstream of BP SS1)

Ecological Status

The Reserve is central to water resource management and enjoys priority of use according to the National Water Act (No. 36 of 1998) (NWA). According to Chapter 1(1) (xviii) of the NWA, the "Reserve" relates to the quantity and quality of water required to satisfy the basic human needs by securing a basic water supply for individuals; and to protect aquatic ecosystems in order to secure ecologically sustainable development and use of water resources.

As part of a Reserve study, EWR sites are set at specific points on the river which are critical localities within a reach of the river. Factors that guide the selection of EWR sites include:

- The suitability of the site for accurate hydraulic modelling throughout the range of possible flows, especially low flows;
- Accessibility of the sites; and
- An area or site that could be critical for ecosystem functioning.

A comprehensive study was initiated in 2010 and completed in 2012 for the Crocodile (West) Marico WMA (DWA, 2012a). No Reserve study has been undertaken in the Matlabas catchment. **Table 9** shows the results from the Reserve Study in terms: Present Ecological Status (PES); Ecological Importance and Sensitivity (EIS); and Recommended Ecological Category (REC) associated with each EWR site. The locations of the EWR sites are shown in **Figure 12**. EWR 8 (downstream of the confluence with the Bierspruit in Ben Alberts Nature Reserve) is of particular relevance in terms of the location of the abstraction weir, and the BP SS1 borrow area.

Table 9: Summary of PES, EIS and REC per resource unit for the Crocodile (West) (DWA, 2012a)

EWR Site number	EWR site name	River	Resource unit	Quaternary catchment	PES	REC	EIS
EWR 1	Upstream of the Hartbeespoort Dam	Crocodile	MRU Crocodile 3	A21H	**D**	**D**	Moderate
EWR 2	Heron Bridge School	Juskei	MRU Crocodile 1	A21C	**E**	**D**	Moderate
EWR 3	Downstream of Hartbeespoort Dam in Mount Amanzi	Crocodile	MRU Crocodile 5	A21J	**C/D**	**C/D**	High
EWR 4	Downstream of Roodeplaat Dam	Pienaars	MRU Pienaars 5	A23B	**C**	**C**	High
EWR 5	Downstream of the Klipvoor Dam in Borakalalo National Park	Pienaars	MRU Pienaars 8	A23J	**D**	**D**	High
EWR 6	Upstream of Vaalkop Dam	Hex	MRU Hex 5	A22J	**D**	**D**	Moderate
EWR 7	Upstream of the confluence with the Bierspruit	Crocodile	MRU Crocodile 10	A24C	**D**	**D**	Moderate
EWR 8	Downstream of the confluence with the Bierspruit in Ben Alberts Nature Reserve	Crocodile	MRU Crocodile 11	A24H	**C**	**C**	Moderate

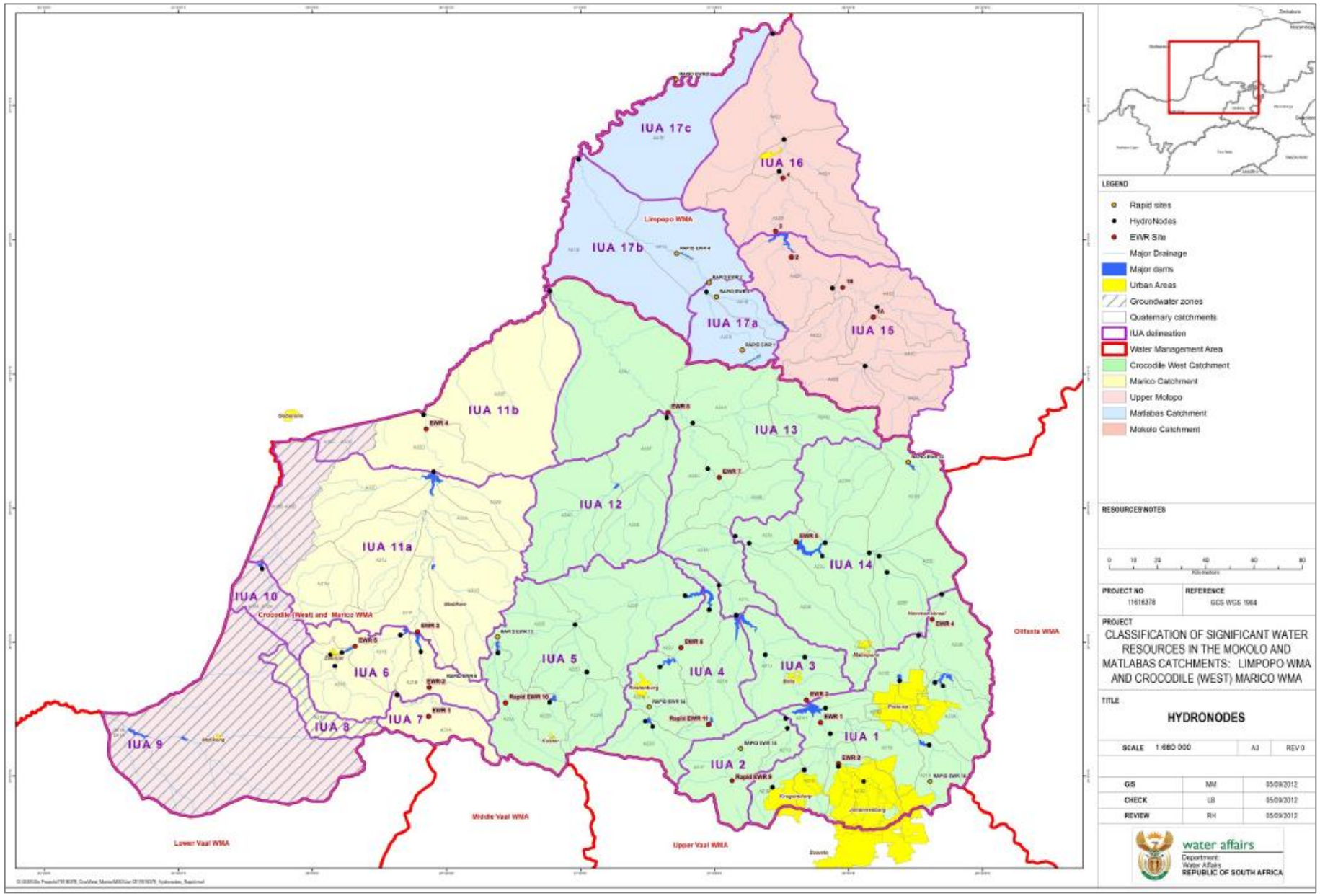


Figure 12: EWR sites applicable to the study area (DWA, 2012a)

According to the River Health Programme (RHP) (2005), the drivers of change that adversely affect the ecological status of the Crocodile River (West) include:

- Extensive water use for agricultural purposes – abstraction for irrigation impacts on natural flow regime of the river;
- Dams and weirs act as barriers to flow and the migration of fauna; and
- Reduced water quality due to agricultural return flows.

Results from the RHP (2008) indicate that the Matlabas catchment has a fair Eco-status and moderate Ecological Importance and Sensitivity (EIS), largely due to the fact that a substantial portion of the catchment falls in Marakele National Park, private nature reserves or game farms.

According to the RHP (2005), only hardy fish species are present in the lower Crocodile River, which can be ascribed to the loss of habitat and connectivity of the river. The Fish Assemblage Integrity was thus found to be poor. The Macro-invertebrate Integrity was also categorised as poor, with reduced water quality and diminished flows leading to dry sections and isolated pools. This reduction in suitable habitat has a severe impact on invertebrate diversity. Also the Instream Habitat Integrity was identified as poor due to extensive irrigation and multiple abstraction points along this reach of river which has a severe impact on river functioning.

Due to the non-perennial nature of the Matlabas, the RHP (2008) found an absence of flow dependent and migratory fish species and low invertebrate biodiversity. **Table 10** contains a list of all the fish species historically recorded in the Crocodile West and Matlabas catchments.

Table 10: All fish species historically recorded in the Crocodile West and Matlabas catchments (RHP, 2008)

Species	English Common Name	Crocodile (West)	Matlabas
Anguilla bengalensis labiata	African mottled eel	✓	
Anguilla mossambica	Longfin eel	✓	
Aplocheilichthys johnstoni	Johnston's topminnow	✓	
Barbus annectens	Broadstriped barb		✓
Barbus bifrenatus	Hyphen barb		✓
Barbus brevipinnis	Shortfin barb	✓	✓
Barbus marequensis	Largescale yellowfish		✓
Barbus mattozi	Papermouth	✓	
Barbus paludinosus	Straightfin barb	✓	✓
Barbus trimaculatus	Threespot barb	✓	✓
Barbus unitaeniatus	Longbeard barb	✓	✓
Barbus viviparus	Bowstripe barb	✓	✓
Chetia flaviventris	Canary Kurper	✓	
Chiloglanis paratus	Sawfin rock catlet	✓	
Chiloglanis pretoriae	Shortspine suckermouth	✓	
Clarias gariepinus	Sharptooth catfish	✓	✓
Labeo cylindricus	Redeye labeo	✓	✓
Labeo molybdinus	Leaden labeo	✓	✓
Labeo rosae	Rednose labeo	✓	✓
Labeo ruddi	Silver labeo		✓

Species	English Common Name	Crocodile (West)	Matlabas
Marcusenius macrolepidotus	Bulldog	✓	✓
Mesobola brevianalis	River sardine	✓	✓
Micralestes acutidens	Silver robber	✓	
Oreochromis mossambicus	Mozambique tilapia	✓	✓
Pseudocrenilabrus philander	Southern mouthbrooder	✓	✓
Schilbe intermedius	Silver catfish	✓	✓
Synodontis zambezensis	Brown squeaker		✓
Tilapia rendalli	Redbreast tilapia	✓	
Tilapia sparrmanii	Banded tilapia	✓	✓

Water Quality

DWS conducts an ongoing water quality monitoring programme on the Crocodile River. There are long term monitoring sites for the preliminary resource units and EWR sites identified during the Reserve determination.

Some of the relevant monitoring sites are listed in **Table 11** below. All the DWS long term monitoring sites include the monitoring of electrical conductivity (EC), pH, the major ions (Mg+, Na+, Ca+, K+, SO4- and Cl-), total alkalinity and nutrients (PO4-P, NH3, NO2, NO3) (DWA, 2012a).

Table 11: DWS water quality sites related to the Crocodile (West) EWR sites (DWA, 2012a)

WATER QUALITY SITE	QUARTENARY CATCHMENT	OTHER INFORMATION
A2H012 – Crocodile River at Kalkheuwel	A21H	Downstream of the confluences of the Jukskei, Hennops and Rietspruit Rivers with the Crocodile River, and upstream of Hartebeespoort Dam.
A2H023 – Jukskei River at Nietgedacht	A21C	Situated at the confluence of the Jukskei River with the Upper Crocodile River, and upstream of Hartebeespoort Dam.
A2H083 – Hartebeespoort Dam: downstream weir	A21J	Crocodile River immediately downstream of Hartebeespoort Dam
A2H006 – Pienaars River at Klipdrift	A23B	Weir is downstream of EWR site
A2H021 – Pienaars River at Buffelspoort	A23L	Weir is 21 km downstream of EWR site
A2H094 – Bospoort Dam: downstream weir	A22J	Weir is situated at Tweedepoort, 4 km downstream of EWR site
A2H060 - Crocodile River at Nooitgedacht	A24C	WQ site is 23 km upstream of the EWR
A2H116 – Paul Hugo Dam: downstream weir	A24F/H/J	Weir is situated at Haakdoorndrift

According to DWA (2012a), the Crocodile River is highly impacted in terms of water quality which is attributed to the following:

- The Lower Crocodile River water quality is deteriorating because of increased salts and nutrients. There are also increased levels of toxicants in the middle reaches of the river;
- Urbanisations, industrial diffuse sources and high agricultural return flows are the major impacting activities; and
- Treated wastewater return flows from the Upper Vaal WMA play an important role downstream where the water is used in the Crocodile West catchment area.

Noteworthy point sources of pollution in the Crocodile River, and the watercourses into which they discharge their effluent, include the following:

- Northern Waste Water Treatment Works (WWTW) - Jukskei River;
- Driefontein WWTW - Muldersdrif-se-loop River;
- Sunderland Ridge WWTW - Hennops River;
- Baviaanspoort and Zeekoegat WWTW - Pienaars River;
- Baviaanspoort and Zeekoegat WWTW - Pienaars River;
- Daspoort, Rooiwal, Temba and Babelegie WWTW - Apies River;
- Sandspruit and Klipgat WWTW - Sand Spruit;
- Rietgat WWTW - Soutpan Spruit; and
- Brits WWTW - Crocodile River.

Organic pollution from point and diffuse pollution sources is a significant contributor to the poor water quality in the Crocodile River, which is evident in the highly eutrophic Hartbeespoort Dam. According to DWAF (2004a), there are no reported water quality problems in the Matlabas Area, either surface or groundwater. Due to the low levels of development in this area, no water quality problems are anticipated.

Habitat

The riparian vegetation at the borrow area BP SS1 is dominated by Lowveld Alluvial Vegetation, which has retained much of its ecological integrity (see **Figure 13** below). The instream habitat of the river is dominated by slow-flowing, medium to deep channel. Prominent sand banks and marginal reed beds are present in the watercourse.

Figure 13: Riparian vegetation along the Crocodile River (West)

Pans and Wetlands

In terms of the National Water Act (No. 36 of 21998), a wetland means "*land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil*".

According to a preliminary review of the National Wetlands Map II of the South African National Biodiversity Institute (SANBI), which was extracted from the National Land Cover 2000 dataset, no wetlands are directly affected by the borrow pit BP SS1. **Figure 14** shows the occurrence of wetlands, adjacent to the Crocodile River (West) on the Farms Hampton 320 KQ, Stratford 462 KQ and Bridgewater 307 KQ, downstream of the borrow area, BP SS1

Figure 14: Wetlands found downstream of BP SS1

FLORA

Regional Vegetation

Mucina and Rutherford (2016) described the study area as falling within the Savanna Biome (**Figure 15**). The Savanna Biome is the largest Biome in southern Africa, occupying 46% of its area, and over one-third the area of South Africa. It is well developed over the Lowveld and Kalahari region of South Africa and is also the dominant vegetation in Botswana, Namibia and Zimbabwe. It is characterized by a grassy ground layer and distinct upper layer of woody plants (Low and Rebelo, 1996).

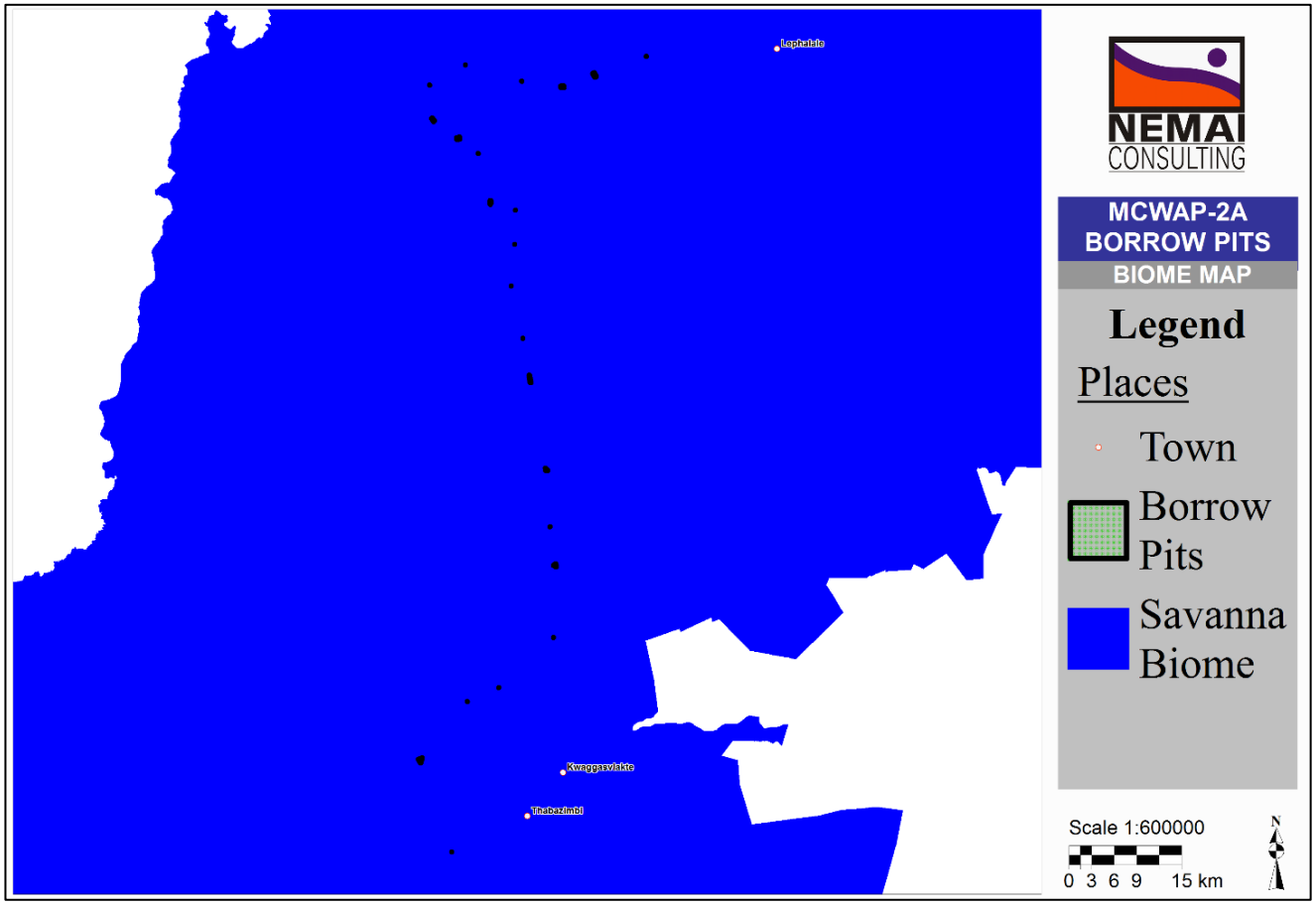


Figure 15: Savanna Biome

The study area traverses five (5) vegetation types-namely (**Figure 16**):

1. Limpopo Sweet Bushveld;
2. Western Sandy Bushveld;
3. Dwaalboom Thornveld;
4. Waterberg Mountain Bushveld; and
5. Subtropical Alluvial Vegetation.

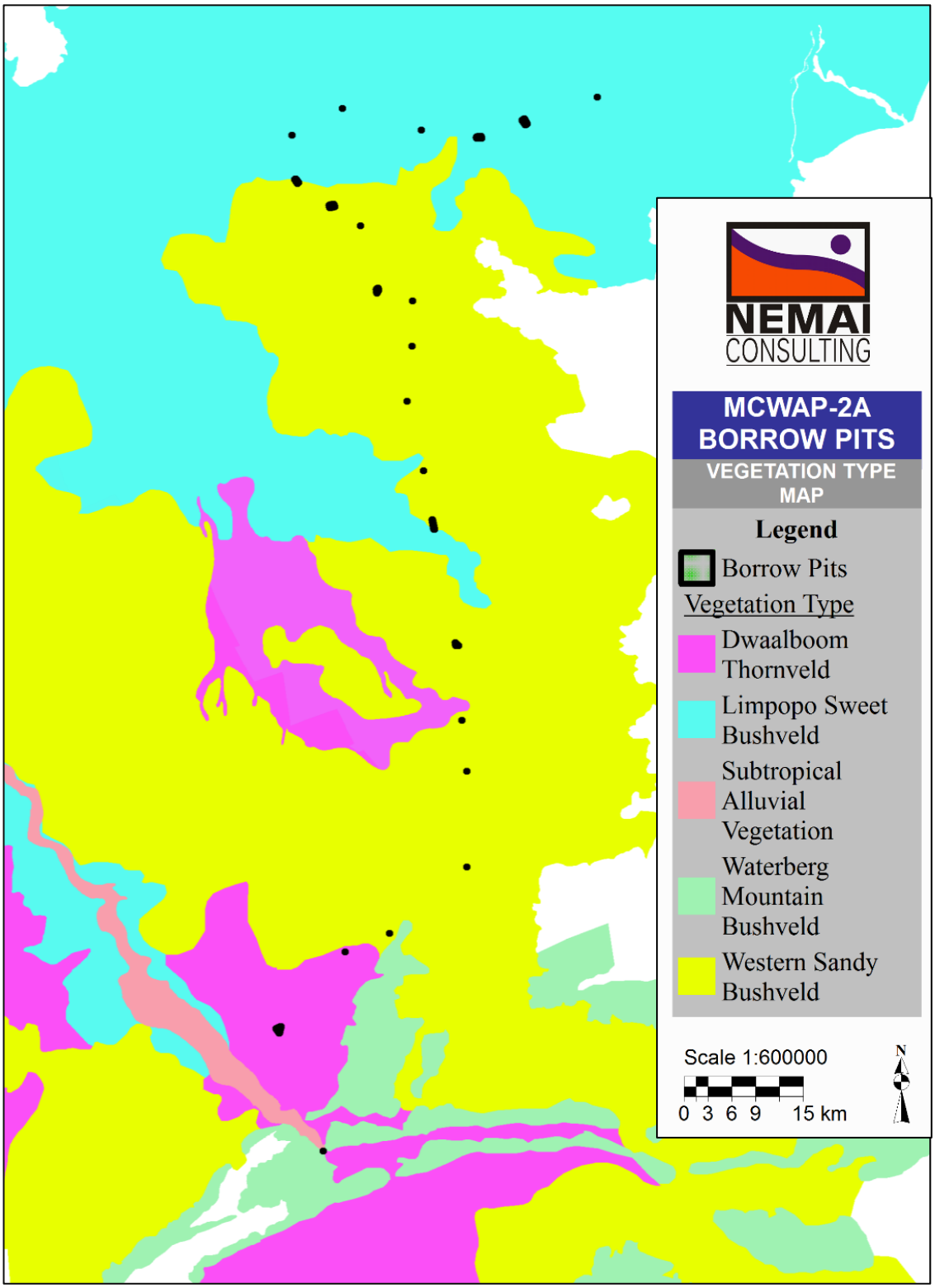


Figure 16: Vegetation types

Limpopo Sweet Bushveld

The Limpopo Sweet Bushveld is found in Limpopo Province. It extends from the lower reaches of the Crocodile and Marico Rivers around Makoppa and Derdepoort, respectively, down the Limpopo River Valley including Lephalale and into the tropics past Tom Burke to the Usutu border post and Taaiboschgroet area in the north. The unit also occurs on the Botswana side of the border (Mucina and Rutherford, 2006).

This vegetation type is listed as **least threatened** with a national conservation target of 19%. Less than 1% is statutorily conserved and limited to reserves straddling the south-eastern limits of the unit, for example the D'Nyala Nature Reserve. Very little of this vegetation type is conserved in other reserves. About 5% is transformed, mainly by cultivation (Mucina and Rutherford, 2006). Borrow areas (BP 15 to BP 51) which are situated in the northern most part of the study area, fall within this vegetation type.

Western Sandy Bushveld

Western Sandy Bushveld vegetation type is found in Limpopo and North-West Provinces. It occurs on flats and undulating plains from Assen northwards past Thabazimbi and remaining west of the Waterberg Mountains towards Steenbokpan in the north. Some patches occur between the Crocodile and Marico Rivers to the west (Mucina and Rutherford, 2006).

This vegetation type is listed as **least threatened** with a national conservation target of 19%. About 6% is statutorily conserved, just over half of which in the Marakele National Park. About 4% is transformed, mainly by cultivation (Mucina and Rutherford, 2006). As seen in Figure 22, approximately 60 % of the proposed borrow areas, fall within this vegetation type.

Dwaalboom Thornveld

The abovementioned vegetation type is found in Limpopo and North-West Provinces. It falls north of the Dwarsberge and associated ridges mainly west of the Crocodile River in the Dwaalboom area, but including a patch around Sentrum. South of the ridges, it extends eastwards from the Nietverdiend area, north of the Pilanesberg to the Northam area (Mucina and Rutherford, 2006).

This vegetation type is listed as **least threatened** with a national conservation target of 19%. Some 6% is statutorily conserved, mostly within the Madikwe Game Reserve in the west. About 14% is transformed mainly by cultivation. Main use is extensive cattle grazing (Mucina and Rutherford, 2006). In the southern section of the study area, BP 25 and BP 30 fall within the vegetation type.

Subtropical Alluvial Vegetation

Subtropical Alluvial vegetation unit is found in Limpopo, Mpumalanga and KwaZulu-Natal Provinces and in Swaziland. It occurs in broad river alluvia and around some river-fed pans in the subtropical regions of eastern South Africa, in particular in the Lowveld, Central Bushveld and in northern KwaZulu-Natal. The most important alluvia include the Limpopo, Luvubu, Olifants, Sabie, Crocodile, Phongolo, Usutu and Mkuze Rivers. This unit is fully embedded within the Savanna Biome (Mucina and Rutherford, 2006).

The conservation status is **least threatened** with a national conservation target of target of 31%. Much of the area has been transformed for cultivation, urban development and road building. Alien woody species commonly occurring in this vegetation type include Melia azedarach, Chromolaena discolor etc (Mucina and Rutherford, 2006). The first borrow area in the southern most region of the study area, BP SS1, falls within this vegetation type.

Terrestrial Threatened Ecosystem

According to the data sourced from SANBI, none of the borrow areas are situated within terrestrial threatened ecosystems. The closest to the proposed borrow pits, is the Springbokvlakte Thornveld, show in **Figure 17** below, which is approximately 73 km from the BP SS1 borrow area.

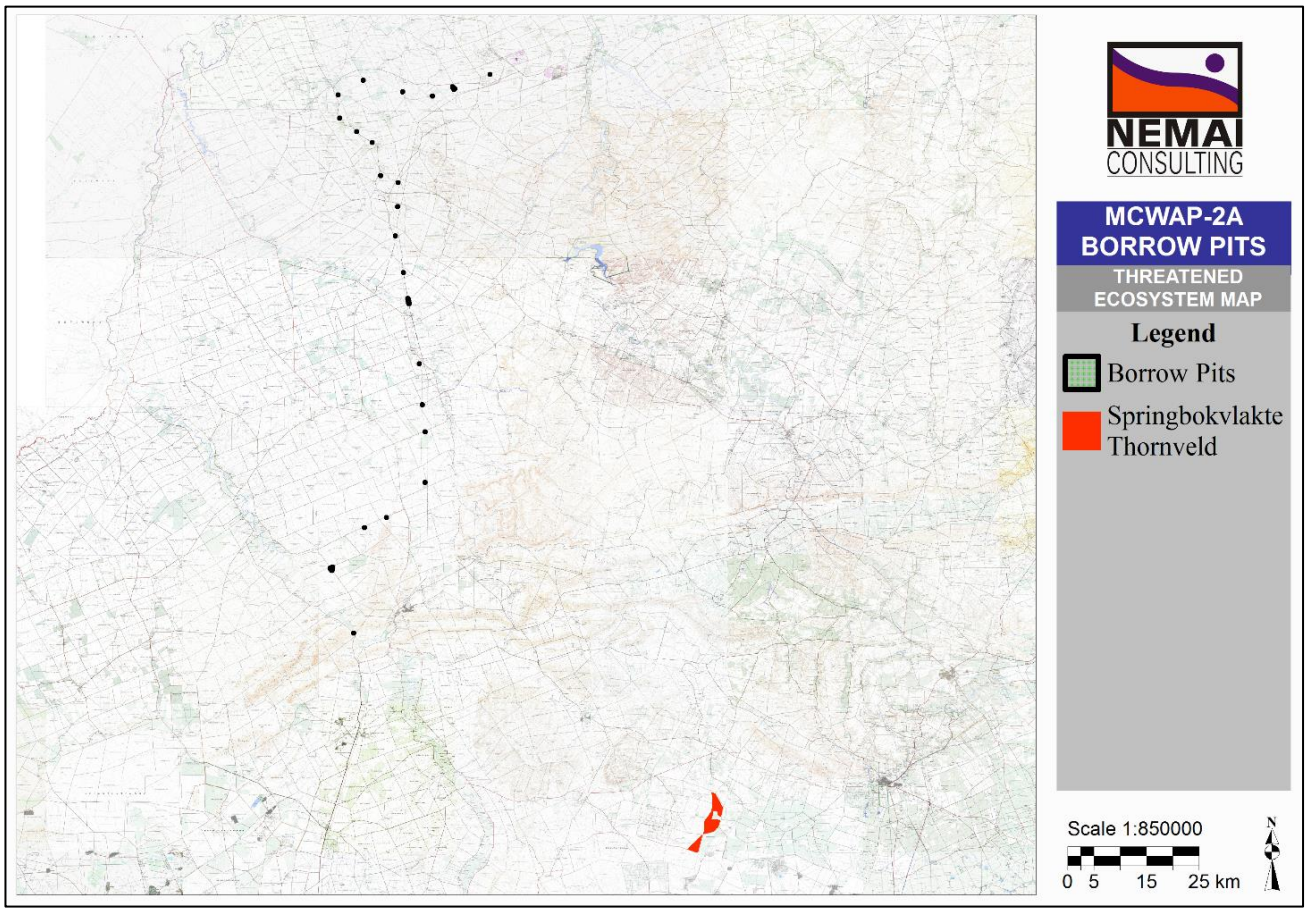


Figure 17: Terrestrial Threatened Ecosystems

Limpopo Conservation Plan

Critical Biodiversity Areas (CBAs) within the bioregion are the portfolio of sites that are required to meet the region's biodiversity targets, and need to be maintained in the appropriate condition for their category (Desmet, 2013). An objective of the CBA map is to identify a network of areas, which if managed according to the land use guidelines would meet the pattern targets for all important biodiversity features, while at the same time ensuring the areas necessary for supporting necessary ecological processes remain functional.

The systematic conservation planning process resulted in 40% of the Limpopo Province being identified as CBAs (CBA1 22% and CBA2 18%). Ecological Support Areas (ESAs) cover a further 22% of the province, of which 16% are intact natural areas (ESA 1) and 7% are degraded or areas with no natural remaining which are nevertheless required as they potentially retain some value for supporting ecological processes (ESA 2) (Desmet, 2013). A CBA map, indicating the Limpopo C Plan categories in relation to the project footprint, is shown in **Figure 18**.

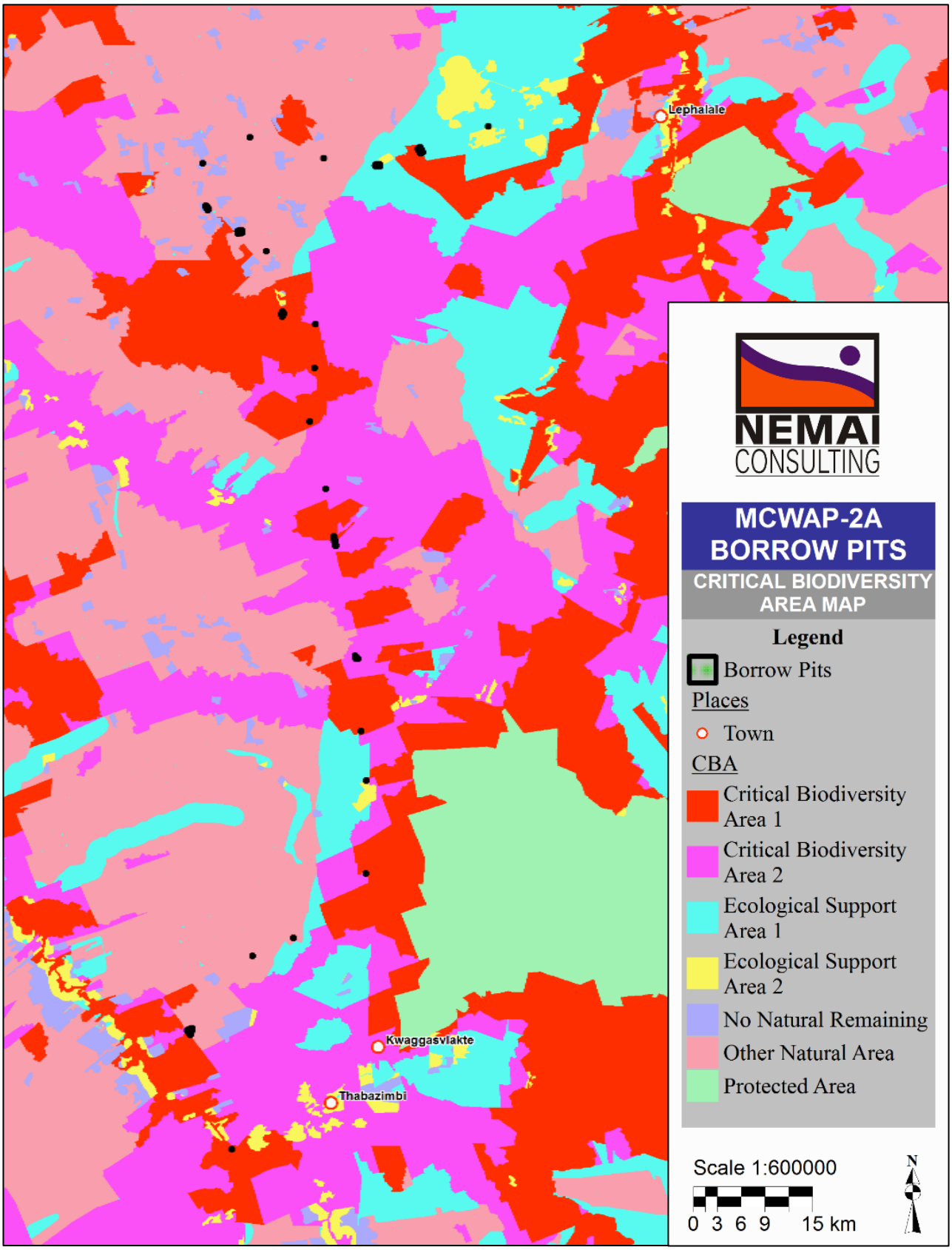


Figure 18: Limpopo Conservation Plan (CBAs and ESAs)

It can be derived from figure above that the highest percentage of BPs fall within areas dominated by CBA 1 and CBA 2 Categories. It must also be noted that none of the BPs fall within any protected areas.

Protected Areas

The nearest protected areas, with a formal status in terms of the National Environmental Management Protected Areas Act (Act No. 57 of 2003), to the study area include the following (see **Figure 19**):

- Marakele National Park – located approximately 3.5 km to the east of BP 28 and BP 41;
- Atherstone Nature Reserve – located approximately 40 km to the west of BP SS1;
- Hans Strijdom Nature Reserve – located approximately 30 km to the east of BP 42; and
- D'nyala Nature Reserve – located approximately 20 km to the east of BP 51.

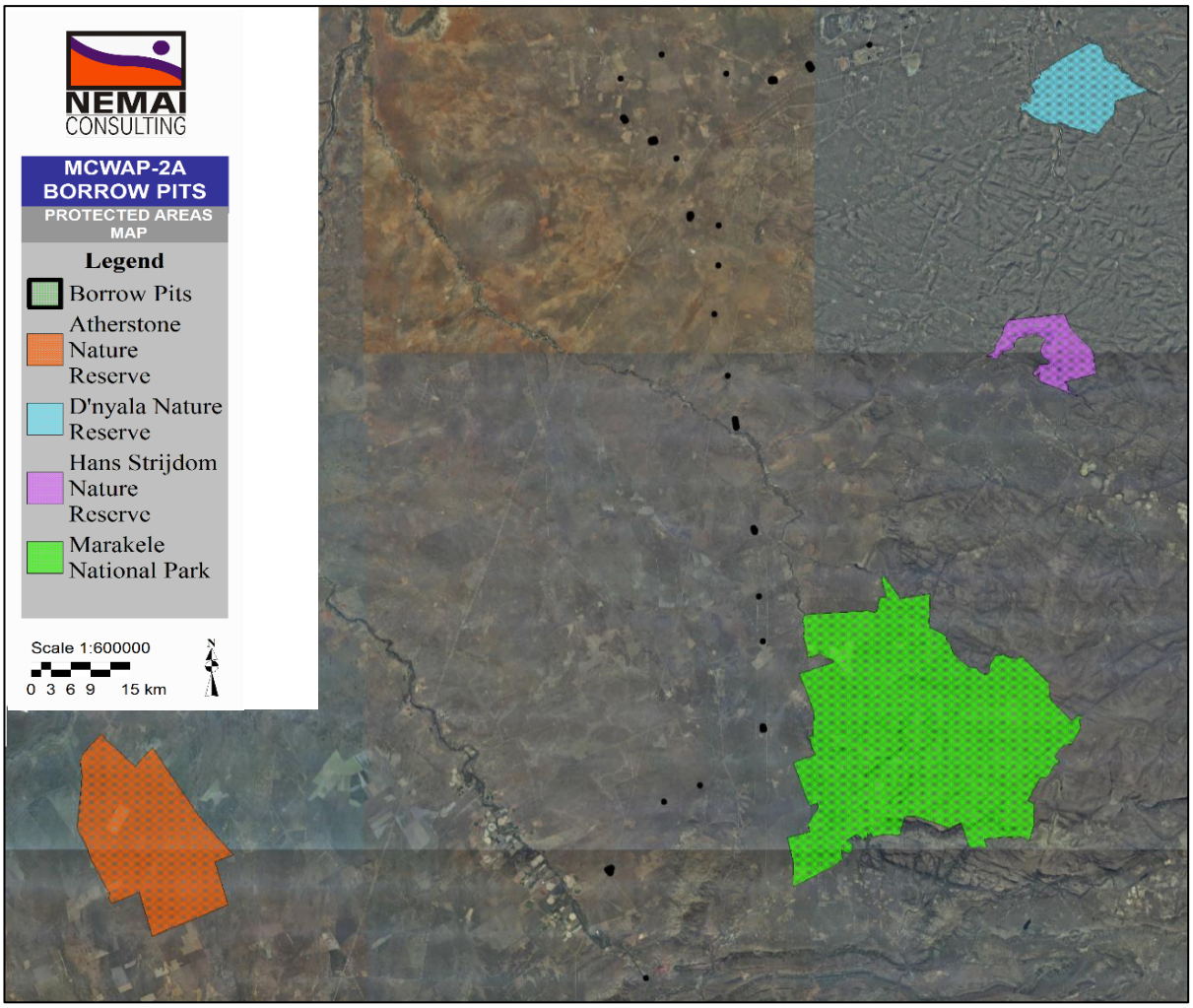


Figure 19: Protected areas in proximity to the proposed borrow pits

The Waterberg Biosphere, which is located to the east of the project area (see **Figure 20**)**,** represents a considerable area of the savanna biome and contains a high level of biological diversity. It stretches from Marakele National Park in the south-west to Wonderkop Nature Reserve in the north-east with Vaalwater as the gateway town. According to UNESCO (2009), Biosphere reserves are areas of terrestrial and coastal marine ecosystems which are internationally recognized under UNESCO's Man and the Biosphere (MAB) Programme. Biosphere Reserves are protected areas and they promote and demonstrate a balanced relationship between people and nature. Sections of the MCWAP-2A WTI central pipeline route and BPs encroach into the transition zone of the biosphere, which is a flexible area of co-operation, which may contain a variety of agricultural activities, settlements and other uses and in which local communities, management agencies, scientists, non-governmental

organizations, cultural groups, economic interests and other stakeholders work together to manage and sustainably develop the area's resources (Waterberg DM, 2013).

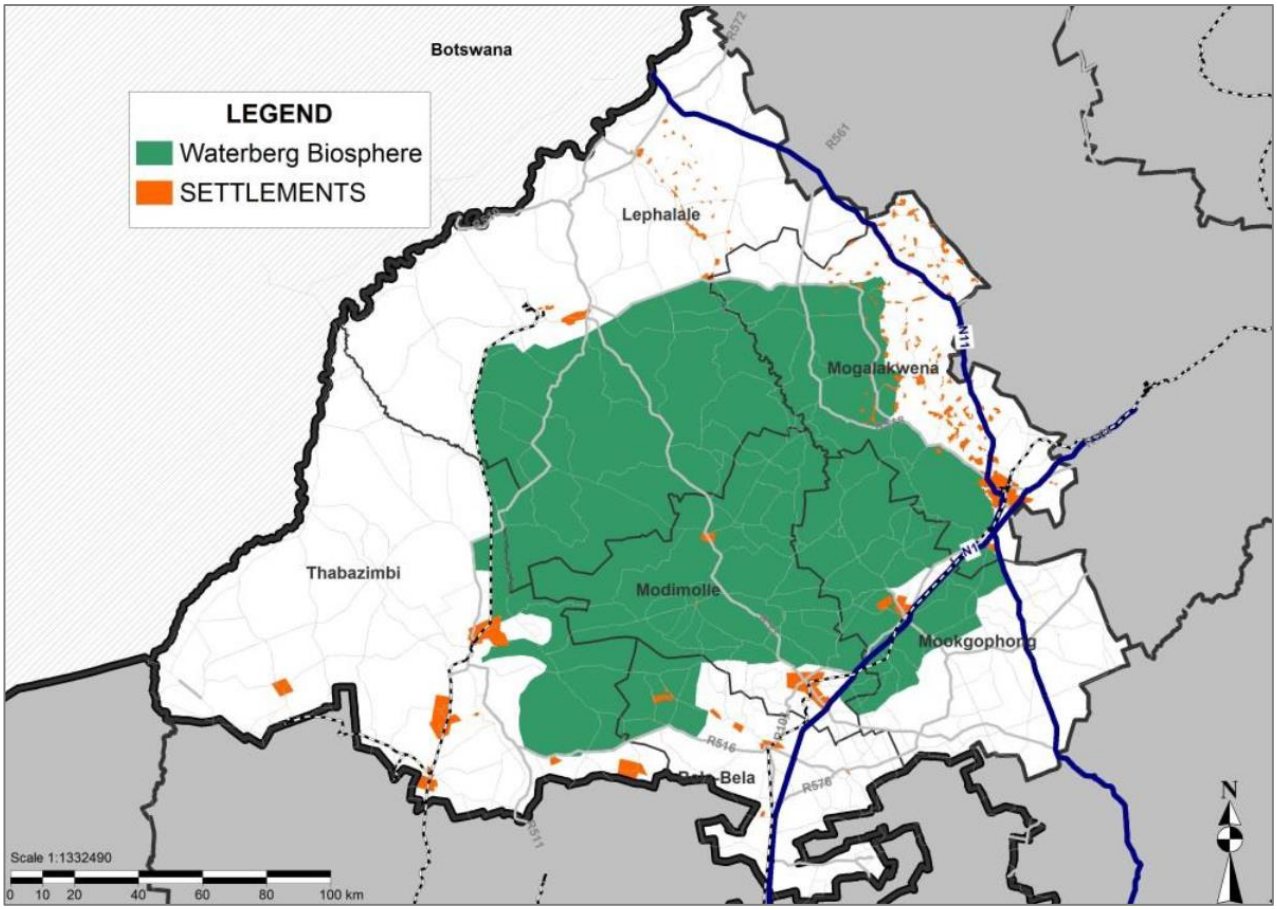


Figure 20: Waterberg Biosphere (Waterberg DM, 213)

The Ben Alberts Nature Reserve lies immediately southeast of the BP SS1. The reserve belongs to **Kumba Iron Ore, Thabazimbi mine, which is currently in its closure phase.**

Flora Species

The study area is located within 2327CB, 2327CD, 2427AB, 2427AD, 2427CB and 2327 DA quarter degree squares in terms of the 1:50 000 grid of South Africa. SANBI uses this grid system as a point of reference to determine any Red Data plant species or any species of conservation importance occurring in South Africa. **Table 12** provides details on the Red Data plant species which have been recorded in grid cells 2427AD and 2427CB (No Red Data plant species were recorded in grid cells 2327CB and 2327CD). The definitions of the conservation status are provided in **Table 13**.

Table 12: Threatened plant species recorded in grid cells 2427AD and 2427CB

Family	Species	Threat status	Growth forms
Scrophulariaceae	*Freylinia tropica* S.Moore	Rare	Shrub
Scrophulariaceae	*Jamesbrittenia bergae* P.Lemmer	VU	Dwarf shrub
Zamiaceae	*Encephalartos eugene-maraisii* I.Verd.	EN	Shrub, tree

Note: EN=Endangered, VU=Vulnerable

Table 13: Definitions of Red Data status (Raimondo et al. 1999)

Symbol	Status	Description
EN	Endangered	A taxon is Endangered when the best available evidence indicates that it meets any of the five International Union for Conservation of Nature (IUCN) criteria for Endangered, and is therefore facing an extremely high risk of extinction in the wild.
VU	Vulnerable	A taxon is Vulnerable when the best available evidence indicates that it meets any of the five IUCN criteria for Vulnerable and it is therefore considered to be facing a high risk of extinction in the wild.
	Rare	A taxon is rare when it does not meet any of the four South African criteria for rarity, but is not exposed to any direct or plausible potential threat and does not qualify for a category of threat according to the five IUCN criteria.

FAUNA

Mammals

The greater area was historically commonly used for cattle grazing. Game farms are now more common, with an associated high faunal biodiversity. Various mammal species (e.g. buffalo) have been introduced through this practice. Numerous farms also keep exotic game species. Proper conservation measures on game farms also afford protection to other species that naturally occur in the area, which include leopard, warthog, baboon and aardvark. Known mammal distributions correlate well with biomes as defined by Acocks (1953), Low and Rebelo (1998), Knobel and Bredenkamp (2005) as well as Mucina and Rutherford (2006). However, the local occurrences of mammals are more closely dependent on broadly defined habitat types, in particular terrestrial, arboreal (treeliving), rupiculous (rock-dwelling) and wetland-associated vegetation cover. The riverine areas and ridges in the area are regarded as significant in terms of the habitat that they provide to fauna. Riparian zones also serve as important corridors to allow for animal migration. The Red Data mammal species that could potentially naturally occur in the project area are those which have been recorded in the grid cells 2327CB, 2327CD, 2327DA, 2427AB, 2427AD and 2427CB (ADU, 2016) are listed in **Table 14.**

Table 14: Red data mammal species recorded in the grid cells (ADU, 2016)

Family	Genus	Species	Subspecies	Common name	Red list category	Atlas region endemic
Bovidae	*Hippotragus*	*equinus*		Roan Antelope	Vulnerable	Yes
Bovidae	*Hippotragus*	*niger*	*niger*	Sable Antelope	Vulnerable	
Felidae	*Acinonyx*	*jubatus*		Cheetah	Vulnerable	Yes
Felidae	*Leptailurus*	*serval*		Serval	Near Threatened	Yes
Hyaenidae	*Hyaena*	*brunnea*		Brown Hyena	Near Threatened	Yes
Felidae	*Acinonyx*	*jubatus*		Cheetah	Vulnerable	Yes
Manidae	*Smutsia*	*temminckii*		Ground Pangolin	Vulnerable	Yes
Mustelidae	*Mellivora*	*capensis*		Honey Badger	Near Threatened	Yes
Vespertilionidae	*Myotis*	*tricolor*		Temminck's Myotis	Near Threatened	Yes

Previous studies found a bat cave that is situated in the Mooivalei area. The bats recorded from the cave are reported to be *Rhinolophus darlingi* and *Miniopterus schreibersii*, and are both ranked as 'Near Threatened'.

Avifauna

The banks of the Crocodile River, where BP SS1 is situated, are steep with reeds that grow in most areas followed by riparian vegetation that varies in density from place to place. The Matlabas River is a smaller river system with more or less the same vegetation that grows on its banks. These rivers are sensitive for bird species that depend on them for food, water and breeding purposes. Bird species such as herons, crakes, moorhens, bishops, weavers, cisticolas and warblers will breed in the reeds growing on the banks of the river systems and will also feed on insects that live within the reeds and semi-aquatic vegetation. Fish living in the water of these rivers will also attract birds such as kingfishers, cormorants and darters. Frogs and crabs also occur and will attract bird species that feed on them such as Hadeda, herons, hamerkop and kingfishers.

The vegetation within the riparian zone consists of large Acacia and broadleafed trees, which are taller than those trees further away from the river due to the availability of water. This riparian vegetation will favour species typically associated with a bushveld habitat. These birds include a great variety of arboreal passerines such as drongos, warblers, flycatchers, shrikes, sunbirds, waxbills and weavers as well as arboreal nonpasserines such as doves, cuckoos and woodpeckers. Many of these species make use of the thorny nature of these trees to build their nests. Acacia trees generally attract many insects and in turn attract a good diversity of typical "Bushveld" bird species.

The bird species within the woodland habitat include a great variety of arboreal passerines such as drongos, warblers, flycatchers, shrikes, sunbirds, waxbills and weavers as well as arboreal non-passerines such as doves, cuckoos and woodpeckers. Many of these species make use of the thorny nature of these trees to build their nests. Acacia trees generally attract many insects and in turn attract a good diversity of typical Acacia savanna bird species. The ground cover between the trees consists of mainly short to long grass interspersed with shrubs.

Several, mainly seasonal, pans are found in the region. Not only are these pans important for Red Data species but also for many Palaearctic waders which visit southern Africa during the summer months. The pans will attract several water bird species such as lapwings, ducks, herons and egrets for foraging, breeding and roosting purposes. They will feed on prey species such as frogs and their tadpoles and fish that aestivate and hibernate in the mud during times when the pans are dry as well as aquatic insects and plants. The pans are also an important source of water for many woodland bird species such as waxbills, buntings, sparrows, weavers and doves especially during hot and dry periods.

Bird distribution data of the Southern African Bird Atlas Project (SABAP1 – Harrison et al. 1997) obtained from the Avian Demography Unit of the University of Cape Town was used in order to ascertain which Red Data bird species occur in the study area (see **Table 15**). The more recent SABAP2 data was also consulted online (http://sabap2.adu.org.za/v1/gap_analysis.php).

Table 15: Red data bird species recorded in the grid cells 2327CB, 2327CD, 2327DA, 2427AB, 2427AD and 2427CB (ADU, 2016)

Common Name	Scientific Name	Conservation Status	2327CB	2327CD	2427AB	2427AD	2427CB
Kori Bustard	*Ardeotis kori*	VU	✓		✓	✓	✓
White-bellied Korhaan	*Eupodotis senegalensis*	VU				✓	
Yellow-throated Sandgrouse	*Pterocles gutturalis*	NT			✓		✓
Greater Painted-snipe	*Rostratula benghalensis*	NT					✓
Black-winged Pratincole	*Glareola nordmanni*	NT	✓				✓
White-backed Vulture	*Gyps africanus*	VU	✓	✓	✓		✓
Cape Vulture	*Gyps coprotheres*	VU	✓		✓		✓
Lappet-faced Vulture	*Aegypius tracheliotus*	VU	✓		✓		
Bateleur	*Terathopius ecaudatus*	VU	✓		✓		
African Marsh-Harrier	*Circus ranivorus*	VU					✓
Tawny Eagle	*Aquila rapax*	VU	✓	✓	✓		✓
Martial Eagle	*Polemaetus bellicosus*	VU			✓	✓	✓
Secretarybird	*Sagittarius serpentarius*	NT	✓	✓	✓	✓	✓
Lesser Kestrel	*Falco naumanni*	VU			✓		✓
Lanner Falcon	*Falco biarmicus*	NT					✓
Yellow-billed Stork	*Mycteria ibis*	NT			✓		✓
Black Stork	*Ciconia nigra*	NT			✓		✓
Marabou Stork	*Leptoptilos crumeniferus*	NT			✓		✓
Red-billed Oxpecker	*Buphagus erythrorhynchus*	NT			✓		✓

The Important Bird & Biodiversity Area (IBBA) programme of southern Africa (Barnes, 1998) identified 124 IBAs in South Africa. IBAs are places of international significance for the conservation of birds and other biodiversity and are sites that together form part of a wider, integrated approach to the conservation and sustainable use of the natural environment. The Waterberg System IBA occurs approximately 3.5 km to the east of BP 28, BP 33 and BP 41 which are situated in the middle of the study area, and the Northern Turf Thornveld IBA is situated approximately 2 km to the south of BP SS1 (see **Figure 21**). No borrow areas encroach into any of the surrounding IBAs.

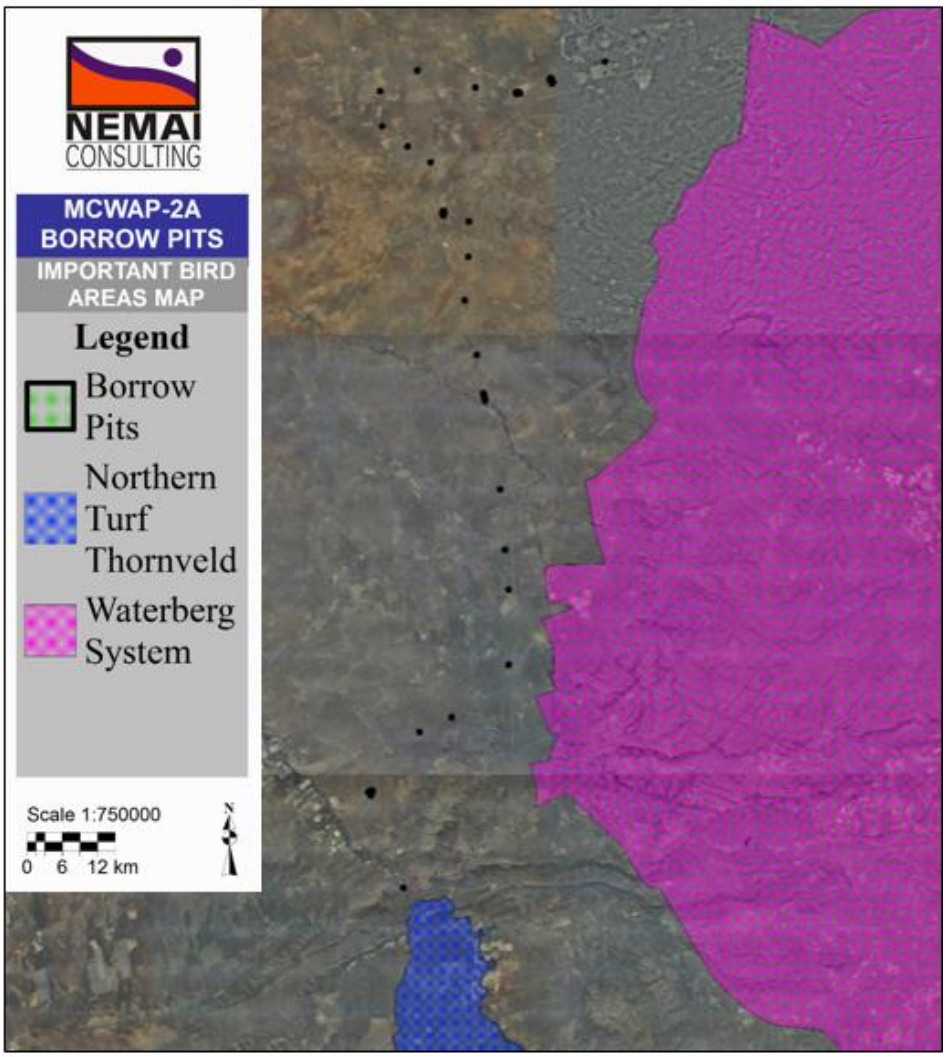


Figure 21: Important Bird Areas

Herpetofauna (Reptiles and Amphibians)

In general, the habitat types affected by the proposed project are suitable for relatively high species diversity. The herpetofauna mainly consists of widespread, common Bushveld species with slight variation due to the presence of sandy substrate, stony to rocky terrain, water bodies, bush and trees. Riparian habitats are ordinarily rich in reptile diversity and densities due to the habitat supporting a high abundance of prey species, such as frogs, birds and small mammals (Branch, 2001). Reptilian species are largely dependent on habitat unit structures and prey abundance, which, in turn, also depends on general habitat unit structure and condition. Many reptilian species, together with a large proportion of their prey species, have been shown to be broadly tolerant to a variety of habitat types. Vegetative cover is also greater within this habitat type. Species are also very often “ousted” into wetland and riparian zones due to transformation of lands for urban and agricultural purposes.

Amphibians are an important component of South Africa’s exceptional biodiversity and are such worthy of both research and conservation effort. This is made additionally relevant by international concern over globally declining amphibian populations, a phenomenon currently undergoing intensive investigation but is still poorly understood (Wyman, 1990 & Wake, 1991). This decline seems to have worsened over the past 25 years and amphibians are now more threatened than either mammals or

birds, though comparisons with other taxa are confounded by a shortage of reliable data. Frogs are particularly restricted to aquatic habitats (wetlands and other surface water bodies) and, thus, impacts on these habitats (as a result of the clearing of the vegetation) are likely to negatively impact on amphibian species. Frogs also require terrestrial habitats adjoining aquatic habitats. Frogs are useful environmental bio-monitors (bio-indicators) and may acts as an early warning system for the quality of the environment. Frogs and tadpoles are good species indicator on water quality, because they have permeable, exposed skins that readily absorb toxic substances. Tadpoles are aquatic and greatly exposed to aquatic pollutants (Blaustein, 2003). The presence of amphibians is also generally regarded as an indication of intact ecological functionality.

Based on Jacobsen (1989), the SARCA Reptile Survey (2006 – 2009) and (Minter et al. 2004) the following list of Red Data herpetofauna species may occur within the project area:

- Giant Bullfrogs (*Pyxicephalus adspersus*);
- African Bullfrog (*Pyxicephalus edulis*); and
- Southern African Python (*Python natalensis*).

SOCIO-ECONOMIC ENVIRONMENT

General

Waterberg DM consists mainly of agricultural/commercial farms, game farms (including exotic game), subsistence farms, rural settlements and small towns. The district's economy is mainly characterised by mining, tourism, agriculture and manufacturing. According to the SDF (Waterberg DM, 213), the dominant economic sectors in the district are shown in the **Figure 22** below.

Figure 22: Dominant economic sectors in Waterberg DM (Waterberg DM, 213)

Local Socio-economic Factors

The borrow areas, and associated infrastructure and access/haul roads are mostly located on privately-owned properties that are primarily used for agriculture, game farming and eco-tourism.

Apart from cultivated land and game farms, some notable socio-economic features in the project area include *inter alia* the following:

- Proximity of farm houses and dwellings of farm labourers to borrow pit locations (e.g. BP 38 and BP 49 are in close proximity to existing residential structures **Figure 23**); and
- Smaller / narrower farms will be affected by project infrastructure and fencing off of borrow areas and haul roads, which may influence future agricultural and game farming practices.

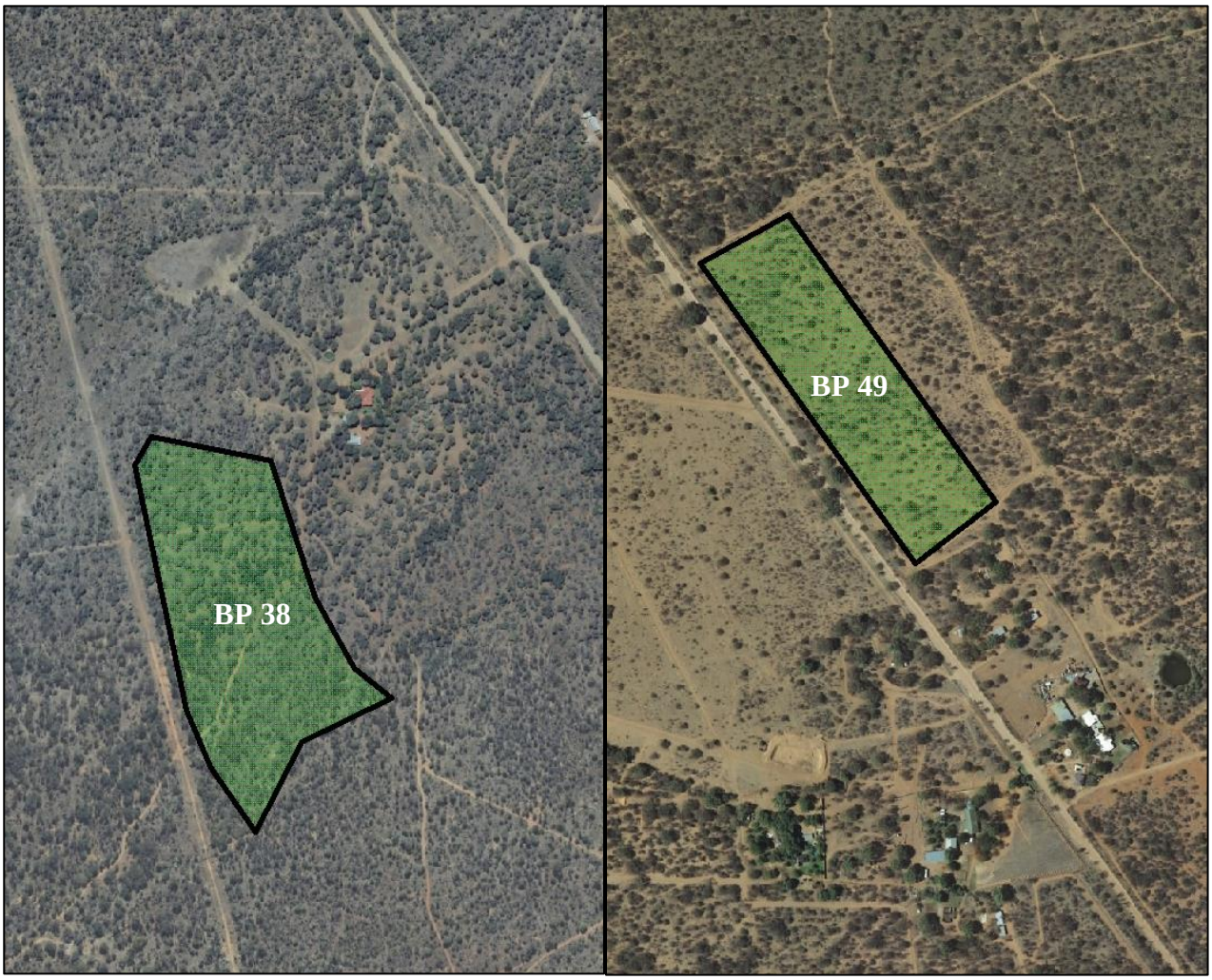


Figure 23: Structures impacted by the close proximity of borrow pits (BP 38 and BP 49)

Socio-Economic Baseline

Data pertaining to the socio-economic profile of Thabazimbi and Lephalale LMs, based on Census 2011, is presented below.

The majority of the population in Thabazimbi LM reside in urban areas, whereas in Lephalale LM the majority resides in traditional areas (see **Table 16**).

Table 16: Geo type for Person weighted (Statistics South Africa, 2013)

	LIM361: Thabazimbi	LIM362: Lephalale
Urban area	70 062	46 120
Tribal or Traditional area	-	52 355
Farm	15 172	17 291

The majority of residents in the two LMs fall in the Black African category (see **Table 17**).

Table 17: Population group for Person weighted (Statistics South Africa, 2013)

	LIM361: Thabazimbi	LIM362: Lephalale
Black African	71 845	104 964
Coloured	527	1 023
Indian or Asian	205	344
White	12 309	9 120
Other	347	317

The male population in the two LMs is higher than the female population (see **Table 18**).

Table 18: Gender for Person weighted (Statistics South Africa, 2013)

	LIM361: Thabazimbi	LIM362: Lephalale
Male	49 877	62 819
Female	35 357	52 948

Setswana is the dominant language in Thabazimbi LM, whereas Sepedi is dominant in Lephalale LM (see **Table 19**).

Table 19: Language for Person weighted (Statistics South Africa, 2013)

	LIM361: Thabazimbi	LIM362: Lephalale
Afrikaans	12 345	8 690
English	2 808	3 338
IsiNdebele	754	1 277
IsiXhosa	9 679	1 044
IsiZulu	1 672	1 972
Sepedi	6 264	55 539
Sesotho	3 085	1 813
Setswana	32 407	25 944
Sign language	247	195
SiSwati	624	259
Tshivenda	1 051	1 669
Xitsonga	5 812	3 218
Other	1 829	2 565
Not applicable	6 657	8 245

Education levels are assessed in order to understand the potential grade or level of employment as well as livelihood of the community. Furthermore, it indicates the functional literacy and skill level of a community. **Table 20** shows the highest level of education reached for both LMs falls within the “some secondary” category.

Table 20: Highest educational level (grouped) for Person weighted (Statistics South Africa, 2013)

	LIM361: Thabazimbi	LIM362: Lephalale
No schooling	5 919	7 431
Some primary	15 753	24 447
Completed primary	4 464	5 559
Some secondary	24 597	33 315
Grade 12/Std 10	15 069	16 707
Higher	4 578	7 986
Unspecified	156	204
Not applicable	14 700	20 121

The majority of people in both LMs are employed (see **Table 21**).

Table 21: Official employment status for Person weighted (Statistics South Africa, 2013)

	LIM361: Thabazimbi	LIM362: Lephalale
Employed	32 916	35 328
Unemployed	8 562	10 101
Discouraged work-seeker	1 236	1 563
Other not economically active	22 437	33 699
Age less than 15 years	-	-
Not applicable	20 082	35 076

The main type of dwelling encountered in both LMs is a house or brick/concrete block structure on a separate stand or yard or on a farm (see **Table 22**).

Table 22: Type of main dwelling for Household weighted (Statistics South Africa, 2013)

	LIM361: Thabazimbi	LIM362: Lephalale
House or brick/concrete block structure on a separate stand or yard or on a farm	15 917	22 816
Traditional dwelling/hut/structure made of traditional materials	469	408
Flat or apartment in a block of flats	306	849
Cluster house in complex	75	95
Townhouse (semi-detached house in a complex)	209	114
Semi-detached house	190	62
House/flat/room in backyard	905	340
Informal dwelling (shack; in backyard)	2 925	2 098
Informal dwelling (shack; not in backyard; e.g. in an informal/squatter settlement or on a farm)	3 580	2 456
Room/flatlet on a property or larger dwelling/servants quarters/granny flat	121	321
Caravan/tent	99	74
Other	282	246
Unspecified	-	-
Not applicable	-	-

The majority of annual household income ranges between R 38 201 - R 76 400 in Thabazimbi LM and R 19 601 - R 38 200 in Lephalale LM (see **Table 23**).

Table 23: Annual household income for Household weighted (Statistics South Africa, 2013)

	LIM361: Thabazimbi	LIM362: Lephalale
No income	3 518	3 745
R 1 - R 4800	686	958

	LIM361: Thabazimbi	LIM362: Lephalale
R 4801 - R 9600	1 027	1 876
R 9601 - R 19 600	3 165	4 876
R 19 601 - R 38 200	4 048	6 046
R 38 201 - R 76 400	5 021	4 608
R 76 401 - R 153 800	3 517	3 354
R 153 801 - R 307 600	2 474	2 358
R 307 601 - R 614 400	1 160	1 417
R 614 001 - R 1 228 800	313	445
R 1 228 801 - R 2 457 600	105	126
R 2 457 601 or more	45	68
Unspecified	2	3

Service Delivery

This section provides a summary of level of services in the two affected LMs. The majority of people in the Thabazimbi LM have piped (tap) water inside dwelling/institution. In the Lephalale LM more people have piped (tap) water inside yard (marginally higher than the aforementioned) (see **Table 24**).

Table 24: Piped water for Person weighted (Statistics South Africa, 2013)

	LIM361: Thabazimbi	LIM362: Lephalale
Piped (tap) water inside dwelling/institution	42 360	36 501
Piped (tap) water inside yard	18 867	37 854
Piped (tap) water on community stand: distance less than 200m from dwelling/institution	9 921	28 176
Piped (tap) water on community stand: distance between 200m and 500m from dwelling/institution	3 123	6 783
Piped (tap) water on community stand: distance between 500m and 1000m (1km) from dwelling /institution	2 343	1 875
Piped (tap) water on community stand: distance greater than 1000m (1km) from dwelling/institution	1 203	570
No access to piped (tap) water	6 852	3 366
Unspecified	492	519
Not applicable	75	117

The primary source of water for both LMs is regional / local water scheme (operated by municipality or other water services provider) (see **Table 25**).

Table 25: Source of water for Person weighted (Statistics South Africa, 2013)

	LIM361: Thabazimbi	LIM362: Lephalale
Regional/local water scheme (operated by municipality or other water services provider)	54 036	83 595
Borehole	12 885	20 685
Spring	141	423
Rain water tank	183	345
Dam/pool/stagnant water	267	2 316
River/stream	165	1 527
Water vendor	2 028	1 992
Water tanker	13 557	3 399
Other	1 899	1 368
Not applicable	75	120

The majority of people have flush toilets in both LMs (see **Table 26**).

Table 26: Toilet facilities for Person weighted (Statistics South Africa, 2013)

	LIM361: Thabazimbi	LIM362: Lephalale
None	5 034	4 539
Flush toilet (connected to sewerage system)	55 176	43 803
Flush toilet (with septic tank)	3 798	4 887
Chemical toilet	1 848	870
Pit toilet with ventilation (VIP)	2 547	33 234
Pit toilet without ventilation	13 512	26 289
Bucket toilet	522	663
Other	2 235	846
Unspecified	492	519
Not applicable	75	120

Electricity is the primary from of energy used for cooking, heating and lighting purposes (see **Tables 27 - 29**).

Table 27: Energy or fuel for cooking for Person weighted (Statistics South Africa, 2013)

	LIM361: Thabazimbi	LIM362: Lephalale
Electricity	58 416	66 270
Gas	4 494	2 838
Paraffin	10 908	5 364
Wood	10 470	40 344
Coal	99	51
Animal dung	18	42
Solar	150	57
Other	27	45
None	90	120
Unspecified	492	519
Not applicable	75	117

Table 28: Energy or fuel for heating for Person weighted (Statistics South Africa, 2013)

	LIM361: Thabazimbi	LIM362: Lephalale
Electricity	60 201	69 231
Gas	1 272	999
Paraffin	5 121	3 852
Wood	9 945	28 092
Coal	108	84
Animal dung	90	69
Solar	177	888
Other	3	-
None	7 746	11 910
Unspecified	492	519
Not applicable	75	117

Table 29: Energy or fuel for lighting for Person weighted (Statistics South Africa, 2013)

	LIM361: Thabazimbi	LIM362: Lephalale
Electricity	67 920	101 124

	LIM361: Thabazimbi	LIM362: Lephalale
Gas	174	108
Paraffin	4 023	459
Candles (not a valid option)	11 970	12 942
Solar	321	276
None	255	219
Unspecified	492	519
Not applicable	75	120

In Thabazimbi LM most of the refuse is removed by the local authority / private company at least once a week. In Lephalale LM most people make use of own refuse dumps for refuse disposal. Refer to **Table 30**.

Table 30: Refuse disposal for Person weighted (Statistics South Africa, 2013)

	LIM361: Thabazimbi	LIM362: Lephalale
Removed by local authority/private company at least once a week	53 046	43 482
Removed by local authority/private company less often	1 218	924
Communal refuse dump	3 699	3 777
Own refuse dump	21 651	53 442
No rubbish disposal	4 143	13 089
Other	909	414
Unspecified	492	519
Not applicable	75	120

Land Claims

The land claims in the district, based on the SDF (Waterberg DM, 2013), are shown in **Figure 24**. The project area around the Matlabas River seems to be the most affected by land claims.

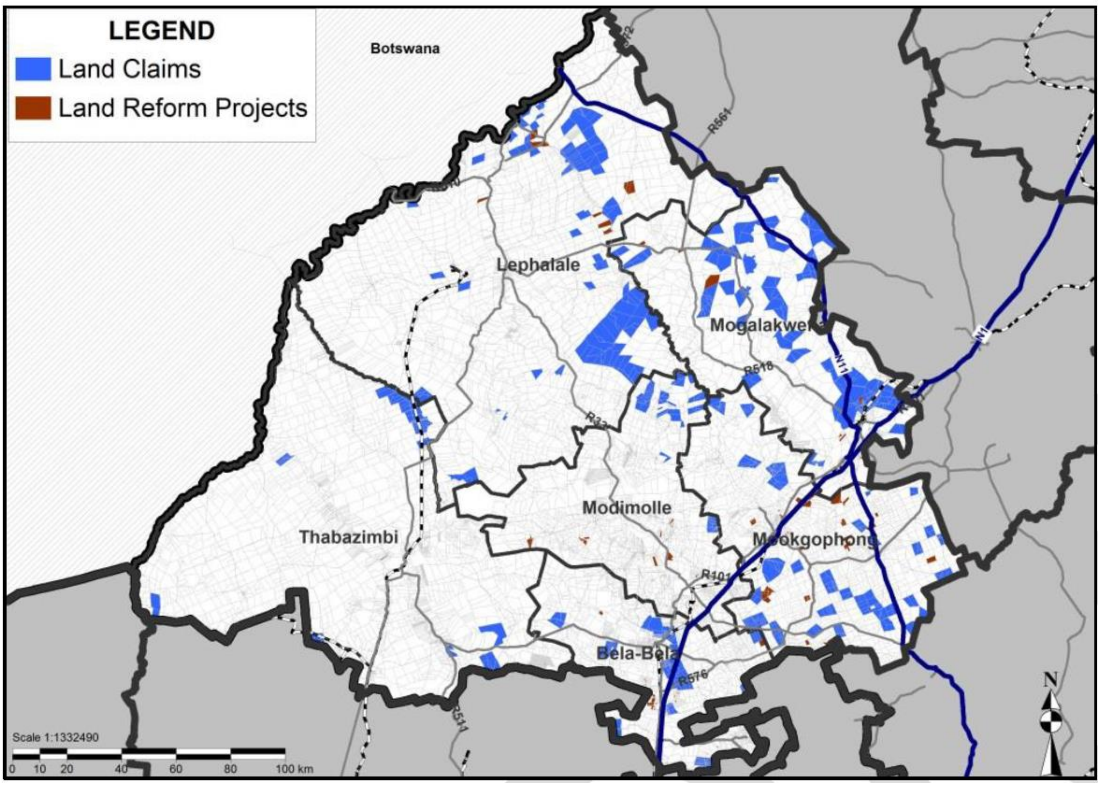


Figure 24: Land claims in district (Waterberg DM, 2013)

AGRICULTURE

Irrigation

In general, the study area is regarded as arid, and irrigation is hence limited to major watercourses, as is evident immediately downstream of the proposed BP SS1 (shown in **Figure 25**). Agricultural practices are mainly reliant on the abstraction of water from the Crocodile River (West), in order to irrigate crops. Formal agricultural groups in the study area include the following:

- Hartbeespoort Irrigation Board;
- Crocodile River (West) Irrigation Board;
- Makoppa Farmers;
- Transvaal Agricultural Union South Africa (TAU SA); and
- Agri-SA Lephalale.

The Makoppa Farmers are downstream of BP SS1 in the Vlieëpoort region (**Figure 25**).

Figure 25: Agricultural practices alongside the Crocodile River (West) downstream of BP SS1

Land Capability

The following observations are made with regards to the land capability map in **Figure 26**:

- Marginal potential arable land is affected by majority of the borrow areas that fall in the central and southern parts of the study area; and
- The borrow areas that fall within the northern region of the study area affect non-arable land (grazing, woodland or wildlife).

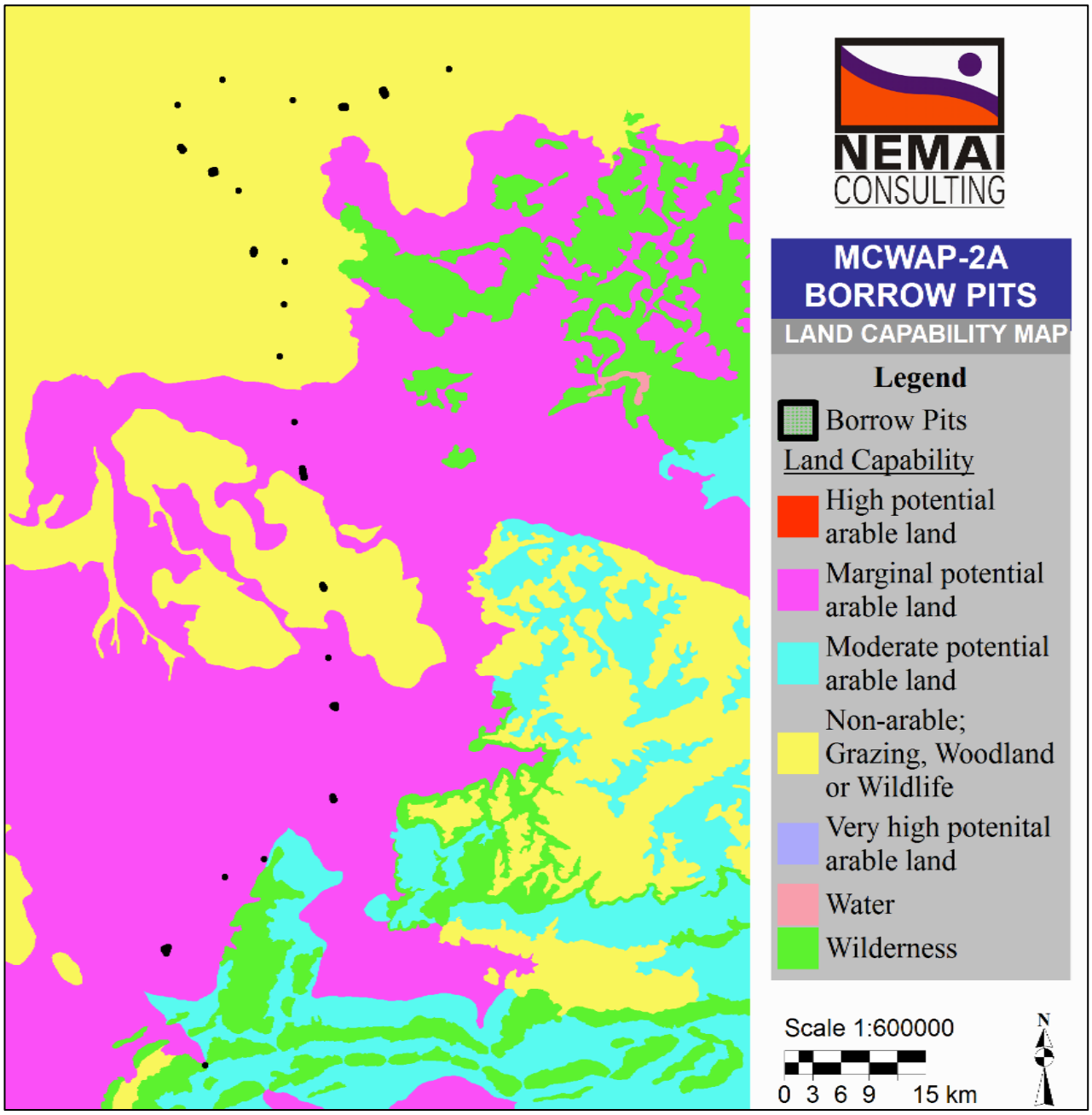


Figure 26: Land capability map

Existing Agricultural Activities

According to the Crocodile (West) Marico Internal Strategic Perspective (ISP) (DWAF, 2004b), smallholding and commercial agricultural activities (limited formal irrigation) take place in the area to the north west of Johannesburg (south of the Magaliesberg northern range). The area between Rustenburg and Brits is known for its citrus farming activities, whereas irrigated cash crop farming takes place below the Hartbeespoort Dam and Brits. Irrigation also occurs along the main stem of the Crocodile River (West), the most significant areas being just south and north of the town of Thabazimbi. The rest of the area is used for dryland farming (limited), cattle grazing and game ranching (DWAF, 2004b). Generally, there has been a movement away from cattle farming towards game farming in the greater area. The project footprint of BP 33 affects existing cultivated fields as seen in **Figure 27**.

Figure 27: Agricultural activities affected by BP 33

HISTORICAL AND CULTURAL FEATURES

The Waterberg Biosphere is rich in cultural heritage. Bushmen entered Waterberg around two thousand years ago, and they produced rock paintings at Lapalala within the Waterberg. Early Iron Age settlers in Waterberg were Bantu, who had brought cattle to the region. Later people left the first Stone Age artefacts recovered in northern South Africa. Starting about the year 1300 AD, Nguni settlers arrived with new technologies, emanating from the Iron Age. Some historical information of the district's administrative areas follows (sourced from Waterberg DM, 2013):

- The heritage and sense of place of the Waterberg lies in its cultural diversity, history, and natural environment. The natural environment is of particular importance due to the prominence of its topography, the unique range of habitats, its tourist attractions and its wildlife;
- Lephalale is the youngest town in the district. It was established in 1960 and got municipal status only in 1986. During the first half of the nineteenth century, Lephalale served as a nexus for hunting parties operating from Vaalwater and the Waterberg in the east, Thabazimbi in the south and Botswana in the north-east; and
- The Thabazimbi-Rooiberg area is known for the prehistoric mining of tin and evidence for pre-historic iron smelting and habitation has been recorded. Thabazimbi is the Tswana word for 'mountain of iron'. The exceptionally rich iron deposits at the Vlieggepoort defile was re-

discovered' by J.H. Williams in 1939. The government bought the ore body and Iscor started with production in 1931. The township of Thabazimbi was mainly established for the employers of Iscor. It was laid out on the farm Kwaggashoek and officially proclaimed on 4 May 1953.

Local Historical Features

Potential historical features within the study area include the following:

- Archaeological sites (possibly linked to the Stone Age and Iron Age);
- Structures of historical value (e.g. farm houses older than 60 years) (see example in **Figure 28**);
- Grave sites; and
- Intangible historical attributes.

Figure 28: Example of an old structure in the study area

Palaeontology

Based on the Palaeontological (Fossil) Sensitivity Map, sourced from South African Heritage Resources Information System (SAHRIS), (see **Table 31** and **Figure 29**), the following is noted in terms of the project footprint in relation to areas of palaeontological sensitivity:

- Very high sensitivity – Possibly affected by BP SS1in the south, and by BP 51 in the north;
- Moderate sensitivity - affected by all the borrow pits which fall within the southern region of the study area (mainly BP 44 – BP 15); and
- Insignificant / zero sensitivity – remainder of proposed borrow pits.

Table 31: Palaeontology Sensitivity Index

Colour	Sensitivity	Required Action
RED	VERY HIGH	Field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	Desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	Desktop study is required
BLUE	LOW	No palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	No palaeontological studies are required
WHITE/CLEAR	UNKNOWN	These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

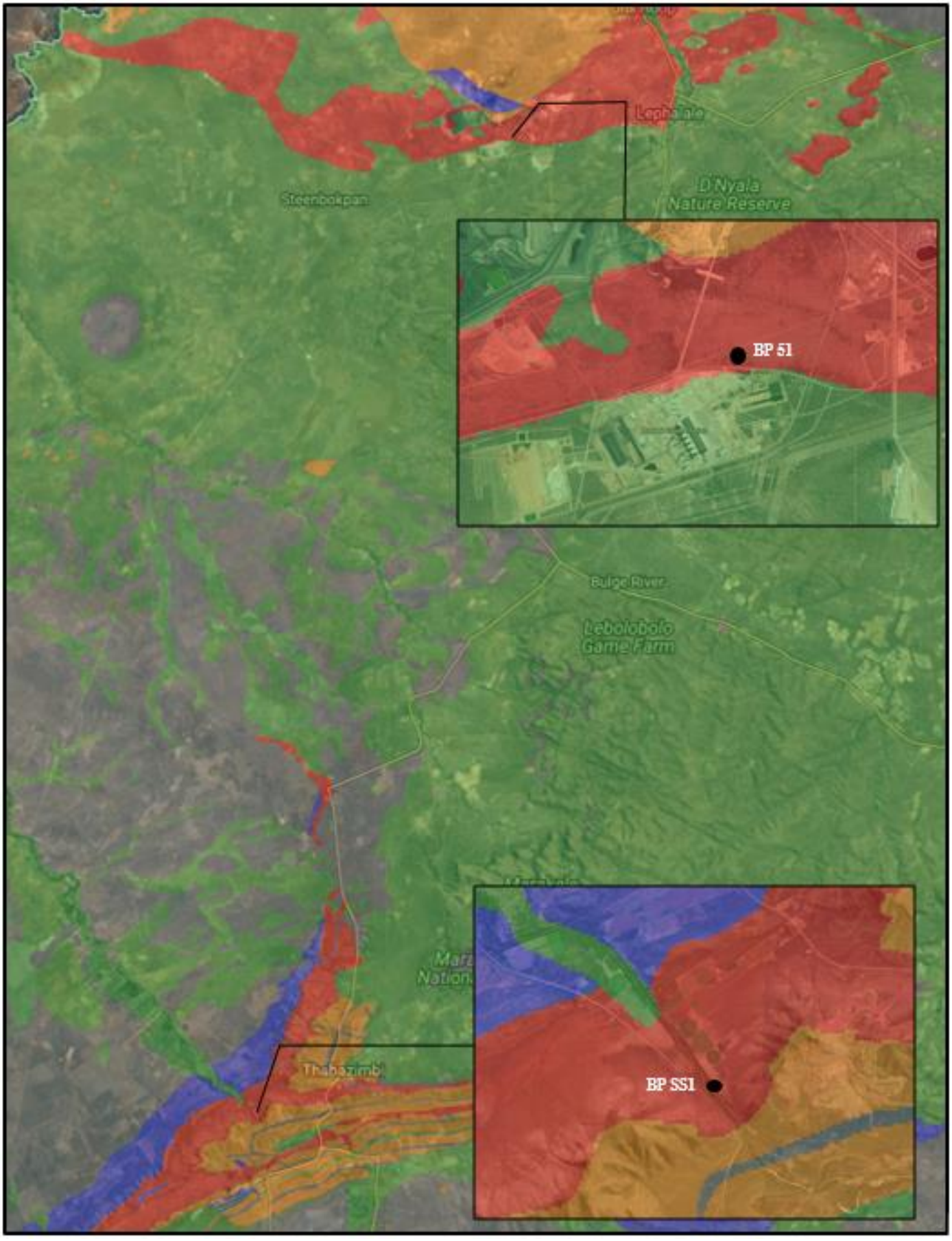


Figure 29: Palaeontological Sensitivity Map (SAHRIS)

TRANSPORTATION

The major transportation network situated in the study region is shown in **Figure 30**.

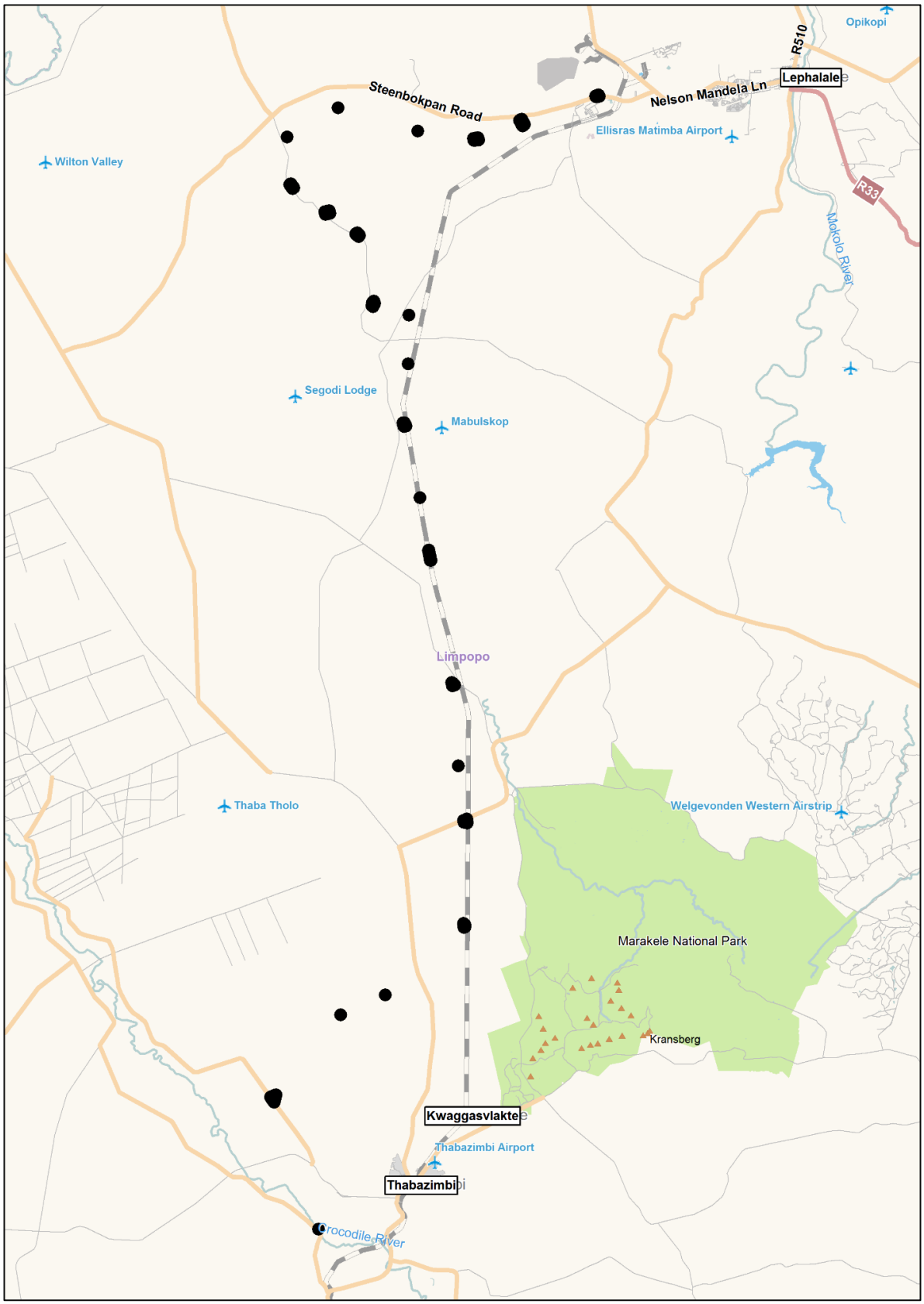


Figure 30: Major transportation network

Provincial roads in Lephalale, which serve as links between Thabazimbi, Vaalwater, Ellisras and Mokopane include:

- P84/1 (Vaalwater/Ellisras/Botswana);
- P19/2 (Ellisras/Marken) that links with (Mokopane); and
- P198/1 (Vaalwater/Ellisras).

The majority of the movement in the municipality occurs between the Mokerong-area and Lephalale where most of the business facilities are located, and along the road networks to Thabazimbi, Mokopane and Gauteng. A number of District Roads link with the Main roads, and there are also a number of internal formal and informal roads, which grant access to farms and settlements within Lephalale district. Lephalale is serviced with a north/south railway line, which transports coal to and from the Grootgeluk Mine. An airfield is also situated in Lephalale, known as the Ellisras Vliegveld/Aerodrome.

Important routes in Thabazimbi municipal area:

- P16/2 (link with the P84/1 situated in the Lephalale Local Municipality);
- P110/1 (north-south route; access route to the North West Province - Brits/Madibeng);
- P20-1 (east-west route; main access to Bela-Bela);
- P20-2 (east-west route; access to Koedoeskop/Northam);
- D928 (access road to Rooiberg from Thabazimbi); and
- D1649 (access road to Dwaalboom).

PLANNING

Waterberg DM covers an area of approximately 4 951 882 ha. It consists mainly of commercial farms, game farming, rural settlements and small towns. The district is geographically, the largest municipality in the Limpopo Province but has the smallest population compared to the other districts (Waterberg DM, 2015). It is located on the western part of the Province.

Thabazimbi LM is located in the south-western part of the Limpopo Province and Waterberg DM. The total area of the municipality is 10 882 km^2, which constitutes 21,97% of the overall DM. The project footprint is located Wards 1 and 3 of the Thabazimbi LM (based on 2015 delimitation of wards).

Lephalale LM is located in the western part of the Limpopo Province and north-western part of the Waterberg DM. The total area of the municipality is 14 000 km^2, which constitutes 28,3% of the overall DM. The project footprint is located Wards 3 and 5 of the Lephalale LM (based on 2015 delimitation of wards).

As mentioned, the proposed borrow areas, and associated haul roads are mostly located on privately-owned properties that are primarily used for agriculture, game farming and eco-tourism.

Spatial Development Framework (SDF)

Limpopo Province SDF

The Limpopo SDF is dated September 2007 and indicates the following elements (Waterberg DM, 213) (see **Figure 31**):

- Infrastructure;
- Nodes;
- Environmentally sensitive areas; and
- Corridors: Four corridors are identified as Strategic Development Initiatives. Two of these impact on the District: namely the Trans-Limpopo Corridor along the N1 and the east-west Corridor from Polokwane via Lephalale to Botswana.

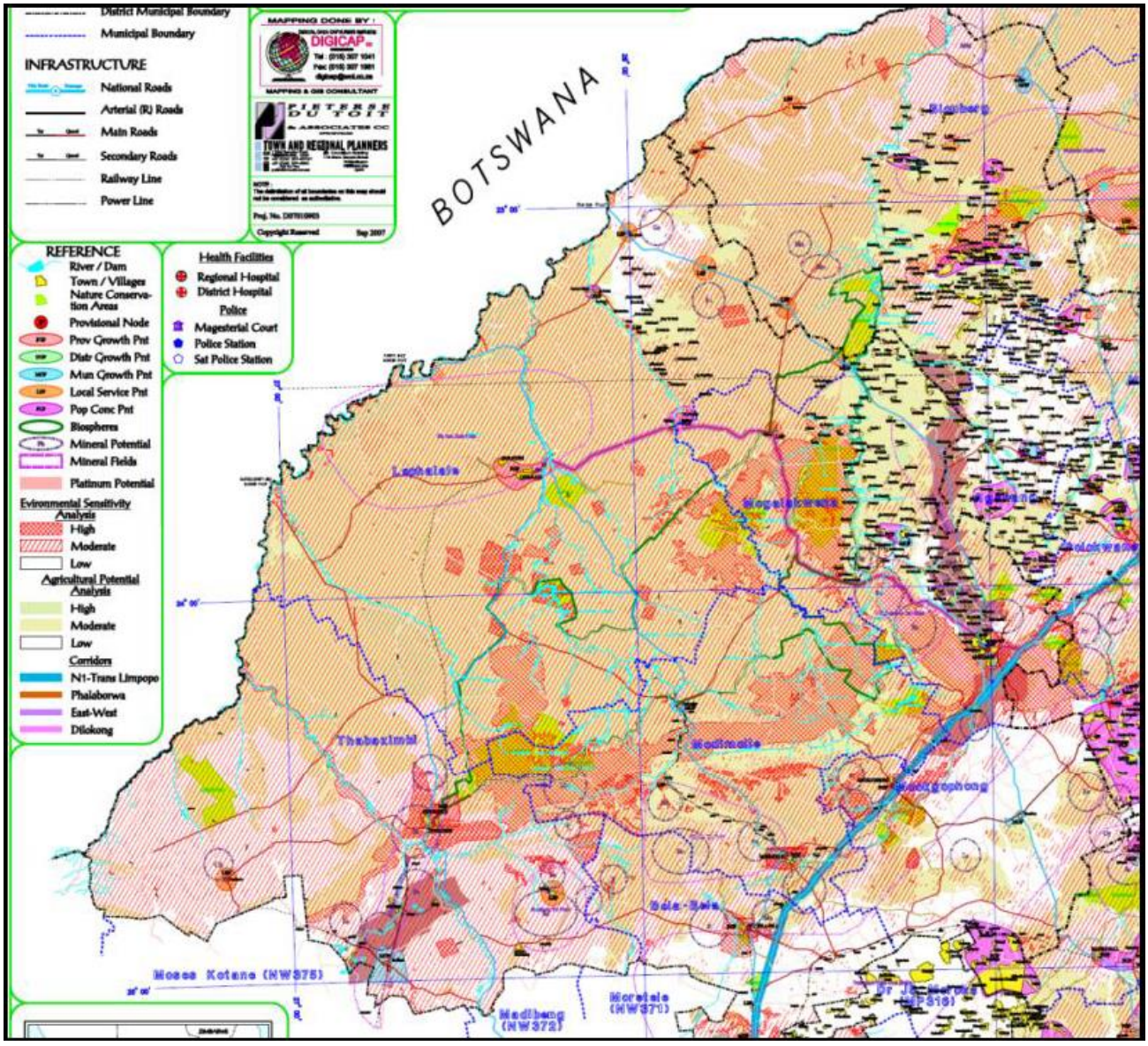


Figure 31: Limpopo Province SDF

Waterberg DM SDF

There is an existing SDF for the Waterberg District, which was approved in 2009, and indicates the following (Waterberg DM, 213) (see **Figure 32**):

- Nodes;
- Networks;
- Conservation and Tourism;
- Mining; and
- Urban and Rural Development.

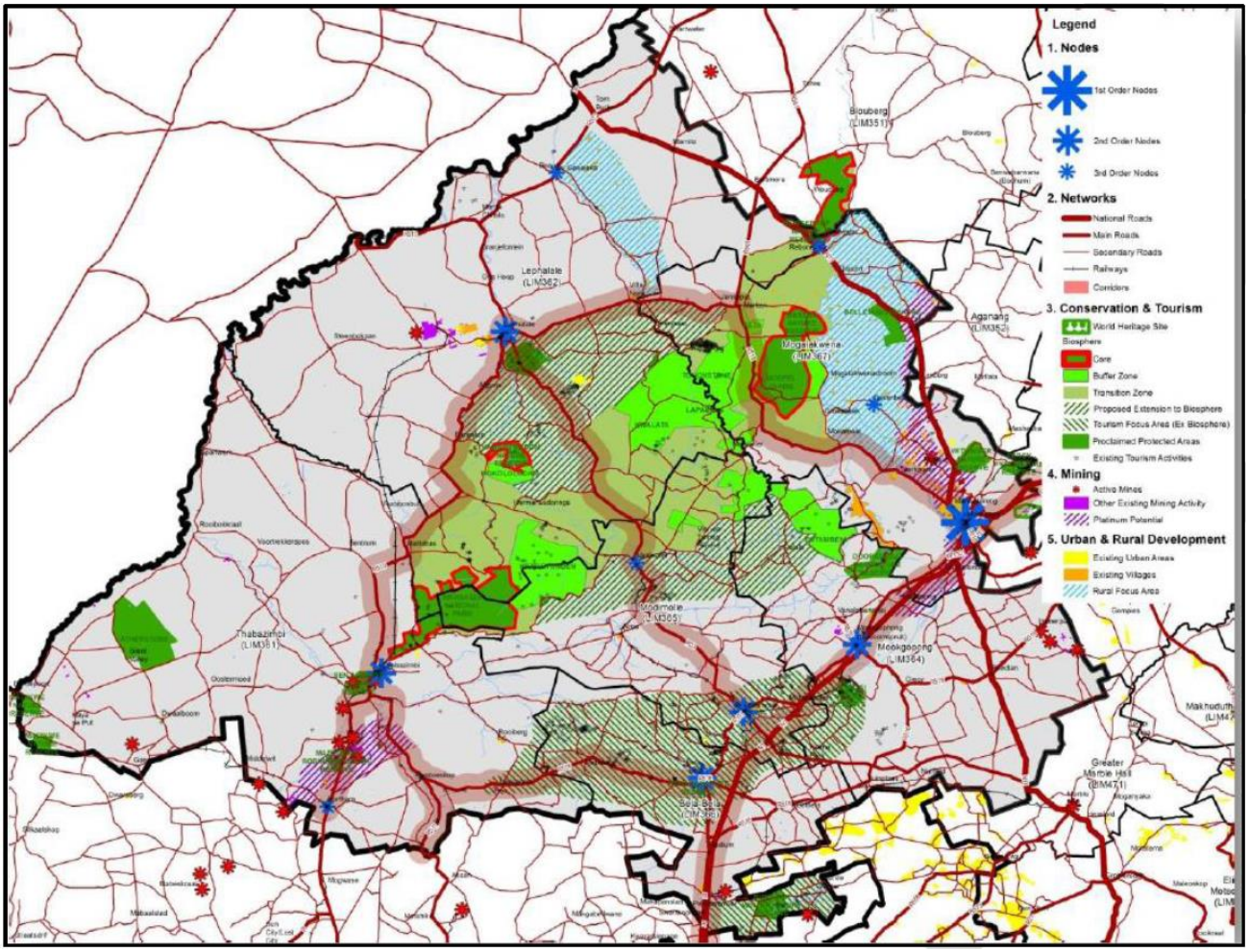


Figure 32: Waterberg DM SDF

Lephalale LM SDF

The Lephalale SDF is dated November 2012 and indicates the following (Waterberg DM, 213) (see **Figure 33**):

- Development corridors and strategic roads;
- Nodal points;
- Human settlement and other zones; and
- Long term vision and other features.

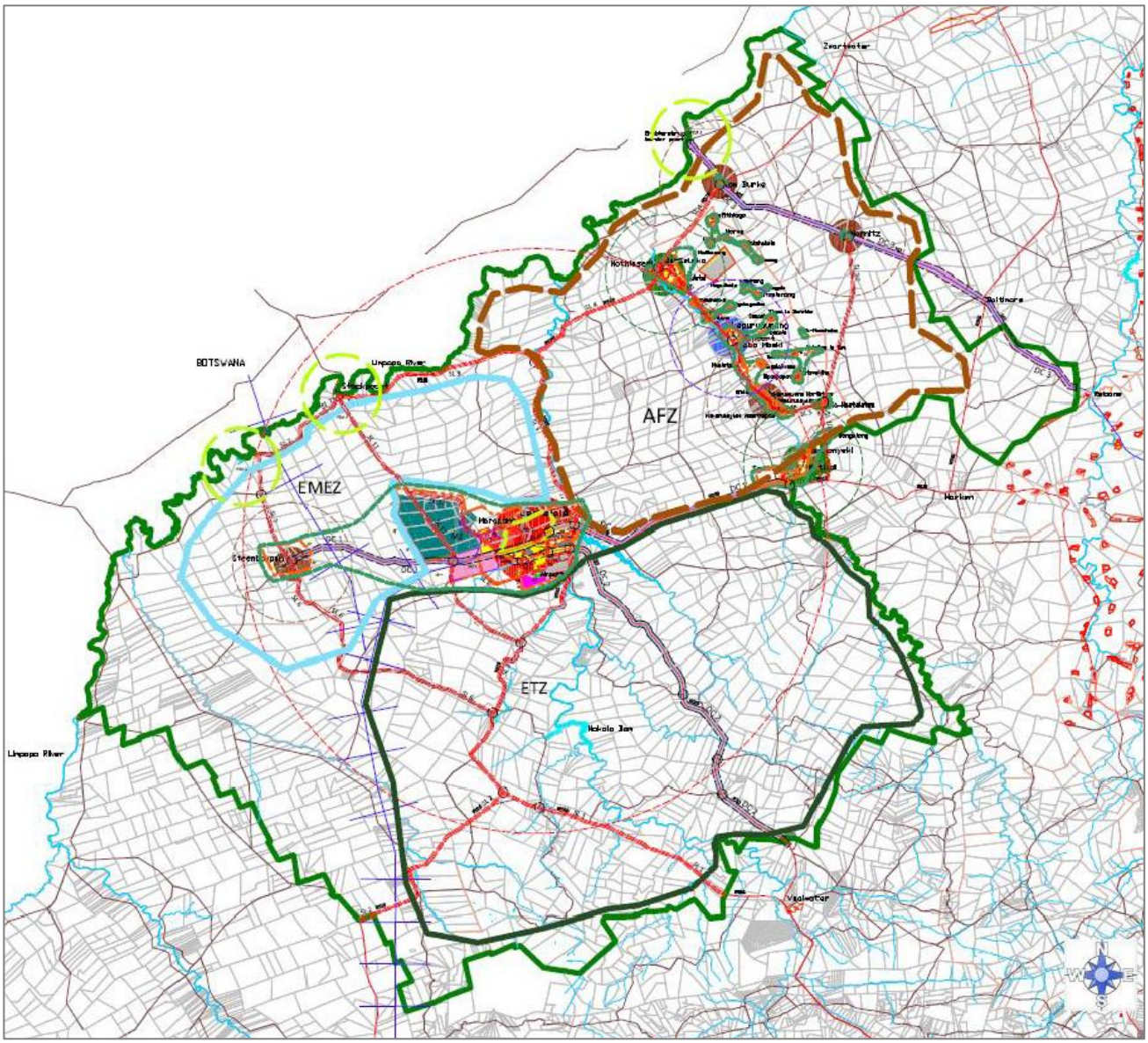


Figure 33: Lephalale LM SDF

Thabazimbi LM SDF

The Thabazimbi SDF is dated June 2008 and indicates the following (Waterberg DM, 213) (see **Figure 34**):

- Growth points;
- Settlements;
- Corridors;
- Nodes;
- Waterberg Biosphere;
- Mines; and
- High-risk river areas.

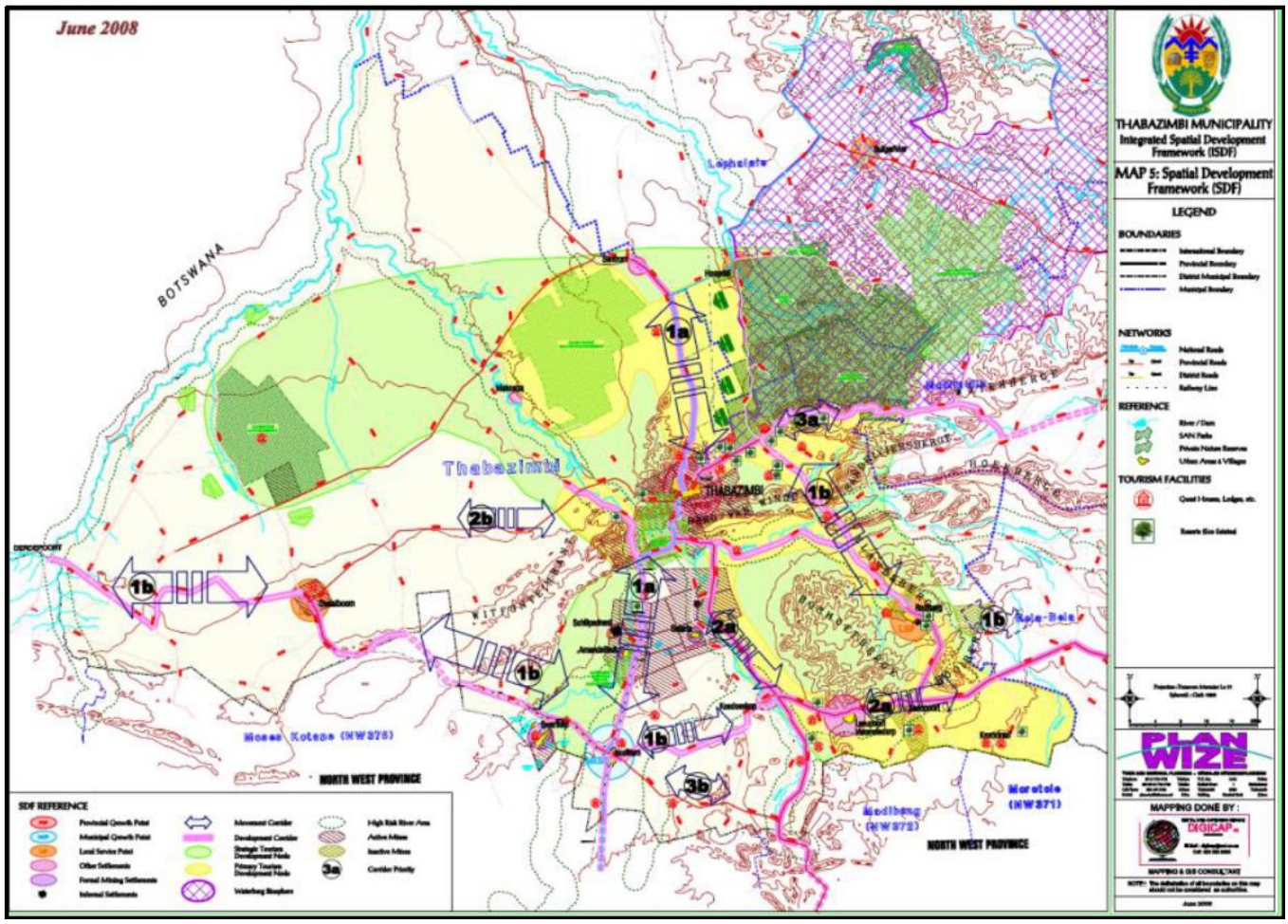


Figure 34: Thabazimbi LM SDF

Environmental Management Framework

An EMF was developed for the Waterberg District with the following objectives:

- Encourage sustainable development;
- Establish development priorities;
- Identify strategic guidance and development management proposals;
- Identify the status quo, development pressures and trends in the area;
- Determine opportunities and constraints;
- Identify geographical areas in terms of NEMA;
- Specify additional activities within identified geographical areas that will require an EIA based on the environmental attributes of such areas;
- Specify currently listed activities that will be excluded from EIA within certain identified geographical areas based on the environmental attributes of such areas; and
- Develop a decision support system for development in the area to ensure that environmental attributes, issues and priorities are taken into account.

In terms of the EMF the project falls within the following Environmental Management Zones (refer to **Figure 35**):

- Zone 4: Game and cattle farming (including hunting) areas with commercial focus;
- Zone 5: Mining and industrial development focus areas;
- Zone 6: Restricted mining focus areas in aesthetic and/or ecological resource areas; and
- Zone 11: Major infrastructure corridors.

It is noted that Zone 11 facilitates the routing of bulk infrastructure, such as the pipeline associated with MCWAP-2A and borrow pits required for the construction of the pipeline infrastructure. The EIA will further assess whether MCWAP-2A is incompatible with the desired state established for the remaining zones.

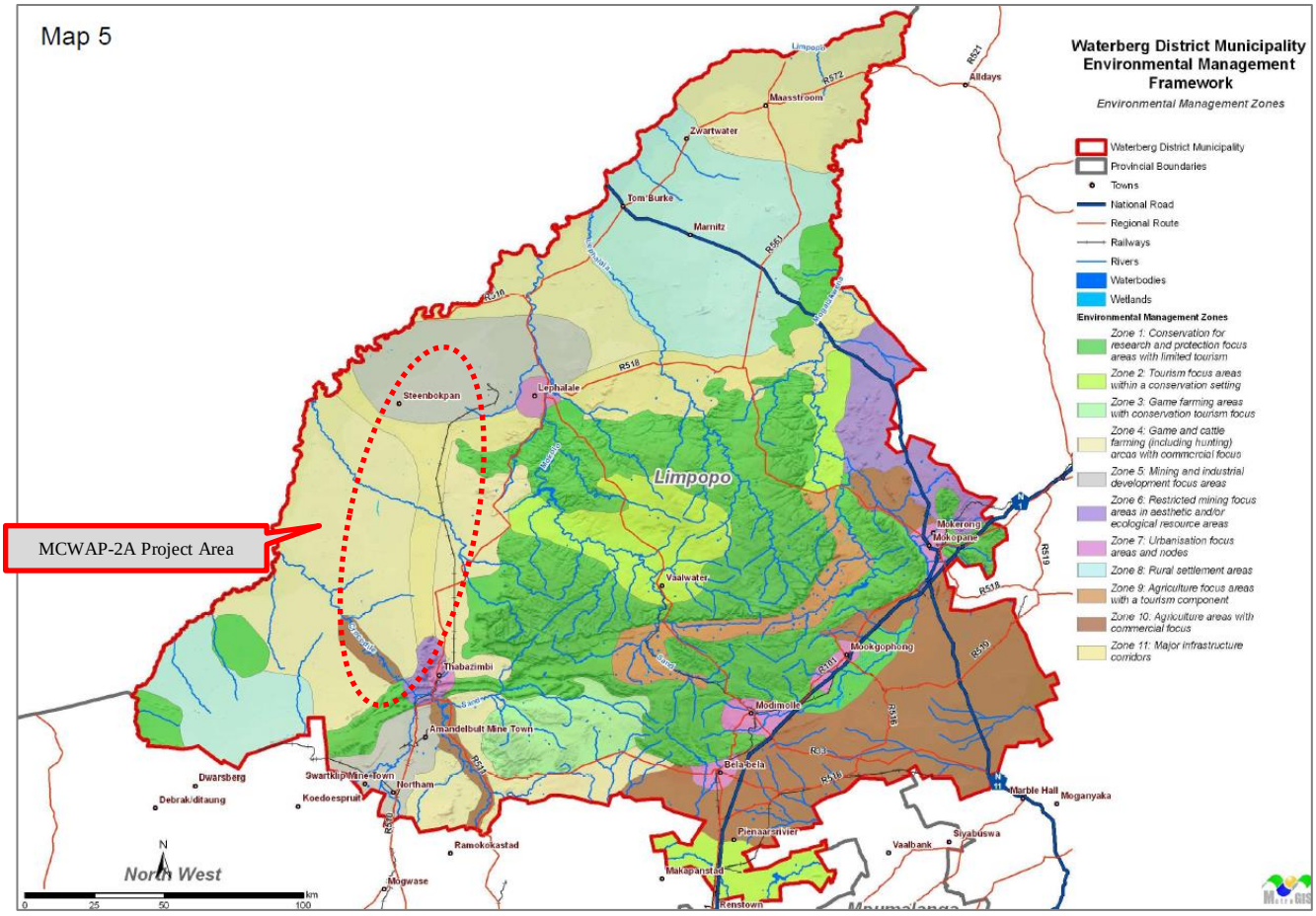


Figure 35: Waterberg DM EMF

WASTE DISPOSAL FACILITIES

Lephalale LM has one permitted waste disposal facility. The life expectancy of the landfill is 5 years without waste minimization programmes but with such programmes the life expectancy can go as far as more than ten years (Lephalale LM, 2015). The Municipality has appointed a service provider to conduct the feasibility studies for the development of new landfill site. According to the IDP (Thabazimbi LM, 2015), there are 3 formal waste disposal sites (Northam, Donkerspoort and Leeupoort) and 1 informal site (Rooiberg) in Thabazimbi LM.

TOURISM

Tourism is a key economic sector within the study area. An abundance of tourism activities are available including hunting, game viewing, bird watching, fishing, horse riding, hiking, etc. There has been a large-scale shift from cattle farming to ecotourism-based land use, hunting and exotic game-farming in the region, with numerous lodges, chalets and other forms of bush-accommodation also available. The Waterberg Mountain Range, which stretches from Thabazimbi to Mokopane, is a popular tourist attraction in the region. Thabazimbi is renowned for the numerous hunting opportunities afforded to tourists. Key tourist attractions in proximity to the study area include (amongst others):

- The Marakele National Park lies to the east of the study area;
- Thaba Tholo, which is renowned for breeding threatened and endangered game species like Roan Antelope, Sable Antelope, Tsessebe and disease-free Buffalo, is situated to the west of the pipeline route;
- The Ben Alberts Nature Reserve lies immediately southeast of BP SS1; and
- Borrow areas fall alongside or within Private game reserves.

AESTHETIC QUALITIES

The visual character of the landscape is typical of the bushveld. Private game farms are prevalent in the project area, which afford a high-level of aesthetic appeal to the region. The visual quality of the area is further enhanced by watercourses, undisturbed vegetation and the Vlieëpoort ridge to the south of the study area. The aesthetic quality of certain areas surrounding the proposed borrow areas is partly degraded due to the existence of infrastructure such as roads, railway lines and transmission lines (see examples in **Figure 36**).

Figure 36: Roads, Railway lines and Transmission Lines in the study area

(b) Description of the current land uses

The dominant land use and land cover in the areas earmarked for the proposed BPs are provided in **Table 32** and shown in **Figure 37.** Further information will be included in the EIR. The proposed borrow pits are mostly located on privately-owned properties, which are primarily used for agricultural practices or game-farming. Sensitive aspects associated with the aforementioned land uses include (amongst others) cultivated commercial fields, orchards and pivots (primarily in the Mooivallei area), agricultural infrastructure and facilities (e.g. pipelines, boreholes, dams), and sensitive game species (e.g. exotic game).

Table 32: Land Cover in the study area

Borrow Pits (BP)	Dominant Land Use & Land Cover
BP SS1	Wetland
BP 25	Woodland/Open bush/Grassland
BP 30	Woodland/Open bush/Grassland
BP 35	Woodland/Open bush
BP 28	Woodland/Open bush
BP 33	Cultivated Fields
BP 41	Woodland/Open bush
BP 38	Woodland/Open bush/Grassland
BP 39	Low shrubland/Woodland/Open bush/Grassland
BP 42	Low shrubland/Woodland/Open bush
BP 44	Woodland/Open bush
BP 43	Woodland/Open bush
BP 53	Woodland/Open bush
BP 52	Woodland/Open bush
BP 50	Low shrubland
BP 48	Cultivated Fields/Low shrubland/Woodland/Open bush
BP 49	Cultivated Fields/Low shrubland/Woodland/Open bush
BP 15	Cultivated Fields
BP 46	Woodland/Open bush/Grassland
BP 59	Woodland/Open bush
BP 13	Woodland/Open bush/Low shrubland
BP 14	Woodland/Open bush/Grassland
BP 51	Woodland/Open bush/Grassland

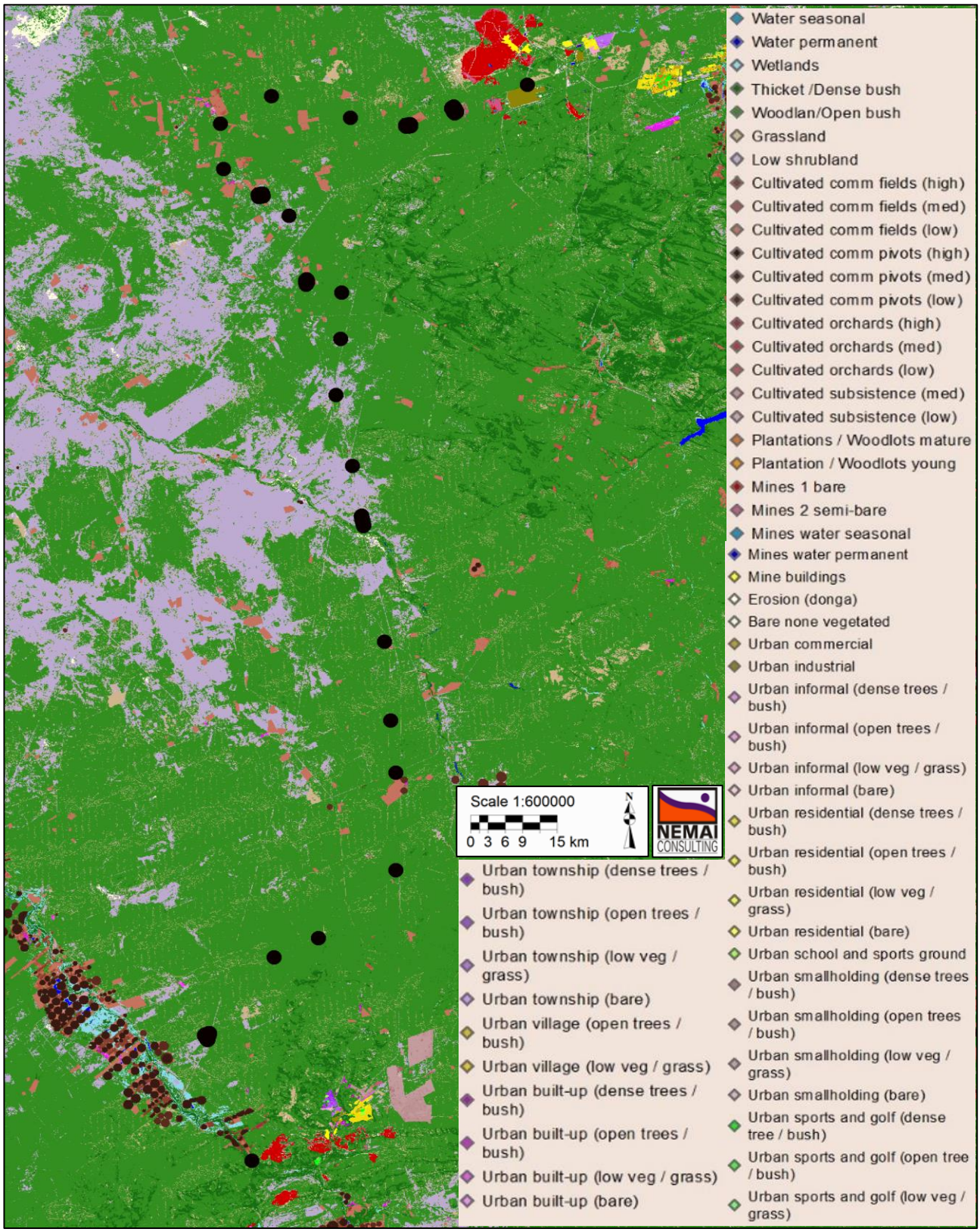


Figure 37: Current land use and land cover

(c) Description of specific environmental features and infrastructure on the site

Please refer to the sensitivity map (**Figure 38**) for all sensitive environmental features within the project area. This section will be updated once Specialist Studies have been conducted in the EIA Phase, and will be provided in the Draft EIA Report. Please refer to **Section 2(d)(ii)** for a description of all activities and infrastructure on-site.

(d) Environmental and current land use map

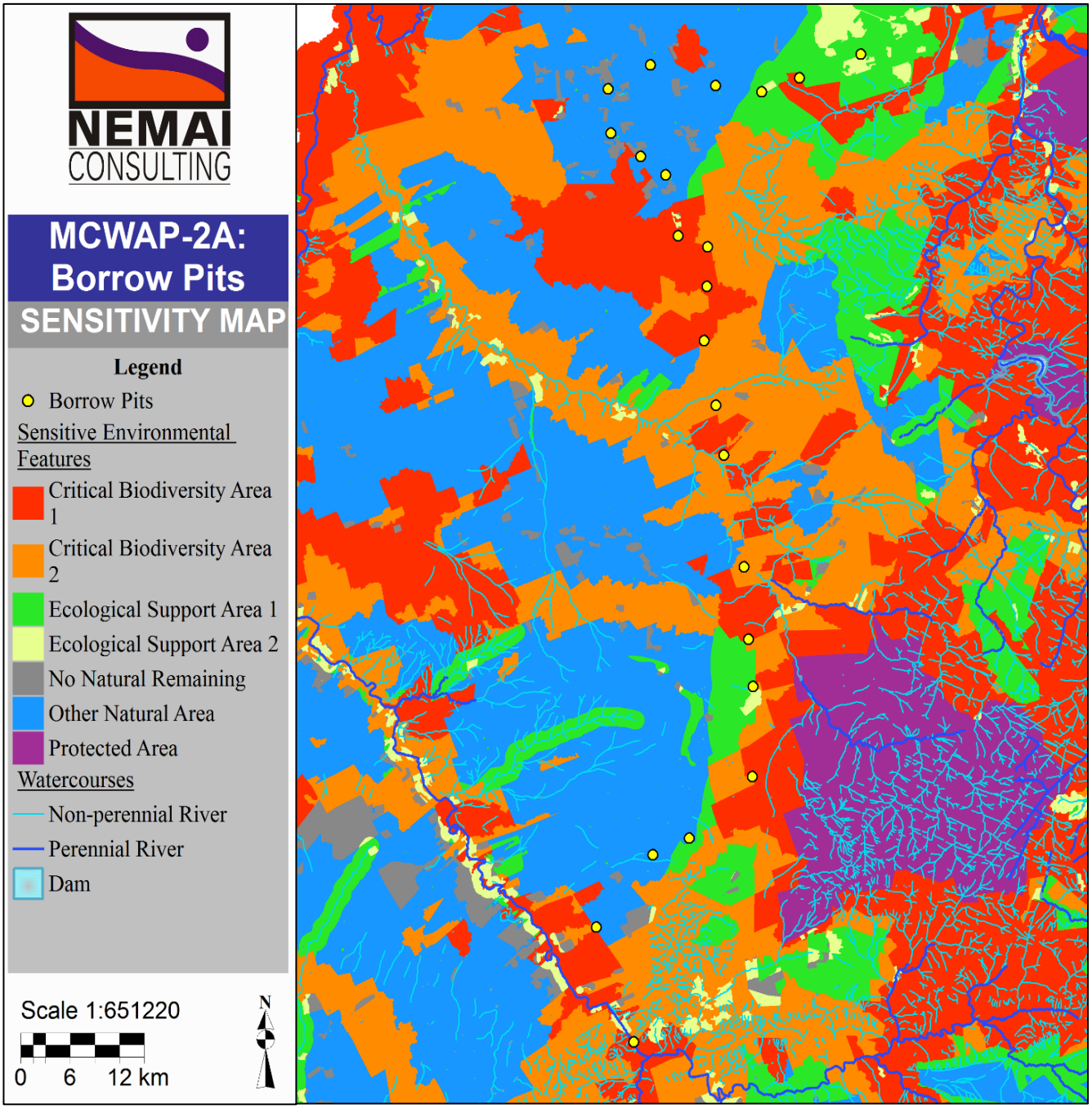


Figure 38: Preliminary sensitivity map (Scoping Phase)

v) Impacts identified (based on desktop screening)

The potential environmental issues/impacts identified during the Scoping Phase, which will be investigated further in the EIA Phase, are provided in **Table 33** below.

Table 33: Potential Significant Environmental Impact/Issues

Environmental Aspect	Pre-Mining & Mining Phases Potential Issues / Impacts
Land Use	• Loss of land used for agriculture and game farming within borrow area. • Fragmentation of farm/farm portions due to access and haul road fencing. • Disturbances on game farms.
Climate	• Possible emission of greenhouse gases during the pre-mining and mining phases of borrow pit, due to delivery and haul vehicles/equipment. • Stormwater management.
Geology	• Blasting related impacts. • Sourcing of construction aggregate and associated impacts (e.g. borrow pits, haul roads). • Disposal of overburden/spoil material. • Unsuitable geological conditions. • Removal of required material within borrow area.
Geohydrology	• Potential disturbance of the aquifer from blasting. • Potential contamination of groundwater during the site clearing and mining stage. • Use of boreholes and groundwater on site. • Possible influence to groundwater flow as a result of excavations at borrow pits. • Contamination of groundwater from poor stormwater management, spills and leaks of hazardous chemical substances (HCS) during operation of borrow area, insufficient bunding of HCS, oil and petrol spills from stagnant vehicles on site.
Soil	• Soil erosion (e.g. steep terrain and instream works). • Soil contamination through poor mining practices and inadequate management of HCS (e.g. fuel, oil).
Hydrology	• Alteration of flow regime at BP SS1 and road crossings. • Impeding/diverting flow of the affected river at BP SS1 and road crossings.
Water Quality	• Sedimentation from instream works. • Water quality impacts due to spillages and poor construction practices. • Runoff from access/haul road in close proximity to affected watercourse.
River Morphology	• BP SS1 in the Crocodile River (West) and the access/haul road may lead to the alteration of the morphology of the watercourse (e.g. destabilisation of bed and banks of watercourses).
Riparian Habitat	• Encroachment of mining activities into riparian zones. • Loss of riparian and instream vegetation within borrow area BP SS1, as well as road crossings.
Wetlands and Pans	• Destabilisation of wetlands due to inadequate reinstatement and rehabilitation. • Impacts to wetlands downstream of BP SS1.
Water Use	• Impact of the instream mining area within the Crocodile River (West) to existing abstraction by downstream users of BP SS1.
Aquatic Ecology	• Instream works will cause a change in the river morphology, thus changing the nature of the river which will impact direct and surrounding aquatic ecology in the river.
Sediment Regime	• Management of sediment and silt from the instream works within the Crocodile River (West) at BP SS1.
Terrestrial Ecology - Flora	• Encroachment into CBAs and ESAs, which are important in terms of biodiversity, ecosystem functionality and ecological processes. • Vegetation will be permanently lost in borrow areas that are to be cleared. The potential loss of significant flora species may occur.

Environmental Aspect	Pre-Mining & Mining Phases Potential Issues / Impacts
	• Clearing of vegetation for construction of haul roads and for the use of the borrow pit may result in the proliferation of exotic vegetation, which could spread beyond the borrow pit domain. • Soil erosion on steep gradients and from runoff from access/haul roads; • Contamination of soil.
Terrestrial Ecology - Fauna	• Ecosystem disruption may occur where clearing and fencing of project footprint is undertaken to allow for the construction of the project infrastructure. • Fauna could be adversely affected through mining-related activities (noise, dust, light pollution, illegal poaching, and habitat loss). This is especially relevant to sensitive game species (including exotic game). • Fencing of the borrow area, and access roads will minimise animal movement on the affected properties. This is particularly significant on smaller game farms.
Socio-economic Environment	• Temporary loss of commercial and agricultural land (including structures and cultivated areas) through clearance of mining areas. • Temporary loss of agricultural production. • Risk to game and livestock as a result of mining related hazards. • Loss of income in eco-tourism sector (hunting and game farming) due to visual impact, noise and dust. • Potential damage to property (e.g. gates, fences, structures). • Temporary use of local road network by delivery and haul vehicles. • Safety and security. • Impact to visual quality and sense of place of direct and adjacent property owners. • Nuisance from dust and noise. • Light pollution. • Influx of people seeking employment and associated impacts (e.g. foreign workforce, cultural conflicts, squatting, demographic changes, anti-social behaviour, and incidence of HIV/AIDS). • Reduction in property value. • If the overall MCWAP projected development materialises, the population and specifically the urban population of the study area will grow substantially.
Agriculture	• Temporary loss of cultivated land within the borrow pit domain. • Temporary loss of grazing land within borrow pit domain. • Disruptions to farming operations as a result of construction-related use of existing access roads. • Loss of fertile soil through land clearance and poor management of stockpiles/spoil sites
Historical and Cultural Features	Risk of heritage and cultural resources being damaged / destroyed through mining activities.
Existing Structures & Infrastructure	• Risk of damaging existing services, infrastructure and structures during site establishment and clearance or stripping of vegetation. • Disruptions to traffic on local road network. This is associated with road crossings, where the borrow area follows an existing road, and as a result of general use of the roads by construction/haul vehicles. • Fenced off restrictions on directly affected farms/farm portions.
Transportation	• Increase in traffic on the local road networks. • Develop temporary access and haul roads. • Risks to existing road users.
Solid Waste	• Waste generated from site preparations (e.g. plant material). • Domestic waste. • Surplus and used building material. • Hazardous waste (e.g. chemicals, oils, soil contaminated by spillages, diesel rags). • Wastewater (sanitation facilities, washing of plant, operations at the batching plant, etc.). • Disposal of excess spoil material (soil and rock) generated as part of the bulk earthworks.
Aesthetics	• Visual quality and sense of place to be adversely affected by mining activities. • Noise and dust generated from blasting affecting households/infrastructure in close proximity to borrow areas. • Provision of light at infrastructure may cause light pollution. • Inadequate reinstatement and rehabilitation of borrow pit footprint.

vi) Methodology used in determining the significance of environmental impacts

Please refer to **Section i(v)** which explains the methodology to be adopted for assessing all environmental impacts during the EIA Phase.

vii) The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected

Refer to **Table 33** for a list of impacts (positive and negative) that the proposed BPs will have on the environment (biophysical and socio-economic aspects) and directly/indirectly affected landowners and communities.

viii) The possible mitigation measures that could be applied and the level of risk

This section will be finalised with specific input from specialist studies and IAPs, in order to address all the issues or concerns, which will be included in the Draft EIA Report once the public review period and specialist studies have been conducted.

ix) The outcome of the site selection Matrix, Final Site Layout Plan

The proposed BP sites can be altered where technically feasible in order to accommodate landowner requirements/input or to avoid sensitive environmental features identified during specialist investigations in the EIA phase.

x) Motivation where no alternative sites were considered

There are no alternatives for the proposed BP locations, as the previous geotechnical investigations (Mokolo Crocodile Consultants, 2012) confirmed the locations of the required borrow pits with the use of test pits. The proposed sites also provide the required volumes that would be excavated and used as construction material. The proposed BP sites can be altered where technically feasible in order to accommodate landowner requirements/input or to avoid sensitive environmental features identified during specialist investigations in the EIA phase.

xi)Statement motivating the preferred site

No alternatives have been assessed for the proposed borrow pit locations, as the previous geotechnical investigations (Mokolo Crocodile Consultants, 2012) confirmed the locations of the required borrow pits with the use of test pits. The proposed sites also provide the required volumes that would be excavated and used as construction material. The proposed BP sites can be altered where technically feasible in order to accommodate landowner requirements/input or to avoid sensitive environmental features identified during specialist investigations in the EIA phase.

i) Plan of study for the Environmental Impact Assessment Process

i) Description of alternatives to be considered including the option of not going ahead with the activity

There are no alternatives for the proposed borrow pit locations, as the previous geotechnical investigations (Mokolo Crocodile Consultants, 2012) confirmed the locations of the required borrow pits with the use of test pits. The proposed sites also provide the required volumes that would be excavated and used as construction material.

No-go Option

As the MCWAP-2A project cannot proceed without the borrow pits, the no go option will be the same as for the Water Transfer Infrastructure (WTI) component, which will have the following implications:

- If no material is sourced for construction, then no required MCWAP-2A infrastructure can be constructed. If no construction occurs, then the development of new power stations, which is of high strategic importance, cannot proceed. Without a suitable source of water, the new power stations will not be possible, with potential future energy shortages;
- No borrow pits means there will be no water pipeline. This causes the absence of water which will ultimately suppress development, with associated socio-economic implications on a national scale; and
- Without MCWAP-2A, Eskom will not be able to implement the Flue-Gas Desulphurisation (FGD) technology at the Medupi Power Station to reduce sulphur emissions, which will violate the related condition in Eskom's World Bank loan.

In contrast, should the proposed MCWAP-2A and the required borrow pits not go ahead, any potentially significant environmental issues associated with the project would be irrelevant and the status quo of the local receiving environment would not be affected by the borrow pits. The objectives of the project would, however, not be met. In addition Eskom will be disallowed to generate any electricity from Medupi endangering the RSA economy.

ii) Description of the aspects to be assessed as part of the environmental impact assessment process

Environmental aspects which will need to be assessed as part of the EIA Phase, and will require specific investigations and input from specialists, is listed in the Table below:

Table 34: Environmental aspects to be assessed in EIA Phase

Environmental Aspects	Pre-Mining & Mining Phases Potential Issues / Impacts	Specialist Investigations / EIA Provisions
Land Use	• Loss of land used for agriculture and game farming within borrow area. • Fragmentation of farm/farm portions due to access and haul road fencing. • Disturbances on game farms.	• Agricultural Impact Assessment; • Terrestrial Ecological Study; • Socio-economic Impact Assessment; • Heritage Impact Assessment;

Environmental Aspects	Pre-Mining & Mining Phases Potential Issues / Impacts	Specialist Investigations / EIA Provisions
		• Wildlife Impact Assessment; and • EMPr.
Climate	• Possible emission of greenhouse gases during the pre-mining and mining phases of borrow pit, due to delivery and haul vehicles/equipment. • Stormwater management.	• EMPr.
Geology	• Blasting related impacts. • Sourcing of construction aggregate and associated impacts (e.g. borrow pits, haul roads). • Disposal of overburden/spoil material. • Unsuitable geological conditions. • Removal of required material within borrow area.	• Geotechnical Study • EMPr
Geohydrology	• Potential disturbance of the aquifer from blasting. • Potential contamination of groundwater during the site clearing and mining stage. • Use of boreholes and groundwater on site. • Possible influence to groundwater flow as a result of excavations at borrow pits. • Contamination of groundwater from poor stormwater management, spills and leaks of hazardous chemical substances (HCS) during operation of borrow area, insufficient bunding of HCS, oil and petrol spills from stagnant vehicles on site.	• Monitoring of groundwater levels during pre-mining and mining phases, as required. • Geotechnical Study; and • EMPr
Soil	• Soil erosion (e.g. steep terrain and instream works). • Soil contamination through poor mining practices and inadequate management of HCS (e.g. fuel, oil).	• Agricultural Impact Assessment; • Geotechnical Study; and • EMPr
Hydrology	• Alteration of flow regime at BP SS1 and road crossings. • Impeding/diverting flow of the affected river at BP SS1 and road crossings.	• Aquatic Impact Assessment; and • EMPr.
Water Quality	• Sedimentation from instream works. • Water quality impacts due to spillages and poor construction practices. • Runoff from access/haul road in close proximity to affected watercourse.	• Water Quality Monitoring Programme • Aquatic Impact Assessment • EMPr
River Morphology	• BP SS1 in the Crocodile River (West) and the access/haul road may lead to the alteration of the morphology of the watercourse (e.g. destabilisation of bed and banks of watercourses).	• Aquatic Impact Assessment • EMPr
Riparian Habitat	• Encroachment of mining activities into riparian zones. • Loss of riparian and instream vegetation within borrow area BP SS1, as well as road crossings.	• Aquatic Impact Assessment • EMPr
Wetlands and Pans	• Destabilisation of wetlands due to inadequate reinstatement and rehabilitation. • Impacts to wetlands downstream of BP SS1.	• Aquatic Impact Assessment • EMPr
Water Use	• Impact of the instream mining area within the Crocodile River (West) to existing abstraction by downstream users of BP SS1.	• EMPr

Environmental Aspects	Pre-Mining & Mining Phases Potential Issues / Impacts	Specialist Investigations / EIA Provisions
Aquatic Ecology	• Instream works will cause a change in the river morphology, thus changing the nature of the river which will impact direct and surrounding aquatic ecology in the river.	• Aquatic Impact Assessment • EMPr
Sediment Regime	• Management of sediment and silt from the instream works within the Crocodile River (West) at BP SS1.	• EMPr
Terrestrial Ecology - Flora	• Encroachment into CBAs and ESAs, which are important in terms of biodiversity, ecosystem functionality and ecological processes. • Vegetation will be permanently lost in borrow areas that are to be cleared. The potential loss of significant flora species may occur. • Clearing of vegetation for construction of haul roads and for the use of the borrow pit may result in the proliferation of exotic vegetation, which could spread beyond the borrow pit domain. • Soil erosion on steep gradients and from runoff from access/haul roads; • Contamination of soil.	• Terrestrial Ecological Impact Assessment • Search, Rescue and Relocation Management Plan • EMPr
Terrestrial Ecology - Fauna	• Ecosystem disruption may occur where clearing and fencing of project footprint is undertaken to allow for the construction of the project infrastructure. • Fauna could be adversely affected through mining-related activities (noise, dust, light pollution, illegal poaching, and habitat loss). This is especially relevant to sensitive game species (including exotic game). • Fencing of the borrow area, and access roads will minimise animal movement on the affected properties. This is particularly significant on smaller game farms.	• Terrestrial Ecological Impact Assessment • Wildlife Impact Assessment • EMPr
Socio-economic Environment	• Temporary loss of commercial and agricultural land (including structures and cultivated areas) through clearance of mining areas. • Temporary loss of agricultural production. • Risk to game and livestock as a result of mining related hazards. • Loss of income in eco-tourism sector (hunting and game farming) due to visual impact, noise and dust. • Potential damage to property (e.g. gates, fences, structures). • Temporary use of local road network by delivery and haul vehicles. • Safety and security. • Impact to visual quality and sense of place of direct and adjacent property owners. • Nuisance from dust and noise. • Light pollution. • Influx of people seeking employment and associated impacts (e.g. foreign workforce, cultural conflicts, squatting, demographic changes, anti-social behaviour, and incidence of HIV/AIDS). • Reduction in property value.	• Socio-economic Impact Assessment • EMPr

Environmental Aspects	Pre-Mining & Mining Phases Potential Issues / Impacts	Specialist Investigations / EIA Provisions
	• If the overall MCWAP projected development materialises, the population and specifically the urban population of the study area will grow substantially.	
Agriculture	• Temporary loss of cultivated land within the borrow pit domain. • Temporary loss of grazing land within borrow pit domain. • Disruptions to farming operations as a result of construction-related use of existing access roads. • Loss of fertile soil through land clearance and poor management of stockpiles/spoil sites	• Agricultural Impact Assessment • Socio-economic Impact Assessment • EMPr
Historical and Cultural Features	Risk of heritage and cultural resources being damaged / destroyed through mining activities.	• Heritage Impact Assessment • EMPr
Existing Structures & Infrastructure	• Risk of damaging existing services, infrastructure and structures during site establishment and clearance or stripping of vegetation. • Disruptions to traffic on local road network. This is associated with road crossings, where the borrow area follows an existing road, and as a result of general use of the roads by construction/haul vehicles. • Fenced off restrictions on directly affected farms/farm portions.	• Socio-economic Impact Assessment • Relocation of affected infrastructure (if necessary) • Satisfy requirements of infrastructure owners • EMPr
Transportation	• Increase in traffic on the local road networks. • Develop temporary access and haul roads. • Risks to existing road users.	• Traffic Impact Assessment • EMPr
Solid Waste	• Waste generated from site preparations (e.g. plant material). • Domestic waste. • Surplus and used building material. • Hazardous waste (e.g. chemicals, oils, soil contaminated by spillages, diesel rags). • Wastewater (sanitation facilities, washing of plant, operations at the batching plant, etc.). • Disposal of excess spoil material (soil and rock) generated as part of the bulk earthworks.	• EMPr
Aesthetics	• Visual quality and sense of place to be adversely affected by mining activities. • Noise and dust generated from blasting affecting households/infrastructure in close proximity to borrow areas. • Provision of light at infrastructure may cause light pollution. • Inadequate reinstatement and rehabilitation of borrow pit footprint.	• EMPr

iii) Description of aspects to be assessed by specialists

According to Münster (2005), a 'trigger' is "*a particular characteristic of either the receiving environment or the proposed project which indicates that there is likely to be an issue and/or potentially significant impact associated with that proposed development that may require specialist input*". The

requisite specialist studies 'triggered' by the findings of the Scoping process, aimed at addressing the key issues and compliance with legal obligations, include:

1. **Aquatic and Wetland Delineation Impact Assessment;**
2. **Terrestrial Ecological Impact Assessment;**
3. **Heritage Impact Assessment;**
4. **Agricultural Impact Assessment;**
5. **Social Impact Assessment;**
6. **Socio-Economic Impact Assessment; and**
7. **Wildlife Impact Assessment.**

In addition, the findings from the following specialist studies that were undertaken as part of the previous EIA for MCWAP-2 will also be considered as part of the above studies and included in the EIA Report (as relevant):

- Ecological Study – Terrestrial;
- Ecological Study – Aquatic;
- Traffic Impact Assessment;
- Heritage Impact Assessment;
- Socio-Economic Study;
- Visual Impact Assessment;
- Social Impact Assessment;
- Noise Study; and
- Geotechnical Investigations.

The Terms of Reference (ToR), both general and specific to the project components within MCWAP-2A project, for the abovementioned specialist studies follow in the sub-sections below. Amongst others, the *Guideline for determining the scope of specialist involvement in EIA processes* (Münster, 2005) was used in compiling the general Terms of Reference for the specialist studies. The following guidelines were also employed to prepare the specific ToR for the respective specialists (where appropriate):

- Guideline for involving biodiversity specialists in EIA processes (Brownlie, 2005);
- Guideline for involving heritage specialists in EIA processes (Winter & Baumann, 2005); and
- Guideline for involving social assessment specialists in EIA processes (Barbour, 2007).

In addition to the above guidelines, the relevant specialists need to satisfy specific requirements stipulated by the following mandated environmental authorities (amongst others):

- DMR;
- DEA;
- LDEDET;
- DWS;

- DAFF;
- LIHRA; and
- SAHRA.

For the inclusion of the findings of the specialist studies into the EIA report, the following guideline will be used: *Guideline for the review of specialist input in EIA processes* (Keatimilwe & Ashton, 2005). Key considerations will include:

- Ensuring that the specialists have adequately addressed IAPs' issues and specific requirements prescribed by environmental authorities;
- Ensuring that the specialists' input is relevant, appropriate and unambiguous; and
- Verifying that information regarding the receiving ecological, social and economic environment has been accurately reflected and considered.

ToR – General

The following general ToR apply to all the EIA specialist studies to be undertaken for the proposed MCWAP-2A project, including the borrow pits and associated access/haul roads:

1. Address all triggers for the specialist studies contained in the subsequent specific ToR.
2. Consider the findings of all specialist studies undertaken as part of the previous EIA for MCWAP-2, where relevant.
3. Address issues raised by IAPs, as contained in the Comments and Response Report, and conduct an assessment of all potentially significant impacts. Additional issues that have not been identified during Scoping should also be highlighted to the EAP for further investigations.
4. Ensure that the requirements of the environmental authorities that have specific jurisdiction over the various disciplines and environmental features are satisfied.
5. Approach to include desktop study and site visits, as deemed necessary, to understand the affected environment and to adequately investigate and evaluate salient issues. Indigenous knowledge (i.e. targeted consultation) should also be regarded as a potential information resource.
6. Assess the impacts (direct, indirect and cumulative) in terms of their significance (using suitable evaluation criteria) and suggest suitable mitigation measures. In accordance with the mitigation hierarchy, negative impacts should be avoided, minimised, rehabilitated (or reinstated) or compensated for (i.e. offsets), whereas positive impacts should be enhanced. A risk-averse and cautious approach should be adopted under conditions of uncertainty.
7. Consider time boundaries, including short to long-term implications of impacts for project life-cycle (i.e. pre-mining, mining and post mining phases).
8. Consider spatial boundaries, including:
    a. Broad context of the proposed project (i.e. beyond the boundaries of the specific site);
    b. Off-site impacts; and
    c. Local, regional, national or global context.

9. The provision of a statement of impact significance for each issue, which specifies whether or not a pre-determined threshold of significance (i.e. changes in effects to the environment which would change a significance rating) has been exceeded, and whether or not the impact presents a potential fatal flaw or not. This statement of significance should be provided for anticipated project impacts both before and after application of impact management actions.
10. Recommend a monitoring programme to implement mitigation measures and measure performance. List indicators to be used during monitoring.
11. Advise if additional specialists are required to investigate specific components and the scope and extent of the information required from such studies.
12. Engage with other specialists whose studies may have bearing on your specific investigation.
13. Present findings and participate at public meetings, as necessary.
14. Information provided to the EAP needs to be signed off.
15. Review and sign off on EIA Report prior to submission to DMR to ensure that specialist information has been interpreted and integrated correctly into the report.
16. Sign a declaration stating independence.
17. The appointed specialists must take into account the policy framework and legislation relevant to their particular studies.
18. All specialist reports must adhere to Appendix 6 of GN No. R 982 of 4 December 2014 (as amended).

ToR – Specific

Aquatic and Wetland Delineation Impact Assessment

Summary of Key Issues & Triggers Identified During Scoping

- Potential impacts during pre-mining phase:
  - Impacts to flow and river morphology during the instream works associated with the pre-mining and mining phase of the borrow pit.
  - Sedimentation from instream works.
  - Water quality impacts due to spillages and poor construction practices.
  - Encroachment of mining activities into riparian zones / wetlands.
  - Loss of riparian and instream vegetation within borrow pit domain.
  - Crossing of watercourse by access and haul roads
  - Disruptions to aquatic biota community due to water contamination, temporary alteration of flow and disturbance to habitat during instream works.
- Potential impacts during mining phase:
  - Alteration of flow regime by associated mining activities and access and haul roads.
  - Destabilisation of river structure due to inadequate reinstatement and rehabilitation.
  - Disturbances of riparian vegetation may lead to erosion and encroachment of exotic vegetation.

- Impacts to wetlands downstream of BP SS1 (surface-groundwater interactions).
- Morphological modification of river by instream works/mining activities.
- The BP SS1 and associated access/haul road will act as instream barriers that will prevent the migration of aquatic biota.
- Management of sediment from mining operations in BP SS1.

Approach

- Undertake desktop study (literature review, topographical maps and aerial photographs) and baseline aquatic survey and describe affected aquatic environments/watercourses within the project footprint.
- Determine ecological status of the receiving aquatic environment, including the identification of endangered or protected species.
- Delineate riparian habitat and all wetlands in accordance with the guideline: *A practical field procedure for identification and delineation of wetlands and riparian areas* (DWAF, 2005) (or any prevailing guidelines prescribed by DWS). This includes assessing terrain, soil form, and soil wetness and vegetation unit indicators to delineate permanent, seasonal and temporary zones of the wetlands. Allocate conservation buffers from the outer edge of the temporary zones of the wetlands (provincial-specific).
- Provide a concise description of the importance of the affected aquatic environments/watercourses in terms of pattern and process, ecosystem goods and services, as appropriate.
- Assess impacts of proposed project to aquatic environments/watercourses.
- Provide suitable mitigation measures to protect the aquatic ecosystems during project life-cycle.
- Recommend monitoring program and indicators for project life-cycle, where findings from survey would serve as baseline data.

Nominated Specialist

Organisation:	The Biodiversity Company
Name:	Christian Fry
Qualifications:	MSc – Aquatic Health
Affiliation (if applicable):	Professional Natural Scientist (119082)

Terrestrial Ecological Impact Assessment

Summary of Key Issues & Triggers Identified During Scoping

- Encroachment of project infrastructure into CBAs and ESAs.
- The potential loss of significant flora and fauna species, as well as ecosystem disruption, as a result of mining activities.
- Proliferation of exotic vegetation, which could spread beyond the borrow pit domain.

- Fauna could be adversely affected through mining-related activities (noise, dust, light pollution, illegal poaching, and habitat loss). This is especially relevant to sensitive game species (including exotic game).
- The construction of access/haul road and the fencing off of the borrow pit and access/haul road will minimise animal movement.
- Possible disturbance to the bat cave that is situated in the Mooivalei area during mining phase.

Approach

- Undertake baseline survey and describe affected environment within the project footprint from a biodiversity perspective.
- Take into consideration the provincial conservation goals and targets.
- Assess the current ecological status and the conservation priority within the project footprint and adjacent area (as deemed necessary). Provide a concise description of the importance of the affected area to biodiversity in terms of pattern and process, ecosystem goods and services, as appropriate.
- Identify protected and conservation-worthy species. Prepare a biodiversity sensitivity map with the use of GIS, based on the findings of the study.
- Assess impacts to fauna and flora, associated with the project. Consider cause-effect-impact pathways for assessing impacts to biodiversity related to the project.
- Comply with specific requirements and guidelines of DMR, DEA and LDEDET.
- Consider the Limpopo Conservation Plan and other relevant policies, strategies, plans and programmes.

Nominated Specialist (to be reviewed by an external specialist)

Organisation:	Nemai Consulting
Name:	Avhafarei Phamphe
Qualifications:	MSc – Botany
Affiliation (if applicable):	❖ Professional Natural Scientist-Ecological Science (Reg number: 400349/12) with South African Council for Natural Scientific Professions (SACNASP) ❖ Professional member of South African Institute of Ecologists and Environmental Scientists (SAIEES) ❖ Professional member of South African Association of Botanists (SAAB)

Heritage Impact Assessment

Summary of Key Issues & Triggers Identified During Scoping

- Potential occurrence of heritage resources, graves and structures older than 60 years within project footprint.

Approach

- Undertake a Heritage Impact Assessment in accordance with the National Heritage Resources Act (Act No. 25 of 1999).
- The identification and mapping of all heritage resources in the project footprint, as defined in Section 2 of the National Heritage Resources Act (Act No. 25 of 1999), including archaeological and palaeontological sites on or close (within 100 m) of the proposed developments.
- Undertake a desktop palaeontological assessment (evaluate site in terms of SAHRIS).
- The assessment of the significance of such resources in terms of the heritage assessment criteria as set out in the regulations.
- An assessment of the impact of development on such heritage resources.
- An evaluation of the impacts of the development on heritage resources.
- Prepare a heritage sensitivity map (GIS-based), based on the findings of the study.
- Identify heritage resources to be monitored.
- Comply with specific requirements and guidelines of LIHRA and SAHRA.

Nominated Specialist

Organisation:	PSG Heritage Consultants
Name:	Polke Birkholtz
Qualifications:	BA (Hons.) Archaeology
Affiliation (if applicable):	Association of Southern African Professional Archaeologists

Agricultural Impact Assessment

Summary of Key Issues & Triggers Identified During Scoping

- Potential impacts during pre-mining phase:
  - Temporary loss of cultivated land and grazing land within the borrow area, by vegetation clearance, construction of new access/haul roads and fencing off of borrow area.
  - Disruptions to farming operations as a result of the use of existing access roads and borrow area falling on cultivated land.
    Temporary loss of fertile soil through land clearance/stripping.
- Potential impacts during mining phase:
  - Potential impacts to water users (and associated agro-economic impact from reduced crop and food production) downstream of BP SS1;
  - Temporary loss of cultivated land due to excavation during mining phase;
  - Poor rehabilitation and destabilisation of borrow pit

Approach

- Determine agricultural potential within project footprint.
- Determine impacts of project from an agricultural perspective.

- Suggest suitable mitigation measures to address the identified impacts.
- Comply with specific requirements and guidelines of the Department of Agriculture and Rural Development.

Nominated Specialist

Organisation:	Index
Name:	Dr Andries Gouws
Qualifications:	PhD Integrated Land Use Modelling
Affiliation (if applicable):	❖ Council of Natural Sciences.No:400036/93, Category: Agricultural sciences. ❖ Member of the Soil Science Society of South Africa

Socio-Economic Impact Assessment

Summary of Key Issues & Triggers Identified During Scoping

- Potential impacts during pre-mining phase:
  - Temporary loss of land (including structures and cultivated areas) through borrow pit project infrastructure.
  - Temporary loss of agricultural production.
  - Risk to game and livestock as a result of site clearing related hazards.
  - Temporary loss of income in eco-tourism sector (hunting and game farming).
  - Potential damage to property (e.g. gates, fences, structures).
  - Restrictions caused by fencing off of borrow area and associated access/haul roads;
  - Impact to visual quality and sense of place.
  - Reduction in property value.
- Potential impacts during mining phase:
  - Impact to visual quality and sense of place due to mining activities.
  - Cumulative impacts to properties that are already affected by existing linear infrastructure,
  - Impacts to water users downstream of BP SS1.
  - Impacts to smaller properties, where the entire borrow area may affect the critical mass required to continue with the current land use.

Approach

- Determine the specific local socio-economic, land utilisation and acquisition implications of the project.
- Collect baseline data on the current socio-economic environment.
- Assess socio-economic impacts (positive and negative) of the project, and quantify the economic impacts.
- Undertake a thorough review of the following:

- Minutes of public meetings and individual meetings; and
- Comments and Responses Report.

❖ Suggest suitable mitigation measures to address the identified impacts.

❖ Make recommendations on preferred options from a socio-economic perspective.

Nominated Specialists

Organisation:	Nemai Consulting
Name:	Ciaran Chidley
Qualifications:	❖ BA (Economics) ❖ BSc Eng (Civil) ❖ MBA
Affiliation (if applicable):	ECSA (Reg No. 980360)

Organisation:	Dr Neville Bews & Associates
Name:	Neville Bews
Qualifications:	❖ BA (Hons) Soc ❖ Henley Post-Graduate certificate in Management (United Kingdom) ❖ MA ❖ D. Litt et Phil
Affiliation (if applicable):	International Association of Impact Assessors South Africa (IAIASA)

Wildlife Impact Assessment

Summary of Key Issues & Triggers Identified During Scoping

❖ Potential impacts during pre-mining and mining phase:
- Sensitive game species (including exotic game) could be adversely affected through mining-related activities (noise, dust, light pollution, illegal poaching, and habitat loss).
- Temporary relocation of game, if required, with associated arrangements to minimise impacts to affected game.

Approach

❖ Wildlife Management Plan to be developed, taking into consideration the types of game kept on the farms and the requisite mitigation measures (based on best practices).

Nominated Specialist

Organisation:	NABRO Ecological Analysts
Name:	Ben Orbán
Qualifications:	MSc - Wildlife Management
Affiliation (if applicable):	Professional Natural Scientist(400061/96) with South African Council for Natural Scientific Professions

iv) Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives

The Scoping exercise aimed to identify and qualitatively predict potentially significant environmental issues for further consideration and prioritisation. During the EIA stage a detailed quantitative impact assessment will be conducted via contributions from the project team and requisite specialist studies (refer to **Section (iii)** for the ToR), and through the application of the impact assessment methodology contained in **Section (v).** Suitable mitigation measures will be identified to manage (i.e. prevent, reduce, rehabilitate and/or compensate) the environmental impacts, and will be incorporated into an EMPr.

v) The proposed method of assessing duration significance

The EIA quantitative impact assessment will further focus on the direct and indirect impacts associated with the project. All impacts will be analysed with regard to their nature, extent, magnitude, duration, probability and significance. The following definitions and criteria apply:

Nature (/Status)
The project could have a positive, negative or neutral impact on the environment.

Extent
- Local - extend to the site and its immediate surroundings.
- Regional - impact on the region but within the province.
- National - impact on an interprovincial scale.
- International - impact outside of South Africa.

Magnitude
Degree to which impact may cause irreplaceable loss of resources.
- Low - natural and social functions and processes are not affected or minimally affected.
- Medium - affected environment is notably altered; natural and social functions and processes continue albeit in a modified way.
- High - natural or social functions or processes could be substantially affected or altered to the extent that they could temporarily or permanently cease.

Duration
- Short term - 0-5 years.
- Medium term - 5-11 years.
- Long term - impact ceases after the operational life cycle of the activity either because of natural processes or by human intervention.
- Permanent - mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.

Probability

- Almost certain - the event is expected to occur in most circumstances.
- Likely - the event will probably occur in most circumstances.
- Moderate - the event should occur at some time.
- Unlikely - the event could occur at some time.
- Rare/Remote - the event may occur only in exceptional circumstances.

Significance

Provides an overall impression of an impact's importance, and the degree to which it can be mitigated. The range for significance ratings is as follows-

0 – Impact will not affect the environment. No mitigation necessary.

1 – No impact after mitigation.

2 – Residual impact after mitigation.

3 – Impact cannot be mitigated.

Information provided by specialists will be used to calculate an overall impact score by multiplying the product of the nature, magnitude and the significance of the impact by the sum of the extent, duration and probability based on the following equation:

Overall Score = **(NxMxS)x(E+D+P)**

Where: **N** = Nature
M = Magnitude
S = Significance
E = Extent
D = Duration
P = Probability

Table 35: Impact methodology

Nature				
Negative		Neutral		Positive
-1		0		+1
Extent				
Local	Regional		National	International
1	2		3	4
Magnitude				
Low		Medium		High
1		2		3
Duration				
Short Term (0-5yrs)	Medium Term (5-11yrs)		Long Term	Permanent
1	2		3	4
Probability				
Rare/Remote	Unlikely	Moderate	Likely	Almost Certain

1	2	3	4	5
Significance				
No Impact/None	No Impact After Mitigation/Low	Residual Impact After Mitigation/Medium	Impact Cannot be Mitigated/High	
0	1	2	3	

For example, the worst possible impact score of -117 would be achieved based on the following ratings:

N = Nature = -1
M = Magnitude = 3
S = Significance = 3
E = Extent = 4
D = Duration = 4
P= Probability = 5

Worst impact score = (-1 x 3 x 3) x (4+4+5) = -117

On the other hand, if the nature of an impact is 0 (neutral or no change) or the significance is 0 (no impact), then the impact will be 0. Impact Scores will therefore be ranked in the following way:

Table 36: Ranking of overall impact score

Impact Rating	Low/Acceptable impact	Medium	High	Very High
Score	0 to -30	-31 to -60	-61 to -90	-91 to -117

vi) The stages at which the competent authority will be consulted

The competent authority for the proposed BPs is the Department of Mineral Resources (DMR). DMR will be consulted during the following stages of the entire EIA Process:

- **Pre-application Phase** – A pre-application meeting was held on 08/05/2018 with DMR: Limpopo Regional Office Officials in order to motivate for a consolidated application approach for all the 23 proposed borrow pits (Refer to minutes of the meeting in **Appendix G1**). The outcome of the meeting was that a motivational letter for a consolidated application process had to be submitted to DMR. (Refer to **Appendix G2**). After the sibmission of the letter, DMR responded by confirming that a consolidated application process for all 23 borrow pits be followed (refer to **Appendix G3**).

- **Scoping Phase** –
  - DMR was notified of the submission of the Application form (Refer to a copy of the Application form in **Appendix H**) and the 30-day public review period of the Draft Scoping Report (DSR);
  - The DMR Case Officer received an invitation to the Authorities Meeting, which was held as part of the review of the Draft Scoping Report; and

- The Scoping Report will be finalised and then the Final Scoping Report (FSR) will be submitted to DMR for review.

❖ **EIA Phase –**

- The EIA Report will be compiled and finalised (including a 30-day public review period for the Draft EIA Report) after receiving acknowledgement from DMR on the FSR, as per the 2014 EIA Regulations (as amended);
- DMR will be notified of the 30-day public review period for the Draft EIA Report;
- The Final EIA Report will be submitted to DMR for review and decision.

vii) Particulars of the public participation process with regard to the Impact Assessment process that will be conducted

(1) Steps to be taken to notify interested and affected parties

Refer to **Section vii (2)** below for a description of the steps taken to notify IAPs.

(2) Details of the engagement process to be followed

Notification of Review of Draft Scoping Report

In accordance with Regulation 43(1) of GN No. R 982 of 4 December 2014 (as amended), registered IAPs were granted an opportunity to review and comment on the Draft Scoping Report.

The following notifications were provided with regards to the review of the Draft Scoping Report:

❖ Landowners, authorities and registered IAPs were notified via email and SMS;

❖ Notices were placed in the following newspapers (copies of the newspaper advertisements to be contained in the Final Scoping Report) -

- The Star;
- The Daily Sun;
- Die Kwêvoël;
- Beeld; and
- Mogol Pos.

❖ Onsite notices were placed on site of all the proposed BPs.

❖ Public notices were placed at the following locations:

- Thabazimbi Municipal Office;
- Thabazimbi Library;
- Agri-SA Ellisras;
- Steenbokpan Shop;
- Lesedi Thusong Centre;
- Koedoeskop Shop;
- Sentrum Agricultural Union Auctioning Kraals;
- Marapong Spar; and
- Marapong Public Library.

Accessing the Draft Scoping Report

The review period for the Draft Scoping Report will take place from **28 September until 29 October 2018**. Copies of the document were placed at the locations provided in **Table 37** below.

Table 37: Locations for review of Draft Scoping Report

Copy	Location	Address	Tel. No.
1.	Lephalale Public Library	Lephalale Civic Centre, c/o Joe Slovo & Dou Water St, Lephalale	014 762 1453
2.	Thabazimbi Public Library	4th Ave, next to Police station in Thabazimbi	014 777 1525
3.	Steenbokpan Winkel	Steenbokpan	014 766 0167
4.	Marapong Public Library	916 Phukubye St, Marapong, Lephalale	014 762 1484

Copies of the Draft Scoping Report were provided to the following regulatory and commenting authorities:

- DMR;
- DEA
- LDEDET;
- DWS Limpopo Regional Office;
- DAFF;
- LIHRA;
- SAHRA;
- Department of Roads and Transport;
- Department of Co-operative Governance;
- Human Settlements and Traditional Affairs;
- South African National Roads Agency SOC Ltd;
- Roads Agency Limpopo;
- Transnet;
- Department of Public Works, Roads and Infrastructure; and
- Waterberg DM, Thabazimbi LM and Lephalale LM.

The Draft Scoping Report was placed on the following website - http://www.nemai.co.za/environmental.html.

Public Meeting to Present the Draft Scoping Report

The details of the public meetings scheduled to present the Draft Scoping Report are provided in **Table 38**. The minutes of these meetings will be appended to the Final Scoping Report.

Table 38: Details of Public Meetings – Draft Scoping Phase

Date	09 October 2018	10 October 2018		11 October 2018	
Area	Meeting 1 Public Open Day	Meeting 2 Public Meeting	Meeting 3 Public Meeting	Meeting 3 Public Meeting	Meeting 4 Public Meeting
	Hartbeespoort Dam	Thabazimbi	Thabazimbi	Lephalale	Steenbokpan
Time	**12:00 – 18:30**	**9:30 – 11:30**	**13:00 – 17:00**	**9:00 – 13:00**	**14:30 – 17:00**
Venue	Hartbeespoort NG Kerk	Kumba Bioscope Hall, Thabazimbi	Kumba Bioscope Hall, Thabazimbi	Mogol Club, Grootgeluk Conference Room	Lesedi Thusong Community Centre

Focus Group Meeting to Present the Draft Scoping Report

A specific focus group meeting will be held with the Mooivalei Farmers, in order to present the findings of the draft Scoping Report, and to capture their main concerns. The minutes of the focus group meeting will be provided in the Final Scoping Report.

Comments Received on the Draft Scoping Report

All comments and correspondence received from authorities and IAPs during the review period of the Draft Scoping Report, will be incorporated into the CRR and will be included in the Final Scoping Report. The Comments Sheets provided in **Appendix I** can be used for capturing comments.

(3) Description of the information to be provided to Interested and Affected Parties

Refer to **Section vii (2)** for a description of the steps that will be taken to notify IAPs.

viii) Description of the tasks that will be undertaken during the environmental impact assessment process

Compile EIA Report

The EIA Report will contain the information that is necessary for DMR to consider and come to a decision on the application. As a minimum, the EIA Report will contain the information stipulated in Appendix 3 of GN No. R 982 of 4 December 2014 (as amended). The following critical components of the EIA Report are highlighted:

- A description of the policy and legislative context;
- A detailed description of the proposed development (full scope of activities);
- A detailed description of the proposed development site, which will include a plan that locates the proposed activities applied for as well as the associated structures and infrastructure;
- A description of the environment that may be affected by the activity and the manner in which physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed development;
- The methodology of the stakeholder engagement process;

- The Comments and Responses Report and IAPs Database will be provided as an appendix to the EIA Report;
- A description of the need and desirability of the proposed development and the identified potential alternatives to the proposed activity;
- A summary of the methodology used in determining the significance of potential impacts;
- A description and comparative assessment of the project alternatives;
- A summary of the findings of the specialist studies;
- A detailed assessment of all identified potential impacts;
- A list of the assumptions, uncertainties and gaps in knowledge;
- An environmental impact statement;
- 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;
- 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;
- An opinion by the consultant as to whether the development is suitable for approval within the proposed site;
- An EMPr that complies with Appendix 4 of GN No. R 982 of 4 December 2014 (as amended);
- Copies of all specialist reports appended to the EIA report; and
- Any further information that will assist in decision making by the authorities.

Maintenance of IAP Database

The IAP database will be updated as and when necessary during the execution of the EIA.

Review of Draft EIA Report

A 30-day period will be provided to IAPs to review the Draft EIA Report, and copies of the document will be lodged for public review at the following venues:

Table 39: Locations for review of Draft EIA Report

Copy	Location	Address	Tel. No.
a)	Lephalale Public Library	Lephalale Civic Centre, c/o Joe Slovo & Dou Water St, Lephalale	014 762 1453
b)	Thabazimbi Public Library	4th Ave, next to Police station in Thabazimbi	014 777 1525
c)	Steenbokpan Winkel	Steenbokpan	014 766 0167
d)	Marapong Public Library	916 Phukubye St, Marapong, Lephalale	014 762 1484

Copies of the Draft EIA Report will be provided to the regulatory and commenting authorities. The Draft EIA Report will also be placed on the following website - http://www.nemai.co.za/documents.html.

All parties on the IAPs database will be notified via email, fax or post of the opportunity to review the Draft EIA Report at the abovementioned locations, the review period and the process for submitting

comments on the report. The public will also be notified in this regard via advertisements in the following newspapers:

- The Star;
- The Daily Sun;
- Die Kwêvoël;
- Beeld; and
- Mogol Pos.

All comments received from IAPs and the responses thereto will be included in the Final EIA Report, which will be submitted to DMR.

Comments and Responses Report

A Comments and Responses Report will be compiled and included in the EIA Report, which will record the date that issues were raised, a summary of each issue, and the response of the team to address the issue. In addition, any unattended comments from the Scoping Phase or where the status of the previous responses has changed, will also be addressed in the Comments and Responses Report for the EIA phase.

Notification of DMR Decision

All IAPs will be notified via email, fax or post after having received written notice from DMR on the final decision on the application. Advertisements will also be placed in local and regional newspapers. These notifications will include the appeal procedure to the decision.

ix) Measures to avoid, reverse, mitigate, or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored

ACTIVITY whether listed or not listed. **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc.)**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc.)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc.)** **E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation..**	**POTENTIAL FOR RESIDUAL RISK**
Pre-mining and Mining of BPs (excavators, dozers, access/haul roads, screeners, site office/stores, ablution, storm water control, stockpiling, spoil sites, camp sites, spillages, waste)	• Dust and noise pollution; • Drainage surface disturbance; • Impact on watercourse and wetland habitat; • Surface/groundwater contamination; • Destruction of heritage resources; • Loss/deterioration of biodiversity and ecosystem resilience; • Clearance and potential loss of significant fauna/flora; • Blasting activities; • Unsuitable geological conditions; • Encroachment of mining activities into riparian zones and wetlands; • Loss of vegetation along watercourse banks;	• Borrow pits to be created, operated and rehabilitated in accordance with the EMPr, as authorised by the DMR; • Mining activities to remain within the designated mining areas/borrow pit footprint; • Subsoil and overburden should be stockpiled separately, and returned for backfilling of borrow areas in the correct soil horizon order; • Suitable barricading to be erected around open excavations within management areas. • Adequate signage on site as a warning of open excavations. • Divert runoff away from borrow areas, where necessary. • Prior to commencing with blasting activities, the blasting Contractor should submit a Method Statement which should comply with the Explosives Regulations (2003) and all relevant SANS standards and health and safety standards for mitigating blasting. The Contractor shall employ industry standard methods to control the impact of blasting and limit the risk of damage to buildings and structures by reducing blast vibrations induced in the rock mass, eliminating fly rock and limiting air-blast and noise to acceptable levels.	**Low**

ACTIVITY whether listed or not listed. **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc.)**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc.)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc.)** **E.g.** **Modify through alternative method.** **Control through noise control** **Control through management and monitoring through rehabilitation..**	**POTENTIAL FOR RESIDUAL RISK**
	• Soil erosion and contamination; • Loss of grazing land; • Proliferation of exotic vegetation; • Nuisance from dust and noise during mining phase; • Construction within watercourse, altering bed banks and impeding flow; • Traffic; • Relocation of existing infrastructure, impact on aesthetics; • Risk to wildlife and livestock in surrounding farms from pre-mining and mining phases; • Destabilisation of watercourse banks and sedimentation downstream from instream works; and • Fuel/oil spillages.	• Implement suitable stormwater management measures at borrow pits. • During in stream works, no direct discharge of sediment laden water to occur without prior treatment. • Access/haul roads to be constructed to allow drainage, by the use of graveling. Roads should be kept in serviceable condition to minimise erosion by rainfall runoff and vehicle use • Fuel/oil storage should be equipped with approved containment.	

j) Other Information required by the competent Authority

i) Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998). the EIA report must include the:-

(1) Impact on the socio-economic conditions of any directly affected person

A Socio-economic Impact Assessment (SEIA) will be undertaken once approval is granted by DMR for the Final Scoping Report, and will then be appended to the Draft and Final EIA Report, to be submitted to DMR.

(2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act

A Heritage Impact Assessment (HIA) will be undertaken once approval is granted by DMR for the Final Scoping Report, and will then be appended to the Draft and Final EIA Report, to be submitted to DMR.

k) Other matters required in terms of sections 24(4)(a) and (b) of the Act

No alternatives were considered as the previous geotechnical investigations (Mokolo Crocodile Consultants, 2012) confirmed the locations of the required BPs with the use of test pits. The proposed sites also provide the required volumes that would need to be excavated and used as construction material for the MCWAP-2A.

'No-go' Option

As the MCWAP-2A cannot proceed without the BPs, the no go option will be the same as for the Water Transfer Infrastructure (WTI) component, which will have the following implications:

- If no material is sourced for construction, then no required MCWAP-2A infrastructure can be constructed. If no construction occurs, then the development of new power stations, which is of high strategic importance, cannot proceed. Without a suitable source of water, the new power stations will not be possible, with potential future energy shortages;
- No BPs means there will be no water pipeline. This causes the absence of water which will ultimately suppress development, with associated socio-economic implications on a national scale; and
- Without MCWAP-2A, Eskom will not be able to implement the FGD technology at the Medupi Power Station to reduce sulphur emissions, which will violate the related condition in Eskom's World Bank loan.

In contrast, should the proposed MCWAP-2A and the required BPs not go ahead, any potentially significant environmental issues associated with the project would be irrelevant and the status quo of the local receiving environment would not be affected by the borrow pits. The objectives of the project would, however, not be met. In addition Eskom will be disallowed to generate any electricity from Medupi endangering the RSA economy.

l) UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I, Donavan Henning, **herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and Interested and Affected parties has been correctly recorded in the report.**

Signature of the EAP
DATE: 20/09/2018

m) UNDERTAKING REGARDING LEVEL OF AGREEMENT

I, Donavan Henning, **herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with interested and Affected Parties and stakeholders has been correctly recorded and reported herein.**

Signature of the EAP
DATE: 20/09/2018

-END-

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