DRAFT SCOPING REPORT FOR THE PROPOSED REZONING OF PROPERTIES, OPENCAST, UNDERGROUND, WASTE ROCK DUMP EXPANSION, NEW TAILINGS STORAGE FACILITY AND THE OVERALL CONSOLIDATION OF THE ENVIRONMENTAL MANAGEMENT PROGRAMMES AT LANNEX SECTION MP 30/5/1/2/2/420 MR AND MP 30/5/1/2/2/204 MR

for

Samancor Chrome Limited
Eastern Chrome Mines

Located on:
Portion 0(RE) and 1 of the Farm Annex Grootboom 335 KT and Grootboom 336 KT
Fetakgomo Tubatse Local Municipality
Limpopo Province

Submitted for: Public Review and Comment
21 August 2020 – 21 September 2020

Please forward all comments before close of business 21 September 2020

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Title:
Draft Scoping Report for the proposed rezoning of properties, opencast, underground, Waste Rock Dump expansion, Tailings Storage Facility (TSF) and the overall consolidation of the Environmental Management Programmes At Lannex Section MP 30/5/1/2/2/420 MR AND MP 30/5/1/2/2/204 MR, located on Portion 0(RE) and 1 of the Farm Annex Grootboom 335 KT and Grootboom 336 KT, Fetakgomo Tubatse Local Municipality, Limpopo Province.

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Applicant Approval

I, _____, duly authorised by Samancor Chrome Ltd, Eastern Chrome Mines, hereby confirm that the report has been reviewed and approved for distribution (Public Participation Process).

_____ _____
Signature Date

REVISION AND AMENDMENTS

Description of Revision / Amendment	**No**	**Date**
Lannex Section Scoping Report (Draft)	0	22 July 2020
Lannex Section Scoping Report (Final)	1	

mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

DRAFT SCOPING REPORT FOR PUBLIC REVIEW

COMMENTING PERIOD: 21 August 2020 to 21 September 2020

Proposed Rezoning of Properties, Opencast, Underground, Waste Rock Dump Expansion, New Tailings Storage Facility and the overall consolidation of the Environmental Management Programmes at Lannex Section MP 30/5/1/2/2/420 MR AND MP 30/5/1/2/2/204 MR

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: Samancor Chrome Limited – Eastern Chrome Mines
TEL NO:
FAX NO:
POSTAL ADDRESS: PO Box 3, Steelpoort, 1133
PHYSICAL ADDRESS: Portion 0(RE) and 1 of Farm Annex Grootboom 335 KT and Farm Grootboom 336 KT
FILE REFERENCE NUMBER SAMRAD: MP 30/5/1/2/2/420 MR AND MP 30/5/1/2/2/204 MR

IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act No. 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 No. 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.

EXECUTIVE SUMMARY

Eastern Chrome Mines, a business unit of Samancor Chrome, is situated approximately 350 km north-east of Johannesburg, close to the town of Steelpoort in the Limpopo Province, and consists of eight mines: Spitskop, Lwala, Doornbosch, Lannex, Tweefontein, Jagdlust, Quartzite and Scheiding. Each mine has its own labour structure, reporting to the General Manager of Eastern Chrome Mines. For the purposes of this application, reference will only be made to the Lannex Mine. Samancor Chrome – Eastern Chrome Mines is the holder of the new order mining right MP 30/5/1/2/2/420 MR and MP 30/5/1/2/2/204 MR

Lannex Mine is an operational mine and has the following existing activities and infrastructures:

Current\existing Operation scope	**Project Proposed Scope\Extent**
The existing mining activities at Portion 0 (RE) and 1 of Farm Annex Grootboom 335 KT; and Farm Grootboom 336 KT: • Underground (operational) • Opencast (Historical) Lannex Mine is an operational mine and has the following existing activities and infrastructures: • Internal haul roads, culverts and bridges; • Topsoil, Product and ROM stockpiles • Overburden stockpiles; • Offices, parking bays, workshops, change house, storehouses and warehouses • Diesel/fuel storage facilities • Trackless workshop • Metallurgical Plants with conveyors • Water supply network, storm water network, pollution control dams, raw water dam, effluent dam, septic tanks and water treatment works • Tailings Storage Facility(Not enough capacity) • Waste Rock Dump(Not enough capacity) • Explosive magazine bay with destruction facilities • Security entrances and gates • Electrical substation and power lines; • Underground adits;	The extent of proposed mining activities at Portion 0 (RE) and 1 of Farm Annex Grootboom 335 KT; and Farm Grootboom 336 KT covers: • Continuation of Underground Workings • Continuation and expansion/extension of historical opencast workings The extent of proposed mining area triggers the following additional infrastructures: • Rezoning of properties; • Tailings Storage Facility; • Water supply network, storm water network, pollution control dams, raw water dam, effluent dam, septic tanks and water treatment works • RoM crushing and screening plant; • Product storage area; • Waste Rock Dump expansion area; • Access road to opencast areas; • Road diversion around opencast area

Listed Activities

NAME OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY	LISTED ACTIVITY	APPLICABLE LISTING NOTICE	WASTE MANAGEMENT AUTHORIZATION
(E.g. For prospecting – drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route)	Ha or m^2	(Mark with an X where applicable or affected)	GNR LN1: 983 / LN2 984 / LN =3: 985 (as amended 07 April 2017)	(Indicate whether an authorization is required in terms of the Waste Management Act). (Mark with an X)
Storm water management infrastructure will be developed around the opencast (phase approach) and the TSF area, these will not be pipelines but open culverts which may exceed the 0.36 m diameter or the 120l/s peak throughput. Lannex Slurry pumping capacity is approximately 180 m^3/h and the pipeline is a160 mm diameter line.	TSF: (2 320 m x 4m) 9 280 m^2 Opencast: (17 000 m x 4 m) 68 000 m^2	X	Develop LN1: #9	
Tailings and return water pipeline will be expanded from the existing TSF to the new TSF. These will be longer than 1 km and will exceed 0.36 m diameter or 120 l/s. As far as possible the pipelines will be located next to internal roads. Lannex Slurry pumping capacity is approximately 180 m^3/h and the pipeline is 160 mm diameter line.	1001 m x 2 pipelines	X	Expand: LN1: #46	
A retaining dam will be located upstream of the proposed opencast sections and may exceed 100 m^2, in addition the proposed opencast sections will cross several watercourses which will result in changes to more than 100 m^2 physical footprint of watercourses. Most of the area is either an ecological support area or CBA. It is not expected that the dam will have a wall height greater than 5 meters.	Opencast areas intercept rivers: 13 477 m, 269 540 m^2 Potential retention dams: 41 000 m^2 (combined footprint areas)	X	LN3: #14	
It is anticipated that 5 retention dams be constructed within watercourses at the opencast section may have a capacity of more than 50 000 m^3	Potential retention dams: 41 000 m^2 (combined footprint areas)	X	Develop: LN1: #12	

The proposed opencast will require additional diesel storage as well as other dangerous goods e.g. Oils to be stored. Combined with the existing capacities already in use at Lannex the 500 m^3 will be exceeded.	3 x 80 m^3 for each of the 3 active opencast pits is anticipated	X	Develop: LN2: #4	
The opencast activities in the impacted watercourses will result in the removal and infilling of material in excess of 10 m^3.	Opencast areas intercept rivers: 13 477 m, 269 540 m^2 Potential retention dams: 41 000 m^2 (combined footprint areas)	X	LN1: #19	
Various access roads will be developed around the TSF as well as access roads to the opencast areas and a temporary access road to Tubatse Village. These roads will be wider than 8 meters but less than 13.5. Some of the roads are existing informal internal roads and will be upgraded (widened by more than 4 meters and lengthened by more than 1 km). Most of the Opencast area is classified as ecological support or CBA areas. The road development will be a phased approach.	Road expansion: 10 ha (total footprint area) New road: (7 596 m x 13.4) 101 787 m^2 WRD Road Diversion: (1 191 m) 5 958 m^2 Tubatse Road diversion (Lannex portion only): 160 m x 13.4 m) 2 144 m^2	X	Expand: LN1: #56 Expansion: LN3: 18	
The TSF, WRD expansion and Opencast areas will require vegetation clearance that will exceed 20 Ha area in an ecological support / CBA area	Opencast: 528 ha Contractors camp: 10 ha TSF and Storm water: 40 ha Potential retention dams: 41 000 m^2 WRD expansion: 10 ha	X	LN2: #15 LN3: #12	

Should any protected plant species require relocation as a result of the proposed opencast activities a permit will be applied for in terms of the NEMBA	1 ha (assumption)	X	LN1: #30	
The new storm water dam at the TSF will require a Water use licence.	1 ha (assumption)	X	Development: LN2: #6	
Phased activities that will take place as per the opencast mining in terms of stormwater development, overburden dumps and backfilling and road development. LN1:24(i), 30, 34, LN2: 5,7,8(ii),11,13,16,27(i)or(ii).	Opencast: 528 ha Road expansion: 10 ha (total footprint area) New road: (7 596 m x 13.4) 101 787 m^2	X	LN1: #67	
Phased activities that will take place as per the opencast mining in terms of stormwater development, overburden dumps and backfilling and road development. Excluded: LN3: 7,8,11,13,20,21,24.	Opencast: 528 ha Road expansion: 10 ha (total footprint area) New road: (7 596 m x 13.4) 101 787 m^2	X	LN3: #26	
The application is for an amended mining right as a result of the proposed opencast and associated minerals being applied for.	1 995.93 ha	X	LN2: #17	
Development of a new residue deposit (Tailing storage facility), expansion of the waste rock dump and new residue stockpile	TSF: 40 ha Residue stockpile: 1 ha TSF expansion area: 10 ha	X		X

Identified impacts

Environmental Aspects	**Potential Impacts List**	**Activities**	**Phase**
Topography	Micro topographical changes	Opencast mining, Road construction, Establishing waste residue deposits (Chrome sand, Overburden stockpile)	Construction, Operational; Decommissioning, Post-closure
Geology	Sterilization of mineral deposits	Opencast mining	Operational
Soil	Soil compaction and degradation	Road construction, Dust suppression, Establishing waste residue deposits (Chrome sand, Overburden stockpile)	Construction, Operational; Decommissioning

Environmental Aspects	Potential Impacts List	Activities	Phase
	Soil Compaction and degradation	Vehicle movement; Construction of new infrastructure	Construction, Operational; Decommissioning
	Erosion	Vehicle movement; Construction of new infrastructure	Construction, Operational; Decommissioning
	Soil contamination	Road construction, Blasting, New infrastructure, such as waste residue deposits (Chrome sand, Overburden stockpile)	Construction, Operational; Decommissioning
Land use and land capability	Loss of grazing land	Road construction; blasting; and construction of proposed infrastructure.	Construction, Operational; Decommissioning
Flora	Impact on habitat for floral species	Blasting, Road construction, Removal of indigenous vegetation, New infrastructure, such as Opencast mining, Establishing waste residue deposits (Chrome sand, Overburden stockpile)	Construction, Operational; Decommissioning
	Impact on important species	Blasting, Road construction, Removal of indigenous vegetation, New infrastructure, such as Opencast mining, Establishing waste residue deposits (Chrome sand, Overburden Stockpile)	Construction, Operational; Decommissioning
Fauna	Loss of faunal habitat and ecological structure	Blasting, Road construction, Removal of indigenous vegetation, New infrastructure, such as Opencast mining, Establishing waste residue deposits (Chrome sand, Overburden Stockpile)	Construction, Operational; Decommissioning
	Impacts on Red Data List faunal species	Blasting, Road Construction, Establishing waste residue deposits (Chrome sand, Overburden Stockpile)	Construction, Operational; Decommissioning
Surface Water	Potential for increased sedimentation production	Blasting, Road construction, Removal of indigenous vegetation, New infrastructure, such as Opencast mining, Establishing waste residue deposits (Chrome sand, Overburden Stockpile)	Construction, Operational; Decommissioning
	Deterioration in surface water quality	Blasting, Road construction, Removal of indigenous vegetation, New infrastructure, such as Opencast mining, Establishing waste residue deposits (Chrome sand, Overburden stockpile)	Construction, Operational; Decommissioning
	Potential for reduction in surface Runoff	Dust suppression; Road construction, Establishing waste residue deposits (Chrome sand, Overburden stockpile)	Construction, Operational; Decommissioning
	Alteration of drainage patterns	New infrastructure, such as Opencast mining	Construction, Operational; Decommissioning

Environmental Aspects	Potential Impacts List	Activities	Phase
	Destruction and degradation of aquatic areas	New infrastructure, such as Opencast mining, Establishing waste residue deposits (Chrome sand, Overburden Stockpile)	Construction, Operational; Decommissioning
Groundwater	Impact on the availability of groundwater	Blasting, Dust suppression; Dewatering; New infrastructure, such Opencast mining	Construction, Operational; Decommissioning
	Impact on the quality of groundwater	Blasting, Road construction, Removal of indigenous vegetation, New infrastructure, such as Opencast mining, Establishing waste residue deposits (Chrome sand, Overburden stockpile)	Construction, Operational; Decommissioning
Air Quality	Fugitive dust (TSP and PM10)	Blasting, Road construction, Removal of indigenous vegetation, New infrastructure, such as Opencast mining, Establishing waste residue deposits (Chrome sand, Overburden stockpile)	Construction, Operational; Decommissioning
Noise	Day time noise impact	Blasting, Road construction, New infrastructure, such as Opencast excavation	Construction, Operational; Decommissioning
	Night-time construction activities	Blasting, Road construction, New infrastructure, such as Opencast excavation	Construction, Operational; Decommissioning
Visual	Alter the overall landscape character and sense of place of the region	Removal of indigenous vegetation, Establishing waste residue deposits (Chrome sand, Overburden stockpile)	Construction, Operational; Decommissioning
	Lighting during night time may impact negatively on receptors situated in the identified receptor site	Road construction, Establishing waste residue deposits (Chrome sand, Overburden stockpile)	Construction, Operational; Decommissioning
Heritage and Cultural Aspects	Destruction of heritage or cultural aspects	Blasting, Road construction, Removal of indigenous vegetation, New infrastructure, such as Opencast mining, Establishing waste residue deposits (Chrome sand, Overburden stockpile)	Construction, Operational; Decommissioning
Socio - Economic	Crime, health and HIV	Influx of new temporary/permanent workers	Construction, Operational; Decommissioning
	Economic opportunities, infrastructure development and employment	Temporary/ permanent employment opportunities from proposed opencast operation	Construction, Operational; Decommissioning
	Loss of current land capability	Blasting, Road construction, Removal of indigenous vegetation, New infrastructure, such as Opencast	Construction, Operational; Decommissioning

Environmental Aspects	Potential Impacts List	Activities	Phase
		mining, Establishing waste residue deposits (Chrome sand, Overburden stockpile)	
	Relocation of people	Blasting	Construction, Operational; Decommissioning

List of Specialist and Specialist Studies

STUDY	**APPOINTED SPECIALIST**
Air quality	Eco Elementum
Archaeological assessment	Anton Pelser
Blasting and Vibration assessment	Blast management and consulting
Climate change assessment	Mamadi
Fauna and Flora Assessment	Red Kite
Flood line determination and Hydrology	Shivan Dhaver
Geohydrological assessment	GPT
Noise Impact Assessment	EARES
Paleontological assessment	Francois Durand
Public Participation	Gudani Consulting
Socio Economic Assessment	Gudani Consulting
Soil and Land capability assessment	Francois Botha
Surface water Assessment inclusive of wetland assessment	Prescali
Visual Assessment	Eco Elementum
Waste Classification	Golder Associates
Geotechnical Assessment (as part of civil design for the Tailings Dam	Mr. Koos Davel

Each specialist will be given Scope of Work to carry out their study. The Impact Assessment Criteria used to rank and rate the impacts and risks will be given to all specialists and it will be compulsory for each specialist to use the same rating during their Impact Assessment. Information and data of the current existing environmental monitoring programs will also be assessed to detect trends and changes in conjunction with environmental attributes triggered by the project activities. Information from historical specialist studies will also be taken into considerations versus the project specialist studies to inform the impact identification, assessment, and remediation process. This will allow for all impacts from all specialists to be incorporated into the EIA and EMPr and thus ensuring consistency, accuracy and reliability of the report and content thereof.

The findings of such specialist studies shall be included in the EIA Report.

Table of content

Page

1. CONTACT PERSON AND CORRESPONDENCE ADDRESS 1
1.1. Details of: 1
1.1.1. The EAP who prepared the report 1
1.2. Expertise of the EAP 1
1.2.1. The qualifications of the EAP 1
1.2.2. Summary of the EAP's past experience. 1
2. DESCRIPTION OF THE PROPERTY. 1
2.1. LOCALITY MAP 1
3. DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY 4
3.1. LISTED AND SPECIFIED ACTIVITIES 4
3.2. Description of the activities to be undertaken 8
3.2.1. Rezoning of properties to Mining 8
3.2.2. Residue deposit area and Crushing and Screening Plant 8
3.2.3. New tailing storage dam with associated infrastructure 8
3.2.4. Expansion of the Waste Rock Dump (WRD) 9
3.2.5. Opencast Area 9
3.2.6. Underground Mining 10
3.2.7. Consolidation of all approved EMPr`s into one document 10
3.2.8. Access roads to opencast areas 10
4. POLICY AND LEGISLATIVE CONTEXT 11
5. NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES. 21
6. PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED 23
7. DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED SITE. 23
7.1. Details of location alternatives 24
7.1.1. Details of the Property on which or location where it is proposed to undertake the activity 24
7.1.2. Location Alternatives 25
7.1.2.1. Rezoning 25
7.1.2.2. New crushing and screening plant and New product stockpile area 26
7.1.2.3. New TSF Area 26
7.1.2.4. WRD expansion area 26
7.1.2.5. Access roads and road diversion 27
7.1.2.6. Site Alternatives for the proposed infrastructure and mining area suitable for opencast and underground operation 28
7.1.3. The type of activity to be undertaken 32
7.1.4. Designs and Layout Alternatives 32
7.1.5. The technology to be used in the activity 32

7.1.6. The operational aspects of the activity 32
7.1.7. The option of not implementing the activity 32
8. DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED 33
8.1. Newspaper Advertisement 33
8.2. Site Notices and Background Information Document distribution 33
8.3. Direct Notification of Identified I&APs 33
8.4. Public Meetings 34
8.5. Draft Scoping Report 34
8.6. Summary of the issues raised by the I&APs 34
9. THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE SITES 37
9.1. Type of environment affected by the proposed activity 37
9.1.1. Regional Location 37
9.1.2. Climate 37
9.1.2.1. Precipitation and Evaporation 37
9.1.2.2. Wind 38
9.1.3. Topography 38
9.1.4. Geology 39
9.1.4.1. Regional Geology 39
9.1.4.2. Lannex Section Geological Setting 42
9.1.4.3. Associated Minerals 43
9.1.4.4. Major Geological features 43
9.1.4.5. Seams mined in the Lannex Section 43
9.1.5. Soil 44
9.1.6. Biodiversity 44
9.1.6.1. Flora 44
9.1.6.2. Fauna 46
9.1.7. Surface Water 46
9.1.7.1. Affected River Basin 46
9.1.7.2. Quaternary Catchments 48
9.1.7.3. River Resource Classification and Reserve 49
9.1.8. Wetland areas 50
9.1.9. Hydrogeology and Aquifers (Groundwater) 51
9.1.9.1. Hydraulic Properties 53
9.1.10. Air Quality 53
9.1.11. Heritage Resources 54
9.1.12. Visual 55
9.1.13. Noise 55
9.1.14. Socio-Economic Environment 56
9.1.14.1. Population Profile 56
9.1.14.2. Population statistics 56
9.1.14.3. Population groups 58

9.1.14.4. Language 59
9.1.14.5. Education Levels 60
9.1.14.6. Income and Poverty Levels 60
9.1.14.7. Poverty in the SDM 63
9.1.14.8. The Status of Orphans 63
9.1.14.9. Employment Status 65
9.1.14.10. Means of Transport 67
9.2. Description of specific environmental features and infrastructure on the site 67
9.2.1. Environmental features 67
9.2.2. Infrastructure on site 68
9.3. Environmental and current land use map. 69
10. IMPACTS AND RISKS IDENTIFIED INCLUDING THE NATURE, SIGNIFICANCE, CONSEQUENCES, EXTENT 70
10.1. Impacts Identified 70
11. METHODOLOGY USED IN DETERMINING THE SIGNIFICANCE OF ENVIRONMENTAL IMPACTS 73
11.1. Assessment Criteria 73
11.1.1. Mitigation 75
11.1.1.1. Determination of Significance-Without Mitigation 75
11.1.1.2. Determination of Significance- With Mitigation 76
11.1.2. Assessment Weighting 76
11.1.2.1. Ranking, Weighting and Scaling 76
11.1.2.2. Identifying the Potential Impacts Without Mitigation Measures (WOM) 77
11.1.2.3. Identifying the Potential Impacts With Mitigation Measures (WM) 77
11.1.2.4. Significance Following Mitigation (SFM) 77
12. 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. 77
13. THE POSSIBLE MITIGATION MEASURES THAT COULD BE APPLIED AND THE LEVEL OF RISK. 78
14. THE OUTCOME OF THE SITE SELECTION MATRIX. FINAL SITE LAYOUT PLAN 80
15. MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED. 80
16. STATEMENT MOTIVATING THE PREFERRED SITE. 80
17. PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS 81
17.1. Description of alternatives to be considered including the option of not going ahead with the activity. 81
17.2. Description of the aspects to be assessed as part of the environmental impact assessment process 81
17.3. Description of aspects to be assessed by specialists 81
17.3.1. Description of the Affected Environment 82
17.3.2. Legal Requirements 82
17.3.3. Impact Identification and Assessment 83

17.3.4. Mitigation measures *84*
17.3.5. Recommended Monitoring and Evaluation Program *84*
17.4. Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives 84
17.5. The stages at which the competent authority will be consulted 84
18. PARTICULARS OF THE PUBLIC PARTICIPATION PROCESS WITH REGARD TO THE IMPACT ASSESSMENT PROCESS THAT WILL BE CONDUCTED 85
18.1. Steps to be taken to notify interested and affected parties. 85
18.2. Details of the engagement process to be followed 86
18.2.1. Report Comment period *86*
18.2.2. Public Meetings and Open Days *86*
18.2.3. Description of the information to be provided to Interested and Affected Parties *86*
19. DESCRIPTION OF THE TASKS THAT WILL BE UNDERTAKEN DURING THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS 87
20. 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. 88
21. OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY 93
21.1. Impact on the socio-economic conditions of any directly affected person. 93
21.1.1. Crime, Health and HIV *93*
21.1.2. Noise *93*
21.1.3. Air Pollution *94*
21.1.4. Light and Visual Aspects *94*
21.1.5. Socio-economic opportunities, Infrastructure Development and Employment *94*
21.2. IMPACT ON ANY NATIONAL ESTATE REFERRED TO IN SECTION 3(2) OF THE NATIONAL HERITAGE RESOURCES ACT. 94
22. OTHER MATTERS REQUIRED IN TERMS OF SECTIONS 24 (4) (A) AND (B) OF THE ACT 95
23. UNDERTAKING REGARDING CORRECTNESS OF INFORMATION 96
24. UNDERTAKING REGARDING THE LEVEL OF AGREEMENT 96
25. References 97
26. APPENDICES 97

LIST OF FIGURES

Page

Figure 2-1: ECM Lannex Section Locality Map (1:50 000) 2
Figure 2-2: Lannex Section Mining Area 3
Figure 2-3: ECM Lannex Section Regional Locality Map (1:250 000) 4
Figure 7-1: Tubatse Residential Area rezoning. 25
Figure 7-2: New crushing and screening plant area with new product stockpile 26
Figure 7-3: Lannex Section Waste Rock Dump Expansion Area 27
Figure 7-4: Proposed access roads. 27
Figure 7-5: Lannex TSF Site selection options 30
Figure 7-6: Lannex "preferred site" Tailings Storage Facility Area 30
Figure 7-7: Lannex Section preferred access road 31
Figure 7-8: Lannex Section temporary road diversion 31
Figure 9-1: Shows topography of the Lannex Mining Right area. 39
Figure 9-2: Location of Lannex Mine in Relation to the Eastern Limb of the Bushveld Complex. 41
Figure 9-3: Generalised Stratigraphy of the Rustenburg Layered Suite 42
Figure 9-4: Lannex Section chromitite layers 43
Figure 9-5: Base map of the Olifants water management area and its sub-areas (Golder Associates) 47
Figure 9-6: Location of the Lannex quaternary drainage areas 49
Figure 9-7: Primary and Secondary Rivers and Streams and drainage lines within the Lannex Mining area. 50
Figure 9-8: Rivers and wetlands in and around Lannex Section (source: Screening tool, 2020) 51
Figure 9-9: Conceptual cross-section through a weathered aquifer in Basement rocks (Chilton and Foster, 1995 (as cited by Delta H, 2015)) 52
Figure 9-10: Operational contributions to predicted PM10 impacts 54
Figure 9-11: Percentage variation population and household statistics for the SDM with comparison of the 2011 Census with the 2016 Community Survey 57
Figure 9-12: Percentage variance of average household size statistics for the SDM with comparison of the 2011 Census with the 2016 Community Survey 57
Figure 9-13: Percentage disaggregation of Fetakgomo Tubatse Local Population by Age and Gender Distribution 58
Figure 9-14: Percentage Population Group by Gender for the FTLM 59
Figure 9-15: Breakdown of language by population group in the former Fetakgomo Local Municipality 59
Figure 9-16: Percentage Annual Household Income Levels per gender in the former Fetakgomo Local Municipality 61
Figure 9-17: Percentage Annual Household Income Levels in the former Fetakgomo Local Municipality 62
Figure 9-18: Percentage Annual Household Income Levels per gender in the former Fetakgomo Local Municipality 63
Figure 9-19: Percentage distribution of population less than 18 years old by orphanage status from the Community Survey, 2016 63
Figure 9-20: Percentage per Municipalities distribution of population less than 18 years old by orphanage status from the Community Survey, 2016 64
Figure 9-21: Percentage total Municipalities distribution of population less than 18 years old by orphanage status from the Community Survey, 2016 64
Figure 9-22: Existing infrastructure at Lannex Section 69
Figure 9-23: Lannex Section Land Use map 70

LIST OF TABLES

Page

Table 3-1: Listed and Specified Activities to be authorised 5
Table 3-2: Lannex Current\Existing and Proposed Scope\Extent Activities 8
Table 7-1: Surface and Chromite rights for Lannex mine as applicable to Samancor Chrome Ltd 24
Table 7-2: TSF site selection process. 28
Table 8-1: Issues and Responses 35
Table 9-1 : minimum and maximum temperatures 37
Table 9-2: Mean climatic rainfall conditions for the project area 38
Table 9-3: Summary of mean monthly wind directions from Lydenburg Station 38
Table 9-4: Associated minerals 43
Table 9-5: Attributes of the Sekhukhune Land Centre of plant endemism 45
Table 9-6: Naturalised and Ecological Reserve 47
Table 9-7: Reconciliation of water requirement and availability for the Steelpoort sub- management area year 2000 (million m^3/a) 48
Table 9-8: Reconciliation of water requirements, Base scenario (million m^3/a) for Steelpoort sub-management area Year 2025 48
Table 9-9: Quaternary drainage area information (WR 2005). 49
Table 9-10: EISC and PES of the affected watercourses (Resource Quality Objectives 4.1, DWAF 2003) 50
Table 9-11: Typical hydraulic conductivities for the wider area 53
Table 9-12: Highest level of education for person weight, LIM476 (Community Survey, 2016) 60
Table 9-13: Poverty headcount and the intensity of poverty in the SDM, according to the Community Survey, 2016 63
Table 9-14: Breakdown of employment by industry in the SDM (Source STATSSA 2011) 65
Table 9-15: The percentage contribution of the informal sector to the local economy (2018/19 FTLM IDP) 66
Table 9-16: Summary of environmental sensitivities 68
Table 10-1: Identified Impact and associated activities 70
Table 11-1: Impact Assessment Criteria 74
Table 11-2: Significance-Without Mitigation 75
Table 11-3: Significance- With Mitigation 76
Table 11-4: Description of assessment parameters with its respective weighting 76
Table 13-1: Possible Mitigation Measures 78
Table 17-1: Specialist studies 81
Table 17-2: Legislative requirements for specialist reports 83
Table 20-1: Impact Measures 88

Abbreviations

(Pty)	Proprietary
(RE)	Remaining extend
BC	Bushveld Complex
BID	Background information document
Cm	centimetre
Cr2O3	Chrome
DAFF	Department of Agriculture, Fisheries and Forestry
DEAT	Department of Environmental Affairs and Tourism
DM	District Municipality
DWAF	Department of Water Affairs and Forestry
EAP	Environmental Assessment Practitioner
ECM	Eastern Chrome Mines
ENPAT	Environmental Potential Atlas for South Africa
Fax	Facsimile
FTLM	Fetakgomo Greater Tubatse Local Municipality
FIDP	Final integrated Development Plan
GDP	Gross Domestic Product
GNR	Government Notice Regulation
Ha	Hectare
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
Km	kilometer
Km^2	Square kilometer
L	litre
LEDET	Department of Economic Development, Environment and Tourism Limpopo
LEMA	Limpopo Environmental Management Act
LG	Lower Group
LM	Local Municipality
Ltd	Limited
Mamsl	meters above mean sea level
ME	Mitigation efficiency
MG	Middle Group
Mm	millimeter
MPRDA	Mineral and Petroleum Resources Development Act
NEMA	National Environmental Management Act
NEMAQA	National Environmental Management Air Quality Act
NEMBA	National Environmental Management Biodiversity Act
NEMWA	National Environmental Management Waste Act
NHRA	National Heritage Resources Act
No	Number
NWA	National Water Act
ºC	Decrees Celsius
OLEMF	Olifants and Letaba Rivers Environmental Management Framework
RoM	Run of Mine
RWD	Return Water Dam
SACNASP	South African Council for Natural Scientific Professions
SAHRA	South African Heritage Resources Agency
SLP	Social and Labour Plan
Tel	Telephone
TSF	Tailings Storage Facility
UG	Upper Group
WM	With Mitigation
WOM	Without Mitigation

DRAFT SCOPING REPORT

1. CONTACT PERSON AND CORRESPONDENCE ADDRESS

1.1. Details of:

1.1.1. The EAP who prepared the report

Name of The Practitioner: Prescali Environmental Consultants. The report was compiled by Gregory Netshilindi *(Cand.Nat. Sci)*.

1.2. Expertise of the EAP

1.2.1. The qualifications of the EAP

(*With evidence attached as Appendix 1).*

Mr Gregory Netshilindi has qualifications in Environmental & Geographical Sciences and Geological Sciences.

Reviewers:

1.2.2. Summary of the EAP's past experience.

(Attach the EAP's curriculum vitae as Appendix 2)

Reviewers:

2. DESCRIPTION OF THE PROPERTY.

Farm Name:	Portion 0 (RE) and 1 of Farm Annex Grootboom 335 KT; and Farm Grootboom 336 KT
Application area (Ha)	3438. 5652
Magisterial district:	Fetakgomo Tubatse Local Municipality, Sekhukhune Magisterial District
Distance and direction from nearest town	4.3 km north-east to Steelpoort, though Tubatse village is 0 km from the extended opencast area
Cadastral Codes	T0KT00000000033500000 T0KT00000000033500001 T0KT00000000033600000 T0KT00000000033600001 T0KT00000000033600002 T0KT00000000033600003 T0KT00000000033600004

2.1. LOCALITY MAP

(show nearest town, scale not smaller than 1:250000 attached as Appendix 3)

Large locality and layout maps will be included as attachments (Appendix 3)

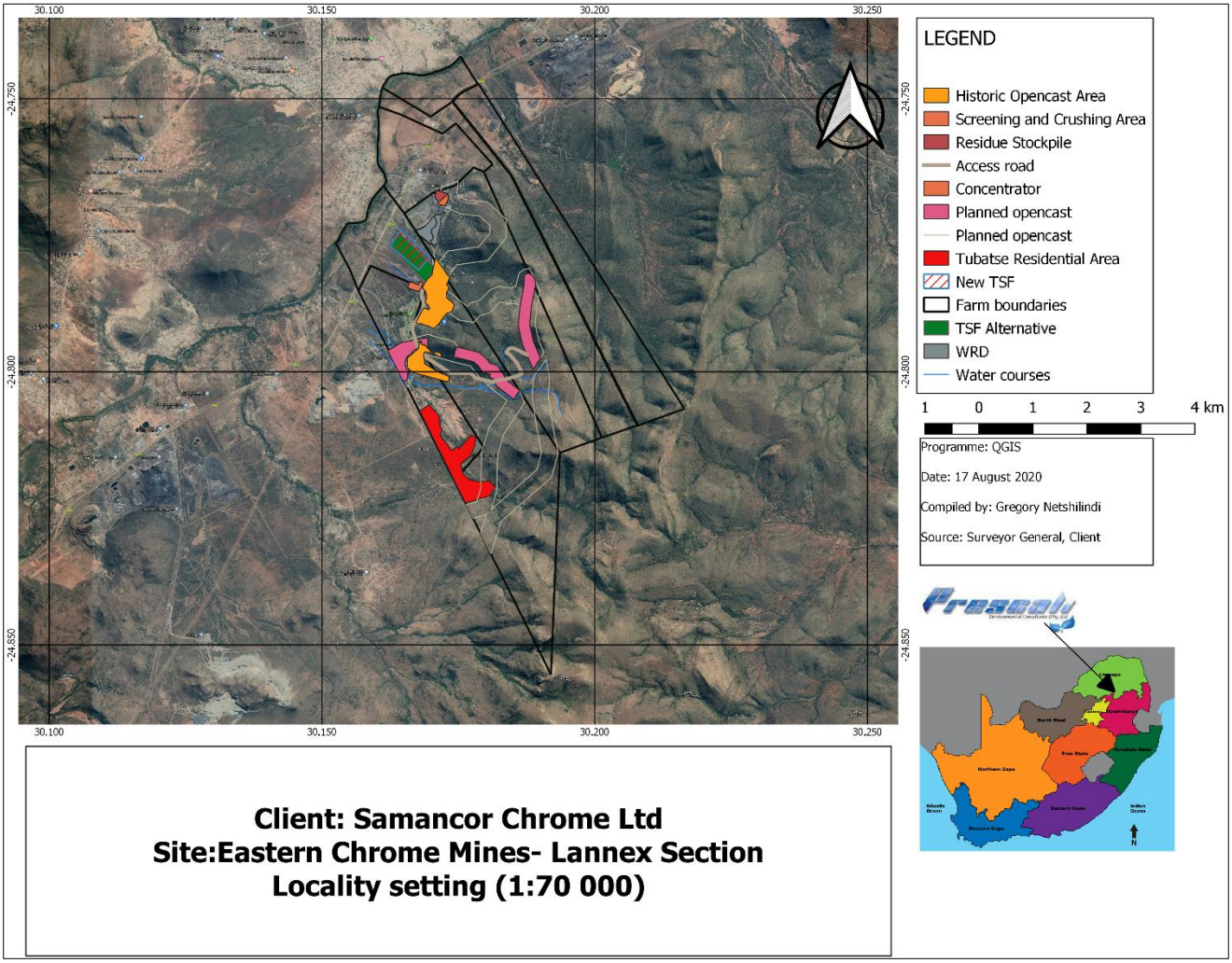


Figure 2-1: ECM Lannex Section Locality Map (1:50 000)

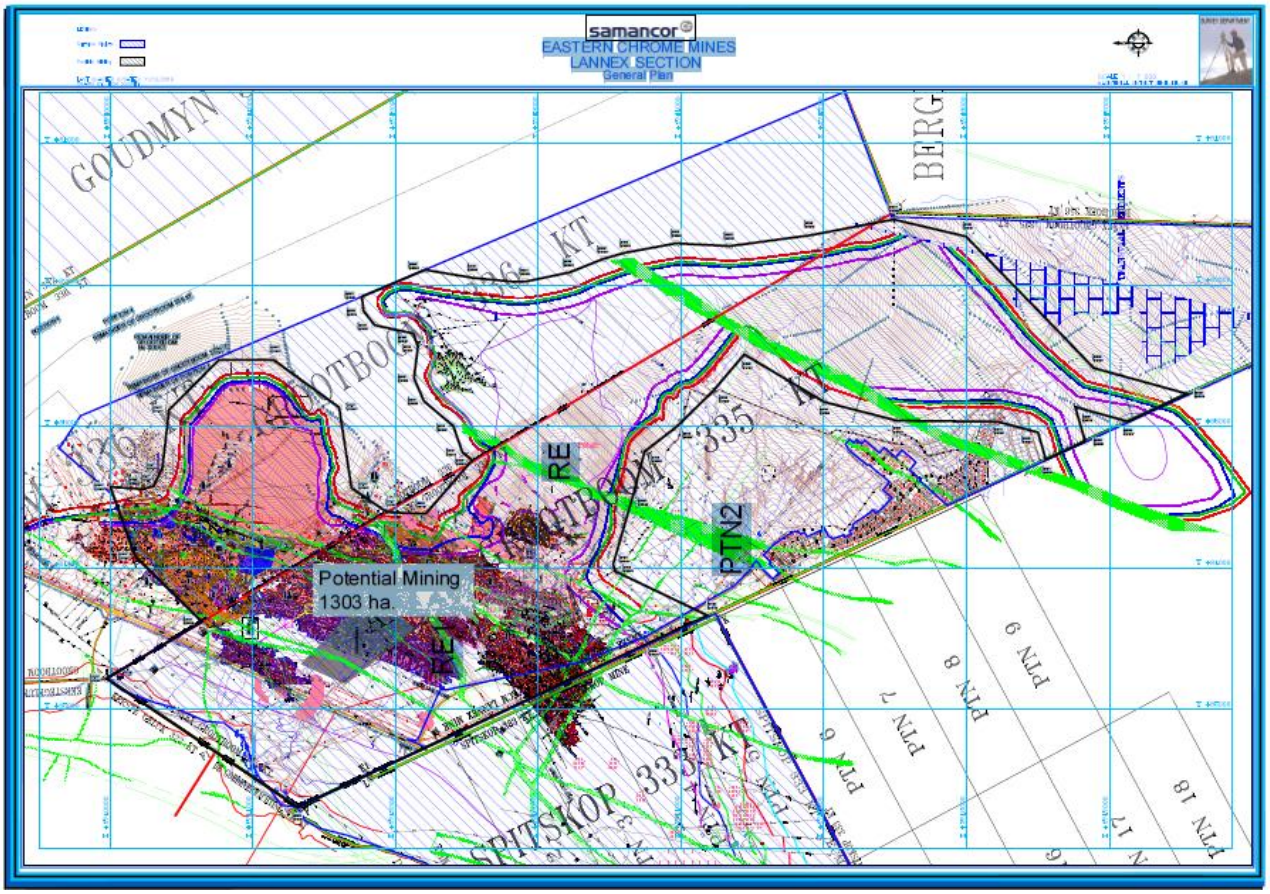


Figure 2-2: Lannex Section Mining Area

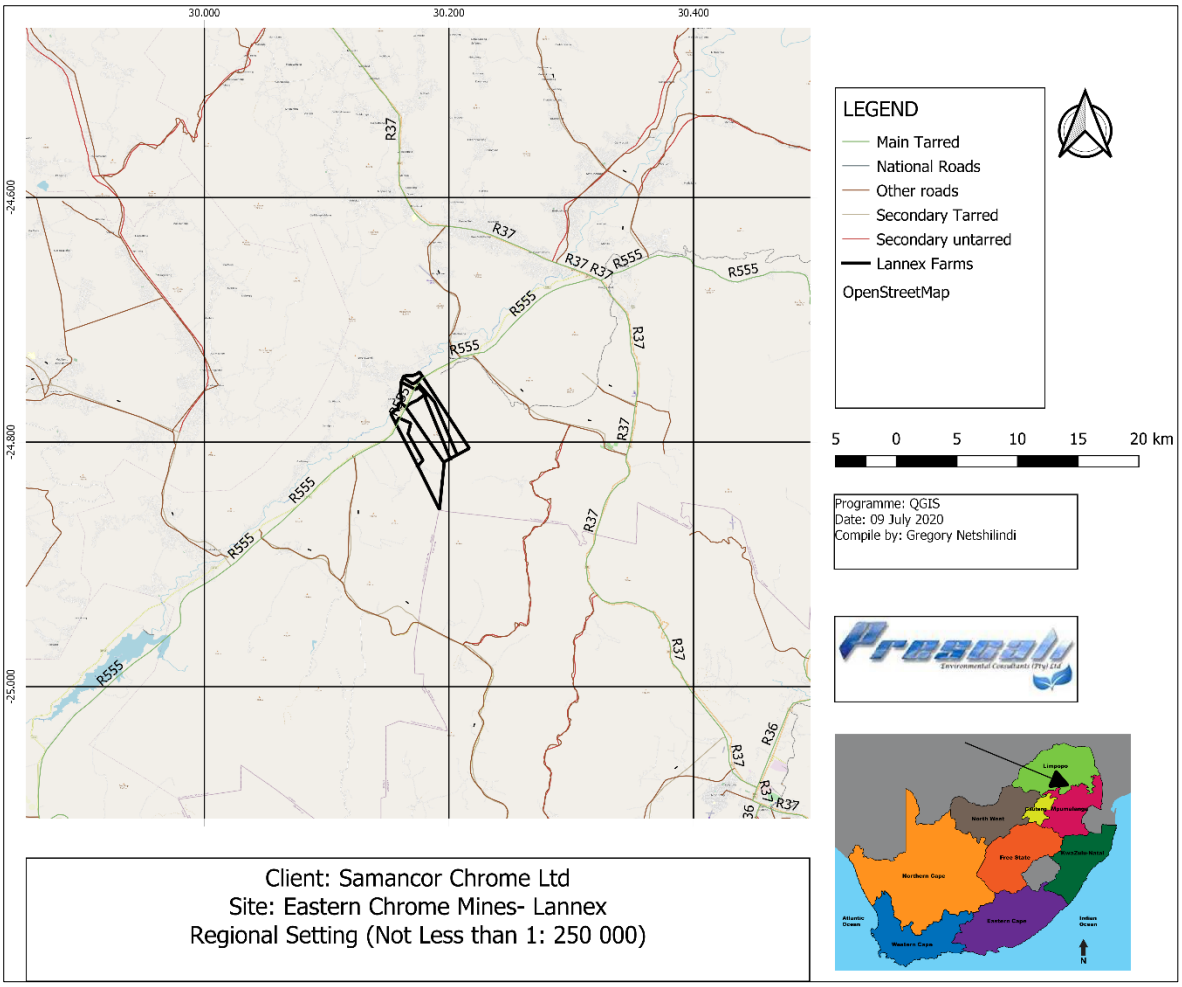


Figure 2-3: ECM Lannex Section Regional Locality Map (1:250 000)

3. DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY

3.1. 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 4 Appendix 5

Table 3-1: Listed and Specified Activities to be authorised

NAME OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY	LISTED ACTIVITY	APPLICABLE LISTING NOTICE	WASTE MANAGEMENT AUTHORIZATION
(E.g. For prospecting – drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route)	Ha or m^2	(Mark with an X where applicable or affected)	GNR LN1: 983 / LN2 984 / LN =3: 985 (as amended 07 April 2017)	(Indicate whether an authorization is required in terms of the Waste Management Act). (Mark with an X)
Storm water management infrastructure will be developed around the opencast (phase approach) and the TSF area, these will not be pipelines but open culverts which may exceed the 0.36 m diameter or the 120l/s peak throughput. Lannex Slurry pumping capacity is approximately 180 m^3/h and the pipeline is a160 mm diameter line.	TSF: (2 320 m x 4m) 9 280 m^2 Opencast: (17 000 m x 4 m) 68 000 m^2	X	Develop LN1: #9	
Tailings and return water pipeline will be expanded from the existing TSF to the new TSF. These will be longer than 1 km and will exceed 0.36 m diameter or 120 l/s. As far as possible the pipelines will be located next to internal roads. Lannex Slurry pumping capacity is approximately 180 m^3/h and the pipeline is 160 mm diameter line.	1001 m x 2 pipelines	X	Expand: LN1: #46	
A retaining dam will be located upstream of the proposed opencast sections and may exceed 100 m^2, in addition the proposed opencast sections will cross several watercourses which will result in changes to more than 100 m^2 physical footprint of watercourses. Most of the area is either an ecological support area or CBA. It is not expected that the dam will have a wall height greater than 5 meters.	Opencast areas intercept rivers: 13 477 m, 269 540 m^2 Potential retention dams: 41 000 m^2 (combined footprint areas)	X	LN3: #14	
It is anticipated that 5 retention dams be constructed within watercourses at the opencast section may have a capacity of more than 50 000 m^3	Potential retention dams: 41 000 m^2 (combined footprint areas)	X	Develop: LN1: #12	

The proposed opencast will require additional diesel storage as well as other dangerous goods e.g. Oils to be stored. Combined with the existing capacities already in use at Lannex the 500 m^3 will be exceeded.	3 x 80 m^3 for each of the 3 active opencast pits is anticipated	X	Develop: LN2: #4	
The opencast activities in the impacted watercourses will result in the removal and infilling of material in excess of 10 m^3.	Opencast areas intercept rivers: 13 477 m, 269 540 m^2 Potential retention dams: 41 000 m^2 (combined footprint areas)	X	LN1: #19	
Various access roads will be developed around the TSF as well as access roads to the opencast areas and a temporary access road to Tubatse Village. These roads will be wider than 8 meters but less than 13.5. Some of the roads are existing informal internal roads and will be upgraded (widened by more than 4 meters and lengthened by more than 1 km). Most of the Opencast area is classified as ecological support or CBA areas. The road development will be a phased approach.	Road expansion: 10 ha (total footprint area) New road: (7 596 m x 13.4) 101 787 m^2 WRD Road Diversion: (1 191 m) 5 958 m^2 Tubatse Road diversion (Lannex portion only): 160 m x 13.4 m) 2 144 m^2	X	Expand: LN1: #56 Expansion: LN3: 18	
The TSF, WRD expansion and Opencast areas will require vegetation clearance that will exceed 20 Ha area in an ecological support / CBA area	Opencast: 528 ha Contractors camp: 10 ha TSF and Storm water: 40 ha Potential retention dams: 41 000 m^2 WRD expansion: 10 ha	X	LN2: #15 LN3: #12	

Should any protected plant species require relocation as a result of the proposed opencast activities a permit will be applied for in terms of the NEMBA	1 ha (assumption)	X	LN1: #30	
The new storm water dam at the TSF will require a Water use licence.	1 ha (assumption)	X	Development: LN2: #6	
Phased activities that will take place as per the opencast mining in terms of stormwater development, overburden dumps and backfilling and road development. LN1:24(i), 30, 34, LN2: 5,7,8(ii),11,13,16,27(i)or(ii).	Opencast: 528 ha Road expansion: 10 ha (total footprint area) New road: (7 596 m x 13.4) 101 787 m^2	X	LN1: #67	
Phased activities that will take place as per the opencast mining in terms of stormwater development, overburden dumps and backfilling and road development. Excluded: LN3: 7,8,11,13,20,21,24.	Opencast: 528 ha Road expansion: 10 ha (total footprint area) New road: (7 596 m x 13.4) 101 787 m^2	X	LN3: #26	
The application is for an amended mining right as a result of the proposed opencast and associated minerals being applied for.	1 995.93 ha	X	LN2: #17	
Development of a new residue deposit (Tailing storage facility), expansion of the waste rock dump and new residue stockpile	TSF: 40 ha Residue stockpile: 1 ha TSF expansion area: 10 ha	X		X

3.2. Description of the activities to be undertaken

(Describe Methodology or technology to be employed, and for a linear activity, a description of the route of the activity)

Lannex Mine wishes to amend and consolidate its existing EMPr by including additional infrastructures, Table 3-2 lists the existing operation scope and the proposed additional scope.

Table 3-2: Lannex Current\Existing and Proposed Scope\Extent Activities

Current\existing Operation scope	Project Proposed Scope\Extent
The existing mining activities at Portion 0 (RE) and 1 of Farm Annex Grootboom 335 KT; and Farm Grootboom 336 KT: • Underground (operational) • Opencast (Historical) Lannex Mine is an operational mine and has the following existing activities and infrastructures: • Internal haul roads, culverts and bridges; • Topsoil, Product and ROM stockpiles • Overburden stockpiles; • Offices, parking bays, workshops, change house, storehouses and warehouses • Diesel/fuel storage facilities • Trackless workshop • Metallurgical Plants with conveyors • Water supply network, storm water network, pollution control dams, raw water dam, effluent dam, septic tanks and water treatment works • Tailings Storage Facility(Not enough capacity) • Waste Rock Dump(Not enough capacity) • Explosive magazine bay with destruction facilities • Security entrances and gates • Electrical substation and power lines; • Underground adits;	The extent of proposed mining activities at Portion 0 (RE) and 1 of Farm Annex Grootboom 335 KT; and Farm Grootboom 336 KT covers: • Continuation of Underground Workings • Continuation and expansion/extension of historical opencast workings The extent of proposed mining area triggers the following additional infrastructures: • Rezoning of properties; • Tailings Storage Facility; • Water supply network, storm water network, pollution control dams, raw water dam, effluent dam, septic tanks and water treatment works • RoM crushing and screening plant; • Product storage area; • Waste Rock Dump expansion area; • Access road to opencast areas; • Road diversion around opencast area

3.2.1. Rezoning of properties to Mining

Applicable areas of the properties will be rezoned from residential to mining to ensure compliance with the Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013) (SPLUMA).

3.2.2. Residue deposit area and Crushing and Screening Plant

A new crushing and screening plant will be constructed on the old TSF footprint area which will also cater for a new residue stockpile area.

3.2.3. New tailing storage dam with associated infrastructure

The existing operational tailings dam has reached capacity and a new tailings dam is needed. This will include stormwater management infrastructures and water slurry pipelines in addition to pipelines. There is an existing road to the proposed area, however maintenance road around the TSF and

stormwater infrastructure is needed. The new TSF and associated infrastructure will cover an area of 40 Ha.

A new residue deposit facility with associated infrastructure (e.g. service/ maintenance road, pipelines and Return water dam) are proposed to be constructed as the current operational facilities is reaching their design capacities. Where possible existing road infrastructure will be used to access the preferred site. The following will be undertaken as part of the application process:

- Site selection whereby various sites will be evaluated for suitability;
- Full design report for the proposed tailings storage facility and associated infrastructure to ensure compliance with the norms and standards for residue deposits and stockpiles;
- Specialist investigations at the alternative site;
- Modelling of impacts as a result of the proposed tailings storage facility;

Construction of the tailing's storage facility will include:

- Vegetation removal;
- Topsoil removal;
- Construction of the service / maintenance road;
- Construction of the pipeline river crossing;
- Construction and operation of the proposed tailings pipeline;
- Construction and operation of the proposed water return pipeline;
- Construction of the proposed liner system;
- Construction of the tailings wall;
- Construction of the penstock system;
- Deposition of tailings during the operational phase;
- Construction and operation of the Return water dam (also to include dirty storm water collection);
- Construction and operation of clean storm water management around the tailings storage facility;
- Reclamation of deposited tailings for retreatment before disposal again.

As reclamation technology improves future re-treatment of already treated tailings may become a possibility thus closure of the facility may not occur once the facility reaches its design capacity.

3.2.4. Expansion of the Waste Rock Dump (WRD)

The existing WRD footprint area will be increased on an area directly adjacent to the existing dump. The area is already a brownfield with very little natural vegetation remaining. The WRD will have an areal extent of 10 Ha

3.2.5. Opencast Area

Three opencasts will be mined during the proposed development and will have an areal extent of 528 Ha. Opencast mining involves the stripping of usable soil and soft over burden material using a fleet of diesel trucks and shovels. Thereafter hard over burden is blasted to break the rock, which is removed as waste. The waste rock is returned directly to mined out portions of the pit where possible, or if necessary, held in a waste rock dump until available mined out pit space is available to receive such material.
Once the hard overburden has been removed, the exposed chromite ore is blasted and hauled to a run of mine (ROM) tip by truck.

3.2.6. Underground Mining

The underground operation entails conventional room-and pillar mining, typically with low-angle adits connecting to a horizontal access level. Blasting within the underground workings relies on drilling with hand-held pneumatic jackleg units. The ore is mined either up-dip or breast in rooms approximately 16 m wide, with the roof supported by ore pillars and roof bolts. Scrapers haul chromite ore to ore passes that feed trains on the haulage level.

Ore is transferred from the ore trains to a conveyor in the hoisting adit. In certain areas of the mine mechanised mining takes place and involves 10 m wide panels that are established on breast and are divided by the panel pillars which are on average 10 m (?) long and 5 m wide depending on the depth below surface. Drilling in these sections is done using a drill rig. Ore is cleaned (picked up) using load haul dumpers (LHD) which transfer the ore to a strike conveyor belt that feeds onto the dip conveyor in the decline shaft. The decline consists of three parallel excavations, one for the conveyor belt, one for vehicles and the other for general access.

3.2.7. Consolidation of all approved EMPr`s into one document

Approval of environmental management programme date October 1995 stamped by the DMR dated 12/11/2006. Approval letter stamped by the DMR dated 1999. The amendment to the approved environmental management programme dated 2006. The amendment was to include Lannex North opencast activities. This application includes continuation with historical opencast mining activity approved in this EMP as it was temporarily ceased. The amendment to the approved environmental management programme date 2013.

3.2.8. Access roads to opencast areas

Access roads will be constructed to access the proposed opencast areas Figure 2-1. The proposed access roads will cover an area of about 10 Ha.

4. POLICY AND LEGISLATIVE CONTEXT

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	**REFERENCE WHERE APPLIED**
(a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process);	
The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) Section 2 of the Constitution states that: "*This Constitution is the supreme law of the Republic; law or conduct inconsistent with it is invalid, and the obligations imposed by it must be fulfilled*." Section 24 of the CA, states that *everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:* • *prevent pollution and ecological degradation;* • *promote conservation; and* • *secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development*. Section 24 guarantees the protection of the environment through reasonable legislative (and other measures) and such legislation is continuously in the process of being promulgated. Section 33(1) concerns administrative justice which includes the constitutional right to administrative action that is lawful, reasonable and procedurally fair.	The draft Scoping Report was accordingly prepared and considered within the constitutional framework set by Section 24 and 33 of the Constitution.
The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and the Environmental Assessment Regulations, 2014 (as amended) The overarching principle of the NEMA is sustainable development. It defines sustainability as meaning *the integration of social, economic and environmental factors into planning, implementation and decision making so as to ensure the development serves present and future generations*. Section 2 of NEMA provides for National Environmental Management Principles. These principles include: • Environmental management must place people and their needs at the forefront of its concern. • Development must be socially, environmentally and economically sustainable. • Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated. • Environmental justice must be pursued. • Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing must be pursued.	The Draft Scoping Report will be distributed for public review for periods stipulated in NEMA as part of the environmental impact assessment process.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
• Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle. • The participation of all Interested and Affected Parties (I&APs) in environmental governance must be promoted. • Decisions must take into account the interests, needs and values of all I&APs. The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment. • Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law. • The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage. • The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment. The EIA process to be undertaken in respect of the authorization process of the proposed mining operations is in compliance with the MPRDA, as well as the NEMA read with the Environmental Impact Assessment Regulations of 2014 (as amended). The proposed development involves 'listed activities', as identified in terms of the NEMA and in terms of section 24(1), the potential consequences for or impacts on the environment of listed activities must be considered, investigated, assessed and reported on to the Minster of Mineral Resources or to the relevant office of the Department responsible for mineral resources, except in respect of those activities that may commence without having to obtain an environmental authorisation in terms of the NEMA.	
GNR 1147 (20 November 2015) of the NEMA - Financial Provisioning Regulations In accordance with the above legislation, the holder of a mining right must make the prescribed financial provision for the costs associated with the undertaking of the management, rehabilitation and remediation of the negative environmental impacts due to prospecting, exploration and mining activities and the latent or residual environmental impacts that may become known in future.	The Final Rehabilitation, Decommissioning and Mine Closure plan will be compiled in accordance with GNR 1147.
Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) Previously South African mineral rights were owned either by the State or the private sector. This dual ownership system represented an entry barrier to potential new investors. The current Government's objective is for all mineral rights to be vested in the State, with due regard to constitutional ownership rights and security of tenure. The MPRDA was passed in order to make provision for equitable access to and sustainable development of the nation's mineral and petroleum	The Scoping Report was compiled as per the guidelines and requirements of the DMR.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
resources, and to provide for matters connected therewith. The Preamble to the MPRDA inter alia affirms the State's obligation to: • protect the environment for the benefit of present and future generations; • ensure ecologically sustainable development of mineral and petroleum resources; and • promote economic and social development. The aforesaid preamble affirms the general right to an environment provided for in section 24 of the Constitution (as set out hereinabove). The objects of the MPRDA, as set out in section 2 thereof serve as a guide to the interpretation of the Act. The objects of the MPRDA are as follows: • recognise the internationally accepted right of the State to exercise sovereignty over all the mineral and petroleum resources within the Republic; • give effect to the principle of the State's custodianship of the nation's mineral and petroleum resources; • promote equitable access to the nation's mineral and petroleum resources to all the people of South Africa; • substantially and meaningfully expand opportunities for historically disadvantaged persons, including women, to enter the mineral and petroleum industries and to benefit from the exploitation of the nation's mineral and petroleum resources; • promote economic growth and mineral and petroleum resources development in the Republic; • promote employment and advance the social and economic welfare of all South Africans; • provide for security of tenure in respect of prospecting, exploration, mining and production operations; • give effect to section 24 of the Constitution by ensuring that the nation's mineral and petroleum resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development; and • ensure that holders of mining and production rights contribute towards the socio-economic development of the areas in which they are operating. The national environmental management principles provided for in section 2 of the NEMA apply to all prospecting and mining operations and any matter relating to such operation. These principles apply throughout the Republic to the actions of all organs of state including inter alia the Department of Mineral Resources that may significantly affect the environment. Any prospecting or mining operation must be conducted in accordance with generally accepted principles of sustainable development by integrating social, economic and environmental factors into the planning and implementation of prospecting and mining projects in order to ensure that exploitation of mineral resources serves present and future generations.	

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
Section 38 of the MPRDA states that the holder of inter alia, a prospecting right, mining right or mining permit: • Must at all times give effect to the general objectives of integrated environmental management laid down in Chapter 5 of NEMA; • Must consider, investigate, assess and communicate the impact of his or her prospecting or mining on the environment as contemplated in section 24(7) of NEMA; • Must manage all environmental impacts – o In accordance with an environmental management plan or approved environmental management programme, where appropriate, and o As an integral part of the prospecting or mining operations, unless the Minister directs otherwise. • Must as far as reasonably practicable, rehabilitate the environment affected by the prospecting or mining operations to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and • Is responsible for any environmental damage, pollution or ecological degradation as a result of prospecting or mining operations and which may occur inside and outside the boundaries of the area to which such right, permit or permission relates.	
National Water Act, 1998 (Act No. 36 of 1998 (NWA) In terms of the NWA, the National Government, acting through the Minister of Water Affairs, is the public trustee of South Africa's water resources, and must ensure that water is protected, used, development, conserved, managed and controlled in a sustainable and equitable manner for the benefit of all persons (section 3(1)). In terms of the NWA a person may only use water without a license under certain circumstances. All other use, provided that such use qualifies as a use listed in section 21 of the Act, require a water use license. A person may only use water without a license if such water use is permissible under Schedule 1 (generally domestic type use) if that water use constitutes a continuation of an existing lawful water use (water uses being undertaken prior to the commencement of the NWA, generally in terms of the Water Act of 1956), or if that water use is permissible in terms of a general authorisation issued under section 39 (general authorisations allow for the use of certain section 21 uses provided that the criteria and thresholds described in the general authorisation is met). Permissible water use furthermore includes water use authorised by a license issued in terms of the NWA. Section 21 of the NWA indicates that "water use" includes: • taking water from a water resource (section 21(a));	Lannex Section already has a water use licence for the existing activities. A new water use licence will be applied for the Section 21 activities identified as a result of the construction of the new proposed activities.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
• storing water (section 21(b)); • impeding or diverting the flow of water in a water course (section 21(c)); • engaging in a stream flow reduction activity contemplated in section 36 (section 21(d)); • engaging in a controlled activity which has either been declared as such or is identified in section 37(1) (section 21(e)); • discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit (section 21(f)); • disposing of waste in a manner which may detrimentally impact on a water resource (section 21(g); • disposing in any manner of water which contains waste from, or which has heated in, any industrial or power generation process (section 21 (h)); • altering the bed, banks, course or characteristics of a water course (section 21(i)); • removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people (section 21(j)); and • using water for recreational purposes (section 21(k)). In addition to the above and in terms of section 26 of the NWA, Regulations on the Use of Water for Mining and Related Activities Aimed at the Protection of Water Resources were published in GN R. 704 of 4 June 1999 (GN R. 704). The aforesaid GN R. 704 provides for inter alia the capacity requirements of clean and dirty water systems (regulation 6), the protection of water resources by a person in control of a mine (regulation 7), security and addition measures (regulation 8) and temporary or permanent cessation of a mine or activity (regulation 9). According to GN R. 704 “no person in charge of a mine may carry on any underground or opencast mining, prospecting or any other operation or activity under or within the 1:50 year flood-line or within a horizontal distance of 100 metres from any watercourse or estuary, whichever is the greatest”. Insofar as the undertaking of section 21 water uses is concerned, it is anticipated that application for registration and water use licensing will be undertaken.	
National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) The NHRA established the South African Heritage Resources Agency (SAHRA) as well as Provincial Heritage Resources Agencies. In terms of the NHRA, no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site. No person may damage, disfigure, alter, subdivide or in any other way develop any part of a protected area unless, at least 60 days prior to the initiation of such changes, he/she/it has consulted with the relevant heritage resources authority.	An archaeological assessment will be conducted on the proposed site alternatives for the proposed additional activities.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
Section 34 of the NHRA provides for the protection of immovable property by providing for a prohibition on altering or demolishing any structure or part of any structure, which is older than 60 years, without a permit issued by the relevant provincial heritage resources authority. Accordingly, should the proposed activities, prospecting or mining activities or the closure and rehabilitation of mined land involve the altering or demolishing of any structure or part of any structure, which is older than 60 years, a permit issued by the relevant provincial heritage resources authority is required. No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite; destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite; trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites. No person may, without a permit issued by SAHRA or a provincial heritage resources authority destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves; destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or bring onto or use at the burial ground or grave referred to above any excavation equipment or any equipment which assists in the detection or recovery of metals. Section 38 of the NHRA states that any person who intends to undertake developments categorised in Section 38 of the NHRA must at the very earliest stages of initiating such development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development. By way of example, the developments referred to in Section 38 of the NHRA include: • the construction of a road, wall, power-line, pipeline, canal or other similar form of linear development or barrier exceeding 300 metres in length; • the construction of a bridge or similar structure exceeding 50 metres in length; • any development or other activity which will change the character of a site as specified in the regulations; • any other category of development provided for in regulations by SAHRA or the provincial heritage resources authority.	

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
However, the abovementioned provisions are subject to the exclusion that section 38 does not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act No. 73 of 1989 (EIA) (now presumably the NEMA in view of the repeal of the listed activities under the ECA: Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.	
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) The NEMBA aims to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith. The NEMBA provides for the publishing of various lists of species and ecosystems by the Minister of Environmental Affairs and Tourism (now the Minister of Water and Environmental Affairs) as well as by a Member of the Executive Council responsible for the conservation of biodiversity of a province in relation to which certain activities may not be undertaken without a permit. In terms of Section 57 of the NEMBA, no person may carry out any restricted activity involving any species which has been identified by the Minister as "critically endangered species", "endangered species", "vulnerable species" or "protected species" without a permit. The NEMBA defines "restricted activity" in relation to such identified species so as to include, but not limited to, "hunting, catching, capturing, killing, gathering, collecting, plucking, picking parts of, cutting, chopping off, uprooting, damaging, destroying, having in possession, exercising physical control over, moving or translocating".\ The Minister has made regulations in terms of section 97 of the NEMBA with regards to Threatened and Protected Species which came into effect on 1 June 2007. Furthermore, the Minister published lists of critically endangered, endangered, vulnerable and protected species in terms of section 56(1) of the NEMBA.	The legislation was considered throughout the EIA process and in particular the Ecological Impact Assessment which will comply with the NEMBA.
National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEMAQA) The NEMAQA came into power on the 24th of February 2005. Additionally, the amendment to the Minimum Emission Standards (GN R 893) also came into effect on the 12 June 2015. This Notice provides a list of activities that may cause atmospheric emissions which have or may have a significant detrimental effect on the environment as well as the minimum emission standards ("MES") for these activities as contemplated in section 21 of NEMAQA.	Currently there are no listed activities that require registration/permitting according to NEMAQA for the proposed activities infrastructures.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
The effect of the commencement of the NEMAQA and the listed activities, listed in GN 964 is that an atmospheric emission licence (AEL) is now required for conducting these listed activities.	
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEMWA) The NEMWA commenced on 1 July 2009 and as a result of its commencement the relevant provisions in the Environment Conservation Act No. 73 of 1989 (ECA) in respect of waste management, were repealed. The NEMWA sets out to reform the law regulating waste management and deals with waste management and control more comprehensively than was dealt with in the ECA. It also introduces new and distinct concepts never before canvassed within the realm of waste management in South Africa, such as the concept of contaminated land and extended producer responsibility. It also provides for more elaborate definitions to assist in the interpretation of the Act. Section 19 of the NEMWA provides for listed waste management activities and states in terms of section 19(1), the Minister may publish a list of waste management activities that have, or are likely to have a detrimental effect on the environment. Such a list was published in GNR 921 of 29 November 2013. In accordance with section 19(3), the Schedule to GNR 921 provides that a waste management licence is required for those activities listed therein prior to the commencement, undertaking or conducting of same. In addition, GNR 921 differentiates between Category A, B, and Category C waste management activities. Category A waste management activities are those which require the conducting of a basic assessment process as stipulated in the EIA Regulations, 2014 promulgated in terms of the NEMA as part of the waste management licence application and Category B waste management activities are those that require the conducting of a scoping and environmental impact assessment process stipulated in the EIA Regulations, 2014 as part of the waste management licence application. Category C waste management activities do not require a waste management licence, however a person who wished to commence, undertake or conduct a waste management activity listed under this category, must comply with the relevant requirements and standards, Section 20 of the NEMWA pertains to the consequences of listing waste management activities and states that no person my commence, undertake or conduct a waste management activity, except in accordance with the requirements or standards for that activity as determined by the Minister or in accordance with a waste management licence issued in respect of that activity, if a licence is required. In terms of the current statutory framework with regards to waste management, a waste management licence is required for those waste management activities identified in the Schedule to GNR 921. Certain of the waste management activities listed in the Schedule are governed by specific thresholds. Where any process or activity falls below or outside the thresholds stipulated, a waste management licence is not required.	The proposed activities (construction and reclamation) requires a waste management licence (WML) as listed in GNR 921 of 29 November 2013 (Category B (11)).

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
Limpopo Environmental Management Act, 2003 (Act No. 7 of 2003) (LEMA) The LEMA came into effect on 1 May 2004 and aims to consolidate and amend the environmental legislation of or assigned to the Province and to provide doe matters incidental thereto. The objectives of the Act are: (a) to manage and protect the environment in the Province; (b) to secure ecologically sustainable development and responsible use of natural resources in the Province; (c) generally, to contribute to the progressive realisation of the fundamental rights contained in section 24 of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) ; and (d) to give effect to international agreements effecting environmental management which are binding on the Province	The Ecological assessment as conducted by the specialist will include the requirements of this Act into their findings.
Integrated Development Plans and Environmental Management Frameworks	
Environmental Management Framework for the Olifants and Letaba Rivers Catchment Areas (OLEMF), December 2009 **Invalid source specified.** The purpose of this EMF is to develop a framework that will integrate policies and frameworks, and align different government mandates in a way that will streamline decision-making to improve cooperative governance and guide future development in an environmentally responsible manner. The objectives of the EMF are to: • 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 the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA); • specify additional activities within identified geographical areas that will require 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.	The requirements of the will be assessed and included in the specialist reports and the EIA/EMP.
Greater Sekhukhune District Municipality (DM) 2014/15 Final Integrated Development Programme (FIDP) Review: Greater Tubatse Local Municipality (LM) Draft IDP 2017 – 2018 Legislation was enacted to guide the establishment of and functions of metropolitan, district and local municipalities, including the promulgation of integrated development planning as a tool for development in district and local municipal IDP	The proposed development fall under the jurisdiction of the Fetakgomo-Greater Tubatse Local Municipality which is located in the Greater

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
reports. Section 25 of the Municipal System Act, 2000 (Act No. 32 of 200) (MSA) requires that an IDP must be compatible with National and Provincial development plans and planning requirements. The above municipalities are characterised by similar developmental constraints highlighted in the Integrated Development Plans for the respective districts: • Large portions of the population reside in rural areas with limited access to opportunities for social and economic upliftment; • Due to its rural nature; the Tubatse Municipality is confronted with a high service delivery backlog. Majority of the settlements are far apart which; makes the provision and maintenance of services very costly. Some of these areas are too small to attain the economic threshold required to provide social facilities in a cost-effective manner. • There are extensive skills shortages in the areas and limited provision of human resource development programmes that would address the skills gap, specifically in the mining sector that is an important revenue generator for both local municipalities; • Existence of large infrastructure backlogs. Together with the identified agriculture and tourism potential, mining is delineated as a priority sector for both municipalities. District municipalities endorse and promote communication and partnerships in the mining industry. It is widely recognised that investment within the mining industry is paramount for the creation of social and economic upliftment within the municipalities.	Sekhukhune District Municipality. The need and desirability of the project is in line with the IDP`s of these municipalities.

5. NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES.

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).

Limpopo has rich mineral resources, making mining a critical sector of the economy of the province, contributing 22% to its Growth Domestic Product (GDP). Unemployment in the region is high with an estimated 42% of the economically active population in the Fetakgomo-Greater Tubatse Local Municipality being unemployed.

Although there are several mines in the area, the proposed minerals mined remain unexploited. Expansion in this sector is important as it brings with it investment in infrastructure, results in creation of job sustainance and generates many other economic spin-offs. The lack of economic growth in the region warrants special attention and support to optimize the available opportunities. However, cognizance should be taken of the outflow of money from the mines in Greater Tubatse to other regions.

Fetakgomo-Greater Tubatse Local Municipality has significant mining in existance and manufacturing (ferrochrome smelters) sectors, but unemployment is still significantly above the provincial average. Information from different sources suggests that new mining developments could reduce unemployment from 73% (expanded unemployment rate definition) in 2001 to 44% in 2010 and 23% in 2015. Further reduction in the unemployment rate will depend on effective intervention by public sector institutions to facilitate economic sector diversification through competitive cluster value-chain development. This implies upstream development in the manufacturing and trade sector to provide essential items in the mining supply chain by local entrepreneurs. It also implies side-stream development in the form of construction and Urban renewal. This approach is consistent with the Limpopo Employment Growth and Development Plan (Fetakgomo Greater Tubatse Municipality , 2016).

The economy of the Sekhukhune District is a mixture of very negative features (such as the highest unemployment rate in Limpopo) and very positive opportunities (like the enormous mining potential within the area). The region is also characterised by a weak economic base, poor infrastructure, major service backlogs, dispersed human settlements and high poverty levels.

Southern Africa hosts about 90% of the world's chromite reserves and resources and accounts for approximately 60% of global chrome ore production. South African output rose above 20Mt for the first time ever in 2018. Most chrome ores are mined as a primary product although, in South Africa, around 30% of chrome ore output in 2018 was derived as a by-product from UG2 tailings of platinum group metal (PGM) operations.

Over 90% of chromium consumption is attributable to metallurgical applications. Stainless steel alone represents more than 75% of consumption. Trends in stainless steel production are, therefore, the main determinant for the outlook of chromium demand. Ferrochrome is the intermediate chromium-iron alloy used in the steel industry. Most of the ferrochrome production is in the form of high-carbon ferrochrome and charge chrome, of which 80-90% is consumed directly in stainless steel. The balance of ferrochrome production is in the form of low- and medium-carbon ferrochrome used to trim the final chromium composition within specified Cr:C ratios of stainless and other steel products.

The chromium chemical and refined metal industry accounted for just over 3% of the total market in 2018. Prices for these niche products have followed different trends to metallurgical chrome ores and ferrochrome. China hosts by far the largest capacity of chromium chemicals production, although producers with less than 10 ktpy capacity were largely eliminated a decade ago because of more stringent environmental regulations. As environmental inspections have ramped up in China in recent years, further closures and suspensions have allowed Kazakhstan, Turkey, the USA and India to gain a combined market share of 45% in chromium chemicals in 2018, up from 30% a decade ago. Demand

for chromium chemicals is estimated to have consumed just over 1.5 Mt of chrome ores in 2018 (Roskill, 2019).

The extraordinary physical properties of the platinum group make its metals almost indispensable in a wide range of industrial applications. Auto catalysts, which account for more than 40% of the total demand for platinum, are the major demand sector for PGMs. Around 38% of the world's platinum finds its way into jewellery, and the electrical and electronics industry accounts for 50% of the annual palladium and ruthenium demands. Growth is associated with PGMs playing a role in fighting viral, bacterial and parasitic infections in the future and even being used as diagnostic tools. The use of clean and efficient fuel cells in the future, in which platinum catalysts are used to convert the chemical energy of a fuel into electrical energy, has for some time been sees as the next new major demand sector for platinum (Mineral Council South Africa, 2008).

An expected increase in the demand for platinum and palladium is expected for the future due to stricter emissions legislation globally and a rise in the growth of vehicle production and sales. In addition, with global energy demand expected to grow by more than 60% by 2030, the security of energy supply has become a concern and has led to the diversification of energy sources. This has created new opportunities for PGMs in the development of fuel cell technology, which could lead to significant socio-economic development as it will result in job creation in terms of manufacturing, installation and maintenance, as well as skills development (Mining Weekly, 2012).

The benefits of the development of the Lannex Mine is apparent from the above, with the expected increase in demand for platinum-group metals (PGMs) on a global basis, especially for fuel cell technology, which not only provides an alternative clean and sustainable energy source but comes with a variety of socio-economic benefits. In addition to the global socio-economic benefits, the continuation of the Lannex Mine will also provide the local communities with various benefits relating mainly to job creation and sustainability of existing job and skills development. Unemployment in the region is high and mining is seen to hold major possibilities for the area.

Without the implementation of this project, the mentioned benefits would not be realised. The realization of the outcome the Mining Charter (2004), within the context of the MPRDA (2002), would therefore also not be reached and this has potentially significant negative impacts on national economic growth and social well-being. The Mining Charter's main objectives, which the Lannex expansion project will assist to reach, are:

- to promote equitable access to South Africa's Mineral Resources for all South Africans;
- to substantially and meaningfully expand opportunities for historically disadvantaged South Africans (HDSAs);
- to utilize the existing skills base for the empowerment of HDSAs (Refer to the Social and Labour Plan (SLP) as part of the Mining Right);
- to expand the skills base of HDSAs to serve the community; (Refer to the SLP conducted according to the MPRDA);
- to promote employment and advance the social and economic welfare of mining communities and areas supplying mining labour; (Refer to the SLP as part of the Mining Right); and
- to promote beneficiation of South Africa's mineral commodities beyond mining and processing, including the production of consumer products.

The proposed Lannex Mine is currently operational, therefore the sustainance and creation of new job opportunities and training in the local community as part of the continuation of the mining project will have a positive impact. Currently the need in the local community is significant and this will be reviewed as part of the overall assessment of the community needs.

As Samancor Chrome possess South African in-house expertise, it has however decided to conduct all opencast operations using contractors. This includes the initial development, and opencast mining. The

mine contractor will also be responsible for the maintenance of all haul roads and any other gravel roads within the mine area. Operating costs were developed from first principles on an owner-operated basis using a combination of inducstry norms and in-house data.

The current number of employment positions (excluding Shared Services) at Lannex Mine is 475. The mine employs no core contractor employees. Of the Lannex workforce, 417 employees (87.4%) are from the FTLM (local labour-sending area). The remaining 58 (12.2%) come from other local municipalities throughout the nine provinces, and South Africa's neighbouring countries. The Shared Services employees are also provided for: 264 (75%) of the 352 are from the FTLM.

ECM is using a scheme whereas community learners are recruoted and placed on a skills development program on a quarterly basis. The program enable community learners to undergo institutional and/or workplace training and assessment. The aim of the program is to give the community learners the opportunity to obtain the necessaty skills and knowledge as per operational requirement. At the end of the program the community learners receive a competency certificate which will in return promote job creation and reduce unemployment.

6. PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

The environmental authorisation is required for 20 years.

For the activities to which a construction phase only is applicable e.g. roads, pipeline, TSF a timeframe of 2 years is proposed.

7. DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED SITE.

NB!! – This section is not about the impact assessment itself; It is about the determination of the specific site layout having taken into consideration (1) the comparison of the originally proposed site plan, the comparison of that plan with the plan of environmental features and current land uses, the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout as a result.

The identification of alternatives is a key aspect of the success of the scoping process. All reasonable and feasible alternatives must be identified and screened to determine the most suitable alternatives to consider and assess in the EIA phase. There are however some significant constraints that have to be taken into account when identifying alternatives for a project of this scope. Such constraints include financial, environmental and social issues, which will be discussed in the evaluation of the alternatives. Alternatives can typically be identified according to:

- *Location alternatives;*
- *Process alternatives;*
- *Technological alternatives; and*
- *Activity alternatives (including the No-go option).*

For any alternative to be considered feasible such an alternative must meet the need and purpose of the development proposal without presenting significantly high associated impacts.

Alternatives can also be distinguished into discrete or incremental alternatives. Discrete alternatives are overall development options, which are typically identified during the pre-feasibility, feasibility and or scoping phases of the EIA process. Incremental alternatives typically arise during the EIA process and are usually suggested as a means of addressing identified impacts. These alternatives are closely linked to the identification of mitigation measures and are not specifically identified as distinct alternatives. This section provides information on the development footprint alternatives, the properties

considered, as well as the type of activity, activity layout, technological and operational aspects of the activity.

7.1. Details of location alternatives

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, provide details of the alternatives considered with respect to:

The section below describes the site/location alternatives considered as part of the project. As indicated above, Lannex Mine is an existing mine, and has been subjected to previous environmental processes, which considered alternatives in the form of both development and land use alternatives prior to approval.

7.1.1. Details of the Property on which or location where it is proposed to undertake the activity

The property on which the proposed opencast and the associated infrastructure will be located are within the Mining Right Area (Figure 2-1) as outlined below:

- Annex Grootboom
- Grootboom

Samancor is also the Surface right holder of these properties and hold the Title Deeds as indicated below.

Table 7-1: Surface and Chromite rights for Lannex mine as applicable to Samancor Chrome Ltd

Title deed number	Farm Number	Farm and portion	Hectares	Rights	Holder
T 11981/1993	335 KT	RE (0) of Farm	1137.5643	Surface rights Chromite and associated minerals	Samancor Chrome Ltd
T 75536/1993	335 KT	RE portion 1	263.8943	Surface rights Chromite and associated minerals	Samancor Chrome Ltd
T 159656/2005	336 KT	Portion 0	434.5842	Chromite and associated minerals	Dolphin Whisper Trading 10 Pty Ltd
T 98215/2001	336 KT	Portion 1	736	Surface rights Chromite and associated minerals	Samancor Chrome Ltd
T 55771/2011	336 KT	Portion 2	103	Chromite and associated minerals	XTLS Inv 129 Pty Ltd
T 17669/1999	336 KT	Portion 3	258	Chromite and associated minerals	Tubatse African Agricultural Merging farmers communal prop Association
T 39213/2001	336 KT	Portion 4	466	Chromite and associated minerals	Ngululu Bulk Carriers Pty Ltd

The type of minerals mined are chrome (Cr_2O_3), and associated minerals: platinum, palladium, rhodium, ruthenium, iridium and osmium, gold, silver, copper, nickel and cobalt, which may be extracted from

normal mining of Chromite in the Middle Group (MG) and Lower Group (LG) Reefs. Samancor will not be mining the UG2 Reef or the Merensky Reef.

The land use of the proposed mining area, new TSF area, TSF reclamation, and access road is now considered to be predominantly for mining and mining related activities, therefore, there is no practical development alternative for the current Lannex Mine area. The proposed extension of the opencast of the current mining area has to be taken into consideration economic viability and practicality as well as the location of the resource to be mined.

7.1.2. Location Alternatives

Lannex is an existing mine with existing infrastructure that will be utilised during the proposed opencast and underground expansion. A site selection process was undertaken to consider the possible location of the proposed tailings storage facility, return water dam, plant area, TSF reclamation, and access road. However, the opencast and underground site was selected based on the availability of Chrome and other minerals that ECM is targeting to extract. Minerals can only be mined where identified and verified, therefore it was not practical to select any the mining site.

7.1.2.1. Rezoning

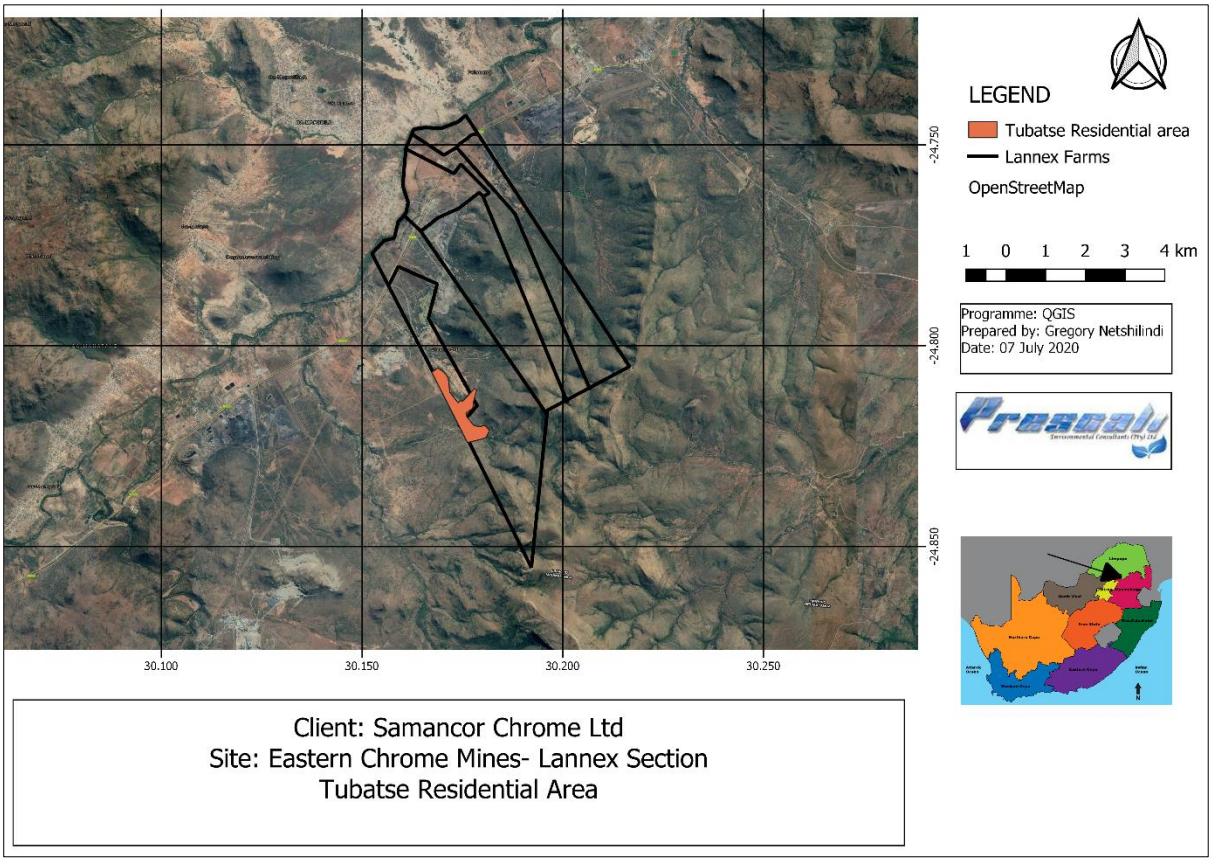


Figure 7-1: Tubatse Residential Area rezoning.

Applicable areas of the properties will be rezoned from residential to mining to ensure compliance with the Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013) (SPLUMA).

7.1.2.2. New crushing and screening plant and New product stockpile area

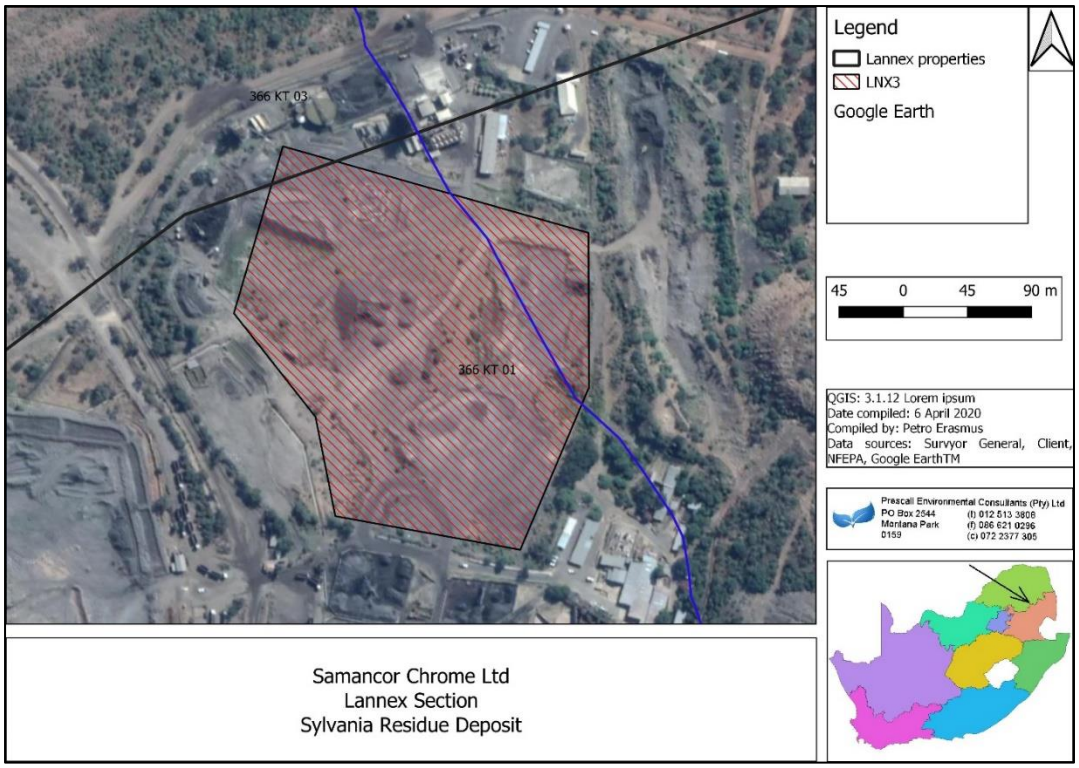


Figure 7-2: New crushing and screening plant area with new product stockpile

7.1.2.3. New TSF Area

Refer to Figure 7-5 Figure 7-6 Figure 7-7

7.1.2.4. WRD expansion area

The proposed expansion area of the WRD was determined by the existing footprint area of the WRD and the expansion area is located next to the existing dump. No other alternatives were considered.

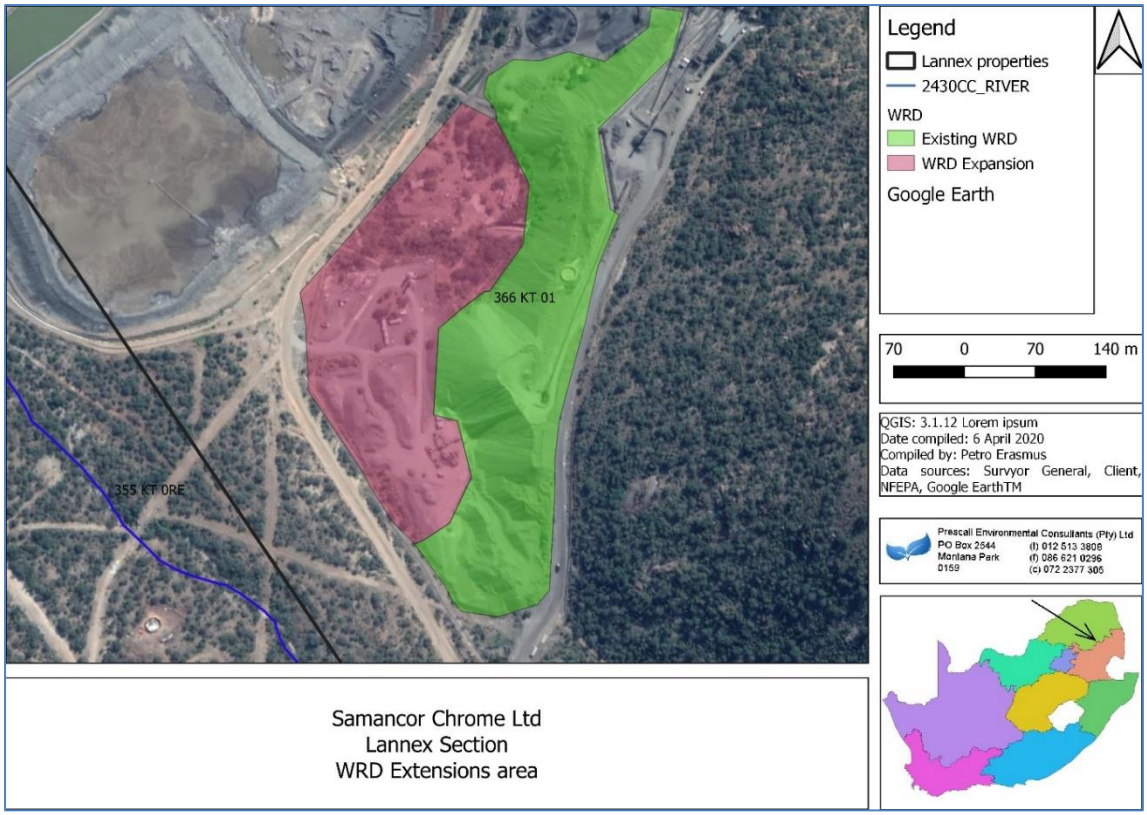


Figure 7-3: Lannex Section Waste Rock Dump Expansion Area

7.1.2.5. Access roads and road diversion

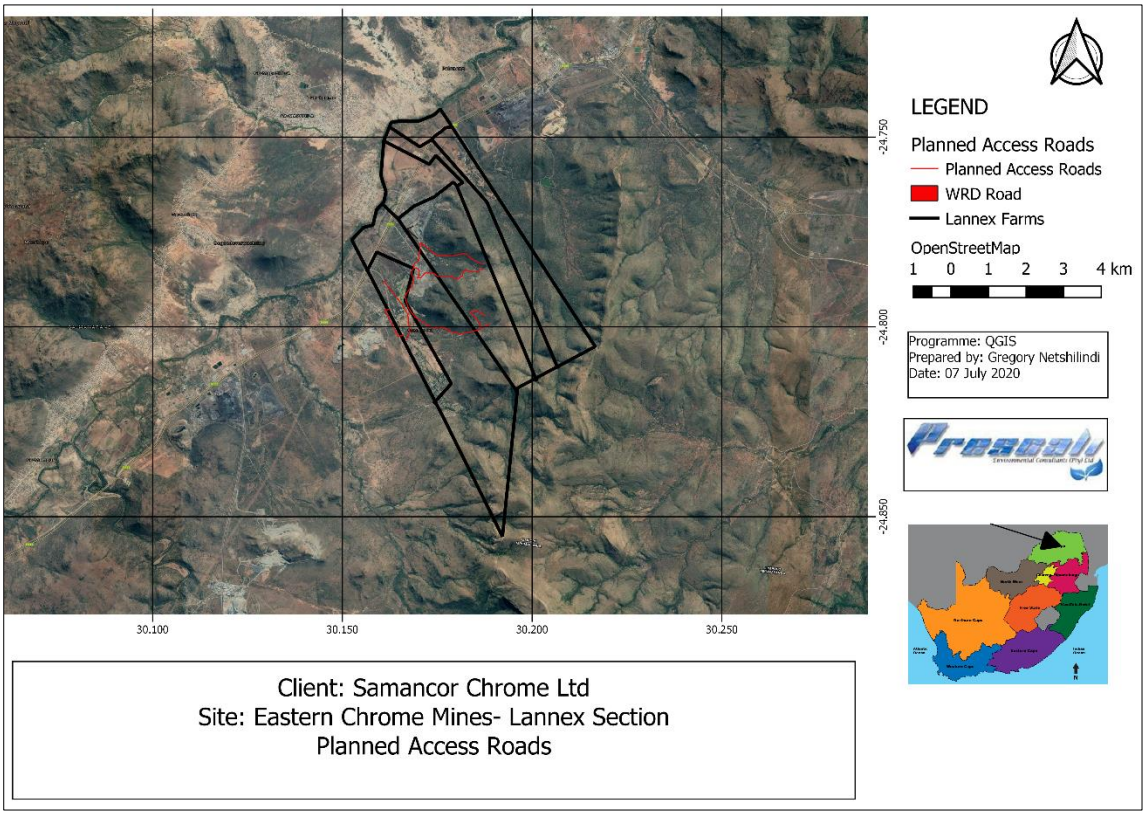


Figure 7-4: Proposed access roads.

7.1.2.6. Site Alternatives for the proposed infrastructure and mining area suitable for opencast and underground operation

The site selection report has identified the following location for the proposed infrastructure show in Figure 7-6 and Table 7-2.

Table 7-2: TSF site selection process.

TSF options	Comments	Average	Rating based on Average
LNX 1	This site is located parallel to the informal settlement and compared to wind flow might get spill over air impacts (e.g. dust). Vegetation seems to be natural though the potential for species of conservation concern (SCC) may be present. Anthropogenic impacts are already visible at this site (e.g. roads). The site is located on a Critical Biodiversity Area (CBA2) and National Protected Area Expansion Strategy (NPAES) area. With a little bit of modification in terms of location this site can be located outside the regulated 100 m surface water buffer, Figure 3-1 (Please note that the 1:100-year flood line needs to be determined and included in the final design and location). In addition, the watercourse to be crossed is an ephemeral stream that only flows during rainfall events. It is believed that a pipeline crossing this watercourse (if designed and maintained properly) would not impact on the watercourse in terms of water quality and quantity. This site is closer to the plant and existing TSF area than LNX2.	2	1
LNX 2	This site is located furthest from the settlement. Vegetation seems to be natural though the potential for SCC may be present. Anthropogenic impacts are already visible at this site (e.g. roads). The site is located on a CBA2, Ecological Support Areas (ESA1) and NPAES area. This site is located further from the plant area and the required pipeline will cross more ephemeral stream increasing the risk relating to potential spills. It is also smaller in size than the area available at LNX3.	2.7	3
LNX 3	This site is located in an already impacted (brown fields area) but close to an informal settlement and the natural surface water drainage has already been diverted around the site. *Concern*: it is possible that this area may not be sufficiently sized for the required tonnage to be disposed.	2.2	2

LNX 4	This site is located downwind from the settlement. Vegetation seems to be natural though the potential for SCC may be present. Anthropogenic impacts are already visible at this site. This site is the least preferred due to the following: 1) Close proximity to the Steelpoort River which is a perennial river. Any incidents from this site that could impact on a surface water resource will thus be more difficult to contain; 2) It crosses an existing water furrow; 3) The pipeline will have to cross the busy provincial road to Steelpoort. 4) Soils may not be suitable for stockpiling.	3.2	4

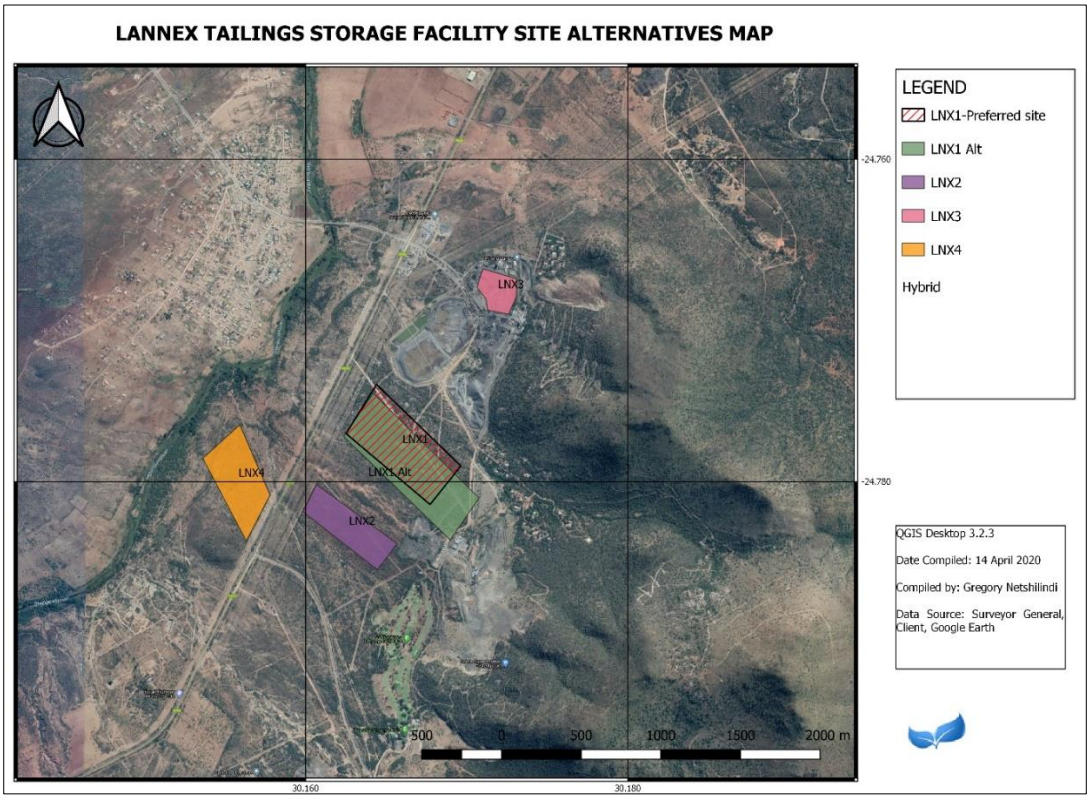


Figure 7-5: Lannex TSF Site selection options

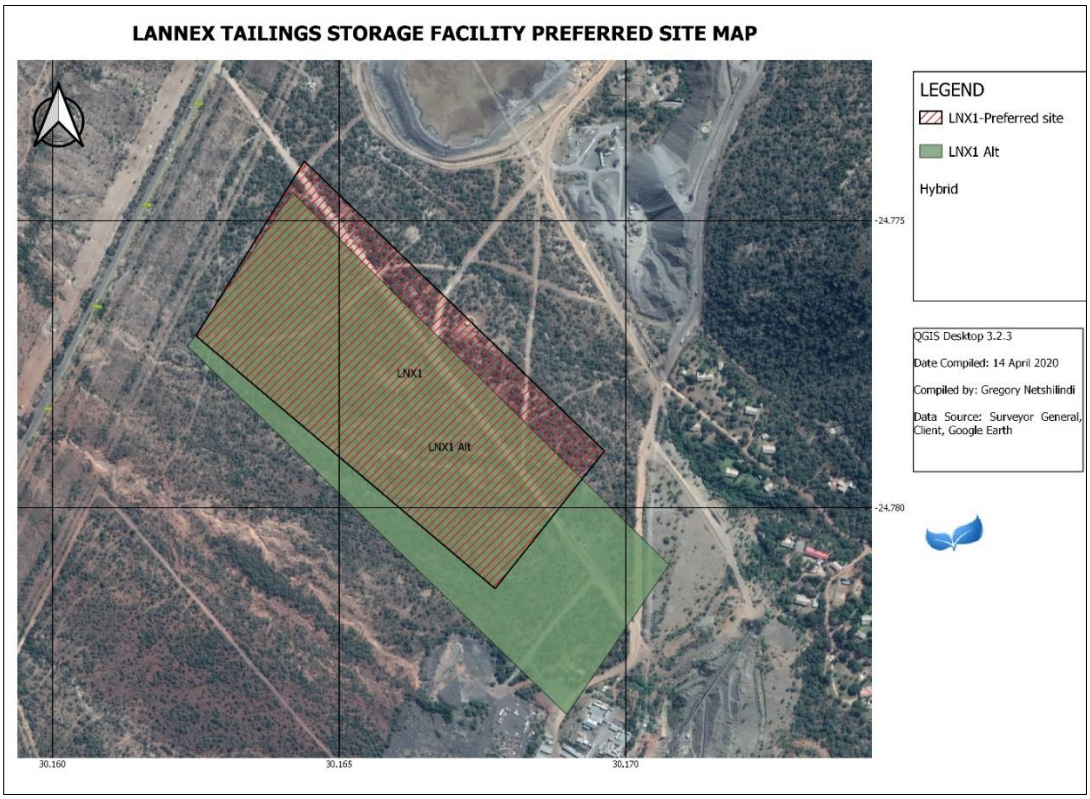


Figure 7-6: Lannex "preferred site" Tailings Storage Facility Area

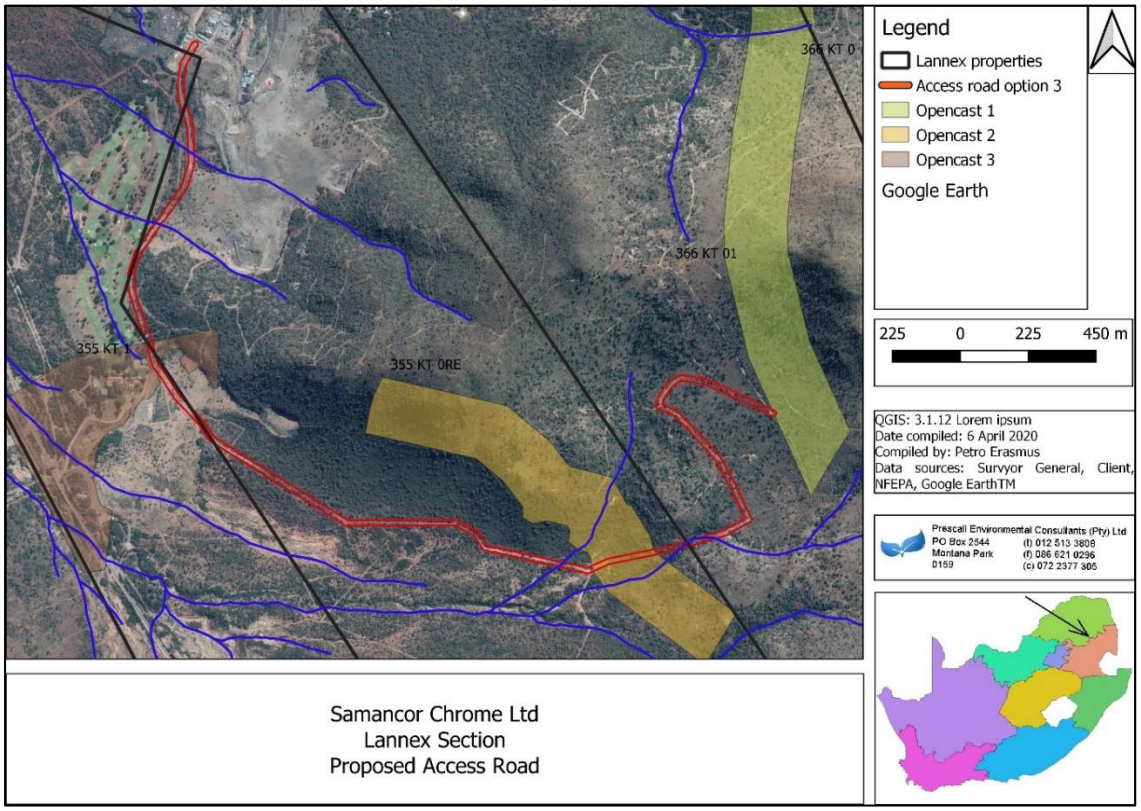


Figure 7-7: Lannex Section preferred access road

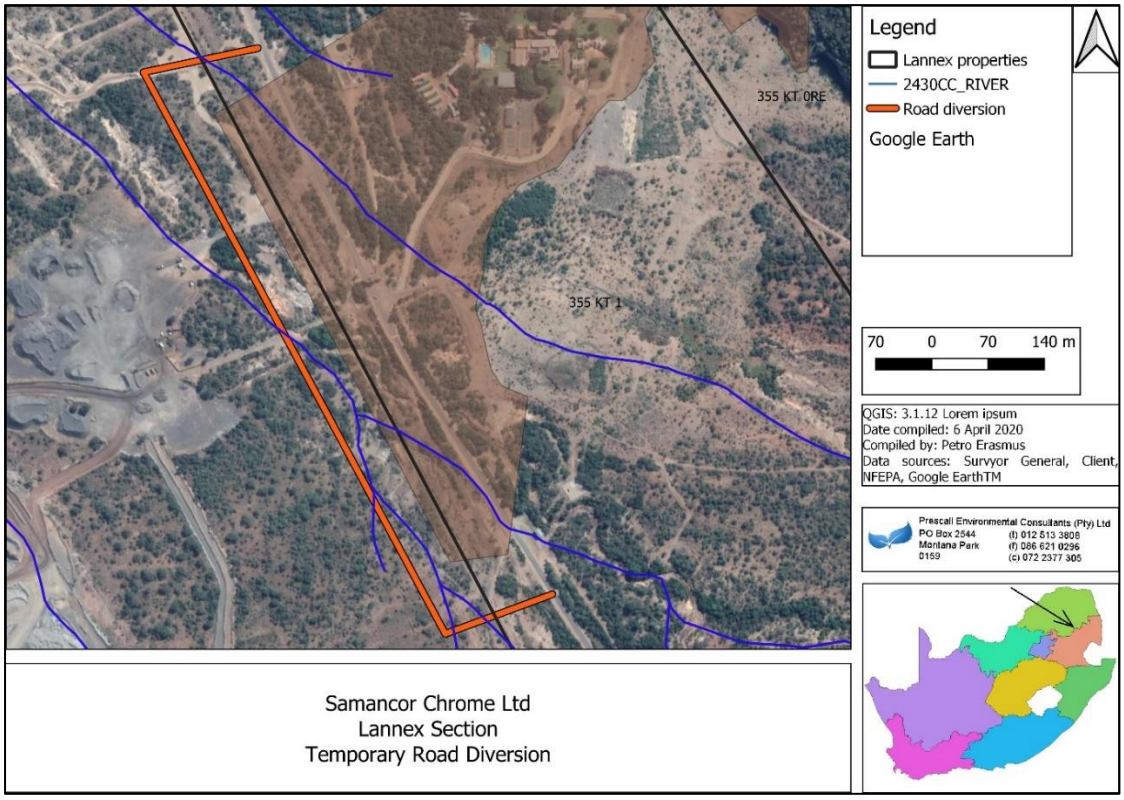


Figure 7-8: Lannex Section temporary road diversion

7.1.3. The type of activity to be undertaken

Lannex section is an operational mining area and the construction of the proposed additional activities are required to allow continued processing of the ROM generated by the mining activities and the re-treatment of the tailings.

WRD depositing will continue as per the current method, no alternatives were investigated.

Due to the location and depth of the mineral resource Opencast mining is the only viable mining method in the areas as identified for opencast mining. Similarly, underground mining will take place where most feasible.

The area is an existing mining area and the area zoned as residential is excluded from the area to be rezoned as mining.

7.1.4. Designs and Layout Alternatives

Please refer to Section 7.1.2 above where the site alternatives for the mining infrastructure in relation to the reserves are discussed.

The final design of the WRD, tailings storage facility and the supporting infrastructure will be prescribed by the site and will comply with the requirements of the Regulations Regarding the Planning and Management of Residue Stockpiles and Residue Deposits, 2015 as published in Government Notice R632 in Government Gazette 39020 dated 24 July 2015.

The design of the Return water dam (Storm water dam) will be compliant with the Requirements of GN704.

All roads will be structurally sound.

7.1.5. The technology to be used in the activity

The technology to be used during the deposition of the mining, TSF, WRD and tailings will be outlined in the final design report which will comply with the requirements of the Regulations Regarding the Planning And Management Of Residue Stockpiles And Residue Deposits, 2015 as published in Government Notice R632 in Government Gazette 39020 dated 24 July 2015.

Technology to used during opencast and underground mining will not change from current technology as the mine has already acquired and adapted to the current mining technology. New and efficient mining technologies will be researched and may be implemented by the mine during the course of the life of mine.

7.1.6. The operational aspects of the activity

Operational aspects of the deposition of the mining, TSF, WRD and tailings will be outlined in the design report which will comply with the requirements of the Regulations regarding the planning and management of residue stockpiles and residue deposits, 2015 as published in Government Notice R632 in Government Gazette 39020 dated 24 July 2015.

7.1.7. The option of not implementing the activity

The no-go option refers to the alternative of the proposed development not going ahead at all. This alternative will avoid potentially positive and negative impacts on the environmental conditionof the area

would remain which is the conditions of the current ECM- Lannex Mine without any deviations or expansions.

The implications of the no-go option will be evaluated as part of the EIA, focusing on comparing potential impacts from the proposed project with the status quo and will be particularly relevant should it be found that detrimental impacts cannot be managed to an acceptable level.

8. DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land. Summary of issues raised by I&APs

Due to the COVID-19 pandemic a Public Participation Plan was submitted to the DMRE, the plan will be adhered to and amended as regulations are gazetted The following process was undertaken to facilitate the public participation process for the proposed opencast project thus far.

8.1. Newspaper Advertisement

An advertisement notifying the public of the environmental Authorisation application as well as the process to be followed: and requesting I&Aps to register their comments with Prescali will be placed on the local newspaper in accordance with regulation 41 (2) (c) and (d) of the EIA Regulation of 2014. The newspaper advertisements were placed as follows:

- Newspaper / and DATE

8.2. Site Notices and Background Information Document distribution

In order to inform the surrounding communities and adjacent landowners of the proposed development, notice boards and Background Information Document (BID) (in accordance with regulation 41 (2) (c) of the EIA Regulations) were erected at key locations surrounding the project site and within the project area on the between 11 August 2020- 21 August 2020.

The purpose of a BID was to provide stakeholders with introductory information on the ECM Lannex Project, the Environmental Impact Assessment (EIA) and environmental management programme (EMP) being undertaken and the stakeholder engagement process. The BID also provided stakeholders who are interested in the project with the opportunity to register as stakeholders by way of requesting and completing the registration sheet distributed with the BID. Information on the registration sheet has been used to register stakeholders on a database to receive all project-related information and invitations to meetings. The registration sheet included a section for comments and issues, which allows stakeholders an opportunity to provide the consultants with written comments and feedback.

8.3. Direct Notification of Identified I&APs

Consultation letters and BIDs were distributed at the following sites informing interested and affected parties about the Lannex Mine Project.

- Consultation letter were also distributed to the Ward Councillor;
- Ward committees;
- Tribal Authorities; and
- Government Departments

Government authority consultation will be undertaken from 21 August 2020- 21 September 2020 as part of the consultation process with I&APs. The following authorities were consulted:

- Limpopo Department of Economic Development, Environmental and Tourism (LDEDET);
- Department of Water and Sanitation;
- Fetakgomo-Greater Tubatse Local Municipality.
- Department of Agriculture, Forestry and Fisheries (DAFF)
- Limpopo Department of Mineral Resource;
- National Department of Environmental Affairs (DEA); Rural Development and Land Reform (RDLR);
- South African Heritage Resource Agency (SAHRA); and
- Limpopo Heritage Agency.

8.4. Public Meetings

A public meeting for the scoping phase will be arrange between the period 21 August 2020 and 18 September 2020. The information will be provided to registered I&APs. A second meeting will be held during the EIA phase and the dates will be confirmed with registered I&APs.

8.5. Draft Scoping Report

The EIA Regulations specify that the Draft Scoping Report (DSR) must be subjected to a public participation process of at least 30 days. A period of 30 days (21 August 2020 to 21 September 2020) was made available for public comment on the DSR as part of the EIA process. The availability of DSR was announced via advertisement, site notices, sms and notification letters as specified above to all identified and potential I&APs.

In addition, the DSR was distributed for comment as follows:

- Electronic copies were made available via email, fax, and post;
- Hard copies were made available at key locations such as the tribal authority offices;
- Hard copies of the report were also made available to LEDET, RDLR, DWS, DMR, DAFF, Local Municipality, District Municipality, Limpopo Heritage Agency and the Tribal Authority.

8.6. Summary of the issues raised by the I&APs

(Complete the table summarising comments and issues raised, and reaction to those responses)

Table 8-1: Issues and Responses

The table will be updated once comments are received.

Interested and Affected Parties		**Date Comments Received**	**Issues raised**	**EAPs response to issues as mandated by the applicant**	**Consultation Status**
List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.					(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					

Interested and Affected Parties		**Date Comments Received**	**Issues raised**	**EAPs response to issues as mandated by the applicant**	**Consultation Status**
Dept. Land Affairs					
Traditional Leaders					
Dept. Environmental Affairs					
Other Competent Authorities affected					
OTHER AFFECTED PARTIES					
INTERESTED PARTIES					

9. THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE SITES

(its current geographical, physical, biological, socio-economic, and cultural character)

9.1. Type of environment affected by the proposed activity

9.1.1. Regional Location

The Lannex Mine is located on the farms of Annex Grootboom 335 KT and Grootboom 336 KT, approximately 10 km south-west of steelpoort in Limpopo Province and is accessed directly from the R555. The area surrounding Lannex is characterised by koppies and mountanious zones to an elevation of over 1 000 m. these elev ated areas slope steeply down to flatter areas where mine infrastructure is located. Mining is conducted on a flatter areas and up into the koppies

9.1.2. Climate

A typical description of the Lannex Mine is hot summers and cold dry winters. The climate of the area is however influenced by prevailing topography being the foothills of the mountain ranges adjacent to the study area that creates microclimatic effects in the form of a hotter and drier climate. In General the climate of Lannex area can be described as sub-arid, warm temperate with a summer rainfall, with over 70% of the annual rainfall occuring during the October to February period. The average minimum and maximum daily temperatures are 14.7 ºC and 31.3 ºC, when averaged over the years 2007-2012 (Table 9-1). The average daily temperature is 31.9 ºC. Average daily maximum temperatures may exceed 30 ºC from September to May. Average daily minimum temperatures of less than 10 ºC occur from June to August.

Table 9-1 : minimum and maximum temperatures

Month	Minimum (ºC)	Average (ºC)	Maximum (ºC)
January	19.2	27.0	36.6
February	18.2	27.3	37.6
March	16.7	25.9	34.9
April	12.3	22.2	31.3
May	8.6	20.1	33.5
June	6.2	16.5	25.99
July	5.2	15.97	26.1
August	8.7	19.1	29.4
September	10.8	23.1	33.6
October	16.2	24.9	34.2
November	16.7	25.9	41.2
December	18.2	26.1	34.0

The lowest rainfall per month is in June (0 mm) and the highest in January with an average of 100 mm to 118 mm per month. Rainfall during winter months is erratic (between 0 mm and 40 mm monthly) while evapotranspiration is never less than 80 mm per month. This implies that the area has a precipitation deficit and can therefore be classified as a dry area for agricultural purposes.

9.1.2.1. Precipitation and Evaporation

Lannex Mine is located on the B41J quaternary catchments. The Water Resources of South Africa 2012 (WR2012) database indicates a mean annual precipitation (MAP) of 591 mm/a for the B71E catchment and a MAP of 598 mm/a for the B41J catchment. The WR2012 data per quaternary catchment was compiled from a number of rainfall stations per quaternary catchment and reviewed to get a final patched rainfall dataset per rain zone (applicable to one or more quaternary catchments that are grouped based on similar rainfall micro climatic zones) that stretched from 1925 to 2010.

Rainfall and temperature data were obtained from the DWS site Buffelskloof @ Buffelskloof Dam (B4E003) was available from 1972/07/01 until 31/01/2015 at B4E003 is approximately 618 mm per year.

Table 9-2: Mean climatic rainfall conditions for the project area

Month	Average Monthly Rainfall (mm)	Mean Monthly Evaporation (mm)
January	118.8	193
February	88.5	164.3
March	59.2	156.9
April	44.5	122.8
May	11.8	101.5
June	5.4	80.5
July	2.2	87.6
August	3.9	122.7
September	16.7	161.8
October	46.9	191.8
November	93.6	184.6
December	124.6	193.4
Annual	617.2	1 760.9

9.1.2.2. Wind

Airshed Planning Professions used a model to determine the wind direction and speed at the mine site.

Table 9-3: Summary of mean monthly wind directions from Lydenburg Station

Month	N	NE	E	SE	S	SW	W	NW
January	49	21	79	87	26	21	15	63
February	34	13	91	133	38	26	11	48
March	28	21	78	95	31	23	18	56
April	41	14	40	65	19	21	26	58
May	32	16	31	50	25	21	25	67
June	33	14	37	63	18	28	25	54
July	32	23	45	55	14	22	17	77
August	57	20	55	56	15	20	28	102
September	64	30	66	78	11	17	23	105
October	86	40	79	56	14	18	29	109
November	75	34	59	68	15	11	25	109
December	69	24	60	79	19	17	14	79
Average	50	23	60	74	20	20	21	77

9.1.3. Topography

The topography of the area is characterised by rugged areas and steep gradients. The project area is situated along rugged hills within a number of rural settlements in the Steelpoort Valley. The terrain consists predominantly of mountainous areas with flatter parcels of developable land on the plateaus, terraces and areas adjacent to the rivers. The Topography of the site is highly variable and range between a maximum altitude of 1 440 and 770 meter above mean sea level.

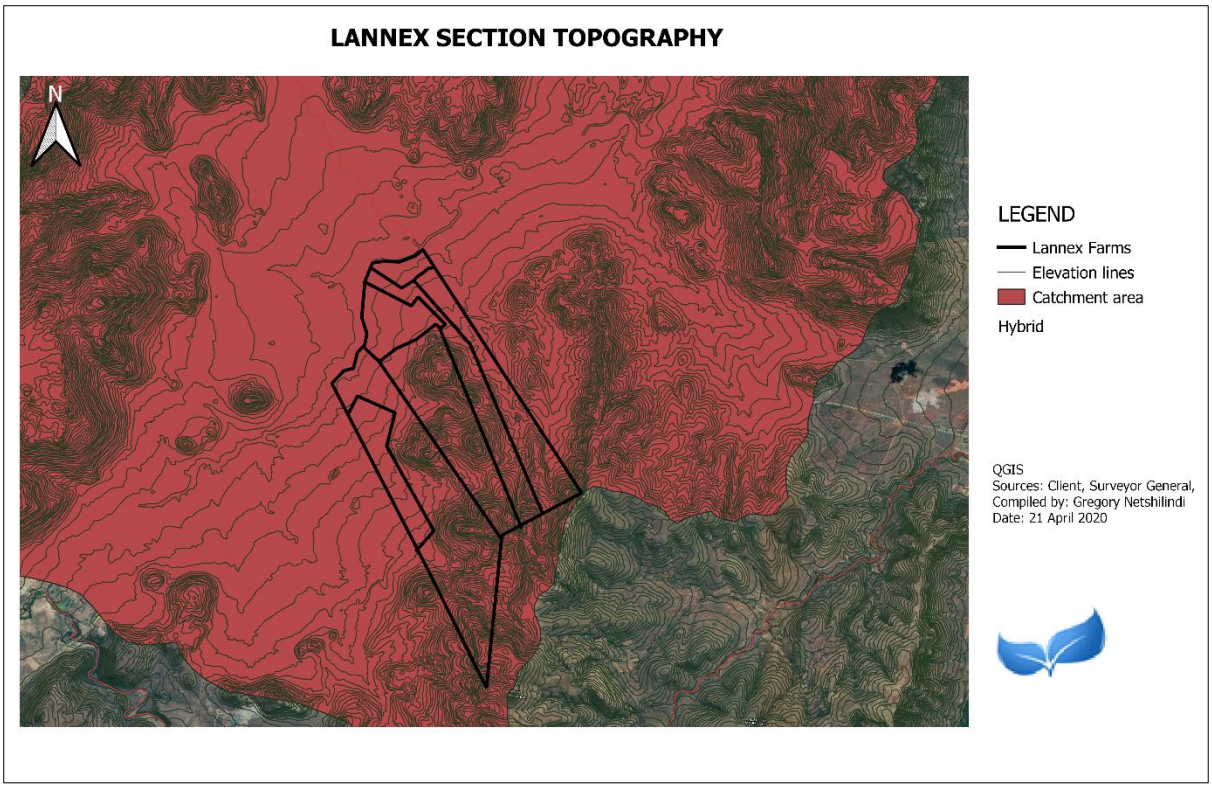


Figure 9-1: Shows topography of the Lannex Mining Right area.

9.1.4. Geology

9.1.4.1. Regional Geology

Approximately 98% of the world`s chrome-ore resources are found within gabbroic-layered intrusions of which the Bushveld Igneous Complex (BIC). The BIC is a world-renowned deposit that hosts PGEs, chromite, vanadium and titanium mineralisation. Situated within the north-central Kaapvaal Craton, this massive Proterozoic intrusive body, or, more likely, a series of interconnected intrusive, has a surface area of approximately 66 000 km^2 and consists of a mafic-ultramafic succession of layered and massive rocks known as the Rustenburg Layered Suite (RLS), a penecontemporaneous series of granitic rocks, termed the Lebowa Granite Suite and felsic extrusive rocks of the Rooiberg Group. For the majority of the area of the BIC, the Transvaal Supergroup forms the floor. ECM transgresses in the northern limb into the Archaean granites.

The ECM deposits occur in the BIC, which was emplaced into the Kaapvaal Craton between 1 700 and 2 100 million years ago. The lower mafic layered intrusion, the Rustenburg Layered Suite consists stratigraphically of a Marginal Zone, a Lower Zone, a Critical Zone and an Upper Zone (Figure 9-3).

The magmatic layering of the ultramafic-mafic rocks is remarkably consistent and can be traced over several hundreds of kilometres of strike. The layering may be correlated throughout most of the BIC. The dip of the igneous layering is generally shallow and towards the centre of the BIC. It is generally accepted that, rather than being a single body, BIC comprises several overlapping lopolith-shaped intrusions. The similarity of geology across large areas within each of the three limbs, particularly the sequence of igneous layering that includes both the Merensky Reef and the UG2, is probably indicative of simultaneous differentiation and replenishment of a basaltic magma under essentially identical conditions.

The ECM falls within the eastern limb of the BIC. Granites and related felsic volcanics occur in the central area between these limbs. Post BIC sedimentary successions of the Waterberg Group and Karoo Supergroup, as well as more recent alluvial deposits of Holocene age, cover large parts of the BIC.

Chromitite layers occur throughout the Critical Zone are in turn divided into Lower-Middle- Upper Groups. At ECM, Chromite ore is being produced from the Lower Group (LG), particularly the LG6 and sometimes also the LG6A chromitite seams at Steelpoort Section, and the Middle Group chromitites (MG), particularly the MG1 chromitite seam at the Lannex and Tweefontein Sections.

The BIC stratigraphy is divided into five major units (from deepest to shallowest).

The Marginal Zone comprises a heterogeneous succession of generally unlayered basic rocks dominated by norites. These rocks contain quartz and hornblende believed to be a result of contamination of the basic magmas by the enclosing host rocks. The Marginal Zone ranges in thickness from several metres to several hundred metres, and field exposures of this zone are generally poor.

The Lower Zone ("LZ") is dominated by ultramafic rocks. The most complete exposure is in the north- eastern part of the eastern limb of the BIC. In this area, the LZ occurs as a series of dunite-harzburgite cyclically layered units. The unit varies in thickness, having a trough-like geometry with the thinnest succession developed over structural highs in the basin floor. The Critical Zone ("CZ") is particularly remarkable for containing the largest Resources of chromium and PGEs in the world. The CZ is subdivided into the Lower Critical Zone ("LCZ") and the Upper Critical Zone ("UCZ") and is made up of cyclic units consisting of chromitite, pyroxenite, norite and anorthosite. Cycles in the LCZ are entirely ultramafic in character and are dominated by pyroxenite with interlayered harzburgite and chromitite layers. The UCZ represents a mixed mafic-ultramafic cyclic unit comprising layered pyroxenites, norites, anorthosites and chromitites. The base of the UCZ is marked by the appearance of cumulus plagioclase. The igneous layering within the CZ is remarkably uniform over much of the BIC and occurs on a variety of scales, with individual layers traceable for tens to hundreds of kilometres, and may also be locally regular to highly irregular in aspect. Chromitite layers occur throughout the CZ, usually at the base of crystallization cycles. The chromitite layers have been classified into lower, middle and upper groups, with the lower group occurring in the pyroxenitic LCZ, the upper group in the anorthositic UCZ and the middle group straddling the boundary between lower and upper divisions. The layers are identified according to their location within the layered succession, with numbers commencing from the bottom up. The lowermost group is known as the LG1 (Lower Group 1), followed by LG2, LG3 to LG7. This sequence progresses upwards from the MG1 (Middle Group 1) through to the MG4 and, finally, to the UG1 (Upper Group 1), UG2, and UG3. The thickness of these chromitite layers ranges from several millimetres to several meters. The chromitite layers may comprise multiple layers of chromitite separated by intercalated silicate rocks. The thickest chromitite layers, specifically the LG6 and MG1, are mined for their chromite content. All of the chromitite layers in the BIC contain anomalous concentrations of PGEs, with a general increase in PGE content upward in the sequence, with the UG2 currently one of two reefs of commercial interest for its PGE content. The other main PGE layer, the Merensky Reef, occurs above the UG chromitites, close to the top of the UCZ. The distance between the UG2 and the Merensky Reef is variable across the BIC and in the eastern limb it can attain stratigraphic distance of between 170 m and 400 m. The top of the CZ is characterised by the Giant Mottled Anorthosite, a robust anorthosite.

The Main Zone ("MZ") is the thickest unit within the RLS. In general, approximately half the RLS stratigraphic interval is occupied by this zone. The MZ consists of gabbro-norites with some anorthosite and pyroxenite layering. The Pyroxenite Marker is located approximately in the top third of the Zone. Layering is not as well-developed as in the CZ and LZ. The Upper Zone ("UZ") is dominated by gabbros. However, layered anorthosite and magnetite sequences are also present. There is no chilled contact with the roof rocks, which comprise rhyolites and granophyres. The base of the UZ is typically taken as the first appearance of cumulus magnetite above the Pyroxenite

Marker. The extent and regional geology (with the relative location of the ECM) of the eastern limb of the BIC is illustrated in Figure 9-2.

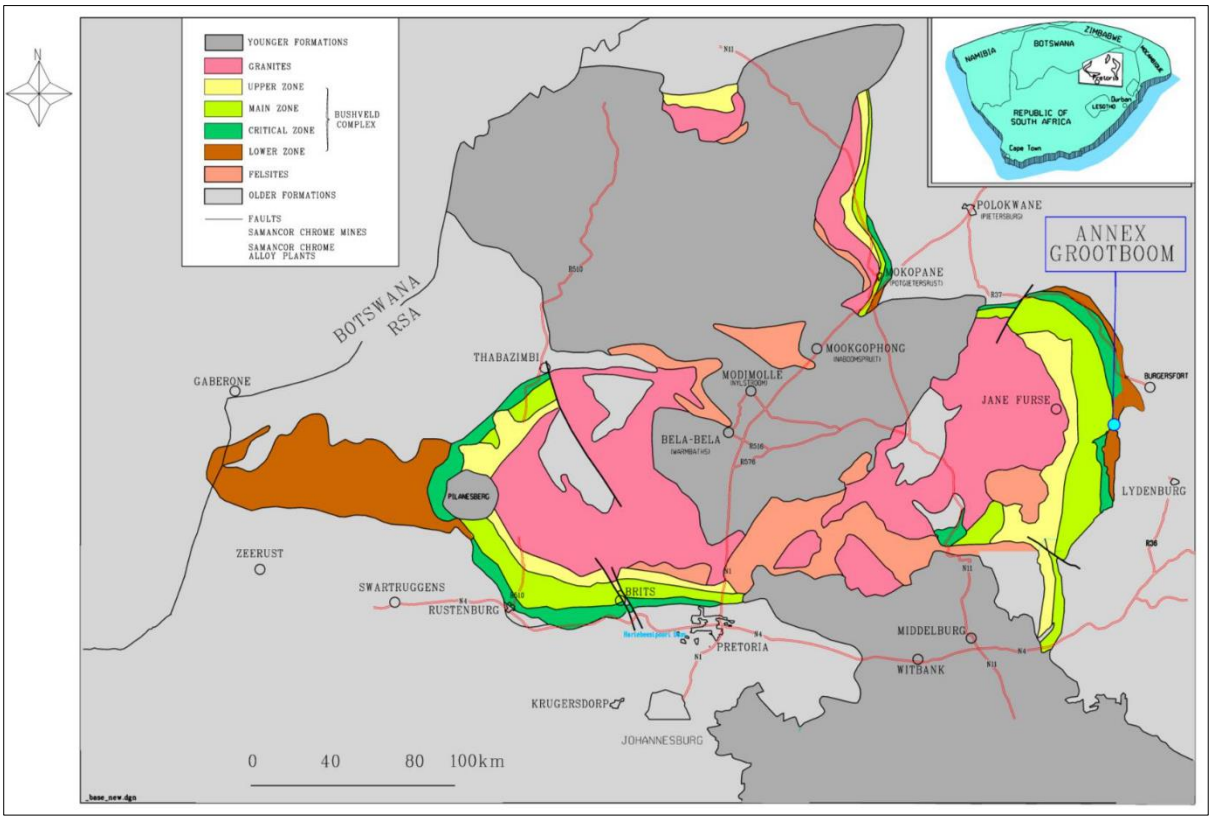


Figure 9-2: Location of Lannex Mine in Relation to the Eastern Limb of the Bushveld Complex.

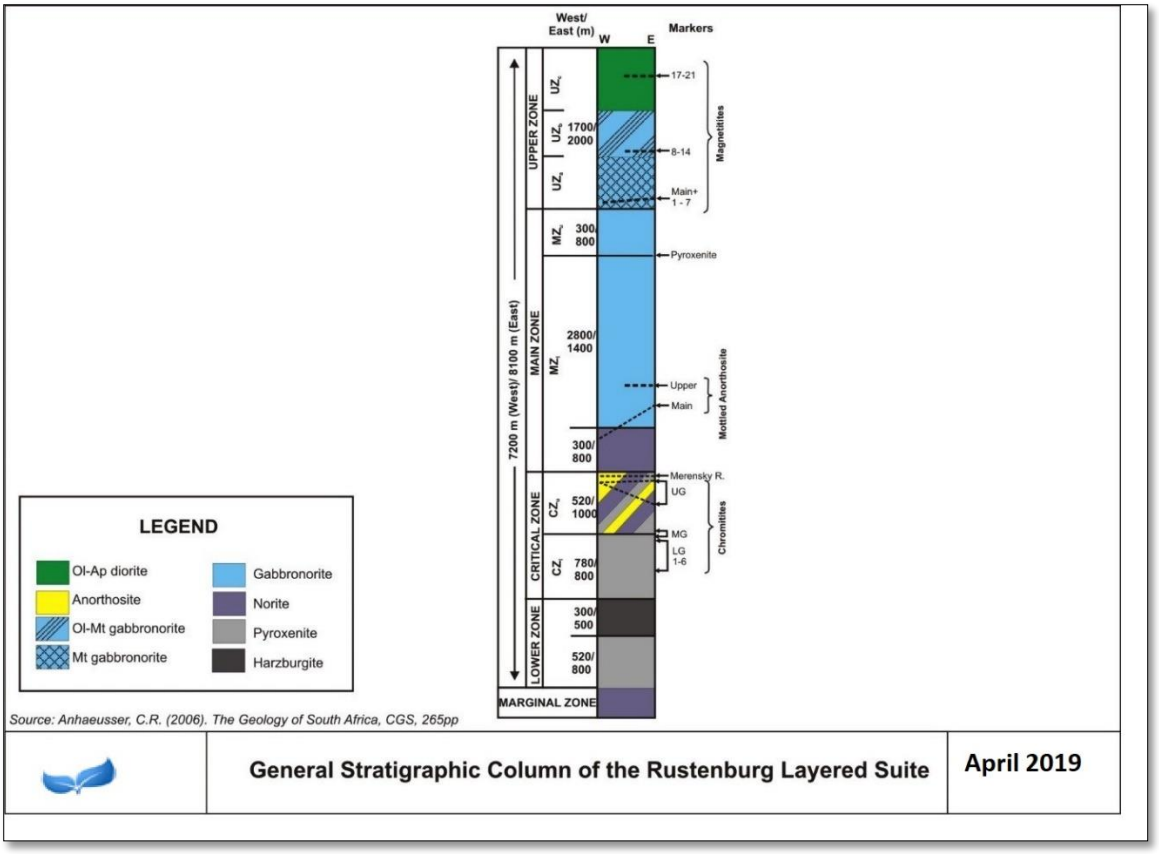


Figure 9-3: Generalised Stratigraphy of the Rustenburg Layered Suite

The Chromitite layers vary in thickness from 2 cm to 2 m and dip towards the centre of the saucer-like structure of the Bushveld Complex. These chromitite layers are remarkably uniform and have been traced for distances of more than 100 km in strike.

Dip Angles are typically between 10 degrees, but vary between 8 and 14 degrees, depending on the area being mined. Local variations beyond these angles do occur, however, due to the rolls in the strata, potholes and large faults. Dip angles at Lannex, situated close to the large Steelpoort Fault, are for instance much steeper. The general dip direction is E-W.

The rock types encountered include anorthosite, norite, pyroxenite and chromitite. The rock type that surrounds the presently mined chromitite seams is pyroxenite. This typically a very massive rock type, with no typical bedding planes, except for specific layering normally caused by other chromitite layers or stringers and parting planes.

9.1.4.2. Lannex Section Geological Setting

The stratigraphy of Lannex Mine is similar to that at Tweefontein Section. In the underground only the MG1 has been mined at Lannex Mine. The opencast extracts the MG1 and MG2.

The Middle Group rocks consist of pyroxenite, norite, anorthosite and chromitite layers. Of particular significance is the MG1 chromitite seam, which is being mined at the Lannex and Tweefontein Mines. Small-scale mining of the MG2 has been carried out in the past.

The MG2 consist of three distinct chromitite layers called A, B, and C at the top. The chromitite layers of the MG2 package are separated by pyroxenite partings and disseminated chromitite layers.

As shown in Figure 9-4 below, the MG1 chromitite seam is separated from the MG2 chromitite layer above by a pyroxenite parting. An anorthosite layer separates the MG2 and MG3 seams.

9.1.4.3. Associated Minerals

The associated minerals that can be economically extracted from the current risings from the Chrome Ore in the current risings mined from the above seams, presently occur in the following rations at the Grootboom mine:

Table 9-4: Associated minerals

Associated Mineral	% of split of current risings from the chrome ore mined
Platinum	58%
Rhodium	16.5%
Palladium	25.5%
Gold	0%

9.1.4.4. Major Geological features

Faults: The Lannex Mine is situated on a horst type structure. The Winze fault, which has a 40 m down-throw in the westerly direction, forms the current western boundary of Lannex Section. The mechanised extension will exploit the resources below the Winze fault. The annex-Grootboom Fault (striking north-west) has a 20 m throw and is situated in the north eastern part of the orebody.

Joints: The major joint set in areas being mined at present is sub-parallel to the Winze Fault, which strikes approximately north to north east.

9.1.4.5. Seams mined in the Lannex Section

Seams mined: The MG1 chromitite seam has been mined extensively at the Lannex section for approximately 1650 m along strike. The MG2 is poorly developed over the area, and is only mined in the open castable areas where possible.

Depth: Current mining at the Lannex Mine, and mining planned are at depth ranging from 30 m to 180 m below surface.

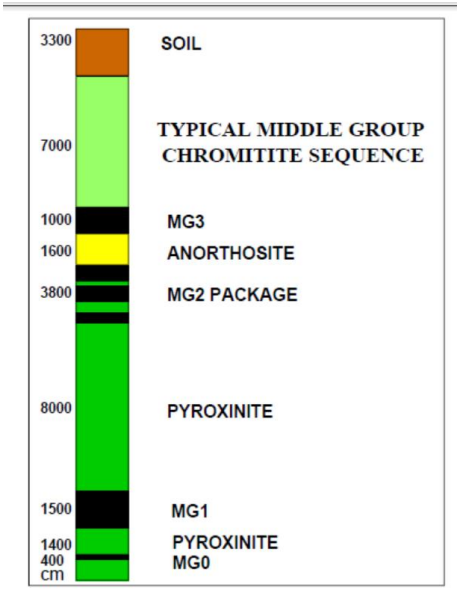


Figure 9-4: Lannex Section chromitite layers

9.1.5. Soil

From the 1999 EMPR the soils are classified as typical black and red clay soils with varying amounts of rocky outcrops and lithosols. Soil types are present on the lease area are Swartland, Mispah and Hutton Forms.

The dominant soil type on Lannex, according to the specialist studies and the taxonomical soil classification system of South Africa is Mispah. The Mispah soil is characterised by a low clay content orthic A-Horizon overlying rock. The effective depth of the Mispah soil is 150 mm. the agricultural potential of the soil is considered low under dryland (>650 mm/y rainfall) and irrigation conditions (>10-15 mm/week 33-1,500 kPa plant available water). Limited evidence of soil erosion or misuse was observed.

The Mispah soil is characterised by neutral ph. values (5.3 and 7.2) and low electrical conductivity values (<250 mS/m). under these conditions plant available nitrogen (15-20 mg/kg), phosphorus (10-15 mg/kg) and potassium (>50 mg/kg are readily available for plant uptake and sustainable plant growth. The orthic A Horizons is kaolinite (1:1-layer silicate), with a low buffer capacity due to the high cation exchange capacity (<10 mol+kg).

9.1.6. Biodiversity

An ecological impact assessment will be conducted for the proposed development, results of the assessment will be reported in the draft EIA/EMPR report. This report will report based on the 2013 EMPr.

9.1.6.1. Flora

An ecological assessment was conducted by EcoSun as part of the 2013 EIAR/EMPR specialist report and a summary is presented below, the full report is found in the volume on specialist reports. The Lannex North section was traversed on foot and a list of fauna and flora species was complied. Although no detailed flora study was undertaken of the Annex Club area, information was gathered from the Tubatse Conservation Ecological Assessment report and both areas are considered to be of a similar ecological value. However, prior to disturbing this area it is advised to undertake a more detailed study to confirm these assumptions.

Generally, the Lannex Mining area falls within the vegetation area of the Sekhukhune Mountain Bushveld and the Sekhukhune plains bushveld. Both vegetation types are common and typical of the Steelpoort area.

The vegetation is characterized by open woodland, the woody vegetation initially dominated by Mountain Syringa *Kirkia wilmsii*, with other trees and shrubs scattered or clumped along the slope. These included Terminalia *prunioides, Acacia senegal* var *leiorhachis*, *A. tortilis, A. nigrescens, Boscia foetida, Grewia flavescens, Psiadia punctulata* and large numbers of *Petalidium oblongifolium*. Grasses are mixed and generally ruderals, annual species which are able to grow under disturbed conditions. These included *Enneapogon cenchroides, Aristida cingesta* ssp. *barbicollis, A. stipitata, A. canescens* and others initially. Forbs such as *Clerodendrum ternatum, Holubia saccata, Emilia transvaalensis, Asparagus* spp., *Kyphocarpa angustifolia and* others are common, especially an unidentified species of Asteraceae which dominated large parts. Succulents such as *Aloe cryptopoda* are abundant, with other species such as *A. castanea* and *A. marlothii* sparsely distributed. A single *Euphorbia monteiroi* was seen while a *Euphorbia* sp. (*E. schinzii* Complex) grew commonly amongst low shrubs over much of the area.

Parts of the area have been impacted on by past anthropogenic activities, including a former road, with the result that the woody vegetation is low and comprised of *Dicrostachys cinerea, Acacia tortilis* some *A. exuvialis* while the grass cover was mixed mostly *Urochloa mossambicensis, Enneapogon cenchroides* as well as *Aristida congesta* ssp. *barbicollis* and some *Eragrostis superba*. Forbs were also

present including *Monechma sp cf divaricata, Coccinia sessilifolia, Ocimum americanum, Hermannia* sp., *Dicoma capensis* and others occurring widespread but sparse.

Vegetation Types

The most recent classification of the area by Mucina & Rutherford shows that the Lannex site is classified as Sekhukhune Mountain Bushveld with small section representative of the Sekhukune Plains Bushveld (. The Sekhukune Mountain Bushveld has a 'Least Threatened' conservation status with 0.4% conserved and nearly 15% transformed, while the Sekhukune Plains Bushveld has a vulnerable conservation status, with 2% statutorily conserved and some 25% that has been transformed. Transformation is mainly through dryland subsistence cultivation and urban build up.

The vegetation structure of the Sekhukune Mountain Bushveld varies from open to dense woody layer, with associated woody and herbaceous shrubs and closed to open grass layer. The landscape topography is mainly moderate to steep slopes on mountainsides and sometimes deeply incised valleys. Flat terrain occurs dispersed in between the sloping terrain.

The landscape features of the Sekhukhune Plains Bushveld vegetation type are mainly semi-arid plains and open valleys between chains of hills and small mountains running parallel to the escarpment. The vegetation structure is mainly short, open to closed thornveld with an abundance of aloe species and other succulents. The area is often heavily exploited by man for cultivation, mining and urbanization. Both man-made and natural erosion dongas occur in areas containing clay rich in heavy metals.

Sekhukhune Land Centre of Endemism

The site forms part of the Sekhukhune Land Centre of Endemism (SCOE). The importance to evaluate the vegetation on the site as part of the Sekhukhune land Centre of Endemism cannot be underestimated. Most of southern Africa's endemic plants are concentrated in only a few, relatively small areas, known as regions or centres of endemism. Not only do these centres hold clues to the origin and evolution of the botanical diversity within a particular area, but these are also areas that, if conserved, would safeguard the greatest number of plant species (Assurance, 2017). Sekhukhune land has been identified through previous studies as one of the most important centres of endemism in the Mpumalanga and Limpopo Provinces. The centre falls within the rainfall shadow of the Drakensberg Escarpment, and it is relatively more arid than the areas to the east. The endemic plants of this area are primarily edaphic specialists that are derived from a unique ecology.

The substrate consists of heavy soils derived from the norite, pyroxenite and anorthosite formations that predominate over the region. Endemics are both herbaceous and woody with endemism high in the anacardiaceae, euphorbiaceae, liliaceae and lamiaceae (Assurance, 2017). The shallow, rocky areas of the development site can be considered especially sensitive as part of the centre of endemism, and will almost certainly show similar vegetation patterns to the endemic regions, especially since the vegetation is still in a natural state. Other important attributes of this region's flora are summarized in Table 9-5 below:

Table 9-5: Attributes of the Sekhukhune Land Centre of plant endemism

Center of Endemism size:	5 449.4 km^2
Total Number of Species/Taxa	± 2 200
Endemic/Near endemic taxa	>100
Rate of endemism	4.5%
Area in Limpopo Province	2 794 km^2
Proportion in Limpopo Province	51.7%
Total % transformed	28.57%

9.1.6.2. Fauna

An ecological assessment was conducted by EcoSun as part of the 2013 EIAR/EMPS specialist report and a summary is presented below, the full report is found in the volume on specialist reports. The Lannex North section was traversed on foot and a list of fauna and flora species was complied. Although no detailed fauna study was undertaken of the Annex Club area, information was gathered from the Tubatse Conservation Ecological Assessment report and both areas are considered to be of a similar ecological value. However, prior to disturbing this area it is advised to undertake a more detailed study to confirm these assumptions. Few species of fauna were recorded during the time of the survey. Only one mammal was recorded, the Scrub Hare *Lepus saxatilis* and a single lizard, the Variable Skink *Trachylepis varia* was seen. It is probable that a number of other species occur but due to the size of the area's most are unlikely to occur in viable populations. A total of 26 mammals, 40 reptiles and 8 amphibian species may occur on the site or in the vicinity.

Three-streaked Tchagra *australis* and White-browed Sparrow Weaver *Plocepasser mahali* were recorded during the survey.

9.1.7. Surface Water

9.1.7.1. Affected River Basin

The Lannex Mine is situated in the Olifants River Water Management Area (WMA) (B4 Primary catchment), refer to Figure 9-5. The Olifants River originates to the east of Johannesburg and initially flows northwards before gently curving eastwards towards the Kruger National Park, where it is joined by the Letaba River before flowing into Mozambique. There are distinct differences in climate between different areas of this catchment area and it range from cool Highveld in the south to subtropical east of the escarpment. Mean annual rainfall is in the range of 500 mm to 800 mm over most of the WMA (DWAF, 2004). A surface water specialist has been appointed to conduct an investigation for the proposed development, results of the report will be reported in the draft EIAR/EMPr.

The Lannex Mine is located within the jurisdiction of the Central Steelpoort River Irrigation District.

Local communities surrounding Lannex Mine use water from the Steelpoort River for domestic purposes and neighbouring farmers use this same water source for irrigation. This localised agricultural use, however, has declined in recent years due to mines in the area buying out the farms for further industrial use.

Situated within the Central Steelpoort River Irrigation District, Lannex Mine is located approximately 1.5 km on the south eastern side of the Steelpoort River, and is accessed via the R555. The mine site and associated plant areas are located mostly along the western slopes of the local hills/mountain (forming part of the Schurinkberg), and are situated in 8.1 km^2 of the Steelpoort sub-catchment. Although no notable drainage paths, except the Steelpoort River, are located in the vicinity of the mine site, there is approximately 1.5 km^2 of this sub-catchment that is affected by the mine's positioning and operations. As Lannex is located in a watercourse valley, small local draining paths arising from the mountain slopes cross the mine site, draining from elevations of about 1 220 mamsl to about 750 mamsl at the Steelpoort River. The drainage density of the Steelpoort sub- catchment occupied by Lannex, measured as kilometres of drainage path per square kilometre of land area, is approximately 1.48 km^2. These paths are non-perennial and only flow under high rainfall events.

Figure 9-5: Base map of the Olifants water management area and its sub-areas (Golder Associates)

Economic activity is highly diverse and ranges from mining and metallurgic industries to irrigation, dry land and subsistence agriculture, and eco-tourism. Most surface runoff originates from the higher rainfall southern and mountainous areas and is controlled by several large dams (DWAF, 2004).

The naturalised Mean Annual Run-off (MAR) and Ecological Reserve requirements as determined for the Olifants River catchment is listed in Table 9-6 for the different sub- management areas.

Table 9-6: Naturalised and Ecological Reserve

Sub-Area	Natural MAR	Ecological Reserve requirements
	X million m^3/a	
Upper Olifants	465	83
Middle Olifants	481	69
Steelpoort	***396***	***94***
Lower Olifants	698	214
Total	**2040**	**460**

From the reconciliation of data available it was determined that there is a deficit of water in 2000, which is still applicable in the year 2025 in the Steelpoort sub-management area (M2 Environmental Connections CC, 2015)

Table 9-7: Reconciliation of water requirement and availability for the Steelpoort sub-management area year 2000 (million m^3/a)

Natural resource		Usable return flow			Total local yield (1)	Transfers in	Grand Total
Surface water	Groundwater	Irrigation	Urban	Mining and Bulk			
42	14	3	1	1	61	0	61
After allowance for the impacts on yield of: ecological component of Reserve, River losses, alien vegetation, rain-fed agriculture and urban runoff							
Local Requirements			Transfers Out		Balance		
95			0		-34		

Table 9-8: Reconciliation of water requirements, Base scenario (million m^3/a) for Steelpoort sub-management area Year 2025

Available Water			Water Requirements			Balance
Local yield	Transfers	Total	Local Requirements	Transfer out	Total	
62	0	62	96	0	96	-34

1) Based on existing infrastructure and under construction in the year 2000. Also includes return flows resulting from growth in requirements
2) Based on normal growth in water requirements as a result of population growth and general economic development. Assumed no general increase in irrigation.
3) Brackets around numbers indicate negative balance

9.1.7.2. Quaternary Catchments

Lannex Mine is Located within the B41J Quaternary catchment of the Steelpoort sub-management area of the Olifants River Catchment. The Steelpoort sub-area is largely rural with agriculture the predominant land use (DWAF, 2004) though vanadium and chrome mining and mineral processing also taking place. The newly constructed De Hoop dam is located upstream of this quaternary catchment.

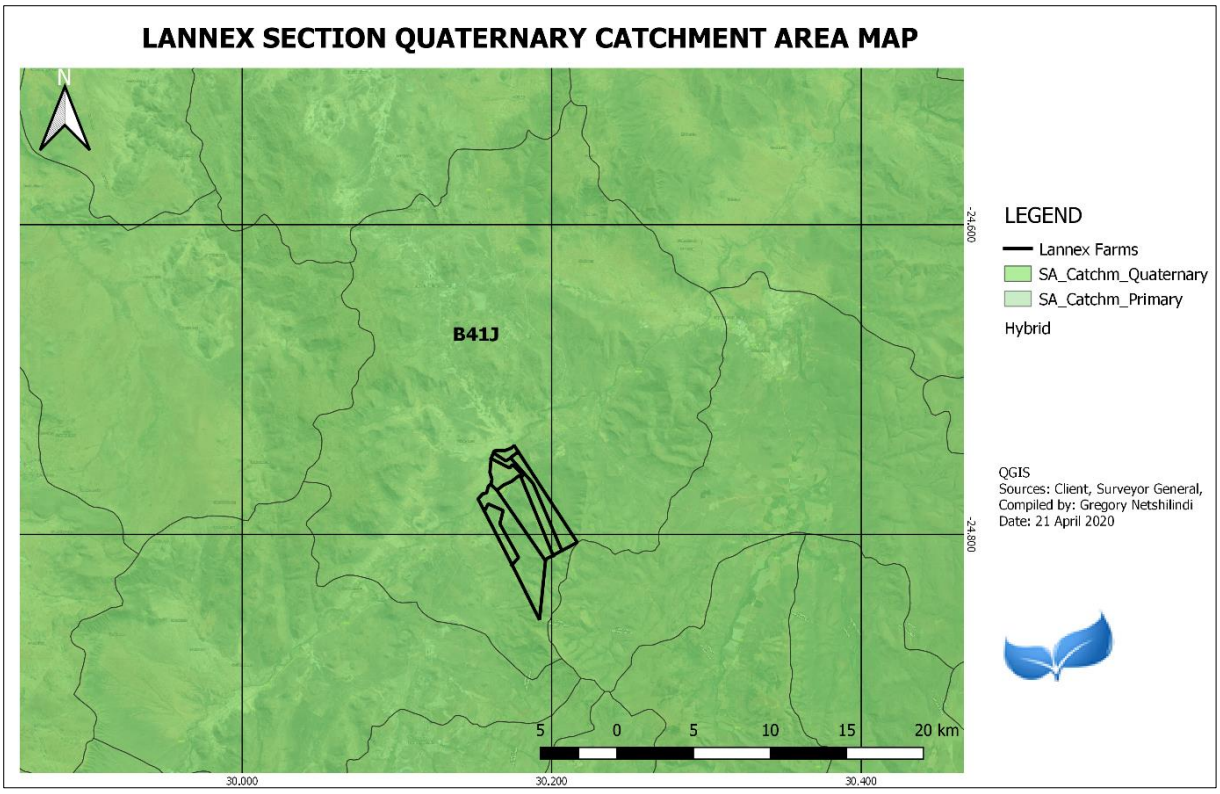


Figure 9-6: Location of the Lannex quaternary drainage areas

The mean annual evaporation, mean annual precipitation and MAR for the B41J quaternary catchment is indicated in Table 9-9.

Table 9-9: Quaternary drainage area information (WR 2005).

Quaternary area	Catchment area (km^2)	MAE (mm) (A-pan)	MAP (mm)	MAR (mcm)
B41J	731.885	2 000- 2 200	598.06	15.13

9.1.7.3. River Resource Classification and Reserve

The water resources within the boundaries of the project areas include Figure 9-7:

- The Steelpoort River; and
- Various unnamed tributaries of the Steelpoort River.

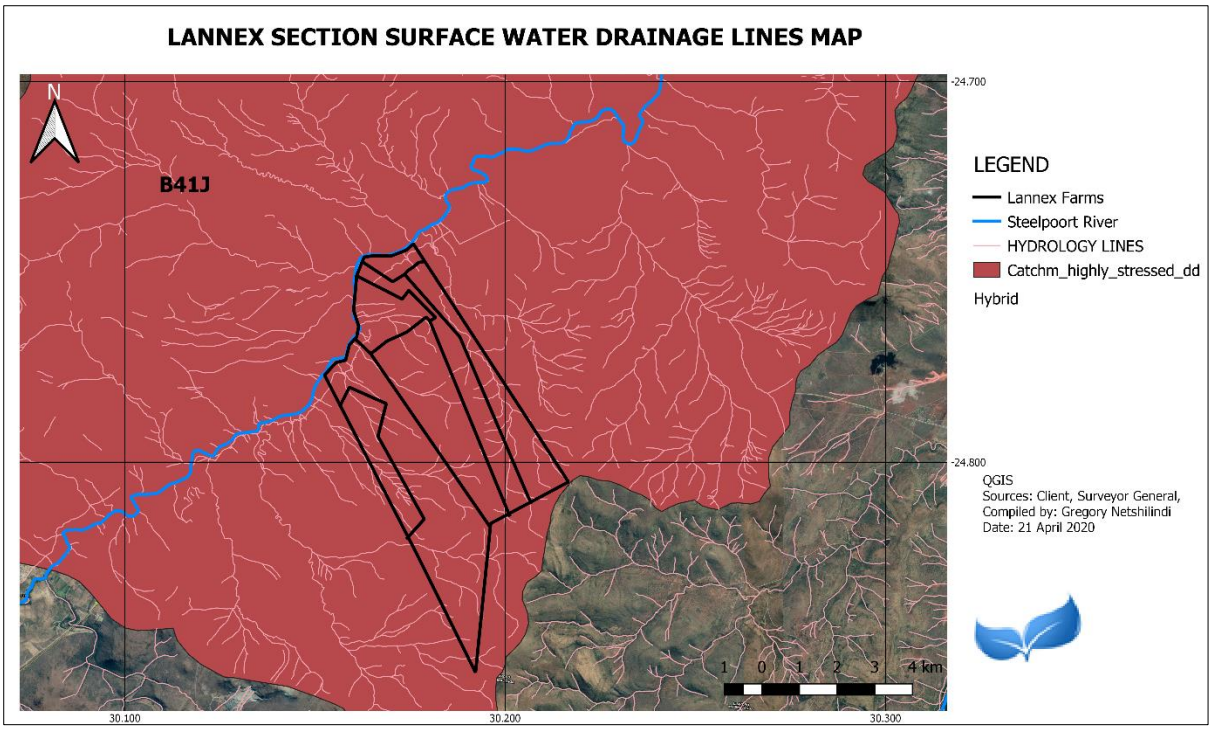


Figure 9-7: Primary and Secondary Rivers and Streams and drainage lines within the Lannex Mining area.

All the unnamed tributaries are classified as Ephemeral (with the potential for subsurface flow) while the Steelpoort River has been classified by the Department of Water and Sanitation as being perennial (Stream order 3) with the Ecological Importance and Sensitivity Class (EISC) and Present Ecological Status (PES) of the quaternary drainage presented in

Table 9-10: EISC and PES of the affected watercourses (Resource Quality Objectives 4.1, DWAF 2003)

Quaternary area	River	EISC	PES
B41J	Steelpoort River	High	Class C: Moderately Modified

9.1.8. Wetland areas

There is no natural occurring wetland on the site and those identified using the freshwater ecosystem priority systems database indicate several artificial wetlands on site (Figure 9-8). Investigations has shown that these were/are wetlands that was identified as FEPA`s at the NFEPA Notational Stakeholder Review Workshop in July 2010 and there are none that occur within or near the Lannex Section.

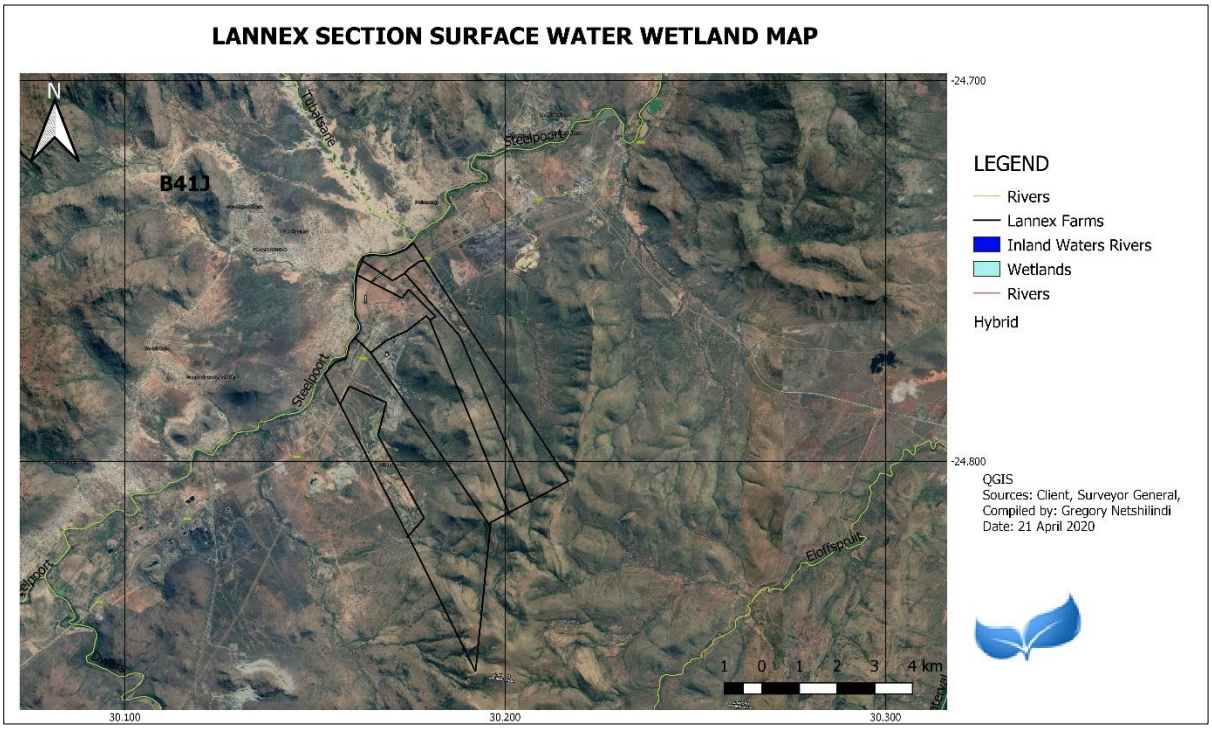


Figure 9-8: Rivers and wetlands in and around Lannex Section (source: Screening tool, 2020)

9.1.9. Hydrogeology and Aquifers (Groundwater)

The conceptual model of the underground aquifer system is similar throughout the region. It comprises a variably thick weathered zone over laying a fractured zone with fresh bedrock below. This sequence is intruded by dyke features considered to compartmentalize the area (ECM, 2013). Fracturing occurs at shallow to moderate depth along the contact zones of the dykes. Within the fault and fractured zone, a series of moderately interconnected horizontal and vertical conduits are assumed to occur where zones of higher permeability are commonly developed. The fractured aquifer may be considered to be anisotropic. Delta H (2012) conducted a study at Lannex and obtained the following information.

The geology of the Lannex Section is characterised by the mafic rocks (pyroxenite, norite and anorthosites) of the Rustenburg Layered Suite of the Bushveld Igneous Complex. Smaller section of the hilltops south-east of the mine site itself are underlain by mostly metamorphic rocks (quartzite and hornfels) of the Pretoria Group. The rocks overlain by weathered material, hill wash and alluvial deposits. Accordingly, the following aquifer system can be distinguished (1) A shallow weathered aquifer, (2) An alluvial aquifer system replacing or overlying the weathered aquifer in the vicinity of river courses (3) A deeper fractured aquifer system within the Bushveld Igneous Complex.

The shallow unconfined or water table aquifer is generally found in the regolith/saprolite (formed as a result of intensive and in-situ weathering processes) to saprock (differentially weathered and fractured bedrock underlying the saprolite) zone (Figure 9-9). The saprolite zone is poorly developed or absent on hill tops or mid-slopes but increases in thickness towards the valley bottom due to hill wash sediments adding to the weathering thickness along with the occurrence of deeper and more intense weathering along the drainage channels. The saprolite (where present) and saprock are treated as a single weathered aquifer unit, referred to as the weathered overburden, that varies in thickness from 0 m at the ridges and steep slopes to 30 to 40 m based on existing borehole logs and evidence of borehole depths. The weathered overburden (referring here mainly to the saprolite) is considered to have low to moderate transmissivity but high storability.

Along the reaches of the Steelpoort River, the weathered aquifer is replaced or overlain by alluvial sediments creating a distinct intergranular aquifer. The alluvial and weathered sediments are good in hydraulic contact, as well as interacting and contributing to the river baseflow and are regarded as on aquifer system. It's important to note that the thickness and lateral extent of the alluvium, adjacent to the Steelpoort River has not been mapped in the field. While the thickness is assumed to be around 30 m, the lateral extent was mapped based on changes in topographical gradients and vegetation and extend between 50 and 100 metres either side of the river course. Typical transmissivities of the shallow aquifer in the wider area of interest (derived from studies on neighbouring mines) average approximately around 1-9 m^2 per day for the weathered aquifer and up to 150 m^2 per day for the fault/ fracture zone (Geocon, 2002; Golder, 2006b). The alluvial aquifer can have transmissivity values of up to around 600 m^2 per day.

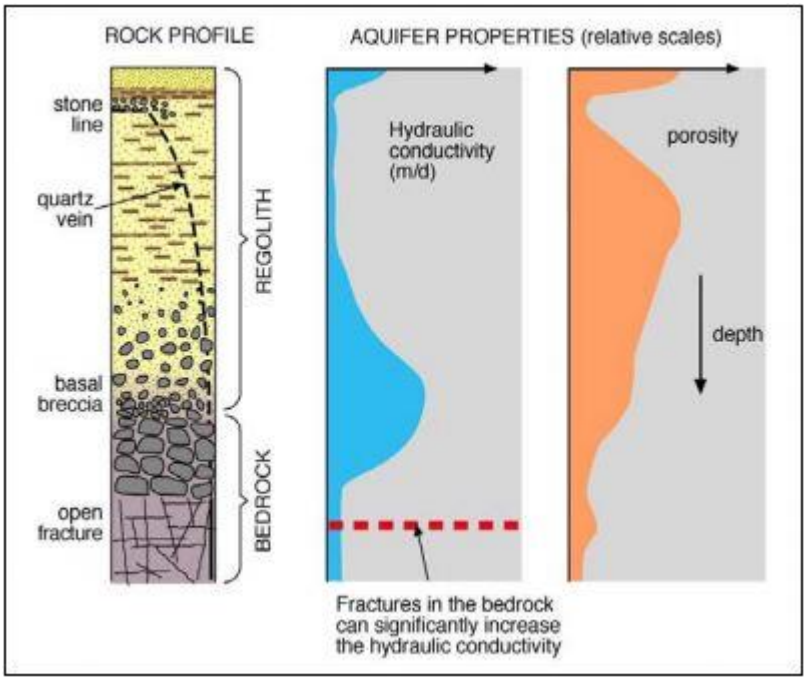


Figure 9-9: Conceptual cross-section through a weathered aquifer in Basement rocks (Chilton and Foster, 1995 (as cited by Delta H, 2015))

Outcropping along the hill tops and in the mid- and upper slopes of the valleys, and underlying the overburden/weathered aquifer is fresh bedrock (Bushveld norites and anorthosites, as well as local diabase/dolerite dykes). Crystalline material, such as the norites, are characterised by an unweathered rock matrix with negligible matrix porosity and permeability, and planes of discontinuity in the rock matrix, including both faults, joints and other geological contact zones (referred to as fractures). These fractures are often filled by precipitates from late phase fluids. The intact bedrock has a very low matrix hydraulic conductivity and its effective hydraulic conductivity is determined by fractures and mine openings. Groundwater flow through interconnected fracture systems allow potentially for vertical groundwater flow from the weathered overburden as well as surface water bodies to greater depths. Although it's expected that permeability would decrease significantly with depth in the bedrock aquifer, groundwater occurrence at greater depths (-200 m) may be associated with regional structures. The permeability and water encountered at this depth however, is expected to be of limited quantities. The hydraulic conductivity of the BIC in the Lannex Mine area was estimated in earlier studies on neighbouring mines to around 1E-02 m/d and 3 m/d.

9.1.9.1. Hydraulic Properties

Average hydraulic conductivity values used in earlier regional modelling studies (involving neighbouring mines) for the different aquifer systems are indicated in Table 9-11 below. No site-specific hydraulic parameters were available to Delta H for the model development.

Table 9-11: Typical hydraulic conductivities for the wider area

Aquifer	Hydraulic conductivity ranges	
	[m/d]	[m/s]
Weathered	0.1 - 1.3	1.2E-06 – 1.5E-05
Alluvial	3	3.5E-05
Bushveld Igneous Complex	0.003 – 0.05	3E-08 – 6E-07

9.1.10. Air Quality

An extensive and in-depth air quality study was undertaken for an area extending over the highveld and Steelpoort Valley (Krause, Thomas, & Burger, 2008). The purpose of the study was to characterize the three-dimensional wind field over the area and to determine the current air quality in the region. The latter was achieved through the establishment and dispersion modelling of a comprehensive emissions inventory consisting of all relevant non-Samancor Chrome sources. The results of the regional dispersion modelling (non-Samancor sources) were used to determine cumulative air pollutant concentrations for various Samancor Chrome smelter plants and chrome mines. Source groups of emissions included in the regional CALPUFF air quality model were: stack vent and fugitive emissions from industrial operations, stack emissions from coal fired power stations, fugitive emissions from opencast mining operations, household fuel emissions and vehicle tailpipe emissions.

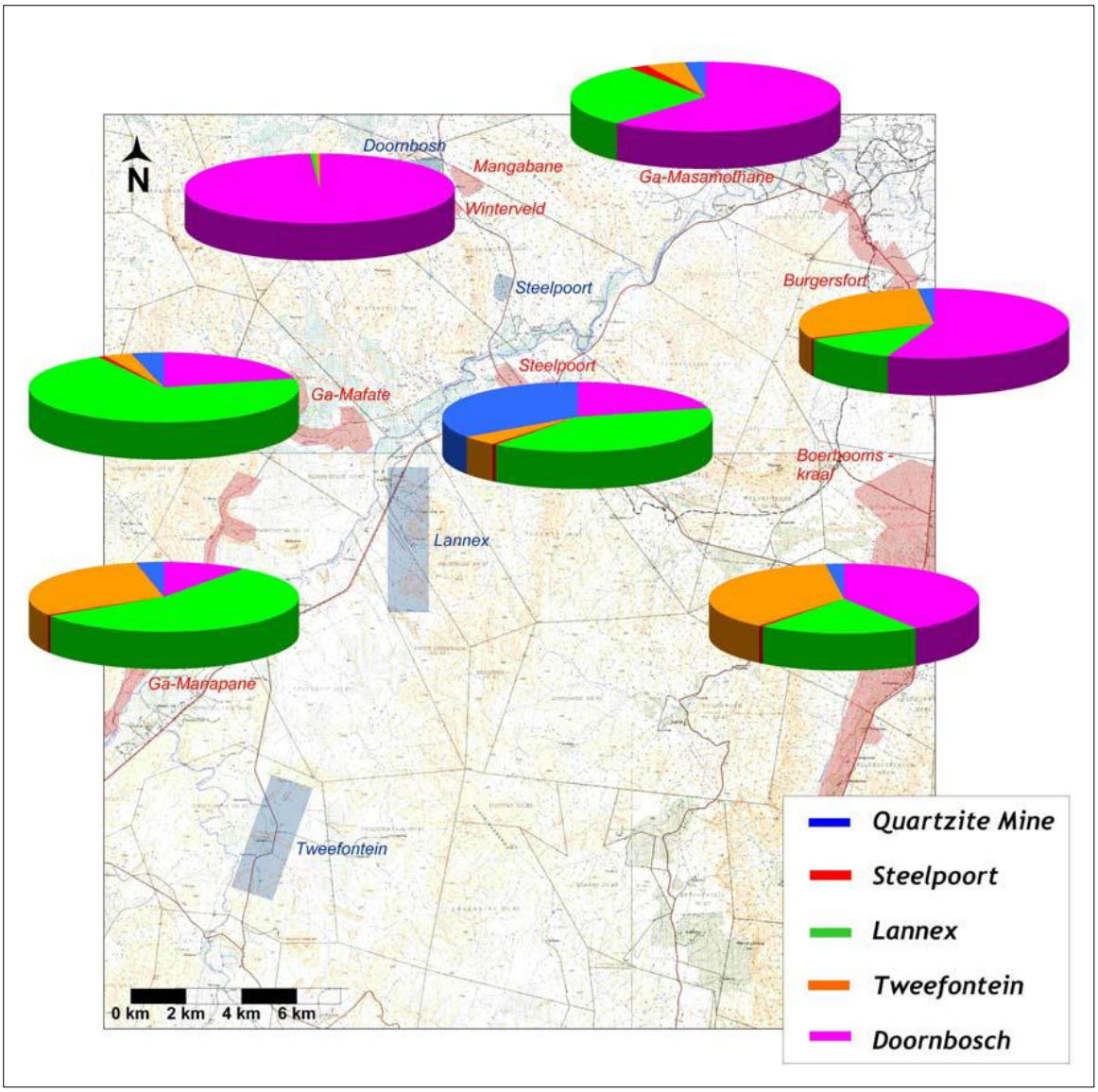


Figure 9-10: Operational contributions to predicted PM10 impacts

Main findings of the emission inventory were as follows:

The total estimated **PM10** emissions as a result of operations at Lannex were to 651 tpa. Vehicle entrained dust from unpaved roads was calculated to be the most significant contributor to total estimated PM10 emissions, accounting for 42% (272 tpa) of the total followed by wind erosion emissions at 24% (156 tpa)

Total estimated **TSP** emissions as a result of operations at Lannex were to 2500 tpa. Vehicle entrained dust from unpaved roads was calculated to be the most significant contributor to total estimated TSP emissions, accounting for 31% (733 tpa) of the total followed by crushing and screening emissions at 28% (693 tpa).

9.1.11. Heritage Resources

The history and archaeology of the larger Sekhukhune region around Steelpoort is primarily well known for the occurrence of Stone Age and Iron Age farmer occurrences. Apelser Archaeological Consulting was appointed to conduct a desktop Phase 1 Archaeological Impact Assessment for the Sylvania Lannex tailings dam and a waste return dam expansion in October 2019. A number of known cultural

heritage (archaeological and historical) sites exist in the larger geographical area within which Lannex Mine area falls, while some sites of cultural heritage (archaeological and/or historical) origin or significance are known to occur in close proximity to the Lannex Mine area. These were identified and studied during previous studies in the area. Some stone Age sites and artifacts are known to exist in the Lannex Mine area, and were identified and studied by the author during previous assessment and archaeological mitigation at the Sylvania Lannex Mine (Pelser et.al 2010) these sites are open air surface sites location located in and around erosion dongas. There is a possibility that similar sites and finds might exists in the new areas earmarked for mining development and expansion.

During previous survey of the Lannex Mine area, two sites of cultural (archaeological) heritage significance was located in the area of the proposed tailings dam (Pelser et.al 2013:9). Site 1 and 2 contained a fairly large number of stone tools and flakes scattered in an erosion donga. The tools probably dated to between Middle and Late Stone Age, based on their side and mode of production. These artifacts were evidence of the presence of people in the area for at least 150 000 years.

The tools were being eroded out by water, and although they were found to be out of context, the site was deemed fairly significant (medium significant) because of the relatedly large number of artifacts identified here and mitigation measures were recommended.

The desktop study concluded that from an archaeological perspective it is recommended that the proposed development/mining activities be allowed to continue taking cognizance of the recommendations put forward at the end. It can be stated that there is a possibility that similar previously unknown Stone Age archaeological sites and materials could be located in the proposed area of development and expansion. Detailed field-based assessment will be conducted in order to determine the possible presence of sites in the development areas. Should any be found then recommendations on the way forward as well as preferred tailings dam and WRD expansion site can be provided.

A heritage specialist has been appointed to conduct a Phase 1 Heritage Impact Assessment for the proposed overall Lannex expansion project. Findings and recommendations of the assessment will be included in the draft and final EIA/EMPr report in due course.

9.1.12. Visual

The proposed development is in a rural area characterised by a system of valley and surrounding *koppies*. There are three dominant landscape types: rocky hills and *koppies*, flat rolling plains and the Olifants River valley, with its associated drainage lines.

The proposed site is a brown field and has already been impacted by current mining operations taking place at Lannex.

Man-made interventions include the R555 to the west and the Lannex mining complex. The view shed analysis demonstrates that the proposed extensions will be visible from the surrounding and high lying areas. The extension of opencast operations to the North will be visible from the R555 and the informal settlements situated on the opposite side of the road. Similarly, the extension of opencast at the Annex club will be visible from both Annex club, Annex village and the R555. It should be noted that mining activities are prominent within the area and the visual impact of such activities are largely accepted.

9.1.13. Noise

An ambient noise assessment was conducted by Francois Malherbe of Acoustic Consultants and a summary is presented below.
Ambient noise levels were measured around the site in order to gain insight into the noise caused by the mining operation attenuates over distances in each specific environment.

The ambient noise level near the R555 is dominated by road traffic, with relatively quiet periods in between. The measured ambient noise level of 51, 5 dBA (decibel A-weighting) is well within the limit of 70 dBA set for industrial areas by SANS 10103.

The ambient noise level in the pit area of Lannex open cast mine is very high, i.e.74.4 dBA and is dominated by the noise emissions from diesel powered earthmoving and mining equipment. It must be noted that at such locations the issue of noise is not controlled by the guidelines of SANS 10103, but by the legally binding SANS 10083. This is due to the fact the in these areas hearing conservation takes precedence over issues related to environmental noise.

The distance between the main receptor (residential areas) and the actual mining activities is at present quite large, and the intervening ground cover provides for acoustically soft ground conditions. Consequently, the current noise levels are not sufficiently high to cause a significant disturbance. However, depending on the equipment used and the proximity of future mining operations the ambient noise levels are likely to increase.

9.1.14. Socio-Economic Environment

A socio-economic assessment will be conducted as part of the EIA phase.

The proposed site falls within the Fetakgomo-Greater Tubatse Local Municipality (FGTLM) area which forms part of the Sekhukhune District Municipality. The information for the profile was sourced from the, 2011 Census and the 2016 community survey conducted by Statistics South Africa. The Integrated Development Plans (IDP's) of the local (Fetakgomo Municipality's 2018/19 IDP) and district (Sekhukhune Municipality's 2017-2021 IDP) municipalities were also used as information sources as the Wards in the new amalgamated Fetakgomo Tubatse Local Municipality have changed significantly.

9.1.14.1. Population Profile

According to the 2016 Community Survey information; the total population of the Fetakgomo Tubatse Municipality was approximately 428 948 with 105 948 households and an average household of 4 persons per household; this makes the Fetakgomo Tubatse Local Municipality (FTLM) the municipality with the highest population in the District. However, in the 2016 Community Survey FTLM records a population increase of 8% (498 902) with a household increase of 15% (125 361), this might be due to the increased influx of migrant labour due to the expansion of mining activities in the Municipality.

The median age for the municipality population is around 15 - 19 years for both female and male at 60 670. According to the statistics there are more females in FTLM than other local municipalities of the SDM. This could mean that there are more female-headed households within the FTLM which is a factor that Samancor ECM has to take into consideration for employment generation and other social responsibility programs.

9.1.14.2. Population statistics

Increasing populations ensures an increase in the labour force. Lack of growth in the labour force will result in a less than full employment level of the economy needs. The increase in demand for food leads to a decrease in natural resources, which are needed to survive. Other negative effects of population growth and, specifically, overpopulation include poverty caused by low income *per capita*, famine, and disease. Rapid population growth causes unemployment to rise because there are more and more people and not enough employment opportunities to be filled those seeking employment. On the flip side, Unemployment tends to increase population growth.

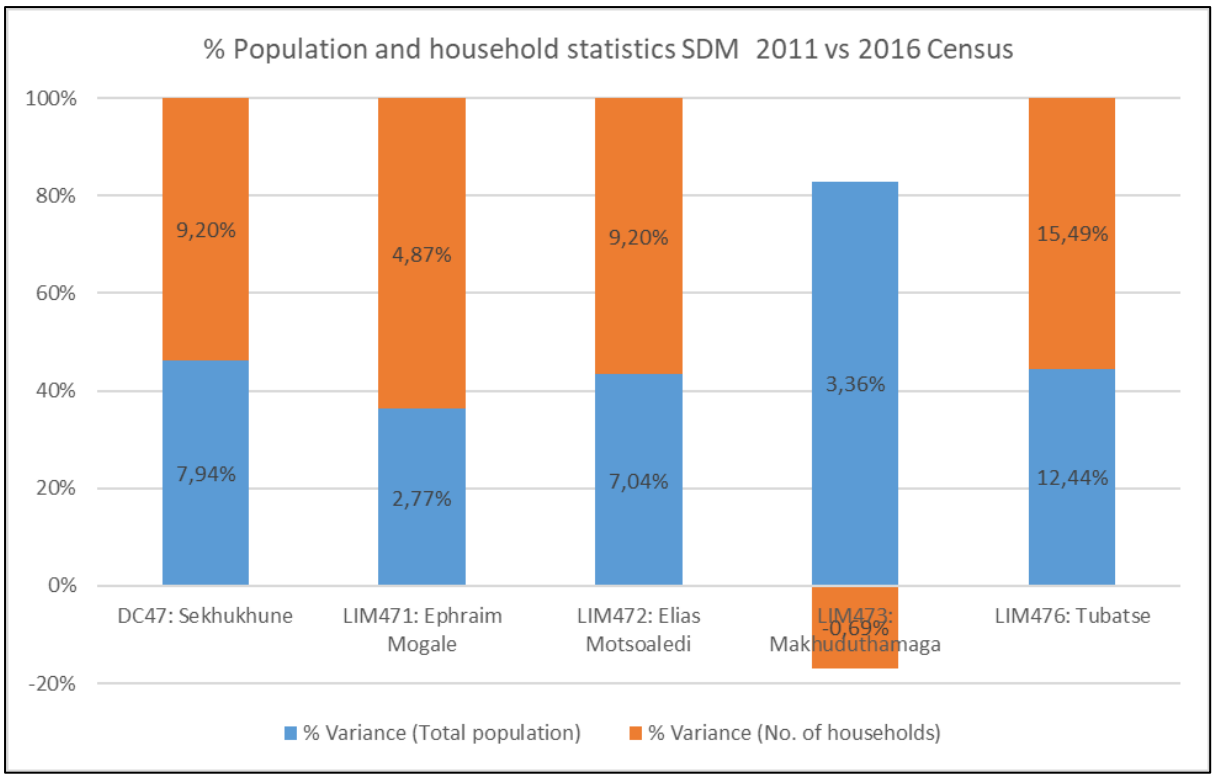


Figure 9-11: Percentage variation population and household statistics for the SDM with comparison of the 2011 Census with the 2016 Community Survey

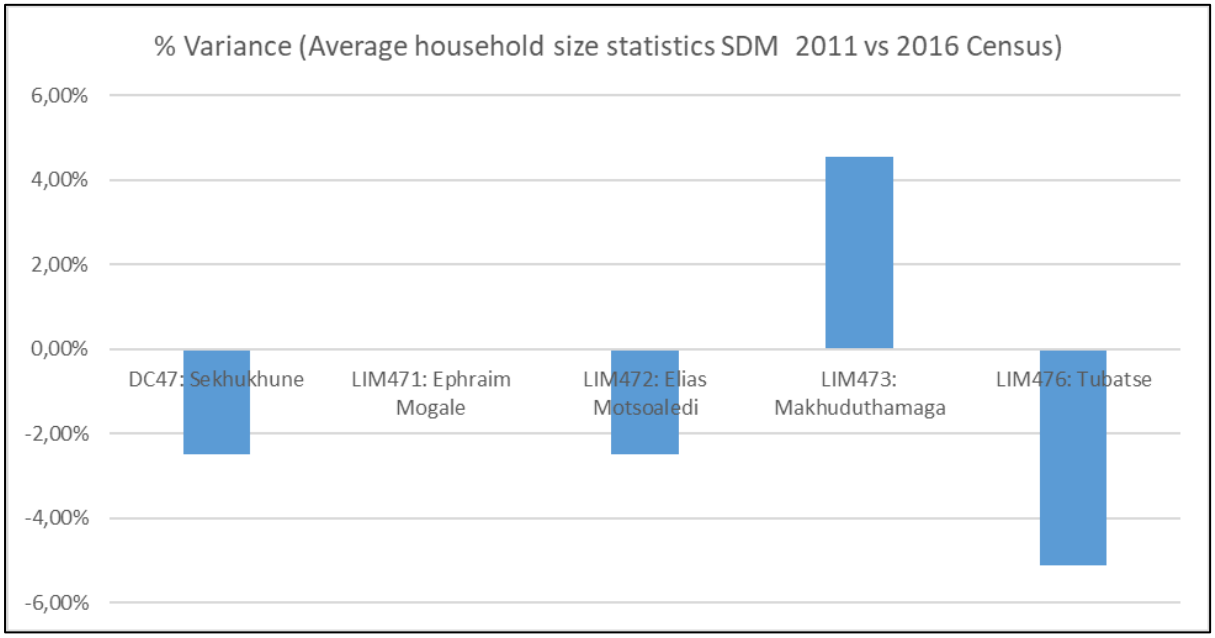
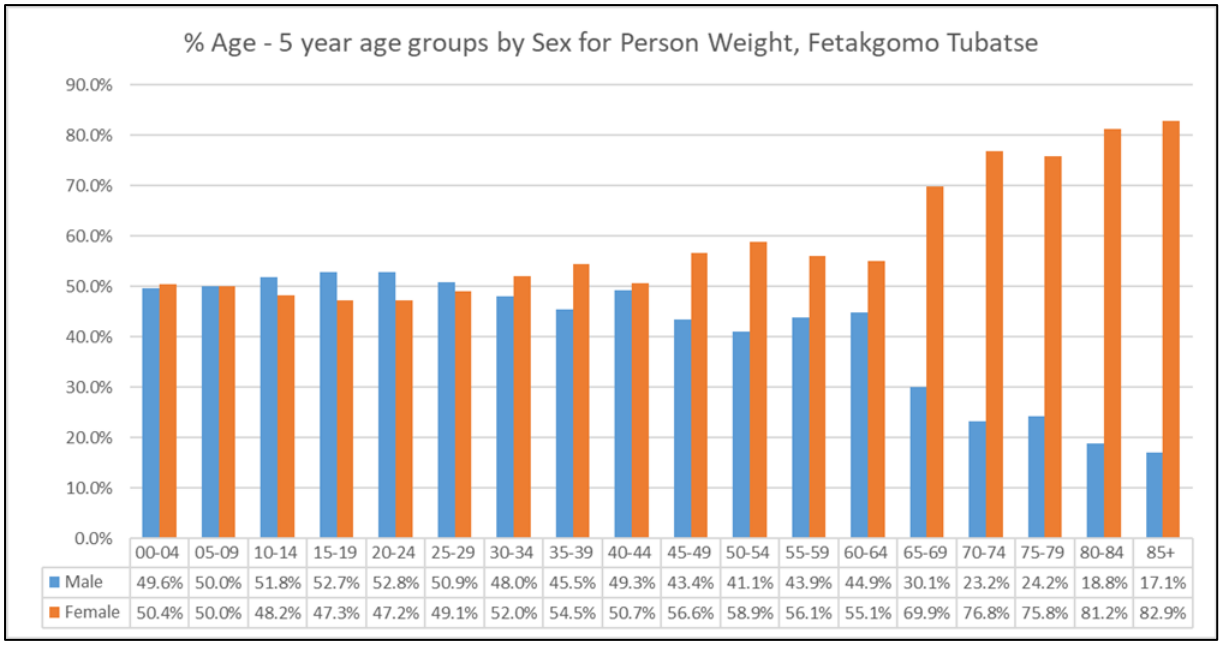


Figure 9-12: Percentage variance of average household size statistics for the SDM with comparison of the 2011 Census with the 2016 Community Survey



	00-04	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Male	49.6%	50.0%	51.8%	52.7%	52.8%	50.9%	48.0%	45.5%	49.3%	43.4%	41.1%	43.9%	44.9%	30.1%	23.2%	24.2%	18.8%	17.1%
Female	50.4%	50.0%	48.2%	47.3%	47.2%	49.1%	52.0%	54.5%	50.7%	56.6%	58.9%	56.1%	55.1%	69.9%	76.8%	75.8%	81.2%	82.9%

Figure 9-13: Percentage disaggregation of Fetakgomo Tubatse Local Population by Age and Gender Distribution

The above figures were extrapolated from *Disaggregation of Fetakgomo Tubatse Local Population by Age and Gender Distribution of Sekhukhune District 2016/17 – 2020/21 IDP Report*.

The demographics in the Figure above indicate that in the FTLM there is a male population from maximum age of 29 years and below, and a rapidly decrease population of males from minimum age of 40 and above, which could indicate that the expectancy life duration of male is shorter than that of females. Whereas female population from minimum age of 29 years and above increases rapidly up to 85+ of age, which could indicate that females have a higher life expectancy than males. This means that there are more females found in the Greater Fetakgomo Tubatse Local Municipality than males. The analysis also indicate that the major population of FTLM is more of a youth age (average working group age between 25 – 44 years), which make the municipality to be vulnerable employment/job demands.

The rapid population growth, especially as the drastic increase is mostly females which is likely to increase birth rates, will reduce *per capita* income growth and well-being, which tends to increase poverty and also increases landlessness and hence the incidence of poverty.

9.1.14.3. Population groups

The figure below was extrapolated from *Population Group by Gender of Fetakgomo Tubatse Local Municipality of Sekhukhune District 2016/17 – 2020/21 IDP Report*. The demographics in the figure demonstrate that the FTLM is dominated by 98.3% (Black Africans), 12% (Indians or Asians), 1.3% (White), 0.2 (Coloured) and 0.1% (Other). Female gender population is more dominant with 52.2% and males with 47.8%.

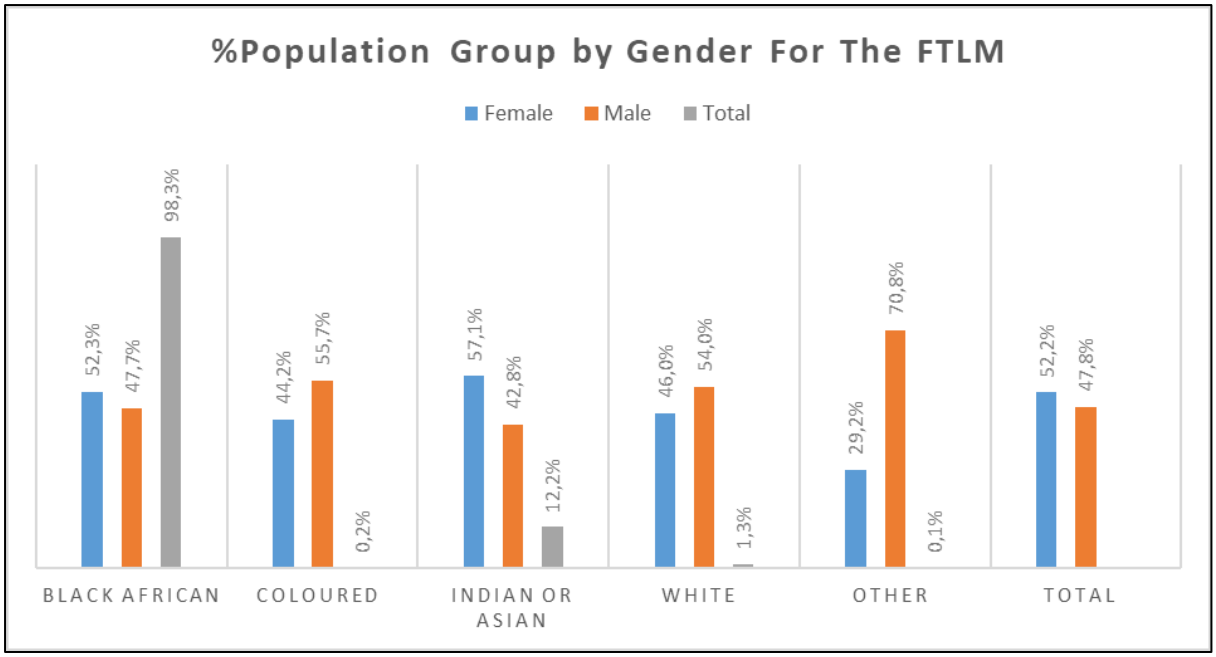


Figure 9-14: Percentage Population Group by Gender for the FTLM

9.1.14.4. Language

The Figure below was extrapolated from *Breakdown of language by population group in the former Fetakgomo Local Municipality of Sekhukhune District 2016/17 – 2020/21 IDP Report*. The FTLM is dominated Africans (94%) with Sepedi (Northern Sotho) as the dominant language, followed by IsiZulu at (1.2%), and White people are almost evenly divided between English at (0.5%) and Afrikaans at (0.5%). However it also demonstrate that the Sepedi language population has decreased (- 3.4%) in 2011 whilst population of other languages increased in 2011 (Zulu 1.07%, Ndebele 0.53%, English 0.41% and other 0.38%), which might indicate that FTLM has increased in cultural diversity which might be as result of mining employment opportunities within the municipality.

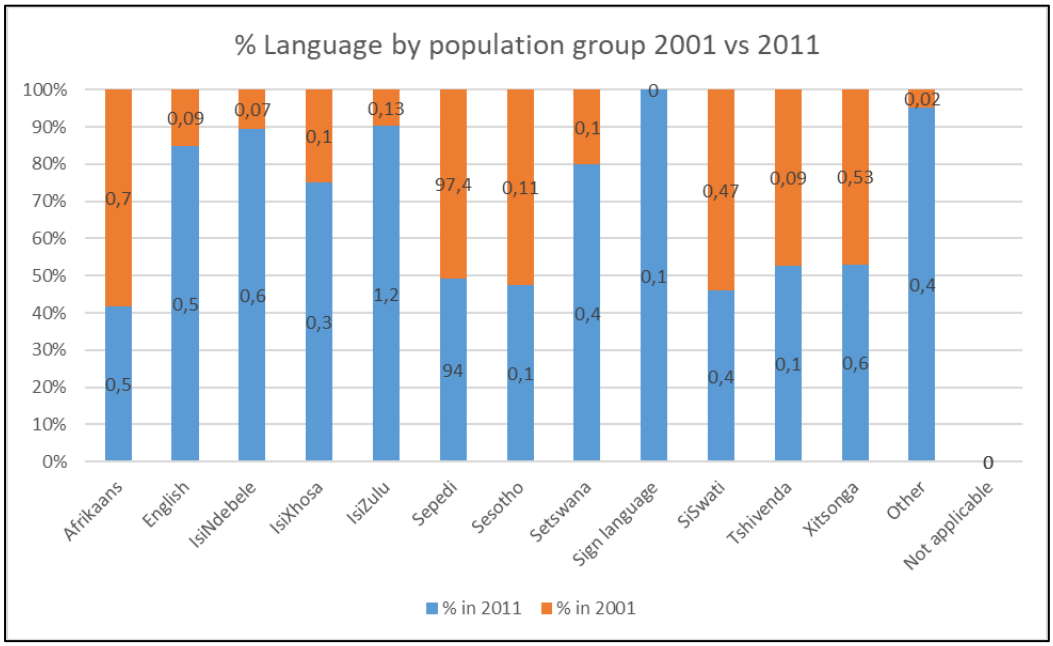


Figure 9-15: Breakdown of language by population group in the former Fetakgomo Local Municipality

9.1.14.5. Education Levels

There are 225 primary and 133 secondary schools and 8 private schools; with 128 740 learners and 4711 Educators. The average level of education for most of the population is low. This has implications for employment since the correlation between educational attainment and the ability to find work has been noted by various sources to have significantly increased over the past years. In addition to the lack of formal educational attainment, communities surrounding the mines suffer from a serious shortage of skills. Thus, when skilled employment opportunities are available, there are limited qualified people to seize them.

Table 9-12: Highest level of education for person weight, LIM476 (Community Survey, 2016)

Level of education	Number	Percentage
No schooling	95120	19.42
Grade 0	18553	3.79
Grade 1/Sub A/Class 1	12883	2.63
Grade 2/Sub B/Class 2	12709	2.59
Grade 3/Standard 1/ABET 1	15633	3.19
Grade 4/Standard 2	14459	2.95
Grade 5/Standard 3/ABET 2	15429	3.15
Grade 6/Standard 4	17087	3.49
Grade 7/Standard 5/ABET 3	14222	2.9
Grade 8/Standard 6/Form 1	22789	4.65
Grade 9/Standard 7/Form 2/ABET 4/Occupational Certificate NQF Level 1	37182	7.59
Grade 10/Standard 8/Form 3/Occupational Certificate NQF Level 2	52040	10.62
Grade 11/Standard 9/Form 4/NCV Level 3/Occupational Certificate NQF Level 3	63487	12.96
Grade 12/Standard 10/Form 5/Matric/NCV Level 4/Occupational Certificate NQF Level 4	69789	1425
NTCI/N1	652	0.13
NTCII/N2	1188	0.24
NTCIII/N3	1921	0.39
N4/NTC4/Occupational Certificate/NQF Level 5	2264	0.46
N5/NTC5/Occupational Certificate/NQF Level 5	1148	0.23
N6/NTC6/Occupational Certificate/NQF Level 5	2667	0.54
Certificate with less than Grade 12/Standard 10	205	0.04
Diploma with less than Grade 12/ Standard 10	358	0.07
Higher/National/Advanced Certificate with Grade 12/Occupational Certificate NQF	1445	0.29
Diploma with Grade 12/ Standard 10/Occupational Certificate NQF Level 6	3695	0.75
Higher diploma/Occupational Certificate NQF Level 7	1456	0.3
Post-High Diploma (Masters)	1241	0.25
Bachelor degree/Occupational Certificate NQF Level 7	2071	0.42
Honours degree/Post graduate diploma/ Occupational Certificate NQF Level 8	1481	0.3
Masters/Professional Masters at NQF level 9 degree	106	0.02
PHD (Doctoral degree/Professional doctoral degree at NQF level 10)	80	0.02
Other	1372	0.28
Do not know	4945	1.01
Unspecified	224	0.05
Grand Total	**489902**	**100**

9.1.14.6. Income and Poverty Levels

Household income is the average income of all people living in a housing unit. household income is a flow that enables consumption and contributes to changes in household wealth or net worth and it improve their material standard of living. The increase in the proportion of household without income in FTLM can be attributed to population growth in both district and local municipality. According to the

increase in other languages, it is clear that people tend to move from other areas to FTLM for employment opportunities, due to recent mining job opportunities, which explains the increase in population

On average, only about 6% of the population in communities are employed. Despite this unemployment, there is a continued migration to the area surrounding the mines, causing a stress to service delivery and introducing competition for limited resources. Employment opportunities are particularly scarce for women. Income levels are low with more than 50% of households in the region earn less than R9 600 per annum. This discrepancy may be explained by the fact that most individuals who receive an income (whether from employment, pensions, other government grants or remittances) support several other household members who do not have any income.

The Figures below were extrapolated from *Annual Household Income Levels per gender in the former Fetakgomo Local Municipality , according to the Community Survey, 2016 of Sekhukhune District 2016/17 – 2020/21 IDP Report*.

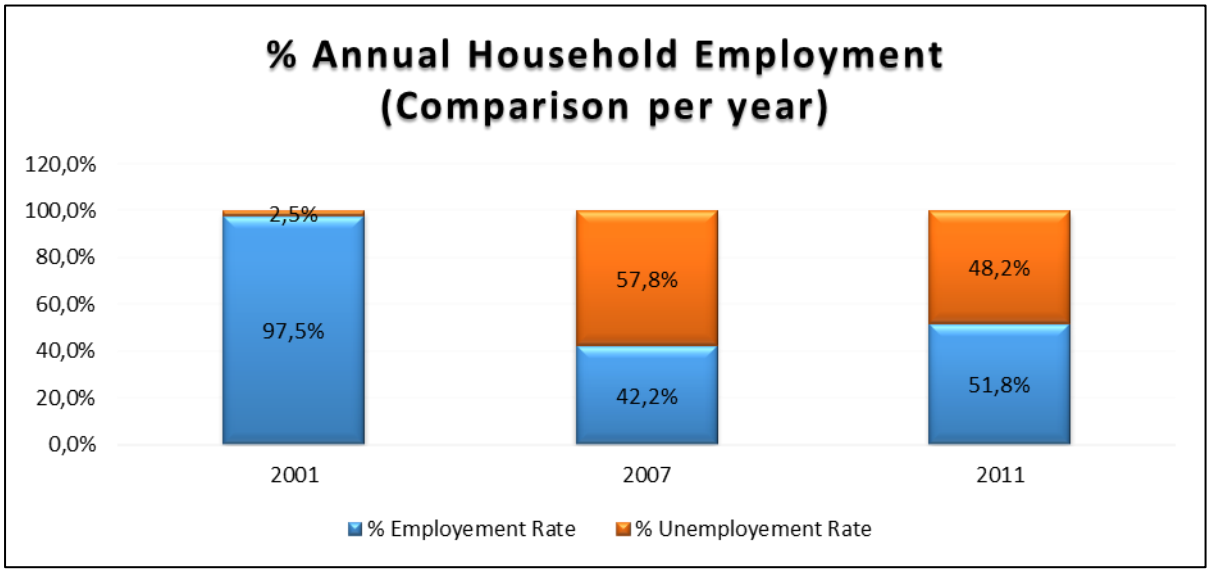


Figure 9-16: Percentage Annual Household Income Levels per gender in the former Fetakgomo Local Municipality

FTLM population has increased with 7.94% with a population of 2 339 523 and have a household size of 4 per household. Distribution of household employment in relation to annual household income decreased from 57.8% in 2007 and 48.2% in 2011; household unemployment increased from 42.2% in 2007 and 51.8% in 2011. With increase in population and decrease in annual household income employment rate, it is indication that the increase in population, triggers more employment opportunities. Unemployment tends to increase population growth. The main factor in this is a tendency for groups with lower education to have higher birth rates. On the flip side, rapid population growth causes unemployment to rise because there are more and more people and not enough employment positions to be filled by everyone.

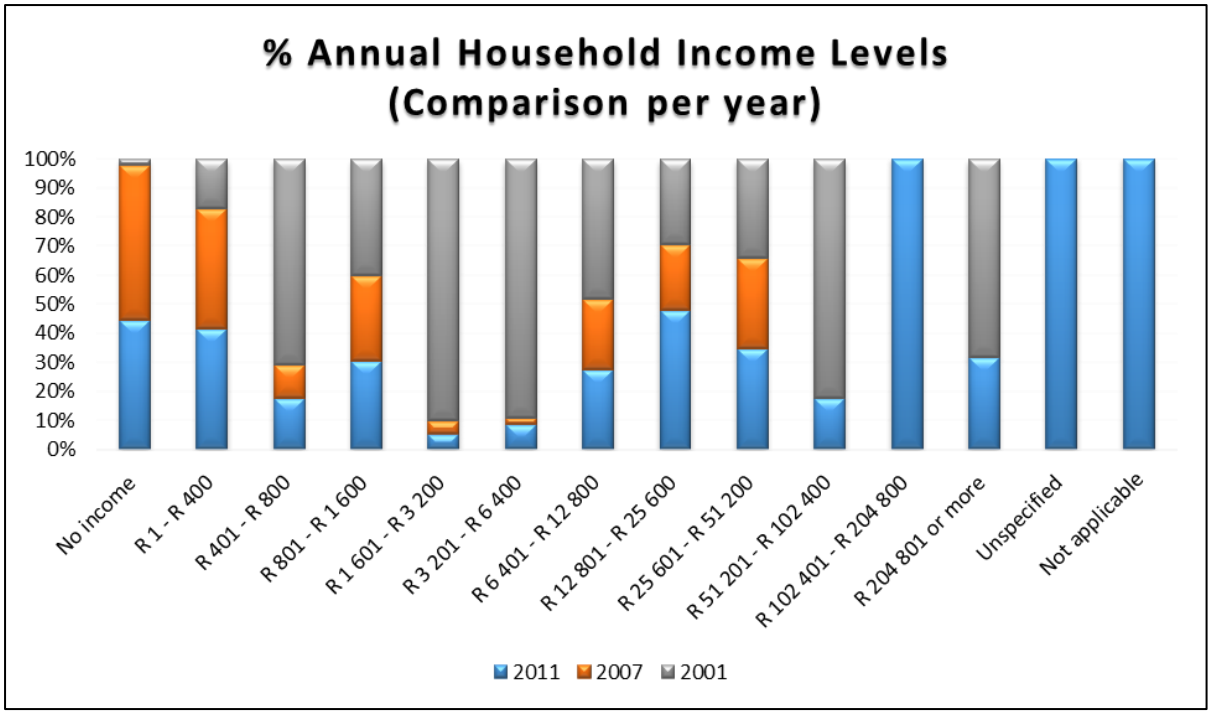


Figure 9-17: Percentage Annual Household Income Levels in the former Fetakgomo Local Municipality

Households in the low income category comprises of an annual household income between R 1 and R 12 800. Overall, households with low income decreased drastically from 97.2% in 2001, and 42% in 2007 and 46.4% in 2011.

Household in the middle income category comprises an annual household income between R 12 801 and R 102 400. This is a more or less stable with a slight decrease from 0.3% in 2001, and 0.2% in 2007 and 0.2% in 2011. An stability is indicative of stable in living conditions of household in FTLM and considered a potential growth of the middle class.

Households in the upper income category comprises an annual household income from R 102 400 and mores. FTLM household within the upper income category increased significantly from 0.1% in 2001, and 0.0% in 2007 and 5.2% in 2011.

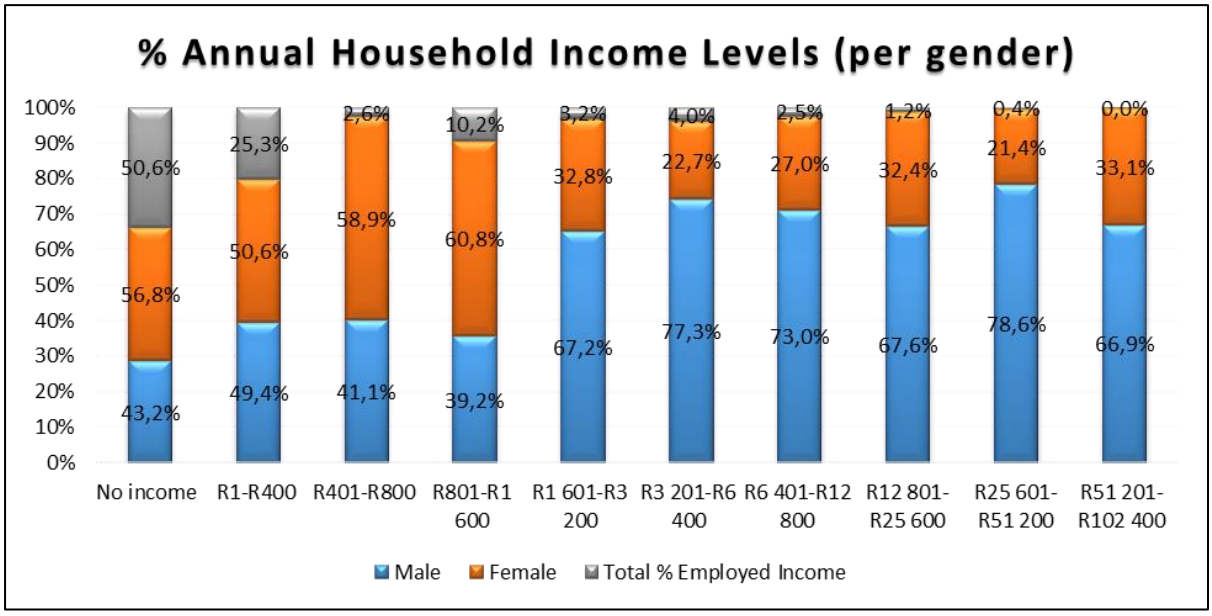


Figure 9-18: Percentage Annual Household Income Levels per gender in the former Fetakgomo Local Municipality

Figure 9-18 demonstrate that there were more female households in the no-income category than male household with 43.2% male and 56.8% female of the total headed count for FTLM. Most of the households are classified as poor or indigent – where the total income is below R 1 500 per month. Approximately 60% of the households fall into this category.

9.1.14.7. Poverty in the SDM

Poverty is defined as a state or condition in which a person or community lacks the financial resources and essentials to enjoy a minimum standard of life. **Table 9-13** depicts the poverty headcount percentage and the intensity of poverty within the local Municipalities of the FTLM. Within the SDM, FTLM shows the highest levels of poverty.

Table 9-13: Poverty headcount and the intensity of poverty in the SDM, according to the Community Survey, 2016

	2011 STATSA		2016 community survey	
Municipalities	**Poverty headcount**	**Intensity poverty**	**Poverty headcount**	**Intensity poverty**
Sekhukhune	11.3	41.6	13.6	42.4
Ephraim mogale	10.3	41	13.1	41.5
Elias motsoaledi	8.5	41.3	10.9	42.3
Makhuduthamaga	12.2	41.4	15.3	42.5
Fetakgomo	9.6	41.3	14.7	41.5
Tubatse	13.5	42.2	14.2	42.9

9.1.14.8. The Status of Orphans

A maternal orphan is a child whose female parent has died; a paternal orphan is a child whose male parent has died; and a double orphan is a child who lost both patents.

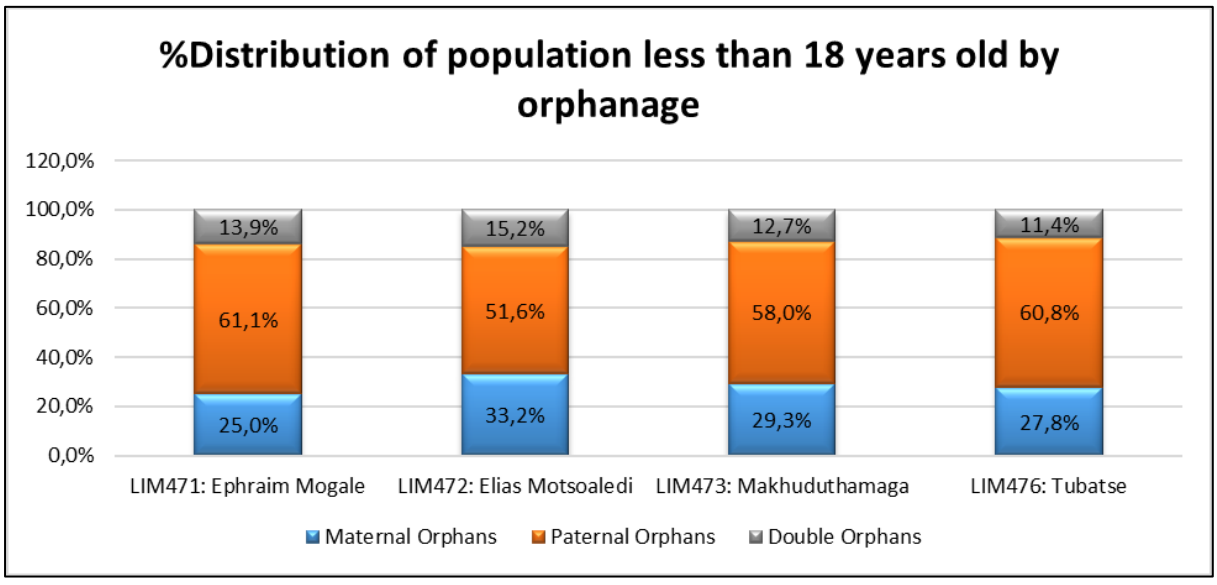


Figure 9-19: Percentage distribution of population less than 18 years old by orphanage status from the Community Survey, 2016

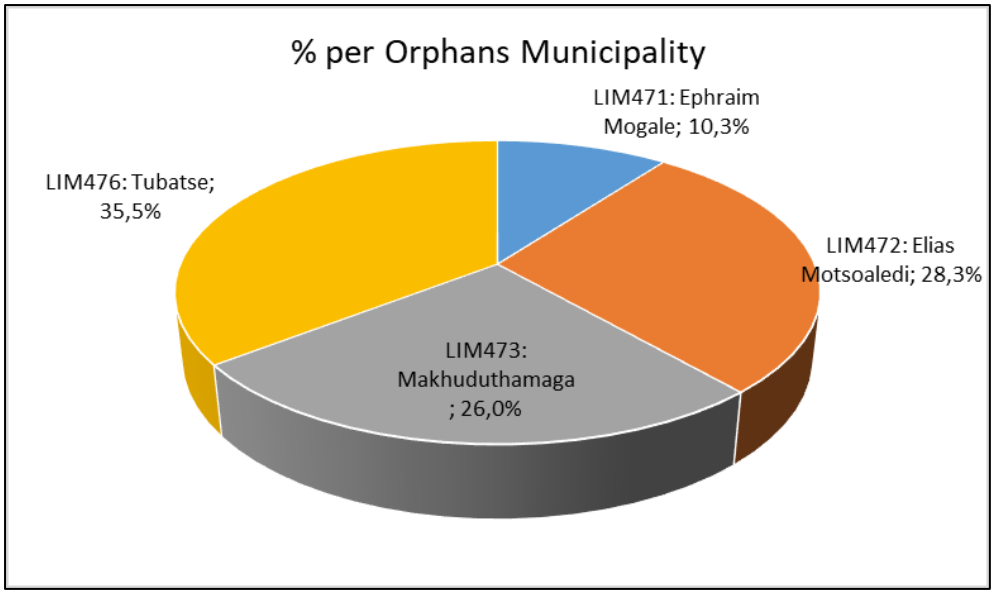


Figure 9-20: Percentage per Municipalities distribution of population less than 18 years old by orphanage status from the Community Survey, 2016

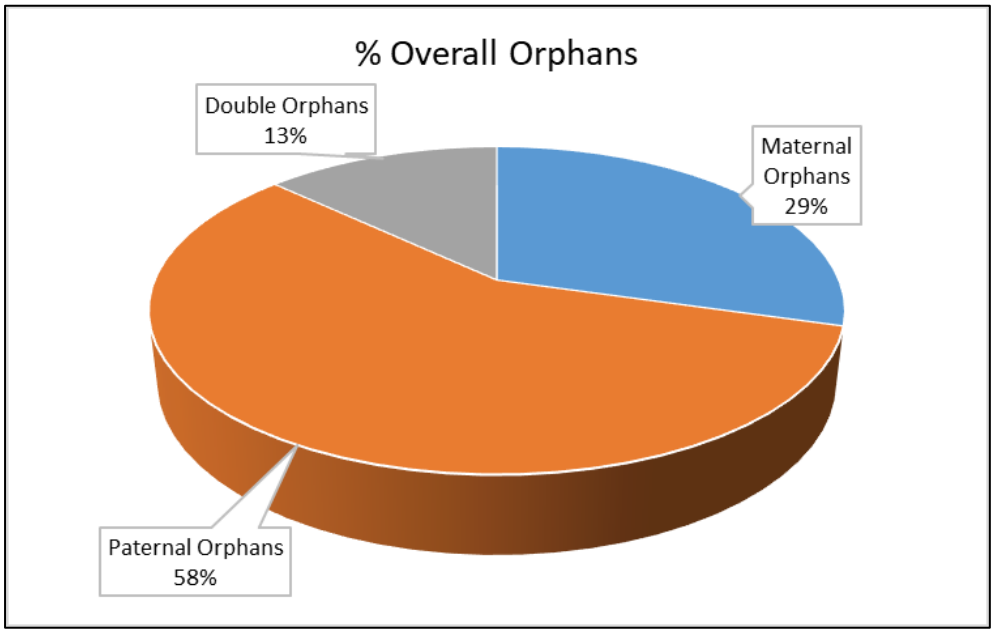


Figure 9-21: Percentage total Municipalities distribution of population less than 18 years old by orphanage status from the Community Survey, 2016

Figure 9-19 shows that the local municipalities located with Sekhukhune District have approximately an uniform distribution of population less than 18 years old for maternal, paternal and double orphans. However, **Figure 9-20** in comparison per total orphans per local municipality, shows that Tubatse has the highest population of less than 18 years old orphans with 35.5%, followed by Elias Motsoaledi (28.3%), Makhuduthamaga (26.0%) and Ephraim Mogale (10.3%). Chrome\Steelpoort sections is located at Tubatse local municipality that has the highest rate of orphans within the Sekhukhune district.

Figure 9-21 demonstrate a 13% of less than 18 years old double orphans population at FTLM which implies that the second parent (neither be a female or male) die, leaving 'double orphans' behind. The average age of becoming a grandparent is 50 years and above.

9.1.14.9. Employment Status

The mining industry is indisputably the municipality's leading job creator and key economic growth driver. With all major mining houses fully represented in the municipality, locals pin their hopes for jobs and income security in the sector, which accounts for 34% of the Municipality's total GVA and 54% of the total labour force in the formal sector. The job absorption patterns in the sector show that the year 2012 witnessed the highest number of jobs (1 833) created. However, owing to plummeting commodity prices and the adverse recession backlash, the sector has shed off a significant number of jobs.

Key actors in the mining sector include inter alia; Implats Tamboti Platinum, Anglo America Modikwa Platinum Mine, Marula Platinum, Xstrata Alloys, Bokoni, Lion Ferrochrome Operation, Samancor Eastern Chrome Mines and other small informal players.

Table 9-14: Breakdown of employment by industry in the SDM (Source STATSSA 2011)

Sectors +C2:I15	Makhuduthamaga	Fetakgomo
Agriculture, Hunting, Forestry and fishing	0.23	0
Mining and Quarrying	0.02	0.4
Manufacturing	0.17	0
Electricity, Gas and Water Supply	0.03	0
Construction	0.31	0.1
Wholesale and retail trade	0.52	0.1
Transport, Storage and communication	0.09	0
Financial, Insurance, Real Estate	0.05	0
Community, Social and personal Services	0.77	0.3
Other and no adequately defined	0.14	0
Not applicable	19.4	8.6
Unspecified	1.54	0.3
Grand Total	**23.27**	**9.9**

- **Commercial Sectors:** Steelpoort is identified as the second order of settlement hierarchy within the FTLM. Steelpoort in comparison to Burgersfort, is comprised more of manufacturing industries and mining related suppliers whilst the latter is more dominated by the retail and service activities. This growth point mostly serves the mining community. There are about six operating mines around the town. Steelpoort town is characterized by a mixed used development; including heavy engineering enterprises; suppliers to the mines; transport facilities; building material suppliers; distributors/ wholesale, medium density housing and a small retail component. The agriculture sector in the FTLM is still emerging and heavily under-invested. About sixty percent of industrial township, i.e. Steelpoort Ext 7 is occupied. Some of the service businesses related to mining have even emerged in fringe areas in the former Lebowa i.e. Tukakgomo and Eerste Geluk, Mapodile just south of Steelpoort.
- **Agriculture Sector:** This sector includes agriculture, hunting and related service activities. It comprises activities such as the growing of crops; gardening and horticulture, mixed farming of animals, hunting, trapping & forestry and fishing & fish farms. Lack of mechanization makes smallholder farming one of the least contributors to the municipality's economic growth. Although the overall contribution of the sector to the total Gross Value Added (GVA) of the municipality is nascent, records availed by StatsSA, 2013, paint a picture of a sector that is gradually experiencing a steady year-on-year growth in output. For instance, in a 12-year period review, the agricultural output rose from 13 957 in 2001 to 22 817 in 2013. The year-on-year growth in output speaks of a sector that shows remarkable growth potential in the future. At its peak in 2001, the agricultural sector provided job security to 1 316 people. However, 2006 represents the sector's darkest period as its job absorption capacity was reduced to 504 jobs. However, the sector's job intake rate started to spike up in 2012 when 768 jobs were realised. Although the sector is far from reaching its 2001

peak, in 2013, 109 more jobs were added from the 2012 figure of 768. The sector suffers from low capacity utilization owing to poor investment in mechanization schemes.

- **Manufacturing Factor:** In the municipality's economic growth matrix, a vibrant and resilient manufacturing sector guarantees the flow of sustainable jobs and further provides a solid foundation for future prosperity and economic growth. This sector covers the manufacturing of goods, products and beverages. It also comprises the production, processing and preservation of meat, fish, fruit, vegetables, oils and dairy products; grain mill, starches and tobacco products; textile products; spinning, weaving; and petroleum products and nuclear fuel. Lack of meaningful beneficiation projects of ore products poses as the main threat to the municipality's quest to transform FTLM as the epicentre of industry and commerce in the province. In employment terms, the formal wing of the sector created more jobs (1162) in 2009 than any other year. Consequently, the formal side of the manufacturing sector witnessed a sharp fall in the job retention rate in 2004 (659), 2005 (689) and 2006 (699). During this period, while the manufacturing output was depressed in the formal side of things, informal manufacturers recorded a steady growth in jobs created retained. Recent 2013 figures show that the informal sector is making giant inroads in the manufacturing sector as the number of job seekers absorbed spiked to 625 from the 2012 figure of 536.
- **Tourism Sector:** Generally, owing to its disposition, the tourism sector is positively linked to other sectors of the economy like agriculture, transport, finance and trade. However, due to its strategic importance in GVA terms, the sector increasingly occupies a prominent position in South Africa's overall economic development matrix. According to StatsSA, the tourism sector emerges as South Africa's top-foreign currency earner and one of the major contributors to the country's employment creation agenda. At a broader scale, South Africa is famous for naturally endowed with breath-taking tourism sites and world heritage assets that have earned it a top tourist destination in the world. Although at local level the sector is deemed embryonic and grossly under-invested, the FTLM has its own fair share of treasured heritage sites and tourism assets that can underpin its future growth potential.
- **SMME Sector:** A resilient and booming SMME sector in any economy represents a sign of strength of that economy. A survey done by Kayamandi Development Services, 2012 on behalf of FTLM shows that Fetakgomo Tubatse Municipality is a hive of a robust SMME activity. For instance, out of an estimated population of 4280 businesses operating in the municipality, 2568 (60%) trade in this space leaving the formal sector to account for the remainder 1712 (40%). Ward 31, which includes Steelpoort, has the second highest number of businesses (388).

Table 9-15: The percentage contribution of the informal sector to the local economy (2018/19 FTLM IDP)

Commercial Sector	% Contribution
Agriculture & farming	3%
Mining, quarrying and industry	2%
Construction	2%
Retailing	55%
Food and beverage	13%
Legal, professional, accounting and marketing	3%
Motor vehicle maintenance and sales	4%
Manufacturing (bakery, dressmaking, furniture manufacturing etc.)	1%
Accommodation (Hotel, guesthouse, B&B, Lodges)	5%
Personal services (hairdressing, shoe repairer, domestic worker)	7%
Social services –education, health, sport	4%
Banking and loans	1%

The proposed continuation of mining operations at Lannex Mine will secure current jobs and possibly increase the number of job opportunities to local and regional communities.

9.1.14.10. Means of Transport

There is inadequacy of public transport in some areas within Fetakgomo Tubatse Local Municipality (FTLM). According to the norms and standards (Limpopo Office of the Premier, 2012), public transport access should not be more than 10 minutes' walk. The dominant modes of public transport within Fetakgomo Tubatse Local Municipality (FTLM) are busses and taxi.

The municipality has two modes of transport: rail for goods and the road for public transport. Road transport in the form of privately-owned taxis and buses is the commonly used public transport service available to most of the communities in remote areas. There is no passenger rail line in the Municipality.

The Municipality conducted a route utilization survey *(date not specified in the 2018/19 IDP report)* and it recorded 405 taxi vehicles and 18 Great North Transport buses and a number of other private bus transport companies like, Sekhukhune express, Nnyanashakwane bus services, Mahlangu bus services, Thembalethu bus services, Midbank buses and Vuthimlilo and Segweka bus services are providing service in this municipal area.

The survey also showed a high volume of weekend operations to transport shoppers from rural hinterlands to Burgersfort. The taxi route survey showed that there were 71 taxi and bus routes in the former Greater Tubatse Municipality.

These routes virtually penetrate all the villages around the urban centres of Burgersfort, Steelpoort and Ohrigstad. The spatial structure, particularly the radial nature of public transport into and from Burgersfort town sees this town function as a focal point but there is no real inter-modal system to speak of. The buses and the taxis do not feed each other but generally compete along the same routes.

In terms of destination, Burgersfort functions as the fulcrum of the local taxi movement with the rest going to Praktiseer, Polokwane, Gauteng and Ohrigstad or Steelpoort. There are long distance taxis operating from three urban nodes going to areas beyond municipal boundaries such as Polokwane, Witbank, Jane Furse, Middleburg, Tembisa and Johannesburg.

9.2. Description of specific environmental features and infrastructure on the site

9.2.1. Environmental features

In terms of the Department of Environmental Affairs and Tourism (DEAT) guidelines for Integrated Environmental Management (IEM), sensitive landscapes are a broad term applying to: Nature conservation or ecologically sensitive areas – indigenous plant communities (particularly rare communities or forests), wetlands, rivers, river banks, lakes, islands, lagoon, estuaries, reefs, inter-tidal zones, beaches and habitats of rare animal species; Unstable physical environments, such as unstable soil and geo-technically unstable areas; Important nature reserves – river systems, groundwater systems, high potential agricultural land; Sites of special scientific interest; Sites of social significance or interest – including sites of archaeological, historic, cultural spiritual or religious importance and burial sites; and Green belts or public open space in municipal areas.

Sensitive landscapes in terms of the above definition are illustrated in Figures below and include:

- Ecological Sensitive areas; and
- Surface Water features.

Noted that features of heritage sensitivity will be reported to the relevant authority should the Heritage Impact Assessment within the Lannex area identifies one.

As a desktop exercise, sensitive areas were identified using the information from the Screening Tool (www.enviornment.gov.za, and a composite map indicating very high and high sensitivity areas are

presented in Appendix 5 and the overall sensitivities for the environmental themes are provided in Table 9-16.

The above will be investigated in more detail during the EIA phase.

Table 9-16: Summary of environmental sensitivities

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

9.2.2. Infrastructure on site

The existing mining activities at Portion 0 (RE) and 1 of Farm Annex Grootboom 335 KT; and Farm Grootboom 336 KT:

- Underground (operational)
- Opencast (Historical)

Lannex Mine is an operational mine and has the following existing activities and infrastructures:

- Internal haul roads, culverts and bridges;
- Topsoil, Product and ROM stockpiles
- Overburden stockpiles;
- Offices, parking bays, workshops, change house, storehouses and warehouses
- Diesel/fuel storage facilities
- Trackless workshop
- Metallurgical Plants with conveyors
- Water supply network, storm water network, pollution control dams, raw water dam, effluent dam, septic tanks and water treatment works
- Tailings Storage Facility (Not enough capacity)
- Waste Rock Dump (Not enough capacity)
- Explosive magazine bay with destruction facilities
- Security entrances and gates
- Electrical substation and power lines; and
- Underground adits

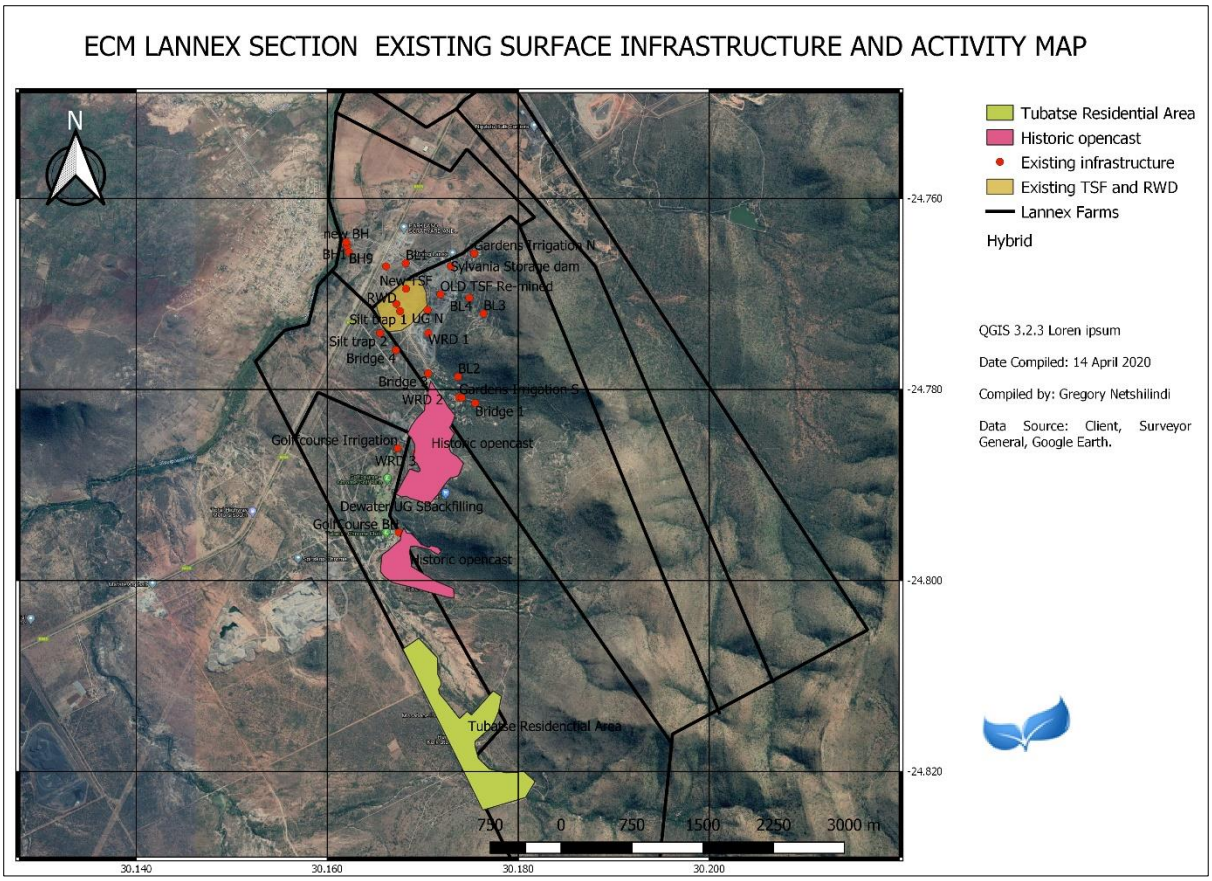


Figure 9-22: Existing infrastructure at Lannex Section

9.3. Environmental and current land use map.

(Show all environmental, and current land use features)

The current land use on site is mining related. Pre-mining land use according to the 1999 EMPR consisted mainly as mainly grazing and irrigated crops on the gentler slopes. Hill tops were probably wilderness/hunting areas. Historical agricultural production consisted of cattle farming and irrigated crops such as maize, cotton, tobacco, tomatoes, pumpkins and sweet potatoes. Evidence of misuse for the whole of the Steelpoort Valley is fairly widespread and evident. Cultivation without soil conservation measures has led to rill has led to the destruction of the indigenous vegetation and to sheet erosion.

Samancor owns the immediately adjacent land to the mining operation. Underground mines exist north, south and east of the proposed opencast mining area. A mine residential area is located between the underground mine to the north and the proposed opencast mining area. A mine office and workshop are located between the underground mine to the south and the proposed opencast mining area.

The Tubatse Township and Chrome Club is situated on the farm Annex Grootboom and is a proclaimed residential area and recreational facility, comprising a golf course, swimming pool, squash courts, tennis courts, and restaurant. The Chrome Club will be affected by the proposed opencast mining and it will be blasted for future mining.

The Lannex, Eerstegeluk, and Tubatse residential areas are in sight of the mine at 0.2, 3.2, and 2 km respectively from the mine.

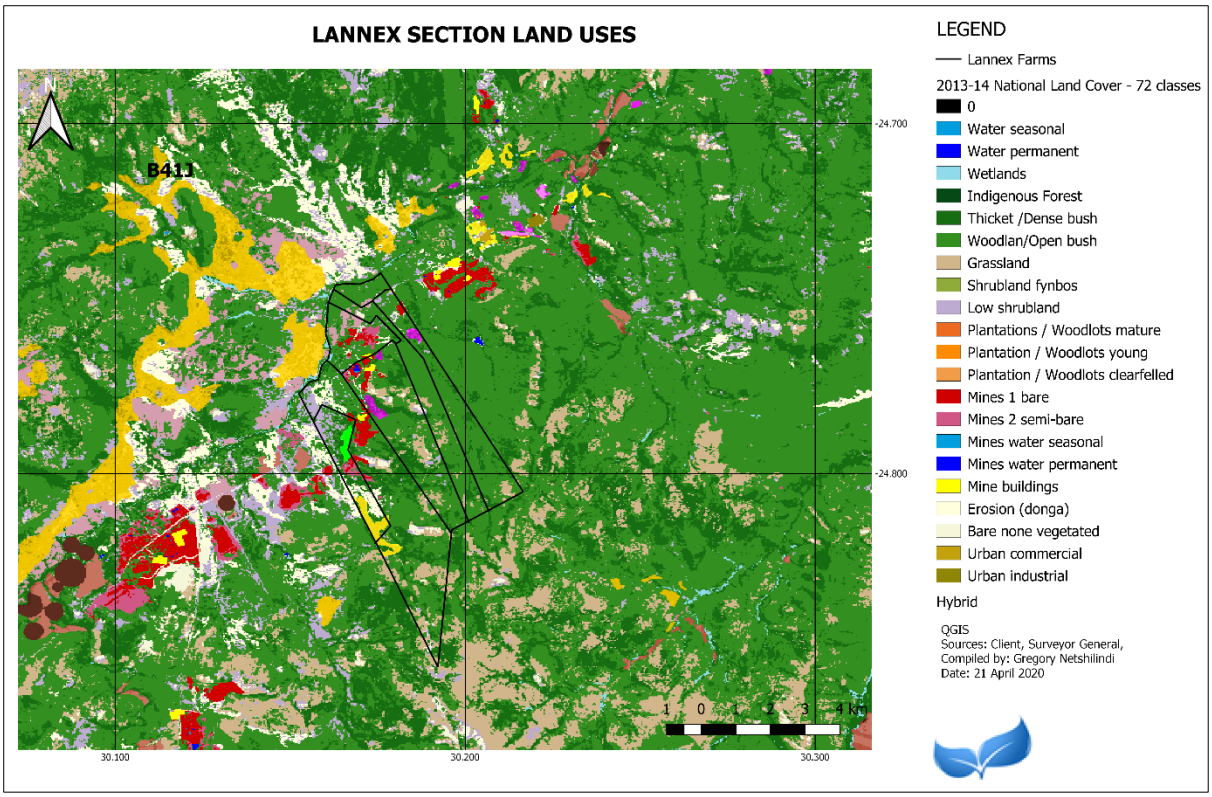


Figure 9-23: Lannex Section Land Use map

10. IMPACTS AND RISKS IDENTIFIED INCLUDING THE NATURE, SIGNIFICANCE, CONSEQUENCES, EXTENT

10.1. Impacts Identified

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability and duration of the impacts)

The following list of potential impacts has been identified as informed by typical known impacts of such activities. The impact and related significances are rated specifically with the assumption that no mitigation measures are applied.

Due to the proposed area being already by the existing Lannex Section and its associated infrastructure, it will already have some of the features and the significance of some of the aspects will be of a much lower impact.

The impacts below are a preliminary assessment and will be fined tuned during the EIA/EMP phase.

Table 10-1: Identified Impact and associated activities

Environmental Aspects	Potential Impacts List	Activities	Phase
Topography	Micro topographical changes	Opencast mining, Road construction, Establishing waste residue deposits (Chrome sand, Overburden stockpile)	Construction, Operational; Decommissioning, Post-closure

Environmental Aspects	Potential Impacts List	Activities	Phase
Geology	Sterilization of mineral deposits		
Soil	Soil compaction and degradation	Road construction, Dust suppression, Establishing waste residue deposits (Chrome sand, Overburden stockpile)	Construction, Operational; Decommissioning
	Soil Compaction and degradation	Vehicle movement; Construction of new infrastructure	Construction, Operational; Decommissioning
	Erosion	Vehicle movement; Construction of new infrastructure	Construction, Operational; Decommissioning
	Soil contamination	Road construction, Blasting, New infrastructure, such as waste residue deposits (Chrome sand, Overburden stockpile)	Construction, Operational; Decommissioning
Land use and land capability	Loss of grazing land	Road construction; blasting; and construction of proposed infrastructure.	Construction, Operational; Decommissioning
Flora	Impact on habitat for floral species	Blasting, Road construction, Removal of indigenous vegetation, New infrastructure, such as Opencast mining, Establishing waste residue deposits (Chrome sand, Overburden stockpile)	Construction, Operational; Decommissioning
	Impact on important species	Blasting, Road construction, Removal of indigenous vegetation, New infrastructure, such as Opencast mining, Establishing waste residue deposits (Chrome sand, Overburden Stockpile)	Construction, Operational; Decommissioning
Fauna	Loss of faunal habitat and ecological structure	Blasting, Road construction, Removal of indigenous vegetation, New infrastructure, such as Opencast mining, Establishing waste residue deposits (Chrome sand, Overburden Stockpile)	Construction, Operational; Decommissioning
	Impacts on Red Data List faunal species	Blasting, Road Construction, Establishing waste residue deposits (Chrome sand, Overburden Stockpile)	Construction, Operational; Decommissioning
Surface Water	Potential for increased sedimentation production	Blasting, Road construction, Removal of indigenous vegetation, New infrastructure, such as Opencast mining, Establishing waste residue deposits (Chrome sand, Overburden Stockpile)	Construction, Operational; Decommissioning
	Deterioration in surface water quality	Blasting, Road construction, Removal of indigenous vegetation, New infrastructure, such as Opencast mining, Establishing waste residue	Construction, Operational; Decommissioning

Environmental Aspects	Potential Impacts List	Activities	Phase
		deposits (Chrome sand, Overburden stockpile)	
	Potential for reduction in surface Runoff	Dust suppression; Road construction, Establishing waste residue deposits (Chrome sand, Overburden stockpile)	Construction, Operational; Decommissioning
	Alteration of drainage patterns	New infrastructure, such as Opencast mining	Construction, Operational; Decommissioning
	Destruction and degradation of aquatic areas	New infrastructure, such as Opencast mining, Establishing waste residue deposits (Chrome sand, Overburden Stockpile)	
Groundwater	Impact on the availability of groundwater	Blasting, Dust suppression; Dewatering; New infrastructure, such Opencast mining	Construction, Operational; Decommissioning
	Impact on the quality of groundwater	Blasting, Road construction, Removal of indigenous vegetation, New infrastructure, such as Opencast mining, Establishing waste residue deposits (Chrome sand, Overburden stockpile)	Construction, Operational; Decommissioning
Air Quality	Fugitive dust (TSP and PM10)	Blasting, Road construction, Removal of indigenous vegetation, New infrastructure, such as Opencast mining, Establishing waste residue deposits (Chrome sand, Overburden stockpile)	Construction, Operational; Decommissioning
Noise	Day time noise impact	Blasting, Road construction, New infrastructure, such as Opencast excavation	Construction, Operational; Decommissioning
	Night-time construction activities	Blasting, Road construction, New infrastructure, such as Opencast excavation	Construction, Operational; Decommissioning
Visual	Alter the overall landscape character and sense of place of the region	Removal of indigenous vegetation, Establishing waste residue deposits (Chrome sand, Overburden stockpile)	Construction, Operational; Decommissioning
	Lighting during night time may impact negatively on receptors situated in the identified receptor site	Road construction, Establishing waste residue deposits (Chrome sand, Overburden stockpile)	Construction, Operational; Decommissioning
Heritage and Cultural Aspects	Destruction of heritage or cultural aspects	Blasting, Road construction, Removal of indigenous vegetation, New infrastructure, such as Opencast mining, Establishing waste residue deposits (Chrome sand, Overburden stockpile)	Construction, Operational; Decommissioning
Socio - Economic	Crime, health and HIV	Influx of new temporary/permanent workers	Construction, Operational; Decommissioning

Environmental Aspects	Potential Impacts List	Activities	Phase
	Economic opportunities, infrastructure development and employment	Temporary/ permanent employment opportunities from proposed opencast operation	Construction, Operational; Decommissioning
	Loss of current land capability	Blasting, Road construction, Removal of indigenous vegetation, New infrastructure, such as Opencast mining, Establishing waste residue deposits (Chrome sand, Overburden stockpile)	Construction, Operational; Decommissioning
	Relocation of people	Blasting	Construction, Operational; Decommissioning

The impacts considered of sufficient importance as to warrant mitigation measures and management during the construction and operational phases of the project (life of mine). The potential impacts and key issues which must be thoroughly investigated during the EIA include the following:

- Air Quality
- Archaeology
- Blasting and Vibration
- Climate change
- Fauna and Flora
- Floodline and Hydrology
- Geohydrology
- Noise
- Palaeontology
- Public Participation
- Socio-economy
- Soil and Land Capability
- Surface water
- Visual
- Waste
- Geotechnical assessment

During the EIA phase the appointed specialist will identify impacts that could occur as a result of the proposed project and will provide management measures to reduce the impact

11. METHODOLOGY USED IN DETERMINING THE SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision).

11.1. Assessment Criteria

The criteria for the description and assessment of environmental impacts were drawn from the EIA Guidelines (DEAT, Environmental Impact Assessment Guidelines, 1998) and as amended from time to time (DEAT, Impact Significance, Integrated Environmental Management, Information series 5., 2002).

The level of detail as depicted in the EIA Guidelines (DEAT, Environmental Impact Assessment Guidelines, 1998) (DEAT, Impact Significance, Integrated Environmental Management, Information series 5., 2002)) was fine-tuned by assigning specific values to each impact. In order to establish a coherent framework within which all impacts could be objectively assessed, it was necessary to establish a rating system, which was applied consistently to all the criteria. For such purposes each aspect was assigned a value, ranging from one (1) to five (5), depending on its definition. This assessment is a relative evaluation within the context of all the activities and the other impacts within the framework of the project.

An explanation of the impact assessment criteria is defined below.

Table 11-1: Impact Assessment Criteria

EXTENT	
Classification of the physical and spatial scale of the impact	
Footprint	The impacted area extends only as far as the activity, such as footprint occurring within the total site area.
Site	The impact could affect the whole, or a significant portion of the site.
Regional	The impact could affect the area including the neighbouring farms, the transport routes and the adjoining towns.
National	The impact could have an effect that expands throughout the country (South Africa).
International	Where the impact has international ramifications that extend beyond the boundaries of South Africa.
DURATION	
The lifetime of the impact that is measured in relation to the lifetime of the proposed development.	
Short term	The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than that of the construction phase.
Short to Medium term	The impact will be relevant through to the end of a construction phase (1.5 years).
Medium term	The impact will last up to the end of the development phases, where after it will be entirely negated.
Long term	The impact will continue or last for the entire operational lifetime i.e. exceed 30 years of the development, but will be mitigated by direct human action or by natural processes thereafter.
Permanent	This is the only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.
INTENSITY	
The intensity of the impact is considered by examining whether the impact is destructive or benign, whether it destroys the impacted environment, alters its functioning, or slightly alters the environment itself. The intensity is rated as	
Low	The impact alters the affected environment in such a way that the natural processes or functions are not affected.
Medium	The affected environment is altered, but functions and processes continue, albeit in a modified way.
High	Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.
PROBABILITY	
This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time. The classes are rated as follows:	
Improbable	The possibility of the impact occurring is none, due either to the circumstances, design or experience. The chance of this impact occurring is zero (0 %).

Possible	The possibility of the impact occurring is very low, due either to the circumstances, design or experience. The chances of this impact occurring is defined as 25 %.
Likely	There is a possibility that the impact will occur to the extent that provisions must therefore be made. The chances of this impact occurring is defined as 50 %.
Highly Likely	It is most likely that the impacts will occur at some stage of the development. Plans must be drawn up before carrying out the activity. The chances of this impact occurring is defined as 75 %.
Definite	The impact will take place regardless of any prevention plans, and only mitigation actions or contingency plans to contain the effect can be relied on. The chance of this impact occurring is defined as 100 %.

The status of the impacts and degree of confidence with respect to the assessment of the significance must be stated as follows:

- **Status of the impact:** A description as to whether the impact would be positive (a benefit), negative (a cost), or neutral.
- **Degree of confidence in predictions:** The degree of confidence in the predictions, based on the availability of information and specialist knowledge.

Other aspects to take into consideration in the specialist studies are:

- Impacts should be described both before and after the proposed mitigation and management measures have been implemented.
- All impacts should be evaluated for the full-lifecycle of the proposed development, including construction, operation and decommissioning.
- The impact evaluation should take into consideration the cumulative effects associated with this and other facilities which are either developed or in the process of being developed in the region.
- The specialist studies must attempt to quantify the magnitude of potential impacts (direct and cumulative effects) and outline the rationale used. Where appropriate, national standards are to be used as a measure of the level of impact.

11.1.1. Mitigation

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

11.1.1.1. Determination of Significance-Without Mitigation

Significance is determined through a synthesis of impact characteristics as described in the above paragraphs. It provides an indication of the importance of the impact in terms of both tangible and intangible characteristics. The significance of the impact “without mitigation” is the prime determinant of the nature and degree of mitigation required. Where the impact is positive, significance is noted as “positive”. Significance is rated on the following scale:

Table 11-2: Significance-Without Mitigation

NO SIGNIFICANCE	The impact is not substantial and does not require any mitigation action.
LOW	The impact is of little importance, but may require limited mitigation.
MEDIUM	The impact is of importance and is therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.

HIGH	The impact is of major importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.

11.1.1.2. Determination of Significance- With Mitigation

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

Table 11-3: Significance- With Mitigation

NO SIGNIFICANCE	The impact will be mitigated to the point where it is regarded as insubstantial.
LOW	The impact will be mitigated to the point where it is of limited importance.
LOW TO MEDIUM	The impact is of importance, however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels.
MEDIUM	Notwithstanding the successful implementation of the mitigation measures, to reduce the negative impacts to acceptable levels, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw.
MEDIUM TO HIGH	The impact is of major importance but through the implementation of the correct mitigation measures, the negative impacts will be reduced to acceptable levels.
HIGH	The impact is of major importance. Mitigation of the impact is not possible on a cost-effective basis. The impact is regarded as high importance and taken within the overall context of the project, is regarded as a fatal flaw. An impact regarded as high significance, after mitigation could render the entire development option or entire project proposal unacceptable.

11.1.2. Assessment Weighting

Each aspect within an impact description was assigned a series of quantitative criteria. Such criteria are likely to differ during the different stages of the project's life cycle. In order to establish a defined base upon which it becomes feasible to make an informed decision, it was necessary to weigh and rank all the criteria.

11.1.2.1. Ranking, Weighting and Scaling

For each impact under scrutiny, a scaled weighting factor is attached to each respective impact (refer Table 11-4). The purpose of assigning weights serves to highlight those aspects considered the most critical to the various stakeholders and ensure that each specialist's element of bias is taken into account. The weighting factor also provides a means whereby the impact assessor can successfully deal with the complexities that exist between the different impacts and associated aspect criteria.

Simply, such a weighting factor is indicative of the importance of the impact in terms of the potential effect that it could have on the surrounding environment. Therefore, the aspects considered to have a relatively high value will score a relatively higher weighting than that which is of lower importance.

Table 11-4: Description of assessment parameters with its respective weighting

EXTENT		DURATION		INTENSITY		PROBABILITY		WEIGHTING FACTOR (WF)		SIGNIFICANCE RATING (SR)	
Footprint	1	Short term	1	Low	1	Probable	1	Low	1	Low	0-19

Site	2	Short to Medium	2			Possible	2	Low to Medium	2	Low to Medium	20-39
Regional	3	Medium term	3	Medium	3	Likely	3	Medium	3	Medium	40-59
National	4	Long term	4			Highly Likely	4	Medium to High	4	Medium to High	60-79
International	5	Permanent	5	High	5	Definite	5	High	5	High	80-100

MITIGATION EFFICIENCY (ME)		**SIGNIFICANCE FOLLOWING MITIGATION (SFM)**	
High	0.2	Low	0 - 19
Medium to High	0.4	Low to Medium	20 - 39
Medium	0.6	Medium	40 - 59
Low to Medium	0.8	Medium to High	60 - 79
Low	1.0	High	80 - 100

11.1.2.2. Identifying the Potential Impacts Without Mitigation Measures (WOM)

Following the assignment of the necessary weights to the respective aspects, criteria are summed and multiplied by their assigned weightings, resulting in a value for each impact (prior to the implementation of mitigation measures).

Equation 1:

Significance Rating (WOM) = (Extent + Intensity + Duration + Probability) x Weighting Factor

11.1.2.3. Identifying the Potential Impacts With Mitigation Measures (WM)

In order to gain a comprehensive understanding of the overall significance of the impact, after implementation of the mitigation measures, it was necessary to re-evaluate the impact.

11.1.2.3.1. Mitigation Efficiency (ME)

The most effective means of deriving a quantitative value of mitigated impacts is to assign each significance rating value (WOM) a mitigation efficiency (ME) rating (refer to *Table 11-4*). The allocation of such a rating is a measure of the efficiency and effectiveness, as identified through professional experience and empirical evidence of how effectively the proposed mitigation measures will manage the impact.

Thus, the lower the assigned value the greater the effectiveness of the proposed mitigation measures and subsequently, the lower the impacts with mitigation.

Equation 2:

Significance Rating (WM) = Significance Rating (WOM) x Mitigation Efficiency

or WM = WOM x ME

11.1.2.4. Significance Following Mitigation (SFM)

The significance of the impact after the mitigation measures are taken into consideration. The efficiency of the mitigation measure determines the significance of the impact. The level of impact is therefore seen in its entirety with all considerations taken into account.

12. 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.

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

As discussed in Section 7.1.2, there is no site alternative considered. The proposed site layout will be presented to affected parties and if there are concerns raised, an alternative layout will be drawn.

13. THE POSSIBLE MITIGATION MEASURES THAT COULD BE APPLIED AND THE LEVEL OF RISK.

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/ discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered).

The Potential for Residual risk may change during the EIA phase of the application as new information becomes available and the specialist studies will guide the process to ensure adequate assessments of impacts that will be expected on the Lannex mine as a result of the new activities.

The following table provides information with regard to the mitigation measures for the generic issues and concerns usually raised by affected parties for most mining developments and will be updated as part of the EIA/EMP phase:

Table 13-1: Possible Mitigation Measures

Environmental Factor	Mitigation Measure	Potential for Residual Risk
Topography	Investigate design measures that will reduce impact on topography. If possible establishing vegetation simultaneously with deposition to ensure vegetation growth on the affected environment as early as possible	Low Medium
Geology	Optimally exploit this resource in terms of tonnage of rock mined and cost as provided for in the mine plan.	Medium
Soil	It is proposed that stripping of soil be done during low rainfall days in order to minimize the mobility of contaminants and soil erosion	Low- Medium
	Vegetation topsoil stockpiles to increase microbial activity. Restrict height of topsoil stockpile. No vehicle movement allowed on topsoil stockpile areas.	Low Medium
	It is proposed that stripping of soil be done during low rainfall days in order to minimize the mobility of contaminants and soil erosion	Low
	Construction machinery to be maintained and if breakdown occurs drip trays must be placed underneath them	Low
Land use and Land capability	Currently the area is classified under mining and residential area (Tubatse village), as the infrastructure will remain permanently on site it is proposed that opencast and access road areas be rehabilitated to ensure grazing land capability is restored	Low Medium
Flora	Employees and contractors will be notified that the natural areas will be off-bounds, and no vegetation is to be collected or disturbed in any manner (apart from the identified species to be removed). Infrastructure will be removed, disturbed areas ripped, top- soiled and vegetated. The area will be maintained for 2 – 3 years after closure	Medium

Environmental Factor	Mitigation Measure	Potential for Residual Risk
	Implement annual alien vegetation assessment and removal of alien invasive plant species.	Low
Fauna	Hunting or trapping of game or game birds will not be allowed on site	Low
Surface Water	If possible, conduct all construction during the dry season and vegetate toe drain areas to prevent sedimentation production.	Low
	Implement storm water management and ensure compliance with GN704. No heavy machinery allowed in watercourses.	Low
	Implement storm water management and ensure compliance with GN704. No heavy machinery allowed in watercourses	Low
	If the old opencast pit is continued to be used as backfill, the impact is existing and no further impacts are foreseen. As far as possible do not select a site that will result in additional impacts.	Low Medium
	If the old opencast pit is continued to be used as backfill, the impact is existing and no further impacts are foreseen. As far as possible do not select a site that will result in additional impacts.	Medium
Groundwater	Groundwater studies are being done by the specialists and boreholes will be drilled (if they do not exist) to do monitoring if possible, tests will be done beforehand to determine the quality of the groundwater before mining operations start. Modelling of impacts should be conducted to ensure that all aspects are mitigated accordingly.	Low Medium
Air Quality	Water will be used for dust suppression on roads traversed by vehicles where the situation requires it. Suppress road dust when dust entrainment behind vehicles is noticeable	Low
	Ensure Vehicles are maintained	Low
Noise	All equipment to be used during construction and operational phases are to be kept in good condition. Regular checks on noise emissions of equipment in operation should be performed.	
Visual	As a result of previous mining activities that took place on site and the addition to the Lannex Mine by the proposed new activities, it is suspected that the new activities will be having a lower impact on the visual aspects of the area.	Low
Socio-economy	The proposed development will have a number of positive economic benefits that will impact on the local area, the greater region and South Africa as a country. These benefits will be in the form of capital investment, employment, support services, and foreign exchange income.	
Heritage	If possible archaeological and cultural sites should be avoided, this will be confirmed by the specialist assessment. If find-spots are recorded during the assessment and it is of low significance no mitigation measures will be required. Should any archaeological	Low

Environmental Factor	Mitigation Measure	Potential for Residual Risk
	feature be unearthed during construction activities, an archaeologist should immediately be contacted to investigate the find.	
Rehabilitation of site	In terms of the MPRDA all mining right holders are obliged to provide for a rehabilitation fund, and in accordance with the latest legislation, these funds need to be updated on an annual basis. The rehabilitation funds get ceded to the DMRE, should a situation arise that the mine cannot conduct the rehabilitation during the life of mine or there is a sudden mine closure, for whatever reason.	Low
Cumulative impacts	The following impacts may have cumulative effects due to the surrounding mining operations. These will have to be assessed by the specialist investigations whether cumulative impacts may be a problem or not: • Visual; • Groundwater; and • Surface water impacts; • Noise impacts; • Socio –Economic impacts.	High

14. THE OUTCOME OF THE SITE SELECTION MATRIX. FINAL SITE LAYOUT PLAN

(Provide a final site layout plan as informed by the process of consultation with interested and affected parties)

Refer to the approved site selection report (Appendix 5), Appendix 4 and (Figure 7-2 Figure 7-3 Figure 7-4 Figure 7-5 Figure 7-8 Figure 2-2) which shows the final site layout as Lannex Mine is an existing. This plan will be updated as part of the EIA phase. Final site layout is still subject to change during the scoping process, final site layout will be included in the EIA/EMPR report.

15. MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED.

The site for the proposed opencast, underground, TSF, WRD and other activities were selected based on thorough geological investigations, which included drilling, geological modelling and resource calculations.

Minerals can only be mined where identified and verified, therefore it was not practical to select any other sites. This fact will guide the opencast positioning as well as the existing infrastructure of Lannex which will limit areas suitable for further expansion and placement.

16. STATEMENT MOTIVATING THE PREFERRED SITE.

(Provide a statement motivation the final site layout that is proposed)

The proposed site is on a prime location due to it being the ideal point to access the reserve from the space available on the Lannex footprint. A detailed site selection process has been undertaken; the results of the site selection process has been attached in Appendix 5.

17. PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

17.1. Description of alternatives to be considered including the option of not going ahead with the activity.

In order to ensure the proposed development enables sustainable development, a number of feasible options must be explored. The various alternatives will be assessed in terms of both environmental acceptability and economic feasibility.

Please refer to Section 7 for alternatives already considered. Should any environmental fatal flaws be identified during the specialist investigation, these will be included within the alternative investigations in order to determine the possible implications thereof on the proposed development.

17.2. Description of the aspects to be assessed as part of the environmental impact assessment process

(The EAP must undertake to assess the aspects affected by each individual mining activity whether listed or not, including activities such as blasting, Loading, hauling and transport, and mining activities such as Excavations, stockpiles, discard dumps or dams, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.).

The key environmental issues identified during the initial Scoping phase were determined through an internal process based on similar developments, desktop analysis, revision of existing information, the historical data, due diligence process with Prescali Environmental Consultants, consultation with interested and affected parties and the relevant stakeholders. The potential risk sources/impacts were identified by the Prescali team who has been on site to appraise the environment and identify the potential impacts of the development.

The EAP hereby undertakes to assess the following aspects which are related to the proposed impacts of the proposed opencast mining project which was identified in Section 9: Climate, Topography, Geology, Soils, Land Capability, Fauna and Flora, Surface Water, Geohydrology, Air Quality, Archaeology.

17.3. Description of aspects to be assessed by specialists

Table 17-1: Specialist studies

STUDY	APPOINTED SPECIALIST
Air quality	Eco Elementum
Archaeological assessment	Anton Pelser
Blasting and Vibration assessment	Blast management and consulting
Climate change assessment	Mamadi
Fauna and Flora Assessment	Red Kite
Flood line determination and Hydrology	Shivan Dhaver
Geohydrological assessment	GPT
Noise Impact Assessment	EARES
Paleontological assessment	Francois Durand
Public Participation	Gudani Consulting
Socio Economic Assessment	Gudani Consulting
Soil and Land capability assessment	Francois Botha
Surface water Assessment inclusive of wetland assessment	Prescali
Visual Assessment	Eco Elementum

Waste Classification	Golder Associates
Geotechnical Assessment (as part of civil design for the Tailings Dam	Mr. Koos Davel

Each specialist will be given Scope of Work to carry out their study. The Impact Assessment Criteria used to rank and rate the impacts and risks will be given to all specialists and it will be compulsory for each specialist to use the same rating during their Impact Assessment. Information and data of the current existing environmental monitoring programs will also be assessed to detect trends and changes in conjunction with environmental attributes triggered by the project activities. Information from historical specialist studies will also be taken into considerations versus the project specialist studies to inform the impact identification, assessment, and remediation process. This will allow for all impacts from all specialists to be incorporated into the EIA and EMPr and thus ensuring consistency, accuracy and reliability of the report and content thereof.

The findings of such specialist studies shall be included in the EIA Report. The specialists are to provide an outline of the approach they use in their assessment. Assumptions and sources of information must also be clearly identified and the knowledge of local people should be incorporated in the assessment. The description of the study approach shall include a short discussion of the appropriateness of the methods used in the specialist study in terms of local and international trends and specific or best practice.

The specialists will employ the following basic methodology:

- Site visits;
- Sampling, where necessary;
- Desktop studies;
- Assessment of baseline data;
- Modelling (Groundwater and noise);
- Assessment of impacts;
- Development of appropriate mitigation measures; and
- Documentation of the findings in the form of reports.

17.3.1. Description of the Affected Environment

A description of the affected environment must be provided. The focus of this description must be relevant to the specialist's field of expertise. The specialist must provide an indication of the sensitivity of the affected environment. Sensitivity, in this context, refers to the "ability" of an affected environment to tolerate disturbance, for example, if disturbance of the natural habitat results in the permanent loss of its biodiversity, the affected environment could be categorised as having a "low tolerance" to disturbance and is, therefore, termed a highly sensitive habitat. If, on the other hand, a habitat is able to withstand significant disturbance without a marked impact on its biodiversity, the affected environment could be categorised as having a high tolerance to disturbance (i.e. "low sensitivity" habitat).

17.3.2. Legal Requirements

As per the new requirements, the specialist should identify and list the relevant South African legislation and permit requirements pertaining to the development proposals. He/she should provide reference to the procedures required to obtain permits and describe whether the development proposals contravene the applicable legislation.
On 20 March 2020 the "*Procedures for The Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in Terms of Sections 24(5)(A) And (H) And 44 Of the National Environmental Management Act, 1998, When Applying for Environmental Authorisation*" was published. The following specialist fields will ensure compliance with the reporting requirements as contained therein:

- Agriculture;

- Biodiversity (terrestrial and aquatic); and
- Noise.

Other specialist studies will follow Government Notice R982 as published in Government Gazette 38282 dated 4 December 2014 and as amended by Government Notice 326 in Government Gazette 40772 dated 7 April 2017, which outlines in Appendix 6 the requirements for specialist reports. The table below provides an overview of the requirements and the applicable sections of this report.

Table 17-2: Legislative requirements for specialist reports

GNR982 as amended by GN326
(1) A specialist report prepared in terms of these Regulations must contain—
(a) details of—
(i) the specialist who prepared the report; and
(ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;
(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;
(c) an indication of the scope of, and the purpose for which, the report was prepared;
(cA) an indication of the quality and age of base data used for the specialist report;
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;
(g) an identification of any areas to be avoided, including buffers;
(h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;
(k) any mitigation measures for inclusion in the EMPr;
(l) any conditions for inclusion in the environmental authorisation;
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;
(n) a reasoned opinion—
(i) whether the proposed activity, activities or portions thereof should be authorised;
(iA) regarding the acceptability of the proposed activity or activities; and
(ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;
(o) a description of any consultation process that was undertaken during the course of preparing the specialist report;
(p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and
(q) any other information requested by the competent authority.
(2) Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.

17.3.3. Impact Identification and Assessment

The specialist must make a clear statement, identifying the environmental impacts of the construction, operation and management of the proposed development. As far as possible, the specialist must quantify the suite of potential environmental impacts identified in the study and assess the significance of the impacts according to the criteria set out below. Each impact will be assessed and rated. The

assessment of the data must, where possible, be based on accepted scientific techniques, failing which the specialist is to make judgements based on his/her professional expertise and experience.

The impact assessment will provide an evaluation of the significance of each of the three phases of the project i.e. design / construction, operational phases and closure/post closure.

17.3.4. Mitigation measures

Mitigation measures should be recommended in order to enhance benefits and minimise negative impacts and they should address the following as discussed.

Mitigation Objectives: What level of mitigation must be aimed at for each identified impact, the specialist must provide mitigation objectives (tolerance limits) which would result in a measurable reduction in impact. Where limited knowledge or expertise exists on such tolerance limits, the specialist must make an "educated guess" based on his/her professional experience.

Recommended Mitigation Measures: For each impact the specialist must recommend practical mitigation actions which can measurably affect the significance rating. The specialist must also identify management actions, which could enhance the condition of the environment. Where no mitigation is considered feasible, this must be stated and reasons provided.

Effectiveness of Mitigation Measures: The specialist must provide quantifiable standards (performance criteria) for reviewing or tracking the effectiveness of the proposed mitigation actions, where possible

17.3.5. Recommended Monitoring and Evaluation Program

The specialist is required to recommend an appropriate monitoring and review programme, which can track the efficacy of the mitigation objectives. Each environmental impact is to be assessed before and after mitigation measures have been implemented. The management objectives, design standards etc., which, if achieved, can eliminate, minimise or enhance potential impacts or benefits must, wherever possible, be expressed as measurable targets. National standards or criteria are examples, which can be stated as mitigation objectives.

Once the above objectives have been stated, feasible management actions, which can be applied as mitigation, must be provided. A duplicate column on the impact assessment tables described above should indicate how the application of the proposed mitigation or management actions has reduced the impact. If the proposed mitigation is to be of any consequence, it should result in a measurable reduction in impacts (or, where relevant, a measurable benefit).

17.4. Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives

Please refer to Section 11 that explains the methodology to be used for assessing the environmental aspects including the proposed method of assessing alternatives.

Section 11 also includes the proposed method of assessing duration and significance.

17.5. The stages at which the competent authority will be consulted

Subsequent to the submission of the Scoping Report, Prescali would require additional consultation with the following Departments regarding the way forward:

- Fetakgomo-Greater Tubatse Local Municipality;

- Sekhukhune District Municipality;
- Department: Water Affairs and Sanitation;
- Department of Mineral Resources and Energy;
- Department of Agriculture;
- Department of Environmental Affairs (DEA);
- Limpopo Department of Economic Development, Environment and Tourism (LEDET); and
- SAHRA and Limpopo Heritage Agency

All comments will be included in the final comments and response report, as an appendix within the Final Scoping Report for submission.

18. PARTICULARS OF THE PUBLIC PARTICIPATION PROCESS WITH REGARD TO THE IMPACT ASSESSMENT PROCESS THAT WILL BE CONDUCTED

18.1. Steps to be taken to notify interested and affected parties.

(These steps must include the steps that will be taken to ensure consultation with the affected parties identified in (h) (ii) herein).

The public participation process will start with pre-identification of I&APs which include:

- Tribal authorities and communities;
- Local Municipality;
- District Municipality;
- Government Departments as identified previously;
- Non-Governmental Organisations; and
- Neighbours.

Advertisements will be placed in a local newspaper and site notices will be placed to provide the opportunity for other I&APs to submit registrations and to be added to the I&AP register.

All Registered I&APs will be kept informed and will be able to provide input into every phase of the EIA process.

Comments and responses will be incorporated into the following documents involved in the EIA process:

- Draft Scoping Report;
- Specialist Reports; and
- Draft EIA/EMP report.

These documents will be made available to the communities within the area. The communities will be informed of the locations of where the draft documents will be and to whom the comments and issues raised need to be sent.

Once all the comments and responses from all the registered I&APs have been received, it will be incorporated into the final document. The issues and comments will be addressed and mitigation measures will be set for each issue. Once all the aforementioned aspects have been addressed the documents will be finalised and the final documents will be submitted to the relevant Departments for authorisation.

Once the department gives authorisation for the proposed project, all the Registered I&APs will be notified thereof, and they will be informed of the commencement dates of the proposed mining operations.

The proposed public participation process for the remainder of the Environmental Impact Assessment will consist of the following as outlined below:

18.2. Details of the engagement process to be followed

(Describe the process to be undertaken to consult interested and affected parties including public meetings and one on one consultation. NB. The affected parties must be specifically consulted regardless of whether or not they attend public meetings and records of such consultation will be required in the EIA at a later stage)

18.2.1. Report Comment period

Presenting all registered Interested and Affected Parties, stakeholders and government departments with the opportunity to read and comment on environmental impact assessment reports, including all specialist reports for a 30-day period;

18.2.2. Public Meetings and Open Days

A public information session/meeting to present and discuss the findings of the Environmental Impact Assessment and related specialist reports will be held. This information session and discussion will give stakeholders and any other members of the public the opportunity to come and read reports, discuss the project with specialists and EIA consultants and have access to photos and reports during the day. The information provided will include the site plan and sufficient detail of the intended operation and the typical impacts of each activity, to enable them to assess what impact the activities will have on them or on the use of their land.

Once I&APs have had the chance to review the draft documents, public meetings will be held to discuss these reports.

18.2.3. Description of the information to be provided to Interested and Affected Parties

(Information to be provided must include the initial site plan and sufficient detail of the intended operation and the typical impacts of each activity, to enable them to assess what impact the activities will have on them or on the use of their land)

The following documents will be made available to the communities within the area as well as all registered Interested and Affected parties:

- Draft Scoping Report;
- Specialist Reports; and
- Draft EIA/EMP report.

All information obtained within these documents, including the site plans and impacts expected as well as all the relevant information as required by the competent authority as contained within the prescribed DMRE format EIA/EMP will be made available to the I&APs for comment.

Once all the comments and responses from all the registered I&APs have been received, it will be incorporated into the final document. The issues and comments will be addressed and mitigation measures will be set for each issue.

19. DESCRIPTION OF THE TASKS THAT WILL BE UNDERTAKEN DURING THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

During the Impact Assessment Phase of the EIA, issues identified during scoping are assessed by environmental specialists. The outcome of the assessments will be presented in the draft EIA, which together with an Environmental Management Plan (EMP), will be made available for interested and affected parties to comment on.

Based on the findings in the EIA/EMP, the Responsible Government Authority will decide, in consultation with other relevant authorities, whether the proposed opencast and underground mine of Lannex and associated infrastructure activities may proceed or not, and under what conditions.

The application process followed for Lannex section has been designed to meet the requirements of both the Mineral and Petroleum Resource Development Act, 2002 (Act No. 28 of 2002) and National Environmental Management Act, 1998 (Act No. 107 of 1998; amended 2006). The authorisation process includes:

- Scoping Phase:
- Stakeholder Notification;
- Authority Consultation;
- Capturing of Issues and Concerns;
- Compilation of a Stakeholder Database;
- Identification of Potentially Significant Impacts;
- Identification of Potentially Sensitive Environmental Aspects; and
- Identification of Required Specialist Studies.

Compilation of a Scoping Report (this document), including:

- Plan of Study for SIA/EIA/EMP.
- Issues Report;
- Stakeholder Review of Documentation; and
- Submission and approval of Scoping Report by relevant authorities.

Impact Assessment Phase:

- Undertake necessary specialist studies;
- Assessment of environmental impacts;
- Compilation of management plans;
- Compilation of an EMP Report;
- Stakeholder document review and comment; and
- Submission of final report for decision-making.

The EMP report includes a description of the proposed project, a list of identified environmental and social aspects that will potentially be impacted upon by the proposed mining project, and impact assessment for these aspects, and environment management programme for the mitigation and management of the identified impacts.

20. 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.

The information below will be fine-tuned during the EIA/EMP phase.

Table 20-1: Impact Measures

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
Opencast Mining	Dangerous excavations	Control access to the site	Low
	Loss of land capability	Remedy the area as close as possible to original land use	Low- Medium
	Impact on geology	Mine within demarcated areas only	Low
	Fugitive dust	Control through monitoring	Low-Medium
	Daytime noise impact	Control through noise control	Low
	Night time noise impact	Control through noise control	Low-Medium
	Alter overall landscape	Control through vegetated screens/berms may not be needed as the current activities are only expanded within Lannex footprint	Low-Medium
	Lighting during night time	Control lighting during night times	Low
	Destruction of heritage or cultural aspects	Control through fencing and demarcations	Low – Medium
Phased approach	Impact on geology	Mine within demarcated areas only	Low-Medium
	Soil erosion	Control through management	High
	Sterilization of topsoil layer	Modify fertility of the soils	Low – Medium
Blasting	Impact on habitat for floral species	Control area of disturbance, specialist to assess the footprint of the electricity extensions and pumping routes that may be employed	Low
	Impact on important species	Implement specialist recommendations, if specialist study indicates any red listed species found	Low
	Loss of faunal habitat	Control buffer zones	Low
	Impact on Red Data List (RDL) species	Modify through training of personnel	Low
	Impact on availability of groundwater	Control through pumping of water, if required	Low

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Impact on groundwater quality	Control seepage and runoff	Low
	Fugitive dust	Control through dust suppression	Low
	Daytime noise impact	Control through noise control	Low-Medium
	Impact on geology	Mine within demarcated areas only	High
	Destruction of heritage or cultural aspects	Control through fencing and demarcations	Low-Medium
Waste rock stockpile	Impact on geology	Mine within demarcated areas only	High
	Soil compaction	Control area of disturbance	Medium-High
	Soil erosion	Control through management	Low – Medium
	Sterilization of topsoil layer	Modify fertility of the soils	High
	Less water reaching the surface water resource	Control storm water	Medium
	Deterioration in water quality	Control pollution sources	Low-Medium
	Impact on groundwater quality	Control seepage and runoff	Low
	Fugitive dust	Control through dust suppression	Low
	Daytime noise impact	Control through noise control	Low-Medium
	After overall landscape	Control through vegetated screens/berms may not be needed as the current activities are only expanded within the Lannex footprint	Low – Medium
Temporary Topsoil storage	Impact on geology	Mine within demarcated areas only	High
	Soil compaction	Control area of disturbance	Medium-High
	Soil erosion	Control through management	Low – Medium
	Sterilization of topsoil layer	Modify fertility of the soils	High
	Deterioration in water quality	Control pollution sources	Low-Medium
	Less water reaching the surface water resource	Control storm water	Medium
	Impact on groundwater quality	Control seepage and runoff	Low
	Fugitive dust	Control through dust suppression	Low
	Daytime noise impact	Control through noise control	Low-Medium

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Alter overall landscape	Control through vegetated screens/berms may not be needed as the current activities are only expanded within the Lannex footprint	Low – Medium
Temporary Overburden stockpiles	Impact on geology	Mine within demarcated areas only	High
	Soil compaction	Control area of disturbance	Medium-High
	Soil erosion	Control through management	Low – Medium
	Sterilization of topsoil layer	Modify fertility of the soils	High
	Deterioration in water quality	Control pollution sources	Low-Medium
	Less water reaching the surface water resource	Control storm water	Medium
	Impact on groundwater quality	Control seepage and runoff	Low
	Fugitive dust	Control through dust suppression	Low
	Daytime noise impact	Control through noise control	Low - Medium
	Alter overall landscape	Control through vegetated screens/berms may not be needed as the current activities are only expanded within the Lannex footprint	Low – Medium
Loading, Hauling and Transporting	Chemical soil pollution	Control through the installation of subsoil drains	Low
	Soil compaction	Control area of disturbance	Medium-High
	Sterilization of topsoil layer	Modify fertility of the soils	High
	Deterioration in water quality	Control pollution sources	Low-Medium
	Less water reaching the surface water resource	Control storm water	Medium
	Fugitive dust	Control through dust suppression	Low
	Daytime noise impact	Control through noise control	Low-Medium
	Night time noise impact	Control through noise control	Medium
	Lighting during night time	Control lighting during night times	Low – Medium
Road construction	Dangerous excavations	Control access to the site	Low
	Soil compaction	Control area of disturbance	Medium-High
	Soil erosion	Control through management	Low – Medium
	Sterilization of topsoil layer	Modify fertility of the soils	High

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Chemical soil pollution	Control through the installation of subsoil drains	Low
	Impact on habitat for floral species	Control area of disturbance	Low
	Impact on important species	Control through establishment of nursery	Low
	Loss of faunal habitat	Control buffer zones	Low
	Impacts on RDL species	Modify through training of personnel	Low
	Loss of wetland habitat and structure	Control buffer zones	Low
	Less water reaching the surface water resource	Control storm water	Medium
	Alteration of drainage patterns	Control storm water	Low-Medium
	Deterioration in water quality	Control pollution sources	Low-Medium
	Impact on groundwater quality	Control seepage and runoff	Low
	Fugitive dust	Control through dust suppression	Low
	Daytime noise impact	Control through noise control	Low-Medium
	Night time noise impact	Control through noise control	Medium
	Lighting during night time	Control lighting during night times	Low – Medium
	Destruction of heritage or cultural aspects	Control through fencing and demarcations	Low-Medium
Water abstraction from opencast	Influx of groundwater into mine workings	Control through pumping of water	Low
	Reduction in resources	Control through training and awareness	Low
	Impact on external users' boreholes	Control through monitoring	Low-Medium
Dust suppression	Soil erosion	Control through management	Low - Medium
	Deterioration in water quality	Control pollution sources	Low-Medium
	Impact on availability of groundwater	Control through pumping of water	Low

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Impact on groundwater quality	Control seepage and runoff	Low
	Fugitive dust	Control through dust suppression	Low
Removal of indigenous vegetation	Impact on habitat for floral species	Control area of disturbance	Low
	Impact on important species	Control through establishment of nursery	Low
	Loss of wetland habitat and structure	Control buffer zones	Medium – High
	Alter overall landscape	Control through vegetated screens/berms may not be needed as the current activities are only expanded within the Lannex footprint	Low – Medium
On-site sanitation	Dangerous excavations	Control access to the site	Low
	Soil compaction	Control area of disturbance	Medium-High
	Chemical soil pollution	Control through the installation of subsoil drains	Low
	Loss of wetland habitat and structure	Control buffer zones	Medium – High
	Less water reaching the surface water resource	Control storm water	Medium
	Deterioration in water quality	Control pollution sources	Low-Medium
	Reduction in resources	Control through training and awareness	Low
	Impact on groundwater quality	Control seepage and runoff	Low
	Impact on external users' boreholes	Control through monitoring	Low-Medium
Hazardous Substances	Deterioration in water quality	Control pollution sources	Low-Medium
	Reduction in resources	Control through training and awareness	Low
	Impact on groundwater quality	Control seepage and runoff	Low
Product stockpiling	Sterilization of topsoil layer	Modify fertility of the soils	High
	Soil compaction	Control area of disturbance	Medium-High
	Deterioration in water quality	Control pollution sources	Low-Medium

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	Reduction in resources	Control through training and awareness	Low
	Less water reaching the surface water resource	Control storm water	Medium
	Impact on groundwater quality	Control seepage and runoff	Low

21. OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

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, 1998 (Act No. 107 of 1998) the EIA report must include the:

21.1. Impact on the socio-economic conditions of any directly affected person.

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim.

Samancor Chrome Ltd is the property and the mineral rights holder on the affected property where the TSF will be located thus no impacts are expected on the company other than if the project does not go ahead it may have serious implications on the mine in terms of employment opportunities and continuation of their core business.

Land claims have been submitted on the applicable properties and from the latest information available has not been finalised as yet.

21.1.1. Crime, Health and HIV

Influx of foreigners and job seekers and increase in disposable income for local people may create negative social impacts such as crime, alcoholism and prostitution in and around the project area. This will usually result in moderate to high negative impacts to the surrounding communities.

The Lannex mine is an existing mine which requires approval for extension of its current activities as outlined in this report.

Therefore, a large influx of new workers and foreigners is not expected as the mine has been already established for a number of years. Job-seekers in the area may start to show new interest in the mine as it becomes apparent that operations are extending and new work opportunities may become available. A medium to low, or low impact is expected.

21.1.2. Noise

The impact of noise from various aspects and equipment of the mining operation will be of low- to-moderate negative significance taking cognizance of the occasional open cast pits blasting and the rural and other mining operations in close proximity. The earth moving equipment and blasting together with grinding and stone crushing activities as well as other noise generated from the new proposed processing plant may generate noise above ambient noise levels in the surrounding areas.

It is however, it is expected that although noise may exist due to the mining operations at Lannex, that the noise levels will revert to pre-mining ambient levels when the mine decommissions. The impact will be of low negative significance for the duration of post mining operations.

21.1.3. Air Pollution

The impact is considered moderate negative significance. The dust generated during the construction of the expansion activities and operational phase of the surface mine infrastructure and mining of the opencast pits may reduce the air quality of the local area immediately adjacent to the mining works. The overburden stockpile disposal activities will also generate dust. Dust impact will be high after blasting events.

Once the mining activities, rehabilitation and re-vegetation over the entire surface are complete no further dust will emanate from the mining site. There will be minimal to no dust or any other emission after decommissioning.

21.1.4. Light and Visual Aspects

The mine is currently operational, expansion project will not increase the light and visual aspects of the surrounding environment. Expansion of the waste rock dump will slightly increase the visual aspects; however, these impacts will be mitigated together with the existing waste rock dump.

Progressive rehabilitation will be implemented throughout the life of mine, such that as closure approaches a significant portion of the mining site would have been rehabilitated to conform to surrounding environmental characteristics and topographic features. This will be subjected to strict implementation and compliance with the environmental management program report to be approved by the DMRE. Over time and towards closure the visual impact should gradually change from its initial impact rating towards low after final rehabilitation is complete.

21.1.5. Socio-economic opportunities, Infrastructure Development and Employment

The impact will be positive to the local and regional economy and those who will get employment as a result of the opencast and underground mining operations. The number of actual employment opportunities and contracts that will be created renders the mining operation to be of high positive significance. This will further be enhanced by the possible secondary economic activities that may arise within the Local Municipality.

Increase in disposable income may create negative social impacts such as crime, alcoholism and prostitution in and around the project area.

21.2. IMPACT ON ANY NATIONAL ESTATE REFERRED TO IN SECTION 3(2) OF THE NATIONAL HERITAGE RESOURCES ACT.

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as Appendix)

None expected, as the Lannex operation is already in existence and intend to expand within its current footprint, therefore the impacts have already been assessed. A Heritage Report will be submitted to the department during the EIA stage.

22. OTHER MATTERS REQUIRED IN TERMS OF SECTIONS 24 (4) (A) AND (B) OF THE ACT

(the EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as Appendix).

Section 24 (4) (b) (i) states the following: "*Procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment – (b) must include, with respect to every application for an environmental authorisation and where applicable— (i) investigation of the potential consequences or impacts of the alternatives to the activity on the environment and assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity*;"

Full impact assessment will be conducted during the EIA phase and the findings will be represented in the EIA document.

A number of alternatives are being investigated – no motivation is required in terms of sub-regulation 22(2) h.

23. UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I Gregory Netshilindi 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: _17 August 2020_____

24. UNDERTAKING REGARDING THE LEVEL OF AGREEMENT

I, Gregory Netshilindi 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: ____17 August 2020_____

-END OF REPORT-

25. References

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26. APPENDICES

Appendix 1: Qualifications of the EAP

Appendix 2: Experience of the EAP

Appendix 3: Locality Map

Appendix 4: Site Layout Maps and other Layout Maps

Proposed alternative sites investigated

Appendix 5: Whole Site screening tool Report

Appendix 6: Public Participation Documentation

Content of Newspaper Advertisement and Site notices
Newspaper Advertisement
Background Information Document
Photographs of Site Notices

Appendix 7: Covid-19 Public Participation Plan