



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH A

**Draft for
Comment**

**ENVIRONMENTAL IMPACT ASSESSMENT REPORT and
ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT**

OENA DIAMOND MINE

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:	African Star Minerals (Pty) Ltd
TEL NO:	+27 13 656 1102 or 1183
FAX NO:	+27 13 656 1104
POSTAL ADDRESS:	Postnet Suite 1017 Private Bag X7297 Witbank 1035
PHYSICAL ADDRESS:	No 205 A/B, 2nd Floor, Smokey Mountain Office Park, Route N4 Business Park, C/O Nelson Mandela Ave. & Paul Sauer St. Witbank
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Contents

PART A: SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

1	Contact Person and correspondence address.....	3
1.1	Details of the EAP.....	3
1.2	Expertise of the EAP.....	3
2	Description of the property.....	3
3	Locality map.....	3
4	Description of the scope of the proposed overall activity.....	7
4.1	Benefits of the operation.....	7
4.2	Major Environmental Findings.....	7
4.3	Description of the activities to be undertaken.....	8
4.4	The Mine Plan.....	8
4.4.1	Future Prospecting and Mining per Mining Section.....	8
4.4.2	Estimated Reserves and Lifespan.....	10
4.4.3	Basic overview of the mining method.....	14
4.5	Processing Method.....	15
4.6	Logistical Facilities and Accommodation.....	18
4.7	Detail of Water Offtake Points.....	20
4.8	Existing and Future Fine Tailings Handling.....	20
5	Listed and specified activities.....	23
6	Description of the activities to be undertaken.....	27
7	Policy and Legislative Context.....	29
8	Need and desirability of the proposed activities.....	30
8.1	Securing ecological sustainable development and use of natural resources.....	31
8.2	Promoting justifiable economic and social development.....	34
8.3	Cumulative Impact Assessment.....	39
9	Motivation for the development footprint.....	39
10	Details of all alternatives considered.....	39
10.1	Property on which or location where it is proposed to undertake the activity;.....	39
10.2	Type of activity to be undertaken;.....	39
10.3	Design or layout of the activity;.....	39
10.4	Technology to be used in the activity;.....	39
10.5	Operational aspects of the activity;.....	39
10.6	Option of not implementing the activity.....	40
11	Details of the Public Participation Process Followed.....	40
12	The Environmental attributes associated with the development footprint alternatives.....	46
12.1	Type of environment affected by the proposed activity.....	46
12.1.1	Geology.....	46

12.1.2	Climate	47
12.1.3	Topography	49
12.1.4	Soil.....	51
12.1.5	Pre-mining land capability	53
12.1.6	Land Use.....	54
12.1.7	Natural vegetation / plant life.....	56
12.1.8	Animal Life	57
12.1.9	Surface Water	58
12.1.10	Groundwater.....	61
12.1.11	Air Quality	61
12.1.12	Noise	62
12.1.13	Visual aspects.....	62
12.2	Description of the current surrounding land uses.	62
12.3	Description of specific environmental features and infrastructure on the site.....	62
12.4	Environmental and current land use map.....	63
13	Impacts and risks identified including the nature, significance, consequence, extent, duration & probability of the impacts	63
14	Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;.....	77
15	The positive & negative impacts that the activity & alternatives will have on the affected environment and the community.....	78
16	The possible mitigation measures that could be applied and the level of risk.....	78
16.1	Motivation where no alternative sites were considered.	79
16.2	Statement motivating the alternative development location within the overall site.	79
17	Description of the process undertaken to identify, assess & rank the impacts & risks the activity will impose on the preferred site through the life of the activity.	79
17.1	Description of all environmental issues and risks that were identified during the environmental impact assessment process.	79
17.2	Assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures	80
17.3	Assessment of each identified potentially significant impact and risk	81
17.4	Summary of specialist reports.....	87
18	Environmental impact statement	88
18.1	Summary of the key findings of the environmental impact assessment.....	88
18.2	Final Site Map.....	89
18.3	Proposed impact management objectives and the impact management outcomes for inclusion in the EMP;.....	89
18.3.1	Impact Management objectives are as follows:	90
18.3.2	Impact Management outcomes are as follows:.....	90
18.4	Final proposed alternatives.	90

19	Aspects for inclusion as conditions of Authorisation.	90
20	Description of any assumptions, uncertainties and gaps in knowledge.	90
21	Reasoned opinion as to whether the proposed activity should or should not be authorised.....	91
21.1	Reasons why the activity should be authorized or not.....	91
21.2	Conditions that must be included in the authorization.....	91
21.2.1	Specific conditions to be included into the compilation and approval of EMPr.....	91
21.2.2	Rehabilitation requirements.....	91
22	Period for which the Environmental Authorisation is required.	91
23	Undertaking	91
24	Financial Provision	92
24.1	Explain how the aforesaid amount was derived.....	92
24.2	Confirm that this amount can be provided for from operating expenditure.....	92
25	Deviations from the approved scoping report and plan of study.	92
25.1	Deviations from the methodology used in determining the significance of potential environmental impacts and risks.	92
25.2	Motivation for the deviation.....	92
26	Other Information required by the competent Authority.....	92
26.1	Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998). The EIA report must include the:-	92
26.1.1	Impact on the socio-economic conditions of any directly affected person.	92
26.1.2	Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act.	93
27	Other matters required in terms of sections 24(4)(a) and (b) of the Act.....	93
28	Details of the EAP,	94
29	Description of the Aspects of the Activity	94
30	Composite Map.....	94
31	Description of Impact management objectives including management statements.....	94
31.1	Determination of closure objectives.....	94
31.2	The process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity.....	95
31.3	Potential risk of Acid Mine Drainage.	95
31.4	Steps taken to investigate, assess, and evaluate the impact of acid mine drainage.	95
31.5	Engineering or mine design solutions to be implemented to avoid or remedy acid mine drainage.....	95
31.6	Measures that will be put in place to remedy any residual or cumulative impact that may result from acid mine drainage.	95

31.7	Volumes and rate of water use required for the mining, trenching or bulk sampling operation.	95
31.8	Has a water use licence has been applied for?	95
32	Impacts to be mitigated in their respective phases	96
33	Impact Management Outcomes	107
34	Impact Management Actions	114
34.1	Topsoil	114
34.2	Domestic and Industrial Waste	115
34.2.1	Policy : Fuels / Lubricant Management	115
34.2.2	Workshop	116
34.2.3	Emergency repairs on site:	116
34.2.4	Domestic Waste	117
34.2.5	Sewage plant location, design and capacity	118
34.2.6	Potable Water	118
34.3	Rehabilitation methodology	118
34.3.1	Excavation rehabilitation:	118
34.3.2	Coarse tailings dumps and other residual post mining dumps	120
34.3.3	Fine Tailings Dumps	121
34.4	No Go areas	122
34.5	Archaeological Impact Management	122
35	Financial Provision	123
35.1	Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under Reg 22(2)(d).	123
35.2	Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.	124
35.3	Rehabilitation plan describing and showing the scale and aerial extent of the main mining activities and the anticipated mining area at the time of closure	124
35.4	Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives	124
35.5	Confirm financial provision will be provided as determined	124
36	Mechanisms for monitoring compliance and performance assessment.	124
36.1	Components, Principles and Roles of Monitoring System	124
36.2	Table showing monitoring actions per impact	126
37	Indicate the frequency of the submission of the performance assessment report.....	141
38	Environmental Awareness Plan	141
38.1	Visitor Environmental Awareness:	141
38.2	Senior and Middle Management Environmental Awareness:	141
38.3	Operator / Workforce Environmental Awareness:	142
38.4	Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.	143

38.5	Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.	143
39	Specific information required by the Competent Authority	143
40	UNDERTAKING	144

List of Figures:

Figure 1: Locality Plan	4
Figure 2: Detail Locality.....	5
Figure 3: Map showing Mining Sections at Oena Diamond Mine	6
Figure 4: Mine design map Oena Section	11
Figure 5: Overview of Mine design map Sandberg Section	12
Figure 6: Overview of proposed Mine Plan for the Blokwerf Sections.....	13
Figure 7: Diamond Processing (Source Wadala Mining and Consulting, 2018).....	18
Figure 8: Logistical Facility Area	19
Figure 9: Soil type distribution.....	52
Figure 10: Drainage (on land use).....	59
Figure 11: Rehabilitation methodology: Residual excavations which do not daylight at lower contour	119
Figure 12: Rehabilitation methodology: Residual excavations which do daylight at lower contour .	119
Figure 13: Fine tailings dam containment walls	121
Figure 14: Proposed geosite development guideline	123

List of Photos:

Photo 1: Current backfilling in the Oena East section. Backfilling has progressed extremely well with material obtained from reprocessing of existing main plant dump.	14
Photo 2: Walking on backfilled excavation in the Oena East Mine block.....	15
Photo 3: View of the main coarse waste rock dump from the top of the Barker pothole site	16
Photo 4: The static plant located on top of the main coarse waste rock stockpile (with recovery plant on the right)	16
Photo 5: The current 3 x 16ft pans depositing fine tailings into the Oena Fine Tailings Dam.....	17
Photo 6: The recently established plant at Blokwerf with 1 x 16ft pan at present	17
Photo 7: Selected photos of the status of facilities at Oena. Workshop and diesel tank above and accommodation in two lower photos.....	20
Photo 8: Looking west over the Sandberg Section showing the jagged mountainous topography on either side of the relatively narrow Orange River valley floor in which the proto and meso- terraces are located.	50
Photo 9: Looking down at the Blokwerf South Fine Tailings Dam. Note that the breach has been cleared.	60
Photo 10: Looking up the valley in the western end of Sandberg where previous processing and in field screening plants were located. Some work as described in the text is required to finally shape the site and rehabilitate old unconfined fine tailings run-off.....	60
Photo 11: Drip trays in position at the equipment parking bay	117
Photo 12: Backfilled and shaped excavation (and dump area) in the west of Oena.....	120
Photo 13: The far western waste rock dump, partially shaped and rehabilitated. The foreground dumps must be levelled or used as backfill for adjacent pits when applicable	120
Photo 14: Newly constructed Fine Tailings Dam wall for the Oena Main Plant.....	121
Photo 15: the Barker pothole swept clean. The photo does not do justice to the scale of this area	122

List of Appendices:

- Appendix 1: Declaration and CV of EAP
- Appendix 2: Background to the site & History of Mining and Prospecting to date
- Appendix 3: Current Disturbances and Rehabilitation requirements (Figures and Tables)
- Appendix 4: Copy of all correspondence Sent (Including Newspaper adverts x 2, Posters x6)
- Appendix 5: Archaeological Impact Assessment
- Appendix 6: Copy of all correspondence received
- Appendix 7: Recommended course content: Environmental Induction Training

List of Abbreviations:

- CBA Critical Biodiversity Area
- DMR Department of Mineral Resources
- EAP Environmental Assessment Practitioner
- EMP Environmental Management Programme
- HWC Heritage: Western Cape
- I&AP Interested and Affected Party
- MWP Mining Work Programme
- ngl Natural Ground Level
- NID Notification of Intent to Develop
- POD Public Open Day
- SDF Spatial Development Framework
- SLP Social and Labour Plan

IMPORTANT NOTICE

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

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

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

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or a 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 ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The objective of the environmental impact assessment process is to, through a consultative process—

- (a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
- (b) Describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;

- (c) Identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
- (d) Determine the—
 - (i) Nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
 - (ii) Degree to which these impacts—
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources, and
 - (cc) can be avoided, managed or mitigated;
- (e) Identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;
- (f) Identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;
- (g) Identify suitable measures to manage, avoid or mitigate identified impacts; and
- (h) Identify residual risks that need to be managed and monitored.

PART A: SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

1 Contact Person and correspondence address

1.1 Details of the EAP

Name of the Practitioner: Craig Donald – Site Plan Consulting

Tel No: 021 854 4260

Fax No: 021 854 4321

E-mail address: craig@siteplan.co.za

1.2 Expertise of the EAP.

- (1) The qualifications of the EAP (with evidence).
- (2) Summary of the EAP's past experience. (In carrying out the Environmental Impact Assessment Procedure)

Refer CV attached as Appendix 1.

2 Description of the property.

Farm Name:	Farm 18 (Namaqualand RD)
Application area (Ha)	±8 800ha
Magisterial district:	Namaqualand
Distance / direction from nearest town	Sendelingsdrift is located 25km west by road via the "Halfmens Pass".
Surveyor General Code	C05300000000001800000

3 Locality map

(Show nearest town, scale not smaller than 1:250000).

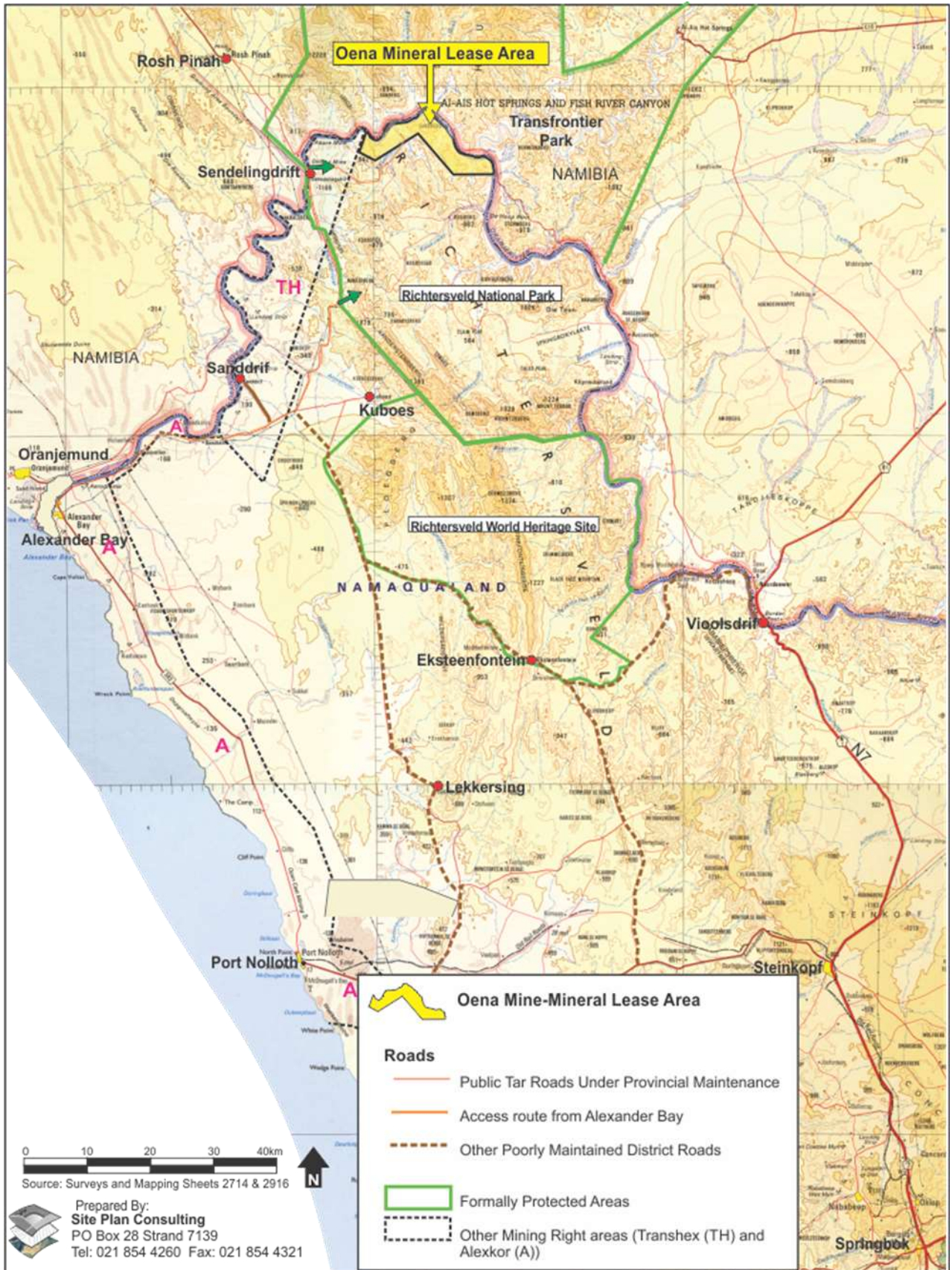


Figure 1: Locality Plan

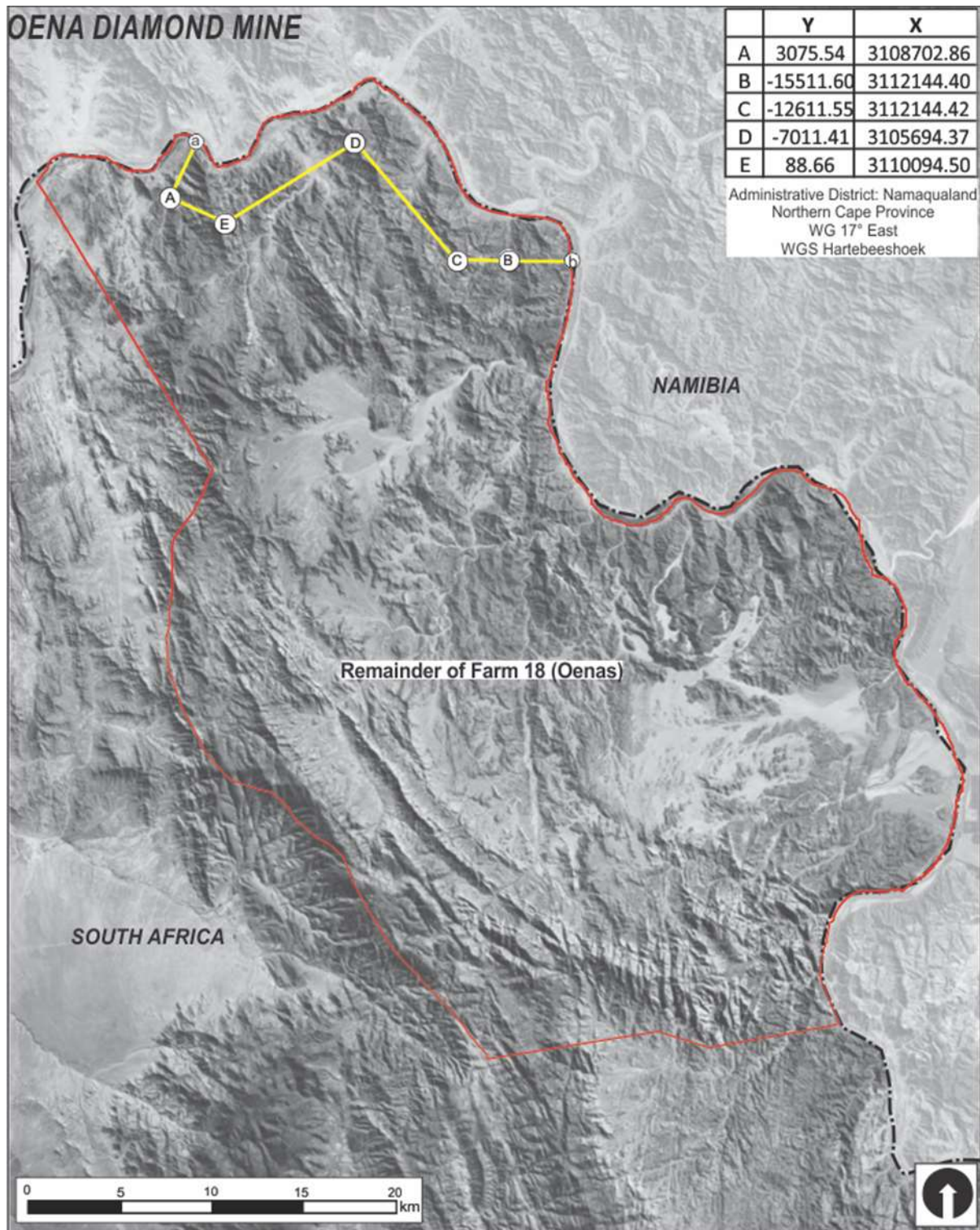


Figure 2: Detail Locality



Figure 3: Map showing Mining Sections at Oena Diamond Mine

4 Description of the scope of the proposed overall activity.

4.1 Benefits of the operation

The mine holds the following benefits:

Environmentally, the further mining of this site provides benefits in that:

- The applicant maintains portion of the 4x4 road which leads to the larger Richtersveld area that is visited by many tourists each year.
- The applicant's security personnel have a close working relationship with the Parks board officials and Police in that they report illegal game hunting, cross border trafficking and reckless driving in environmentally sensitive areas.

Socially and Economically, the continuation of this project provides the following benefits (as described fully in the Social and Labour Plan submitted with the Conversion application and updated from time to time):

- Direct employment of 20-40 people when in full production.
- Indirect benefit of 200 – 300 local people.
- Provide on a daily and weekly basis help to the local herders with transport, food from town, transport of sick people etc.

4.2 Major Environmental Findings

The mining lease area is located within the Ai-Ais-Richtersveld Transfrontier Conservation Park. There are 3 zones of distinct topographical, vegetation & faunal dissimilarity that run semi-parallel to the Orange River. They are, from the Orange River:

- The riparian edge / flood plain of the Orange River. This consists of silty flood deposited soils and probably contains more than 99% of the vegetation and animal life in the mining lease area. This area is not to be disturbed by the proposed operations.
- The remainder of the Orange River valley consists of barren (in terms of vegetation and animal life) alluvial gravel deposits. This is the area where mining will take place.
- The mountainous barely accessible hinterland of the Northern Richtersveld. This area will not be disturbed by proposed activities.

The operational and residual impacts of the proposed mining programme are summarised below for each of the environmental aspects.

- Topography: The largest impact and will result from the:
 - Extension of existing plant coarse tailings dumps and fine tailings dumps. These will however have their edges rounded to mimic natural contours. At the time of application, the applicant is busy processing some of the material in this dump and backfilling the residue in Oena East excavations.
 - The excavations will be backfilled with oversize and overburden. This will account for 80% of the excavation volume and will result in 20% residual excavation volume to be shaped during operational rehabilitation.

- Soils: Topsoil is sparse and indeed unavailable on the exposed meso gravels. Where topsoil is available, it will be removed for use as later cover material during rehabilitation.
- Land Capability and Land Use: The mining area will still be available for grazing by goats. The grazing takes place in the riparian edge and there is no “mixing” of mining and grazing. The closure objective of the operation is to return the area as a wilderness area with possible partial retention of the logistical facility area as Park infrastructure (campsite or administration), if so required by the Park management.
- Vegetation: As discussed above, all vegetation is located within the riparian edge which will not be disturbed by mining. The only activity required is the location and use of pump stations to supply domestic and process water.
- Animal Life: All located within the riparian edge and they will not be disturbed by the proposed operation
- Surface Water:
 - The 1:100 year flood line has been demarcated on the enclosed figures through on-site assessment and recording of the silt edges on the ground. No activity will be permitted on these silts and as such no impact in this regard will occur
 - Surface water quality could be compromised by potential oil/fuel leaks. This will however be prevented by the implementation of the fuel / oil handling policy to be defined in the EMP.
 - The operation requires the abstraction of 208 000m³ of water per year at full production.
- Dust and Noise: Need only be controlled to prevent impact on the employees. There will be no impact on surrounding land users or uses.
- Archaeology and Cultural heritage:
 - The Barker Pothole is a historical mining of a particularly rich diamond trap site. The bedrock has been swept clean over a large area and it is proposed to register the site as a geosite. Boardwalks, signage and viewpoints are proposed and the site will form an added attraction to the Park.
 - Full AIA has been conducted by UCT. Attached as Appendix 5

It is clear that, provided the rehabilitation measures as proposed in this document are implemented, the overall operational and residual impact of the operation will be minimal.

4.3 Description of the activities to be undertaken

Refer Appendix 2 for a description of Background to Mining and Prospecting on the site. This following section contains a broad overview of future mining and processing on the site with further detail contained in the Mining Work Programme lodged with the application. Current disturbances are shown in table and figure form in Appendix 3.

4.4 The Mine Plan

4.4.1 Future Prospecting and Mining per Mining Section

OENA:

- i. Mining: consists of continued mining of Oena blocks 1 – 8 as shown in figure 4 and processing at Oena main plant.
- ii. Processing of material: will take place at the Oena main plant. No other washing plants are planned for this area
- iii. Washing Plant residue:
 - a. Coarse Tailings: will be dumped as an extension to the (past &) existing coarse tailings dump south of the plant towards the hillslope to the south i.e. no further northward expansion of that dump
 - b. Continued disposal of fine tailings into the upgraded fine tailings dam west of the plant.

SANDBERG SECTION:

- Refer to figure 5 for proposed extent of mining. Figure 5 shows the maximum likely extent of possible gravels. The area to actually be mined may be reduced through more detailed mine prospecting, ahead of mining.
- A detail drilling program was done during 2008 over the entire Sandberg section.
- Plant establishment adjacent to Bradis pit. Plant residue will be used to backfill the Bradis pit

BLOKWERF SECTION

- Refer figure 6 for proposed extent of mining. Figure 6 shows the maximum extent of possible gravels. The area to actually be mined may be reduced through more detailed mine prospecting ahead of mining.
- Assessment of the results of bulk sampling programme at Blokwerf south and Blokwerf central.
- Drilling to establish extent of “Deep” channel gravels in the Blokwerf north section. Such drilling has not yet been scheduled.
- New plant has been established at Blokwerf south, with fine residue being used to fill FTD to the SW
- Possible future plant in Blokwerf Central with new Fine Tailings Dam as shown in figure 6

VISRIVIER SECTION

- Conduct surface mapping of terraces in light of the information gained from (especially) the Blokwerf bulk sampling
- Conduct drilling to determine extent and nature of gravel deposits
- Conduct prospecting bulk sampling with prospecting plant in Visrivier terrace area (or alternatively transport concentrate (after infield screening) to be processed at a future Blokwerf plant.

KABIES SECTION

- Conduct surface mapping of terraces
- Conduct drilling to determine extent and nature of gravel deposits
- Conduct prospecting bulk sampling with prospecting plant in Visrivier terrace area (or alternatively transport concentrate (after infield screening) to be processed at a future Blokwerf plant.

4.4.2 Estimated Reserves and Lifespan

The following resource statement is sourced from the Mining Work Programme compiled by Wadala Mining and Consulting (2018)

Locality	Block		Indicated Resource			Inferred Resource			Total		
			Gravel			Gravel			Gravel		
			(t)	ct/100t	ct	(t)	ct/100t	ct	(t)	ct/100t	ct
Oena Mine	1	Meso									
	2	Meso	118 000	0.15	177				118 000	0.15	177
	3	Meso	84 424	0.15	127				84 424	0.15	127
	4	Meso	110 147	0.15	165				110 147	0.15	165
	5	Meso	210 335	0.15	316				210 335	0.15	316
	6	Meso	953 032	0.15	1 430				953 032	0.15	1 430
	7	Meso	1 212 238	0.15	1 818				1 212 238	0.15	1 818
	8	Proto	146 016	0.15	219				146 016	0.15	219
	9A	Tailings				3 000 000	0.10	3 000	3 000 000	0.1	3 000
9B	Tailings				2 000 000	0.08	1 600	2 000 000	0.08	1 600	
Sub Total: Oena			2 834 192	0.15	4 251	5 000 000	0.09	4 600	7 834 192	0.12	8 851
Sandberg	10	Basal				3 361 568	0.12	4 034	3 361 568	0.12	4 034
	11	Sus-pended				10 304 404	0.12	12 365	10 304 404	0.12	12 365
Sub Total: Sandberg						13 665 972	0.12	16 399	13 665 972	0.12	16 399
Blokwerf	12	Upper				7 300 000	0.12	8 760	7 300 000	0.12	8 760
	13	Lower				7 600 000	0.12	9 120	7 600 000	0.12	9 120
Sub Total: Blokwerf						14 900 000	0.12	17 880	14 900 000	0.12	17 880
Grand Total			2 834 192	0.15	4 251	33 565 972	0.12	38 879	36 400 164	0.12	43 130

The lifespan has been calculated to be 15 years based on following calculation:

Year	Production Volume (tons)	Recovery Grade (ct/100t)	Recovery (carats)	Total Material moved (tons)	Waste / Grizzly (tons)	Sand Screens (tons)	Tons through processing plant
1	800 400	0.2	1 601	800 400	320 160	120 060	360 180
2	2 401 200	0.2	4 802	2 401 200	960 480	360 180	1 080 540
3	2 401 200	0.2	4 802	2 401 200	960 480	360 180	1 080 540
4	2 401 200	0.2	4 802	2 401 200	960 480	360 180	1 080 540
5	2 401 200	0.2	4 802	2 401 200	960 480	360 180	1 080 540
6	2 401 200	0.2	4 802	2 401 200	960 480	360 180	1 080 540
7	2 401 200	0.2	4 802	2 401 200	960 480	360 180	1 080 540
8	2 401 200	0.2	4 802	2 401 200	960 480	360 180	1 080 540
9	2 401 200	0.2	4 802	2 401 200	960 480	360 180	1 080 540
10	2 401 200	0.2	4 802	2 401 200	960 480	360 180	1 080 540
11	2 401 200	0.2	4 802	2 401 200	960 480	360 180	1 080 540
12	2 401 200	0.18	4 322	2 401 200	960 480	360 180	1 080 540
13	2 401 200	0.16	3 842	2 401 200	960 480	360 180	1 080 540
14	2 401 200	0.16	3 842	2 401 200	960 480	360 180	1 080 540
15	2 401 200	0.16	3 842	2 401 200	960 480	360 180	1 080 540
TOTAL	34 417 200		65 473	34 417 200	13 766 880	5 162 580	15 487 740

Source: Mining Work Programme compiled by Wadala Mining and Consulting (2018)

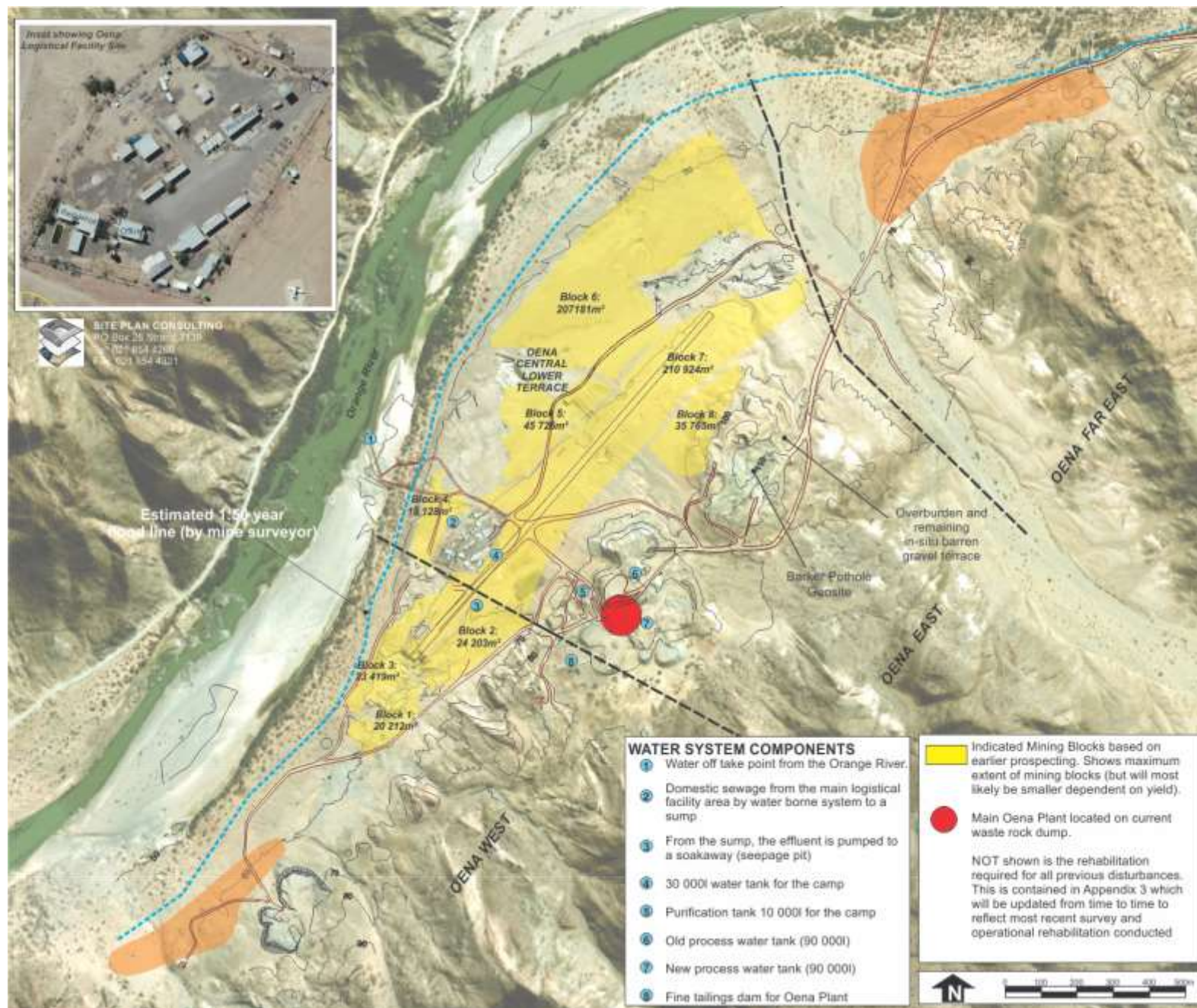


Figure 4: Mine design map Oena Section

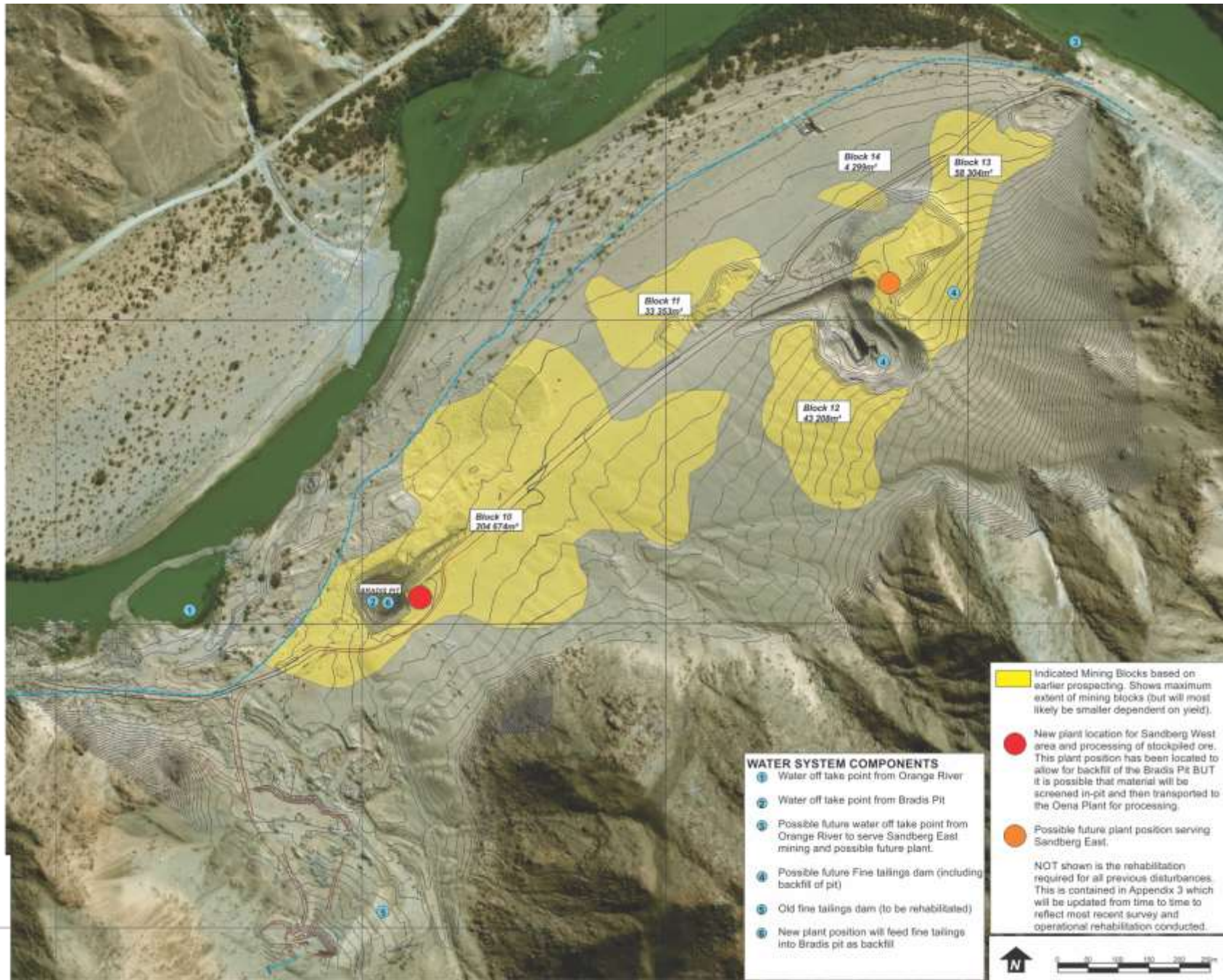


Figure 5: Overview of Mine design map Sandberg Section

4.4.3 Basic overview of the mining method

Mining takes place through:

1. Removal of topsoil
2. Removal and stockpiling (or immediate backfill) of overburden
3. Extraction/ Mining of in situ gravels and transport to the plant
4. Screening of gravels at the plant
5. Load all +25mm material at the plant to be transported back to the mining area for backfilling purposes ($\pm 55\%$)
6. Rehabilitation and backfilling is conducted according the principles of rehabilitation method to be outlined in the EMP

The overburden material to be removed consists of semi-consolidated and unconsolidated alluvial and Aeolian deposits, so no blasting is required. The material is removed by earthmoving equipment to haul trucks which remove the overburden to direct backfill of previously developed pits. The exposed gravels are removed by excavator. Note that the mining method therefore includes operational rehabilitation in the following components:

- Topsoil is removed prior to overburden removal. Topsoil is stockpiled along the excavation and when backfilling occurs in future, it is spread as a top layer.
- The overburden is transported directly to existing excavations as backfill.

The following procedure will be followed in terms of backfilling and rehabilitation:

The coarse gravel sifted at the grizzly screen, tailings from the pans and fine concentrate will be transported back to and dumped into open Block. During this process of backfilling, variation in the dumping sequence of different sized materials will be followed to ensure better compaction and stability of the reclaimed gravel. This will ensure that the voids surrounding the coarse gravel will be filled up with finer sediments. Compaction will be achieved through the movement of heavy vehicles over the area during the backfilling stage.



Photo 1: Current backfilling in the Oena East section. Backfilling has progressed extremely well with material obtained from reprocessing of existing main plant dump.

The mining sequence will be followed until the last block is reached. Topsoil stored at the beginning of the mining operation will now be utilized for the final rehabilitation of the last block.



Photo 2: Walking on backfilled excavation in the Oena East Mine block

African Star Minerals Pty Ltd and appointed contractors will utilise heavy duty mining equipment (yellow fleet) for the mining and processing and will include excavators, Front-end loaders, dump trucks, mobile screen with a combined value in excess of R25 million. Workshop equipment and tools to be used consist of secured container stores containing grease pumps, rigger chains, hydraulic jacks, air compressors, electric testers, welders, grinders, socket sets, gas sets, magnetic drills, hydraulic test instruments, tools, spanners and tool boxes.

4.5 Processing Method

The amount of material that will be moved from year two onwards amounts to 2 401 200 tons per annum for a full year of production. A large quantity (approximately 40%) will be removed as overburden or screened out at the grizzly and sand screens amounting to approximately 1 113 200 tons per annum for a full year of production with 1 080 540 tons being processed in the plants.

Equipment that will be utilised in the processing plant include:

- 1 Mobile or Static screen
- 4 x 16ft rotary pan plants with de-watering screens (might be increased to 6 pans)
- Recovery Plant
- Sand Screens
- 2 x Front end loaders for the feeding of the plant conveyors
- 4 X Scrubber Plants

Additional equipment that may be used, include:

- Tipping bin and conveyors for gravel reclamation;
- Tipping bins and feeding conveyors for each washing pan;

- Water Pumps, Water tanks with stands, Water pipes
- Concentrate conveyors;
- Electricity cables.
- Bins for Concentrate
- 2 x 450 Kva Generator Sets

An estimated 1 601 carats will be produced during year 1 of the operation and will increase to an estimated 4 802 carats for a full year of production which will be sold by tender to the highest bidder.

The waste rock will be transported back into the excavations. The waste from the plant (tailings) after the dewatering process as well as the +25mm product will also be transported back to the excavations as part of the rehabilitation process. The dewatered product will be pumped to slimes dams where it will be stored until it has dried out.



Photo 3: View of the main coarse waste rock dump from the top of the Barker pothole site



Photo 4: The static plant located on top of the main coarse waste rock stockpile (with recovery plant on the right)



Photo 5: The current 3 x 16ft pans depositing fine tailings into the Oena Fine Tailings Dam



Photo 6: The recently established plant at Blokwerf with 1 x 16ft pan at present

The following process is copied from the Mining Work Programme compiled by Wadala Mining and Consulting, 2018 (slightly adapted).

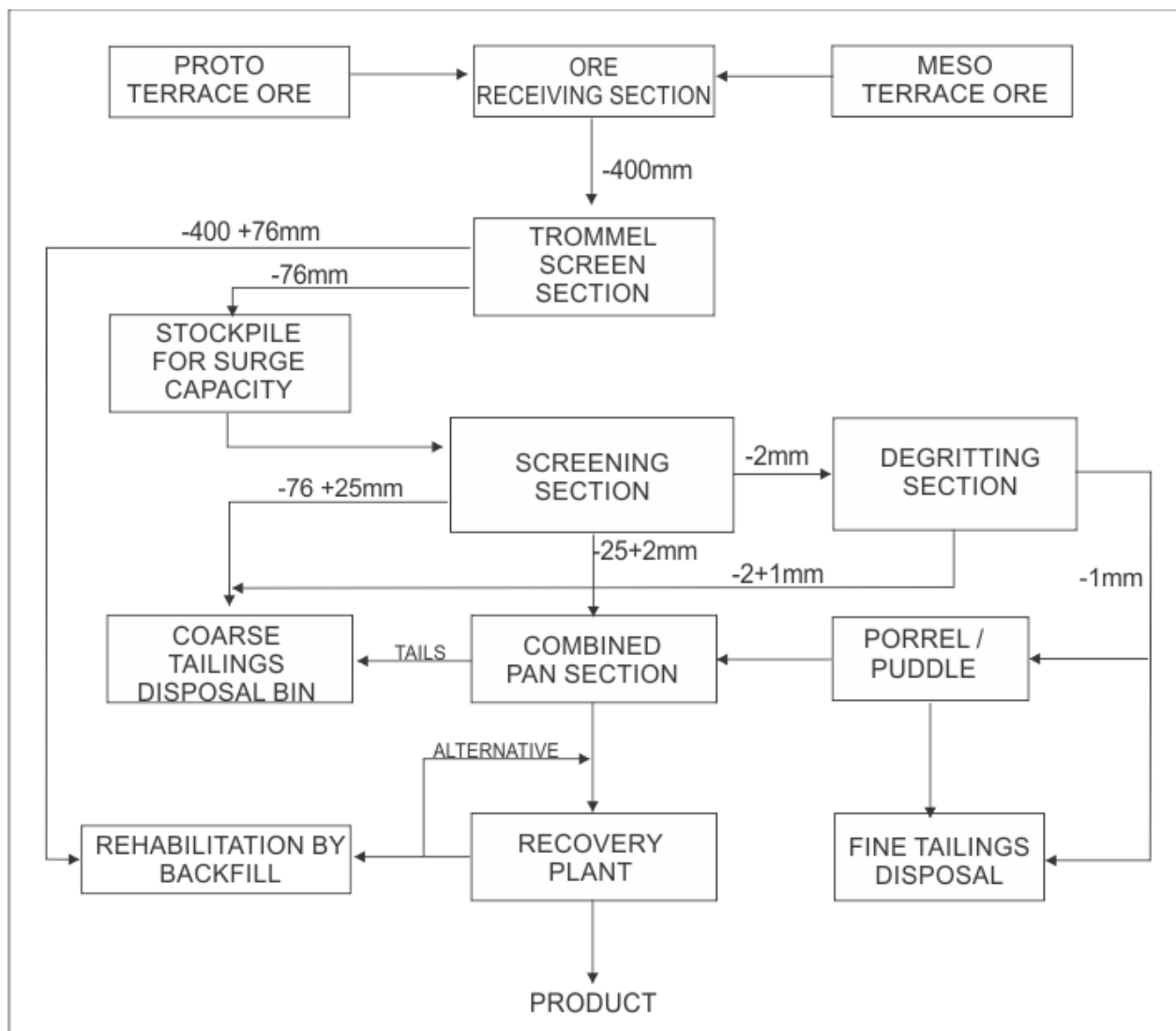


Figure 7: Diamond Processing (Source Wadala Mining and Consulting, 2018)

4.6 Logistical Facilities and Accommodation

The main logistical facility area is located in the Oena Central area (as per figure 4) and contains the workshop, diesel storage, security, accommodation, kitchen and recreational facilities and residences.

The office/workshop/accommodation area is supplied with soakaways. Domestic sewage from the main logistical facility area and accommodation is fed by water-borne sewage system to a sump (located on the northern side of the facility area) – Refer Figure 4. From the sump, the effluent is pumped to a soakaway (seepage pit) located on the southern side of the airstrip.

Portable chemical toilets must be provided at the working areas for plant operators and earthmoving staff.

There is a water purification plant near the main plant (refer figure 4) feeding water to the drinking water tanks (30 000l) at the logistical facility area.



Figure 8: Logistical Facility Area

The photos below show the standard of the structures currently in place:



Photo 7: Selected photos of the status of facilities at Oena. Workshop and diesel tank above and accommodation in two lower photos

4.7 Detail of Water Offtake Points

Figure 4, 5 and 6 show the proposed water off-take points for each mining section. It is important to note that these are largely still subject to WULA yet to be finalised.

4.8 Existing and Future Fine Tailings Handling

The fine tailings are pumped to the fine tailings dams and all dams must be developed and maintained in accordance with the Chamber of Mines Code of Practice for Mine Residue

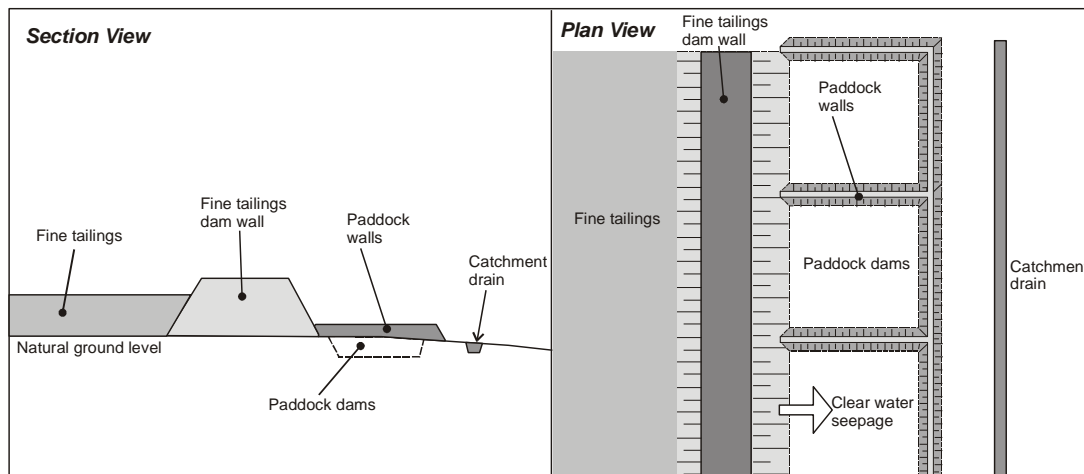
Deposits. The following fine tailings dam paddock and wall management plans are proposed / implemented:

Oena Fine Tailings Dam This is the main fine tailings dam and is located at the main Oena plant. The upgrade of this dam requires/ required the following actions:

- Construction of the dam wall to the north - completed. Note that holders are currently (Oct 2018) construction a second wall, south of the existing wall.
- Provision of paddock dams below the wall to capture any water which may seep through the walls. Recycled water will be pumped from these paddocks – the lower dam (i.e) between the northern and southern walls can serve this function
- Finally provision of a cut off drain leading to a sump.

It is suggested that coarse tailings **not** be dumped over the leading edge of the fine tailings dam wall as it would prevent the checking of the dam wall for signs of piping (or other signs of instability) as required in terms of the Code of Practice.

The fine tailings dams containment walls and paddock structures must be developed as follows:



Discontinued Fine Tailings Dam at the Sandberg site:

At this site the fine tailings were not properly confined by a fine tailings dam wall or berm which caused tailings to flow without restraint. In addition, an erosion donga formed to the south east on the dam. Such donga requires rehabilitation. The following rehabilitation measures are proposed:

- Removal of fine tailings in the stream course in the NE to fill the erosion donga
- Construct coarse tailings berm to 300mm high along the eastern extent of the fine tailings dam to prevent silt erosion into the stream channel.
- The tailings are to be covered with coarse tailings. This will result in a deflation surface type topography, typical of the gravel terraces and prevent the development of windblown dust plumes.

Existing Fine Tailings Dam at Blokwerf South: Previously handled the Fine Tailings of the washing plant that has been removed from that site. The fine tailings dam was once

again uncontained and the fine tailings did spill (2009) into the flood channel of the Orange River. In the 208 visit there was no evidence of these fine tailings. It must be remembered that in the event of an Orange River flood episode washing away these fine tailings, the impact on the system would be negligible given:

- The high ambient silt load of a flooding Orange River and
- The fine tailings are inert and are made up of exactly the same material as the Orange River silts below it.

Be that as it may, the following measures must be implemented for the proposed extension to the SW:

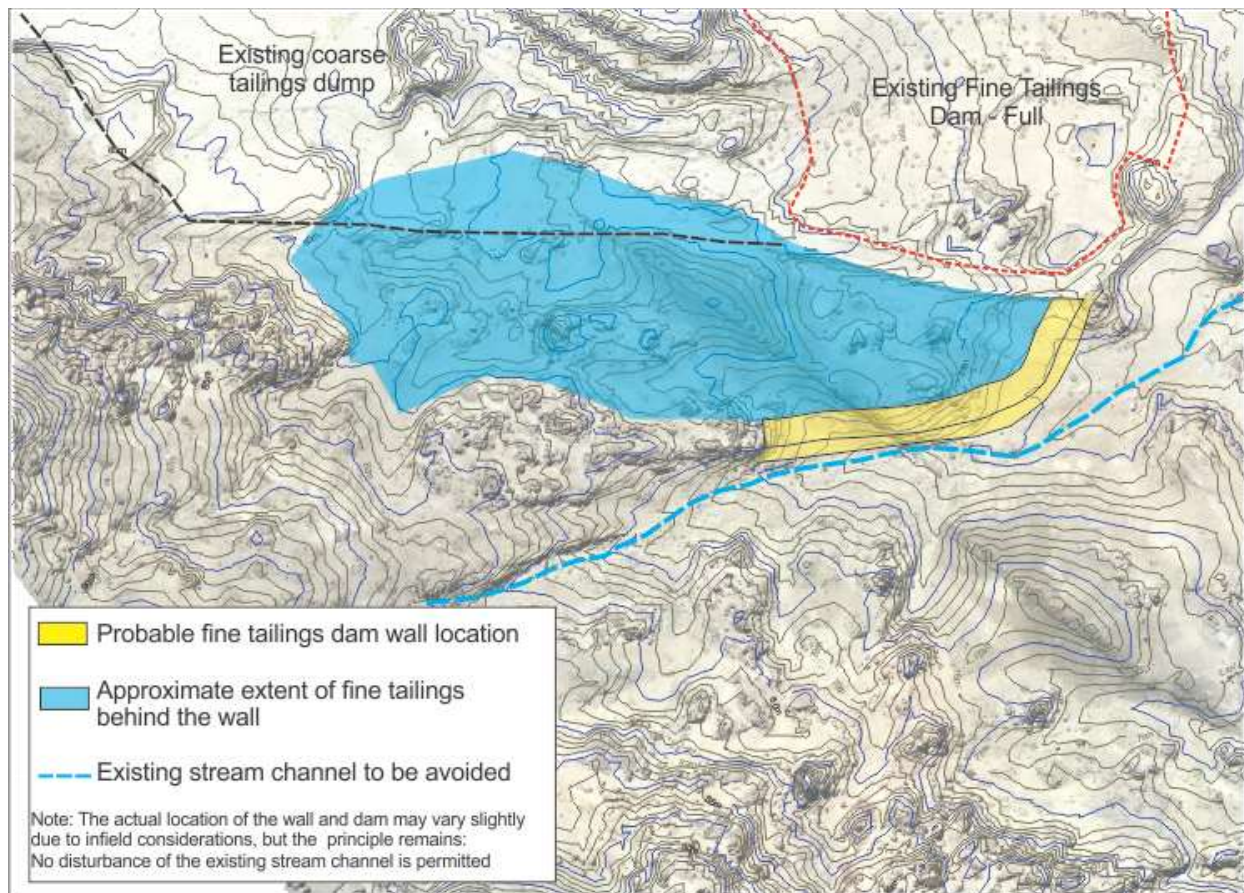
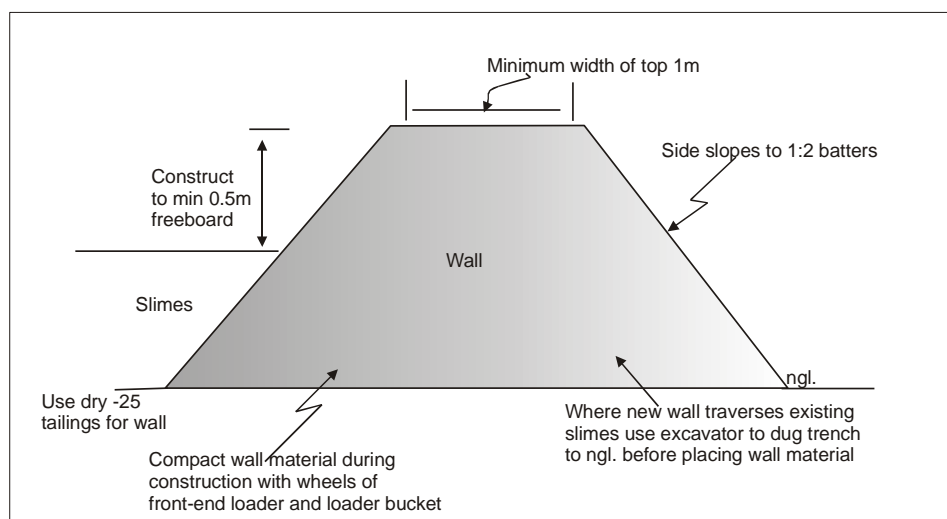


Figure 9: Approximate site and extent of Blokwerf South Fine Tailings Dam

The following is required for all new fine tailings dam's walls:

- Construct slimes dam wall to the following cross section dimensions.
- Align wall to contain area as shown below



5 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 (attached as **Appendix 3**). Refer also Fig 4-6 above for copies.

In order to determine listed activities, cognisance must normally be taken of location of national parks and formally protected areas, CBA's, Endangered Vegetation Types. Note that this operation takes place within a National Park.

Note also that in the table below, all activities have been included in the list so that they can be properly earmarked as listed activities.

NAME OF ACTIVITY	Aerial extent of Activity (Ha or m ²)	LISTED ACTIVITY (Mark with an X where applicable or affected)	APPLICABLE LISTING NOTICE (<i>GNR 983, GNR 984 or GNR 985 (as amended in 2017)</i>)	WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X)
Section 102 Application: EMP update over approved Mining Right area: 8 800ha.	8 800ha	X ¹	GNR984: Activity # 17	
1. ESTABLISHMENT ACTIVITIES	There is no establishment phase. All facilities are in place at this operational mine. However, the following activities/ facilities must be put in place to reduce / eliminate impacts. Also note that processing plants may be established in locations as shown in Figures4-6			
1.1. Access road is already in place and approved in terms of earlier EMP.		X	GNR 985: Activity # 4	

¹ Whilst Section 102 application is not specifically listed as a listed activity, it will result in a Mining Right being granted over an area if approved. As a result such listed activity has been included.

NAME OF ACTIVITY	Aerial extent of Activity (Ha or m ²)	LISTED ACTIVITY (Mark with an X where applicable or affected)	APPLICABLE LISTING NOTICE (GNR 983, GNR 984 or GNR 985 (as amended in 2017))	WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X)
1.2. All haul roads and on-site roads are already in place but will be included as a listed activity in any event.		X	GNR 985: Activity # 4	
1.3. All offices and admin building are already in place				
1.4. Workshop is already in place				
1.5. Fuel Tanks are already in place. Storage Capacity 48kl		X	GNR985: Activity #10	
1.6. Points 1.3 and 1.4 include personnel amenities to septic tank and then French drain				
1.7. Airstrip (1km long) in place		X	GNR 985: Activity # 7	
1.8. Processing plant. The main plant is located in the Oena Section with a new 16ft pan plant at Blokwerf South but additional plants may be developed later at other Sections		X	GNR984: Activity # 17	
1.9. Ensure domestic and industrial waste management system is in place				
2. OPERATIONAL PHASE ACTIVITIES				
<p>The exact footprint of mining in alluvial diamond bearing gravels is impossible to accurately determine. However, geological surveys conducted at Oena Section, Sandberg Section and Blokwerf Section has shown "Potential Resource diamondiferous gravels". The proposed mine plan is based on those polygons in their entirety, although future mining may show some areas to be barren.</p>				

NAME OF ACTIVITY	Aerial extent of Activity (Ha or m ²)	LISTED ACTIVITY (Mark with an X where applicable or affected)	APPLICABLE LISTING NOTICE (<i>GNR 983, GNR 984 or GNR 985 (as amended in 2017)</i>)	WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X)
2.1. Topsoil removal to perimeter stockpile. Total area available for potential future mining according to prospecting results as follows: <ul style="list-style-type: none"> - Oena Blocks 1-8 = 58.5ha - Sandberg 10-14 = 34.4ha - Blokwerf Gravels = Total 252ha (assume conservative 25% suitable based on Oena and Sandberg polygons) = 63ha. Visrivier and Kabies Section programmed for prospecting. The proposed excavation extension area is located in a Formal Protected Area (National Park) and must be considered a CBA.	Min 155.9ha	X	GNR 984: Activity # 15 ² GNR 985: Activity # 12 ³	
2.2. Clearing of overburden as backfill to previously mined area		X	GNR983: Activity # 19 ⁴	
2.3. In pit screening of material (may apply) and all +25mm returned as backfill			GNR984: Activity # 17	
2.4. Backfilled excavations to be covered with previously stockpiled topsoil				
2.5. Hauling of gravel to plant for processing.				
2.6. Processing of material to obtain diamonds. Note that existing plant is located in Oena Section. Processing plant locations are as shown in figures 4-6 for Oena, Sandberg and Blokwerf.			GNR984: Activity # 17 GNR983: Activity # 12	
2.7. Stockpiling of coarse waste from plant or return to pit as backfill	Unknown but to be minimised		May be backfilled	X
2.8. Stockpiling of fine tailings from plant	Unknown but to be minimised		May be backfilled	X

² This is included purely to acknowledge the fact that the site is located in a formally protected area / National Park. The proposed mining blocks are located on completely denuded gravel terraces and sand overburden and this listed activity has been included as a cautionary inclusion.

³ Even though no natural vegetation will be disturbed, the virgin surface of land will be disturbed within a protected area (CBA), by virtue of location within National Park and this listed activity has been included as a cautionary inclusion.

⁴ The listed activity has an exclusion that applies in the case of a Mining Permit and not a Mining Right. It appears that not mentioning the Mining Right is an omission from the listed activity, but the activity is listed here just in case. It is possible that small drainage channels may be impacted by future mining. The WULA consultant is reminded to determine if and then whether to include the possible alteration of stream banks and courses if the excavation do disturb the stream courses crossing the Orange River valley from the mountainous hinterland.

NAME OF ACTIVITY	Aerial extent of Activity (Ha or m²)	LISTED ACTIVITY (Mark with an X where applicable or affected)	APPLICABLE LISTING NOTICE <i>(GNR 983, GNR 984 or GNR 985 (as amended in 2017))</i>	WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X)
2.9. Use of water for processing of material at plant	WULA required ⁵ .			
Other OPERATIONAL ACTIVITIES				
2.10. Use of workshop				
2.11. Use of wash bay (if contemplated)				
2.12. Use of Refuelling Facility (48kl capacity on site)	48kl			
2.13. Use of access/delivery road to the site				
2.14. Water Use: WULA in place but inadequate for abstraction. Will require additional WULA.	Will require WULA			
3. OPERATIONAL NON – MINING REHABILITATION ACTIVITIES				
3.1. Maintain access/delivery road on site				
3.2. Domestic waste is transported by bakkie to Sendelingsdrift and handled in terms of that town's domestic waste management				
3.3. Enforce no-go area access				
3.4. Decontaminate floors and diesel tanks when required				
4. DECOMMISSIONING PHASE ACTIVITIES- Refer Appendix 4		X	GNR983: Activity # 22	
4.1. Complete backfilling of excavations with nearby material (when available) and cover with topsoil OR				
4.2. Shape excavation edges to 1:3 slope and topsoil				
4.3. Shape any remaining dumps as per EMP specification and cover with topsoil if available				
4.4. Demolish all unrequired structures				
4.5. Remove all process plant and steel structures				
4.6. Remove all protruding foundations and footings				
4.7. Remove all pipelines and cables				
4.8. Remove diesel tank & decontaminate				
4.9. Rip / scarify logistical facility area				
4.10. Retain access roads for future use				
5. AFTERCARE PERIOD				
5.1. Remove alien vegetation (if applicable)				

⁵ WULA consultant has been appointed – Wadala Mining and Consulting

NAME OF ACTIVITY	Aerial extent of Activity (Ha or m²)	LISTED ACTIVITY (Mark with an X where applicable or affected)	APPLICABLE LISTING NOTICE <i>(GNR 983, GNR 984 or GNR 985 (as amended in 2017))</i>	WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X)
5.2. Conduct final performance assessment				
5.3. Lodge closure Application				
5.4. DMR Grant Closure Application				

6 Description of the activities to be undertaken

Refer Para 5 and 6 above. The listed activities numbered above are as follows:

Environmental Impact Assessment Regulations, Listing Notice 1 of 2014 (Amended 2017)	
GNR983: Activity # 12	The development of—....(iv) dams, where the dam, including infrastructure and water surface area, exceeds 100 square meters in size;... a. within a watercourse; b. in front of a development setback; or c. if no development setback exists, within 32 meters of a watercourse, measured from the edge of a watercourse;....
GNR983: Activity # 19 ⁶	The infilling or depositing of any material of more than 10 cubic meters into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic meters from a watercourse..... but excluding where such infilling, depositing, dredging, excavation, removal or moving—falls within the ambit of activity 21 in this Notice, in which case that activity applies;
Environmental Impact Assessment Regulations, Listing Notice 2 of 2014 (Amended 2017)	
GNR 984: Activity # 15 ⁷	The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for— i. the undertaking of a linear activity; or ii. maintenance purposes undertaken in accordance with a maintenance management plan.

⁶ The listed activity has an exclusion that applies in the case of a Mining Permit and not a Mining Right. It appears that not mentioning the Mining Right is an omission from the listed activity, but the activity is listed here just in case. It is possible that small drainage channels may be impacted by future mining. The WULA consultant is reminded to determine if and then whether to include the possible alteration of stream banks and courses if the excavation do disturb the stream courses crossing the Orange River valley from the mountainous hinterland.

⁷ This is included purely to acknowledge the fact that the site is located in a formally protected area. The proposed mining blocks are located on completely denuded gravel terraces and sand overburden and this listed activity has been included as a cautionary inclusion.

<p>GNR984: Activity # 17</p>	<p>Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including—</p> <ul style="list-style-type: none"> a. associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or b. the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in this Notice applies.
<p>Environmental Impact Assessment Regulations, Listing Notice 3 of 2014 (Amended 2017) (as relevant for Northern Cape)</p>	
<p>GNR 985: Activity # 4</p>	<p>The development of a road wider than 4m with a reserve less than 13,5m.</p> <ul style="list-style-type: none"> i. <i>In an estuary;</i> ii. <i>Outside urban areas:</i> <ul style="list-style-type: none"> a) A protected area identified in terms of NEMPAA, excluding disturbed areas; b) National Protected Area Expansion Strategy Focus areas; c) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; d) Sites or areas identified in terms of an international convention; e) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; f) Core areas in biosphere reserves; g) Areas within 10km from national parks or world heritage sites or 5km from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas; or.....
<p>GNR 985: Activity # 7</p>	<p>The development of aircraft landing strips and runways 1.4km and shorter.....</p> <ul style="list-style-type: none"> ii. <i>Outside urban areas:</i> <ul style="list-style-type: none"> a) A protected area identified in terms of NEMPAA, excluding conservancies; b) National Protected Area Expansion Strategy Focus areas; c) World Heritage Sites; d) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; e) Sites or areas identified in terms of an international convention; f) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; g) Core areas in biosphere reserves; h) Areas within 10km from national parks or world heritage sites or 5km from any other protected area identified in terms of NEMPAA or from the core of a biosphere reserve; i) Areas seawards of the development setback line or within 1 kilometer from the high-water mark of the sea if no such development setback line is determined; or j) Areas within a watercourse or wetland; or within 100 meters from the edge of a watercourse or wetland; or...

<p>GNR985: Activity #10</p>	<p>The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30m³ but not exceeding 80m³....</p> <p>ii. <i>Areas within a watercourse or wetland; or within 100 meters from the edge of a watercourse or wetland;</i></p> <p>iii. <i>Outside urban areas:</i></p> <ul style="list-style-type: none"> a) A protected area identified in terms of NEMPAA, excluding conservancies; b) National Protected Area Expansion Strategy Focus areas; c) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; d) Sites or areas identified in terms of an international convention; e) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; f) Core areas in biosphere reserves; g) Areas within 10km from national parks or world heritage sites or 5km from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve; h) Areas seawards of the development setback line or within 1km from the high-water mark of the sea if no such development setback line is determined; or <p>(ii) Within 500m of an estuary; or....</p>
<p>GNR 985: Activity # 12⁸</p>	<p>The clearance of an area of 300 square meters or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan:</p> <ul style="list-style-type: none"> i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; ii. Within critical biodiversity areas identified in bioregional plans; iii. Within the littoral active zone or 100 meters inland from high water mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.

7 Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY / LEGISLATIVE
National Environmental Management Act	Entire document including public participation	Environmental Authorization from DMR as competent authority
Mineral and Petroleum Resources Development Act	Template for Scoping Report	DMR application and process

⁸ Even though no natural vegetation will be disturbed, the virgin surface of land will be disturbed within a protected area (CBA) and this listed activity has been included as a cautionary inclusion.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY / LEGISLATIVE
Municipality's SDF	Need & Desirability (Para 9)	End Use informant
National Water Act (<i>inter alia</i> S21)	14.1.8 and 14.1.9	Water Use Licence
Heritage Resources Act (S38)	23.1.2	Specialist study included
EMF	Need and Desirability (Para 9)	End Use Informant
EIA Guideline and Information Document Series' "Guideline on Need and Desirability"	Need and Desirability (Para 9)	Guideline for information utilized in this document
EIA Guideline 5 Assessing alternatives and impacts	Cumulative Impact Assessment (Para 9.2.1)	Guideline for information utilized in this document
NEMWA	EMP	The backfill of processed material does not require Waste Licence. BUT the fine tailings dam/dump and coarse waste rock dump do.

8 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).

The EIA Guideline and Information Document Series' "Guideline on Need and Desirability" dated 2017 has been used to consider this aspect.

Important: The actual mining takes place in the short term (relatively speaking) and as a result the need and desirability should not **only** focus on the actual mining phase of this site's lifespan but also concentrate on the long term / permanent post mining land use proposal. As background to the following paragraphs, the **proposed eventual land use is to eventually return the mined out and rehabilitated area as a part of the wilderness area in the Richtersveld National Park.**

Need refers to timing of a project whilst desirability is defined to consider the placing of the activity. An important point to remember when assessing the need and desirability of an existing mine, is that the need and desirability of such an operation has already been established given that the mine is still in operation as a profitable venture. If the mine was neither desirable nor required, such mine would have ceased operations.

The following tables are from the published 2017 Guideline on Need and Desirability.

8.1 Securing ecological sustainable development and use of natural resources

1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?		
1.1.	How were the following ecological integrity considerations taken into account:	
1.1.1.	Threatened Ecosystems	This site is located in a National Park on the banks / flood plain of the Orange River. Although the area cannot in isolation be called part of threatened ecosystem, it does fall within a National Park. As such it is critical that environmental management be kept up to the highest standard possible and that no residual impacts remain after mining.
1.1.2.	Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure	
1.1.3.	Critical Biodiversity Areas (“CBAs”) and Ecological Support Areas (“ESAs”),	
1.1.4.	Conservation targets.	
1.1.5.	Ecological drivers of the ecosystem.	
1.1.6.	Environmental Management Framework	The site is located in a National Park – a formally Protected Area
1.1.7.	Spatial Development Framework, and	The site is located in a National Park
1.1.8.	Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.).	This Park is actually a Transfrontier Park and extends northwards into Namibia.
1.2.	How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts	The continued / extended mining is unlikely to result in the loss of any biological diversity. Remember that all disturbances take place in areas completely devoid of vegetation (i.e. the windblown denuded proto and meso terraces) All mitigation and monitoring efforts aimed at minimising or preventing any negative impacts are as described in the text.
1.3.	How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	The only real risk of pollution to the site and surrounds is through hydrocarbon pollution. All mitigation and monitoring efforts aimed at minimising or preventing any negative impacts are addressed in the Hydrocarbon policy which forms part of this documentation.

1.4.	<p>What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?</p>	<p>Minimal waste is generated at this site. The waste which is generated is dispatched by “bakkie” to Sendelingsdrift for handling in terms of that town’s waste disposal.</p>
1.5.	<p>How will this development disturb or enhance landscapes and/or sites that constitute the nation’s cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?</p>	<p>The application has been subject to full heritage impact assessment – refer Appendix 5. The results and measures prescribed/ recommended in those documents have been included in this documentation.</p>
1.6.	<p>How will this development use and/or impact on non-renewable natural resources?</p> <p>What measures were explored to ensure responsible and equitable use of the resources?</p> <p>How have the consequences of the depletion of the non-renewable natural resources been considered?</p> <p>What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts?</p> <p>What measures were explored to enhance positive impacts?</p>	<p>The mine targets diamonds which are in human terms a non-renewable resource (although synthetic diamonds are now available, it appears that original diamonds are still in high demand).</p> <p>In terms of equitable use of the resource, the applicant has met all the legal requirements of the mining charter and in respect of responsible use of the resource, the application is subject to all Mineral and Environmental legislation and the public participation associated therewith. The application is subject to comment and input from several commenting authorities as well as specialist input in aspects of environment determined by public input and / or legislation.</p> <p>The consequences of depletion of non-renewable resource has been considered in the post mining land use. The impact is in any event insignificant.</p>
1.7.	<p>How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part?</p> <p>Will the use of the resources and/or impact on the ecosystem jeopardize the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds?</p> <p>What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources?</p> <p>What measures were taken to ensure responsible and equitable use of the resources?</p> <p>What measures were explored to enhance positive impacts?</p>	<p>Water is used from the Orange River in the processing of materials. Currently no recycling of this water takes place. Note that the Blokwerf plant has been constructed with a water recycling plant after the 16ft pan. This is expected to massively reduce water demand as water from the “Porrel” is recycled for use. However, at this stage it is not known what percentage of water savings will accrue.</p> <p>The volumes used are in any event, insignificant in relation to the water within the Orange River and the use does not pose any risk to that system.</p>

1.7.1.	Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialized growth)? (note: sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life)	This mining operation does not lower the dependency on use of resources to maintain economic growth. The resources it does use are diesel, water and labour. Waste generation is very low.
1.7.2.	Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources against a proposed development alternative?)	The opportunity cost is impact on natural resources within the National Park, with the more tangible opportunity cost being the revenue generated by tourism. The impact on natural resources is very low and will be zero in the long term provided all rehabilitation measures are implemented. Furthermore, it is highly unlikely that the presence of the Oena Diamond Mine dissuades any would be visitor to the park from visiting the Park.
1.7.3.	Do the proposed location, type and scale of development promote a reduced dependency on resources	No.
1.8.	How were a risk-averse and cautious approach applied in terms of ecological impacts	Yes. Impacts of mining have been subject to specialist input
1.8.1.	What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	None known.
1.8.2.	What is the level of risk associated with the limits of current knowledge?	In respect of the mining at this site, such risk has been reduced significantly by incorporation of rehabilitation methodology into the mine plan as an integral part of the process. The main perceived impacts have been subject of specialist to ensure the minimization and understand the risk associated with future mining.
1.8.3.	Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	See line item 1.8.2 above.
1.9.	How will the ecological impacts resulting from this development impact on people's environmental right in terms following:	
1.9.1.	Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	The negative impacts have been identified in part 13 of this document. Measures taken to avoid, minimise, manage and remedy negative impacts as well as monitoring are described under their relevant headings in this EIA/EMP.

1.9.2.	Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?	Proposed measures taken to enhance positive impacts are contained under the relevant headings in this EIA/EMP.
1.10.	Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socioeconomic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?	The impact on Socioeconomic and Heritage profile of the area is provided in Para 26.1.1 and 26.1.2 (in the case of Heritage).
1.11.	Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/ targets/ considerations of the area?	At this stage of the process, it is clear (based on past activities at the site) that if all rehabilitation takes place as proposed, that there will be no residual impact of any significance.
1.12.	Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?	The potential environmental impacts that were perceived to possibly be significantly impacted upon or about which insufficient information was available have been subjected to specialist study. All studies found that the mining of the site (within the prescriptions of the document) will not result in an impact significant enough to consider the no go option. It is unlikely that mining of any resource would result in the "best practicable environmental option" in terms of ecological considerations but it must be remembered that there are other considerations in respect of the socio-economic environment which also have a bearing.
1.13.	Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?	Cumulative impact has been described as insignificant on all aspects of the ecology (as described in para 8.3).

8.2 Promoting justifiable economic and social development

2.	Promoting justifiable economic and social development	
2.1.	What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?:	Refer also para 26.1.1
2.1.1.	The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks of policies applicable to the area,	The IDP targets economic growth but makes very little mention of mining in the Municipality. The proposed development meets targets of the IDP in that it does facilitate development as well as creating jobs (albeit very few and temporary of nature).
2.1.2.	Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.),	Not applicable
2.1.3.	Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and	Being located within a National Park, the mine could be considered a conflicting land use. But provided rehabilitation measures are applied, there is no reason why the mine cannot be fully integrated as part of the park in the future (post mining).

2.1.4.	Municipal Economic Development Strategy (“LED Strategy”).	The Municipality, along with many others, suffers from low employment rates and virtually any economic development has the potential for large multiplier effects.
2.2.	Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?	Refer Para 26.1.1
2.2.1.	Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?	The small scale, simple nature of and temporary nature of the proposed development does not lend itself to significant economic development or skills development. So although these factors will occur they will be relatively small. However having said that, all mining rights require the compilation of a Social and Labour Plan. Such document outlines skills development for staff and community members as well providing details on programmed corporate social responsibility.
2.3.	How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities	
2.4.	Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?	Any impact in this regard will be absolutely insignificant.
2.5.	In terms of location, describe how the placement of the proposed development will:	
2.5.1.	result in the creation of residential and employment opportunities in close proximity to or integrated with each other	NA
2.5.2.	reduce the need for transport of people and goods	NA
2.5.3.	result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport),	NA
2.5.4.	compliment other uses in the area,	Provided rehabilitation occurs as per the EMP, then the impact will be insignificant
2.5.5.	be in line with the planning for the area,	Provided rehabilitation occurs as per the EMP, then the impact will be insignificant
2.5.6.	for urban related development, make use of underutilised land available with the urban edge,	Not applicable
2.5.7.	optimise the use of existing resources and infrastructure	Not applicable.
2.5.8.	opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),	Not applicable
2.5.9.	discourage "urban sprawl" and contribute to compaction/densification,	Not applicable
2.5.10.	contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,	Not applicable
2.5.11.	encourage environmentally sustainable land development practices and processes	This is mining and although mining usually cannot encourage such sustainable land development practices and processes, in this case, it can be conducted in such a way as to minimise the impact on the environment through immediate backfill of mined out gravels.
2.5.12.	take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.),	Not applicable. This is a Mining Right.
2.5.13.	the investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential),	It may be argued that grazing / tourism at this site could provide socio-economic returns, but those pale into insignificance when compared with the mining’s economic potential. In addition, the proposed mining does not preclude post mining future use of the site for grazing.

2.5.14.	impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and	Full heritage impact assessment has been undertaken by specialist. Refer para 26.1.2 and Appendix 5.
2.5.15.	in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?	Not applicable.
2.6.	How were a risk-averse and cautious approach applied in terms of socio-economic impacts?	
2.6.1.	What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	None Known. Small scale of activity and the fact that mining has been taking place here since 1992, makes it unlikely that there any gaps in knowledge in respect of socio-economic impacts.
2.6.2.	What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?	There is no risk to these socio-economic aspects through the proposed mining at the site.
2.6.3.	Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	Not applicable.
2.7.	How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following	
2.7.1.	Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts	<p>The negative impacts have been identified in part 26.1.1 of this document. Measures taken to avoid, minimise, manage and remedy negative impacts are described under the relevant headings in this report.</p> <p>All mining rights require the compilation of a Social and Labour Plan. Such document outlines skills development for staff and community members as well providing details on programmed corporate social responsibility.</p>
2.7.2.	Positive impacts. What measures were taken to enhance positive impacts?	See line item 2.7.1 above
2.8.	Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socio-economic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	The impact on natural resources is very low and will be zero in the long term provided all rehabilitation measures are implemented. Furthermore, it is highly unlikely that the presence of the Oena Diamond Mine dissuades any would be visitor to the park from visiting the Park.
2.9.	What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations	Not applicable, given the very low negative (if any) impact of socio-economic considerations.
2.10.	What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?	There is no unfair discrimination against any person as a result of the proposed continued mining. The company meets all its mining charter requirements.
2.11.	What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	All legislation has been adhered to. And in the case of this application, an application entity has been specifically incorporated to meet the requirements of BEE shareholding

2.12.	What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	All mines are subject to Health and Safety legislation (Mine Health and Safety Act 29 of 1996). Such prescriptions are not within the ambit of this document but are strictly monitored by DMR.
2.13.	What measures were taken to:	
2.13.1.	Ensure the participation of all interested and affected parties.	Refer Part 11 for description of proposed Public Participation
2.13.2.	Provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation.	Refer Part 11 for description of proposed Public Participation
2.13.3.	Ensure participation by vulnerable and disadvantaged persons.	The amendment will be advertised in free local newspaper and advertised on posters at the suitable locations
2.13.4.	Promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.	None
2.13.5.	Ensure openness and transparency, and access to information in terms of the process.	Refer Part 11 for description of proposed Public Participation
2.13.6.	Ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge, and,	Refer Part 11 for description of proposed Public Participation
2.13.7.	ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein were be promoted.	Refer Part 11 for description of proposed Public Participation
2.14.	Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g.. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?	Not applicable to this kind of application
2.15.	What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	All mines are subject to Health and Safety legislation (Mine Health and Safety Act 29 of 1996). Such prescriptions are not within the ambit of this document but are strictly monitored by DMR.
2.16.	Describe how the development will impact on job creation in terms of, amongst other aspects:	
2.16.1.	the number of temporary versus permanent jobs that will be created,	The life of mine is only 15 years.
2.16.2.	whether the labour in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area),	Yes. Mining is already underway
2.16.3.	the distance from where labourers will have to travel,	Staff will be brought to site as required and there is accommodation on site at this isolated site.
2.16.4.	the location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits), and	Very small scale impacts. Job opportunities are also limited.
2.16.5.	the opportunity costs in terms of job creation (e.g. a mine might create 100 jobs, but impact on 1000 agricultural jobs, etc.).	The proposed mining operation will not take any jobs away in any other sector (eg tourism).
2.17.	What measures were taken to ensure:	

2.17.1.	that there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment, and	Refer Part 11 for description of Public Participation which has taken place and has included all relevant State Departments at all levels of governance
2.17.2.	that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures	Not applicable
2.18.	What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?	Environmental impact has been assessed to be insignificant in all aspects of the environment (provided rehabilitation takes place as per the EMP). The proposed project has been subject to extensive public participation to ensure all public are aware of and have input into the planning and approval process.
2.19.	Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	The operation is already a going concern and where backfilling has taken place, such are is indistinguishable from its natural surrounds. The management of operational impact is the responsibility of the applicant with monitoring and auditing largely by independent parties. The Mineral legislation requires that Closure be granted before the applicant can relinquish responsibility for the site. Such closure process is arduous and requires enforced participation by and satisfaction of relevant State Departments.
2.20.	What measures were taken to ensure that he 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 will be paid for by those responsible for harming the environment?	In terms of operational control of environmental impact and pollution, the EMP prescribes measures to be put in place to monitor and then mitigate / manage or avoid any known or unexpected impact. All Mining Right's holders are responsible to annually update a calculation to determine the costs of Immediate Closure of the site. Such calculation is based on DMR Guideline and the value of the fund must be provided to the DMR either in form of cash or by bank Guarantee. Should the holder "disappear", then the fund is used by the State to rehabilitate the site.
2.21.	Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	The only feasible alternative applicable to this application is the no go option. This would have been considered had the specialist studies shown that significant impact would have resulted from the proposed development, but specialist studies and past rehabilitation activities have revealed no excessive environmental degradation (PROVIDED rehabilitation actually takes place).
2.22.	Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area?	The impact of this development has already occurred and is so small that no detailed cumulative impact assessment is deemed necessary. Such detailed analysis would most certainly show that there is no or negligible cumulative impact arising out of this application. Refer Para 8.3

8.3 Cumulative Impact Assessment

The assessment of cumulative impacts on a site specific basis is often a complex operation. The aim of this impact analysis is ultimately to determine at which point the combined impacts from several operations (similar or dissimilar) in the area will affect the environment or part thereof to such a negative degree that the project should not be allowed to proceed.

However, the impact of this development has already occurred and is so small that no detailed cumulative impact assessment is deemed necessary. Such analysis would most certainly show that there is no or negligible cumulative impact arising out of this application.

9 Motivation for the development footprint

Including a full description of the process followed to reach the proposed footprint.

The draft Scoping report was used as a basis for initial comment. That round of public participation provided input into the final Scoping Report and the draft EIA/EMP that is now circulated for comment.

The footprint contained in the draft and final scoping report was fundamentally the same as this draft EIA/EMP report and no material changes have occurred.

10 Details of all alternatives considered.

With reference to the site plan provided as Figures 3-7 and the location of the individual activities on site, provide details of the alternatives considered with respect to the following.

10.1 Property on which or location where it is proposed to undertake the activity;

Not applicable. This is an upgrade of the EMP to an existing operation. The development of a brand new operation would double the impacts and is in any case confounded by:

- Finding suitable geological formation / material – highly unlikely
- Finding an area which is not sterilized by surrounding / on site land uses

10.2 Type of activity to be undertaken;

No alternative type of activity has been considered viable.

10.3 Design or layout of the activity;

There will be no change to the existing site layout through this EMP upgrade.

10.4 Technology to be used in the activity;

The technology is tried and tested and will not be altered. The holders are in the process of installing a water recycling leg to the pan plant in place at Blokwerf. However, the plant is not yet up and running to determine the efficiency of water savings. If such water savings are significant enough then such technology will be put in place at all the rotary pan plants.

10.5 Operational aspects of the activity;

There is no reason to amend any of the operational aspects of the proposed future mining (when compared to the existing site layout).

10.6 Option of not implementing the activity.

The impacts appear to be so negligible that the option of not implementing the activity should not be considered.

11 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.

Public participation has and will continue to take place in the following manner:

- 1) Consultation with the **landowner**. The landowner is the State and as a result the Department of Public Works has been included as I&AP's. However, being located within a National Park, SANParks have also been included as I&AP and comment has been sought and received from them.
- 2) **Surrounding landowners / Community**: There are no surrounding landowners who will be impacted by the proposed mining. However, this site is located in the Richtersveld and as such, all the communities located within the Richtersveld were deemed I&AP's. The communities of Kuboes, Eksteensfontein, Lekkersing, Alexander Bay and Sendelingsdrift were all notified of the application through poster placement, notification of Ward Councilor, Community Property Association representatives and placement of copies of documentation in libraries in each centre.
- 3) **State Departments**: Registered mail and / or email was sent to the following State departments and NGOs, with copies of relevant draft documentation for their comment:
 - a. Department of Environment and Nature Conservation (Kimberley and Springbok)
 - b. Department of Water and Sanitation (Kimberley)
 - c. Orange Catchment Management Agency
 - d. Dept. of Agriculture Forestry and Fisheries
 - e. Department of Public Works
 - f. Municipality – Manager's Office and Environmental Section
 - g. SAHRA – Lodging onto SAHRIS
 - h. Land Claims Commissioner.
- 4) **Broader public** were notified in 3 ways:
 - a. By way of newspaper advert in 2 local newspapers. Note that newspaper adverts were placed in Plattelander and the Gemsbok – Refer Appendix 4.
 - b. By way of posters placed in Sendelingsdrift, Eksteensfontein, Kuboes, Alexander Bay, Lekkersing and at the mine. Posters measured 62 x 40cm as per NEMA regulations – See Appendix 4
 - c. Though notification of the local ward councilor and representatives of the Sida Hub Community Property Association – See Appendix 4

Please note that each of these notifications contained details as to:

- How to contact the EAP
- In the case of the draft Scoping report, How to get to see a copy of the draft Scoping report with notice that copies of the draft Scoping Report were available at the local Public Libraries (of Alexander Bay, Eksteensfontein, Kuboes, Lekkersing and Sendelingsdrift) or available per email or hard copy by post

This document contains all comments received in respect of the draft Scoping Report and responses to those comments received.

The following is yet to be undertaken:

- 1) Distribution of draft EMP to registered I&AP's as well as all State Departments and NGOs listed above for 30 day commenting period - NOW
- 2) If comments received on draft EMP make material change to EMP, then redistribution of 2nd draft version of the EMP will take place
- 3) Lodging of Final EMP to DMR with all comments and changes made as required, by 25 January 2019.

Interested and Affected Parties: List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section in this report where the issues / responses were incorporated.
AFFECTED PARTIES				
Landowner/s				
Department of Public Works Administered by SANParks – see below				
Lawful occupier/s of the land				
Ai- Ais/Richtersveld Transfrontier Park. Park Manager: Mr Brent Whittington. Email: Brent.whittington@sanparks.org Tel: 027 831 1506 (Reception)	email	14 August 2018 27 August 2018	Thank you for registering SANParks (Richtersveld National Park) as an Interested and Affected Party. I acknowledge receipt of scoping report. I would like to inform you that this is National Park (which is not mentioned in the scoping report); no mining is allowed in terms of S48(1), however acknowledge the special circumstance of mining in RNP. Would it be possible to provide me with the review conducted in terms of 48 (2) please? I need to request more time to consult with my principals, our Minister’s office and the land owner, namely the Richtersveld community, as provided for in S 48 (2), (3), (4).	Thanks for the input. Regarding your request for review in terms of Section 48 – In terms of which Act is it that you are referring to? Please bear in mind that this is not an application for a Mining Right. The Mining Right has already been granted and legally established. This MPRDA Section 102 application is merely to update their outdated EMP. Also, please continue to consult with all parties you need to consult with. The process from here is that the final scoping report is lodged to the DMR by no later than 3 September, then the DMR have 43 days to “approve” the scoping report’s Plan of Study of the way forward. The applicant then has 104 days to lodge the final EMP, which period must include the issuing of a draft EIA/EMP for your input / comment. Note that in the draft Scoping Report, we do state that this operation is in a National Park (Being in the national park triggers listed activities in pages 24-25, also on Page 20, page 26, Page 27 (5x), page 29, page 30, page 47, page 57, etc).
Thivhulawi Nethononda Directorate: Protected Areas Planning Legislation, Compliance & Monitoring Tnethononda@environment.gov.za		13 September 2018	Registered as I&AP after close of Scoping Comments. Copy of draft EIA/EMP sent	

Interested and Affected Parties: List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section in this report where the issues / responses were incorporated.
Surrounding Landowners				
No surrounding landowners have been identified, but the communities of the Richtersveld have been notified and requested to provide input – see below				
Municipality. The mine is located in Ward 1 of the Richtersveld Local Municipality				
Municipal Councillor: Ward 1 Mr Willie Links: 072 263 7928 willielinks@vodamail.co.za	email	None yet		
Municipality: Richtersveld Municipal Manager (Acting) Mr Sydney Adams Sydney@richtersveld.gov.za Cc cathrine@richtersveld.gov.za 027 851 1111	email	None yet		
Municipality: Infrastructure Branch: (Environmental): John Komanisi 027 851 1111 john@richtersveld.gov.za	email	None yet		
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom etc.)				
None				
Communities				
Richtersveld Sida !Hub Community Property Association: Representing Sanddrift, Kuboes, Lekkersing, Eksteensfontein and Alexander bay Secretary: Annemarie de Wet Tel: 063 894 0794 rgevcpa@gmail.com	email	None yet	But see individuals who did register as I&AP's in last line items in this table.	
Dept. Land Affairs				
Commission On Restitution Of Land Rights: Regional Land Claims Commission: Northern Cape. Tel: (053) 807 5700 Ryan.oliver@drdlr.gov.za	email	24 July 2018	No land claim is applicable to Farm 18	

Interested and Affected Parties: List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section in this report where the issues / responses were incorporated.
Traditional Leaders				
None				
State Departments / NGO's				
Department of Environment and Nature Conservation : Northern Cape Private Bag X6120, Kimberley, 8301 Tel 053 807 7300 Head of Department	Reg Mail	None yet		
Department of Environment and Nature Conservation : Northern Cape Private Bag X16 Springbok 8240 Tel 053 807 7300 Ms Onwabile Ndzumo	Reg Mail	None yet		
Department of Water and Sanitation: Mr Abe Abrahams: Chief Director: Northern Cape Private Bag X6101 KIMBERLEY 8300 Tel: (053) 836 7648 Ms V Ramugondo ramugondov@dws.gov.za	Reg Mail and email	14 September 2018	The letter received from DWS acknowledges receipt of the Scoping report and states that there is no objection to the proposed operation BUT that application must be made in terms the National Water Act for a WULA and also requires pre-application meeting with consultant compiling the WULA to determine specialist's studies and nature of application.	A consultant has been appointed by the holder to compile the WULA. THE letter from DWS has been forwarded to that consultant.
Orange CMA Moses Mahunonyane MahunonyaneM@dws.gov.za Cell: 082 805 7553	Email	None yet		
Dept. of Agriculture Forestry and Fisheries: Head of Department Mr Thebe Thebe 072 991 8114 tthebe@ncpg.gov.za	Email	None yet		

Interested and Affected Parties: List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section in this report where the issues / responses were incorporated.
Department of Public Works Faizal Paulsen Private Bag X5002, Kimberley, 8300 Tel: 053 838 5324 Email: Faizal.Paulsen@dpw.gov.za	Reg Mail and email	14 Aug 2018 16 Aug 2018	Acknowledged receipt of Scoping Report and requested copy of Surface Mining Lease Agreement	These were dispatched by the applicant	
OTHER AFFECTED PARTIES					
SAHRA/HNC Lodgement on Heritage electronic lodging system: SAHRIS					
INTERESTED PARTIES					
Vivienne Thomson EnviroAfrica CC	Newspaper Advert or Poster	23 August	Registered as I&AP		
David Pells: Resident	Newspaper Advert or Poster	30 August	Registered as I&AP		
Christo Slander: Sanddrift Resident	Newspaper Advert or Poster	31 August	Registered as I&AP. Requested meeting with Mining Rights Holder Management		
Angelo Hufke: Resident	Newspaper Advert or Poster	29 August	Registered as I&AP		

12 The Environmental attributes associated with the development footprint alternatives.

(The environmental attribute described must include socio- economic, social, heritage, cultural, geographical, physical and biological aspects) - Baseline Environment

12.1 *Type of environment affected by the proposed activity.*

Note: The nature / impact of the existing operation will also be described in this section.

12.1.1 Geology

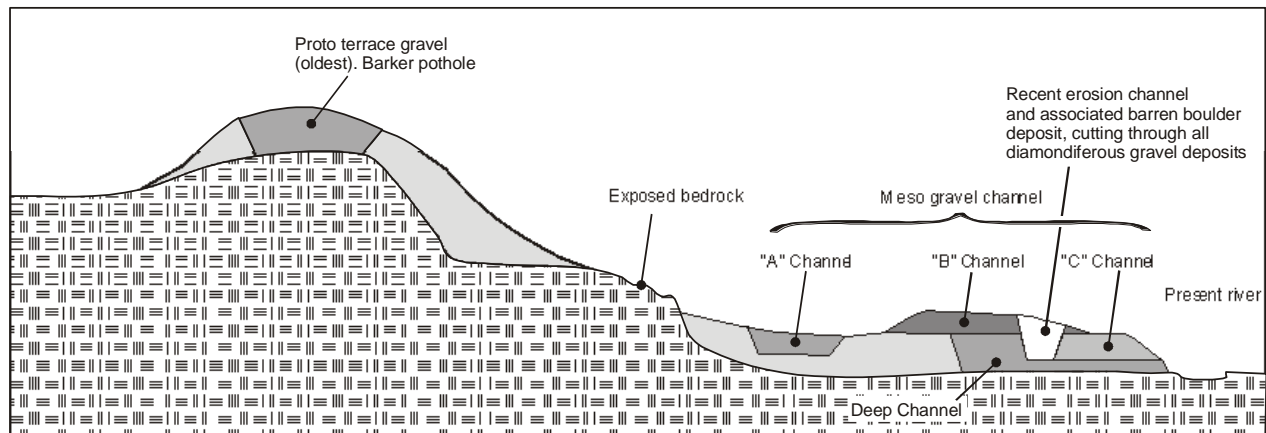
Bedrock consists mostly of grey gneissic granite and mafic lava (a product of the granitisation) of the middle to late Proterozoic age (1300-590 million years). The bedrock was deeply eroded by the Orange River some 65-140 million years ago to create the highly irregular bedrock surface conducive to the establishment of the trapsites as discussed below. The diamond bearing alluvial gravels of the lower Orange River were deposited in two suites. (R.J. Jacobs et al, 1999):

- The older (19-17mill years ago- Miocene age) higher lying proto-Orange terrace deposits form the Arriesdrift Gravel Formation.
- The lower and younger meso gravel terraces have not been aged but are assumed to have been deposited not much earlier than 3-5million years ago - these gravels are for the most part the targets of the future mining at Oena. These lower terraces have lower quality diamonds but the diamonds are generally larger.

It bears mentioning, because of the impact on the mining method, that the highest concentration of diamonds is located in the lowest basal levels of the gravels (normally at the interface of the gravel and bedrock). This requires that all gravels be removed to ensure all diamonds are recovered. Having said that, the upper more mobile layers of the gravels may also contain diamonds but in much lower concentrations.

At Oena, the on-site geology consists of the following deposits as shown in the cross section below:

- The older (richer) proto-terraces were deposited at higher altitudes than the meso gravels. Note that Barker's pothole (earmarked for geosite registration (refer Figure 15 and photo 15) is located in these proto gravels (as is the main plant excavation)
- The lower lying meso-terraces (at Oena mine) have been found to have been deposited in 4 phases resulting in what is known as the "A", "B", "C" and "Deep" terraces. In addition a much later depositional cycle filled recent erosion channels with barren boulder deposits. These recent deposits cut through 1 or more of the 4 earlier diamondiferous deposits as shown below.



At Oena mine, the meso-terrace gravels generally have insubstantial overburden covering, however sandy overburden is present to approximately 10m deep above the gravels in the Sandberg section (as seen in the Bradis Pit and Sandberg East old Barker Pit).

The majority of diamonds are “trapped” in a variety of trapsite types (R.J. Jacobs et al, 1999):

Fixed Trapsites: represent the highest concentration of diamonds recovered.

- Scour pools – resultant from water eroding a geological structural weakness in the bedrock (faults, joints etc.). The resultant deeper structure is filled with coarse gravels and heavier material (such as diamonds – S.G of 3.2) The Barker Pothole is an example of this type of trapsite. The Barker Pothole is under consideration for registration as a geosite.
- Push bars – are usually located upstream of a scour pond through gravel deposition as the stream loses velocity over the scour pool. This would have been the case upstream of the Barker Pothole where the river flows “upstream” after the pothole.
- Bedrock highs – These are small-scale obstructions in the river flow, such as a quartz dyke, which allows for the deposition of gravels as the water flows over these obstructions.

Mobile Trapsites: represent lower grades

- Riffle platforms – The platform refers to the basal layer of gravel onto which a longitudinal bar is formed. The downstream and upstream ends of the platform are known as riffles. Any diamonds that may be located in such structures will be located in the downstream riffle.
- The bar – the longitudinal bar that is deposited on the platform (as discussed above) may also contain diamonds concentrated at the downstream edge. The upstream end will be barren. Note however that these bars are generally mobile and only the least mobile will contain diamond-bearing gravel.

In order to recover all diamonds, it is essential that all gravels be removed to reveal these trapsites.

12.1.2 Climate

The lease area is located in the Arid West Coast Climatic Region of Southern Africa (Transitional Desert of the Orange River Trough: Köppen Code) and has more in common with the adjacent climate of the southern Namib Desert of Namibia than with the higher lying Richtersveld or of the Orange River mouth at Alexander Bay which are cooled by altitude and sea temperature respectively.

This unique climate of the lower Orange River is characterised by:

- Very low rainfall <50mm/year;
- Only occasional penetration of coastal fog this far inland;
- Frost free winters given low altitude;
- Strong south-westerly winds; and
- Very high temperatures and uncomfortable summer working conditions.

In the absence of local weather statistics, the climatic conditions are described from a combination of Violsdrift (100km upstream) and Alexander Bay (60km downstream) statistics.

Precipitation

The monthly rainfall distribution for Violsdrift is an average of 40.8mm/year (over the period of 1993 to 2000).

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average Rainfall	Annual
1.8	7.0	3.8	0.3	4.7	1.7	8.0	1.6	2.9	2.7	4.8	1.4	40.8mm	

This compares well to the average of Alexander Bay which measured 46mm over the period of 1951 to 1987 (WB40). The average rainfall of Rosh Pinah is 54mm. With respect to seasonality, the precipitation generally occurs in the months of March to June for Alexander Bay and May to August for Rosh Pinah.

Rain either occurs as light winter rain from the west associated with an extensive low-pressure cell over the South Western Cape or as very occasional thunderstorms in the months of March/April. Hail seldom occurs.

The highest monthly precipitation recorded for Alexander Bay is 46mm while the highest 24 hour rainfall is 39mm. In Violsdrift the highest daily rainfall over 1993 – 2000 was recorded as 51.8mm with other daily peaks seldom-exceeding 20mm.

Given the general permeability of the sandy soils, surface run-off is very limited in these areas and restricted to a limited number of well-defined run-off channels.

Given the bare rock exposure of the catchment areas (especially east areas with steep topography), concentrated run-off does occasionally cause wash-aways of sandy soils in the stream channels in this area despite the general low intensity of rainfall.

Temperature

As the lease area is not cooled by the proximity of the sea as in Alexander Bay, the temperature regime of the lease areas is reflected by statistics of Violsdrift which reveals the following monthly averages:

- Daily temperature for the summer months of December, January and February of between 27 and 30°C.
- Daily maximum temperature for December, January and February exceed 35°C between 14h00 and 17h00 hours.
- Daily minimum temperature seldom falls below 6°C at 06h00 in June.

Wind

The wind regime is seen as a combination of Port Nolloth, Keetmanshoop, and Vioolsdrift wind regimes. The assessment reveals that for Port Nolloth, south winds predominate with frequency of 23% and a speed of 5m/per second for the summer months. In winter a high percentage calms (36%) is experienced with low wind speeds and wind direction generally from the E and ENE.

The figures for Vioolsdrift compare directly with a dominance of >30% in the S, SSW and SW sectors in summer with southerly wind speeds also generally >5m/s and an easterly wind domination in the winter months of March – September.

Evaporation

The mean monthly evaporation “A-Pan” is best reflected by a combination of Okiep and Keetmanshoop statistics measured over a period of 4 years (WB28 page 226,227) giving an average monthly evaporation of 298mm/month or 3576mm/year.

The implications of the above temperature/rainfall/evaporation scenario for rehabilitation are as follows:

- Unless irrigated for their entire life, trees, shrubs or grasses (which are not endemic) will not survive as landscape or rehabilitation measures and should not be considered.
- Natural reseeding offers the only method of stabilisation/revegetation of denuded areas.
- High evaporation will cause accelerated water loss from shallow tailings dams and increase salinity of the recycled process water from such dams.
- High wind speeds will cause wind erosion of sharp edges of cuttings and dumps as evidenced on the Port Nolloth – Alexander Bay road if such cuttings are not partially armoured with coarse rock which can form a deflation surface.

Incidence of Extreme Weather

- Extremely high maximum daily temperatures are significant in the Orange River Valley (up to 50°C on occasion).
- No frost occurs.
- Hail occurs on rare occasions only.
- While wind speeds are sufficiently high to cause dust storms on a regular basis they are generally not high enough to cause any structural damage to buildings.

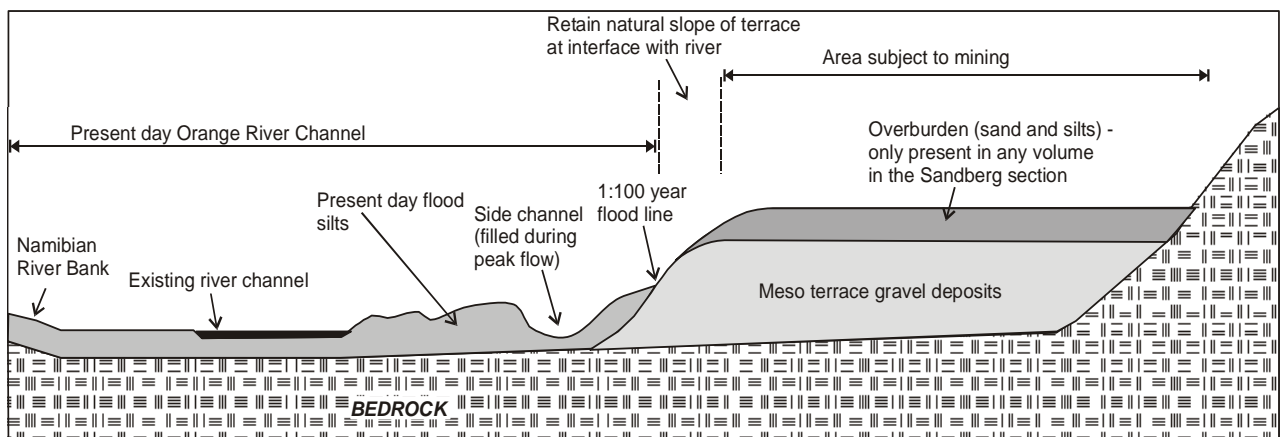
12.1.3 Topography

The granites and lavas north and south of the Orange River have been deeply eroded by several (now) small episodic streams to develop the jagged barely accessible mountainous topography (refer photo below) that makes up the local part of southern Namibia and the northern Richtersveld. This bedrock was deeply eroded by the existing and palaeo Orange River flow to form the wide valley that is now in evidence.



Photo 8: Looking west over the Sandberg Section showing the jagged mountainous topography on either side of the relatively narrow Orange River valley floor in which the proto and meso- terraces are located.

Within the valley floor area (i.e. area subject to mining) the topography generally consists of the following features from the Orange River to the mountain edge:



- The wide valley incised into the bedrock by the present and palaeo Orange River flow.
- The present day silts of the Orange River channel form the temporary and locally undulating topography typical of such a channel. Of note here is the general presence of a side channel that carries overflow water during peak flood flow. Given the damming of the Orange, Vaal & Malibamatso Rivers upstream, the normal and flood flow of the Orange River has been altered to such an extent that normal flood flows do not occur (only occasional flooding when the Fish River system floods).
- The 1:100 year flood line is generally located near or at the interface of the meso terrace gravel deposits, where present.
- The meso gravel terrace deposits, where present, are for the most part exposed at surface (except in the Sandberg section where overburden (sand and silt) may be up to 10m deep).
- It is proposed to, during mining, retain the leading edge of the terrace at the interface with the flood silts.
- The valley slopes formed by the (mostly) gneissic granite mountains of the northern Richtersveld.

The local topography is further complicated by stream channels flowing across the gravel terraces from the mountains. These streams have washed away the gravel deposits and deposited much younger soils.

12.1.4 Soil

Type, erodibility and depth of topsoil

Topsoil in the Oena mining lease area is scarce. This is a result of the action of the Orange River over the last few million years which has scoured away most of the topsoil in the broad valley to leave either the exposed meso-gravel deflation terraces or the deposited silts of recent flood periods. Aeolian (windblown) sands are also in evidence (particularly in the Sandberg and Northern Blokwerf Areas).

In addition to rocky areas (where rocks cover 80% or more of the area), a total of 4 soil types which group into categories as follows (Refer figure 9):

(i) Dundee

This soil form is the dominant (Du) form of the flood-plain of the Orange River. 2 phases of Dundee are identified:

- DuA – layers of fine sand interbedded with silt. No stones or gravel depth >150mm (0-6% clay).
- DuB – layers of medium to coarse sand depth >1500mm.

DuA - immediately adjacent to the river, stratified and fine, formed by high flood episodes and forms the agricultural component of river bank farms.

DuB – this coarse sand phase is found mainly in the tributaries and flood-plains of the episodic run-off side channels as well as in the alluvial fans of the mountains. They can contain a good percentage of gravel and stones.

(ii) Alluvial Gravels (Terrace Soils) (T)

Typical diamond gravels where the coarse pebble / gravel fraction is 70 – 90% and clay content is 6 – 15%.

(iii) Aeolian Sands, includes:

a) Huttons

Characteristically occurs in higher lying alluvial fans of the ridges and mountains but also includes the red Aeolian (Kalahari) sands.

(iv) Colluvial Gravels

On mountain slopes where the angular stone fragments >70%.

Erodibility

Given their low clay content (sandy / silty nature of all the soils) they are mostly highly erodable when subject to concentrated run-off.

As they are generally highly permeable, the low rainfall intensity, yields them as having low erodibility under level conditions where rainfall is not concentrated. Where however, higher lying rocky areas, despite low intensity rainfall, generate rapid surface run-off in episodic drainage channels, erosion of these sand filled channels does occur.

General

It is imperative that all soils in any area to be disturbed (roads, manoeuvring areas, product stockpile areas, etc.) are removed to stockpile before any development in the affected areas.

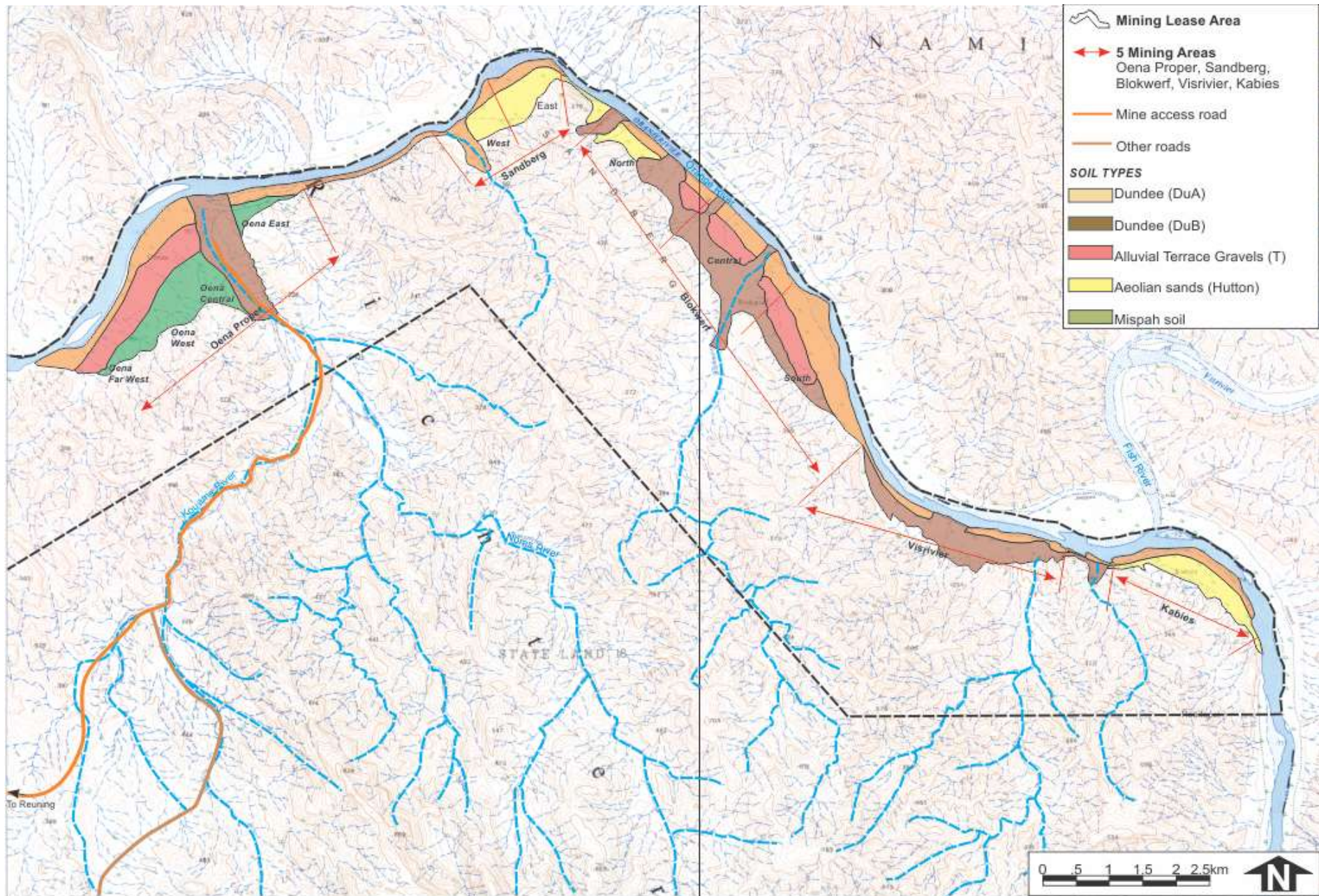


Figure 10: Soil type distribution

12.1.5 Pre-mining land capability

Assuming the mining lease area to measure $\pm 8\ 800$ ha as shown in Figure 1 and 2, this area exhibits the land capability components as shown in the tables below. The area falls entirely within the Ai-Ais-Richtersveld Transfrontier Conservation Park and even though grazing (for goats at 1 small stock unit per 15ha) takes place within the Mining Lease Area, the area has been ascribed the more restrictive wilderness area rating. Note that SANParks have limited the number of goats in the park to ensure sustainability and prevent overgrazing.

While the Dundee soils are suitable for cultivation, the land has been ascribed a wilderness rating given:

- That the area is in a National park
- Flood Damage: Even though floods are less frequent as a result of the upstream damming, history has shown that floods do make cultivation on the flood plain uneconomic
- Distance to market is also a determining factor.

The closure objective of the mine is to maximise the residual wilderness rating of the land parcel.

Though the entire lease area measures 8 800ha, the overwhelming majority of this land is unsuitable for mining. Only an absolute maximum of 400ha is suitable as potential mining area between the mountains and the river. This figure (of 400ha) assumes that all gravels are diamond bearing and is a liberal estimate. NOT all of the 400ha is suitable for mining from a diamond bearing point of view.

	Mining Lease Area (8800ha)		Comments
	Area (ha)	%	
Arable Land	0ha	0%	While the Dundee soils area suitable for cultivation, the land has been ascribed a wilderness rating given: That the area is in a National park Flood Damage: Even though floods are less frequent as a result of the upstream damming, history has shown that floods do make cultivation on the flood plain uneconomic. Distance to market
Grazing Land	0ha	0%	Note that the mining authorisation area has been applied the more restrictive land capability rating (i.e. wilderness as opposed to grazing)
Wetland	650ha	7.4%	The Orange River course is assigned the wetland rating.
Wilderness area	8150ha	92.6%	This includes areas previously disturbed by mining. Refer table below for quantification.
Total	8800ha	100%	

The table above shows the wilderness area to measure 8 150ha (the remainder being the actual Orange River course). Of this area, 85.2ha (1.07% of the wilderness area), has been disturbed by previous and current mining on the site. Appendix 3 shows detail of current disturbances as well as proposed rehabilitation requirements:

<i>Mining Section</i>	<i>Refer figure</i>	<i>Description of disturbances</i>	<i>Surface area disturbed to date</i>	<i>% of total wilderness area (8 150ha)</i>
Oena West	4	Coarse tailings dump of the Oena far west plant	2.7ha	
		Excavation	0.7ha	
Oena East	4	Excavations	5.9ha	
		Main Coarse Waste rock dump	11.3ha	
		Main slimes dam	3.2ha	
		All other dumps	1.4ha	
		Logistical Facility site	1.9ha	
		Airfield	1.9ha	
Oena Far East	4	Barker pothole site (earmarked for geosite registration)	5.8ha	
		Scattered small excavations	1.5ha	
		Scattered small dumps	1.6ha	
OENA TOTAL			37.9ha	0.48%
Sandberg West	5	Workings in the far east	7.5ha	
		Old plant area on coarse tailings (plant removed)	1.3ha	
		Old slimes dam	1.5ha	
		Scattered oversize and ore dumps around the plant area	5.7ha	
		The Bradis pit and associated overburden and ore dumps	6.0ha	
Sandberg East	5	Excavations and associated overburden dumps	8.1ha	
SANDBERG TOTAL			31.1ha	0.37%
Blokwerf North	6	Old Barker Blokwerf excavation and overburden dump	4.8ha	
Blokwerf Central	6	Exploration pits & associated dumps surrounding the pits	2.5ha	
Blokwerf South	6	Excavations associated dumps surrounding the pits	6.2ha	
		Plant on coarse tailings dump	1.8ha	
		Slimes dam area	0.9ha	
BLOKWERF TOTAL			16.2ha	0.22%
Visrivier	NA	None	0.0ha	
Kabies	NA	None	0.0ha	
Total			85.2ha	1.07%

12.1.6 Land Use

Existing land use

The mining lease area has been divided into mining sections as shown in figure 3. Detail maps of current disturbances in Appendix 3. The general use of the site is diamond mining in the relatively narrow strip along the Orange River. Goat grazing also takes place in the entire mining lease area,

although restricted by the barely accessible and unvegetated mountain wilderness hinterland. A brief description of the **on-site land use** for each mining section (from east to west) is as follows. Note that a single spine road links all these sections. Note further that every single disturbance has been photographed with the latest record in October 2018:

- Oena Section (Refer figure 4)
 - Oena West
 - The entire previously mined area in the far west has been backfilled and rehabilitated. The in-field screening plant was dismantled and removed.
 - All that remains in that area are a few small overburden dumps and an oversize dump and a small excavation.
 - Closer to the logistical facility area there are some more recent excavations and dumps which are currently being processed and there have been signs of backfill of the pit west of the runway (Eow1)
 - Oena East:
 - Represents the main activity area in that the main logistical facility area and main plant are located here
 - The airfield is also partially located in this section
 - The main pump station for the plant and logistical facility area is located opposite the logistical facility area.
 - Note that a large percentage of the open mine blocks at Oena east have been backfilled and rehabilitated, and the process continues at present with the excavations being backfilled with material sourced from the processing of the main waste rock dump
 - The remainder of the airfield and the access road from Sendelingsdrift to the site is located in this section
 - The Barker Pothole earmarked for geosite registration is located in the higher lying central portion of this section
 - The main focus of present mining is taking place within the Oena east lower terrace from the east of this section.
 - Oena Far East
 - Minor historical mining and exploratory activity took place in this section and a few small mining blocks and exploration trenches were developed over the past few years which still require backfilling and rehabilitation.
- Sandberg Section
 - Sandberg West
 - Mining and exploratory work dominate the lower NW corner of the Sandberg section. The Bradis pit is located here
 - The previous 16ft pan plant was located in the valley to the south (since removed). The coarse tailings dump and slimes dam still remain.
 - Sandberg East

- Excavations and dumps of the exploratory work conducted by Barker are located within this section.
- Blokwerf Section
 - Blokwerf North
 - Minor exploratory excavations and dumps (Barker workings) in the far north
 - Blokwerf Central
 - Some small excavations and dumps in the leading edges of the gravel terraces adjacent to the episodic streams
 - Blokwerf South
 - This area represents the major exploration drive of the present applicants through the development of 10 excavations.
 - A new plant has been located in this section with one 16ft rotary pan
- Visrivier and Kabies Sections:
 - No activity to date

Surrounding land uses are as follows:

- The Orange River bounds the site to the north
- The arid mountainous northern Richtersveld forms the southern boundary to the mining strip.
- A single access road to the site enters from the south as shown in figures 1 & 2 (from Sendelingsdrift).

Existing structures

The site's main logistical facility area is located in Oena West section and consists of the structures as shown in figure 9. In addition the following structures are located within the mining lease area:

- The main Oena west processing plant
- The pump house at the river in the Oena West section
- The main logistical facility and accommodation site is located at Oena proper.

12.1.7 Natural vegetation / plant life

The mining lease area is located within the Richtersveld Succulent Karoo biome. The uniqueness of this Richtersveld biome is well documented and the mining lease area is located within an area of high vegetation conservation value in local, regional and international contexts. Having said that, the proposed mining is to take place on terraces that are completely devoid of any vegetation cover. The main vegetation component to potentially be disturbed is the (mainly) trees of the Orange River flood silts below the area to be mined.

Dominant species

Mountains: *Euphorbia species, Ozoroa sp.*

Trees in the floodplain include:

Ziziphus mucronata Willd.
Rhus pendulina (White Karee)
Euclea pseudobenus (Black ebony)
Tamarix usenoides (Abikwa Yellow Wood)
Salix mucronata (Cape Willow)
Acacia karoo (Sweet Thorn)
Boscia albitrunca (Witgatboom)

Endangered or rare species

Aloe pillansii (Located in the mountains beyond the proposed mining area)
Lithops hereii (generally located on quartz banks - there are no quartz banks to be disturbed by the proposed mining, although one such quartz bank is present south of the Barker Pothole –it is not to be disturbed)
(These only occur well outside the mining disturbance area and will never be affected by the proposed mining).

Alien or exotic species

South American Wild Tobacco (*Nicotiana glauca*)
Suidwesdoring (*Prosopis juliflora*)

12.1.8 Animal Life

The mining lease area is located within the Ai-Ais-Richtersveld Transfrontier Conservation Park. The Richtersveld is especially recognized as an area of special conservation concern for South African reptiles and amphibians (Branch, 1988) given that these species are generally less mobile than other species and as such give rise to isolated communities being established.

The mining lease areas consist of 3 potential habitat types viz, the mountainous hinterland, the elevated terraces above the river and the vegetated riparian edge. Most species occur within the riparian edge and no disturbance of this zone is to be tolerated. Least species rich is the barren raised terraces, where mining is planned to take place, between the mountainous hinterland and the riparian edge.

Commonly occurring species

(Source: Report on Soil conditions, Vegetation and Wildlife of the Baken / Reuning Area, Richtersveld. Nic Geldenhys and associates, 2000 and Information supplied by Mr/Mrs. Giel de Kok (Parks Board), Louis Pienaar and Joos Botes)

Reptiles:

Tortoises:

The Speckled Padloper, the Angulate tortoise and Namaqualand Tent tortoise all inhabit the Richtersveld. However, the northern Richtersveld is at the very limit of their range and they will, if at all, occur in very low numbers within the mining lease area.

Lizards:

The proposed mining terraces do not represent a very suitable habitat for lizards and geckos as their main habitat will be along the Orange River bank and within the mountainous areas to the south.

Snakes:

Mining activities along the lower Orange River will not have a significant impact as a species level on the 25 species of snakes potentially occurring within the Richtersveld.

Amphibians:

The Common River Frog, The Cape River frog and the Clicking Stream frog will all habitate the banks of the Orange River.

Birds:

The riverine vegetation corridor will provide habitat for a large percentage of these species and as such will require preservation. No activities are proposed to take place in this corridor, with the exception of the continued use of the pump station in Oena West section.

Mammals:

47 mammal species occur within the Richtersveld. Once again, the vegetated fringe of the Orange River will form the main habitat for the Vervet monkey, the black tailed tree rat, the Cape clawless otter and the water mongoose. No activities will take place in this zone with the exception of the existing pump station installation in Oena West.

*Endangered or rare species***Amphibians:**

Breviceps macrops (Desert Rain Frog) is listed as a red data species – highly unlikely to occur within the mining lease area as it prefers the coastal dunes situated in the coastal fog belt.

Reptiles:

Lizards: Of the 38 lizard species occurring in the Richtersveld, 7 have restricted ranges. Fortunately, their ranges are mountainous areas and boulder strewn areas away from the Orange River, unlikely to be impacted upon by mining.

Birds:

The Martial Eagle and Kori Bustard are listed as vulnerable, but if located within the mining area will be of such low numbers that mining will never have any impact on the species.

12.1.9 Surface Water

The main water source in the area is the Orange River, which forms the only perennial river in the region. All other streams are episodic and rarely flow (for example the Kouams River is the only other river to have flowed – for a few hours since March 1999 (Kuboes Diamante, 2002)).

Figure 11 below shows the overall drainage pattern.

The 1:100 year floodline has been shown on figures 4-6. It was determined through on-site assessment and recordal of upper limit of the Orange River flood silts. No activity is to be permitted below the 1:100 year floodline except for locating and accessing the pump stations as required. Note that the spine road crosses the 1:100 year flood line in the east of Oena east where the silts banks up against the mountain.

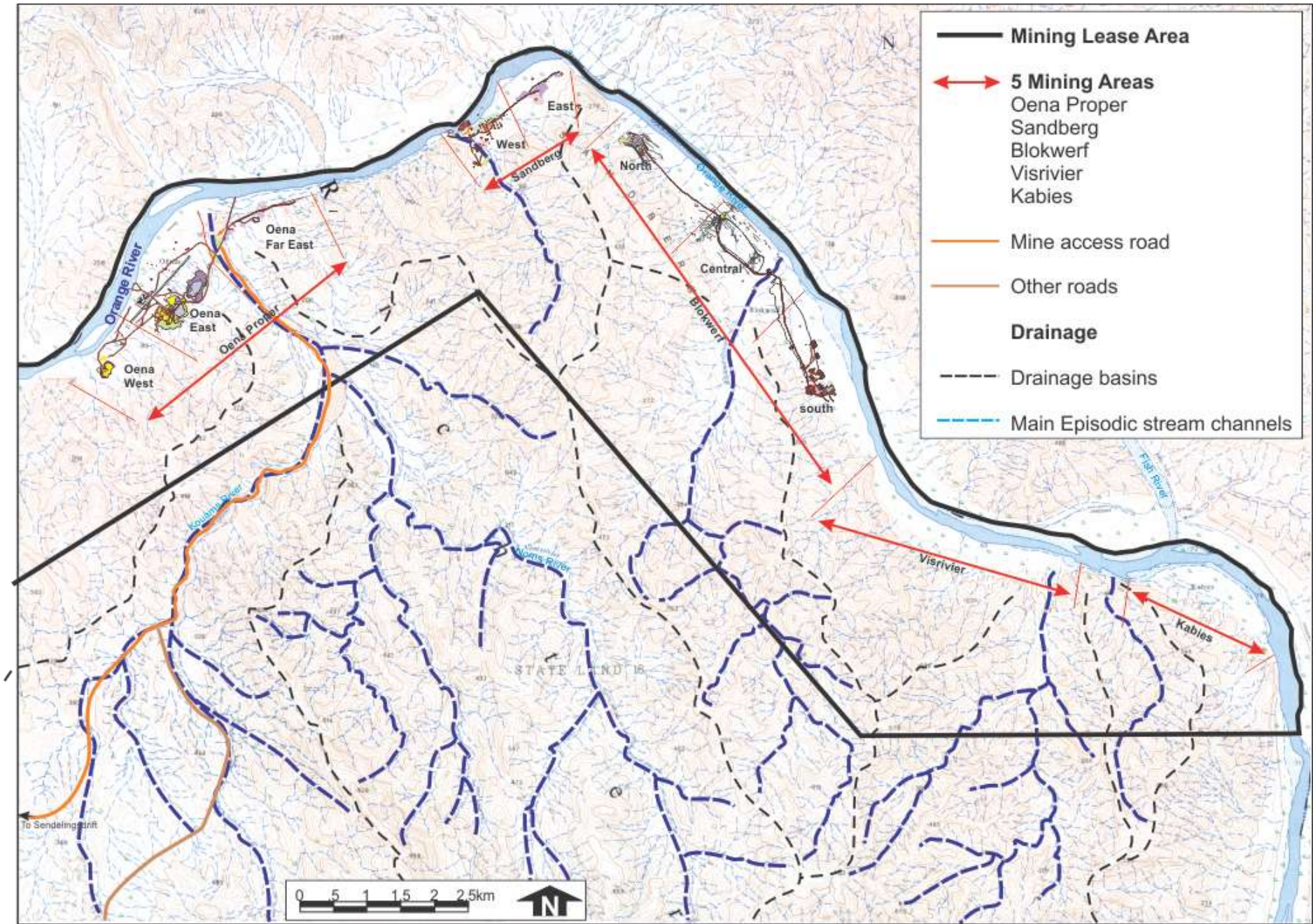


Figure 11: Drainage (on land use)

Inadequate fine tailings dam planning and development in the past has led to:

- i) Fine tailings breach at Blokwerf south – Refer figure 6. This dam was located fairly close to the silty flood plain of the Orange River and the breach had allowed fine tailings to be deposited on the flood plain. These breached silts were not noted in the 2018 visit to the site and have been removed either through rehabilitation by previous owners or through flooding by the Orange River.

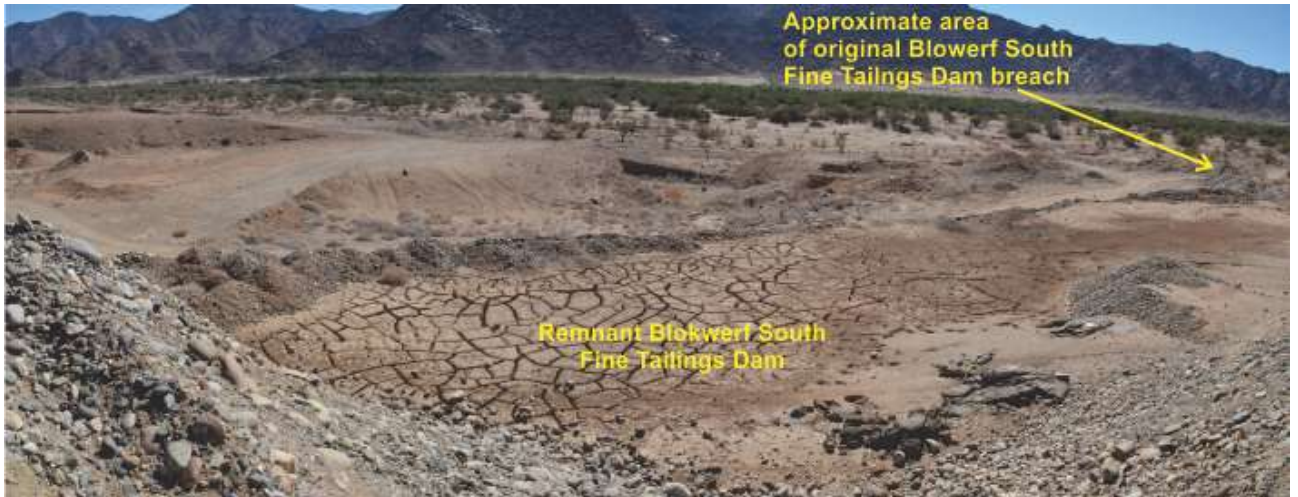


Photo 9: Looking down at the Blokwerf South Fine Tailings Dam. Note that the breach has been cleared.

- ii) Uncontrolled fine tailings run-off into the natural veld at Sandberg west (refer photo below and figure 5). These tailings were never confined and were allowed to flow directly onto natural ground level and into a short section of the natural drainage channel. Continual pumping of slimes onto the existing dam led to the development of a temporary erosion channel in the slimes. This erosion channel moves with water flow down the slope and is of little consequence, but must be rehabilitated in the end.



Photo 10: Looking up the valley in the western end of Sandberg where previous processing and in field screening plants were located. Some work as described in the text is required to finally shape the site and rehabilitate old unconfined fine tailings run-off

Silt impact will be prevented through the use of effective fine tailings dams. However, for these dams to be effective they must be constructed properly and the fine tailings must not simply be allowed to run through the natural lands uncontained. Such lack of silt containment leads to large areas being impacted and does not allow for water recirculation. So, fine tailings dam must be planned and provided with suitable wall, paddock and sump (as per Appendix 3). Appendix 3 also contains plans showing future fine tailings handling. Existing impacts in this regard (uncontained fine tailings) must be rectified.

Surface water quality

A water sample analysis of the Orange River (as comparison), Domestic & Process water and tailings leachate was conducted at the Oena mine. The measurements were made under laboratory conditions using Orion model 15 and 290A testing equipment obtained from SA Weather Services in Springbok. The results were recorded as follows:

Aspect	Orange River	Domestic Water	Process Feed	Plant Waste water	Pan Tailings Leachate	Pan tailings dam evaporate
pH	7.167	7.964	7.609	7.855	7.340	7.246
mV	-13.1	-56.4	-35.9	-49.9	-20.3	-14.6
Rel. mV	-12.9	-56.4	-36.3	-50.0	-20.9	-14.8
Conc.	0.610	0.112	0.242	0.143	0.440	0.560
Temp.	20.0	21.2	20.7	20.9	20.8	20.7
Cond.	319µS	308µS	30.0µS	340µS	8.10mS	13.03mS
Sal.	0.1%	0.1%	0.1%	0.2%	4.5%	7.4%
TDS	148mg/l	147mg/l	143mg/l	157mg/l	4390mg/l	7310mg/l

Surface water use

The applicants at present abstract water from the Orange River for domestic purposes (minor volumes) as well as process water for use in the washing plant (at approx. 3 000m³ per month).

There was a WULA awarded in 2002, but has appointed Wadala Mining and Consulting to apply for new licence through a new WULA to allow for abstraction of 208 000m³ per annum.

12.1.10 Groundwater

Apart from the water contained in the palaeochannel at Sandberg, no underground water has been located in the course of mining and exploration. The water at Sandberg was located at 20m below surface. Being located within a palaeo channel, this water does not form part of the regional groundwater regime. The groundwater encountered at Sandberg east (Barker pit) is brackish and unsuitable for animal/human consumption

12.1.11 Air Quality

The only negative impact on air quality is the generation of dust. Ambient dust levels are very low except under high wind conditions, when dust is generated off the vast expanses of unvegetated land in the region. Other regional dust sources include:

- Dust is also generated in fairly low volumes by other mines in the region.
- Dust generated by vehicles traveling on unsurfaced roads in the area (main method of dust generation)

Current dust generation at the mine occurs under the following instances:

- Vehicles traveling on unsurfaced roadways.
- Topsoil (if available) removal.
- Tipping of gravels into the main hopper – note that the processing of the diamond gravels is generally a wet process and dust generation at the plant is low.
- Backfilling of overburden.

Given the isolation of the site, no dust impact on surrounding land use or land users will occur.

With respect to employee health, dust levels will be continuously monitored and attenuated to keep these below the prescribed maximum levels for the life of the mine in terms of the Mine Health and Safety Act: “Guidelines for Occupational Health Programme on Personnel Exposure to Airborne Pollutants”. Monitoring of dust in the workplace will be conducted in terms of the programme using gravimetric sampling apparatus.

12.1.12 Noise

Ambient noise levels are very low. The only significant noise source in the area is a result of the activities at Oena mine, through:

- Heavy vehicle and equipment activities
- Gravel processing plants

Given the isolation of the site, no impact in this regard will occur and noise need only be attenuated to ensure employee health.

12.1.13 Visual aspects

The Oena mine is located within the National Park, however access to the mining area is restricted to authorized personnel only. The workings are visible to anyone travelling down the Orange River and to the occasional persons on the Namibian side of the Orange River. (Bear in mind that diamond mining takes place on the Namibian side of the River as well).

12.2 Description of the current surrounding land uses.

The site is very isolated and there are no surrounding land uses that will be impacted by continued mining at the site. Being a diamond mine, the traffic generation on and off site is very low as there are no products for delivery (such as at an aggregate or dimension stone quarry).

The only surrounding land use to be considered is the National / Trans Frontier Park in which Oena Mine is located.

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

Refer Para 12.1 and 12.2 as well as Chapter 4. Appendix 3 also contains detail on current and proposed disturbances.

12.4 Environmental and current land use map.

Refer Appendices 2 and 3, as well as applicable figures in this text in respect of the relevant aspects of the environment.

13 Impacts and risks identified including the nature, significance, consequence, extent, duration & probability of the impacts

(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. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated).

Note that in the draft Scoping Report (and the draft EIA/EMP), only those potential impacts identified as typical impacts known for such activities have been listed. These are subject to public participation to identify additional / different impacts.

The first table serves to identify all applicable impacts, whilst the following table ascribes significance and details to each impact.

This table identifies potential negative impacts only. Does not show beneficial impacts which arise out of operational or decommissioning rehabilitation activities or monitoring.	Geology	Topography	Soil/ Topsoil	Visual	Land Capability	Vegetation	Surface Water	Ground Water	Animal Life	Noise	Air Quality (Dust)	Social/ Economic	Archaeology/ Cultural	Hydrocarbon	Traffic /Access
Activity															
1. ESTABLISHMENT ACTIVITIES															
1.1. Access road is already in place and approved in terms of earlier EMP.															
1.2. All haul roads and on-site roads are already in place but will be included as a listed activity in any event.															
1.3. All offices and admin building are already in place															
1.4. Workshop is already in place															
1.5. Fuel Tanks are already in place. Storage Capacity 48kl															
1.6. Points 1.3 and 1.4 include personnel amenities to septic tank and then French drain															
1.7. Airstrip (1km long) in place															
1.8. Processing plant. The main plant is located in the Oena Section but additional plants may be developed later at other Sections															
1.9. Ensure domestic and industrial waste management system is in place															
2. OPERATIONAL PHASE ACTIVITIES															

This table identifies potential negative impacts only. Does not show beneficial impacts which arise out of operational or decommissioning rehabilitation activities or monitoring.	Geology	Topography	Soil/ Topsoil	Visual	Land Capability	Vegetation	Surface Water	Ground Water	Animal Life	Noise	Air Quality (Dust)	Social/ Economic	Archaeology/ Cultural	Hydrocarbon	Traffic /Access
The exact footprint of mining in alluvial diamond bearing gravels is impossible to accurately determine. However, geological surveys conducted at Oena Section, Sandberg Section and Blokwerf Section has shown "Potential Resource diamondiferous gravels". The proposed mine plan is based on those polygons in their entirety, although future mining may show some areas to be barren.															
2.1. Topsoil removal to perimeter stockpile.															
2.2. Clearing of overburden as backfill to previously mined area															
2.3. In pit screening of material (may apply)															
2.4. All -25mm returned as backfill															
2.5. Backfilled excavations to be covered with previously stockpiled topsoil															
2.6. Hauling of gravel to plant for processing.															
2.7. Processing of material to obtain diamonds. Note that existing plant is located in Oena Section. The material from Sandberg may be processed there as well, but material from Blokwerf will be processed at a plant at Blokwerf (to be established).															
2.8. Stockpiling of coarse waste from plant or return to pit as backfill															
2.9. Stockpiling of fine tailings from plant															
2.10. Use of water for processing of material at plant															
Other OPERATIONAL ACTIVITIES															
2.11. Use of workshop															
2.12. Use of wash bay (if contemplated)															
2.13. Use of Refuelling Facility (48kl capacity on site)															
2.14. Use of access/delivery road to the site															
2.15. Water Use: WULA in place but inadequate for abstraction. Will require additional WULA.															
3. OPERATIONAL NON – MINING REHABILITATION ACTIVITIES															
3.1. Maintain access/delivery road on site															

This table identifies potential negative impacts only. Does not show beneficial impacts which arise out of operational or decommissioning rehabilitation activities or monitoring.	Geology	Topography	Soil/ Topsoil	Visual	Land Capability	Vegetation	Surface Water	Ground Water	Animal Life	Noise	Air Quality (Dust)	Social/ Economic	Archaeology/ Cultural	Hydrocarbon	Traffic /Access
3.2. Domestic waste is transported by bakkie to Sendelingsdrift and handled in terms of that town's domestic waste management															
3.3. Enforce no-go area access															
3.4. Decontaminate floors and diesel tanks when required															
4. DECOMMISSIONING PHASE ACTIVITIES															
4.1. Complete backfilling of excavations with nearby material (when available) and cover with topsoil OR															
4.2. Shape excavation edges to 1:3 slope and topsoil															
4.3. Shape any remaining dumps as per EMP specification and cover with topsoil if available															
4.4. Demolish all unrequired structures															
4.5. Remove all process plant and steel structures															
4.6. Remove all protruding foundations and footings															
4.7. Remove all pipelines and cables															
4.8. Remove diesel tank & decontaminate															
4.9. Rip / scarify logistical facility area															
4.10. Retain access roads for future use															
5. AFTERCARE PERIOD															
5.1. Remove alien vegetation (if applicable)															
5.2. Conduct final performance assessment															
5.3. Lodge closure Application															
5.4. DMR Grant Closure Application															

Note the table below contains only the potential negative impacts as identified in the above. It does not (and is not meant to) show beneficial impacts which arise out of operational or decommissioning rehabilitation activities or monitoring. This has been done in order to reduce the length of this report. So, for example, the positive impact on topography, vegetation and land capability which arises out of backfilling is not shown in the tables which follow.

Activity	Nature of impact	Extent	Duration	Probability	Significance	Extent to which impact can cause or be:			
						reversed	irreplaceable loss of resource	avoided, managed or mitigated	or
1. ESTABLISHMENT ACTIVITIES									
1.1. Access road is already in place and approved in terms of earlier EMP.	Impact of use is contained in line item 2.14 below								
1.2. All haul roads and on-site roads are already in place	Impact of use is contained in line item 2.14 below								
1.3. All offices and admin building are already in place									
1.4. Workshop is already in place.	Impact of use is contained in line item 2.11 below								
1.5. Fuel Tanks are already in place. Storage Capacity 48kl	Impact of use is contained in line item 2.13 below								
1.6. Points 1.3 and 1.4 include personnel amenities to septic tank and then French drain	Impact of use is contained in line item 2.15 below								
1.7. Airstrip (1km long) in place	Impact of use is contained in line item 2.16 below								
1.8. Processing plant. The main plant is located in the Oena Section but additional plants may be developed later at other Sections	Impact of use is contained in line item 2.3 and 2.7 below								
1.9. Ensure domestic and industrial waste management system is in place									
2. OPERATIONAL PHASE ACTIVITIES									
2.1. Topsoil removal to perimeter stockpile or for immediate use in cover of previously backfilled area.	Total area available for potential future mining according to prospecting results as follows: - Oena Blocks 1-8 = 58.5ha - Sandberg 10-14 = 34.4ha - Blokwerf Gravels = Total 252ha (assume conservative 25% suitable based on Oena and Sandberg polygons) = 63ha. TOTAL: Min 155.9ha Visrivier and Kabies Section programmed for prospecting								
2.1.1. Soil/topsoil	Removal of topsoil ahead of mining and stockpiling or use as cover material in previously mined and backfilled area	Min 155.9ha	Life of Mine or until replacement	Definite	Moderate	Yes	No	Must be managed	

Activity	Nature of impact	Extent	Duration	Probability	Significance	Extent to which impact can cause or be:		
						reversed	irreplaceable loss of resource	avoided, managed or mitigated
2.1.2. Visual	Denuded areas will be visible	... but only to persons who visit Oena mine or the north bank of Orange River	Life of Mine or until replacement	Probable (denuded topsoil same colour as subsoil so not easily distinguishable (from visual impact point of view))	Insignificant, if any	Yes	No	Must be managed as part of topsoil management
2.1.3. Land Capability	The areas with removed topsoil may not be suitable as current habitat, although this impact most likely to occur during deeper excavations given that topsoil has no vegetative cover	Min 155.9ha in stages / phases	Life of Mine or until replacement	Possible	Insignificant given vast tracts of similar "habitat" surrounding disturbance area	Yes	No	Must be managed as part of topsoil management
2.1.4. Animal Life	The areas with removed topsoil may not be suitable as current habitat, although this impact most likely to occur during deeper excavations given that topsoil has no vegetative cover	Min 155.9ha in stages / phases	Life of Mine or until replacement	Possible	Insignificant given vast tracts of similar "habitat" surrounding disturbance area	Yes	No	Must be managed as part of topsoil management
2.1.5. Noise	Noise generated by earthmoving equipment and trucks	Very local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary
2.1.6. Air Quality	Dust generated by earthmoving equipment and trucks	Local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary
2.1.7. Archaeology	Possible disturbance of archaeological artefacts	Local	On execution	Possible but unlikely	Insignificant	No	Yes	Managed or avoided
2.1.8. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Local	Until cleanup	Possible	Insignificant	Yes	No	Managed
2.2. Clearing of overburden where present as backfill to previously mined area								
2.2.1. Geology	Removal of subsoil will impact on local geological stratigraphy	Local	Permanent	Definite	Insignificant	Yes	No	Mitigated

Activity	Nature of impact	Extent	Duration	Probability	Significance	Extent to which impact can cause or be:			
						reversed	irreplaceable loss of resource	avoided, managed or mitigated	or
2.2.2. Topography	Overburden will be removed to expose gravels. Gravels will be removed and processed. Most material will be backfilled	Local	Permanent (if not backfilled)	Definite	Moderate	Yes (if backfilled)	No	Must be mitigated and avoided where possible	
2.2.3. Visual	Denuded areas will be visible	... but only to persons who visit Oena mine or the north bank of Orange River	Permanent or until backfill nor shaping	Possible (from visual impact point of view)	Insignificant, if any	Yes	No	Must be mitigated	
2.2.4. Land Capability	Any remnant excavations could impact on wilderness land capability	Local	Permanent or until backfill or shaping	Definite	Insignificant	Yes (if backfilled)	No	Must be mitigated and avoided where possible	
2.2.5. Surface Water	Excavations could disturb water course from mountainous hinterland	Local if any	Permanent or until backfill	Possible	Insignificant (given rarity of flows and low contribution to Orange River system)	Yes if excavation backfilled and water course re-instated	No	Must be avoided	
2.2.6. Groundwater	Excavations could expose groundwater	Local if any	Until backfill. Must be backfilled if encountered	Possible	Insignificant	Yes	No	Must be mitigated if encountered	
2.2.7. Noise	Noise generated by earthmoving equipment and trucks	Very local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary	
2.2.8. Air Quality	Dust generated by earthmoving equipment and trucks	Local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary	
2.2.9. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Local	Until cleanup	Possible	Insignificant	Yes	No	Managed	

Activity	Nature of impact	Extent	Duration	Probability	Significance	Extent to which impact can cause or be:			
						reversed	irreplaceable loss of resource	avoided, managed or mitigated	or
2.3. In pit screening of material (may apply)									
2.3.1. Noise	Noise generated by plant	Very local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary	
2.3.2. Air Quality	Dust generated by plant	Local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary	
2.3.3. Hydrocarbon	Possible fuel / oil leaks from plant and equipment	Local	Until cleanup	Possible	Insignificant	Yes	No	Managed	
2.4. All -25mm returned as backfill									
2.4.1. Noise	Noise generated by earthmoving equipment and trucks	Very local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary	
2.4.2. Air Quality	Dust generated by earthmoving equipment and trucks	Local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary	
2.4.3. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Local	Until cleanup	Possible	Insignificant	Yes	No	Managed	
2.5. Backfilled excavations to be covered with previously stockpiled topsoil									
2.5.1. Noise	Noise generated by earthmoving equipment and trucks	Very local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary	
2.5.2. Air Quality	Dust generated by earthmoving equipment and trucks	Local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary	
2.5.3. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Local	Until cleanup	Possible	Insignificant	Yes	No	Managed	

Activity	Nature of impact	Extent	Duration	Probability	Significance	Extent to which impact can cause or be:			
						reversed	irreplaceable loss of resource	avoided, managed or mitigated	or
2.6. Hauling of gravel to plant for processing.									
2.6.1. Noise	Noise generated by earthmoving equipment and trucks	Very local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary	
2.6.2. Air Quality	Dust generated by earthmoving equipment and trucks	Local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary	
2.6.3. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Local	Until cleanup	Possible	Insignificant	Yes	No	Managed	
2.7. Processing of material to obtain diamonds ⁹									
2.7.1. Noise	Noise generated by plant	Very local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary	
2.7.2. Air Quality	Dust generated by plant	Local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary	
2.7.3. Hydrocarbon	Possible fuel / oil leaks from plant and equipment	Local	Until cleanup	Possible	Insignificant	Yes	No	Managed	
2.7.4. Surface Water	Water use from Orange River	WULA to be lodged for 208 000m ³ /annum	Life of mine	Definite	Insignificant	No	Yes	Must be managed (and monitored)	
2.8. Stockpiling of coarse waste from plant or return to pit as backfill									
In the case of Backfill									
2.8.1. Noise	Noise generated by earthmoving equipment and trucks	Very local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary	

⁹ Note that existing main plant is located in Oena Section. A smaller plant has been established at Blokwerf South. Two other sites have been identified for possible plant establishment as per figures 4-6.

Activity	Nature of impact	Extent	Duration	Probability	Significance	Extent to which impact can cause or be:			
						reversed	irreplaceable loss of resource	avoided, managed or mitigated	or
2.8.2. Air Quality	Dust generated by earthmoving equipment and trucks	Local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary	
2.8.3. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Local	Until cleanup	Possible	Insignificant	Yes	No	Managed	
In the case of stockpiling, all of the above PLUS...									
2.8.4. Topography	Waste rock dumps will remain on site post mining (but dumps will be shaped)	Local	Permanent	Definite	Insignificant (if shaped)	Yes	No	Must be mitigated	
2.8.5. Visual	Waste rock dumps will be visible	... but only to persons who visit Oena mine or the north bank of Orange River	Permanent or until shaping	Possible (from visual impact point of view)	Insignificant (when shaped)	Yes	No	Must be mitigated	
2.9. Stockpiling of fine tailings from plant	Must be kept to minimum lateral extent								
2.9.1. Land Capability	Fine tailings dams / dumps will cover natural habitat	All fine tailings dams	Permanent	Definite	Insignificant given relative small scale	Yes	No	Must be mitigated & kept to minimum lateral extent	
2.9.2. Vegetation / Animal Life	Fine tailings dams / dumps will cover natural habitat	All fine tailings dams	Permanent	Definite	Insignificant given relative small scale	Yes	No	Must be mitigated	
2.9.3. Surface Water	Will result in loss of surface water through evaporation (such water sourced from Orange River)	All water pumped into dams with fine tailings (if not recycled)	Permanent	Definite	Insignificant given relative small scale	Yes	No	Could be mitigated if recycling considered	
2.9.4. Air Quality	Dried fine tailings may be blown from old fine tailings dams	Local	Several decades	Definite (without mitigation)	Insignificant given nature of surroundings (but such dust plume must be avoided)	Yes	No	Must be mitigated / Avoided	
2.10. Use of water for processing of material at plant									

Activity	Nature of impact	Extent	Duration	Probability	Significance	Extent to which impact can cause or be:			
						reversed	irreplaceable loss of resource	avoided, managed or mitigated	or
2.10.1. Surface Water	Will result in loss of surface water through evaporation (such water sourced from Orange River)	All water pumped into dams with fine tailings (if not recycled)	Permanent	Definite	Insignificant given relative small scale	Yes	No	Could be mitigated if recycling considered ¹⁰ .	
Other OPERATIONAL ACTIVITIES									
2.11. Use of workshop									
2.11.1. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Local	Until cleanup	Possible	Insignificant	Yes	No	Managed	
2.12. Use of wash bay (if contemplated)									
2.12.1. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Local	Until cleanup	Possible	Insignificant	Yes	No	Managed	
2.13. Use of Refuelling Facility (48kl capacity on site)									
2.13.1. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Local	Until cleanup	Possible	Insignificant	Yes	No	Managed	
2.14. Use of access/delivery road to the site									
2.14.1. Noise	Noise generated by earthmoving equipment and trucks	Very local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary	
2.14.2. Air Quality	Dust generated by earthmoving equipment and trucks	Local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary	
2.14.3. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Local	Until cleanup	Possible	Insignificant	Yes	No	Managed	
2.14.4. Traffic	Traffic generated by mine through the National Park.	Occasional vehicles moving staff to and from mine	Life of mine (infrequent)	Definite	Insignificant	No	No	Managed	

¹⁰ It is worth noting that the new plant at Blokwerf South has been constructed with a water recycling leg from the 16ft Rotary pan. It is however unknown for now how much water can be recycled by this method. It has the added advantage of limiting the size of the settling pond required.

Activity	Nature of impact	Extent	Duration	Probability	Significance	Extent to which impact can cause or be:			
						reversed	irreplaceable loss of resource	avoided, managed or mitigated	or
2.15. Use of Septic Tank and French drain									
2.15.1. Surface Water	Possible pollution of surface water resources	Local	Until dilution	Highly unlikely	Insignificant	Yes	No	Avoided	
2.15.2. Groundwater	Possible pollution of groundwater resources	Local	Until dilution	Unlikely	Insignificant	Yes	No	Avoided	
2.16. Use of airstrip									
2.16.1. Noise	Noise generated by aircraft	Local	On execution. Very infrequent	Possible	Insignificant	No	No	Not necessary	
2.16.2. Hydrocarbon	Possible fuel / oil leaks from aircraft / during fuel transfer	Local	Until cleanup	Highly unlikely	Insignificant	Yes	No	Managed	
2.17. Water Use: WULA in place but inadequate for abstraction. Will require additional WULA.									
3. OPERATIONAL NON – MINING REHABILITATION ACTIVITIES									
3.1. Maintain access/delivery road on site									
3.1.1. Noise	Noise generated by earthmoving equipment and trucks	Very local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary	
3.1.2. Air Quality	Dust generated by earthmoving equipment and trucks	Local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary	
3.1.3. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Local	Until cleanup	Possible	Insignificant	Yes	No	Managed	
3.2. Domestic waste is transported by bakkie to Sendelingsdrift and handled in terms of that town's domestic waste management									
3.3. Enforce no-go area access									
3.4. Decontaminate floors and diesel tanks when required									

Activity	Nature of impact	Extent	Duration	Probability	Significance	Extent to which impact can cause or be:			
						reversed	irreplaceable loss of resource	avoided, managed or mitigated	or
3.4.1. Hydrocarbon	Possible fuel / oil leaks	Local	Until cleanup	Possible	Insignificant	Yes	No	Managed	
4. DECOMMISSIONING PHASE ACTIVITIES									
4.1. Complete backfilling of excavations programmed for backfilling with nearby material (when available) and cover with topsoil OR ...									
4.1.1. Noise	Noise generated by earthmoving equipment and trucks	Very local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary	
4.1.2. Air Quality	Dust generated by earthmoving equipment and trucks	Local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary	
4.1.3. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Local	Until cleanup	Possible	Insignificant	Yes	No	Managed	
4.2. ...Shape excavation edges to 1:3 slope and topsoil									
4.2.1. Noise	Noise generated by earthmoving equipment and trucks	Very local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary	
4.2.2. Air Quality	Dust generated by earthmoving equipment and trucks	Local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary	
4.2.3. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Local	Until cleanup	Possible	Insignificant	Yes	No	Managed	
4.2.4. Topography	Will result in residual shaped excavations	Point	Permanent	Possible	Insignificant to moderate	Yes (in theory)	No	Mitigated	
4.3. Shape any remaining dumps as per EMP specification and cover with topsoil if available									

Activity	Nature of impact	Extent	Duration	Probability	Significance	Extent to which impact can cause or be:		
						reversed	irreplaceable loss of resource	avoided, managed or mitigated
4.3.1. Noise	Noise generated by earthmoving equipment and trucks	Very local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary
4.3.2. Air Quality	Dust generated by earthmoving equipment and trucks	Local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary
4.3.3. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Local	Until cleanup	Possible	Insignificant	Yes	No	Managed
4.3.4. Topography	Will result in residual shaped dumps	Point	Permanent	Possible	Insignificant	Yes (in theory)	No	Mitigated
4.4. Demolish all unrequired structures								
4.5. Remove all process plant and steel structures								
4.6. Remove all protruding foundations and footings								
4.7. Remove all pipelines and cables								
4.8. Remove diesel tank & decontaminate								
4.8.1. Hydrocarbon	Possible fuel / oil leaks contamination	Local	Until cleanup	Possible	Insignificant	Yes	No	Managed
4.9. Rip / scarify logistical facility area								
4.9.1. Noise	Noise generated by earthmoving equipment and trucks	Very local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary
4.9.2. Air Quality	Dust generated by earthmoving equipment and trucks	Local	On execution	Definite	Insignificant (None on surrounding landowners)	No	No	Not necessary
4.9.3. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Local	Until cleanup	Possible	Insignificant	Yes	No	Managed
4.10. Retain access roads for future use								
5. AFTERCARE PERIOD								

Activity	Nature of impact	Extent	Duration	Probability	Significance	Extent to which impact can cause or be:			
						reversed	irreplaceable loss of resource	avoided, managed or mitigated	or
5.1. Remove alien vegetation (if applicable)									
5.2. Conduct final performance assessment									
5.3. Lodge closure Application									
5.4. DMR Grant Closure Application									

14 Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;

(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).

The impact ratings ascribed in this document are as per the following process and criteria:

An initial table was compiled which described each activity (whether listed or not in terms of NEMA), potential impact, significance and duration. Such table was included in all draft reporting (including this draft EIA/EMP) and made available to all identified Interested and Affected Parties.

Any relevant responses received would then inform a revision of the site layout plan. Although there have been no revisions required as yet, it is possible that the site layout require revision through continued input by I&AP's.

The impacts are rated according to nature, extent, duration, probability of occurring and significance.

a) The significance level is based on the following criteria:

<i>Significance</i>		<i>Criteria</i>
Negative	Significant (S)	<ul style="list-style-type: none"> Recommended level always exceeded with associated widespread community action Disturbance to areas that are pristine, have conservation value, are important resource to humans and will be lost forever Complete loss of land capability Destruction of rare or endangered specimens May affect the viability of the project
	Moderate (M)	<ul style="list-style-type: none"> Moderate measurable deterioration and discomfort Recommended level occasionally violated – still widespread complaints Partial loss of land capability Complete change in species variety or prevalence May be managed Is insignificant if managed according to EMP provisions
	Minor/ Insignificant (I)	<ul style="list-style-type: none"> Minor deterioration. Change not measurable Recommended level will rarely if ever be violated Sporadic community complaints Minor deterioration in land capability Minor changes in species variety or prevalence
	Negligible	<ul style="list-style-type: none"> An impact will occur but it is barely discernible and not worthy of further investigation
Positive	Minor	<ul style="list-style-type: none"> Improvements in local socio-economics
	Significant	<ul style="list-style-type: none"> Major improvements in local socio-economics with some regional benefits

b) The **duration** is classified as:

- Permanent (post-closure)
- Life of Mine (LOM)

- Temporary

c) The **probability** is ranked as:

- Definite/Certain
- Possible
- Unlikely

15 The positive & negative impacts that the activity & alternatives will have on the affected environment and the community.

(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)

No alternatives have been presented through the public participation process and the original mine plan described in the original documentation remains virtually unchanged.

In terms of positive and negative impacts that the proposed activity will have on the affected environment and community, provided the mitigation and management measures that are contained in this EIA/EMP are applied then the impact of the proposed operation in the overall sense will be insignificant, with the greatest impact being the temporary disturbance of portion of the National Park. The only permanent impact will be that on topography, as some parts of the landscape will be reshaped, however, the rehabilitation methodology is aimed at ensuring that there will be no residual steep slopes or sharp edges.

There will be no impact on surrounding landowners or users in terms of noise and dust.

One of the main concerns from a Socio-economic point of view is that tourism and sense of place will be affected to such a degree that negative socio-economic impact will occur. However, such impact would have already occurred given the history of the site within the National Park. The post mining diamond mine could fulfill a tourist function through declaration of the geosite in respect of the Barker Pothole excavation site as well use of retained facilities (if considered).

16 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).

To date no concerns have been raised in respect of the environmental impact of the operation. All comments so far relate to:

- The requirement for WULA (currently under application by other consultants)

- Details of surface rental (from DPW)
- Other legal issues not related to the update of the EMP

16.1 Motivation where no alternative sites were considered.

Not applicable.

16.2 Statement motivating the alternative development location within the overall site.

Not applicable to this existing project.

17 Description of the process undertaken to identify, assess & rank the impacts & risks the activity will impose on the preferred site through the life of the activity.

(Including a description of all environmental issues and risks that were identified during the environmental impact assessment process and an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.)

The process undertaken to identify, assess and rank the impacts and risks consisted of 4 steps as follows:

Step 1: Determine the exact nature of the disturbances that have and would take place in a spatial sense as well as in respect of activities typical of mining based existing impacts and on several years' experience in this regard in similar operations (by the EAP).

Step 2: Determination on expected impacts of each activity / disturbance that have / would take place in such a mining activity with a provisional rating of significance, duration, etc. based on experience of the EAP as well as actual on site impacts.

Step 3: Such information was presented in tabular format for ease of reference as well as ensuring that no activities or disturbances could inadvertently be "left out" of future discussion in the reporting.

Step 4: The draft Scoping report and draft EIA/EMP were distributed amongst State Departments as well as NGO,s Parastatals and the broader public to test the identification, assessment and ranking of the impacts and risks that the activities would impose based on comments received from all parties.

17.1 Description of all environmental issues and risks that were identified during the environmental impact assessment process.

The issues that were identified are described fully under their relevant headings and tables in Part 16 and will not be repeated in this para in full. However, in list form the issues and risks related to:

- Vegetation and Ecosystem integrity, CBA
- Impact on Water Resources
- Topography
- Socio-economic (specifically Tourism)

17.2 Assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures

- For significance of each issue and risk – Refer table in para 13
- For indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures – Refer Table in Part 13
- Actual mitigation measures are described in Para 34.

17.3 Assessment of each identified potentially significant impact and risk

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties).

ACTIVITY whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)	SIGNIFICANCE if not mitigated	MITIGATION TYPE (modify, remedy, control, or stop) Through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc). E.g. Modify through alternative method. Control through noise control Control through management and Monitoring, through rehabilitation.	SIGNIFICANCE if mitigated.
1. ESTABLISHMENT ACTIVITIES				
1.1. Access road is already in place and approved in terms of earlier EMP.				
1.2. All haul roads and on-site roads are already in place				
1.3. All offices and admin building are already in place				
1.4. Workshop is already in place.				
1.5. Fuel Tanks are already in place. Storage Capacity 48kl				
1.6. Points 1.3 and 1.4 include personnel amenities to septic tank and then French drain				
1.7. Airstrip (1km long) in place				
1.8. Processing plant. The main plant is located in the Oena Section but additional plants may be developed later at other Sections				
1.9. Ensure domestic and industrial waste management system is in place				
2. OPERATIONAL PHASE ACTIVITIES				
2.1. Topsoil removal to perimeter stockpile or for immediate use in cover of previously backfilled area.	2.1.1. Soil/topsoil	Moderate	Control / Remedy through management and rehabilitation	Insignificant / none
	2.1.2. Visual	Insignificant	Control / Remedy through management and rehabilitation	Insignificant / none
	2.1.3. Land Capability	Moderate	Control / Remedy through management and rehabilitation	Insignificant / none
	2.1.4. Animal Life	Insignificant	Avoid through monitoring and management	None / Insignificant
	2.1.5. Noise	Insignificant	None, except to ensure vehicle silencers are in operation	Insignificant to None

ACTIVITY whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)	SIGNIFICANCE if not mitigated	MITIGATION TYPE (modify, remedy, control, or stop) Through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc). E.g. Modify through alternative method. Control through noise control Control through management and Monitoring, through rehabilitation.	SIGNIFICANCE if mitigated.
	2.1.6. Air Quality	Insignificant	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Insignificant to none
	2.1.7. Archaeology	Insignificant	Avoid through monitoring and management	None / Insignificant
	2.1.8. Hydrocarbon	Insignificant	Avoid through monitoring and management	None
2.2. Clearing of overburden where present as backfill to previously mined area	2.2.1. Geology	Insignificant	Rehabilitation through backfill	None
	2.2.2. Topography	Moderate to Significant	Rehabilitation through backfill	None to insignificant
	2.2.3. Visual	Insignificant	Rehabilitation through backfill	None to insignificant
	2.2.4. Land Capability	Moderate	Control / Remedy through management and rehabilitation	Insignificant / none
	2.2.5. Surface Water	Insignificant	Avoid through monitoring and management	None / Insignificant
	2.2.6. Groundwater	Insignificant	Rehabilitation through backfill	None to insignificant
	2.2.7. Noise	Insignificant	None, except to ensure vehicle silencers are in operation	Insignificant to None
	2.2.8. Air Quality	Insignificant	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Insignificant to none
	2.2.9. Hydrocarbon	Insignificant	Avoid through monitoring and management	None
2.3. In pit screening of material (may apply). Note that in pit screening is a rehabilitation method in that maximum backfill is ensured. Positive impact on topography.	2.3.1. Noise	Insignificant	None, except to ensure vehicle silencers are in operation	Insignificant to None
	2.3.2. Air Quality	Insignificant	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Insignificant to none
	2.3.3. Hydrocarbon	Insignificant	Avoid through monitoring and management	None
2.4. All -25mm returned as backfill . Note that backfill is a rehabilitation method. Positive impact on	2.4.1. Noise	Insignificant	None, except to ensure vehicle silencers are in operation	Insignificant to None

ACTIVITY whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc...)	SIGNIFICANCE if not mitigated	MITIGATION TYPE (modify, remedy, control, or stop) Through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc). E.g. Modify through alternative method. Control through noise control Control through management and Monitoring, through rehabilitation.	SIGNIFICANCE if mitigated.
topography.	2.4.2. Air Quality	Insignificant	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Insignificant to none
	2.4.3. Hydrocarbon	Insignificant	Avoid through monitoring and management	None
2.5. Backfilled excavations to be covered with previously stockpiled topsoil	2.5.1. Noise	Insignificant	None, except to ensure vehicle silencers are in operation	Insignificant to None
	2.5.2. Air Quality	Insignificant	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Insignificant to none
	2.5.3. Hydrocarbon	Insignificant	Avoid through monitoring and management	None
2.6. Hauling of gravel to plant for processing.	2.6.1. Noise	Insignificant	None, except to ensure vehicle silencers are in operation	Insignificant to None
	2.6.2. Air Quality	Insignificant	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Insignificant to none
	2.6.3. Hydrocarbon	Insignificant	Avoid through monitoring and management	None
2.7. Processing of material to obtain diamonds ¹¹	2.7.1. Noise	Insignificant	None, except to ensure vehicle silencers are in operation	Insignificant to None
	2.7.2. Air Quality	Insignificant	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Insignificant to none
	2.7.3. Hydrocarbon	Insignificant	Avoid through monitoring and management	None
	2.7.4. Surface Water	Insignificant	Monitor to measure use. Recycle to limit use	Insignificant
2.8. Stockpiling of coarse waste from plant or return to pit as backfill				
In the case of Backfill	2.8.1. Noise	Insignificant	None, except to ensure vehicle silencers are in operation	Insignificant to None

¹¹ Note that existing main plant is located in Oena Section. A smaller plant has been established at Blokwerf South. Two other sites have been identified for possible plant establishment as per figures 4-6.

ACTIVITY whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)	SIGNIFICANCE if not mitigated	MITIGATION TYPE (modify, remedy, control, or stop) Through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc). E.g. Modify through alternative method. Control through noise control Control through management and Monitoring, through rehabilitation.	SIGNIFICANCE if mitigated.
	2.8.2. Air Quality	Insignificant	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Insignificant to none
	2.8.3. Hydrocarbon	Insignificant	Avoid through monitoring and management	None
In the case of stockpiling, all of the above PLUS...	2.8.4. Topography	Moderate	Rehabilitation through shaping or backfill to pit	Insignificant to none
	2.8.5. Visual	Insignificant	Rehabilitation through backfill	None to insignificant
2.9. Stockpiling of fine tailings from plant	2.9.1. Land Capability	Insignificant	Maximise backfill of existing pits to limit impact on natural ground level. Minimise size through containment Minimise size through recycling. Rehabilitate post mining through cover	None to insignificant
	2.9.2. Vegetation / Animal Life	Insignificant, if any	Maximise backfill of existing pits to limit impact on natural ground level. Minimise size through containment Minimise size through recycling. Rehabilitate post mining through cover	None to insignificant
	2.9.3. Surface Water	Insignificant	Maximise recycling of water	Insignificant
	2.9.4. Air Quality	Moderate	Prevent windblown dried fine tailings and plume development through cover when finalised	None
2.10. Use of water for processing of material at plant	2.10.1. Surface Water	Insignificant	Maximise recycling of water	Insignificant
Other OPERATIONAL ACTIVITIES				
2.11. Use of workshop	2.11.1. Hydrocarbon	Insignificant	Avoid through monitoring and management	None
2.12. Use of wash bay (if contemplated)	2.12.1. Hydrocarbon	Insignificant	Avoid through monitoring and management	None
2.13. Use of Refuelling Facility (48kl capacity on site)	2.13.1. Hydrocarbon	Insignificant	Avoid through monitoring and management	None
2.14. Use of access/delivery road to the site	2.14.1. Noise	Insignificant	None, except to ensure vehicle silencers are in operation	Insignificant to None
	2.14.2. Air Quality	Insignificant	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Insignificant to none

ACTIVITY whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)	SIGNIFICANCE if not mitigated	MITIGATION TYPE (modify, remedy, control, or stop) Through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc). E.g. Modify through alternative method. Control through noise control Control through management and Monitoring, through rehabilitation.	SIGNIFICANCE if mitigated.
	2.14.3. Hydrocarbon	Insignificant	Avoid through monitoring and management	None
	2.14.4. Traffic	Insignificant	Limit impact through enforcing low speed limits on road	Insignificant
2.15. Use of Septic Tank and French drain	2.15.1. Surface Water	Insignificant	Avoid through use of sewage system or chemical toilets	None
	2.15.2. Groundwater	Insignificant	Avoid through use of sewage system or chemical toilets	None
2.16. Use of airstrip	2.16.1. Noise	Insignificant	None feasible (but rarely occurs)	Insignificant
	2.16.2. Hydrocarbon	Insignificant	Avoid through monitoring and management	None
2.17. Water Use: WULA in place but inadequate for abstraction. Will require additional WULA.				
3. OPERATIONAL NON – MINING REHABILITATION ACTIVITIES				
3.1. Maintain access/delivery road on site	3.1.1. Noise	Insignificant	None, except to ensure vehicle silencers are in operation	Insignificant to None
	3.1.2. Air Quality	Insignificant	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Insignificant to none
	3.1.3. Hydrocarbon	Insignificant	Avoid through monitoring and management	None
3.2. Domestic waste is transported by bakkie to Sendelingsdrift and handled in terms of that town's domestic waste management				
3.3. Enforce no-go area access				
3.4. Decontaminate floors and diesel tanks when required	3.4.1. Hydrocarbon	Insignificant	Avoid through monitoring and management	None
4. DECOMMISSIONING PHASE ACTIVITIES				
4.1. Complete backfilling of excavations programmed for backfilling with nearby material (when available) and cover with topsoil OR ...	4.1.1. Noise	Insignificant	None, except to ensure vehicle silencers are in operation	Insignificant to None
	4.1.2. Air Quality	Insignificant	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Insignificant to none
	4.1.3. Hydrocarbon	Insignificant	Avoid through monitoring and management	None

ACTIVITY whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)	SIGNIFICANCE if not mitigated	MITIGATION TYPE (modify, remedy, control, or stop) Through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc). E.g. Modify through alternative method. Control through noise control Control through management and Monitoring, through rehabilitation.	SIGNIFICANCE if mitigated.
4.2. ...Shape excavation edges to 1:3 slope and topsoil	4.2.1. Noise	Insignificant	None, except to ensure vehicle silencers are in operation	Insignificant to None
	4.2.2. Air Quality	Insignificant	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Insignificant to none
	4.2.3. Hydrocarbon	Insignificant	Avoid through monitoring and management	None
	4.2.4. Topography	Moderate	Rehabilitation through shaping or backfill to pit	Insignificant to none
4.3. Shape any remaining dumps as per EMP specification and cover with topsoil if available	4.3.1. Noise	Insignificant	None, except to ensure vehicle silencers are in operation	Insignificant to None
	4.3.2. Air Quality	Insignificant	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Insignificant to none
	4.3.3. Hydrocarbon	Insignificant	Avoid through monitoring and management	None
	4.3.4. Topography	Moderate	Rehabilitation through shaping or backfill to pit	Insignificant to none
4.4. Demolish all unrequired structures				
4.5. Remove all process plant and steel structures				
4.6. Remove all protruding foundations and footings				
4.7. Remove all pipelines and cables				
4.8. Remove diesel tank & decontaminate	4.8.1. Hydrocarbon	Insignificant	Avoid through monitoring and management	None
4.9. Rip / scarify logistical facility area	4.9.1. Noise	Insignificant	None, except to ensure vehicle silencers are in operation	Insignificant to None
	4.9.2. Air Quality	Insignificant	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Insignificant to none
	4.9.3. Hydrocarbon	Insignificant	Avoid through monitoring and management	None
4.10. Retain access roads for future use				
5. AFTERCARE PERIOD				
5.1. Remove alien vegetation (if applicable)				
5.2. Conduct final performance assessment				

ACTIVITY whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)	SIGNIFICANCE if not mitigated	MITIGATION TYPE (modify, remedy, control, or stop) Through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc). E.g. Modify through alternative method. Control through noise control Control through management and Monitoring, through rehabilitation.	SIGNIFICANCE if mitigated.
5.3. Lodge closure Application				
5.4. DMR Grant Closure Application				

17.4 Summary of specialist reports.

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form):-

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN EIA (Mark with an X where applicable)	REFERENCE
Phase 1 Archaeological Impact Assessment	<p>“Mitigation will be relatively quick to accomplish at most of these sites since all are open scatters lying on the surface. While occasional areas may require some sieving of the sandier substrate, the majority could be done through careful surface collection within a grid system. The main aim of the mitigation will be to document the nature of ESA and MSA artefacts that are present and to document the pottery tradition present in the area. It is unfortunate that no finds of significance accompanied the pottery at any of the sites found. Only one pottery site preserved some organic material (OES fragments) which could be the only chance of dating the pottery.</p> <p>Also: “Visrivier and Kabies only received preliminary searches. Both will require further survey ...”</p>	X	Attached as Appendix 5. See also para 34.5 for inclusion of these mitigation measures.

18 Environmental impact statement

18.1 Summary of the key findings of the environmental impact assessment

The mining lease area is **located within the Ai-Ais-Richtersveld Transfrontier Conservation Park**. There are 3 zones of distinct topographical, vegetation & faunal dissimilarity that run semi-parallel to the Orange River. They are, from the Orange River:

- The riparian edge / flood plain of the Orange River. This consists of silty flood deposited soils and probably contains more than 99% of the vegetation and animal life in the mining lease area. This area is not to be disturbed by the proposed operations.
- The remainder of the Orange River valley consists of barren (in terms of vegetation and animal life) alluvial gravel deposits. This is the area where mining will take place.
- The mountainous barely accessible hinterland of the Northern Richtersveld. This area will not be disturbed by proposed activities.

The operational and residual impacts of the proposed mining programme are summarised below for each of the environmental aspects.

- Topography: The largest impact and will result from the:
 - Extension of existing plant coarse tailings dumps and fine tailings dumps. These will however have their edges rounded to mimic natural contours.
 - The excavations will be backfilled with oversize and overburden. This will account for $\pm 80\%$ of the excavation volume and will result in $\pm 20\%$ residual excavation volume to be shaped during operational rehabilitation.
- Soils: Topsoil is sparse and indeed unavailable on the exposed meso gravels. Where topsoil is available, it will be removed for use as later cover material during rehabilitation.
- Land Capability and Land Use: The mining area will still be available for grazing by goats. The grazing takes place in the riparian edge and there is no "mixing" of mining and grazing. The closure objective of the operation is to return the area as a wilderness area with **possible** partial retention of the logistical facility area as Park infrastructure (campsite or administration)
- Vegetation: As discussed above, all vegetation is located within the riparian edge which will not be disturbed by mining. The only activity required is the location and use of pump stations to supply domestic and process water.
- Animal Life: All located within the riparian edge and they will not be disturbed by the proposed operation
- Surface Water:

- The 1:100 year flood line has been demarcated on the enclosed figures through on-site assessment and recording of the silt edges on the ground. No activity will be permitted on these silts and as such no impact in this regard will occur
- Surface water quality could be compromised by potential oil/fuel leaks. This will however be prevented by the implementation of the fuel / oil handling policy to be defined in this EMP.
- The operation requires the abstraction of 208 000m³ of water per year at full production. WULA is required for this and other aspects of the operation. Such WULA is currently (Oct 18) underway by others.
- Dust and Noise: Need only be controlled to prevent impact on the employees. There will be no impact on surrounding land users or uses.
- Archaeology and Cultural heritage:
 - The Barker Pothole is a historical mining of a particularly rich diamond trapsite. The bedrock has been swept clean over a large area and it is proposed to register the site as a geosite. Boardwalks, signage and viewpoints are proposed and the site will form an added attraction to the Park.
 - Full AIA has been conducted by UCT. Attached as Appendix 5

It is clear that, provided the rehabilitation measures as proposed in this document are implemented, the overall operational and residual impact of the operation will be minimal.

18.2 Final Site Map

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers.

Refer Figures 4-6 and Appendix 3. Appendix 3 has been designed to be able to be updated from time to time without the requirement for rewriting of the entire EIA/EMP.

Such figures and appendix 3 also shows the overall measured disturbance areas.

18.3 Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;

Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.

Objectives are non-specific / less measureable aims of the rehabilitation/impact management programme.

Outcomes are the measurable effects the rehabilitation /impact management must accomplish.

18.3.1 Impact Management objectives are as follows:

- 1) To prevent any impact on the tourism industry in the area
- 2) Minimise post mining negative residual impacts and take advantages of any positive impacts which may be available
- 3) To eliminate impact on biodiversity given location of site partially within the National Park and by extension within a CBA
- 4) To ensure that the proposed operation does not contravene policies of local / municipal SDF, IDF and other policy documentation
- 5) Elimination of any possible impact on surface water and groundwater regime
- 6) Limit any environmental nuisance factors resulting from mining at this site
- 7) To have community and SANParks representation in the Environmental Management System

18.3.2 Impact Management outcomes are as follows:

- 1) Ensure that mine plans and integrated concurrent rehabilitation takes place as per Mine plan phasing in Para 5 and 6 and Appendix 3.
- 2) Ensure maximization of backfill to limit residual impacts in respect of topography.
- 3) Ensure effective Fine Tailings handling to eliminate siltation of Orange River and residual dust plume development
- 4) Ensure that buffers are in place to prevent impact on water regime
- 5) General site husbandry must be of the highest order and management must be fully *au fait* with content and measures prescribed in the final EIA/EMP.
- 6) A transparent Environmental Management system with community representation on a Monitoring Committee.

18.4 Final proposed alternatives.

(Provide an explanation for the final layout of the infrastructure and activities on the overall site as shown on the final site map together with the reasons why they are the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment)

Not applicable yet (and unlikely to become applicable).

19 Aspects for inclusion as conditions of Authorisation.

The following conditions must be included as conditions of authorisation:

- 1) All aspects and measures prescribed in the EMP must be strictly applied.
- 2) Applicant must provide proof of all attempts to establish a community involved Monitoring Committee and must present minutes of future meetings in Environmental Audit Reports.

20 Description of any assumptions, uncertainties and gaps in knowledge.

(Which relate to the assessment and mitigation measures proposed)

None known.

21 Reasoned opinion as to whether the proposed activity should or should not be authorised

21.1 Reasons why the activity should be authorized or not.

Not applicable in this case given that Mining Right already exists for the operation.

However, at this stage (i.e. post Scoping and prior to draft EIA/EMP distribution) there has been no reason offered as to why the project should not continue. Provided that all the EMP provisions / prescriptions are adhered to, then the residual impact of the operation will be negligible.

21.2 Conditions that must be included in the authorization

21.2.1 Specific conditions to be included into the compilation and approval of EMPr

The following conditions must be included as conditions of authorisation:

- All aspects and measures prescribed in the EMP must be strictly applied.
- Applicant must provide proof of all attempts to establish a community and SANParks involved Monitoring Committee and must present minutes of future meetings in Environmental Audit Reports.
- Appendix 3 to the EMP be updated every 2 years as part of the Environmental Audit

21.2.2 Rehabilitation requirements

None, except to state that all prescriptions of the EMP must be met including the ongoing nature of rehabilitation behind advancing mining.

22 Period for which the Environmental Authorisation is required.

17 years - This mine has a planned lifespan of 15 years but an additional 2 years is required for aftercare before final closure of the site.

23 Undertaking

Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic assessment report and the Environmental Management Programme report.

Confirmed in respect of the EMPr.

There was no Basic Assessment.

24 Financial Provision

This is an operational and licenced mine. As such the holder is required to annually update the calculation of the fund required to rehabilitate the site under the following assumptions:

- 1) Use of outside contractors.
- 2) At current state of the operation (i.e. immediate closure)

24.1 Explain how the aforesaid amount was derived.

Not applicable.

24.2 Confirm that this amount can be provided for from operating expenditure.

(Confirm that the amount, is anticipated to be an operating cost and is provided for as such in the Mining work programme, Financial and Technical Competence Report or Prospecting Work Programme as the case may be).

Yes, the Mining Work Programme which accompanied the application showed through detailed cash flow forecast that ongoing rehabilitation could be funded from operating expenditure. The amount required is provided by means of a Bank Guarantee with annual updates of the quantum calculation.

25 Deviations from the approved scoping report and plan of study.

25.1 Deviations from the methodology used in determining the significance of potential environmental impacts and risks.

(Provide a list of activities in respect of which the approved scoping report was deviated from, the reference in this report identifying where the deviation was made, and a brief description of the extent of the deviation).

None

25.2 Motivation for the deviation.

Not applicable.

26 Other Information required by the competent Authority

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

26.1.1 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, attach

the investigation report as **Annexure** and confirm that the applicable mitigation is reflected herein).

Socio-economic impact occurs as a result of the following parties' socio-economic status being altered:

- Landowner: Usually a positive impact in respect of surface rental and / or other income as a result of the mining. In this case it is slightly more complicated given although the landowner is the Republic of South Africa, the land is located in a National Park. The point however is the National Park does not lose any income as a result of the Oena Diamond Mine being within its boundary.
- Mining Company and employees: Guaranteed income for duration of the project.
- Consumer: Continued supply of gem quality diamonds.
- The applicant company is bound by prescriptions of the Social and Labour Plan to contribute to the community's skills development and must also implement a Local Economic Development project which meets the satisfaction of the DMR and local authority.
- The social and labour plan also prescribes skills development for staff and community members.

26.1.2 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** and confirm that the applicable mitigation is reflected herein).

Refer Appendix 3. The Phase 1 AIA is was compiled by J Orton and L Webley. The survey did find scattered artefacts of Early and Middle Stone Age over the cobbled terraces. However, the impact was described as insignificant provided "fairly easy" mitigation took place.

Such mitigation merely entails the detailed recording of the finds prior to mining of the affected sites.

27 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 alternatives are considered in part 9, 14 and 15 under the relevant template headings.

PART B: ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

28 Details of the EAP,

(Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 1(a) herein as required).

Refer Para 1.

29 Description of the Aspects of the Activity

(Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, herein as required).

Yes. Refer table in Part A: Part 4 and 5.

30 Composite Map

(Provide a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers)

Refer Figure 4-6 and Appendix 3.

31 Description of Impact management objectives including management statements.

31.1 *Determination of closure objectives.*

(Ensure the closure objectives are informed by type of environment)

The closure objectives are as follows:

- 1) Minimise post mining negative residual impacts and take advantages of any positive impacts which may be available
- 2) To allow for the entire Mining Right area (particularly disturbances) to form part of the National Park fabric.
- 3) To prevent any negative impact on the tourism industry in the area. It is possible that parts of the post mining landscape could form part of a tourism consideration.
- 4) Elimination of any possible impact on surface water and groundwater regime
- 5) Ensure that mine plans and integrated concurrent rehabilitation takes place as per Mine plan phasing in Para 5 and 6 and Appendix 3.
- 6) Ensure maximization of backfill to limit residual impacts in respect of topography.
- 7) Ensure effective Fine Tailings handling to eliminate siltation of Orange River and residual dust plume development

31.2 The process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity.

The full Environmental Management System will consist of:

- Implementation of measures as prescribed in this text (especially part 4 and 34 as well Appendix 3).
- Environmental Awareness and Induction Training of staff (Appendix 7).
- Monitoring (Refer Part 36) through:
 - o Community / SANParks representation on annual monitoring committee.
 - o Continual on site in-house monitoring.
 - o Environmental Audit every 2 years by independent party.
 - o Update of Appendix as part of Environmental Audit
- Emergency Action Plans for Environmental incidents.
- Inspections by DMR/DEA environmental officers as legislated.
- Appointment of ECO to visit site at least on 6-monthly basis to guide rehabilitation (This site is isolated and fairly difficult to access).

31.3 Potential risk of Acid Mine Drainage.

(Indicate whether or not the mining can result in acid mine drainage).

None

31.4 Steps taken to investigate, assess, and evaluate the impact of acid mine drainage.

NA

31.5 Engineering or mine design solutions to be implemented to avoid or remedy acid mine drainage.

NA

31.6 Measures that will be put in place to remedy any residual or cumulative impact that may result from acid mine drainage.

NA

31.7 Volumes and rate of water use required for the mining, trenching or bulk sampling operation.

NA

31.8 Has a water use licence has been applied for?

The application for WULA is currently (October 2018) being compiled by others and will be lodged to DWS when ready.

32 Impacts to be mitigated in their respective phases

Measures to rehabilitate the environment affected by the undertaking of any listed activity

ACTIVITIES And Impact Aspect	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
1. ESTABLISHMENT ACTIVITIES				
1.1. Access road is already in place and approved in terms of earlier EMP.				
1.2. All haul roads and on-site roads are already in place				
1.3. All offices and admin building are already in place				
1.4. Workshop is already in place.				
1.5. Fuel Tanks are already in place. Storage Capacity 48kl				
1.6. Points 1.3 and 1.4 include personnel amenities to septic tank and then French drain				
1.7. Airstrip (1km long) in place				
1.8. Processing plant. The main plant is located in the Oena Section but additional plants may be developed later at other Sections				

ACTIVITIES And Impact Aspect	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
1.9. Ensure domestic and industrial waste management system is in place				
2. OPERATIONAL PHASE ACTIVITIES				
2.1. Topsoil removal to perimeter stockpile or for immediate use in cover of previously backfilled area.	Total area available for potential future mining according to prospecting results as follows: - Oena Blocks 1-8 = 58.5ha - Sandberg 10-14 = 34.4ha - Blokwerf Gravels = Total 252ha (assume conservative 25% suitable based on Oena and Sandberg polygons) = 63ha. TOTAL: Min 155.9ha Visrivier and Kabies Section programmed for prospecting			
2.1.1. Soil/topsoil	Expected minimum 155.9ha in blocks as mining progresses. Moderate. Life of mine or until replacement	Topsoil Management Programme as per para 34.1	Rehabilitation standard as prescribed in EMP	Continuously with advancing rehabilitation behind mining, where topsoil was removed
2.1.2. Visual	Denuded areas will be visible but only to persons who visit Oena mine or the north bank of Orange River. Insignificant. Life of mine or until replacement	Linked to topsoil management. Will be returned to natural state after topsoil replacement where applicable	Rehabilitation standard as prescribed in EMP	Linked to topsoil management.
2.1.3. Land Capability	The areas with removed topsoil may not be suitable as current habitat, although this impact most likely to occur during deeper excavations given that topsoil has no vegetative cover. Insignificant given vast tracts of similar "habitat" surrounding disturbance area.	Linked to topsoil management and backfill . Will be returned to natural state after topsoil replacement where applicable	Rehabilitation standard as prescribed in EMP	Linked to topsoil management.
2.1.4. Animal Life	The areas with removed topsoil may not be suitable as current habitat, although this impact most likely to occur during deeper excavations given that topsoil has no vegetative cover Insignificant given vast tracts of similar "habitat" surrounding disturbance area	None required	Not applicable	Not applicable

ACTIVITIES And Impact Aspect	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
2.1.5. Noise	Noise generated by earthmoving equipment and trucks: Local Insignificant Impact	Ensure vehicular silencers are operational. Reduce speed on all roads	Recommended standards in SANS 0103-1983 – refer para 12.1.10	Whilst active
2.1.6. Air Quality	Dust generated by earthmoving equipment and trucks: Local Insignificant Impact	None required unless levels exceeded	Recommended standards in SANS 1929:2004 – Refer para 12.1.9	Whilst Active
2.1.7. Archaeology	Possible disturbance of archaeological artefacts: Local Insignificant Impact	Conduct pre disturbance sweep as per para 34.5	AIA prescriptions	Prior to development
2.1.8. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment. Local Insignificant Impact	Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	EMP prescriptions	Continuously
2.2. Clearing of overburden where present as backfill to previously mined area				
2.2.1. Geology	Removal of subsoil will impact on local geological stratigraphy. Insignificant local impact.	Backfill or shaping – Refer para 34.3	EMP prescriptions	Backfill will take place behind advancing faces as a continuous exercise
2.2.2. Topography	Overburden will be removed to expose gravels. Gravels will be removed and processed. Most material will be backfilled. Moderate local impact	Backfill or shaping – Refer para 34.3	EMP prescriptions	Backfill will take place behind advancing faces as a continuous exercise
2.2.3. Visual	Denuded areas will be visible. Denuded areas will be visible but only to persons who visit Oena mine or the north bank of Orange River. Insignificant. Life of mine or until replacement.	Backfill or shaping – Refer para 34.3	EMP prescriptions	Backfill will take place behind advancing faces as a continuous exercise
2.2.4. Land Capability	Any remnant excavations could impact on wilderness land capability. Moderate if not rehabilitated through shaping	Backfill or shaping – Refer para 34.3	EMP prescriptions	Backfill will take place behind advancing faces as a continuous exercise

ACTIVITIES And Impact Aspect	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
2.2.5. Surface Water	Excavations could disturb water course from mountainous hinterland. Insignificant and local impact (especially given rarity of flows and low contribution to Orange River system)	Backfill or shaping – Refer para 34.3	EMP prescriptions	Backfill will take place behind advancing faces as a continuous exercise
2.2.6. Groundwater	Excavations could expose groundwater	Backfill – Refer para 34.3	EMP rehabilitation methodology. Note any pits exposing groundwater must be backfilled	Backfill will take place behind advancing faces as a continuous exercise
2.2.7. Noise	Noise generated by earthmoving equipment and trucks	Ensure vehicular silencers are operational. Reduce speed on all roads	Recommended standards in SANS 0103-1983 – refer para 12.1.10	Whilst active
2.2.8. Air Quality	Dust generated by earthmoving equipment and trucks	None required unless levels exceeded	Recommended standards in SANS 1929:2004 – Refer para 12.1.9	Whilst Active
2.2.9. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	EMP prescriptions	Continuously
2.3. In pit screening of material (may apply)				
2.3.1. Noise	Noise generated by earthmoving equipment and trucks	Ensure vehicular silencers are operational. Reduce speed on all roads	Recommended standards in SANS 0103-1983 – refer para 12.1.10	Whilst active
2.3.2. Air Quality	Dust generated by earthmoving equipment and trucks	None required unless levels exceeded	Recommended standards in SANS 1929:2004 – Refer para 12.1.9	Whilst Active
2.3.3. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	EMP prescriptions	Continuously
2.4. All -25mm returned as backfill				
2.4.1. Noise	Noise generated by earthmoving equipment and trucks	Ensure vehicular silencers are operational. Reduce speed on all roads	Recommended standards in SANS 0103-1983 – refer para 12.1.10	Whilst active

ACTIVITIES And Impact Aspect	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
2.4.2. Air Quality	Dust generated by earthmoving equipment and trucks	None required unless levels exceeded	Recommended standards in SANS 1929:2004 – Refer para 12.1.9	Whilst Active
2.4.3. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	EMP prescriptions	Continuously
2.5. Backfilled excavations to be covered with previously stockpiled topsoil				
2.5.1. Noise	Noise generated by earthmoving equipment and trucks	Ensure vehicular silencers are operational. Reduce speed on all roads	Recommended standards in SANS 0103-1983 – refer para 12.1.10	Whilst active
2.5.2. Air Quality	Dust generated by earthmoving equipment and trucks	None required unless levels exceeded	Recommended standards in SANS 1929:2004 – Refer para 12.1.9	Whilst Active
2.5.3. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	EMP prescriptions	Continuously
2.6. Hauling of gravel to plant for processing.				
2.6.1. Noise	Noise generated by earthmoving equipment and trucks	Ensure vehicular silencers are operational. Reduce speed on all roads	Recommended standards in SANS 0103-1983 – refer para 12.1.10	Whilst active
2.6.2. Air Quality	Dust generated by earthmoving equipment and trucks	None required unless levels exceeded	Recommended standards in SANS 1929:2004 – Refer para 12.1.9	Whilst Active
2.6.3. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	EMP prescriptions	Continuously
2.7. Processing of material to obtain diamonds ¹²				

¹² Note that existing main plant is located in Oena Section. A smaller plant has been established at Blokwerf South. Two other sites have been identified for possible plant establishment as per figures 4-6.

ACTIVITIES And Impact Aspect	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
2.7.1. Noise	Noise generated by earthmoving equipment and trucks	Ensure vehicular silencers are operational. Reduce speed on all roads	Recommended standards in SANS 0103-1983 – refer para 12.1.10	Whilst active
2.7.2. Air Quality	Dust generated by earthmoving equipment and trucks	None required unless levels exceeded	Recommended standards in SANS 1929:2004 – Refer para 12.1.9	Whilst Active
2.7.3. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	EMP prescriptions	Continuously
2.7.4. Surface Water	Water use from Orange River. WULA to be lodged for 208 000m ³ /annum	Maximise recycling of water to limit requirement. Note that the new Blokwerf pan plant has been fitted with water recycling leg. Accurate determination of savings will be calculated during the operation of that plant.	Future Water Use Licence (currently (Oct 18) under application	Continuously for life of mine
2.8. Stockpiling of coarse waste from plant or return to pit as backfill				
In the case of Backfill				
2.8.1. Noise	Noise generated by earthmoving equipment and trucks	Ensure vehicular silencers are operational. Reduce speed on all roads	Recommended standards in SANS 0103-1983 – refer para 12.1.10	Whilst active
2.8.2. Air Quality	Dust generated by earthmoving equipment and trucks	None required unless levels exceeded	Recommended standards in SANS 1929:2004 – Refer para 12.1.9	Whilst Active
2.8.3. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	EMP prescriptions	Continuously
In the case of stockpiling, all of the above PLUS...				
2.8.4. Topography	Waste rock dumps will remain on site post mining (but dumps will be shaped). Impact permanent and moderate/ insignificant	Rehabilitation methodology. Para 34.3	EMP prescriptions	Decommissioning Rehabilitation but preferably during mining

ACTIVITIES And Impact Aspect	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
2.8.5. Visual	Waste rock dumps will be visible but only to persons who visit site or the north bank of Orange River	Rehabilitation methodology. Para 34.3	EMP prescriptions	Decommissioning Rehabilitation but preferably during mining
2.9. Stockpiling of fine tailings from plant				
2.9.1. Land Capability	Fine tailings dams / dumps will cover natural habitat except in the case of backfill. Temporary insignificant until rehabilitation.	Rehabilitation methodology. Para 34.3	EMP prescriptions	Decommissioning Rehabilitation per Fine Tailings dam (i.e. When plant is removed from that site)
2.9.2. Vegetation / Animal Life	Fine tailings dams / dumps will cover natural habitat except in the case of backfill. Temporary insignificant until rehabilitation.	Rehabilitation methodology. Para 34.3	EMP prescriptions	
2.9.3. Surface Water	Will result in loss of surface water through evaporation (such water sourced from Orange River). All water pumped into dams with fine tailings (if not recycled). Insignificant	Maximise recycling. Note that the new Blokwerf pan plant has been fitted with water recycling leg. Accurate determination of savings will be calculated during the operation of that plant.	Future Water Use Licence	As required
2.9.4. Air Quality	Possible windblown dust from dried out fine tailings dams. If not covered, then impact is long term	Rehabilitation methodology. Para 34.3	EMP prescriptions	Must be covered with coarse tailings as part of rehabilitation
2.10. Use of water for processing of material at plant				
2.10.1. Surface Water	Water use from Orange River. WULA to be lodged for 208 000m ³ /annum	Maximise recycling of water to limit requirement. Note that the new Blokwerf pan plant has been fitted with water recycling leg. Accurate determination of savings will be calculated during the operation of that plant.	Future Water Use Licence (currently (Oct 18) under application	Continuously for life of mine
Other OPERATIONAL ACTIVITIES				

ACTIVITIES And Impact Aspect	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
2.11. Use of workshop				
2.11.1. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	EMP prescriptions	Continuously
2.12. Use of wash bay (if contemplated)				
2.12.1. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	EMP prescriptions	Continuously
2.13. Use of Refuelling Facility (48kl capacity on site)				
2.13.1. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	EMP prescriptions	Continuously
2.14. Use of access/delivery road to the site				
2.14.1. Noise	Noise generated by earthmoving equipment and trucks	Ensure vehicular silencers are operational. Reduce speed on all roads	Recommended standards in SANS 0103-1983 – refer para 12.1.10	Whilst active
2.14.2. Air Quality	Dust generated by earthmoving equipment and trucks	None required unless levels exceeded	Recommended standards in SANS 1929:2004 – Refer para 12.1.9	Whilst Active
2.14.3. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	EMP prescriptions	Continuously
2.14.4. Traffic	Insignificant traffic generation	Ensure speed limits are adhered to	National Park imposed limits	Continuously
2.15. Use of Septic Tank and French drain				
2.15.1. Surface Water	Possible pollution of surface water resources	Monitoring	Future Water Use Licence	As required
2.15.2. Groundwater	Possible pollution of groundwater resources	Monitoring	Future Water Use Licence	As required
2.16. Use of airstrip				
2.16.1. Noise	Occasional noise generated by aircraft visiting site	None	None	None
2.16.2. Hydrocarbon	Possible fuel / oil leaks from aircraft	Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	EMP prescriptions	Continuously

ACTIVITIES And Impact Aspect	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
2.17. Water Use: WULA in place but inadequate for abstraction. Will require additional WULA.				
3. OPERATIONAL NON – MINING REHABILITATION ACTIVITIES				
3.1. Maintain access/delivery road on site				
3.1.1. Noise	Noise generated by earthmoving equipment and trucks	Ensure vehicular silencers are operational. Reduce speed on all roads	Recommended standards in SANS 0103-1983 – refer para 12.1.10	Whilst active
3.1.2. Air Quality	Dust generated by earthmoving equipment and trucks	None required unless levels exceeded	Recommended standards in SANS 1929:2004 – Refer para 12.1.9	Whilst Active
3.1.3. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	EMP prescriptions	Continuously
3.2. Domestic waste is transported by bakkie to Sendelingsdrift and handled in terms of that town's domestic waste management				
3.3. Enforce no-go area access				
3.4. Decontaminate floors and diesel tanks when required				
3.4.1. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	EMP prescriptions	Continuously
4. DECOMMISSIONING PHASE ACTIVITIES				

ACTIVITIES And Impact Aspect	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
4.1. Complete backfilling of excavations programmed for backfilling with nearby material (when available) and cover with topsoil OR ...				
4.1.1. Noise	Noise generated by earthmoving equipment and trucks	Ensure vehicular silencers are operational. Reduce speed on all roads	Recommended standards in SANS 0103-1983 – refer para 12.1.10	Whilst active
4.1.2. Air Quality	Dust generated by earthmoving equipment and trucks	None required unless levels exceeded	Recommended standards in SANS 1929:2004 – Refer para 12.1.9	Whilst Active
4.1.3. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	EMP prescriptions	Continuously
4.2. ...Shape excavation edges to 1:3 slope and topsoil				
4.2.1. Noise	Noise generated by earthmoving equipment and trucks	Ensure vehicular silencers are operational. Reduce speed on all roads	Recommended standards in SANS 0103-1983 – refer para 12.1.10	Whilst active
4.2.2. Air Quality	Dust generated by earthmoving equipment and trucks	None required unless levels exceeded	Recommended standards in SANS 1929:2004 – Refer para 12.1.9	Whilst Active
4.2.3. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	EMP prescriptions	Continuously
4.2.4. Topography	Any residual excavations will be shaped. Impact permanent and moderate/ insignificant	Rehabilitation methodology. Para 34.3	EMP prescriptions	Decommissioning Rehabilitation but preferably during mining
4.3. Shape any remaining dumps as per EMP specification and cover with topsoil if available				

ACTIVITIES And Impact Aspect	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
4.3.1. Noise	Noise generated by earthmoving equipment and trucks	Ensure vehicular silencers are operational. Reduce speed on all roads	Recommended standards in SANS 0103-1983 – refer para 12.1.10	Whilst active
4.3.2. Air Quality	Dust generated by earthmoving equipment and trucks	None required unless levels exceeded	Recommended standards in SANS 1929:2004 – Refer para 12.1.9	Whilst Active
4.3.3. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	EMP prescriptions	Continuously
4.3.4. Topography	Waste rock dumps will remain on site post mining (but dumps will be shaped). Impact permanent and moderate/ insignificant	Rehabilitation methodology. Para 34.3	EMP prescriptions	Decommissioning Rehabilitation but preferably during mining
4.4. Demolish all unrequired structures				
4.5. Remove all process plant and steel structures				
4.6. Remove all protruding foundations and footings				
4.7. Remove all pipelines and cables				
4.8. Remove diesel tank & decontaminate				
4.8.1. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	EMP prescriptions	Continuously
4.9. Rip / scarify logistical facility area				
4.9.1. Noise	Noise generated by earthmoving equipment and trucks	Ensure vehicular silencers are operational. Reduce speed on all roads	Recommended standards in SANS 0103-1983 – refer para 12.1.10	Whilst active
4.9.2. Air Quality	Dust generated by earthmoving equipment and trucks	None required unless levels exceeded	Recommended standards in SANS 1929:2004 – Refer para 12.1.9	Whilst Active

ACTIVITIES And Impact Aspect	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
4.9.3. Hydrocarbon	Possible fuel / oil leaks from vehicles and mobile equipment	Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	EMP prescriptions	Continuously
4.10. Retain access roads for future use				
5. AFTERCARE PERIOD				
5.1. Remove alien vegetation (if applicable)				
5.2. Conduct final performance assessment				
5.3. Lodge closure Application				
5.4. DMR Grant Closure Application				

33 Impact Management Outcomes

(A description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated in paragraph 31);

ACTIVITY whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc...)	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm- water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc.	STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
1. ESTABLISHMENT ACTIVITIES			
1.1. Access road is already in place and approved in terms of earlier EMP.			
1.2. All haul roads and on-site roads are already in place			

ACTIVITY whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm- water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc.	STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
1.3. All offices and admin building are already in place			
1.4. Workshop is already in place.			
1.5. Fuel Tanks are already in place. Storage Capacity 48kl			
1.6. Points 1.3 and 1.4 include personnel amenities to septic tank and then French drain			
1.7. Airstrip (1km long) in place			
1.8. Processing plant. The main plant is located in the Oena Section but additional plants may be developed later at other Sections			
1.9. Ensure domestic and industrial waste management system is in place			
2. OPERATIONAL PHASE ACTIVITIES			
2.1. Topsoil removal to perimeter stockpile or for immediate use in cover of previously backfilled area.	2.1.1. Soil/topsoil	Control / Remedy through management and rehabilitation	Rehabilitation standard as part of end use objective
	2.1.2. Visual	Control / Remedy through management and rehabilitation	Rehabilitation standard as part of end use objective
	2.1.3. Land Capability	Control / Remedy through management and rehabilitation	Rehabilitation standard as part of end use objective
	2.1.4. Animal Life	Avoid through monitoring and management	Impact avoided
	2.1.5. Noise	None, except to ensure vehicle silencers are in operation	Noise level
	2.1.6. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Dust level
	2.1.7. Archaeology	Avoid through monitoring and management	Impact avoided
	2.1.8. Hydrocarbon	Avoid through monitoring and management	Impact avoided
2.2. Clearing of overburden where present as backfill to previously mined area	2.2.1. Geology	Rehabilitation through backfill	Not applicable
	2.2.2. Topography	Rehabilitation through backfill	Rehabilitation standard as part of end use objective

ACTIVITY whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm- water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc.	STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
	2.2.3. Visual	Rehabilitation through backfill	Rehabilitation standard as part of end use objective
	2.2.4. Land Capability	Control / Remedy through management and rehabilitation	Rehabilitation standard as part of end use objective
	2.2.5. Surface Water	Avoid through monitoring and management	Impact avoided
	2.2.6. Groundwater	Rehabilitation through backfill	Impact avoided
	2.2.7. Noise	None, except to ensure vehicle silencers are in operation	Noise level
	2.2.8. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Dust level
	2.2.9. Hydrocarbon	Avoid through monitoring and management	Impact avoided
2.3. In pit screening of material (may apply). Note that in pit screening is a rehabilitation method in that maximum backfill is ensured. Positive impact on topography.	2.3.1. Noise	None, except to ensure vehicle silencers are in operation	Noise level
	2.3.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Dust level
	2.3.3. Hydrocarbon	Avoid through monitoring and management	Impact avoided
2.4. All -25mm returned as backfill . Note that backfill is a rehabilitation method. Positive impact on topography.	2.4.1. Noise	None, except to ensure vehicle silencers are in operation	Noise level
	2.4.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Dust level
	2.4.3. Hydrocarbon	Avoid through monitoring and management	Impact avoided
2.5. Backfilled excavations to be covered with previously stockpiled topsoil	2.5.1. Noise	None, except to ensure vehicle silencers are in operation	Noise level
	2.5.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Dust level
	2.5.3. Hydrocarbon	Avoid through monitoring and management	Impact avoided
2.6. Hauling of gravel to plant for processing.	2.6.1. Noise	None, except to ensure vehicle silencers are in operation	Noise level
	2.6.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Dust level
	2.6.3. Hydrocarbon	Avoid through monitoring and management	Impact avoided

ACTIVITY whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm- water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc.	STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
2.7. Processing of material to obtain diamonds ¹³	2.7.1. Noise	None, except to ensure vehicle silencers are in operation	Noise level
	2.7.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Dust level
	2.7.3. Hydrocarbon	Avoid through monitoring and management	Impact avoided
	2.7.4. Surface Water	Monitor to measure use. Recycle to limit use	Limit impact. Water Use licence limits
2.8. Stockpiling of coarse waste from plant or return to pit as backfill			
In the case of Backfill	2.8.1. Noise	None, except to ensure vehicle silencers are in operation	Noise level
	2.8.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Dust level
	2.8.3. Hydrocarbon	Avoid through monitoring and management	Impact avoided
In the case of stockpiling, all of the above PLUS...	2.8.4. Topography	Rehabilitation through shaping or backfill to pit	Rehabilitation standard as part of end use objective
	2.8.5. Visual	Rehabilitation through backfill	Residual Impact avoided
2.9. Stockpiling of fine tailings from plant	2.9.1. Land Capability	Maximise backfill of existing pits to limit impact on natural ground level. Minimise size through containment Minimise size through recycling. Rehabilitate post mining through cover	Rehabilitation standard as part of end use objective
	2.9.2. Vegetation / Animal Life	Maximise backfill of existing pits to limit impact on natural ground level. Minimise size through containment Minimise size through recycling. Rehabilitate post mining through cover	Residual Impact avoided

¹³ Note that existing main plant is located in Oena Section. A smaller plant has been established at Blokwerf South. Two other sites have been identified for possible plant establishment as per figures 4-6.

ACTIVITY whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm- water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc.	STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
	2.9.3. Surface Water	Maximise recycling of water	Limit impact. Water Use licence limits
	2.9.4. Air Quality	Prevent windblown dried fine tailings and plume development through cover when finalised	Residual Impact avoided
2.10. Use of water for processing of material at plant	2.10.1. Surface Water	Maximise recycling of water	Limit impact. Water Use licence limits
Other OPERATIONAL ACTIVITIES			
2.11. Use of workshop	2.11.1. Hydrocarbon	Avoid through monitoring and management	Impact avoided
2.12. Use of wash bay (if contemplated)	2.12.1. Hydrocarbon	Avoid through monitoring and management	Impact avoided
2.13. Use of Refuelling Facility (48kl capacity on site)	2.13.1. Hydrocarbon	Avoid through monitoring and management	Impact avoided
2.14. Use of access/delivery road to the site	2.14.1. Noise	None, except to ensure vehicle silencers are in operation	Noise level
	2.14.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Dust level
	2.14.3. Hydrocarbon	Avoid through monitoring and management	Impact avoided
	2.14.4. Traffic	Limit impact through enforcing low speed limits on road	Impact avoided
2.15. Use of Septic Tank and French drain	2.15.1. Surface Water	Avoid through use of sewage system or chemical toilets	Impact avoided
	2.15.2. Groundwater	Avoid through use of sewage system or chemical toilets	Impact avoided
2.16. Use of airstrip	2.16.1. Noise	None feasible (but rarely occurs)	Noise level
	2.16.2. Hydrocarbon	Avoid through monitoring and management	Impact avoided
2.17. Water Use: WULA in place but inadequate for abstraction. Will require additional WULA.			Limit impact. Water Use licence limits
3. OPERATIONAL NON – MINING REHABILITATION ACTIVITIES			
3.1. Maintain access/delivery road on site	3.1.1. Noise	None, except to ensure vehicle silencers are in operation	Noise level
	3.1.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Dust level
	3.1.3. Hydrocarbon	Avoid through monitoring and management	Impact avoided

ACTIVITY whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm- water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc.	STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
3.2. Domestic waste is transported by bakkie to Sendelingsdrift and handled in terms of that town's domestic waste management			
3.3. Enforce no-go area access			
3.4. Decontaminate floors and diesel tanks when required	3.4.1. Hydrocarbon	Avoid through monitoring and management	Impact avoided
4. DECOMMISSIONING PHASE ACTIVITIES			
4.1. Complete backfilling of excavations programmed for backfilling with nearby material (when available) and cover with topsoil OR ...	4.1.1. Noise	None, except to ensure vehicle silencers are in operation	Noise level
	4.1.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Dust level
	4.1.3. Hydrocarbon	Avoid through monitoring and management	Impact avoided
4.2. ...Shape excavation edges to 1:3 slope and topsoil	4.2.1. Noise	None, except to ensure vehicle silencers are in operation	Noise level
	4.2.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Dust level
	4.2.3. Hydrocarbon	Avoid through monitoring and management	Impact avoided
	4.2.4. Topography	Rehabilitation through shaping or backfill to pit	Rehabilitation standard as part of end use objective
4.3. Shape any remaining dumps as per EMP specification and cover with topsoil if available	4.3.1. Noise	None, except to ensure vehicle silencers are in operation	Noise level
	4.3.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Dust level
	4.3.3. Hydrocarbon	Avoid through monitoring and management	Impact avoided
	4.3.4. Topography	Rehabilitation through shaping or backfill to pit	Rehabilitation standard as part of end use objective
4.4. Demolish all unrequired structures			
4.5. Remove all process plant and steel structures			
4.6. Remove all protruding foundations and footings			
4.7. Remove all pipelines and cables			
4.8. Remove diesel tank & decontaminate	4.8.1. Hydrocarbon	Avoid through monitoring and management	
4.9. Rip / scarify logistical facility area	4.9.1. Noise	None, except to ensure vehicle silencers are in operation	Noise level

ACTIVITY whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm- water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc.	STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
	4.9.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	Dust level
	4.9.3. Hydrocarbon	Avoid through monitoring and management	Impact avoided
4.10. Retain access roads for future use			
5. AFTERCARE PERIOD			
5.1. Remove alien vegetation (if applicable)			
5.2. Conduct final performance assessment			
5.3. Lodge closure Application			
5.4. DMR Grant Closure Application			

34 Impact Management Actions

The management of environmental damage as a result of this undertaking consists of the following with detail description below:

- 1) Topsoil handling methodology as per para 34.1 below (Topsoil and revegetation handling methodology)
- 2) Domestic and Industrial Waste Handling: Hydrocarbon pollution prevention must take place in accordance with the Hydrocarbon pollution prevention methodology in para 34.2 below.
- 3) Rehabilitation methodology: Dumps, Excavations and Fine Tailings Dams in Para 34.3
- 4) Demarcation / No go areas are explained in para 34.4
- 5) Archaeological Impact Management (Para 34.5)

34.1 Topsoil

The management of topsoil is of utmost importance. Without topsoil management, the disturbed area is subject to several other potential long term impacts such as lack of revegetation or extended revegetation time, dust generated off denuded areas and prolonged visual scarring.

“The storage of topsoil, however done, is problematic because soil fauna and michorrhiza in the topsoil decline with storage time (Haigh, 2000). The storage of the topsoil is, however, important in terms of the composition of the organic material, however old, which will be needed to “kick-start” the rehabilitation process with the addition of some kind of organic mulch. Topsoil must be stored in long, low berms, rather than in huge piles. Wetting (rainfall) and aeration of the stored topsoil must be maximised” – K Coetzee, 2015.

It is however important to note that in some areas, topsoil is absent and the removal of topsoil is impossible. So the following only applies where topsoil is available.

Topsoil stripping

Successful rehabilitation is dependent on careful management of topsoil. Usually some 70-80% of all plant species found on site can return if topsoil is conserved and replaced following mining.

Prior to any topsoil removal the holder must ensure that the prescriptions contained in the Archaeological Impact Assessment area adhered to (Refer Para 34.5)

Topsoil stripping is to takes place ahead of mining by excavator/dozer. The process will entail:

- The selection of area where topsoil is to be removed; should be no more than 50m ahead of mining
- Conduct sweep of proposed topsoil removal area for any slow moving fauna to be relocated - unlikely to be located

- Removal of topsoil to full depth along with all vegetation content (if any).

Topsoil will initially be stored either in berm ahead of final face advance per excavation for use in rehabilitation of final mining block. This method of topsoil removal will unfortunately require double handling especially if the excavation is more than 50m from the final excavation edge so all efforts must be geared to limiting the handling of topsoil by removing topsoil to final edge of mining as soon as practically possible.

The principle behind topsoil handling is however that all topsoil removed subsequent to the initial block's topsoil is utilised immediately (or as soon as feasible given machinery requirements) in the rehabilitation of mined out, backfilled / shaped and prepared areas.

Topsoil storage:

No topsoil may be stored within the 1:100 year floodline. As described above, some topsoil will be stockpiled in berms along excavation upper edge for use in rehabilitation of the final mining block. Such topsoil berms are to be restricted to 2m height and may be as wide as required. The reason for the 2m height restriction is to preserve as much of the natural seed bank as viable. Side slopes of the berms must be sloped to minimum 1:2 to prevent wind and water erosion of the slopes. Should wind erosion become an issue, it is imperative that shade cloth netting be put in place.

The theory of topsoil management in this document is that topsoil removed ahead of mining be used simultaneously in the rehabilitation of subsequent mining blocks. However, in practice this cannot happen because of machinery constraints. In practice, the topsoil will be stockpiled ahead of mining within the proposed excavation area or on the excavation floor for replacement on mined out and prepared areas as soon as feasible.

Returning topsoil

Topsoil to be replaced over prepared areas to removed thickness.

34.2 Domestic and Industrial Waste

The following paragraphs describe existing and proposed measures to be implemented at the site:

34.2.1 Policy : Fuels / Lubricant Management

The holder currently manages their own fuels and lubricants on site with supply by contractor and collection of used oil by "used oil company". This system is to be inclusive of:

- Receipt and storage of fuels at the main depot in the Oena Mine Camp in (Refer photo 7)
- Fuel supply and transport to all facilities from the main fuel depot by fuel bowser.
- Lubricant receipt and storage

- Collection and temporary storage of used oils, contaminated filters, pipes, etc prior to disposal at a suitably licensed disposal site.
- Temporary storage of such in demarcated areas in the workshop.

In order to achieve the above with due regard for proper environmental protection, the following programme shall apply and facilities be upgraded / constructed.

FUEL RECEIPT, STORAGE AND DISPENSING.

In the management of fuel supply, receipt, storage and use the following procedures will be followed, cautions taken and facilities built / upgraded to properly manage this operational sector:

- The fuel delivery transport contractor will be cautioned to adhere to safe driving speeds and drive cautiously on the arduous gravel roads to the site.
- The existing fuel tanks are as shown in photo 7. The following applies:
 - A bund capable of holding 1.1 x the full capacity of the tanks within it has been developed.
 - A concreted floor has been developed.
 - A concreted service apron sufficiently large to catch fuel spills during receipt and supply of fuel is in place.
 - Such apron must be dished concrete to lead rain-water or wash-water to drain pit (sump) for collection of oily-run-off and suitable decontamination / disposal thereof as shown hereafter.
 - During dispensing of fuel to other facilities (plants) or field vehicles via tanker, the dispensing vehicle is to be fitted with suitable pumps and funnel extensions to reduce the risk of spillage in the transfer of fuels.

34.2.2 Workshop

On-site repairs: All scheduled mobile plant repairs which are to take place on the mine will take place in the workshop. The workshop is already on site with a constructed concrete floor (refer photo 7). The apron is constructed with oil trap where separated oil will be collected and disposed of in the oil recycling container. Any oil spills on the concreted apron or floor below the tank is to be treated with OT8 or similar oil decontaminant as per the product instructions. Waste oils from servicing of vehicles must be stored of in the waste oil collection facility.

The collection of used oils and disposable spares is to be conducted as follows:

- Place all used disposable spares in open drums and store such drums in demarcated “used oils” storage area in the workshop.
- Also continue contract with used oil company (such as Oilkol) to place their used oil container in this area from which they (Oilkol) will periodically collect such used oils and contaminated spares for recycling or legal disposal.
- All oils are to be drained from equipment prior to placement of equipment in the salvage yard

34.2.3 Emergency repairs on site:

In the event of a breakdown repair being required in the field (excavation or plant area), the staff should be trained in use of drip trays and suitable funnels (not to

drain oil into the sand) for filling and draining of lubricants and the staff shall be provided with such equipment to prevent oil contamination.

In addition:

- Used/replaced filters, hoses, belts, cloths, etc. are to be placed in a bin for return to the used oil and lubricant storage area which is to be constructed as shown above. Used filters are not to be buried at the site of repair (nor discarded in the waste rock dumps).
- In the event of soil contamination, the soils are to be treated with a suitable decontaminant such as the OT8 product range or Spillsorb or similar product (refer attached copy of brochure).

All staff involved in mobile plant operation and maintenance are to be made aware of these oil and lubricant procedures. Staff will require instruction in the:

- Deleterious effects of oil / fuel on the environment
- Neutralisation of oil leaks on the concrete apron,
- The operation of the oil trap (including the storage of trapped oil); and
- Use of OT8 / Spillsorb products.

General Provisions

- All operators are to check their equipment for leaks and report such leaks on a daily basis.
- No used oils are to be used as dust suppressants on manoeuvring areas.
- All staff to be instructed to report oil spills immediately and be trained in fire fighting and the use of biodegradable solvents such as OT8 or Spillsorb or similar products in the clean-up operation

The current holders have this aspect in hand and even the vehicle parking bay is supplied with two “roving” drip trays for use in catching oil leaks:



Photo 11: Drip trays in position at the equipment parking bay

34.2.4 Domestic Waste

All domestic waste will be collected in bins located strategically around the site i.e. at the office, the processing plant and at the workshop). The domestic waste is to be collected on a daily basis and placed in the designated temporary storage area in a position next to the Workshop (to the west). Such waste will be periodically collected

and dumped at the mine's domestic solid waste disposal site. Such site is operated as follows:

- The site must be fenced to catch windblown litter
- Refuse is burned on a weekly basis
- Burned refuse must be covered with overburden (also on weekly basis)
- Ensure that only domestic waste is tipped in the site (all industrial waste must first be assessed as below and decontaminated before disposal may be considered at the general disposal site).

34.2.5 Sewage plant location, design and capacity

Refer figure 4. The office/workshop/accommodation area is supplied with soakaways as shown in figure 4. Domestic sewage from the main logistical facility area and accommodation is fed by water-borne sewage system to a sump (located on the northern side of the facility area. From the sump, the effluent is pumped to a soakaway (seepage pit) located on the southern side of the airstrip.

Portable chemical toilets must be provided at the working areas for plant operators and earthmoving staff.

34.2.6 Potable Water

Potable water is pumped from the Orange River to a small water plant located in the logistical facility area. The water is filtered via a sand filter, flocculated with aluminium sulphate, treated with granular chlorine and allowed to settle before use.

34.3 Rehabilitation methodology

The following table shows the basic rehabilitation methodologies per disturbance type at the mine:

<i>Disturbance type</i>	<i>Rehabilitation methodology / options</i>
Excavation Development	The main aim is to backfill all excavations. Those that cannot be backfilled will be shape as far as possible to mimic surrounding contours. Note that given losses to fine and coarse tailings dumps and other compaction considerations, it is estimated that only 80% of the excavations can be backfilled based on similar experiences at other alluvial diamond mines
Fine Tailings Dams	Cover with coarse tailings to provide deflation surface (typical of the gravel terraces)
Coarse Tailings Dumps	Shoulders and toes are to be rounded to mimic natural contours

34.3.1 Excavation rehabilitation:

The main goal is to backfill as many excavations as possible. It is clear however, given the size of the waste rock stockpiles that there will be excavations that cannot be backfilled. These residual excavations must be shaped as follows:

- The excavation walls must be sloped to minimum 1:2 slope

- All sharp edges must be rounded
- In areas where topsoil is available, then the remnant slopes and floors must be covered with such.

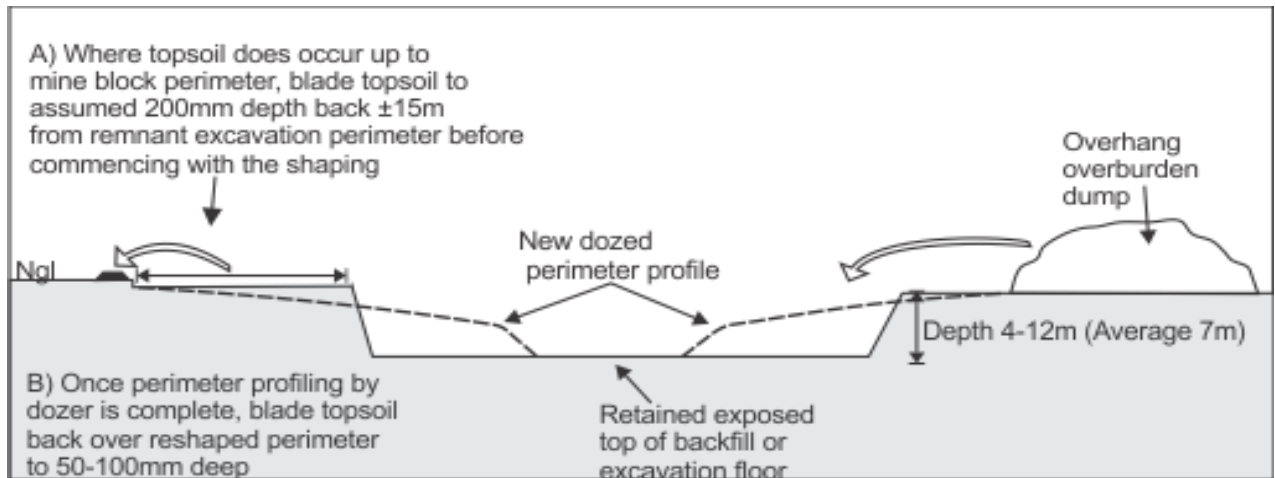


Figure 12: Rehabilitation methodology: Residual excavations which do not daylight at lower contour

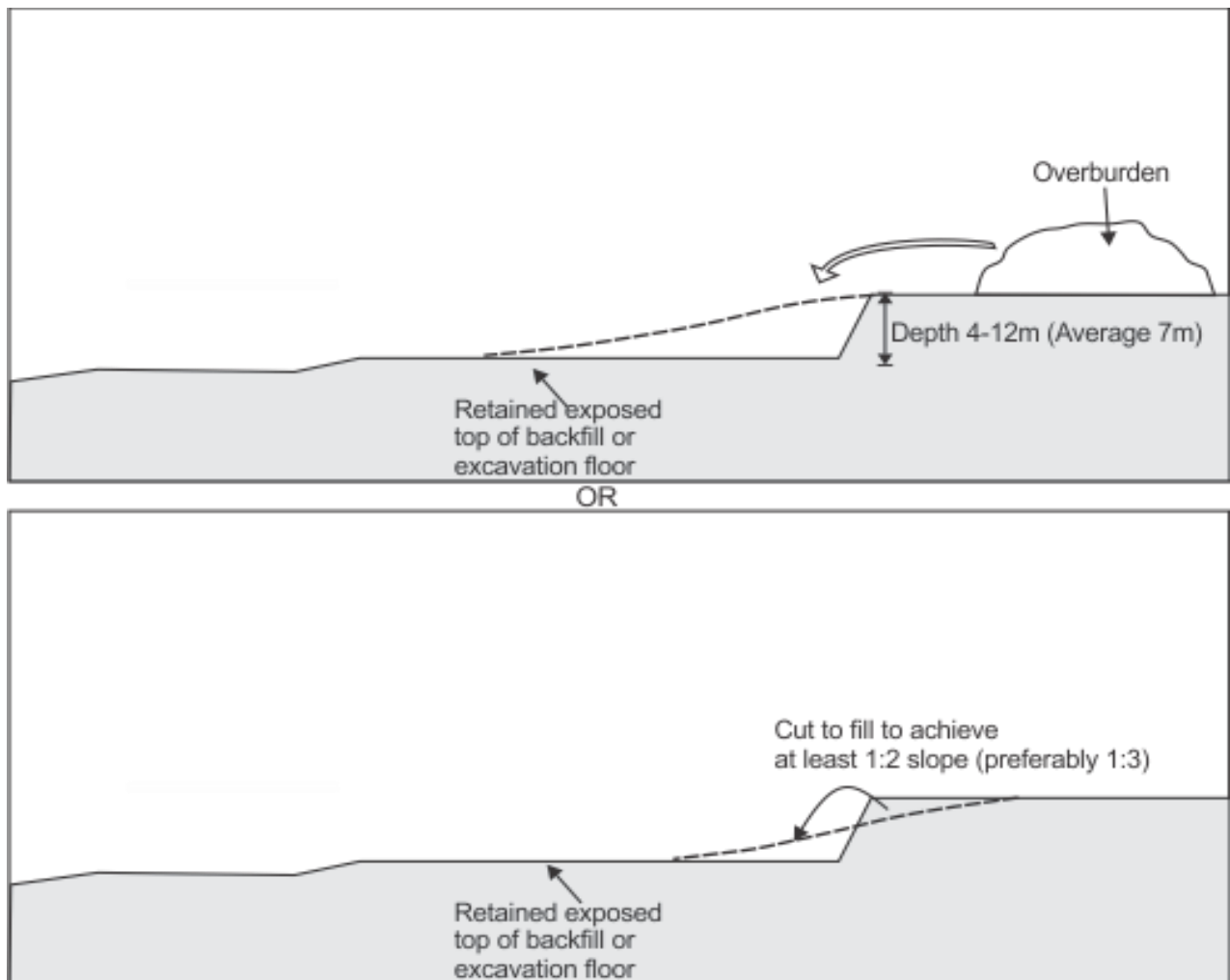


Figure 13: Rehabilitation methodology: Residual excavations which do daylight at lower contour



Photo 12: Backfilled and shaped excavation (and dump area) in the west of Oena

34.3.2 Coarse tailings dumps and other residual post mining dumps

Coarse tailings dumps' (and other residual dumps') impact on topography will be attenuated through:

- Where possible, locating the coarse tailings dump against the side of a hill as shown in the diagram below. This will reduce the costs of rehabilitation and enable less work to rehabilitate the dump.
- The rounding of all sharp edges to mimic natural contours as shown in the diagram below.
- Where topsoil is available (although unlikely) such topsoil is to be spread over the dump.

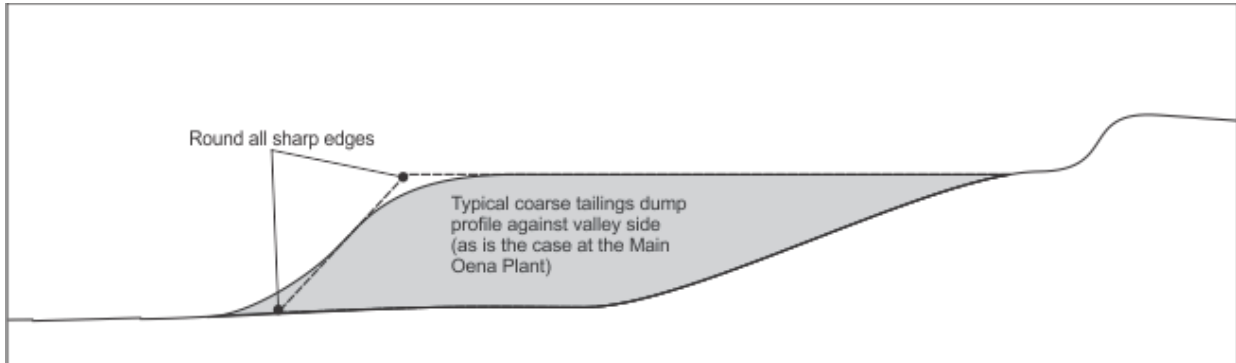


Photo 13: The far western waste rock dump, partially shaped and rehabilitated. The foreground dumps must be levelled or used as backfill for adjacent pits when applicable

34.3.3 Fine Tailings Dumps

1) Containment

The goal for fine tailings dams is that such fine tailings must be used to backfill existing excavations (mixed with plant oversize). But where this is not possible then Fine Tailings dams must be developed on surface.

Silt impact is prevented through the use of fine tailings dams. However, for these dams to be effective they must be constructed properly and the fine tailings must not simply be allowed to run through the natural lands uncontained as has occurred in the past by other operators at this site. Such lack of silt containment leads to large areas being impacted, siltation of Orange River flood plain and does not allow for water recycling. So, all fine tailings dam must be planned and provided with suitable wall, paddock and sump as shown below:

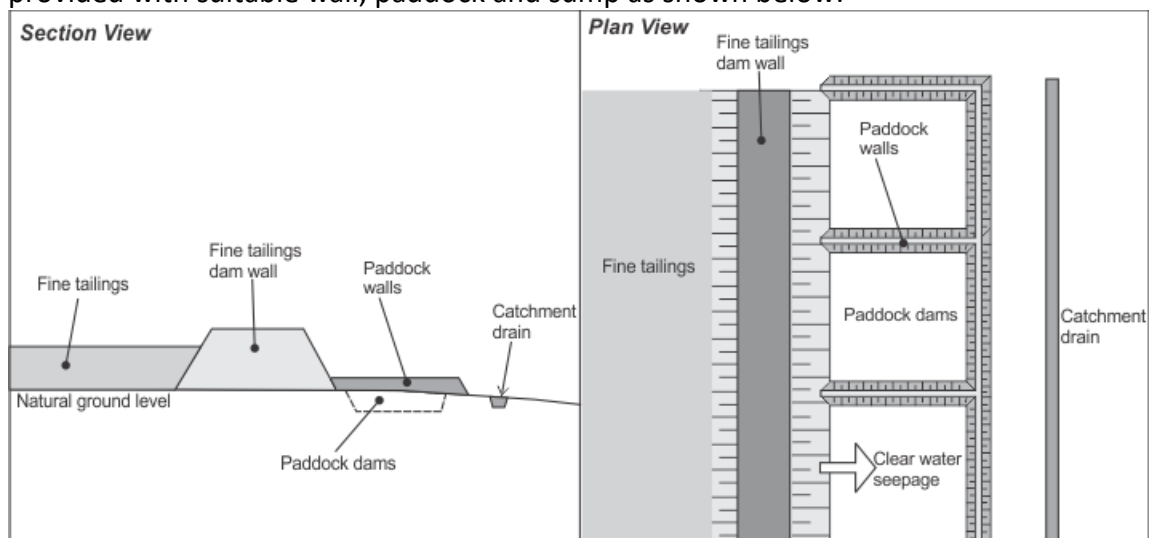


Figure 14: Fine tailings dam containment walls



Photo 14: Newly constructed Fine Tailings Dam wall for the Oena Main Plant

2) Rehabilitation

In the case of both backfilled fine tailings (into existing excavation) and fine tailings dam on surface, it is essential that the captured silts be covered with a 200mm thick layer of coarse tailings. This will eliminate residual long term wind-blown dust and dust plume development downwind from the unrehabilitated fine tailings dams.

34.4 No Go areas

The areas identified as being below the 1:100year flood line is easily identified as the silty depositions adjacent to the Orange River and usually represents the start of the riparian vegetation. This area is to be defined as a no go area with the exception of access to the water off-take points as identified in Figures 4-6 and approved in terms of future WULA.

The areas outside of the actual mining areas are inhospitable and will not be easily accessed in any event.

34.5 Archaeological Impact Management

The following is quoted directly from the specialist archaeologist report:

“Mitigation will be relatively quick to accomplish at most of these sites since all are open scatters lying on the surface. While occasional areas may require some sieving of the sandier substrate, the majority could be done through careful surface collection within a grid system. The main aim of the mitigation will be to document the nature of ESA and MSA artefacts that are present and to document the pottery tradition present in the area. It is unfortunate that no finds of significance accompanied the pottery at any of the sites found. Only one pottery site preserved some organic material (OES fragments) which could be the only chance of dating the pottery.

Also:

“Visrivier and Kabies only received preliminary searches. Both will require further survey ...”

In addition, it is recommended that the Barker pothole be declared a geo-site to possibly form a tourist attraction in the Park as part of the closure process. Refer figure 15 below for development guidelines. This needs to be discussed with National Park representatives prior to implementation.



Photo 15: the Barker pothole swept clean. The photo does not do justice to the scale of this area

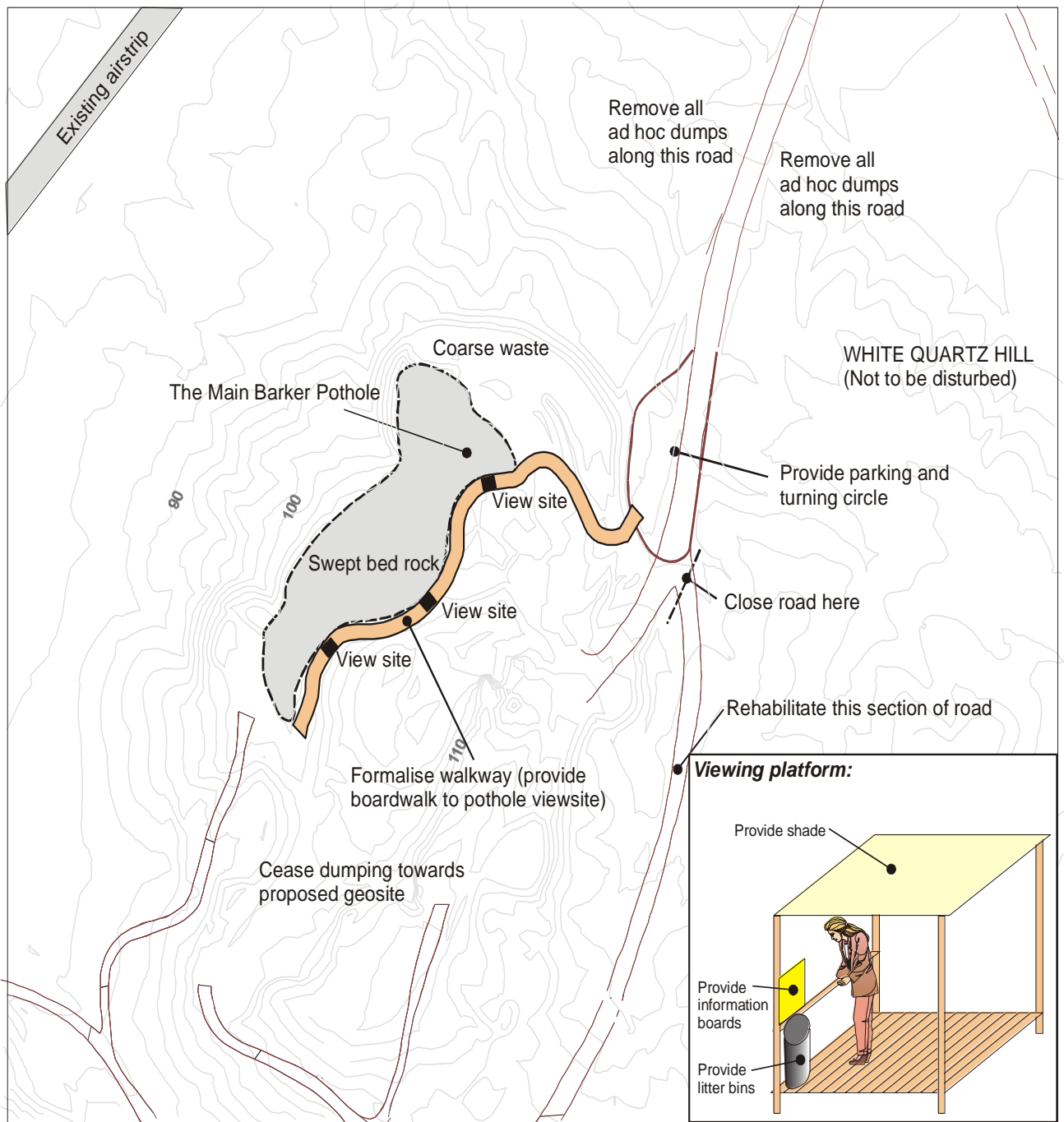


Figure 15: Proposed geosite development guideline

35 Financial Provision

35.1 Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under Reg 22(2)(d).

The closure objectives are as follows:

- 1) Minimise post mining negative residual impacts and take advantages of any positive impacts which may be available
- 2) To allow for the entire Mining Right area (particularly disturbances) to form part of the National Park fabric.

- 3) To prevent any negative impact on the tourism industry in the area. It is possible that parts of the post mining landscape could form part of a tourism consideration.
- 4) Elimination of any possible impact on surface water and groundwater regime
- 5) Ensure that mine plans and integrated concurrent rehabilitation takes place as per Mine plan phasing in Para 5 and 6 and Appendix 3.
- 6) Ensure maximization of backfill to limit residual impacts in respect of topography.
- 7) Ensure effective Fine Tailings handling to eliminate siltation of Orange River and residual dust plume development

It will be clear to any reader that these objectives are aligned to the baseline environment.

35.2 Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.

Yes. The draft Scoping Report and this draft EIA/EMP was subjected to extensive public participation. Such document contained proposals in respect of end use.

35.3 Rehabilitation plan describing and showing the scale and aerial extent of the main mining activities and the anticipated mining area at the time of closure

Refer Appendix 3. The mine is spread out over 5 sections (with 3 being the focus of this EMP (Oena, Sandberg and Blokwerf)). Given the proposed prospecting which is yet to take place and the nature of alluvial diamond mining, it is required that Appendix 3 be regularly updated (at least as part of the Environmental Audit which must take place every 2 years).

35.4 Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.

The aim of all rehabilitation is to shape the post mining landscape so that it mimics surrounding natural contours. Backfilling of existing and proposed excavations is to receive the highest priority.

35.5 Confirm financial provision will be provided as determined.

The annually calculated financial provision will, subject to DMR approval, be provided by way of Bank Guarantee as has been the case for several years at the site

36 Mechanisms for monitoring compliance and performance assessment.

36.1 Components, Principles and Roles of Monitoring System

In order to ensure that all aspects of the operation are monitored effectively, the following components will be put in place:

1. Legally required Environmental Audit: All mines are required by law to conduct Environmental Audits every 2 years or as per EMP prescribed

interval. Such audits are compiled in terms of Reg 34 and Appendix 7 of NEMA and must be compiled by independent party.

2. Appointment of ECO: It is required that an ECO be appointed for the site. Such ECO need not be in the permanent employ of the applicant but must visit the site at least once every 6 months and, monitor and record site activities, mining and rehabilitation
3. Internal Monitoring and its formalisation: Internal monitoring is required in terms of the content of para 36.2 below. The issue that typically arises out of the system is that no formal record of internal monitoring takes place. It is required that management design forms/ reports containing details of the monitoring as required in terms of the table below. These must be made available to the DMR, the ECO, independent Environmental Auditor and the Monitoring Committee to be established in terms of point 4 below.
4. The final component is the Environmental Monitoring Committee to consist of Mining Right representative, National Park representative, community representative, possibly a municipal representative and independent environmental consultant (if required). This provision has been used very successfully at other sites. The committee must meet at least once per year at the mine for physical visual inspection / tour of the site followed by meeting to discuss issues noted. Minutes are taken and included in the Environmental Audits.
5. Note further that the requirement for monitoring must be impressed upon all staff members during their environmental training. Specific staff members must be assigned areas of responsibility in terms of monitoring and their reporting must form part of the formal reporting by the mine manager.

36.2 Table showing monitoring actions per impact

Source activity & Impacts requiring monitoring programmes	Mitigation Measures	Functional requirements for monitoring	Roles and responsibilities for the execution of the monitoring programmes	Monitoring and reporting frequency and time periods for implementing impact management actions
1. ESTABLISHMENT ACTIVITIES				
1.1. Access road is already in place and approved in terms of earlier EMP.				
1.2. All haul roads and on-site roads are already in place				
1.3. All offices and admin building are already in place				
1.4. Workshop is already in place.				
1.5. Fuel Tanks are already in place. Storage Capacity 48kl				
1.6. Points 1.3 and 1.4 include personnel amenities to septic tank and then French drain				
1.7. Airstrip (1km long) in place				
1.8. Processing plant. The main plant is located in the Oena Section but additional plants may be developed later at other Sections				
1.9. Ensure domestic and industrial waste management system is in place				
2. OPERATIONAL PHASE ACTIVITIES				
2.1. Topsoil removal to perimeter stockpile or for immediate use in cover of previously backfilled area.				

Source activity & Impacts requiring monitoring programmes	Mitigation Measures	Functional requirements for monitoring	Roles and responsibilities for the execution of the monitoring programmes	Monitoring and reporting frequency and time periods for implementing impact management actions
2.1.1. Soil/topsoil	Control / Remedy through management and rehabilitation. Topsoil handling as per para 34.1	Remedy through removal, Storage and eventual replacement during rehabilitation	<ol style="list-style-type: none"> 1) Ensure that all topsoil is removed. 2) Ensure topsoil stockpiling in correct place 3) Ensure topsoil stockpiled in accordance with specifications in this document 4) Ensure no erosion of topsoil 5) Ensure topsoil spread over backfilled / shaped area is of sufficient depth. 	Mine Manager. Operators at site of occurrence. Independent assessor during biennial audits ECO once per month
2.1.2. Visual	Control / Remedy through management and rehabilitation	Linked to topsoil management as per line item 2.1.1. above	Linked to topsoil management as per line item 2.1.1. above	Linked to topsoil management as per line item 2.1.1. above
2.1.3. Land Capability	Control / Remedy through management and rehabilitation	Linked to topsoil management as per line item 2.1.1. above	Linked to topsoil management as per line item 2.1.1. above	Linked to topsoil management as per line item 2.1.1. above
2.1.4. Animal Life	Avoid through monitoring and management	Conduct monitoring sweep prior to advance into previously undisturbed area to search for slower species (unlikely)	Operator	Immediately prior to any new advance
2.1.5. Noise	None, except to ensure vehicle silencers are in operation	None	NA	NA
2.1.6. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	<ul style="list-style-type: none"> - Visual monitoring of dust direction (and volume) - If complaint is received from any quarter, then formal monitoring with permanent DustWatch type system must take place at site of complaint or wetting of affected area or activity– Very unlikely 	Staff, Mine Manager	Continuously

Source activity & Impacts requiring monitoring programmes	Mitigation Measures	Functional requirements for monitoring	Roles and responsibilities for the execution of the monitoring programmes	Monitoring and reporting frequency and time periods for implementing impact management actions
2.1.7. Archaeology	Avoid through monitoring and management	Refer Para 34.5	Specialist to document and collect artefacts prior to mining at the site (Sandberg and Blokwerf)	Once off prior to full scale mining at Blokwerf and Sandberg
2.1.8. Hydrocarbon	Avoid through monitoring and management. Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	Any leaks or non-functioning to be reported to management immediately	To be conducted by operators on occurrence	Implement specification in Para 34.2 if shortcomings identified
2.2. Clearing of overburden where present as backfill to previously mined area				
2.2.1. Geology	Rehabilitation through backfill	Monitoring is aimed at ensuring that overburden (where present) is backfilled into mined out pit	Mine manager and operator to plan such backfill prior to mining block. Mine manager to ensure that backfill is occurring as per plan	Operator / Manager to discuss backfilling prior to advance into new block. Mine manager to ensure backfilling occurring as per plan at least once per week
2.2.2. Topography	Rehabilitation through backfill	Linked to backfill management as per line item 2.2.1 above	Linked to backfill management as per line item 2.2.1 above	Linked to backfill management as per line item 2.2.1 above
2.2.3. Visual	Rehabilitation through backfill	Linked to backfill management as per line item 2.2.1 above	Linked to backfill management as per line item 2.2.1 above	Linked to backfill management as per line item 2.2.1 above
2.2.4. Land Capability	Control / Remedy through management and rehabilitation	Linked to backfill management as per line item 2.2.1 above	Linked to backfill management as per line item 2.2.1 above	Linked to backfill management as per line item 2.2.1 above
2.2.5. Surface Water	Avoid through monitoring and management	Ensure that no streams (from mountains to Orange River across the floodplain) are disturbed	Mine manager	As part of mine planning. As part of environmental awareness induction (refer Appendix 7)
2.2.6. Groundwater	Rehabilitation through backfill	Linked to backfill management as per line item 2.2.1 above	Linked to backfill management as per line item 2.2.1 above	Linked to backfill management as per line item 2.2.1 above

Source activity & Impacts requiring monitoring programmes	Mitigation Measures	Functional requirements for monitoring	Roles and responsibilities for the execution of the monitoring programmes	Monitoring and reporting frequency and time periods for implementing impact management actions
2.2.7. Noise	None, except to ensure vehicle silencers are in operation	None	NA	NA
2.2.8. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	<ul style="list-style-type: none"> - Visual monitoring of dust direction (and volume) - If complaint is received from any quarter, then formal monitoring with permanent DustWatch type system must take place at site of complaint or wetting of affected area or activity– Very unlikely 	Staff, Mine Manager	Continuously
2.2.9. Hydrocarbon	Avoid through monitoring and management. Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	Any leaks or non-functioning to be reported to management immediately	To be conducted by operators on occurrence	Implement specification in Para 34.2 if shortcomings identified
2.3. In pit screening of material (may apply)				
2.3.1. Noise	None, except to ensure vehicle silencers are in operation	None	NA	NA
2.3.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	<ul style="list-style-type: none"> - Visual monitoring of dust direction (and volume) - If complaint is received from any quarter, then formal monitoring with permanent DustWatch type system must take place at site of complaint or wetting of affected area or activity– Very unlikely 	Staff, Mine Manager	Continuously
2.3.3. Hydrocarbon	Avoid through monitoring and management. Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	Any leaks or non-functioning to be reported to management immediately	To be conducted by operators on occurrence	Implement specification in Para 34.2 if shortcomings identified

Source activity & Impacts requiring monitoring programmes	Mitigation Measures	Functional requirements for monitoring	Roles and responsibilities for the execution of the monitoring programmes	Monitoring and reporting frequency and time periods for implementing impact management actions
2.4. All -25mm returned as backfill				
2.4.1. Noise	None, except to ensure vehicle silencers are in operation	None	NA	NA
2.4.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	<ul style="list-style-type: none"> - Visual monitoring of dust direction (and volume) - If complaint is received from any quarter, then formal monitoring with permanent DustWatch type system must take place at site of complaint or wetting of affected area or activity– Very unlikely 	Staff, Mine Manager	Continuously
2.4.3. Hydrocarbon	Avoid through monitoring and management. Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	Any leaks or non-functioning to be reported to management immediately	To be conducted by operators on occurrence	Implement specification in Para 34.2 if shortcomings identified
2.5. Backfilled excavations to be covered with previously stockpiled topsoil				
2.5.1. Noise	None, except to ensure vehicle silencers are in operation	None	NA	NA
2.5.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	<ul style="list-style-type: none"> - Visual monitoring of dust direction (and volume) - If complaint is received from any quarter, then formal monitoring with permanent DustWatch type system must take place at site of complaint or wetting of affected area or activity– Very unlikely 	Staff, Mine Manager	Continuously

Source activity & Impacts requiring monitoring programmes	Mitigation Measures	Functional requirements for monitoring	Roles and responsibilities for the execution of the monitoring programmes	Monitoring and reporting frequency and time periods for implementing impact management actions
2.5.3. Hydrocarbon	Avoid through monitoring and management. Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	Any leaks or non-functioning to be reported to management immediately	To be conducted by operators on occurrence	Implement specification in Para 34.2 if shortcomings identified
2.6. Hauling of gravel to plant for processing.				
2.6.1. Noise	None, except to ensure vehicle silencers are in operation	None	NA	NA
2.6.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	<ul style="list-style-type: none"> - Visual monitoring of dust direction (and volume) - If complaint is received from any quarter, then formal monitoring with permanent DustWatch type system must take place at site of complaint or wetting of affected area or activity– Very unlikely 	Staff, Mine Manager	Continuously
2.6.3. Hydrocarbon	Avoid through monitoring and management. Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	Any leaks or non-functioning to be reported to management immediately	To be conducted by operators on occurrence	Implement specification in Para 34.2 if shortcomings identified
2.7. Processing of material to obtain diamonds ¹⁴				
2.7.1. Noise	None, except to ensure vehicle silencers are in operation	None	NA	NA

¹⁴ Note that existing main plant is located in Oena Section. A smaller plant has been established at Blokwerf South. Two other sites have been identified for possible plant establishment as per figures 4-6.

Source activity & Impacts requiring monitoring programmes	Mitigation Measures	Functional requirements for monitoring	Roles and responsibilities for the execution of the monitoring programmes	Monitoring and reporting frequency and time periods for implementing impact management actions
2.7.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	<ul style="list-style-type: none"> - Visual monitoring of dust direction (and volume) - If complaint is received from any quarter, then formal monitoring with permanent DustWatch type system must take place at site of complaint or wetting of affected area or activity– Very unlikely 	Staff, Mine Manager	Continuously
2.7.3. Hydrocarbon	Avoid through monitoring and management. Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	Any leaks or non-functioning to be reported to management immediately	To be conducted by operators on occurrence	Implement specification in Para 34.2 if shortcomings identified
2.7.4. Surface Water	Monitor to measure use. Recycle to limit use	Ensure that recycling is maximised. A new system has been installed at the Blokwerf Pan. Monitoring must be conducted to determine percentage of water which is saved.	Mine manager (or plant manager if applicable)	Monthly reporting of water use (withdrawn from Orange River)
2.8. Stockpiling of coarse waste from plant or return to pit as backfill		Monitoring is aimed at ensuring that overburden (where present) is backfilled into mined out pit	Mine manager and operator to plan such backfill prior to mining block. Mine manager to ensure that backfill is occurring as per plan	Operator / Manager to discuss backfilling prior to advance into new block. Mine manager to ensure backfilling occurring as per plan at least once per week
In the case of Backfill				
2.8.1. Noise	None, except to ensure vehicle silencers are in operation	None	NA	NA

Source activity & Impacts requiring monitoring programmes	Mitigation Measures	Functional requirements for monitoring	Roles and responsibilities for the execution of the monitoring programmes	Monitoring and reporting frequency and time periods for implementing impact management actions
2.8.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	<ul style="list-style-type: none"> - Visual monitoring of dust direction (and volume) - If complaint is received from any quarter, then formal monitoring with permanent DustWatch type system must take place at site of complaint or wetting of affected area or activity– Very unlikely 	Staff, Mine Manager	Continuously
2.8.3. Hydrocarbon	Avoid through monitoring and management. Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	Any leaks or non-functioning to be reported to management immediately	To be conducted by operators on occurrence	Implement specification in Para 34.2 if shortcomings identified
In the case of stockpiling, all of the above PLUS...				
2.8.4. Topography	Rehabilitation through shaping or backfill to pit	Monitoring is aimed at ensuring that shaping meets the prescriptions contained in this EIA/EMP	Mine manager and operator to plan such shaping as required. Mine manager to ensure that shaping is occurring as per plan	Operator / Manager to discuss shaping per dump. Mine manager to ensure has occurred as required
2.8.5. Visual	Rehabilitation through backfill	Linked to shaping management as per line item 2.8.4 above	Linked to shaping management as per line item 2.8.4 above	Linked to shaping management as per line item 2.8.4 above
2.9. Stockpiling of fine tailings from plant				
2.9.1. Land Capability	<p>Maximise backfill of existing pits to limit impact on natural ground level.</p> <p>Minimise size through containment</p> <p>Minimise size through recycling.</p> <p>Rehabilitate post mining through cover</p>	Ensure that fine tailings dams have been placed and developed as per EMP specifications.	Mine Manager on site. EAP as part of 2 yearly Audit.	Continuously when on site by Mine Manager. EAP every 2 years.

Source activity & Impacts requiring monitoring programmes	Mitigation Measures	Functional requirements for monitoring	Roles and responsibilities for the execution of the monitoring programmes	Monitoring and reporting frequency and time periods for implementing impact management actions
2.9.2. Vegetation / Animal Life	Maximise backfill of existing pits to limit impact on natural ground level. Minimise size through containment Minimise size through recycling. Rehabilitate post mining through cover	Ensure that fine tailings dams have been placed and developed as per EMP specifications.	Mine Manager on site. EAP as part of 2 yearly Audit.	Continuously when on site by Mine Manager. EAP every 2 years.
2.9.3. Surface Water	Maximise recycling of water	Ensure that recycling is maximised. A new system has been installed at the Blokwerf Pan. Monitoring must be conducted to determine percentage of water which is saved.	Mine manager (or plant manager if applicable)	Monthly reporting of water use (withdrawn from Orange River)
2.9.4. Air Quality	Prevent windblown dried fine tailings and plume development through cover when finalised	Ensure cover with 200mm waste rock	Mine Manager on site. EAP as part of 2 yearly Audit	As part of decommissioning of each fine tailings dam
2.10. Use of water for processing of material at plant				
2.10.1. Surface Water	Maximise recycling of water	Ensure that recycling is maximised. A new system has been installed at the Blokwerf Pan. Monitoring must be conducted to determine percentage of water which is saved.	Mine manager (or plant manager if applicable)	Monthly reporting of water use (withdrawn from Orange River)
Other OPERATIONAL ACTIVITIES				
2.11. Use of workshop				
2.11.1. Hydrocarbon	Avoid through monitoring and management. Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	Any leaks or non-functioning to be reported to management immediately	To be conducted by operators on occurrence	Implement specification in Para 34.2 if shortcomings identified
2.12. Use of wash bay (if contemplated)				

Source activity & Impacts requiring monitoring programmes	Mitigation Measures	Functional requirements for monitoring	Roles and responsibilities for the execution of the monitoring programmes	Monitoring and reporting frequency and time periods for implementing impact management actions
2.12.1. Hydrocarbon	Avoid through monitoring and management. Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	Any leaks or non-functioning to be reported to management immediately	To be conducted by operators on occurrence	Implement specification in Para 34.2 if shortcomings identified
2.13. Use of Refuelling Facility (48kl capacity on site)				
2.13.1. Hydrocarbon	Avoid through monitoring and management. Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	Any leaks or non-functioning to be reported to management immediately	To be conducted by operators on occurrence	Implement specification in Para 34.2 if shortcomings identified
2.14. Use of access/delivery road to the site				
2.14.1. Noise	None, except to ensure vehicle silencers are in operation	None	NA	NA
2.14.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	<ul style="list-style-type: none"> - Visual monitoring of dust direction (and volume) - If complaint is received from any quarter, then formal monitoring with permanent DustWatch type system must take place at site of complaint or wetting of affected area or activity– Very unlikely 	Staff, Mine Manager	Continuously
2.14.3. Hydrocarbon	Avoid through monitoring and management. Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	Any leaks or non-functioning to be reported to management immediately	To be conducted by operators on occurrence	Implement specification in Para 34.2 if shortcomings identified
2.14.4. Traffic	Limit impact through enforcing low speed limits on road	As part of induction training (Refer Appendix 7)	ECO/Mine Manager	As required
2.15. Use of Septic Tank and French drain				

Source activity & Impacts requiring monitoring programmes	Mitigation Measures	Functional requirements for monitoring	Roles and responsibilities for the execution of the monitoring programmes	Monitoring and reporting frequency and time periods for implementing impact management actions
2.15.1. Surface Water	Avoid through use of sewage system or chemical toilets	Check all systems of sewage system for operation	Mine manager to delegate responsibility	Weekly
2.15.2. Groundwater	Avoid through use of sewage system or chemical toilets	Check all systems of sewage system for operation	Mine manager to delegate responsibility	Weekly
2.16. Use of airstrip				
2.16.1. Noise	None feasible (but rarely occurs)	NA	NA	NA
2.16.2. Hydrocarbon	Avoid through monitoring and management. Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	Any leaks or non-functioning to be reported to management immediately	To be conducted by operators on occurrence	Implement specification in Para 34.2 if shortcomings identified
2.17. Water Use: WULA in place but inadequate for abstraction. Will require additional WULA.				
3. OPERATIONAL NON – MINING REHABILITATION ACTIVITIES				
3.1. Maintain access/delivery road on site				
3.1.1. Noise	None, except to ensure vehicle silencers are in operation	None	NA	NA
3.1.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	<ul style="list-style-type: none"> - Visual monitoring of dust direction (and volume) - If complaint is received from any quarter, then formal monitoring with permanent DustWatch type system must take place at site of complaint or wetting of affected area or activity– Very unlikely 	Staff, Mine Manager	Continuously

Source activity & Impacts requiring monitoring programmes	Mitigation Measures	Functional requirements for monitoring	Roles and responsibilities for the execution of the monitoring programmes	Monitoring and reporting frequency and time periods for implementing impact management actions
3.1.3. Hydrocarbon	Avoid through monitoring and management. Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	Any leaks or non-functioning to be reported to management immediately	To be conducted by operators on occurrence	Implement specification in Para 34.2 if shortcomings identified
3.2. Domestic waste is transported by bakkie to Sendelingsdrift and handled in terms of that town's domestic waste management				
3.3. Enforce no-go area access				
3.4. Decontaminate floors and diesel tanks when required				
3.4.1. Hydrocarbon	Avoid through monitoring and management. Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	Any leaks or non-functioning to be reported to management immediately	To be conducted by operators on occurrence	Implement specification in Para 34.2 if shortcomings identified
4. DECOMMISSIONING PHASE ACTIVITIES				
4.1. Complete backfilling of excavations programmed for backfilling with nearby material (when available) and cover with topsoil OR ...				
4.1.1. Noise	None, except to ensure vehicle silencers are in operation	None	NA	NA

Source activity & Impacts requiring monitoring programmes	Mitigation Measures	Functional requirements for monitoring	Roles and responsibilities for the execution of the monitoring programmes	Monitoring and reporting frequency and time periods for implementing impact management actions
4.1.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	<ul style="list-style-type: none"> - Visual monitoring of dust direction (and volume) - If complaint is received from any quarter, then formal monitoring with permanent DustWatch type system must take place at site of complaint or wetting of affected area or activity– Very unlikely 	Staff, Mine Manager	Continuously
4.1.3. Hydrocarbon	Avoid through monitoring and management. Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	Any leaks or non-functioning to be reported to management immediately	To be conducted by operators on occurrence	Implement specification in Para 34.2 if shortcomings identified
4.2. ...Shape excavation edges to 1:3 slope and topsoil				
4.2.1. Noise	None, except to ensure vehicle silencers are in operation	None	NA	NA
4.2.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	<ul style="list-style-type: none"> - Visual monitoring of dust direction (and volume) - If complaint is received from any quarter, then formal monitoring with permanent DustWatch type system must take place at site of complaint or wetting of affected area or activity– Very unlikely 	Staff, Mine Manager	Continuously
4.2.3. Hydrocarbon	Avoid through monitoring and management. Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	Any leaks or non-functioning to be reported to management immediately	To be conducted by operators on occurrence	Implement specification in Para 34.2 if shortcomings identified
4.2.4. Topography	Rehabilitation through shaping or backfill to pit			

Source activity & Impacts requiring monitoring programmes	Mitigation Measures	Functional requirements for monitoring	Roles and responsibilities for the execution of the monitoring programmes	Monitoring and reporting frequency and time periods for implementing impact management actions
4.3. Shape any remaining dumps as per EMP specification and cover with topsoil if available				
4.3.1. Noise	None, except to ensure vehicle silencers are in operation	None	NA	NA
4.3.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	<ul style="list-style-type: none"> - Visual monitoring of dust direction (and volume) - If complaint is received from any quarter, then formal monitoring with permanent DustWatch type system must take place at site of complaint or wetting of affected area or activity– Very unlikely 	Staff, Mine Manager	Continuously
4.3.3. Hydrocarbon	Avoid through monitoring and management. Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	Any leaks or non-functioning to be reported to management immediately	To be conducted by operators on occurrence	Implement specification in Para 34.2 if shortcomings identified
4.3.4. Topography	Rehabilitation through shaping or backfill to pit	Monitoring is aimed at ensuring that shaping meets the prescriptions contained in this EIA/EMP	Mine manager and operator to plan such shaping as required. Mine manager to ensure that shaping is occurring as per plan	Operator / Manager to discuss shaping per dump. Mine manager to ensure has occurred as required
4.4. Demolish all unrequired structures				
4.5. Remove all process plant and steel structures				
4.6. Remove all protruding foundations and footings				
4.7. Remove all pipelines and cables				
4.8. Remove diesel tank & decontaminate				

Source activity & Impacts requiring monitoring programmes	Mitigation Measures	Functional requirements for monitoring	Roles and responsibilities for the execution of the monitoring programmes	Monitoring and reporting frequency and time periods for implementing impact management actions
4.8.1. Hydrocarbon	Avoid through monitoring and management. Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	Any leaks or non-functioning to be reported to management immediately	To be conducted by operators on occurrence	Implement specification in Para 34.2 if shortcomings identified
4.9. Rip / scarify logistical facility area				
4.9.1. Noise	None, except to ensure vehicle silencers are in operation	None	NA	NA
4.9.2. Air Quality	Impact is insignificant – no measures defined at this stage (except in respect of health and safety)	<ul style="list-style-type: none"> - Visual monitoring of dust direction (and volume) - If complaint is received from any quarter, then formal monitoring with permanent DustWatch type system must take place at site of complaint or wetting of affected area or activity– Very unlikely 	Staff, Mine Manager	Continuously
4.9.3. Hydrocarbon	Avoid through monitoring and management. Hydrocarbon / Industrial/Domestic Waste Management Protocol as per para 34.2	Any leaks or non-functioning to be reported to management immediately	To be conducted by operators on occurrence	Implement specification in Para 34.2 if shortcomings identified
4.10. Retain access roads for future use				
5. AFTERCARE PERIOD				
5.1. Remove alien vegetation (if applicable)				
5.2. Conduct final performance assessment				
5.3. Lodge closure Application				
5.4. DMR Grant Closure Application				

37 Indicate the frequency of the submission of the performance assessment report.

Environmental Audit reporting is required once every 2 years.

38 Environmental Awareness Plan

Environmental Awareness is required not only for management and employees (as described in Section 39(3)(c)) but also for visitors to the site. To this end, the following strategies and plans will be put into place for each of the parties.

38.1 Visitor Environmental Awareness:

Visitor/sub-contractor environmental awareness will be generated through the handing out of simple pamphlets describing very briefly the environmental considerations applicable to them. The pamphlet should contain the following information:

- Statement of the applicant's commitment to environmental principles.
- List of the "rules" to which the visitor must abide. This will include:
 - No littering. Dispose of all waste in the bins provided.
 - No fires
 - Stay on demarcated roadways and paths only
 - Kindly report any environmental infringements they may notice
 - Check your vehicle/equipment for diesel/oil leaks
- A signed commitment by the visitor stating that he/she has read the rules and will abide by them

These pamphlets should be handed to the visitor at the security kiosk or at the office and collected when they leave the site. This pamphlet should form part of the indemnity a visitor signs which will also contain his/her undertaking to adhere to all health & safety precautions.

Staff of sub-contractors must also be given Environmental Induction Training as per Appendix 7.

38.2 Senior and Middle Management Environmental Awareness:

Achieving environmental awareness at upper levels of management is slightly different from the process at the operational level. There is often a fair level of the general value of environmental awareness but site-specific issues will most often need to be communicated. This will be achieved by:

- The management must make themselves fully au fait with the EMProgramme.

- Ensuring that there is a spare copy of the approved EMP programme at his/her disposal. The management is encouraged to make notes in the document regarding the difficulty / ease of implementing the environmental management measures. These notes should be sent to the consultants to assist in future revisions of the EMP programme
- The manager must be available to accompany the environmental audit team on their rounds.
- The manager must ensure that the operators perform regular monitoring of their workstations / areas (see below).

In the management's execution of their daily activities/being at the site, the management must be constantly aware of and observant of especially the following:

- dust levels
- noise levels
- general housekeeping
- topsoil management
- movement outside of demarcated areas
- litter management
- fuel/oil management/leaks/changes

38.3 Operator / Workforce Environmental Awareness:

Achieving environmental awareness amongst the operators and labour is probably the most important because they are usually present at the place where most environmental transgressions take place or in fact cause them. It is the aim of increased environmental awareness to reduce any such environmental transgressions.

Increasing environmental awareness at these levels can be achieved through the following strategies:

- **Induction environmental training:** (As per the draft Environmental Induction Training document in Appendix 7) When a new operator / labourer is employed from outside of the company, then the site manager must briefly go through the environmental issues which would apply to that person's post as part of the induction of that person.
- **Training:** Each and every employee must go through an environmental training process where at least the following items are covered:
 - The oil/fuel management policy must be explained to the employees. The reason for the policy must also be explained (i.e. to not impact on groundwater, surface water, soil quality etc).
 - The domestic and industrial waste management policy & method must also form part of the training
 - The topsoil handling method and the reasons for preserving topsoil (i.e. post mining revegetation, erosion prevention etc)
 - Protection of the natural veld by not driving/maneuvering or walking through the protected areas.

- Emergency management procedures such as dealing with oil spills or fires must also be practiced
- Such training will, in this case, be carried out by the site manager / contract manager
- **Monitoring:** Management should design forms for use by the operators to conduct regular environmental monitoring of their stations and procedures. The site manager must retrieve the forms on a regular basis and check their responses against what is seen on site. A discussion of the differences between the responses received and what is seen on site will highlight areas where additional environmental training and awareness is required.

(Refer Appendix 7 for preliminary Induction Training manual)

38.4 Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.

The Applicant will develop an Environmental Awareness “course” to be presented to staff at induction or once per annum for existing staff. Provisional course content is included in Appendix 7.

38.5 Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.

Refer proposed course documentation in Appendix 7 as well as proposed monitoring in part 36.

39 Specific information required by the Competent Authority

The following reporting must take place:

- 1) Annual update of the Rehabilitation fund quantum calculation (on the anniversary of the last one).
- 2) Environmental Audit Report once every 2 years (including monitoring results).
- 3) In addition, the applicant is required to report on Mining Charter requirements, Social and Labour Plan Progress reports annually and to review of SLP every 5 years.

40 UNDERTAKING

The EAP herewith confirms the:

- a) Correctness of the information provided in the reports
- b) Inclusion of comments and inputs from stakeholders and I&As
- c) Inclusion of inputs and recommendations from the specialist reports where relevant and
- d) Acceptability of the project in relation to the finding of the assessment and level of mitigation proposed.

UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I, Craig Donald 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: 29 October 2018

UNDERTAKING REGARDING LEVEL OF AGREEMENT

I Craig Donald 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: 29 October 2018