

ENVIRONMENTAL AUDIT REPORT FOR IMERYS GECKO OKANJANDE GRAPHITE (PTY) LTD



Okanjande graphite mine – Mine Waste Stockpile Area December 2017 to August 2020.

MINING LICENCE (ML)196 & EXCLUSIVE PROSPECTING LICENCE (EPL) 4717

2017- 2020

Submitted to:

The Permanent Secretary
Ministry of Environment and
Tourism
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ENVIRONMENTAL AUDIT REPORT FOR IMERY'S GECKO OKANJANDE GRAPHITE (PTY) LTD: ACTIVITIES ON MINING LICENCE (ML) 196 AND EXPLORATION WITHIN EPL4717

1. SUMMARY

The Okanjande Mine is situated approximately 14 km south of Otjiwarongo in the Otjozondjupa region. Mining operations consist of open pit mining by drilling and blasting within ML196. The processing of the ore took place at the processing plant at the Okorusu Mine. Exploration for new graphite resources within EPL4717. Currently the mine is under Care and Maintenance and neither mining nor exploration occur.

This audit report reviews the activities and bi-annual reporting that took place during the reporting period 2017 to 2020.

Figure 1 renders an image of the location of the two mineral licences.

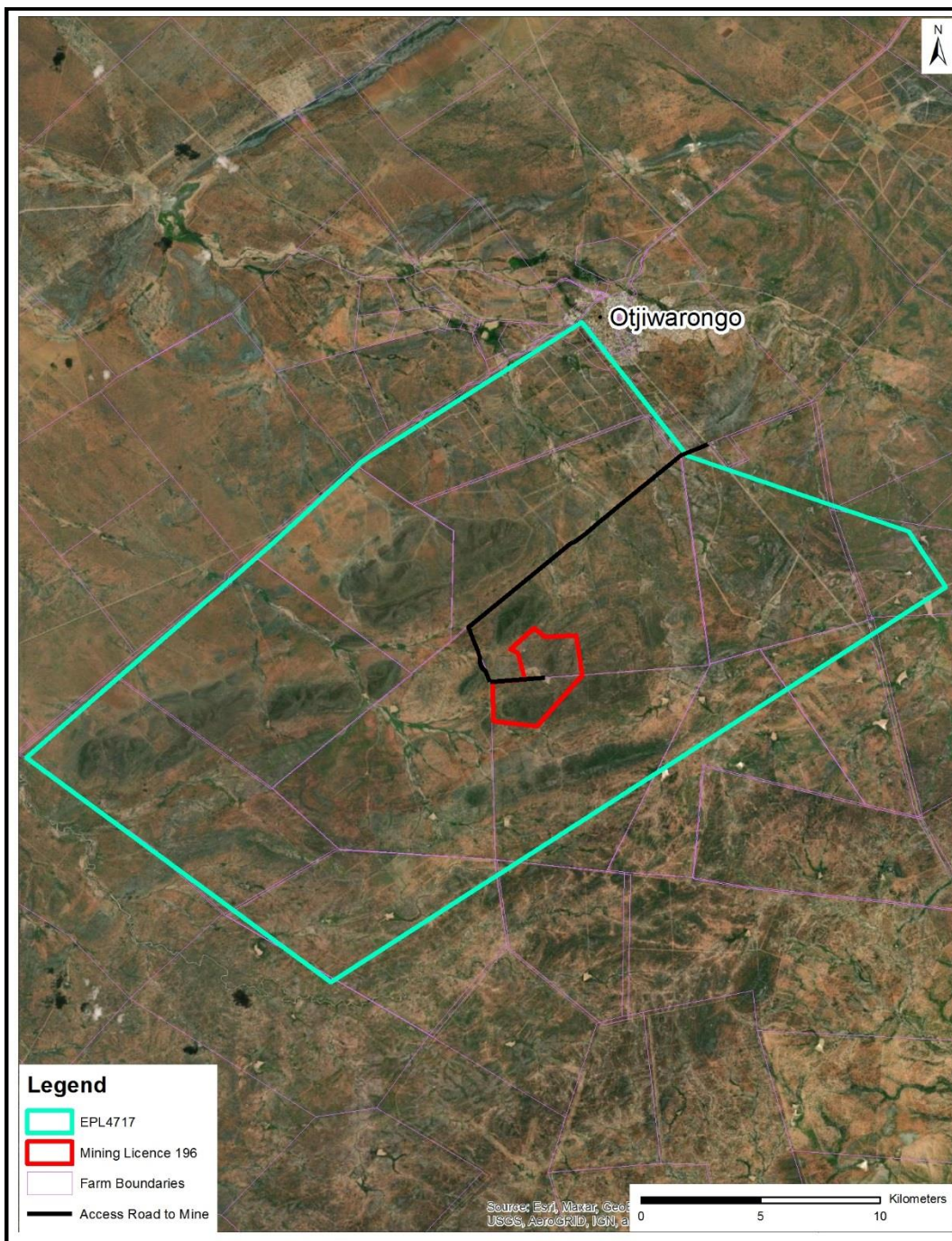


Figure 1. Locations of ML196 and EPL4717

2. CONTACT DETAILS

Table 1. Details of ML holder

ML 196	Licence Holder Details
Name of Holder	Imerys Gecko Okanjande Mining (Pty) Ltd.
Name of Chief Industrial Officer	Jean-François Claver Mobile: + 33 6 30 00 02 41
Name of Pit Manager	Daniel Machoko Tel: 067 305 404 Mobile: +264 (0) 81 255 3652 E-mail Address: Daniel.Machoko@imerys.com
Postal / Registered Address	P.O. Box 81307, Olympia, Windhoek

3. PROGRESS REPORT ON CURRENT ACTIVITIES

3.1 Metallurgical Research and Development

This process was discontinued in November 2018 when exploration, mining and processing were placed under care & maintenance.

3.2 Exploration

Exploration occurred within EPL4717 during 2017 and 2018 but stopped when the care and maintenance phase began in November 2018. All activities pertaining to exploration were carried out in accordance with the EMP and the permit requirements for bush clearing.



Figure 2. Exploration bush clearing along temporary drilling roads..

3.3 Environmental Impact Assessment (EIA) Report & Environmental Management Plan (EMP)

3.4 Monitoring & Auditing

Monitoring of the dust fallout using dust buckets was done on a monthly basis at Okanjande up to November 2018. Till October 2019 the sampling of the dust buckets was done quarterly.

No results were available for any quarters after this. Sampling will resume on a monthly basis should mining start up again.

Water monitoring is carried out for two water points. The analysis results for samples taken in the last reporting period of 2019 and were provided in the 2020 H1 Bi-annual report. Water samples will be taken on a quarterly basis in the future.

3.5 Maintenance

General maintenance and general housekeeping is ongoing for the Care & Maintenance phase. The roads are in good repair. Road verges are covered naturally by grasses, thus reducing the dusty conditions. Figure 3 renders images of the natural restoration of grasses on the road verges at the end of the 2020 first half reporting period. I am satisfied from the photographic survey that the EMP is being followed for this aspect.



Figure 3. Grass covered road verges (6.8.20)

3.6 Infrastructure Development

New infrastructure was developed during this last 3 year period. The waste sorting, vehicle workshop, wash bay, offices, parking and generator building were all completed in this 3 year period.



Figure 4 to Figure 6 renders images of these structures. Signage and the general housekeeping is being maintained well.



Figure 4. Vehicle workshop (left) and wash bay (right).(6.8.20)



Figure 5. Generator room (left), and separate sorting waste drums (right)(6.8.20)



Figure 6. Parking and offices (left), and fuel bay (right)

4. ENVIRONMENTAL PROGRAMMES

4.1 Stakeholder Consultation / Communication Management Programme

Engagement with the stakeholders, various authorities and farmers was thorough during the whole 3 year period. Good communication was maintained. Problems were resolved amicably. A record of the main issues were highlighted in the Bi-annual Reports for the period.

4.2 Safety & Security Management Programme

The company safety protocols were maintained well for the whole 3 year period. No major incidences were recorded. Both the EMP and Company requirements were met. Figure 7 renders images of the main entrance to the mine and the farm road checkpoint.

No safety related incidents occurred on site at Okanjande mine during this 3 year period.



Figure 7. Guard house at main mine gate (left) and farm road check point (right)

4.3 Surface Water Management Programme

Effluent disposal permits were received during the 3 year period. No incidents were recorded. Excellent flood control mechanisms have been implemented along the roads and near the drainage lines. All control measures are in place at the generator, work shop and fuel storage locations.

4.4 Groundwater Management Programme

Water extracted from the borehole was mainly used for toilets and showers as well as vehicle washbays. The recently completed oil water separator ensures that wash water does not enter the groundwater.

There are no tailings facilities nor processing plant present on site as all the raw materials are processed and transported to Okrorusu mine, which significantly reduces the risks of contaminations of underground water.

Spillage of fuel is unlikely to occur due to the bunded facility in place. (See Figure 8). The drainage tap for rain water is bunded in case any floating fuel leaks out at the end of a drainage exercise.



Figure 8. Self bunded fuel storage tank.

Water samples were taken from a borehole 1.35 km NE of the mine pit and from a tap at the maintenance yard whose source is a borehole 350 to the west. These samples were taken on the 18th October 2019. The analysis results for the samples are provided at the end of this report. The comparison with the guidelines for human consumption shows that the water falls within the group B for all elements and in group A for most elements. All future sampling will take place on a quarterly basis as per the Ministry guidelines.

4.5 Air Quality Management Programme

Monitoring of the dust fallout using dust buckets was done on a monthly basis at Okanjande up to November 2018. Till October 2019 the sampling of the dust buckets was done quarterly. No results were available for any quarters after this. Sampling will resume on a monthly basis should mining start up again.

The requirements of the EMP have been met during this 3 year period. Unfavourably dusty conditions on the haul road was mitigated with dust suppression using the grey water from the municipality. A biodegradable palliative was also applied to sections of the road during the truck haulage period. This greatly assisted in keeping dusty conditions to a minimum.

4.6 Noise & Vibration Management Programme

No monitoring was carried out during the three year period. It was deemed unnecessary due to the fact that machinery were well maintained and the processing plant was not constructed at this site yet.

4.7 Biodiversity Management Programme

No incidences were reported during this care and maintenance phase. Bush clearing for the waste rock dump area, the workshop and office area, the soil stockpile area, the extension of the mine pit and the roads and drill pads for the exploration all formed part of the areas that needed to be cleared of trees and shrubs was carried out during the 3 year period under review. Permits were applied for prior to the clearing. Some trees were kept standing as they had protection status. Some changes were made to the plans based on the protection status of the trees. Top soil has been stockpiled for future use in rehabilitating some areas should mine closure take place or some areas need rehabilitating as they will no longer be used.

4.8 Visual Management Programme

Dust suppression and general house keeping ensures that conditions experienced were acceptable for the geologist and pit manager, security personnel and the general public.

4.9 Archaeology Management Programme

No chance finds were reported during this 3 year period.

4.10 Traffic Management Programme

All the requirements of the EMP followed for this aspect during the 3 year period.

4.11 Social & Economic Management Programme

Before the care and maintenance phase started this programme was still in its development stage. The company pit manager and geologist, Daniel Machoko, is currently responsible for overseeing the care and maintenance of the Okanjande mine site. He oversees the skeleton security staff who rotate shifts 24/7.

4.12 Resource Management Programme

Inventory of all stored fuel and ore stockpiles was established at the start of the care and maintenance phase. Figure 9 renders an image of the ore stockpile area that was for the most part depleted at the end of 2018. Grasses have established themselves in this area showing inactivity at the mine.



Figure 9. Graphite ore stockpile (6.8.20)

4.13 Soil Management Programme

Regular checks of the soil stock piles and waste rock are carried out in case heavy rains shift the material and block the dry river that transects the dump/stockpile area. Flooding due to heavy rains should not impact the stock piles negatively. Figure 10 renders images of the various mineral material stockpiles. Grasses and other plants have re-established in these areas which reduces the dust fallout for the mining area.



Figure 10. Views of soil (left)(across the track) and waste rock (right) (both sides of track) stockpiles.

4.14 Waste Management Programme

No incidences were reported during this care and maintenance phase. All domestic waste is removed off site periodically. This programme was developed and implemented over the last three year period. EMP objectives are being met.

Note:

All photos were taken on the 6th August 2020 unless otherwise stated.

Water Analysis Results: (Samples taken on 18th October 2019)

Analyte	As	Ba	Be	Ca	Cr	Co	Cu	Fe	Mg	Mn	Mo	Ni	P	Pb	S	Ti	V	W	Zn	Zr	Al	Ga	Cd
Units	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
OKA-Tap unacid	0.058	0.057	0.021	42.18	0.003	0.013	0.03	0.236	26.84	0.02	0.008	0.038	0.125	0.013	54.49	0.008	0.056	0.009	0.032	0.006	0.126	0.08	0.012
OKA-Tap acid	0.034	0.064	0.011	48.72	0.005	0.004	0.029	0.218	29.79	0.01	0.008	0.004	0.129	0.004	56.16	0.008	0.033	0.01	0.032	0.006	0.09	0.081	0.007
OKA-BH-WW203554 unacid	0.026	0.029	0.010	56.5	0.006	0.004	0.039	0.349	9.433	0.88	0.007	0.002	0.15	0.003	179.5	0.008	0.02	0.01	0.045	0.006	0.128	0.037	0.006
OKA-BH-WW203554 acid	0.024	0.028	0.010	58.52	0.006	0.003	0.039	0.928	9.331	0.898	0.007	0.001	0.253	0	170.9	0.012	0.021	0.01	0.009	0.006	0.143	0.044	0.005

Guidelines for the evaluation of drinking water for human consumption, DWA, Namibia,

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Parameter	Units	Recommended maximum limits			
		Human consumption			Livestock watering
		Group A	Group B	Group C	
pH		6-9	5.5-9.5	4-11	
Electrical Conductivity	mS/m	150	300	400	
Turbidity	NTU	1	5	10	
Total Dissolved Solids (calc.)	mg/l				6000
P-Alkalinity as CaCO ₃	mg/l				
Total Alkalinity as CaCO ₃	mg/l				
Total Hardness as CaCO ₃	mg/l	300	650	1300	
Ca-Hardness as CaCO ₃	mg/l	375	500	1000	2500
Mg-Hardness as CaCO ₃	mg/l	290	420	840	2057
Chloride as Cl ⁻	mg/l	250	600	1200	1500-3000
Fluoride as F ⁻	mg/l	1.5	2.0	3.0	2.0-6.0
Sulphate as SO ₄ ²⁻	mg/l	200	600	1200	1000
Nitrate as N	mg/l	10	20	40	100
Nitrite as N	mg/l				10
Sodium as Na	mg/l	100	400	800	2000
Potassium as K	mg/l	200	400	800	
Magnesium as Mg	mg/l	70	100	200	500
Calcium as Ca	mg/l	150	200	400	1000
Manganese as Mn	mg/l	0.05	1.0	2.0	10
Iron as Fe	mg/l	0.1	1.0	2.0	10