



ZEST INVESTMENTS CC

Quarrying of Aggregates, near Omakange Settlement, Omusati Region

An Updated Environmental Management Plan for the Renewal of an
Environmental Clearance Certificate

APP-001878

<p>PROJECT NAME</p>	<p>An Updated Environmental Management Plan for the Continuation of Aggregate Quarrying at Omakange Quarry 1 and 2, near Omakange Settlement in Omusati Region</p> <p>Renewal of an Environmental Clearance Certificate</p>
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EXECUTIVE SUMMARY

Zest Investments CC (ZI) is a local company involved in the quarrying, crushing and distribution of aggregates. ZI has its quarrying operation on the outskirts of Omakange settlement in Omusati region, and was granted an Environmental Clearance Certificate (ECC) on 10 August 2017 which has since expired. Through the ECC, ZI was permitted to continue and to expand its aggregate quarrying operation. However, an unprecedented economic recession had hit the local construction sector, that started around 2015 causing massive jobs losses, estimated at 60 000, by the Construction Industries Federation of Namibia (CIF).

The impact of the recession was that, ZI did not quarry a single ton of rock since the ECC was granted. During the past three years, all aggregate requirements were met from existing stockpiles and was achieved with a trimmed workforce of approximately 40% of the workforce employed prior to the onset of the recession. Despite limited demand for aggregates over the last five years, ZI would like to keep the quarry active and all the necessary permits and licenses valid and in good standing, in anticipation of the construction sector bouncing back.

A site visit to the quarry was undertaken by Ekwao Consulting on 18 June 2021 to assess and compare the current physical environmental conditions against the baseline information gathered during the EIA scoping which was conducted in March 2017. At the same time, the activities of the proponent were also assessed for compliance to the conditions stipulated in the EMP which formed the basis for granting the ECC to ZI. The following were observed:

- No quarrying (mining) has been conducted from both sites – Omakange 1 & 2 since the ECC was granted in August 2017.
- No land clearing was done in order to open up virgin land for quarrying and nor blasting was carried out to generate raw materials for crushing and screening at both sites.
- Stockpiles of large volume of materials observed during the scoping were reprocessed by screening in order to meet aggregate demand.
- The workforce has been trimmed to about 40% when compared to the workforce at the scoping stage.
- No clearing of vegetation took place because there was no need to prepare new grounds for quarrying. After three years of non-activities, grass has covered most of the excavations and stockpile areas including the topsoil stored for rehabilitation purposes.
- Visual impact from C41 tar road has been reduced by an earth berm erected around the northern side of the quarry premises.
- Overall, the works on the quarry premises were well organized, clean and very neat, from the camping site, offices, workshop and parking area for trucks were kept clean and functionally efficient.

Notwithstanding the fact that, no quarrying activities were performed by ZI, Ekwao was satisfied that, to a large extent, the proponent was found to have been compliant to the conditions applicable to its specific operation, as set out in the various commitments contained in the EMP.

It is recommended that the ECC be renewed to allow ZI to resume quarrying once the construction recovered.

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ABBREVIATIONS AND ACRONYMS

BAT	Best Available Technology
CO ₂	Carbon Dioxide
COVID-19	'CO' - Corona, 'VI'- Virus & 'D' - Disease of 2019
EC	Environmental Commissioner
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
GPS	Global Positioning System
GRN	Government of the Republic of Namibia
ha	hectare (1 ha = 10 000 m ²)
HPP	The Harambee Prosperity Plan
IAPs	Interested and Affected Parties
km/hr	kilometer per hour
m ²	square meters
MME	Ministry of Mines and Energy
MEFT	Ministry of Environment, Forestry and Tourism
NCCI	Namibia Chamber of Commerce and Industries
MHSS	Ministry of Health and Social Services
NHC	National Heritage Council
NO ₂	Nitrogen Dioxide
NSI	Namibia Standards Institute
ORC	Omusati Regional Council
PTM	Project Target Market
PPE	Personal Protective Equipment
RFA	Road Fund Administration
SHE	Safety, Health & Environment
SME	Small and Medium Enterprises
TIPEEG	Targeted Intervention Programme for Economic and Employment Growth
ZI	Zest Investments (The Proponent)
List of Road Numbers	
B1	The name of the longest route in Namibia, starting from the southern border at Noordoewer (Karas Region) to the northern border at Oshikango (Ohangwena Region) via the towns of Windhoek, Okahandja, Otjiwarongo, Tsumeb and Ondangwa.
C41/(MR122)	The route number for the road starting from Oshakati to Opuwo via Okahao and Omakange Settlement.
C35	The route number for the road starting from the coastal of Henties Bay to Ruacana through Uis, Khorixas, Kamanjab and Omakange Settlement.
D3608	The district road that starts from B1 at Omafo (Ohangwena Region) to Outapi (Omusati Region) via the settlements of Ongenga and Onandjaba.
D3616	The route number for the district road from the town of Tsandi to C46 via the settlements of Onesi and Epalela.
D3668	The route number for the district road which connects the border post of Wakashamane (Okalongo Constituency) to D3608.

DEFINITIONS

TERM	EXPANSION
Environmental Compliance Inspection	A systematic verification process of objectively obtaining and evaluating evidence to determine whether specified environmental activities, conditions, management systems and or information about these matters conform with the criteria and communicating results of the such process to the client.
Cumulative Impacts	In the context of quarrying, cumulative impacts would mean the impacts of quarrying activities which in themselves may not significant but may become significant when added to the existing and potential impacts resulting from similar or diverse activities or underrating in the area.
Environmental Component/Aspect	An attribute or constituent of the environment (i.e., air quality; marine water; waste management; geology, seismicity, soil, and groundwater; marine ecology; terrestrial ecology, noise, traffic, socio-economic) that may be impacted by the proposed project.
Environmental Impact	A positive or negative condition that occurs to an environmental component as a result of the activity of a project or facility. This impact can be directly or indirectly caused by the activity.
Environmental Impact	A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.
Environmental Management Plan (EMP)	A working document which contains site-, project-, or facility-specific plan developed to ensure that environmental management practises to eliminate and control environmental impacts are followed during the developmental phases of that site, project and or facility and would normally consist of construction phase, operational phase and decommissioning phases. Commissioning and Operation phases.
Environmental Monitoring	The collection, evaluation and summarization of environmental data by continuous or periodic monitoring of certain qualitative and quantitate indicators characterizing the state of environmental components and their modification as a result of the impact of natural and anthropogenic factors.
General Waste	Waste that does not pose an immediate threat or hazard to health or the environment and includes: <ul style="list-style-type: none"> • domestic waste; • building rubble and demolition waste; • business waste; and • inert waste.
Hazardous Materials/Substances	This refers to any substance that contains an element of risk and could have a deleterious effect on the environment
Hazardous Waste	Any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have detrimental impact on health and the environment.
Infrastructure	The network of facilities and services that are needed for economic activities, e.g. roads, electricity, water, sewerage, etc.
Interested and Affected Parties	All persons who may be affected by the project either directly or indirectly, or who have an interest or stake in the area to be affected by the project, including neighbouring landowners & Road Fund Administration.
Mitigation	Measures designed to avoid, reduce or remedy adverse impacts.
Non-compliance	Issues that are in direct non-compliance with the requirements, commitments and/or management measures as approved in the EMP.
Overburden	In the context of this quarrying operation, overburden is the soil layer that lies above the dolomitic rock which is extracted for the production of aggregates. The first 400mm layer of the overburden comprises of topsoil which supports the rooting system for vegetation, plants and trees and should be set aside and preserved for future rehabilitation.
Recycle	A process where waste or waste water is reclaimed for further use, this process involves the separation of waste from a waste stream for further use and the processing of that separated materials as a product or raw material.
Re-use	To utilise articles from the waste or water again for a similar or different purpose without changing the form or properties of the articles.
Sensitive Area	A sensitive area or environment is described as an area or environment where a unique ecosystem, habitat for plant and animal life, wetlands or conservation activity exists or where there is high potential for ecotourism
Storage	The accumulation of waste in a manner that does not constitute a treatment or disposal of that waste.
Topsoil	This is defined as a horizon of the soil profile. Topsoil is the upper layer of soil from which plants obtain their nutrients for growth. It is often darker in colour, due to the organic

	fraction. Topsoil is deemed, for the purposes of this EMP, as the layer of soil from the surface to the specified depth required for excavation.
Vegetation Rehabilitation	This refers to the re-establishment of indigenous vegetation with a similar species composition to that which naturally occurs in the specific geographical environment.
Waste	Any substance, whether or not that substance can be reduced, re-used or recycled and recovered- <ul style="list-style-type: none"> • that is surplus, unwanted, rejected, discarded, abandoned or disposed of; • which the generator has no further use of and for the purposes of production; • that should be treated or disposed of; • that is identified as waste by the Minister by notice in the Gazette and includes waste generated by the quarrying, mining, medical or other sector, and • any portion of waste, once reused, recycled and recovered, ceases to be waste.
Waste Classification	Establishing whether a waste is hazardous or not based on the nature of its physical, health and environmental hazardous properties (hazard classes); and The degree or severity of the hazard posed (hazard categories).
Waste Generator	Any person whose actions, production processes or activities including waste management activities, results in the generation of waste.
Waste Management	Classifying, recycling, treatment and disposal of waste generated during construction, operation and decommissioning activities.

1. PROJECT BACKGROUND

1.1 Introduction

This is an updated Environmental Management Plan (EMP) prepared in support of an application for the renewal of an Environmental Clearance Certificate (ECC). The ECC was granted on 10 August 2017 and has since expired (**Annexure A**). Notice to renew the ECC was given to the Ministry of Environment, Forestry and Tourism (MEFT) in September 2020 and the application allocated the number, APP-001878.

1.2 The Proponent

Zest Investments CC (ZI) is a Namibian owned, and managed company, which is involved in quarrying activities for the production of road and building construction materials for supply to the construction economic sector. The company has its operational base along the C41 tar road, about 14 km northeast of the Omakange Settlement (**Fig. 2**) in the Omusati Region. The contact details of ZI are as provided on the cover page of this document and have not changed since an ECC was granted to the company for its operation over three years ago.

1.3 Aggregate Quarrying at Omakange

The aggregate quarry at Omakange was developed by a South African company which won a tender to upgrade MR122 from Omakange to Okahao in 2008. The quarry was acquired by ZI in 2012 in order to supply G3 base course materials and bitumen surfacing stones needed for the tarring of two roads that were under construction at that time. The first road was the 98 km district road, D3609 which starts from B1 at the village of Omafo in Ohangwena region to C35 tar road in the town of Outapi in Omusati region. The second road was D3668, a short road of approximately 8 km which connects the border post of Wakashamane and the Onandjaba settlement in the Okalongo electoral constituency.

Huge volumes of aggregates were required in the construction of these roads which were not readily available within a radius of 170 km of each construction site. Such materials were therefore sourced from Omakange and transported to the construction sites. The successful completion of MR122 had the procurements of such materials commercially feasible.

1.4 Post Road Construction

After both roads were successfully built in 2015, ZI resolved to continue quarrying aggregates at Omakange in the hope of securing new opportunities in the construction sector of the northern regions. The quarry is strategically located to meet construction materials, to any new road building project occurring in the northwest and northeast of Kunene region and in the whole of Omusati and Oshana regions. In addition, there were also a number of new towns (Opuwo, Okahao, Outapi, Onesi, Tsandi, Ruacana, Oshikuku, Oshakati, Ongwediva, Ondangwa and Helao Nafidi) that were, relatively, enjoying construction growth. Such construction boom required the supply of good quality aggregates that ZI could produce at Omakange.

In March 20017, Ekwao Consulting was appointed by ZI to conduct an EIA which resulted in the quarrying operation being awarded an ECC by the Environmental Commissioner, on 10 August 2017. It is important to point out that when ZI acquired the Omakange quarry in 2012, the requirement of an ECC was not mandatory and as such ZI and its predecessor were not required to obtain ECC.

2. ACTIVITY DESCRIPTION

ZI is involved in the quarrying, crushing, screening and distribution of building and road construction materials. The core products processed are:

- G3 base course materials;
- Bitumen surfacing stones;
- Crushed concrete stones (19 mm, 13 mm, 9.5 mm and 7mm)
- Unscreened fine aggregates for street road building;
- Screened fine aggregates for the manufacturing of cement based products, and
- Crusher dust (crushed materials under the size of 7 mm).

The following steps are involved.

2.1 Overburden stripping

This process entails the removal of the topsoil which covers the dolomitic rock quarried for the production of aggregates. Overburden stripping is preceded by carefully planning of the area to be stripped. Normally, the planning process will entail aspects such as siting of access routes to the working area, a careful assessment of the portion of land to be cleared, accounting for overburden volumes to be stripped, demarcating suitable sites where to stockpile topsoil and waste materials for progressive and future rehabilitation. Stockpiles for topsoil and waste materials have to be kept separate because the topsoil has the organisms that support the rooting systems for vegetation and plants.

2.2 Drilling and Blasting

Once the overburden has been removed and the dolomitic rock underneath exposed, the next step is to demarcate the area to be blasted. Drill holes are first marked out on the face of the dolomitic rock followed by drilling such holes down to a predetermined depth. The volume of aggregates generated for quarrying (mining) is determined by the extent of the demarcated area, the depth of the drilled blast holes, the type of explosives utilised and the efficient use of blast energy in the rock breaking process. The ultimate purpose of blasting is to break down the massive hard rock, into small pieces that can be handled safely in the subsequent sizing reduction processes.

Ideally, a successful blast should aim to achieve a high degree of rock fragmentation with less throw of rock materials, less blast vibration and a greater level of safety and stability to nearby structures and for all the people working around the quarry.

2.2 Loading, Crushing and Screening

In traditional quarries where fixed crushing plants are used, the blasted rock is loaded into a dump truck and hauled out of the quarry pit and delivered to the fixed plant. In the case of ZI this standard practice is not being used. ZI is making use of modern mobile plants, comprising of the primary crushing unit, a secondary crushing unit and a screening plant which separates the crushed stones into different commercial sizes. The mobile plants are brought in the quarry pit without the need to haul the blasted rock out of the pit.

Big rocks such as boulders which cannot be handled by loading machinery are either blasted for the second time or broken down mechanically by means of hydraulic jack hammers.

2.3 Stockpiling of Products

The mobile plants (crusher-screening) employed by ZI ensure that only the aggregates and fines are hauled out of the quarry and stockpiled. The fines have been used as berms around the quarry premises (**Figures: 5 & 29**). It is important to site the stockpiles on ground that is levelled, firm, stable, properly drained and away from any watercourses. The area chosen for stockpiling various types of aggregates should ensure the lowest environmental impacts possible and should therefore be adequate to

accommodate free movements of tipper truck when delivering the aggregates and loaders handling the products.

2.4 Location

The raw materials for the production of aggregates is sourced from two quarry pits referred to in the EIA scoping report as Omakange Quarry 1 and Quarry 2. Quarry 1 is on land measuring about 3.5 ha while Quarry 2 is on land measuring about 1.4 ha. Quarry 2 is to the south of Quarry 1 about 500 m away. The quarrying infrastructure is built on Quarry 1 (**Fig. 3**) which is along the C41 tar road, approximately 14 km from the Omakange informal settlement. C41 is the name of the highway which links the town of Oshakati to the town of Opuwo via Okahao and Omakange. Oshakati and Opuwo are the administrative capitals for the regions of Oshana and Kunene respectively.

2.5 Non-Activity Since ECC was Granted

Since ZI was granted an ECC in August 2017, no crushing activities were conducted by the company because the local construction industry went into an economic recession. According to the estimates of the Construction Industries Federation (CIF), over 60 000 job losses have been lost in the subsector between 2016 and 2018. ZI has also trimmed its personnel compliment by about 40% when compared to the employment numbers on the payroll of the company by 2015. Over the last four years, the few volumes of aggregates ordered by end-users, were supplied by screening from existing stockpile materials. As such no drilling and blasting were performed in both quarry pits, Omakange Quarry 1 and 2 in order to generate raw materials.

3. RENEWAL OF THE ECC

Ekwaio Consulting who did the original EIA study, was retained by ZI to handle the renewal of its ECC. In spite of limited demand for construction materials, ZI is optimistic about the future and would like to keep the quarry active by ensuring that all the required permits and licenses are valid and in good standing, in anticipation of the construction industry bouncing back from its current slump.

3.1 Purpose for the ECC Renewal

Based on the information received from the Roads Authority Administration (RFA), there are advanced plans to upgrade at least three gravel roads to bitumen standards within the regions of Omusati and Kunene in the near future. These gravel roads are:

- D3616, Tsandi to Onesi (28 km)
- C43, Opuwo to Okangwati (140 km)
- D3616, Onesi to Epalela (12 km)

ZI would therefore like to keep all the necessary permits to its quarrying activities valid and in good standing in the hope of exploiting such opportunities when RFA secures funding for the construction of such roads. Supplying B3 base course materials and bitumen stones to these roads from Omakange quarries is beneficial both from the cost and environmental perspectives.

3.2 Justification for the Renewal

Aggregate is the lifeblood of the construction and building sectors. An adequate supply of aggregates which is of good quality and meeting industry standards and specifications, is therefore critically required by the construction and building sectors in the northern regions where some fifteen (**Table 1**) local authorities have been established by GRN in order to stimulate economic activities. These fifteen local authority authorities have been referred to, in this report as the Project Target Market (PTM). To achieve the aspirations of the GRN, for Namibia to become an industrialized nation by 2030, investments in economic and social infrastructures have to be made on a continuous basis, especially in the PTM.

Before the construction of MR122 (now C41) from Omakange to Okahao, aggregate to end users in the PTM was sourced from two suppliers who are based at Tsumeb, travelling distances as shown in the **Table 1**. The difference in distances between sourcing aggregates from an Omakange and Tsumeb based suppliers are shown in Table 1. The local authority office in each town has been used as reference points.

By their nature, aggregates are low cost, high volume products. Transporting aggregates over a long distance is therefore very expensive. An end-user based at Outapi sourcing aggregate from Tsumeb would pay N\$9 000 more on transport (if the going rate of N\$35.00 per ton is applied) than when such aggregates is sourced from Omakange. The cost of transport is almost three times the cost of the product. Ultimately, this cost is passed on to the consumer which makes the cost of living just a little more expensive.

Table 1: Distances to Aggregate Consumption Locations

Key Aggregate Consumption Locations	Sourced from (km)		Distances Between the Sources (km)
	Omakange	Tsumeb	
Opuwo (Kunene administrative capital)	70	505	435 km longer
Ruacana	90	440	350 km longer
Outapi (Omusati administrative capital)	110	370	260 km longer
Okahao	80	350	270 km longer
Onesi	105	410	305 km longer
Tsandi	80	380	300 km longer
Oshikuku	145	315	170 km longer
Oshakati (Oshana administrative capital)	150	290	90 km longer
Ongwediva	160	280	80 km longer
Ondangwa	190	250	60 km longer
Oniipa	200	245	45 km longer
Omuthiya (Oshikoto administrative capital)	270	170	100 km shorter
Helao Nafidi/Oshikango	190	305	115 km longer
Eenhana (Ohangwena administrative capital)	240	290	50 km longer
Okongo (Tsumeb delivery is Mpungu)	340	310	40 km shorter

From the table above, consumers in the PTM will therefore make huge savings on transport cost when they source aggregates from an Omakange based supplier than when such products are sourced from Tsumeb based suppliers.

3.3 Value Addition to Aggregates

The supply of aggregates from Omakange has the potential to stimulate interest of those local entrepreneurs aspiring to establish value addition projects which make use of aggregates as raw materials. The production of cement based products such as bricks, pavers, road kerbs, lintels, concrete pipes, concrete roof tiles, etc. are all construction materials which require the supply of good quality aggregates and are in high demand.

Local SMEs could establish such facilities targeting to supply end users in their own towns, i.e. Okahao, Tsandi, Outapi, etc. Over 90% of cement bricks that meet the specifications required for all government funded projects in the local authorities listed in **Table 1** are supplied by one big Tsumeb based supplier who has a satellite operation at Ondangwa.

According to a study done by First Capital, the estimated average monthly combined brick consumption in towns of Outapi, Oshakati and Ongwediva is 1.2 million units. Prior to the onset of the economic recession which impacted the construction sector, the biggest cement producer at Ondangwa was making 2.5 million bricks per months and averaging 6 000 m³ aggregates in sales (mostly building stones) per month within the locations listed in Table 1.

There is therefore need for additional value addition facilities especially in the regional administrative capitals of Outapi, Opuwo, Oshakati, Eenhana and Omuthiya.



Figure 1: Quarry Location – National Context

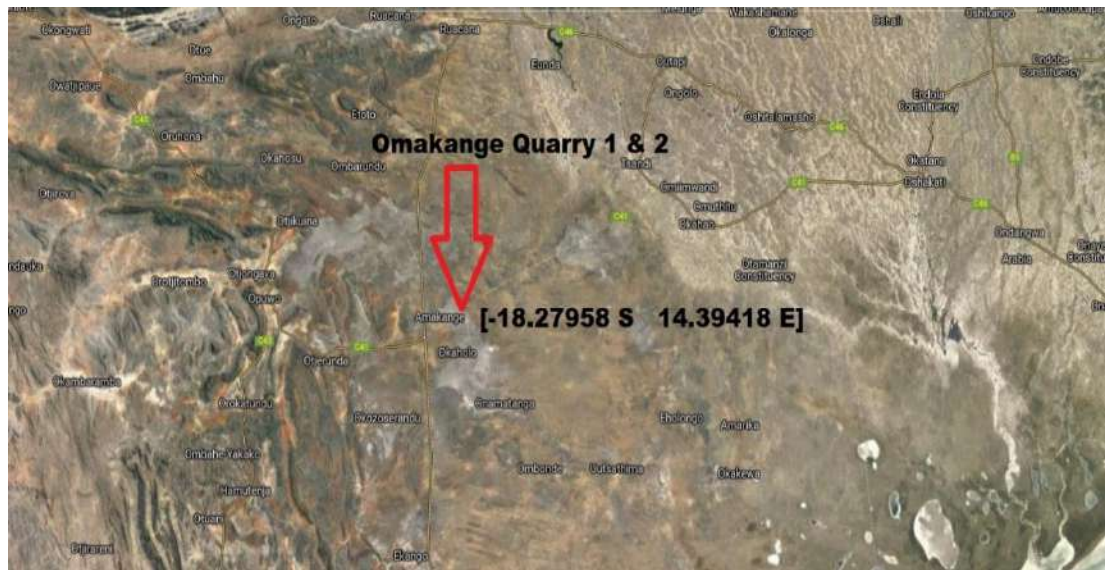


Figure 2: Quarry Location & Regional Context



Figure 3: Quarry Layout & Facilities

4. EXISTING INFRASTRUCTURE AND SERVICES

4.1 Water

The settlement of Omakange is one of the driest places in the country without any natural sources of water. Water to the residents of the Omakange settlement and to the communal cattle farmers in the surroundings is supplied from boreholes sunk at different localities. The borehole supplying water to the quarry was sunk by the company which established the quarry and transferred to GRN on completion of the project. ZI is sourcing its water supply from that borehole.

The water from the borehole is of good quality and fit for human consumption without the need for purification process. The quarrying operation itself does not require the use of water. The water required for the operation is for human use and cleaning of machinery and equipment. During the wet seasons a substantial amount of rainwater is collected in the quarry pit which the company pumps into water tanks (**Figures: 33 & 34.**). This water is used for cleaning purposes and dust suppression, supplementing the water sourced from the boreholes.

4.2 Electricity

A powerline was extended to Omakange settlement through the rural electrification program of the Ministry of Mines and Energy in September 2019 and commissioned in June 2020. The Omakange Combined Primary School which is a modern institution constructed by GRN in 2018 was connected to the grid for the first time in June 2020. About 500 learners are accommodated at the school.

The quarry is making use of mobile crushing and screening plants which generate their own power onboard. A generate set and solar panels are used to supply electricity to the site camp, the workshop and the administrative office.

4.3 Roads

The Omakange quarry is accessed via a network of good roads – all built within the last twelve years and therefore in good conditions. MR122 from Omakange to Okahao which has become C41 after it was upgraded to bitumen, is the main highway passing the quarry. C41 links the quarry to Opuwo and Oshakati via the towns of Okahao, Tsandi, Outapi and Oshikuku.

At Omakange settlement, C35 is encountered which starts from the coastal town of Henties Bay to Ruacana via the towns of Uis, Kamanjab and Omakange. With the exception of Onesi, all the aggregate consumption locations listed in **Table 1** are accessed by good tarred roads which, thanks to GRN, makes the delivery of basic construction materials to such locations relatively ease, efficient and cost effective.

The Omakange settlement itself is about 14 km from the quarry and boasts a health primary clinic and a police charge office.

5. REGULATORY FRAMEWORK

The following legislations, policies and regulations are applicable to this operation and ZI, as the promotor, is expected to observe, and where applicable, to comply with such laws, regulations and policies.

Table 2: Applicable Regulations and Policies

Aspects	Applicable Legislation
Quarrying requires an Environmental Clearance Certificate (ECC)	Environmental Management Act, Act No. 7 of 2007
Extraction of industrial minerals <i>(NB: at present aggregate is not classified as a mineral resource in Namibia, but this could change)</i>	Minerals (Prospecting and Mining) Act, Act 33 of 1992 Environmental Management Act
Generation of electricity including renewable energy whether using wind or sun	The Electricity Act, Act 4 of 2007
Erection of accessory works (workshops, fixed crushing and screening plants, etc.)	Minerals (Prospecting and Mining) Act, Act No. 33 of 1992, Section 90 (1) (e) and 2(a)
Requirements or permission to possess, transport, store and to use explosives	The Explosive Act, Act No. 26 of 1956, Section 6(1)
Permission to conduct blasting activities using explosives	Explosive Act, Act No. of 1956, Section 9 (1)
Regulations related to labour, conditions of employment, hiring, termination, conditions, etc.	The Namibian Labour Act, Act No. 6 of 1992, as amended
Wastewater effluent disposal	Water Act, 1956 No. 54 of 1956, Section 21 and 22 Water Resource Management Act, No. 11 of 2013 Section 13
Aspects related to water abstraction, water use including permission to drill for boreholes	Water Resources Management Act, Act No. 11 of 2013
Air pollution and control	Atmospheric Pollution Prevention Ordinance No. 11 of 1976
Waste handling and management (solid, industrial and hazardous)	Waste Management Regulations: Local Authorities Act of 1992 Solid Waste Management Strategies Hazardous Substance Ordinance No. 14 of 1974
Installation of fuel consumer facilities	Petroleum Products and Energy Act, Act No. 13 of 1990
Reporting of major fuel spills and leakages	Petroleum Products and Energy Act, Petroleum Products Regulations of 2000, Reg. 49(1)
Licensing to operate vehicles on public roads Driving vehicles on public roads Fitness of vehicles to be operated on public roads Road safety Road speed limits on public roads Installation of traffic signs Driving while under the influence of liquor Overloading and related fines for offenders	Road Traffic and Transport Act, Act No 22 of 1999
Log books for mass distance charges Overloading Abnormal permits, etc.	Road Fund Administration Act, Act No. 18 of 1999
Measures related to Covid-19 Pandemic Lock downs Testing and quarantining Wearing of face masks Sanitation Vaccines	Public and Environmental Health Act No. 86 of 2015

6. ENVIRONMENTAL COMPLIANCE INSPECTION

The key objective of conducting an environmental compliance audit was to compile a report for the project site in order to support the renewal application for the ECC. The audit has indicated and compared the current semi-dormant state of the project against the approved baseline information as contained in EIA scoping report.

The objectives are, inter alia, the following:

- To assess the compliance of ZI with respect to regulatory stipulations applicable to its operational sphere, i.e. the quarrying operation.
- To provide any verifiable findings in a structured and systematic manner.
- To ascertain the level and degree of compliance of ZI with respect to management measures as recommended in the EMP for standard and specific conditions.
- To identify, if any predicted impacts of the project had occurred as well as any unforeseen deviations that may merit the implementation of corrective measures.

The assessment was carried out by Ekwao Consulting on 18 June 2021 and is intended to cover the period from August 2017 and August 2020, i.e. the ECC validity period.

6.1 Methodology

The methodology used in this report is based on a parallel documentation review and site visual confirmation assessment process compliance. In addition, interviews were held with ZI Management, site personnel, facility inspection and discussions with relevant stakeholders in order to gain insight into key operational processes and the alignment of such processes with the actual compliance requirements as outlined in the EMP.

Observations and findings were made during the said visit which was conducted specifically for the purpose of assessing the compliance against the provisions of the EMP and the ECC granted to ZI for its quarrying operation.

Each condition contained in the EMP was rated in terms of compliance by using the following four criteria non-compliance (NC), full compliance (FC), not applicable (NA) and for noting only (NO) and shown in **Table 3** below in colour coded scheme.

Table 3: Compliance Rating Criteria

Rating Criteria	
Non-Compliant (NC)	The company is not in compliance with the conditions in the EMP, or the implementation has been partially fulfilled at this stage.
Full Compliant (FC)	The requirements as stipulated in the EMP have been complied with based on site inspections, discussions with staff personnel, general workers and or documentary evidence produced.
Not Applicable (NA)	A requirement of the EMP, or other environmental legislation is not applicable or it was not assessed because no activities took place or it is no longer applicable to the specific site.
For Noting Only (NO)	A requirement as prescribed in the EMP has been noted but does not require the compliance at this stage.
<p><i>It is important to note that since ZI was granted an ECC, no quarrying activities i.e. no raw materials were excavated for crushing and screening. Although every effort is put into conducting a thorough site compliance assessment, due to the time constraints, the limited activities performed and the nature of activities viewed on the day of the assessment, only a sample of the operation can be reasonably assessed.</i></p>	

6.2 Compliance Inspection Findings

Based on the site assessment and discussions held with relevant ZI personnel, the overall compliance for Omakange Quarry #1 and #2 operations to the relevant conditions/provisions set out in the EMP is summarized as shown in **Table 4** and graphically in **Fig. 2** below.

Table 4: Compliance Inspection Findings

Compliance Inspection Findings		
Rating	Condition	Percentage
Non-compliant (NC)	5	9.26%
Full Compliant (FC)	49	90.74%
Not Applicable (NA)	3	
For Noting Only (NO)	30	
Total	87	

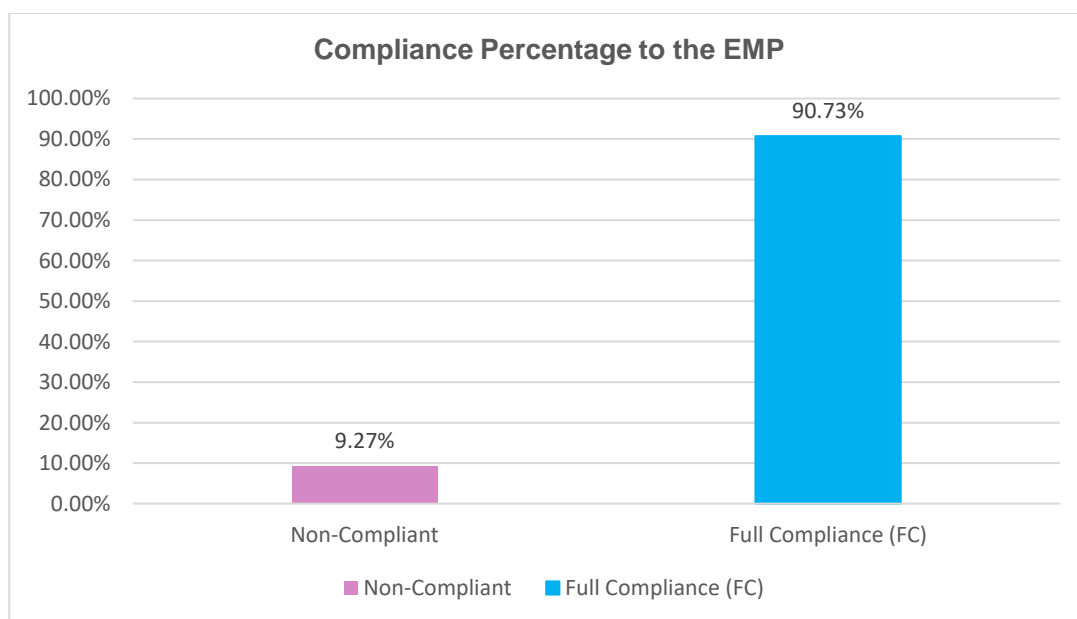


Figure 2: Compliance Percentage

6.3 Compliance Inspection Findings

The EMP for the Omakange Quarry #1 and #2 had a number of compliance conditions. Notwithstanding the fact that no full scale quarrying activities were conducted by ZI since an ECC was granted, the findings of the compliance assessment as carried out by Ekwo Consulting can be summarized as follow:

- a total of 87 conditions were assessed for compliance;
- 3 conditions were found non applicable;
- 31 conditions were recorded for noting only; and
- 53 conditions were recorded as assessable conditions.

Out of the 53 assessable conditions, ZI was found fully compliant on 48 conditions and non-compliant on 5 conditions. The compliance percentage was therefore based on the 53 assessable conditions, out of which ZI recorded 90.57% compliance and 9.43% non-compliant.

6.4 Compliance Inspection Conclusions

Based on the assessment conducted which is supported by the site observations and discussions held with key personnel of the company, ZI is committed to achieving full compliance with the requirements set out in the updated EMP. A few instances of non-compliance were found which require the attention of ZI Management.

7. THE UPDATED EMP

The EMP has been updated to reflect the following environmental parameters:

- Monitoring Performances,
- Inspection Parameters and Schedules,
- Inspection Checklist, and
- Environmental Code of Conduct.

7.1 Monitoring Performances

A simplified environmental monitoring performance indicators has been added to the EMP and is intended to assist ZI management in early detection of environmental impacts, and to take corrective actions timely and where deemed necessary, to report such impacts to the authorities.

Table 5: Monitoring Performances of Quarrying Operations at both pits.

Environmental Aspects & Mitigation Measures	Compliance	Follow Up Action	By Whom	Date Completed
1. Land and Soil Disturbances				
Has any new virgin land been cleared of vegetation for quarrying?				
How big is the area to be cleared?				
Is there any deviation from the provisions in the EMP on land disturbances?				
Has the area to be cleared properly planned, surveyed and clearly demarcated?				
Have the access routes to the new area been planned and clearly demarcated?				
Are there any big trees that need to be conserved within the identified area?				
Are there any sensitive habitats, i.e. birds nestling in trees in the area earmarked for clearing?				
2. Solid Waste Disposal (household waste, office, etc.)				
Are there any deviations from the provisions contained in the EMP on solid waste handling and disposal?				
Are waste bin emptied and cleaned on a regular basis?				
Are there any litters around the site camp, administrative office, management camp, workshop, weighbridge, quarry routes, etc.?				
Are there any litters around the quarry premises, windblown papers, plastics, empty bottles, etc.?				
Has any follow up training been given to the employees on waste handling and management?				
Are the measures as recommended in the EMP adequate to deal with the solid waste generated by the quarrying operation?				
3. Sewage Waste Management				
Are there any deviations from the provisions in the EMP on sewage waste?				
Is the septic sewage system used at the quarrying operation regularly inspected, pumped and the waste disposed of in a safe and responsible manner?				
4. Oil Spillage and Used Oil				
Are there any deviations from the provisions in the EMP on oil spills and on how to handle used oil?				
Are steel drums provided in good conditions to prevent any leaks of oil from such drums?				
Are there any oil spills in the workshop, work area, etc.?				
Have the employees been trained on the procedure on how to contain any spills that may occur?				
Has the quantity of used oil been recorded and disposed of in a responsible manner?				
Are clear records being kept of services of machinery, vehicles/trucks and equipment?				
5. Dust Impacts on Air Quality				
Are there any deviations from the provisions in the EMP on dust mitigation measures?				
Has any complaint been received from any stakeholders with respect to dust generated by the operation?				
Are internal routes regularly maintained and spread with gravel in order to combat dust?				

Environmental Aspects & Mitigation Measures	Compliance	Follow Up Action	By Whom	Date Completed
Is the speed limit on internal routes being complied with?				
Are stockpiles sited in a manner which allows dust from such stockpiles to be blown away from the direction in which people are working?				
Are employees working in areas where dust levels are higher provided with suitable PPEs or dust masks?				
Is wearing of PPEs enforced and are employees found not wearing PPEs reprimanded?				
6. Noise and Blasting Vibrations				
Are there any deviations from the provisions of the EMP on noise and vibrations?				
Are working hours being complied with?				
Is adequate warning given to stakeholders prior to carrying out any blasting activity at the quarry?				
Are machinery, trucks and LDV regularly serviced and redundant exhausts replaced to ensure minimal noise generation?				
Has any complaint on noise or vibrations from blasting received from any stakeholders?				
7. Landscapes and Visual Intrusions				
Are there any deviations from the provisions of the EMP with respect to landscape and visual impact mitigation measures?				
Are permanent structures such as buildings, workshop sheds, etc. located away from sensitive and elevated areas?				
Are topsoil stockpiles kept at low heights and vegetated in order to prevent soil erosion and to decrease visual disturbances?				
Are effective dust suppression measures being implemented so as to avoid dust escaping into the atmosphere becoming a visual nuisance?				
Is a high standard of housekeeping being maintained such that plastics and papers are regularly picked up and not blown around becoming visual annoyances?				
8. Surface Water, Drainage and Underground Water				
Are there any deviations from the provisions of the EMP with respect to surface water, drainage and underground water?				
Are surface water catchment drainages and quarry pits regularly cleaned of accumulated sediments?				
Is water collected in the quarry pits used to wash machinery and equipment and is not be pumped out into natural water streams.				
Are areas which suffered soil erosion during the rainy season, inspected and corrective measures taken to prevent further erosions?				
9. Traffic Impact on National Roads				
Are there any deviations from the provisions of the EMP on traffic impacts on national roads?				
Has the RFA been consulted to install road signs to warn motorists approaching the quarry from the directions of Omakange and Okahao of possible heavy duty trucks turning in or accessing the quarry.				
Are road regulations complied with, i.e. vehicles used on public roads are licensed, roadworthy and operated by licensed drivers.				
Are trucks loaded to the required payloads and are such truck drivers given printouts from the weighbridge indicating the tonnages carried?				
Are tipper trucks transporting sand covered with suitable canvas to ensure that dust blown from the trucks does not become a safety hazard and nuisance to other road users				
Has any complainant been received from any stakeholders regarding any traffic violations?				
10. Biodiversity (Fauna and Flora)				
Are there any deviations from the provisions of the EMP on biodiversity?				
Is land clearing kept to the minimum possible area where dolomitic rock occurs and is preceded by careful planning of access routes as well as areas where to site stockpiles for topsoil and products?				
Are big trees and trees where any bird is nesting avoided during land clearing?				
Are employees trained to preserve all forms of life during land clearing and quarrying activities, i.e. reptiles such as snakes should not be skilled unless where it poses a danger to humans.				
Are employees cautioned against illegal hunting of wildlife loaming around in the area?				
Are employees cautioned against harvesting of trees for any purposes without the necessary permission?				
Has any complaint been received with respect to illegal killing of wildlife or harvesting of trees?				
11. Aspects Related to Archaeological and Cultural Interests				

Environmental Aspects & Mitigation Measures	Compliance	Follow Up Action	By Whom	Date Completed
Are there any deviations to the provisions of the EMP with respect to archaeological and cultural matters				
Have employees received training on issues related to archaeological and cultural interest?				
Have employees been informed on what to do in the event an item of cultural or archaeological interest is unearthed during quarrying operations?				

7.2 Inspection Parameters and Schedules

The inspection parameters and schedule listed in **Table 6** below, is provided to be used as a guideline in the implementation of the EMP and for the maintenance of housekeeping rules.

Table 6: Inspection Parameters and Schedules

Inspection Parameters	Frequency	Responsibility
Compliance with the provisions of the EMP	At all times during the quarrying activities	ZI Management
Earthmoving Plants, Tipper Trucks & LDVs: <ul style="list-style-type: none"> Pre-start checks General conditions & cleanliness No overloading No spills from loaded trucks 	Daily, at the beginning of each shift Daily, at the beginning of each shift Daily, during loading operations Daily, during the loading of trucks	Each Machine Operator
Littering on site: <ul style="list-style-type: none"> Camp Site Administrative office Workshop section Parking section Quarry pit access route Weighbridge section Stockpiles Access gate to the quarry site Along perimeter fence and berms 	Daily Daily Daily Once weekly Once weekly Once weekly Biweekly Once weekly Once weekly Once monthly	Quarry Supervisor or as delegated
General Conditions <ul style="list-style-type: none"> Quarry boundaries Topsoil stockpiles Product stockpiles Internal access routes Wearing of PPE 	Biweekly Weekly Weekly Weekly Daily	Quarry Supervisor or as delegated
Dust Control Measures <ul style="list-style-type: none"> Topsoil excavation Drilling & Blasting Loading & Hauling Quarry internal routes Topsoil stockpiles 	When quarrying When drill Daily, when loading Weekly Once, monthly	Quarry Supervisor
Erosion Control (Rainwater) <ul style="list-style-type: none"> Quarry slopes Topsoil stockpiles Product stockpiles Internal access routes 	Before, during & after rainy period	Quarry Supervisor or as delegated
Hazardous waste and or spills <ul style="list-style-type: none"> oil, fuel & lubricants, etc. explosive waste detonator waste 	When reported	Quarry Supervisor
Waste Disposal <ul style="list-style-type: none"> Household & office waste Hazardous waste (old batteries, oil filters, etc) Scrap metals, old tyres, etc. Sewage 	Monthly Once yearly Once yearly or as the need arise Once yearly or as the need arise	Quarry Supervisor
Noise nuisance (idling, revving, hooting, etc.)	Daily, when quarrying	Quarry Supervisor
Good housekeeping practices	Daily, when quarrying	Quarry Supervisor or delegated
Effective vegetation cover on mined out areas	Post rehabilitation	Quarry Supervisor or as delegated
Internal Environmental Reporting	Quarterly	Quarry Management
Overall Operational Environmental Audit	Annually	Quarry Management

Inspection Parameters	Frequency	Responsibility
<p>Note: The overall responsibility for ensuring that cleaning and the proposed inspections are carried out is vested with the Quarry Manager who may delegate such functions to junior staff members as deemed appropriate.</p>		

7.3 Environmental Inspection Checklist

The environmental inspection checklist in **Table 7** is provided as a guideline to help improve and cultivate a culture of safeguarding the environment and should be improved upon by ZI Management.

Table 7: Environmental Inspection Checklist

Item	Yes	No	N/A
Date of Inspection: _____			
Checked by: _____			
Copy of the EMP available and readily accessible			
Name of the Quarry Manager is clearly displayed			
Name of the Workshop Foreman			
The Following Information must be displayed on a Notice Board at the site office:			
• Contact number of Regional Health Safety Officer is displayed.			
• Contact number of the Local Police Charge Office is displayed.			
• Contact number of nearest Ambulance.			
• Contact number of the Local Primary Health Clinic is displayed.			
• Contact number of nearest regional Fire Brigade.			
Training of Employees			
• Is suitable training provided to each newly person assigned to a job?			
• Are all employees offered training on the provisions of the EMP?			
• Is adequate instructions on the use of PPEs provided?			
• Has training on the use of emergency equipment provided?			
• Has training offered provided a thorough review on hazardous associated with the job?			
• Ha the training stressed the importance to comply with the EMP			
• Has follow up training provided?			
Response Plan to Incidents and Accidents			
• Has a plan been drawn up to deal with any incident or accident which may arise?			
• Has the plan been communicated to the employees?			
• Are all employees aware and know of what to do in case of a serious incident or accident occurring?			
• Is there an Emergency Assemble Point which is clearly marked and known by all employees?			
Fire Emergency Procedures			
• Is there a clear fire response plan for each work area?			
• Do the workers know the plan and what to do in the event of a fire outbreak?			
• How regularly are fire drills held?			
• Are there enough fire extinguishers available to do the job?			
• Are the locations of the extinguishers clearly marked and accessible?			
• Are all extinguishers fully charged and in working orders?			
Housekeeping			
• Are the working areas clean and orderly?			
• Are there enough waste bins provided to all working sections?			
• Are the permanent walkways clearly marked and kept clean?			

Item	Yes	No	N/A
<ul style="list-style-type: none"> Are quarry internal routes spill free, adequately signaged and covered with crushed stones? Are the ablution facilities well ventilated, kept clean and sanitary? Are waste bins regularly emptied? Are all facilities at the workers' camp site in good repair? 			
Medical and First Aid <ul style="list-style-type: none"> Is the first aid kit kept well stocked? Do all employees know where to get first aid? Are there employees well trained to provide first aid? 			
Personal Protective Equipment (PPE) <ul style="list-style-type: none"> Is required PPE provided, correctly used and properly maintained? Is the PPE provided of good quality and meeting industry standards? Are warning signs clearly displayed where the wearing of PPE is mandatory? Is the wearing of PPE used only in instances when it is not possible to control or to eliminate the hazardous substances or process by other means? 			
Land Clearing for new Quarrying Activities <ul style="list-style-type: none"> Is land to be cleared of vegetation preceded by detailed planning and physical observations? Has the size of the land surveyed and the extent of dolomitic rock occurrence accurately ascertained? Is the number of big trees on that land ascertained? Are there no birds nesting on such trees? Are internal routes to such land pre-planned and clearly demarcated? Are the areas where to site stockpiles for topsoil and products planned and clearly demarcated? 			
Quarry Internal Routes <ul style="list-style-type: none"> Are internal routes properly demarcated, spill free and well maintained? Are truck movements in and out of the quarry restricted to one internal route? Have adequate signs been provided with respect to speed limit, etc. 			
Rehabilitation of Worked Out Areas <ul style="list-style-type: none"> Are worked out areas progressively rehabilitated in tandem with quarrying? Is vegetation growth establishing on topsoil stockpiles and on the slopes of the quarry? Have areas prone to storm water erosion identified and measures put in place to limit such impacts? 			
Waste Management <ul style="list-style-type: none"> Is the quarry site kept free of litters, clean and neat? Are waste bins emptied on a regular basis and kept clean and tidy? Is hazardous waste kept in steel drums that are secured, leak-proof and stored in bunded areas? Have employees been trained on the different types of waste and handling thereof? 			
Traffic Management <ul style="list-style-type: none"> Are trucks operated on public roads licensed and roadworthy and operated by licensed drivers? Are speed limit on public roads respected by the operators? Are trucks transporting aggregates weighted on the weighbridge? Is the level of impairment or intoxication of the drivers tested each day at the beginning the shift? How often are plants and trucks serviced to avoid breakdowns and associated oil leaks and or oil spills? Is refueling of mobile plants working in the quarry performed by means of a suitable diesel bowser? 			
Drilling and Blasting <ul style="list-style-type: none"> Is blasting conducted by a qualified and blaster in possession of a valid open pit license? Is adequate warning given to stakeholders prior to blasting? 			

Item	Yes	No	N/A
• Are explosives handled, transported and stored in conformity with the provisions of the Explosive Act?			
• Is the size of the blast designed in such a way that air and vibrations resulting from such a blast is not excessive to cause destruction of nearby structures, buildings, etc.			
• Are records of each blast kept at the quarry office?			
• Is post-blast inspection carried out by a qualified blaster and any misfired holes made safe before people and machinery are allowed to work in the blasted area?			

7.4 Environmental Code of Conduct

To improve its overall environmental compliance measures as stipulated in the EMP, it is proposed to recommend a set of Environmental Code of Conduct which ZI Management should strive to implement once its quarrying activities are resumed.

The code of conduct should apply to all current and future employees of ZI, clients visiting the quarrying premises, contractors hired to perform certain functions at the quarry such as the drilling and blasting crew and any visitors entering the quarry facility.

In terms of this Environmental Code of Conduct, the Quarry Manager is authorized to issue warning and to discipline any person who transgresses environmental rules and regulations.

Table 8: Environmental Code of Conduct

ENVIRONMENTAL CODE OF CONDUCT
HEALTH AND SAFETY GUIDELINES
<p>Covid-19 Protocols:</p> <ul style="list-style-type: none"> • Respect the regulations provided for the Covid-19 pandemic, • Wear a suitable face mask, • Sanitize your hands regularly, • Avoid large social gathering such as weddings, bars, funerals, etc. • Seek treatment when feeling unwell, and • Get vaccinated. <p>Water:</p> <ul style="list-style-type: none"> • Do not drink water collected in the quarry pit or water used to spray internal routes. • Only drink water supplied by the company or purified water. <p>HIV/AIDS Virus:</p> <ul style="list-style-type: none"> • Take the necessary precautions to avoid contracting the HIV/AIDS virus. • Take the necessary precautions to avoid contracting diseases. <p>Restricted Areas:</p> <ul style="list-style-type: none"> • Do not enter an areas marked as restricted or demarcated as dangerous, i.e. a blasting area without permission. • Do not enter any area that is out of bound or fenced in by climbing over the fence without the permission of the Quarry Manager. • Do not enter an area marked 'PPE required' unless wearing suitable PPE. • Any stranger or unauthorized person found wandering around in the quarry premises must be reported to the Quarry Manager. <p>Housekeeping Rules:</p> <ul style="list-style-type: none"> • The use of drugs on duty or at the site camp is strictly forbidden. • Coming to work while intoxicated is strictly forbidden. • Limited use of alcohol at the site camp site may be allowed. • Possession of a firearm at work or at the site camp is strictly forbidden.
FAUNAL AND FLORAL MANAGEMENT GUIDELINES
<p>Faunal Guidelines:</p> <ul style="list-style-type: none"> • No feeding, teasing or playing with, hunting, killing or setting devices to trap wild animals (including birds, reptiles and mammals) and livestock is allowed. • No dogs are allowed. • A maximum of two cats maybe be kept but they should be fed and not allowed to hunt down rats and mice in the surrounds as that could create an imbalance in the ecosystem. • No food items should be left around to attract animals, birds and or insects. Leftover food items must be placed in waste bin with lids such that animals do not gain access. • Feeding wildlife (e.g. baboons) should be discouraged as it leads to conflict situations between wildlife and humans. • When clearing land for quarrying purposes, any sensitive habitats where animals are breeding should be avoided.

ENVIRONMENTAL CODE OF CONDUCT
<p>Floral Guidelines:</p> <ul style="list-style-type: none"> • No cutting or harvesting of any plants and or trees for whatever purposes is allowed. Dead trees within the quarry premises maybe collected for firewood • Trees in which birds are nestling must be avoided and not uprooted. Any bird nestling must not be disturbed. • Internal routes should not be sited over sensitive habitats for plants.
<p>GUIDANCE WITH RESPECT TO DISPOSAL OF SOLID AND LIQUID WASTE</p>
<ul style="list-style-type: none"> • Train employees on the various types of waste: general waste and hazardous waste • Train employees on how to identify waste bins, drums or bags for the different types of waste. • Train employees not dispose hazardous waste in the bins or skips intended for general waste. • Educate employees to appreciate the importance of not littering or throwing away waste anywhere on the quarry, not to throw waste in the field or along the road. • Under no circumstances should waste be buried on site. • Urinating and or defecating at any other place other than using the toilets provided is prohibited. • Waste in bins should be disposed of at regular intervals and the bins cleaned and the surrounds kept clean and tidy.
<p>• GUIDELINES WITH RESPECT TO QUARRY ACCESS AND VEHICLE USES</p>
<ul style="list-style-type: none"> • No vehicle must be driven unless it is roadworthy and has a valid Licence. Any driver refusing to operate a vehicle that is not roadworthy and without valid licenses should not be reprimanded. • No third party truck should be loaded with aggregate unless it has a valid licensed and a MDC logbook. • No driver must operate a vehicle/truck when intoxicated. • Vehicles should be operated on demarcated internal routes and off-road driving is prohibited. • Vehicles operated on public roads must not be overloaded and drivers must adhere to the speed limit. • Unnecessary engine idling, revving and hooting must be avoided.
<p>GUIDELINES WITH RESPECT HAZARDOUS WASTE</p>
<ul style="list-style-type: none"> • Hazardous substances such as oil, fuel, solvents, chemicals, etc. should not be discharged into natural water streams or buried in the soil. • Any accidental spills of hazardous substances must be immediately contained and corrective action taken. All hazardous spills must be reported to the Quarry Manager. • Under no circumstances may hazardous substance waste be allowed to soak into the soil. • Any leaks or spillage of hazardous substances, unhygienic conditions at the ablation facilities must be immediately reported and corrective measures taken.
<p>GUIDELINES WITH RESPECT TO ENVIRONMENTAL RELATED COMPLAINANTS</p>
<ul style="list-style-type: none"> • Any complaint reported by any stakeholder with respect to working conditions, noise, dust, violations of road regulations by truck operators, pollution or any other harmful or dangerous condition must recorded, investigated and corrective action taken. • Where warranted, feedback should be provided to the complainant.

8. CONCLUSION AND RECOMMENDATION

8.1 Conclusion

ZI was granted an ECC to quarry and expand its aggregate operation at Omakange. However, the award of the ECC had coincided with a massive economic recession which hit the construction sector following the end of the TIPEEG projects in 2014. Ever since the ECC was granted, ZI did not quarry a single ton of rock in order to generate raw materials for crushing and screening.

In preparation for this renewal application, the quarrying operation was visited by Ekwao Consulting during which an environmental compliance inspection, as described in section 6, **Annexure B** and photographic evidence presented in **Annexure C**, was carried out. Out of the possible 53 assessable conditions, ZI was found fully compliant on at least 48 conditions which translates into a compliance rating of 90.57%.

With about 50% of the Namibian population resident in the northern regions, the aggregate quarry has a vital and beneficial role to play in the economic setups of such regions and should be supported. Minimal disturbance to the environment should be expected, but with the recommendations as suggested in this updated EMP, and the fact that ZI is committed to implementing such measures, quarrying at Omakange can be carried out, in a manner which is technically feasible and environmentally sustainable.

8.2 Recommendation

Based on the environmental compliance inspection conducted, the quarrying operation is very well organized and management is committed to implement and to comply with the provisions of the EMP. It is recommended that the ECC be renewed.



REPUBLIC OF NAMIBIA

MINISTRY OF ENVIRONMENT AND TOURISM

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05 August 2017

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

The Managing Director
Zest Investment cc
P O Box 11583
Windhoek
Namibia

Dear Sir /Madam

SUBJECT: ENVIRONMENTAL CLEARANCE CERTIFICATE FOR THE EXISTING AND AN EXTENSION OF QUARRYING OF AGGREGATES AT OMAKANGE QUARRY 1 AND 2, OMUSATI REGION.

The Environmental Scoping Report and Environmental Management Plan submitted are sufficient as these made provisions of the environmental management concerning the project's activities. From this perspective regular environmental monitoring and evaluations on environmental performance should be conducted. Targets for improvements should be established and monitored throughout this process.

This Ministry reserves the right to attach further legislative and regulatory conditions during the operational phase of the project. From this perspective, I issue this clearance with the following conditions: (a) relevant permitting authority involved must be properly consulted and written consent obtained from them; (b) any key biodiversity habitats must be protected.

On the basis of the above, this letter serves as an environmental clearance for the project to proceed. However, this clearance letter does not in any way hold the Ministry of Environment and Tourism accountable for misleading information, nor any adverse effects that may arise from this project's activities. Instead, full accountability rests with Zest Investment Cc and its consultants.

This environmental clearance is valid for a period of 3 (three) years, from the date of issue unless withdrawn by this office.

Yours sincerely,

Teofilus Nghitila

ENVIRONMENTAL COMMISSIONER



"Stop the poaching of our rhinos"

All official correspondence must be addressed to the Permanent Secretary



ANNEXURE B: Compliance Inspection Checklist

Areas: Quarry Pit 1 & 2, Workshop, Camp Site & Quarry Premises

Table 9: Environmental Compliance Inspection Report

NO.	MANAGEMENT MEASURES	NC	FC	NA	NO	REMARKS	REFERENCE
STANDARD CONDITIONS							
1.	Quarrying is a listed activity which may not be conducted without a valid ECC having been granted by the EC.				x	ZI has complied and obtained an ECC for its operation.	
2.	The conditions as contained in the EMP are binding on the company and compliance is mandatory.				x	ZI has taken note of the requirement.	
3.	All current personnel as well as any other employees who may be hired in future are expected to be acquainted with the provisions of the EMP.				x	ZI has noted the requirement and will accordingly comply when full scale quarrying commences.	
4.	Any material changes to, or deviations from the project description as previously presented to MEFT, must be approved by the EC. The impacts of such changes must be evaluated and assessed.				x	No changes or deviations from the project were noted during the site assessment audit.	
5.	Where any of the applicant's contact details change including the name of the responsible person, the physical address and/or telephonic details, the applicant is expected to notify the office of the EC of such changes.				x	No change has taken place since the ECC was granted.	
6.	A copy of the EMP and the ECC must be kept at the site office. Both documents should be provided to any GRN official(s) who may request such documents for purposes of inspections.		x			Copies of both the EMP and ECC were present at the office.	File
7.	Any contractor hired to do any work on the quarry must be provided with a copy of the EMP. The proponent must ensure that the contractor has understood the terms of the EMP.				x	ZI has taken note of the requirement and will accordingly comply whenever work is assigned to third parties.	None
8.	The ECC does not negate the company to comply with any other statutory requirements which may be applicable to the activity being undertaken.				x	ZI has noted the requirement.	
9.	Unless indicated otherwise or withdrawn an ECC is normally valid for a period of three years.				x	ZI has taken note of the condition.	
CONDITIONS RELATED TO STAFFING AND PERSONNEL							
10.	Appointment of a Quarry Manager		x			An experienced and competent Quarry Manager has been appointed for the operation.	
11.	Appointment of SHE Officer			x		The scope of the operation does not justify the appointment of a SHE Officer as previously envisaged.	
12.	Conduct the recruitment in a fair and transparent manner by considering women and persons with disabilities who have suitable skills and experiences. People from marginalised communities (OvaHimbas, etc.) should also be considered.			x		No recruitment was made during the period due to lack of construction opportunities in the country. Otherwise Management has taken note of the guidance suggested.	

NO.	MANAGEMENT MEASURES	NC	FC	NA	NO	REMARKS	REFERENCE
13.	All employees must have formal employment contracts duly signed by both parties.		x			Employment contracts between the parties have been executed and are on file.	
14.	Proper records must be kept with respect to the number of people employed, their full names, IDs, residential addresses.		x			Records are kept on file at the office	Office Files
15.	Employees to be registered with all statutory institutions such as Social Security, Inland Revenue, etc.		x			ZI has complied with the requirement.	Office files
16.	Employees should be allowed to belong to a trade union of their choice. An employee charged with a misconduct should be allowed to have a representative.				x	ZI management has taken note of the recommendation.	
PROJECT SPECIFIC CONDITIONS							
HEALTH AND SAFETY MANAGEMENT							
17.	Develop a Health and Safety Plan for the quarrying operation. The plan must make provision for raising of awareness and sharing of information.	x				Management is committed to implementing the recommendation once full scale activities are resumed.	None
18.	Develop an Emergency Response Plan for the operation to deal with any safety incidents or accidents occurring at the quarry.	x				No formal written emergency response plan exists, but management is working towards implementation.	None
19.	Provide First Aid kits for the quarrying and ensure that such kits are fully stocked and employees trained in the giving first aid in case on an accident or incident.		x			First kids have been provided and are adequately stocked. Training to provide first aid assistance in case of an accident or incident is ongoing.	Office Files
20.	Appropriate PPE's should be provided to employees and use thereof enforced.		x			The requirement has been complied. All employees are issued with suitable PPEs. File records and employees	Office files
21.	Potentially hazardous areas within the quarry premises that are not immediately repaired or rectified must be demarcated and cordoned off with danger tapes.				x	No work was conducted during the site assessment. Discussions with site personnel indicated that employees were aware of what to do when hazardous areas become evident.	None
22.	Appropriate signs must be placed to caution employees and contractors not to enter certain structures without being authority to do.		x			Warning signs appropriate to activities undertaken or restricting access to certain areas were affixed or prominently erected.	Figures: 4, 7, 17 & 39
23.	Maintain good housekeeping practices at the workplace and camping site. No consumption of alcohol should be allowed at work and the camp site. No guns and nor drugs are permitted. Promote proper handling and disposal of waste.		x			ZI has complied with the requirement. Work place, camp site, administrative offices, workshop and parking areas were clean and tidy. Alcohol is not permitted on the company premises. No incidence of violence has been reported as a result of alcohol abuse.	Figures: 12, 14, 15 & 16
LAND DISTURBANCES RESULTING FROM QUARRYING ACTIVITIES							
24.	Avoid unnecessary land clearing and ensure that quarrying activities are confined to areas where dolomitic rock occur. Such areas should be identified and clearly marked out with visible markings before commencing with clearing.				x	No new excavations were made and therefore no land clearing has taken place since the ECC was granted. This condition has been noted by ZI.	

NO.	MANAGEMENT MEASURES	NC	FC	NA	NO	REMARKS	REFERENCE
25.	Topsoil must be stripped off and stockpiled for future rehabilitation. Where topsoil is not used within two years, topsoil stockpiles should be levelled and contoured to allow for natural grass to grow over the area. This will help to keep the soil biologically active.		X			Notwithstanding that no quarrying activities were conducted since the ECC was granted to ZI, topsoil and overburden stockpiles excavated when the ECC was not mandatory, were separated by type and stored in separate designated areas. No stockpiles were observed located in areas considered as drainage areas. Berms were constructed separating various stockpiles within the quarry pit. Vegetation regrowth was observed on a number of topsoil stockpiles.	Fig. 20 Fig. 23 Fig. 36 Fig. 38
26.	Under no circumstances should material stockpiles be disposed outside the boundaries of the quarry.		X			No stockpiles of any material were observed stored outside the quarry boundaries. Discussions with quarry personnel did not reveal any such practice.	
27.	All traffic movements within the quarry premises must be restricted to quarry internal routes which must be well planned and well maintained.		X			During the site assessment, quarry internal routes were observed, clearly demarcated and movements of vehicles restricted to such routes. No vehicle marks were observed outside the demarcated internal routes. Furthermore, the routes were covered with crushed aggregates in order to reduce dust generation.	Fig. 23 Fig. 39
EROSION CONTROL MEASURES							
28.	Develop an erosion control plan where mined out areas and erosion prone areas are visually monitored at the beginning of and at the end of the wet season in order to identify erosion gullies/channels and to effect repairs. Areas where erosion was remediated previously should also be monitored.				X	ZI management has taken note of the requirement. The fact that the quarry area receives less than 300 mm of rain per annum makes the prospects of soil erosion remote, however management agreed to monitor potentially erosion prone areas with the quarry site.	None
29.	Areas temporarily disturbed during excavations that will not be required for operations should be identified, graded and rehabilitated to improve aesthetics and reduce erosion				X	No rehabilitation of worked out areas has been carried out, but the requirement has been noted by ZI Management.	
PREVENTION OF SURFACE AND GROUNDWATER CONTAMINATION							

NO.	MANAGEMENT MEASURES	NC	FC	NA	NO	REMARKS	REFERENCE
30.	Within the quarry premises, specific areas must be demarcated for fuel storage, fueling and machine repair workshop. Such areas must be banded to reduce the possibility of soil and water contamination.		X			The fuel storage and repair work shop are separate from each. The workshop has not been completely banded yet. During the last three years no bulk fuel was procured due to limited activities. Management has committed to address the shortcoming.	Fig. 13
31.	Any spillages of fuel or oil whether (major or minor) must be contained and effectively cleaned up as soon as they occur.	X				Discussions with site personnel have detailed a verbal procedure to be followed during incidents which includes immediate stopping of spills, using spill absorbent materials, use of drip trays and clean-up and disposal of spilled and contaminated materials.	None
32.	In the case of accidental spillage, contaminated soil must be removed and disposed of at an approved off-site facility.				X	Contaminated materials are safely stored and transported from the quarry to an approved off-site disposal facility.	
33.	Sewage and any contaminated water used for cleaning purposes must not be discharged into the natural environment.		X			A functional sewage system has been installed. No waste water was observed discharging in the natural environment.	Fig. 15 Fig. 16
WASTE HANDLING AND MANAGEMENT							
34.	Management must develop a practical waste management plan for the quarrying operation to handle all types of waste generated.		x			Management has a waste management plan which employees are well acquainted with. However, the waste management plan has not been documented yet.	Fig. 14 Fig. 24
35.	Hazardous waste should be handled by suitably trained personnel and must be disposed of at an approved off-site landfill. Items such as used oil filters should be stored in marked containers that allow oil to drain out but not to escape from the storage.		x			The amount of hazardous waste generated by the operation is fairly small (used oil, old batteries, etc.). Hazardous waste is stored in leak proof containers and disposed of in responsible manner.	
36.	All domestic and general office waste produced should be cleaned and contained daily.		x			Cleaning is done on a daily basis and suitable waste containers have been provided to all sections of the quarrying operation: workshop, Camp Site and administrative office. Waste generated on site is stored in containers resistant to scavengers and disposed of in a responsible manner.	Fig. 14
37.	Waste containers or bins should be provided, marked for the various types of waste and emptied on a regularly basis.		x			ZI has complied fully with requirement.	Fig. 14
38.	Keep the quarry premises tidy and liter- free at all times.		x			The premises are kept tidy, clean and indeed very pleasing to the eye.	
39.	Clean and pick up liters and windblown papers around the quarry premises on a regular basis.	X				Empty beer bottles and windblown papers were observed on the premises perimeters.	Fig. 8
40.	Food waste must be placed in containers which are scavenger proof to prevent wildlife feeding on such waste.		x			Suitable waste bins have been provided at the workshop, administrative office and camp site.	Fig. 14
NOISE MANAGEMENT							

NO.	MANAGEMENT MEASURES	NC	FC	NA	NO	REMARKS	REFERENCE
41.	Limit quarrying activities to day light hours and between the hours of 07h00 to 17h00. No work may be performed on Sunday and public holidays.		x			Working hours are displayed at the entrance of the premises. No work is performed outside such hours, on Sundays and public holidays	Fig. 17
42.	Machineries and equipment should be properly maintained and regularly serviced (defective silencers should be replaced, etc.)		x			All equipment and machinery onsite were found to be well kept and well maintained, despite limited operational activities.	Fig. 9
43.	Machineries must be switched off when not in use and unnecessary hooting, idling & revving should be avoided.		x			According to operators this requirement is being met.	
44.	Any noise related complaints received from stakeholders/community should be recorded, immediately investigated and corrective action taken.		x			According to management no complaint has been received with respect to noise since the ECC was granted. Also, there are no sensitive noise receptors in the surroundings.	
AIR QUALITY MANAGEMENT							
45.	The access road and all quarry internal routes should be covered with crushed stones to reduce dust generation.		x			The access road to the quarry and internal quarry routes were covered with crushed stones. No potholes were observed.	Figures: 23 39 & 40
46.	To minimise NO ₂ emissions, the earthmoving truck fleet should be properly maintained and regularly serviced with limited idling times allowed.		x			Proponent is compliant to the requirement	
47.	Speed limits within the working areas should be set and adhered to by all truck operators at all times.		x			A speed limit of 20km/hr is applied and maintained on all internal quarry routes.	
48.	Any dust related complainant that is received from any stakeholder should be recorded, investigated and corrective action taken.		x			No complainants were received from anyone since the ECC was granted. Also, there are no dust receptors in close proximity of the quarry.	
MANAGEMENT OF BLASTING AND ASSOCIATED VIBRATION IMPACTS							
49.	Ensure that any blasting and handling of explosives are handled within the parameters of the law and performed by a person in possession of a valid open surface blasting certificate.				x	No drilling and blasting has been performed since ZI was granted an ECC. According to ZI, drilling and blasting is contracted to a third party who is licensed and permitted to transport, store and handle explosives. No explosives are stored on site. For any blast, the third party would procure and bring to the quarry the exact quantity of explosive needed to perform that specific blast. The actual blasting is performed by a qualified and experienced blaster who is in possession of a valid opencast blasting certificate.	None
50.	Explosives and related devices may only be transported in a fit-for-purpose vehicle approved and licensed for such purpose.				x		
51.	Ensure that explosives are stored in an approved tamper-proof explosive storage magazine, constructed as prescribed by the Explosive Act.				x		
52.	Ensure that blasting is conducted between Monday and Friday between the hours of 09h00 and 16h00.				x		
53.	Adequate notice of at least 48 hours should be given to all stakeholders.				x		
54.	The scale of blast must be designed in such a way that air and ground vibrations resulting from such blasts are not destructive but within acceptable parameters.				x		
55.	The area blasted must be inspected by a qualified blaster, any misfired holes treated and made safe before quarrying activities are resumed. All explosive remnants and detonators must be collected from the blasted site and disposed of in a prescribed manner.				x	A post blast examination of the site blasted is also carried out by the blaster and any misfired holes treated and made safe. The site is only entered by the quarry personnel once declared safe by the blaster.	

NO.	MANAGEMENT MEASURES	NC	FC	NA	NO	REMARKS	REFERENCE
FUEL STORAGE AND HANDLING							
56.	Bulk fuel must be stored in a suitable above ground tank located within a designated area which is secured, with the installation made in full compliance of the Petroleum Products and Energy Act.		x			An above ground fuel storage tank has been installed on a smooth impermeable surface base and properly secured and fenced in with access limited to authorized personnel only.	
57.	The personnel handling fuel should be properly trained and well acquainted with fuel regulations and the provisions of the EMP.		x			According to ZI Management, the person handling the fuel is well trained and experienced. However, no significant amount of bulk fuel was procured over the period under review.	None
58.	The fuel storage facility must be fitted with lids which are kept firmly shut at all times with keys kept in the onsite office. Smoking and naked flames must not be allowed in the vicinity of the fuel storage area.		x			The requirement is being complied with.	
59.	Earthmoving and equipment refueling should be undertaken on a hard impermeable surface or over drip pans to ensure that any spilled fuel is captured and cleaned up. Refueling of earthmoving machines working in the quarry pit should be done from a suitable mobile diesel bowser.		x			A mobile diesel bowser has been procured and is being used.	Fig. 26
60.	Symbolic signage clearly depicting "No Smoking" "Danger" & "No Naked Lights" must be clearly displayed.		x			The requirement was only partially complied with.	
FIRE PREVENTION AND MANAGEMENT							
61.	Fire extinguisher that are in good working order must be made available at all times for their usage in the event accidental fires.		x			Fire extinguishers were observed at the site and were in working conditions	Figures: 25 & 28
62.	Workers must be adequately trained in the handling of firefighting equipment.		x			Employees are trained in the handling of firefighting equipment.	None
63.	Open fire must be made at designated places only, i.e. Camp Site. No open fire must be made in the vicinity of fuel storage place.		x			Discussions with personnel detailed that open fire is only allowed at the Camp Site where employees reside.	None
64.	Smoking must be prohibited in the vicinity of flammable substances.		x			According to employees, smoking is strictly prohibited in the workshop and fuel storage area.	None
TRAFFIC IMPACT ON PUBLIC ROADS							
65.	Liaise with the Roads Authority and install traffic signs on either side of C41 highway. This is to warn road users approaching the quarry from both directions of possible heavy duty trucks leaving the quarry or turn into the quarry.		x			No road signs have been installed to warn motorists using the C41 highway on the existence of a quarry and the possibility of trucks slowing down to turn to or entering the highway from the quarry. A stop sign must be installed where the access road from the quarry intersects C41.	Fig. 41

NO.	MANAGEMENT MEASURES	NC	FC	NA	NO	REMARKS	REFERENCE
66.	Install a weighbridge to have truck payloads weighted and recorded so as to avoid overloading which causes undue wear and tear of public roads.		x			A full scale weighbridge has been installed and all trucks leaving the quarry are weighed and their loads recorded.	Figures: 6 & 7
67.	All vehicles used on public roads must be licensed, roadworthy, supplied with Mass Distance Logbooks and operated by licensed drivers with valid public driver's permits.		x			The company is complying fully with these statutory conditions.	Office files
68.	Spillage on public roads could endanger the safety of motorists using such roads. Ensure that trucks are not loaded beyond the recommended capacity and height of tailboards.		x			ZI is complying with the requirement	None
69.	Building sand transported in a tipper trail is prone to be blown out by wind, polluting the environment and becoming a safety hazard to road users. Ensure that tipper trucks are covered with suitable tarpaulin covers.				x	ZI has taken note of this requirement.	
70.	Keep a logbook where all vehicles visiting the operation are recorded, the time of entry, exit, the type of vehicle, and its destination. This will give an indication of the number of vehicles visiting the operation.				x	ZI has taken note of this requirement.	
71.	Any complainant received from stakeholders regarding traffic violations, must be recorded, promptly investigated and corrective action taken.		x			No complainant has been received with respect to traffic violations since the ECC was granted.	
IMPACTS ON THE ECOSYSTEM							
72.	Allow vegetation to grow on quarry slopes and topsoil stockpiles. Storm water management should be put in place to limit the potential of soil erosion. Big trees and any trees in which birds are nestling should be avoided.		x			Vegetation regrowth was observed on topsoil stockpiles. Some big trees were observed in the quarry which were preserved and not uprooted.	Figures: 19, 20 & 23
73.	Machinery should be operated on dedicated internal routes only. Such routes should be well maintained. Off-road driving should be discouraged and drivers found driving off-road should be reprimanded.		x			Quarry internal routes were clearly demarcated but not adequately signposted. No truck marks were observed outside the internal routes.	Figures: 23, 34, 38 & 39.
74.	Illegal harvesting of trees for fire wood or for any other purposes is prohibited. Open fire is allowed at designated places only.		x			Site personnel confirmed that dead wood and trees were harvested for firewood for meal preparations.	None
75.	Illegal hunting, killing and or theft of livestock grazing around the quarry premises are criminal offences punishable by law and are not allowed.		x			No incidents of illegal hunting or killing of wildlife was brought to the attention of ZI Management.	
VISUAL INTRUSIONS							
76.	Reduce visual impacts of permanent structures by ensuring that such structures are made to blend in well with the natural environment. Where possible roofs and walls should be painted with paint of matt finish so as to reduce reflection. Locate infrastructures away from sensitive and elevated area.		x			The quarry is located in a remote area with no sensitive receptors in its surrounds. It is however along C41 highway, but effectively shielded away by mopane trees and therefore barely visible from the road. The workshop, camp site and the administrative office have all been adequately obscured from the C41 motorists' vantage points. Overall, the quarry has a low visual impact.	Figures: 10, 11, 12 & 13

NO.	MANAGEMENT MEASURES	NC	FC	NA	NO	REMARKS	REFERENCE
77.	Materials stockpiled for future quarry rehabilitation should preferably be levelled, profiled and vegetated to reduce the risk of soil erosion and decrease visual disturbance. Keep the heights of product stockpiles as low as possible to reduce visual impact.		x			Since the ECC was granted to ZI, no quarrying activities have been conducted, i.e. no raw materials were processed. During this time work has concentrated on processing (screening) existing stockpiles which resulted in reduced stockpile heights and significantly improved the visual amenity of the operation.	Fig. 19 Fig. 20 Fig. 29 & Fig. 30
78.	Ensure effective suppression of dust including spraying with water on quarry internal routes, stockpiles and quarry floor areas to avoid dust escaping into the atmosphere becoming a visual nuisance to the general public.		x			All quarry routes and work areas have been spread with crushed gravel. Vehicles movements are restricted to a speed limit of 20 km/hr.	
79.	Ensure that security lights at the quarry does not offend the public using C41 and cattle herders in the vicinity. The lighting layout should direct lights inwards to the quarry and not outwards to the road.		x			The quarry is barely visible from the C41 highway. Limited lighting is used at night and is not visible from the public using C41.	Figures: 10, 11, 12 & 13
ASPECTS RELATED TO ARCHAEOLOGICAL AND CULTURAL HERITAGE							
80.	Safeguard and protect any findings of archaeological or cultural heritage nature until such time that confirmation of such findings is made by relevant authority and direction provided on the way forward.				x	ZI has taken note of condition in the EMP.	
81.	Should a cultural heritage site or an archaeological item site be uncovered or discovered during the quarrying operations, i.e. a "chance find" the procedure outlined in the EMP should be followed.				x	ZI has taken noted of the guidelines in the EMP.	
MONITORING							
82.	The EC reserves the right to carry out monitoring of the quarrying activities in order to ensure compliance with the legislation and the conditions set out in the EMP.				x	ZI has taken note of the requirement.	
83.	It is incumbent upon the promoter to ensure that effective management and monitoring of the impacts of the quarrying activities on the environment are maintained throughout the operational life of the project.				x	ZI has noted the requirement.	
SITE CLOSURE AND DECOMMISSIONING							
84.	Notice of decommissioning should be made to the relevant stakeholders including MEFT.				x	ZI has noted the requirement.	
85.	The decommissioning of any individual activity within the overall listed quarrying activity must take place within the ambit of the EMP.				x	ZI has taken note of the requirement.	
86.	Abandoning the site without carrying out the necessary rehabilitation activities as outlined in the EMP is an infringement of the provisions of the EMP and could result in penalties being imposed on the promoter.				x	The requirement has noted by ZI Management.	
87.	All possible mitigation measures as outlined in the EMP for decommissioning should be implemented.				x	ZI has taken note of the requirement.	

ANNEXURE C: Figure References

It is important to highlight the fact, that while every effort is put into conducting a compliance inspection, due to the time constraints and the nature of activities viewed on the day of the inspection, only a sample of the operations can be reasonably assessed.

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Figure 3: Gate to Quarry. Note stop sign along C41



Figure 4: View from the Gate. Note berm wall to the left



Figure 5: Crusher fines used as berms along C41



Figure 6: Full weighbridge



Figure 7: Weighbridge seen from entry side



Figure 8: Empty beer bottles along the berm wall



Figure 9: Mobile plants & machinery parked in the yard due to reduced construction activities





Figure 10: Camp site tucked away



Figure 11: Site Office & management quarters



Figure 12: Access to the employees' camp site



Figure 13: Workshop and equipment yard



Figure 14: Employees' site camp, clean and tidy. Note different types of waste bins supplied.

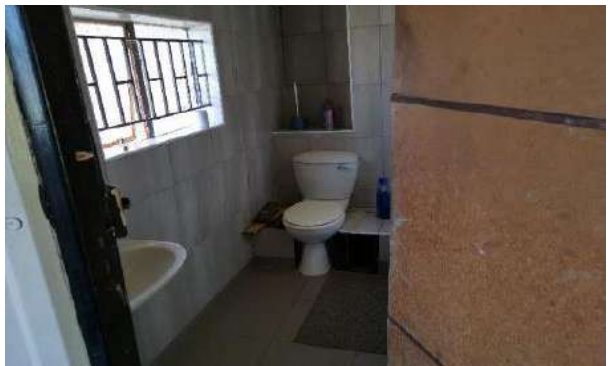


Figure 15: Ablution facilities at the employees' site camp



Figure 16: Working hours



Figure 17: Quarry Pit (Photo taken March 2017)



Figure 18: Quarry slopes – note vegetation growth



Figure 19: Topsoil stockpile – note vegetation growth



Figure 20: Access route to Quarry #2 (Mar 2017)



Figure 21: Access route to Quarry #2 (Current, July 2021)



Figure 22: Berms separating sections of the Quarry



Figure 23: Effective re-use of waste products



Figure 24: Fire extinguisher workshop area



Figure 25: Mobile diesel bowser for refuelling



Figure 26: Employee wearing PPE (Mar 2017)



Figure 27: Fire extinguisher - earthmoving truck



Figure 28: Overburden stockpiles (Mar 2017)



Figure 29: Site after stockpile reprocessing (Jul 2021)



Figure 30: Conserved acacia trees in the quarry premises



Figure 31: Conserved Mopane trees in the quarry



Figure 32: Rainwater in the quarry pit (Mar 2017)



Figure 33: Water from the quarry pit stored in tanks



Figure 34: Internal routes & signage at the weighbridge



Figure 35: Berms serving as boundary & firebreak



Figure 36: Internal routes with signage



Figure 37: No traffic signs along C41 to warn motorists