
BLUE BERRIES NAMIBIA (PTY) LTD

Environmental and Social Impact Assessment Report

Proposed Blueberries Irrigation Project, Located in
Divundu Village, Okavango East Region, Namibia

April 2023



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CONSULTANT'S EXPERTISE

I.N.K Enviro Consultants cc is the independent firm of environmental consultants that has been appointed by Blue Berries Namibia (Pty) Ltd to conduct the ESIA process.

Immanuel N. Katali, the Environmental Assessment Practitioner holds a B. Arts (Honours) Geography, Environmental Studies and Sociology and has over seven years of relevant experience in conducting/managing Environmental and Social Impact Assessments (ESIAs), and Environmental Compliance/Monitoring Audits in Namibia. Immanuel is certified as an Environmental Assessment Practitioner under the Environmental Assessment Professionals Association of Namibia (EAPAN).

DECLARATION OF INDEPENDENCE AND DISCLAIMER

I.N.K Enviro Consultants cc herewith declare that this report represents an independent assessment of the proposed Blueberries Irrigation Project, on the request of Blue Berries Namibia (Pty) Ltd.

The Environmental Consultant has prepared this report based on an agreed scope of work and acts in all professional manner as an Independent Environmental Consultant to Blue Berries Namibia (Pty) Ltd and exercises all reasonable skill and care in the provision of its environmental professional services in a manner consistent with the level of expertise exercised by members of the environmental profession.

The information, statements and commentary contained in this report have been prepared by I.N.K Enviro Consultants cc from information provided by Blue Berries Namibia (Pty) Ltd and the Public Participation Process. I.N.K Enviro Consultants cc does not express an opinion as to the accuracy or completeness of the information provided, the assumptions made by the party that provided the information or any conclusions reached. I.N.K Enviro Consultants cc has based this report on information received or obtained, on the basis that such information is accurate and, where it is represented to I.N.K Enviro Consultants cc as such, complete.

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EXECUTIVE SUMMARY

Project Background

Blue Berries Namibia (Pty) Ltd intends to apply for an Environmental Clearance Certificate (ECC) for its proposed blueberries irrigation activities, located on a piece of land measuring ±253.9 hectares (ha), along the south eastern bank of the Okavango River, in Divundu Village.

Water for the irrigation project will be abstracted from the Kavango River, which is located approximately 300m south of the project site. The irrigation project will require roughly 2 million m³ of water per annum from the Okavango River during the operational phase and aims to produce blueberries (large-scale production) over four (4) phases.

This proposed project follows the footsteps of the Government of Namibia's aims and objectives of ensuring agricultural productivity and food security as envisaged in NDP III and Vision 2030 strategy.

Project Need and Desirability

Namibia's "Green Scheme Policy" (MAWF, 2008) states that "[t]he mandate of the Ministry of Agriculture, Water and Forestry is the promotion, development, management and utilisation of agricultural, water and forestry resources." It is, therefore, the objective of the Government to ensure agriculture productivity and food security in line with the Vision 2030 strategy."

The "Green Scheme Policy" (MAWF, 2008) goes on to state "*[t]he Green Scheme is designed to maximise irrigation opportunities along the maize triangle (Grootfontein, Tsumeb and Otavi) as well as in the North Central and North Eastern regions using the Kunene, Kavango and Zambezi rivers as well as the promotion of agro projects in the South using Orange River and dams such as Naute and Hardap. This policy aims at harnessing the resources of Government and other stakeholders in order to increase agriculture productivity and social development as envisaged in NDP III and Vision 2030 strategy.*"

The proposed irrigation project falls within the ambit of Namibia's "Green Scheme".

Scoping

The main purpose of scoping is to indicate which environmental aspects relating to the proposed project might have an impact on the environment, to assess them and to provide management and mitigation measures to avoid or minimise these impacts.

Public Participation Process

The public participation process for the proposed project is conducted to ensure that all persons and/or organisations that may be affected by, or interested in the proposed project, were informed of the project and could register their views and concerns. By consulting with relevant authorities and I&APs, the range of environmental issues to be considered in this Report has been given specific context and focus.

General Assumptions and Limitations

The key assumptions and limitations of this EIA Report are detailed below.

- ◆ It is assumed that the information provided by Blue Berries Namibia (Pty) Ltd, relating to the project activities is accurate and that the project will be implemented and operated as described.
- ◆ The results of specialist studies formed the basis for the assessment of impact significance. The specialist investigations are conducted by independent specialists considered to be experts in their fields. It was assumed that the information from these sources is relevant and accurate.
- ◆ The assumptions and limitations of any specialist study or opinion are detailed in the individual reports.
- ◆ The latest Namibian Population Census was carried out in 2011 and there have been continuous rural – urban migration and changes in the economic environment. Therefore, to prevent misleading conclusions and outcomes as a result of this outdated data, the information available, where possible, has been assumed, through the comparative analysis of the socio-economic context of the settlement in 2011 and the current baseline social and economic conditions of the settlement, such as evident town expansion, increase in local shops, new townships and investment in the town.

Applicable Namibian Regulations

As the main source of legislation, the Constitution of the Republic of Namibia (1990) makes provision for the creation and enforcement of applicable legislation. In this context and in accordance with its constitution, Namibia has passed numerous laws intended to protect the natural environment and mitigate against adverse environmental impacts.

The management and regulation of agricultural activities fall within the jurisdiction of the Ministry of Agriculture, Water and Land Reform (MAWLR). The environmental regulations are guided and implemented by the DEA within the MEFT.

In the context of the proposed project activities, there are several laws and policies currently applicable.

Applicable International Standards (International Finance Corporation)

International Finance Corporation's (IFC) Environmental and Social Performance Standards define IFC clients' responsibilities for managing their environmental and social risks. The Performance Standards provide guidance on how to identify sustainability risks and impacts and are designed to help avoid, mitigate, and manage them as a way of doing business in a more sustainable way.

Identification of Potential Environmental Aspects and Potential Impacts

The consultation process with key stakeholders that included government authorities and I&APs allowed the opportunity to raise the issues associated with the project development. It was identified that; the following aspects will need to be further assessed:

- ◆ Biodiversity Impacts.
- ◆ Groundwater and Surface Water Contamination.
- ◆ Socio-Economic Impacts.
- ◆ Health and Safety (Pesticides and Fertilizers)

The relevance of the potential impacts (“screening”) to determine aspects to be assessed in further detail are also presented.

Assessment Approach and Methodology

An assessment of the potential positive and negative impacts associated with the construction and operations phase of the proposed irrigation project is provided below. As an outcome of the Scoping Phase, specialist input was requested for some of the environmental issues and has been included in this assessment.

Other potential environmental impacts resulting from the proposed project activities and facilities (also identified during the Scoping Phase of the EIA) were assessed by I.N.K and are also presented below.

Impacts are considered in a cumulative manner where possible such that the impacts of the proposed Project are seen in the context of the baseline conditions described in Section 6. Information that has been included in Section 6 will not be repeated in this Section.

- ◆ Both the criteria used to assess the impacts and the Method of determining the frequency/severity of the impacts is outlined in Biodiversity Impacts.
- ◆ Groundwater and Surface Water Contamination.
- ◆ Socio-Economic Impacts.
- ◆ Health and Safety (Pesticides and Fertilizers).

Table 12. This Method complies with the EIA Regulations: EMA, 2007 (Government Gazette No. 4878) EIA regulations.

Both mitigated and unmitigated scenarios are considered for each impact in the ESIA results.

Environmental and Social Management Plan

The aim of the Environmental and Social Management Plan (ESMP) is to detail the actions required to effectively implement mitigation and management measures. These actions are required to minimise negative impacts and enhance positive impacts associated with the operations.

It is important to note that an ESMP is a living document in that it will be updated and amended as new information (e.g. environmental data), policies, authority guidelines, technologies and proposed activities develop. The conceptual management measures proposed to mitigate the potential impacts are detailed in the action plans below.

Conclusions and Recommendations

Overall, the development of the Namibia Berries Irrigation Project would have a positive impact on the local community and economy as well as on the Namibian economy as a whole. In addition, the project would provide an invaluable contribution to job creation, fiscal revenues and food security in Namibia as a whole.

The need for various specialist assessments, including groundwater, surface water, social and economic was identified during the scoping and EIA process. It was concluded from the specialist assessments and qualitatively by I.N.K that the development of the project would potentially have significant impacts on the biodiversity, groundwater quality, surface water quantity, health and safety, and social and economic. Construction and operational impacts would have minimal impact on heritage/archaeology, air quality, noise levels, and visual characteristics. Socio-economics were deemed to be positively impacted both directly and indirectly from both construction and operations at the site but some negative impacts were identified, such as the relocation and in-migration of people into the town. The employment and skills development of local people is included in the project plan.

Mitigation measures have been identified and recommended both by the specialist assessments and by I.N.K to promote the positive impacts of the project, as well as to reduce the negative impacts to acceptable levels. An ESMP was further developed which identifies potential impacts of the project during the construction and operation phases. The ESMP is a legally binding document to which Namibia Berries and contractors onsite must adhere.

I.N.K concludes that should Namibia Berries follow the actions (i.e. management and mitigation measures) provided in the ESMP report, the project would result in optimized value creation locally as well as globally in relation to the ecological, social and economic aspects.

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LIST OF ACRONYMS, ABBREVIATIONS AND UNITS

Acronyms / Abbreviations / Units	Definition
BID	Background Information Document
DAE	Department of Agricultural Engineering
DEA	Directorate of Environmental Affairs
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental management Act
ESMP	Environmental and Social Management Plan
ha	Hectares
HDPE	High Density Polyethylene
IRR	Issues and Response Report
I&APs	Interested and Affected Party
LPG	Liquid Propane Gas
m ³ /h	Cubic Metres per Hour
MAWLR	Ministry of Agriculture, Water and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
MHSS	Ministry of Health and Social Services
MLSW	Ministry of Labour and Social Welfare
MME	Ministry of Mines and Energy
NDP	National Development Plan
PAN	Pesticides Action Network
PPP	Public Participation Process

1 INTRODUCTION

1.1 Project Background

Blue Berries Namibia (Pty) Ltd (hereinafter referred to as “Namibia Berries”) intends to apply for an Environmental Clearance Certificate (ECC) for its proposed blueberries irrigation activities, located on a piece of land measuring ±253.9 hectares (ha), along the south eastern bank of the Okavango River, in Divundu Village.

Water for the irrigation project will be abstracted from the Kavango River, which is located approximately 300m south of the project site. The irrigation project will require roughly 2 million m³ of water per annum from the Okavango River during the operational phase and aims to produce blueberries (large-scale production) over four (4) phases.

The project objectives include the following:

- ◆ Green scheme agricultural production focusing on expanding market access for Namibia & promoting responsible sourcing.
- ◆ Implementation of sustainable practices, including habitat conservation & protection of natural resources.
- ◆ Local employment opportunities focusing on gender equality and reducing migration of women.
- ◆ Significant impact investment in the project area.
- ◆ Training, development and research opportunities for Namibia.
- ◆ Local community partnership.

The project infrastructure layout (Figure 2) consist of the following:

- ◆ Blueberry Orchard (238.65 ha).
- ◆ Tissue Culture Lab (3,0 ha).
- ◆ Grow-on: Avocados (3,0 ha).
- ◆ Greenhouse: Avocados (3,0 ha).
- ◆ Packhouse (3,0).

This proposed project follows the footsteps of the Government of Namibia’s aims and objectives of ensuring agricultural productivity and food security as envisaged in NDP III and Vision 2030 strategy.

Prior to the commencement of the project, an environmental clearance is required based on an approved Environmental and Social Impact Assessment (ESIA) and Environmental and Social

Management Plan (ESMP). The report describes the Environmental and Social Impact Assessment (ESIA) process being followed and provides an overview of the affected environment. It includes an assessment of the environmental impacts that the proposed activities are likely to have and sets out the consultants' recommendations. The proposed management and mitigation measures related to the proposed activities are documented in an Environmental and Social Management Plan (ESMP).

I.N.K Enviro Consultants cc (I.N.K), an independent firm of environmental consultants, has been appointed to undertake the Environmental and Social Impact Assessment process for this project. For more details on the ESIA process that was followed, please refer to Section 1.3.

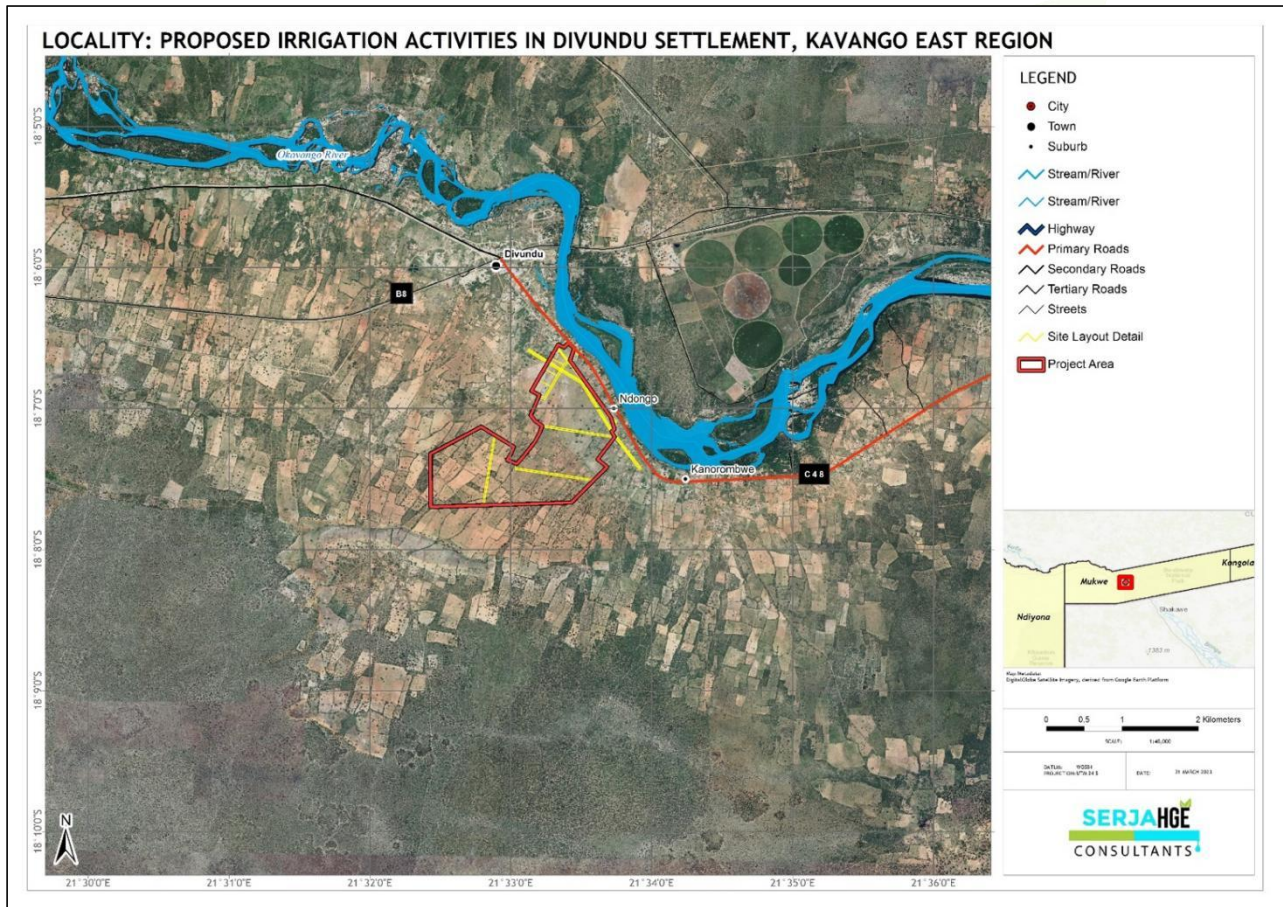


Figure 1: Project Site Location Map

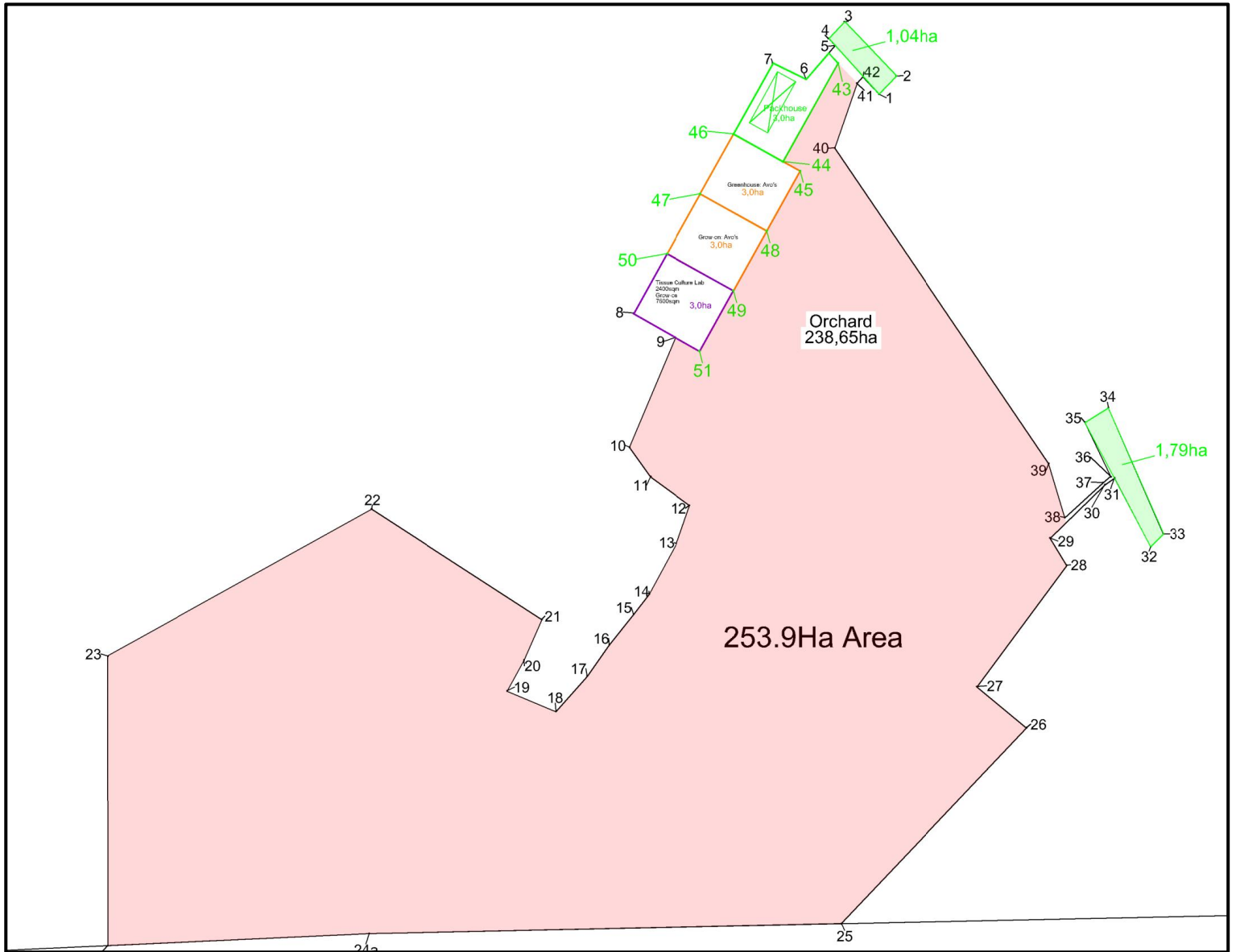


Figure 2: Project Site Layout

1.2 Project Need and Desirability

Namibia's "Green Scheme Policy" (MAWF, 2008) states that "[t]he mandate of the Ministry of Agriculture, Water and Forestry is the promotion, development, management and utilisation of agricultural, water and forestry resources." It is, therefore, the objective of the Government to ensure agriculture productivity and food security in line with the Vision 2030 strategy."

The “Green Scheme Policy” (MAWF, 2008) goes on to state “[t]he Green Scheme is designed to maximise irrigation opportunities along the maize triangle (Grootfontein, Tsumeb and Otavi) as well as in the North Central and North Eastern regions using the Kunene, Kavango and Zambezi rivers as well as the promotion of agro projects in the South using Orange River and dams such as Naute and Hardap. This policy aims at harnessing the resources of Government and other stakeholders in order to increase agriculture productivity and social development as envisaged in NDP III and Vision 2030 strategy.”

The proposed irrigation project falls within the ambit of Namibia’s “Green Scheme”.

The challenge for the project proponent is its contribution towards achieving these objectives while avoiding or mitigating possible negative social and environmental impacts.

1.3 Introduction to the Environmental and Social Impact Assessment Process

Environmental and Social Impact Assessments are regulated by the Ministry of Environment, Forestry and Tourism (MEFT) in terms of the Environmental Management Act, 7 of 2007. This Act was gazetted on 27 December 2007 (Government Gazette No. 3966) and enacted on 6 January 2012. The Environmental and Social Impact Assessment Regulations: Environmental Management Act, 2007 (Government Gazette No. 4878) were promulgated on 6 January 2012.

1.3.1 ESIA Process

The ESIA process that has been followed is summarized in the table below:

Table 1: ESIA Process

ESIA OBJECTIVES	CORRESPONDING ACTIVITIES
Project initiation, Screening Phase	
<ul style="list-style-type: none"> ◆ Understanding of the environmental and social baseline relating to the proposed Project. ◆ Notify the decision-making authority of the proposed Project. ◆ Initiate the Environmental and Social Impact Assessment process. ◆ Site visits and identify environmental issues. ◆ Identify key stakeholders and early 	<ul style="list-style-type: none"> ◆ Project Inception and initiation meetings to discuss the Project and ESIA process requirements. ◆ Liaise with various specialists ◆ Draft ESIA Schedule. ◆ Initiate baseline studies. ◆ Submit Application for authorisations and a Background Information Document (BID) to the authorities. ◆ Register the Project and Applications for environmental clearances with MEFT (DEA) on its online portal. ◆ Early identification of environmental aspects and

ESIA OBJECTIVES	CORRESPONDING ACTIVITIES
identification of other I&APs.	potential impacts associated with the proposed Project.
Scoping Phase	
<ul style="list-style-type: none"> ◆ Notify other regulatory authorities and I&APs of the proposed Project (via newspaper advertisements, BID, emails, site notices and telephone calls). ◆ Conduct Key Stakeholder and Public meetings. ◆ Carry out specialist investigations and establish baseline environmental conditions. ◆ Determine the terms of reference for additional assessment work. ◆ Compile Scoping Report and Issues and Response Report (IRR) ◆ Distribute the Scoping Report for review and comment by relevant authorities and I&APs. ◆ Assessment of potential issues, consider comments received and compile the ESIA final report. ◆ Submit the final reports to relevant Ministries for their review and final decision on the Applications for environmental clearance. 	<ul style="list-style-type: none"> ◆ Develop Public Participatory Process (PPP) Programme. ◆ Develop I&AP database. ◆ Prepare BID and distribute to I&APs. ◆ Notify government authorities and I&APs of the Project and ESIA process (telephone calls, e-mails, BID newspaper advertisements and site notices). ◆ IAP registration and comments. ◆ Meetings with authorities and I&APs. ◆ Investigations by appointed specialists. ◆ Compilation of Scoping Report and ESMPs. ◆ Distribute Scoping Report and ESMPs to all I&APs for review and comments. ◆ Assess potential issues, obtain comments and update the Scoping Report and ESMPs. ◆ Submit final documents to MAWLR and MEFT for review and decision-making.

Within this framework, the required components of the ESIA report are discussed in more detail as part of the ESIA Methodology in Section 8.

ESIAs are influenced by national legislation and a range of guidelines. The legislation applicable to this project and the ESIA process is discussed further in Section 3 below.

1.3.2 ESIA Team

I.N.K Enviro Consultants cc is the independent firm of consultants that has been appointed by Namibia Berries to undertake the Environmental and Social Impact Assessment and related

processes. The full ESIA team comprises of various environmental experts and specialists as per the following table below.

Table 2: ESIA Team

Specialist	Designation	Tasks and Roles	Company
Mr. Immanuel N. Katali	Project Manager Social Expert	Management of the process, team members and other stakeholders. Report compilation and process review.	I.N.K Enviro Consultants cc
Mr. Johann Venter	Health and Safety and Risk Assessment Practitioner	Health and Safety Input	I.N.K Enviro Consultants cc
Ms. Fredrika Shagama	Hydrogeology Specialist	Hydrogeology Assessment	Serja Hydrogeo-Environmental Consultants cc
Mr. Nahas Angula	Vegetation Expert	Vegetation Input	Freelance

1.3.3 Applicable Listed Activities

The EIA Regulations promulgated in terms of the Environmental Management Act, identify certain activities which could have a substantially detrimental effect on the environment. These listed activities require environmental clearance from MEFT prior to commencing. The following activities identified in the regulations apply to the proposed project:

Table 3: Listed activities triggered by the proposed Project.

Listed activity
4. The clearance of forest areas, deforestation, afforestation, timber harvesting or any other related activity that requires authorisation in term of the Forest Act, 2001 (Act No.12 of 2001) or any other law.
8.1 The abstraction of ground or surface water for industrial or commercial purposes.
8.3 Any water abstraction from a river that forms an international boundary.
8.7 Irrigation schemes for agriculture excluding domestic irrigation.

Listed activity

8.8 Construction and other activities in water courses within flood lines.

10.1 The construction of-(a) oil, water, gas and petrochemical and other bulk supply pipelines;



2 SCOPING METHODOLOGY

2.1 Information collection

I.N.K used various information sources to identify and assess the issues associated with the proposed project as per the following:

- ◆ Site visit by I.N.K.
- ◆ Consultation with Namibia Berries Project Technical Team.
- ◆ Consultation with MEFT via online application system.
- ◆ Consultation with I&APs.
- ◆ Atlas of Namibia.
- ◆ Google Earth.
- ◆ Internet sources.

2.2 Scoping

The main purpose of scoping is to indicate which environmental aspects relating to the proposed project might have an impact on the environment, to assess them and to provide management and mitigation measures to avoid or minimise these impacts.

Table 4 outlines the Scoping requirements as set out in Section 8 of the Environmental and Social Impact Assessment Regulations that were promulgated in January 2012 in terms of the Environmental Management Act, 7 of 2007.

Table 4: Scoping requirements stipulated in the ESIA regulations.

Requirements for a Scoping Report in terms of the February 2012 regulations	Reference in report
(a) the curriculum vitae of the EAP who prepared the report;	Appendix A
(b) a description of the proposed activity;	Section 4
(c) a description of the site on which the activity is to be undertaken and the location of the activity on the site;	Section 4
(d) a description of the environment that may be affected by the proposed activity and the manner in which the geographical, physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed listed activity;	Sections 6
(e) an identification of laws and guidelines that have been considered in the preparation of the Scoping Report;	Section 3
(f) details of the public consultation process conducted in terms of regulation 7(1)	Sections 2.3, 2.4, 2.5 and

<p>in connection with the application, including -</p> <ul style="list-style-type: none"> (i) the steps that were taken to notify potentially interested and affected parties of the proposed application; (ii) proof that notice boards, advertisements and notices notifying potentially interested and affected parties of the proposed application have been displayed, placed or given; (iii) a list of all persons, organisations and organs of state that were registered in terms of regulation 22 as interested and affected parties in relation to the application; and (iv) a summary of the issues raised by interested and affected parties, the date of receipt of and the response of the EAP to those issues; 	<p>Appendix B</p>
<p>(g) a description of the need and desirability of the proposed listed activity and any identified alternatives to the proposed activity that are feasible and reasonable, including the advantages and disadvantages that the proposed activity or alternatives have on the environment and on the community that may be affected by the activity;</p>	<p>Sections 1.2</p>
<p>(h) a description and assessment of the significance of any significant effects, including cumulative effects, that may occur as a result of the undertaking of the activity or identified alternatives or as a result of any construction, erection or decommissioning associated with the undertaking of the proposed listed activity;</p>	<p>Sections 7 and 8</p>
<p>(i) terms of reference for the detailed assessment; and</p>	<p>Section 7 & 8</p>
<p>(j) a management plan, which includes -</p> <ul style="list-style-type: none"> (i) information on any proposed management, mitigation, protection or remedial measures to be undertaken to address the effects on the environment that have been identified including objectives in respect of the rehabilitation of the environment and closure; (ii) as far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of the activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and (iii) a description of the manner in which the applicant intends to modify, remedy, control or stop any action, activity or process that causes pollution or environmental degradation and remedy the cause of pollution or degradation and migration of pollutants. 	<p>Section 9</p>

2.3 Public Participation Process

The public participation process for the proposed project is conducted to ensure that all persons and/or organisations that may be affected by, or interested in the proposed project, were informed of the project and could register their views and concerns. By consulting with relevant

authorities and I&APs, the range of environmental issues to be considered in this Report has been given specific context and focus.

Included below is a summary of the I&APs consulted, the process that was followed and the issues that were identified.

2.4 The Proposed Blueberries Irrigation Project I&APs

The table below provides a broad list of persons, group of persons or organisations that were informed about the project and were requested to register as I&APs should they be interested and/or affected.

Table 5: Namibia Berries' Project Stakeholders

IAP Grouping	Organisation
Government Ministries	<ul style="list-style-type: none"> ◆ Ministry of Environment, Forestry and Tourism (MEFT). ◆ Ministry of Agriculture, Water and Land Reform.
Local Authorities	<ul style="list-style-type: none"> ◆ Divundu Village Council
Nearest Communities	<ul style="list-style-type: none"> ◆ Residents in Divundu Village
Media	Newspaper adverts (Friday, 10 and Friday, 17 March 2023): Die Republikein and The Namibian Sun.
Other interested and affected parties	Any other people with an interest in the proposed project or who may be affected by the proposed project.

2.5 Steps in the consultation process

Table 6 sets out the steps that were followed as part of the consultation process:

Table 6: Consultation process with I&APs and Authorities

TASK	DESCRIPTION
Notification - regulatory authorities and IAPs	
Notification to MEFT	I.N.K submitted the Application Form (online system) as a form of project registration and notification to MEFT.
I&AP identification	A stakeholder database was developed for the proposed project and ESIA process. Additional I&APs will be updated during the ESIA process as required.
Distribution of background	BIDs were made available to all I&APs on the project's stakeholder database. Copies of the BID were available on request to I.N.K.

TASK	DESCRIPTION
Notification - regulatory authorities and IAPs	
information document (BID), flyers and stakeholders meeting invitation letters	<p>Stakeholder meeting invitation were given out to the residents of Divundu Village.</p> <p>The purpose of the BID was to inform I&APs and authorities about the proposed project, the ESIA process, possible environmental impacts and means of providing input into the ESIA process. Attached to the BID was a registration and response form, which provided I&APs with an opportunity to submit their names, contact details and comments on the project. A copy of the BID is attached in Appendix B.</p>
Newspaper Advertisements	<p>Block advertisements were placed as follows:</p> <ul style="list-style-type: none"> ◆ Die Republikein (10 and 17 March 2023) ◆ The Namibian Sun (10 and 17 March 2023) <p>Refer to Appendix B.</p>
Scoping Meetings	<p>Several consultations were made with I&APs. This included meetings and telephonic discussions.</p> <p>Meetings were held with key stakeholders as follows:</p> <ul style="list-style-type: none"> ◆ Homestead within the boundary of the site - Ndongo Village, Divundu on Friday, 24 March 2023. ◆ General public meeting - Ndongo Village, Divundu on Saturday, 25 March 2023 <p>The due date to register as an I&AP and submit comments was 07 April 2023. However, the ESIA report was made available at the Village Council for additional commenting.</p>
Comments and Responses	Minutes and Issues and Response of the meetings is attached in Appendix B.
MEFT review of ESIA Report and ESMP	A copy of the final Scoping Report, including authority and I&AP review comments, will be submitted to MEFT on completion of the public review process via the online application system.

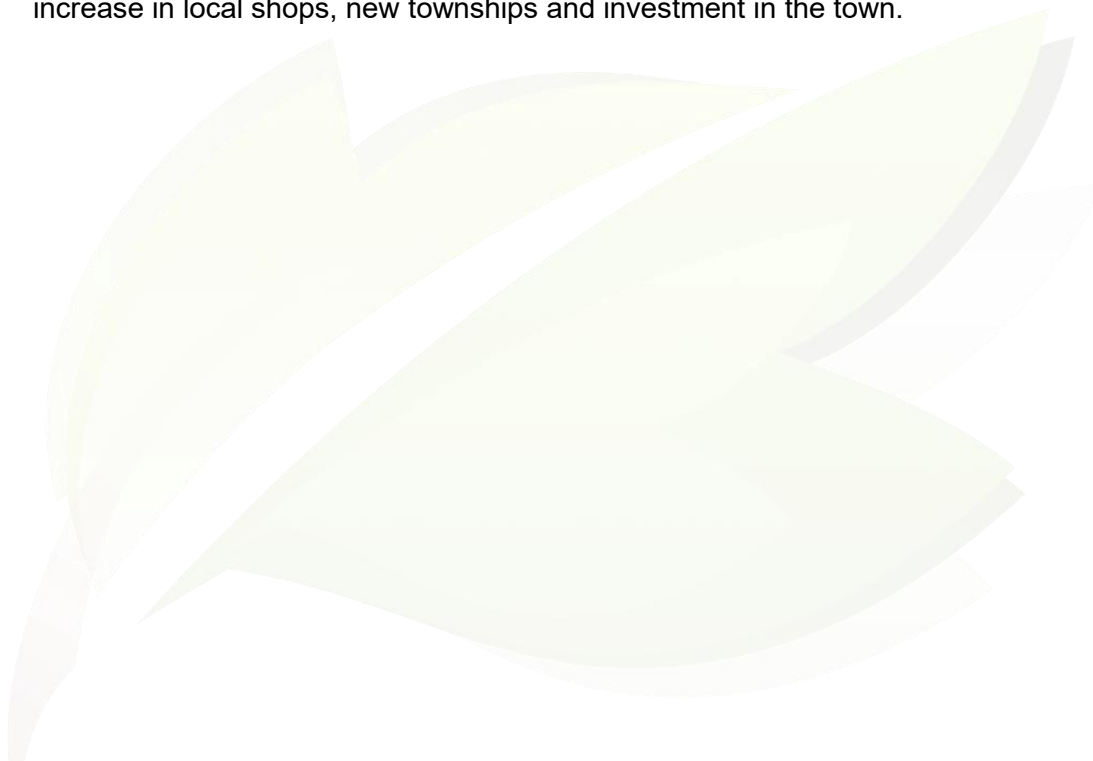
2.6 General Assumptions and Limitations

The key assumptions and limitations of this EIA Report are detailed below.

- ◆ It is assumed that the information provided by Blue Berries Namibia (Pty) Ltd, relating to the project activities is accurate and that the project will be implemented and operated as described.
- ◆ The results of specialist studies formed the basis for the assessment of impact significance. The specialist investigations are conducted by independent specialists

considered to be experts in their fields. It was assumed that the information from these sources is relevant and accurate.

- ◆ The assumptions and limitations of any specialist study or opinion are detailed in the individual reports.
- ◆ The latest Namibian Population Census was carried out in 2011 and there have been continuous rural – urban migration and changes in the economic environment. Therefore, to prevent misleading conclusions and outcomes as a result of this outdated data, the information available, where possible, has been assumed, through the comparative analysis of the socio-economic context of the settlement in 2011 and the current baseline social and economic conditions of the settlement, such as evident town expansion, increase in local shops, new townships and investment in the town.



2.7 Introduction

The Republic of Namibia has five tiers of law and several policies relevant to environmental assessment and protection, which include:

- ◆ The Constitution.
- ◆ Statutory law.
- ◆ Common law.
- ◆ Customary law.
- ◆ International law.

As the main source of legislation, the Constitution of the Republic of Namibia (1990) makes provision for the creation and enforcement of applicable legislation. In this context and in accordance with its constitution, Namibia has passed numerous laws intended to protect the natural environment and mitigate against adverse environmental impacts.

The management and regulation of agricultural activities fall within the jurisdiction of the Ministry of Agriculture, Water and Land Reform (MAWLR). The environmental regulations are guided and implemented by the DEA within the MEFT.

In the context of the proposed project activities, there are several laws and policies currently applicable. Key legislation and policies are summarized below, and all relevant National Acts, Policies, Plans, as well as International Conventions and Protocols, are listed below.

The EIA Policy (1995) is enforced through the Environmental Management Act, 7 of 2007 and the EIA Regulations of 6 January 2012 (EIA Regulations). In terms of this legal framework certain identified activities may not commence without an environmental clearance issued by MEFT.

3 IDENTIFICATION OF APPLICABLE ENVIRONMENTAL AND SOCIAL GUIDELINES

3.1 Policies and Plans

Namibia's policies provide the framework to the applicable legislation. Whilst policies do not often carry the same legal recognition as official statutes, policies are used in providing support to legal interpretation. The following policies and plans are applicable:

- ◆ The EIA Policy (1995).

- ◆ Namibia's Environmental Assessment Policy for Sustainable Development and Environmental Conservation (1995).
- ◆ Namibia Vision 2030.
- ◆ National Development Plan, 201/2018 – 2021/2022, guided by Vision 2030.
- ◆ Policy for the Conservation of Biotic Diversity and Habitat Protection, 1994.
- ◆ Namibia's Second National Biodiversity Strategy and Action Plan (2013-2022).
- ◆ National Environmental Health Policy (2002).
- ◆ National Solid Waste Management Strategy (2020).
- ◆ The National Climate Change Policy of Namibia (2010).
- ◆ New Equitable Economic Empowerment Framework Policy, 2011.
- ◆ National Rangeland Management Policy and Strategy of 2012.
- ◆ Atmospheric Pollution Prevention Ordinance of 1976.
- ◆ Hazardous Substance Ordinance of 1974.
- ◆ SADC Protocol on Shared Watercourses 1995

3.2 Summary of Applicable legislation and standards

The following legislation is applicable:

- ◆ The Public Health Act 36 of 1919.
- ◆ National Monuments Act 28 of 1969.
- ◆ Soil Conservation Act 76 of 1969.
- ◆ Nature Conservation Ordinance 14 of 1975.
- ◆ The Constitution of the Republic of Namibia of 1990.
- ◆ Nature Conservation General Amendment Act 1990.
- ◆ The Regional Councils Act No. 22 of 1992.
- ◆ Nature Conservation Amendment Act 5.
- ◆ Road Traffic and Transport Act, 1999 (No. 22 of 1999).
- ◆ The Forestry Act 12 of 2001.
- ◆ Pollution Control and Waste Management Bill (3rd Draft September 2003).
- ◆ National Heritage Act 27 of 2004.
- ◆ Burial Place Ordinance, Act No. 27 of 1966.
- ◆ Labour Act, 2007 (No. 11 of 2007).
- ◆ Electricity Act No.4 of 2007.

- ◆ Environmental Management, Act 7 of 2007.
- ◆ Regulations promulgated in terms of the Environmental Management, Act 7 of 2007.
- ◆ Draft Protected Areas and Wildlife Management Bill (2009).
- ◆ Public and Environmental Health Act No. 1 of 2015.
- ◆ Nature Conservation Amendment Act 3.
- ◆ Draft Bill Wildlife and Protected Areas Management (version March 2021).
- ◆ Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act No. 36 of 1947.
- ◆ Air Quality Act (No. 39 of 2004).
- ◆ Traditional Authorities Act (No. 17 of 1995)

A summary of the applicable legislation is provided below:

Table 7: Applicable Legislation

YEAR	NAME	Natural Resource Use (energy & water)	Emissions to air (fumes, dust & odours)	Emissions to land (non-hazardous & hazardous)	Emissions to water (industrial & domestic)	Noise	Visual	Impact on Land use	Impact on biodiversity	Impact on Archaeology	Socio-economic	Safety & Health
1990	The Constitution of the Republic of Namibia of 1990	X	X	X	X	X	X	X	X	X	X	X
1997	Namibian Water Corporation Act, 12 of 1997	X									X	
2001	The Forestry Act 12 of 2001	X						X	X			
2013	Water Resources Management Act 11 of 2013	X			X						X	
2004	National Heritage Act 27 of 2004									X		X
2007	Environmental Management, Act 7 of 2007	X	X	X	X	X	X	X	X	X	X	X
2012	Regulations promulgated in terms of the Environmental Management, Act 7 of 2007											
1975	Nature Conservation Ordinance 14 of 1975	X			X				X	X		
1976	Atmospheric Pollution Prevention Ordinance 11 of 1976		X									
1995	Namibia's Environmental Assessment Policy for Sustainable	X	X	X	X	X	X	X	X	X		X

	Development and Environmental Conservation											
2008	Green Scheme Policy										X	
1995	National Agricultural Policy										X	
2003	Agricultural (Commercial) Land Reform Amendment Act										X	

3.3 Applicable IFC Performance Standards

International Finance Corporation's (IFC) Environmental and Social Performance Standards define IFC clients' responsibilities for managing their environmental and social risks. The Performance Standards provide guidance on how to identify sustainability risks and impacts and are designed to help avoid, mitigate, and manage them as a way of doing business in a more sustainable way.

The following are the performance standards that are applicable to the construction and operation of the project and are used as the basis of investigation for the ESMP:

Table 8: Applicable Performance Standards

IFC Performance Standard	Description	Applicable	Not Applicable
1. Environmental and Social Management System	An environmental and social management system (ESMS) helps companies integrate plans and standards into their core operations—so they can anticipate environmental and social risks posed by their business activities and avoid, minimize, and compensate for such impacts as necessary. A good management system provides for consultation with stakeholders and a means for complaints from workers and local communities to be addressed.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Labour and Working Conditions	It asks that companies treat their workers fairly, provide safe and healthy working conditions, avoid the use of child or forced labor, and identify risks in their primary supply chain.	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3. Pollution Prevention and Control	It guides companies to integrate practices and technologies that promote energy efficiency, use resources—including energy and water—sustainably, and reduce greenhouse gas emissions.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Occupational Health and Safety, Public Health and Security	It helps companies adopt responsible practices to reduce such risks including through emergency preparedness and response, security force management, and design safety measures.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5. Land Acquisition and Involuntary Resettlement	It advises companies to avoid involuntary resettlement wherever possible and to minimize its impact on those displaced through mitigation measures such as fair compensation and improvements to and living conditions. Active community engagement throughout the process is essential.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. Biodiversity and Ecosystems	It recognizes that protecting and conserving biodiversity, maintaining ecosystem services, and managing living natural resources adequately are fundamental to sustainable development.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7. Rights and Interests of Indigenous People	It seeks to ensure that business activities minimize negative impacts, foster respect for human rights, dignity and culture of indigenous populations, and promote development benefits in culturally appropriate ways. Informed consultation and participation with IPs throughout the project process is a core requirement and may include Free, Prior and Informed Consent under certain circumstances.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8. Cultural Heritage	Cultural heritage encompasses properties and sites of archaeological, historical, cultural, artistic, and religious significance. It also refers to unique environmental features and cultural knowledge, as well as intangible forms of culture embodying traditional lifestyles that should be preserved for current and future generations. PS8 aims to guide companies in protecting cultural heritage from adverse impacts of project activities and supporting its preservation. It also promotes the equitable sharing of benefits from the use of cultural heritage.	<input checked="" type="checkbox"/>	<input type="checkbox"/>

4 PROJECT DESCRIPTION

4.1 Abstraction of Water from Okavango River

An estimated Four (4) pump stations will be used for the abstraction of water from the river. This will be placed on the river with pontoons anchored to the riverbank.

The pump boosters are centrifugal end-suction pumps, that will be located on top of the riverbank, inside a pump house.

4.2 Introduction

As mentioned in Section 1.1, Namibia Berries intends to apply for an Environmental Clearance Certificate (ECC) for its proposed blueberries irrigation activities, located on a piece of land measuring ±253.9 hectares (ha), along the south eastern bank of the Okavango River, in Divundu Village. The proposed project aims to produce blueberries (large-scale production) over four (4) phases.

Water for the irrigation project will be abstracted from the Kavango River (located approximately 300m south of the project site) to the irrigation site. The irrigation project will require approximately 2 000 000 (two million) m³ of water per annum from the Okavango River during the operational phases.

The project infrastructure layout (Figure 2) consist of the following:

- ◆ Blueberry Orchard (238.65 ha)
- ◆ Tissue Culture Lab (3,0 ha)
- ◆ Grow-on: Avocados (3,0 ha)
- ◆ Greenhouse: Avocados (3,0 ha)
- ◆ Packhouse (3,0)

The sections below provide a description of the activities (construction and operational) associated with the above-mentioned project components.

4.3 Pipelines and Water Supply

The irrigation project intends to abstract approximately 2 million m³ of water per annum from the Okavango River. The water will be sourced through the River Abstraction Pump Stations from the Okavango River and transported via a pipeline to the booster pump station(s) and from there further to the irrigation systems. A network of smaller-diameter pipelines will distribute irrigation water from the booster pump station(s) to the individual irrigation systems. The project

irrigation will require roughly 2 000 000 (two million) m³ of water per annum and about 7 500 m³ of water per day during the peak demand period, from July to December during the operational phases. An application for a water abstraction permit has been submitted to the Department of Water Affairs (DWA). The water for irrigation will be supplied to the project site as per the following:

- ◆ Pipeline is proposed to be flexible High-Density Polyethylene (HDPE) type pipe from pontoon to booster station.
- ◆ Pipeline will be floating on water and above ground up to riverbank.
- ◆ Pipework from the booster to irrigation will be sub-surface as permitted by the soil conditions.

Besides the water needed for irrigation purposes, water is also required for general use, e.g. drinking water, washing and cleaning, etc. Potable water will be obtained (purchased) from the Divundu Village Council water supply.

4.4 Power Supply

A combination of Generators (Diesel and Petrol), Solar System with inverters and batteries, and connection from NORED grid are available options for power supply during both construction and operations phases of the irrigation project.

4.5 Use of Pesticides and Herbicides

The project will be completely GAP (Good Agriculture Practice) compliant so all handling of fertilizers and chemicals will be done in accordance with EURO GAP. The objective of these GAP codes, standards and regulations includes, to a varying degree:

- ◆ ensuring safety and quality of produce in the food chain
- ◆ capturing new market advantages by modifying supply chain governance
- ◆ improving natural resources use, workers health and working conditions, and/or
- ◆ creating new market opportunities for farmers and exporters in developing countries.

Good Agricultural Practices are "practices that address environmental, economic and social sustainability for on-farm processes, and result in safe and quality food and non-food agricultural products" (FAO COAG 2003 GAP paper).

International standards of best practice in the use of pesticides, fungicides and herbicides in agriculture will be followed. This will include:

- ◆ Select chemicals with low toxicity outside target groups (i.e. highly specific), short half-lives and high levels of adsorption (this will prevent leaching);
- ◆ Use optimal, not maximal doses;
- ◆ Apply for as short periods as possible and select days that are not windy;
- ◆ Ensure that there is no overspray that drifts into the adjacent indigenous habitats or into areas of human habitation;
- ◆ Given that most of the chemicals will be applied through the irrigation system, using an optimal water management approach based on measured soil moisture levels will also mean that leaching and runoff will be limited.

The ecotoxicity of each chemical will be confirmed using an independent database such as the Pesticide Action Network (PAN) Pesticide Database.

The majority of fertilizer will be applied through the irrigation system, herbicides and fungicides will be applied with boom sprayers or during planting.

4.6 Waste and Sewerage Management

Domestic waste will be generated on site during construction and operations. The exact quantities cannot be determined at this stage and will vary according to season. Waste will be transported off site and disposed of at the nearest landfill site. No waste will be disposed of or burnt on site.

All hazardous waste, i.e., pesticide containers, chemical containers, hydrocarbon contaminated materials, used hydrocarbons etc., will be removed from site and disposed of at a licensed hazardous waste disposal site (there is currently only two hazardous waste facilities in Namibia), either at the Kupferberg Landfill Site in Windhoek or the Hazardous Waste Site in Walvis Bay

Sewerage from ablution facilities within the project site should be installed with septic tanks connected to french drains and to Divundu's sewerage system in order to prevent its accumulation in the natural environment and contamination of surface water and groundwater thereof.

4.7 Employment

The project will employ an approximate 300 workers on a permanent basis and approximately 3000-4000 people will be employed on seasonal contracts over the project development.

4.8 Construction Activities

4.8.1 Debushing

The main construction-related activity will be the de-bushing of the agricultural footprint. The de-bushing/clearing activity is required to clear the proposed field areas of vegetation and infrastructure, i.e. homesteads, within the site boundary.

4.8.2 Water Reticulation

Construction activities associated with the water reticulation will include:

- ◆ Installation of river pump station
- ◆ Clearing pipeline routes of vegetation
- ◆ Cutting trenches for installation of pipelines
- ◆ Placing and joining pipeline segments
- ◆ Construction of booster pump stations:
 - Clearing
 - Laying foundations
 - Building construction
 - Installation of pumps
- ◆ Installation of irrigation systems

4.8.3 Training Academy

The construction of the training academy and nurseries will involve:

- ◆ Earthworks : Cleaning and grubbing bulldozing activities
- ◆ Earthworks : Soil levelling and excavation
- ◆ Disposal or treatment of potentially contaminated soil
- ◆ Construction of internal roads
- ◆ Construction and use of temporary access roads and rail siding – clearing of areas
- ◆ Civil works: Foundation excavations
- ◆ Building activities
- ◆ Storage and handling of material : Sand, rock , cement , chemicals , additives in cement
- ◆ Water utilisation
- ◆ Mixing of concrete
- ◆ Operation and movement of construction vehicles and machinery

- ◆ Refuelling of equipment
- ◆ Erection and dismantling of scaffolding
- ◆ Building of shutters
- ◆ Installing re-enforcement steel
- ◆ Handling, storage and disposal of hazardous waste
 - Hydrocarbon wastes
 - Empty paint containers
 - Cements bags
 - Chemical additives for cement containers
 - Contaminated PPE and other wastes
 - Redundant concrete
- ◆ Handling, storage and disposal of non-hazardous waste
 - Domestic waste
 - Steel
 - Wood
 - Other construction waste
- ◆ Transportation of hazardous material
- ◆ Transportation of non-hazardous material
- ◆ Transportation via abnormal road vehicles
- ◆ Construction of temporary workshops
- ◆ Painting , grinding and welding
- ◆ Provision and operation of sanitation facilities
- ◆ Appointment of contractors, labourers, etc.

4.8.4 Fencing and Security

Due to the presence of livestock and wildlife in the surrounding areas, the irrigation fields need to be effectively fenced off. A stock-proof fence surrounding the perimeter will be required to prevent entry of livestock and wildlife as well as unauthorised people into the project site. This fence should be comprised of a 2.4m high fence with electrical offsets and a 1m high jackal proof lower section.

As it is likely that the increase of people in the area could increase the risk of criminal activities such as theft of agricultural equipment and produce. In view of this, appropriate security control measures including access points should be considered.

4.8.5 Health and Safety

All workers will be exposed to health and safety risks in the course of their work. Activities associated with the operation of machinery, i.e., mobile equipment, electrical equipment and tools heavy motor vehicles and/or hazardous chemicals pose high risk to workers.

The presence of wildlife such as crocodiles or hippopotamus along the Kavango riverbank from which water will be pumped to the irrigation area makes certain areas of the project particularly dangerous. This increases the possibility of injury, and the contractor must ensure that all employees and contractors are made aware of the potential risks of injury on site.

In order to limit the possibility of injury to persons or damage to property all reasonable practicable measures will be taken to fully train its workforce to identify and mitigate health risks and hazards associated with the project's activities.

Malaria and schistosomiasis cases could increase as the construction activities create conducive environment for the breeding of mosquito and mollusks. Inclement weather conditions such as thunderstorms, extreme hot or cold weather may contribute to a variety of conditions such as sunstroke, fatigue, dehydration etc.

Namibia Berries is committed to reducing the risk of incidents by implementing acceptable operating systems which will be utilised in the preparation and operational phases of the project. The outcome it hopes to achieve by this implementation is the prevention of injury and adverse health effects.

4.8.6 Transport Routes/Access

Access to the project area will be via the main C48 tarred road linking urban Divundu center and the Ndongu Village. Within the project area, single lane gravel roads will be constructed to the farming units and the booster pump stations.

4.8.7 Sanitation During Construction

Portable toilets with associated septic tanks will be used. The septic tanks will be emptied on a regular basis ensuring no spillages. The effluent shall be disposed of at a licensed facility.

Due to health and safety concerns, personnel may not relieve themselves in the area.

4.8.8 Construction Staff

The approximate number of contractors on site during construction should be between 10-30 at any one time.

5 PROJECT ALTERNATIVES

5.1 Alternative Site Location

According to the Divundu Village Council, the site is located within boundaries, which they have jurisdiction over. The Government of Namibia has identified food security as a national priority and the project location is considered optimal in terms of water availability, land availability, land ownership and proximity to an urban centre for labour supply.

Not implementing the project at these specific locations with favourable conditions will, therefore, cause a limitation on the national employment and Namibia's food security.

5.2 Alternative Potable Water Supply Options

Currently the plan for the supply of portable water to the project will be from the existing portable water supply in Divundu. However, the option of installing a small purification plant for purifying water from the Okavango River could be considered. However, this option is neither financially nor logistically feasible.

5.3 The “no project” option

The Labour Act, No. 11 of 2007 aims to promote and maintain the welfare of the people, to further a policy of labour relations conducive to economic growth, stability and productivity. The project will employ an approximate 300 workers on a permanent basis and approximately 3000-4000 people will be employed on seasonal contracts, throughout the project phases.

The International Finance Corporation's Performance Standard 2 on labour and working conditions, which recognises that the pursuit of economic growth through employment creation and income generation should be accompanied by protection of the fundamental rights of workers.

Therefore, the challenge facing the project proponent is its contribution towards achieving these goals while at the same time preventing and/or mitigating potential negative social and environmental impacts. The proponent will have to ensure that the identified mitigation measures and commitments to address the potential impacts, will appropriately be implemented and adhered to.



6 DESCRIPTION OF THE CURRENT ENVIRONMENT

This section was compiled utilising the following sources of information:

- ◆ Information shared by Blue Berries Namibia (Pty) Ltd.
- ◆ Visual observations during a site visit by I.N.K.
- ◆ Specialist investigations (Hydrogeology, Vegetation).
- ◆ Google Earth.
- ◆ Atlas of Namibia.
- ◆ Internet sources.

6.1 Climatic Conditions

The climate is classified as semi-arid with a moisture deficiency throughout the year. The Kavango regions are normally frost-free, and the climatic conditions are favourable for crop production (Ministry of Agriculture, Water and Forestry, 1994).

6.1.1 Temperature

The Region is usually warm to hot with average maximum temperatures above 30°C for nine months of the year, and average minimums are below 10 °C during the coolest months June, July and August. Temperatures below freezing are occasionally recorded but are rare and are usually only experienced in low-lying valleys such as found along the Kavango River and drainage lines (Omurambas) (Stubenrauch et al., 2015).

From a local perspective, Divundu area has annual temperature of more than 22°C, minimum temperatures ranging between 4 and 6°C and maximum temperatures varying from 32 to 36°C. The average annual rainfall ranges between 500 to 600mm and humidity ranging between 10% and 20% (Mendelsohn et al., 2002).

6.1.2 Precipitation

Kavango East Region receives an annual average rainfall varies between 450 and 600 mm, with a clear increasing trend from south to north. Rains fall almost entirely in summer, with the months from May to September usually being dry, and the first early rains coming to the region in October and November. Highest rainfalls usually occur in January and February.

6.1.3 Topography

According to Mendelsohn et al., (2002), the landscape of Divundu and surroundings is characterized by the Kalahari sediments, hence Kalahari Sandveld. This landscape is found in much of the northern and eastern Namibia dominated by Savanna woodlands growing on sands deposited by wind over the last 70-63 million years ago. The landscape is particularly flat, although the sands have been moulded into dunes in some areas. Altitudes are highest in the central and western areas, from where the whole landscape slopes gently down to lower ground in the east and south.

6.2 Soil, Landscape and Geology

The Okavango Basin is part of the greater Kalahari Basin, which covers most of the northern and eastern parts of Namibia and extends across the Namibian border into Botswana and Angola. The bedrock underlying the basin filled with Kalahari Sequence deposits consisting of basal rocks of the Damara Sequence, followed by the Karoo Sequence sediments, overlain and intruded by volcanics of Karoo age. The unconsolidated to semi- consolidated clay, sand and gravel of the Kalahari Sequence fill the Okavango Sub-basin, which thickens from the northeast towards the northwest, from 0 to >400 m along the north-west trending basin axis (Bittner, 2002).

The geology of Divundu area is characterized by the Kalahari sands (Mendelsohn et al., 2002). The project site is underlain by the sands and calcrete of the Kalahari Group.

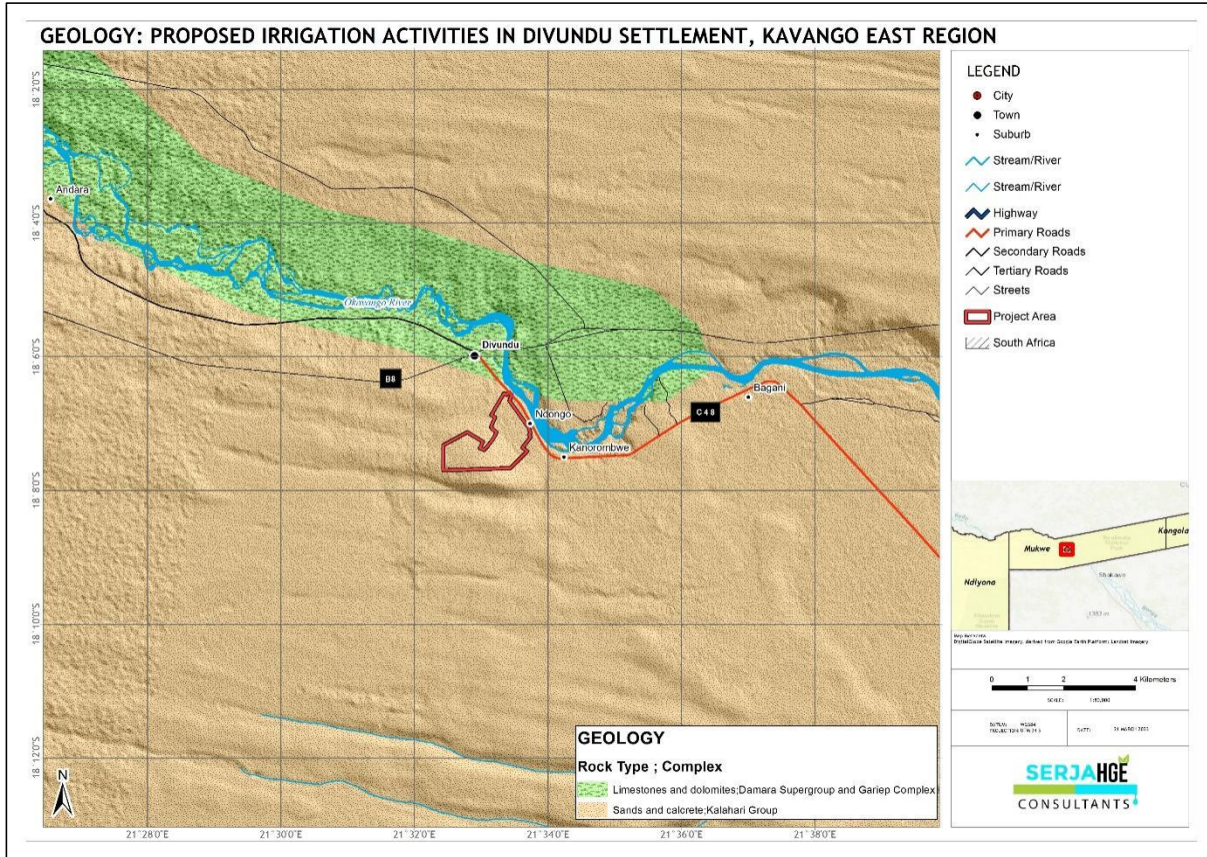


Figure 3: A typical landscape within the proposed project

The dominant soils on and around the project site area are ferralic arenosols. According to Mendelsohn et al (2002), ferralic are defined as soils with high contents of combined oxides of iron and aluminium. Arenosols are formed from wind-blown sand and usually extend to a depth of at least one meter, with sand generally making up more than 70% of the soil (Mendelsohn et al, 2002).

6.3 Biodiversity

6.3.1 Vegetation - Trees and Shrub Diversity

The description of vegetation is an important requirement in ensuring sustainable management of plant resources. The settlement is dominated by Broadleaved Tree-and-Shrub Savanna. These plants produce leaves, roots, wood, fruit and seeds, and in so doing they provide various resources and services for people, animals and the environment. On the other hand, the area is very much an open grassland, with scattered shrub and thorn bushes. There are several fruit bearing trees, such as Jackals Berry, Monkey Orange, Baobab and Xemina Africana.

The settlement falls within the Forest Savanna and Woodland which extends from the north-eastern part of the Zambezi Region to the eastern part of Okavango East Region, covering the area of Divundu Village.

Table 9: Woody vegetation cover in the settlement

Species common name	Scientific name	Dominanc/cover	Protected/
Thorn tree	<i>Senegalia nigrescens</i>	Sparely distributed in the settlement	
Kiaat	<i>Pterocarpus angolensis</i>	Isolated	
Wild syringa	<i>Burkea africana</i>	Very few in the area	
Monkey oranges	<i>Strychnos cocculoides and pungens</i>	Sparely distributed	
Leadwood	<i>(Combretum species)</i>	Dominant trees	
Baobab trees	<i>andasonia Digitata</i>	About 5 in the area	Protected
Jackal Berry	<i>Diospyros mespiliformis</i>	Sparely distributed	Protected
Makalani	<i>hypheane petersiana</i>	Short and sparsely	Protected
silver terminalia	<i>Terminalia sericea</i>	Sparely distributed	

There are certain indigenous plants which are valuable to the community. Plants such as Makalani, Baobab and Jackal Berry, provide some nutritional value, and are usually recognised through local use, knowledge and cultural value. These are therefore classified as protected species. Below are some images of the tree species that are found in the area.

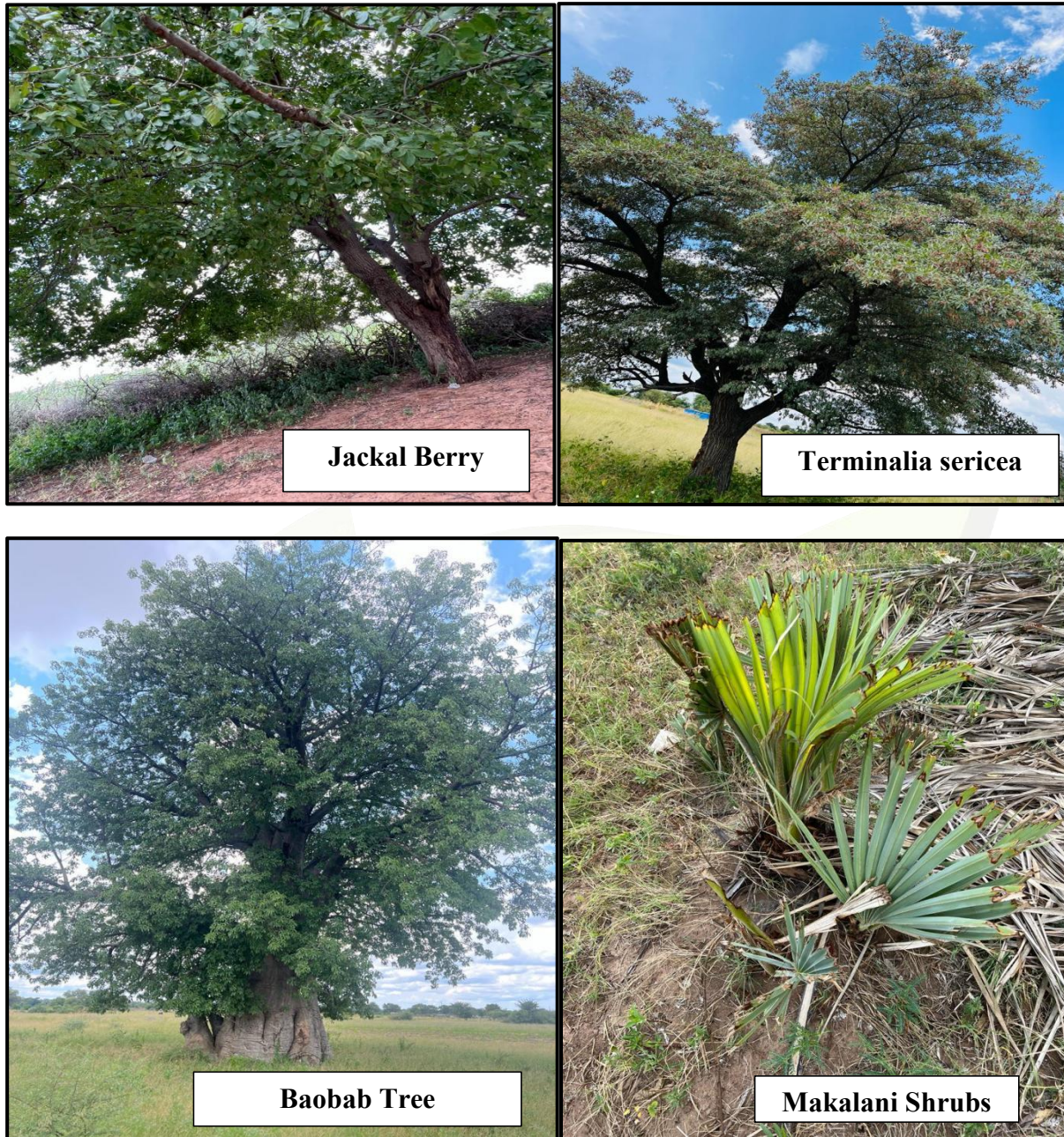


Figure 4: Trees and shrubs that occur and/or expected to occur within the proposed project vicinity.

The vegetation type varies from deciduous woodlands to shrubs. Together with other plant species they create a mixture of open woodland vegetation, thorn shrubs and other shrubs. The broadleaved woodlands are considered to be less sensitive and scarce (MET, 2013). Of the listed vegetation from the area, the Baobab trees, Jackal Berry trees and Makalani shrubs are considered protected. These plants bear fruits that are consumed by the local community for

subsistence. Although not found in large numbers, they need to be considered for conservation. Otherwise, the biodiversity of the vegetation in the area and associated fringe woodlands are considered to be moderately sensitive and scarce (MET, 2013).

The area being classified as a communal area, a portion of the land is demarcated as fields in low-lying drainage areas, used for rainfed crop cultivation for subsistence livelihood.

6.3.1.1 Grasses and Forbs

The grass *Imperata cylindrica* dominates the settlement while a variety of palatable species grow in the areas too, such as *Schmidtia pappophoroides*, *Brachiaria nigropedata*. These grass species provide some of the best grazing resources in the area. The settlement is largely covered by grass, and the grass cover can be described as diverse, comprising a different suite of grass composition with scattered shrubs and forbs. Even with the presence of vegetation, the area is vastly an open space dominated by grasses, shrubs and forbs.



Figure 5: The open grass dominated space in the settlement with some forbs and shorter shrubs.

However, in some cases, mostly tall, coarse, sour perennial grasses are present in the settlement area. The area is further fringed by forbs and shrubs, as well as tall woody plants which dominate along the settlement margins.

In summary, the vegetation composition of the area is highly diverse, with some plants considered as protected species, because of their scarcity and their use as natural resources. The area is largely an open space with selected vegetation scattered around the edges.

6.3.2 Fauna

6.3.2.1 Mammal Diversity

Wildlife density appears to be very low, no doubt affected by the disturbance caused by human activities and the large proportion of converted habitat in the area. With the single exception of some mole-rat diggings, no signs were seen of the presence of any wildlife and definitely not of herbivores. Grasslands is the most likely to support the presence of savanna wildlife. The project area is in proximity to the Bwabwata National Park, where large concentrations of elephant and buffalo occur. The main predators include lion, leopard, cheetah and hyena.

Livestock such as cattle and goats can be widely found in the area due to subsistence farming. These animals can be observed during the day grazing on the vast grassland that the area offers.

6.3.2.2 Reptile Diversity

Although it is not the most diverse part of Namibia for reptiles, the project area is still likely to support a relatively rich herpetofauna with about 63 species. Considering only species for which the habitats available on site are either highly or moderately suitable, this number drops to 53 species, which is still remarkably high for reptiles.

Because of the deep sandy substrate, the region supports a burrowing fauna belonging to four different families (*Typhlopidae*, *Leptotyphlopidae*, *Attractaspididae* and *Amphisbaenidae*), but the snakes, geckos and lizards overall are poorly represented and there are only two lacertids (sand lizards), a taxon in which Namibia overall is particularly diverse, while black mamba snakes are found in the area.

6.3.2.3 Avian Diversity

The region is exceptionally rich in bird life. 430 species of birds recorded, include breeding pairs of the rare Wattled Crane; Slaty Egret, Stanley's Bustard, Rosy-throated Longclaw, Dickinson's

Kestrel, Allen's Gallinule, Lesser Jacana, Black-winged and Red-winged Pratincoles, Long-toed, Lapwing, Luapula Cisticola, Coppery-tailed Coucal and Black Coucal.

6.4 Hydrogeology

According to the hydrogeological map of Namibia (Christelis and Struckmeier, 2011), the regional groundwater potential is moderate. Groundwater within the wider area of the Kavango Regions (Kavango East and West), is hosted in two distinct aquifer systems, Kalahari aquifers and fractured bedrock aquifers. These two aquifers are treated separately in this study as they have different characteristics. Kalahari aquifers hold water in intergranular pore spaces, whereas water in fractured aquifers is held in cracks and fractures in otherwise impermeable strata. Kalahari aquifers are common in the Kavango Regions (Christelis and Struckmeier, 2011).

The aquifers in the study area can be sub-divided into two main groups, namely the primary (porous) aquifers and secondary (fractured) aquifers. The primary aquifers consist mainly of argillaceous and arenitic unconsolidated to semi-consolidated sediments of the Kalahari Sequence, that occur throughout the two Kavango Regions. The secondary aquifers comprise fractured and weathered pre-Kalahari bedrock. The secondary aquifers are only important in areas where the Kalahari sediments are absent or thinly developed such as in the north-eastern and south-eastern parts of the Kavango Regions.

The Kalahari Sequence sediments constitute the most important aquifers in the region and the vast majority of boreholes drilled for rural and bulk water supply intersect the Kalahari aquifers. Boreholes drilled in close proximity to the Okavango River, intersecting paleo-channels, are often high yielding and most of the bulk water schemes are developed along the river.

Groundwater in the project site area is hosted in the porous Kalahari sediments (primary aquifers) with radial flow towards the north (to the Kavango River).

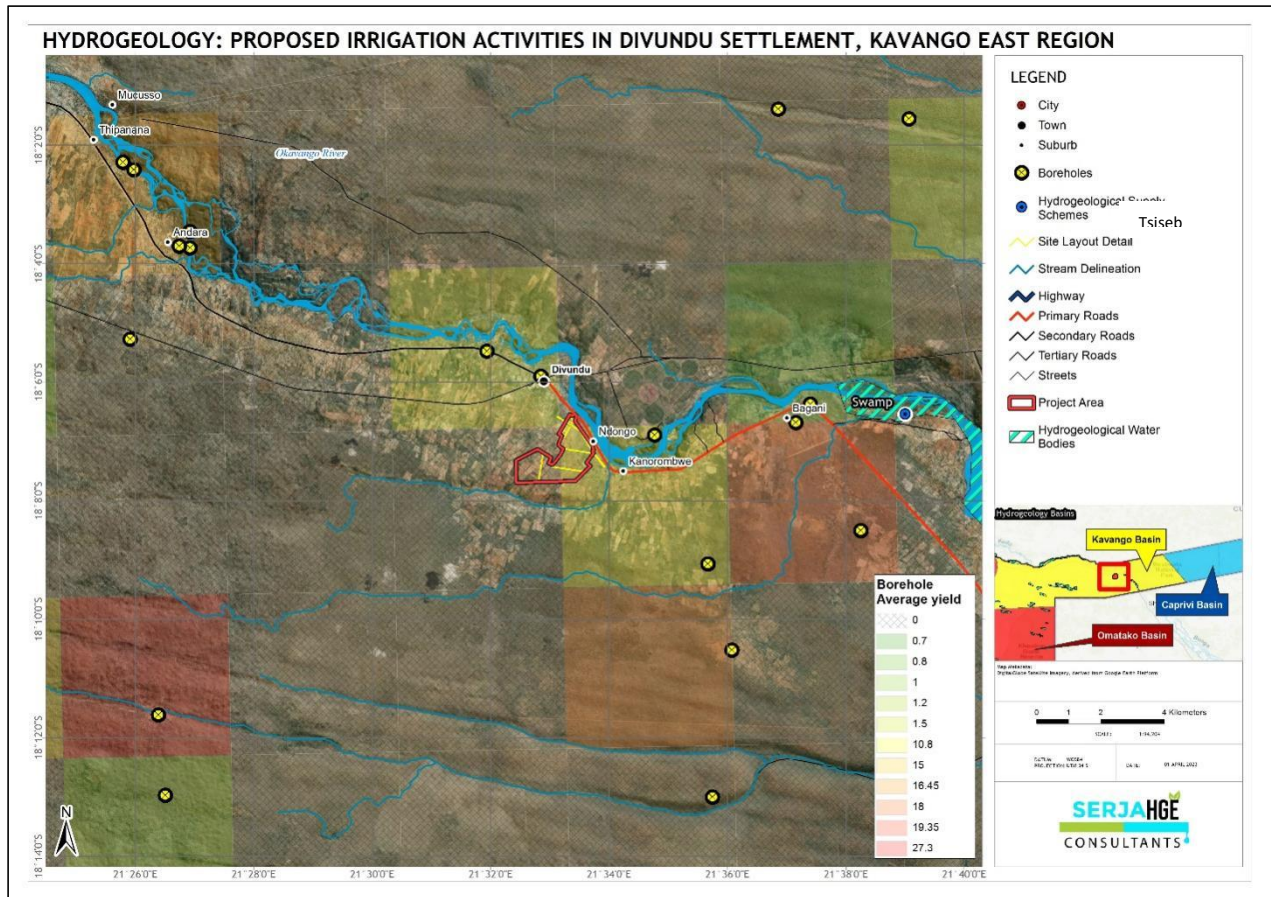


Figure 6: Hydrogeology map of the project site

6.4.1 Boreholes Yields

Borehole yields in the Regions range between less than 1 cubic meter per hour (m^3/h) and greater than $70m^3/h$ with the majority of boreholes yielding between $5m^3/h$ and $10m^3/h$, which is suitable to satisfy the general rural water supply demand. High yielding areas are along the Okavango River and within the shallow aquifer southwest of Rundu. Low yields between $1 m^3/h$ and $3m^3/h$ can be expected in areas with a deep-water table and where the Kalahari sediments comprise a higher clay content. The borehole yield depends generally on the drilling method and borehole design. The yield of recently drilled boreholes has improved compared to earlier drilling, due to the application of suitable drilling diameters, pre-manufactured screens and adequate gravel pack (Ministry of Agriculture, Water and Forestry, 1994).

According to the hydrogeological map above, the average yields of the boreholes range between 1.5 and $27m^3/h$, with the site boreholes ranging varying between 1.5 and $15m^3/h$.

6.4.2 Groundwater Recharge and Flow

Recharge to the Kalahari Group aquifers is indicated to be primarily by inflow from fractured basement rocks (marble, dolomite and quartzite) adjacent to the Kavango regions. The areas of basalt and Damara meta-sediment outcropping within the region are not considered to be recharge sources. Direct infiltration is considered to be minimal due to evapotranspiration and evaporation rates being high. These two processes can lead to near surface salinisation (salt concentration in sediments due to the unsaturated zone water flux) and any recharge waters could therefore show high levels of Total Dissolved Solids (TDS). Localised infiltration could occur in the interdunal zones and in the omirambas where they pond (Southern African Regional Environmental Programme (SAREP), 2011).

Water flow direction: The groundwater flow gradient suggests that the Okavango River is not a recharge source. However, in Botswana, where a similar groundwater gradient towards the Okavango River exists, recharge from the river is indicated within its floodplain. The recharge mechanisms of the Kavango region need to be verified by strategically placed monitoring boreholes (SAREP, 2011).

6.4.3 Vulnerability of Site Groundwater Resources to Pollution

It is important to note that groundwater vulnerability does not equate pollution, but a possibility of groundwater being exposed to something (pollution), its level and significance when and if it occurs.

In semi-arid rural areas, like in the Kavango Regions, where extensive agriculture is practiced and with little industrial development taking place, groundwater pollution is a minor threat. However, with the increasing number of economic developments along the Okavango River, the aspects of groundwater pollution and groundwater protection have increasingly become an issue.

The porous Kalahari aquifers (aeolian and alluvial sediments) in the area could provide a ready passage for the flow of pollutants from the ground surface to the water table (groundwater). Other areas of great concern are areas with a shallow water table (along the Okavango River), where fuel products can easily percolate into the aquifer.

According to the Groundwater Vulnerability Map of the Site area, the vulnerability of groundwater to pollution is moderate (the area enclosed by the red ellipse). The vulnerability of groundwater to pollution in the project area could be explained by the presence of

unconsolidated sediments and possibly fractures/faulted bedrocks. These types of formations could provide ready pathways for pollution transport (fast spreading of polluted water) if any pollution escape from the site surface and into the ground mainly the operational phase, if there is a mishandling and storage of fertilizers, fuels and wastewater.

6.5 Hydrology and Catchments

Divundu is bordered to its immediate north by a perennial river (Kavango River) as shown in the map (immediate north of the site). This river has a catchment area of 115,000km² and average water volume of 5,200 million m³ water per year (Mendelsohn et al., 2002).

6.5.1 Sub-Catchment Delineation

The project site was delineated by using ArcGIS. The digital elevation model (DEM) was used as an input to enable the delineation of a drainage system and then quantify the characteristics of that system. The tool in the extension allows the user to determine, for any location in a grid, the upslope area contributing to that point and the down slope path that would be followed by the water. This data is usually important during impact assessments.

According to Robins (2020), groundwater flows on a catchment scale from beneath the higher ground towards the lower ground to discharge as baseflow into the surface waters. The speed of the flow is a function of the hydraulic gradient, or the inclination of the water table, and the permeability or transmissive properties of the rocks. The volume of groundwater in the flow system depends on the effective rainfall, which is the actual rainfall minus evaporation, less any surface water runoff.

Subsequently, a sub-catchment delineation map was created for the project site area. The catchment map indicate that the project site falls under sub-catchment A (covering an area of 135.59km²) which also covers part of the Kavango River from which water for the project will be abstracted.

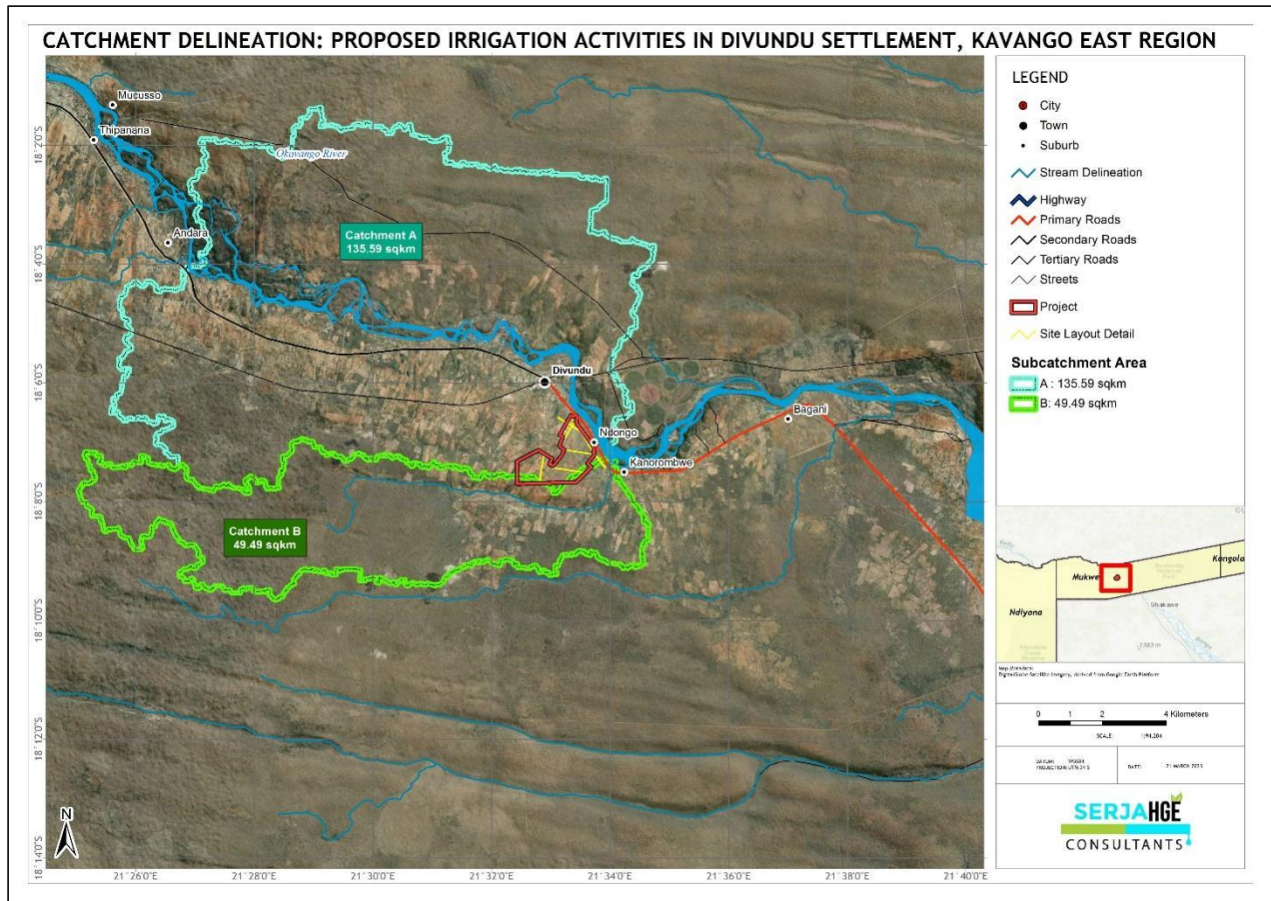


Figure 7: Hydrology Map (surface water) of the project site

6.5.2 Surface Water Vulnerability to Pollution

With regards to surface water, potential pollution is likely to occur in the operational phase, particularly during heavy rain seasons. i.e., between October and March, when there would be a high risk of surface water run-off carrying along fertilizers, herbicides, accidental spills of hydrocarbons (oils and or fuels) and effluent (wastewater) into the river. If irrigation is to be carried out dry season (dry months of the year), then the risk of surface water pollution owing to rainfall run-off will be low to none. This is because wet waste spills would be easy to control, clean up and manage compared to rainy season with high surface runoff during heavy rains.

Similarly, the risk of pollution to surface water systems during the operational phase would be high if any major spills or leaks of fuels and fertilizers, herbicides land on the ground surface during the rainy seasons compared to dry or months with little to no rainfall (May to September).

6.6 Heritage/Archaeology

No archaeological sites were noted within the perimeter of the site. However, should archaeological/heritage material be found during the construction phase, a “chance find procedure” should be followed as per the ESMP.

6.7 Dust and Noise

The only source of dust in the area is generated by the vehicles on the tracks connecting the homesteads to the C48 tarred road and the day-to-day community and agricultural activities.

Existing noise sources within and around the project site include:

- ◆ natural sounds from wind, animals and birds.
- ◆ vehicle movement on the public road network.
- ◆ noise arising from the day to day activities associated with the Ndongo Village.

Potential receptors of noise are the neighboring homesteads in Ndongo Village. The sensitivity of noise receptors usually increases at night when conditions are still, and ambient noise levels are at their lowest.

6.8 Visual and Sense of Place

The proposed project area is currently used predominantly for subsistence farming activities. The area is dominated by community activities and has no unique scenic features. The visual receptors would be the travelers and tourists on the C48 tarred road, however, due to presence of community activities, the landscape character of the area is therefore regarded as low to moderate and therefore does not present any significant visual impact.

6.9 Land-use

The land in Divundu is either under State or communal administration. The communities depend to a great extent on resources directly from the land. The land within the project boundary is largely cleared for homesteads, crop production fields and recreational activities such as informal soccer and netball fields. Most of the crop fields are used for subsistence farming of cereal which is made up of mahangu and sorghum, where each individual and family holds rights to land zoned for cultivation. Apart from crop production, a vast open grassland can also be found within the boundary of the site which is largely used for livestock grazing.

The rest of the communal land in the surrounding is made up of commercial uses such as tourist lodges. The state-controlled areas consist primarily of game reserves and national parks, and state forests.

6.10 Traffic

The traffic observed is the vehicles of the residents of Divundu and tourists traveling on the C48 tarred road to and from the nearby lodges.

6.11 Social and Economic Environment

6.11.1 National Overview

Namibia is a sparsely populated country with an average population density in 2001 of roughly 1,8 persons per square km. Although not regarded as a poor country by Africa standards, it displays a very high level of income disparity both geographically and culturally. Namibia's comprehensive, guiding strategy "Vision 2030" which was finalised in 2004 aims to achieve "a prosperous and industrialised Namibia" to be realised through economic transformation and industrialization.

It plans to achieve economic progression by developing value added industrialisation, substituting imports for locally produced goods, creating value-chains of production, and to accelerate Small and Medium Enterprise (SME) development.

In 2015, the third President of Namibia Hage Geingob spearheaded the Harambee Prosperity Plan [HPP] to complement Vision 2030. The HPP is a focused and targeted approach to achieve high economical and developmental impact in defined priority areas.

6.11.2 Regional Overview

Kavango East Region contains the western half of the Caprivi Strip. In the north, Kavango East borders the Cuando Cubango Province of Angola, and in the south and southeast the North-West District of Botswana. Domestically, it borders Zambezi, Otjozondjupa and Kavango West Regions.

Because of its rather high rainfall compared to most other parts of Namibia and its location on the Kavango River after which it was named, this region has agricultural potential for the cultivation of a variety of crops, as well as for organised forestry and agro-forestry, which stimulates furniture making and related industries. Kavango East and its sister region Kavango West are nevertheless the poorest regions in Namibia.

6.11.3 Local Overview

The socio-economic status in Divundu where the proposed project site is situated is characterized by Agro Marketing and Tourism industry. Large numbers of tourists are recorded to visit Divundu and its neighbouring tourist attraction areas. Attraction features like wildlife national parks, Popa Falls, and Okavango River which favour aquatic ecosystems contribute to the socio-economic status of Divundu. It is also a transport networking village town from Angola, Botswana, and Zambia and apart from that, it is also Kavango East regional second administrative village town. The village town is characterized by low-income earners, rapid population growth, development, and large vast tracts of land (RKPC, 2022).

6.11.4 An Economic Overview

Political stability, sound economic management, moderate economic growth, and a sustained fiscal commitment to social programmes have helped Namibia confront its developmental challenges since Independence. This has attracted foreign investors to develop sectors such as mining, agriculture and construction, while Government has focused its revenue to achieve sustained and inclusive economic growth, reduce unemployment, poverty and income inequality.

Until recently, the Namibian government has been able to generate high revenues and it has controlled expenditure to keep debt levels lower than in most developing countries. Government revenue and expenditure has increased from N\$1.6 and N\$2.2 billion respectively in 1990/91 to N\$56.7 and N\$65.0 billion respectively in 2018/19. Consumptive tax on goods and services (notably Value Added Tax and the fuel levy) has contributed on average 22% of the fiscal revenue share. Income tax on individuals contribute about 21% and Corporate Tax a further 13%.

In 2015, President Hage Geingob took over an economy with declining government revenue, a fiscal deficit at 6% and debt to GDP at around 24%. Government re-prioritised and contracted its expenditure. It heavily limited targeted infrastructure spending to prioritise roads and housing, causing a massive slump in the construction industry and throughout the tertiary sector. The economy contracted and entered an on-going recession with significant job losses and a further reduction in fiscal revenue. Public service ministries are barely able to function as operational expenditures have been severely cut, except for their wage bill. On average, the government spends 45% of its total expenditure on public servants per year.

The only way government could continue to function was to borrow and debt to GDP rose significantly, reaching 43% in 2018. Government debt is expected to reach N\$ 92 billion by the

end of 2019/20, comprised of 65 and 35% of domestic and foreign debt respectively. Foreign debt more than doubled between 2014 to 2015 rising from N\$ 12 billion to N\$ 27 billion. Consequently, the cost of servicing the public debt is rising, made worse by the Rand/N\$ currency depreciation with the USD. Debt servicing is expected to be N\$ 6.5 billion in 2018/19 equivalent to 11% of GDP.

First Capital Namibia believes that the government's fiscal policy is at a crossroad because of the following:

- ◆ "Total Government debts have reached critical levels at 43% of GDP.
- ◆ Inelastic, non-progressive and volatile government tax revenue and narrow tax base.
- ◆ Default risk is on the rise by local authorities, private sector, state owned enterprises (SOEs) and households and may need bailouts.
- ◆ The economy is fragile and weak while many people are calling for additional fiscal stimulus to grow the economy and alleviate poverty.
- ◆ National savings levels are very low to support government while chances of foreign borrowings are diminishing."
- ◆ In addition, farmers in most of the country say they are facing the worst drought for decades.

First Capital Namibia concludes its study by recommending that "rather than rising expenditure, efficiency should be increased on the current expenditure levels to increase the output with similar resource allocations".

The proposed blueberries project is likely to bring economic benefits to government in the form of direct and indirect taxes.

6.11.5 Demographics

According to the 2011 National census, the Mukwe Constituency had a population of 27 690 inhabitants of which there are slightly more female (14 326) residents in the area than male (13 364). The surrounding area of the proposed irrigation site is largely confined to scattered homesteads and lodges towards the banks of the Kavango River. The only large settlement near the proposed site is the Divundu urban center where basic services such as water, electricity, sewerage system, water reticulation for residential, police and business activities are available.

6.11.6 Education and Literacy

The literacy rate for population aged 15 years and above in Mukwe Constituency, stands at 74.7%, which ranks it the 4th highest out of 6 constituencies in Kavango East Region. There are 6027 literate females, compared to 5997 males, indicating that the literacy rate is higher among females in this constituency.

6.11.7 Health

Namibia is a signatory to the Sustainable Development Goals. Goal 3: “Ensure healthy lives and promote well-being for all at all ages”. One of the 13 sub-goals is “By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases.”

HIV remains a major public health problem in Namibia and the high prevalence rates imply that the number of HIV/AIDS cases will continue to increase in future years. There is a need to continue with forceful HIV and AIDS policies and programmes in the workplace and in the community. An effective HIV/AIDS workplace policy and programme should be implemented for the construction and operations phase. Other HIV prevention strategies, which employers are encouraged to promote, are information and educational efforts focusing on the interruption of partner concurrency, reducing risk taking associated with alcohol use, and treatment of sexually transmitted infections (STI).

6.11.8 Crime and Policing

The irrigation project could potentially lead to an increase in criminal activities such as theft, poaching, murder and rape in the immediate and broader area. In addition to high or electric fences, dogs and night patrols that could be recommended, the nearest police station is in Divundu for the reporting of any crime related activities.

6.11.9 The Economy of the wider project area

The project area falls within the Mukwe Constituency, which has one Proclaimed Settlement – Divundu, which is regarded as the business and administration centre of the constituency.

6.11.10 Agriculture

Agriculture is one of the most important employment sectors in the region followed by Tourism.

The project area is dominated by subsistence farming scattered over a vast area. However, regular the site is dominated by fertile soil for the production of mahangu and maize. Vast patches of grassland for livestock grazing are found within the site.

6.11.11 Tourism

As described in section 6.3 above, the socio-economic status in Divundu where the proposed project site is situated is characterized by Agro Marketing and Tourism industry. Large numbers of tourists are recorded to visit Divundu and its neighbouring tourist attraction areas. Attraction features like wildlife national parks, Popa Falls, and Okavango River which favour aquatic ecosystems contribute to the socio-economic status of Divundu. There are various lodges, game farms, guesthouses and camp sites in the area surrounding the proposed irrigation site.



7 IDENTIFICATION OF ENVIRONMENTAL ASPECTS AND POTENTIAL IMPACTS

The consultation process with key stakeholders that included government authorities and I&APs allowed the opportunity to raise the issues associated with the project development. It was identified that; the following aspects will need to be further assessed:

- ◆ Biodiversity Impacts.
- ◆ Groundwater and Surface Water Contamination.
- ◆ Socio-Economic Impacts.
- ◆ Health and Safety (Pesticides and Fertilizers)

The relevance of the potential impacts (“screening”) are also presented in the tables below to determine aspects to be assessed in further detail (Section 8 of this report).

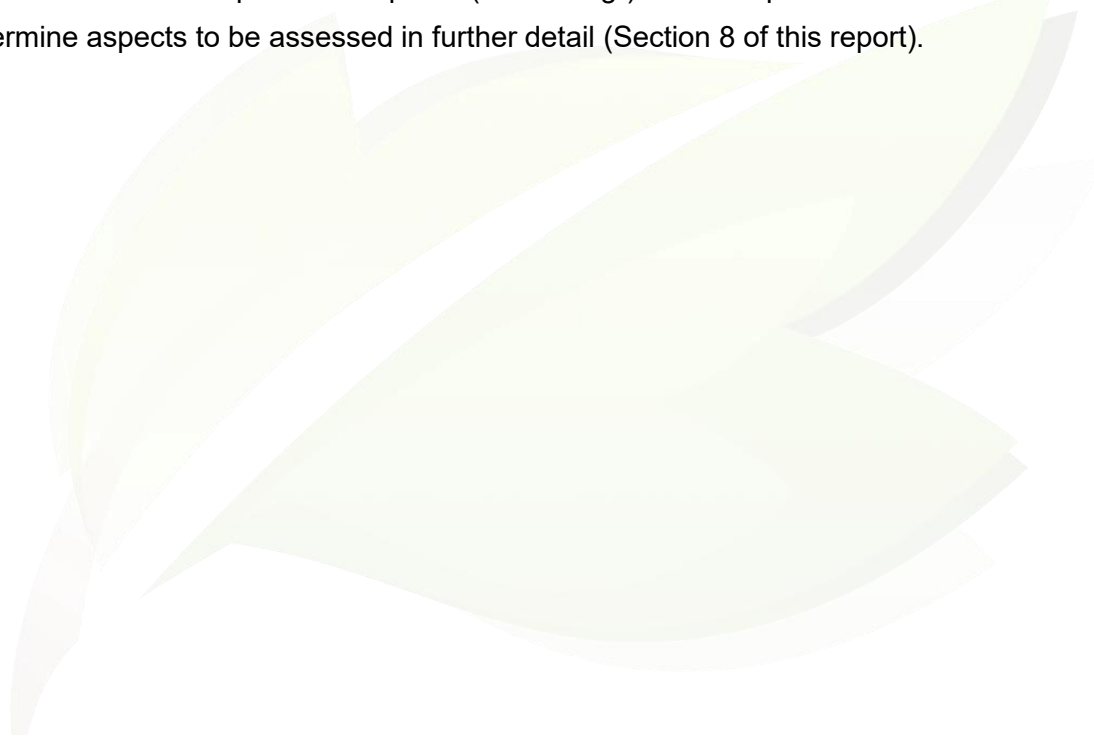


Table 10: Environmental Aspects and Potential Impacts

ACTIVITY / FACILITY	ASPECT	POTENTIAL ENVIRONMENTAL IMPACT	RELEVANCE (SCREENING) OF POTENTIAL IMPACT
Construction Phase	Soil stripping (earthmoving equipment)	Potential impact on biodiversity (physical impacts and general disturbance) <ul style="list-style-type: none"> ◆ Loss of habitat ◆ Loss of biodiversity 	With reference to section 6.3.1, the area is very much an open grassland, with scattered shrub and thorn bushes. There are a number of fruit bearing trees, such as Jackals Berry, Monkey Orange, Baobab and Xemina Africana. Due to the sensitivities of above-mentioned species, biodiversity has been assessed further in section 8.
		<ul style="list-style-type: none"> ◆ Potential impact on heritage sites ◆ Destruction and loss of heritage sites 	With reference to section 6.6, no archaeological sites were noted within the perimeter of the site. The related management and mitigation measures are stipulated in the ESMP, and no further assessment is required.
	Oil and diesel spillages from vehicles and other equipment	Impact on groundwater water quality.	With reference to section 6.4.2, it is important to note that groundwater vulnerability does not equate pollution, but a possibility of groundwater being exposed to something (pollution), its level and significance when and if it occurs. In semi-arid rural areas, like in the Kavango Regions, where extensive agriculture is practised and with little industrial development taking place, groundwater pollution is a minor threat. However, with the increasing number of economic developments along the Okavango River, the aspects of groundwater pollution and groundwater protection have increasingly become an issue. Due to the potential pollution impact, groundwater pollution has been assessed further in section 8.
	Dust and Noise	Impact on health and safety	With reference to section 6.8, The only source of dust in the area is generated by the vehicles on the tracks connecting the homesteads to the C48 tarred road and the day-to-day community and agricultural activities. Existing noise sources within and around the project site include natural sounds from wind, animals and birds, vehicle movement on the public road network and noise arising from the day-to-day activities associated with the community members of Ndongo Village. Therefore, the potential dust and noise levels are not expected to increase significantly. The related management and mitigation measures are stipulated in the ESMP, and no further assessment is required.
	Economic impacts	Impacts on local economy <ul style="list-style-type: none"> ◆ Increased Employment opportunities. 	With reference to section 4.7, an approximate 100 workers will be permanently employed over the 4 phases of the project. Due to the potential socio-economic impacts, traffic has been assessed further in section 8.

		◆ Transfer of skills	
	Vehicle and truck movement	Injury to people and animals and health and safety impacts	<p>With reference to section 6.10, The traffic observed is the vehicles of the residents of Divundu and tourist traveling on the C48 tarred road to and from the nearby lodges.</p> <p>The intersection to the access roads can cause accidents that may lead to death and/or injury to people and animals. The flow of traffic on the road is expected to be disrupted during the construction activities, such as during pipeline installation from the river to the site which will intersect the C48 tarred road.</p> <p>Due to the potential traffic impacts, health and safety has been assessed further in section 8.</p>
	Waste disposal Sewerage management	Health and Safety impacts on people.	<p>With reference to section 4.6, Domestic waste will be generated on site during construction and operations. The exact quantities cannot be determined at this stage and will vary according to season. Waste will be transported off site and disposed of at the nearest landfill site. No waste will be disposed of or burnt on site.</p> <p>All hazardous waste, i.e., pesticide containers, chemical containers, hydrocarbon contaminated materials, used hydrocarbons etc., will be removed from site and disposed of at a licensed hazardous waste disposal site (Kupferberg).</p> <p>Due to the significance of the potential impact as a result of hydrocarbons, pollution has been assessed further in section 8.</p>
General Operations	Vehicle and truck movement	Injury to people and animals and health and safety impacts	<p>With reference to section 6.11, The traffic observed is the vehicles of the residents of Divundu and tourists traveling on the C48 tarred road to and from the nearby lodges.</p> <p>However, there is no significant increase in traffic anticipated during the operational phase.</p> <p>The related management and mitigation measures are stipulated in the ESMP, and no further assessment is required.</p>
	Dust and Noise generated	Increase in disturbing noise and dust levels (nuisance impact to third parties)	<p>With reference to section 6.8, The only source of dust in the area is generated by the vehicles on the tracks connecting the homesteads to the C48 tarred road and the day-to-day community and agricultural activities.</p> <p>Therefore, the dust and noise levels are not expected to increase during the operational phase.</p> <p>The related management and mitigation measures are stipulated in the ESMP, and no further assessment is required.</p>
	Waste disposal Sewerage management	Emissions to land, impact on biodiversity, environmental degradation and nuisance impacts and contamination of surface water and groundwater	<p>With reference to section 4.6, Domestic waste will be generated on site during construction and operations. The exact quantities cannot be determined at this stage and will vary according to season. Waste will be transported off site and disposed of at the nearest landfill site. No waste will be disposed of or burnt on site.</p> <p>All hazardous waste, i.e., pesticide containers, chemical containers, hydrocarbon contaminated materials, used hydrocarbons etc., will be</p>

			<p>removed from site and disposed of at a licensed hazardous waste disposal site (there is currently only two hazardous waste facilities in Namibia), either at the Kupferberg Landfill Site in Windhoek or the Hazardous Waste Site in Walvis Bay.</p> <p>Due to the significance of the potential impact as a result of the pesticides, pollution impacts have been assessed further in section 8.</p>
Visual Impacts and sense of place	Changes in visual conditions		<p>The solar pv plant, agricultural area and industrial facility could alter the view and the sense of place for travelers on the D 2303 gravel road.</p> <p>Refer to Section 8 for the assessment of the potential impacts on Visual. Related management and mitigation measures are however stipulated in the ESMP (refer to Appendix F).</p>
Economic impacts	Impacts on local economy ◆ Increased Employment opportunities		<p>With reference to section 4.7, an approximate 100 workers will be permanently employed over the 4 phases of the project.</p> <p>Due to the potential socio-economic impacts, socio-economic has been assessed further in section 8.</p>
Ground Water Contamination	Impact on groundwater quality		<p>With reference to section 6.4.2, it is important to note that groundwater vulnerability does not equate pollution, but a possibility of groundwater being exposed to something (pollution), its level and significance when and if it occurs.</p> <p>In semi-arid rural areas, like in the Kavango Regions, where extensive agriculture is practised and with little industrial development taking place, groundwater pollution is a minor threat. However, with the increasing number of economic developments along the Okavango River, the aspects of groundwater pollution and groundwater protection have increasingly become an issue.</p> <p>Due to the potential pollution impact, groundwater pollution has been assessed further in section 8.</p>
Surface Water Contamination			<p>With reference to section 6.5.2, surface water potential pollution is likely to occur in the operational phase, particularly during heavy rain seasons. i.e., between October and March, when there would be a high risk of surface water run-off carrying along fertilizers, herbicides, accidental spills of hydrocarbons (oils and or fuels) and effluent (wastewater) into the river. If irrigation is to be carried out dry season (dry months of the year), then the risk of surface water pollution owing to rainfall run-off will be low to none. This is because wet waste spills would be easy to control, clean up and manage compared to rainy season with high surface runoff during heavy rains.</p> <p>Similarly, the risk of pollution to surface water systems during the operational phase would be high if any major spills or leaks of fuels and fertilizers, herbicides land on the ground surface during the rainy seasons compared to dry or months with little to no rainfall (May to September).</p> <p>Due to the potential pollution impact, surface water pollution has been assessed further in section 8.</p>

8 ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

8.1 Assessment Approach and Methodology

An assessment of the potential positive and negative impacts associated with the construction and operations phase of the proposed irrigation project is provided below. As an outcome of the Scoping Phase, specialist input was requested for some of the environmental issues and has been included in this assessment.

Other potential environmental impacts resulting from the proposed project activities and facilities (also identified during the Scoping Phase of the EIA) were assessed by I.N.K and are also presented below.

Impacts are considered in a cumulative manner where possible such that the impacts of the proposed Project are seen in the context of the baseline conditions described in Section 6. Information that has been included in Section 6 will not be repeated in this Section.

- ◆ Both the criteria used to assess the impacts and the Method of determining the frequency/severity of the impacts is outlined in Biodiversity Impacts.
- ◆ Groundwater and Surface Water Contamination.
- ◆ Socio-Economic Impacts.
- ◆ Health and Safety (Pesticides and Fertilizers).

Table 12. This Method complies with the EIA Regulations: EMA, 2007 (Government Gazette No. 4878) EIA regulations.

Both mitigated and unmitigated scenarios are considered for each impact in the ESIA results.

The potential impacts that require further assessment includes the following:

- ◆ Biodiversity Impacts.
- ◆ Groundwater and Surface Water Contamination.
- ◆ Socio-Economic Impacts.
- ◆ Health and Safety (Pesticides and Fertilizers).

Table 11: Frequency/Severity Rating

Likelihood/ Frequency	Definition	Probability	Rating	Consequence/ Severity				
				Insignificant	Minor	Moderate	Major	Critical
				Very minor or no impact.	Minor impact that can be contained	Impact may have moderate effects	Serious impact/effect	Permanent Impact/effect
				1	2	3	4	5
Very high	Almost certain Extremely likely	>90%	5	Low	Medium	High	Extreme	Extreme
				5	10	15	20	25
High	Very likely Will probably occur	60-90%	4	Low	Medium	Medium	High	Extreme
				4	8	12	16	20
Medium	Likely to happen	40-59%	3	Low	Low	Medium	Medium	High
				3	6	9	12	15
Low	Possible but unlikely	10-39%	2	Low	Low	Low	Medium	Medium
				2	4	6	8	10
Very low	Conceivable but extremely unlikely	<10%	1	Low	Low	Low	Low	Low
				1	2	3	2	2

8.2 Socio-economic environment

8.2.1 Issue: Socio-Economic Benefits

This project has the potential to create significant socio-economic benefits through employment creation, economic contributions and food security. Namibia’s “Green Scheme Policy” (MAWF, 2008) states “[t]he mandate of the Ministry of Agriculture, Water and Forestry is the promotion, development, management and utilisation of agricultural, water and forestry resources. It is, therefore, the objective of the Government to ensure agriculture productivity and food security in line with Vision 2030 strategy.” The proposed Namibia berries project falls under the ambit of Namibia’s “Green Scheme”. The benefits include employment opportunities, skills and development training and capital injection into businesses within Okavango East.

Additionally, project offers the region an opportunity to develop sustainably through its collaborative links with the local authorities, in fast tracing development in the region, in order to enhance improved public service delivery and social welfare in the region.

Approximately 300 permanent jobs and more than 4000 part-time jobs would be created over the project development.

Given the above, the cumulative unmitigated severity is **high**, but may be reduced to **extreme** with the successful implementation of the mitigation measures outlined in the ESMP.

Table 12: Assessment - Socio-Economic Benefits

Likelihood	Definition	Probability	Rating	Severity	
				Unmitigated	Mitigated
Very High	Almost certain Extremely likely	>90%	5	High (15)	Extreme (25)

8.3 Issue: Negative Impacts on the Socio-economic Environment

Although the project may benefit the socio-economic environment, the project may also draw people to the town (in-migration), which may place pressure on existing services and opportunities and may create health and safety issues, such as housing, health, sanitation and educational facilities. The influx of people may also result in an increase in negative social

behaviours including an increase in the crime rate. It may also lead to increase in the spread of diseases.

Given the above, the cumulative unmitigated severity is **high**, but may be reduced to **low** with the successful implementation of the mitigation measures outlined in the ESMP.

Table 13: Assessment - Negative Impacts on the Socio-Economic Environment

Likelihood	Definition	Probability	Rating	Severity	
				Unmitigated	Mitigated
Very High	Almost certain Extremely likely	>90%	5	High (15)	Low (5)

8.4 Issue: Involuntary Resettlement

The land in Divundu is either under State or communal administration. The communities depend to a great extent on resources directly from the land. The land within the project boundary is largely cleared for homesteads, crop production fields and recreational activities such as informal soccer and netball fields. Most of the crop fields are used for subsistence farming of cereal which is made up of mahangu and sorghum, where each individual and family holds rights to land zoned for cultivation. Apart from crop production, a vast open grassland can also be found within the boundary of the site which is largely used for livestock grazing. 25 homesteads with Predominantly traditional huts and some conventional structures are proposed to be resettled.

Given the above, the cumulative unmitigated severity is **extreme**, but may be reduced to **medium** with the successful implementation of the mitigation measures outlined in the ESMP.

Table 14: Assessment - Involuntary Resettlement

Likelihood	Definition	Probability	Rating	Severity	
				Unmitigated	Mitigated
Very High	Almost certain Extremely likely	>90%	5	Extreme (25)	Medium (10)

8.5 Biodiversity

The following are sources of risk to biodiversity as a result of the project:

- ◆ Clearing of land and handling and deposition of material cleared from the site.
- ◆ Use of roads by vehicles.
- ◆ Introduction of large amounts of pesticides and herbicides into a novel environment.
- ◆ Introduction of large amounts of nitrogen-based chemicals into the environment.
- ◆ Human behaviour:
 - Collection of firewood,
 - Sanitation practices,
 - Illegal collection of plants and animals.

Overall, impacts may increase or decrease the risk of species persistence through indirect or direct effects on population processes, chiefly as a result of alteration of habitat size, quality and cohesiveness, as well as alteration of key ecological processes.

8.5.1 Issue: Direct destruction of organisms and their habitats

The death of plants and slow-moving animals, as well as dormant invertebrates, could be caused by the removal or destruction of individual organisms during construction activities or by being struck by vehicles and machinery.

Since there is few threatened fauna species that could be affected, the expected increase in risk to species survival is low. However, at a habitat level, the loss of important fruit bearing trees, such as Jackals Berry, Monkey Orange, Baobab and Xemina Africana

For woodlands, animals that are likely to be affected include tortoises (especially Speke's Hinged Tortoise), small mammals and lizards, skinks and geckos and a number of woodland bird species.

For Grasslands and Pans, all the species that require ephemeral wetlands for breeding or shelter, as well as species that depend on open grazing, will be affected.

Direct impacts to birds would include removal of nest sites in trees and on the ground.

The death of plants and slow-moving animals, as well as dormant invertebrates, could be caused by the removal or destruction of individual organisms during construction activities or by being struck by vehicles and machinery.

Given the above, the cumulative unmitigated severity is **extreme**, but may be reduced to **medium** with the successful implementation of the mitigation measures outlined in the ESMP.

Table 15: Assessment - Direct destruction of organisms and their habitats

Likelihood	Definition	Probability	Rating	Severity	
				Unmitigated	Mitigated
Very High	Almost certain Extremely likely	>90%	5	Extreme (20)	Medium (10)

8.5.2 Issue: Pollution of environment with pesticides

This impact could result from the application of pesticides as a routine measure to decrease herbivory, seed predation and interspecific competition. The runoff of all chemicals into permanent water bodies and leaching into groundwater would have further impacts on the regional biodiversity.

Pesticides form one of the three pillars of the so-called 'green revolution'; the other two being new and rapidly replaced seed varieties, and high fertilizer inputs. Because invertebrate organisms are a food source for a large number of vertebrates, pesticides, even the ones that are designed to affect only one or two target groups, have spillover effects on the ecosystem and may cause morbidity and mortality in secondary consumers of all kinds.

All hazardous waste, i.e., pesticide containers, chemical containers, hydrocarbon contaminated materials, used hydrocarbons etc., will be removed from site and disposed of at a licensed hazardous waste disposal site (Kupferberg).

Effects of compounds that are not completely biodegradable are cumulative, building up in groundwater and open water bodies over time and could have significant impacts on the regional ecosystem.

Although direct contact may cause death of organisms, the most critical aspect is perhaps the potential for chemicals to:

- Spread beyond the site boundaries
- Leach into groundwater
- Migrate to open water

- Build up in the environment over time

Given the above, the cumulative unmitigated severity is **extreme**, but may be reduced to **medium** with the successful implementation of the mitigation measures outlined in the ESMP.

Table 16: Assessment - Pollution of environment with pesticides

Likelihood	Definition	Probability	Rating	Severity	
				Unmitigated	Mitigated
Very High	Almost certain Extremely likely	>90%	5	Extreme (20)	Medium (10)

8.5.3 Issue: Soil and water pollution by application of fertiliser

The primary source of risk in this regard relates to the application of nitrogen- and phosphorous-based fertilisers to improve growth and overall yield of most crops.

The main problem with the use of fertilisers in an agricultural project in this particular site is related to the focal increase of nitrogen in an essentially dystrophic environment (acidic water that is low in oxygen and supports little life). Excessive nitrogen, particularly if applied over extended periods, will cause eutrophication resulting in overgrowth of nitrogen-fixing weeds on land and algae in water.

Fertiliser impacts on biodiversity will most likely only occur when application levels exceed levels that the crop plants can use.

Given the above, the cumulative unmitigated severity is **extreme**, but may be reduced to **medium** with the successful implementation of the mitigation measures outlined in the ESMP.

Table 17: Assessment - Soil and water pollution by application of fertiliser

Likelihood	Definition	Probability	Rating	Severity	
				Unmitigated	Mitigated
Very High	Almost certain Extremely likely	>90%	5	Extreme (20)	Medium (10)

8.5.4 Issue: Interference with movement of animals to and from patches of habitat in the irrigation area

Unfettered movement by all vertebrates is key to the functioning of the Kalahari woodland. Barring the removal or fenestration of the fences, there is nothing much that can be done to mitigate this. However, the severity of this impact is somewhat lessened by the fact that the human-caused disturbance along the length of the Okavango River is probably already preventing access to the river from the hinterland; the current project is therefore likely to contribute minimally to the overall interference of movement.

Whether natural patches are left amongst the irrigation circles will also influence the impact of the fences: many species won't be attracted to cultivated areas anyway, so the effect of loss of habitat becomes a more important impact.

Given the above, the cumulative unmitigated severity is **medium**, but may be reduced to **low** with the successful implementation of the mitigation measures outlined in the ESMP.

Table 18: Assessment - Interference with animals moving to and from patches of habitat in the irrigation area.

Likelihood	Definition	Probability	Rating	Severity	
				Unmitigated	Mitigated
Medium	Likely to happen	40-59%	3	Medium (9)	Low (4)

8.6 Groundwater and Surface Water

The risk assessment for the two issues (over-abstraction and pollution) that may impact the water resources during the duration of the irrigation activities on site is presented below.

8.6.1 Issue: Over-abstraction from the Okavango River

Excessive abstraction or damming of rivers affects the flow, which in turn affects water chemistry, sediment transport and average temperatures. This has an impact on aquatic biota and the human beings that rely on the water and biota for their livelihoods and well-being. The sources in this aspect will be the over-pumping of water for irrigation, which will affect people relying on the river water and the river environment.

Although it is confirmed that the water for Blue Berries Namibia’s proposed irrigation activities will be supplied from the Kavango River, the actual volumes of water required is not yet known. Regardless, once determined, the volumes will need to be regulated to minimise the impact on the resource.

The pathway of this impact is determined by the amount of water abstracted and water flow direction. The nature and extent of activities that require water along the Kavango River would cause rapid decrease in river levels through excessive and long-term unmanaged over-abstraction. It is difficult to assess the impact of the proposed irrigation activities, given the fact that there are already existing similar projects and other activities along the river, not only on the Namibian side, but Angola and Botswana which abstract from the river. With that said, the impact of the project on the water resources (quantity) will be cumulative.

The water users downstream of the project site (particularly towards the Botswana side) and surrounding environmental components like vegetation can be considered potential receptors. Excessive abstraction of water at the project site may lead to the decrease in river water levels downstream.

Given the above, the cumulative unmitigated severity is **high**, but may be reduced to **low** with the successful implementation of the mitigation measures outlined in the ESMP.

Table 19: Assessment - Over-abstraction from the Okavango River

Likelihood	Definition	Probability	Rating	Severity	
				Unmitigated	Mitigated
High	Very likely Will probably occur	60-90%	4	High (16)	Low (4)

8.6.2 Issue: Pollution of water resources (groundwater and surface water)

The anticipated key potential source of pollution to water resources from the project activities would be agricultural run-offs (from on-site fertilizers, pesticides and herbicides) used to enhance crop growth on the irrigated fields. Further sources will include wastewater generated on site, septic and fuel tanks and other pollution sources related to irrigation activities. The pollution would potentially impact downstream water users that rely on the river for water supply or further infiltrate into the ground and pollute aquifers. However, the pollution significance

would also depend on the volumes of spilled or leaked pollutant (major spills and leaks would mean significant pollution).

Polluted water would travel from the potential sources to downstream water users (receptors). Pollution can be transported to nearby receptors via the unconsolidated alluvium in overlaying the project area via intense surface run-offs and unconsolidated sediments (sands) or fractures/faulted aquifer rock units. The unconsolidated sediments and fractured/faulted bedrocks would act as ready pathways for polluted water (pollution) to spread fast and to a large area. The extent of the pollution will however depend on the amount of pollutant amount or spills washed into in the river or infiltrating aquifers from the ground surface. Therefore, without proper planning on the handling and management of hazardous substances and wastewater on the ground (site/land surfaces), pollution of groundwater would be moderate.

The downstream water users (people and animals) of the Kavango River from the project site, low-lying areas and surrounding environmental components like vegetation can be considered potential receptors to this impact. A sudden decrease in water quality during the irrigation project especially downstream would be linked to the irrigation activities. However, a thorough study would need to be undertaken to ascertain the linkage of the experienced water quality issue to the irrigation activities or with other irrigation activities carried out on the Angola side of the Kavango River, if any.

The implementation of water monitoring plan and adherence to the water permitting conditions and legislations are essential for the prevention and management of water pollution.

Given the above, the cumulative unmitigated severity is **high**, but may be reduced to **low** with the successful implementation of the mitigation measures outlined in the ESMP.

Table 20: Assessment - Pollution of water resources (groundwater and surface water)

Likelihood	Definition	Probability	Rating	Severity	
				Unmitigated	Mitigated
High	Very likely Will probably occur	60-90%	4	High (16)	Low (4)

8.7 Health and Safety

8.7.1 Issue: Potential Health and Safety Impacts

Namibia Berries will ensure that safety standards are applied at all times during the construction and operation as required by the Labour Act of Namibia. The safety, security and health of the labour force, employees and general public are of great importance. The company will develop and implement a robust ESMP to mitigate all safety and security risks associated to its activities. Workers should be orientated with the maintenance of safety and health procedures, and they should be provided with PPE (Personal Protective Equipment). Health and safety representatives should be employed to coordinate and monitor risks and its associated hazards and report all health and safety related issues in the workplace.

The promotion and maintenance of the physical and mental well-being of its workforce is paramount. In this regard Health and Safety Policies will be developed to ensure full compliance with the various legislative requirements.

In view of the diverse composition of its workforce, Namibia Berries will arrange for the pre-employment medical check-ups, the purpose of which to identify persons with disease carrying illnesses such as Covid-19, HIV/Aids, diabetes, high blood pressure, colour blindness, or any physical factor which, if not identified in time, may result in any form of loss and/or claims to the proponent as the employer.

A health risk assessment will be conducted in order identify hazards as referred to above. The outcome of such assessment will enable it to make appropriate provision for the development of policies and procedures relevant to the site.

Given the above, the cumulative unmitigated severity is **high**, but may be reduced to **low** with the successful implementation of the mitigation measures outlined in the ESMP.

Table 21: Assessment - Potential Health and Safety Impacts

Likelihood	Definition	Probability	Rating	Severity	
				Unmitigated	Mitigated
High	Very likely Will probably occur	60-90%	4	High (16)	Low (4)

9 CONCLUSIONS AND RECOMMENDATIONS

Overall, the development of the Namibia Berries Irrigation Project would have a positive impact on the local community and economy as well as on the Namibian economy as a whole. In addition, the project would provide an invaluable contribution to job creation, fiscal revenues and food security in Namibia as a whole.

The need for various specialist assessments, including groundwater, surface water, social and economic was identified during the scoping and EIA process. It was concluded from the specialist assessments and qualitatively by I.N.K that the development of the project would potentially have significant impacts on the biodiversity, groundwater quality, surface water quantity, health and safety, and social and economic. Construction and operational impacts would have minimal impact on heritage/archaeology, air quality, noise levels, and visual characteristics. Socio-economics were deemed to be positively impacted both directly and indirectly from both construction and operations at the site but some negative impacts were identified, such as the relocation and in-migration of people into the town. The employment and skills development of local people is included in the project plan.

Mitigation measures have been identified and recommended both by the specialist assessments and by I.N.K to promote the positive impacts of the project, as well as to reduce the negative impacts to acceptable levels. An ESMP was further developed which identifies potential impacts of the project during the construction and operation phases. The ESMP is a legally binding document to which Namibia Berries and contractors onsite must adhere.

I.N.K concludes that should Namibia Berries follow the actions (i.e. management and mitigation measures) provided in the ESMP report, the project would result in optimized value creation locally as well as globally in relation to the ecological, social and economic aspects.

References

- Bittner, A. (2002). The Environmental Profile of the Kavango Region: Hydrogeology of the Kavango Region. Windhoek: BIWAC.
- Christelis, G. and Struckmeier, F. (editors). (2011). Groundwater in Namibia: An Explanation to the Hydrogeological Map. Windhoek: Ministry of Agriculture, Water and Land Reform.
- First Capital Namibia. (2019). Namibia Fiscal Policy Analysis First Capital Treasury Solutions (Pty) Ltd
- HTSPE Limited. (2013). Water Management and Irrigation Assessment and Development. Hertfordshire: European Commission.
- Mendelsohn, J., Jarvis, A., Roberts, C., Robertson, A., (2002). Atlas of Namibia: A portrait of the land and its people. Windhoek: Ministry of Environment and Tourism.
- Ministry of Environment and Tourism [MET]. 2013. Management Plan for Bwabwata National Park 2013/2014 to 2017/2018. Government of the Republic of Namibia. Windhoek.
- Ministry of Agriculture, Water and Forestry (now Ministry of Agriculture, Water and Land Reform). (1994). Investigation into the Surface Water Resources of the Okavango Region with Special Reference to the Okavango River. Windhoek: Ministry of Agriculture, Water and Forestry.
- NSA. (2013). Namibia 2011 Population and Housing Census Main Report. Namibia Statistics Agency
- NSA. (2014). 2011 Population and Housing Census: Kavango East Regional Tables based on 4th delimitation. Namibia Statistics Agency.
- OKACOM. (2023). Thematic Area 2: Water Resources Management. <https://www.okacom.org/thematic-area-2-water-resources-management>. OKACOM.
- RKPC. (2022). Environmental Assessment (EA) Scoping report and Impact Management Plan (IMP) for the proposed redevelopment of ERF 492 Divundu Extension 1 (from public open space to various business land uses) for the Divundu Village Council in Namibia - August 2022.
- RoN. (2016). Harambee Prosperity Plan. Republic of Namibia.
- Robins, N. (2020). Introducing Hydrogeology. Edinburgh: Dunedin Academic Press Ltd.
- Southern African Regional Environmental Programme (SAREP). (2011). Kavango Region Namibia: Regional Monitoring Network Study. Gaborone: Water Surveys (Botswana) (Pty.) Ltd.
- SRK. (2006). Preliminary Surface and Ground Water Impact Assessment for the Scoping Supplement: Assessment for the Proposed New Filling Station in Paul Kruger Street, Secunda. Northlands: SRK.

Stubenrauch Planning Consultants, Geocarta Namibia, SAIEA and AHT Group AG. (2015).
Integrated Regional Land Use Plan for the Kavango East Region, Namibia: Baseline Report Vol.
1. Windhoek: Ministry of Lands and Resettlements.

