

TABLE OF CONTENTS

1.	INTRODUCTION	1
1.1	Background	4
1.2	Activities Applied for in Terms of NEMA	28
1.3	Listed Activities in Terms of NEMWA	38
1.4	The Town Planning Process	41
1.5	Environmental Assessment Practitioner (EAP)	42
1.6	Scope of Work and Approach to the Study	43
2.	LOCALITY	45
3.	REGISTERED OWNERS AND TITLE DEEDS	45
4.	EXISTING ZONING AND LAND USE AND PROPOSED ZONING AND LAND USE	46
4.1	Existing Zoning and Land Use	46
4.2	Proposed Zoning and Land Use	50
4.2.1	Proposed Zoning	52
4.2.2	Proposed Land Use	54
5.	ALTERNATIVES IDENTIFIED	66
5.1	Locality alternatives	66
5.2	Land use alternatives	66
5.3	Layout use alternatives	67
5.4	No-Go alternative	69
5.5	Planning Approach	73
6.	DESCRIPTION OF THE BIOPHYSICAL AND SOCIO-ECONOMICAL ENVIRONMENT	74
6.1	THE BIOPHYSICAL ENVIRONMENT	74
6.1.1	PHYSICAL	74
6.1.1.1	Geology and Soils	74
6.1.1.2	Regional Geology and Soils	75
6.1.2	Hydrology	83
6.1.2.1	Surface Hydrology	83
6.1.2.2	Subsurface Hydrology	85
6.1.2.3	Wetlands	96

6.1.3	Topography	107
6.1.4	Climate	113
6.2	THE BIOLOGICAL ENVIRONMENT	116
6.2.1	Vegetation	117
6.2.2	Fauna	122
6.2.3	Aquatic and Wetland Ecological Assessment	127
6.3	DESCRIPTION OF THE SOCIO-ECONOMIC ENVIRONMENT	145
6.3.1	Archaeology/Cultural History	154
6.3.2	Social Aspects of the Proposed Development Area	155
6.3.2.1	Zoning and Land Use	155
6.3.2.1.1	Existing Zoning and Land Use	155
6.3.2.1.2	Surrounding Zoning and Land Uses	155
6.3.2.1.3	Proposed Land use	156
6.3.3	Qualitative Environment	166
6.3.3.1	Visual Aspects	166
6.3.3.2	"Sense of Place" and Place Structures	170
6.3.3.3	Noise	173
6.3.3.4	Light pollution	192
6.3.3.5	Air pollution	192
6.3.4	Services	201
6.3.4.1	Water	201
6.3.4.2	Sewage Disposal	211
6.3.4.3	Storm Water	215
6.3.4.4	Solid Waste	219
6.3.4.5	Electricity	222
6.3.4.6	Bulk roads Infrastructure	225
6.3.4.7	Roads and Traffic	232
6.3.5	Socio- Economical	239
6.3.6	Need and Desirability	244
6.3.7	Public Participation	250
6.4	Institutional Environment	255

6.4.1	On an International Level	255
6.4.2	On a National Level	256
6.4.3	On a Provincial Level	269
6.4.4	On a Local Level	271
7	SIGNIFICANCE ASSESSMENT	276
7.1	Description of Significance Assessment Methodology	276
7.2	Significance Assessment of Anticipated Impacts	279
7.3	Discussion of Significance Assessment	285
8.	CONCLUSION	286
9.	RECOMMENDATIONS	293

LIST OF FIGURES

- Figure 1:** Locality Map
- Figure 2:** Aerial Map of the Study Area
- Figure 3:** Photographs of Manufacturing Activities within the Plywood Plant
- Figure 4:** The Various Activity Zones Associated With The Existing Sabie Site – Map Compiled for Reference and Orientation Purposes
- Figure 5:** Detailed Map Of The Existing Sabie Sawmill Facilities
- Figure 6:** Photograph Of The Material Safety Data Sheet (MSDS) In The Glue Room
- Figure 7:** Zone A: Sewage Treatment Plant
- Figure 8:** Sabie Sawmill Sewage Treatment Plant: Flow Diagram
Waste Streams
- Figure 9:** Site Layout (Existing)
- Figure 10:** Site Layout (Proposed)
- Figure 11:** Existing Land Uses
- Figure 12:** Photograph of the North-South Stretching Eskom Power Line That Traverses the Western Section Of The Study Area
- Figure 13:** Encroachment Plan

- Figure 14:** Proposed Zonings
- Figure 15:** Aerial Map – Proposed land Uses
- Figure 16:** Waste Streams
- Figure 17:** Layout Alternative
- Figure 18:** Hydrology map
- Figure 19:** Flood Lines Map
- Figure 20:** Position of Boreholes
- Figure 21:** Wetland and Riparian Zones
- Figure 22:** 3D Map
- Figure 23:** Ecological Sensitivity Map
- Figure 24:** Position of Cemetery
- Figure 25:** Land Use Plan
- Figure 26:** 3D Visual Analysis
- Figure 27:** Noise Sensitive Receptors
- Figure 28:** Noise Footprint
- Figure 29:** Storm Water Layout
- Figure 30:** Bioswales and Drop Down Grid Filter Locations
- Figure 31:** Storm Water Monitoring Points
- Figure 32:** Waste Streams
- Figure 33:** Existing Sub-station and power lines
- Figure 34:** Existing Roads and Proposed access Routes
- Figure 35:** Proposed Re-Alignment of Road D2220 and D2431
- Figure 36:** Sensitive Issues Map
- Figure 37:** Sensitivity Map

LIST OF TABLES

- Table 1:** Listed activities in terms of Notice R. 544, 545 & R 546 submitted to MDEDET

Table 2:	Listed activities in terms of Notice R. 718, 3 July 2009 submitted to MDEDET
Table 3:	Listed activities in terms of Notice R. 718, 3 July 2009 to be submitted to DEA
Table 4:	Existing Facilities
Table 5:	Waste generated at Sabie site
Table 6:	Wood By-products generated at Sabie site
Table 7:	Geology – Predicted Soil & Rock Types
Table 8:	Issues and Impacts – Geology and Soils
Table 9:	Significance of Issue 1 (Risk for formation of sinkholes and dolines) After Mitigation
Table 10:	Significance of Issue 2 (Stability of structures) After Mitigation
Table 11:	Significance of Issue 3 (Erosion) After Mitigation
Table 12:	Significance of Issue 4 (<i>Stockpile areas for construction materials and topsoil</i>) After Mitigation
Table 13:	Hydrogeological units and Aquifer Types
Table 14:	Issues and Impacts – Hydrology
Table 15:	Significance of Issue 5 (Siltation, erosion and water pollution) After Mitigation/ Addressing of the Issue
Table 16:	Significance of Issue 6 (Lowering of groundwater) After Mitigation/ Addressing of the Issue
Table 17:	Significance of Issue 7 (Ground water pollution) After Mitigation/ Addressing of the Issue
Table 18:	Significance of Issue 8 (Seasonal flooding and perched water conditions) After Mitigation/ Addressing of the Issue
Table 19:	Significance of Issue 9 (Removal of vegetation coverage, increased hard surfaces and increased erosion, surface water pollution and siltation problems) After Mitigation/ Addressing of the Issue
Table 20:	Issues and Impacts – Wetland/riparian zone
Table 21:	Significance of Issue 10 (Impact on wetlands/riparian zone) After Mitigation/ Addressing of the Issue

- Table 22:** Issues and Impacts – Topography
- Table 23:** Significance of Issue 11 (the proposed development will never be completely visible from the View Sheds around the Study Area) After Mitigation/ Addressing of the Issue
- Table 24:** Significance of Issue 12 (Roofs and Parking Areas Could Reflect the Sun into the Eyes of Oncoming Traffic and Surrounding Landowners) After Mitigation/ Addressing of the Issue
- Table 25:** Significance of Issue 13 (The Lights Of The Development (Exterior And Interior) And The Lights Of Signage Could Cause Visual Pollution During The Night) After Mitigation/ Addressing of the Issue
- Table 26:** Issues and Impacts – Climate
- Table 27:** Significance of Issue 14 (Should the construction phase be scheduled for the summer months, frequent rain could cause very wet conditions, which makes it extremely difficult to build in and to do rehabilitation works of disturbed areas) After Mitigation/ Addressing of the Issue
- Table 28:** Significance of Issue 15 (Dust Pollution) After Mitigation/ Addressing of the Issue
- Table 29:** Issues and Impacts – Flora and Fauna
- Table 30:** Significance of Issue 16 (Impact on sensitive wetland/riverine vegetation) After Mitigation/ Addressing of the Issue
- Table 31:** Significance of Issue 17 (Impact on wetland/aquatic ecology) After Mitigation/ Addressing of the Issue
- Table 32:** Significance of Issue 18 (The eradication of invasive species) After Mitigation/ Addressing of the Issue
- Table 33:** Significance of Issue 20 (Noise of construction machinery could have a negative impact on the fauna species during the construction phase) After Mitigation/ Addressing of the Issue
- Table 34:** Significance of Issue 21 (During the construction and operational phase (if not managed correctly) fauna species could be disturbed, trapped, hunted or killed) After Mitigation/ Addressing of the Issue
- Table 35:** Significance of Issue 21 (Loss of habitat can lead to the decrease of

	local fauna numbers and species) After Mitigation/ Addressing of the Issue
Table 36:	Cultural Landscape Types
Table 37:	Heritage Impact Assessment Matrix
Table 38:	Issues and Impacts – Cultural and Historical
Table 39:	Significance of Issue 22 (Structures of cultural and historical significance may be destroyed) After Mitigation/ Addressing of the Issue
Table 40:	Issues and Impacts – Proposed Land-Use
Table 41:	Significance of Issue 23 (Impact on infrastructure in the area) After Mitigation/ Addressing of the Issue
Table 42:	Significance of Issue 24 (Loss of existing public open space area) After Mitigation/ Addressing of the Issue
Table 43:	Significance of Issue 25 (Impact on Lone Creek River Lodge) After Mitigation/ Addressing of the Issue
Table 44:	Significance of Issue 26 (Impact on tourism in the area) After Mitigation/ Addressing of the Issue
Table 45:	Significance of Issue 27 (Compatibility with surrounding land uses) After Mitigation/ Addressing of the Issue
Table 46:	Significance of Issue 28 (Economic viability) After Mitigation/ Addressing of the Issue
Table 47:	Significance of Issue 29 (Generation of electricity) After Mitigation/ Addressing of the Issue
Table 48:	Significance of Issue 32 (Decommissioning of Mount Anderson Landfill Site) After Mitigation/ Addressing of the Issue
Table 49:	Significance of Issue 31 (Creation of temporary and permanent jobs) After Mitigation/ Addressing of the Issue
Table 50:	Visual Impact Criteria
Table 51:	Issues and Impacts – Visual
Table 52:	Issues and Impacts – “Sense of Place”
Table 53:	Significance of Issue 36 (If not planned and managed correctly, the proposed development could have a negative impact on the “Sense of

Place" of the study area and its surroundings) After Mitigation/
Addressing of the Issue

Table 54: Issues and Impacts – Noise

Table 55: Significance of Issue 33 (If not planned and managed correctly, the proposed development could have a noise impact on surrounding residents/properties) After Mitigation/ Addressing of the Issue

Table 56: Maximum long-term annual average modelled concentrations for each pollutant from Run 1 and Run 2

Table 57: Maximum short-term average modelled concentrations for formaldehyde

Table 58: Issues and Impacts – Air pollution

Table 59: Significance of Issue 34 (If not planned and managed correctly, the proposed Sabie Site expansion development could contribute to air pollution which may affect the health and wellbeing of the nearby residents) After Mitigation/ Addressing of the Issue

Table 60: Calculated Existing Water Demand

Table 61: Possible Water Losses

Table 62: Waste generated at Sabie site

Table 63: Wood By-products generated at Sabie site

Table 64: Issues and Impacts – Services

Table 65: Significance of Issue 35 (Damage to existing services) After Mitigation/
Addressing of the Issue

Table 66: Significance of Issue 39 (The construction and operational phases of the proposed development will create large quantities of builder's, domestic and industrial waste and liquids) After Mitigation/ Addressing of the Issue

Table 67: Issues and Impacts – Roads and Traffic

Table 68: Significance of Issue 40 (Some intersection upgrades and realignment of existing roads are required in order to accommodate the expansion of the Sabie Site) After Mitigation/ Addressing of the Issue

Table 69: Significance of Issue 41 (Traffic increase during the construction and operational phases of the development will have an impact on traffic

flow of the area) After Mitigation/ Addressing of the Issue

Table 70:	Issues and Impacts – Socio-Economical
Table 71:	Issues and Impacts – Need and Desirability
Table 72:	Issues and Impacts – Institutional
Table 73:	Severity Ratings
Table 74:	Result of Significance Assessment of Impacts Identified to be Associated with the Proposed Sabie Site Expansion Project (After Mitigation)

LIST OF DIAGRAMS

- Diagram 1:** Sabie Site Process Flow (Current)
- Diagram 2:** Conversion Chain Options
- Diagram 3:** Integrated Site Process Flow
- Diagram 4:** Integrated Site Process Flow: Merchandising Log yard
- Diagram 5:** Integrated Site Process Flow: Sawmill
- Diagram 6:** Integrated Site Process Flow: Plywood
- Diagram 7:** Integrated Site Process Flow: Fibre Board Log yard
- Diagram 8:** Integrated Site Process Flow: Fibre Board
- Diagram 9:** Integrated Site Process Flow: Value Adding Plant
- Diagram 10:** Integrated Site Process Flow: Boiler
- Diagram 11:** Integrated Site Process Flow: Cogen
- Diagram 12:** Wetland Categorization for the Sabie River
- Diagram 13:** Wetland Categorization for the non-perennial river
- Diagram 14:** Flow Chart Air Pollution
- Diagram 15:** Sabie Site Existing Water User
- Diagram 16:** Dry Bioswale Cross Section
- Diagram 17:** Solid Waste and By-Products generated by Plant
- Diagram 18:** Main Rd / Old Lydenburg Rd upgrading

LIST OF ANNEXURES

Annexure A:	Enlargements of Figures in Scoping Report
Annexure B:	Correspondence MDEDET (Scoping Report and Plan of Study for EIA)
Annexure C:	Amended EIA Application
Annexure D:	Public Participation Amended SR
Annexure E:	Proof of Submission of Scoping Report to MDEDET
Annexure F:	Current Process Flow
Annexure G:	MSDS
Annexure H:	Layout Plan
Annexure I:	EIA Application for Co-Generation Facility submitted to DEA
Annexure J:	Draft AEL
Annexure K:	Proof of Submission of WULA
Annexure L:	Approval of DFA application
Annexure M:	Company Profile and CV of EAP
Annexure N:	Geological Report
Annexure O:	Fauna and Flora Survey and Wetland Delineation
Annexure P:	Cultural Report
Annexure Q:	Land Use Plan
Annexure R:	Noise Impact Assessment
Annexure S:	Air Quality Impact Assessment
Annexure T:	Health Risk Assessment
Annexure U:	Civil Services Report
Annexure V:	Storm Water Management Plan
Annexure W:	Electrical Services
Annexure X:	Waste Management Procedure
Annexure Y:	Traffic Impact Study
Annexure Z:	Demacon Study
Annexure AA:	Public Participation
Annexure BB:	EMP

LIST OF ABBREVIATIONS

AEL	:	Air Emissions License
APPA	:	Atmospheric Pollution Prevention Act
AsgiSA	:	Accelerated and Shared Growth Initiative for South Africa
DEA	:	Department of Environmental Affairs
DFA	:	Development Facilitation Act
DWA	:	National Department of Water Affairs
EAP	:	Environmental Assessment Practitioner
EIA	:	Environmental Impact Assessment
ECO	:	Environmental Control Officer
EMP	:	Environmental Management Plan
I&AP's	:	Interested and Affected Parties
IEM	:	Integrated Environmental Management
ILASA	:	Institute for Landscape Architects in South Africa
LDA	:	Land Development Area
MBCP	:	Mpumalanga Biodiversity Conservation Plan
MSDS	:	Material Safety Data Sheet
MDEDET	:	Mpumalanga Department of Economic Development, Environment and Tourism
NEMA	:	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMAQA	:	National Environmental Management: Air Quality Act
NEMWA	:	National Environmental Management : Waste Act
NHBRC	:	National Home Builder Registration Council
NHRA	:	National Heritage Resources Act
RIDS	:	Regional Industrial Development Strategy
SAHRA	:	South African Heritage Resources Agency
SACLAP	:	South African Council of the Landscape Architects Profession
IAIA	:	International Association of Impact Assessments

IEMA	:	Institution for Environment Management and Assessment
SANRAL	:	South African National Roads Agency Limited
WUL	:	Water Use License
WWTW	:	Waste Water Treatment Works

GLOSSARY OF TERMS

Alien Species: A plant or animal species introduced from another region: neither endemic nor indigenous.

Applicant: Any person who applies for an authorisation to undertake an activity in terms of the National Environmental Management Act (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2006.

Biodiversity: The variability among living organisms of terrestrial, marine and other aquatic ecosystems.

C-Plan: The Mpumalanga DEDET C-Plan focuses on the mapping and management of biodiversity priority areas within Mpumalanga. The C-Plan includes protected areas, irreplaceable and important sites due to the presence of Red Data species, endemic species and potential habitat for these species to occur.

Ecology: The study of the inter relationships between organisms and between organisms and their environments.

Environment: All physical, chemical and biological factors and conditions that influence and object and/or organism. Also defined as the surroundings within which humans exist and are made up of the land, water, atmosphere, plant and animal life (micro and macro), interrelationships between the factors and the physical or chemical conditions that influence human health and well-being.

Environmental Impact Assessment: Investigation of the negative and positive consequences that an activity may have on the biological, physical, social and economical environment may have as well as the significance of these consequences and how they can be prevented or mitigated.

Environmental Management Plan: A legally binding document, which stipulates biological, physical and socio-economic prevention and mitigation measures that must be implemented by several responsible parties throughout all the phases of the proposed activity.

Land Development Area: Any area of land which is the subject of land development

Open Space: Areas free of building providing ecological, socio-economic and place-making functions at all scales of the metropolitan area.

Study area: Refers to the entire study area encompassing the total area of the land parcels as indicated on the study area map.

Sustainable Development: Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.



1. INTRODUCTION

York Timbers (Pty) Ltd is planning the expansion of the existing industrial activities of the Sabie Site situated on a Portion of the Remainder of Portion 101 of the farm Grootfontein 196 JT and a Portion of the Remainder of the farm Olifantsgeraamte 198 IT (**referred to as the study area in this report**) (refer to Figure 1, Locality Map and Figure 2, Aerial Map). The study area is approximately **172.66 ha** in extent and is situated in the area of jurisdiction of the **Thaba Chweu Municipality** within the **Ehlanzeni District Municipality** in the **Mpumalanga Province**.

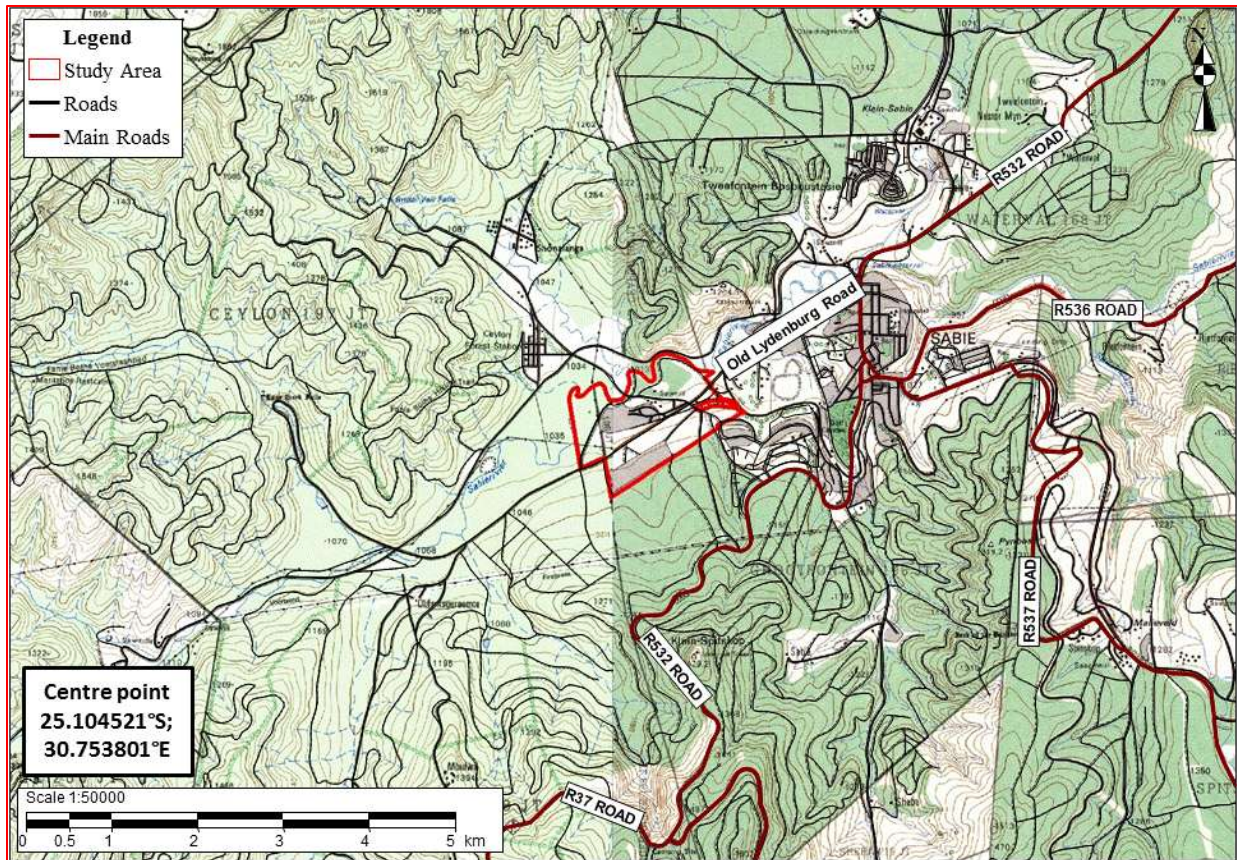


Figure 1 – Locality Map

PLEASE NOTE THAT FOR CLARITY PURPOSES ENLARGEMENTS OF FIGURES IN THIS EIA REPORT ARE ATTACHED IN ANNEXURE A.

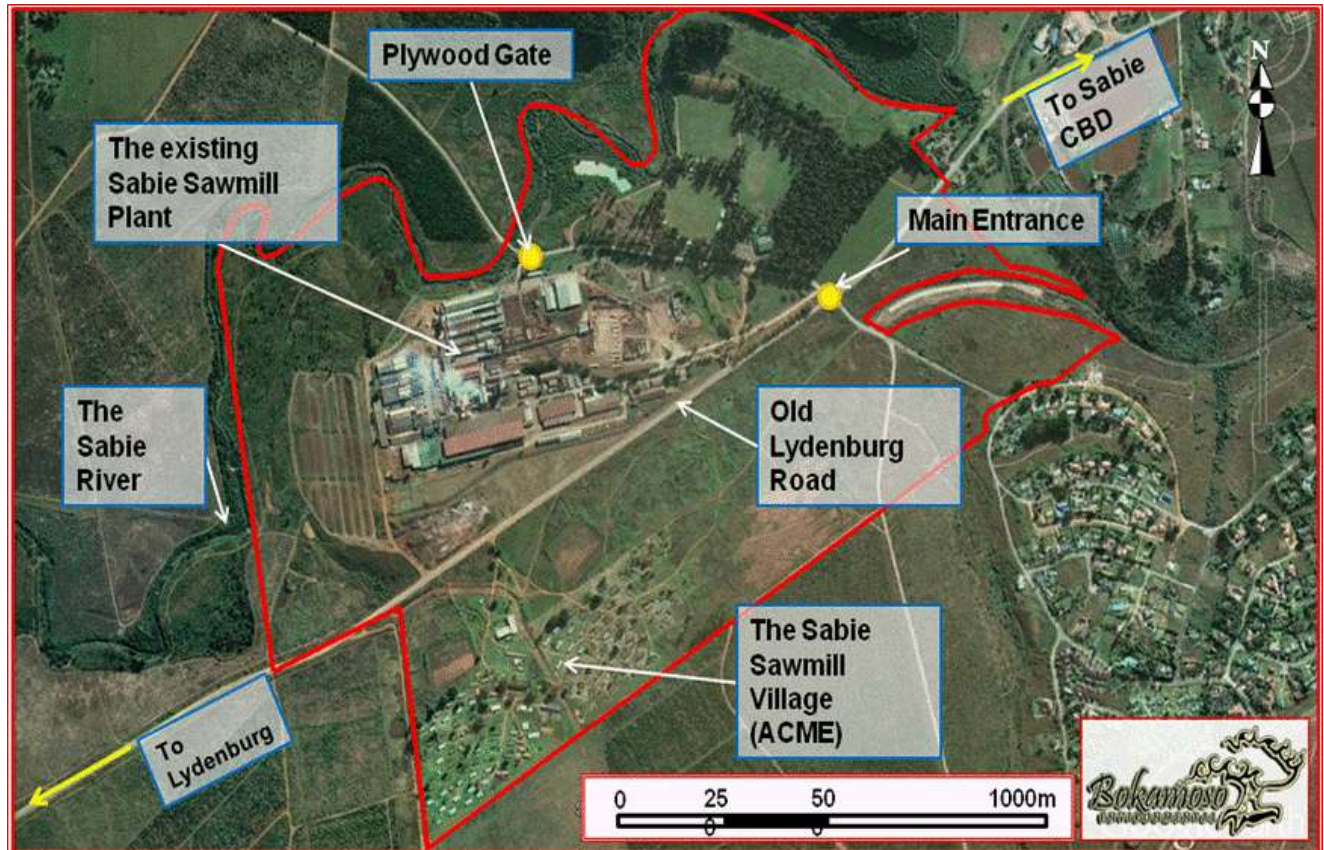


Figure 2: Aerial Map of Study Area

During pre-application consultations with MDEDET and DEA officials it was suggested that an integrated and holistic process be followed for the environmental related applications for the existing and proposed expansion of the industrial activities of the Sabie Site.

The following environmental related applications had been submitted:

- Applications in terms of the 2010 Amended NEMA EIA Regulations:
 - i) Co-generation application – DEA (DEA Ref: 12/12/20/2573)
 - ii) **All other NEMA EIA applications (Listing Notices 1-3) – MDEDET**

- Applications in terms of NEMWA:
 - i) **General waste applications – MDEDET**
 - ii) Hazardous waste applications – DEA

- Applications submitted in terms of NEMAQA:
 - i) Conversion Application - MDEDET – 1st Draft submitted 13 September 2011 for provisional license
 - ii) Final Conversion Application - MDEDET
 - iii) Air Emissions License Application –MDEDET

- Applications had been submitted in terms of The National Water Act:
 - Section 21 Water-Use License Application – The National Department of Water Affairs (DWA)

The Scoping Report and Plan of Study for EIA for the NEMA EIA application for activities triggered in listing notices 1-3 (reference number: 17/2/3/E-152), the General Waste License application (reference number: 17/4/WL/MP321/12/01) and the Hazardous Waste License application in terms of NEMWA had been accepted by MDEDET on 22 October 2012 and the undertaking of the EIA may proceed in accordance with the tasks that are outlined in the Plan of Study for EIA, however the Department advised the following:

Refer to Annexure B for correspondence from MDEDET.

1. If the proposed realignment of existing power lines triggers activity 10(i) or (ii) of Government Notice R544 or activity 8 of Government Notice R545, environmental authorisation must be obtained from the National Department of Environmental Affairs. A separate EIA application will be submitted to DEA

Response: *A separate EIA application will be submitted to DEA for the relocation of existing power lines.*

2. The application does not include activity 24 of Government Notice R544. Activities proposed on land subsequent to it being zoned Private Open Space will be subject

to environmental authorisation should transformation of such land exceed the stipulated threshold.

Response: Activity 24 of Government Notice R544 was included in the EIA application. An amended EIA application form was submitted to MDEDET (**refer to Annexure C**); The listed activity was advertised as per the GNR 543 and all Registered I & APs (current and newly registered) were informed of this change and provided with an opportunity to comment. No comments were received. **Refer to Annexure D.** The Scoping Report (SR) was amended to include the new activity, the amended report was subjected to PP and was submitted to the Department (MDEDET) (**refer to Annexure E**).

3. The Department can only consider whether or not to authorise listed activities that have not yet commenced. Since a number of activities listed in terms of the EIA Regulations, 2006 commenced on the site in the absence of the required environmental authorisation, the information submitted to the Department as part of this EIA process must distinctly clarify and describe the specific activities that were included in the application form.

This Report represents the Environmental Impact Assessment Report (EIAR) to be compiled for the EIA and Waste License applications.

1.1 Background

(Note: Some of the information supplied in this section were obtained from Documents Compiled by Umsebe Development Planners)

Sabie and the Sawmill

A company named ACME Timber Industries established the Sabie Sawmill in 1959. In 1972 ACME built the Plywood Plant.

Mondi Timbers Limited purchased the sawmill and plywood plant from ACME Timber Industries in 1983. Global Forest Products (Pty) Limited purchased the sawmill and the plant from Mondi in year 2000.

York Timbers (Pty) Limited acquired Global Forest Products (Pty) Limited in 2007, by implication, it took ownership of all assets vested in the name of Global Forest Products including the plywood plant, sawmill and forestry plantations.

The Sabie sawmill already operated 48 years (from 1959) and the plywood plant 35 years (from 1972) when York Timbers (Pty) Limited took ownership in 2007.

Land Use Rights

An investigation was done to determine if any land use rights exist on the application properties.

A meeting was held with Ms. Heila Meintjes, Town Planner at Thaba Chweu Local Municipality, to determine if any files related to town planning matters for the subject properties exist. It was confirmed that the subject properties fall outside the Sabie Town Planning Scheme, 1984 and that land use rights, if any, were most probably obtained in terms of legislation governed by the provincial department.

A meeting was held with Ms. Marita Stoop at the Mpumalanga Department of Agriculture, Rural Development and Land Administration to obtain information on any permits or rights granted by the provincial authority. No record or file could be traced of any application that was made in the past to obtain land use rights on the subject properties.

York Timbers (Pty) Limited

York Timbers (Pty) Limited was established 1916 and has been listed on the Johannesburg Stock Exchange (JSE) since 1946.

The company is a forest products enterprise with principal activities in commercial forestry, softwood sawmilling, plywood manufacture and trade in timber products.

The company has three segments which produce and or sell timber products, including:

1	Sawmilling:	5 Sawmills located in close proximity to Sabie (the subject site), Graskop, White River, Ermelo and Amsterdam, which produce and sell a broad range of structural and industrial sawn timber products.
2	Plywood:	A plywood plant is located in Sabie (the subject site), which manufactures and sells plywood timber products.
3	Warehousing:	All sites have warehouses as well as one (1) warehouse located in Pretoria (Tshwane) which sells timber related products from the company's manufacturing plants.

Current Processes and Activities

Refer to Diagram 1 –Current Site Process Flow (also attached as Annexure F)

The existing Sabie site consists of a sawmill and plywood plant, each with its own log yard, processing facility and dispatch area. The mill is one of the biggest and the plywood plant is the biggest of its kind in South Africa.

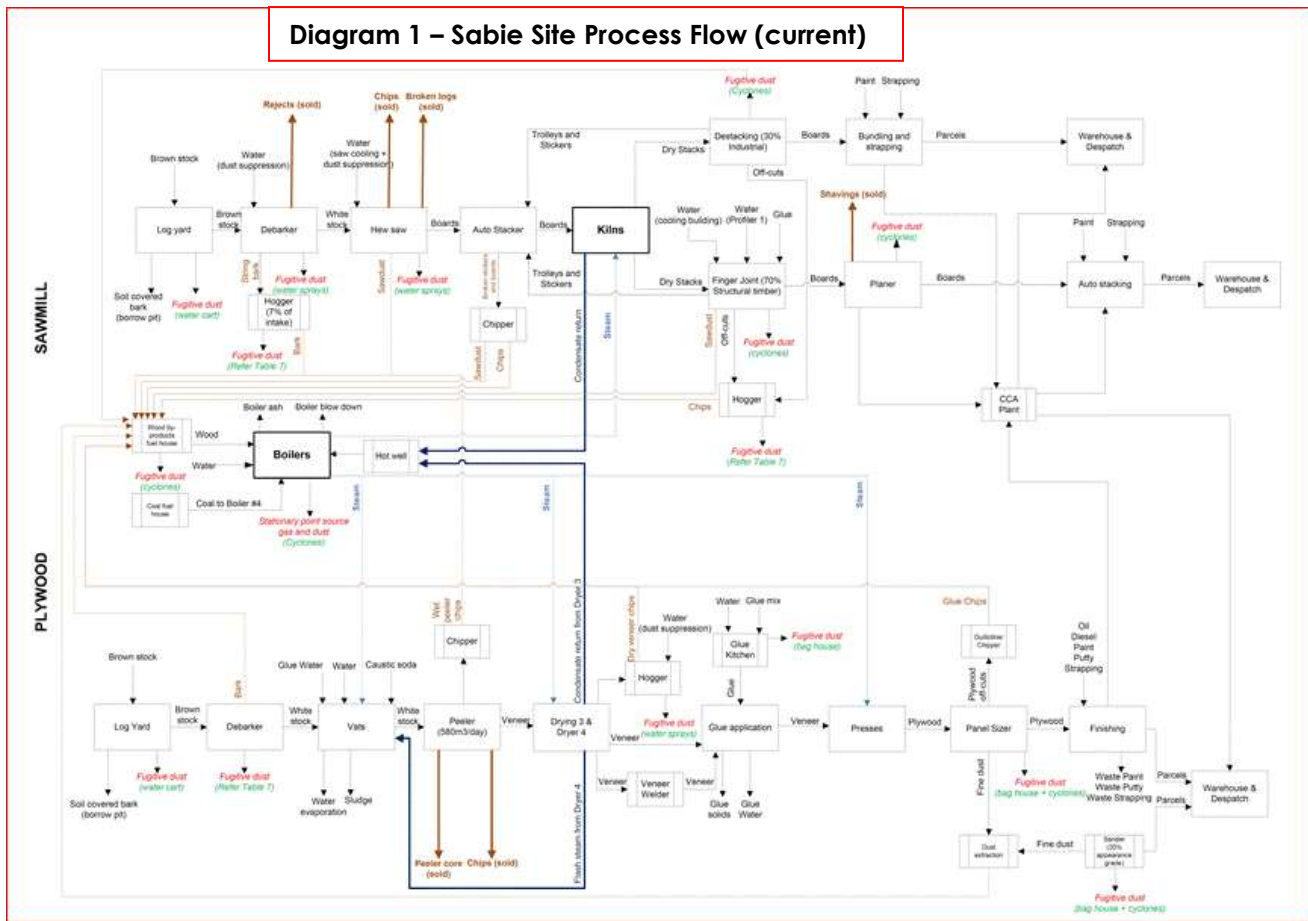




Figure 3: Photographs Of Manufacturing Activities Within The Plywood Plant



Figure 4 - The Various Activity Zones Associated With The Existing Sabie Site – Map Compiled for Reference and Orientation Purposes

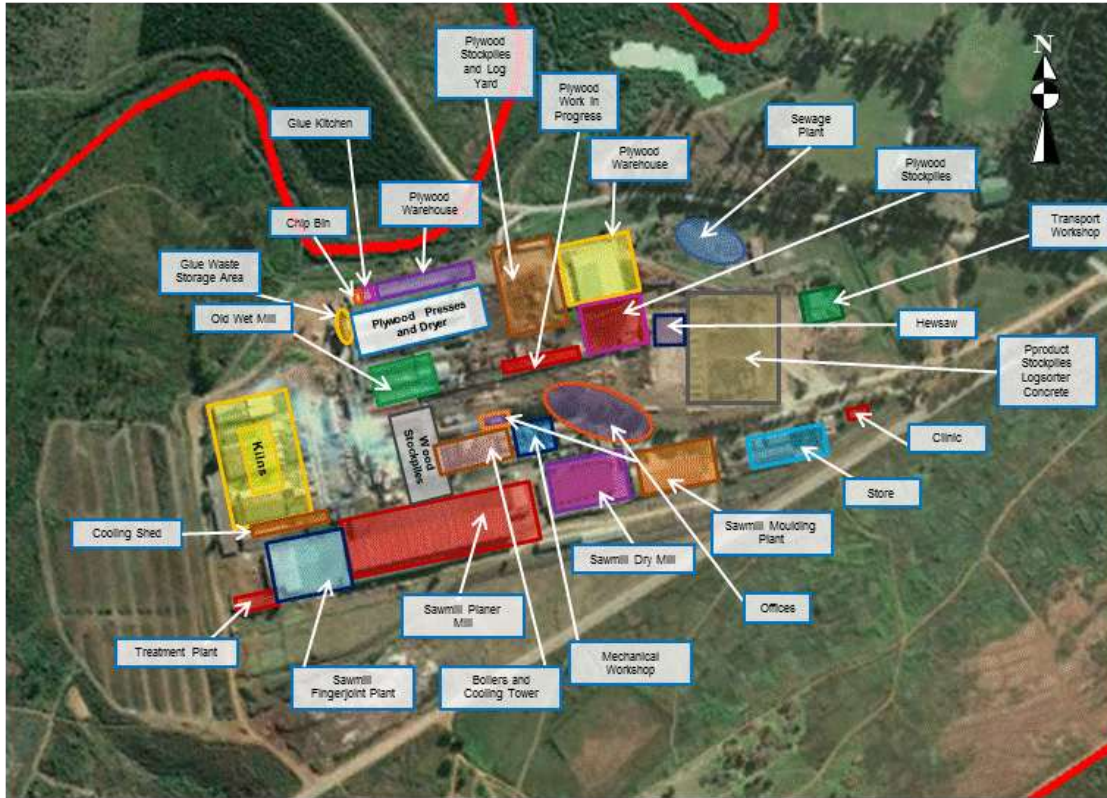


Figure 5 – Detailed Map of The Existing Sabie Sawmill Facilities

Portion 101 of the farm Grootfontein 196 JT and the Remainder of the Farm Olifants Geraamte 198 IT

Brief description of processing of logs:

- At the sawmill processing facility, logs are supplied in length, sawn into boards and the boards are dried, finger jointed and planed before dispatch.
- The plywood processing facility prepares the logs in vats, logs are then peeled into sheets, and then veneer dried and thereafter sized. The sheets are layered with glue and pressed, sanded and painted before dispatch.

The current sawmill intake is 800m³/day with a headcount of 361, whilst the plywood plant intake is 550m³/day with a headcount of 420.

The Log Yard, the De-barker, the Peeler, the Pre-Press and the Hard Press: (Zone B, Figure 4)

The log yard is used for the storing of the “brown stock”/ the logs that are still covered with bark. From the log yard the “brown stock” is fed into a de-barker. The debarked logs are/ the cores of the logs are also stored at the log yard. The cores of the logs are then cooked in vats to soften the wood fibers.

After the log cooking process the plywood logs are peeled and thin veneer sheets are created. The moisture content of the logs is measured by a moisture meter and the sheets are then graded according to their moisture content. The veneer sheets are used for the manufacturing process in the plant and the peeler core is stored at the log yard. The peeler core is sold and removed from the site.

After drying the veneer sheets such sheets undergo a dry pre-press process. A sandwich is created with veneer sheets and glue is applied in between the sheets. The product then goes through a hard press process and this process utilizes steam of approximately 120-130°C.

The glue used for the plywood manufacturing is stored in a closed glue room, which houses glue-holding tanks. The glue room complies with the relevant safety standards and as required, the Materials Safety Data Sheet is attached to one of the walls in the glue room. **Refer to Figure 6.**

The glue is mixed in the glue room (**Zone B, Figure 4**) and water from the borehole is used for the mixing of the glue. Due to pollution risks, the glue mixing and storage areas are bunded areas.

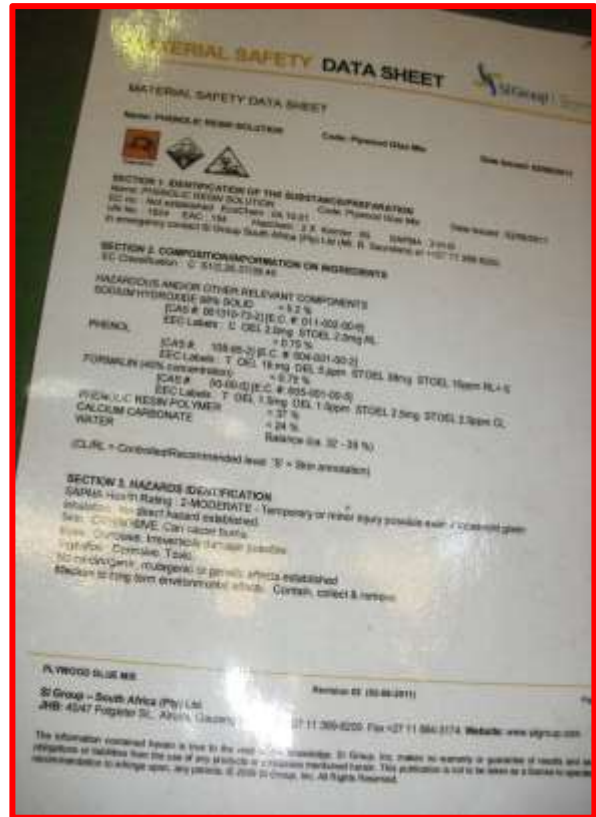


Figure 6: Photograph Of The Material Safety Data Sheet (MSDS) In The Glue Room

Five glue holders, three pre-presses, two hard presses and a glue machine are amongst the equipment used to create the plywood sheets. The plywood sheets are then cut into various sizes and the plywood off-cuts are stored in a dry container and transported to the boilers for usage as boiler fuel.

The glue used for the manufacturing of the plywood contains some formaldehyde and in the past, some parties accused York Timbers of releasing unacceptable levels of formaldehyde into the air through the burning of the plywood off-cuts. These accusations however made it necessary for York Timbers to conduct air pollution studies in order to determine whether such accusations were true. The results of the recent air pollution study however proved that the formaldehyde levels released are well below the thresholds and it was therefore possible to confirm that the emissions released by the boilers are well within the required standards and poses no threats to the surrounding environment. An Air Pollution Study had been conducted **(refer to Section 6.3.3.5 and Annexure R)**.

After pressing and cutting the plywood sheets are stored for approximately 24 hours to ensure quality (curing or post-curing).

The plywood sheets also undergo a sanding process, which is responsible for the smooth appearance of each plywood board. The dust created by the sander is extracted by means of an overhead extracting machine and the dust is also transported to the boilers for usage as boiler fuel. The dust-extractor prevents dust pollution within the plant.

This western section of the plywood plant (just outside the western section of the building) is used as storage area for the waste products to be removed from the site. The solid and fluid wastes are stored in sealed waste drums that are collected (on a regular basis) by a suitably qualified waste removal contractor.

The Sawmill Plant: (Zone D, Figure 4)

(refer to Figure 3 above for photos of activities associated with the sawmill)

Logs for the sawmill plant are also stored in a log yard. Prior to entering the plant building, the logs undergo a log sorting and de-barking process. The logs are then transported on a log-feeder and bark is transported on a bark-conveyer to the boiler house for usage as boiler fuel. During this process saw dust and wood chips are also separated and transported for usage as boiler fuel. Sappi also collects some of the woodchips for usage at the Sappi plant.

According to the management of the Sabie Site the plan is to convert the current feeding and sorting process into one integrated process that will require an area with a length of at least 200m. The proposed future layout for the plant described in the following sections of this report was specifically planned to incorporate a straight area of at least 200m.

Inside the plant building the logs are x-rayed and cut into appropriate sized boards. Some of the boards are then lengthened by means of finger joints that area tightly glued together. The glue area is also furnished with a Material Safety Data Sheet (MSDS). The glue mixture used for the finger joints does **not** contain formaldehyde ***(refer to MSDS attached as Annexure G)***.

The kilns **(Zone D, Figure 4)** on the site are used to dry the timber and the boilers supply the kilns with steam for such drying processes. Some of the kilns were recently (mid 2011) destroyed in a fire at the plant and the Mpumalanga Provincial Government Department of Economic Development, Environment and Tourism (MDEDET) was already notified of the plan to replace such kilns. The department requested that Bokamoso provide them with a letter to notify them of the replacement of the burnt down kilns with new kilns consisting of similar design specifications. The letter was submitted to the department and it was also determined that no environmental related licenses or permits will be required for the replacement of the kilns. The installation of the new kilns was not regarded as commencement with the expansion project, but as a mere replacement of the existing kilns.

After the condensation of the steam used for the kiln drying processes, such water is transported back to the boilers for re-usage/ water recycling purposes. Water quantity meters are attached to each of the kilns, because York Timbers want to quantify the amount of water recycled.

During the hot summer months water is sprayed onto the roof of the finger joint section of the plant for cooling down purposes.

The Boiler House and the Ablution Block: (Zone F, Figure 4)

The boiler house accommodates five boilers of which one previously used coal as boiler fuel. However the coal fired boiler had been replaced with a wood fired boiler. York Timbers is currently in possession of a Registration Certificate issued for the boilers in terms of the Air Pollution Prevention Act (APPA) and they already applied for the conversion of this Certificate into an Air Emissions License (AEL) in terms of the National Environmental Management Air Quality Act (NEMAQA). The Draft AEL has been issued (**refer to Annexure J**). The boilers supply steam to the kilns to dry the timber and to the plywood plant's vats, driers and presses. **No steam is currently used for the generation of electricity.** The long term plan is however to generate heat and electricity and the installation of a co-generation facility is incorporated as part of the application. An EIA application for the co-generation facility has already been submitted to the National Department of Environmental Affairs (DEA) (**DEA Reference: 12/12/20/2573**).

Boiler ash is stored in ash skips just outside the boiler house (at the southern entrance of the boiler house). The ash storage area is concreted and bunded. Mist is used to spray onto the fly-ash and ash traps are used to prevent ash from entering water. The coal is stored in a bunded area.

A recently introduced re-firing system on two of the boilers however caused a significant decrease in the boiler ash generated.

The biomass fired at the boilers is mainly bark, sawdust and chipped off-cuts. Other biomass is sold, including chips, shavings, peeler cores and rejected logs.

All on site ablution facilities are connected to the site Sewage Treatment Works. A sewerage survey conducted during 2011 revealed some leaks. York has repaired some of the leaks and is in the process of repairing the remaining leaks.

A CCA plant is situated in the southwestern corner of the study area, but according to the plant management, only limited treating (sometimes plywood) takes place. **(Activity Zone D, Figure 4)**

The Workshop Area: (Zone E, Figure 4)

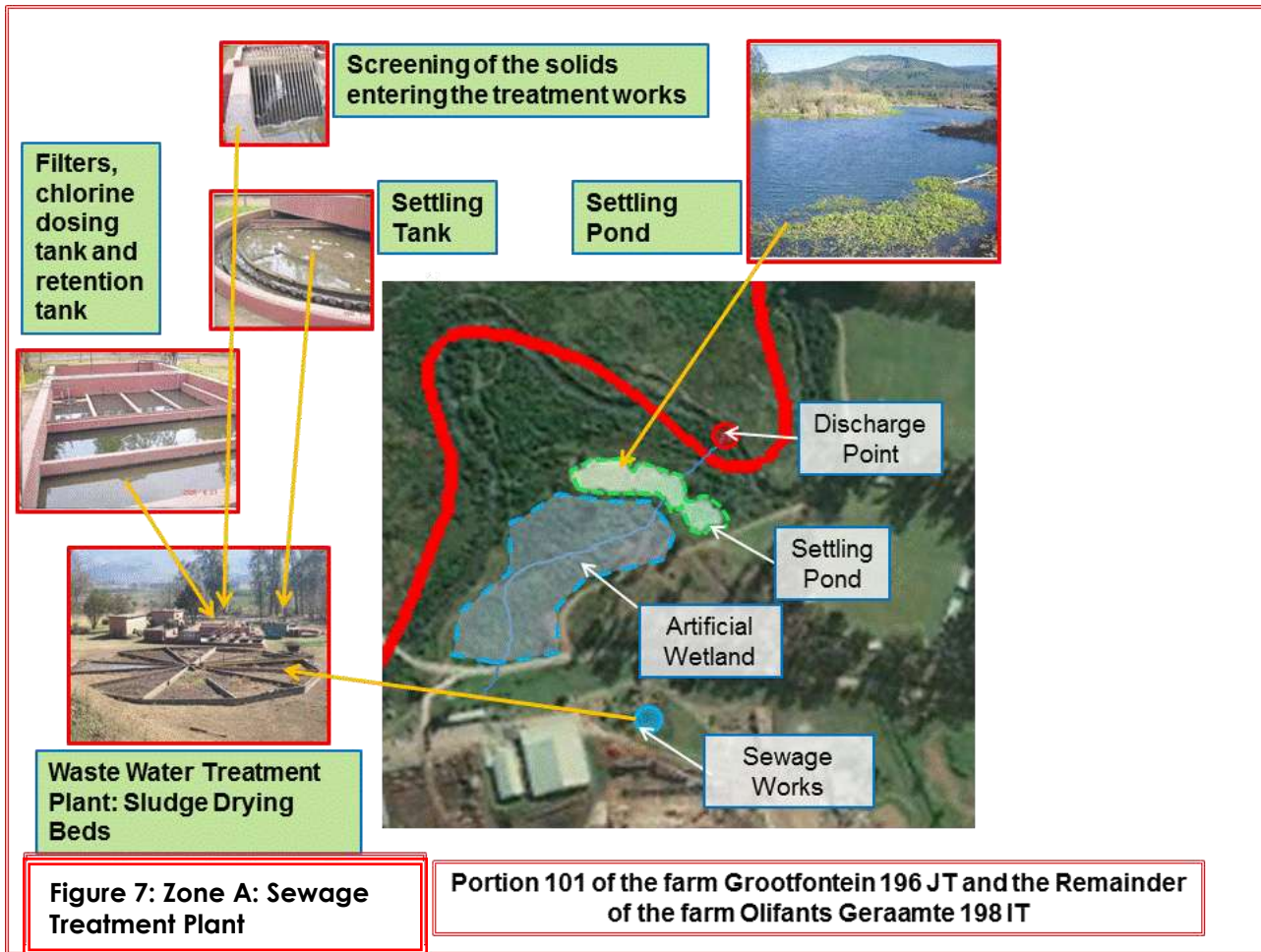
This area is currently used for the servicing of vehicles and other machinery. Only a section of the services area is bunded. The area is furthermore provided with a sump and two oil separators in series. York Timbers plans to relocate the workshop area **(refer to Figures 10 for proposed position of workshop and garage area)**. Bioremediation will take place at the existing workshop area.

The Sewage Treatment Facility: (Zone A, Figure 4)¹

Refer to Figure 7 and 8 below

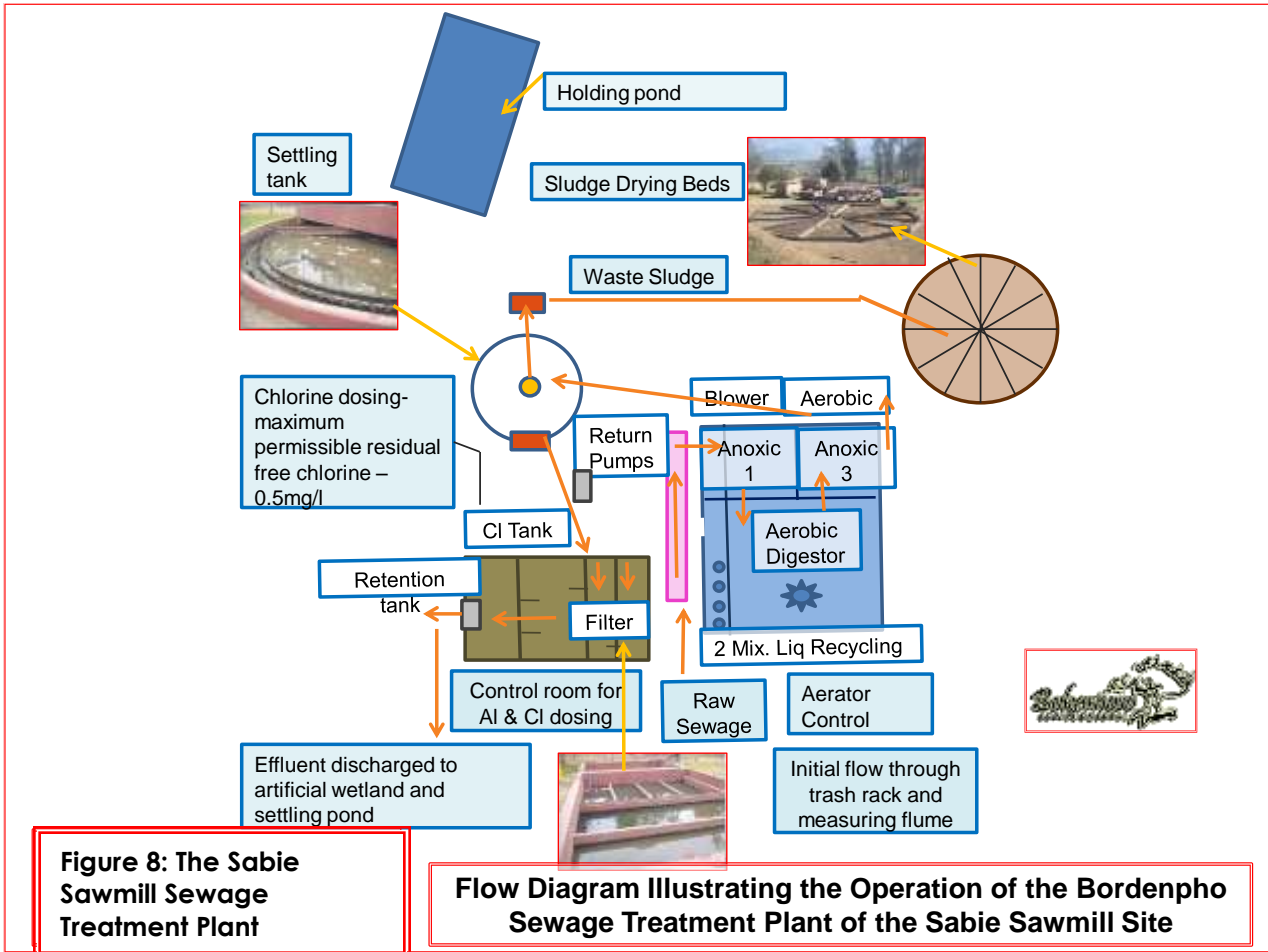
The Sabie site is not linked to a municipal sewerage system. The sewage generated on the property is treated on-site at a well functioning treatment facility known as a Bardenpho Sewage Treatment Plant. The treated effluent discharged from the facility is monitored on a regular basis and the samples tested proved that the treated water is of a very high standard complying with DWA general standard as stipulated in the Exemption Permit. The plan is to either upgrade the sewage treatment plant to comply with DWA special standard or to connect to the Municipal sewage works.

¹ Please note: The Waste License application for the sewage treatment facility will be submitted to DEA



The system consists of the following components:

- A sewage works (detail of the works is set out in **Figure 8 below**);
- A treated wastewater pipeline opening into a channel, which transports the treated wastewater to a settling pond and a discharge point for the discharge of water into the river.



In terms of the National Water Act of 1998, the proposed sewage works will require some Section 21 Water-Use licenses. The facility also qualifies for a waste license in terms of the National Environmental Management Waste Act (NEMWA). The Section 21 Water-Use license applications have already been submitted to the National Department of Water Affairs (DWA) for consideration and a preliminary waste license application has already been submitted to DEA for consideration. DEA however requested that the EIA process associated with the Waste License first be completed and that the Waste License application be re-submitted once more detailed information regarding all the waste activities that require licenses becomes available. The integrated EIA Applications for all the NEMA listed activities have already been submitted to the relevant authorities (this report represents the EIAR for both the EIA and Waste License application submitted to MDEDET). The waste licenses will only be issued after the NEMA Decision for the integrated EIA was issued.

A mini scrap yard is situated just east of the treatment works. This yard mainly houses old machinery and the idea is to make such old scrap metal available for recycling purposes. If the future upgrading plans include a mini-scrap metal storage area, there is a possibility that such an area could also require a Waste License.

The Acme Workers Village: (Zone G, Figure 4)

A workers village named the ACME Village is also situated on the study area (to the south of the Old Lydenburg Road). The village currently accommodates approximately 450 registered residents/plant workers, but according to available information approximately 900 people reside in the village.

The sewage generated by the village is also treated at the on-site treatment works in Zone A.

Other facilities ancillary to main activities include offices, a clinic and guardhouses.

Figure 9 illustrates the layout plan of the existing Sabie Sawmill.

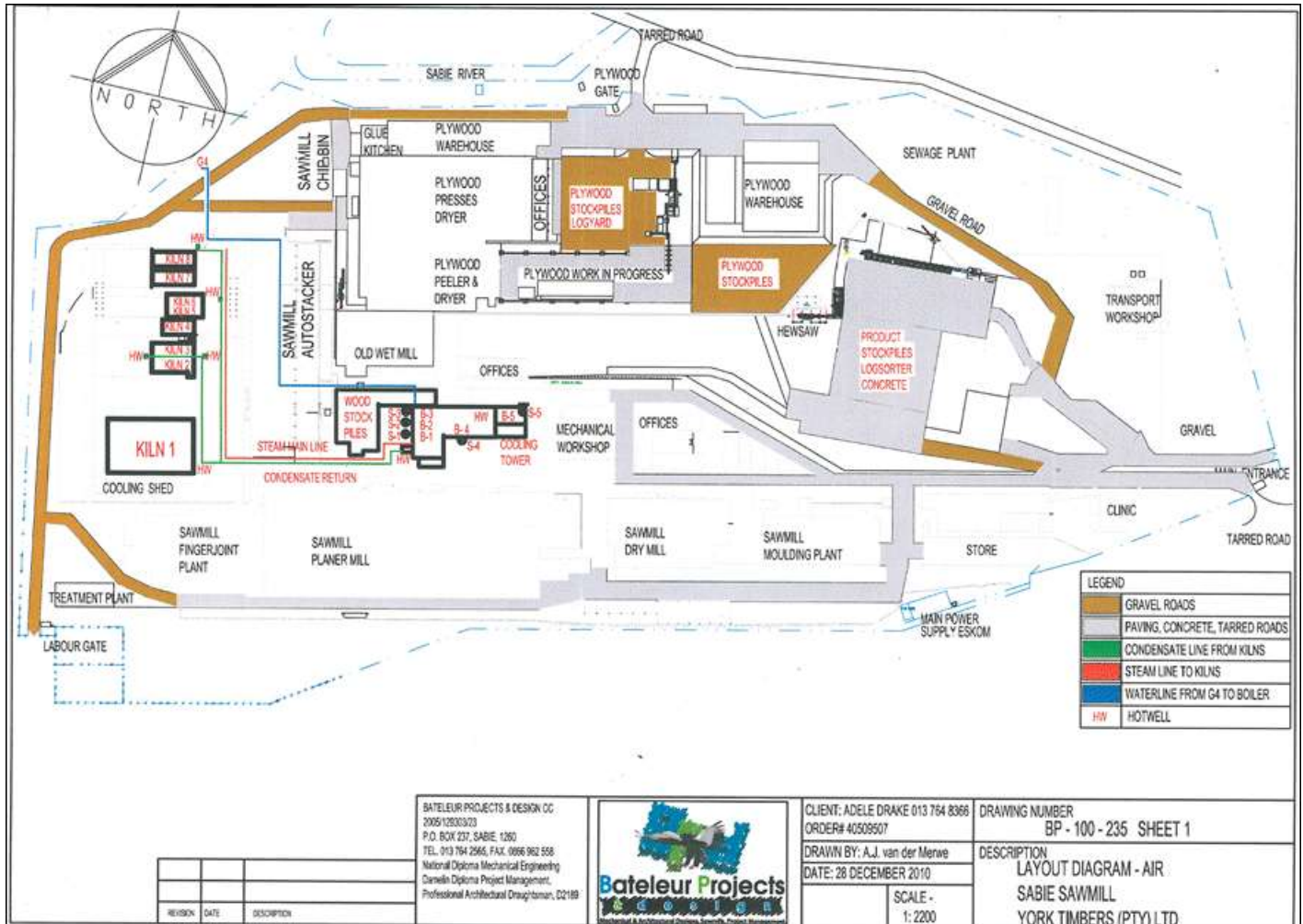


Figure 9: Layout Diagram Sabie Sawmill (existing)

Upgrading/Expansion of existing plant

The future strategy of York Timbers requires the expansion of the current industrial plant to include a co-generation facility, value adding plants, upgrades to the sawmill and plywood plants and the relocation of the workshop and a final dispatch area. **Refer to Figure 10, Proposed Site Layout (also attached as Annexure H) and refer to Section 4.2.2 for a detailed discussion on the proposed expansion/upgrading of the plant.**

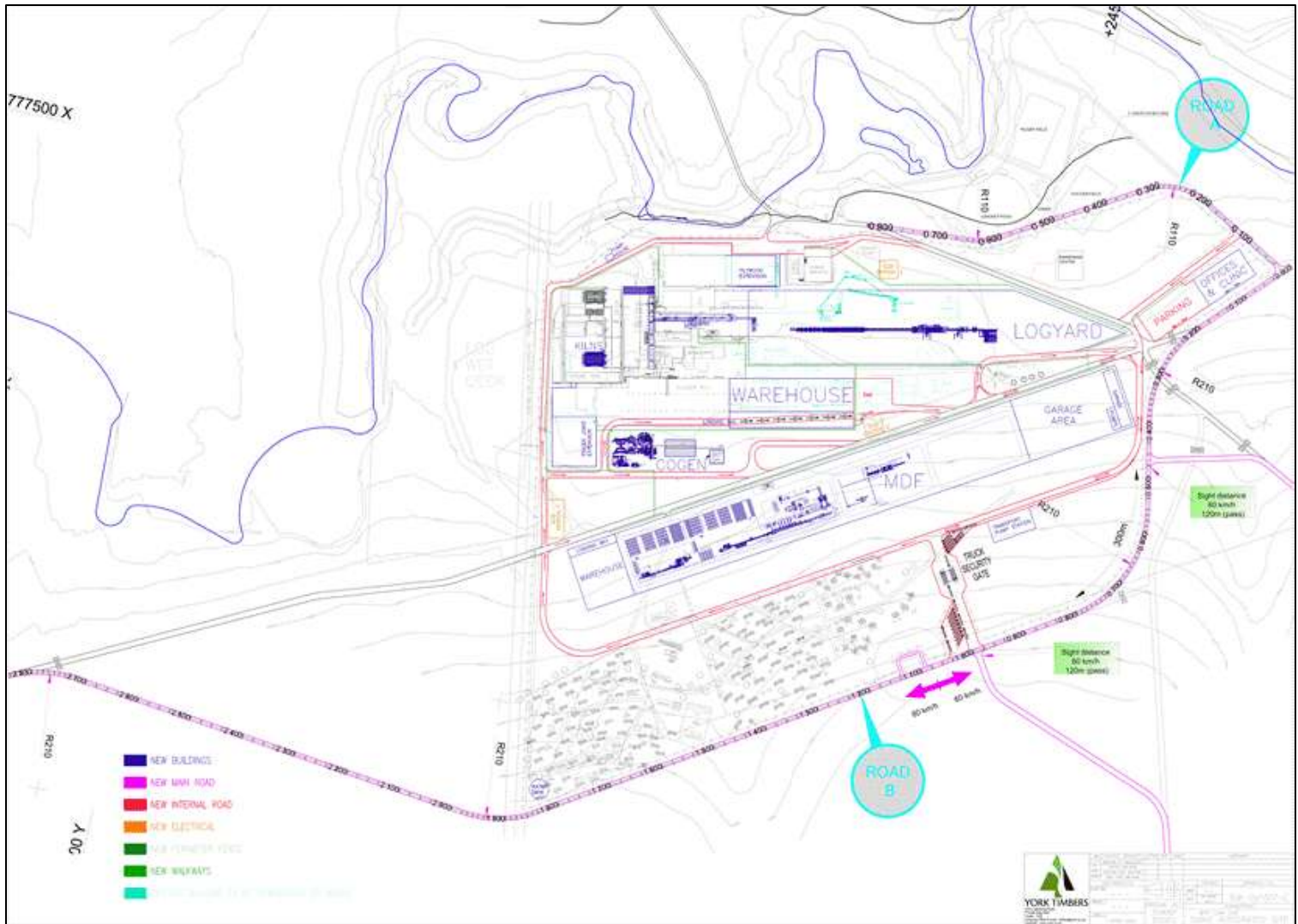


Figure 10: Proposed Site Layout (expansion)

The existing and proposed activities of the Sabie Site triggers a number of the activities as listed in Government Notice No. **R 544 (Notice Listing 1)**, **No. R 545 (Notice Listing 2)** and **Notice No. R 546 (Notice Listing 3)** of the Amended Regulations, which came into effect on 2 August 2010. Therefore the applicant, **York Timbers (Pty) Ltd** appointed **Bokamoso Landscape Architects and Environmental Consultants**, as **independent** environmental consultants, for the Environmental Impact Assessment (EIA) Application for the existing development/proposed expansion and its associated listed activities.

As already mentioned an application for **Environmental Authorisation** in terms of the NEMA, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2010; was submitted to the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET) in April 2012. *Please Note: A separate EIA application for the Sabie Site Co-Generation Facility was submitted to the Department of Environmental Affairs (DEA)⁵ (refer to Annexure I for a copy of the EIA Application form). (Reference number 12/12/20/2573 was assigned to the application).*

A Waste Management License for General Waste in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) and Government Notice 718 of 2009 was submitted to MDEDET in April 2012.

It is also important to note that the proposed development additionally requires licenses in terms of the National Environmental Management Act: Air Quality Act (NEMAQA), National Environmental Management: Waste Act (NEMWA) and the National Water Act. Bokamoso Environmental Consultants was also appointed to assist with the application processes associated with these Acts:

- **License in terms of the National Environmental Management Act: Air Quality Act (NEM:AQA)**

An application for the conversion of the existing Registration Certificate in terms of APPA into a provisional AEL in terms of NEMAQA was submitted to MDEDET in September 2011. The Draft AEL was issued by MDEDET on 9 April 2013. **Refer to Annexure J for AEL.**

The following listed activities in terms of NEMA are triggered:

No. & date of the relevant notice:	Activity number	Activity Description
Listing Notice 1, 544, 18 June 2010	28	The expansion of existing facilities for any process or activity where such expansion will result in the need for a

⁵ The Department of Environmental Affairs is the competent authority for energy related applications and therefore the application for the cogeneration facility was submitted to DEA.

		<p>new, or amendment of, an existing permit or license in terms of national or provincial legislation governing the release of emissions or pollution, excluding where the facility, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Waste Act, 2008 (Act No. 59 Of 2008) in which case that Act apply.</p> <p>Reason for inclusion: The proposed activities will result in the need of a new license or the amendment of existing licenses/permits that regulate pollution (i.e. Conversion Application for Air Emissions Licenses and new Air Emissions License Application)</p>
<p>Listing Notice 2, 545, 18 June 2010</p>	<p>5</p>	<p>The construction of facilities for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, effluent and which is not identified in Notice No. 544 or included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act. No. 59 of 2008) in which case the Act will apply.</p> <p>Reason for inclusion: The proposed expansion of the Sabie site includes the construction of facilities for process/activities that require an AEL (i.e. co-generation facility, boilers)</p>

- **Licenses in terms of the National Environmental Management: Waste Act (NEMWA)**

A Waste License (for non-hazardous waste) application was submitted to MDEDET and a Waste License Application (for hazardous waste) will be submitted to DEA.

A waste license application for hazardous waste was submitted to DEA, however the department requested that the EIA process associated with the Waste License first be completed and that the Waste License application be re-submitted once more detailed information regarding all the waste activities that require licenses becomes available. The EIA Applications for all the NEMA listed activities have already been submitted to the relevant authorities. The waste licenses will only be issued after the NEMA Decision for the integrated EIA was issued.

The following listed activities in terms of NEMA are triggered by the waste activities:

No. & date of the relevant notice:	Activity number	Activity Description
Listing Notice 1, 544, 18 June 2010	13	<p>The construction of facilities or infrastructure for the storage, or for the storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 80 but not exceeding 500 cubic metres</p> <p>Reason for inclusion: To make provision for the temporary storage of hazardous waste (i.e. contaminated off-cuts of plywood, Fibre Board Plant and Value Adding Plant) above the threshold and the storage and handling of diesel/petrol.</p> <p>Please note: <i>It was confirmed that the total design capacity of the Glue Waste Storage Area is 22,05m³ and therefore less than 35m³.</i></p>
Listing Notice 1, 544, 18 June 2010	27	The decommissioning of existing facilities or

		<p>infrastructure for:</p> <p>(iv) activities, where the facility or land on which it is located is contaminated;</p> <p>(v) storage and handling of dangerous goods of more than 80 cubic metres</p> <p>Reason for inclusion: To make provision for the decommissioning of existing facilities or infrastructure located on contaminated land or used for the storage and handling of dangerous goods.</p> <p>The upgrading of the existing plant will require some demolition activities and alterations/upgradings in existing areas and such activities could reveal some contaminated land or could require the temporary / permanent storage and handling of dangerous goods within the threshold as supplied in this activity (i.e. Bioremediation site at Mobile Workshop).</p>
<p>Listing Notice 1, 544, 18 June 2010</p>	<p>28</p>	<p>The expansion of existing facilities for any process or activity where such expansion will result in the need for a new, or amendment of, an existing permit or license in terms of national or provincial legislation governing the release of emissions or pollution, excluding where the facility, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Waste Act, 2008 (Act No. 59 Of 2008) in which case that Act apply.</p> <p>Reason for inclusion:</p>

		<p>The proposed activities will result in the need of new licenses or the amendment of existing licenses/permits that regulate pollution (i.e. Conversion Application for Air Emissions Licenses, New Air Emissions License Applications, Water Use licenses and Waste licenses).</p>
<p>Listing Notice 1, 544, 18 June 2010</p>	<p>42</p>	<p>The expansion of facilities for the storage, or storage and handling of a dangerous good, where the capacity of such storage facility will be expanded by 80 cubic metres or more.</p> <p>Reason for inclusion: To make provision for the expansion of facilities for the storage and handling of dangerous goods (i.e. boiler ash, contaminated off-cuts of wood, glue waste, CCA sludge etc.) if required.</p>
<p>Listing Notice 2, 545, 18 June 2010</p>	<p>3</p>	<p>The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic meters.</p> <p>Reason for inclusion: To make provision for the construction of facilities or infrastructure for the storage and handling of dangerous goods above the threshold.</p>
<p>Listing Notice 2, 545, 18 June 2010</p>	<p>5</p>	<p>The construction of facilities for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, effluent and which is not identified in Notice No. 544 or included in the list of waste management activities published in terms of section</p>

		<p>19 of the National Environmental Management: Waste Act, 2008 (Act. No. 59 of 2008) in which case the Act will apply.</p> <p>Reason for inclusion: The proposed expansion will include the construction of facilities that will result in the need of new licenses or the amendment of existing licenses/permits that regulate pollution (i.e. Conversion Application for Air Emissions Licenses, New Air Emissions License Applications, Water Use licenses and Waste licenses).</p>
<p>Listing Notice 3, 546, 18 June 2010</p>	<p>10</p>	<p>The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.</p> <p>(a) In Mpumalanga: (ii) Outside urban areas, in: (cc)critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.</p> <p>Reason for inclusion: To make provision for construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good within a critical biodiversity area, if required.</p> <p>According to MDEDET C-Plan the study area falls within an area identified as Highly Significant in terms of Aquatic Biodiversity sub catchment and Terrestrial Biodiversity Assessment</p>

- **Licenses in terms of the National Water Act.**

Thandamanzi have been appointed to compile and apply for a Water Use License (WUL) for all York water uses in terms of Section 21 of the National Water Act, Act 36 of 1998.

The WULA for existing activities includes the following:

Section 21(a)

- Production borehole
- Fire abstraction

Section 21 (c & i)

- Settling pond
- Stormwater system
- Discharge from wetland

Section 21(f & g)

Discharge of wastewater into:

- Wetland
- Settling pond
- Sabie River (3x)

The WULA include the following for future activities:

Section 21 (c & i)

- Future stormwater system

Section 21 (a)

- Fire abstraction

Refer to Annexure K for submission of WULA.

The following listed activity in terms of NEMA is triggered by the water related activities:

No. & date of the relevant notice:	Activity number	Activity Description
Listing Notice 1, 544, 18 June 2010	28	<p>The expansion of existing facilities for any process or activity where such expansion will result in the need for a new, or amendment of, an existing permit or license in terms of national or provincial legislation governing the release of emissions or pollution, excluding where the facility, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Waste Act, 2008 (Act No. 59 Of 2008) in which case that Act apply.</p> <p>Reason for inclusion: The proposed activities will result in the need of new licenses or the amendment of existing licenses/permits that regulate pollution (i.e. Conversion Application for Air Emissions Licenses, New Air Emissions License Applications, Water Use licenses and Waste licenses).</p>

This report represents the Environmental Impact Assessment Report in terms of the NEMA, 1998 (Act No. 107 of 1998), as amended and the EIA Regulations, 2010 (as part of the Integrated Environmental Authorisation and Waste Management License application).

1.2 Activities Applied for in Terms of NEMA

In April 2006 the Minister of Environmental Affairs and Tourism passed Environmental Impact Assessment Regulations⁶ (the Regulations) in terms of Chapter 5 of the National Environmental Management Act, 1998⁷ (NEMA). The Regulations replaced the Environmental Impact Assessment (EIA) regulations, which were promulgated in terms of the Environment Conservation Act, 1989⁸ in 1997. The new regulations came into place on 3 July 2006 and, therefore, all new applications submitted after this date (and prior to June 2010) must have been made in terms of the New NEMA regulations and not in terms of the New Regulations of the ECA. The Minister of Environmental Affairs (DEA) passed in June 2010 the **Amended Environmental Impact Assessment Regulations** in terms of Chapter 5 of the National Environmental Management Act, 1998 (NEMA). The Amended Regulations came into effect on 2 August 2010. The purpose of this process is to determine the possible negative and positive impacts of the proposed development on the surrounding environment and to provide measures for the mitigation of negative impacts and to maximise positive impacts.

Notice R. 544, R 545, & R 546 of the Amended Regulations list activities that indicate the process to be followed. The Activities listed in Notice No. Notice R. 544 & R 546 require that a Basic Assessment process be followed and the activities listed in Notice No. R 545 requires that the Scoping and EIA process be followed.

In the environmental application process (to be compiled in terms of NEMA) the applicant is applying for the following listed activities:

Table 1: Listed activities in terms of Notice R. 544, 545 & R 546 submitted to MDEDET

No. & date of the relevant notice:	Activity number	Activity Description
Listing Notice 1, 544, 18 June 2010	9	The construction of facilities or infrastructure exceeding 1000m in length for the bulk transportation of water, sewer or stormwater – (i) with an internal diameter of

⁶ Environmental Impact Regulations, 2006

⁷ Act No. 107 of 1998

⁸ Act No. 73 of 1989

		<p>(ii) 0,36m or more; or with a peak throughput of 120 l per second or more</p> <p>Reason for inclusion: To make provision for the construction of pipelines exceeding 1000m in length with an internal diameter of more than 0,36 m for the bulk transportation of water, sewage or stormwater if required.</p>
Listing Notice 1, 544, 18 June 2010	11	<p>The construction of: (i) canals (iii) bridges (iv) dams (v) bulk storm water outlets (xi) infrastructure or structures covering 50 square metres or more -</p> <p>where such construction occurs within a watercourse or within 32m of a watercourse</p> <p>Reason for inclusion: To make provision for the construction of above-mentioned structures within the Sabie River or within 32m of the Sabie River if required i.e. settling pond</p>
Listing Notice 1, 544, 18 June 2010	13	<p>The construction of facilities or infrastructure for the storage, or for the storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 80 but not exceeding 500 cubic metres</p> <p>Reason for inclusion: To make provision for the storage and handling of hazardous waste (i.e. glue waste and contaminated off-cuts of wood) in containers above the threshold and the storage and handling of diesel/petrol.</p>
Listing Notice 1, 544, 18 June 2010	18	<p>The infilling or depositing of material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soils or rock from:</p> <p>(i) a watercourse</p> <p>but excluding where such infilling, depositing, dredging, excavation, removal</p>

		<p>or moving</p> <ul style="list-style-type: none"> (i) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or (ii) occurs behind the development setback line. <p>Reason for inclusion: To make provision for the infilling or removal of soil from the Sabie River and associated wetland if required.</p>
Listing Notice 1, 544, 18 June 2010	22	<p>The construction of a road, outside urban areas,</p> <ul style="list-style-type: none"> (i) with a reserve wider than 13,5 metres or (ii) where no reserve exists where the road is wider than 8 metres (iii) for which an environmental authorisation was obtained in terms of Activity 5 in Government Notice 387 of 2006 or activity 18 in Notice 545 of 2010 <p>Reason for inclusion: To make provision for the realignment of roads D2220 and D2431 and road upgradings.</p>
Listing Notice 1, 544, 18 June 2010	23	<p>The transformation of undeveloped, vacant or derelict land to –</p> <ul style="list-style-type: none"> (i) industrial use inside an urban area, and where the total area to be transformed is 5 ha or more, but less than 20 hectares, or (ii) industrial use outside an urban area where the total area to be transformed is bigger than 1 ha and smaller than 20 hectares <p>Reason for inclusion: To make provision for the expansion of the current facilities at the Sabie Site.</p>
Listing Notice 1, 544, 18 June 2010	24	<p>The transformation of land bigger than 1000 square metres in size, to residential, retail, commercial, industrial or institutional use, where, at the time of the coming into</p>

		<p>effect of this Schedule such land was zoned open space, conservation or had an equivalent zoning.</p> <p>Reason for inclusion: A section of the study area is currently zoned open space.</p>
Listing Notice 1, 544, 18 June 2010	27	<p>The decommissioning of existing facilities or infrastructure for:</p> <p>(iv) activities, where the facility or land on which it is located is contaminated; (v) storage or storage and handling of dangerous goods of more than 80 cubic metres</p> <p>Reason for inclusion: To make provision for the decommissioning of existing facilities or infrastructure located on contaminated land or used for the storage and handling of dangerous goods.</p> <p>The upgrading of the existing plant will require some demolition activities and alterations/upgradings in existing areas and such activities could reveal some contaminated land or could require the temporary/permanent storage and handling of dangerous goods within the threshold as supplied in this activity.</p>
Listing Notice 1, 544, 18 June 2010	28	<p>The expansion of existing facilities for any process or activity where such expansion will result in the need for a new, or amendment of, an existing permit or license in terms of national or provincial legislation governing the release of emissions or pollution, excluding where the facility, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Waste Act, 2008 (Act No. 59 Of 2008) in which case that Act apply.</p> <p>Reason for inclusion: The proposed activities will result in the need of new licenses or the amendment of existing licenses/permits that regulate pollution (i.e. Conversion Application for Air Emissions Licenses, New Air Emissions</p>

		License Applications, Water Use licenses and Waste licenses).
Listing Notice 1, 544, 18 June 2010	37	<p>The expansion of facilities or infrastructure for the bulk transportation of water, sewage or storm water where:</p> <ul style="list-style-type: none"> (a) the facility or infrastructure is expanded by more than 1000m in length, or (b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more – <p>excluding where such expansion:</p> <ul style="list-style-type: none"> (i) relates to transportation of water, sewage or storm water within a road reserve; or (ii) where such expansion will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse. <p>Reason for inclusion: To make provision for the expansion of facilities or infrastructure for the bulk transportation of water, sewage or storm water outside road reserves or within 32 metres from the Sabie River.</p>
Listing Notice 1, 544, 18 June 2010	39	<p>The expansion of</p> <ul style="list-style-type: none"> (i) canals (v) bulk storm water outlet structures <p>within a watercourse or within 32 metres of a watercourse, where such an expansion will occur behind the development setback line.</p> <p>Reason for inclusion: To make provision for the possible widening of a bridge across Sabie River/ new bridge/ structures across the Sabie River and the expansion of canals and storm water outlet structures within the Sabie River if required.</p>
Listing Notice 1, 544, 18 June 2010	40	<p>The expansion of</p> <ul style="list-style-type: none"> (iii) buildings by more than 50 square metres <p>within a watercourse or within 32 metres of</p>

		<p>a watercourse, measured from the edge of a watercourse, but excluding where such expansion will occur behind the development setback line.</p> <p>Reason for inclusion: To make provision for the possible expansion of buildings within 32m from the Sabie River if required.</p>
Listing Notice 1, 544, 18 June 2010	42	<p>The expansion of facilities for the storage, or storage and handling of a dangerous good, where the capacity of such storage facility will be expanded by 80 cubic metres or more.</p> <p>Reason for inclusion: To make provision for the expansion of facilities for the storage and handling of dangerous goods (i.e. glue waste, ash, contaminated off-cuts of wood) if required.</p>
Listing Notice 1, 544, 18 June 2010	47	<p>The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre-</p> <ul style="list-style-type: none"> (i) where the existing reserve is wider than 13,5 metres; or (ii) where no reserve exists, where the existing road is wider than 8 metres. <p>Reason for inclusion: To make provision for the widening or lengthening of existing roads if required.</p>
Listing Notice 1, 544, 18 June 2010	56	<p>Phased activities for all activities listed in this schedule, which commenced on or after the effective date of this schedule, where any one phase of the activity may be below a threshold.</p> <p>Reason for inclusion: To make provision for phased activities associated with the upgrading of the plant that may be above the thresholds as listed when considered collectively.</p>
Listing Notice 2, 545, 18 June 2010	3	<p>The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than</p>

		<p>500 cubic meters.</p> <p>Reason for inclusion: To make provision for the storage and handling of dangerous goods in containers above the threshold i.e. glue waste, contaminated wood off-cuts, etc.)</p>
Listing Notice 2, 545, 18 June 2010	5	<p>The construction of facilities for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, effluent and which is not identified in Notice No. 544 or included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act. No. 59 of 2008) in which case the Act will apply.</p> <p>Reason for inclusion: The proposed expansion of the Sabie Site will result in the need of new licenses or the amendment of existing licenses/permits that regulate pollution (i.e. Conversion Application for Air Emissions Licenses, New Air Emissions License Applications, Water Use licenses and Waste licenses).</p>
Listing Notice 2, 545, 18 June 2010	15	<p>Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more.</p> <p>Reason for inclusion: To make provision for the expansion of the existing facilities at York Timbers' Sabie Site</p>
Listing Notice 2, 545, 18 June 2010	18	<p>The route determination of roads and design of associated physical infrastructure, including roads that have not yet been built for which routes have been determined before 30 July 2006 and which have not been authorised by a competent authority in terms of the Environmental Impact Assessment Regulations, 2006 or 2009, made under section 24(5) of the Act and published in Government Gazette Notice No. R. 385 of 2006 –</p>

		<ul style="list-style-type: none"> (i) it is a national road as defined in section 40 of the South African National Roads Agency Limited and National Roads Act, 1998 (Act No. 7 of 1998); (ii) it is a road administered by a provincial authority; (iii) the road reserve is wider than 30 metres; or (iv) the road will cater for more than one lane of traffic in both directions. <p>Reason for inclusion: To make provision for the re-alignment of Provincial road D2220 and road D2431 as well as road upgradings required for the expansion of the plant.</p>
Listing Notice 3, 546, 18 June 2010	4	<p>The construction of a road that is wider than 4 metres with a reserve less than 13,5 metres.</p> <ul style="list-style-type: none"> (a) In Mpumalanga: (ii) Outside an urban area, in: (cc)critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans. <p>Reason for inclusion: To make provision for the realignment of roads D2220 and D2431 within a critical biodiversity area. According to MDEDET C-Plan the study area falls within an area identified as Highly Significant in terms of Aquatic Biodiversity sub catchment and Terrestrial Biodiversity Assessment.</p>
Listing Notice 3, 546, 18 June 2010	10	<p>The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.</p> <ul style="list-style-type: none"> (b) In Mpumalanga: (ii) Outside urban areas, in: (cc)critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent

		<p>authority or in bioregional plans.</p> <p>Reason for inclusion: To make provision for construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good within a critical biodiversity area, if required.</p> <p>According to MDEDET C-Plan the study area falls within an area identified as Highly Significant in terms of Aquatic Biodiversity sub catchment and Terrestrial Biodiversity Assessment</p>
Listing Notice 3, 546, 18 June 2010	12	<p>The clearance of an area of 300 square metres or more of vegetation where 75% or more of vegetative cover constitutes indigenous vegetation.</p> <p>(b)within critical biodiversity areas identified in bioregional plans.</p> <p>Reason for inclusion: To make provision for the clearance of vegetation if required by the upgrading of the plant.</p> <p>According to MDEDET C-Plan the study area falls within an area identified as Highly Significant in terms of Aquatic Biodiversity sub catchment and Terrestrial Biodiversity Assessment</p>
Listing Notice 3, 546, 18 June 2010	13	<p>The clearance of an area of 1 ha or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation.</p> <p>(a)within critical biodiversity areas identified in bioregional plans.</p> <p>(c)(ii) Outside urban areas, in: (cc)critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.</p> <p>Reason for inclusion: To make provision for the clearance of vegetation if required by the upgrading of the plant.</p>

		<p>According to MDEDET C-Plan the study area falls within an area identified as Highly Significant in terms of Aquatic Biodiversity sub catchment and Terrestrial Biodiversity Assessment.</p>
<p>Listing Notice 3, 546, 18 June 2010</p>	<p>14</p>	<p>The clearance of an area of 1 ha or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation.</p> <p>Reason for inclusion: To make provision for the clearance of vegetation if required by the upgrading of the plant.</p> <p>According to MDEDET C-Plan the study area falls within an area identified as Highly Significant in terms of Aquatic Biodiversity sub catchment and Terrestrial Biodiversity Assessment</p>
<p>Listing Notice 3, 546, 18 June 2010</p>	<p>16</p>	<p>The construction of:</p> <p>(iii) buildings with a footprint exceeding 10 square metres in size , or infrastructure covering 10 square metres or more</p> <p>Where such construction occurs within a watercourse or within 32m of a watercourse measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</p> <p>(a) Mpumalanga (c) (ii) Outside urban areas, in: (cc) critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.</p> <p>Reason for inclusion: To make provision for the construction of buildings or infrastructure exceeding above limits within the Sabie River or within 32m from the Sabie River or associated wetlands if required.</p> <p>According to MDEDET C-Plan the study area falls within an area identified as Highly Significant in terms of Aquatic Biodiversity sub catchment and Terrestrial Biodiversity Assessment</p>

1.3 Listed Activities in terms of NEMWA

The applicant is applying for the following activities in terms of the NEMWA:

Table 2: Listed activities in terms of Notice R. 718, 3 July 2009 submitted to MDEDET

No. & date of the relevant notice:	Activity numbers (as listed in the waste management activity list) :	Description of listed activity:
R. 718, 3 July 2009	Category A: Item 3 (1)	<p>The storage, including the temporary storage, of general waste at a facility that has the capacity to store in excess of 100m³ of general waste at any one time, excluding storage of waste in lagoons.</p> <p>Reason for inclusion: To make provision for the storage of general waste above the threshold if required.</p>
R. 718, 3 July 2009	Category A Item 3 (8)	<p>"The recovery of waste including refining, utilisation, or co-processing of the waste at a facility to process in excess of three tons of general waste or less than 500kg of hazardous waste per day, excluding recovery that takes place as an integral part of an internal manufacturing process within the same premises."</p> <p>Reason for inclusion: Composting site for surplus bark on portion of wet log deck</p>
R. 718, 3 July 2009	Category A: Item 3 (12)	<p>The remediation of contaminated land</p> <p>Reason for inclusion: Bioremediation site at mobile workshop. If demolition works reveal any contaminated land, some remediation measures could be required.</p>
R. 718, 3 July 2009	Category A: Item 3 (18)	<p>The construction of facilities for activities listed in Category A of this Schedule (not in isolation to associated activity)</p> <p>Reason for inclusion: Some of the existing facilities might require</p>

		upgrading/improvements (i.e. the provision of concrete flooring/bunded areas.
R. 718, 3 July 2009	Category A: Item 3 (19)	<p>The expansion of facilities or changes to existing facilities for any process or activity, which requires an amendment of an existing permit or licence or a new permit or licence in terms of legislation governing the release of pollution, effluent or waste.</p> <p>Reason for inclusion: The proposed expansion of the Sabie Site will result in the need of new licenses or the amendment of existing licenses/permits that regulate pollution (i.e. Conversion Application for Air Emissions Licenses, New Air Emissions License Applications and Water Use licenses).</p>
R. 718, 3 July 2009	Category A: Item 3 (20)	<p>The decommissioning of activities listed in this schedule</p> <p>Reason for inclusion: The decommissioning of the Mount Anderson landfill site is proposed. Please note: the landfill site was not classified as hazardous. In addition, the proposed upgrading to the plant could also require the decommissioning of some of the activities that are listed in the schedule.</p>
R. 718, 3 July 2009	Category B: Item 4 (8)	<p>The incineration of waste regardless of the capacity of such a facility.</p> <p>Reason for inclusion: Burning of wood off-cuts, clean bark, saw dust and wood chips as boiler fuel.</p>
R. 718, 3 July 2009	Category B: Item 4 (10)	<p>The disposal of general waste to land covering an area in excess of 200m².</p> <p>Reason for inclusion: The disposal of soil covered bark in borrow pit (off site on York plantation). Composting site for surplus bark on portion of wet log deck</p>
R. 718, 3 July 2009	Category B: Item 4 (11)	<p>The construction of facilities for activities listed in Category B of this Schedule (not in isolation to associated activity)</p>

		<p>Reason for inclusion:</p> <p>To make provision for the construction of facilities for the composting storage site and for wood off-cuts, clean bark, saw dust and wood chips as boiler fuel.</p>
--	--	--

As already mentioned this Report represents the EIAR for the NEMA EIA application for activities triggered in listing notices 1-3 (*reference number: 17/2/3/E-152*), the General Waste License application in terms of NEMWA (*reference number: 17/4/WL/MP321/12/01*) to be submitted to MDEDET and the Hazardous Waste License application to be submitted to DEA.

Table 3: Listed activities in terms of Notice R. 718, 3 July 2009 to be submitted to DEA

No. & date of the relevant notice:	Activity numbers (as listed in the waste management activity list) :	Description of listed activity:
R. 718, 3 July 2009	Category A: Item 3 (2)	<p>The storage, including the temporary storage of hazardous waste at a facility that has the capacity to store in excess of 35m³ of general waste at any one time, excluding the storage of hazardous waste in lagoons.</p> <p>Reason for inclusion:</p> <p>To make provision for the temporary storage of hazardous waste (i.e. contaminated off-cuts of plywood, Fibre Board plant and Value Adding Plant) above the threshold and the storage and handling of diesel/petrol.</p>
R. 718, 3 July 2009	Category B: Item 4 (2)	<p>The reuse and recycling of hazardous waste</p> <p>Reason for inclusion:</p> <p>To make provision for the reuse and recycling of hazardous waste i.e. incineration of plywood off-cuts, off-cuts from the Fibre Board Plant and Value Adding Plant, all containing glue.</p>
R. 718, 3 July	Category B: Item 4 (7)	The treatment of effluent, wastewater or

<p>2009</p>		<p>sewage with an annual throughput of 15 000 cubic meters or more.</p> <p>Reason for inclusion: On site treatment of sewage and discharge of treated effluent in the area of the existing on-site sewage treatment facility. The current sewage treatment works has a capacity of 250m³/day, which equals 91 250 m³ per annum. The proposed upgrading to the plant could require a larger sewage treatment facility.</p>
<p>R. 718, 3 July 2009</p>	<p>Category B: Item 4 (9)</p>	<p>The disposal of any quantity of hazardous waste to land.</p> <p>Reason for inclusion: The disposal of hazardous waste i.e. sewage sludge to land (in forest plantations, for rehabilitation of disturbed/degraded soils).</p>
<p>R. 718, 3 July 2009</p>	<p>Category B: Item 4 (11)</p>	<p>The construction of facilities for activities listed in Category B of this Schedule (not in isolation to associated activity)</p> <p>Reason for inclusion: The construction of the Sewage Treatment Works and other facilities for activities as listed above.</p>

1.4 The Town Planning Process

The town planning application on the subject property would best be dealt with in terms of the provisions of the Development Facilitation Act (DFA), 1995. This act is specifically aimed at creating a single legal mechanism to deal with all the diverse aspects of land development in an integrated fashion. This implies that all the preparatory work must be concluded prior to the submission of the application to ensure that it may be evaluated by all role-players, taking cognisance of all the important aspects, such as access arrangements, provision of services, environmental impact etc. **Umsebe Development Planners** was appointed for the DFA Application for the establishment of a Land Development Area (LDA) to be known as **Sabie X 17**.

The DFA Application had been approved by the Mpumalanga Tribunal (**refer to Annexure L**).

1.5 Environmental Assessment Practitioner (EAP)

The new Environmental Regulations require that relevant details of the independent Environmental Assessment Practitioner be included as part of the Scoping Report. In this regard, attached as **Annexure M**, is a copy of the CV of Lizelle Gregory as well as the company profile of Bokamoso Landscape Architects and Environmental Consultants. In summary details of the EAP are indicated below:

- **Name:** Lizelle Gregory
- **Company:** Bokamoso Landscape Architects and Environmental Consultants.
- **Qualifications:** Registered Landscape Architect and Environmental Consultant (degree obtained at the University of Pretoria) with 17 years experience in the following fields:
 - Environmental Planning and Management;
 - Compilation of Environmental Impact Assessments;
 - Landscape Architecture; and
 - Landscape Contracting

Ms. L. Gregory also lectured at the Technicon of South Africa and the University of Pretoria. She is a registered member at the South African Council of the Landscape Architects Profession (SACLAP), International Association of Impact Assessments (IAIA), Institute for Landscape Architects in South Africa (ILASA) and the Institution for Environmental Management and Assessment (IEMA).

1.6 Scope of Work and Approach to the Study

An application form for Environmental Authorisation of the relevant activity as well as an Environmental Scoping Report has been submitted to MDEDET. An investigative approach was followed and the relevant physical, social, economic and institutional environmental aspects were assessed.

The scope of work includes the necessary investigations, to assess the suitability of the study area and the surrounding environment for the proposed activities. The Scoping exercise identified the anticipated environmental aspects in an issues matrix and it also supplied a preliminary significance rating for the impacts identified. The Scoping process also assessed the possible impacts of the proposed development on the surrounding environment (including the interested and affected parties).

As already mentioned this document represents the EIA Report for the proposed Sabie Site Expansion Project. The EIA Report must be in line with Section 32 of the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998) and the Approved Plan of Study for EIA that was submitted as part of the Scoping Report.

The EIA takes into consideration the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity. A description of the property on which the activity is to be undertaken and the location of the activity on the property are described. A description of the proposed activity and any feasible and reasonable alternatives were identified. In addition, a description of the need and desirability of the proposed activity, including advantages and disadvantages that the proposed activity or alternatives may have, on the environment and community that may be affected by the activity are included.

An identification of all Legislation and Guidelines that we are currently aware of is considered in the preparation of this EIA Report. Furthermore a description of environmental issues and potential impacts, including cumulative impacts, are identified

and discussed. Information on the methodology that will be adopted in assessing the potential impacts is furthermore identified, including any specialist studies or specialised processes that were/ should be undertaken.

The EIA Report eventually determines whether a proposed project should receive the “go-ahead” or whether the “no-go” option should be followed. If the EAP recommends that the project receive the “go-ahead”, it will (in most cases) be possible to mitigate the issues identified to more acceptable levels. Reference is also made to the mitigation of identified impacts or for further studies that may be necessary to facilitate the design and construction of an environmentally acceptable facility.

Details of the Public Participation Process (in terms of Sub-Regulation 1) are also included. Sub-Regulation 1 requires that the following information be included as part of the Public Participation Section of the EIA Report:

- (i) The steps undertaken in accordance with the Plan of Study For EIA;
- (ii) A list of persons, organisations and government organs that were registered as interested and affected parties;
- (iii) A summary of comments received from, and a summary of issues raised by the interested and affected parties, the date of receipt of these comments and the response of the EAP to those comments; and
- (iv) Copies of any representations, objections and comments received from the registered interested and affected parties.

The mitigation measures and guidelines that are listed in the EIA Report are also summarised in a user-friendly document named an Environmental Management Plan (EMP). A Draft EMP is also a requirement of the EIA Process (Section 32 and 34 of the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998).

2. LOCALITY

The study area is located in Mpumalanga Province, within the area of jurisdiction of Thaba Chweu Local Municipality and to the immediate west of the small town of Sabie.

In a local context, the study area is divided (into a northern and southern portion) by the west-east stretching road D2220 (Old Lydenburg Road) and it lies approximately 2km to the west of the Sabie Town Centre (**refer to Figures 1 & 2**). The existing plant covers almost the entire northern portion and the York Timbers' workers village named the ACME village covers almost the entire southern portion.

The Sabie Extension 6 and Extension 9 Townships and the Lone Creek River Lodge are situated to the immediate east of the study area and the Mt Anderson Residential Township is situated to the southeast of the study area. The Sabie River forms the northern boundary and a portion of the western boundary of the study area.

The study area is accessible via Old Lydenburg Road (D2220) and from the P33-3 (R532) via a dirt road. Road D2431 traverses the application site providing access to Bridal Veil Falls and Shonalanga village further to the north.

3. REGISTERED OWNERS AND TITLE DEEDS

York Timbers (Pty) Ltd is the registered owner of the properties in terms of Deed of Transfer **T127464/2007**.

4. EXISTING ZONING AND LAND USE AND PROPOSED ZONING AND LAND USE

4.1 Existing Zoning and Land Use

Existing Zoning

The study area is situated outside the Sabie Town Planning Scheme Boundary, 1984.

Existing Land Use

The study area is currently used for the following:

- The sawmill and plywood plant including the manufacturing, processing, storage and trade in timber products and uses ancillary thereto.
- ACME village, a residential village with associated community facilities that provides housing to mainly the people employed at the plant.
- Sabie sports and recreational facilities comprising of 3 sports fields and the Bambanane Hall.
- Mount Anderson Landfill Site.
- The remaining areas are vacant.

Refer to Figure 11, Existing Land Uses

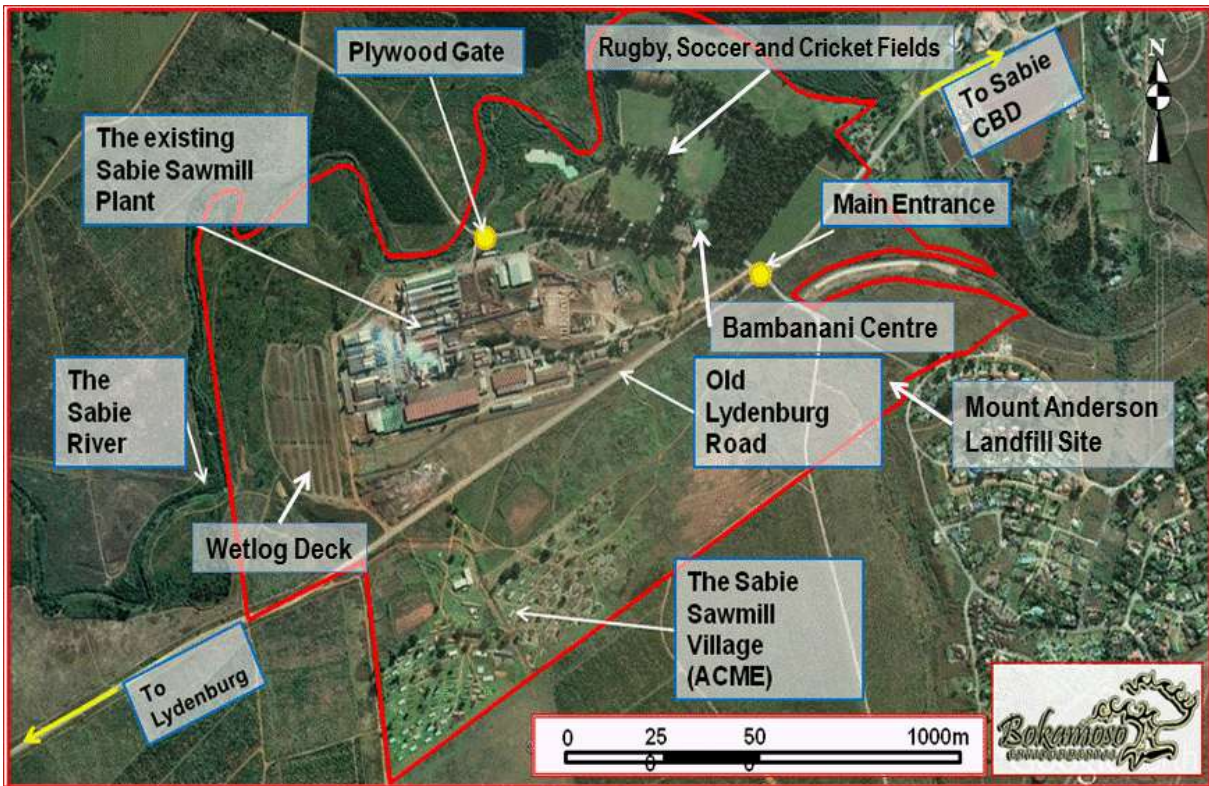


Figure 11: Existing Land Uses

The sizes (m²) of existing facilities are indicated in **Table 4** below:

Table 4: Existing Facilities

No	Facility	Area (m ²)
1	Clinic	260.00
2	General industrial	330.12
3	Store	1733.49
4	Sawmill Moulding Plant	2869.82
5	Sawmill Dry Mill	3704.25
6	Undercover dispatch	1070.40
7	Sawmill Planer Mill	14609.58
8	Sawmill Finger Joint Plant	3957.63
9	Treatment plant	218.40
10	Labour gate	39.26
11	Cooling shed	1715.40

12	Cooling shed	1299.15
13	Kiln 1	2458.92
14	General industrial	696.48
15	General industrial	810.98
16	Wood stock piles	1524.73
17	General industrial	899.56
18	Boiler house & power station	1949.10
19	Mechanical Workshop	813.32
20	Offices	1141.46
21	General industrial	537.40
22	Work office & Sub station	574.83
23	Filing shop	470.12
24	Old wet mill	2632.72
25	General industrial	866.71
26	Plywood peeler & Dryer	4652.57
27	Plywood pressed dryer	6845.52
28	Plywood warehouse & Glue kitchen	2359.65
29	General industrial	239.65
30	General industrial	509.17
31	Kiln 2 & 3	617.40
32	General industrial	1242.36
33	Kiln 4	412.70
34	Kiln 5 & 6	447.80
35	General industrial	374.50
36	General industrial	653.34
37	Kiln 7 & 8	939.92
38	General industrial	732.56
39	General industrial	499.78
40	Plywood warehouse	807.23
41	Plywood Logshed	2994.81
42	General industrial	336.41
43	WTW	643.44
44	General industrial	374.40
45	Transport workshop	1187.78
46	General industrial	340.48
47	General industrial	376.14
48	General industrial	300.70

49	ACME village	15736.58
50	Sports buildings	2565.84
	Total buildings:	93374.57

Servitudes

No diagrams are registered in the office of the Surveyor-General for servitudes that affect the Remaining Extent of Portion 101 of the farm Grootfontein 196 JT.

Agreements however exist between Eskom and York Timbers (Pty) Limited for the distribution of electricity to the plant, traversing the Remaining Extent of Portion 101 of the farm Grootfontein 196 JT. These power lines would have to be re-aligned to accommodate the proposed expansion. A separate EIA application will be submitted to DEA.



Figure 12 - Photograph of the North-South Stretching Eskom Power Line That Traverses the Western Section Of The Study Area

The portion of the Remainder of the farm Olifantsgeraamte 198 JT is subject to a servitude in favour of Eskom for an overhead electrical power line. This servitude, due to its alignment, does not affect the proposed development.

Property encroachments

Lone Creek River Lodge, located on Portion 29 and Portion 1 of Erf 766 Sabie Extension 6 encroached onto the Remaining Extent of Portion 101 of the farm Grootfontein 196 JT. **(refer to Figure 12: Encroachment sketch plan).**

This encroachment does not affect the existing and proposed Sabie Site land uses.

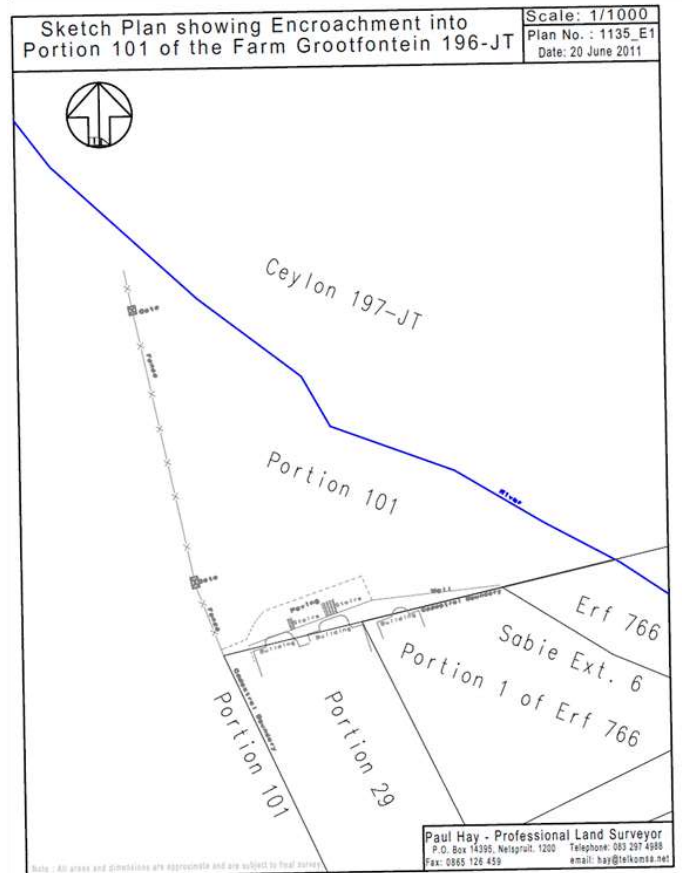


Figure 13 – Encroachment Plan

4.2 Proposed Zoning and Land Use

Information supplied by Umsebe Development Planners

Future Strategy

Currently York Timbers (Pty) Limited only has timber plantations, the sawmills and plywood plant where the **primary conversion** of timber takes place to provide structural and industrial sawn timber products and plywood timber products.

The future strategy of York Timbers (Pty) Ltd is to enter the secondary conversion sector where the production of a wide variety of end products is possible through optimising the use of its raw material (trees). **Refer to Diagram 2.**

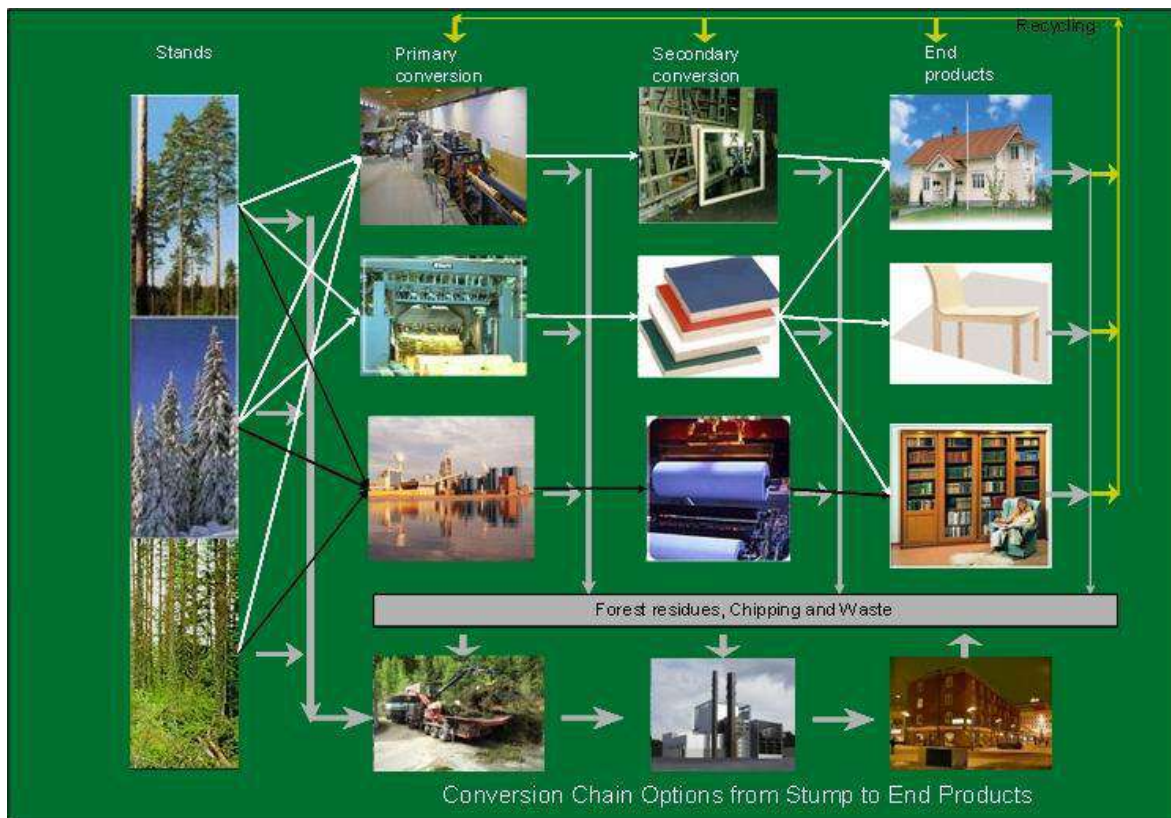


Diagram 2 – Conversion Chain Options from Stump to End Products

Further to this, the residues, such as forest residue, bark, sawdust, chips and shavings can be used more efficiently to produce thermal and electrical energy in a co-generation facility.

The future strategy requires the expansion of the current industrial plant to include a co-generation facility, value adding plants, upgrades to the sawmill and plywood plants and the relocation of the workshop and a final dispatch area.

4.2.1 Proposed Zoning

Refer to Figure 14, Zonings Map

In terms of the Sabie Town Planning Scheme, 1984 the erven in the proposed land development area are to be zoned as follows:

Zonings:

Erven 1, 2, 3 and 5: “Private Open Space”

These erven shall be zoned “Private Open Space” for the purposes of private open space, private clubs, agricultural buildings, agriculture, nurseries and special uses and will be subject to the following development controls:

- The height of the buildings to be erected shall not exceed 2 storeys.
- The coverage of the buildings and structures to be erected shall not exceed 1% of the area of the erf.
- The floor area ratio shall not exceed 0.02.
- The building lines will be 5m on any street boundary and 2m on any side boundary. This may be relaxed in terms of a Site Development Plan, approved by Thaba Chweu Local Municipality.
- Parking shall be provided to the satisfaction of the local authority.

Erf 4: “Industrial 2”

The erf shall be zoned “Industrial 2”, including a sawmill, plywood plant, log merchandising plant, co-generation facility, value adding plant, fibre processing plant and uses ancillary and or related to the main use and will be subject to the following development controls:

- The height of the buildings to be erected shall not exceed 2 storeys.
- The coverage of the buildings and structures to be erected shall not exceed 50% of the area of the erf.

- The floor area ratio shall not exceed 0.6.
- The building lines will be 5m on any street boundary and 2m on any side boundary. This may be relaxed in terms of a Site Development Plan, approved by Thaba Chweu Local Municipality.
- Parking spaces per 100m² gross leasable industrial floor area.

Erf 6: “Special”

The erf shall be zoned “Special for Provincial Roads”.

“Proposed new roads and widening”

The extension of Assegaai Street from Sabie Extension 9 (Mount Anderson) to the realigned D2220 road shall be a municipal road to be zoned “Proposed new roads and widenings”.

Roads and access

- Access to the new plant will be obtained off the realigned D2220 road.
- A 10m wide Right of Way servitude will be registered over Erf 1 in favour of the general public.
- A 15 wide Right of Way servitude will be registered over Portion 2 of the farm Grootfontein 196 JT in favour of all erven in the Land Development Area.
- A Right of Way servitude will be registered over Erf 4 to the graveyard in favour of the relatives of the deceased.

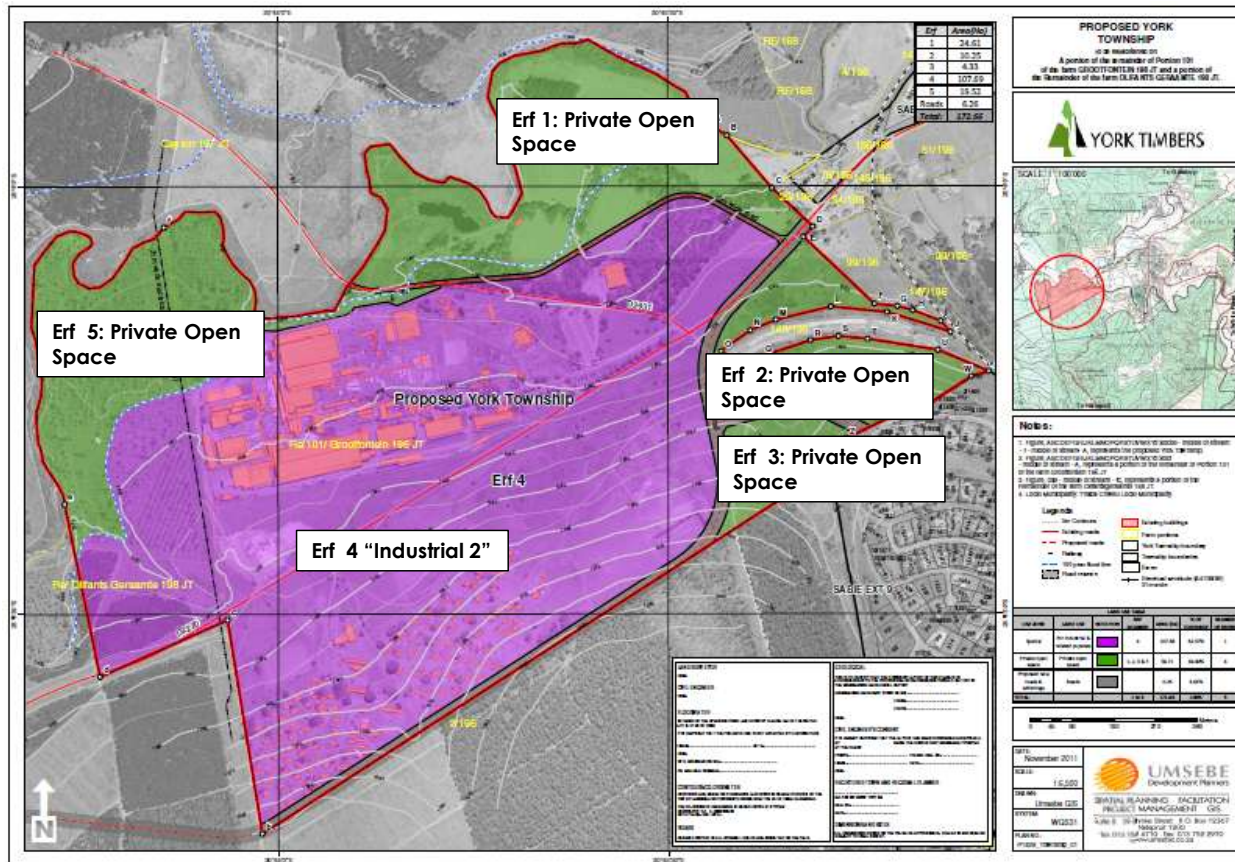


Figure 13: Proposed Zonings

4.2.2 Proposed Land Uses

As already mentioned York Timbers (Pty) Limited currently only has timber plantations, the sawmills and plywood plant where the **primary conversion** of timber takes place to provide structural and industrial sawn timber products and plywood timber products. The future strategy requires the expansion of the current industrial plant to include a co-generation facility, value adding plants, upgrades to the sawmill and plywood plants and the relocation of the workshop and a final dispatch area.

The proposed plant upgrade will consist of four phases, as described below:

- **Phase A** – is a **co-generation facility** that will replace the current boiler installations with three new chimney flue steam boilers utilising natural biomass fuels. At present

the plant is only producing heat, but the future plan is to produce both heat and electricity. The proposed electrical generation capacity for the co-generation plant is **30 MW** while the York Timbers Plant will consume an estimated **25 MW** of the generated energy. The remaining electricity will be fed into the municipal grid at rates yet to be agreed with Eskom. *As already mentioned an EIA application for the Co-Generation facility had been submitted to DEA.*

- **Phase B** – a merchandising log yard, where logs are harvested and transported to the site in tree lengths. A straight distance of at least 200m is required to accommodate the modern equipment required for the processes associated with this phase. These longer length logs are scanned and the optimal value length is determined and cut. These new lengths are sorted into value and size classes and then distributed to the correct processing facility. The log merchandising yard will have a planned intake of 1 000 000m³ per year.

- **Phase C** – is the upgrade of the sawmill and plywood plants. Both sites will be upgraded to increase throughput volumes. Intake volumes to the sawmill will be increased from 800m³ to 3500m³ and from 550m³ to 900m³ per day at the plywood plant. Equipment will be upgraded and replaced and additional equipment will be installed. Warehousing facilities will also be increased.

- **Phase D** - is a value adding plant. The type of value adding has not yet been decided yet, but it could be one or more of the following:
 - Engineered Wood Timber Products Plant,
 - Moulding Plant,
 - Component Manufacturing Plant, or
 - Medium Density Fibre Board (MDF) plant with an estimated output of 800m³/day.

A third of the total sawmill output will be processed in the value-adding plants.

Refer to Figure 10, Site layout Plan and Figure 15, Aerial Map of proposed land uses.

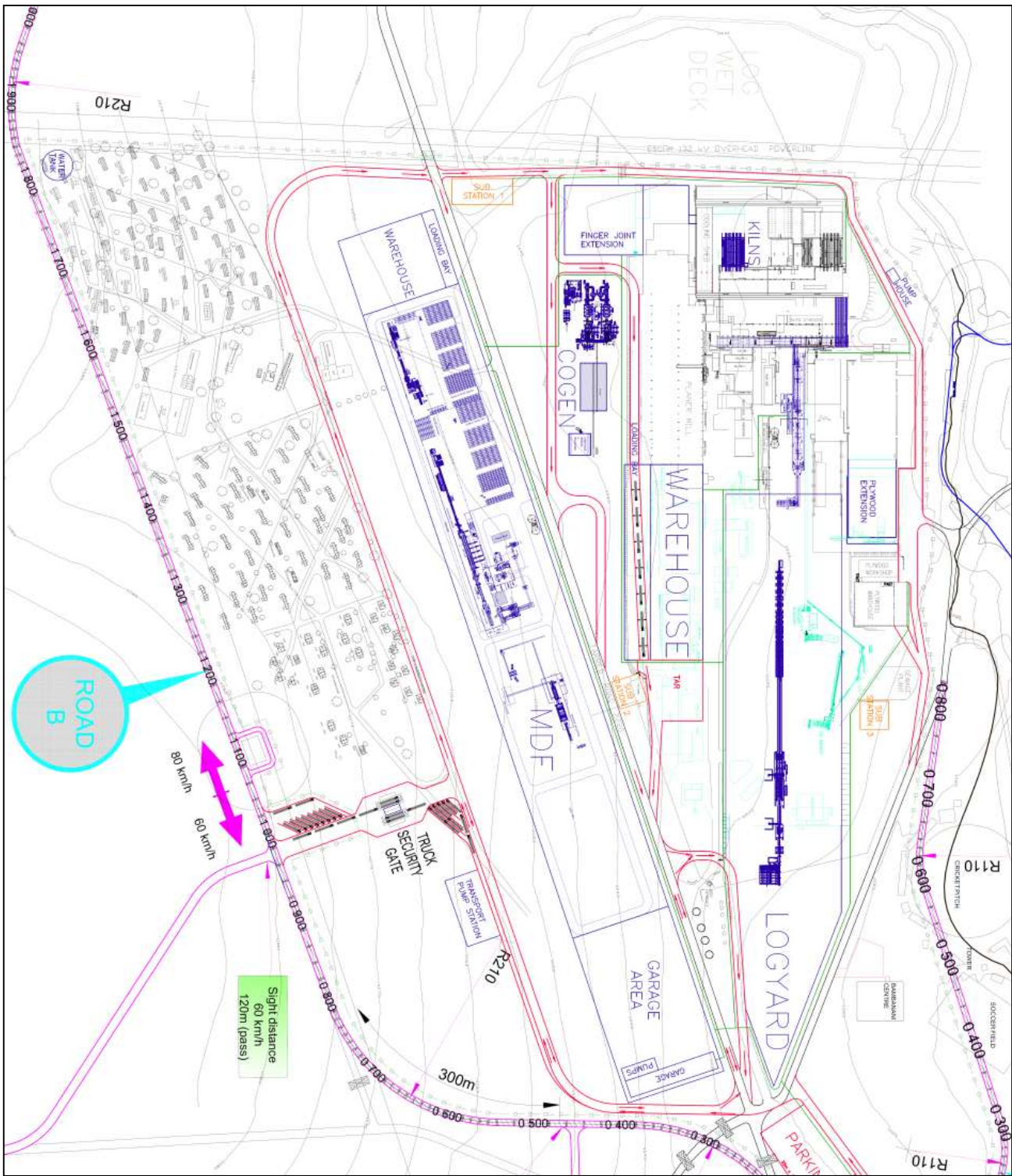


Figure 15: Proposed Land Uses

The integrated site process flows are indicated in Diagrams 3 - 11 below.

Diagram 3: Integrated Site Process Flow

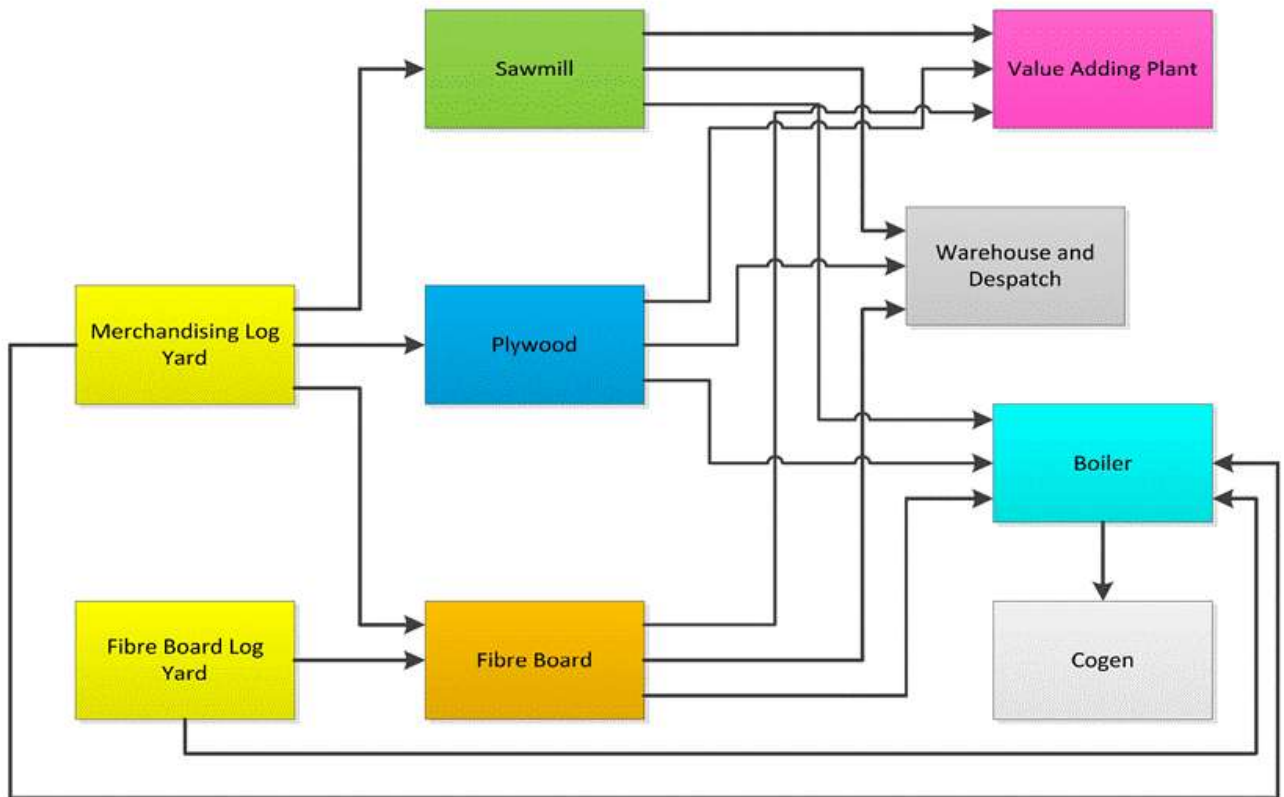


Diagram 4: Integrated Site Process Flow Merchandising Log Yard

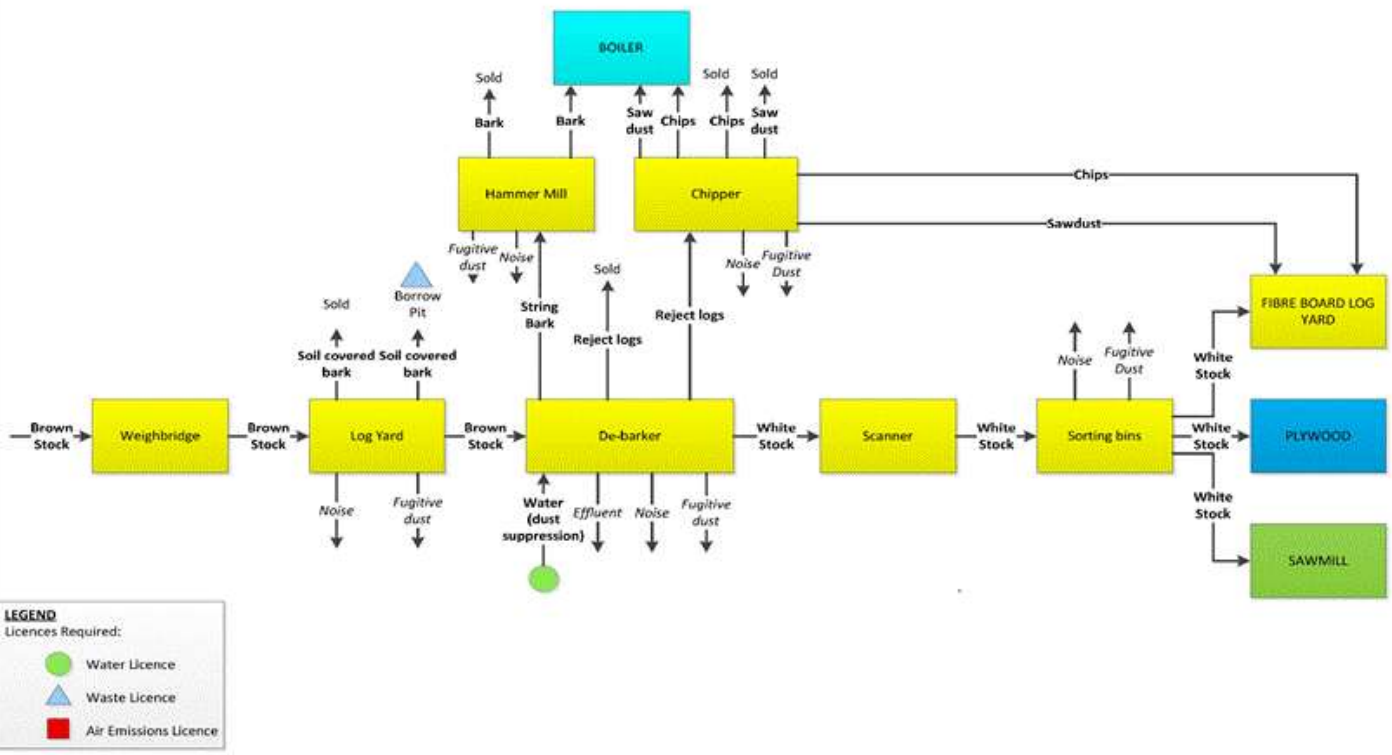


Diagram 5: Integrated Site Process Flow Sawmill

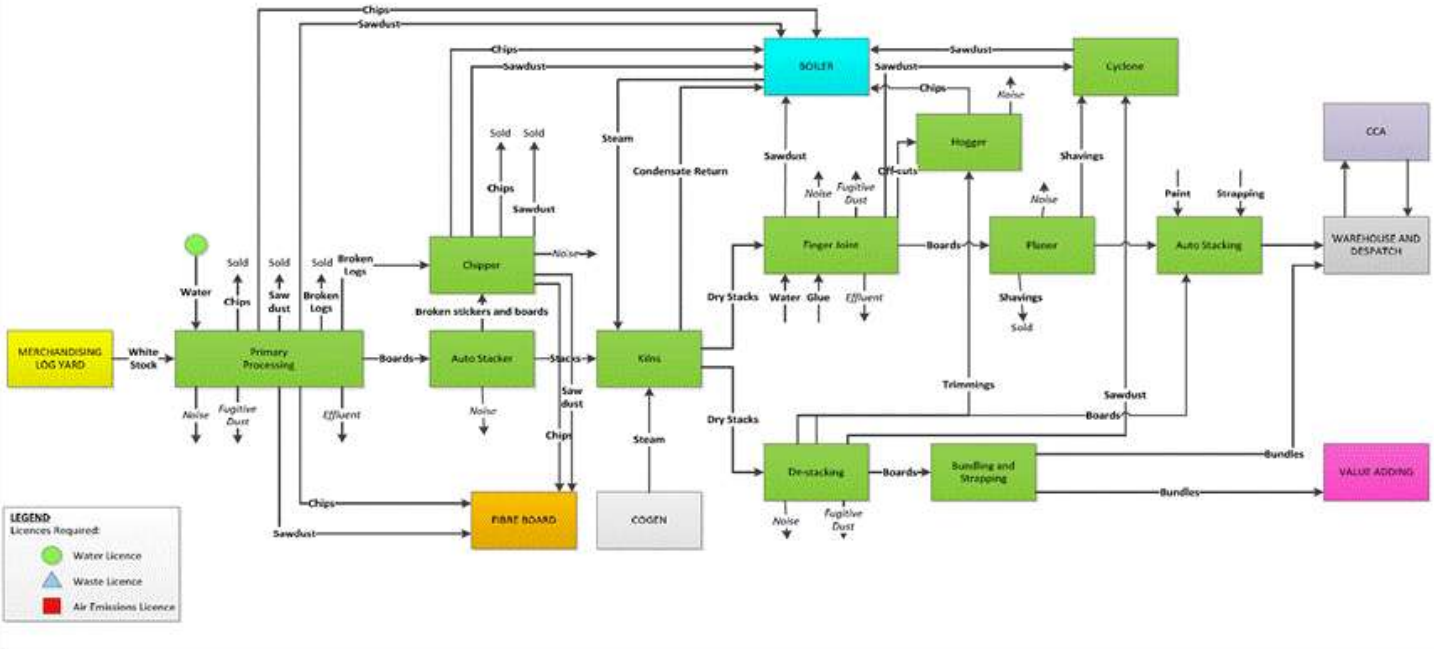


Diagram 6: Integrated Site Process Flow Plywood

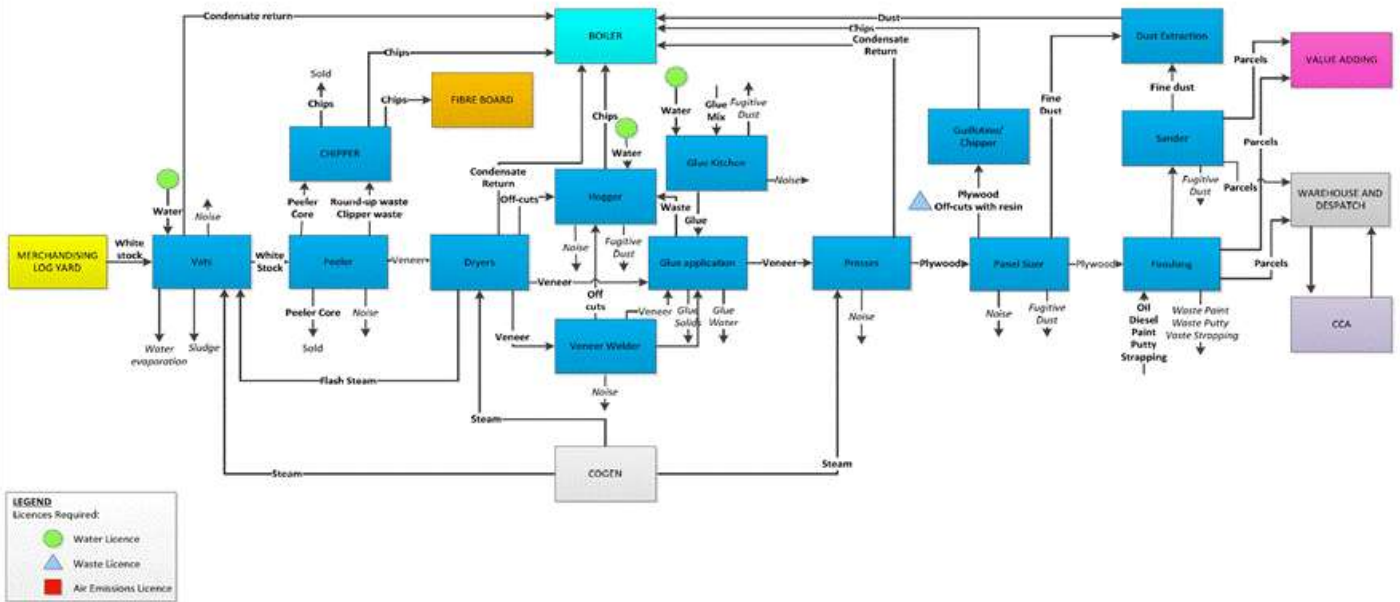


Diagram 7: Integrated Site Process Flow Fibre Board Log Yard

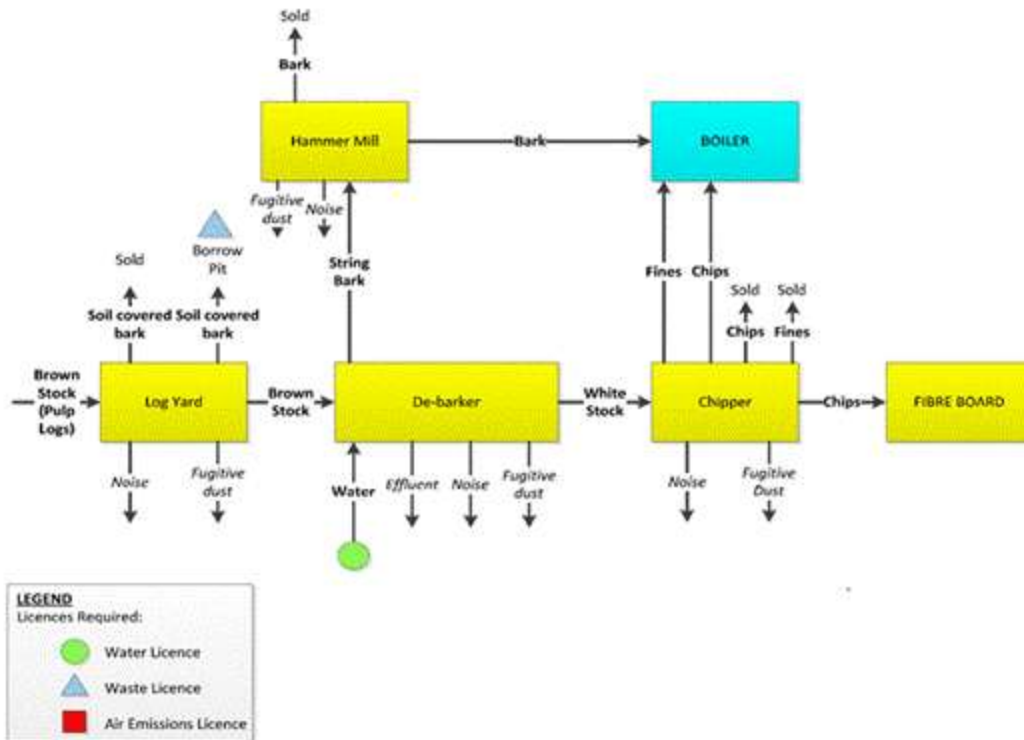


Diagram 8: Integrated Site Process Flow Fibre Board

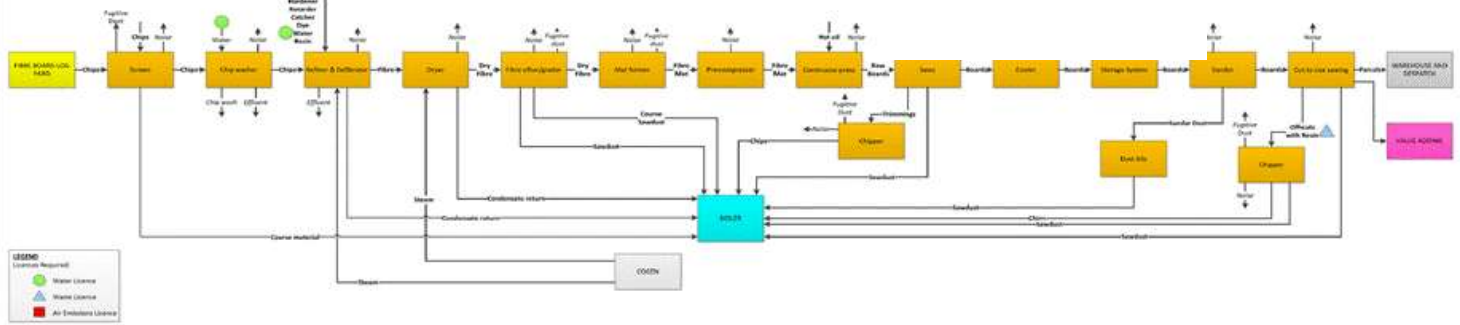


Diagram 9: Integrated Site Process Flow Value Adding

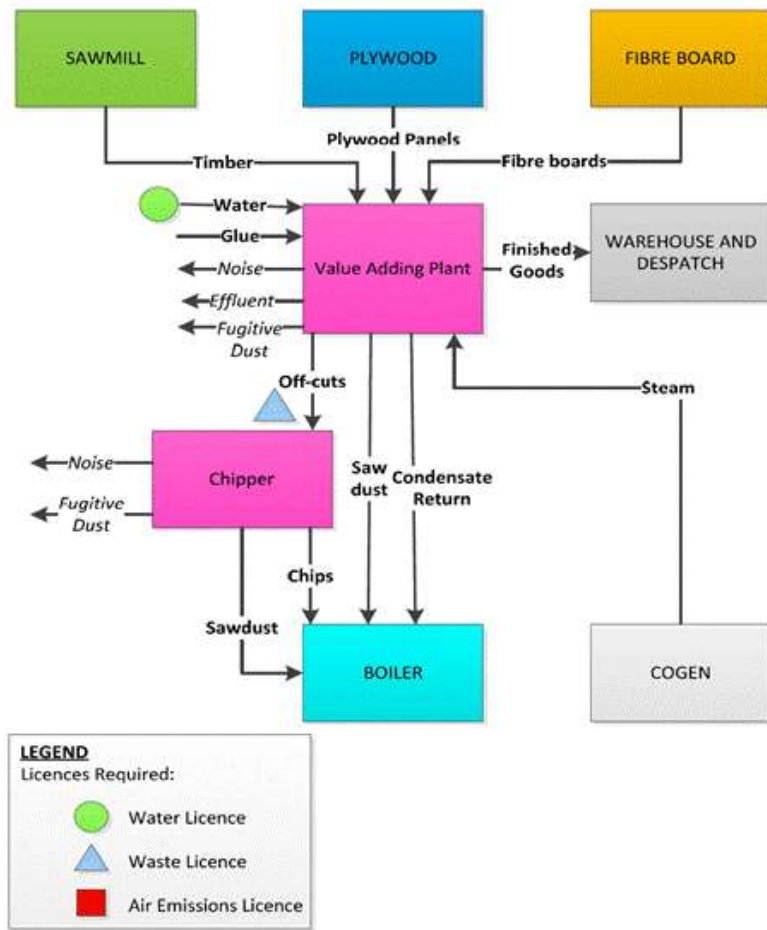


Diagram 10: Integrated Site Process Flow Boiler

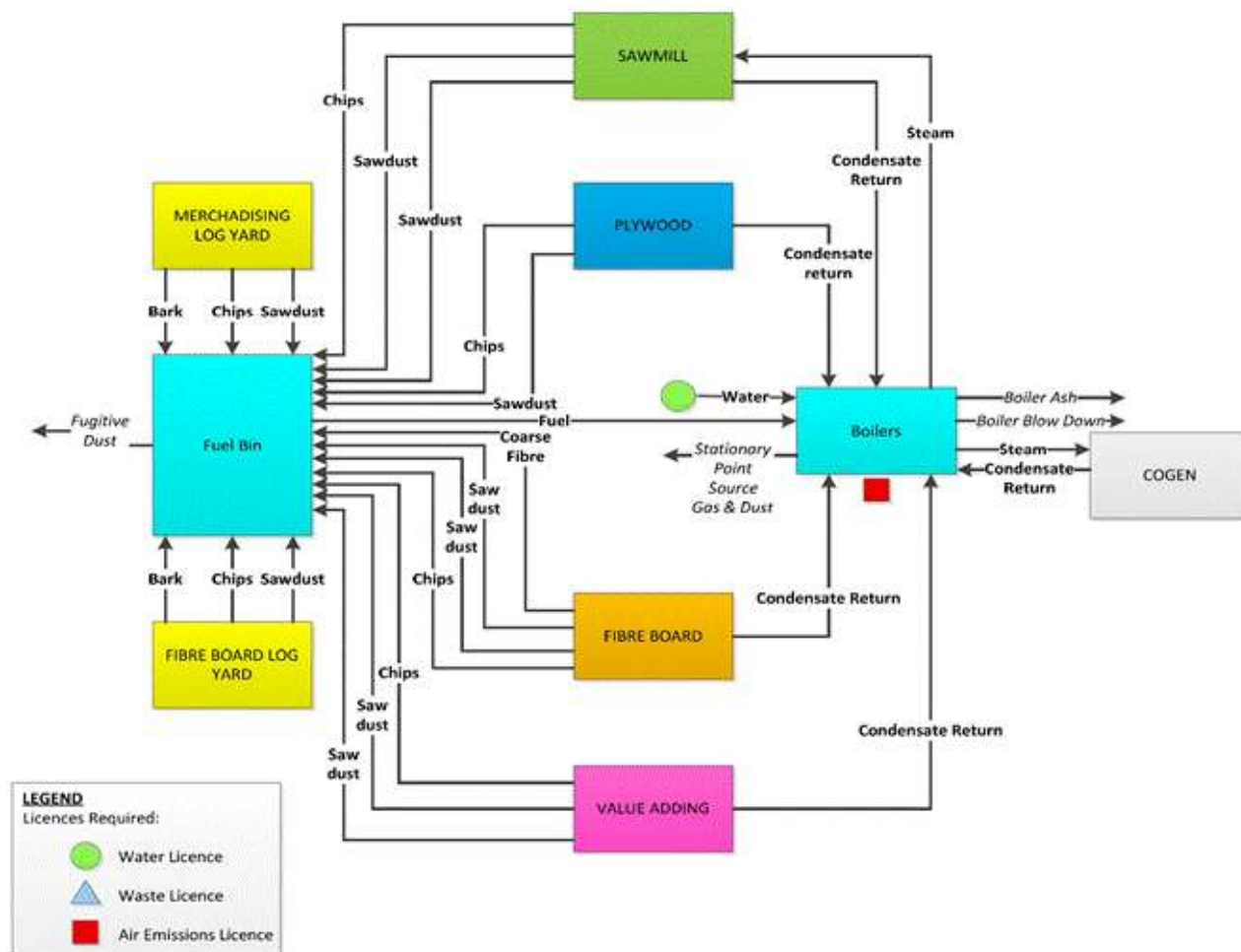
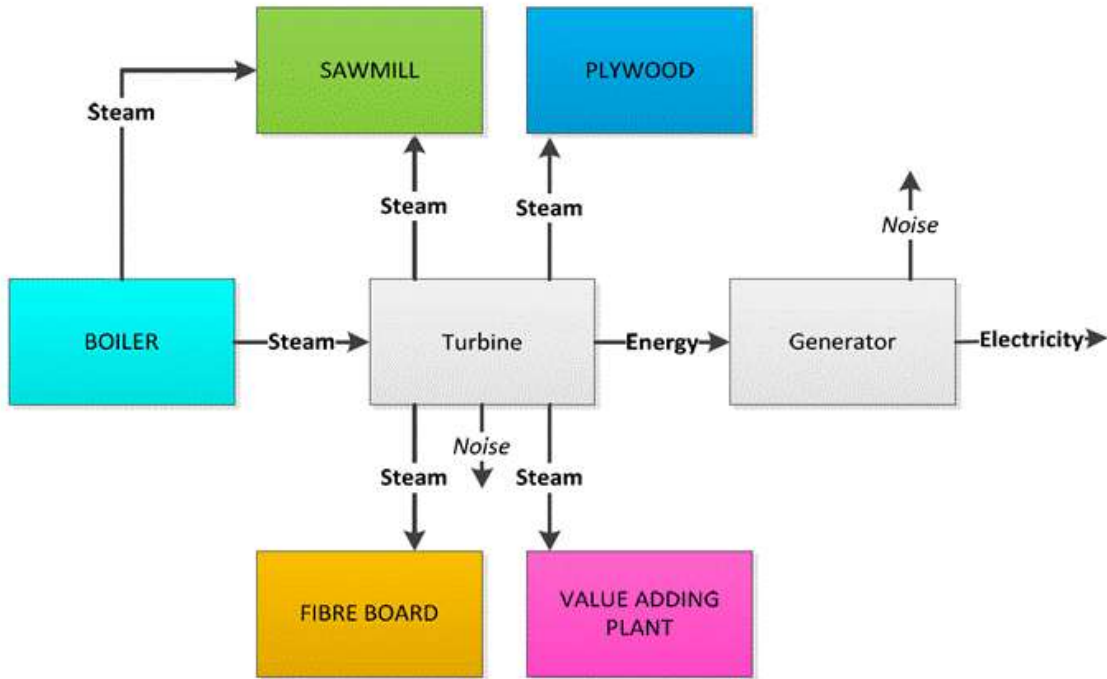


Diagram 11: Integrated Site Process Flow Cogen



Development Implications:

The expansions will impact on the existing roads and power lines traversing the site. It was originally proposed to re-locate the ACME Village, however due to the socio-economic impact on the residents it was decided to rather incorporate the ACME village in the layout of the proposed expansion project. ACME Village could however be relocated in the long term. A separate EIA application will have to be submitted for the relocation. The proposed expansion will also encroach onto the existing cricket pitch and soccer fields, however the existing rugby field is not affected.

Road re-alignments:

The proposed development will require expansion to the south, across road D2220 (Old Lydenburg Road) and to the north, across road D2431 (Bridal Veil Falls Road). From the Traffic Impact Study prepared by Endecon, it is recommended that the D2220 and D2431 Roads be re-aligned, as per the attached Site Layout Plan (**refer to Figure 10, Township Layout and Annexure Y, Traffic Impact Study**).

During preliminary discussions with Thaba Chweu Local Municipality and Department of Public Works, Roads and Transport, the parties indicated that they would support the proposed road re-alignments.

Re-alignment of power lines:

It is confirmed that the existing power lines will have to be re-aligned to accommodate the proposed expansion project. As already mentioned a separate EIA application will be submitted to DEA.

Wastes and By-Products Generated:

Various solid wastes and by-products are produced by the production of saw logs and plywood.

Both hazardous and non-hazardous waste and wood by-products are generated by the existing activities and proposed expansion of the Sabie Site. **Refer to Tables 5 and 6**

Table 5: Waste generated at Sabie site

Type	Source	Waste management method	Where	Transport
Hazardous waste				
Boiler ash to E2E Braaks	Boilers	Reused	Earth2Earth	Interwaste
Glue waste	Plywood	Disposed	Holfontein	Enviroserve
CCA sludge	CCA treatment plant	Disposed	Holfontein	Enviroserve
Fluorescent tubes	Electrical Workshop	Disposed	Holfontein	Enviroserve
Medical waste	Clinic	Disposed	Westmead KZN	Compass Waste
Plywood off-cuts (containing glue)	Plywood	Reused	Boilers - fuel	Conveyor belt
Fibre board plant off-cuts (containing glue)	Fibre board plant	Reused	Boilers - fuel	
Value -adding plant off-cuts (containing glue)	Value adding plant	Reused	Boilers - fuel	
Sewage sludge	STW drying bed	Stored	STW drying bed	NA
Used Oil	Garage	Recycled	Kia-ora Oil	Kia-ora Oil
Oil sludge and sand	Garage oil separator	Disposed	Holfontein	Enviroserve
Used oil filters	Garage	Disposed	Holfontein	Kia-ora
Oily rags	Garage	Disposed	Holfontein	Enviroserve
Non-hazardous waste				
Domestic waste	Sabie site	Disposed	Municipal landfill site	Sabie tractor
Steel	Sabie scrapyard	Recycled	Nieuwco	Nieuwco
Used tyres	Garage	Stored	On site	NA

Table 6: Wood By-products generated at Sabie site

Wood by-products				
Type	Source	Management method	Where	Transport
Peeler core	Plywood peeler	Reused	Sold to Summit/Sandveld Timbers etc.	Contractor
Clean bark	Plywood debarker	Reused	Boiler fuel/Nutrigro - composting	Contractor
Soil covered bark	Log yards	Reused	Borrow pit/Nutrigro -	Contractor

			composting	
Wood chips	Hewsaw	Reused	Sappi	Contractor
Shavings	Planer	Reused	Shavings Supply Company	Contractors
Wood off-cuts	Hogger	Reused	Boiler fuel/ACME - Fire wood	Sabie tractor
Saw dust	Wetmill	Reused	Boilers - fuel	Conveyor belt
Wood chips	Hewsaw	Reused	Boilers - fuel	Conveyor belt
Off cuts (breakages)	Drymill operations/Plywood Dryers/Plywood wet side and dry side	Reused	Boilers - fuel	Conveyor belt/Scraper chains/Tractor and trailer

Note: As per the NEM: WA definition of waste, a by-product is not considered to be waste. York Timbers regards wood as a by-product.

Refer to Figure 16 for a map illustrating the waste streams.

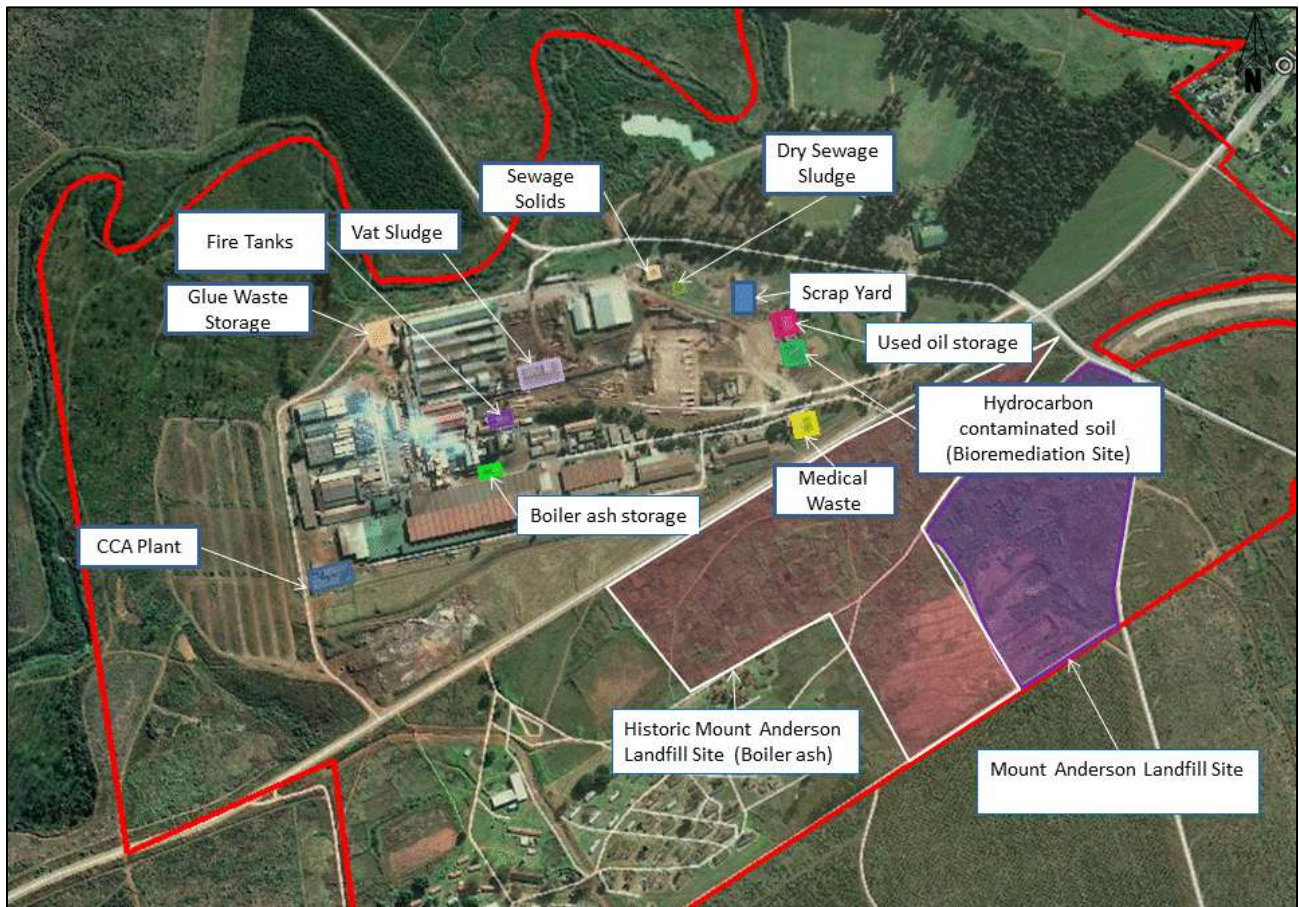


Figure 16: Waste Streams

5. ALTERNATIVES IDENTIFIED

5.1 Locality Alternatives

No locality alternatives were considered since the Sabie Sawmill and Plywood Plant had been established on the study area a number of years ago and had since been in operation.

5.2 Land Use Alternatives

5.2.1 Residential development

Residential land use is not compatible with the industrial activities associated with the sawmill and plywood plant and was therefore not considered as a viable land use alternative for the expansion project. The current plant supplies jobs to thousands (direct and indirect employment) of people and the replacement of the Sabie Saw Mill with a residential development will require the retrenchment of a large number of workers. This will have a devastating effect on the co-existence of the town of Sabie, because the Sawmill is regarded as the life-line of the town and the local economy largely dependent on the financial injections (in various ways) from the sawmill management and the workers that support the local businesses.

5.2.2 Industrial (development proposal)

As already mentioned the Sabie Sawmill and Plywood Plant had been in operation on the study area for many years. An industrial zoning (according to the Town and regional Planners "Industrial 2") that can accommodate the existing and proposed activities and facilities associated with the sawmill and plywood plant is regarded as the preferred land-use alternative for the study area.

5.3 Layout Alternatives

The preliminary layout for the proposed expansion was only finalised after specialist studies were conducted to establish the sensitivities and the design criteria for the site. Various multi-disciplinary planning meetings were held with civil -, traffic -, electrical - and stormwater engineers, as well as environmentalists, town planners and the developer to discuss the development potential, opportunities and constraints of the study area.

The wetlands/buffer zone, floodlines, existing graveyard, existing power lines, alignment of Road D2220 and D2431, access point to the site and ACME Village were considered as the main form giving elements for the layout. After it was concluded that the proposed area is suitable for the proposed expansion of the existing industrial activities, a concept layout was produced and presented at the meetings. During the meetings the concept layout was placed over an already prepared environmental issues/sensitivity map (**refer to Figure 36 and 37 for the Sensitivity Maps**).

In the preliminary layout ACME Village was affected by the proposed expansion area and it was proposed that the village be relocated to a site near Simile Township where a full range of services will be provided. **Refer to Figure 17, Layout Alternative**.

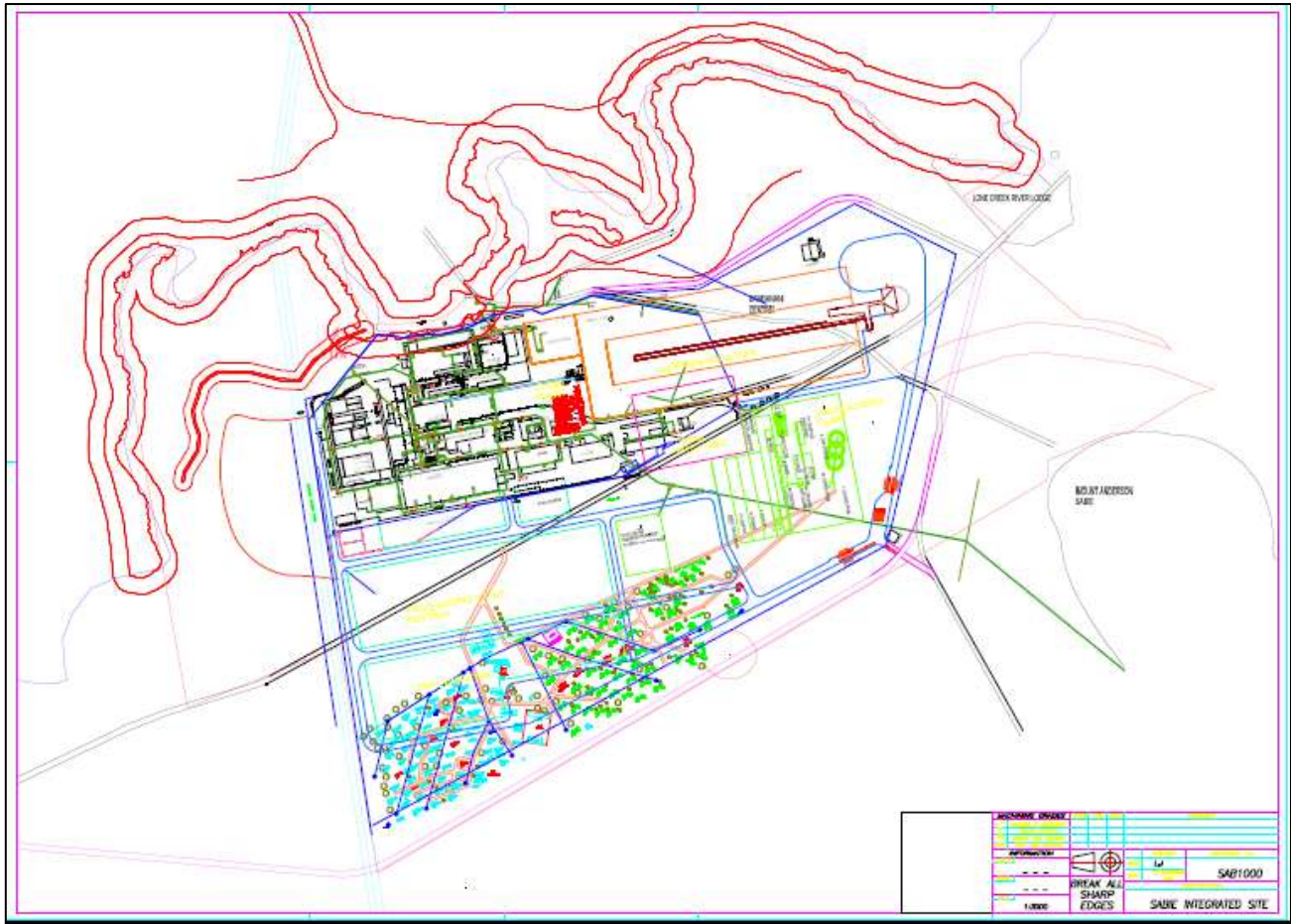


Figure 17: Layout Alternative

Final Layout

Refer to Figure 10 and Annexure H

The layout was altered to accommodate the environmental opportunities and constraints as reflected on the sensitivity map as well as the requirements of the above mentioned disciplines. The final layout accommodates the ACME Village and therefore the relocation of ACME Village is not required at this stage (**refer to Figure 10**).

The proposed Sabie Site expansion will require expansion to the south, across road D2220 (Old Lydenburg Road) and to the north, across road D2431 (Bridal Veil Falls Road) and it was recommended that the D2220 and D2431 roads be re-aligned as indicated on the layout plan.

It is confirmed that the existing power lines will have to be re-aligned to accommodate the proposed expansion.

5.4 The “No-Go” Alternative

The “No-Go” Alternative would entail that the site remains in its current state and that no expansion to the current industrial plant takes place.

The proposed expansion project would have the following benefits:

- York Timbers' expansion strategy proposes to optimise the use of its raw material through value adding and beneficiation which would create new business opportunities as a larger variety of end-products would be produced on-site.
- A large number of jobs will be created during the construction period and during the operational phase.
- The proposed Sabie site expansion could therefore contribute to local economic growth.
- The generation of energy by the proposed co-generation plant.
- The proposed development will introduce advanced technologies for fuel handling, heat generation, timber drying technology and competitiveness against imports and will result in improved forestry practices as well as supply chain optimisation. The use of these technologies will also ensure skills transfer and advance scientific knowledge.
- As part of the company's commitment to practicing sustainable forestry, conserving natural resources and continually improving its environmental management practices, the proposed development will result in reduction in emission levels, noise reduction, infrastructure improvements including civil and sewerage as well as reduced by-products generated.
- The proposed development will result in major development and revitalisation of Sabie as well the social upliftment of the communities around the site. The

development will have tremendous benefits for the hospitality industry and other multipliers as economic spin-offs.

- The proposed development will result in the improvement of the road network by upgrading the Main road (R532)/Old Lydenburg Road (D2220) intersection and upgrade identified sections of the D2220 Old Lydenburg Road.
- Bulk services contribution payable to the municipality will be used to increase the capacity of the sewer reticulation network and the wastewater treatment works of Sabie, if it is decided that it would be the better option to use the municipal sewer network.
- The applicant will augment the appearance of the business and make it more compatible with the surrounding land uses ensuring an aesthetically pleasing development.
- Buildings are situated on already disturbed land, which has no agricultural value.
- Buildings are situated outside the flood plain and wetland areas.

If the “No-Go” alternative is followed none of the above-mentioned benefits would realise.

However, as already discussed the proposed expansion project will impact on the existing roads traversing the site. It is therefore proposed that D2220 and D2431 Roads be re-aligned.

The following diagrams represent a comparison between the “No-Go” alternative and the development alternative.

Diagram 2: Environmental issues - “No-Go” Option.


Issue	Short term	Medium term	Long Term	Impact	Description
Geology and soils				Positive	Vegetation is currently disturbed and invaded by alien plants, therefore erosion will increase in time and alien plants
				Neutral	
				Negative	

			will eventually invade sensitive areas surrounding the development site. Leaking water borne services could increase the risk for the formation of sinkholes and dolines.
Hydrology		Positive Neutral Negative	With increased erosion, siltation will become an increasing problem in the catchment and water pollution will occur when storm water runoff is not managed. Water pollution caused by the existing facilities will continue to take place .
Vegetation		Positive Neutral Negative	Exotic invaders currently occurring on the study area together with erosion will degrade vegetation further.
Fauna		Positive Neutral Negative	Fauna numbers and diversity of species will decrease over time as a result of degraded vegetation and pollution of water resources.
Social		Positive Neutral Negative	The social benefits associated with the expansion project will not take place.
Economic		Positive Neutral Negative	The economical benefits associated with the expansion project will not take place

Note: The “no-go” option is predominantly neutral in the short and medium term, and turns negative in the long term.

Diagram 3: Preliminary Environmental issues of the proposed development

Issue	Short term	Medium term	Long Term	Impact	Description
Geology and soils				Positive	If the proposed development goes ahead, areas will be rehabilitated, and together with storm water management measures, will drastically decrease erosion.
				Neutral	
				Negative	
Hydrology				Positive	Storm water, ground water and environmental management plans will be implemented and this will ensure that current water pollution and degradation of the aquatic resources on the site will decrease and even improve.
				Neutral	
				Negative	
Vegetation				Positive	Disturbed vegetation on site will be rehabilitated, managed and maintained as well as protected. The proposed development will provide the financial means to achieve this objective.
				Neutral	
				Negative	
Fauna				Positive	When habitat for fauna such as the wetland boundaries and buffers are rehabilitated, conserved, protected, maintained and managed fauna will automatically benefit as well and the biodiversity of the study area may even increase.
				Neutral	
				Negative	
Social				Positive	The proposed expansion project will create a large number of employment opportunities during
				Neutral	
				Negative	

			the construction and operational phases and will result in social upliftment of the communities around the site.
Economic		Positive Neutral Negative	The proposed Sabie site expansion could contribute to local economic growth. Optimal utilization of infrastructure; Job opportunities will be provided to the local communities.

Note: From the investigations that were done, it is anticipated that the proposed development option is predominantly negative in the short term, turns neutral in the medium term and then positive in the long term.

From the above discussion it is clear that the proposed expansion project is desirable from an ecological, social and economical point of view.

5.5. Planning Approach

Based on the above, the planning approach to the proposed layout will be done by a complete professional team consisting of Land Surveyors, Town Planners, Urban Planners, Traffic Engineers, Environmental Consultants, Civil Engineers, Electrical Engineers, Geotechnical Engineers and the developer.

From the specialist and other environmental information available, the project team already compiled a preliminary layout for the development. An effort was already made (during the preliminary layout phase) not only to make use of the opportunities, but to utilise the terrain, site features, visibility and access to the best benefit of all, including the surrounding environment.

6. THE DESCRIPTION OF THE BIOPHYSICAL AND SOCIO-ECONOMICAL ENVIRONMENTS – (In line with Section 32 (d))

This section briefly describes the biophysical and socio-economical environments. It also lists the anticipated adverse and beneficial impacts of the proposed development on the environment. Where possible, mitigation measures were supplied for the adverse impacts and the significance of the impacts listed was also indicated in specific impact tables. In some cases the impacts have already (during the planning phase) been addressed to such an extent that it was not regarded as necessary to carry the impacts over to the significance rating section of the report.

Although it was not necessary to mitigate the positive impacts listed in the impacts tables, the positive impacts identified in this section of the report will also automatically be carried over to the significance rating section of the report to indicate the specific benefits associated with the proposed development. This will also make it possible to compare the severity of the adverse impacts with the advantages of the beneficial impacts and to eventually make an informed decision regarding the proposed development.

The following information incorporates the most important information supplied by specialist studies and reports.

6.1 THE BIO-PHYSICAL ENVIRONMENT

6.1.1 The Physical Environment

6.1.1.1 Geology and Soils

Refer to Annexure N (i) for the Engineering Geological Report by ENGEOLAB CC

ENGEOLAB CC was appointed to conduct a geotechnical desktop study to assess the site's development suitability in terms of its physical and sanitary aspects pertaining to the

fatal flaws associated with the complex geology, hydrogeology and the environmental conditions.

The following information was used in the investigation and assessment of the terrain:

- Garmap SA 1:50 000 Topographical and Recreation series map of the area.
- The 1:250 000 scale geological map, sheet 2530 Barberton.
- The 1:500 000 scale hydrogeological map, sheet 2530 Nelspruit.
- Verbal description of the scope of work during a meeting and a site visit with personnel of York Timbers.
- A hydro-census report compiled by Nepid Consultants in January 2010, referred to as the 'Hydro-Census and Groundwater Quality Monitoring Plan'.

6.1.1.2 Regional Geology and Soils

According to the available information the site is mainly underlain by **dolomite** and **chert** of the **Malmani Subgroup, Chuniespoort Group, Transvaal Sequence**. The bedrock is sequentially overlain by residuum, colluvial soils, with alluvium along the flood plain of the Sabie River. The York Timbers ACME village is sequentially underlain by colluvial soils, chert and dolomite of unknown thickness and depth.

According to the involved geotechnical engineers the study area comprises a cut-to-fill platform with sections of the log yard covered by loose organic fill, comprising sawdust and wood chips.

Table 7 below is a summary of the predominant soil types and bedrock:-

Table 7: Geology – Predicted Soil & Rock Types

LITHOLOGY	UNIT	MAIN SOIL TYPES
Alluvium / Colluvium	Quaternary Period	Variable: Gravels to Clay
Dolomite, Chert	Malmani Subgroup/ Chuniespoort Group/ Transvaal Sequence	Variable: Transported soils overlaying Chert Gravel and/or Wad

Issues and Impacts – Geology and Soils

Table 8: Issues and Impacts – Geology and Soils

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possibilities High 🟢 Medium 🟡 Low 🔴 Positive Impact - Not Necessary To Mitigate ☀️
1)	Risk for formation of sinkholes and dolines	-	🟡
2)	Stability of structures	-	🟢
3)	Erosion	-	🟡
4)	Stockpile areas for construction materials and topsoil	-	🟡

Discussion of issues identified, possible mitigation measures and significance of issue after mitigation

1) Risk for formation of sinkholes and dolines

There is a risk for the development of sinkholes and dolines associated with dewatering of the aquifer. However, according to the involved geotechnical engineers the formation of sinkholes and dolines in the Sabie area are expected to be small with a low to moderate potential of damage to structures.

If the NHBRC precautionary measures for development on dolomite are not implemented there is a risk for the formation of sinkholes and dolines.

Table 9: Significance of Issue 1 (Risk for formation of sinkholes and dolines) After Mitigation

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ⚡</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during Planning phase, Construction and/ or Operational phase</p> <p>P / C / O Mitigation</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>Medium 🟡</p>	<p>P & C – The NHBRC precautionary measures for development in dolomitic areas must be implemented.</p> <p>P, C & O – A dolomite risk management plan must be compiled.</p> <p>P, C & O – Stormwater management on the study area is extremely important to prevent the concentration of stormwater.</p> <p>P, C & O - Groundwater monitoring must form an integral part of the risk management plan.</p> <p>P, C & O - The normal drainage precautionary measures and special installation measures for underground wet services, applicable to dolomitic terrain should be adhered to.</p>	<p>H - To be included in EMP</p> <p>H - To be included in EMP</p> <p>H - To be included in EMP</p> <p>H - To be included in EMP</p> <p>H - To be included in EMP</p>

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed and assessed in the Significance Rating Table

2) Stability of structures

The foundation recommendations by the geotechnical engineers should be implemented to ensure the stability of structures.

Table 10: Significance of Issue 2 (Stability of structures) After Mitigation

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ☀️</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during Planning phase, Construction and/ or Operational phase</p> <p>P / C / O Mitigation</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>High 🟢</p>	<p>P - It is recommended that dolomite stability investigations be conducted only on areas where development is planned. The following geotechnical aspects are to be investigated:</p> <ul style="list-style-type: none"> - Shear strength, bearing capacity, compressibility and predicted settlements of the founding materials; - Excavatability of site soils and bedrock to 2.5m below surface; - Availability of construction materials and their applications; and - Slope stability where applicable <p>P & C - The precautionary measures and foundation design from the involved geotechnical engineer must be implemented.</p>	<p>M - To be included in EMP</p> <p>M - To be included in EMP</p>

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed and assessed in the Significance Rating Table

3) Erosion

Unnecessary clearing of vegetation could lead to exposed soils prone to erosive conditions. Insufficient soil coverage after placing of topsoil, especially during construction where large surface areas are applicable could also cause erosion. To cause the loss of soil by erosion is an offence under the Soil Conservation Act (Act No 76 of 1969). The management of surface water run-off during construction is very important to prevent soils erosion on the site. If construction takes place during the rainy season, sufficient storm water management will be required to manage water runoff.

Table 11: Significance of Issue 3 (Erosion) After Mitigation

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ☀️</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during Planning phase, Construction and/ or Operational phase</p> <p>P / C / O Mitigation</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>Medium 🟡</p>	<p>P & C - A storm water management plan must be compiled for the construction and operational phases of the proposed development.</p> <p>P & C - The storm water management plan must be submitted to the local authority and Council for Geoscience for approval.</p>	<p>M - To be included in EMP</p> <p>M - To be included in EMP</p>

	<p>P & C – Due to the fact that most of the study area is underlain by dolomite no natural channels will be allowed. All open channels and attenuation ponds must be lined with concrete. Concentrated surface drainage is also not permitted.</p> <p>P & C – Large exposed areas during the construction phases should be limited. Where possible areas earmarked for construction during later phases should remain covered with vegetation coverage until the actual construction phase. This will prevent unnecessary erosion and siltation in these areas.</p> <p>P & C - Rehabilitate exposed areas immediately after construction in these areas is completed (not at the end of the project).</p> <p>P & C – Unnecessary clearing of flora resulting in exposed soil prone to erosive conditions should be avoided.</p> <p>P – Specifications for topsoil storage and replacement to ensure sufficient soil coverage as soon as possible after construction must be implemented.</p> <p>P & C – All embankments must be adequately compacted and planted with grass to stop any excessive soils erosion and scouring of the landscape.</p> <p>C – Storm water diversion measures are recommended to control peak flows during thunder storms.</p> <p>P & C – The eradication of alien</p>	<p>M - To be included in EMP</p> <p>L - To be included in EMP</p> <p>M - To be included in EMP</p> <p>M - To be included in EMP</p> <p>M - To be included in EMP</p> <p>M - To be included in EMP</p> <p>M - To be included in EMP</p> <p>M - To be included in EMP</p> <p>M - To be included in EMP</p> <p>M - To be included in EMP</p>
--	---	---

	<p>vegetation should be followed up as soon as possible by replacement with indigenous vegetation to ensure quick and sufficient coverage of exposed areas.</p>	
--	---	--

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed and assessed in the Significance Rating Table

4) Stockpile areas for construction materials and topsoil

Designated areas for stockpiling of construction materials must be specified by the Environmental Control Officer in an area that is already disturbed. Stockpiling in the wrong areas might be detrimental to fauna and flora and will deplete the soil quality. Topsoil should be stockpiled as specified in the EMP to ensure that the soil quality doesn't deplete and that the grass seed remain in the soil for later rehabilitation of the disturbed areas.

In addition to the impact discussed in the paragraph above, rainwater falling onto stockpiles may become polluted with dust originating from aggregate and other construction material, such as bitumen from pre-mix stockpiles. Therefore stockpiles of topsoil should be correctly covered to prevent this as well as loss of topsoil by wind erosion.

The footprint of stockpile areas will be contaminated with the stored material and will require cleaning before rehabilitation.

Table 12: Significance of Issue 4 (Stockpile areas for construction materials and topsoil) After Mitigation

<p>Mitigation Possibilities High 🟢 Medium 🟡 Low 🔴 Positive Impact/ Neutral - Not</p>	<p>Mitigation Already achieved ✓ Must be implemented during</p>	<p>Significance of Issue after mitigation Low/ eliminated L / E Medium M</p>
---	---	--

<p>Necessary To Mitigate ☠</p>	<p>Planning phase, Construction and/ or Operational phase P / C / O Mitigation</p>	<p>High H Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>Medium 😊</p>	<p>C - Remove vegetation only in designated areas for construction.</p> <p>C - Rehabilitation works must be done immediately after the involved works are completed</p> <p>C -All compacted areas should be ripped prior to them being rehabilitated/landscaped;</p> <p>P/C - The top layer of all areas to be excavated must be stripped and stockpiled in areas where this material will not be damaged, removed or compacted. This stockpiled material should be used for the rehabilitation of the site and for landscaping purposes</p> <p>C - Strip topsoil at beginning of works and store in stockpiles no more than 1,5 m high in designated materials storage area.</p> <p>C - Stockpiles should be covered correctly</p>	<p>M - To be included in EMP</p> <p>M - To be included in EMP</p> <p>M - To be included in EMP</p> <p>M - To be included in EMP</p> <p>M - To be included in EMP</p> <p>M - To be included in EMP</p>

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed and assessed in the Significance Rating Table

6.1.2 Hydrology

6.1.2.1 Surface Hydrology

The physiography of the site is dominated by the east flowing perennial Sabie River, the main drainage course of the regional Quaternary catchment area. The site is characterised by two landforms: i.e. a local drainage channel and the gently sloping southerly flank of the Sabie River. The average gradient of the site is approximately 4°- 6° to the north-east.

The highest elevations of the terrain at 1140m above mean sea level are along the southern boundary from where the terrain slopes towards the Sabie River (**Refer to Figure 18**).

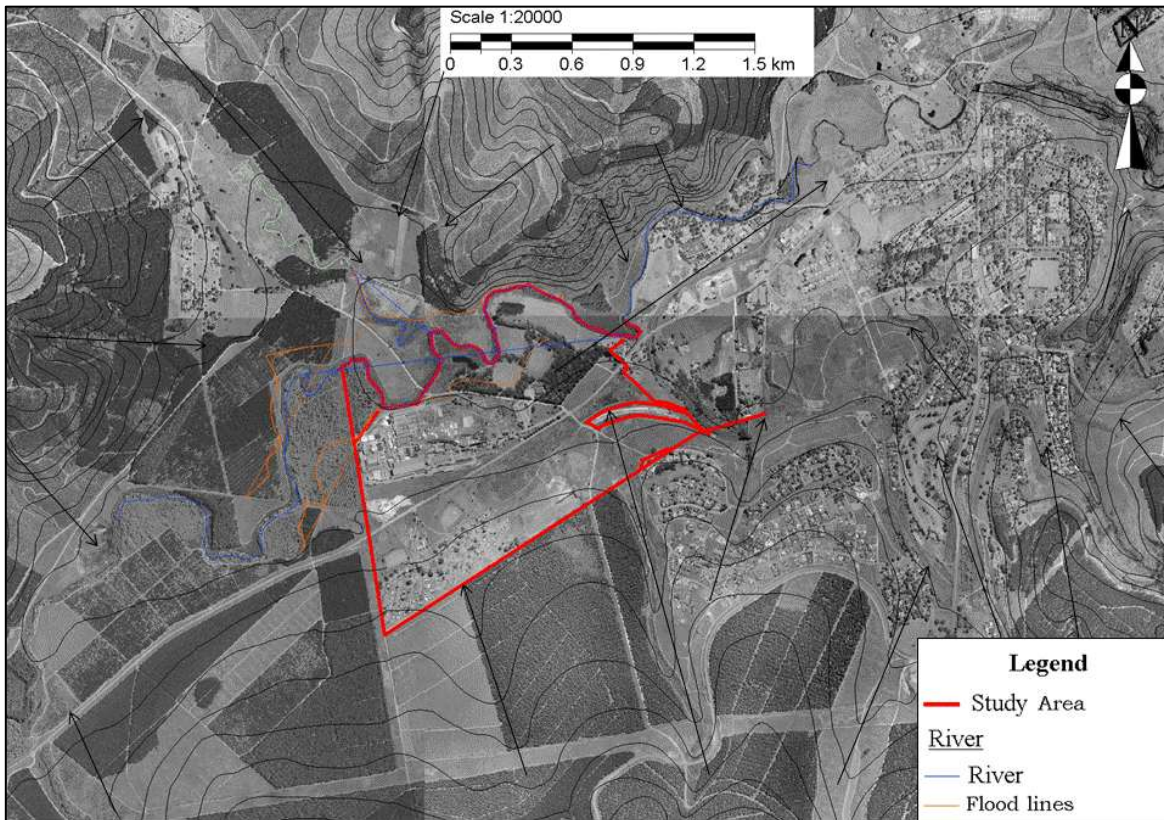


Figure 18: Hydrology Map

6.1.2.1a Flood Lines

The study area is affected by the 1:100 year floodlines of the Sabie River and these flood lines (**as indicated on Figures 19**) were calculated by Endecon Ubuntu (Pty) Ltd Engineering Consultants.

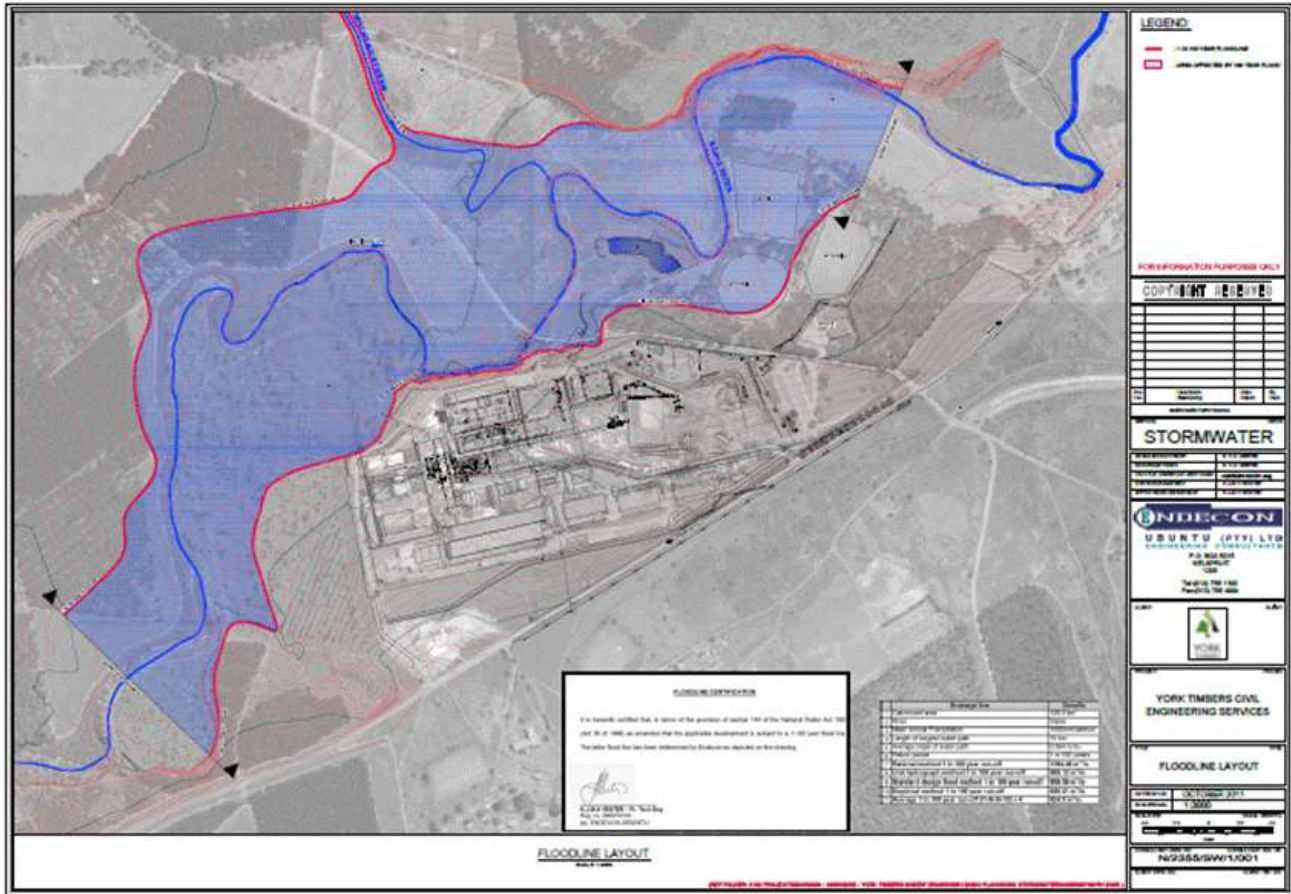


Figure 19: Flood Lines

6.1.2.2 Subsurface Hydrology

Refer to Annexure N (i) for the Engineering Geological Report by ENGEOLAB CC and Annexure N (ii) for the Geohydrological Report compiled by Aurecon

A detailed hydro-census was conducted in 2010 by Nepid Consultants. Ten boreholes in the vicinity of the Sabie site were yield tested and according to the involved geotechnical engineer only a single borehole near the kilns is in production at the moment.

Water levels of the boreholes are recorded on a quarterly basis. The lowering of the static water levels recorded during the latest readings indicated variations of 1m to 3m seemingly due to poor recharge of the aquifer which can be attributed to the dry winter months. **Refer to Table 5.2.1 of Annexure N(i) for a summary of the water level recordings.**

The hydrogeological units and aquifer classes that occur in the immediate area are described in **Table 13** below.

Table 13: Hydrogeological units and Aquifer Types

Hydrogeological unit	Aquifer Type	Borehole yield l/s
Malmani Subgroup, Chert & Dolomite	Karst	0.5-2.0

Although seepage was absent during the drive-over survey, the involved geotechnical engineers stated that the vlei area located below the site on the northern side was very soft and moist.

Aurecon was appointed in 2012 to do a comprehensive review of the geohydrological and surface water data at the Sabie Site. **Refer to Annexure N (ii)**

The following conclusions were made by Aurecon:

- The dolomitic formation underlying the Sabie Site may be compartmentalized by a diabase dyke.

- The compartmentalization may be responsible for the lower water level elevation in boreholes between the sawmill and the landfill site.
- The deviation of water levels from the correlation with topographic elevation confirms the possible compartmentalization.
- The groundwater flow is towards the river and to the east towards the river.
- The effluent surface water quality is only showing iron and bacteriological contamination.
- The effluent surface water does not seem to impact on the river water quality.
- The groundwater quality sampled in 2011 generally is good quality and the surface effluent does not seem to impact on the groundwater except at G3, G7 and G8 where higher salinity is present.
- The TDS contours confirm the existence of a pollution plume at G3, G7 and G8.
- The settling pond is located below the flood line.

The following recommendations were made by Aurecon:

- It was recommended that gravity and magnetic geophysical traverses be done across the site to establish the possible compartmentalization of the aquifers.
- The DWA may request that the sustainability of the production borehole be calculated according to their requirements for WULA.
- The settling pond is below the flood-line and the wall of the pond needs to be raised.
- The establishment of a new settling pond that will eventually replace the existing one must be considered for the expansion of the plant.

Please note: Bokamoso does not recommend the removal of the artificial wetland and settling pond within the flood line since it will pose a significant impact on the ecosystems that has evolved around the wetland and pond in the past 52 years from the erection of the wetland and pond. The wetland and pond are of significant importance for the following: attenuation of storm- and floodwater, purification purposes and support of the faunal and floral ecosystems. The removal of either the wetland or settling pond would

have a negative impact on storm water management and the ecosystem which evolve around these sources.

Mount Anderson Landfill Site

Aurecon was appointed to do a comprehensive review of the geohydrological at the Mount Anderson Landfill Site **(refer to Annexure N (iii))**.

The following conclusions were made by Aurecon:

- The dolomitic formation underlying the Mount Anderson Landfill site may be compartmentalized by a diabase dyke.
- The compartmentalization may be responsible for the higher water level elevation in boreholes north of the sawmill.
- The deviation of water levels from the correlation with topographic elevation confirms the possible compartmentalization.
- The regolith below the landfill is between 10 and 20 m thick and has relatively low permeability.
- The groundwater occurrence is at 35 m in G6 and the water level below the site varies between 47 and 30m below ground level.
- The deep water occurrence and groundwater level proved adequate in preventing any leachate formation and migration.
- The groundwater flow from the landfill is towards the river and to the east towards the river.
- The groundwater quality sampled in 2011 generally is good quality and does not show high impact by the waste site.
- The high iron reported in the 2008 groundwater quality data compared to the low values in 2011 must be addressed.
- The high iron, manganese and antimony can be attributed to the natural geology of the area.
- After 50 years of operation the old landfill showed very little impact on the groundwater in boreholes G2 and G10. **Refer to Figure 20 for position of boreholes.**

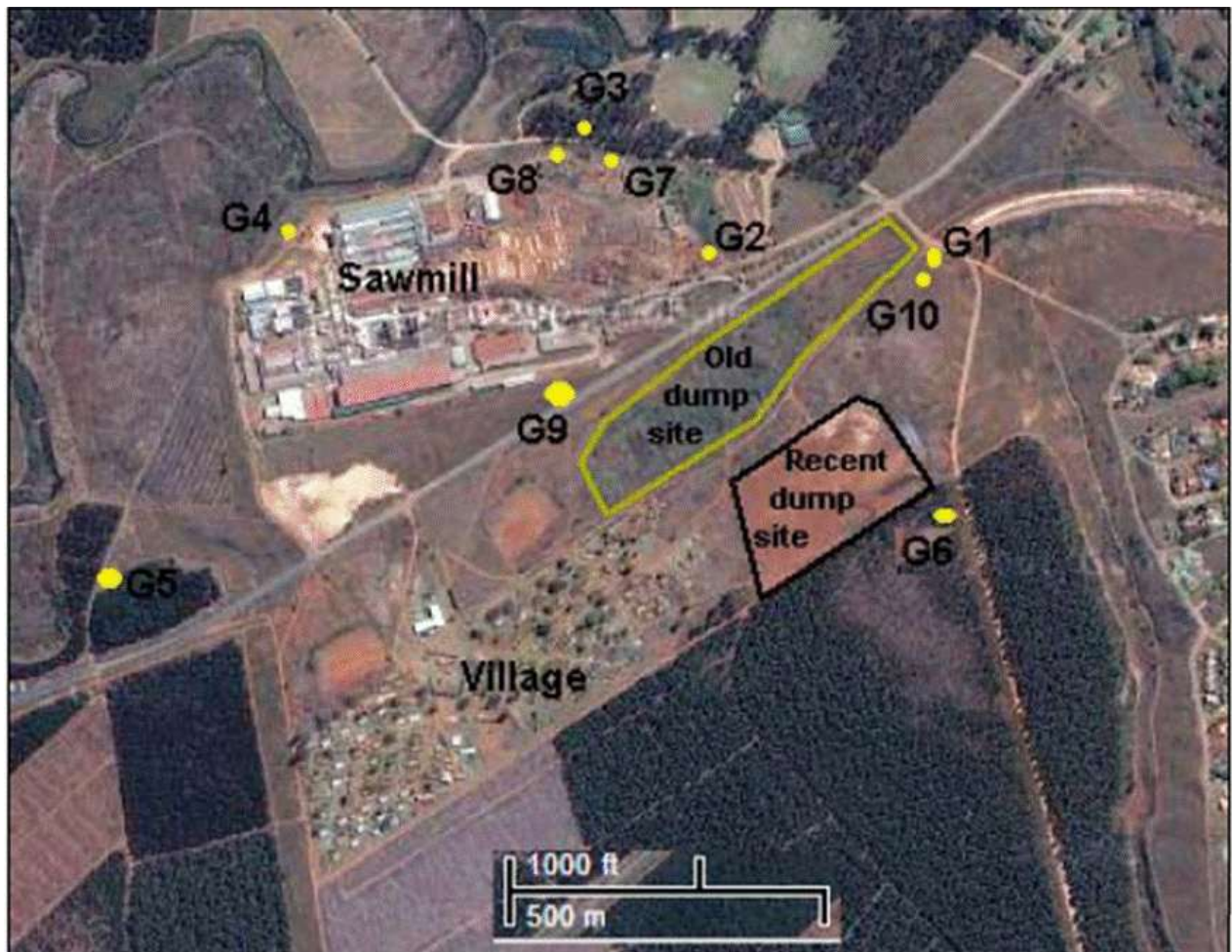


Figure 20: Position of Boreholes

The following recommendations were made by Aurecon:

- It is recommended that gravity and magnetic geophysical traverses be done across the site to establish the possible compartmentalization of the aquifers.
- The difference in iron content in 2008 compared to 2011 in the groundwater must be investigated further.
- The high salinity in G6 need to be investigated as it is not leachate from the ash.
- The land surface must be rehabilitated and all trenches and pits filled to reduce any ingress of water into the waste.

- It is recommended that surface water run-off must be diverted around the site in order to minimize ingress into the waste.
- It is recommended that a further monitoring borehole be drilled east of the site to investigate any impact in that direction.

Table 14: Issues and Impacts – Hydrology

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possibilities High 🟢 Medium 😊 Low 🟡 Positive Impact/ Neutral - Not Necessary To Mitigate 🌞
5)	Siltation, erosion and water pollution could occur in the Sabie River and water bodies lower down the catchment area if a stormwater management plan is not implemented and due to activities associated with the plant.	-	😊
6)	Lowering of groundwater	-	🔴
7)	Groundwater pollution	-	😊
8)	Perched water, Seasonal flooding		
9)	Removal of vegetation coverage, increased hard surfaces and increased erosion, surface water pollution and siltation problems	-	🟢

Discussion of issues identified, possible mitigation measures and significance of issue after mitigation

5) Siltation, erosion and water pollution of the Sabie River and water bodies lower down the catchment if a stormwater management plan is not implemented.

If erosion, siltation and water pollution is not addressed, the sustainability of the Sabie river and the associated wetlands and open space systems lower down in the catchment area can be negatively impacted by the development.

Table 15: Significance of Issue 5 (Siltation, erosion and water pollution) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities High 🟢 Medium 😊 Low 🟡 Positive Impact/ Neutral - Not Necessary To Mitigate ✨</p>	<p>Mitigation Already achieved ✓ Must be implemented during Planning phase, Construction and/ or Operational phase P / C / O Mitigation</p>	<p>Significance of Issue after mitigation Low/ eliminated L / E Medium M High H Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>Medium 😊</p>	<p>P / C / O - The storm water design for the proposed development must be designed to: - Reduce and/ or prevent siltation, erosion and water pollution. If erosion, siltation and water pollution is not addressed, the sustainability of the Sabie River and associated wetlands and the open space systems lower down in the catchment area can be negatively impacted by the</p>	<p>M - To be included in EMP</p>

	<p>development.</p> <ul style="list-style-type: none"> - Storm water runoff should not be concentrated as far as possible and sheet flow should be implemented. - The vegetation must be retained as far as possible, and rehabilitated if disturbed by construction activities to ensure that erosion and siltation do not take place. - No trees should be planted within five meters of the line of the water bearing services. - Industrial water may not be discharged directly into stormwater canals prior to entering the artificial wetland. - Discharge points of on-site channelled stormwater and other surface run-off should preferably be outside the 1:100 year flood lines. <p>O – The effluent of the sewerage plant should be monitored on a regular basis to ensure that it complies with DWA standards.</p>	<p>M - To be included in EMP</p>
--	--	---

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed and assessed in the Significance Rating Table

6) Lowering of groundwater.

Further depletion of the aquifer should be prevented and proactive measures should be implemented.

Table 16: Significance of Issue 6 (Lowering of groundwater) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ✨</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>Medium 🟡</p>	<p>P / C / O -</p> <p>Ongoing monitoring of groundwater levels on and in the immediate vicinity of the site is recommended.</p> <p>P / C / O -</p> <ul style="list-style-type: none"> - Monthly monitoring of the borehole's water levels should take place; - Depleted aquifers should be given sufficient time to recharge by using raw river water instead of groundwater for industrial application. 	<p>L - To be included in EMP</p> <p>L - To be included in EMP</p>

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table

7) Groundwater pollution

The dolomitic formation is regarded as the best aquifer in South Africa and it has a very high yielding and storage capacity as well as a high recharge potential. If not planned and managed correctly, the construction and operational phases of the Sabie Site expansion project could cause sub-surface water pollution.

Table 17: Significance of Issue 7 (Ground water pollution) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ☀️</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>Medium 🟡</p>	<p>P/C/O - Compilation of a storm water management plan that will address storm water management during the construction and operational phases of the project</p> <p>O - Regular monitoring of the boreholes should take place to monitor any groundwater pollution as a result of the activities associated with the plant.</p> <p>P/C/O - It is recommended that gravity and magnetic geophysical traverses be done across the site to establish the possible compartmentalization of the aquifers.</p> <p>P/C/O - The difference in iron content in 2008 compared to 2011 in the groundwater must be investigated further.</p> <p>P/C/O - The high salinity in G6 need to be investigated.</p> <p>P/C - The land surface must be rehabilitated and all trenches and pits filled to reduce any ingress of water into the waste.</p>	<p>M - To be included in EMP</p> <p>M - To be included in EMP</p>

	<p>P/C/O - It is recommended that surface water run-off must be diverted around the site in order to minimize ingress into the waste.</p> <p>P/C/O - It is recommended that a further monitoring borehole be drilled east of the site to investigate any impact in that direction.</p>	
--	--	--

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed and assessed in the Significance Rating Table

8) Seasonal flooding and perched water conditions

The north-eastern portion of the site is susceptible to seasonal flooding by the Sabie River and perched water conditions may pose problems for excavation and trenching.

Table 18: Significance of Issue 8 (Seasonal flooding and perched water conditions) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ☀️</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>High 🟢</p>	<p>P/C - No structures to be erected within the 1:100 year floodline</p> <p>P - Perched water conditions should be taken into consideration during</p>	<p>M - To be included in EMP</p>

	excavations and trenching.	
--	----------------------------	--

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed and assessed in the Significance Rating Table

- 9) Removal of vegetation coverage, increased hard surfaces and increased erosion, surface water pollution and siltation problems

The Sabie Site expansion project will add hard surfaces such as paving and structures with roofs to the study area. It will also lead to the compaction of soils. The soils layers will thus become less permeable, storm water will be canalised rather than evenly spread. The quantity and speed of the storm water will increase significantly and the quality of the surface water will deteriorate, because of the lack of vegetative coverage. Erosion and siltation will also become a problem.

In order to address this issue, it will be necessary to compile a storm water management plan/ system for the proposed development. The storm water management plan must be designed to:

- Reduce and/ or prevent siltation, erosion and water pollution. If erosion, siltation and water pollution is not addressed, the long-term sustainability of the water bodies and open space systems lower down in the catchment area cannot be guaranteed; and
- Improve the surface and ground water quality of the study area and the lower lying areas within the catchment area.

Table 19: Significance of Issue 9 (Removal of vegetation coverage, increased hard surfaces and increased erosion, surface water pollution and siltation problems) After Mitigation/ Addressing of the Issue

Mitigation Possibilities High 🟢 Medium 🟡 Low 🔴	Mitigation Already achieved ✓ Must be implemented during	Significance of Issue after mitigation Low/ eliminated L / E
--	--	--

<p>Positive Impact/ Neutral - Not Necessary To Mitigate ☠</p>	<p>planning phase, construction and/ or operational phase P / C / O</p>	<p>Medium M High H Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>High 😊</p>	<p>P - Compilation of a storm water management plan that will address storm water management during the construction and operational phases of the project</p>	<p>M - To be included in EMP and conditions of approval</p>

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed and assessed in the Significance Rating Table

6.1.2.3 Wetlands

Refer to Annexure O for the Wetland Delineation Report by S. van Staden, Scientific Aquatic Services CC.

Scientific Aquatic Services (SAS) was appointed to undertake a baseline study of the aquatic, faunal and floral Present Ecological State (PES) and investigate these communities habitat integrity and importance assessment of the ecosystem associated with the proposed expansion of the York timbers processing facility, near Sabie in Mpumalanga, Republic of South Africa.

The purpose of this report was to define areas of increased aquatic and wetland Ecological Importance and Sensitivity (EIS) and the Present Ecological State (PES) of the aquatic resources along the proposed development route **(also refer to Section 6.2.3 of this report for a discussion)**. In addition a wetland delineation exercise was undertaken in order to define the extent of the wetland and riparian resources on the subject property. It was the objective of this study to provide detailed information to guide the activities associated with the expansion project in the vicinity of wetland and riparian areas to

ensure that the ongoing functioning of the wetlands and rivers are facilitated with specific mention of the following:

- Ensure that connectivity of the wetland and river areas are maintained between the areas upstream and downstream of the portions of proposed expansion;
- Ensure ongoing functioning of the wetland and river areas in the vicinity of proposed expansion facilities;
- Ensure that permanent, seasonal and temporary wetland zone functionality is maintained through provision of measures to ensure that soil wetting conditions are maintained;
- Ensure that no incision and canalisation of the wetland and river systems takes place as a result of the proposed expansion;
- Ensure that no significant persistent impact on water quality will take place; and
- Minimise impacts on the aquatic ecology of the resources associated with the proposed expansion, within the Sabie River system, which is considered to be of high ecological importance and sensitivity.

The Aquatic assessment was compiled on the Sabie River, which flows past the north of the study area. In addition to the Sabie River, **one small valley bottom wetland feature was identified**, which is a very small tributary of the Sabie River. However, according to Mr. van Staden (Scientific Aquatic Services) a tributary of the Sabie River originating in the more southern areas no longer reaches the Sabie River but enters the stormwater system of the town of Sabie. **Refer to Figure 21.**

The study area falls within the Sabie-Sand Management Area (quaternary catchment X31A) and is located within the North Eastern Highlands Aquatic Ecoregion.

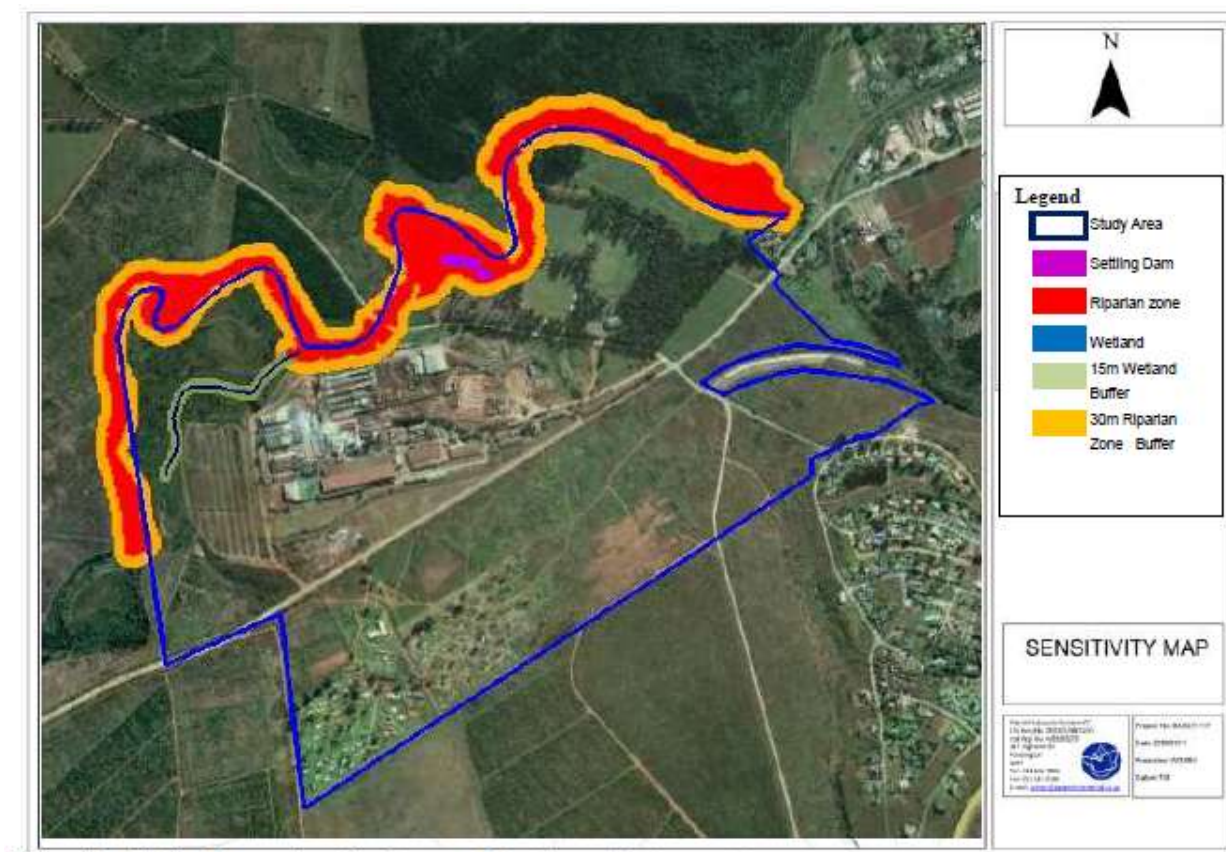


Figure 21 – Wetland and Riparian Zones and Associated Buffer Zones

Wetland Assessment

- **Wetland System Characterization**

SAS characterized the riparian system associated with the Sabie River feature with the use of the *Wetland System Characterisation Methodology*, as illustrated in the diagrams below:

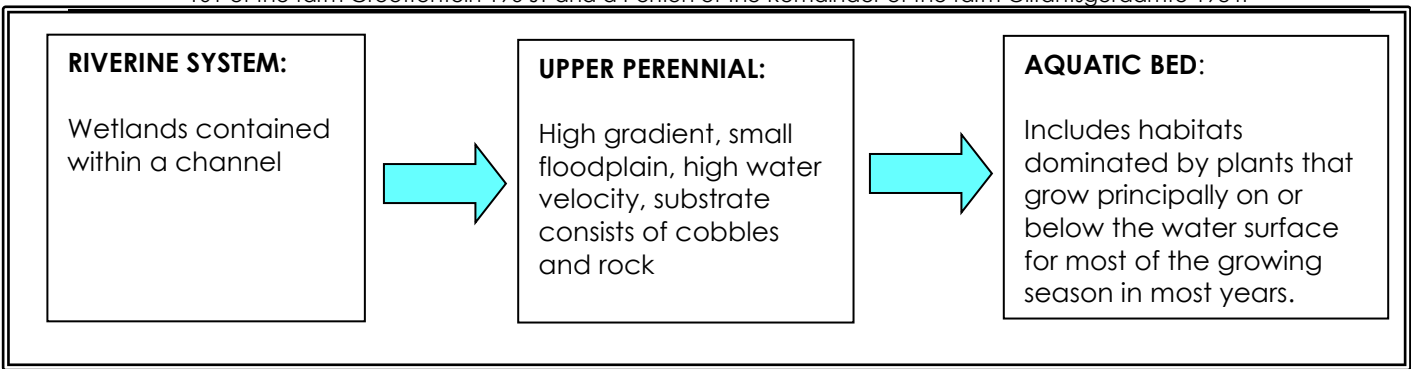


Diagram 12 - Wetland Categorization For The Sabie River

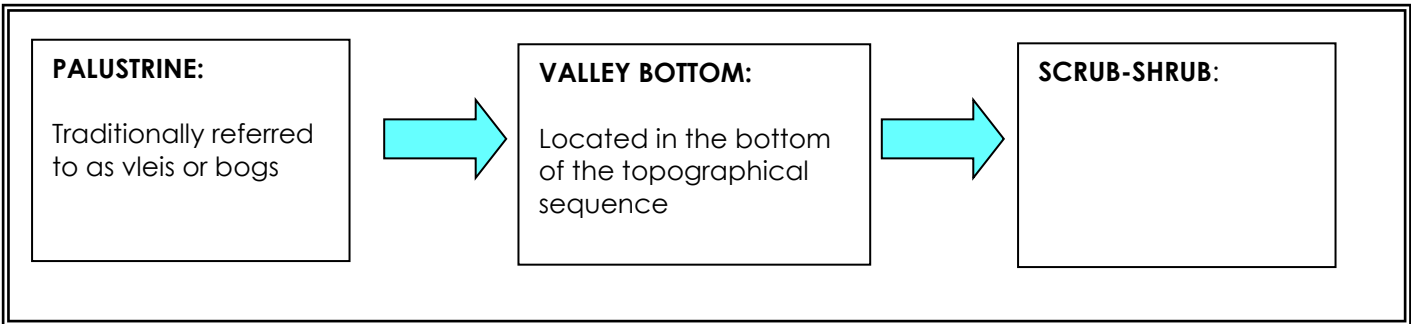


Diagram 13 - Wetland Categorization For The Non-Perennial Drainage Feature On The Study Area

- **Wetland Function Assessment**

Wetland function and service provision were assessed within the study area (**refer to Table 18, Annexure O**). From the results of the assessment, it is evident that the Sabie River has an **intermediate** level of ecological function and service provision. According to SAS the feature is the most important in terms of **erosion control, flood attenuation, sediment trapping and phosphate assimilation**. Other important functions it serves are **toxicant assimilation, tourism and recreation and biodiversity maintenance**.

The non perennial valley bottom drainage feature have a much lower level of service provision and are particularly unimportant from a socio-cultural and socio-economic point of view. These systems pay their most significant role in sediment trapping.

- **Present Ecological State**

The result for the criteria and attributes used for the calculation of the PES is stipulated in **Table 19 and Table 20, Annexure O**.

SAS stated that the mean score obtained for the determination of the PES of the Sabie River was 3.3, indicating the PES falls within class B – largely natural with few modifications. The mean score obtained for the non perennial valley bottom wetland was 3.0, indicating the PES falls within class C indicating moderately modified conditions. Based on these observations it is evident that the Sabie River is in a better condition than the non perennial valley bottom wetlands at the current time.

- **Ecological Management Class**

The results obtained from the wetland assessment indicated low transformation on all levels of ecology and functionality on the Sabie River while the non perennial valley bottom wetland showed higher levels of disturbance. Therefore, the Ecological Management Class (EMC) deemed appropriate to enhance and maintain currently ecology as well as functionality is class B (Moderately modified) in line with the recommendations of Kleynhans 1999.

Mitigation measures and recommendations stipulated in this report, if followed, are deemed adequate to reach this goal on a localised scale however, according to Mr. van Staden the catchment wide impacts on the drainage system will limit the ability to reach this EMC objective.

- **Wetland delineation and sensitivity mapping**

During the assessment, the following temporary zone indicators were used:

- Vegetation was utilised for the identification of the wetland temporary zone and was used as primary indicator
- Terrain units were also utilised for the determination of the feature due to the feature being contained in a channel.
- Surface water was considered during the delineation of the wetland feature with surface water being present throughout the feature.
- For the soil form indicator, the presence of gleyed soils (most of the iron has been leached out of the soil leading to a greyish/greenish/bluish colour) and mottling (created by a fluctuating water table) were investigated to aid in identifying areas with wetland characteristics where no indication of a temporary wetland zone could be identified from the vegetation or landscape characteristics.

Upon the assessment of the area, the various riparian vegetation components were assessed. Dominant species were characterised as either riparian or terrestrial species. The riparian species were then further categorised as temporary, seasonal and permanent zone species. The vegetation component identified during the assessment was mostly uniform for the feature.

A **30m** buffer zone around the **riverine feature** and a **15m** buffer zone around the **wetland feature** are recommended by SAS. **Refer To Figure 21 For The Riparian Zone And Wetlands Boundary And Associated Buffer Zones.**

Mitigation measures to minimise the impact on the wetland and aquatic ecology of the area supplied by SAS:

- Measures to contain and reuse as much water as possible within the plant process water system should be sought;
- A return water structure should be developed where plant process water is stored in a lined dam in order to prevent impacts on the receiving aquatic environment;
- As far as possible all infrastructure should remain out of the riparian zone and associated buffer;

- No dirty water runoff must be permitted to reach the wetland and riverine resources during the entire life of the plant, and clean and dirty water management systems must be put in place to prevent the contaminated runoff (suspended solids and salts and water with low pH) from entering the receiving aquatic environment. All dirty water containment structures should be designed to contain a minimum storm event of a 24 hour 1 in 50 year flood event;
- Adequate stormwater management must be incorporated into the design of the proposed development in order to prevent erosion and the associated sedimentation of the riparian and in stream areas, as these systems have aquatic communities which rely on stream substrates clear of sediment and on clear, fast flowing water. In this regard special mention is made of:
 - Sheet runoff from cleared areas, paved surfaces and access roads needs to be curtailed.
 - Runoff from paved surfaces should be slowed down by the strategic placement of berms.
- During any construction phase activities no vehicles should be allowed to indiscriminately drive through the wetland areas and vehicles must remain on designated roadways;
- All areas of increased ecological sensitivity near to plant operations should be clearly marked as "out of bounds" areas for all staff;
- During the construction and operational phases of the proposed expansion of the plant erosion berms should be installed to prevent gully formation and siltation of the wetland resources. The following points should serve to guide the placement of erosion berms:
 - Where the track has slope of less than 2%, berms every 50m should be installed.
 - Where the track slopes between 2% and 10%, berms every 25m should be installed.
 - Where the track slopes between 10%-15%, berms every 20m should be installed.
 - Where the track has slope greater than 15%, berms every 10m should be installed.

- No dumping of waste should take place within the riparian zone. If any spills occur, they should be immediately cleaned up;
- All disturbed open space areas should be rehabilitated and stabilised using a suitable grass mix to prevent sedimentation of the aquatic resources in the area.
- Close monitoring of water quality must take place. Monitoring of water quality should take place at a minimum frequency of once a month during which time major salts and basic metals, are monitored along with basic parameters such as pH, TSS and TDS, dissolved oxygen and EC;
- Ongoing biomonitoring of the aquatic resources in the vicinity of the plant must take place. Biomonitoring should take place at points located upstream and downstream of the plant activities on the Sabie River. Biomonitoring should take place on 6 monthly basis as a minimum in the autumn and spring of each year. Biomonitoring should take place using the SASS5 and IHAS indices. Biomonitoring should take place throughout the life of the plant. In addition an assessment of the fish community should take place according to the FAI index every two years. The results of the biomonitoring program should be compared to the results of this study to allow any temporal trends to be observed. Should any problems be indicated measures to minimise or prevent the impact should be implemented;
- Toxicity testing plant process water should take place concurrently with the biomonitoring program in order to monitor the toxicological risk of the process water system to the receiving environment. Tests should include the following test organisms:
 - *Vibrio fischeri*
 - *Daphnia pulex*
 - *Poeciliareticulata*
 - Algal Growth Potential
- Definitive toxicological testing according to the DEEEP protocol should take place should it become evident that process water discharge will occur. By following the DEEEP protocol accurate assessments of dilution requirements can be made to ensure that no toxicological response is observed in the sensitive Sabie River system.

Table 20: Issues and Impacts – Wetland/riparian zone

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possibilities High 🟢 Medium 😊 Low 🟡 Positive Impact/ Neutral - Not Necessary To Mitigate ☀️
10)	Impact on wetlands/riparian zone	-	🟡

Discussion of issues identified, possible mitigation measures and significance of issue after mitigation

10) The proposed Sabie Site expansion project could have an impact on the wetlands and riparian zone of the Sabie River.

If erosion, siltation and water pollution is not addressed, the sustainability of the Sabie river, riparian zone and associated wetlands can be negatively impacted by the development.

Table 21: Significance of Issue 10 (Impact on wetlands/riparian zone) After Mitigation/ Addressing of the Issue

Mitigation Possibilities High 🟢 Medium 😊 Low 🟡 Positive Impact/ Neutral - Not Necessary To Mitigate ☀️	Mitigation Already achieved ✓ Must be implemented during Planning phase, Construction and/ or Operational phase P / C / O Mitigation	Significance of Issue after mitigation Low/ eliminated L / E Medium M High H Not possible to mitigate, but not regarded as a

	<p>be clearly marked as “out of bounds” areas for all staff;</p> <p>C/O - Erosion berms should be installed to prevent gully formation and siltation of the wetland resources. The following points should serve to guide the placement of erosion berms:</p> <ul style="list-style-type: none"> - Where the track has slope of less than 2%, berms every 50m should be installed. - Where the track slopes between 2% and 10%, berms every 25m should be installed. - Where the track slopes between 10%-15%, berms every 20m should be installed. - Where the track has slope greater than 15%, berms every 10m should be installed. <p>C/O - No dumping of waste should take place within the riparian zone. If any spills occur, they should be immediately cleaned up;</p> <p>C - All disturbed open space areas should be rehabilitated and stabilised using a suitable grass mix to prevent sedimentation of the aquatic resources in the area.</p> <p>O –</p> <ul style="list-style-type: none"> • Close monitoring of water quality must take place. Monitoring of water quality should take place at a minimum frequency of once a month during which time major salts and basic metals, are monitored along with basic parameters such as pH, TSS and TDS, dissolved oxygen and EC; • Ongoing biomonitoring of the aquatic resources in the vicinity of the plant must take place. Biomonitoring should take place at points located upstream and downstream of the plant activities on the Sabie River. Biomonitoring should take place on 6 monthly basis as a minimum in the autumn and spring of each year. Biomonitoring should take place using the SASS5 and IHAS indices. Biomonitoring should take place throughout the life of the plant. In addition an assessment of the fish 	<p>M - To be included in EMP</p> <p>M - To be included in EMP</p> <p>M - To be included in EMP</p> <p>M - To be included in EMP</p>
--	--	---

	<p>community should take place according to the FAIL index every two years. The results of the biomonitoring program should be compared to the results of this study to allow any temporal trends to be observed. Should any problems be indicated measures to minimise or prevent the impact should be implemented;</p> <ul style="list-style-type: none"> • Toxicity testing plant process water should take place concurrently with the biomonitoring program in order to monitor the toxicological risk of the process water system to the receiving environment. Tests should include the following test organisms: <ul style="list-style-type: none"> - <i>Vibrio fischeri</i> - <i>Daphnia pulex</i> - <i>Poeciliareticulata</i> - Algal Growth Potential • Definitive toxicological testing according to the DEEEP protocol should take place should it become evident that process water discharge will occur. By following the DEEEP protocol accurate assessments of dilution requirements can be made to ensure that no toxicological response is observed in the sensitive Sabie River system. 	
--	--	--

Result: *Although issue can be mitigated, the significance of the impact should still be determined / confirmed and assessed in the Significance Rating Table*

6.1.3 Topography

The average gradient of the site is approximately 4°- 6° to the north-east. The highest elevations of the terrain at 1140m above mean sea level are along the southern boundary from where the terrain slopes towards the Sabie River.



Figure 22: 3 Dimensional Map

- According to the consulting engineers the slope is sufficient to allow for natural stormwater drainage as well as for the cost-effective installation of essential engineering services.
- The topographical characteristics will have no detrimental effect on the development potential of the site.
- No unstable slopes, which will pose a problem to the development, were observed.

Issues & Impact Identification – Topography

Table 22: Issues and Impacts – Topography

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possibilities High 🟢 Medium 😊 Low 🟡 Positive Impact - Not Necessary To

			Mitigate ☀
11)	Due to the relatively flat topography and location of the study area, the undulating landscapes of the surrounding area, surrounding pine forests and other dense vegetation in the area, the proposed development will never be completely visible. Only sections of the facility will be visible from some of the view sheds identified (i.e. from certain viewpoints along Road R 532 and from the houses along the western periphery of the Mt Anderson suburb)	- / + Depending on the architectural style and finishes	☺
12)	If not planned correctly, roofs and parking areas could reflect the sun into the eyes of oncoming traffic on the D2220 and D2431		☺
13)	If not planned and managed correctly the lights (interior and exterior) and the signage of the development could cause visual pollution.	-	☹

Discussion of issues identified, possible mitigation measures and significance of issue after mitigation

11) Due to the relatively flat topography and location of the study area, the undulating landscapes of the surrounding area, surrounding pine forests and other dense vegetation in the area, the proposed development will never be completely visible. Only sections of the facility will be visible from some of the view sheds identified (i.e. from certain viewpoints along Road R 532 and from the houses along the western periphery of the Mt Anderson suburb)

Table 23: Significance of Issue 11 (the proposed development will never be completely visible from the View Sheds around the Study Area) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ☀️</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>Medium 🟡</p>	<p>P –</p> <ul style="list-style-type: none"> The architectural styles, colours, textures and construction materials will determine the visual impact of the proposed expansions on the surrounding areas. The proposed development will be seen from a distance and, therefore, the roofs should not reflect the sun or be covered with roofing materials that has bright colours. Existing trees should be retained as far as possible on the site and surrounding area in order to soften the impact of the proposed permanent structures and to bring the scale of the higher structures down to a more human scale; Landscaping should be done in concurrence with the building construction in order to create an instant visual enhancement of the development. The landscaping of the proposed development should blend in with the natural vegetation of the area. Trees, shrubs and groundcovers that are 	<p>M – To be incorporated as part of the EMP</p>

	<p>endemic to the area and/or indigenous should preferably be used – landscaping that is in line with the natural vegetation of the area will not only help to reduce the visual impact of the development, but it will also create habitats for fauna and flora species.</p>	
--	---	--

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table

12) If not planned correctly, roofs and parking areas could reflect the sun into the eyes of oncoming traffic and surrounding landowners

Although the nuisance factor of this impact is regarded as high, it is easy to mitigate. The roof materials used for buildings and structures must be non-reflective materials. Walls and earth berms could also be used to screen-off the impacts of cars in parking areas.

Table 24: Significance of Issue 12 (Roofs and Parking Areas Could Reflect the Sun into the Eyes of Oncoming Traffic and Surrounding Landowners) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities High 🟢 Medium 🟡 Low 🟠 Positive Impact/ Neutral - Not Necessary To Mitigate ✨</p>	<p>Mitigation Already achieved ✓ Must be implemented during planning phase, construction and/ or operational phase P / C / O</p>	<p>Significance of Issue after mitigation Low/ eliminated L / E Medium M High H Not possible to mitigate, but not regarded as a fatal flaw NP</p>
	<p>P/C – Roof materials used for</p>	<p>L - To be included in EMP</p>

<p>Medium ☹️</p>	<p>buildings and structures must be non-reflective materials and not bright.</p> <p>P – Suitable plant materials should be used at strategic points to screen off impacts caused by roofs and cars in large parking areas.</p>	<p>L – To be incorporated as part of the EMP</p>
-------------------------	---	---

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table

13) If not planned and managed correctly, the lights of the development (exterior and interior) and the lights of signage could cause visual pollution during the night.

Table 25: Significance of Issue 13 (The Lights Of The Development (Exterior And Interior) And The Lights Of Signage Could Cause Visual Pollution During The Night) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 😊 Medium ☹️ Low 🟡</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ⚡</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>Medium ☹️</p>	<p>P/C – The generation of light by night events, security lighting and other lighting shall be effectively designed so as not to spill unnecessary outward into the oncoming traffic, or into neighbouring properties or open spaces.</p>	<p>L - To be included in EMP</p>

Result: *Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table*

6.1.4 Climate

The study area falls within the summer rainfall region within a transition zone of the *Northern Escarpment Dolomite Grassland* and *Quartzite Sourveld Grassland* vegetation type (Mucina & Rutherford, 2006).

Northern Escarpment Dolomite Grassland:

The rainfall varies from 700mm in the north, increasing southwards to 1 420mm (MAP 1 034mm). Most of this unit occurs in the mistbelt, with increased precipitation. Warm-temperate climate, with low frequency of frost. Temperature increases northwards, ranging from MAT of 15°C in the south to 17°C in the northern regions of the unit (Mucina & Rutherford, 2006).

Northern Escarpment Quartzite Sourveld:

Orographic effects enhance precipitation (overall regional MAP 1 176mm). Mist common along the highest areas. Warm temperature climate (MAT 16.6°C), with infrequent frost (Mucina & Rutherford, 2006).

Issues & Impact Identification – Climate

Table 26: Issues and Impacts – Climate

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possibilities High 🟢 Medium 😊 Low 🟡 Positive Impact - Not Necessary To Mitigate ☀️

14)	Should the construction phase be scheduled for the summer months, frequent rain could cause very wet conditions, which makes it extremely difficult to build in and to do rehabilitation works of disturbed areas.	-	😊
15)	If dry and windy conditions occur during the construction phase, dust pollution could become a problem. Although this impact will only be a short term impact, mitigation will be necessary during the construction phase.	-	😊

Discussion of issues identified, possible mitigation measures and significance of issue after mitigation

14) Should the construction phase be scheduled for the summer months, frequent rain could cause very wet conditions, which makes it extremely difficult to build in and to do rehabilitation works of disturbed areas.

These wet conditions often cause delays to building projects and the draining of water away from the construction works (in the case of high water tables) into the water bodies of the adjacent properties, could (if not planned and managed correctly) have an impact on the water quality of these water bodies.

Table 27: Significance of Issue 14 (Should the construction phase be scheduled for the summer months, frequent rain could cause very wet conditions, which makes it extremely difficult to build in and to do rehabilitation works of disturbed areas) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 😊 Medium 😐 Low 🛑</p> <p>Positive Impact/ Neutral - Not</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p>
---	--	--

Necessary To Mitigate ☼	and/ or operational phase P / C / O	High H Not possible to mitigate, but not regarded as a fatal flaw NP
High ☺	P/C – Construction workers and construction vehicles and machinery must stay out of the soggy areas during the wet periods. Barrier tape should be used to demarcate the areas that are drenched with water (especially the ecologically sensitive areas and the areas covered with valuable topsoil) and it should only be removed when the appointed Environmental Control Officer (ECO)/ site supervisor/ project manager/ main contractor regard the conditions in the affected areas as favourable.	L - To be included in EMP

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table

15) If dry and windy conditions occur during the construction phase, dust pollution could become a problem.

Sweeping of the construction site, clearing of builders' rubble and debris as well as the regular watering of the construction site (storage areas, roads etc.) must take place at least once a day.

Table 28: Significance of Issue 15 (Dust Pollution) After Mitigation/ Addressing of the Issue

Mitigation Possibilities High ☺ Medium ☹ Low 🛑 Positive Impact/ Neutral - Not Necessary To Mitigate ☼	Mitigation Already achieved ✓ Must be implemented during planning phase, construction and/ or operational phase	Significance of Issue after mitigation Low/ eliminated L / E Medium M High H
--	---	---

	P / C / O	Not possible to mitigate, but not regarded as a fatal flaw NP
High 😞	P/C - Sweeping of the construction site, clearing of builders' rubble and debris as well as the regular watering of the construction site (storage areas, roads etc.) must take place at least once a day.	L - To be included in EMP

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table

6.2 THE BIOLOGICAL ENVIRONMENT

Scientific Aquatic Services (SAS) was appointed to conduct a faunal, floral, wetland and aquatic assessment. **Refer to Annexure O**

Fauna and Flora Habitat Assessment

The study area site falls within the *Grassland Biome* (Rutherford & Westfall, 1994). Biomes are further divided into bioregions, which are spatial terrestrial units possessing similar biotic and physical features, and processes at a regional scale. The study area is situated within the *Mesic Highveld Grassland Bioregion* (Mucina & Rutherford, 2006) and within a transition zone of the *Northern Escarpment Dolomite Grassland* and *Quartzite Sourveld Grassland* vegetation type (Mucina & Rutherford, 2006).

Site Surveys

Two site visits were undertaken, one during August 2011 with a follow-up summer assessment in November 2011 to determine the ecological status of the subject property. A reconnaissance „walkabout“ was initially undertaken to determine the general habitat

types found throughout the study area and, following this, specific study sites were chosen that were representative of the habitats found within the area - special emphasis was placed on areas that may potentially support *Red Data Listed* species. Sites were investigated on foot to identify the occurrence of the *dominant* plant species and habitat diversities.

6.2.1 Vegetation Survey Results

Three vegetation units were identified:

- Riparian zone;
- Open Veld areas; and
- Transformed areas

Habitat Unit 1: Riparian zone

The riparian zone is present along the northern boundary of the study area where the Sabie River forms the boundary with adjacent properties. According to Mr. van Staden the ecological functioning and habitat integrity of the riparian zone was relatively high, although some disturbances were recorded. Alien plant species encroachment was high, with species such as *Rubus caneifolius* and *Lilium formosanum* occurring sporadically. The tree species that dominated the riparian zone included the indigenous species *Leucosida sericea* and *Rhamnus prinoides* as well as the alien species *Ligustrum japonicum* and *Castanea dentata*. The dominant shrub present on the study area was *Cliffortia linearifolia*, which occurs in dense stands along the edge of the river. Forb diversity was relatively high, but consisted of a large proportion of alien species, including invasive species such as *Solanum sysimbrifolia*, *S. mauritianum* and *Lilium formosanum*. Upon conclusion of the summer assessment, a number of indigenous *Crinum macowanii* and *Hypoxis hemerocallidae* specimens, (the latter being listed by SANBI as a species of concern) were also encountered in this region.

SAS stated that overall, vegetative cover was high, with exposed soils limited to localised areas. The riparian zone was generally up to 25 metres wide on both river banks and minimal erosion and incision of the riverbanks was noted. **Refer to Table 3, Annexure O for a presentation of the dominant species encountered during the assessment of the riparian zone.**

In terms of conservation value, the ecological functionality of the riparian zone is deemed to be **high**, notwithstanding the occurrence of a high number of invasive plant species. The habitat integrity and functionality of this habitat unit is relatively intact, which increases the Ecological Importance and sensitivity thereof. The Sabie River furthermore provides migratory connectivity for faunal species that move through the area, as well as specialist habitat for a number of faunal species associated with riparian habitats. The riparian zone is deemed to be **highly sensitive**, even though some historical impacts and changes to the floral compositions of the area have occurred. **Refer to Figure 21, Wetland and Riparian Zone Map.**

Habitat Unit 2: Open Veld areas

During the site visits it was noted that the Open Veld areas have experienced recent burning and disturbance and are similar in species composition and structure to the Transformed Areas. The Open Veld areas have a low density and diversity of woody species and are dominated by pioneer grass species and alien plant invaders. According to SAS the community has a **low** overall biodiversity.

In terms of conservation value, the ecological functionality and habitat integrity of the Open Veld community are **low**. This community provides a low degree of habitat for faunal species that inhabit and move through the area. Thus, the open veld plant community is deemed to be of **low sensitivity**.

Habitat Unit 3: Transformed areas

The Transformed areas include the old fields/ abandoned agricultural land and residential area in the south of the study area, as well as the sports fields in the north east, the *Eucalyptus* plantations and the wet log deck to the west of the present timber processing plant. The vegetation in this habitat unit is characterised by agricultural weeds, as well as alien and alien invasive species. As a result, biodiversity is **low**.

In terms of conservation value, the low ecological functionality and high number of alien plant invaders of the Transformed community, significantly lower the ecological sensitivity of this habitat unit.

RDL Floral Status Assessments

An assessment considering the presence of any plant species of concern, as well as suitable habitat to support any such species, was undertaken.

No RDL or protected plant species were identified during the assessment and the Probability of Occurrence of RDL taxa occurring within the subject property is deemed low although some species may occur in the riparian zone, which should remain undeveloped as open space.

Exotic and Invader Species

Levels of alien floral invasion were very high in the Open Veld and Transformed areas. **Refer to Table 11, Annexure O for a list of alien plant species, which occur on the study area.** The species encountered occurred at times in dense stands, and in significant populations or colonies. This further contributes to the low ecological sensitivity and high degree of loss of functionality and habitat provision of the majority of the study area.

Medicinal Plant Species

Medicinal plant species are not necessarily indigenous species, with many of them regarded as alien invasive weeds. According to SAS the medicinal species are all commonly occurring species and are not confined to the study area. **Refer to Table 12, Annexure O for a list of plant species with traditional medicinal value, plant parts traditionally used and their main applications, which were identified during the field assessment.**

Impact of Wet Log Deck on Sabie River

Upon conclusion of the assessment, it has been found that the proposed construction of a wet log deck to the south of the Sabie River and directly to the south of the wetland on the western portion of the site, will not pose any significant detrimental impact on the Sabie River. The potential impact thereof, may however be mitigated through ensuring that no dirty water runoff be permitted to reach the wetland and riverine resources. Clean and dirty water management systems must be put in place to prevent any contaminated runoff from entering the receiving aquatic environment. All dirty water containment structures should be designed to contain a minimum storm event of a 24 hour, 1 in 50 year flood event.

SAS supplied the following conditions and recommendations:

- All development activities must be situated only within the Open Veld and Transformed areas. No infringement into the Riparian and Wetland areas or its associated buffer zones may occur;
- The north western section of the study site bordered by the wetland buffer and the riparian zone buffer may serve as a biodiversity offset area;
- When revegetating or rehabilitating the site, focus must be on re-introducing trees, and particularly grass and forb species as found on the study area;
- Concurrent revegetation/ rehabilitation must be performed as far as possible; Bare exposed soils are to be avoided for extended periods;

- Activity footprint areas must be minimised as far as possible;
- No trapping of faunal species must be allowed on the property;
- Illicit or informal fires must be prohibited, and firebreaks around the property must be maintained;
- Removal of the alien and weed species encountered on the property must take place in order to comply with existing legislation (amendments to the Regulations under the Conservation of Agricultural Resources Act, 1983 and Section 28 of the National Environmental Management Act, 1998);
- As much of the existing vegetation should be maintained within the proposed development area in order to protect soils and to reduce the percentage of the surface area which is paved. In this regard, special mention is made of the need to use indigenous vegetation species as the first choice during landscaping;
- Adequate stormwater management must be incorporated into the design of the proposed upgrades in order to prevent incision, erosion and the associated sedimentation of the riverine and riparian areas. In this regard specific mention is made of the need to ensure that sufficient attenuation of stormwater takes place and to ensure that any stormwater released is released in such a way that the energy in the system is minimised and to prevent erosion and incision of the aquatic resources in the receiving environment;
- It must be ensured that separation of clean and dirty water takes place where possible and runoff generated by the wet log deck is contained in order to minimize potential impacts on the Sabie River and associated wetlands;
- During construction, erosion berms should be installed to prevent gully formation.

The following points should serve to guide the placement of erosion berms:

- Where the track has a slope of less than 2%, berms every 50m should be installed.
- Where the track slopes between 2% and 10%, berms every 25m should be installed.
- Where the track slopes between 10%-15%, berms every 20m should be installed.
- Where the track has a slope greater than 15%, berms every 10m should be installed.

6.2.2 Fauna

Refer to Annexure O, Section C

SAS stated that small mammals are unlikely to be directly observed in the field because of their nocturnal/crepuscular and cryptic nature. Larger faunal species were recorded during the subject property assessment with the use of visual identification, spoor, call and dung. It is important to note that the majority of the site is currently already in a developed state and have experienced high levels of anthropogenic impacts, which further influences the probability of observing certain faunal species.

Due to the nature and habits of fauna it is unlikely that all species will have been recorded during the site assessment, however the results obtained is deemed adequate to determine the faunal habitat availability within the subject property. The faunal categories covered by SAS are Mammals, Birds, Reptiles, Amphibians and Invertebrates.

Due to the fact that more accurate assessment would require seasonal assessment and it is deemed most likely that higher levels of faunal diversity would be observed in the warmer summer months and when there is more food available from actively growing vegetation, a second summer assessment was conducted. Fires in large parts of the open veld area hampered faunal community assessments significantly.

During the follow-up field assessment in November 2011, Sherman traps were placed at strategic points in the vicinity of water and/or food resources, in order to aid in the identification of small mammal species.

6.2.2.1 Mammals

One small mammal species, namely *Mastomys natalensis* (multimammate mouse), was directly observed during the assessment of the study area (through the use of the Sherman traps) in the vicinity of the Riparian Zone. Field signs were also recorded and these included dung from the Cape clawless otter (*Aonyx capensis*), located within the Riparian zone adjacent to the Sabie river, as well as that of a common duiker (*Sylvicapra grimmia*)

and another small antelope species. Dung of another small mammal species, thought to be serval or a similar small feline species, such as the African civet, was found on the study area within the Open Veld habitat unit.

In addition to the species mentioned above, evidence of burrowing mammals, such as rodents were also found in the study area, within the Transformed and Open Veld habitat units. Even though these areas show signs of disturbance, it nonetheless provides potential habitat for both small and larger mammal species. **Refer to Table 2, Annexure O, Section C for a list of the recorded mammal species during the August 2011 and November surveys.**

No highly threatened RDL mammal species were found during the site surveys. The study area provides suitable forage and breeding habitat for two threatened mammal species, namely the African civet (*Civettictis civetta*) and the Side-striped jackal (*Canis adustus*), which was not recorded during this study, but may potentially occur on the study area. These species are listed as Rare and Near-threatened respectively.

6.2.2.2 Birds

All bird species seen or heard during the time of the assessment were recorded and surveys were conducted across the entire subject property. The period of investigation was undertaken during late winter and it must be noted that some migratory birds may not have been identified. **Refer to Table 4, Annexure O, Section C for a list of all the bird species identified during the assessment.**

Habitat, particularly in the Riparian zone, is well suited for a diverse bird life. **No highly threatened RDL bird species were found during the surveys.**

6.2.2.3 Reptiles

Only one reptile species was identified during the assessment, namely the common brown house snake (*Lamprophis fuliginosus*). These species are widespread and commonly found throughout the entire southern African subregion. They are adapted to urban

environments and are often to be found near areas of human habitation, where they reside under debris or under stones in rocky areas. According to SAS the study area does however offer some degree of habitat for various reptile species. One reptile species, the Short-head legless skink (*Acontias breviceps*) which were not recorded during the field surveys, may potentially reside on the study area, and is listed as Vulnerable.

6.2.2.4 Amphibians

No amphibian species were reported during the initial field survey, mainly due to the survey being conducted during late winter, when many amphibian species may still remain inactive. The November survey also yielded no recording of amphibian species. Should amphibians be present on the study area, their range will be limited by moisture availability in the riparian and wetland areas, which is to remain protected. The possibility exists that the Natal Ghost Frog (*Heleophryne natalensis*), listed as Vulnerable, resides in the study area, as suitable habitat and forage material is available for these species. These species were however not encountered during the field surveys.

6.2.2.5 Invertebrates

It must be noted that the initial period of investigation was undertaken during late winter. Insects are most visibly identified in their adult stage of their life cycles and thrive and are most active during the southern African spring and summer times (September through May months). The survey conducted during late winter (August) recorded a very low invertebrate species count, with the follow-up survey showing a higher species count, as the subject property does offer habitat for various invertebrate species within the majority of the subject property.

No RDL or threatened invertebrate species were recorded during the field surveys.

No red listed faunal species were encountered on the study area and the Probability of Occurrence of RDL taxa occurring within the subject property is deemed low, although

these species are likely to utilise the riparian zone as primary habitat, which should remain undeveloped as open space.

Sensitivity Mapping

SAS created a sensitivity map with the use of the floral habitat integrity and diversity encountered during the assessment of the study area. From the assessment it became clear that the study area is, for the most part, in a degraded condition, with impaired habitat structure and ecological functioning. The riparian zone, however, does provided habitat for a number of species and the ecological functioning of this section of the study area is considered high. As a result, **the riparian zone and wetland areas were deemed to be of a highly sensitive nature and the Transformed and Open Veld areas of a low sensitivity.** A buffer zone was incorporated into the sensitivity map to protect the riparian zone of the Sabie River as well as the wetland identified on the study area. **Refer to Figure 23.**

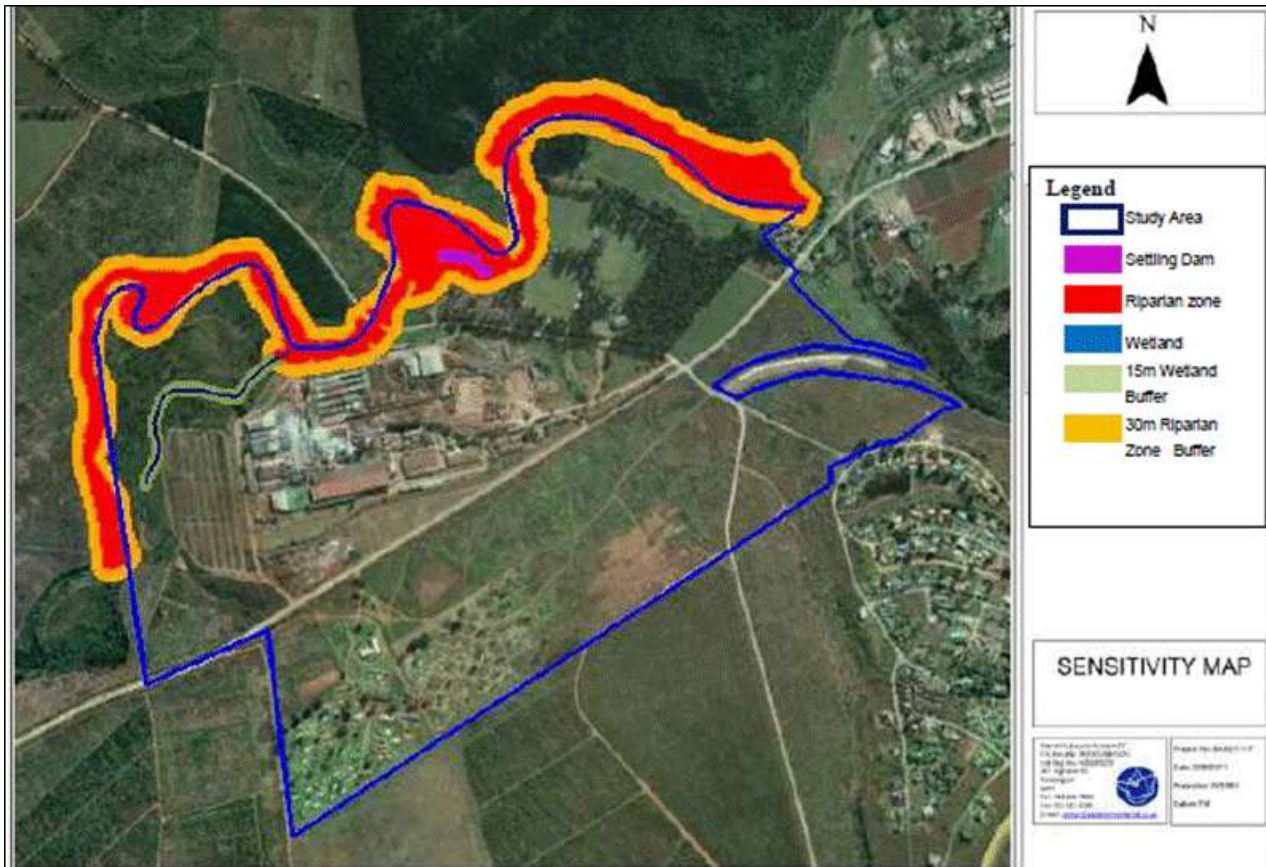


Figure 23: Ecological Sensitivity Map

SAS supplied the following conditions and recommendations:

- The development footprint should remain as small as possible and should not encroach on possible faunal habitat, primarily within the Riparian zone with its intact habitat structure. Footprint areas may be fenced to contain all activities within designated areas;
- Special care and thought during the pre-construction and design phase of the proposed infrastructure should be taken into account in order to reduce the impact of the development on faunal species;
- It is recommended that no development intervention or disturbance should occur within the riparian zone and wetland as identified on site and their associated buffer zones;
- It must be ensured that sensitive areas are off-limits to construction vehicles and personnel;
- Educate construction personnel about the importance of the natural faunal species and biodiversity of the natural surroundings;
- All informal fires on the property should be prohibited. Where a burning regime is implemented, it should be overseen by a qualified and experienced professional;
- No trapping or hunting of fauna is to take place. Access control must be implemented to ensure that no illegal trapping or poaching takes place;
- Ensure that migratory connectivity is maintained between open space areas.
- Education on identification for any RDL faunal species that may be found within the study site. Special mention must be made of all potential RDL species that may occur on the study area as outlined in this report;
- If any RDL species are to be discovered and disturbed, ensure effective relocation of individuals to suitable offset areas (the northwest area of the study site bordered by the wetland buffer and the riparian zone buffer may serve as such a biodiversity offset area) or nearby conservation areas;
- No dumping of waste may take place within the sensitive areas. If any spills or waste deposits occur, they should be immediately cleaned up;

6.2.3 Aquatic and Wetland Ecological Assessment

Refer to Annexure O, Section D

The purpose of this report was to define areas of increased aquatic and wetland Ecological Importance and Sensitivity (EIS) and the Present Ecological State (PES) of the aquatic resources along the proposed development route. In addition, a wetland delineation exercise was undertaken in order to define the extent of the wetland and riparian resources on the subject property. It is the objective of this study to provide detailed information to guide the activities associated with the expansion project near wetland and riparian areas to ensure that the ongoing functioning of the wetlands and rivers are facilitated with specific mention of the following:

- Ensure that connectivity of the wetland and river areas are maintained between the areas upstream and downstream of the portions of proposed expansion;
- Ensure ongoing functioning of the wetland and river areas in the vicinity of proposed expansion facilities;
- Ensure that permanent, seasonal and temporary wetland zone functionality is maintained through provision of measures to ensure that soil wetting conditions are maintained;
- Ensure that no incision and canalisation of the wetland and river systems takes place as a result of the proposed expansion;
- Ensure that no significant persistent impact on water quality will take place; and
- Minimise impacts on the aquatic ecology of the resources associated with the proposed expansion, within the Sabie River system which is considered to be of high ecological importance and sensitivity.

Results and Interpretation

Aquatic Assessment

Visual assessment:

Refer to Photographs¹⁰ below for views of the river and **Refer to Table 4, Annexure O, Section D** for a summary of the observations for the various criteria made during the visual assessment undertaken at the aquatic assessment site.



Photograph 1 - Upstream view of the upper most assessment point where the water was slower flowing



Photograph 2- Downstream view of the site on the Sabie River showing the excellent riffle and rapid habitat on the river providing niche habitat



Photograph 3 - Upstream view of the lower most site indicating the clear water and rocky substrate dominating the site



Photograph 4 – Downstream view of the site indicating the presence of some overhanging vegetation providing cover for fish

¹⁰ Photographs supplied by SAS

Physico-Chemical Water Quality

SAS made the following observations:

- The general water quality can be considered to be very good;
- The electrical conductivity (EC) value for the Sabie River is very low indicating that no addition of salts to the system occurs and that limited osmotic stress on the aquatic community is deemed likely to occur. No clear spatial trend is evident in the dissolved salt concentrations along the water course;
- The pH may be considered natural and no impact on the aquatic ecology of the system is deemed likely;
- Dissolved oxygen concentrations are high and the water can be defined as being oxygen saturated. Conditions can be regarded as being suitable for supporting a diverse and sensitive aquatic community; and
- Temperatures can be regarded as normal for the time of year and time of day when assessment took place although a clear increasing trend in temperature was observed. This may be as a result of diurnal variation between sampling times but close monitoring of this trend should take place.

Refer to Table 14, Annexure O, Section D for the biota specific water quality of the study area.

Habitat Assessment

From the results of the application of the Intermediate Habitat Integrity assessment (IHIA) to the segment of the Sabie River adjacent to the York Timbers site SAS noted that most of the observed impacts are limited in significance. Instream impacts ranged from large impacts due to the presence of alien fish species, namely rainbow and brown trout. Moderate impacts from bed, channel and flow modification as well as to the inundation were observed. Overall, the site achieved a 73.4% score for instream integrity and a 65.7% score for riparian zone integrity. The impact on the riparian zone included a large impact from indigenous vegetation removal as well as smaller impacts from channel modification, bank

erosion, flow modification, water abstraction and exotic vegetation encroachment. The site obtained an IHIA rating of 69.5%, which indicates moderately modified (Class C) conditions.

Aquatic Macro-invertebrates and their habitat

The data from the York Timbers aquatic biomonitoring program was analysed by SAS in order to define the sensitivity of this community. The data is based on biomonitoring data since 2004.

- From the spatial analyses it is evident that there is a clear decreasing trend in aquatic macro-invertebrate community in a downstream direction. The trend is particularly evident in winter. The observed deteriorations in a downstream direction may be related to variations in habitat suitability for aquatic macro-invertebrates but an impact from deteriorating water quality cannot be ruled out as a causal factor in this trend.
- The ASPT data however indicates that there is little spatial variation in aquatic macro-invertebrate community integrity. This observation indicates that the observed reductions in SASS score are likely to be related to variations in habitat suitability and not necessarily variations in water quality.
- From the temporal data analyses it is evident that the SASS scores are highly variable over time which is likely to be related to seasonal variation with special mention of flow and water temperature. With all three monitoring points showing similar variability over time, the observed variation can be considered to be largely natural.
- The temporal analyses of the ASPT data indicate that the APST of the system at all three points is largely stable and no clear trends are evident. This serves to indicate that the York Timbers mill is currently not affecting the macro-invertebrate community integrity of the Sabie River.

Fish Community Integrity

SAS sampled the fish community for a period of one half hour at each assessment point.

Refer to Table 15, Annexure O, Section D for a summary of the results.

- According to Skelton (2001) and Kleynhans (1999) a wide diversity of fish species are expected to occur in the Sabie River. Fish species expected to occur range from low sensitivity species to species with high sensitivities. Several of the species expected to occur have a low tolerance for water quality modifications as well as flow and substrate condition modifications.
- SAS observed three fish species within the river system, all of which can be said to be sensitive to habitat and flow changes. *Chiloglanis anoterus* and *Salmo trutta* can be considered to be sensitive to water quality variations. Higher concentrations of *Labeobarbus marequensis* were observed in the summer assessment
- According to SAS the fish community of the area is considered critically modified (Class F). The FALL data indicates that the fish community in this area has suffered a severe general loss in integrity. The low diversity and abundance of fish in the system is indicative of long term impacts on the system, with special mention of impacts on from exotic fish (*Salmo trutta*), loss of spawning habitat and upstream and downstream migration barriers.
- It is important to note that *Chiloglanis anoterus* is endemic to the escarpment streams of the Nkomati and Pongolo River systems and as such this species has a limited distribution range. SAS stated that it is therefore deemed important to ensure that conditions in the Sabie River do not deteriorate leading to this species dying out in the system.
- It is therefore deemed important to ensure that any development associated with the proposed Sabie Site timber processing facility expansion do not impact on the aquatic ecology of the Sabie River system. Careful design of the proposed expansion should take place in order to achieve minimal impact on the system.

Riparian Vegetation Integrity

According to SAS a moderate diversity of indigenous riparian species is present at this site, with the level of encroachment by alien invasive species being moderate to high. The indigenous riparian woody layer is dominated by *Leucosidea sericea*, *Cliffortia linearifolia* and *Rhamnus prinoides*, with the alien plant species *Castanea dentata* also present in significant numbers. In-stream vegetation levels are low, but some sedges, such as *Juncus* sp. are present. The RVI for the YKT1 site was 11.5 (out of a possible 20), a value which falls within the boundary of a class D (largely modified) stream. The RVI for the YKT3 site was 9.4 (out of a possible 20), a value which falls within the boundary of a class D (largely modified) stream. The reason for this site receiving this value comes mostly from the moderate to high abundance of alien plant species. The habitat integrity and functionality of this habitat unit is, however still relatively intact, with indigenous species being well-represented, with *Leucosidea sericea* being dominant.

The Wetlands

From the results of the assessment by SAS, it is evident that the Sabie River has an intermediate level of ecological function and service provision. The feature is the most important in terms of erosion control, flood attenuation, sediment trapping and phosphate assimilation. Other important functions it serves are toxicant assimilation, tourism and recreation and biodiversity maintenance.

The non-perennial valley bottom drainage feature has a much lower level of service provision and is particularly unimportant from a socio-cultural and socio-economic point of view. These systems play their most significant role in sediment trapping.

The mean score obtained for the determination of the PES of the Sabie River was 3.3, indicating the PES falls within class B – largely natural with few modifications. The mean score obtained for the non perennial valley bottom wetland was 3.0, indicating the PES falls within class C indicating moderately modified conditions. Based on these observations

it is evident that the Sabie River is in a better condition than the non perennial valley bottom wetland at the current time.

During the winter assessment it was found that, considering the terrain units, a wetland may be present to the south east of the subject property. During the summer assessment, this was however found not to be the case.

Recommendations supplied by SAS to minimise the impact on the wetland and aquatic ecology of the area:

- Measures to contain and reuse as much water as possible within the plant process water system should be sought;
- A return water structure should be developed where plant process water is stored in a lined dam in order to prevent impacts on the receiving aquatic environment;
- As far as possible all infrastructure should remain out of the riparian zone and associated buffer;
- No dirty water runoff must be permitted to reach the wetland and riverine resources during the entire life of the plant, and clean and dirty water management systems must be put in place to prevent the contaminated runoff (suspended solids and salts and water with low pH) from entering the receiving aquatic environment. All dirty water containment structures should be designed to contain a minimum storm event of a 24 hour 1 in 50 year flood event;
- Adequate stormwater management must be incorporated into the design of the proposed development in order to prevent erosion and the associated sedimentation of the riparian and in-stream areas, as these systems have aquatic communities, which rely on stream substrates clear of sediment and on clear, fast flowing water. In this regard special mention is made of:
 - Sheet runoff from cleared areas, paved surfaces and access roads needs to be curtailed;
 - Runoff from paved surfaces should be slowed down by the strategic placement of berms;

- During any construction phase activities no vehicles should be allowed to indiscriminately drive through the wetland areas and vehicles must remain on designated roadways;
- All areas of increased ecological sensitivity near plant operations should be clearly marked as "out of bounds" areas for all staff;
- During the construction and operational phases of the proposed Sabie Site development erosion berms should be installed to prevent gully formation and siltation of the wetland resources. The following points should serve to guide the placement of erosion berms:
 - Where the track has slope of less than 2%, berms every 50m should be installed;
 - Where the track slopes between 2% and 10%, berms every 25m should be installed;
 - Where the track slopes between 10%-15%, berms every 20m should be installed;
 - Where the track has slope greater than 15%, berms every 10m should be installed;
- No dumping of waste should take place within the riparian zone. If any spills occur, they should be immediately cleaned up;
- All disturbed open space areas should be rehabilitated and stabilised using a suitable grass mix to prevent sedimentation of the aquatic resources in the area;
- Close monitoring of water quality must take place. Monitoring of water quality should take place at a minimum frequency of once a month during which time major salts and basic metals, are monitored along with basic parameters such as pH, TSS and TDS, dissolved oxygen and EC;
- Ongoing biomonitoring of the aquatic resources in the vicinity of the plant must take place. Biomonitoring should take place at points located upstream and downstream of the plant activities on the Sabie River. Biomonitoring should take place on a six monthly basis as a minimum in the autumn and spring of each year. Biomonitoring should take place using the SASS5 and IHAS indices. Biomonitoring should take place throughout the life of the plant. In addition an assessment of the fish community should take place according to the FAll index every two years. The

results of the biomonitoring program should be compared to the results of this study to allow any temporal trends to be observed. Should any problems be indicated measures to minimise or prevent the impact should be implemented;

- Toxicity testing plant process water should take place concurrently with the biomonitoring program in order to monitor the toxicological risk of the process water system to the receiving environment. Tests should include the following test organisms:
 - *Vibrio fischeri*
 - *Daphnia pulex*
 - *Poeciliareticulata*
 - Algal Growth Potential
- Definitive toxicological testing according to the DEEEP protocol should take place should it become evident that process water discharge will occur. By following the DEEEP protocol accurate assessments of dilution requirements can be made to ensure that no toxicological response is observed in the sensitive Sabie River system.

Issues & Impact Identification – Flora and Fauna

Table 29: Issues and Impacts – Flora and Fauna

	Issue/ Impact	Positive/ Negative / Neutral ±	Mitigation Possibilities High 🟢 Medium 😊 Low 🟡 Positive Impact - Not Necessary To Mitigate ☀️
16)	Impact on sensitive wetland/riverine vegetation	-	🟡
17)	Impact on wetland and aquatic ecology	-	🟡
18)	The eradication of weeds and exotic invaders	+	☀️

19)	Noise of construction machinery could have a negative impact on the fauna species during the construction phase.	-	☹️
20)	During the construction and operational phase (if not managed correctly) fauna species could be disturbed, trapped, hunted or killed.	-	☹️
21)	Loss of habitat can lead to the decrease of fauna numbers and species.	-	☹️

Discussion of issues identified, possible mitigation measures and significance of issue after mitigation

16) Impact on vegetation including sensitive wetland/riverine vegetation.

The proposed expansion project could have an impact on sensitive wetland/riverine vegetation if mitigation measures are not implemented.

Table 30: Significance of Issue 16 (Impact on sensitive wetland/riverine vegetation) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ⚡</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>Low 🔴</p>	<p>P/C/O – All construction and related activities must be situated only within the Transformed and Open Veld areas. No infringement into the Riparian habitat unit and</p>	<p>H -To be included in EMP</p>

	<p>wetland areas and associated buffer zones must occur. All infrastructure should remain out of the riparian zone and associated buffer as far as possible.</p> <p>P/C/O – Activity footprint areas must be minimised.</p> <p>C/O - Rehabilitation must take place post-development and where possible trees, grass and forb species as identified on the study area must be re-introduced.</p> <p>O - Concurrent rehabilitation must be performed as far as possible.</p> <p>C - It must be ensured that sensitive areas are off-limits to construction vehicles and personnel.</p> <p>C - If any floral RDL species are to be discovered and disturbed during the construction activities, ensure effective relocation of individuals to suitable offset areas (the northwest area of the study site bordered by the wetland buffer and the riparian zone buffer may serve as such a biodiversity offset area) or nearby formal conservation areas.</p> <p>C/O - Illicit or informal fires must be prohibited. Where a burning regime is implemented, it should be overseen by a qualified and experienced professional.</p> <p>C/O - As much vegetation growth as possible should be</p>	<p>H -To be included in EMP</p> <p>H -To be included in EMP</p> <p>H -To be included in EMP</p> <p>H -To be included in EMP</p> <p>H -To be included in EMP</p> <p>H -To be included in EMP</p> <p>H -To be included in EMP</p> <p>H -To be included in EMP</p> <p>H -To be included in EMP</p>
--	---	--

	<p>promoted within the proposed development area in order to protect soils and to reduce the percentage of the surface area which is paved. In this regard, special mention is made of the need to use indigenous vegetation species as the first choice during landscaping.</p>	
--	--	--

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table

17) Impact on wetland/aquatic ecology

The proposed activities at the Sabie Site expansion project could have an impact on wetland and aquatic ecology if mitigation measures are not implemented.

Table 31: Significance of Issue 17 (Impact on wetland/aquatic ecology) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities High ☺ Medium ☹ Low 🛑 Positive Impact/ Neutral - Not Necessary To Mitigate ⚙</p>	<p>Mitigation Already achieved ✓ Must be implemented during planning phase, construction and/ or operational phase P / C / O</p>	<p>Significance of Issue after mitigation Low/ eliminated L / E Medium M High H Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>Medium ☹</p>	<p>P/C/O – Adequate stormwater management must be incorporated into the design of the proposed development in order to prevent incision, erosion and the associated sedimentation of the riverine and riparian areas.</p>	<p>M -To be included in EMP</p>

	<p>P/C/O –</p> <ul style="list-style-type: none"> -Measures to contain and reuse as much water as possible within the plant process water system should be sought. -A return water structure should be developed where plant process water is stored in a lined dam in order to prevent impacts on the receiving aquatic environment. - No dirty water runoff must be permitted to reach the wetland and riverine resources during the entire life of the plant, and clean and dirty water management systems must be put in place to prevent the contaminated runoff (suspended solids and salts and water with low pH) from entering the receiving aquatic environment. All dirty water containment structures should be designed to contain a minimum storm event of a 24 hour 1 in 50 year flood event. <p>C/O –</p> <ul style="list-style-type: none"> Close monitoring of water quality must take place. - Monitoring of water quality should take place at a minimum frequency of once a month during which time major salts and basic metals, are monitored along with basic parameters such as pH, TSS and TDS, dissolved oxygen and EC. - Ongoing biomonitoring of the aquatic resources in the vicinity of the plant must take place. Biomonitoring should take place at points located upstream and downstream of the plant activities on the Sabie River. Biomonitoring should take place on 6 monthly basis as a minimum in the autumn and spring of each year. Biomonitoring should take place using the SASS5 and IHAS indices. Biomonitoring should 	
--	--	--

	<p>take place throughout the life of the plant. In addition an assessment of the fish community should take place according to the FALL index every two years. The results of the biomonitoring program should be compared to the results of this study to allow any temporal trends to be observed. Should any problems be indicated measures to minimise or prevent the impact should be implemented.</p> <ul style="list-style-type: none"> - Toxicity testing of plant process water should take place concurrently with the biomonitoring program in order to monitor the toxicological risk of the process water system to the receiving environment. Tests should include the following test organisms: Vibrio fischeri Daphnia pulex Poecilia reticulata Algal Growth Potential - Definitive toxicological testing according to the DEEEP protocol should take place should it become evident that process water discharge will occur. By following the DEEEP protocol accurate assessments of dilution requirements can be made to ensure that no toxicological response is observed in the sensitive Sabie River system. 	
--	--	--

Result:

Positive impact, the significance of the impact should still be determined / confirmed and assessed in the Significance Rating Table

18) The proposed development will result in the eradication of exotic invaders and weeds.

In order to comply with existing legislation (amendments to the Regulations under the Conservation of Agricultural Resources Act, 1983 and Section 28 of the National Environmental Management Act, 1998) removal of the alien and weed species encountered on the property must take place.

Table 32: Significance of Issue 18 (The eradication of invasive species) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ⚡</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>Positive Impact - Not Necessary To Mitigate ⚡</p>	<p>P/C/O – All alien and weed species encountered on the site must be eradicated prior to construction and throughout the operational phase of the development.</p> <p>P/C/O – No plants not indigenous to the area, or exotic plant species, especially lawn grasses and other ground-covering plants, should be introduced in the communal landscaping of the proposed site, as they will drastically interfere with the nature of the area.</p>	<p>M -To be included in EMP</p> <p>L -To be included in EMP</p>

Result:

Positive impact, the significance of the impact should still be determined / confirmed and assessed in the Significance Rating Table

20) Noise of construction machinery could have a negative impact on the fauna species during the construction phase

If not managed correctly, noise pollution (i.e. by machinery without noise muffing devices) could have a negative impact on the fauna and birds in the area. This will however only be a short-term impact and it is expected that many of the birds will return to the area during the operational phase.

Table 33: Significance of Issue 20 (Noise of construction machinery could have a negative impact on the fauna species during the construction phase) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ☀️</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>Medium 🟡</p>	<p>P / C - Noise should be kept to a minimum and the development should be done in phases to allow faunal species to temporarily migrate into the conservation areas in the vicinity.</p>	<p>L -To be included in EMP</p>

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed and assessed in the Significance Rating Table

21) During the construction and operational phase (if not managed correctly) fauna species, especially birds, could be disturbed, trapped, hunted or killed.

There is always a risk that construction personnel or personnel of the plant may disturb, trap, hunt or kill fauna on the study area. This will have a detrimental impact on the local biodiversity and will decrease fauna numbers. The issue can be mitigated if this issue is included in conservation-orientated clauses that may be built into contracts of construction personnel and residents and if council prosecute offenders of these actions.

Caught animals should also be relocated to conservation areas in the vicinity.

Table 34: Significance of Issue 21 (During the construction and operational phase (if not managed correctly) fauna species could be disturbed, trapped, hunted or killed) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ⚡</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>High 🟢</p>	<p>C/O - Special care and thought during the pre-construction and design phase of the proposed infrastructure should be taken into account in order to reduce the impact of the development on faunal species.</p> <p>C/O - The integrity of remaining wildlife should be upheld, and no trapping or hunting by construction personnel should be allowed. Caught animals should be relocated to the conservation areas in the vicinity. Council shall prosecute offenders. .</p>	<p>L -To be included in EMP</p> <p>L -To be included in EMP</p>

	<p>Access control must be implemented to ensure that no illegal trapping or poaching takes place.</p> <p>C - Educate construction personnel about the importance of the natural faunal and floral species and biodiversity of the natural surroundings.</p>	<p>L - To be included in EMP</p>
--	--	---

Result: *Although issue can be mitigated, the significance of the impact should still be determined / confirmed and assessed in the Significance Rating Table*

21) Loss of habitat can lead to the decrease of fauna numbers and species

All mitigation measures for impacts on the indigenous flora of the area should be implemented in order to limit habitat loss and maintain and improve available habitat, in order to maintain and possibly increase numbers and species of indigenous fauna.

Table 35: Significance of Issue 21 (Loss of habitat can lead to the decrease of local fauna numbers and species) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ⚡</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>Low 🔴</p>	<p>P / C / O – Ensure that migratory connectivity is maintained between open space areas.</p>	<p>H - In terms of local fauna population</p> <p>L - In terms of the global conservation status of fauna</p>

Result:

This issue cannot be mitigated and the significance of the impact should be determined / confirmed and assessed in the Significance Rating Table

6.3 THE DESCRIPTION OF THE EXISTING SOCIO-ECONOMIC ENVIRONMENT

6.3.1 Archaeology/Cultural History

Refer to Annexure P for the Heritage Survey by Stephan Geiger from G&A Heritage. Mr. Geiger is a qualified archaeologist and listed by SAHRA (South African Heritage Resource Agency).

An independent heritage consultant was appointed to conduct a survey to locate, identify, evaluate and document sites, objects and structures of cultural importance found within the boundaries of the proposed development site. The scope of work consisted of conducting a Phase 1 archaeological survey of the site in accordance with the requirements of Section 38(3) of the National Heritage Resources Act, 1999 (Act 25 of 1999).

Identified Sites

Refer to Figure 24

- **Paleontological sites**

No paleontological sites of high value could be identified. Paleontological sites could be affected if bedrock was to be disturbed during the trenching activities.

Mitigation

Paleontological monitoring during excavation activities where bedrock is to be disturbed.



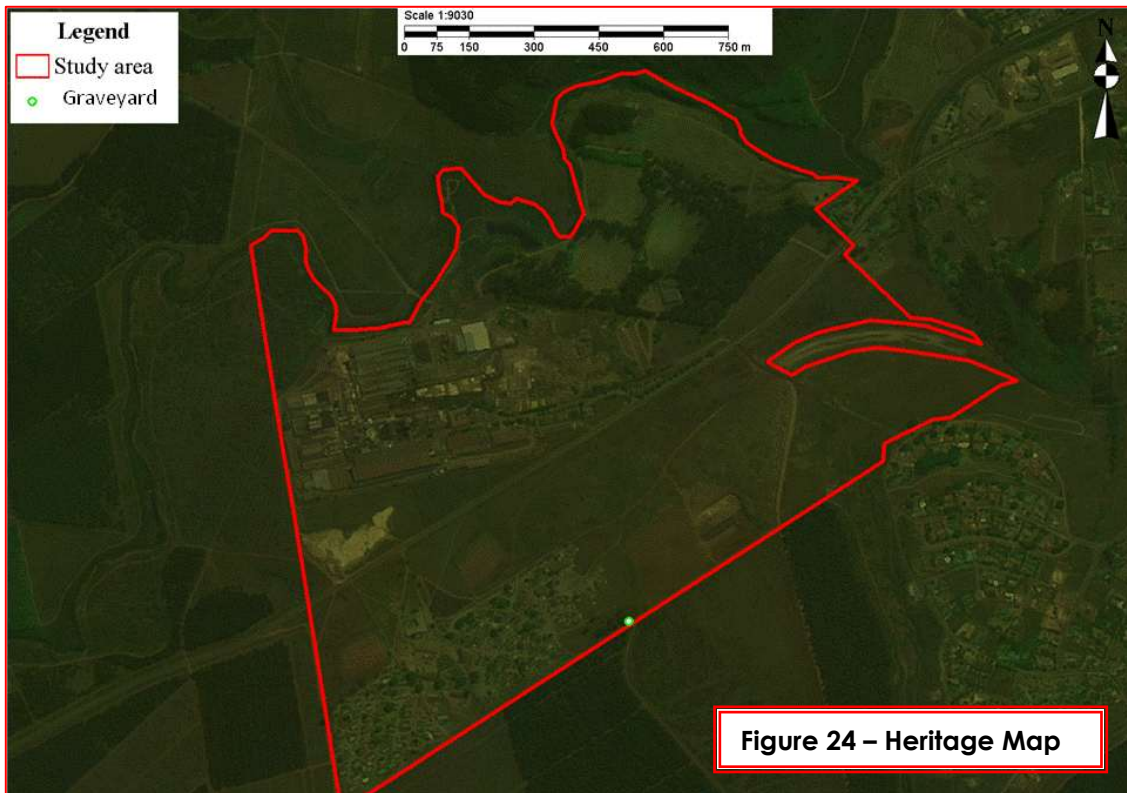
Photograph 5 - An Informal Cemetery With 10+ Graves Varying From Granite Inscribed Headstones To Simple Rock Cairns Or Outlines

- **Archaeological Sites**

One site of archaeological importance i.e. a small graveyard with at least ten graves was identified on the study area (**refer to Photograph 5 and Figure 24**). According to the heritage specialist this site has a high local significance.

Mitigation

It is recommended that the development design avoid the grave site. A safety buffer of 50 meters from the edge of the site was recommended by the heritage specialist. However due to the proposed alignment of road D2220 it would not be possible to allow for a safety buffer of 50m. **Refer to Figure 34, Sensitivity Map.**



- **Built Environment**

Some modern structures associated with farming were identified on the property adjacent to the site, which includes:

- A brick shed with corrugated roof (modern)
- Brick outbuildings and labor quarters (modern)
- Barb-wire fences (modern)
- Concrete reservoirs (modern)
- Dirt roads (modern)
- Footpaths

Mitigation

None of the structures with the exception of the roads and fences will be affected by the development activities. It is recommended that the fences and roads be rehabilitated after completion of the project.

- **Cultural Landscape**

The following landscape types were identified during the study.

Table 36: Cultural Landscape Types

Landscape Type	Description	Occurrence still possible?	Identified on site?
1. Paleontological	Mostly fossil remains. Remains include microbial fossils such as found in Baberton Greenstones	Yes, sub-surface	No
2. Archaeological	Evidence of human occupation associated with the following phases – Early-, Middle-, Late Stone Age, Early-, Late Iron Age, Pre-Contact	Yes, sub-surface	No

	Sites, Post-Contact Sites		
3. Historic Built Environment	<ul style="list-style-type: none"> - Historical townscapes/streetscapes - Historical structures; i.e. older than 60 years - Formal public spaces - Formally declared urban conservation areas - Places associated with social identity/displacement 	No	No
4. Historic Farmland	<p>These possess distinctive patterns of settlement and historical features such as:</p> <ul style="list-style-type: none"> - Historical farm yards - Historical farm workers villages/settlements - Irrigation furrows - Tree alignments and groupings - Historical routes and pathways - Distinctive types of planting - Distinctive architecture of cultivation e.g. planting blocks, trellising, terracing, ornamental planting. 	Yes	Yes, reservoirs, furrows, pathways. Eucalyptus trees indicating cemetery.
5. Historic rural town	<ul style="list-style-type: none"> - Historic mission settlements - Historic townscapes 	No	No
6. Pristine natural landscape	<ul style="list-style-type: none"> - Historical patterns of access to a natural amenity - Formally proclaimed nature reserves - Evidence of pre-colonial occupation - Scenic resources, e.g. view corridors, viewing sites, visual edges, visual linkages - Historical structures/settlements 	No	No

	<ul style="list-style-type: none"> older than 60 years - Pre-colonial or historical burial sites - Geological sites of cultural significance. 		
7. Relic Landscape	<ul style="list-style-type: none"> - Past farming settlements - Past industrial sites - Places of isolation related to attitudes to medical treatment - Battle sites - Sites of displacement 	Yes	Yes, existing saw mill and associated structures.
8. Burial grounds and grave sites	<ul style="list-style-type: none"> - Pre-colonial burials (marked or unmarked, known or unknown) - Historical graves (marked or unmarked, known or unknown) - Graves of victims of conflict - Human remains (older than 100 years) - Associated burial goods (older than 100 years) - Burial architecture (older than 60 years) 	Yes	Yes, cemetery at Site 001
9. Associated Landscapes	<ul style="list-style-type: none"> - Sites associated with living heritage e.g. initiation sites, harvesting of natural resources for traditional medicinal purposes - Sites associated with displacement & contestation - Sites of political conflict/struggle - Sites associated with an historic event/person - Sites associated with public memory 	No	No
10. Historical Farmyard	<ul style="list-style-type: none"> - Setting of the yard and its context - Composition of structures - Historical/architectural value of individual 	No	No

	<ul style="list-style-type: none"> structures - Tree alignments - Views to and from - Axial relationships - System of enclosure, e.g. defining walls - Systems of water reticulation and irrigation, e.g. furrows - Sites associated with slavery and farm labour - Colonial period archaeology 		
11. Historic institutions	<ul style="list-style-type: none"> - Historical prisons - Hospital sites - Historical school/reformatory sites - Military bases 	No	No
13. Amenity landscape	<ul style="list-style-type: none"> - View sheds - View points - Views to and from - Gateway conditions - Distinctive representative landscape conditions - Scenic corridors 	No	No

Mitigation

It is recommended that the development designs take into account the positive and negative characteristics of the existing cultural landscape types and that they endeavor to promote the positive aspects while at the same time mitigating the negative aspects.

Assessment of Impacts by G&A Heritage

Activities that will affect the heritage environment:

Post-Contact Heritage

Nature of Impacts: The proposed expansion of the Sabie Site could negatively affect the graveyard site located at Site 1 through excavation activities. The structural foundation remains found here could also be negatively affected by trenching and road building activities.

Extent of Impacts: Localised damage to the site (see *Impact Statement* section for application).

Table 37: Heritage Impact Assessment Matrix

NHRA Class	Identification		Significance	Impact	Recommendations
	Site	GPS			
Graves and Burial Grounds	Site 001	25° 53' 04" S 29° 24' 16" E	High	Severe	Alter development layout

Resource Management Recommendations

Although unlikely, sub-surface remains of heritage sites could still be encountered during the construction activities associated with the project. The cultural/heritage specialist stated that such sites would offer no surface indication of their presence due to the high state of alterations in some areas as well as heavy plant cover in other areas. The following indicators of unmarked sub-surface sites could be encountered:

- Ash deposits (unnaturally grey appearance of soil compared to the surrounding substrate);
- Bone concentrations, either animal or human;
- Ceramic fragments such as pottery shards either historic or pre-contact;

- Stone concentrations of any formal nature.

The following recommendations are given should any sub-surface remains of heritage sites be identified as indicated above:

- All operators of excavation equipment should be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures should they be encountered.
- All construction in the immediate vicinity (50m radius of the site) should cease.
- The heritage practitioner should be informed as soon as possible.
- In the event of obvious human remains the South African Police Services (SAPS) should be notified.
- Mitigation measures (such as refilling etc.) should not be attempted.
- The area in a 50m radius of the find should be cordoned off with hazard tape.
- Public access should be limited.
- The area should be placed under guard.
- No media statements should be released until such time as the heritage practitioner has had sufficient time to analyze the finds.

Comments from SAHRA

The Heritage Report was sent to SAHRA for comments.

Issues & Impact Identification – Cultural and Historical

Table 38: Issues and Impacts – Cultural and Historical

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possibilities High 🟢 Medium 😊 Low 🟡 Positive Impact - Not Necessary To

			Mitigate ☀
22)	Structures of cultural and historical significance may be destroyed.	-	😊

Discussion of issues identified, possible mitigation measures and significance of issue after mitigation

22) Structures of cultural and historical significance may be destroyed.

The only structures with any cultural heritage significance identified on the study area were a small graveyard consisting of approximately ten graves.

The involved cultural specialist recommended that the proposed development exclude the graveyard and that a safety buffer of 50m be provided in the layout. **The graveyard will be conserved, however it is not possible to allow for a 50m buffer around the graveyard due to the proposed re-alignment of road D2220 which encroaches onto the 50m buffer zone.** The proposed smaller buffer was discussed with the cultural and heritage specialist and he indicated that it will be possible to reduce the proposed buffer to accommodate the access road.

Table 39: Significance of Issue 22 (Structures of cultural and historical significance may be destroyed) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 😊 Medium 😐 Low ☹</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ☀</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p>	<p>Significance of Issue after mitigation</p> <p>Positive ☀</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>High 😊</p>	<p>P / C / O - It should be noted that in terms of the South</p>	<p>H - To be included in the EMP</p>

	<p>African Resources Act (Act 25 of 1999) Section 35(4) no person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or material</p> <p>P / C / O - Also important is that Section 34(1) of this act states that no person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit, issued by the relevant provincial heritage resources authority.</p> <p>P / C / O - The mitigation measures supplied by the heritage specialist must be implemented.</p> <p>C -It is recommended that should bedrock be affected during trenching activities that a palaeontologist be appointed to monitor the construction activities.</p>	<p>H - To be included in the EMP</p> <p>H - To be included in the EMP</p> <p>M - To be included in the EMP</p>
--	--	---

Result:

The issue can be mitigated and turned into a positive impact, the significance of this positive impact still need to be determined/confirmed and assessed in the Significance Rating Table

6.3.2 Social Aspects of the Proposed Development Area

6.3.2.1 ZONING AND LAND USE

6.3.2.1.1 Existing Zoning and Land Use (Study Area)

Refer to Section 4.1

6.3.2.1.2 Surrounding Zoning and Land Use

Information supplied by Umsebe Development Planners

The area to the north, west and south of the site is rural in character including forestry plantations, an agri village (Shonalanga village) and tourist related uses such as Lone Creek Falls (± 4 km to the north-west), Horseshoe Falls (± 9 km to the west) and Bridal Veil Falls to the north.

Moving eastwards along the D2220 road towards the town centre the following land uses are evident: **(refer to Refer to Figure 25 and Annexure Q: Land Use Plan).**

- Industrial – i.e. Green Gold Park, Miracle Timber, Timber Sales Depot, Nieuwco Recycling Specialist, Mountain View Workshop & Auto Electrical, depots and warehouses;
- Institutional – Municipal testing station, Department of Roads and Transport, Telkom offices, Sybrand van Niekerk High School;
- Tourism and accommodation – Merry Pebbles Resort, Floreat Riverside Lodge, Billy Bongo Backpackers, Valley View Guest House, Jock Sabie Lodge, Glass Bungalow & River Chalets;
- Businesses and commercial uses are mainly found in the CBD along Main Street; and
- Sabie Extension 9 is a residential township located adjacent south-east of the site. Scattered residential developments occur along the D2220 road.

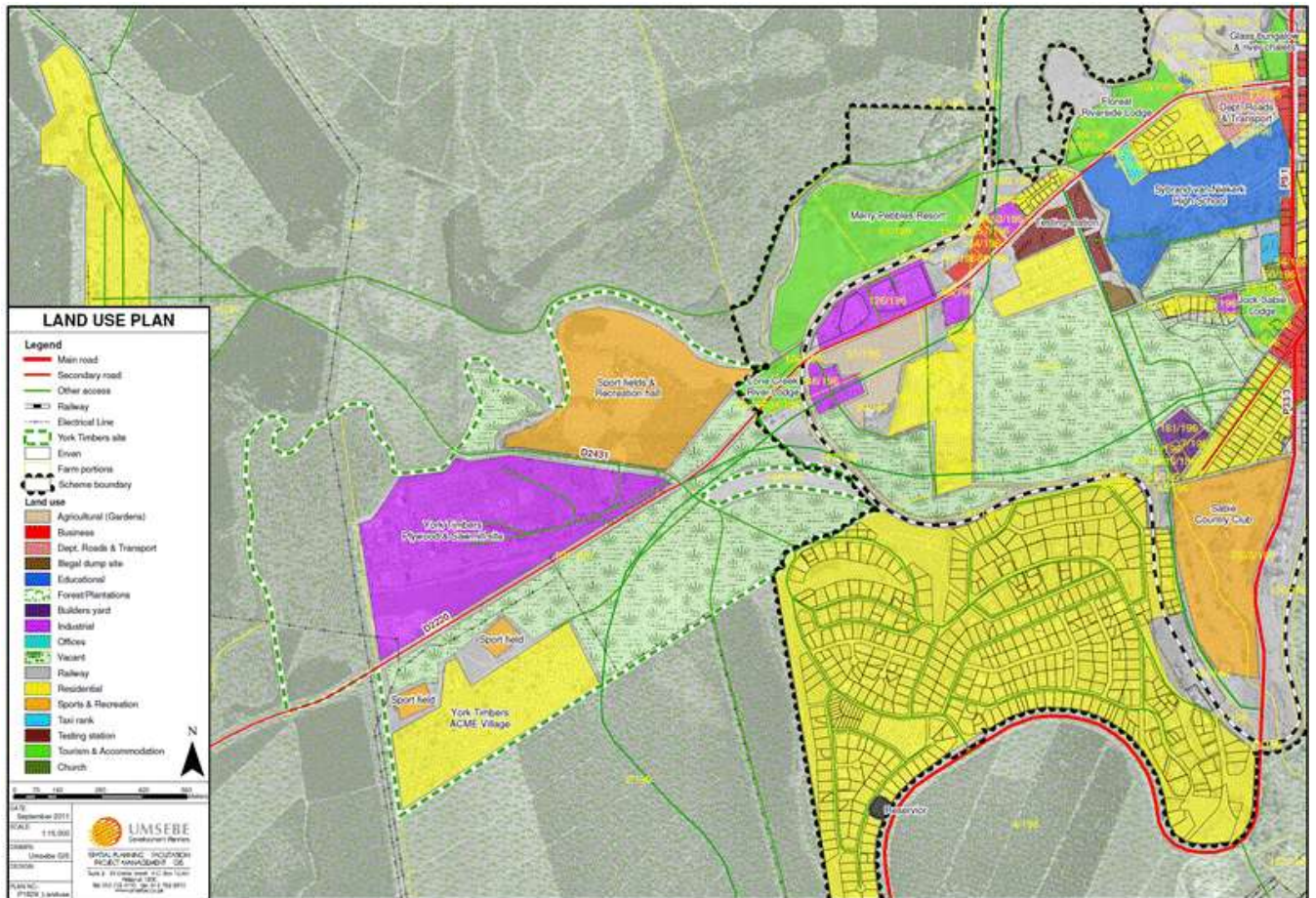


Figure 25 – Land Use Plan

6.3.2.1.3 Proposed Zoning and Land Use

Refer to Section 4.2

Issues & Impact Identification – Proposed Land-use

Table 40: Issues and Impacts – Proposed Land-Use

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possibilities High 🟢 Medium 😊 Low 🟡 Positive Impact - Not Necessary To Mitigate ☀️
23)	Impact on infrastructure in the area	-	😊
24)	Loss of public open space areas	+	☀️
25)	Impact on Lone Creek River Lodge	+	☀️
26)	Impact on tourism in the area	+	☀️
27)	Compatibility with surrounding land uses	-	😊
28)	Economic viability	-	😊
29)	Generation of electricity	-	😊
30)	Decommissioning of Mount Anderson Landfill Site	-	😊
31)	Creation of temporary and permanent jobs	+	☀️

Discussion of issues identified, possible mitigation measures and significance of issue after mitigation

23) The proposed expansion of the Sabie site will have an impact on infrastructure in the area.

Construction of the new development may cause damage to the existing services and infrastructure and could disrupt service provision (i.e. electricity, water, Telkom cables) to local residents on surrounding properties during the construction phase. As already mentioned Road D2220 and Road D2431D will be realigned in order to accommodate the proposed expansion and the relocation of existing power cables are required.

Table 41: Significance of Issue 23 (Impact on infrastructure in the area) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ☀️</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>Medium 🟡</p>	<p>P / C – Determine areas where services will be upgraded and relocated well in advance. Discuss possible disruptions with affected parties to determine most convenient times for service disruptions and warn affected parties well in advance of dates that service disruptions will take place</p> <p>P / C – Temporary routes should be provided during the realignment of the roads.</p>	<p>L – To be included in the EMP</p> <p>L – To be included in the EMP</p>

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table

24) Loss of existing public open space areas

The expansion of the Sabie Site will encroach the public open space areas with rugby, cricket and soccer fields in the north-eastern portion of the study area. The proposed realignment of Road D2431 traverses the existing cricket pitch and soccer field however the existing rugby field is not affected. Private open space areas, will be provided in other sections of the study area (**refer to Figure 14, Zonings Map**).

Table 42: Significance of Issue 24 (Loss of existing public open space area) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ☀️</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>Medium 🟡</p>	<p>P / C - Private Open Space areas must be included in the layout of the expansion project.</p>	<p>L - To be included in the EMP</p>

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table

25) Impact on Lone Creek River Lodge (LCRL)

The proposed expansion of the Sabie Site could have noise impacts on Lone creek River i.e. noise from heavy trucks transporting timber and operational noise from the plant.

Financial loss to LCRL's hospitality business due to noise caused by operations at plant.

A noise impact assessment was conducted by Jongens Keet Associates (JKA) and mitigation measures were supplied (**refer to Section 6.3.3.3 and Annexure R**).

Table 43: Significance of Issue 25 (Impact on Lone Creek River Lodge) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ⚡</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>Medium 🟡</p>	<p>P / C / O- The mitigation measures supplied by the acoustical engineers must be implemented (refer to Section 6.3.3.3 and Annexure R).</p>	<p>H – To be included in the EMP</p>

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table

26) Impact on tourism in the area

The proposed expansion could have a negative impact on tourism in the area i.e. increase in heavy vehicles, deterioration of roads etc.

Table 44: Significance of Issue 26 (Impact on tourism in the area) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ⚡</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
		<p>NP</p>

Result:

The issue can not be mitigated, the significance of the impact should be determined / confirmed assessed in the Significance Rating Table

27) Compatibility with surrounding land uses.

The existing Sabie Plant and proposed expansions could have an impact on surrounding land uses i.e. noise impact on LCRL and other properties adjacent to site and access roads.

However, the following measures will be implemented to enhance the appearance of the plant and make it more compatible with the surrounding land uses:

- A screen wall will be erected on the perimeter
- Internal roads and parking areas will be paved

- Strict architectural and landscaping guidelines will be applied
- The main access will be improved and the truck road be formalized

Table 45: Significance of Issue 27 (Compatibility with surrounding land uses) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🟠</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ☀️</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P/ C / O</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>Medium 🟡</p>	<p>P/ C/O – Mitigation measures supplied by the acoustical engineer must be implemented (refer to Section 6.3.3.3 and Annexure R).</p> <p>P/ C - A screen wall should be erected on the perimeter</p> <p>P/ C - Internal roads and parking areas should be paved</p> <p>P/ C - Strict architectural and landscaping guidelines will be applied</p> <p>P/ C - The main access must be improved and the truck road be formalized</p>	<p>M – To be included in the EMP</p>

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table

28) Economic viability

The economical viability of the proposed expansion project had been confirmed (**refer to Section 6.3.5 and Annexure Z**)

Table 46: Significance of Issue 28 (Economic viability) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ⚡</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>Positive Impact - Not Necessary To Mitigate ⚡</p>		

Result:

Although issue is positive, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table

29) Generation of electricity

The proposed co-generaiton facility will generate electricity to be used by the plant and access electricity to be fed into the municipal grid.

Table 47: Significance of Issue 29 (Generation of electricity) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p>	<p>Mitigation</p> <p>Already achieved ✓</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p>
---	---	---

Positive Impact/ Neutral - Not Necessary To Mitigate ☀	Must be implemented during p lanning phase, c onstruction and/ or o perational phase P / C / O	Medium M High H Not possible to mitigate, but not regarded as a fatal flaw NP
Positive Impact - Not Necessary To Mitigate ☀		

Result:

Although issue is positive, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table

30) Decommissioning of Mount Anderson Landfill Site

The Mount Anderson Landfill site will be decommissioned as part of the Sabie Site expansion project.

The landfill site was classified as non-hazardous by Aurecon (**refer to Section 6.1.2.2 and Annexure N (iii)**) and a Waste License application had been submitted to MDEDET for the decommissioning of the landfill site.

Table 48: Significance of Issue 32 (Decommissioning of Mount Anderson Landfill Site) After Mitigation/ Addressing of the Issue

Mitigation Possibilities High 🟢 Medium 🟡 Low 🔴 Positive Impact/ Neutral - Not Necessary To Mitigate ☀	Mitigation Already achieved ✓ Must be implemented during p lanning phase, c onstruction and/ or o perational phase P / C / O	Significance of Issue after mitigation Low/ eliminated L / E Medium M High H Not possible to mitigate, but not regarded as a fatal flaw NP
Medium 🟡	C – Mitigation measures for the	L – To be included in the EMP

	decommissioning of the landfill site must be implemented. Refer to EMP, Annexure BB	
--	---	--

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table

31) Creation of temporary and permanent jobs

The expansion project will create temporary job opportunities during the construction phase and temporary and permanent job opportunities during the operational phase. Should local communities not benefit from these opportunities, it could lead to an influx of people from other areas. Only employing people from the local community could mitigate the potential adverse impact.

Table 49: Significance of Issue 31 (Creation of temporary and permanent jobs) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ⚡</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>Positive Impact - Not Necessary To Mitigate ⚡</p>	<p>C / O – In order to limit the influx of people from other areas, it is recommended that (where possible) only people from the local communities in and around Sabie be employed.</p>	<p>L – To be included in the EMP</p>

Result: *Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table*

6.3.3 Qualitative Environment

6.3.3.1 Visual Aspects

The following visual assessment criteria (**refer to Table 50**) have been used to determine the impact of the proposed development on the state of the environment – the significance is indicated by the respective colour coding for each of the impacts, being high, medium and low:

Table50: Visual Impact Criteria

CRITERIA	IMPACT		
	HIGH	MEDIUM	LOW
Visibility	A prominent place with an almost tangible theme or ambience.	A place with a loosely defined theme or ambience.	A place having little or no ambience with which it can be associated.
Visual quality	A very attractive setting with great variation and interest – no clutter.	A setting with some visual and aesthetic merit.	A setting with no or little aesthetic value.
Compatibility with the surrounding landscape	Cannot accommodate proposed development without the development appearing totally out of place – not compatible with the existing theme.	Can accommodate the proposed development without it looking completely out of place.	The surrounding environment will ideally suit or match the proposed development.
Character	The site or surrounding area has a definite character/ sense of place.	The site or surrounding environment has some character.	The site or surrounding environment exhibits little or no character/ sense of place.
Visual Absorption Capacity	The ability of the landscape not to accept a proposed development	The ability of the landscape to less easily accept visually a particular	The ability of the landscape to easily accept visually a particular type of

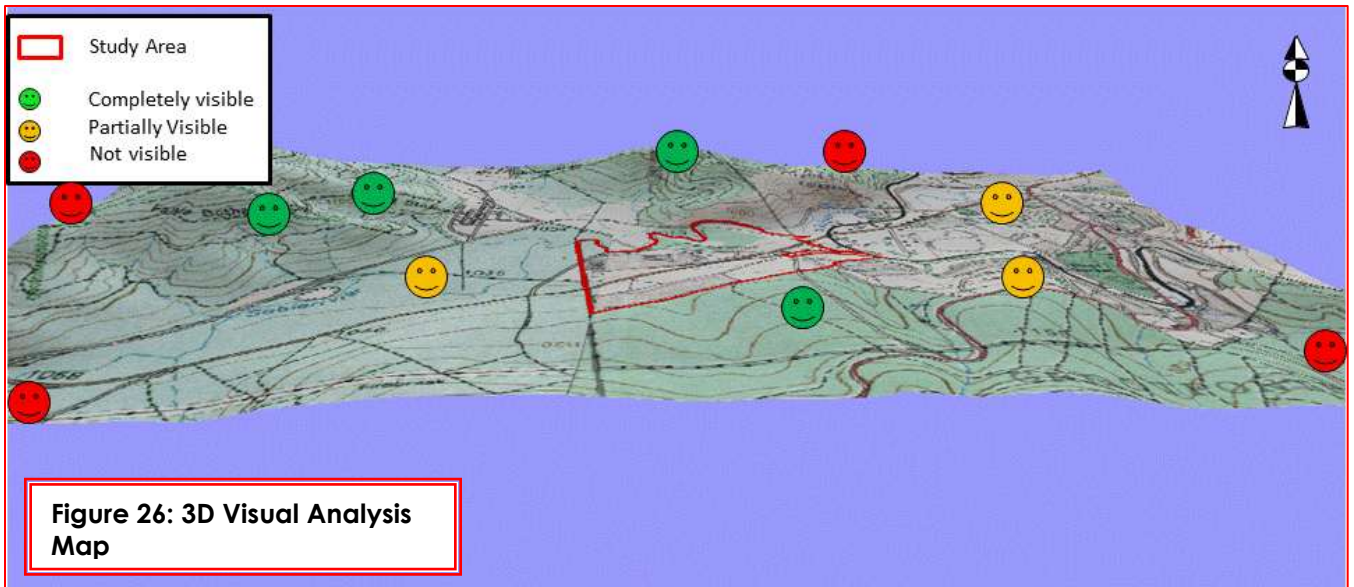
	because of a uniform texture, flat slope and limited vegetation cover.	type of development because of less diverse landform, vegetation and texture.	development because of its diverse landform, vegetation and texture.
View distance	If uninterrupted view distances to the site are > 5 km.	If uninterrupted view distances to the site are < 5 km but > 1 km.	If uninterrupted view distances to the site are > 500 m and < 1000 m.
Critical Views	Views of the site seen by people from sensitive view sheds i.e. farms, nature areas, hiking trails etc.	Some views of the site from sensitive view sheds.	Limited or partial views of the site from sensitive view sheds.
Scale	A landscape with horizontal and vertical elements in high contrast to human scale.	A landscape with some horizontal and vertical elements in some contrast to human scale.	Where vertical variation is limited and most elements are related to the human and horizontal scale.

Due to the undulating landscape, the pine forests and other dense vegetation coverage in the surrounding area, the plant will not be completely visible from any of the sensitive view sheds. From some view sheds the plant was not visible at all (i.e. the Lone Creek Guest house).

The views from the following points are regarded as the most sensitive:

- Views from certain points on the road R 532;
- Views from the houses along the eastern boundary of the Mt Anderson suburb; and
- The views from roads and viewpoints to the north of the Sabie River.

The design phase of the proposed new facility must consider these sensitive view sheds.



The applicant undertook to augment the appearance of the plant and make it more compatible with the surrounding land uses ensuring an aesthetically pleasing development through the implementation of the following measures, which will minimize the visual impact:

- Erect a screen wall on the perimeter
- Pave internal roads and parking areas
- Apply strict architectural and landscaping guidelines
- Improve the main access and formalise the ramp road

As a result of the visual impacts already experienced in the area (the existing Sabie Sawmill and Plywood buildings and associated infrastructure, we are of the opinion that the proposed expansion of the Sabie site (although it will add to the visual impacts) will not cause major visual pollution.

Issues & Impact Identification – Visual

Table 51: Issues and Impacts – Visual

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possibilities High 🟢 Medium 😊 Low 🟡 Positive Impact - Not Necessary To Mitigate 🌟
11)	Due to the relatively flat topography and location of the study area, the undulating landscapes of the surrounding area, surrounding pine forests and other dense vegetation in the area, the proposed development will never be completely visible. Only sections of the facility will be visible from some of the view sheds identified (i.e. from certain viewpoints along Road R 532 and from the houses along the western periphery of the Mount Anderson suburb) - Please refer to Section 6.1.3	- / + Depending on the architectural style and finishes	😊
12)	If not planned correctly, roofs and parking areas could reflect the sun into the eyes of oncoming traffic and surrounding landowners - Please refer to Section 6.1.3	-	😊
13)	If not planned and managed correctly the lights (interior and exterior) and the signage of the development could cause visual pollution - Please refer to Section 6.1.3	-	😊

6.3.3.2 “Sense of Place” and Place Structure

The concept of a “Sense of Place” does not equate simply to the creation of picturesque landscapes or pretty buildings, but to recognise the importance of a sense of belonging. The quality of place is attained by embracing uniqueness as opposed to standardisation.

In terms of the natural environment it requires the identification, a response to and the emphasis of the distinguishing features and characteristics of landscapes. Different natural landscapes suggest different responses. Accordingly, settlement design should respond to nature.

In terms of the human made environment, quality of place recognises that there are points where elements of settlement structure, particularly the movement system, come together to create places of high accessibility and special significance. These are the meeting places of townships e.g. parks. In the best cases, the importance of these places is recognised in that they become the focus of public investment, aimed at making them attractive, user-friendly and comfortable to experience.

The landscape is usually experienced in a sensory, psychological and sequential sense, in order to provide a feel and image of place (“genius loci”). A landscape is thus an integrated set of elements, which responds to different influences and is experienced as the unique spirit of place, or “genius loci”. Each landscape has a distinct character, which makes an impression in the mind, an image that endures long after the eye has moved to other settings. **“Sense of Place” is the subjective feeling a person gets about a place by experiencing the place visually, physically, socially and emotionally. The “Sense of Place” of an area is one of the major contributors to the “Image of the area”.**

The image of an area consists of two main components, namely **Place Structure** and **“Sense of Place”**. These could be defined as the following:

- **Place Structure** refers to the arrangement of physical place making elements within a unique structure that can be easily legible and remembered; and

- The “**Sense of Place**” is the subjective meaning attached to a certain area by individuals or groups and is linked to its history, culture, activities, ambience and the emotions the place creates.




As mentioned the applicant will augment the appearance of the plant and make it more compatible with the surrounding land uses ensuring and aesthetically pleasing development through the implementation of the following measures which will minimize the visual impact:

- Erect a screen wall on the perimeter
- Pave internal roads and parking areas
- Apply strict architectural and landscaping guidelines
- Improve the main access and formalise the ramp road

Issues & Impact Identification – “Sense of Place”

Table 52: Issues and Impacts – “Sense of Place”

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possibilities High 🟢 Medium 😊 Low 🟡 Positive Impact - Not Necessary To Mitigate 🌟
32)	If not planned and managed correctly, the proposed development could have a negative impact on the “Sense of Place” of the study area and its surroundings.	-	😊
11)	Due to the relatively flat topography and location of the study area, the undulating landscapes of the surrounding area,	-/+ Depending on the	😊

	surrounding pine forests and other dense vegetation in the area, the proposed development will never be completely visible. Only sections of the facility will be visible from some of the view sheds identified (i.e. from certain viewpoints along Road R 532 and from the houses along the western periphery of the Mount Anderson suburb) - Please refer to Section 6.1.3	architectural style, finishes and lighting design	
12)	If not planned correctly, roofs and parking areas could reflect the sun into the eyes of oncoming traffic and surrounding landowners - Please refer to Section 6.1.3	-	
13)	If not planned and managed correctly the lights (exterior and exterior) and the signage of the development could visual pollution - - Please refer to Section 6.1.3	-	
16)	If dry and windy conditions occur during the construction phase, dust pollution could become a problem - Please refer to Section 6.1.4	-	

Discussion of issues identified, possible mitigation measures and significance of issue after mitigation

32) The proposed development could have some impact on the "Sense of Place" of the study area and its surroundings and, therefore, it must be planned and managed correctly.

Table 53: Significance of Issue 36 (If not planned and managed correctly, the proposed development could have a negative impact on the “Sense of Place” of the study area and its surroundings) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ⚙️</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>High 🟢</p>	<p>P/C</p> <ul style="list-style-type: none"> - A screen wall should be erected on the perimeter; - Internal roads and parking areas should be paved; - Strict architectural and landscaping guidelines should be applied; - The main access should be improved and the ramp road be formalised 	<p>L/E – To be included in the EMP</p>

Result:

The issue is eliminated by implementing the mitigation measures and can also be turned into a positive impact however the significance of this positive impact still needs to be determined confirmed/assessed in the significance rating table

6.3.3.3 Noise

Jongens Keet Associates (JKA) were appointed to undertake a detailed noise impact assessment. **Refer to Annexure R**

The following Terms of Reference were set:

- A sufficiently detailed quantitative (by measurement) assessment was to be undertaken within the area of influence of the factory in order to enable a full appreciation of the nature, magnitude, extent and implications of the potential noise impact related to the expansion development.
- The noise investigation was also to take into account the impact of the re-aligned Road D2220 and Road D2431, as well as the formalization of Ramp Road as an access to the Sabie Sawmill.
- All aspects of the investigation were to conform to the requirements of relevant environmental legislation and noise standards.
- The potential impacts of the pre-construction, construction and operational phases of the project were to be assessed.
- Where relevant, appropriate noise mitigation measures were to be identified. These needed only to be conceptual at this stage.
- No attendance at public meetings was required.

Only the details that have an influence on aspects of the noise impact assessment were identified and analysed by the involved Noise Specialist:

- **Topography**

The terrain in the core is defined as being "low mountains". The Sabie River lies immediately to the north of the study area and drains through the area from west to east. The noise specialist stated that the topography is such that it will have a significant influence on the propagation of noise both in that the high hills will block the transmission of sound and the valleys will channel the noise.

- **Existing Road System**

The main roads influencing the study area:

- **Road D2220** is aligned in an east-west direction just to the south of the existing sawmill.

The road bisects the York Timbers property.

- **Road D2431** is aligned in a south-east to north-west direction from the intersection with Road D2220 at Assegai Road near the eastern side of the York Timbers property.
- **Ramp Road** is gravel road aligned in a north-south direction from the intersection with Assegai Road to the intersection with Road P33/3 (Road R532). The latter is the road to Long Tom Pass and Lydenburg.

- **Road Traffic**

A detailed Traffic Impact Study has been undertaken for the expansion project by Endecon Ubuntu (Pty Ltd). **Refer to Annexure Y and Section 6.3.4.7 for a discussion.**

- **Railways**

There is one main railway line through the area.

- The Nelspruit - Graskop line is aligned in a south to north direction through the centre of the study area. This line is not being used at present.
- There is a spur railway line from the main line to the York Timbers Sabie Sawmill. This line is not being used at present.

- **Existing Land Use**

There are a number of land uses in the core study area of which the following have the potential to be affected by the development in terms of noise:

Residential:

- The town of Sabie lies to the east of the York Timbers Sabie Sawmill. In particular, the Mount Anderson residential township is affected by the sawmill noise as it overlooks this facility.
- Ceylon and Shonalonga Villages to the north of the sawmill. These villages also overlooks the sawmill site.

- The ACME Village to the south of the sawmill belongs to York Timbers and are used by the employees of the factory.
- Various farmhouses and farm worker dwellings.

Tourism:

- The Lone Creek River Lodge which lies adjacent to the east of the sawmill property.
- Various camping grounds and natural tourist attractions in the area.

Educational:

There are several schools in Sabie.

Industrial:

- The York Timbers Sawmill and Plywood Factory.
- There are several other sawmills and lumber yards in the vicinity of the York Timbers Sawmill.

Agricultural:

Forestry

Noise Sensitive Receptors

The Noise specialist classified the residential, educational and tourist areas as noise sensitive receptors (NSRs). **Refer to Figure 2**

Annexure R and Figure 27.

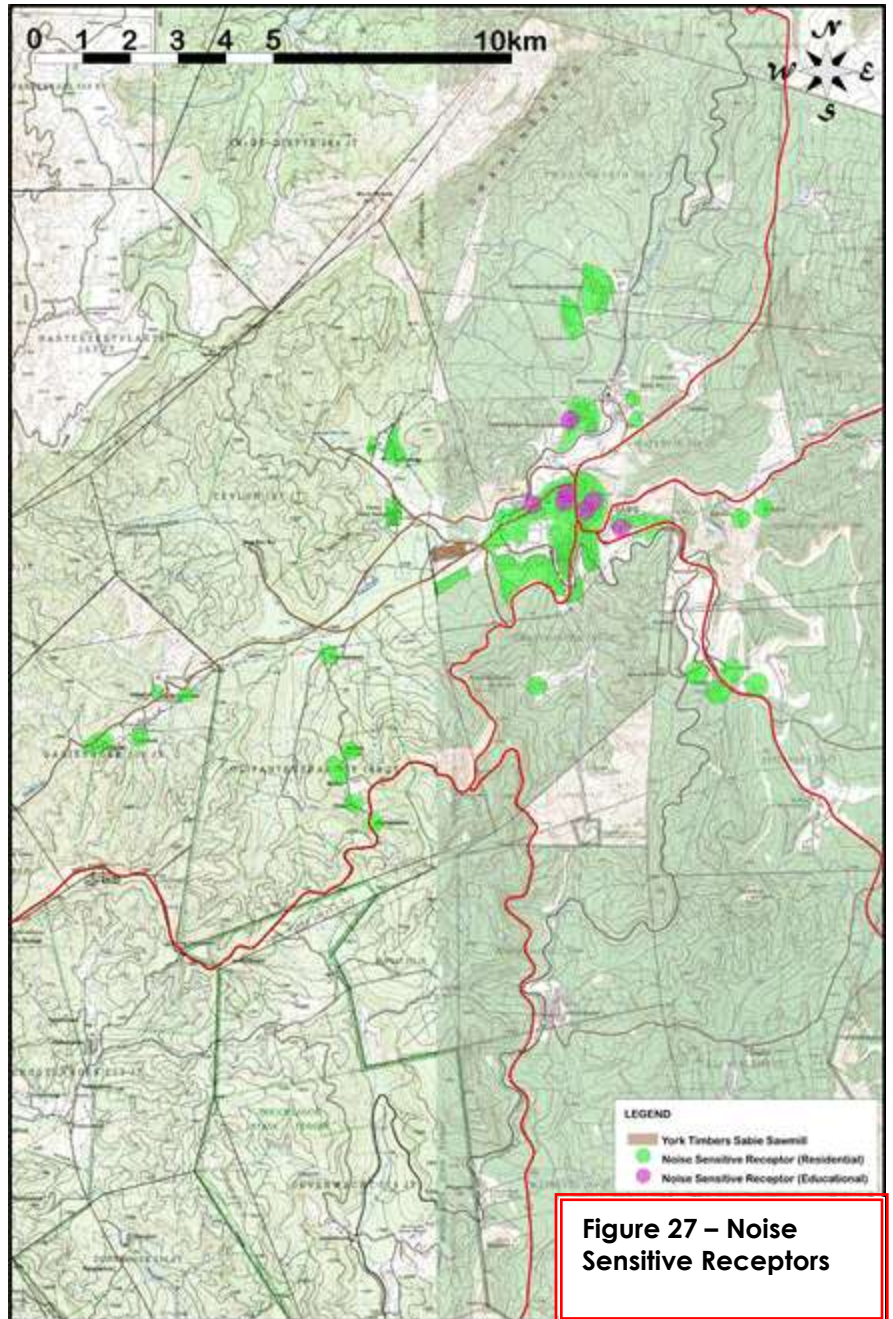


Figure 27 – Noise Sensitive Receptors

Aspects of Acoustical Significance

- **Terrain**

According to the involved noise specialist the topography is such that it will have a significant influence on the propagation of noise both in that the high hills will block the transmission of sound and the valleys will channel the noise.

- **Meteorological Aspects**

The involved noise specialist stated that the main meteorological aspect that will affect the transmission (propagation) of the noise is the **wind**. The wind can result in periodic enhancement downwind or reduction upwind of noise levels. Analysis of the wind records for the area indicates that in general the main prevailing winds blow from the east. There are minor daytime/night-time variations.

He also stated that atmospheric temperature inversions also have a significant effect on the noise propagation character of the area. Temperature inversions tend to increase noise levels at some distance from a source. A temperature inversion is formed when air near the ground is cooler than the air above. This occurs mainly at night or to a lesser extent during cloudy days away from large bodies of water. Stable conditions with high humidity and very low velocity wind conditions are necessary. As cool air is denser than warm air, sound rays are refracted towards the cooler air, that is, towards the ground.

Findings and Assessment of Impact by JKA:

The following conditions were observed in the study area and the following aspects were determined from the surveys and the predictive modelling undertaken for the assessment of the noise impact of the activities at the factory development.

- **The Residual (Existing Ambient) Noise Climate**

Measurements and *auditory observations* were taken at six main monitoring sites either on or in the areas immediately adjacent to factory property. For a description of the measurement sites and for more technical details of the measurement survey, **refer to Appendix B, Annexure R**. Conditions for the daytime and evening periods were ascertained. The summary of all the noise measurements that were taken at the main sites is given in **Table B1, Appendix B, Annexure R**.

The effect of the traffic noise from the main roads in the area is given in **Tables B2 and B3 in Appendix B, Annexure R**.

Baseline measurements were taken in the factory area of the Sabie Site sawmill in order to establish the sound power level of the component machinery. These data were then input to a noise generation and propagation acoustic model to establish the existing noise footprint. The sound power levels of the following plant and equipment were used:

- Hew saw
- Log Merchandiser air release
- Debarker
- Plywood peeler
- Panel saw Plywood
- Sander
- Tiltthoist Sawmill
- Sawmil Opticat Scanner
- Fingerjoint Autopacker
- Fingerjoint Saw
- Tiltthoist Drive Pulley
- Boiler House
- Boiler pressure Release
- Front End Loaders

Allowance was made for much of the plant being indoors and a conservative estimate of the insertion loss due to the building cladding was applied. Worst case meteorological conditions, namely temperature inversion conditions, were modelled. **The current noise footprint is as shown in Figure B2 in Appendix B, Annexure R.**

In overview, JKA found the existing situation with respect to the **noise climate** in the study area to be as follows:

- The study area lies in the hinterland between rural area (agricultural/forestry) to the north, west and south, and suburban residential (Sabie) and industrial to the east. The noise climate can be defined as rural when one is fairly distant from the York Timbers Sabie sawmill and from the main roads.
- The main sources of noise in the area are from traffic on the roads through the area, and from various sawmills.
- The existing *noise climate* alongside the relevant roads are degraded with regard to residential living for up to the following distances:
 - Road D2220 - 250 metres
 - Ramp Road - 50 metres
 - Road D2431 - 60 metres
- There are numerous noise sensitive receptors in the core study area that are potentially affected by the noise from the York Timbers Sabie sawmill and plywood plant (**refer to Figure B2, Appendix B, Annexure R**).
- Although the noise of the current operations at the York Timbers sawmill indicates a potentially wide area of influence (**see noise profile in Figure B2, Appendix B, Annexure R**), the impact is significantly reduced with distance due to dilution with other urban noises to the east. This represents the worst situation with temperature inversion conditions. When normal conditions prevail, the propagation of the noise from the factory and the roads is significantly influenced most of the time by an easterly wind which carries the noise away from Sabie.
- The heavy trucks delivering logs and other delivery trucks carrying the final product from the plant are one of the major sources of noise nuisance in the study area, especially at night when the Noise Sensitive Receptors (NSRs) are exposed to the

single noise event of a passing truck. In particular, residences in the Mount Anderson residential township are exposed to truck traffic along Ramp Road and NSRs such as the Lone Creek River Lodge are exposed to traffic noise from Road D2220 (Old Lydenburg Road). It should be noted, however, that trucks on route to York Timbers Sabie site do not pass Lone Creek River Lodge after hours and over weekends.

Noise Standards/Impact Criteria

From these findings and observations on site JKA applied the following noise standards and impact criteria to the study area:

Residential:

- **Rural residential** standards could still be applied to some areas remote from the main roads in the area and to farmhouses, farm labourers' dwellings and tourism residential NSRs further than 3800 metres from the York Timbers Sabie plant, where the daytime period ambient noise level should not exceed 45dBA and that for the night-time period should not exceed 35dBA (SANS 10103). (LR,dn = 45dBA). Such residential sites are very few in this area.
- **Suburban residential:** The noise impact on the residences in Sabie, Mount Anderson, Ceylon, Shonalonga and ACME Village has been determined on the basis of suburban residential district standards (SANS 10103), where the daytime period ambient noise level should not exceed 50dBA and that for the night-time period should not exceed 40dBA. (LR,dn = 50dBA).
- **Urban residential** standards could be applied to some residences in the central section of Sabie where the daytime period ambient noise level should not exceed 55dBA and that for the night-time period should not exceed 45dBA (SANS 10103). (LR,dn = 55dBA).

Educational:

Noise levels at any educational complex should not exceed 50dBA (outdoor condition) with the proviso that indoor classroom conditions do not exceed 40dBA.

Industrial districts:

The various sawmills and lumber yards in the area where the daytime period ambient noise level should not exceed 70dBA at the property boundary and that for the night-time period should not exceed 60dBA (SANS 10103). (LR,dn = 70dBA).

Assessment of the Pre-Construction Phase

The involved noise specialist stated that activities during the planning and design phase that normally have possible noise impact implications are those related to field surveys (such seismic testing and geological test borehole drilling for prospecting purposes and/or investigation of founding conditions for large buildings/plant/equipment). As these activities are usually of short duration and take place during the day, they are unlikely to cause any major noise disturbance or nuisance in most adjacent areas.

Construction Noise Impact

The noise impact assessment by JKA revealed that the nature of the noise impact from the building construction activities at the factory development site is likely to be as follows:

- Source noise levels from many of the construction activities will be high. Noise levels from all work areas will vary constantly and in many instances significantly over short periods during any day working period.
- Ambient daytime noise levels from the construction at the nearest residential areas (to the east and south) are predicted not to **exceed 45dBA**. However for much of the time the construction noise will be "masked" by the louder noise from traffic from the main roads surrounding the development site. **Refer to Tables B2 and B3 (Appendix B), Annexure R.**
- At times the maximum short-term noise levels from general construction operations at the nearest noise sensitive sites around the development site could be of the order of **65dBA**. This would be classed as a noise nuisance (annoyance).
- For all construction work, the construction workers working with or in close proximity to equipment will be exposed to high levels of noise as can be seen from **Table 1, Annexure R (refer to the 5 metre offset noise levels).**

During the construction period, it is anticipated that the factory site generated construction traffic will use mainly Road D2220 (Old Lydenburg Road). The volume of traffic that will be generated by the construction contract will be relatively small in comparison with the existing traffic on the external main road system. No traffic impact assessment has been undertaken, but it is estimated that there could be of the order of 150 vehicle trips (2-way) to and from the site daily.

Towards the end of the contract this volume could peak at about 300 trips per day. This volume is very small in comparison to the current daily traffic volumes on the surrounding roads and it is estimated that these construction traffic volumes will raise the noise climate adjacent to Road D2220 by about 1dBA. There will, however, be a nuisance factor.

It should be noted that higher ambient noise levels than recommended in SANS 10103 are normally accepted by local residents as being reasonable during the construction period, provided that the very noisy construction activities (**refer to Table 1, Annexure R**) are limited to the daytime and that the contractor takes reasonable measures to limit noise from the work site. Note that it has been assumed that construction will generally take place from 06h00 to 18h00 with no activities (or at least no noisy construction activities) at night. There are noise sensitive receptors that potentially will be adversely affected by the construction noise, namely the Lone Creek River Lodge and some of the residences on the western perimeter of the Mount Anderson Township.

Noise Impact Assessment of the Operational Phase

General

JKA established the potential future noise climate for the following:

- Operational conditions at the upgraded and new works of the sawmill and factory and the effects of such on the external noise sensitive areas.

- Operational conditions along the main roads in the study area as related to the development's traffic generation effects on external noise sensitive areas and the effects of traffic in general on the development.

Operational Conditions at the Upgraded and New Works

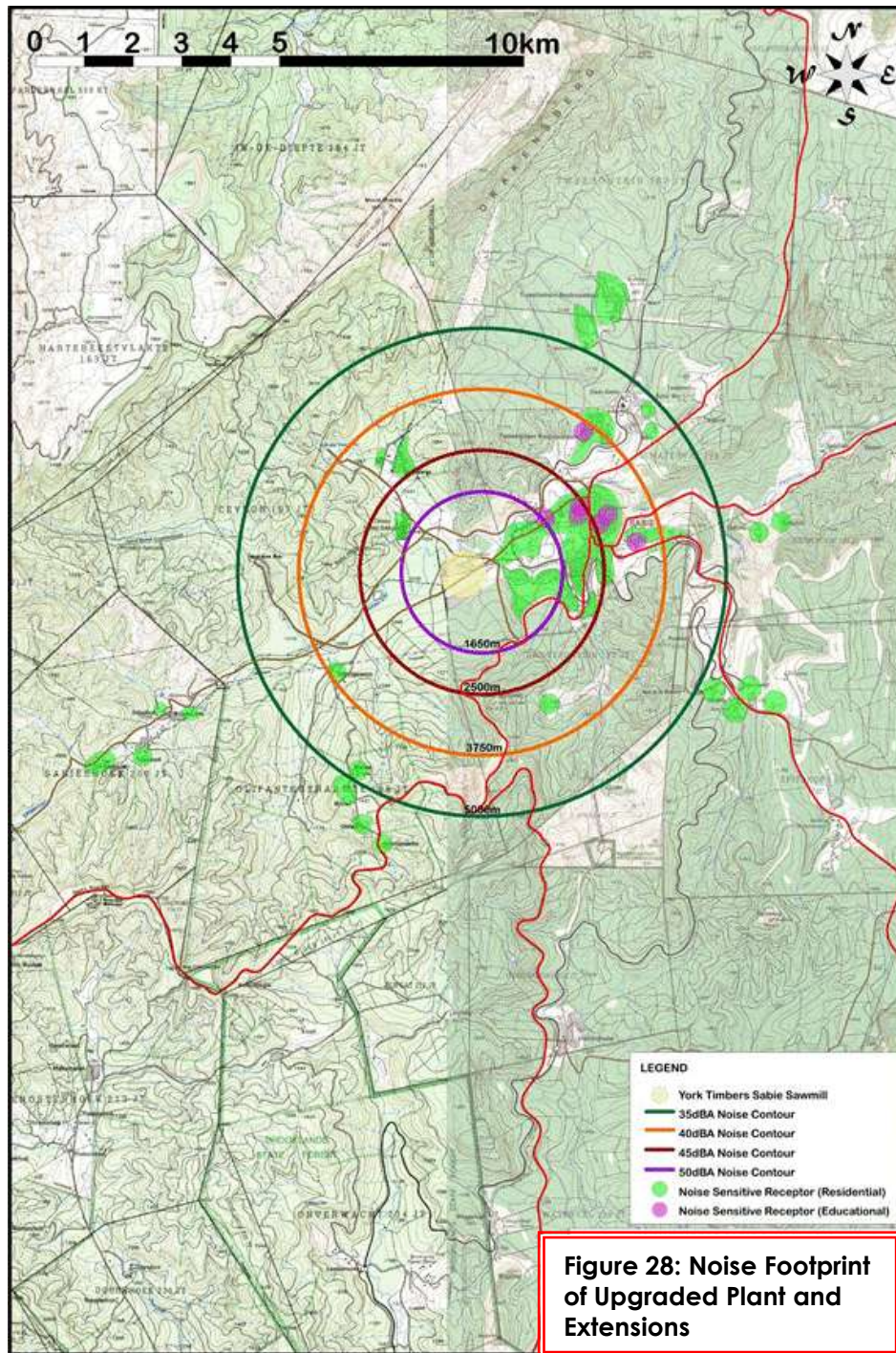
JKA established the likely noise climate that will result from the factory development from baseline noise measurement data of plant and equipment at the existing factory and specific calculation of the situation. The exact final layout of and plant to be used for the upgraded sections and extension works was not available during the noise impact assessment. The increase in noise levels generated by the new development has been based on the sound power levels of the existing plant and a factor of 3,4 based on the increase in GLA, which acoustically translates into an increase of 5,3dBA.

The noise profile for the ultimate development is given in **Table 3 Annexure R and Figure 27**.

There are also intermittent noises, such as the venting of steam from the boilers that are very loud. These discharges, which have a sound power level (LW) of 134dB, can take place at any time of day or night and have a high annoyance/nuisance value.

Although the noise of the future operations at the York Timbers sawmill indicates a potentially wide area of influence (**refer to noise profile, Figure 28**), JKA stated that the impact is significantly reduced with distance due to dilution with other urban noises to the east. This represents the worst situation with temperature inversion conditions. When normal conditions prevail, the propagation of the noise from the factory and the roads is significantly influenced most of the time by an easterly wind which carries the noise away from Sabie.

According to JKA the surrounding hills will also play a major role in modifying the transmission of the noise from the development, that is, many areas will be shielded while noise will be channelled along the valleys.



Operational Conditions Along the Main Roads in the Study Area

Analysis of the intersection of Main Road and Old Lydenburg Road in the Sabie CBD indicated that in 2017 there would only be an increase in traffic noise level of +1.1dBA in the vicinity of the intersection.

Analysis of the intersection between Ramp Road and Road P33/3 indicated that in 2017 there would only be an increase in traffic noise level of +2.2dBA in the vicinity of the intersection.

Noise Mitigation Measures supplied by JKA:

Construction phase:

- Construction site yards and other noisy fixed facilities should be located well away from noise sensitive areas adjacent to the development sites.
- All construction vehicles and equipment are to be kept in good repair.
- Where possible, stationary noisy equipment (for example compressors, pumps, pneumatic breakers) should be encapsulated in acoustic covers, screens or sheds. Proper sound insulation can reduce noise by up to 20dBA. Portable acoustic shields should be used in the case where noisy equipment is not stationary (for example drills, angle grinders, chipping hammers, poker vibrators).
- Construction activities, and particularly the noisy ones, are to be contained to reasonable hours during the day and early evening.
- With regard to unavoidable very noisy construction activities in the vicinity of noise sensitive areas, York should liaise with local residents on how best to minimise the impact.
- Machines in intermittent use should be shut down in the intervening periods between work or throttled down to a minimum.
- In general, operations should meet the noise standard requirements of the Occupational Health and Safety Act (Act No 85 of 1993).

- Construction staff working in areas where the 8-hour ambient noise levels exceed 75dBA should wear ear protection equipment.

Operational Phase

Mitigation Measures: Sawmill and Plant

- The design of all major plant for the factory is to incorporate all the necessary acoustic design aspects required in order that the overall generated noise level from the new installation does not exceed a maximum equivalent continuous day/night rating level (LRdn), namely a noise level of 70dBA (just inside the *property projection plane*, namely the property boundary of the factory) as specified for industrial districts in SANS 10103. **Refer to Appendix A, Annexure R.** Notwithstanding this provision, the design is also to take into account the maximum allowable equivalent continuous day and night rating levels of the potentially impacted sites outside the property. Where the noise level at such an external site is presently lower than the maximum allowed, the maximum shall not be exceeded. Where the noise level at the external site is presently at or exceeds the maximum, the existing level shall not be increased by more than indicated as acceptable in SANS 10103.
- The latest technology incorporating maximum noise mitigation measures for components of the complex should be designed into the system. Ideally, plant and equipment should meet the following specification: the sound power level (LW) should be such that the sound pressure level (SPL – i.e. the noise level) measured at 1 metre from the surface of the given plant/equipment should not exceed 85dBA. When ordering plant and machinery, manufacturers should be requested to provide details of the sound power level. Where possible, those with the lowest sound power level (most quiet) should be selected.
- The design process is to consider, *inter alia*, the following aspects:
 - The position and orientation of buildings and plant on the site.
 - The design of the buildings to minimise the transmission of noise from the inside to the outdoors.
 - The insulation of particularly noisy plant and equipment.

- Noise sources on the higher levels of the factory walls (specifically the fans venting to the outside of the building) are not attenuated to the same extent by the building walls as those on the ground level. Therefore, particular care needs to be taken to ensure that these noise sources are appropriately shielded.
- All plant, equipment and vehicles are to be kept in good repair.
- If the factory operates on a continuous 24-hour basis, particular care should be taken to keep night-time noise levels to a minimum. This relates specifically to noises which may be regarded as annoying, such as the reversing sirens on trucks and forklift trucks.
- Deliveries and dispatch should be limited to the day-time (06h00 to 18h00 or perhaps 20h00).

Mitigation Measures: Traffic

- Reducing the operating speed of the traffic. For the general traffic composition on a road such as Old Lydenburg Road, a reduction in operating speed from 80km/h to 60 km/h will achieve a reduction in noise level of about 1,5dBA.
- Road surfacing material. SANS 10210 indicates that reductions of up to 3,5dBA from the tyre-road interaction can be achieved from the use of porous type road surfacing. Properly designed surfacings (as used in Europe) have been found to achieve reductions of at least 5dBA. It must be noted that these surface treatments are expensive in relation to the commonly used (but noisier) road seals/surfacings and have a shorter operational life.
- The grades along the re-aligned Road D2220 should be as flat as possible up to the new entrance and exit gates to the sawmill and factory. If practical, this section should also be in cutting.
- The construction of noise attenuation barriers either close the road or at a practical point on the intervening ground between the source and the impacted areas from the noise. Structural barrier walls or earth berms or combinations of these two types may be used. As relatively high and long sections are required to be effective, construction costs can be high. The barrier must also be carefully positioned and designed to ensure that its effects are optimised. Barriers should be considered:

- On the eastern boundary of the York Timbers property at the intersection of realigned Road D2431 and Road D2220. This barrier should cater for the traffic on Road D2431 and therefore should be to the east of this road. It should also cater for the noise from the extended log merchandising yard.
- Along the southern side of the re-aligned Road D2220 between the relocated Assegai Road intersection and the new exit gate.
- Along the eastern side of Ramp Road. The use of wood sound barriers as an alternative should be considered.
- Dense planting of the area between the road and the residential areas with evergreen indigenous trees and shrubs. The belt of planting should where possible be at least 10 metres wide and the species of tree chosen should attain a height at maturity of at least 8 metres. This is the necessary height measured above the level of road that is necessary for additional noise screening. Smaller trees can also be used where appropriate. It should be noted that this vegetation does not provide a high level of noise screening (approximately 3dBA/10 metre thickness). It will complement the noise attenuation barrier and cannot be used exclusively to screen the noise sensitive sites.

Conclusions made by JKA:

- The study area lies in the hinterland between rural area (agricultural/forestry) to the north, west and south, and suburban residential (Sabie) and industrial to the east. The noise climate can be defined as rural when one is fairly distant from the York Timbers Sabie sawmill and from the main roads. The sawmill and factory lie on the edge of the developed area of Sabie.
- The main sources of noise in the area are from traffic on the roads through the area, and from various sawmills.
- There are numerous noise sensitive receptors in the core study area that are potentially affected by the noise from the new developments at the York Timbers Sabie sawmill and plywood plant (**refer to Figure 27**). The expansion project of the

existing York Timbers factory will extend the current 35dBA noise footprint by approximately 1200 meters.

- There will be very loud and short term noises (for example steam venting from the boilers) that will be heard at times well beyond the indicated positions of the respective 35dBA contours and the total 35dBA contour envelope of the operation.
- Although the noise of the future operations at the York Timbers sawmill indicates a potentially wide area of influence (**refer to noise profile in Figure 28**), the impact is significantly reduced with distance due to dilution with other urban noises to the east. This represents the worst situation with temperature inversion conditions. When normal conditions prevail, the propagation of the noise from the factory and the roads is significantly influenced most of the time by an easterly wind which carries the noise away from Sabie.
- **The heavy trucks delivering logs and other delivery trucks carrying the final product from the plant will remain one of the major sources of noise nuisance in the study area, especially at night when the Noise Sensitive Receptors (NSRs) are exposed to the single noise event of a passing truck.** In particular, residences in the **Mount Anderson residential township** are exposed to truck traffic along Ramp Road and NSRs such as the **Lone Creek River Lodge** are exposed to traffic noise from Road D2220 (Old Lydenburg Road). It should be noted, however, that York Timbers are currently not using trucks during the night-time period.
- Residual noise levels at the schools meet the noise standards required for educational purposes, namely does not exceed 50dBA during school hours.
- **In general the upgrading of existing and addition of new extensions to the York Timbers site will not alter the noise profile and character of the area significantly.** The expected increase in the ambient noise levels of the area will be of the order of **5dBA**. There are measures that can be introduced to mitigate some of the impact of the operational noise.

Recommendations by JKA:

- SANS 10103 and the National Noise Control Regulations should be used as the main guidelines for addressing any future potential noise impact issues on this project.
- Various measures to prevent or reduce the potential noise impact from the elements of factory development should be applied and the mitigation measures supplied need to be considered.
- The noise mitigation measures will need to be checked by an acoustical engineer in order to optimise the design parameters and ensure that the cost/benefit of the measure is optimised.
- At commissioning of the factory, its noise footprint should be established by measurement in accordance with the relevant standards, namely SANS ISO 8297:1994 and SANS 10103. The character of the noise (qualitative aspect) should also be checked to ascertain whether there is any nuisance factor associated with the operations.
- Once the details of the expansions are known, a noise monitoring programme should be instituted. Noise monitoring guidelines should now be drafted and the monitoring points identified. As a preliminary recommendation, the following are suggested:
 - A main monitoring control point should be set up within the factory property.
 - Four external monitoring points should be set up at critical NSRs:
 - ❖ On the eastern boundary of the York Timbers property adjacent to the Lone Creek River Lodge.
 - ❖ At the Ceylon Village.
 - ❖ On Assegai Road at the first houses in Mount Anderson township.
 - ❖ On the corner of Virgilia Close and Virgilia Street in Mount Anderson Township.

Note: The first three points are intended to monitor the York Timbers sawmill and plywood factory noise, while the last is recommended to monitor the truck traffic noise on Ramp Road.

Issues & Impact Identification – Noise

Table 54: Issues and Impacts – Noise

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possibilities High 🟢 Medium 😊 Low 🟡 Positive Impact - Not Necessary To Mitigate 🌞
33)	If not planned and managed correctly, the proposed Sabie Site expansion development could have a noise impact on surrounding residents/properties i.e Lone Creek River Lodge, Mount Anderson township.	-	😊

Discussion of issues identified, possible mitigation measures and significance of issue after mitigation

33) The proposed expansion project could have a noise impact on surrounding residents and properties, therefore, it must be planned and managed correctly.

Table 55: Significance of Issue 33 (If not planned and managed correctly, the proposed development could have a noise impact on surrounding residents/properties) After Mitigation/ Addressing of the Issue

Mitigation Possibilities High 🟢 Medium 😊 Low 🟡	Mitigation Already achieved ✓	Significance of Issue after mitigation Low/ eliminated L / E
--	----------------------------------	--

<p>Positive Impact/ Neutral - Not Necessary To Mitigate ☀</p>	<p>Must be implemented during planning phase, construction and/ or operational phase P / C / O</p>	<p>Medium M High H Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>High ☹</p>	<p>P/C/O - The mitigation measures supplied by JKA must be implemented. Refer to Section 6.3.3.3 and Annexure R.</p>	<p>M – To be included in the EMP</p>

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table

6.3.3.4 Light Pollution

The design and placement of street and security lighting must take oncoming traffic and the surrounding area into consideration. Light beams must face downwards and not higher than a 45 degree angle from the ground.

6.3.3.5 Air Pollution/Dust

As already mentioned the glue used for the manufacturing of the plywood contains some formaldehyde and in the past, some parties accused York Timbers of releasing unacceptable levels of formaldehyde (CH₂O) into the air through the burning of the plywood off-cuts. These accusations made it necessary for York Timbers to conduct air pollution studies in order to determine whether such accusations were true.

WSP Environment and Energy (WSP E&E) had been appointed to conduct an Air Quality Monitoring and a Health Risk Assessment on the study area. **Refer to Annexure S for Air Quality Impact Assessment on Boiler Stack Emissions and Annexure T for Community**

Human Health Risk Assessment of Formaldehyde Air Emissions associated with York Timbers, Sabie Site.

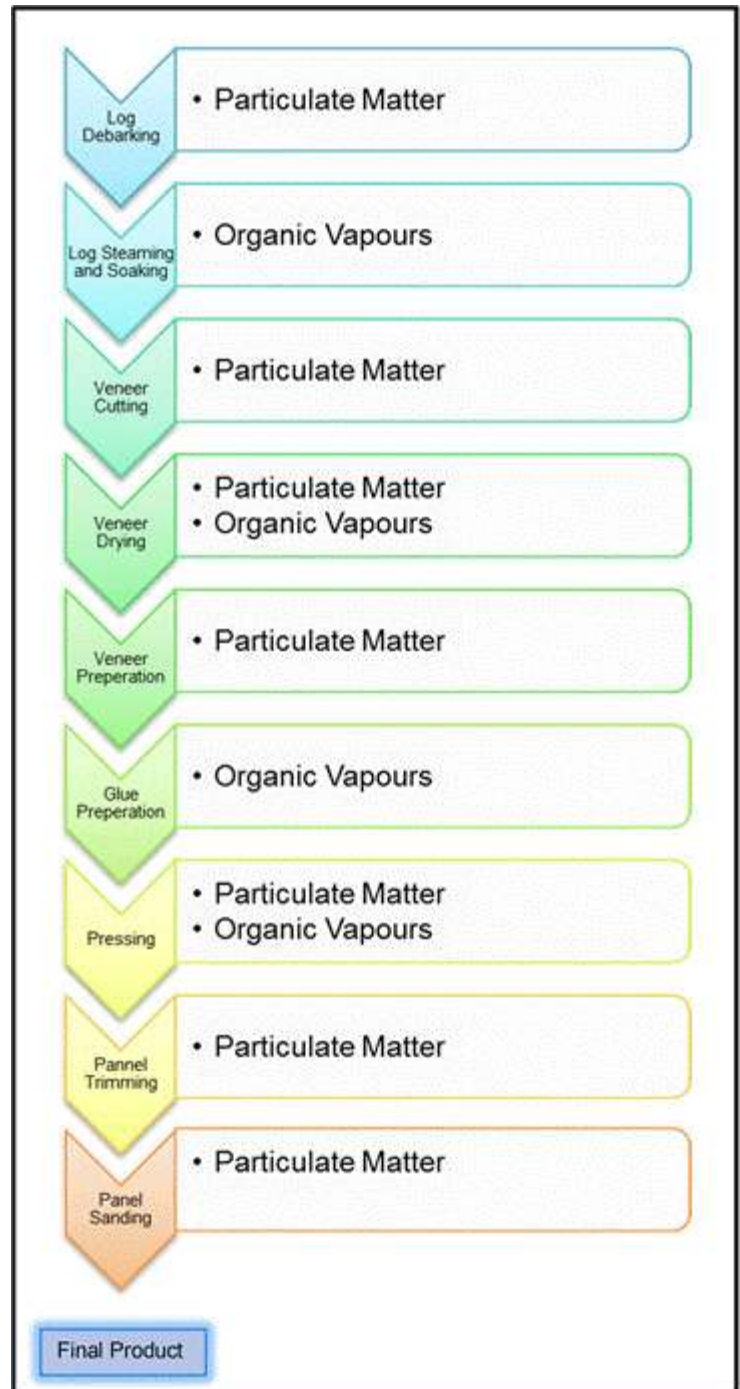
Air Quality Impact Assessment on Boiler Stack Emissions

According to WSP E&E the main sources of air pollution emanating from this Sabie site include (but are not limited to) **windblown dust from unpaved access roads, formaldehyde from the use of adhesives and emissions from the five boilers.** The key air pollutants emitted from the boilers include particulates, sulphur dioxide, oxides of nitrogen and carbon monoxide. Small quantities of formaldehyde contained in the scrap wood and sawdust fuel stock may also persist in the stack emissions. Four wood burning boilers and one coal fired boiler raise steam for power generation, drying of timber and veneer. Please note: another wood burning boiler is proposed (Boiler 6).

Sabie site - Production Process

The production process and the associated air pollutants released are briefly summarised in **Diagram 14 (Airshed, 2005).**

Diagram 14 – Flow Chart summarising air pollution generated during each step of the plywood manufacturing process (Airshed, 2005)



The basin like area of the site and its surroundings is characterised by topographic channelling of air pollution and poor atmospheric dispersion which has given rise to several air quality issues being raised by the local community. It therefore became critical to assess the current air quality levels within the vicinity of the plant, as the existing levels and trends in criteria pollutants will need to be compared with the South African National Ambient Air Quality Standards (NAAQS - promulgated as regulations under National Environmental Air Quality Act 2004 (NEMAQA)) in order to ascertain the percentage of saturation capacity in the local environment over various time intervals and meteorological conditions.

WSP Environment and Energy (WSP E&E) was appointed to assess the dispersion of key air pollutants in and around the York Timbers, Sabie site. To effectively achieve this, WSP E&E had commissioned *Apex Emission Testing* to conduct a stack monitoring campaign during November 2011. For the purpose of this Air Quality Impact Assessment (AQIA), the pollutants of most concern include, but are not limited to, PM₁₀ (suspended particulate matter with a diameter of 10 microns or less), SO₂ (sulphur dioxide), NO₂ (nitrogen dioxide) and CH₂O (formaldehyde). Three modelling scenarios, one short- and two long-term were run. The long-term model outputs were compared to NAAQS and ATSDR MRL standards, whilst the short-term model output was verified against the measured formaldehyde results.

According to WSP E & E no background concentrations were available from the local municipality or provincial government departments and, as such, were not considered in this study. However, a short-term ambient monitoring survey for formaldehyde (CH₂O) was conducted simultaneously with the stack emission tests in order to verify the model through establishing the source-pathway-receptor relationship over one week (Run 3). As such, background concentrations of formaldehyde were considered by WSP E & E; samplers are not selective and therefore represent cumulative impact.

WSP E & E obtained meteorological information from York Timbers' own meteorological station which is located onsite in the valley floor. Due to the local air flow, a large number of calm conditions (wind speeds < 0.4 m/s) were recorded. The dispersion model used (ADMS v4.2) reads a minimum of 0.75 m/s wind speed. In terms of the Draft Best Practice

Guideline for Regulatory Air Dispersion Modelling in South Africa, calm conditions can be converted to the minimum value that the model can process, providing that the method of 'nudging' is stated along with recognition of this as a potential limitation or uncertainty. This was conducted accordingly on Run 2 to achieve a higher percentage data usage.

The model output from Run 1 (unadjusted meteorological data) was overlaid onto a topo-cadastral backdrop to provide a clear graphical presentation of the resultant plume footprint. WSP E & E stated that model outputs for each pollutant parameter confirm very low concentrations being dispersed in a north easterly and more dominantly in a westerly direction away from any residential receptors. This is mainly due to the prevailing wind directions over Sabie, which are strongly channelled by the terrain. Results from both Run 1 and Run 2 are presented in tabular formats to assess the sensitivity of the model to meteorological inputs and compare results of ambient concentrations at discrete receptors with the applicable National Ambient Air Quality Standards (NAAQS).

WSP E & E tabulated the **maximum** long-term annual average modelled concentrations for each pollutant from Run 1 and Run 2 (**refer to table 56 below**) to summarise the worst-case long-term modelled concentrations emanating from the boiler stacks and a quantification of environmental impact, based on chronic exposure health risk criteria. In addition, the **maximum** short-term average modelled concentrations for formaldehyde (Run 3) has also been tabulated to show the worst-case predicted concentrations during the actual week of stack testing and passive sampling.

Although background concentrations could not be obtained for long-term modelling requirements, it should be considered that *the below figures represent the highest annual concentrations recorded anywhere in the domain, from near source to distant slopes, and therefore remains a highly conservative approach.* According to WSP E & E the annual average for each of 10,000 positions was based on 17,520 hours (two years) of meteorological data. In addition to this huge number of permutations computed by the model (> 175 million outputs per pollutant), confidence in model predictions is reinforced by the low results measured in the short-term survey of formaldehyde, being the pollutant of most concern to neighbours.

Table 56: Maximum long-term annual average modelled concentrations for each pollutant from Run 1 and Run 2

Model Run1	PM10 2 Max. Conc. (µg/m3)	Annual Ambient Standard (µg/m3)	Compliant (percent Saturation)	SO2 Max. Conc. (µg/m3)	Annual Ambient Standard (µg/m3)	Compliant (percent saturation)	NO2 3 Max. Conc. (µg/m3)	Annual Ambient Standard (µg/m3)	Compliant (percent saturation)
1 (LT)	14.8	50.0	Yes (29.6%)	2.9	50.0	Yes (5.8%)	2.2	40.0	Yes (5.5%)
2 (LT)	8.5	50.0	Yes (17.0%)	1.7	50.0	Yes (3.4%)	1.3	40.0	Yes (3.3%)

Table 57: maximum short-term average modelled concentrations for formaldehyde

Model Run1	CH2O Max. Conc. (µg/m3)	ATSDR Chronic MRL (µg/m3)	Compliant (percent saturation)
1 (LT)	0.17	9.8	Yes (1.7%)
2 (LT)	0.10	9.8	Yes (1.0%)
3 (ST)	0.13	9.8	Yes (1.3%)

Statistical results and compliance tests for exceedence revealed that none of the modelled concentrations from each scenario are predicted to exceed the relevant National Ambient Air Quality Standard (NAAQS) guideline or the ATSDR MRLs for any relevant averaging period (NAAQS annual, daily or hourly and ATSDR MRL chronic or acute, as applicable). Nevertheless, frequent air emission monitoring and maintenance of a high standard of plant efficiency and housekeeping are key to minimisation of air quality impacts in the vicinity of York Timbers.

Conclusions by WSP E & E:

This study assessed the impacts that would emanate when all four wood fired boiler stacks were in operation using ADMS v4.2. Stack monitoring results were obtained from a stack

monitoring campaign undertaken by *Apex Emission Testing*. Results show the plume adopting a west and north-east orientation owing to the prevailing wind directions over Sabie, which are strongly channelled by the terrain. The lineation is therefore parallel to the long axis of the valley which forms the basin like topography, in which York Timbers, Sabie Site is located on the valley floor. Concentrations of TPM, SO₂, NO₂ and smaller amounts of CH₂O being emitted from all the boiler stacks at York Timbers result in ambient impacts that fall well below the annual NAAQS and ATSDR MRL recommendations for a healthy environment. Furthermore, the plume disperses away from surrounding receptors and the town of Sabie, therefore posing very little threat to the human environment.

Sabie does, however, comprise of other industrial and vehicular emission sources that can combine to create higher ambient air concentrations as shown by the passive sampling results, being cumulative by nature. It is envisaged that if background ambient concentrations were considered in the model, the plume concentration and extent would increase owing to the addition of other sources. However, there is a **large margin of tolerance on all the predicted concentrations for gaseous pollutants**, with particulates being slightly more significant.

It is suggested that annual stack emission tests be conducted, along with occasional passive sampling of ambient formaldehyde concentrations to quantify and monitor the air pollution emanating from the boilers at the Sabie Site and in the surrounding area, so that the impacts can be managed effectively and the public assured of **compliance with best international practice**. Furthermore, maintaining a high level of combustion efficiency in the boilers and good housekeeping throughout the plant is key to environmental impact minimisation in this sensitive area.

Health Risk Assessment

As already mentioned WSP E & E was appointed to conduct a Community Human Health Risk Assessment of Formaldehyde Air Emissions associated with York Timbers' Sabie Site **(refer to Annexure T)**.

The objective of this Community Health Risk Assessment Study was to quantitatively assess the potential risk to local communities, resident or working in the area surrounding the York Timbers facility from exposure to airborne formaldehyde, this being the primary air contaminant of concern emitted by the facility.

WSP E & E prepared the risk assessment in accordance with international best practice for human health and environmental risk assessment of contaminated land. Specific guidance that has been followed in this study includes the Environmental Health Risk Assessment Guidelines for Assessing Human Health Risks from Environmental Hazards issued by the Australian Health Council, and the Risk Assessment Guidance for Superfund (RAGS) issued by the USEPA Office of Emergency and Remedial Response. Whilst international best practice has been applied in the preparation of this risk assessment, it is noted that due consideration has been given to local regulatory guidance and practice where applicable.

WSP E & E stated that the results of this community health risk assessment indicate that the potential formaldehyde exposure at various receptor locations evaluated following internationally accepted best practice methods and by applying conservative assumptions throughout is well **within acceptable levels. There is found to be no health risk concern associated with the measured formaldehyde levels in the area.** Furthermore, in respect of York Timbers, the levels of formaldehyde emitted from the facility and which are contributed to the existing background concentrations in the area are negligible (<0.5% of the total background level).

WSP E & E based the assessment on consideration of both threshold (cytotoxic effects) and non-threshold (carcinogenic) effects with due consideration of the latest toxicological information and dose-response models for formaldehyde.

According to WSP E & E the calculated incremental lifetime cancer risk from the estimated exposures determined by applying highly conservative assumptions are well below the

most conservative internationally applied limit for environmental risks of 1 in 1 million. The calculated risk levels for communities surrounding York Timbers are less than 1 in 100 million.

In terms of potential irritant effects such as nose, throat and eye irritation from exposure to formaldehyde. Based on the monitoring results WSP E & E is of the opinion that the levels of formaldehyde in the area are all below the threshold levels for these responses.

Issues & Impact Identification – Air pollution

Table 58: Issues and Impacts – Air pollution

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possibilities High 🟢 Medium 😊 Low 🟡 Positive Impact - Not Necessary To Mitigate 🌟
34)	If not planned and managed correctly, the proposed Sabie Site expansion development could contribute to air pollution which may affect the health and wellbeing of the nearby residents	-	😊

Discussion of issues identified, possible mitigation measures and significance of issue after mitigation

34) If not planned and managed correctly, the proposed Sabie Site expansion development could contribute to air pollution which may affect the health and wellbeing of the nearby residents.

The results of the Air Quality Impact Assessment indicated that concentrations of TPM, SO₂, NO₂ and smaller amounts of CH₂O being emitted from all the boiler stacks at York Timbers result in ambient impacts that fall well below the annual NAAQS and ATSDR MRL recommendations for a healthy environment. Furthermore, the plume disperses away from surrounding receptors and the town of Sabie, therefore posing very little threat to the human environment.

The results of the Health Risk Assessment indicated that there is **no health risk** concern associated with the measured formaldehyde levels in the area.

Table 59: Significance of Issue 34 (If not planned and managed correctly, the proposed Sabie Site expansion development could contribute to air pollution which may affect the health and wellbeing of the nearby residents) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ✨</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>High 🟢</p>	<p>🔴 - Annual stack emission tests should be conducted, along with occasional passive sampling of ambient formaldehyde concentrations to quantify and monitor the air pollution emanating from the boilers at the Sabie Site and in the surrounding area, so that the impacts can be managed effectively and the public assured of <i>compliance with best international practice</i>.</p> <p>🔴 - A high level of combustion efficiency should be maintained in the boilers.</p>	<p>M – To be included in the EMP</p> <p>M – To be included in the EMP</p>

	O - Good housekeeping throughout the plant is key to environmental impact minimisation.	M – To be included in the EMP
--	--	--------------------------------------

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table

6.3.4 Services

Endecon Consulting Engineers have been appointed to compile the Service Report for the York Timbers Sabie Site. **Refer to Annexure U for the Civil Engineering Report by Endecon Consulting Engineers**

6.3.4.1 Water

6.3.4.1.1 Bulk Water Supply

A ring main, which can be fed by three different supplies, has been installed to supply water to the Sabie site. Each of these supplies is metered and detailed records are kept by York Timbers (Pty) Ltd. There are three options for water supply:

- **Option 1: Borehole**

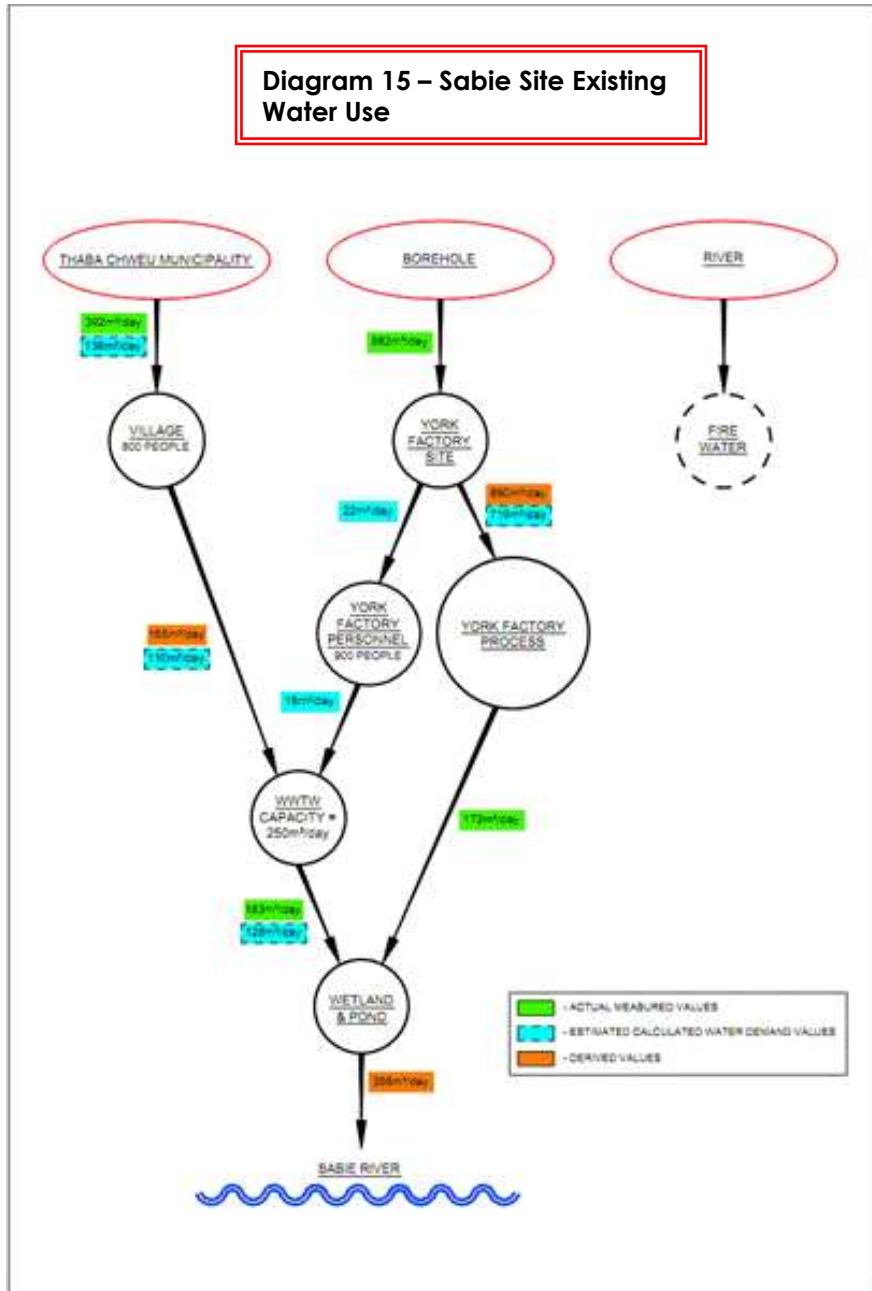
A production borehole is currently used to supply York Timbers with potable water for the personnel working there as well as all the water required for the process itself.

- **Option 2: Municipal water supply**

The Thaba Chweu Local Municipality provides potable water to the ACME Village. Provision is also made to supply the Sabie site ring main from this connection. The connection to the Sabie site was however not in use at the time of the study since it was being supplied by the borehole connection.

• **Option 3: Sabie River**

A raw water pump station supplies water from the river to the firewater reservoirs on the site. There is also a connection to the York factory ring main from the river pumps but it was not in use at the time of the study. The Sabie River is utilized as back-up water supply to the borehole.



6.3.4.1.2 Quality of Supply

- **Option 1: Borehole**

The test result values indicate that the borehole supply complies with Class I of SANS 241:2006 and is subsequently considered to be **acceptable**. Although the *E. Coli* levels comply with SANS 241:2006, the involved engineers indicated that it is good practice to chlorinate the borehole water for disinfection purposes and is required to obtain the prescribed residual chlorine levels. It is therefore recommended that disinfection is achieved prior to supply.

- **Option 2: Municipal supply**

The test result values also indicate that municipal supply complies with Class I of SANS 241:2006 and is subsequently considered to be acceptable.

- **Option 3: Sabie River**

The raw water from the Sabie River does **not** comply with SANS 241:2006 and a treatment facility will have to be provided if this source is to be utilized for potable water. A conventional treatment facility will be required in order for the water to meet the SANS standards. The river water supply is fitted with a Chlorinator.

6.3.4.1.3 Existing Water Use

Diagram 15 provides a schematic of the existing water use. The involved engineers obtained all values as indicated for "actual measured values" from monthly water meter readings as supplied by York Timbers (Pty) Ltd for the last 12 months and then averaged and divided by 30 to obtain an average daily demand. The values as indicated for "estimated calculated water demand values" were all calculated as detailed in this report. The values as indicated for "derived values" were calculated by doing a water balance i.e. if the total amount of borehole water is 893 m³ per day and the calculated

water demand for the factory personnel is 22 m³ per day, then 871 m³ per day must go to the factory process.

Calculated existing and future water demand

Existing Water Demand

Refer to Table 60 below for the theoretical calculated existing water demand for the people working at the Sabie site as well as the workers staying at the village adjacent to York.

Table 60: Calculated Existing Water Demand

	Village	Sabie Site
No. of persons	800 persons	758 persons
Water demand	150 l/p/d	25 l/p/d
Average Annual Daily Demand (ADDD)	120000 liter	18950 liter
Allow for 15% losses	18000 liter	2842.5 liter
Gross Average Annual Daily Demand (GADDD)	138000 liter	21792.5 liter
Gross Average Annual Daily Demand (GADDD)	138 m ³	22 m ³

It was further determined from information provided by York Timbers (Pty) Ltd that the boilers is the principle user of water in the plant processes. It was indicated that the boilers use 162 - 193 m³/day of water. Another major water use process is the cooling of the finger joints which amount to 345 m³/day when in use. This is however only used during summer time and the assumption is therefore that it is used 50% of the time resulting in an average water use of 173 m³/day.

Not all water uses are measured, but flow measurements for the waste stream going into the ponds provide one with an indication of the amount of water used. The average waste stream (referred to as the plywood stream in York documentation) measurement is 144 m³/day. Assuming that 50% of the water used is lost before it is measured in the waste stream, an assumption can be made that it relates to a water use of 2 x 144 m³/day = 288

m³/day . For the purposes of this report a total average daily demand from the Sabie site process is taken as 200 m³/day for the boilers, 173 m³/day for the cooling of the finger joints and a further 288 m³/day for the remainder of the Sabie site which amounts to a total of 661 m³/day. When the personnel usage of 22 m³/day is added, the total Sabie site usage is 683 m³/day.

Existing Calculated Water Demand vs. Existing Water Use

From the above it is now evident that the actual water use exceeds the calculated theoretical water demand by a considerable margin. **Table 61** below is a summary indicating the possible losses (*please also refer to Diagram 15*).

Table 61: Possible Water Losses

	Village
Actual daily water use	392 m ³ per day
Expected calculated daily water demand	138 m ³ per day
Possible losses	254 m ³ per day
	York factory site
Actual daily water use	882 m ³ per day
<u>Expected calculated daily water demand:</u>	
from personnel	22 m ³ per day
from boilers	200 m ³ per day
from factory	346 m ³ per day
average finger joint cooling	173 m ³ per day
Expected calculated daily water demand	741 m ³ per day
Possible losses	141 m ³ per day

From the above information, it became evident that there is an unaccounted volume of 141 m³/day at the York factory site and 254 m³/day at the village. It was eventually determined, through the usage of cameras in the water pipes, that there were several water leaks in the water reticulation system, which caused the water losses. York Timbers is currently repairing the leaks that were identified and this will prevent the continuous loss of water.

Future Water Demand

As already discussed the following future expansions are anticipated:

Phase A: Co-Generation

Phase B: Log Merchandising Yard

Phase C: Sawmill & Plywood Upgrade

Phase D: Value Adding Plants

The new Co-Generation Boilers provided under Phase A will replace all the existing boilers and will actually result in a reduction in the water demand. Information provided by York Timbers (Pty) Ltd indicates that the new Co-Generation Boilers have a daily demand of 10 m³/day in comparison to the 200 m³/day of the existing boilers. As a result the future demand will **decrease with 190 m³/day**.

Phase B entails the addition of a new log merchandising yard. A log yard does not have a water demand as such except for the few people that work there.

Phase C entails the upgrade of the existing sawmill and plywood factory as well as the provision of additional storage area. It is the understanding of the involved engineer that the upgrades of the existing infrastructure and the additional storage area will result in **additional water demand**, the exact extent could not be verified by York Timbers at this stage.

Phase D entails the provision of additional value adding plants. The extent of the value adding plant was not made clear to the involved engineer but the understanding is that it will entail for example furniture factories or the like. The implication of this is that there will be a water demand from the additional people employed but there will not be a significant water demand from the process utilized in these factories.

The number of people currently working at the Sabie site is estimated at 758. The reduction

in water demand as a result of the provision of the Co-Generation plant (first phase) is in the order of **190 m³/day**.

6.3.4.1.4 Existing services

Water Reticulation

As previously indicated, the Sabie site water reticulation consists of a ring main, which can be fed by either one of the three supplies. The main ring is currently, and unless there is a problem, being fed by the borehole supply.

The involved engineers stated that the existing water reticulation infrastructure in use possibly needs refurbishment that is evident from the possibility of a leak(s) as indicated previously.

The houses and/or communal facilities in ACME village are fed from a reticulation system, which is supplied by the Thaba Chweu Municipality connection. According to the involved engineers there is a possible leak(s) in this water reticulation system and it is probably also in need of refurbishment.

Fire Fighting

York Timbers (Pty) Ltd currently makes use of a separate fire fighting system, which consists of an automatic sprinkler system. A pump station pumps water from the Sabie River to two storage tanks with a total capacity of 875 m³. One diesel and one electrically driven pump, to supply the fire-fighting network, are in a pump house next to the storage tanks. The pumps each have a capacity of 9335 liter per minute at a pressure of 800 kPa and feed the sprinkler system via above ground pipe network.

Proposed services for future phases

Distribution Network

The distribution of water to the future phases will be based on the criteria as prescribed in the Red Book¹¹.

Water Treatment Facilities

Although the water being obtained from the borehole meets the requirements of SANS 241:2006, it is still recommended to provide some form of disinfection, preferably chlorine as it also has a residual value in order to combat any growth in the system. Disinfection by means of UV sterilization has also proven effective.

Should it be decided to utilize the Sabie River as a source for potable water, a treatment facility will have to be provided as it does not comply with the requirements of SANS 241:2006. A conventional treatment facility will be required in order for the water to meet these standards.

Water Use Licensing

York Timbers (Pty) Ltd has two existing water authorizations issued under the Water Act, Act 54 of 1956 i.e. Permit 407N for Water Abstraction (Reference B32/2/2230/2) and Exemption Permit 514B for Effluent Discharge (Reference B32/2/2230/2).

Permit 407N for Water Abstraction (Reference B32/2/2230/2) authorized the use for industrial purposes of 495 000 m³ per year (or 1500 m³ per day for 330 working days) to be obtained from:

- Sabie River and/or
- Lone Creek and/or
- Sabie Municipality

¹¹ "Guidelines for Human Settlement Planning and Design"

Exemption Permit 514B for Effluent Discharge (Reference B32/2/2230/2) is for discharging 128 000 m³ per annum (at an average of 350 m³ per day) of purified effluent from the sewage treatment works into the Sabie River. The exemption allows "...effluent, complying with the less stringent requirements of the General Standard, to be disposed of into the River."

Even though the borehole water use is not included in the existing permit, it has been registered as water use with the Department of Water Affairs under Registration Certificate 2400 1447 for:

Section 21(a) Taking 288 000 m³ of water from a borehole

Section 21(f) Discharging 65 300 m³ of waste or water containing waste through pipe, canal or sewer (sewage plant effluent)

Registration Certificate 2405 3499 for:

Section 21(h) Disposing 65 300 m³ of heated waste water (boiler blow down)

ThandaManzi Consultants have been appointed to compile and apply for a Water Use License (WUL) for all York water uses in terms of Section 21 of the National Water Act, Act 36 of 1998, running parallel to the EIA process. The new water license applications were compiled in accordance with the New Guidelines of DWA and other relevant documentation (i.e. the registration of the storage of water, registration of water user etc.) were submitted a part of the license application.

Conclusion made by the involved engineers

- The Sabie Site is currently using 474 155 m³ per year of water. This amount can be reduced by rectifying either measuring equipment or possible leaks and is being investigated further. Changes to the measuring equipment have been implemented, but the result will only be evident over time. Some leaks have been identified and repaired and there is an ongoing investigation in this regard.

However, for the purposes of this report the annual water use will remain as 474 155 m³ per year. This amount is made up from three sources:

- Village (Thaba Chweu Municipality) = 141 092 m³
 - Sabie River = 15 643 m³
 - Borehole = 317 420 m³
-
- The village water supply is provided by a service provider in terms of the Water Services Act, and should therefore be excluded from the water use license application.
 - Currently the York Sabie site is using an average of 882 m³/day (317 420 m³ per year) of which 141 m³/day is unaccounted for so the actual use is probably 741 m³/day (270 000 m³ per year). It is therefore estimated that the future use will not exceed the existing permit which is for 495 000 m³ per year, considering that the first phase (Co-generation boilers) will actually result in a saving of 190 m³/day. It is therefore recommended that the Water Use License which is in the process of being obtained, be for the same amount as the current permit which is for 495 000 m³ per year. The permit does however not allow for abstraction borehole water and this water use will have to be included in the license application.
 - The existing water registration for the borehole is for 288 000 m³ per year and it will also have to be addressed during the Water Use License application as the borehole abstraction for the last year exceeded this value.
 - From the information provided by York Timbers (Pty) Ltd, the borehole yield is indicated as 80 m³ per hour. This value exceeds the required amount. It is recommended that a chlorination facility, for disinfection purposes, be provided for the borehole.

6.3.4.2 Sewage Disposal

6.3.4.2.1 Existing sewer infrastructure and sewage production

Sewer Reticulation

The staff village has been provided with waterborne sewerage and a gravity pipeline transports the sewage from the village to the WWTW. This pipeline runs across the Sabie site and the ablutions on the site are also connected to this line via the sewer reticulation network.

Due to the fact that the sewage system has already been in operation for several years, York Timbers undertook a sewerage survey by means of CCTV during August 2011 during which defects were identified. According to the involved engineers the repair of leaks identified commenced during September 2011 and will be concluded by March 2012.

Wastewater Treatment Works (WWTW)

(Refer to Zone A, figure 5 of this report)

Domestic waste produced at the village as well as all the ablution facilities on the Sabie site are treated by the WWTW on the Sabie Site (Zone A, Figure 5). A report provided by York Timbers (Pty) Ltd indicates the WWTW has a hydraulic capacity of 250 m³ per day. The effluent of the WWTW is discharged into an artificial wetland, before draining into a pond and finally being discharged into the Sabie River.

Process effluent water from the Sabie site collects in a stream (commonly referred to as the Plywood stream) which discharges into the artificial wetland, before draining into the pond blending with the effluent of the WWTW before being discharged into the Sabie River. **Refer to Figures 8 and 9.**

The York WWTW is an activated sludge plant consisting of pre-anoxic, aerobic and post anoxic zones. The involved engineers stated that generally these plants are designed for

biological COD, ammonia and nitrite/nitrate removal, however there is not any provision made for the anaerobic zone, which is required for biological phosphate removal. The report on the WWTW indicated that provision was initially made to remove the phosphate chemically by means of dosing ferric chloride/alum in order to precipitate and then settle out the dissolved phosphate.

From visual observations by the involved engineers, the existing WWTW seems to be in a good working condition and all mechanical equipment is in working order and is being maintained on a regular basis. However, the concrete is showing signs of corrosion with the aggregate being exposed as a result.

6.3.4.2.2 Calculated existing and future sewage demand (production)

Existing Sewage Demand (production)

The water demand for the village was calculated at 138 m³/day (**refer Table 3, Annexure S**). The estimated sewage production is taken as 80% of the water demand which results in the sewage production being 110 m³/day (**as indicated on Figure 1, Annexure S**).

The water demand for the staff working at the York factory site was calculated at 22 m³/day (**refer Table 3, Annexure S**). The estimated sewage production is taken as 80% of the water demand which results in the sewage production being 18 m³/day (**as indicated on Figure 1, Annexure S**).

Existing Calculated Sewage Demand (production) vs. Existing Sewage Production

The total theoretical calculated existing sewage production going into the WWTW is then 128 m³/day compared to the actual inflow measurements which show an average of 183 m³/day (only the values from May 2011 onwards are used to calculate the average as this is the date on which flow measuring equipment was calibrated).

Future Sewage Demand (production)

Due to the increase in personnel required for the proposed expansions the future sewage production will increase. Currently, the WWTW is operating at an average inflow of 183 m³/day. This would still mean that the WWTW has 250 minus 183 = 67 m³/day spare capacity.

Proposed services for future phases

At the time of the compilation of the Services Report the exact locations of all the phases were not known and it was subsequently assumed by the involved engineers that it will not be possible to gravitate all of the sewage and that a pump station will be required (worst case).

Refer to Section 3.4, Annexure U for details of the sewer pump stations and outfall sewer designs.

Conclusions made by the engineers

- York Timbers (Pty) Ltd have identified and already repaired leaks in the sewerage reticulation system; and
- York Timbers (Pty) Ltd has two options in terms of sewage treatment for the expanded site:

Wastewater Treatment option A

The existing WWTW can be utilized to treat the sewage from the site and the staff village. Preliminary indications are that the hydraulic capacity of the WWTW (250 m³ per day) seems sufficient for the existing and future domestic sewage. The effluent also complied with existing permit requirements. Upgrading the existing WWTW to increase capacity/effluent quality can be undertaken should it be required.

The process wastewater from the Sabie site is currently being directed to the artificial wetland and pond for treatment and blending with the WWTW effluent. The test results provided indicate that most of the time the effluent complies with the existing permit requirements. A specialist investigation is required to determine whether this is achievable all of the time, especially if one considers the expansion of the Sabie site and the potential increase in wastewater produced.

Wastewater Treatment option B

This option entails pumping sewage into the municipal sewer network, which eventually ends up in the Sabie WWTW, which is currently being operated and maintained by the Thaba Chweu Municipality.

Correspondence from and discussions with the municipality indicated that there is sufficient capacity in the distribution network for the existing workers at the Sabie site only.

Future expansion of the treatment plant and network may be a requirement and the bulk services contribution payable to the Municipality will be utilized for the purpose of creating capacity in the treatment works and network. A sewer pump station and pipeline will have to be constructed to transport the sewage from the York site to the network.

According to some information sources, the municipal sewer system is not well maintained and it currently causes water pollution problems in the Sabie River. It is therefore not at this stage (if this is the case) advisable to link up with the municipal sewage system, because the linking up will cause even more pollution in the Sabie River. The existing plant at the Sabie Site functions well and the treated water discharged into the Sabie River comply with the required DWA standards.

If a municipal sewer connection is a requirement for the project approval, the conditions of approval must make the connection to the municipal sewage system subject to the upgrading and regular maintenance of the municipal sewage plant. Water quality tests

that will determine the functioning of the plant must also be done on a regular basis and the tests must be available to the public.

6.3.4.3 Stormwater

A Storm Water Management Plan (SWMP) for the Sabie Site was compiled by York Timbers **(refer to Annexure V)**

Purpose and Scope

The purpose of the Sabie Storm Water Management Plan is to ensure that storm water at Sabie site is managed in accordance with Regulation 704, published in terms of the National Water Act, Act 36 of 1998, and to implement phase 2 of storm water management at the Sabie site.

The scope of this plan covers all storm water run-off generated on site as well as storm water run-off generated upstream of the site which is diverted away from the site, and contaminated process water.

Storm water management methodology

The purpose of the Storm water Management Plan is to effectively control storm run-off so that all clean storm water falling off-site is diverted away from site and routed directly to the Sabie River, but that all process water is retained onsite and reused as far as possible.

- **Clean storm water falling off-site**

All storm water falling off-site is regarded as clean and will be diverted away from site **(refer to Figure 29)**.

As part of phase 1 of the Sabie site storm water management plan implemented during 2008/2009 the following storm water infrastructure was installed to divert storm water falling outside the Sabie site perimeter away from the Sabie site:

- ACME village drainage system
- Southern perimeter drainage channel.

- **Storm water falling on site**

According to Regulation 704 all storm water falling on site is regarded as dirty water. Considering that the Sabie site is located on the edge of the Sabie River it is not possible to construct dirty water retention dams as these structures would fall within the 1:100 year flood line, which contradicts Regulation 704.

During discussions with DWA Mpumalanga it was proposed that the existing storm water system, i.e. storm water run-off channelled through western and eastern wetlands be retained.

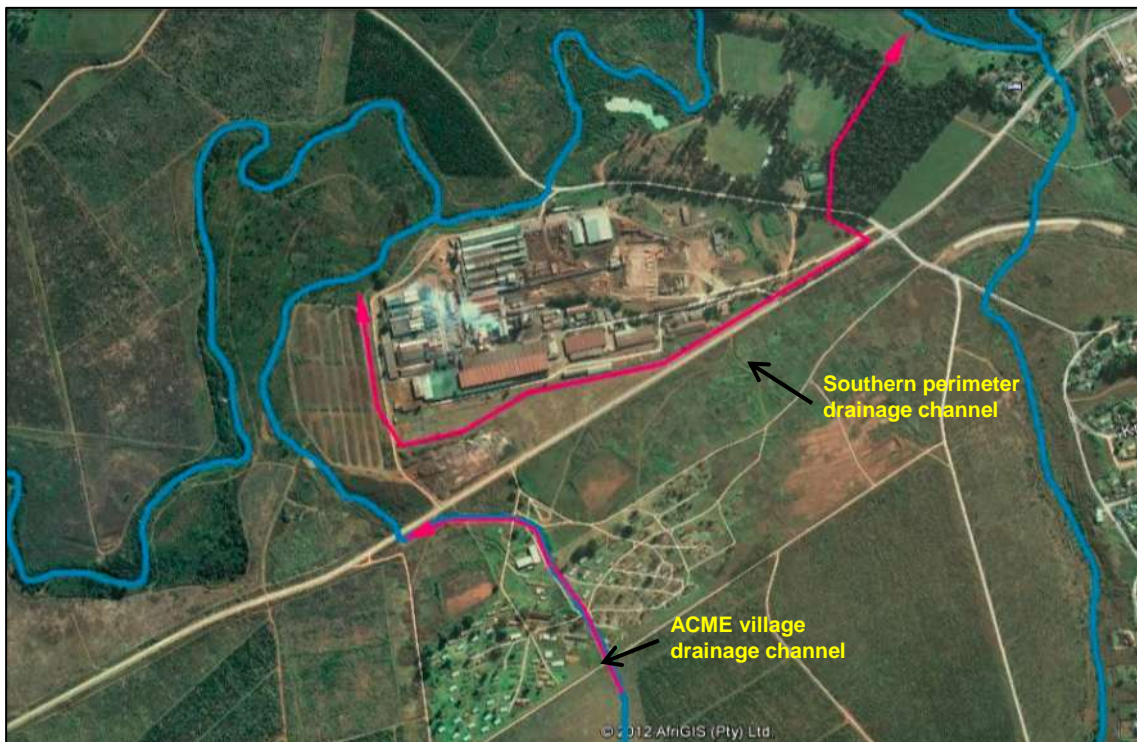


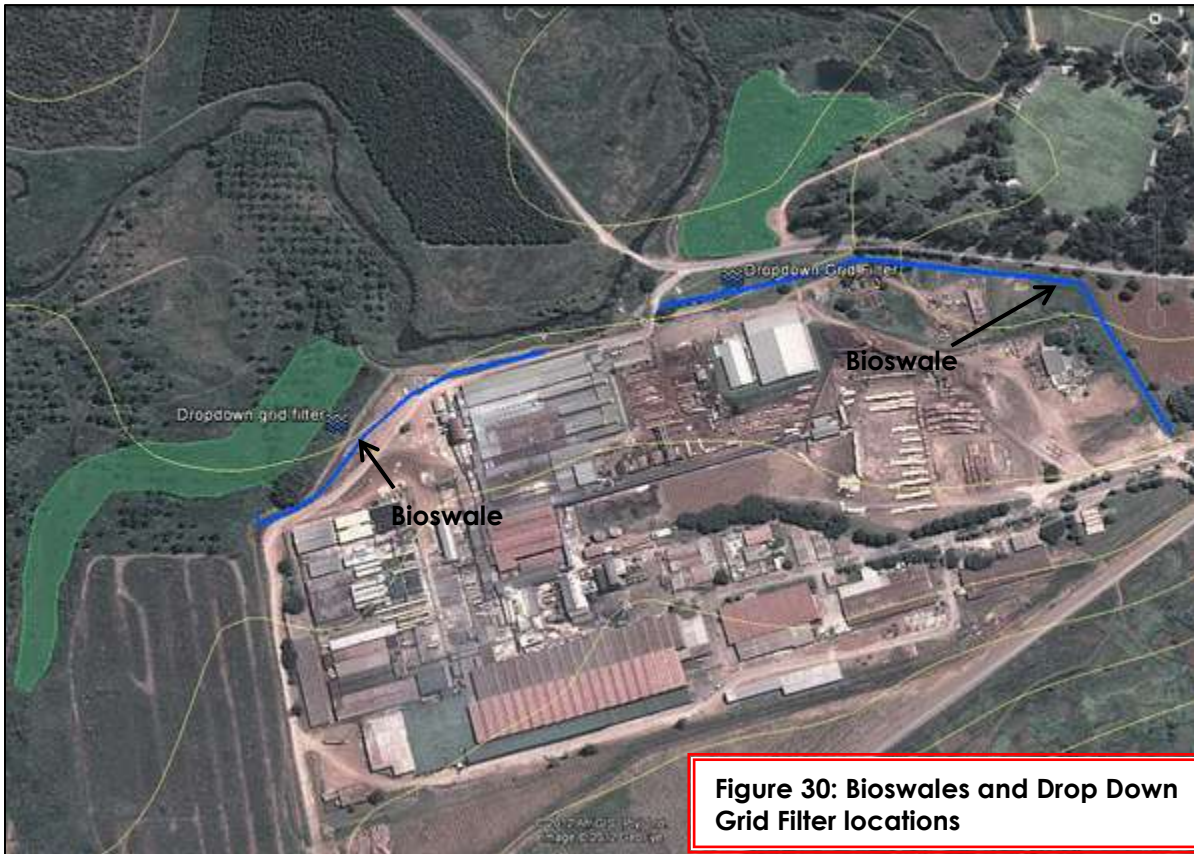
Figure 29: Clean storm water run-off off-site

Water resource protection measures

In order to protect the wetlands and the Sabie River it was proposed that the following measures be implemented prior to routing storm water into the two wetlands:

- Dropdown grid filter with energy breakers
 - Strain storm water on the west by means of a dropdown grid filter prior to exiting site perimeter,
 - Strain storm water on the east by means of a dropdown grid filter prior to exiting site perimeter,
- Bioswales
 - Bioswale on north western perimeter before storm water exits the site perimeter.
 - Bioswale on north eastern perimeter before storm water exits the site perimeter.

Refer to Figure 30 for locations of proposed structures.



Pollutant Removal

As stormwater runoff flows through bioswales, pollutants are removed through filtering by vegetation and soils. Above ground plant parts (stems, leaves, and stolons) retard flow and thereby encourage particulates and their associated pollutants to settle. The pollutants are then incorporated into the soil where they may be immobilized and/or decomposed.

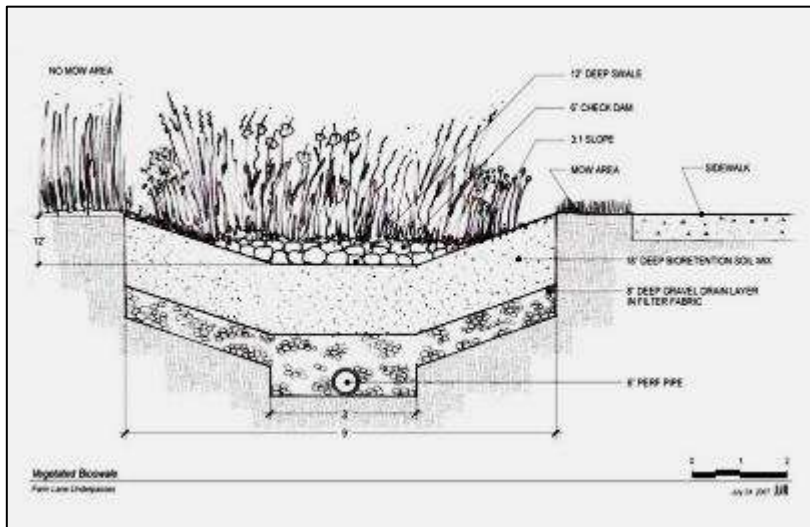


Diagram 16: Dry Bioswale Cross Section

Storm water monitoring

The existing quarterly surface water monitoring program of York Timbers will be amended to include two additional sampling points.

Surface water monitoring to be conducted on a quarterly basis at all storm water exit points (on site) when run-off occurs i.e. at points SW1, A1, and B6 and at points before storm water entering the Sabie River following filtering through wetland when run-off occurs i.e. at points A2 and B8.

Water quality of storm water monitored at the points as indicated on **Figure 31** to comply with the General limit for waste water.



Figure 31: Stormwater Monitoring Points

6.3.4.4 Solid Waste

Both hazardous and non-hazardous wastes as well as by-products are generated by the Sabie Sawmill and Plywood Plant and associated activities. **Refer to Diagrams 17 and Tables 62 and 63 and refer to Figure 31, Waste Steams.**

A Waste Mangement Procedure was compiled for the Sabie Site (**refer to Annexure X**).

Diagram 17 – Solid Wastes and By-Products generated by the Sawmill and Plywood Plant

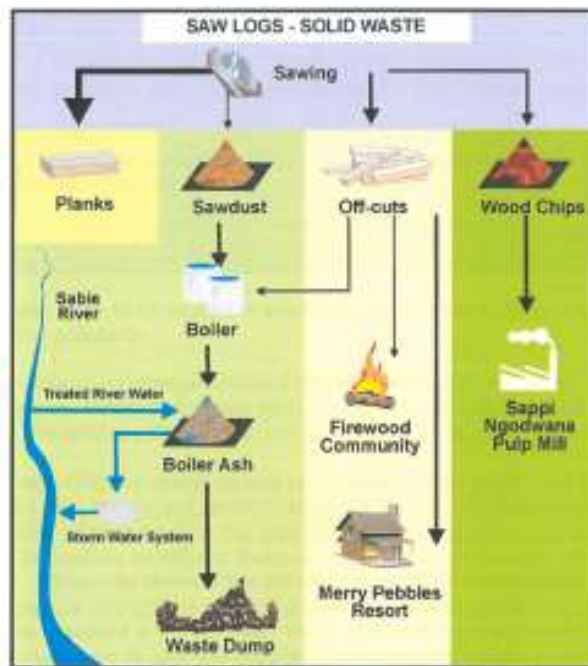


Table 62: Waste generated at Sabie site

Type	Source	Waste management method	Where	Transport
Hazardous waste				
Boiler ash to E2E Braaks	Boilers	Reused	Earth2Earth	Interwaste
Glue waste	Plywood	Disposed	Holfontein	Enviroserve
CCA sludge	CCA treatment plant	Disposed	Holfontein	Enviroserve
Fluorescent tubes	Electrical Workshop	Disposed	Holfontein	Enviroserve
Medical waste	Clinic	Disposed	Westmead KZN	Compass Waste
Plywood off-cuts (containing glue)	Plywood	Reused	Boilers - fuel	Conveyor belt
Fibre board plant off-cuts (containing glue)	Fibre board plant	Reused	Boilers - fuel	
Value adding plant off-cuts (containing glue)	Value adding plant	Reused	Boilers - fuel	
Sewage sludge	STW drying bed	Stored	STW drying bed	NA
Used Oil	Garage	Recycled	Kia-ora Oil	Kia-ora Oil

Oil sludge and sand	Garage oil separator	Disposed	Holfontein	Enviroserve
Used oil filters	Garage	Disposed	Holfontein	Kia-ora
Oily rags	Garage	Disposed	Holfontein	Enviroserve
Non-hazardous waste				
Domestic waste	Sabie site	Disposed	Municipal landfill site	Sabie tractor
Steel	Sabie scrapyard	Recycled	Nieuwco	Nieuwco
Used tyres	Garage	Stored	On site	NA

Table 63: Wood By-products generated at Sabie site

Wood by-products				
Type	Source	Management method	Where	Transport
Peeler core	Plywood peeler	Reused	Sold to Summit/Sandveld Timbers etc.	Contractor
Clean bark	Plywood debarker	Reused	Boiler fuel/Nutrigro - composting	Contractor
Soil covered bark	Log yards	Reused	Borrow pit/Nutrigro - composting	Contractor
Wood chips	Hewsaw	Reused	Sappi	Contractor
Shavings	Planer	Reused	Shavings Supply Company	Contractors
Wood off-cuts	Hogger	Reused	Boiler fuel/ACME - Fire wood	Sabie tractor
Saw dust	Wetmill	Reused	Boilers - fuel	Conveyor belt
Wood chips	Hewsaw	Reused	Boilers - fuel	Conveyor belt
Off cuts (breakages)	Drymill operations/Plywood Dryers/Plywood wet side and dry side	Reused	Boilers - fuel	Conveyor belt/Scraper chains/Tractor and trailer

Note: As per the NEM: WA definition of waste, a by-product is not considered to be waste. York Timbers regards wood as a by-product.

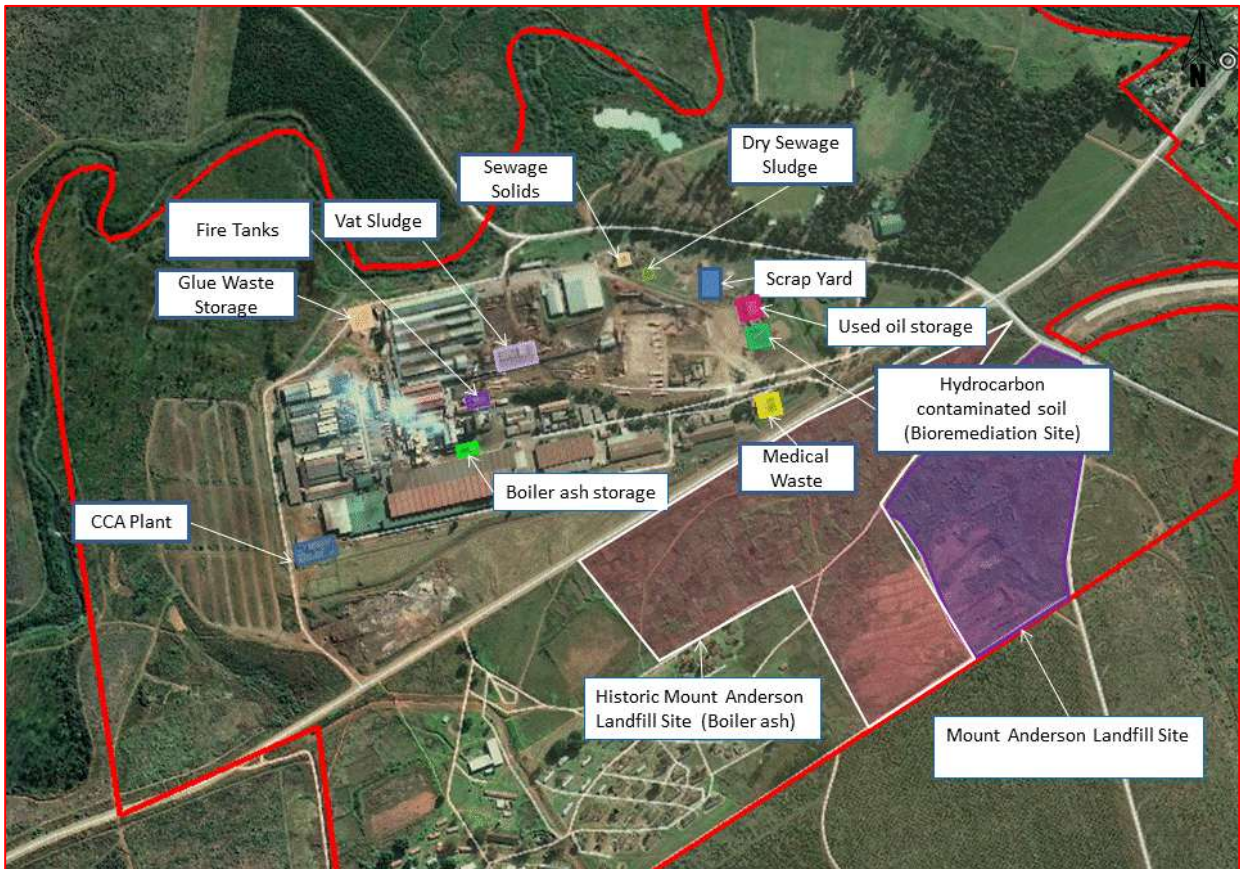


Figure 32: Waste Streams

6.3.4.5 Electricity

Refer to Annexure W for the Electrical Services Report prepared by Netgroup South Africa (Pty) Limited

The proposed expansion of the Sabie Site includes a co-generation facility with a capacity to produce **30MW** from which an estimated **25MW** will be consumed by York Timbers (Pty) Limited. The remaining electricity will be fed into the existing municipal grid at rates yet to be agreed with Eskom. As already mentioned a separate EIA application for the proposed co-generation facility was submitted to DEA.

Supply

The Eskom network currently supplies electricity to the York Timbers Plant by means of a 22kV overhead-line, which supplies a 3 x 5 MVA transformer substation (G.F.P. SABIE Mill, 22/11kV substation). The 22kV overhead-line is 2,6 km length and the installed conductor is Hare, the source of supply is the Eskom 132/22kV substation at Sabie. **Refer to Figure 33.**



Figure 33: Existing Substations and powerlines

Demand

According to the electrical engineers the maximum demand for the York Timbers Plant is currently 5 MVA with the possibility of increasing to 6 MVA upon completion of the proposed upgrade and the notified maximum demand is 7 MVA.

Conclusions made by the involved Electrical Engineer

The proposed future upgrade of the York Timber plant will result in the injection of power to the existing Eskom grid at 22kV whereby the following considerations will have to be taken into account:

- The existing 22kV overhead-line supply from Sabie 132/22kV substation to the G.F.P. Sabie Mill 22/11kV substation is adequate for supplying 9MW however consideration for a second overhead line would ensure supply security in the event of a fault on the existing line. However, Eskom should be consulted regarding the utilization of the existing lines and its adequacy for integration into the existing grid.
- Eskom should be engaged to explore possible integration options taking into account the existing network constraints.
- Eskom/The Local Municipality should be engaged for purposes of negotiating a Power Purchase Agreement for the surplus generation capacity.
- The proposed development is taking place within close proximity to existing Eskom 22kV and 132kV Power-lines hence it is important to ensure adherence to existing Eskom standards and the OHS Act (Electrical Machinery Regulations), in terms of minimum clearances and servitude restrictions for buildings and trees on either side of the power-lines.
- There is a need for consideration of detailed studies in regard to Generator protection (Undervoltage, under/overfrequency, load unbalance, over-current, etc).
- The following studies will have to be carried out to determine the effect of the Generation integration with Eskom:
 - Load flow studies with York Timber connected to Eskom to determine normal operating conditions
 - Load flow studies with York Timber islanded from Eskom to determine islanded operating conditions.
 - Fault studies with York Timbers connected to Eskom to determine setting while generator is running.

- Protection grading settings with York Timber connected to Eskom to determine setting with generator off-line.
- Protection grading settings with York Timber islanded from Eskom.
- An islanding philosophy should also be developed that will guide York Timber on what to do under various operating conditions.
- Transient stability studies with York Timber connected to Eskom under various fault scenarios to determine weakness in the power system & point of separation.
- The establishment of Point of supply battery limits and control arrangements for the Main circuit breaker for islanding purposes.

Two new substations are proposed as indicated on **Figure 10, Site Layout**.

6.3.4.6 Bulk Road Infrastructure

Main Access Roads

The development needs to be serviced with public access into the area by means of access roads to the public road network system in the area. There are currently three provincial roads in the vicinity of the study area servicing the immediate area (**refer to Figure 34, also included as Annexure D1, Annexure U**):

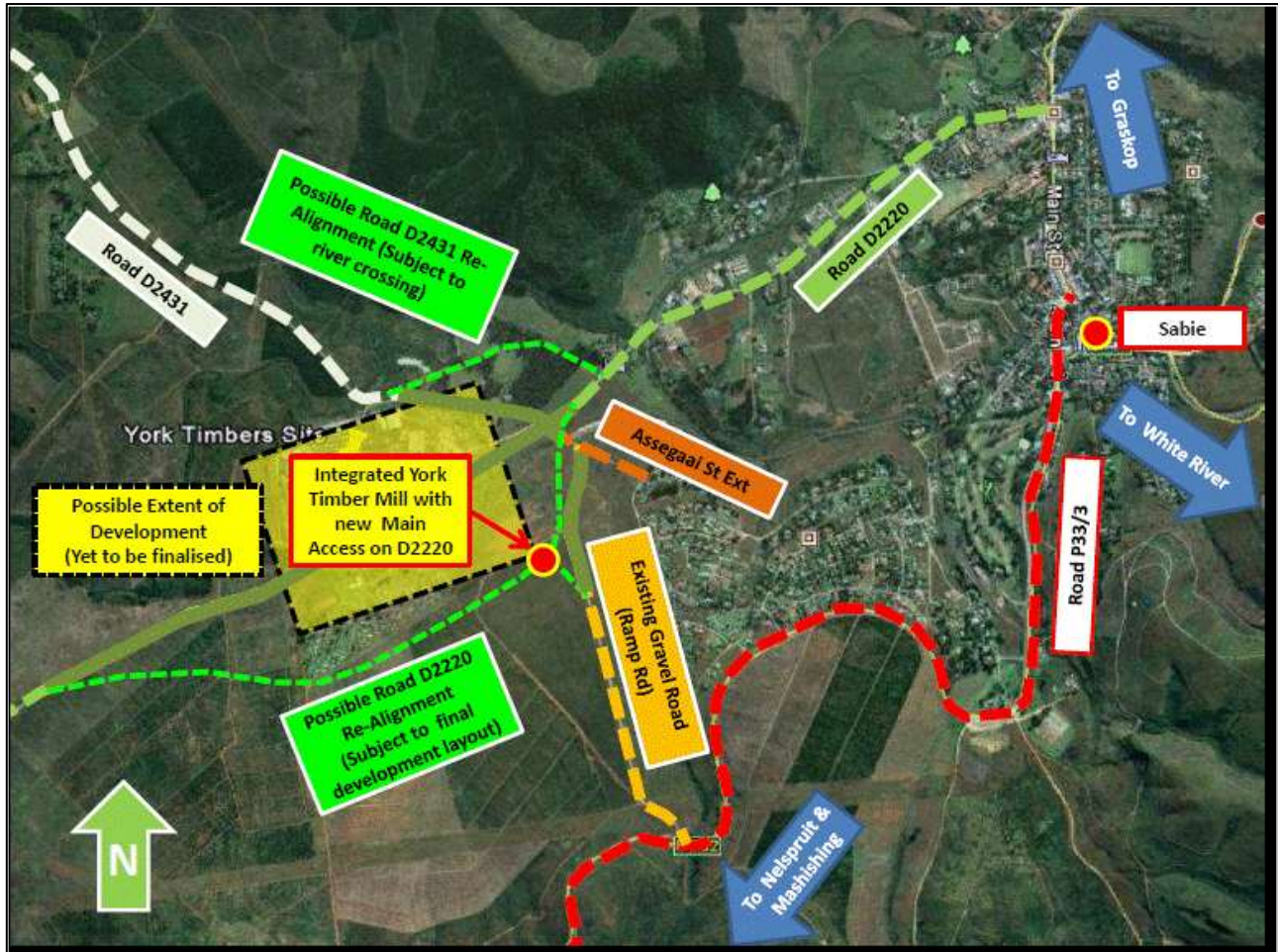


Figure 34: Existing Roads And Proposed Access Routes

- **Road P33/3 (R532)**

This road is a provincial road which connects Sabie with Mashishing (Lydenburg) via the R03703S (R37 – Long Tom Pass) and Sabie with Nelspruit via the R03704S (R37 to Nelspruit). The road serves as the major access road to Sabie from the west (Mashishing and surrounds) and the south (Nelspruit and surrounds) and is occasionally heavily trafficked during weekends and holiday periods as it is one of the main tourist routes (Panorama route) in the area. Heavy vehicles involved with timber haulage also use this road.

Road R532 runs in a general south/north direction but is not located directly adjacent the Sabie Site. A gravel road (referred to as the Ramp Road) currently connects this road with

an extension of Assegai St and ultimately Road D2220. Although Road R532 is nearly 2km south of the proposed development, it is considered as the likely location for the development's main access via a connection road with Road D2220 since it will alleviate the inevitable flow of heavy vehicle traffic through the Sabie CBD. The Ramp Road referred to earlier currently provides the said connection but it will be privatized (by adding boom gates) and upgraded (according to York's requirements) if it is to function as the main access to the development.

- **Road D2220**

This road is a provincial road, which connects the northern part of the Sabie CBD with the Lone Creek waterfall and forestry plantations to the west of the town. It also connects Sabie with residential areas and light industrial areas to the east of the study area as well as Sabie's southern residential areas via an extension of Assegai Street. Road D2220 currently provides the main surfaced access to the Sabie site located adjacent to it. It runs in a general east/west direction adjacent to the study area and its current condition is generally poor. The realignment of this road is proposed in order to accommodate the proposed expansion of the Sabie site.



- **Road D2431**

Road D2431 is a de-proclaimed provincial road and currently a private road which branches off Road D2220 at the York Timber Sports Grounds and connects the northern part of the Sabie CBD with the Bridal Veil waterfall and forestry plantations to the west of the town. It runs in a general south/north direction adjacent to the study area. Its current condition is generally poor and the re-alignment of this road is proposed in order to accommodate the proposed expansion of the Sabie Site. Careful consideration will have to be given to where it crosses the Sabie River as a relocation of the existing crossing will require an application for a Full Water Use License as well as the submission of an Environmental Impact Assessment.

Issues & Impact Identification – Services

Table 64: Issues and Impacts – Services

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possibilities High 🟢 Medium 😊 Low 🟡 Positive Impact - Not Necessary To Mitigate 🌞
9)	Storm water The proposed development will lead to increased hard surfaces and the quantity and the speed of the storm water across the study area and into the water bodies and adjacent properties will increase. Refer to Section 6.1.2	-	😊
5)	Construction works (especially near the Sabie River and wetlands) could cause water pollution, siltation, soil compaction and impacts on sensitive wetlands and eco-systems lower down in the catchment area. Refer to Section 6.1.2	-	😊
35)	Temporary disruption of services due to relocation and installation of services	-	😊
36)	Water supply Sufficient water supply is available.	+ -	🌞
37)	Sewer Some upgrading of the existing on-site WWTW is required.	-	😊

38)	<p>Electricity</p> <ul style="list-style-type: none"> The proposed co-generation facility will have a capacity to produce 30MW from which 25MW will be consumed by York Timbers (Pty) Limited. The balance will be fed into the existing municipal grid. Therefore the proposed expansions will not have an impact on the demand for electricity. 	+	
39)	<p>Waste Management</p> <p>The construction and operational phases of the proposed development will create large quantities of builder's waste and waste generated by the plant operations. Waste license applications have been submitted for both hazardous and non-hazardous waste generated by the existing plant operations and the proposed expansion of the plant.</p>	-	

Discussion of issues identified, possible mitigation measures and significance of issue after mitigation

35) Construction of the new development may cause damage to the existing services and infrastructure and will disrupt service provision (i.e. electricity, water, Telkom cables) to local residents on surrounding properties during the construction phase.

Table 65: Significance of Issue 35 (Damage to existing services) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p> <p>Positive Impact/ Neutral - Not Necessary To Mitigate ☀️</p>	<p>Mitigation</p> <p>Already achieved ✓</p> <p>Must be implemented during planning phase, construction and/ or operational phase</p> <p>P / C / O</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p> <p>Medium M</p> <p>High H</p> <p>Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>High 🟢</p>	<p>P / C – Determine areas where services will be upgraded and relocated well in advance. Discuss possible disruptions with affected parties to determine most convenient times for service disruptions and warn affected parties well in advance of dates that service disruptions will take place</p>	<p>M – To be included in the EMP</p>

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table

39) During the construction and operational phases waste would be generated on site.

Both hazardous and non-hazardous waste and by-products will be generated during the operational phase of the plant.

Table 66: Significance of Issue 39 (The construction and operational phases of the proposed development will create large quantities of builder’s, domestic and industrial waste and liquids) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities</p> <p>High 🟢 Medium 🟡 Low 🔴</p>	<p>Mitigation</p> <p>Already achieved ✓</p>	<p>Significance of Issue after mitigation</p> <p>Low/ eliminated L / E</p>

<p>Positive Impact/ Neutral - Not Necessary To Mitigate ☀</p>	<p>Must be implemented during planning phase, construction and/ or operational phase P / C / O</p>	<p>Medium M High H Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>Medium 😊</p>	<p>C – Prevent unhygienic usage on site and pollution of the natural assets. Develop a central waste temporary holding site to be used during construction. (Near the access entrance). This site should comply with the following:</p> <ul style="list-style-type: none"> - Skips for the containment and disposal of waste that could cause soil and water pollution, i.e. paint, lubricants, etc.; - Small lightweight waste items should be contained in skips with lids to prevent wind littering; - Bunded areas for containment and holding of dry building waste. - THESE AREAS SHALL BE PREDETERMINED AND LOCATED IN AREAS THAT IS ALREADY DISTURBED. THESE AREAS SHALL NOT BE IN CLOSE PROXIMITY OF DRAINAGE CHANNELS. <p>C - Workers will only be allowed to use temporary chemical toilets on the site. CHEMICAL TOILETS SHALL NOT BE IN CLOSE PROXIMITY OF DRAINAGE CHANNELS.</p> <p>C - No French drain systems may be installed.</p> <p>C - No bins containing organic solvents such as paints and</p>	<p>L – To be included in the EMP</p>

	<p>thinners shall be cleaned on site, unless containers for liquid waste disposal are placed for this purpose on site; All waste must be removed to a recognized waste disposal site on a weekly basis. No waste materials may be disposed of on or adjacent to the site. The storage of solid waste on site, until such time that it may be disposed of, must be in the manner acceptable to the Local Authority</p> <p>C - Keep records of waste reuse, recycling and disposal for future reference. Provide information to ECO. (Environmental Control Officer)</p> <p>O – Waste must be disposed of /reused/recycled/stored according to the Waste Management Procedure document (refer to Annexure X).</p>	
--	--	--

Result:

Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table

6.3.4.7 Roads and Traffic

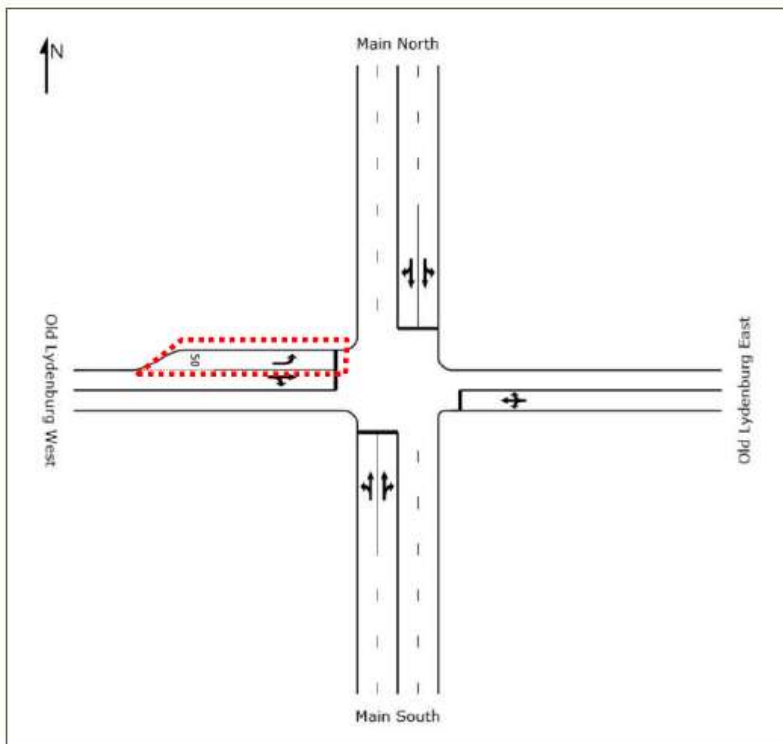
Refer to Annexure Y for the report of the Traffic Impact Study that was compiled by Endecon Ubuntu Engineering Consultants.

Endecon Ubuntu (Pty) Ltd was requested by York Timbers (Pty) Ltd to conduct a Traffic Impact Study (TIS) for the proposed expansion of the York Timbers Sabie site. During discussions with the Mpumalanga Department of Public Works, Roads & Transport (Mpumalanga Roads), initial indications are that access to the site will primarily be obtained from a re-aligned section of the Old Lydenburg Rd (D2220) and the existing Ramp Rd connecting the Old Lydenburg Rd with Long Tom Pass (P33/3 or R532). Also

considered in the TIS is the possible relocation of the ACME Village adjacent the existing Sabie site. The ACME Village is currently the main residence for the majority of the Sabie site labour force.

Based on the conclusions that have been derived from this study, the involved traffic engineers made the following recommendations:

- The following **intersection upgrades** will be required to accommodate the anticipated development traffic of the York Timbers Sabie Integrated Mill (**refer to Diagram 18**):
 - **Main Rd (R532)/Old Lydenburg Rd (D2220)**: Provide a left-turn short-lane (30m short-lane with a 30m taper) on the Old Lydenburg Rd approach from the west and maintain the intersection as a 4-way stop.
 - **Access Intersections**: At the York Main Access/Ramp Rd/D2220 (Old Lydenburg Rd) intersection provide a normal 2-way stop (with priority for the D2220) and provide simple T-junctions at the relocated Mount Anderson and Bridal Veil Falls accesses.



**Diagram 18 - Main Rd/
Old Lydenburg Rd
proposed upgrading**

- The **re-alignment of the D2220 and D2431 is proposed:**

Meetings were held with Mpumalanga Roads, Thaba Chweu Local Municipality (TCLM) and TRANSNET to discuss the access options detailed below. All relevant meeting minutes can be viewed in **Annexure A of Annexure Y**.

The proposed upgrade of the Sabie site will require expansion across and to the south of the D2220 (Old Lydenburg Rd) and across and to the north of the D2431 (Bridal Falls Rd). York Timbers indicated that optimal functioning of the Sabie Integrated Mill would require an “in-line” process, which will require the re-alignment of the said roads around the site. **Refer to Figure 35 for the proposed re-alignments, based on a 60km/h design speed (80km/h is not feasible in terms of Mpumalanga Roads design standards and safety given the access locations).**

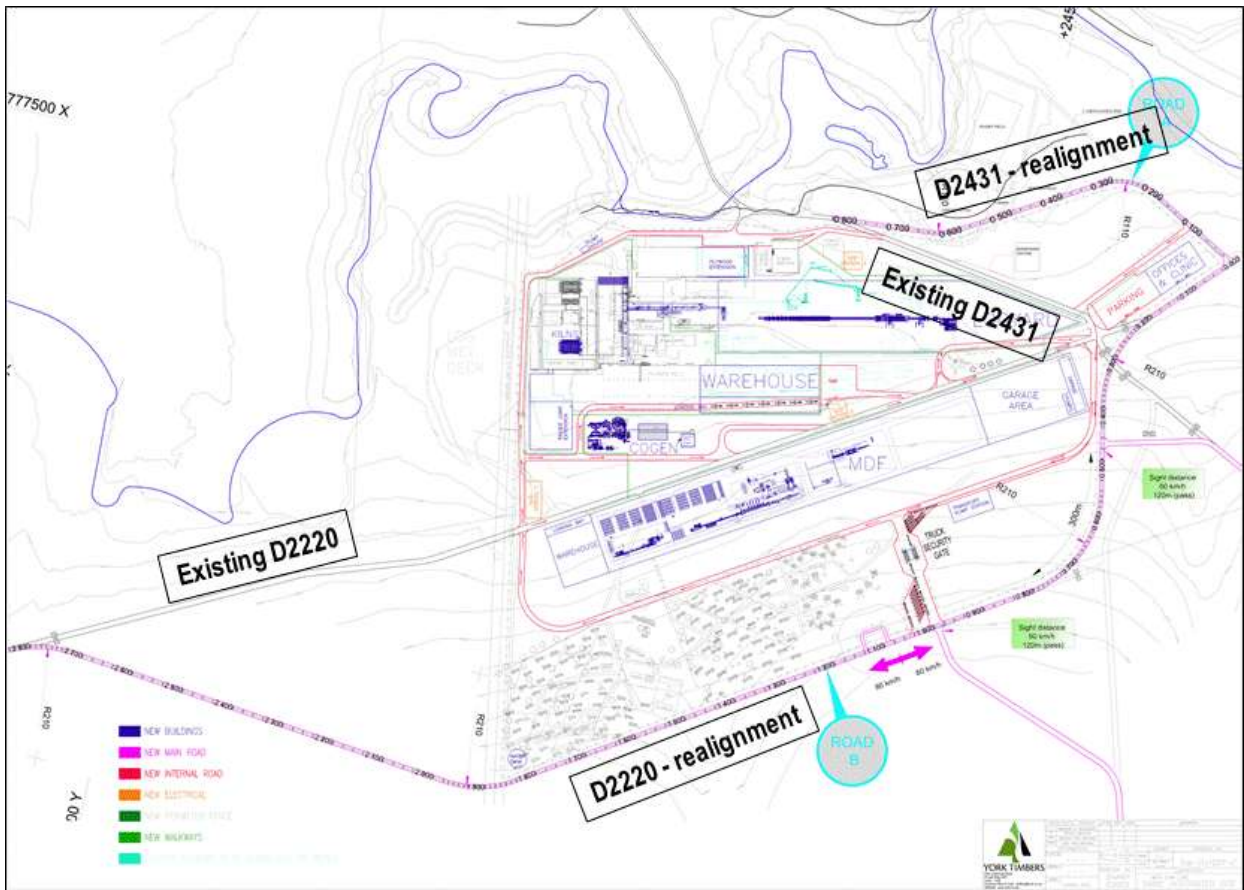


Figure 35: Proposed Realignment of Roads D2220 and D2431

Initial indications from technical (based on current survey data) and traffic flow points of view indicated that the proposed re-alignments will not present major problems, however the involved traffic engineers stated that there are some other issues that definitely require consideration:

Costs: York Timbers should consider its options in terms of the associated costs with the proposed re-alignments – a cheaper alternative may be to maintain the current alignments and use over/underpasses to integrate the sites on either sides of the D2220.

Mpumalanga Roads: Should re-alignment be adopted as the way forward, the re-alignment should conform to the design and safety standards/requirements of Mpumalanga Roads and the correct procedures as provided (**refer to Section 8 of Annexure Y**) should be followed to facilitate the re-alignments/closures.

TRANSNET: York Timbers must terminate their siding ownership contract with TRANSNET should it prove impractical to accommodate the York siding in the proposed York Timbers Sabie Integrated Mill.

Graskop-Sabie railway line: It is currently under consideration for privatisation and may prove useful in future for transporting timber to the mill; in that case York may consider maintaining the siding infrastructure.

Existing level crossing of the Old Lydenburg Rd (D2220): It can be improved by TRANSNET through the use of standard removable concrete slabs on the approaches that facilitate future maintenance whilst York's contractor will be responsible for the upgrading/improvements of the road up to the edge of the extent of the concrete slabs.

Thaba Chweu Local Municipality: York Timbers must engage TCLM to determine their policy regarding bulk services contributions and negotiate the application thereof for the rehabilitation of the Old Lydenburg Rd (D2220), of which the extent of the rehabilitation is to be established by a formal road condition investigation to be commissioned by York Timbers.

- The **formalisation of the Ramp Rd is proposed:**
 - Based on the intersection analysis results (**refer to Section 6 of Annexure Y**) York Timbers should maintain the Ramp Rd as its **primary access route** for trucks from Hazyview, White River, Nelspruit and Mashishing, and subsequently reduce the impact on the Sabie CBD and the Main Rd/Old Lydenburg Rd intersection.
 - Based on the findings of a further formal road condition investigation to be commissioned by York Timbers, the **extent of upgrading** required is to be established and the **safety requirements** set by Mpumalanga Roads at the Long Tom Pass intersection is to be incorporated as part of the upgrading.
 - Preventative measures in terms of driver training in the **responsible use of brakes and gears** in conjunction with the use of **infrared cameras** at the weighbridge to prevent incorrect/unsafe use of brakes should be considered by York to prevent accidents due to runaway trucks with overheated brakes.
 - Should York formalize/pave its Ramp Rd, **a gate should be erected to maintain it as a private road** and hence prevent it from eventually becoming a public road in the long run; the “privatised” Ramp Rd can then also be used as a waiting area for incoming trucks.

- The majority of the residents of **ACME Village** do not have access to private vehicles and therefore the proposed relocation of the village will require York Timbers to engage the residents on their transport needs and assist them in providing transport to/from the York Timbers Sabie Integrated Mill (**refer to Section 9 of Annexure Y**).

- In general it is recommended that the proposed upgrading of the Sabie site be **approved from a Traffic Engineering** point of view by the relevant authorities concerned.

Issues & Impact Identification – Roads and Traffic

Table 67: Issues and Impacts – Roads and Traffic

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possibilities High 🟢 Medium 🟡 Low 🔴 Positive Impact - Not Necessary To Mitigate 🌟
40)	Roads Some intersection upgrades and realignment of existing roads are required i.e. D2220 & D2431 in order to accommodate the proposed expansion of the Sabie Site.	-	🟢
41)	Increase in traffic, especially heavy vehicle traffic.	-	🟢

Discussion of issues identified, possible mitigation measures and significance of issue after mitigation

40) Some intersection upgrades and realignment of existing roads are required i.e. D2220 & D2431 in order to accommodate the proposed expansion of the Sabie Site.

Table 68: Significance of Issue 40 (Some intersection upgrades and realignment of existing roads are required in order to accommodate the expansion of the Sabie Site) After Mitigation/ Addressing of the Issue

Mitigation Possibilities High 🟢 Medium 🟡 Low 🔴	Mitigation Already achieved ✓ Must be implemented during	Significance of Issue after mitigation Low/ eliminated L / E

<p>Positive Impact/ Neutral - Not Necessary To Mitigate ☼</p>	<p>planning phase, construction and/ or operational phase P / C / O</p>	<p>Medium M High H Not possible to mitigate, but not regarded as a fatal flaw NP</p>
<p>High ☺</p>	<p>P/C – The intersection upgrades and realignment of Roads D2220 and D2431 recommended by the traffic engineers must be implemented.</p>	<p>L – To be included in the EMP</p>

Result: Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table

41) Traffic increase during the construction and operational phases of the development will have an impact on traffic flow of the area. The impact of additional traffic during the construction phase, especially heavy construction vehicles that can slow traffic down, can be mitigated to a certain extent by not allowing construction vehicles to use public roads during peak traffic times, as well as to avoid construction activities on public roads during peak traffic times. Heavy trucks delivering logs and other delivery trucks could have a significant impact on traffic in the area, however it should be noted that these trucks are not allowed to use the roads at night time.

Table 69: Significance of Issue 41 (Traffic increase during the construction and operational phases of the development will have an impact on traffic flow of the area) After Mitigation/ Addressing of the Issue

<p>Mitigation Possibilities High ☺ Medium ☹ Low ☒ Positive Impact/ Neutral - Not Necessary To Mitigate ☼</p>	<p>Mitigation Already achieved ✓ Must be implemented during planning phase, construction and/ or operational phase P / C / O</p>	<p>Significance of Issue after mitigation Low/ eliminated L / E Medium M High H Not possible to mitigate,</p>
--	---	--

		but not regarded as a fatal flaw NP
High 😊	<p>P/ C - Construction vehicles and activities to avoid peak hour traffic times</p> <p>O – Heavy trucks delivering logs not allowed to travel at night time.</p>	L – To be included in the EMP

Result: *Although issue can be mitigated, the significance of the impact should still be determined / confirmed assessed in the Significance Rating Table*

6.3.5 Socio- Economical

Refer to Annexure Z

Demacon Market Studies were commissioned to conduct a Socio-Economic Specialist Investigation.

- **Economic Overview**

Demacon is of the opinion that the combination of low interest rates (prime lending interest rate currently lowest since 1976), increased fiscal stimulus, on-going infrastructural activity and a sound banking system should provide the basis for a solid, but ultimately below potential, economic **recovery** in South Africa during the next 18 months.

An **improving economy has positive implications** for disposable income growth and thus residential purchasing power in the near term. Demacon stated that global expectations for 2011 show **signs of economic recovery, which** would have beneficial advantages for South Africa and major metropolitan regions.

The following Key Attributes and Trends were identified in the Thaba Chweu Local Economy:

- Moderate growth rates although from a small economic base
- Relatively concentrated economy becoming slightly more diverse
- Economic pillars include Manufacturing, Mining, Transport and Communication, Finance and Business Services and General Government Services Sectors.
- Low levels of employment growth –1.9% formal, 0.4% informal
- Labour force characterised by large segment skilled labour and nearly even segment of semi and unskilled labour.
- Job losses are contributed to by a lack of appropriate skills and increased capital intensive production processes (less labour intensive)
- Employment pillars include Trade, Manufacturing, General Government Services, Mining and Community, Social and Personal Services Sectors.

- **Demographic Overview**

Demacon stated that the proposed sawmill expansion will **affect a very specific geographic market area**. It should therefore be understood that certain areas within this trade radius reflect distinct socioeconomic profiles and **behavioural characteristics** and hence will therefore react differently to the proposed development with respect to their needs and specific preferences.

A new gap in the labour market will be created by the new investment with multiple economic opportunities including skills development, PAYE (individual income tax), disposable income est. and in turn stimulate various real estate markets. According to Demacon the anticipated labour split in terms of skills level is as follow: 20% skilled, 50% semi-skilled and 30% unskilled job opportunities will be created in the market area with the new Sabie site expansion.

The following Key Attributes and Trends in the Thaba Chweu Local Municipality were identified:

- Large population segment – 96 427 people / 42 946 households in 2010
- Low and declining population growth – 3.8% per annum (1996 to 2010 average), declining to an average growth of 2.7% over the past three years.
- Relative segment of HIV+ population – 17.4%, AIDS deaths represent 64.5% of annual deaths in the region
- Medium sized economically active segment – 64.5%, with high levels of employment – 60.3%
- Disposable Income and Final Expenditure Growth is 3.8% and 3.8% per annum respectively (1995 to 2008) – decreasing to 1.1% and 1.4% over the past few years.

Socio-Economic Profile of Study Area – Sabie (10km Trade radius) (refer to Table 8: Annexure Z):

- Approximately 14 089 people/ 5 733 households in 2011
- Predominant African Black population – 79.9%
- Large young and upcoming segment, followed by a large segment of mature adults
- Moderate levels of educated adults (20yrs and older) – 33% Grade/12 and higher education
- Relatively large economically active population segment – 73.8% of which more than half is employed (79.3%), reflecting moderately low dependency ratios
- Predominance of blue collar occupations serving as proxy for lower to medium income consumer market
- Moderate to lower living standards – LSM 1 to 3 (58.6%), LSM 4 to 10+ (41.4%)
- Lower to middle income consumer market – weighted average monthly household income of HH earning an income R5 112, weighted average monthly household income LSM 4 to 10+ is R13 527
- Strong reliance on public transport with emphasis on minibus and bus transport – Generally reflects a consumer market with a dominant demand for residential and

commercial products and services towards the lower to middle-end of the scale.

- **Location Overview**

According to Demacon the Sabie site has enough land (directly located next to the sawmill site) and the necessary infrastructure available for the proposed expansion. The York Timbers Sabie site is a large industrial node in the Sabie context.

- **Forestry Analysis**

The South African Forestry Industry plants 360 000 trees every working day - more than 90 million trees every year.

Mpumalanga has the ideal climate and topography for forests with Sabie and Graskop representing the hub of the industry with the two largest sawmills located in the area i.e. Tweefontein (Hans Merensky Timbers) and York Timbers.

Forest fires are of great concern to sawmill's. The Tweefontein sawmill in Sabie was closed down due to forest fires that destroyed a large number of their plantations. With the 25 to 30 year planting cycle, Tweefontein was forced to close down due to no trees begin mature enough for processing. A large percentage of any forester's budget is devoted to weed control, using mechanical, chemical and biological control methods.

- **Wood and wood product processing analysis**

A number of options are available when moving into the secondary conversion sector. A basic input of wood and wood products or paper and paper products can have a number of outputs and end products which can be manufactured. Demacon stated that the value chain approach will add value to the product before trading and can stimulate the development of clusters (economies of scale) which will lead the local job creation.

- **Socio-Economic Impact Analysis**

The expansion of the Sabie site will have a direct and indirect social and economic impact on the community local and regional economy.

The expansion of the Sabie site will create approximately 350 new on-site job opportunities. A direct impact of the expansion of the Sabie will entail the relocation of approximately 440 households to a new residential settlement located northwest of Simile on the farm Waterval. An indirect social impact of the relocation entail the additional need for schools, clinics, libraries, etc. in close proximity to the new residential development.

Refer to Table 10, Annexure Z for a Synthesis of Economic Impact Modelling Results.

The results of the socio-economic impact analysis indicates that the proposed expanded Sabie site could, when fully operational, **increase** the current **Thaba Chweu local economic growth rate** from **4.5% to 6.6% per annum** – all other factors being equal.

Demacon concludes that the proposed Sabie site expansion could therefore contribute to local economic growth, and thereby ultimately aid in reaching **economic growth targets** as set out in the **Millennium Development Goals** and **New Growth Path**. If the proposed Sabie site expansion **were not to occur**, the **above benefits** in terms of additional business sales, GGP, employment and taxes, as well as increased economic growth would be **lost to the local and national economies**.

From the above analysis it is clear that future development should focus firstly on forestry and secondly on the value chain downstream beneficiation.

Issues & Impact Identification – Socio-Economical

Table 70: Issues and Impacts – Socio-Economical

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possibilities High 🟢 Medium 🟡 Low 🔴 Positive Impact - Not Necessary To Mitigate ☀️
42)	The proposed Sabie site expansion could contribute to local economic growth, and thereby ultimately aid in reaching economic growth targets.	+	☀️

6.3.6 Need and Desirability

Information supplied by Umsebe Development Planners

Town planning motivation for Industrial Uses

Tourism and industries in Sabie

The town of Sabie is situated on the scenic Drakensberg escarpment. Tourists are attracted to the area, not only by its natural beauty, but also by a variety of places of geological and historical interest. In addition, the area is well situated as a stopover en route to the Lowveld with its well-known Kruger National Park.

The area of Sabie also hosts many timber plantations that support vibrant woodcutting, wood-milling and related industries. As is often, if not always, the case in such areas, the tourism and timber industries must coexist.

The coexistence of these developments is further emphasized by the Thaba Chweu SDF, which confirms that the role and function of Sabie/Simile is to focus on the forestry industry and the potential for adventure tourism.

Although the sawmill and plywood plant existed long before the development of the tourism market as it exists today, tourism and timber related industries coexisted in Sabie for long period of time. This is evident if one travels westward along the D2220 old Lydenburg road where these uses are intermingled.

Tourism developments	Industrial developments
Glass bungalow & River Chalets	Green Gold Park
Jock Sabie Lodge	Miracle Timber
Valley View Guest House	Timber Sales Depot
Billy Bongo Backpackers	Nieuwco Recycling Specialist
Floreat Riverside Lodge	Sabie Sawmill and Plywood Plant
Merry Pebbles Resort	Mountain View Workshop & Auto Electrical
Lone Creek River Lodge	Depots and Warehouses

Distinct locational requirements

Extensive industrial uses have, traditionally, been established in rural residential areas due to affordability issues and the fact that, on those areas, the necessary arrangements could be made in order to ensure that the said uses will not be dependent on municipal services such as water and sewerage by making use of ground water, river water and sewage package plants.

Considering the distinct requirements which these types of activities have, in terms of manoeuvring space, storage space, log yards, depots, warehousing, have resulted in

these types of activities to develop on the outskirts of towns or cities, on small holdings or small farm portions.

Timber industries similar to York Timbers (Pty) Limited are either raw material related (closer to the raw material i.e. plantations) or closer to the end user.

The challenges associated with industries that are raw material related are the long travelling distances for employees between work and home (nearest town). Alternatively, employees settle in agri-villages close to the plant where little or no social and engineering infrastructure exists.

Agri-villages are generally not sustainable settlements, because of the lack of engineering and social infrastructure and the fact that the economic activity can cease due to unforeseen circumstances (i.e.: exploitation of raw material, change in the market etc), which leaves the residents unemployed, usually far from town.

The Sabie site is ideally located as it is central to its raw materials (plantations), on the outskirts of Sabie town with the necessary space available for these types of developments. It is close to town where the necessary social and engineering services are available to its employees.

Considering the main places of origin and destination listed below, the locality of the site just outside Sabie and the gravel road that links the site to the P33/3(R532 and R37) road to the south, it is evident that the plant does not cause traffic congestion in the CBD (along Main Street).

The percentage distribution from the following origins (raw materials):

- 25% from Lydenburg direction via Long Tom Pass
- 28% from Nelspruit direction via R37
- 31% from Graskop direction via R532
- 11% from White River direction via R537

- 5% from Hazyview direction via R536

The percentage distribution towards the following destinations (finished goods):

- 70% to Nelspruit direction via the R37
- 10% to Lydenburg direction via Long Tom Pass
- 10% to Graskop direction via R532
- 5% to White River direction via R537
- 5% to Hazyview direction via R536

Need and Economic Sustainability

- Although there was growth in all economic sectors of the Municipal Area from 2001 to 2005, growth in real economic terms is primarily concentrated in the **agriculture and forestry sector** (24.3%), the **manufacturing sector** (23.6%), the community, social and personal services sector (15.5%), the wholesale and retail trade sector (12.4%) and mining and quarrying sector (10.1%).
- Agriculture and forestry, is the largest economic sector in the municipal area. Continued growth in this sector is crucial for the economy of the area. The mist belt provides an excellent climate zone for forest plantations, which takes up 151 000 ha in extent covering 30% of the total area of Thaba Chweu and providing the area a very strong primary economic sector
- Manufacturing is the second largest economic sector in the municipal area. This economic sector is very strong in Ehlanzeni District Municipality. The large employment creating potential of these two economic sectors (agriculture and forestry sector and manufacturing) is well known.
- The two major industrial enterprises that contribute significantly to the economy of the municipality are the Xtrata Chrome Smelter based in Lydenburg/Mashisheng and York Timbers based in Sabie.

Xstrata Chrome Smelter

The Xstrata Chrome Smelter is situated north of Mashishing (Lydenburg) and produces 402 000 ton of Ferrochrome per annum. The ore is mined at the Thornecliffe Mine.

York Timbers

The sawmill is one of the biggest and the plywood plant is the biggest of its kind in South Africa. York Timbers (Pty) Limited currently employs about 780 employees.

Project Benefits

The following project benefits have been identified by York Timbers and clearly indicate the need for the proposed development:

Job creation:

The anticipated construction period over 5 years will result in continuous jobs for 200 people, bio mass collection 250 sustainable jobs, new specialised skills and value adding plant 350 sustainable jobs.

Energy shortage:

The proposed Co-generation plant will have a capacity to produce 30 MW of which York Timbers will consume 25MW and the surplus will be fed into the municipal grid to alleviate energy requirements.

Technology advances:

The proposed development will introduce advanced technologies for fuel handling, heat generation, timber drying technology and competitiveness against imports and will result in

improved forestry practices as well as supply chain optimisation. The use of these technologies will also ensure skills transfer and advance scientific knowledge.

Improved environmental practices:

As part of the company's commitment to practising sustainable forestry, conserving natural resources and continually improving its environmental management practices, the proposed development will result in reduction in emission levels, noise reduction, infrastructure improvements including civil and sewerage as well as reduced by-products generated.

Socio-economic:

The proposed development will result in major development and revitalisation of Sabie as well the social upliftment of the communities around the site. The development will have tremendous benefits for the hospitality industry and other multipliers as economic spin-offs.

Improved road network:

The proposed development will result in the improvement of the road network by upgrading the Main road (R532)/Old Lydenburg Road (D2220) intersection and upgrade identified sections of the D2220 Old Lydenburg Road.

Increased sewer capacity:

Bulk services contribution payable to the municipality will be used to increase the capacity of the sewer reticulation network and the wastewater treatment works of Sabie, if it is decided that it would be the better option to use the municipal sewer network.

Improved appearance:

The applicant will augment the appearance of the business and make it more compatible with the surrounding land uses ensuring and aesthetically pleasing development.

The applicant intends to do the following:

- Erect a screen wall on the perimeter

- Pave internal roads and parking areas
- Apply strict architectural and landscaping guidelines
- Improve the main access and formalise the ramp road

Through implementing the above, noise and dust levels will decrease and the visual impact will be minimised.

Issues and Impact Identification - Need and Desirability

Table 71: Issues and Impacts – Need and Desirability

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possibilities High 🟢 Medium 😊 Low 🟡 Positive Impact - Not Necessary To Mitigate 🌟
43)	There is a proven need and desirability for the proposed Sabie site expansion project.	+	🌟

6.3.7 Public Participation

Refer to Annexure AA

Public participation is an important aspect of the Environmental Impact Assessment process. The principles of the Environment Conservation Act, 1989 (Act No. 73 of 1989) govern many aspects of environmental impact assessments, including public participation. These include provision of sufficient and transparent information on an ongoing basis to stakeholders to allow them to comment and ensuring the participation of previously disadvantaged people, women and youth.

Effective public involvement is an essential component of many decision-making structures, and effective community involvement is the only way in which the power given to communities can be used efficiently. The Public Participation Process is designed to provide sufficient and accessible information to interested and affected parties (I&AP's) in an objective manner to assist them to:

- Raise issues of concern and suggestions for enhanced benefits;
- Verify that their issues have been captured;
- Verify that their issues have been considered by the technical investigations; and
- Comment on the findings of the Environmental Impact Assessment.

In terms of the Guideline Document for Environmental Impact Assessment (EIA) Regulations promulgated in terms of the Environment Conservation Act, 1989 (Act No.73 of 1989), stakeholders (I&APs) were notified of the Environmental Evaluation Process (EIA Phase) through:

- Site notices that were erected (at prominent points on and around the study area) on 11 February 2013 (**Annexure AA (i)**);
- On 11 February 2013 public notices were distributed to the neighbouring properties and estates/developments that may be affected by the proposed development; (**Annexure AA (ii)**)
- Notices regarding the project were further mailed, e-mailed and faxed to a list of I&AP's and the councillors in the area (**Annexure AA (iii)**);
- An advertisement was placed in *The Hazyview Herald* on 15 March 2013 (**Annexure AA (iv)**);
- Three parties registered as Interested and affected party during the Scoping Phase: Ehlanzeni District Municipality, Lone Creek River Lodge and Antoinette Fourie and one party registered during the EIA Phase (**refer to Annexure AA(v)**);

The following institutions were also identified as I&APs by the consultant and added to the Register of I&APs:

- Thaba Chweu Municipality;
- Department of Water Affairs(DWA);
- South African National Roads Agency Limited (SANRAL);
- South African Heritage Association (SAHRA);
- ESKOM; and
- Mpumalanga Department of Public Works: Roads and Transport.

The Bokamoso environmental public participation process also informed the residents of the ACME Village of the proposed relocation. The on-going public participation was conducted through a delegated representative of the community Ms. Sindy Mathebula and Andrea Prins.

Ms. Sindy Mathebula presented the proposed relocation project to the residents of the village on 7 February 2012. However as mentioned the relocation of ACME Village has been placed on hold.

- **Comments and Issues raised by I&APs include the following:**

Marissa Labuschagne, a representative from Lone Creek River Lodge raised the question of the measures York Timbers pose to resolve the existing encroachment of Lone Creek structures (cottages) on York Timbers property.

Response

LG indicated that the matter will be referred to York Timbers and that they will contact Lone Creek for a formal contact/discussion session.

The draft Scoping Report was available for review by I & APs for a period of sixty days. **Refer to Annexure AA (vi) for proof of notification of I & APs.**

No comments were received from Thaba Chweu Municipality and Department of Water Affairs (DWA).

Comments received from Thaba Chweu Municipality and Department of Water Affairs (DWA) after submission of the final Scoping Report will be addressed in the EIA Report.

Comments on the draft Scoping Report were only received from one registered party i.e. Lone Creek River Lodge (LCRL) (refer to Annexure AA (vii)).

LCRL strongly objects to the proposed expansion of the operational activities of York's Sabie Sawmill and Plywood Plant in light of the anticipated negative impacts that it may have on their Hotel business. Lone Creek River Lodge is of the opinion that mitigatory steps that may be proposed by York in its application will most likely be ineffective to prevent the further unlawful interference with their rights.

The following issues/concerns were raised by LCRL:

- The impact of industrial activities associated with the Sawmill and Plywood Plant on the tourism industry of the Sabie area.
- Noise from heavy trucks transporting timber at all hours (including nights).
- Operational noise from the plant.
- Financial loss to LCRL's hospitality business due to noise caused by operations at plant.
- Deteriorating roads in Sabie as a result of increased heavy logging trucks.
- Safety concerns to pedestrians, specifically from trucks passing schools.
- Increased noise and destruction of the environmental tranquillity and sense of place.
- Impact of expansion of the plant on guests of LCRL and LCRL hotel business as well as tourism in general.
- Environmental compliance: Possible negative impacts of and/or apparent unlawful activities at the Sawmill with respect to water pollution, water use, waste management and disposal, air pollution of hazardous chemical substances,

nuisance dust fallout, illegal land use of heavy industrial activities in an agricultural zoned area, the absence of an EIA and environmental authorisation for listed activities performed in the past of the previous upgrade of the Sawmill to increase production, etc. This resulted in a High Court Order.

LCRL requested that the negative effects of logging and timber operations on tourism be investigated in depth and that the importance of tourism in the most recent spatial planning be adequately addressed in the EIA application and balanced with the negative impacts of the timber industry.

In conclusion LCRL stated the following:

- In light of the above mentioned material procedural and substantive concerns as well as LCRL's objections that the negative impacts of the proposed expansion of the operations of the sawmill will have on the Lodge, hotel, guests and tourism in the area, LCRL object to the proposed expansion of the Swamill as it will destroy their very livelihood.
- Given the apparent lack of environmental compliance and alleged poor environmental management at the Sawmill operations, as neighbours that will be affected by the proposed expansions, it is asked how can the Sawmill be tructed with additional environmental obligations?
- It is requested that the investigations be amended so as to clearly illustrate the negative impacts that the operations of the Sawmill and plywood Plant will have on the rights and interests of LCRL as well as those of the tourist industry in general in Sabie, failing which LCRL will have no alternative than to argue that the EIA application is biased and do not represent all relevant information to the authorities as are required to do.
- In light of the above, LCRL was advised that York's application and the various environmental applications are premature because it addressed matters which are *sub judice* and form part of a pending criminal trial. **In the meantime it is requested that that Bokamoso stops the application and the environmental license applications, pending finalization of the criminal trial.**

Response

Refer to Annexure AA (viii) for response document by Bokamoso.

The Draft EIA Report will be available for review by I & APs for a period of 60 days. Comments received will be addressed in the Final EIA Report.

6.4 INSTITUTIONAL ENVIRONMENT

This section contains a documented motivation of the sustainability of the proposed development in terms of the relevant design rationale, proposed zoning and development controls and guidelines of several policy documents.

The development is in line with the planning frameworks and strategies of both the local, provincial and national authorities:

6.4.1 On an International Level

Relevant International Conventions to which South Africa is party:

- **Convention relative to the Preservation of Fauna and Flora** in their natural state, 8 November 1993 (London);
- **Convention on Biological Diversity**, 1995
(provided and added stimulus for a re-examining and harmonization of its activities relating to biodiversity conservation. This convention also allows for the in-situ and ex-situ propagation of gene material);
- **Agenda 21** adopted at the United Nations Conference on Environment and Development (UNCED) in 1992.
(An action plan and blueprint for sustainable development).

6.4.2 On a National Level

The Development Facilitation Act, 1995 (Act No 67 of 1995) (DFA)

Information supplied by Umsebe Development Planners

The application is submitted in terms of the Development Facilitation Act 1995 (Act No. 67 of 1995) and therefore it is pertinent to acknowledge the development principles laid down by this Act. In this regard the paragraphs below motivate compliance with these principles.

Principle 3(1)(a): Provision should be made for urban and rural land development plus should facilitate the development of formal and informal, existing and new settlements.

It is confirmed that the development proposal falls squarely within the ambit of this principle. The current situation requires that the municipal land use management tool, being the Sabie Town Planning Scheme, 1984, be used to facilitate development that aligns with the strategic future planning of the municipality.

Principle 3(1)(b): Illegal occupation of land should be discouraged

This principle calls on public authorities to discourage illegal invasion of land. The subject properties are situated in an area where illegal land invasion can occur. The establishment of a land development area and inclusion thereof into the Sabie Town Planning Scheme, 1984 will contribute to sensible development and prevent any illegal invasion of land in future.

Principle 3(1)(c): Efficient and integrated land development

The objective of this principle is to achieve 'integrated and efficient land use'. This principle:

- Emphasises that urban and rural planning cannot be done in isolation. Planning and implementing new developments must be done in a way that considers the influence and impact of such development on the adjacent rural, undeveloped land.
- Recognises how important it is for people to live close to job opportunities. This is particularly important for people of lower income who cannot afford high transport cost and the large amount of time taken to travel to work.
- Give emphasis to the fact that resources are limited and therefore must be optimally utilised. In other words, if money has already been spent on roads, schools, hospitals, water reservoirs and other infrastructure, new land developments should be close enough to use this existing infrastructure.
- Acknowledges the importance of sustaining a good relationship between settlements and the natural environment.

The proposed extensions will be done in such a way as to augment the appearance of the plant and to minimise the impact on its surroundings. The impact on the environment will be minimised through adhering to the findings of the Environmental Impact Assessment and accompanying specialist studies and abiding to the prescribed development conditions.

The relocation of the residents of ACME village to an area close to Simile will result in a slightly longer travelling distance between work and home. In this regard York Timbers (Pty) Limited will engage the residents on their transport needs and assist them in providing transport to/from the site.

The proposed development will ensure that existing resources are optimally utilised i.e. engineering infrastructure, roads, land and schools. It may therefore be argued that the principle of efficient and integrated land development is supported in terms of this application.

Principle 3(1)(d): Public participation

The Development Facilitation Act, 1995 underlines the importance of public participation and a transparent application process is promoted. As is required in terms of the Act, the application will be advertised and circulated in the prescribed manner and appropriate public participation will therefore be the result. It is important to note that the environmental process also included public participation. The application therefore complies with this principle.

Principle 3(1)(h): Sustainable land development

This principle promotes sustainable development, which implies that each development must be viable over the long term from a physical, social and economical perspective. It is confirmed that the development can be regarded as being sustainable from a physical, social, environmental and economical perspective as confirmed in the various specialist reports and information that accompanies the application documents.

Principle 3(1)(j): Equal attention to all land uses.

This principle states that no one land use is more important than any other, so no land use should be favoured above any others. Decisions about land uses must be based on sound planning where a number of different factors, such as population projections, economic growth strategies, the environment and other factors are taken into account.

The merits of the application under consideration are clear and have been demonstrated in this memorandum. Compliance with this principle is therefore achieved.

Principle 3(1)(l): Co-ordination of land development

This principle places the responsibility on the decision-making authorities to coordinate the interests of the various sectors in order to minimise conflict in demand on scarce resources. In this regard it is confirmed that the development addresses a need and is of

such a nature that conflicting demands on resources and infrastructure are appropriately managed.

This application is considered to be in line with the principles of the Development Facilitation Act, 1995 as it will ensure the availability of employment opportunities close to residential areas (future), optimise the use of existing resources, exploit the opportunities provided by the site's location and it will be environmentally sustainable.

The desirability of the development area is further motivated by the following:

The site's characteristics lend itself suitable for industrial purposes as:

- It constitutes a large area which is fairly flat to gentle sloping;
- The soil and subsoil conditions are suitable for industrial type buildings;
- Buildings are situated on already disturbed land, which has no agricultural value.
- Buildings are situated outside the flood plain and wetland areas.

Land earmarked for High Impact Industrial in terms of the SDF is too small to accommodate the proposed extensions.

Future prospects for the business look bright considering York's strategy to optimise the use of its raw material through value adding and beneficiation. This creates new business opportunities as a larger variety of end-products would be produced on-site.

In conclusion, it is submitted that the existing and proposed development is both needed and desirable, and the application for a land development area, therefore, be approved.

National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA) with amendments

NEMA provide for co-operative, environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state and to provide for matters connected therewith.

This Act formulates a set of general principles to serve as guidelines for land development and it is desirable that:

- The law develops a framework for integrating good environmental management into all development activities;
- The law should promote certainty with regard to decision-making by organs of state on matters affecting the environment;
- The law should establish principles guiding the exercise of functions affecting the environment;
- The law should ensure that organs of state maintain the principles guiding the exercise of functions affecting the environment;
- The law should establish procedures and institutions to facilitate and promote co-operative government and inter-governmental relations;
- The law should establish procedures and institutions to facilitate and promote public participation in environmental governance; and
- The law should be enforced by the State and that the law should facilitate the enforcement of environmental laws by civil society.

Integrated Environmental Management

Integrated Environmental Management (IEM) is a philosophy, which prescribes a code of practice for ensuring that environmental considerations are fully integrated into all stages of the development process. This philosophy aims to achieve a desirable balance

between conservation and development (Department of Environmental Affairs, 1992). The IEM guidelines intend endearing a pro-active approach to sourcing, collating and presenting information at a level that can be interpreted at all levels.

Principles Contained in NEMA and the DFA

Principles of NEMA and the DFA, which give effect to sustainable development, were followed:

- Development must be socially, environmentally and economically sustainable; and
- Promotion of integrated land development in rural and urban areas in support of each other.

Implications for the development

The proposed development is in line with the principles of NEMA and the DFA and will be economically and environmentally sustainable.

Environmental Impact Assessment Regulations in terms of Notices No. R. 544 R 545, & R 546, 2 August 2010

In April 2006 the Minister of Environmental Affairs and Tourism passed Environmental Impact Assessment Regulations¹² (the Regulations) in terms of Chapter 5 of the National Environmental Management Act, 1998¹³ (NEMA). The Regulations replaced the Environmental Impact Assessment (EIA) regulations, which were promulgated in terms of the Environment Conservation Act, 1989¹⁴ in 1997. The new regulations came into place on 3 July 2006 and, therefore, all new applications must be made in terms of the New NEMA regulations and not in terms of the New Regulations of the ECA. The Minister of

¹² Environmental Impact Regulations, 2006

¹³ Act No. 107 of 1998

¹⁴ Act No. 73 of 1989

Environmental Affairs (DEA) passed in June 2010 the **Amended Environmental Impact Assessment Regulations** in terms of Chapter 5 of the National Environmental Management Act, 1998 (NEMA). The Amended Regulations came into effect on 2 August 2010. The purpose of this process is to determine the possible negative and positive impacts of the proposed development on the surrounding environment and to provide measures for the mitigation of negative impacts and to maximise positive impacts.

Notice R. 544 R 545, & R 546 of the Amended Regulations list activities that indicate the process to be followed. The Activities listed in Notice No. Notice R. 544 & R 546 require that a Basic Assessment process be followed and the activities listed in Notice No. R 545 requires that the Scoping and EIA process be followed.

Implications for the development

In the environmental application process (to be compiled in terms of NEMA) the applicant is applying for listed activities listed in Notices R. 544, R. 545 and R. 546 and therefore a Scoping and EIA process must be followed. **Refer to Section 1.2 for a more detailed description of activities applied for.**

The National Water Act, 1998 (Act No 36 of 1998)

The purpose of this Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways that take into account, amongst other factors, the following:

- Meeting the basic human needs of present and future generations;
- Promoting equitable access to water;
- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Reducing and preventing pollution and degradation of water resources;
- Facilitating social and economic development; and

- Providing for the growing demand for water use.

In terms of the Section 21 of the National Water Act, the developer must obtain water use licenses if the following activities are taking place:

- a) Taking water from a water resource;
- b) Storing water;
- c) Impeding or diverting the flow of water in a watercourse;
- d) Engaging in a stream flow reduction activity contemplated in section 36;
- e) Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);
- f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
- g) Disposing of waste in a manner which may detrimentally impact on a water resource;
- h) Disposing in any manner of water which contains waste from or which has been heated in any industrial or power generation process;
- i) Altering the bed, banks, course or characteristics of a water course;
- j) Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
- k) Using water for recreational purposes.

The National water Act also required that (where applicable) the 1:50 and 1:100 year flood line be indicated on all the development drawings (even the drawings for the external services) that are being submitted for approval.

Implications for development

- York Timbers (Pty) Ltd has existing licenses/permits in place.
- Existing Water Use Licenses and Permits to authorise the discharge of effluent and abstraction of water from water source to be amended;
- Existing monitoring boreholes are in the process of being registered.

Thandamanzi has been appointed to compile and apply for a Water Use License (WUL) for all York water uses in terms of Section 21 of the National Water Act, Act 36 of 1998.

National Environmental Management: Air Quality Act (Act No. 39 of 2004)

This act replaced the Atmospheric Pollution Prevention Act (Act No. 45 of 1965), however Part 2 of this act is still applicable. Part 2 of the act is however still applicable and deals with the control of noxious or offensive gases. The proposed development will not release any of the listed gases into the atmosphere and this act is therefore not applicable to the proposed development.

The purpose of the Act is "To reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto."

Dust pollution could be a concern primarily during the construction phase of the proposed project. Dust control would be adequately minimised during this phase by way of water spraying and possible dust-nets.

The operations at the Sabie Site, especially the wood and coal burnt in the boilers, result in air pollution. The following are the main pollutants: particulate matter, Carbon Monoxide (CO), Nitrogen Dioxide (NO₂), Sulphur Dioxide (SO₂) and Formaldehyde.

Implications for development

York Timbers has an existing Air Emissions Registration Certificate that was issued in terms of the Atmospheric Pollution Prevention Act, 1965 (APPA) (Act No. 45 of 1965). The

Atmospheric Pollution Prevention Act was superseded by the National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) (NEMAQA) and therefore an application has been lodged and submitted to MDEDET) for the conversion of the Air Emissions Registration Certificate to an Atmospheric Emissions License/provisional Atmospheric Emissions License (AEL). *The Draft AEL was issued by the department (refer to Annexure J).*

National Environmental Management:Waste Act (Act 59, 2008)

The Waste Management Act was finally Gazetted on 10 March 2009. Its aim is to give effect to the White Paper on Integrated Pollution and Waste Management and the National Waste Management Strategy (NWMS).

Purpose:

To reform the law regulating waste management in order to protect the health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development ; to provide for institutional arrangements and planning matters ;national norms and standards for regulating the management of waste by all spheres of government; to provide for specific waste management measures; to provide for the licensing and control of waste management activities; to provide for the remediation of contaminated land; to provide for the national waste information system; to provide for compliance and enforcement; and to provide for matters connected therewith.

Objectives:

- To ensure sound environmental management of waste.
- To provide for utilisation of environmentally-sound methods that maximise the utilisation of valuable resources and encourage resource conservation and recovery;
- To reduce risk to human health and prevent the degradation of the environment through usage of mechanisms that promote the following:

- Pollution prevention and cleaner production
- Volume reduction at source
- Recycling, recovery and reuse
- Set guidelines and targets for waste avoidance and volume reduction through source reduction and waste minimisation measures, including composting, recycling, re-use, recovery, green charcoal process, and others, before collection, treatment and disposal in appropriate and environmentally sound waste management facilities in accordance with this act;
- To ensure the proper segregation, collection, transportation, storage, treatment and disposal of waste through the formulation and adoption of the best environmental practice in ecological waste management;
- To promote national research and development programs for improved waste management and resource conservation techniques, more effective institutional arrangement and indigenous and improved methods of cleaner production, waste reduction, reuse, collection, treatment, separation and recovery;
- To encourage greater private sector participation in waste management;
- To encourage cooperation and self-regulation among waste generators through the application of market-based instruments;
- To institutionalise public participation in the development and implementation of national, provincial and local integrated, comprehensive, and ecological waste management programs; and
- To strengthen the integration of ecological waste management and resource conservation and recovery topics into the academic curricula of formal and non-formal education in order to promote environmental awareness and action among the citizenry.
- To control the export, import, transit, reuse, recovery, treatment and disposal of waste to ensure that all operations relating to export, import, transit, reuse, recovery, treatment and disposal will be undertaken in an environmentally sound manner.

Implications for the Development

Both hazardous and non-hazardous wastes are generated by the Sabie Sawmill and Plywood Plant and associated activities.

An integrated environmental authorisation and waste management licence (for non-hazardous waste) in terms of NEMA and NEMWA was submitted to MDEDET. Due to MDEDET administrative constraints the applications were later split into a separate waste licence application and environmental authorisation application and resubmitted to MDEDET. A waste license application for hazardous waste was submitted to DEA.

The National Heritage Resources Act, 1999 (Act 25 of 1999) (NHRA)

The NHRA requires heritage resources impact assessments for various categories of development stipulated in section 38 of the Act. It also provides for the grading of heritage resources and the implementation of a three-tier level of responsibilities and functions for heritage resources to be undertaken by the State, Provincial authorities, depending on the grade of the heritage resource. The Act defines cultural significance, archaeological and palaeontological sites and materials (section 35), historical sites and structures (section 34), and graves and burial sites (section 36) that fall under its jurisdiction. Archaeological sites and material are generally those resources older than a hundred years, including gravestones and grave dressing. Procedures for managing graves and burial grounds are set out in section 36 of the NHRA. Graves older than 100 years are legislated as archaeological sites and must be dealt with accordingly.

Section 38 of the NHRA makes provision for application by developers for permits before any heritage resource may be damaged or destroyed.

Implications for Development

A small graveyard with at least ten graves occurs on the site. It was recommended that the development design avoid the grave site.

Accelerated and Shared Growth Initiative for South Africa (AsgiSA)

Information supplied by Umsebe Development Planners

The South African Government was mandated in 2004 to halve poverty and unemployment by 2014 and this resulted in the establishment of the Accelerated and Shared Growth Initiative for South Africa (AsgiSA).

The South African government has set out 10 economic priorities to meet the Accelerated and Shared Growth Initiative of South Africa's (Asgi-SA) target. In this context, two sectors have been identified for special priority attention:

Business process outsourcing and **tourism** have been identified as sectors that require special priority attention. A third sector is biofuels.

Further priority sectors include:

- Chemicals
- Metals beneficiation, including the capital goods sector
- Creative industries (crafts, film & TV, content and music)
- Clothing and textiles
- Durable consumer goods
- **Wood, pulp and paper** (as mentioned in provincial projects)

Implications for development

The proposed development has been identified as a priority sector in meeting the targets of the South African Government as indicated above.

National Spatial Development Perspective (2006)

Information supplied by Demacon

With reference to national policies, the Sabie site expansion is in line with the National Spatial Development Perspective (2006). The NSDP indicates that the implementation of the forestry initiatives, including further development of forests and forestry products, could have a positive impact on rural poverty and job creation, while also contributing to ecological services through carbon sequestration, nutrient cycling and improved water quality by reducing surface run off and evaporation, increasing the top-soil quality.

According to the Industrial Policy Action Plan (2010-2013) the expansion of the Sabie site is in line with its development initiatives. The development of furniture clusters as well as biomass sub-sector developments is well suited for the initiative of York Timbers to move into the secondary conversion sector which includes the economic use of saw dust from sawmill operations and off-cuts and sanding dust from shavings in the furniture manufacturing industries. The furniture centre of competence can link with the social development programmes.

6.4.3 On a Provincial Level

Information supplied by Umsebe Development Planners

Regional Industrial Development Strategy (RIDS) 2006

During 2005 the Department of Trade and Industry (DTI) announced that a new Regional Industrial Development Strategy (RIDS) for South Africa has been initiated to achieve the objectives set out in the National Spatial Development Perspective (2006) and other spatial initiatives.

The strategic objectives of the RIDS are:

- To reduce economic disparities between regions, address the needs of both the first and the second economies, and narrow the gap between them,
- Pay particular attention to the needs of those regions which are lagging behind in terms of the national norms,
- Enhance current regional strengths and lead sectors of the economy,
- Promote sustainable economic growth and employment in provinces and municipalities,
- Build regional competitive capabilities and firm-level support measures, and
- Enhance regional performance in attracting foreign direct investment.

The proposed development is in line with the strategic objectives of the RIDS as it will enhance current regional strengths and lead sectors of the economy, in particular Mpumalanga Province as well as Thaba Chweu Local Municipality. It is believed that the development will promote sustainable economic growth and employment.

Provincial Growth Development Strategy (2005)

Information supplied by Demacon

The Sabie site expansion is in line with the Provincial Growth Development Strategy (2005) of Mpumalanga which promotes the maximising of forestry potential and opportunities within the province. The proposed movement into the secondary conversion sector is also in line with the provincial vision of an increased level of beneficiation and value addition projects.

6.4.4 On a Local Level

Information supplied by Umsebe Development Planners

Ehlanzeni District Spatial Development Framework, 2007

The purpose of the aforementioned Spatial Development Framework is to guide spatial planning within the Ehlanzeni District Municipality. Accordingly, the following proposals are made for Thaba Chweu Local Municipality with specific reference to Sabie/Simile:

A hierarchy of activity nodes has been identified to accommodate regional and sub-regional growth, with:

- Lydenburg/Mashishing as a 1st order activity centre,
- Sabie/Simile and Graskop as 2nd order activity centres and
- Leroro, Matibidi, Moremela as rural activity centres

The future role and function of the main centres have been identified as follows:

Lydenburg	Sabie/Simile	Graskop
<ul style="list-style-type: none"> ▪ A strong social infrastructure ▪ Sub-regional trade for the municipality and adjoining areas ▪ Municipal administrative centre ▪ Mining products and services ▪ Specially services and products ▪ Tourism products 	<ul style="list-style-type: none"> ▪ The forestry industry ▪ Needs of the local population ▪ Accessibility of Nelspruit as regional centre ▪ Potential adventure tourism 	<ul style="list-style-type: none"> ▪ Provides a centre for adjoining communities ▪ Tourism centre

Pertinent for the intended development is that Sabie/Simile has been identified as a sub-regional growth point with a strong focus on the forestry industry. Furthermore, the needs of the local community are priority, to improve access to Nelspruit and the potential that exists for adventure tourism.

Thaba Chweu Spatial Development Framework, 2007

The purpose of the aforementioned Spatial Development Framework is to guide spatial planning within Thaba Chweu Local Municipality. The strategic objective for Sabie/Simile and development directives for the application site is indicated below:

Strategic objective for Sabie/Simile

“To maintain and enhance the role and function of Sabie as second order activity centre providing for surrounding areas and to utilize the existing and future economic thrusts provided by the mining, forestry and tourism sector to stimulate and integrate socio economic development and growth”.

Development Directives

Accordingly, the application properties are earmarked as following:

The Remaining Extent of Portion 101 of the farm Grootfontein 196 JT and the portion of the Remaining Extent of the farm Olifantsgeraamte 198 JT, located on the northern side of the D2220 road is earmarked **High Impact Industrial**.

The Land Use Directives for Planning Area H (Sabie/Simile) pertaining to Industrial are:

- The Floor Area Ratio must not exceed FAR 0.6
- Parking: 2 parking spaces per 100m²

Portion 101 of the farm Grootfontein 196 JT – the portion situated to the south of road D2220 is earmarked for **Medium Density Residential** and **Open Space**.

The Land Use Directives for for Planning Area H (Sabie/Simile) pertaining to Residential are:

- Residential densities must be in accordance with Map Density Directives

- The informal residential areas need to be formalised into sustainable residential areas providing for the full range of community facilities such as schools, clinics, open spaces etc
- Single dwellings can be used for the purposes of bed and breakfast establishments subject to the Bed and Breakfast Policy
- The protection of public open space should be made a priority.
- Non-residential facilities such as spaza shops, tuck shops, hair salons, churches, taverns should only be provided with the conditional consent of the municipality after the neighbours have been consulted.

The Land Use Directives for for Planning Area H (Sabie/Simile) pertaining to Open Space are:

- Open spaces need to be functional and should developments fronting onto parks be sensitive to the character and functioning of the park and in accordance with the open spaces guidelines. Open spaces can be used for agricultural purposes

The Remaining Extent of the farm Olifantsgeraamte 198 JT is earmarked for **Rural Hinterland/Forestry** Plantations. The SDF indicates that the rural hinterland predominantly supports agriculture and forestry and may also include industrial concentrations such as canning factories, and sawmills.

The study area is located inside the **Urban Edge**, which means the site is intended for urban development.

Pertinent for the intended development is that the northern part of the site is earmarked for industrial purposes and that the entire site is situated within the urban edge. It is recommended that the SDF be reviewed to provide for the expansion of the industrial development to the south of the D2220 road.

Thaba Chweu Local Municipality, Integrated Development Plan, 2009/2010

The following vision was created for Thaba Chweu Local Municipality (TCLM):

"The tourism home to the scenic wonders of Africa"

The vision was created by carefully combining and considering the following issues:

- The municipality is ideally located in a naturally beautiful part of the country with one of the most spectacular canyons in the world located in the area.
- The word 'home' portrays images of hospitality, warmth and friendliness.
- Tourism is the focus industry of the municipality and the municipality endeavours to attract more tourists.

In order to achieve its vision, the TCLM will have to focus on those services that must be implemented in order to attract new and returning tourists. The far-sighted effects of this vision are that its benefits will have a *natural flow-on effect to the community*. Tourists will bring income to the area, more jobs and a resultant higher overall standard of living to the community, with more money available to be spent on basic services. The community will also benefit by efforts to reduce crime, improve roads, water and sanitation and develop alternative energy sources – particularly since there is no adequate electricity supply in the area.

Mission

A mission describes the purpose of a municipality. It describes the area on which the municipality should focus in order to achieve its vision. The TCLM decided on the following mission statement:

"To provide tourism based developmental local government through the rendering of

- *World-class Quality services*
- *Socio- and economic development*

- *A safe and healthy environment*
- *Public participation*
- *Tourism enhancement"*

Implications for development

- The proposed expansion of the Sabie Plant will contribute to local economical empowerment and socio-economic development in the area.
- The advanced technology that will be implemented as part of the expansion of the Sabie Plant will contribute to a safer environment by means of a decrease in pollution by the operation of the plant.
- The proposed expansion of the Sabie Plant could have an impact on tourism in the area.

When looking at the institutional environment, it is important that legislation relevant to all environments (economical, ecological and social) be taken into consideration.

Issues & Impact Identification – Institutional

Table 72: Issues and Impacts – Institutional

	Issue/ Impact	Positive/ Negative/ Neutral ±	Mitigation Possibilities High 🟢 Medium 😊 Low 🟡 Positive Impact - Not Necessary To Mitigate ☀️
44)	The proposed development will be in line with the international, national, provincial and local legislation, planning frameworks, guidelines, policies etc.	+	☀️

7. SIGNIFICANCE ASSESSMENT

7.1 Description of Significance Assessment Methodology

The significance of Environmental Impacts was assessed in accordance with the following method:

Significance is the product of probability and severity. Probability describes the likelihood of the impact actually occurring, and is rated as follows:

- | | | |
|--|---|--|
| <input type="checkbox"/> Improbable | - | Low possibility of impact to occur either because of design or historic experience.
Rating = 2 |
| <input type="checkbox"/> Probable | - | Distinct possibility that impact will occur.
Rating = 3 |
| <input type="checkbox"/> Highly probable | - | Most likely that impact will occur.
Rating = 4 |
| <input type="checkbox"/> Definite | - | Impact will occur, in the case of adverse impacts regardless of any prevention measures.
Rating = 5 |

The **severity factor** is calculated from the factors given to “intensity” and “duration”. The Intensity and duration factors are awarded to each impact, as described below.

The **Intensity factor** is awarded to each impact according to the following method:

- Low intensity - natural and man made functions not affected Factor 1

- Medium intensity - environment affected but natural and man made functions and processes continue Factor 2

- High intensity - environment affected to the extent that natural or man made functions are altered to the extent that it will temporarily or permanently cease or become dysfunctional Factor 4

Duration is assessed and a factor awarded in accordance with the following:

- Short term <1 to 5 years - Factor 2

- Medium term - 5 to 15 years - Factor 3

- Long term - impact will only cease after the operational life of the activity, either because of natural process or by human intervention - Factor 4.

- Permanent - mitigation, either by natural process or by human intervention, will not occur in such a way or in such a time span that the impact can be considered transient - Factor 4.

The **severity rating** is obtained from calculating a severity factor, and comparing the severity factor to the rating in the table below. For example:

$$\begin{aligned} \text{The Severity Factor} &= \text{Intensity Factor X Duration Factor} \\ &= 2 \times 3 \\ &= 6 \end{aligned}$$

A **Severity Factor** of six (6) equals a Severity Rating of Medium severity (Rating 3) as per table below:

Table 73: Severity Ratings

RATING	FACTOR
Low Severity (Rating 2)	Calculated Values 2 To 4
Medium Severity (Rating 3)	Calculated Values 5 To 8
High Severity (Rating 4)	Calculated Values 9 To 12
Very High severity (Rating 5)	Calculated Values 13 To 16
Severity factors below 3 indicate no impact	

A Significance Rating is calculated by multiplying the Severity Rating with the Probability Rating.

The **Significance Rating** should influence the development project as described below:

- Low significance (calculated Significance Rating 4 to 6)
 - Positive impact and negative impacts of low significance should have no influence on the proposed development project.

- Medium significance (calculated Significance Rating >6 to 15)
 - Positive impact:
Should weigh towards a decision to continue
 - Negative impact:
Should be mitigated to a level where the impact would be of medium significance before project

can be approved.

❑ High significance (calculated Significance Rating 16 and more)

- Positive impact:
Should weigh towards a decision to continue, should be enhanced in final design.
- Negative impact:
Should weigh towards a decision to terminate proposal, or mitigation should be performed to reduce significance to at least medium significance rating.

7.2 Significance Assessment of Anticipated Impacts

Impacts indicated under each section of the environment were each assessed according to the above mentioned methodology. Listed below are the results of the Significance Assessment.

Table 74: Result of Significance Assessment of Impacts Identified to be Associated with the Proposed Sabie Site Expansion Project (After Mitigation)

Impact	Probability Rating	Severity Rating		Severity Factor	Severity Rating	Significance Rating
		Intensity	Duration			
CONSTRUCTION PHASE						
Beneficial Impacts						
11. Due to the relatively flat topography and location of the study area, the undulating landscapes of the surrounding area, surrounding pine	4	2	4	8	3	12 Medium

forests and other dense vegetation in the area, the proposed development will never be completely visible. Only sections of the facility will be visible from some of the view sheds identified (i.e. from certain viewpoints along Road R 532 and from the houses along the western periphery of the Mt Anderson suburb).						
18. The eradication of weeds and exotic invaders	5	4	3	12	4	20 High
31. Creation of temporary Job opportunities.	5	4	2	8	3	15 Medium
Adverse Impacts						
1. Risk for formation of sinkholes and dolines due to underlying dolomite.	4	4	4	16	5	20 High
2. Stability of structures if foundation requirements from geotechnical engineer and <i>precautionary measures for construction on dolomite are not followed.</i>	3	4	4	16	5	15 Medium
3. Erosion may be caused by the construction activities on site.	3	4	2	8	3	9 Medium
4. Incorrect topsoil stockpiling may cause a loss of topsoil or pollution and stockpile areas for construction materials may cause soil and visual pollution.	4	2	4	8	3	12 Medium
5. Siltation, erosion and water pollution could occur in the Sabie River and water bodies lower down the catchment area if a stormwater management plan is not implemented and due to activities associated with the plant.	4	2	4	8	3	12 Medium
9. Erosion, surface water pollution and siltation problems due to removal of vegetation coverage and increased hard surfaces.	4	2	4	8	3	12 Medium

10. Impacts on wetland/riparian zone areas due to construction activities and activities associated with the operation of the plant.	4	4	4	16	5	20 High
14. Construction during the wet season may cause erosion and delays to the construction phase.	3	2	2	4	2	6 Low
15. Construction during the dry and windy season may cause dust pollution.	3	2	2	4	2	6 Low
16, 17 Impact on sensitive wetland/riverine vegetation and aquatic ecology.	4	4	4	16	5	20 High
19. Noise of construction machinery could have a negative impact on the fauna species during the construction phase.	3	2	2	4	2	6 Low
20. During the construction phase (if not managed correctly) fauna species could be disturbed, trapped, hunted or killed.	3	4	3	12	4	12 Medium
21. Loss of habitat can lead to the decrease of fauna numbers and species.	5	4	4	16	5	25 High
22. Structures of cultural significance may be destroyed.	5	4	4	16	5	25 High
24. Impact on ACME Village	4	2	4	8	3	12 Medium
25. Impact on Lone Creek River Lodge	5	4	4	16	5	25 High
32. If not planned and managed correctly, the proposed development could have a negative impact on the "Sense of Place" of the study area and its surroundings	3	2	2	4	2	6 Low
33. If not planned and managed correctly, the proposed Sabie Site	5	2	4	8	3	15 Medium

expansion development could have a noise impact on surrounding residents/properties i.e Lone Creek River Lodge, Mount Anderson township.						
35. Temporary disruption of services due to relocation and installation of services	4	4	2	8	3	12 Medium
39. The creation of large quantities of builder's waste and waste associated with the operation of the plant to be accommodated by local legal landfill sites/alternative sites for waste.	4	4	2	8	3	12 Medium
40. Some intersection upgrades and realignment of existing roads are required i.e. D2220 & D2431 in order to accommodate the proposed expansion of the Sabie Site.	5	4	4	16	5	25 High
41. Increase in traffic, especially heavy vehicle traffic.	4	4	2	8	3	12 Medium
OPERATION PHASE						
Beneficial Impacts						
28. Economic viability	3	4	4	16	5	15 Medium
29. Generation of electricity	5	4	4	16	5	25 High
31. Creation of temporary and permanent Job opportunities.	5	4	4	16	5	25 High
36. Sufficient water supply is available.	5	4	4	16	5	25 High
38. The proposed co-generation facility will have a capacity to produce 30MW from which 25MW will be consumed by York Timbers (Pty) Limited. The balance will be fed into the existing municipal grid. Therefore the proposed expansions will not have an impact on the demand for electricity.	5	4	4	16	5	25 High

42. The proposed Sabie site expansion could contribute to local economic growth and social upliftment, and thereby ultimately aid in reaching economic growth targets.	5	4	4	16	5	25 High
43. There is a proven need and desirability for the proposed Sabie site expansion project.	5	4	4	16	5	25 High
44. The proposed development will be in line with the international, national, provincial and local legislation, planning frameworks, guidelines, policies etc.	5	4	4	16	5	25 High
45. The proposed upgrading of the plant will implement technology advantages which will result in decreased pollution and improved environmental practices.	5	4	4	16	5	25 High
Adverse Impacts						
1. Risk for formation of sinkholes and dolines due to underlying dolomite.	4	4	4	16	5	20 High
6. Risk of the lowering of groundwater	3	4	4	16	5	15 Medium
7. Possible ground water pollution.	3	4	4	16	5	15 Medium
8. Seasonal flooding could occur	3	4	4	16	5	15 Medium
10. Impacts on wetland/riparian zone	4	4	4	16	5	20 High
11. Due to the relatively flat topography and location of the study area, the undulating landscapes of the surrounding area, surrounding pine forests and other dense vegetation in the area, the proposed development will never be completely visible. Only sections of the facility will be visible from some of the view sheds identified (i.e. from certain viewpoints along Road R 532	4	2	4	8	3	12 Medium

and from the houses along the western periphery of the Mt Anderson suburb)						
12. If not planned correctly, roofs and parking areas could reflect the sun into the eyes of oncoming traffic on the D2220 and D2431	2	2	4	8	3	6 Low
13. If not planned and managed correctly the lights (interior and exterior) and the signage of the development could cause visual pollution.	2	2	4	8	3	6 Low
16. Impact on sensitive wetland/riverine vegetation	3	4	3	12	4	12 Medium
17. Impact on wetland and aquatic ecology	3	4	3	12	4	12 Medium
20. During the operational phase (if not managed correctly) fauna species could be disturbed, trapped, hunted or killed.	3	4	3	12	4	12 Medium
21. Loss of habitat.	5	4	4	16	5	25 High
23. Impact on infrastructure in the area	4	2	4	8	3	12 Medium
24. Impact on ACME Village	4	2	4	8	3	12 Medium
25. Impact on Lone Creek River Lodge	5	4	4	16	5	25 High
26. Impact on tourism in the area	4	2	4	8	3	12 Medium
27. Compatibility with surrounding land uses	4	2	4	8	3	12 Medium
30. Decommissioning of Mount Anderson Landfill Site	5	4	4	16	5	25 High
32. The proposed development could have a negative impact on the	3	2	2	4	2	6 Low

"Sense of Place" of the study area and its surroundings).						
33. The proposed Sabie Site expansion development could have a noise impact on surrounding residents/properties i.e. Lone Creek River Lodge, Mount Anderson township.	5	2	4	8	3	15 Medium
34. The proposed Sabie Site expansion development could contribute to air pollution which may affect the health and wellbeing of the nearby residents	5	2	4	8	3	15 Medium
37. Some upgrading of the existing on-site WWTW is required.	5	2	4	8	3	15 Medium
37. Increased surface water run-off to storm water management system from hard surfaces such as roofs and paved areas may impact on surface and ground water.	2	2	4	8	3	6 Low
39. The operational phase of the proposed development will create large quantities of waste generated by the plant operations both hazardous and non-hazardous waste.	4	4	2	8	3	12 Medium
41. Increase in traffic, especially heavy vehicle traffic.	5	2	4	8	3	15 Medium

7.3 Discussion of Significance Assessment

Twelve beneficial impacts associated with the proposed development are anticipated, of which nine have a high significance rating. The Environmental Management Plan (**Refer to Annexure BB**) contains measures to achieve maximum gain from the above beneficial impacts. Eleven of the anticipated beneficial impacts are Socio-economic related, and one relate to the physical environment. This indicates that the proposed Sabie Site

expansion project should contribute to an improvement in the quality of life of the people residing in the broader area and the quality of the physical environment.

Of the forty seven anticipated adverse impacts associated with the construction and occupation phases of the proposed development twelve of the anticipated impacts have a high significance rating, twenty-seven impacts have a medium significance rating and eight have a low significance rating.

Measures that are recommended in this report and the Environmental Management Plan could mitigate the medium and high-anticipated adverse impacts to an acceptable level. No "fatal flaw" adverse impacts, or adverse impacts that cannot be adequately mitigated, are anticipated to be associated with the proposed Sabie Site Expansion project.

8. CONCLUSION

The purpose of the EIA (Environmental Impact Assessment) process was to further investigate the Biophysical and Socio-economic environments by means of specialist studies to identify further issues/impacts of the proposed Sabie Site Expansion Project on these environments. Further, to provide mitigation measures for adverse impacts and to assess the significance of these impacts over the short and long term.

The results of the specialist studies that were done and the layout workshops that were held (the various specialists attended the layout workshops) made it possible to produce a final layout for the proposed Sabie Site Expansion Project that takes all the environmental issues identified into consideration.

As environmental consultants we feel satisfied that all site sensitivities were taken into consideration when the layout was finalised and it is recommended that the proposed final layout (**Included as Annexure H**) be accepted as the layout for the development.

The most significant environmental issues identified during the EIA process are the following **(refer to Figure 36 and Figure 37, Sensitivity Maps):**

Biophysical

Geology

The study area is underlain by dolomite and there is a risk for the formation of sinkholes and dolines associated with dewatering of the aquifer. However, according to the involved geotechnical engineers the formation of sinkholes and dolines in the Sabie area are expected to be small with a low to moderate potential of damage to structures.

Hydrology

The Sabie River flows along the northern boundary and a small valley bottom wetland occurs in the north-western section of the site. The site is affected by the 1: 100 year floodline of the Sabie River. The proposed expansion of the Sabie Site could lead to siltation, erosion and water pollution of the Sabie River and wetland as well as groundwater pollution. Section 21 Water Use License applications are required.

The settling pond is below the flood-line and the involved geohydrological engineer recommended that the wall of the pond needs to be raised and that the establishment of a new settling pond that will eventually replace the existing one must be considered for the expansion of the plant. However, Bokamoso does not recommend the removal of the artificial wetland and settling pond within the flood line since it will pose a significant impact on the ecosystems that has evolved around the wetland and pond in the past 52 years from the erection of the wetland and pond. The wetland and pond are of significant importance for the following: attenuation of storm- and floodwater, purification purposes and support of the faunal and floral ecosystems. The removal of either the wetland or settling pond would have a negative impact on storm water management and the ecosystem which evolve around these sources.

Ecology

The Sabie river, wetlands/buffer zones and riparian vegetation were identified as sensitive and should be excluded from the development.

Socio-Economical

Cultural

A graveyard with approximately 10 ten graves were identified on the study area. The graveyard must be excluded from the development and be conserved.

Compatibility with surrounding land uses

- Negative environmental impacts on LCRL with special reference to noise impacts from trucks and operation of plant which could result in financial losses to LCRL. Mitigation measures were supplied for the noise impact resulting from the plant and delivery trucks.
- Increase in heavy vehicle trips due to the expansion will have an effect on the capacity of the surrounding and immediate roads and the safety of surrounding residents/land owners. A Traffic Impact Assessment had been conducted and measures were supplied to reduce and alleviate the impact of increased traffic.
- The proposed expansion could have an effect on the overall safety and security of the immediate and surrounding residents/land-owners. Mitigation measures were supplied in the EMP (**refer to Annexure BB**).

Qualitative

- Visual

Adverse visual impact on the surrounding view sheds due to the proposed expansion. However, due to the relatively flat topography and location of the study area, the

undulating landscapes of the surrounding area, surrounding pine forests and other dense vegetation in the area, the proposed development will never be completely visible. Only sections of the facility will be visible from some of the view sheds identified (i.e. from certain viewpoints along Road R 532 and from the houses along the western periphery of the Mt Anderson suburb)

- Sense of Place

The proposed expansion of the Sabie Site could have a negative impact on the Sense of Place and tranquility of the area.

- Noise

Noise levels could increase due to the proposed expansion of the plant. An acoustical engineer has been appointed to conduct a noise impact assessment. Mitigation measures were supplied to reduce anticipated noise levels to acceptable standards.

- Air Pollution

The proposed expansion could generate dust and emissions that could lead to reduced/altered air quality. An Air Quality Monitoring and a Health Risk Assessment were conducted on the study area. The results of the Air Quality Monitoring indicated that emissions from all the boiler stacks result in ambient impacts that fall well below the recommendations for a healthy environment. In addition, the plume disperses away from surrounding receptors and the town of Sabie, therefore posing very little threat to the human environment. There is found to be no health risk concern associated with the measured formaldehyde levels in the area. A Draft AEL had been issued by MDEDET.

Job Creation

A large number of temporary and permanent employment opportunities will be created during the construction and operational phase of the expansion project.

Economic growth

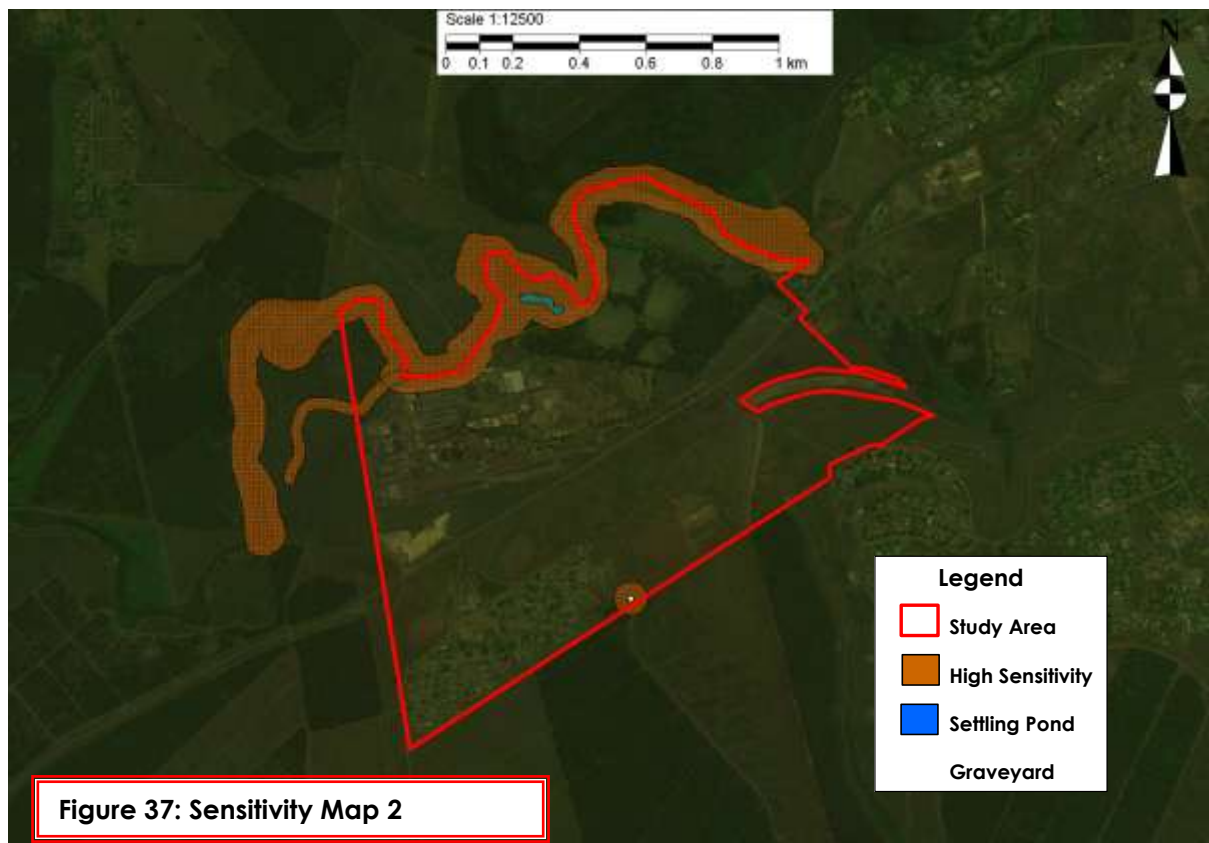
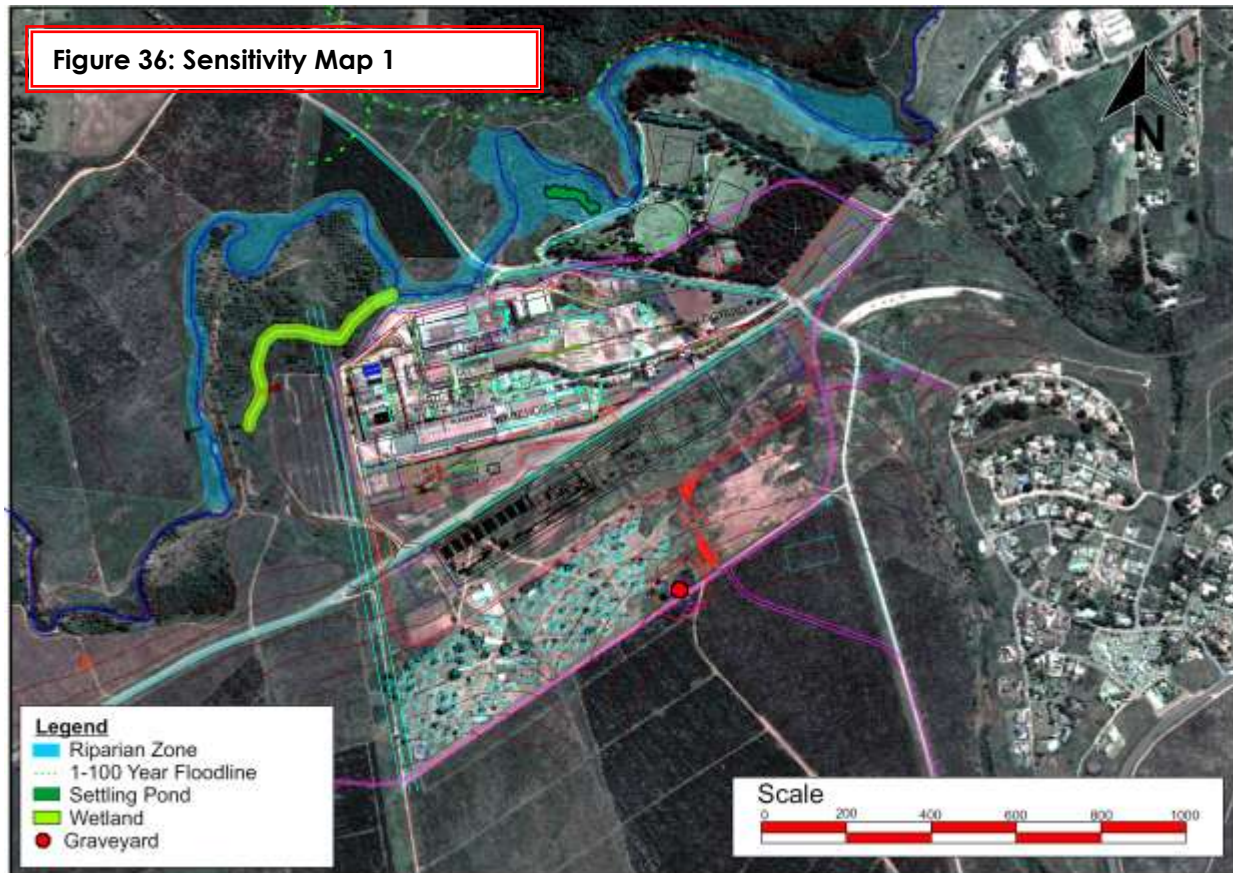
The Sabie Site Expansion project will promote sustainable economic growth and employment.

Services and Infrastructure

- The proposed expansion project will require expansion to the south, across road D2220 (Old Lydenburg Road) and to the north, across road D2431 (Bridal Veil Falls Road) and would require the realignment of these roads.
- The existing power lines will have to be re-aligned to accommodate the proposed expansion. An EIA application to be submitted to DEA.
- The existing WWTW on site needs to be upgraded in order to accommodate the proposed expansion project. A Waste License application had been submitted to DEA and a Water Use License application submitted to DWA.
- Large amounts of both hazardous and non-hazardous waste will be created by the existing and proposed expansion of the plant. Waste License applications had been submitted to MDEDET (general waste) and DEA (hazardous waste).
- The increase in heavy logging trucks due the expansion of the Sabie Plant could result in further deterioration of the roads in Sabie;

Tourism

The proposed expansion of the Sabie Site could have negative environmental impacts on the tourism industry in the area.



From the findings of this EIA Report the following can be concluded:

- The site has no physical constraints that could have detrimental effects for construction of the proposed development if the recommended precautions are taken;
- The proposed expansion of the Sabie site will be in line with the land uses that have been earmarked for this area in various planning documents listed in the institutional section of this report;
- The proposed expansion of the Sabie site will contribute to the upgrading of infrastructure and services;
- The expansion project will promote the usage of alternative energy sources and some of the electricity to be generated will be available for tapping into the Eskom grid;
- The proposed expansion of the Sabie site will increase the capacity of the plant which will contribute to the creation of a large number of jobs, upliftment of the community and local economical growth;
- The proposed expansion of the plant will implement improved environmental practices resulting in energy savings, recycling and reduction of waste.
- Realignment of roads D2220 and D2431 are required to accommodate the proposed development;
- If not well planned and managed, the proposed expansion could result in increased noise and air pollution levels as well as water pollution;
- The mitigations and adaptive monitoring, with respect to potential adverse impacts, should result in limited adverse impacts on local and regional, natural and socio-economic resources. Balanced with the overall beneficial positive economic and environmental impacts identified, the potential net adverse effects attributable to the proposed project do not constitute a threat to local and regional ecological resources and social systems;
- No "fatal flaws" or adverse impacts that cannot be mitigated are anticipated to be associated with the proposed Sabie Site Expansion project; and

- According to the specialists and engineers, there are no reasons why the proposed development cannot proceed if adhered to the proposed mitigation measures and recommendations.

9. RECOMMENDATIONS

It is believed that both the beneficial and adverse impacts were thoroughly assessed, the needs and the benefits for this project has been assessed so as to give it a go ahead subject to the following:

- The implementation of the mitigation measures contained in the Environmental Management Plan (**Annexure BB**) to achieve maximum advantage from beneficial impacts, and sufficient mitigation of adverse impacts;
- The implementation of a stormwater management plan to mitigate the impact of the development on the Sabie River and wetlands;
- The implementation of a Health Risk Management Plan;
- The implementation of a Noise Monitoring Programme;
- The Implementation of an Integrated Waste and Water Quality and Quantity Management and Monitoring Plan (IWWMMP);
- The implementation of a bio-monitoring program in order to monitor the toxicological risk of the process water system to the receiving environment. This program must also be incorporated as part of the IWWMMP;
- No new infringements into the riparian and wetland areas or its associated buffer zones may occur;
- The submission of an application for the conversion of the Air Emissions Certificate in terms of APPA to an Atmospheric Emissions License/provisional license in terms of NEMAQA;
- The submission of waste license applications for both hazardous and non-hazardous waste management activities in terms of NEMWA; and
- The submission of Section 21 WULA's for all listed activities in terms of the National Water Act.

