GEORGE
TEL: +27 (0) 44 873 4923 **FAX:** +27 (0) 44 874 5953
EMAIL: info@sescc.net **WEBSITE:** www.sescc.net
ADDRESS: 102 Merriman Street, George 6530
PO BOX: 9087, George , 6530

CAPE TOWN
TEL: +27 (0) 21 554 5195 **FAX:** +27 (0) 86 575 2869
EMAIL: betsy@sescc.net **WEBSITE:** www.sescc.net
ADDRESS: Tableview, Cape Town, 7441
PO BOX: 443, Milnerton, 7435

AQUATIC BIODIVERSITY VERIFICATION ASSESSMENT

FOR THE

PROPOSED DEVELOPMENT OF ERF 21275, MOSSEL BAY

PREPARED FOR: Mr Kaye Smith
Storage Mossel Bay Pty (Ltd)

PREPARED BY: Sharples Environmental Services cc
Email: debbie@sescc.net

DATE: 23 April 2021

AQUATIC TEAM

The authors of this report are in agreeance with the 'Declaration of Independence'.

SPECIALIST	QUALIFICATIONS	DETAILS
DR BRIAN COLLOTY (COLLABORATING SCIENTIST)	(PR SCI NAT 400268/07) ❖ B.Sc. Degree (Botany & Zoology) - NMMU ❖ B.Sc. Hon (Zoology) - NMMU ❖ M.Sc. (Botany - Rivers) - NMMU ❖ PhD (Botany – Estuaries & Mangroves) – NMMU	Ecologist & Environmental Assessment Practitioner (Pr. Sci. Nat. 400268/07). Member of the South African Wetland Society. 25 years' experience in environmental sensitivity and conservation assessment of aquatic and terrestrial systems inclusive of Index of Habitat Integrity (IHI), WET Tools, Riparian Vegetation Response Assessment Index (VEGRAI) for Reserve Determinations, estuarine and wetland delineation throughout Africa. Countries include Mozambique, Kenya, Namibia, Central African Republic, Zambia, Eritrea, Mauritius, Madagascar, Angola, Ghana, Guinea-Bissau and Sierra Leone. Professional Natural Scientist (Pr.Sci.Nat) in Ecology – The South African Council for Natural Scientific Professions (SACNASP)
DEBBIE FORDHAM AQUATIC ECOLOGIST	M.Sc - Environmental Science BA (Hons) - Environmental Science BA - Environmental Science and Geography	Debbie is a qualified aquatic ecologist and environmental scientist. Debbie holds a BA (Environmental Science and Geography), BA (Hons) and M.Sc in Environmental Science from Rhodes University. She was awarded her Master of Science degree, by thesis, in Wetland Science, entitled: The origin and evolution of the Tierkloof Wetland, a peatland dominated by *Prionium serratum* in the Western Cape. She has specialised in aquatic habitat assessment and has produced numerous aquatic habitat impact assessment reports. She is well established in her specialist field and has worked in various provinces within South Africa.

DECLARATION OF INDEPENDENCE

I, Debbie Fordham, declare that I:

- Act as an independent specialist consultant, in this application, in the field of wetland ecology;
- Do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the amended EIA Regulations, 2014 (amended);
- Have, and will have, no vested interest in the proposed activity proceeding;
- Have no, and will not engage in, conflicting interests in the undertaking of the activity;

- Undertake to disclose, to the competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the amended EIA Regulations, 2014; and
- Will provide the competent authority with access to all the information at my disposal regarding the application, whether such information is favourable to the applicant or not.

The following report has been prepared:

- As per the requirements of Section 32 (3) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) Environmental Impact Assessment Regulations 2017 as per Government Notice No. 326 Government Gazette, 7 April 2017.
- In accordance with Section 13: General Requirements for Environmental Assessment Practitioners (EAPs) and Specialists as well as per Appendix 6 of GNR 982 - Environmental Impact Assessment 2014 Regulations and the National Environmental Management Act, 1998.
- With consideration to Cape Nature's standard requirements for biodiversity assessments.
- In accordance with DEA&DP's Guideline on Involving biodiversity specialists in the EIA process.
- Independently of influence or prejudice by any parties.

INDEMNITY AND COPYRIGHT

The project deliverables, including the reported results, comments, recommendations and conclusions, are based on the author's professional knowledge as well as available information. The author reserves the right to modify aspects of the report including the recommendations if and when new information may become available from on-going research or further work in this field or pertaining to this investigation. The author has exercised reasonable skill, care and diligence in the provision of services, however, accepts no liability or consequential liability for the use of the supplied project deliverables and any information or material contained therein.

The client, including their agents, by receiving these deliverables indemnifies Sharples Environmental Services cc (including its members, employees and sub-consultants) against any actions, claims, demands, losses, liabilities, costs, damages and expenses arising directly or indirectly from or in connection with services rendered, directly or indirectly by Sharples Environmental Services cc. All intellectual property rights and copyright associated with Sharples Environmental Services cc services are reserved and project deliverables may not be modified or incorporated into subsequent reports, in any form or by any means, without the written consent of the author. This also refers to electronic copies of this report. This report should be appropriately referenced if the results, recommendations or conclusions in this report are used in subsequent documentation.

SUMMARY

The aquatic verification study was undertaken using desktop data analysis, site assessment, GIS mapping and scientific knowledge, to inform the proposed development of Erf 21275. It was determined that there are no watercourses within the proposed site or the 500m Regulated Area. The sensitive status of the site is likely a result of an aquatic feature shown within the BSP data and because there is a slight drop in elevation on the property, which can be misconstrued as a drainage area. Therefore, following an infield assessment for confirmation, it was determined that the site has a Low sensitivity and the development will not significantly impact aquatic biodiversity.

TABLE OF CONTENTS

LIST OF FIGURES

List of Tables

Report checklist

PROTOCOL FOR THE SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS FOR ENVIRONMENTAL IMPACTS ON AQUATIC BIODIVERSITY

2. SITE SENSITIVITY VERIFICATION AND MINIMUM REPORT CONTENT REQUIREMENTS	
Prior to commencing with a specialist assessment, the current use of the land and the environmental sensitivity of the site under consideration identified by the screening tool must be confirmed by undertaking a site sensitivity verification.	Refer to Section 1
2.1. The site sensitivity verification must be undertaken by an environmental assessment practitioner or a specialist.	See 'Aquatic Team'
2.2. The site sensitivity verification must be undertaken through the use of:	
(a) a desk top analysis, using satellite imagery;	Section 2 – Desktop assessment
(b) a preliminary on-site inspection; and	Section 5.2 – Site Assessment
(c) any other available and relevant information.	Section 3 – Approach and Methods
2.3. The outcome of the site sensitivity verification must be recorded in the form of a report that:	
(a) confirms or disputes the current use of the land and the environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.;	Section 5 – Site Verification
(b) contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity; and	Section 6- Compliance Statement & Figures 12-16
(c) is submitted together with the relevant assessment report prepared in accordance with the requirements of the Environmental Impact Assessment Regulations.	Section 6- Compliance Statement

1 INTRODUCTION

Sharples Environmental Services cc (SES) has been appointed by *Storage Mossel Bay Pty (Ltd),* to conduct an Aquatic Biodiversity Assessment for the proposed development of ERF 21275, Mossel Bay. The 'Very High' sensitivity status of the site indicated by the online Screening Tool required verification by the aquatic specialist.

The National Web based Environmental Screening Tool was utilized for this proposal in terms of the Environmental Impact Assessment (EIA) Regulations 2014, as amended, to screen the proposed site for any environmental sensitivity. Screening Tool identifies related exclusions and/ or specific requirements including specialist studies applicable to the proposed site and/or development, based on the national sector classification and the environmental sensitivity of the site. The Screening Tool allows for the generating of a Screening Report referred to in Regulation 16 (1) (v) of the Environmental Impact Assessment Regulations 2014, as amended whereby a Screening Report is required to accompany any application for Environmental Authorisation. Requirements for the assessment and reporting of impacts of development on aquatic biodiversity are set out in the 'Protocol for the assessment and reporting of environmental impacts on aquatic biodiversity as contained in the "*Procedures to be followed for the assessment and minimum criteria for reporting of identified environmental themes of Section 45 (a) and (h) of the National Environmental Management Act, 1998, when applying for Environmental Authorization*" (10 May 2020).

According to the Screening Report, the proposed development falls within an area of "very high" sensitivity and requires the assessment and reporting of impacts of development on Aquatic Biodiversity (Figure 1). This will need to be verified on site by the specialist by undertaking an Initial Site Sensitivity Verification. If specialist assessment differs from the designation of "Very High" aquatic biodiversity sensitivity from the national web based environmental screening tool and it is found to be of a "Low" sensitivity, then only an Aquatic Biodiversity Compliance Statement is required.

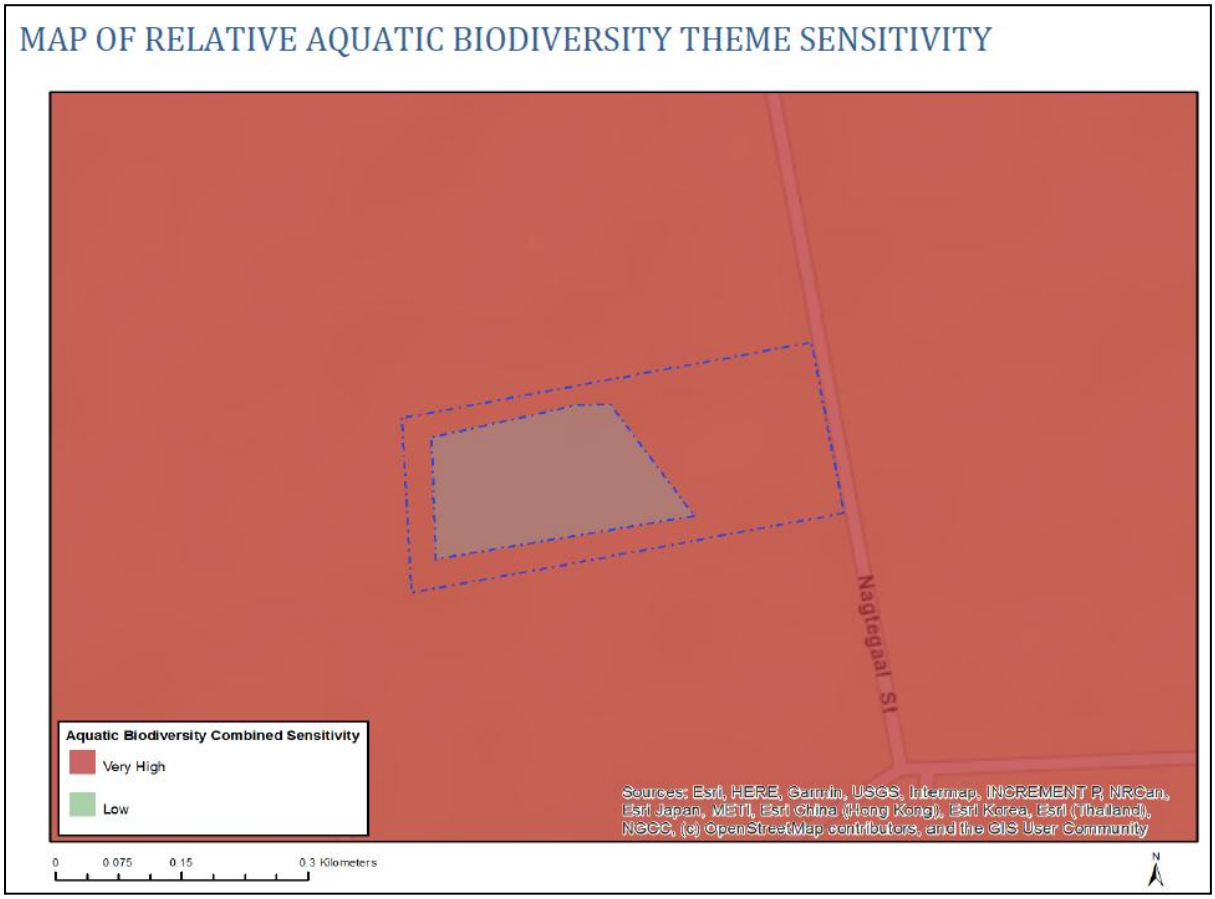

Figure 1: The aquatic biodiversity sensitivity site map generated by the Screening Tool

1.1 Location

The study area is situated in an area named Aalwyndal, inland of Mossel Bay. The site is located east of the airstrip on the coastal plateau (Figure 2).

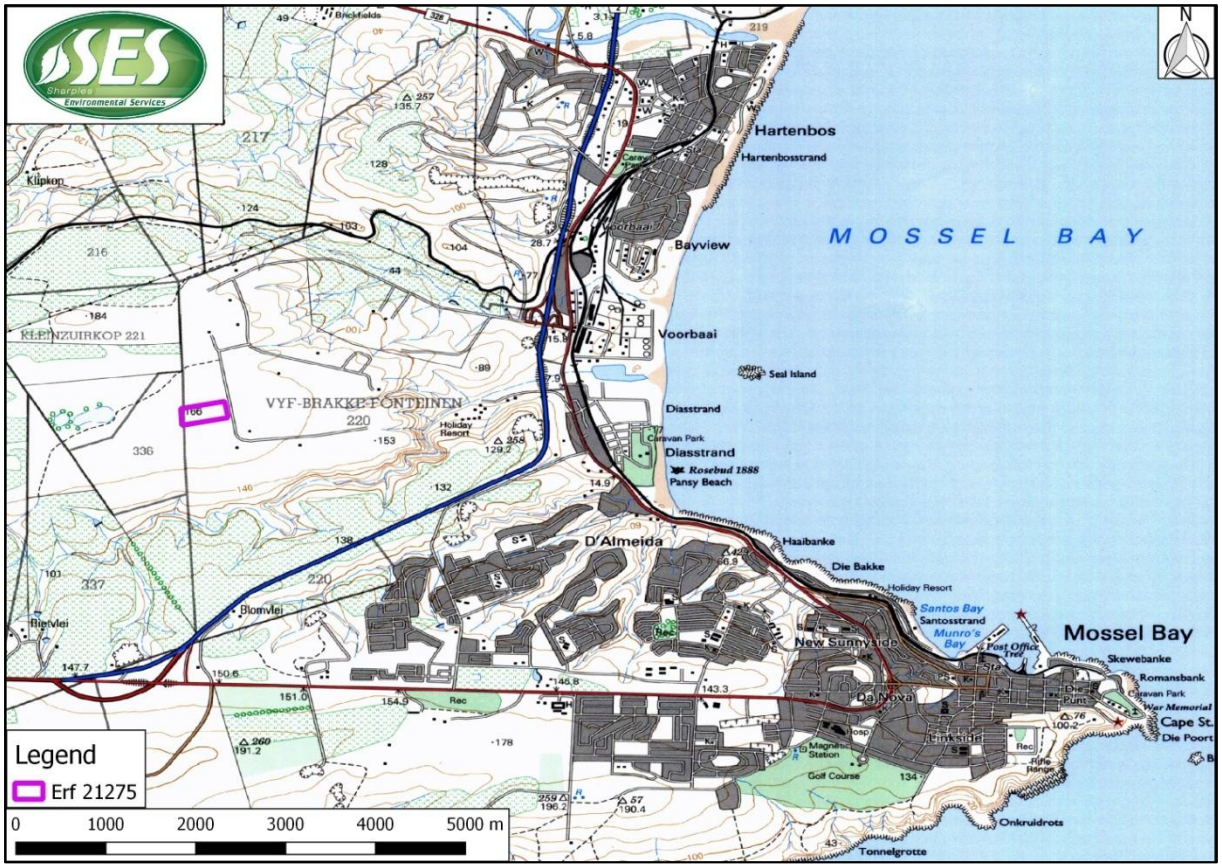

Figure 2: A cadastral map showing the location of the proposed site

1.2 Relevant Legislation

The protection of water resources is essential for sustainable development and therefore many policies and plans have been developed, and legislation promulgated, to protect these sensitive ecosystems. The proposed project must abide by the relevant legislative requirements. Table 1 below shows an outline of the environmental legislation relevant to the project.

Table 1: Relevant environmental legislation

Legislation	Relevance
South African Constitution 108 of 1996	The constitution includes the right to have the environment protected
National Environmental Management Act 107 of 1998	Outlines principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for coordinating environmental functions exercised by organs of state.
Environmental Impact Assessment (EIA) Regulations	The 2014 regulations have been promulgated in terms of Chapter 5 of NEMA and were amended on 7 April 2017 in Government Notice No. R. 326. In addition, listing notices (GN 324-327) lists activities which are subject to an environmental assessment.

The National Water Act 36 of 1998	Chapter 4 of the National Water Act addresses the use of water and stipulates the various types of licensed and unlicensed entitlements to the use of water. Also, according to the Department of Water and Sanitation (DWS), any structures within a 500-metre radius from the boundary of a wetland constitutes a Section 21(c) and (i) water use and as such requires a water use licence.
General Authorisations (GAs)	Any uses of water which do not meet the requirements of Schedule 1 or the GAs, require a license which should be obtained from the Department of Water and Sanitation (DWS). Government Notice R509 of 2016 was issued as a revision of the General Authorisations (No. 1191 of 1999) for section 21 (c) and (i) water uses (impeding or diverting flow or changing the bed, banks or characteristics of a watercourse) as defined under the NWA. Determining if a water use licence is required is associated with the risk of impacting on that watercourse. A low risk of impact could be authorised in terms of a General Authorisations (GA).
National Environmental Management: Biodiversity Act No. 10 of 2004	This is to provide for the management and conservation of South Africa's biodiversity through the protection of species and ecosystems; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; and the establishment of a South African National Biodiversity Institute.
Conservation of Agricultural Resources Act 43 of 1967	To provide for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.

1.3 Scope of Work

1.3.1 Initial Site Sensitivity Verification

The Initial Site Sensitivity Verification was undertaken through the use of:

(a) a desk top analysis, using historical photographs and satellite imagery; and

(b) an on-site inspection to identify if there are any discrepancies with the current use of land and environmental status quo versus the environmental sensitivity as identified on the

national web based environmental verification tool (Very high), such as new developments, infrastructure, indigenous/pristine vegetation, etc.

The outcome of the Initial Site Sensitivity Verification has been recorded in the form of a report that-

(a) confirms or disputes the current use of the land and environmental sensitivity as identified by the national web based environmental verification tool;

(b) contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity.

1.3.2 Aquatic Biodiversity Compliance Statement

The Aquatic Biodiversity Compliance Statement was prepared by a suitably qualified specialist in the field of aquatic sciences in order to verify:

a. That the site is of low sensitivity for aquatic biodiversity; and
b. Whether or not the proposed development will have an impact on the aquatic features.

The Aquatic Biodiversity Compliance Statement contains, as a minimum, the following information:

a. Contact details and curriculum vitae of the specialist;
b. A signed statement of independence by the specialist;
c. Baseline profile description of biodiversity and ecosystems, including the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;
d. Methodology used to verify the sensitivities of the aquatic biodiversity features on the national web based environmental verification tool;
e. Methodology used to undertake the Initial Site Sensitivity Verification and preparation of the Compliance Statement, including equipment and modelling used, where relevant;
f. Where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr;
g. A description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations; and any conditions to which the statement is subjected.

The above is in terms of the latest NEMA Minimum Requirements and Protocol for Specialist Aquatic Biodiversity Impact Assessment as contained in the "*Procedures to be followed for the assessment and minimum criteria for reporting of identified environmental themes of Section 45 (a) and (h) of the National Environmental Management Act, 1998, when applying for Environmental Authorization*" (10 May 2020).

2 DESKTOP ASSESSMENT

Mapping the locality of aquatic habitat is essential for classification into the different wetland and river ecosystem types across the country, which in turn can be used with other data to identify aquatic systems of conservation significance. The verification study was informed by the available datasets relevant to water resources, as well as historic and the latest aerial imagery, to develop an understanding of the fluvial processes of the study area. A significant amount of the latest spatial data has been provided through the products of the 2018 National Biodiversity Assessment (NBA). The NBA is the primary tool for monitoring and reporting on the state of biodiversity in South Africa. It is used to inform policies, strategies and actions in a range of sectors for managing and conserving biodiversity more effectively. The desktop assessment findings were used to identify areas important for site investigation which require a more detailed level of infield verification study.

2.1 Biophysical characteristics

The study area is located within the K10A quaternary catchment of the Southern Coastal Belt Ecoregion (Figure 3). It lies upon the relatively flat coastal plateau. The mean annual runoff rate is 56.31 mm/annum. The study area has a mean annual precipitation rate of 475 mm, which is less than half of the mean annual evaporation rate of 965.20 mm. There are no Strategic Water Source Areas mapped near the site.

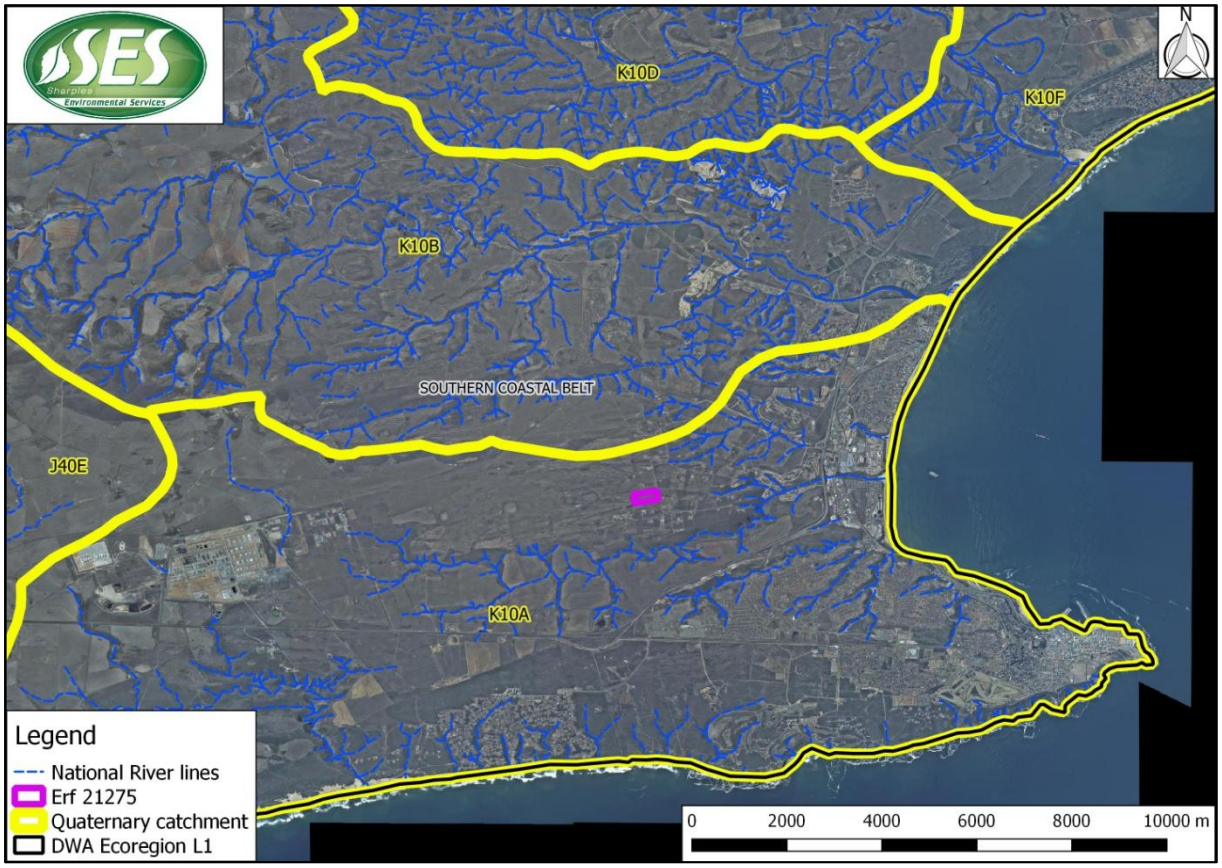

Figure 3: The proposed site in relation to the drainage network

According to a 2019 botanical assessment conducted for the Aalwyndal area by Mr Nick Helme, the SA Vegetation map is very inaccurate in this particular area. The national vegetation map indicates that the vegetation type on site is North Langeberg Sandstone Fynbos (Figure 4), however; it is characteristic of Mossel Bay Shale Renosterveld. Mossel Bay Shale Renosterveld is listed as Endangered in terms of the national list of Threatened Terrestrial Ecosystems (DEA 2011), as only 49% of its original extent remains and the unit has a national conservation target of 36% of its original extent, with nothing (0%) formally protected (Rouget *et al* 2004). The vegetation type is thus very poorly conserved and is often vulnerable to further loss, usually to agriculture, quarrying, and urban development. Typical species include *Protea lanceolata, Protea repens, Leucadendron salignum, Bobartia robusta, Erica peltata, Erica discolor, Prismatocarpus candolleanus, Hermannia saccifera, Restio helenae, R. capensis and Tritoniopsis antholyza*. Mossel Bay Shale Renosterveld is known to support a number of rare and threatened *Haworthia* species (*e.g. H parksiana*; Bayer 1999; Mucina & Rutherford 2006), and these small, highly cryptic succulent plants could well be present on some of the undisturbed parts of the site. The small patches of thicket on site include large woody shrubs such as *Searsia, Euclea* and *Diospyros.* However, *Acacia cyclops* (Rooikrans) has encroached into disturbed areas (Figure 5). The soil disturbance from the historically ploughed land is also indicated by areas consisting of *Hermannia saccifera, Hyparrhenia hirta* (thatching grass) and *Selago glutinosa*.

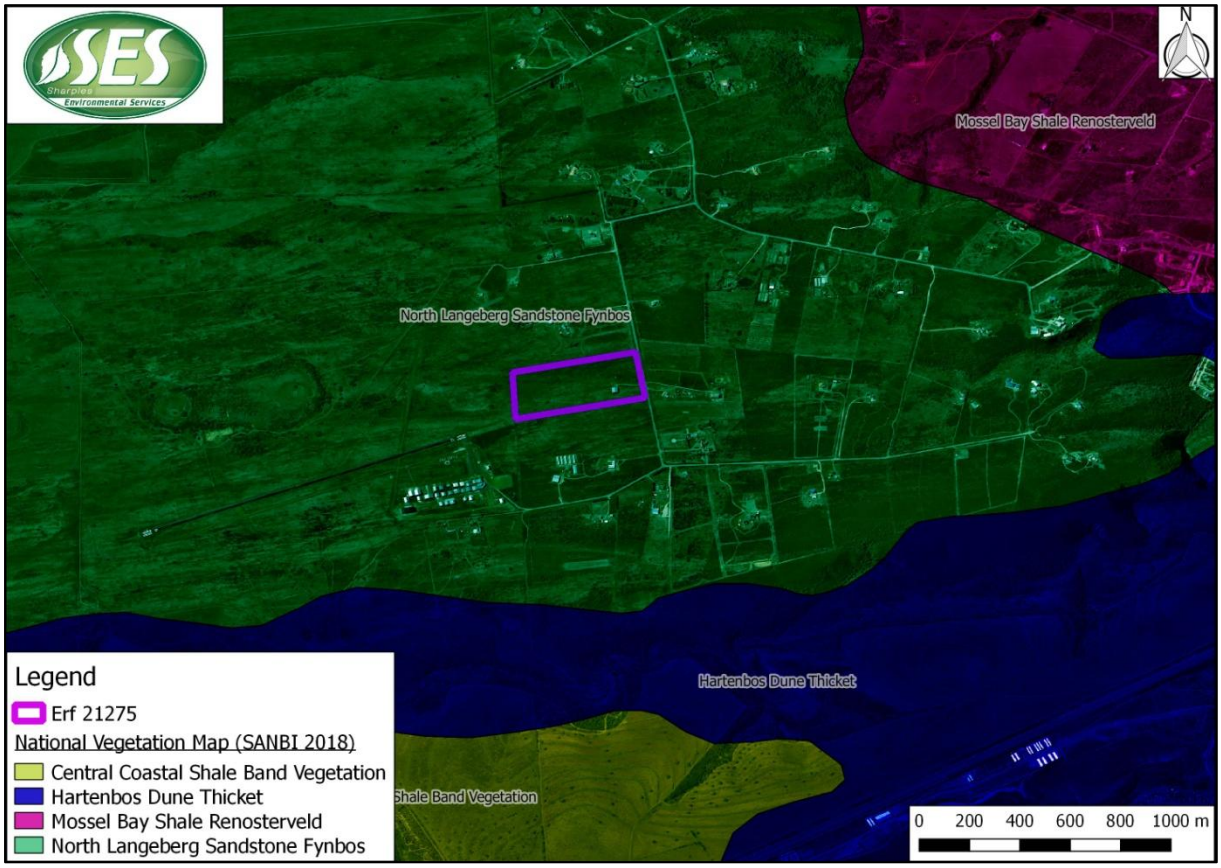

Figure 4: The proposed site in relation to the national vegetation map (SANBI 2018)

Figure 5: Photograph of <u>Acacia cyclops</u> (Rooikrans) which has established in patches on site

The Nardouw Subgroup of the Cape Fold Mountain Group is mapped as the lithology of the area the stony site is located upon (Figure 6). The soils have large quantities of quartzite, manganese and sandstone pebbles in a shale matrix, and the former were probably laid down by extensive river deposition.

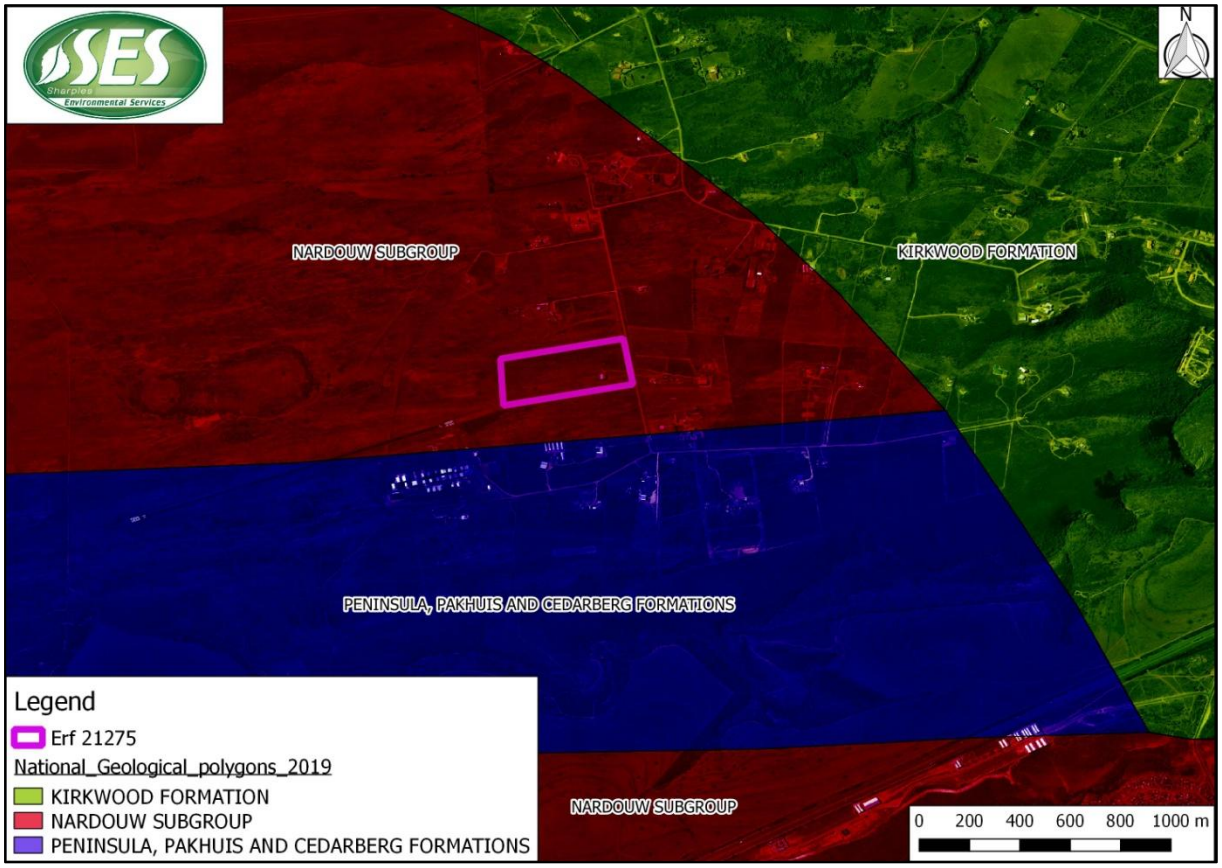

Figure 6:The proposed site in relation to the South African Geological Map (CGS 2019)

2.2 South African Inventory of Inland Aquatic Ecosystems

The National Freshwater Ecosystem Priority Areas (NFEPA 2011) data provides strategic spatial priorities for conserving South Africa's aquatic ecosystems and supporting sustainable use of water resources. FEPAs were identified based on a range of criteria dealing with the maintenance of key ecological processes and the conservation of ecosystem types and species associated with rivers, wetlands and estuaries (Driver *et al.* 2011). The NFEPA project identified wetlands within the area, however, none are classified as FEPA wetlands. The river indicated by the NFEPA project within the study area is classified as a FEPA. In 2018 the national wetland and river dataset, including the 2011 NFEPA data, was updated as part of the National Biodiversity Assessment (SANBI 2018). A South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was established and offers a collection of data layers pertaining to ecosystem types and pressures for both rivers and inland wetlands. National Wetland Map 5 includes inland wetlands and estuaries, associated with river line data and many other data sets within the South African Inventory of Inland Aquatic Ecosystems (SAIIAE) 2018.

The South African National Wetlands Map (NWM) provides information on the location, spatial extent, and ecosystem types of estuarine and inland aquatic ecosystems (Van Deventer *et al.*, 2018).

According to the data provided by the South African Inventory of Inland Aquatic Ecosystems (SAIIAE 2018) there is no aquatic habitat within or bordering the proposed development site. The NWM identifies a depression wetland situated more than 500m to the west, but no other drainage features on the plateau near the site (Figure 7).

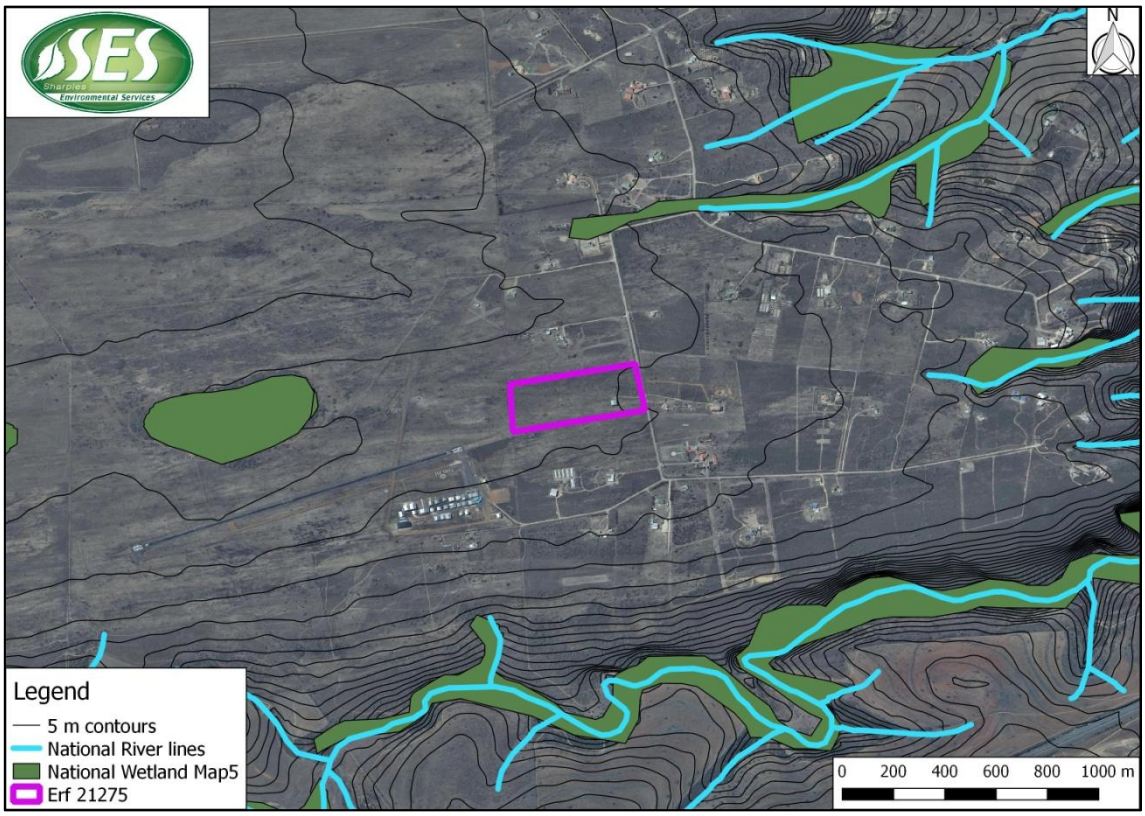

Figure 7: The wetland data of the South African Inventory of Inland Aquatic Ecosystems (CSIR 2018)

2.3 Western Cape Biodiversity Spatial Plan

The Western Cape Biodiversity Spatial Plan (WCBSP) is recognised by both the Department of Environmental Affairs and South African National Biodiversity Institute. The primary purpose of a map of Critical Biodiversity Areas and Ecological Support Areas is to guide decision-making about where best to locate development. Critical Biodiversity Areas (CBA's) are required to meet biodiversity targets. These areas have high biodiversity and ecological value and therefore must be kept in a natural state without further loss of habitat or species. Low-impact, biodiversity sensitive land uses are the only land uses allowed in CBA's. Critically Endangered (CR) ecosystems, critical corridors for maintaining landscape connectivity and areas required to meet biodiversity pattern targets, are included in CBA's. The WCBSP made a distinction between areas likely to be in a natural condition (CBA1) and areas that could be degraded (CBA2). Ecological Support Areas (ESA's) are not

essential for meeting biodiversity targets but are important as they support the functioning of CBA's and Protected Areas (PA's). ESA's support landscape connectivity, surrounds ecological infrastructure that provide ecosystem services, and strengthen resilience to climate change. These areas include Endangered vegetation; water source and recharge areas; and riparian habitat around rivers and wetlands. The WCBSP also made a distinction between ESA's in a functional condition (ESA1) and degraded areas in need of restoration (ESA2).

There are no CBAs mapped within the study site. The BSP data categorises the habitat on the western portion of the site as ESA1 aquatic (Figure 8). According to Helme (2019), this mapping is regarded as very inaccurate as, amongst other data, it is based on the SA vegetation map for this area, which classifies the site as North Langeberg Sandstone Fynbos (which it is not). The vegetation type is not listed as a threatened vegetation type and hence the lack of CBAs within this unit on site.

The identification of ESA1 Aquatic on the site by the BSP was investigated further during infield verification assessment.

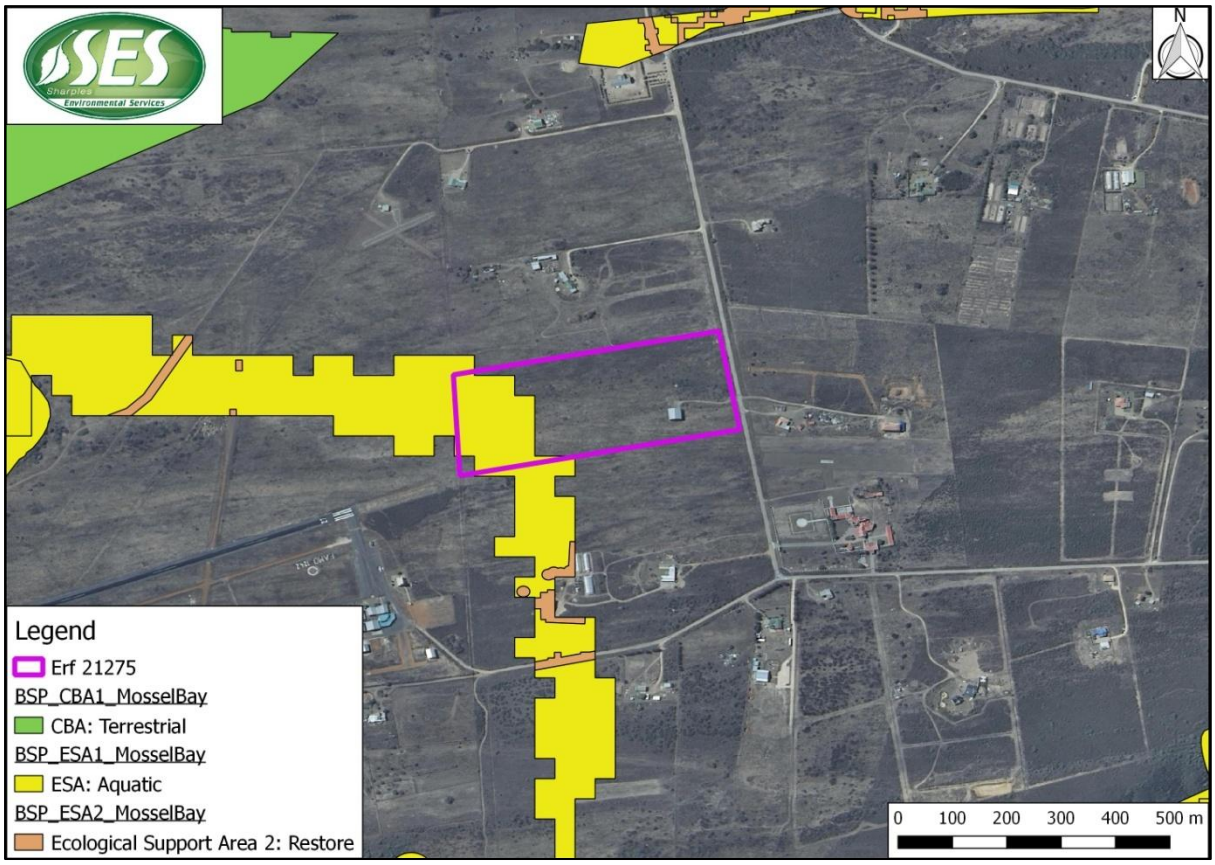

Figure 8: The study site in relation to features identified by the WCBSP (Pence, 2017).

2.4 Historic impacts

Historical aerial photography and Google satellite imagery was analysed to identify potential aquatic features within the landscape and develop an understanding of the change in land uses within the study area over time. This is important in any wetland assessment as wetland health is defined as a measure of the deviation of wetland structure and function from the wetland's natural reference condition (Macfarlane *et al*. 2009). Catchment and site-specific impacts are important for determining a baseline of the current status quo.

Figure 9 is a historic aerial photograph of the study site from 1991. The photograph shows that the area was undeveloped and the airport had not yet been established. It is seemingly between this date and 2005 within which land use changed and the area was largely developed. The land was subdivided into small-holdings and zoned residential. Presently the main land use in the area is small-scale/subsistence agriculture (such as grazing pastures for sheep, goats and horses) but this is changing rapidly to urban development.

The site itself remains untransformed and is largely covered by indigenous vegetation. It is currently used for horse grazing pasture, as well as a large storage shed and small scale tillage for cultivation (Figure 10). Historic Google satellite imagery indicates that the majority of the property was ploughed in 2017. It has not since been actively tilled and has consequently Fynbos vegetation has re-established (within indigenous grass cover consisting mostly of Eragrostis sp.). Rooikrans has however encroached onto the property and established dense tree pockets on the previously ripped areas. Woody alien invasive vegetation increases the fuel load, and can burn substantially hotter than indigenous vegetation, leading to biodiversity loss, soil damage and resultant erosion, and potentially uncontrollable veld fires that threaten private property. From an ecological point of view, further loss of natural vegetation in the Aalwyndal area should be avoided as best possible.

Figure 9: Aerial photography from 1991 of the study area, showing the undisturbed site and agricultural activities surrounding the site. The approximate location of the site is indicated by the red circle.

Figure 10: Photograph of the site showing the grazed and trampled vegetation

3 APPROACH AND METHODS

3.1 Desktop Assessment Methods

- The contextualization of the study area was undertaken in terms of important biophysical characteristics and the latest available aquatic conservation planning information in a Geographical Information System (GIS). It is imperative to develop an understanding of the regional drainage setting and longitudinal dynamics of the watercourses. The conservation planning information aids in the determination of importance and sensitivity, management objectives, and the significance of potential impacts.
- Following this, desktop delineation and illustration of all potential watercourses within the study area was undertaken utilising available site-specific data such as aerial photography, contour data and water resource data. Digitization and mapping were undertaken using QGIS 2.18 GIS software (Table 3).
- These results, as well as professional experience, allowed for the identification of specific areas that could potentially be impacted by the activities and therefore required groundtruthing and detailed assessment. The following data sources listed within Table 2 assisted with the assessment.

Table 2: Utilised data and associated source relevant to the proposed project

Data	Source
Google Earth Pro™ Imagery	Google Earth Pro™
DWS Eco-regions (GIS data)	DWS (2005)
South African Vegetation Map (GIS Coverage)	Mucina & Rutherford (2006-2018)
National Biodiversity Assessment Threatened Ecosystems (GIS Coverage)	SANBI (2018)
Geology	Council for Geoscience (2019)
Contours (elevation) - 5m intervals	Surveyor General
NFEPA river and wetland inventories (GIS Coverage)	CSIR (2011)
NEFPA river, wetland and estuarine FEPAs (GIS Coverage)	CSIR (2011)
Western Cape Biodiversity Framework 2017: Critical Biodiversity Areas of the Western Cape.	Pence (2017)
National Wetland Map 5	Van Deventer, et al. (2018)

3.2 Site Assessment Methods

- Infield site assessment was conducted on the 21st of April 2021 to identify if there are any discrepancies with the current use of land and environmental status quo versus the environmental sensitivity as identified on the national web based environmental verification

tool (Very high), such as new developments, infrastructure, indigenous/pristine vegetation, etc.

- The identified aquatic ecosystems were classified in accordance with the, '*National Wetland Classification System for Wetlands and other Aquatic Ecosystems in South Africa'* (Ollis *et al*. 2013) and *WET-Ecoservices* (Kotze *et al*. 2009).
- Infield delineation was undertaken with a hand-held GPS (Figure 11), for mapping of any potentially affected aquatic ecosystems, in alignment with standard field-based procedures in terms of the Department of Water and Sanitation (DWAF 2008) *Updated Manual for the Identification and Delineation of Wetlands and Riparian Areas,* and a Dutch soil auger. The delineation is based upon observations of the landscape setting, topography, vegetation and soil characteristics (using a hand-held soil auger for wetland soils).

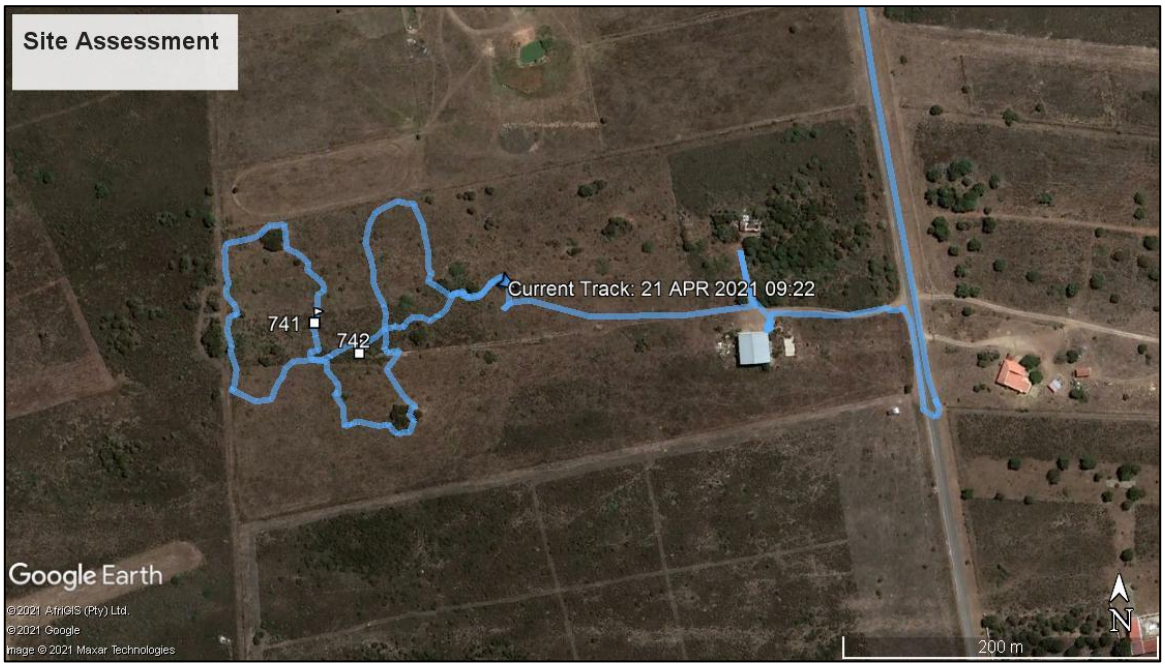

Figure 11: Map showing some of the Garmin GPS tracks and waypoints recorded during the site assessment

- Identify legislation and permit requirements that are relevant to the development proposal from an aquatic perspective.
- Present recommendations of any monitoring requirements for inclusion in the EMPr of the site based on sensitivity analysis.

4 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations are relevant:

- Aquatic ecosystems vary both temporally and spatially. Once-off surveys such as this are therefore likely to miss certain ecological information due to seasonality, thus limiting

accuracy and confidence. That said, the entire property was groundtruthed on foot, following a rainfall event, and the level of confidence in the findings is high.

- Infield soil and vegetation sampling was only undertaken within a specific focal area around the proposed site, while the remaining aquatic features were delineated at a desktop level.
- No detailed assessment of aquatic fauna/biota was undertaken as no aquatic habitat was identified.
- The vegetation information provided is based on observation not formal vegetation plots. As such species documented in this report should be considered as a list of dominant and/or indicator species and only provide a very general indication of the composition of the vegetation communities. Refer to the botanical report for detailed information.

5 SITE SENSITIVITY VERIFICATION

Following desktop and field analysis of the site, the subsequent results were obtained.

5.1 Desktop analysis

Historical photographs and satellite imagery show no discernible aquatic features within the site. The imagery did show that majority of the property has been ploughed in the past but that Fynbos vegetation has since re-established.

The contour data indicated that the topography or the study area is relatively flat, with no landscape features typically conducive to the formation of wetland habitat.

The National Wetland Map 5 does not identify any wetland habitat within the site. There is a depression wetland mapped to the west of the site but more than 500m away.

The geology and vegetation data does not indicate any features to suggest aquatic habitat in the study area. There are no strategic water source areas present.

The majority of desktop data does not suggest the presence of aquatic habitat in the study area. However, the BSP classifies the western portion of the site as ESA1 Aquatic. The map shows a watercourse which begins in the study area on the plateau and flows in a southerly direction to join the drainage network. Therefore, this area was assessed further on site to verify the presence of the identified aquatic feature.

5.2 Site assessment

The on-site inspection (conducted on the 21st of April 2021) determined that there is a discrepancy between the environmental status quo versus the environmental sensitivity as identified on the national web based environmental screening tool (Very high). No aquatic habitat was identified within the site or within the 500m Regulated Area of the site. The reason for the discrepancy is likely due to the ESA1 Aquatic classification of a portion of the site. Also, while not noticeable during desktop assessment using 5m contour line data, the onsite topography has a shallow dip in elevation which could be misinterpreted as a drainage area.

The entire area was assessed on site in fine detail but no indicators of aquatic habitat were observed. Investigations were especially focused upon the lower lying area and the small area that was not ploughed in 2017. However, the soils and plant species are relatively uniform throughout the site (Figure 12).

Figure 12: Photograph of the site looking east, showing the Fynbos vegetation which has recovered from the ploughing, interspersed with pockets of invasive Rooikrans trees.

The quartzitic stony substrate (Figure 13) shows no evidence of seasonal or permanent soil wetness

(determined through soil sampling with a soil auger and the examining the degree of mottling). There was no wetland plant species observed within the area. Therefore, the lack of any indicators precludes the classification of any areas within the site as wetland habitat.

Figure 13: Photograph of the soils which have large quantities of quartzite, manganese and sandstone pebbles in a shale matrix, and the former were probably laid down by extensive river deposition, but are not the characteristic hydric soils of wetland habitat.

The fynbos vegetation of the site has been altered by past soil disturbances and is currently grazed and trampled by horses. The soil disturbance from the historically ploughed land is indicated by areas consisting of *Hermannia saccifera, Hyparrhenia hirta* (thatching grass) and *Selago glutinosa (*Figure 14). *Acacia cyclops* (Rooikrans) has also encroached into disturbed areas and established in scattered pockets. However, the relatively undisturbed areas contain plants species typical of Mossel Bay Shale Renosterveld such as Leucadendron sp*., Erica peltata, Erica discolor, Prismatocarpus candolleanus, Hermannia saccifera* and *Tritoniopsis antholyza*. The small patches of thicket on site include large woody shrubs such as *Searsia, Euclea, Diospyros* and contain *Aloe ferox.* Figure 15 shows the Erica vegetation within the area not ploughed in 2017. Mossel Bay Shale Renosterveld is known to support a number of rare and threatened *Haworthia* species and these small, highly cryptic succulent plants could well be present on some of the undisturbed parts of the site.

Figure 14: Photograph of the Hyparrhenia hirta (thatching grass) and Hermannia saccifera within the disturbed areas of the site

Figure 15: Photograph of the Erica sp on undisturbed portion of the site

The fire break on the western fence line of the property has been cleared of vegetation and the open area clearly showed soil and topographic characteristics which confirmed that there is no east-west drainage line (Figure 16).

Figure 16: Photograph of the fire break clearly showing that there are no characteristic wetland or river indictors present

6 COMPLIANCE STATEMENT

The findings of the site verification assessment indicate a site of very 'Low' sensitivity which differs from the 'Very High' Screening Tool status. Based on the motivation and evidence presented above, this study disputes the environmental sensitivity as identified by the national web based environmental screening tool. The assessment has determined that the development of the property will not impact upon any aquatic habitat.

7 CONCLUSION

Sharples Environmental Services cc were appointed by Storage Mossel Bay to conduct an independent specialist aquatic verification assessment for the development of Erf 21275. All watercourses within the area of the proposed site were identified, delineated, investigated infield, and screened in accordance to their risk of being impacted upon. During desktop and in-field assessment, no aquatic habitat was identified within the boundaries of the proposed site. There is no aquatic habitat present within 500m of the site. It was determined that the site has a very Low aquatic sensitivity status and the proposed development will not impact aquatic biodiversity.

8 REFERENCES

BROMILOW, C. 2001. Problem Plants of South Africa: a Guide to the Identification and Control of more than 300 invasive plants and other weeds. Briza Publications, Pretoria.

CSIR (Council for Scientific and Industrial Research). 2010. National Aquatic Ecosystem Priority Areas (NFEPA). Council for Scientific and Industrial Research, Pretoria, South Africa.

DEPARTMENT OF ENVIRONMENTAL AFFAIRS, DEPARTMENT OF MINERAL RESOURCES, CHAMBER OF MINES, SOUTH AFRICAN MINING AND BIODIVERSITY FORUM, AND SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE. 2013. Mining and Biodiversity Guideline: Mainstreaming biodiversity into the mining sector. Pretoria.

DEPARTMENT OF WATER AFFAIRS AND FORESTRY, 1999a. Resource Directed Measures for Protection of Water Resources. Volume 4. Wetland Ecosystems Version 1.0, Pretoria.

DEPARTMENT OF WATER AFFAIRS AND FORESTRY, 2005. A Practical Field Procedure for Identification and Delineation of Wetland and Riparian areas. Edition 1, September 2005. DWAF, Pretoria.

DEPARTMENT OF WATER AFFAIRS AND FORESTRY, 2007. Internal Guideline: Generic Water Use Authorisation Application Process

DEPARTMENT OF WATER AFFAIRS AND FORESTRY. 2009. DWAF Training Manual: National Water Act Section 21(c) and (i) Water Uses. Version: November 2009.

DRIVER, A., NEL, J.L., SNADDON, K., MURRAY, K., ROUX, D.J., HILL, L., SWARTZ, E.R., MANUEL, J. AND FUNKE, N. 2011. *Implementation Manual for Aquatic Ecosystem Priority Areas. Report to the Water Research Commission*. Pretoria

DWAF. 2008. Updated Manual for the Identification and Delineation of Wetlands and Riparian Areas, prepared by M. Rountree, A. L. Batchelor, J. MacKenzie and D. Hoare. Stream Flow Reduction Activities, Department of Water Affairs and Forestry, Pretoria, South Africa

KLEYNHANS, C.J., 1996. Index of Habitat Integrity (IHI).

KOTZE, D.C., MARNEWECK, G.C., BATCHELOR, A.L., LINDLEY, D.S. AND COLLINS, N.B. 2009. WET-Ecoservices: A technique for rapidly assessing ecosystem services supplied by wetlands.

NAIMAN, R.J., AND H. DECAMPS. 1997. The ecology of interfaces -- riparian zones. Annual Review of Ecology and Systematics 28:621-658

MACFARLANE, D.M. and Bredin, I.P. 2016. Buffer zone guidelines for rivers, wetlands and estuaries. Part 2: Practical Guide. WRC Report No (tbc), Water Research Commission, Pretoria.

MACFARLANE, D.M., KOTZE, D.C., ELLERY, W.N., WALTERS, D., KOOPMAN, V., GOODMAN, P. & GOGE, C. 2008. WET-Health: A technique for rapidly assessing wetland health, Version 2.

MUCINA, L. AND RUTHERFORD, M. C. (EDS) 2006. The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

ROGERS KH. 1995. Riparian Wetlands. In: Wetlands of South Africa, Cowan GI (ed). Department of Environmental Affairs and Tourism: Pretoria.

VAN GINKEL, C.E., GLEN, R.P., GORDAN-GRAY, K.D., CILLIERS, C.J., MUASYA AND VAN DEVENTER, P.P., 2011. Easy identification of some South African Wetland Plants (Grasses, Resticios, Sedges, Rushes, Bulrushes, Eriocaulons and Yellow-eyed grasses). WRC Report No. TT 459/10.