

AQUATIC SPECIALIST ASSESSMENT REPORT FOR THE PROPOSED DEVELOPMENT ON ERF 8741, WELLS ESTATE, GQEBERHA

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1. SPECIALIST DETAILS AND EXPERTISE

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Contact details:	53 Dummer St, Somerset West, 7130; Phone: 082 883 8055; Email: toni@bluescience.co.za
Profession:	Aquatic Scientist (P. Sci. Nat. 400040/10)
Fields of Expertise:	Specialist in freshwater assessments, monitoring and reporting
Years in Profession:	30+ years

Toni Belcher worked for the Department of Water Affairs and Forestry for more than 17 years. During this period she worked for the Directorate Water Quality Management, the Institute for Water Quality Studies and the Western Cape Regional Office and has built up a wide skills base on water resource management and water resource quality for rivers, estuaries and the coastal marine environment. Since leaving the Department in 2007, she has been working in her private capacity and was co-owner of BlueScience (Pty) Ltd, working in the field of water resource management and has been involved in more than 500 aquatic ecosystem assessments for environmental impact assessment and water use authorisation purposes. In 2006 she was awarded a Woman in Water award for Environmental Education and was a runner up for the Woman in Water prize for Water Research.

Professional Qualifications:

1984	Matriculation Lawson Brown High School
1987	B.Sc. – Mathematics, Applied Mathematics University of Port Elizabeth
1989	B.Sc. (Hons) – Oceanography University of Port Elizabeth
1998	M.Sc. – Environmental Management (cum laude) Potchefstroom University

Key Skills: Areas of specialisation: Aquatic ecosystem assessments, Monitoring and evaluation of water resources, Water resource legislation and authorisations, River classification and Resource Quality Objectives, River Reserve determination and implementation, Water Quality Assessments, Biomonitoring, River and Wetland Rehabilitation Plans, Catchment management, River maintenance management, Water education.

Summary of Experience:

1987 – 1988	Part-time field researcher, Department of Oceanography, University of Port Elizabeth
1989 – 1990	Mathematics tutor and administrator, Master Maths, Randburg and Braamfontein Colleges, Johannesburg
1991 – 1995	Water Pollution Control Officer, Water Quality Management, Department of Water Affairs, Pretoria
1995 – 1999	Hydrologist and Assistant Director, Institute for Water Quality Studies, Department of Water Affairs and Forestry, Pretoria
1999 – 2007	Assistant and Deputy Director, Water Resource Protection, Western Cape Regional Office, Department of Water Affairs, Cape Town
2007 – 2012	Self-employed – Aquatic Specialist
2013 – 2020	Senior Aquatic Specialist and part-owner, BlueScience
2020 – present	Self-employed– Aquatic Specialist


2. DECLARATION OF INDEPENDENCE

I, **Antonia Belcher**, as the appointed specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
 - other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
 - ~~am not independent, but another specialist that meets the general requirements set out in Regulation 13 of GN No. 326 have been appointed to review my work (Note: a declaration by the review specialist must be submitted);~~
- in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- have disclosed/will disclose, to the Applicant, the Department and registered interested and affected parties, all material information that have or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application;
- have ensured/will ensure that information containing all relevant facts in respect of the application was/will be distributed or was/will be made available to interested and affected parties and the public and that participation was/will be facilitated in such a manner that all interested and affected parties were/will be provided with a reasonable opportunity to participate and to provide comments;
- have ensured/will ensure that the comments of all interested and affected parties were/will be considered, recorded and submitted to the Department in respect of the application; and
- am aware that a false declaration is an offence in terms of Regulation 48 of the NEMA EIA Regulations, 2014 (as amended).

Date: 15 December 2021

Name of company: BlueScience (Pty) Ltd

Signature of the specialists: 

3. INTRODUCTION

It is proposed to extend the existing Shoprite Distribution Centre on Erf 8741, Wells Estate, Gqeberha (Figure 1). The extended area will comprise storage warehouses and a range of associated infrastructure (e.g., offices, workshops, wash bays, parking stands and hardstands, a refuse yard, guardhouses, and a stormwater retention facility). The complete development area is 22.0961 ha. The existing development within the site has an area of 3.1071 ha, thus the “new” development area under consideration is 18.98Ha. This aquatic specialist report provides an assessment of any aquatic ecosystem constraints within the site, discusses the potential aquatic ecosystem impacts and risk and provides recommended mitigation measures.

Table 1. Key information related to the water resources which may be impacted by the proposed activities

Descriptor	Name / details	Notes
Water Management Area	Mzimvubu -Tsitsikamma	
Catchment Area	Coega River	
Quaternary Catchment	M30B	
Present Ecological State (PES)	D (largely modified)	DWAF 2012 rapid assessment for the Coega River (Appendix C)
Ecological Importance and Ecological Sensitivity (EI&ES)	Ecological Importance – Moderate Ecological Sensitivity - Moderate	
Water resource	The lower Coega River and associated wetlands as well as the Coega Estuary	
Latitude	33°49'2.7"S	Centre of the site
Longitude	25°37'12.3"E	

The Screening Tool of the Department of Environment Affairs indicates the wider area in which the site is located to be of very high sensitivity (Figure 1). This is because the site lies within a Strategic Water Source Area for groundwater (Coega Table Mountain Group Aquifer) as well as the fact that the wider Quaternary Catchment M30B has been mapped as an aquatic CBA2 (selected catchments/wetland clusters to achieve connectivity).



Screening Report Map

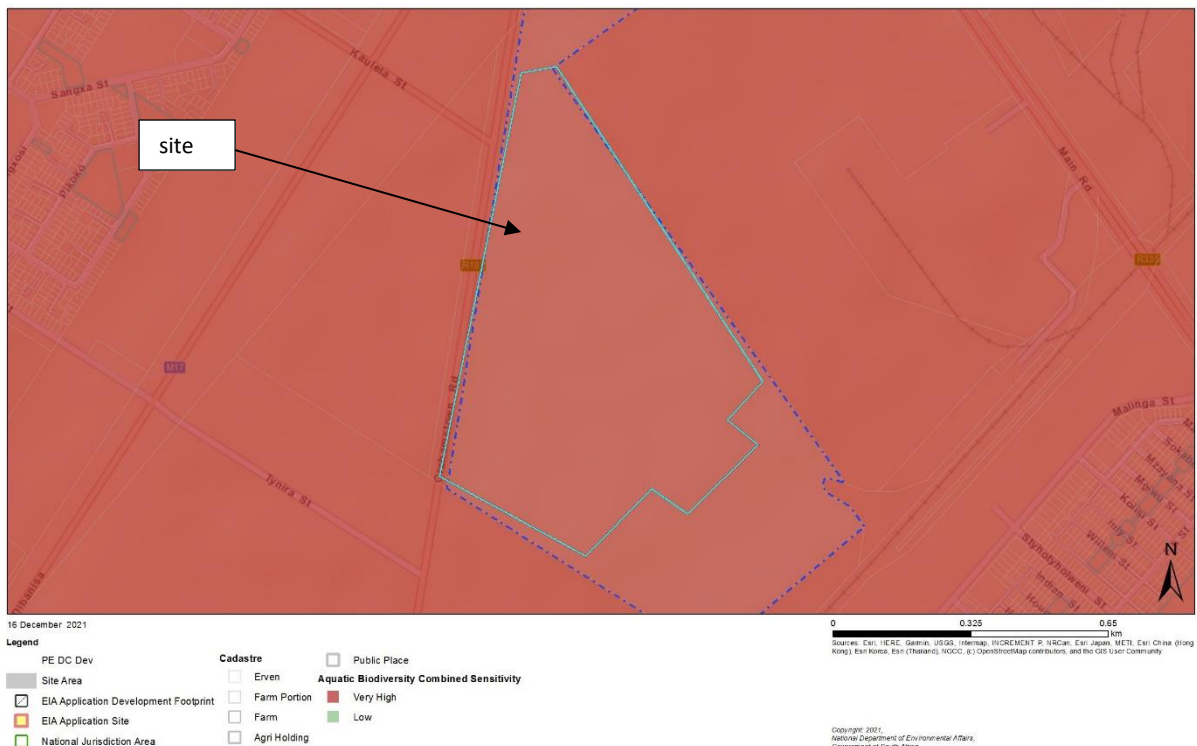


Figure 1. Screening map for Aquatic Biodiversity combined Sensitivity for the area

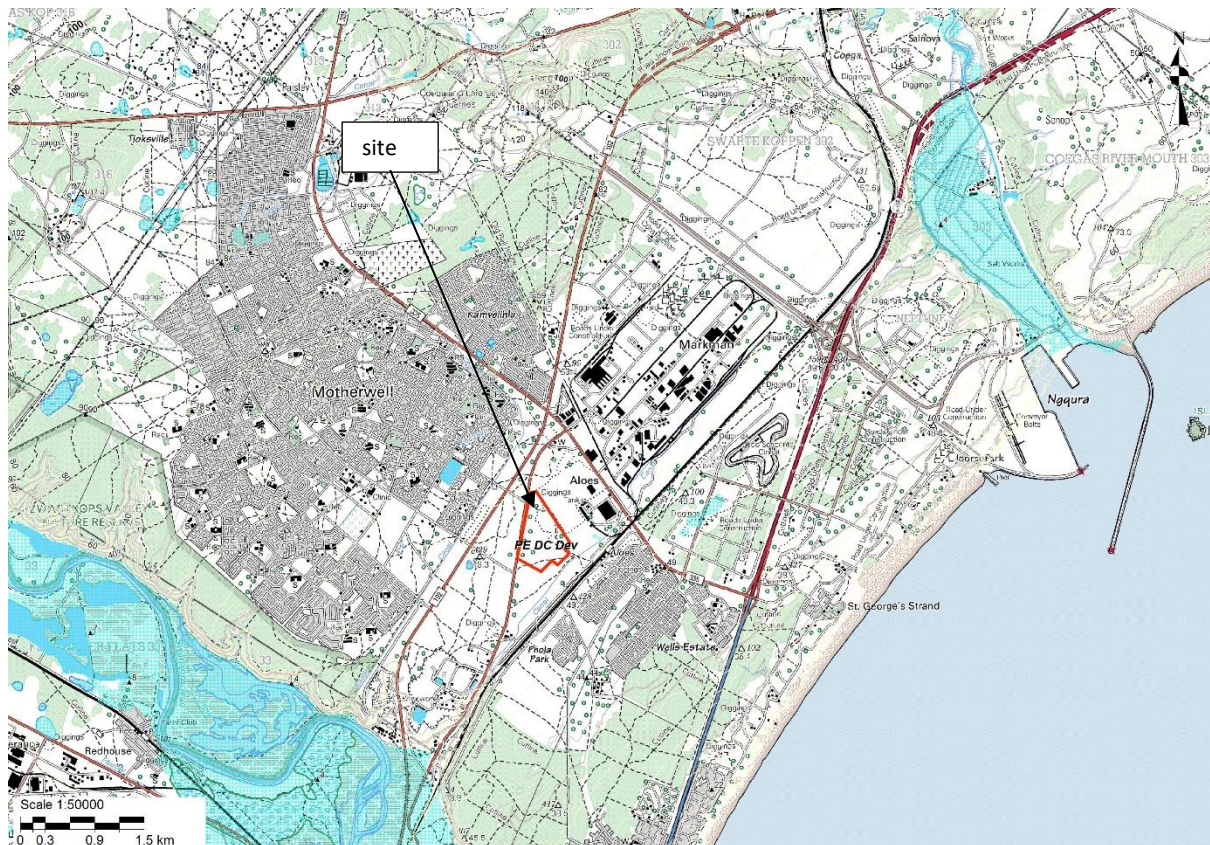


Figure 2. A topographical map of the study area, indicating the locality of the site (red polygon)

3.1 TERMS OF REFERENCE

The agreed-upon scope of works for this specialist aquatic assessment report comprises of the following tasks:

1. *Undertake a desktop assessment for the wetland at the site;*
2. *Conduct a DWS Risk Assessment (as outlined in Government Notice 509 of 2016) in consideration of the Section 21(c) and (i) water uses associated with the proposed activities;*
3. *Compile a brief aquatic ecological report detailing the following:*
 - a. *Confirms if any aquatic ecosystems are present on the site and immediate surrounds;*
 - b. *Assesses the significance of the aquatic ecosystems;*
 - c. *Provides a statement regarding the risks of the development, footprint, new and existing stormwater facility and diesel storage to the aquatic ecosystems;*
 - d. *Considers the DEA Screening tool protocol and confirms the risk level - if low provide a statement confirming that no further freshwater impact assessment or compliance statement is required;*
 - e. *Includes a risk assessment to inform the water use authorisation process for the proposed activities; and*
4. *Review and Liaison*

3.2. METHODOLOGY AND LIMITATIONS OF THE STUDY

Input into this report was informed by a combination of a desktop assessment of existing freshwater ecosystem information for the study area and catchment, past fieldwork undertaken in the area, as well as recent photographs of the site, taken in July 2021. Past aerial imagery of the site was also utilized to assist with the delineation of the aquatic habitat. The SANBI Biodiversity GIS and Cape Farm Mapper websites were consulted to identify any constraints in terms of fine-scale biodiversity conservation mapping as well as possible freshwater features mapped in the Freshwater Ecosystem Priority Areas maps.

3.3. USE OF THIS REPORT

This report reflects the professional judgment of its author. The full and unedited content of this should be presented to the client. Any summary of these findings should only be produced in consultation with the author.

4. DESCRIPTION OF THE SITE AND SURROUNDING AREA

The study area is within the lower catchment of the Coega River (Quaternary catchment M30B), close to the watershed with the adjacent Swartkops River (Quaternary catchment M10D). The site is situated within the Nelson Mandela Metropolitan Municipality near Port Elizabeth, in the Eastern Cape. Coega is a Nguni word that means 'ground water'. The area is underlain by an artesian aquifer that is formed by sandstones and quartzites of the Table Mountain Group and recharged from the Winterhoek Mountains to the north. This aquifer is, however, is unlikely to have any interaction with the aquatic features on the site. The topography at the site is generally flat.

The mean annual rainfall for the area is approximately 483mm which is received throughout the year. The drier months are December and January when approx. 24 mm and 22 mm are received respectively. The months of late winter to spring; August, September and October, receive higher rainfall than the rest of the year, with an average monthly rainfall of 34 mm, 35 mm and 38 mm respectively. The area is relatively moderate with the monthly average day time midday temperature varying by only 5.9°C between the hottest month; February (25.2°C), and the coldest month; July (19.3°C). Winds are predominantly from the west and west-south-west (41% combined frequency) all year round, and from the east (15%) from October through to March

The geology underlying the site comprises mainly the Alexandria Formation of the Algoa Group, which is underlain by the older Sundays River Formation of the Uitenhage Group. The Alexandria Formation consists of alternating layers of calcareous sandstone, conglomerate and coquinite and has an average thickness of 9 m. The conglomerates contain pebbles and cobbles that are set in a fine to medium-grained sand matrix. The coquinites are pebbly in places and consist of 70% invertebrate shell remains that are commonly recrystallised. The Sundays River Formation comprises grey to bluish green mudstone, siltstone and sandstone.

From the geotechnical investigation of the site, the soil profile of the site was found to mostly comprise a combination of silty sand overlying calcrete (hardpan or gravel), overlying calcareous sand, overlying shelly silty sand or clayey sand, which in turn overlies shale bedrock. Fill material was found in the northwestern, northeastern and southwestern corners of the site.

The aquifer that occurs in the area is indicated to be a minor fractured aquifer with yields of 0.1 to 0.5 l/s and electrical conductivity of 150 to 370 mS/m. The average depth to the groundwater table is about 22 m below ground level. Recharge is approx. 11 mm/a. The aquifer is classified as having a medium to high susceptibility to contamination from anthropogenic activities. A groundwater assessment undertaken by SRK (2021) for this

project, determined the groundwater levels in the area to be shallow (<4 mbgl) with the general drainage being towards the southeast and southwest.

The naturally occurring vegetation on the site is mapped as Coega Bontveld which is characterised by clumps of low (2-3m) thicket interspersed within open grassland. The more detailed vegetation mapping undertaken for the Nelson Mandela Bay Municipality refers to the vegetation type Grass Ridge Bontveld. The vegetation type is considered Vulnerable. This vegetation type is characterised by thicket clumps dominated by *Euclea undulata*, *Searsia incisa* and *Searsia pterota* with grasslands of *Ehretia rigida* and *Themeda triandra* (grass). The most common invasive alien plant species are Rooikrans (*Acacia cyclops*), Port Jackson willows (*Acacia saligna*) and Prickly Pear (*Opuntia ficus-indica*).

The Coega and Swartkops Rivers are the most significant surface water features within the wider study area with the Coega River being approx. 7 km to the northeast of the site and the Swartkops River about 3 km to the southwest. The site is located on the plateau adjacent to the Coega River Catchment. Several small depression wetland areas or pans occur on the flat plateau between the two river systems. No wetland areas are mapped as occurring within the site.

Landuse within the catchment consists largely of a mix of residential areas associated with Motherwell to the northwest and Wells Estate to the southeast. To the northeast is the industrial area of Markman with the Coega Industrial Development Zone (IDZ) and the Port of Nqura to the northeast of Markman. Some natural vegetation still occurs in the undeveloped surrounding areas. The IDZ was established in 1999 and covers 115 km² of land that is intended for the phased development of heavy, medium and light industries.

5. CONSERVATION VALUE OF THE AQUATIC FEATURES

Two sets of conservation mapping results are of relevance to the national and provincial identification of the ecological importance that has been attributed to the aquatic ecosystems in the study area: The National Freshwater Ecosystem Priority Areas map; and the Nelson Mandela Bay Municipality Critical Biodiversity Areas (CBA) map (that was a product of the Provincial Fine Scale mapping process undertaken at a local authority level).

FEPAs are intended to provide strategic spatial priorities for conserving South Africa's freshwater ecosystems and supporting the sustainable use of water resources and have been determined through a process of systematic biodiversity planning. The Coega River catchment is a Phase 2 FEPA river (Figure 3). Phase 2 FEPAs are considered to be moderately modified and should not be allowed to be degraded or modified further as they may need to be rehabilitated to meet biodiversity targets. The site largely falls outside of the Phase 2 FEPA river sub-catchment. Several pans occur on the plateau adjacent to the Coega River that is mapped as FEPA Wetland clusters. Some small depression wetlands are mapped to the east and west of the site. The closest wetland, approximately 270m east of the site, is mapped as part of the wetland cluster however it is within an area that has recently been developed. The proposed development is unlikely to impact the FEPA River status or the adjacent FEPA wetlands.

In terms of the CBA map, the larger catchment in which the Coega River and the adjacent wetland clusters are mapped is mapped as an aquatic CBA2 (Figure 4). CBA2 areas should be maintained in a natural (or near-natural state if this is the current condition of the site) that secures the retention of biodiversity patterns and ecological processes. If land-use activities are unavoidable in these areas and depending on the condition of the site, set-aside areas must be designed in the layout and implemented. The site falls outside of the CBA mapped area.

It can thus be said that the proposed development is unlikely to impact the ecological integrity of the larger river and wetland systems mapped as being of aquatic biodiversity conservation value.



Figure 3. National Freshwater Ecosystem Priority Areas within the wider vicinity of the site (Council for Scientific and Industrial Research. NFEPA rivers 2011 obtained from SANBI BiodiversityGIS (<http://bgis.sanbi.org>) in December 2021)

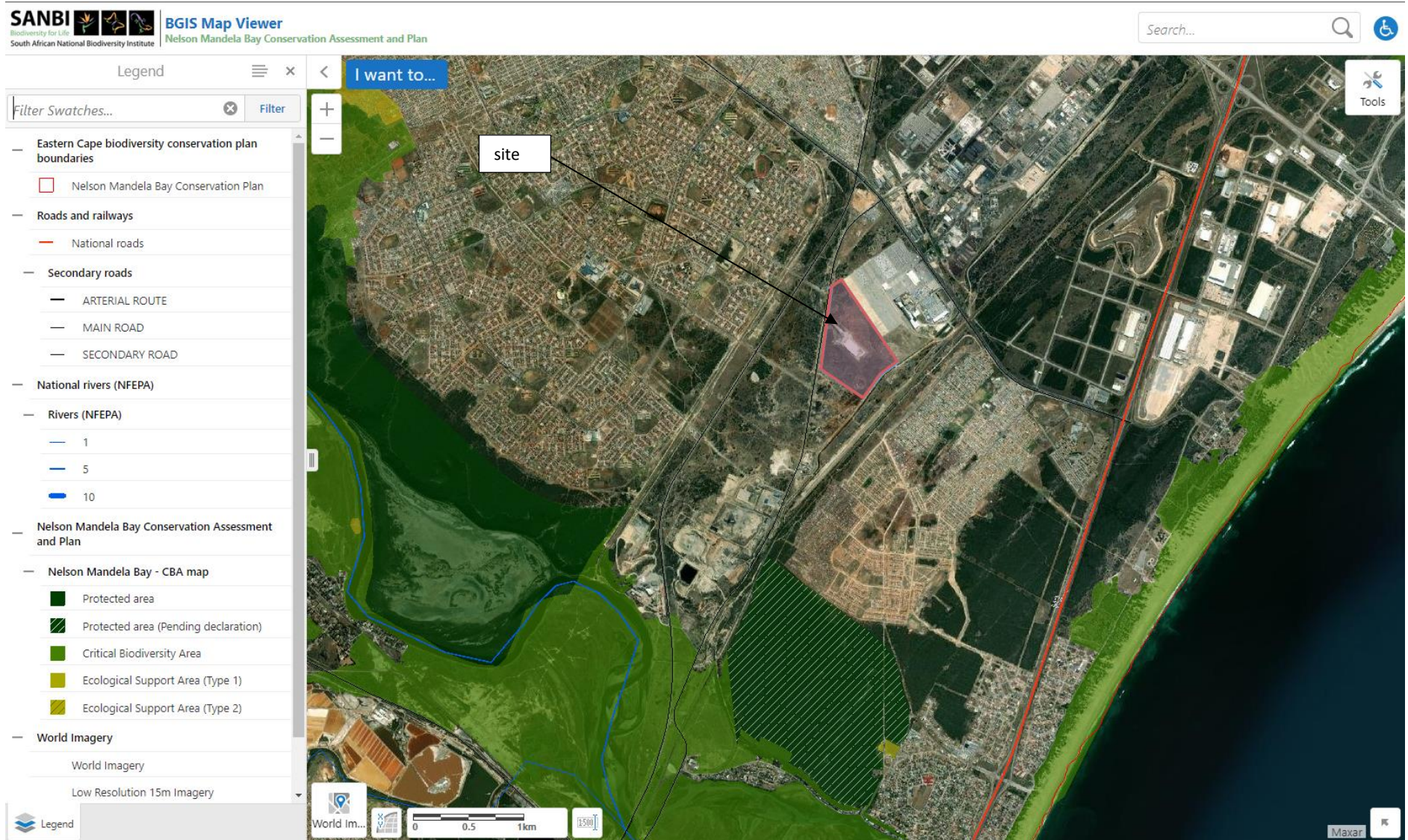


Figure 4. 2019 Eastern Cape Biodiversity Conservation Plan for the area (obtained from SANBI BiodiversityGIS (<http://bgis.sanbi.org>) in December 2021)

6. ASSESSMENT OF AQUATIC FEATURE AT THE SITE

The only feature occurring at the site is a constructed stormwater pond that has developed wetland characteristics. In this section, this freshwater feature is further described and assessed.

6.1. PAST MODIFICATION OF THE AQUATIC FEATURES AT THE STUDY SITE

Past imagery available in Google Earth was considered to view the site before any development of the site took place. The earliest image is available for April 2004. In this image, no wetland is clearly on the site and most of the site is in a largely natural ecological condition with just some roads and paths crossing the site. A depression wetland (mapped in the FEPA wetland mapping) is visible to the east of the site (Figure 5).



Figure 5. Google Earth image, captured in April 2004, with the site extent indicated (red polygon)

In August 2012, construction of the existing distribution center and the stormwater pond had commenced within the central and lower portion of the site (Figure 6). The adjacent site had almost entirely been developed by this time with the FEPA mapped depression wetland having been largely lost as a result of the altered topography on the adjacent developed site.

The most recent image from September 2021 (Figure 7) shows the current level of development of the site and the stormwater pond. The pond lies within the southern unfenced portion of the site that is subject to ongoing disturbance such as cattle grazing.



Figure 6. Google Earth images captured in August 2012 showing the increasing development of the area



Figure 7. Most recent Google Earth image of the site from September 2021

6.2. WETLAND ASSESSMENT

Wetlands as defined by the National Water Act (Act 36 of 1998) “are a portion of land that is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which under normal circumstances supports or would support vegetation typically adapted to life in saturated soil.” Wetland delineation relates to the determination and marking of the boundary of a wetland to the outer edge of the temporary zone of wetness.

The wetland in the south of the site comprises an artificial shallow depression type wetland that has been created to mitigate stormwater runoff from the developed portion of the site. Apart from the physical modification of the landscape at the depression as a result of the surrounding development, other impacts such as a change of surface water runoff from the developed areas, grazing of the vegetation and a low density of alien invasive plants such as *Acacia cyclops* and *A. saligna* are evident. The area surrounding the pond comprises a mosaic of grasses (mostly *Cynodon dactylon*) and dwarf shrubs (*Asparagus africanus*, *Lycium cinereum*, *Lycium ferocissimum*, *Passerina corumbosa*). Alien invasive *Cortaderia selloana* occur along the wetland edge.

Table 2. Characterisation of wetland at the site, its present ecological condition, ecological importance and sensitivity, key ecological services and Recommended Ecological Category

Name	Artificial wetland (Stormwater pond) on Erf 8741 Wells Estate
System	Inland
Ecoregion	South Eastern Coastal Belt
Landscape unit	Hilltop Bench
Hydrogeomorphic Type	Depression
Longitudinal zonation	Not applicable
Drainage	Surface runoff – enhorheic
Seasonality	Intermittent
Anthropogenic influence	Topographical alteration to create stormwater pond with altered runoff from the developed area
Vegetation	Grass Ridge Bontveld: Depression
Substrate	Clay
Salinity	Fresh to brackish
Present Ecological Status	Largely modified/artificial
Ecological Importance and Sensitivity	Low / no fauna of conservation importance was observed associated with the wetland habitat
Key ecological services	Due to the wetland's small extent 0.35 ha and modified ecological condition it provides limited goods and services that now relate largely to stormwater mitigation. The wetland is largely disconnected with any other wetland.
Recommended Ecological Category	Retain the current condition function of the pond as being part of the stormwater management system for the site.



Figure 8. View of the depression wetland that is located south of the proposed development area

7. LEGISLATIVE REQUIREMENTS

The construction of the proposed development needs to take cognizance of the legislative requirements, policies, strategies, guidelines and principles of the relevant regulatory documents of the City of Nelson Mandela area, such as the Spatial Development Framework and the Nelson Mandela Bay Municipal Biodiversity Plan was officially gazetted on 30th March 2015, as well as the National Water Act (NWA) and the National Environmental Management Act (NEMA). An environmental process in terms of NEMA has already been undertaken and this assessment is only providing input into the water use authorisation process in terms of the NWA.

7.1. NEMA AND ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS

The National Environmental Management Act (NEMA), Act 107 of 1998, is the overarching piece of legislation for environmental management in South Africa and includes provisions that must be considered to give effect to the general objectives of integrated environmental management. These provisions are contained in Section 24 (4)(a)(b) of the Act and will be considered during the EIA process. Activities listed in terms of Chapter 5 of NEMA in Government Notice No. R. 983, 984 and 985, dated 4 December 2014, as amended in 2017, trigger a mandatory Basic Assessment (BA), or even a full scoping Environmental Impact Assessment (EIA) process, before development. Many of the listed activities relate to activities within or adjacent to aquatic ecosystems.

7.2. NATIONAL WATER ACT, 1998 (ACT NO. 36 OF 1998)

The purpose of the NWA is to provide a framework for the equitable allocation and sustainable management of water resources. Both surface and groundwater sources are redefined by the Act as national resources which

cannot be owned by any individual, and rights to which are not automatically coupled to land rights, but for which prospective users must apply for authorisation and register as users. The NWA also provides for measures to prevent, control and remedy the pollution of surface and groundwater sources.

The Act aims to regulate the use of water and activities (as defined in Part 4, Section 21 of the NWA), which may impact on water resources through the categorisation of 'listed water uses' encompassing water abstraction and flow attenuation within catchments as well as the potential contamination of water resources, where the DWS is the administering body in this regard. The water uses most likely to be associated with the proposed activities are as follows:

Reference in the NWA	Description	Comment
Section 21(c)	Impeding or diverting flow of water in a watercourse	Works adjacent to the wetland is likely to trigger this water use
Section 21(i)	Altering the bed, banks, course or characteristics of a watercourse	Any works within or adjacent to any of the mapped aquatic features is likely to trigger this water use

Defined water use activities require the approval of DWS in the form of a General Authorisation or Water Use Licence authorisation if not considered an existing lawful use (a water use that was lawful 2 years before the promulgation of the NWA in 1998) and a Schedule 1 use (small-scale/non-commercial level use). There are restrictions on the extent and scale of listed activities for which General Authorisations apply.

Section 22(3) of the National Water Act allows for a responsible authority (DWS) to dispense with the requirement for a Water Use Licence if it is satisfied that the purpose of the Act will be met by the grant of a licence, permit or authorisation under any other law.

GENERAL AUTHORISATION IN TERMS OF SECTION. 39 OF THE NWA

According to the preamble to Part 6 of the NWA, *"This Part established a procedure to enable a responsible authority, after public consultation, to permit the use of water by publishing general authorisations in the Gazette..."* *"The use of water under a general authorisation does not require a licence until the general authorisation is revoked, in which case licensing will be necessary..."*

The General Authorisations 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 were revised in 2016 (Government Notice R509 of 2016). The proposed works adjacent to the wetland area have the potential to change the characteristics of the associated freshwater ecosystems and may therefore require authorization. Determining if a water use licence is required for these water uses is now associated with the risk of degrading the ecological status of a watercourse. A low risk of impact could be authorised in terms of a General Authorisation (GA). A risk assessment for the proposed project has been undertaken for this purpose.

REGULATIONS REQUIRING THAT A WATER USER BE REGISTERED, GN R.1352 (1999)

Regulations requiring the registration of water users were promulgated by the Minister of DWA in terms of provisions made in section 26(1)(c), read together with section 69 of the National Water Act, 1998. Section 26(1) (c) of the Act allows for registration of all water uses including existing lawful water use in terms of section 34(2). Section 29(1) (b) (vi) also states that in the case of a general authorisation, the responsible authority may attach a condition requiring the registration of such water use. The Regulations (Art. 3) oblige any water user as defined under section 21 of the Act to register such use with the responsible authority and effectively to apply for a Registration Certificate as contemplated under Art.7(1) of the Regulations.

8. AQUATIC ECOSYSTEM IMPACT AND RISK ASSESSMENT

8.1. DESCRIPTION OF PROPOSED DEVELOPMENT

The proposed development comprises of the construction of the following distribution centers (See Figure 9):

- Dry Goods: 37,568m² (3,152 m² existing)
- Freshmark: 8,944m² (4,251m² existing)
- Returns Centre: 9,294m² (1,194m² existing)

The development also includes a refueling-, workshop and a truck wash facility. Each one of the aforementioned facilities will be equipped with oil separators with separate connections to the foul sewer network to ensure that the downstream watercourses are protected from these substances.



Figure 9. Proposed spatial development plan for the site

Provision for subsoil drains is proposed to address a shallow groundwater table is encountered during construction. The proposed subsoil network will consist of 110mm diameter perforated pipes connecting to the stormwater system. Stormwater run-off from the impervious areas will be routed via roadside channels, as well

as low points with inlets towards the underground stormwater pipe network into the attenuation facilities, located on the western and southern boundary of the site. The internal stormwater system consists mainly of an underground gravity pipe and culvert network, Q-drain channels, roadside channels in the parking area and inlet structures that drain the roads and marshaling yards. This system was designed to have sufficient capacity to convey a 1:5-year rainfall event.



Figure 10. Proposed stormwater pan and overland flow within the developed site

During rainfall events with a return period larger than 1:5-years, the proposed roads, marshaling yards, parking areas and channels will act as overland flow routes that will channel, attenuate and ultimately discharge the surface runoff via predetermined escape routes into the attenuation facilities. The design of these dams will make allowance to adequately manage the 1:50-year rainfall event. Two stormwater attenuation facilities/dams will be constructed on the south and western boundaries of the site and will operate as a dry extended detention facility. The attenuation dam outlets will be connected to the existing stormwater channel to the southeast of the site. The outlet capacity of the attenuation dams will be capped at 1400l/s by limiting the outlet pipe sizing.

An alternative layout was proposed that has been rejected due to the potential impact on sensitive terrestrial vegetation. All proposed facilities for the alternative are identical to the preferred layout. The footprint has just been re-arranged as well as an alternative pond layout. Figure 11 shows the alternative layout. The potential aquatic ecosystem impacts would be very similar for both the Preferred and the alternative (Rejected) layout and are thus both considered in the impact assessment and the risk assessment tables in the following section.

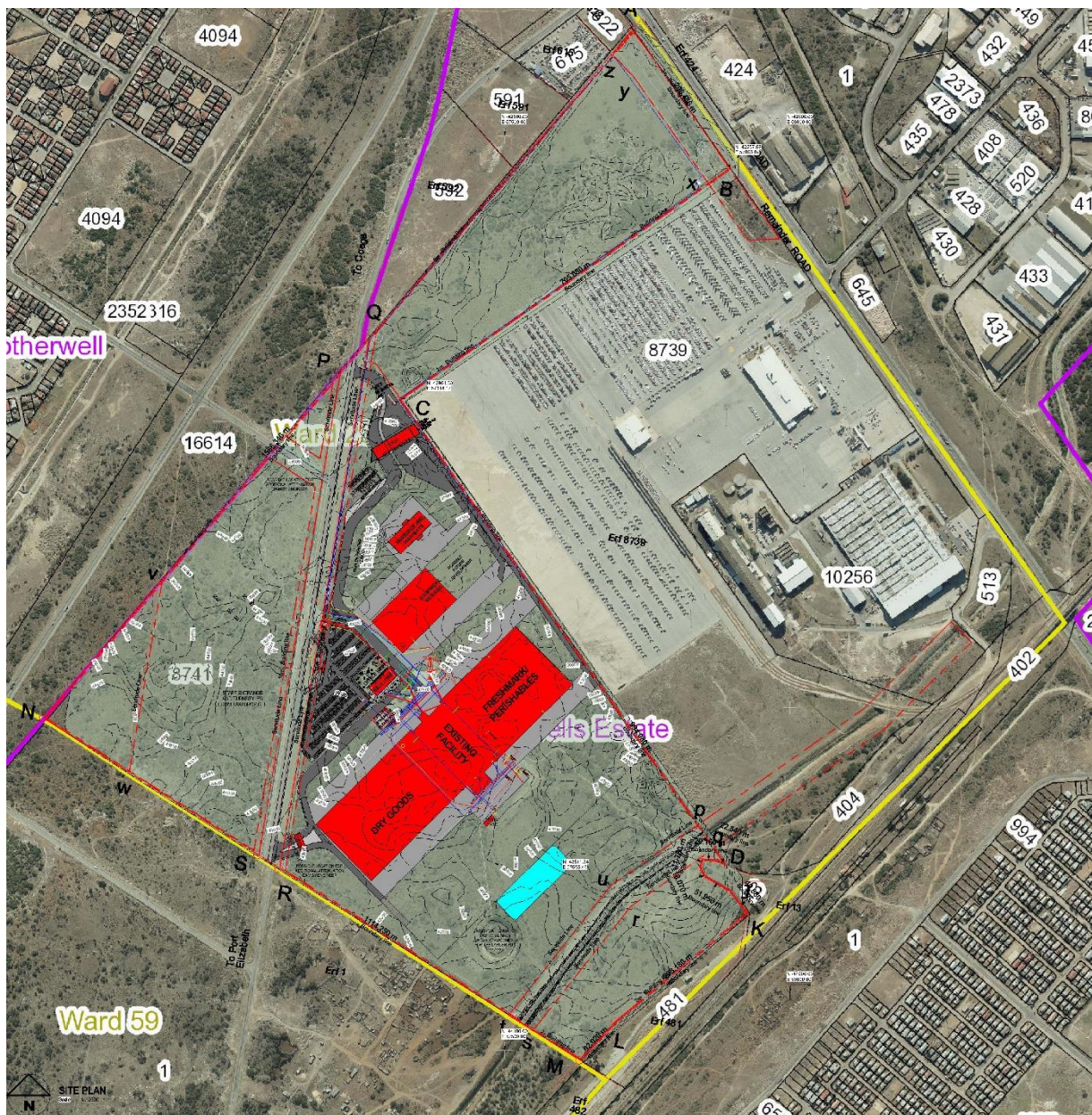


Figure 11. Alternative (rejected) spatial development plan for the site

8.2 AQUATIC IMPACT ASSESSMENT

The wetland on the site will be modified and replaced with the proposed two new stormwater ponds within the site to meet the stormwater management requirements of the proposed development. Because the wetland on the site is artificial and has formed in the existing pond constructed to mitigate stormwater runoff from the currently developed area on the site, new wetland habitat will likely form within the new stormwater ponds proposed for the south and southwestern portions of the site. There would thus be no loss of wetland functionality (given that the primary wetland function is stormwater mitigation) or wetland habitat within the site. The surface area of the combined two new stormwater ponds is 0.5 ha, an increase from the existing 0.35 ha.

Significance of impacts without mitigation: Low negative impact

Proposed mitigation:

Wetland habitat within the new stormwater infrastructure at the site should be constructed to mitigate the loss of the existing stormwater pond wetland habitat. The facilities should be planted with a mixed community of indigenous sedges and rushes.

Significance of impacts after mitigation: Very Low negative with potential for a low positive significance

Potential impact and risk:	Proposed development	No-Go Alternative
Construction Phase		
Nature of impact:	Modification of aquatic habitat	
Status	Negative	Negative
Duration of impact:	Short Term	Short term
Extent	Localised	Localised
Magnitude/Intensity	Medium to low	Low
Consequence of impact or risk:	Low	Low
Probability of occurrence:	Definite	Possible
Degree impact may cause irreplaceable loss of resources:	Low	Low
Degree impact can be reversed:	High	High
Indirect impacts:	-	
Cumulative impact prior to mitigation:	Low	Low
Significance rating of impact prior to mitigation	Low	Low
Degree impact can be avoided:	High to Medium	High
Degree impact can be managed:	High	High
Degree impact can be mitigated:	High	High
Proposed mitigation:	See above	
Residual impacts:	Aquatic habitat modification	None
Cumulative impact post mitigation:	Very Low	Very low
Significance rating of impact after mitigation	Very Low	Very Low
Confidence	High	High

Potential impact and risk:	Proposed development	No-Go Alternative
Operation Phase		
Nature of impact:	Disturbance and modification of aquatic habitat; flow modification	
Status	Negative	Negative
Duration of impact:	Short term	Short term
Extent	Localised	Localised
Magnitude/Intensity	Low	Low
Consequence of impact or risk:	Low	Low

Probability of occurrence:	Possible	Possible
Degree impact may cause irreplaceable loss of resources:	Low	Low
Degree impact can be reversed:	Medium	High
Indirect impacts:	Facilitating the spread of alien vegetation	
Cumulative impact prior to mitigation:	Low	Low
Significance rating of impact prior to mitigation	Low	Low
Degree impact can be avoided:	Low	High
Degree impact can be managed:	Medium	High
Degree impact can be mitigated:	High to medium	High
Proposed mitigation:	See above	
Residual impacts:	Aquatic habitat modification	None
Cumulative impact post mitigation:	Very Low to insignificant	Low
Significance rating of impact after mitigation	Very Low to insignificant	Low
Confidence	Medium to High	High

8.3 RISK ASSESSMENT

A risk assessment, summarised in Table 3, has been undertaken to inform the water use authorisation process and is included in this report in Appendix B. The risk rating for the proposed works comes out as moderate to low since the aquatic feature is a wetland and required maximum scoring in terms of the severity of the impacts. Considering however that the wetland at the proposed development site is artificial and is associated with a stormwater pond that is to be replaced with two new ponds, the risk of altering the ecological status of the aquatic feature as a result of the proposed development is considered to be very low for the construction phase and operational phase.

Table 3. A summary of the risk assessment for the proposed development

Phases	Activity	Aspect	Impact	Significance	Risk Rating	Adjusted Risk Rating*
Construction	Infilling and shaping of the site and the stormwater ponds for development	Soil movement and construction activities adjacent to aquatic feature	Modification of habitat and water quality impacts	63	M/L	L
Operation	Stormwater run-off generated on-site	Flow and quality of runoff from the developed site	Modified flow and water quality of stormwater	63	M/L	L

Provided the stormwater mitigation measures are implemented within the developed site, the potential risks to the adjacent depression would be low such that the proposed activities could be approved in terms of the General Authorisation for Section 21(c) and (i) water use activities.

9. CONCLUSIONS AND RECOMMENDATIONS

The aquatic feature at the proposed development site comprises

a small artificial depression wetland associated with a stormwater pond on the site. The wetland is in a largely modified ecological condition and is considered of low ecological importance and sensitivity.

Provided the following mitigation measures are implemented, the potential aquatic ecosystem impacts and the risks of the proposed development altering the integrity of the artificial depression wetland would be low to very low such that the proposed activities could be approved in terms of the General Authorisation for Section 21(c) and (i) water use activities.

The following mitigation measures are recommended:

- The water quality impacts during the construction phase should be addressed through a Construction Environmental Management Plan for the project, and implemented by an on-site Environmental Officer;
- The stormwater management plan for the site should ensure that any impacts of stormwater from the site are mitigated as far as possible within the site (measures such as the use of permeable surfaces, re-use of runoff from built areas such as roofs as well as the use of measures such as swales) to minimise the stormwater impacts on the watercourse;
- Where necessary pre-treatment areas such as oil, sediment and litter traps should be included in the stormwater management design; and
- Wetland habitat within the new stormwater infrastructure at the site should be constructed to mitigate the loss of the existing stormwater pond wetland habitat. The facilities should be planted with a mixed community of indigenous sedges and rushes.

10. REFERENCES

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APPENDIX A: PRESENT ECOLOGICAL STATE OF THE COEGA RIVER (DWAf, 2012)

SELECT SQ REACH	SQR NAME	LENGTH km	STREAM ORDER	PES ASSESSED BY XPERTS? (IF TRUE="Y")	REASONS NOT ASSESSED	PES CATEGORY DESCRIPTION	PES CATEGORY BASED ON MEDIAN OF METRICS
M30A-08796	Coega	72.92	1	Y		LARGELY MODIFIED	D
MEAN EI CLASS	MEAN ES CLASS	DEFAULT ECOLOGICAL CATEGORY (DEC)	RECOMMENDED ECOLOGICAL CATEGORY (REC)				
MODERATE	MODERATE	C	0.00				
PRESENT ECOLOGICAL STATE		ECOLOGICAL IMPORTANCE			ECOLOGICAL SENSITIVITY		
INSTREAM HABITAT CONTINUITY MOD	LARGE	FISH SPP/SQ	12.00	INVERT TAXA/SQ	13.00	FISH PHYS-CHEM SENS DESCRIPTION	HIGH
RIP/WETLAND ZONE CONTINUITY MOD	SERIOUS	FISH: AVERAGE CONFIDENCE	2.83	INVERT AVERAGE CONFIDENCE	1.15	FISH NO-FLOW SENSITIVITY DESCRIPTION	HIGH
POTENTIAL INSTREAM HABITAT MOD ACT.	LARGE	FISH REPRESENTIVITY PER SECONDARY:	VERY HIGH	INVERT REPRESENTIVITY	VERY HIGH	INVERT PHYS-CHEM SENS DESCRIPTION	HIGH
RIPARIAN-WETLAND ZONE MOD	SERIOUS	FISH REPRESENTIVITY PER SECONDARY:	VERY HIGH	INVERT RARITY PER	VERY LOW	INVERTS VELOCITY SENSITIVITY	VERY HIGH
POTENTIAL FLOW MOD ACT.	MODERATE	FISH RARITY PER SECONDARY: CLASS	VERY LOW	ECOLOGICAL IMPORTANCE : RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) RATING	LOW	RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) INTOLERANCE WATER LEVEL/FLOW CHANGES DESCRIPTION	LOW
POTENTIAL PHYSICO-CHEMICAL MOD ACTIVITIES	LARGE	ECOLOGICAL IMPORTANCE: RIPARIAN-WETLAND-INSTREAM VERTEBRATES (EX FISH) RATING	LOW	HABITAT DIVERSITY CLASS	VERY HIGH	STREAM SIZE SENSITIVITY TO MODIFIED FLOW/WATER LEVEL CHANGES DESCRIPTION	HIGH
		RIPARIAN-WETLAND NATURAL VEG RATING BASED ON % NATURAL	VERY HIGH	HABITAT SIZE (LENGTH) CLASS	VERY HIGH	RIPARIAN-WETLAND VEG INTOLERANCE TO WATER LEVEL CHANGES DESCRIPTION	LOW
		RIPARIAN-WETLAND	LOW	INSTREAM MIGRATION	MODERATE		
				RIPARIAN-WETLAND ZONE MIGRATION	LOW		
				RIPARIAN-WETLAND ZONE	LOW		
				INSTREAM HABITAT INTEGRITY CLASS	MODERATE		

APPENDIX B: RISK ASSESSMENT

ASPECTS AND IMPACT REGISTER/RISK ASSESSMENT FOR WATERCOURSES INCLUDING RIVERS, PANS, WETLANDS, SPRINGS, DRAINAGE LINES: PROPOSED DEVELOPMENT ON ERF 8741, WELLS ESTATE, GQEBERHA
 COMPILED BY: Toni Belcher (SACNASP no. 400040/10)
 DATE: December 2021

Nr	Phases	Activity*	Aspect	Impact	Severity				Severity	Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating	Adjusted Risk Rating*	Control Measures	Confidence	Type Watercourse; PES and EIS
					Flow Regime	Physico & Chemical (Water Quality)	Habitat (Geomorph +Vegetation)	Biota															
1	Construction	Infilling and shaping of the site and the stormwater ponds for development	Soil movement and construction activities adjacent to aquatic feature	Modification of habitat and water quality impacts	5	5	5	5	5	1	1	7	1	2	5	1	9	63	M/L	L	*The water quality impacts during the construction phase should be addressed through a Construction Environmental Management Plan for the project, and implemented by an on-site Environmental Officer; *The stormwater management plan for the site should ensure that any impacts of stormwater from the site are mitigated as far as possible within the site (measures such as the use of permeable surfaces, re-use of runoff from built areas such as roofs as well as the use of measures such as swales) to minimise the stormwater impacts on the watercourse; *Where necessary pre-treatment areas such as oil, sediment and litter traps should be included in the stormwater management design; and *Wetland habitat within the new stormwater infrastructure at the site should be constructed to mitigate the loss of the existing stormwater pond wetland habitat. The facilities should be planted with a mixed community of indigenous sedges and rushes.	High	Artificial depression wetland associated with an existing stormwater pond on the site: PES =D; EIS = low
2	Operation	Stormwater run-off generated on-site	Flow and quality of runoff from the developed site	Modified flow and water quality of stormwater	5	5	5	5	5	1	1	7	1	2	5	1	9	63	M/L	L		Medium/high	

Signed: 
 Toni Belcher (P. Sci. Nat. 400040/10)