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DRAFT
BASIC ASSESSMENT REPORT

FOR THE

PROPOSED UPGRADE OF THE MOORDKUIL RAW WATER PUMP STATION ON PORTIONS 15, 24 AND 25 OF THE FARM KLIPHEUVEL NO. 143, KLEINBRAK RIVIER, MOSSEL BAY MUNICIPALITY, WESTERN CAPE.

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2014 (as amended 7 April 2017)

PREPARED FOR: *Mossel Bay Municipality*
Private Bag X29
Mossel Bay
6500

DATE: 28 October 2025

SES REF NO: UMPS/FK/MBM/10/25

BASIC ASSESSMENT REPORT

THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) AND THE ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS.

GENERAL PROJECT DESCRIPTION

The proposed upgrade of the Moordkuil Raw Water Pump Station on Portions 15, 24 and 25 of the Farm Klipheuvel No. 143, Kleinbrak Rivier, Mossel Bay Municipality, Western Cape.

REQUIREMENTS OF THE BASIC ASSESSMENT PROCESS:

Table 1: Objective of the Basic Assessment Process:

1. The environmental outcomes, impacts and residual risks of the proposed activity must be set out in the basic assessment report.	✓
2. The objective of the basic assessment process is to, through a consultative process— (a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;	✓
(b) identify the alternatives considered, including the activity, location, and technology alternatives;	✓
(c) describe the need and desirability of the proposed alternatives;	✓
(d) through the undertaking of an impact and risk assessment process, inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine— (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and (ii) the degree to which these impacts— (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; and	✓
(e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to— (i) identify and motivate a preferred site, activity and technology alternative; (ii) identify suitable measures to avoid, manage or mitigate identified impacts; and (iii) identify residual risks that need to be managed and monitored.	✓

Table 2: Scope of Assessment and Content of Basic Assessment Reports:

(1) A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include— (a) details of— (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	Section A and Appendix L
(b) the location of the activity, including: (i) the 21 digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Section B and Appendix A1
(c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale; or, if it is— (ii) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Section B and Appendix B1
(d) a description of the scope of the proposed activity, including— (i) all listed and specified activities triggered and being applied for; and (ii) a description of the activities to be undertaken including associated structures and infrastructure;	Section B and Section D
(e) a description of the policy and legislative context within which the development is proposed including— (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	Section C and Section E
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section E

(g) a motivation for the preferred site, activity and technology alternative;	Section E
(h) a full description of the process followed to reach the proposed preferred alternative within the site, including: (i) details of all the alternatives considered; (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; (iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts— (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; (vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; (vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (viii) the possible mitigation measures that could be applied and level of residual risk; (ix) the outcome of the site selection matrix; (x) if no alternatives, including alternative locations for the activity were Investigated, the motivation for not considering such; and (xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;	Section E, Section F and Section H
(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including— (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or	Section G and Section H

addressed by the adoption of mitigation measures;	
(j) an assessment of each identified potentially significant impact and risk, including— (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be avoided, managed or mitigated;	
(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	Section I
(l) an environmental impact statement which contains— (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Section J
(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr;	Section I
(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Section J
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section J
(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Section J
(q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be	Section J

concluded, and the post construction monitoring requirements finalised;	
(r) an undertaking under oath or affirmation by the EAP in relation to— (iii) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and	Declaration of the EAP
(s) where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	Not Applicable
(t) any specific information that may be required by the competent authority; and	Not Applicable
(u) any other matters required in terms of section 24(4)(a) and (b) of the Act.	Not Applicable

ACRONYMS

DAFF:	Department of Forestry and Fisheries
DEA:	Department of Environmental Affairs
DEA& DP:	Department of Environmental Affairs and Development Planning
DHS:	Department of Human Settlement
DoA:	Department of Agriculture
DoH:	Department of Heath
DWS:	Department of Water and Sanitation
EMPr:	Environmental Management Programme
HWC:	Heritage Western Cape
NFEPA:	National Freshwater Ecosystem Protection Assessment
NSBA:	National Spatial Biodiversity Assessment
TOR:	Terms of Reference
WCBSP:	Western Cape Biodiversity Spatial Plan
WCG:	Western Cape Government

ATTACHMENTS

APPENDIX			✓ (Tick) or x (cross)
Appendix A:	Maps		
	Appendix A1:	Locality Map	x
Appendix B:	Appendix B1:	Site development plan(s)	x
	Appendix B2	A map of appropriate scale, which superimposes the proposed development and its associated structures and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffer areas;	x
Appendix C:	Photographs		x
Appendix D:	Biodiversity overlay map		x
Appendix E:	Permit(s) / license(s) / exemption notice, agreements, comments from State Department/Organs of state and service letters from the municipality.		
	Appendix E1:	Final comment/ROD from HWC	x
Appendix F:	I& AP List:		x
Appendix G:	Specialist Report(s)		
	Appendix G1:	Aquatic Biodiversity Impact Assessment Report	x
	Appendix G2:	Botanical Impact Assessment Report	x
	Appendix G3:	Faunal and Avifaunal Compliance Statement Report	x
	Appendix G4:	Exemption of any Palaeontological Impact Assessment Letter	x
	Appendix G5:	Agricultural Compliance Statement Report	x
	Appendix G6:	Concept and Viability Design Report	x
	Appendix G7:	HWC NID	x
Appendix H:	EMPr		x
Appendix I:	Screening tool report		x

SECTION A: ADMINISTRATIVE DETAILS

Highlight the Departmental Region in which the intended application will fall	**Department of Forestry, Fisheries and the Environment**	
Duplicate this section where there is more than one Proponent Name of Applicant/Proponent:	Mossel Bay Municipality	
Name of contact person for Applicant/Proponent (if other):	Mr. S. Naidoo (Municipal Manager: Mossel Bay Municipality)	
Company/ Trading name/State Department/Organ of State:	Mossel Bay Municipality	
Company Registration Number:		
Postal address:	Private Bag X29	
	Mossel Bay	Postal code: 6500
Telephone:	044 606 5082	Cell:
E-mail:	dnaidoo@mosselbay.gov.za	Fax: ( )
Company of EAP:	Sharples Environmental Services cc	
EAP name:	Michael Jon Bennett (EAP) Christiaan Smit (Candidate EAP)	
Postal address:	PO Box 9087	
	George	Postal code:6530
Telephone:	044 873 4923	Cell:
E-mail:	Michael@sescc.net Christiaan@sescc.net	Fax: ( )
Qualifications:	Michael: • BSc in Environmental and Geographic Science & Ocean and Atmospheric Science. Christiaan: • M.Phil. in Environmental Management. • PGD in Environmental Management. • BSc in Biodiversity and Ecology.	
EAP registration no:	Michael (EAP): 2021/3163 Christiaan (Candidate EAP): 2024/8297	
Duplicate this section where there is more than one landowner Name of landowner:	Department of Water and Sanitation	
Name of contact person for landowner (if other):	Glenn Daniel	
Postal address:	Private Bag X16	
	Sanlamhof Bellville	Postal code: 7530
Telephone:	( )	Cell:
E-mail:	DaniellG@dws.gov.za	Fax: ( )
Name of Person in control of the land:	Department of Water and Sanitation	
Name of contact person for person in control of the land:	Glenn Daniel	
Postal address:	Private Bag X16	
	Sanlamhof Bellville	Postal code: 7530
Telephone:	( )	Cell:
E-mail:	DaniellG@dws.gov.za	Fax: ( )

Duplicate this section where there is more than one Municipal Jurisdiction Municipality in whose area of jurisdiction the proposed activity will fall:	Mossel Bay Municipality	
Contact person:	Mr. S. Naidoo	
Postal address:	Private Bag X79	
	Mossel Bay	Postal code:6500
Telephone	044 606 5082	Cell:
E-mail:	dnaidoo@mosselbay.gov.za	Fax: ( )

SECTION B: CONFIRMATION OF SPECIFIC PROJECT DETAILS AS INCLUDED IN THE APPLICATION FORM

1.	Is the proposed development (please tick):	New		Expansion	**X**
2.	Is the proposed site(s) a brownfield of greenfield site? Please explain.				
Brownfield site, the site consists of the existing Moordkuil Pumpstation and associated infrastructure.					
3.1.	Property size(s) of all proposed site(s):				
	Portion 25 of the Farm Klipheuvel No. 143				0.23Ha
	Portion 15 of the Farm Klipheuvel No. 143				0.52Ha
	Portion 24 of the Farm Klipheuvel No. 143				0.21Ha
3.2.	Developed footprint of the existing facility and associated infrastructure (if applicable):				Approx. 400 m^2
3.3.	Development footprint of the proposed development and associated infrastructure size(s) for all alternatives:				
	Proposed pump station footprint including proposed inlet hopper structure, pipes, and drywell (excl. pipes under road) = 249 m^2 New concrete access road (incl. cut / fill slopes) = 1100 m^2 Gabions = 150 m^2 Reinstatement of gravel road (incl. cut / fill slopes) = 810 m^2 Water meter chamber = 20 m^2 Rising main = 11 m^2 Subsoil drainage pipe = 123 m^2 Air valve chambers (3 No.) 25 m^2 Therefore, the total development footprint = 2488 m^2				
3.4.	Provide a detailed description of the proposed development and its associated infrastructure (This must include details of e.g. buildings, structures, infrastructure, storage facilities, sewage/effluent treatment and holding facilities).				

Project Background and Need for the Upgrade:

Sharples Environmental Services cc was appointed by *Neil Lyners and Associates (Pty) Ltd*, on behalf of the *Mossel Bay Municipality*, as the Independent Environmental Assessment Practitioner to conduct the Basic Assessment Report for the Upgrading of the Moordkuil Raw Water Pump Station (Moordkuil Pump Station).

The existing raw water abstraction works (been here since 1980) was designed to abstract 800 litres per second of water from the Moordkuil river and to pump the water to the Klipheuwel Dam for

storage. The Klipheuwel Dam is one of four reservoirs from which Mossel Bay residents receive their water. Only one of the existing two axial pumps is currently operational, which means that the facility is operating at half its original intended design capacity. The existing axial pump station design is outdated and it is not able to be maintained / repaired due to the unavailability of parts and other maintenance restrictions (unable to remove parts easily, axial pumps are not protected from silt and are subject to repeated wear and tear). It is therefore required to upgrade the existing raw water abstraction works and pump station with more modern technology that will be low maintenance, cost effective and efficient (able to abstract water at the full original intended design capacity of 800 litres per second and low maintenance). Please refer to Figure 1 and 2 below for the locality of the Moordkuil Pump Station.

Figure 1: Location of the Moordkuil Pump Station.

Figure 2: Close-up Locality of the Moordkuil Pump Station.

The proposal to upgrade the Moordkuil Pump Station had commenced in 2014, whereby *Sharples Environmental Services cc* obtained an Environmental Authorisation for the proposed upgrades on the 4th of June 2018 (EA Ref: 14/12/16/3/3/1/1840). However, the project was paused and the EA subsequently lapsed. The project has since resumed in September 2024, and therefore a new application and BAR will be done to obtain Environmental Authorisation for the proposed upgrades.

Description of the Proposed Development:

The proposed development project entails the upgrade of the existing Raw Water Abstraction Works and Pump Station. In summary, the following is proposed to be constructed:

- The construction of a new reinforced concrete inlet hopper structure for the pump station;
- The construction of pipe protection ramp structure for the pipes into the existing pump station building.
- An existing informal dirt road off Blesbok Road, provides access to the site. It is proposed to reinstate the existing gravel road (180m long and 3.6m wide) within the same development footprint, which has become almost impassable due to water ingress into the existing layerworks (farmers leaking irrigation channel). The final road is proposed to be 3m wide. 300mm is proposed on each side for the bottom layerworks that have to be wider than the top layerworks to transfer vehicle loads to the soil. The proposed affected area will be 3.6m but the final road will be 3m wide with a stormwarter channel/ditch of about 1m width adjacent. The existing road is approximately 3m wide as well and we can safely assume that its layerworks would also have been similar to the proposed reinstatement design.
- A new concrete road (in an already disturbed area mostly). The new concrete road proposed is has a footprint of approximately 1100m2 and has a width of 3m with a stormwater channel/ditch of about 1m width adjacent.
- Installation of gabions between the cement access road edge and the river;
- Construction of an access ramp to the hopper;
- The construction of a new water meter chamber next to the pump station. The development footprint of the water meter chamber is approximately 20m^2;
- Replacing of three air-valves and construction of new chambers around the air-valves;
- Installation of new pipework, pumps and motor control centers;

- Installation of other mechanical items such as cover, trash-racks, etc.
- Upgrading of the electrical supply and breakers within the existing pump station building;
- Installation of a sediment barrier downstream of the crossing to curb sediment generation in the river;
- Final reinstatement of the river bed to the requirements of the CEMP;

The concrete inlet hopper structure is proposed to be anchored to the bedrock by means of piling foundations. In order to install the piles, a pile rig needs to obtain access in the correct position. It is for this reason that a temporary platform structure is required to be constructed within the Moordkuil River.

The area where the inlet hopper (and the associated pile foundations) is proposed to be constructed is below the 1:10 year floodline, within the river. It is therefore required to construct a coffer dam around the area where the inlet hopper structure is proposed to be built in order to have a dry area for construction and concrete setting.

All of the above, except for the proposed temporary platform, cement access road, new water meter chamber and sediment barrier, are proposed within the existing development footprint.

It is also proposed to demolish the existing underwater cement bag wall, existing above water concrete steps and the existing underwater concrete plinths for the existing pipes.
Please refer to the proposed site layout plans below.

Upon recommencement of the project in late 2024, an underwater survey was undertaken to assess changes in the riverbed topography since 2014. ASP Tech, who undertook the initial sedimentation study, was subsequently appointed by Lyners to conduct a Verification Study to evaluate, among other factors, the appropriateness of the original intake structure in light of the updated bathymetry survey. The resulting report is provided as Appendix G6. During the verification study on the riverbed topography a significant rock outcrop upstream of the proposed intake structure was identified. As a result, it was determined that the outcrop would need to be removed, and the intake structure enlarged beyond the dimensions proposed in the 2014 – 2016 feasibility study to ensure effective operation.

An alternative solution involves relocating the intake structure directly onto the rock outcrop, which presents several technical and economic advantages:

- Improved Foundation Conditions: Relocating the intake would result in more favourable geotechnical conditions, potentially yielding a cost saving of approximately R1.7 million.
- Operational Continuity: By situating the intake upstream at the rock outcrop, it may be possible to maintain operation of the existing pump station throughout the construction period.
- Minimal Disruption to Adjacent Infrastructure: The nearby farmers' pump station, located just downstream of the existing station, would remain unaffected.

Should the existing pump station remain operational during construction, an estimated cost saving of approximately R24.5 million could be realized over the 18-month construction period by avoiding the need to purchase water from the Wolwedans Dam and the associated saving in chemicals at the water treatment works.

A new dry well pump station could be constructed at an estimated cost of approximately R2.4 million. This facility would enable continuous operation of the existing pump station with minimal interruption of the water abstraction during the construction phase. An additional benefit of constructing a permanent dry well is that it would allow the end-suction pumps to be installed at a lower elevation. This could possibly eliminate the requirement for immersible pumps within the intake structure in the future and enable the use of foot valves in combination with a priming system. A new dry well will also provide additional space for the installation of the proposed electrical equipment as the existing MCC room is very small.

Based on the abovementioned, Option 3 (wetwell on rock outcrop with drywell next to pump station, Concept Layout 2) is recommended for implementation for the Moordkuil Pump Station upgrade, as it offers the lowest capital and operational costs, best operational reliability, and acceptable environmental impact (Please refer to the Concept and Viability Design Report – Appendix G6).

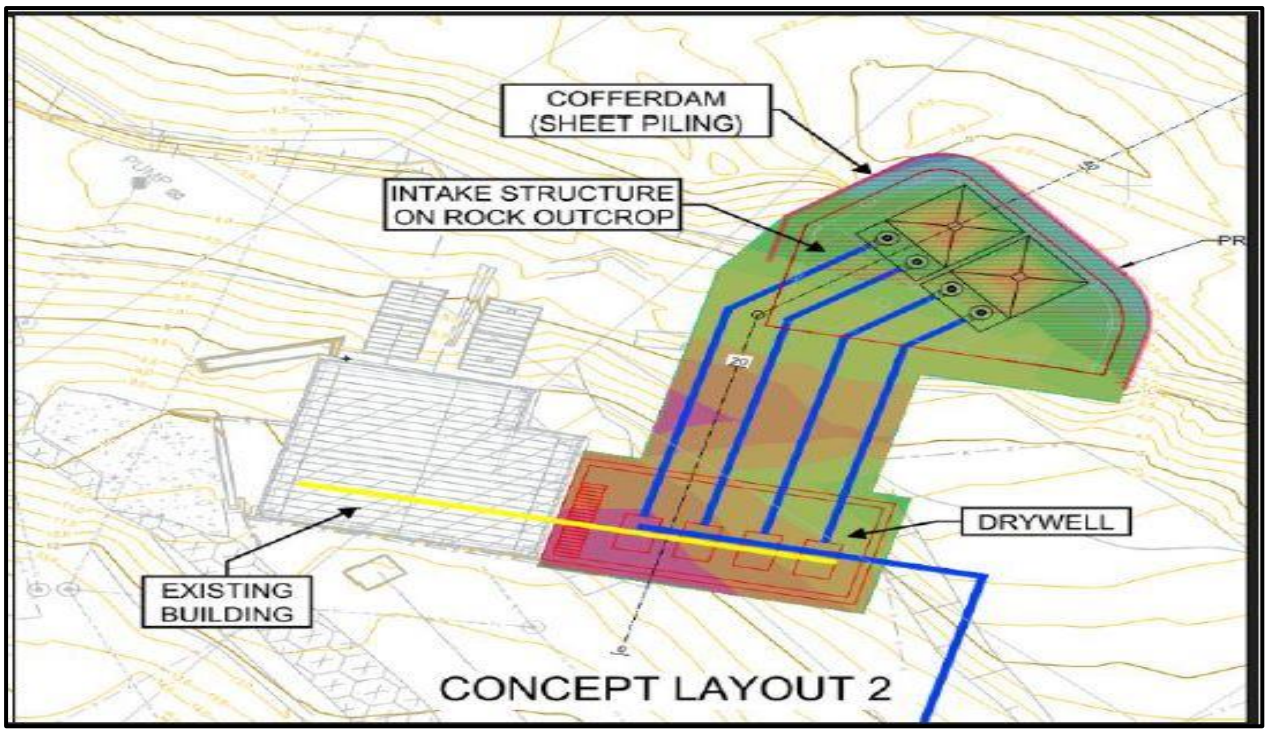

Figure 3: Option 3 – Concept Layout 2.

To maximise the value of existing assets, a phased approach should be adopted:

- Phase 1: Utilisation of existing immersible and end-suction pumps that was bought based on the previous (2014 – 2016) investigation.
- Phase 2: Replacement of the immersible pumps with foot valves and installing larger single stage end suction pumps in die drywell. The detailed considerations for this system, such as the operation of the foot valves and the suction pipework priming, will be included in the detailed design report.

The hydraulic design ensures the intake structure is self-scouring and resilient to sediment deposition. The civil design provides for robust, flood-resistant structures, with careful integration of new and existing facilities to maintain operational continuity during construction.

The mechanical design supports both current and future pump configurations, with appropriate safety margins for motor sizing and lifting equipment.

The electrical design requires upgrading of the transformer and cabling to accommodate increased power demand, with a focus on direct online (DOL) drives for reliability and ease of maintenance.

The control system will be kept as simple as possible, with automated protection, measurement, and reporting. Remote monitoring will be implemented for real-time status updates, but remote control will not be enabled, as per client requirements.

Three alternative site camp locations are also proposed, however based on the specialist assessments it was determined that site camp option 3 is the only feasible option. Please refer to the Figures below showing the proposed services layout, the working area and site camps, and Google Earth Imagery of the construction footprint.

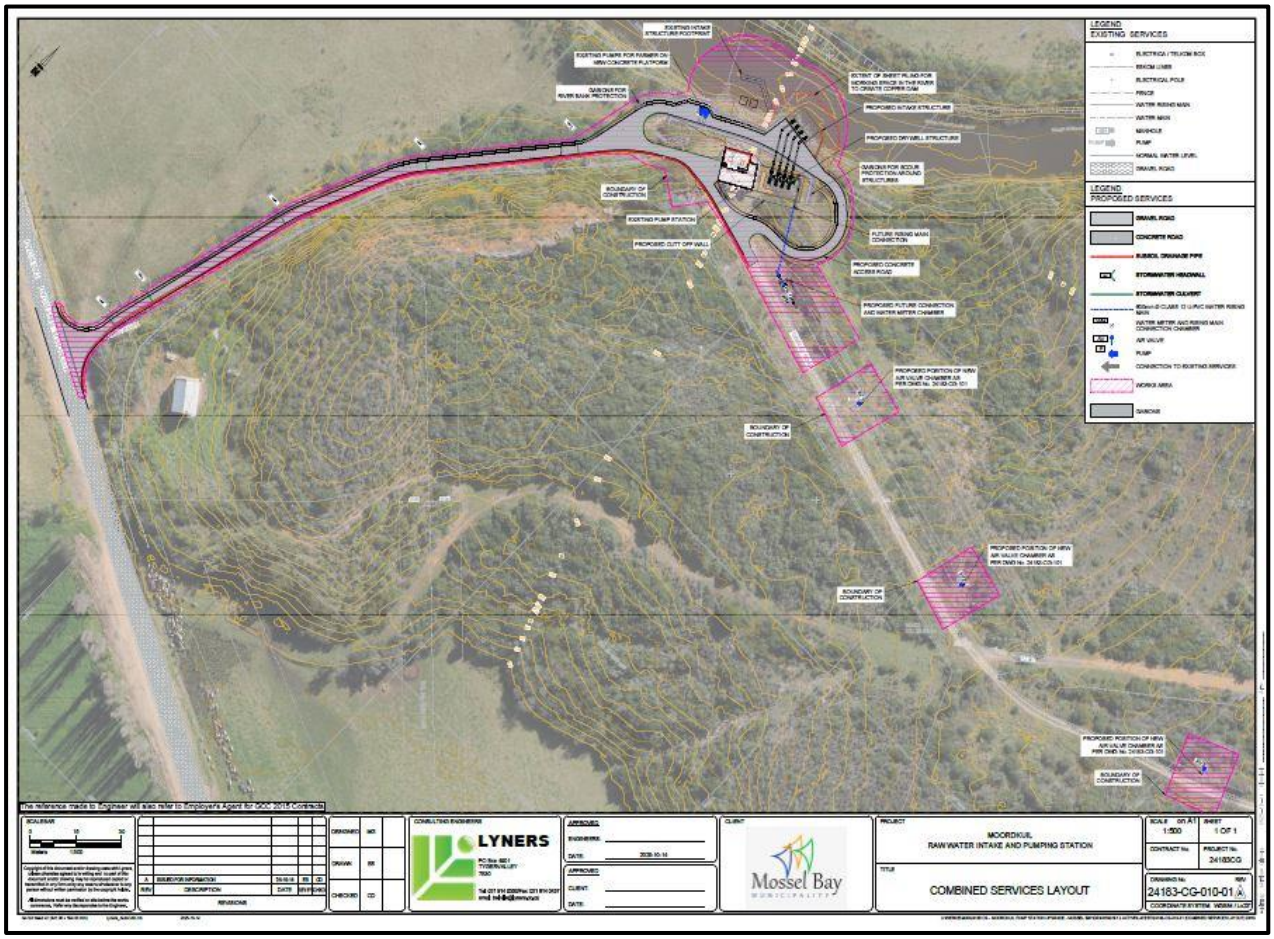

Figure 4: Proposed Services Layout.

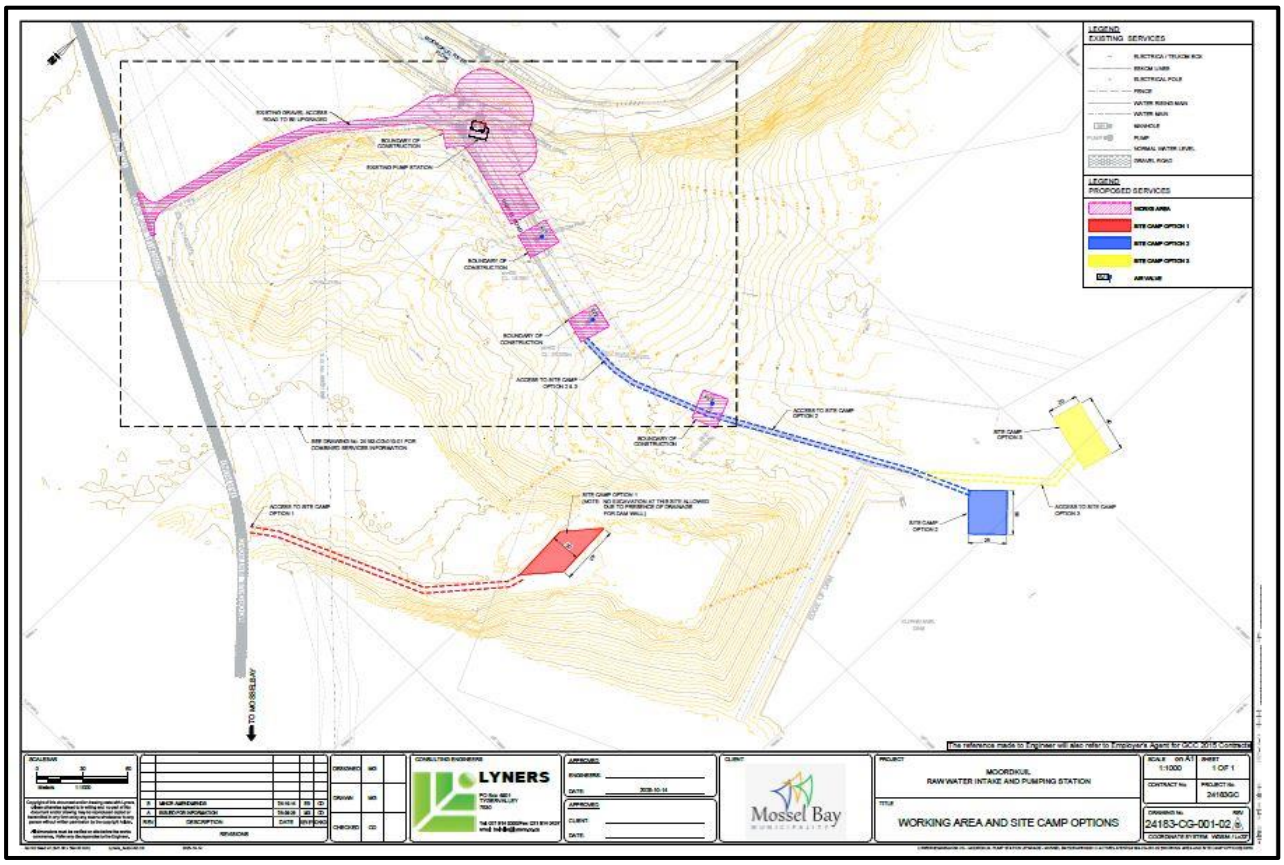

Figure 5: Working Area and Site Camp Locations Layout.

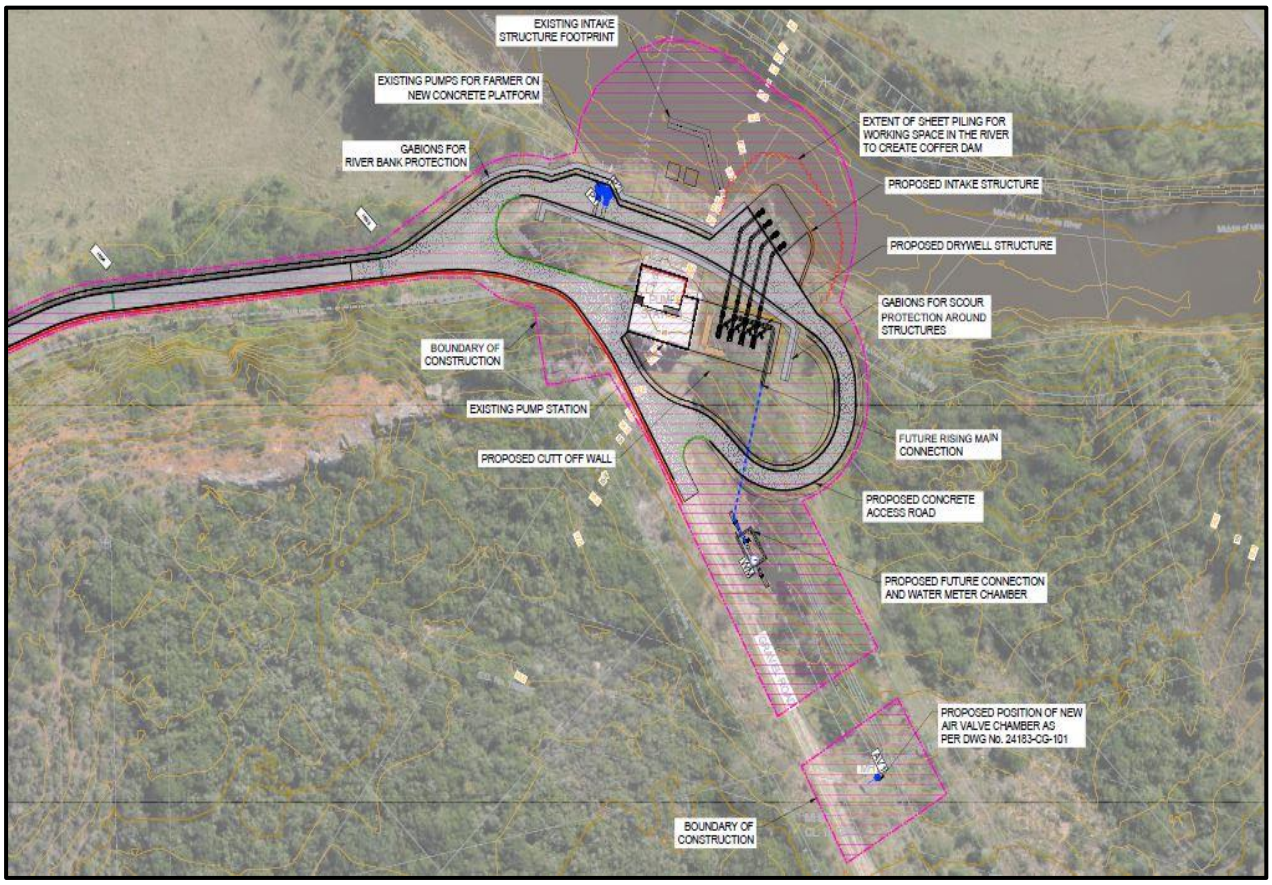

Figure 6: Proposed Upgrades to the Moordkuil Pump Station.

3.5.	Indicate how access to the proposed site(s) will be obtained for all alternatives.

An existing informal dirt road off Blesbok Road, provides access to the site. It is proposed to reinstate the existing gravel road (180m long and 3.6m wide) within the same development footprint, which has become almost impassable due to water ingress into the existing layerworks (farmers leaking irrigation channel). The final road is proposed to be 3m wide. 300mm is proposed on each side for the bottom layerworks that have to be wider than the top layerworks to transfer vehicle loads to the soil. The proposed affected area will be 3.6m but the final road will be 3m wide with a stormwarter channel/ditch of about 1m width adjacent. The existing road is approximately 3m wide as well and we can safely assume that its layerworks would also have been similar to the proposed reinstatement design.

It is also proposed to construct a short concrete access road (in an already disturbed area mostly). The new concrete road proposed footprint is approximately 1100m^2 and has a width of 3m with a stormwater channel/ditch of about 1m width adjacent.

3.6.	SG Digit code(s) of the proposed site(s) for all alternatives:	
	Portion 25 of the Farm Klipheuvel No. 143	C05100000000014300025
	Portion 15 of the Farm Klipheuvel No. 143	C05100000000014300015
	Portion 24 of the Farm Klipheuvel No. 143	C05100000000014300024
3.7.	Coordinates of the proposed site(s) for all alternatives (corner points):	

Portion 25 of the Farm Klipheuvel No. 143	Latitude (S)	° 34	‘03	“11.50
	Longitude (E)	° 22	‘08	“05.07
	Latitude (S)	° 34	‘03	“13.04
	Longitude (E)	° 22	‘08	“05.49
	Latitude (S)	° 34	‘03	“12.56
	Longitude (E)	° 22	‘08	“07.16
	Latitude (S)	° 34	‘03	“11.08
	Longitude (E)	° 22	‘08	“06.90
Portion 15 of the Farm Klipheuvel No. 143	Latitude (S)	° 32	‘03	“11.08
	Longitude (E)	° 22	‘08	“06.90
	Latitude (S)	° 34	‘03	“11.61
	Longitude (E)	° 22	‘08	“07.01
	Latitude (S)	° 34	‘03	“12.24
	Longitude (E)	° 22	‘08	“10.27
	Latitude (S)	° 34	‘03	“10.89
	Longitude (E)	° 22	‘08	“11.47
	Latitude (S)	° 34	‘03	“09.80
	Longitude (E)	° 22	‘08	“09.24
Portion 24 of the Farm Klipheuvel No. 143	Latitude (S)	° 34	‘03	“11.61
	Longitude (E)	° 22	‘08	“07.01
	Latitude (S)	° 34	‘03	“17.56
	Longitude (E)	° 22	‘08	“07.16
	Latitude (S)	° 34	‘03	“13.10
	Longitude (E)	° 22	‘08	“09.59
	Latitude (S)	° 34	‘03	“12.24
	Longitude (E)	° 22	‘08	“10.28

SECTION C: LEGISLATION/POLICIES AND/OR GUIDELINES/PROTOCOLS

1. Exemption applied for in terms of the NEMA and the NEMA EIA Regulations

Has exemption been applied for in terms of the NEMA and the NEMA EIA Regulations. If yes, include a copy of the exemption notice in Appendix E18.	YES	**NO**

2. Is the following legislation applicable to the proposed activity or development.

The National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008) ("ICMA"). If yes, attach a copy of the comment from the relevant competent authority as Appendix E4 and the pre-approval for the reclamation of land as Appendix E19.	YES	**NO**
The National Heritage Resources Act, 1999 (Act No. 25 of 1999) ("NHRA"). If yes, attach a copy of the comment from Heritage Western Cape as Appendix E1.	YES	**NO**
The National Water Act, 1998 (Act No. 36 of 1998) ("NWA"). If yes, attach a copy of the comment from the DWS as Appendix E3.	**YES**	NO
The National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) ("NEM:AQA"). If yes, attach a copy of the comment from the relevant authorities as Appendix E13.	YES	**NO**
The National Environmental Management Waste Act (Act No. 59 of 2008) ("NEM:WA")	YES	**NO**
The National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004 ("NEMBA").	**YES**	NO
The National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) ("NEMPAA").	YES	**NO**
The Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983). If yes, attach comment from the relevant competent authority as Appendix E5.	YES	**NO**

3. Other legislation

List any other legislation that is applicable to the proposed activity or development.

- Amended Environmental Impact Assessment Regulations, GN No. R. 324 – 327 (7 April 2017)
- The Constitution of the Republic of South Africa, 1996 (Act 108 of 1996)
- Spatial Planning and Land Use Management Act, No. 16 of 2013 (SPLUMA)
- Infrastructure Development Act, 2014 (Act No. 23 of 2014)
- The National Environmental Management Laws Amendment Act, 2022

4. Policies

Explain which policies were considered and how the proposed activity or development complies and responds to these policies.

- National Development Plan 2030 (2012);
- Western Cape Provincial Spatial Development Framework (PSDF) 2014;
- Mossel Bay Municipality Spatial Development Framework (SDF);

5. Guidelines

List the guidelines which have been considered relevant to the proposed activity or development and explain how they have influenced the development proposal.

Guideline on Need and Desirability (2013/2017)	Guideline considered during the assessment of the Need and Desirability of the proposed development project.
Guideline on Environmental Management Plans (2005)	Guideline considered in the compilation of the EMP attached to this Basic Assessment Report.
Guideline for the Review of Specialist Input into the EIA Process (2005)	Guideline considered during the review and integration of specialist input into this Basic Assessment Report.
Integrated Environmental Management Information Series 7: Cumulative Effects Assessment (2004)	Guideline considered during the assessment of the cumulative effect of the identified impacts.

Guideline on Public Participation (2013)	Guideline considered in the undertaking of the public participation for the proposed development. All relevant provisions contained in the guideline were adhered to in the basic assessment process as appropriate, except where an exemption/deviation has been granted by the Competent Authority.
Guideline on Alternatives (2013)	Guideline considered when identifying and evaluating possible alternatives for the proposed development. Alternatives that were considered in the impact assessment process are reported on in this Basic Assessment Report (see Section E).

6. Protocols

Explain how the proposed activity or development complies with the requirements of the protocols referred to in the NOI and/or application form

The following specialist studies were undertaken for this proposal (as agreed with DFFE officials during the Pre-Application Meeting held on the 13th of March 2025):

Specialist Assessment	Assessment Protocol
Terrestrial Biodiversity Impact Assessment – Compliance Statement	Terrestrial
Animal Species Assessment – Compliance Statement	Terrestrial Animal Species
Aquatic Biodiversity Impact Assessment	Aquatic
Plant Species Assessment	Terrestrial Plant Species
Agricultural Impact Assessment – Compliance Statement	Agriculture
Archaeological and Cultural Heritage Impact Assessment – NID	General
Palaeontology Impact Assessment – Compliance Statement	General

SECTION D: APPLICABLE LISTED ACTIVITIES

List the applicable activities in terms of the NEMA EIA Regulations

Activity No(s):	Provide the relevant **Basic Assessment Activity(ies)** as set out in **Listing Notice 1**	Describe the portion of the proposed development to which the applicable listed activity relates.
12	**The development of—** (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or **(ii) infrastructure or structures with a physical footprint of 100 square metres or more;** **where such development occurs—** **(a) within a watercourse;** (b) in front of a development setback; or **(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse**; —	The development of the intake structure, pumps, pipes, drywell, water meter chamber and cement access road all occur within 32 meters of the Moordkuil River and exceeds the 100 square meters threshold. **Therefore, this activity will be triggered.**

	excluding— (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; (ee) where such development occurs within existing roads, road reserves or railway line reserves; or (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.	
19	**The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse**; but excluding where such infilling, depositing, dredging, excavation, removal or moving— (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or (e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.	The work in and along the river for the construction of the intake structure and coffer dam will require the removal of more than 10 cubic meters of soil from the Moordkuil River. **Therefore, this activity will be triggered**.
45	**The expansion of infrastructure for the bulk transportation of water or storm water where the existing infrastructure—** **(i) has an internal diameter of 0,36 metres or more;** or (ii) has a peak throughput of 120 litres per second or more; and	The current design throughput capacity of the Raw Water Abstraction Works is 800 litres per second. Only one of the two axial pumps is however operational so the facility has an operational capacity of 400 litres per second. It is proposed that the facility

	(a) where the facility or infrastructure is expanded by more than 1 000 metres in length; or (b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more; excluding where such expansion— (aa) relates to transportation of water or storm water within a road reserve or railway line reserve; or (bb) will occur within an urban area.	will have a throughput capacity, the same as its current design capacity, of 800 litres per second so it is not proposed to increase the current design throughput capacity. The internal diameter of the existing pipeline infrastructure does exceed 360mm diameter and it is proposed to upgrade the existing axial pumps and water pipeline infrastructure **therefore this activity is triggered.**
Activity No(s):	Provide the relevant **Basic Assessment Activity(ies)** as set out in **Listing Notice 3**	Describe the portion of the proposed development to which the applicable listed activity relates.
4	**The development of a road wider than 4 metres with** **a reserve less than 13,5 metres.** **i. Western Cape** i. Areas zoned for use as public open space or equivalent zoning; ii. Areas outside urban areas; **(aa) Areas containing indigenous vegetation;** (bb) Areas on the estuary side of the development setback line or in an estuarine functional zone where no such setback line has been determined; or iii. Inside urban areas: (aa) Areas zoned for conservation use; or (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority.	The proposed new cement access road ranges in width from 3m to 7.4m. The site is outside of an urban area, in an area containing indigenous vegetation. The proposed road reserve will be less than 13.5m as the road reserve in this case is the size of the road (3m to 7.4m in one section). This activity is **therefore triggered** because a portion of the road is wider then 4m with a reserve less than 13.5m, in the Western Cape, outside of an urban area and the site contains indigenous vegetation.
12	**The clearance of an area of 300 square metres or more of indigenous vegetation** except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. **i. Western Cape** **i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity** **Assessment 2004;** **ii. Within critical biodiversity areas identified in bioregional plans;** iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas;	The proposed development will require the clearance of more than 300 square meters of indigenous vegetation. The Western Cape Biodiversity Spatial Plan of 2023 maps the proposed development as being located within CBA2: Terrestrial; CBA2: Earmarked; CBA2: Threatened Ecosystem; CBA2: Aquatic; CBA2: River; CBA2: Estuary; CBA: Terrestrial; CBA; Threatened Ecosystem; CBA: Aquatic; CBA: Estuary; CBA: River. The vegetation unit also has a threat status of critically endangered. **Therefore this activity will be triggered.**

	iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning; or v. On land designated for protection or conservation purposes in an Environmental Management Framework adopted in the prescribed manner, or a Spatial Development Framework adopted by the MEC or Minister.	
14	**The development of—** (i) dams or weirs, where the dam or weir, including Infrastructure and water surface area exceeds 10 square metres; or **(ii) infrastructure or structures with a physical footprint of 10 square metres or more;** **where such development occurs—** **(a) within a watercourse;** (b) in front of a development setback; or **(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;** excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour. **i. Western Cape** i. Outside urban areas: (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) World Heritage Sites; (dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (ee) Sites or areas listed in terms of an international convention; **(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans**; (gg) Core areas in biosphere reserves; or (hh) Areas on the estuary side of the development setback line or in an estuarine functional zone where no such setback line has been determined.	The new intake structure and associated infrastructure will be constructed within the river, all other infrastructure (cement access road, water meter chamber, drywell, rising main) will be constructed within 32 meters of the Moordkuil River. The area is also mapped as an aquatic CBA, **therefore this activity will be triggered**.

SECTION E: PLANNING CONTEXT AND NEED AND DESIRABILITY

1.	Provide a description of the preferred alternative.

The preferred alternative entails the upgrade of the existing Raw Water Abstraction Works and Pump Station. In summary, the following is proposed to be constructed:

- The construction of a new reinforced concrete inlet hopper structure for the pump station;
- The construction of pipe protection ramp structure for the pipes into the existing pump station building.
- An existing informal dirt road off Blesbok Road, provides access to the site. It is proposed to reinstate the existing gravel road (180m long and 3.6m wide) within the same development footprint, which has become almost impassable due to water ingress into the existing layerworks (farmers leaking irrigation channel). The final road is proposed to be 3m wide. 300mm is proposed on each side for the bottom layerworks that have to be wider than the top layerworks to transfer vehicle loads to the soil. The proposed affected area will be 3.6m but the final road will be 3m wide with a stormwarter channel/ditch of about 1m width adjacent. The existing road is approximately 3m wide as well and we can safely assume that its layerworks would also have been similar to the proposed reinstatement design.
- A new concrete road (in an already disturbed area mostly). The new concrete road proposed is has a footprint of approximately 1100m2 and has a width of 3m with a stormwater channel/ditch of about 1m width adjacent.
- Installation of gabions between the cement access road edge and the river;
- Construction of an access ramp to the hopper;
- The construction of a new water meter chamber next to the pump station. The development footprint of the water meter chamber is approximately 20m^2;
- Replacing of three air-valves and construction of new chambers around the air-valves;
- Installation of new pipework, pumps and motor control centers;
- Installation of other mechanical items such as cover, trash-racks, etc.
- Upgrading of the electrical supply and breakers within the existing pump station building;
- Installation of a sediment barrier downstream of the crossing to curb sediment generation in the river;
- Final reinstatement of the river bed to the requirements of the CEMP;

The concrete inlet hopper structure is proposed to be anchored to the bedrock by means of piling foundations. In order to install the piles, a pile rig needs to obtain access in the correct position. It is for this reason that a temporary platform structure is required to be constructed within the Moordkuil River.

The area where the inlet hopper (and the associated pile foundations) is proposed to be constructed is below the 1:10 year floodline, within the river. It is therefore required to construct a coffer dam around the area where the inlet hopper structure is proposed to be built in order to have a dry area for construction and concrete setting.

All of the above, except for the proposed temporary platform, cement access road, new water meter chamber and sediment barrier, are proposed within the existing development footprint.

It is also proposed to demolish the existing underwater cement bag wall, existing above water concrete steps and the existing underwater concrete plinths for the existing pipes.

Upon recommencement of the project in late 2024, an underwater survey was undertaken to assess changes in the riverbed topography since 2014. ASP Tech, who undertook the initial sedimentation study, was subsequently appointed by Lyners to conduct a Verification Study to evaluate, among other factors, the appropriateness of the original intake structure in light of the updated bathymetry survey. The resulting report is provided as Appendix G6. During the verification study on the riverbed topography a significant rock outcrop upstream of the proposed intake structure was identified. As

a result, it was determined that the outcrop would need to be removed, and the intake structure enlarged beyond the dimensions proposed in the 2014 – 2016 feasibility study to ensure effective operation.

An alternative solution involves relocating the intake structure directly onto the rock outcrop, which presents several technical and economic advantages:

- Improved Foundation Conditions: Relocating the intake would result in more favourable geotechnical conditions, potentially yielding a cost saving of approximately R1.7 million.
- Operational Continuity: By situating the intake upstream at the rock outcrop, it may be possible to maintain operation of the existing pump station throughout the construction period.
- Minimal Disruption to Adjacent Infrastructure: The nearby farmers' pump station, located just downstream of the existing station, would remain unaffected.

Should the existing pump station remain operational during construction, an estimated cost saving of approximately R24.5 million could be realized over the 18-month construction period by avoiding the need to purchase water from the Wolwedans Dam and the associated saving in chemicals at the water treatment works.

A new dry well pump station could be constructed at an estimated cost of approximately R2.4 million. This facility would enable continuous operation of the existing pump station with minimal interruption of the water abstraction during the construction phase. An additional benefit of constructing a permanent dry well is that it would allow the end-suction pumps to be installed at a lower elevation. This could possibly eliminate the requirement for immersible pumps within the intake structure in the future and enable the use of foot valves in combination with a priming system. A new dry well will also provide additional space for the installation of the proposed electrical equipment as the existing MCC room is very small.

Based on the abovementioned, Option 3 (wetwell on rock outcrop with drywell next to pump station, Concept Layout 2) is recommended for implementation for the Moordkuil Pump Station upgrade, as it offers the lowest capital and operational costs, best operational reliability, and acceptable environmental impact (Please refer to the Concept and Viability Design Report – Appendix G6).

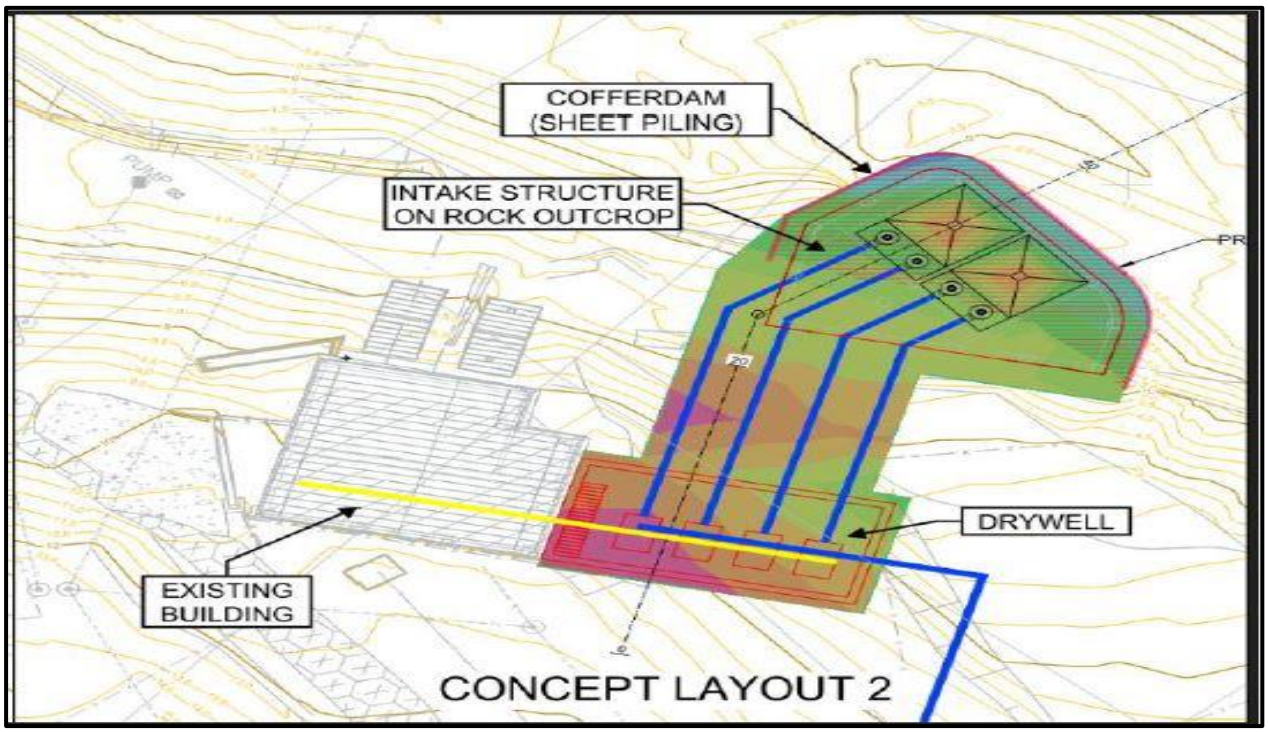

Figure 7: Option 3 – Concept Layout 2.

To maximise the value of existing assets, a phased approach should be adopted:

- Phase 1: Utilisation of existing immersible and end-suction pumps that was bought based on the previous (2014 – 2016) investigation.
- Phase 2: Replacement of the immersible pumps with foot valves and installing larger single stage end suction pumps in die drywell. The detailed considerations for this system, such as the operation of the foot valves and the suction pipework priming, will be included in the detailed design report.

The hydraulic design ensures the intake structure is self-scouring and resilient to sediment deposition. The civil design provides for robust, flood-resistant structures, with careful integration of new and existing facilities to maintain operational continuity during construction.

The mechanical design supports both current and future pump configurations, with appropriate safety margins for motor sizing and lifting equipment.

The electrical design requires upgrading of the transformer and cabling to accommodate increased power demand, with a focus on direct online (DOL) drives for reliability and ease of maintenance.

The control system will be kept as simple as possible, with automated protection, measurement, and reporting. Remote monitoring will be implemented for real-time status updates, but remote control will not be enabled, as per client requirements.

Three alternative site camp locations are also proposed, however based on the specialist assessments it was determined that site camp option 3 is the only feasible option.

2.	Explain how the proposed development is in line with the existing land use rights of the property as you have indicated in the NOI and application form? Include the proof of the existing land use rights granted in Appendix E21.

The proposed development entails the upgrading of the existing Moordkuil Pump Station, which has been operating for more than 40 years. The proposed development is therefore in line with the existing land use rights of the property.

3.	Explain how potential conflict with respect to existing approvals for the proposed site (as indicated in the NOI/and or application form) and the proposed development have been resolved.

The previous Environmental Authorisation has lapsed; it was confirmed by DFFE that a new application and BAR must be conducted to obtain Environmental Authorisation for the proposed upgrades.

4.	Explain how the proposed development will be in line with the following?
4.1	The Provincial Spatial Development Framework.

The PSDF (2014) highlights that investment in infrastructure (including maintenance and upgrading of existing infrastructure) is needed to bring about the desired urban spatial transitions envisaged in the PSDF. The proposed refurbishment of the existing raw water abstraction works and pump station may indirectly support/ facilitate further development in the Mossel Bay area, as continued development is dependent on the availability of sufficient water resources. The proposed development is thus aligned with the 2014 PSDF.

4.2	The Integrated Development Plan of the local municipality.

The Mossel Bay Municipality is cognizant of the National and Provincial Policy development directives and has as such also aligned its development strategy to these while pursuing its constitutional mandates. The Municipal Key Performance Areas (KPA's) and Strategic Objectives set the strategic tone and pave the direction for future developments, investments and public/private partnership interventions. The Key Performance Areas and Strategic Objectives will guide service delivery and development over the next five years. The Municipality will endeavour to demonstrate alignment to these overarching objectives in all documentation such as Annual Budgets, the Service Delivery Budget and Implementation Plan (SDBIP), Performance Agreements of Section 57 Managers as well as performance reporting. The latter is essential to ensure that every

single investment in the outflow of projects and programmes are identified, planned and designed to contribute towards the realization of the Municipality's overarching developmental objectives.

One of the Key Performance Areas listed in the 2025/2026 IDP is "Basic Service Delivery and Infrastructure Development".

The associated Focus Areas include:

- Water Provision;
- Sewage and Sanitation Services;
- Household Electricity And Lighting;
- Housing and Serviced Site Opportunities;
- Provide Public Transport and Road Infrastructure;
- Solid Waste Management;
- Project Management and Technical Support Services.

The proposed development will result in more water being available from the Klipheuwel Dam for treatment which will reduce the risk of water restrictions and the risk of the municipality not being able to provide the basic service of water supply to the community.

4.3.	The Spatial Development Framework of the local municipality.

The Mossel Bay SDF (Draft 2022-2023) identifies "the provision and maintenance of adequate and sustainable infrastructure to support socio-economic growth" as a key spatial objective. The SDF highlights that continued residential, industrial and tourism expansion along the Mossel Bay – Hartenbos – Dana Bay corridor is placing increasing pressure on bulk water supply infrastructure. Upgrading the Moordkuil Pump Station directly supports this strategic goal by strengthening the regional bulk water system that supplies the main urban areas. Doubling the pumping capacity will ensure sufficient and reliable water delivery to meet the projected urban, industrial and tourism related growth identified in the SDF. This represents proactive infrastructure planning that aligns with the SDF's emphasis on "infrastructure led growth" instead of reactive service provision.

The SDF identifies water scarcity and climate variability as major risks to the municipality's long term resilience. One of its key environmental objectives is to strengthen infrastructure that enhances climate adaptation capacity, particularly in the face of recurring droughts and increasing water demand. The proposed upgrades directly advances this objective by increasing water transfer efficiency and redundancy in the bulk water supply network of the municipality. It reduces the municipality's vulnerability to supply interruptions and supports a more adaptive and resilient water management system. This aligns with the SDF's Sustainability Objective 3: "to build environmental and infrastructural resilience through responsible resource management".

The Environmental Management Framework Section of the SDF classifies the Moordkuil area as Low to Medium with regards to the Environmental Sensitivity Zone. Here infrastructure upgrades within existing footprints are considered desirable, provided that best practice environmental management measures are implemented. Because the proposed upgrade will occur within an existing disturbed footprint, it is consistent with the EMF's guideline that new bulk infrastructure should be located or expanded within already transformed areas and avoid sensitive biodiversity corridors. The project therefore aligns with the spatial environmental directives of the SDF-EMF integration.

4.4.	The Environmental Management Framework applicable to the area.

No EMF for Mossel Bay.

5.	Explain how comments from the relevant authorities and/or specialist(s) with respect to biodiversity have influenced the proposed development.

To be included in the Final BAR.

Three site camp locations were proposed for the construction process, however upon investigation the specialists determined that only site camp option 3 would be feasible. Site camp option 2 harbours sensitive botanical elements and sits within an aquatic buffer zone, and site camp option 1 sits in a unchanneled valley bottom wetland.

6.	Explain how the Western Cape Biodiversity Spatial Plan (including the guidelines in the handbook) has influenced the proposed development.

Source: Botanical Impact Assessment: Proposed Upgrading of Moordkuil Pump Station, Mossel Bay. Complied by Dr. Mark Berry of MB Botanical Surveys.

Figure 8: Extract of the Western Cape Biodiversity Network Map.

A large part of the project area falls inside the Western Cape biodiversity network. The pipeline route and two of the camp site options fall inside a terrestrial critical biodiversity area (CBA) and degraded critical biodiversity areas (CBA2). The pumpstation itself and camp site option below the dam wall encroach on aquatic (river) CBA's and degraded aquatic CBA's. Reasons for the mapped units include the presence of a climate adaption corridor, ecological processes (FEPA river corridor), threatened vegetation type (albeit the wrong type), threatened vertebrate habitat (bontebok), estuary (Klein Brak Estuary), river types (ephemeral upper foothill river & permanent lower foothill river), wetland types (channelled & unchannelled valley bottom wetlands) and water resource protection (Southern Coastal Belt). It was previously noted that most of the intact vegetation in the Mossel Bay interior is found on the steeper hill slopes. These areas are thus considered of great value in the biodiversity network. The CBA2's correspond with transformed areas, such as pastures and roads. The Moordkuil River has been mapped as an aquatic CBA. The closest protected area to the site is the Doring River Wilderness Area, located 15 km away to the north.

CBA's are defined as areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure (Pool-Stanvliet, 2017). These sites are selected for meeting national targets for species, habitats and ecological processes (Pool-Stanvliet, 2017). Many of these areas support known occurrences of threatened plant species, and/or may be essential elements of designated ecological corridors. Loss of designated CBA's is therefore not recommended. ESA's, on the other hand, are supporting zones required to prevent the degradation of CBA's and Protected Areas.

7.	Explain how the proposed development is in line with the intention/purpose of the relevant zones as defined in the ICMA.
Not Applicable.	

8.	Explain whether the screening report has changed from the one submitted together with the application form. The screening report must be attached as Appendix I.
The Screening Tool Report has not changed.	
9.	Explain how the proposed development will optimise vacant land available within an urban area.
The proposed development will not make use of vacant land within an urban area, therefore this is not applicable.	
10.	Explain how the proposed development will optimise the use of existing resources and infrastructure.
The proposal is to upgrade the existing Moordkuil Pump Station, majority of the upgrades will tie into existing infrastructure.	
11.	Explain whether the necessary services are available and whether the local authority has confirmed sufficient, spare, unallocated service capacity. (Confirmation of all services must be included in Appendix E16).
No additional bulk services are required as the proposal is for the upgrade of an existing facility.	
12.	In addition to the above, explain the need and desirability of the proposed activity or development in terms of this Department's guideline on Need and Desirability (March 2013) or the DEA's Integrated Environmental Management Guideline on Need and Desirability. This may be attached to this BAR as Appendix K.

In order to properly interpret the EIA Regulations' requirement to consider "need and desirability", it is necessary to turn to the principles contained in NEMA, which serve as a guide for the interpretation, administration and implementation of NEMA and the EIA Regulations. With regard to the issue of "need", it is important to note that this "need" is not the same as the "general purpose and requirements" of the activity. While the "general purpose and requirements" of the activity might to some extent relate to the specific requirements, intentions and reasons that the applicant has for proposing the specific activity, the "need" relates to the interests and needs of the broader public. In this regard the NEMA principles specifically inter alia require that environmental management must:

- "place people and their needs at the forefront of its concern" and equitably serve their interests;
- "be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option;
- pursue environmental justice "so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person";
- ensure that decisions take "into account the interests, needs and values of all interested and affected parties"; and
- ensure that the environment is "held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage".

Community wellbeing – Increasing Water Demand:
The Moordkuil Pump Station is a critical component of the regional bulk water supply network serving the Mossel Bay Local Municipality and its residents. The proposed upgrade will double its current capacity from 400 l/s to 800 l/s and this will help to address the growing domestic, commercial and industrial water demands within the municipal area.

Water Security:
South africa is currently experiencing a water crisis with dam levels exceedingly low. The Garden Route Region is particularly water stressed and there is increasing pressure on water resources. By increasing the current abstraction volume from 400 to 800 litres per second, as per the facilities intended original design, it will contribute significantly to increasing the volume of water stored in the Klipheuwel Dam, one of the main water sources of the Mossel Bay Municipality.

System Efficiency and Reliability:
The current system operates under high strain and the pipes are at risk of being washed away by flooding events. This increases the risk of mechanical failure, upgrading the facility will improve operational redundancy, reduce energy strain, and allow for maintenance without disrupting water delivery.

SECTION F: PUBLIC PARTICIPATION

The Public Participation Process ("PPP") must fulfil the requirements as outlined in the NEMA EIA Regulations and must be attached as Appendix F. Please note that If the NEM: WA and/or the NEM: AQA is applicable to the proposed development, an advertisement must be placed in at least two newspapers.

1. Confirm that the PPP as indicated in the application form has been complied with. All the PPP must be included in Appendix F.

   To be included in the Final BAR.

2. Confirm which of the State Departments and Organs of State indicated in the Notice of Intent/application form were consulted with.

   To be included in the Final BAR.

3. If any of the State Departments and Organs of State were not consulted, indicate which and why.

   To be included in the Final BAR.

4. if any of the State Departments and Organs of State did not respond, indicate which.

   To be included in the Final BAR

5. Provide a summary of the issues raised by I&APs and an indication of the manner in which the issues were incorporated into the development proposal.

   To be Included in the Final BAR.

Note:

A register of all the I&AP's notified, including the Organs of State, and all the registered I&APs must be included in Appendix F. The register must be maintained and made available to any person requesting access to the register in writing.

The EAP must notify I&AP's that all information submitted by I&AP's becomes public information.

Your attention is drawn to Regulation 40 (3) of the NEMA EIA Regulations which states that *"Potential or registered interested and affected parties, including the competent authority, may be provided with an opportunity to comment on reports and plans contemplated in subregulation (1) prior to submission of an application but **must** be provided with an opportunity to comment on such reports once an application has been submitted to the competent authority."*

All the comments received from I&APs on the pre -application BAR (if applicable and the draft BAR must be recorded, responded to and included in the Comments and Responses Report and must be included in Appendix F.

All information obtained during the PPP (the minutes of any meetings held by the EAP with I&APs and other role players wherein the views of the participants are recorded) and must be included in Appendix F.

Please note that proof of the PPP conducted must be included in Appendix F. In terms of the required "proof" the following is required:

- a site map showing where the site notice was displayed, dated photographs showing the notice displayed on site and a copy of the text displayed on the notice;
- in terms of the written notices given, a copy of the written notice sent, as well as:
  - if registered mail was sent, a list of the registered mail sent (showing the registered mail number, the name of the person the mail was sent to, the address of the person and the date the registered mail was sent);
  - if normal mail was sent, a list of the mail sent (showing the name of the person the mail was sent to, the address of the person, the date the mail was sent, and the signature of the post office worker or the post office stamp indicating that the letter was sent);
  - if a facsimile was sent, a copy of the facsimile Report;
  - if an electronic mail was sent, a copy of the electronic mail sent; and
  - if a "mail drop" was done, a signed register of "mail drops" received (showing the name of the person the notice was handed to, the address of the person, the date, and the signature of the person); and
- a copy of the newspaper advertisement ("newspaper clipping") that was placed, indicating the name of the newspaper and date of publication (of such quality that the wording in the advertisement is legible).

SECTION G: DESCRIPTION OF THE RECEIVING ENVIRONMENT

All specialist studies must be attached as Appendix G.

1. Groundwater

1.1.	Was a specialist study conducted?	YES	**NO**
1.2.	Provide the name and or company who conducted the specialist study.		
1.3.	Indicate above which aquifer your proposed development will be located and explain how this has influenced your proposed development.		
1.4.	Indicate the depth of groundwater and explain how the depth of groundwater and type of aquifer (if present) has influenced your proposed development.		

2. Surface water

2.1.	Was a specialist study conducted?	**YES**	NO
2.2.	Provide the name and/or company who conducted the specialist study.		
Mr. Colin Fordham of Upstream Consulting.			
2.3.	Explain how the presence of watercourse(s) and/or wetlands on the property(ies) has influenced your proposed development.		

Source: Aquatic Biodiversity Impact Assessment: Proposed Upgrade of the Raw Water Abstraction Works and Pump Station, Moordkuil River, Portion 15, 24 and 25 of the Farm Klipheuvel, Mossel Bay, 17 March 2025. Complied by Mr. Colin Fordham of Upstream Consulting.

The proposal is to be undertaken within and near the Moordkuil River, therefore Colin Fordham of Upstream Consulting was appointed to conduct and Aquatic Impact Assessment to assess the impacts of the proposed development on the surrounding aquatic environment. According to the Aquatic Impact Assessment Report (Appendix G1), the study area lies within the Southern Coastal Belt DWA Level 1 Ecoregion and DWS quaternary catchment K10F of the Gouritz Catchment Management Area. The Moordkuil River, a tributary of the Klein Brak River, is the largest river in this catchment. There are many unnamed perennial and non-perennial tributaries and dams in this catchment, with much abstraction occurring for agricultural practices. The Moordkuil River is categorised as being in moderate health, having a Present Ecological State (PES) score of C, which is Moderately modified.

The site sits at an elevation of between 1 and 15 m.a.s.l. on a moderately steep bank of the riparian section adjacent to the river. According to the latest national desktop river and wetland inventories, the Moordkuil River is incorrectly classified as an estuary at this location (Figure 4). The DC 4 road bridge prevents any saltwater ingress from the estuary. There are NFEPA or National Wetland Map 5 wetlands in the study area that will not be impacted by the proposed development. According to national river map all these systems eventually drain into the Moordkuil River. Within the larger 500m buffer area there is an additional three non-perennial systems.

The study area is outside of any within the desktop mapped Strategic Water Source Areas (Figure 5). However, according to the Western Cape Biodiversity Spatial Plan (WCBSP) (CapeNature, 2023) the biodiversity priority areas mapped by the WCBSP relative to the study area are shown in Figure 6. It indicates that the drainage lines support CBA 1 River, CBA 2 Estuary and CBA 2 Terrestrial. The WCBSP identifies biodiversity priority areas, Critical Biodiversity Areas, Ecological Support Areas (ESAs) and Other Natural Areas (ONA), which, together with Protected Areas (PA), are important for the persistence of a viable representative sample of all ecosystem types and species, as well as the long-term ecological functioning of the landscape. The primary purpose of a map of CBAs and ESAs is to

guide decision-making about where best to locate development. Only low-impact, biodiversity-sensitive land-uses are appropriate within CBA. No rare or endangered aquatic biota were identified on site.

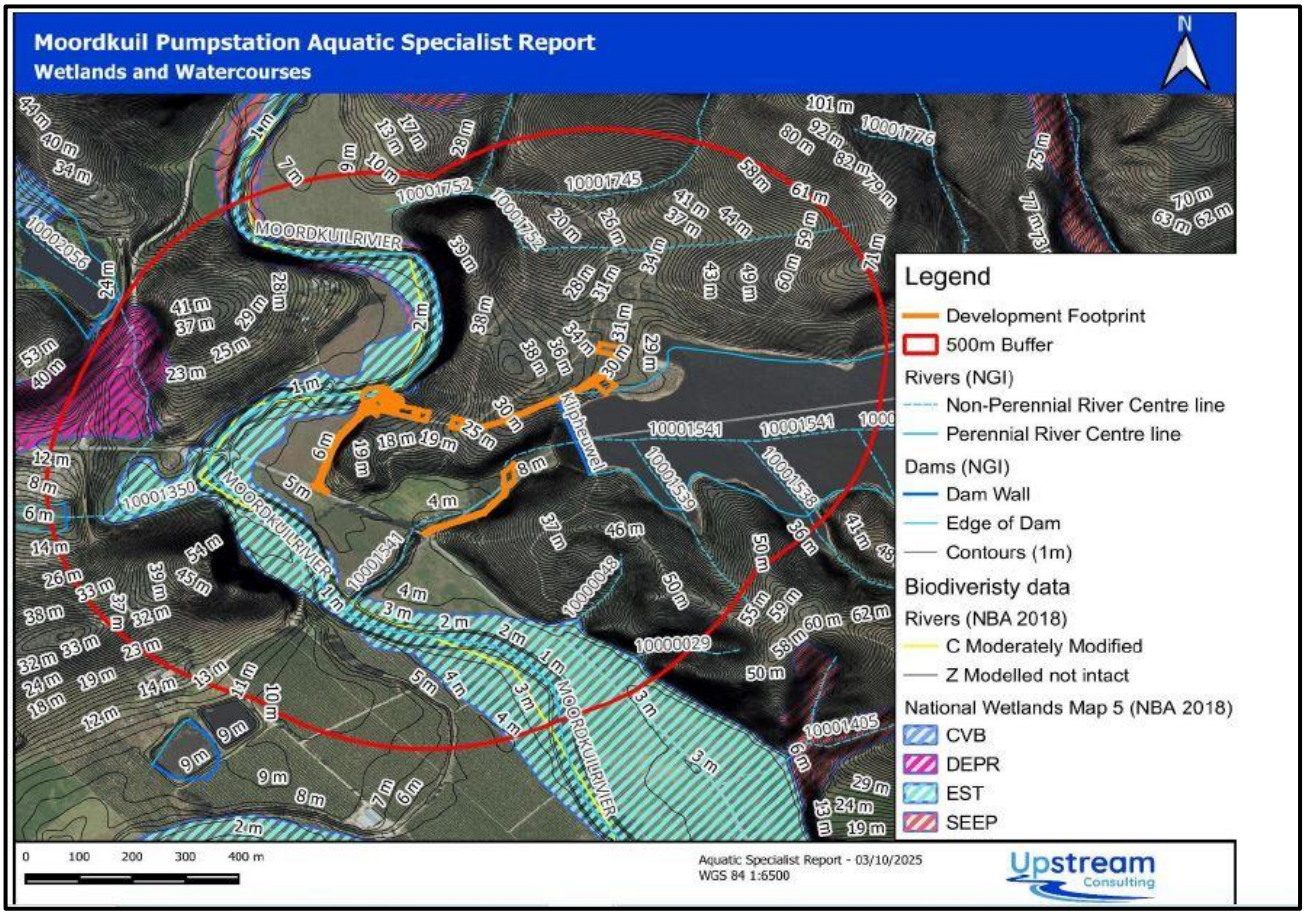

Figure 9: The site in relation to the national wetland and river desktop data inventories.

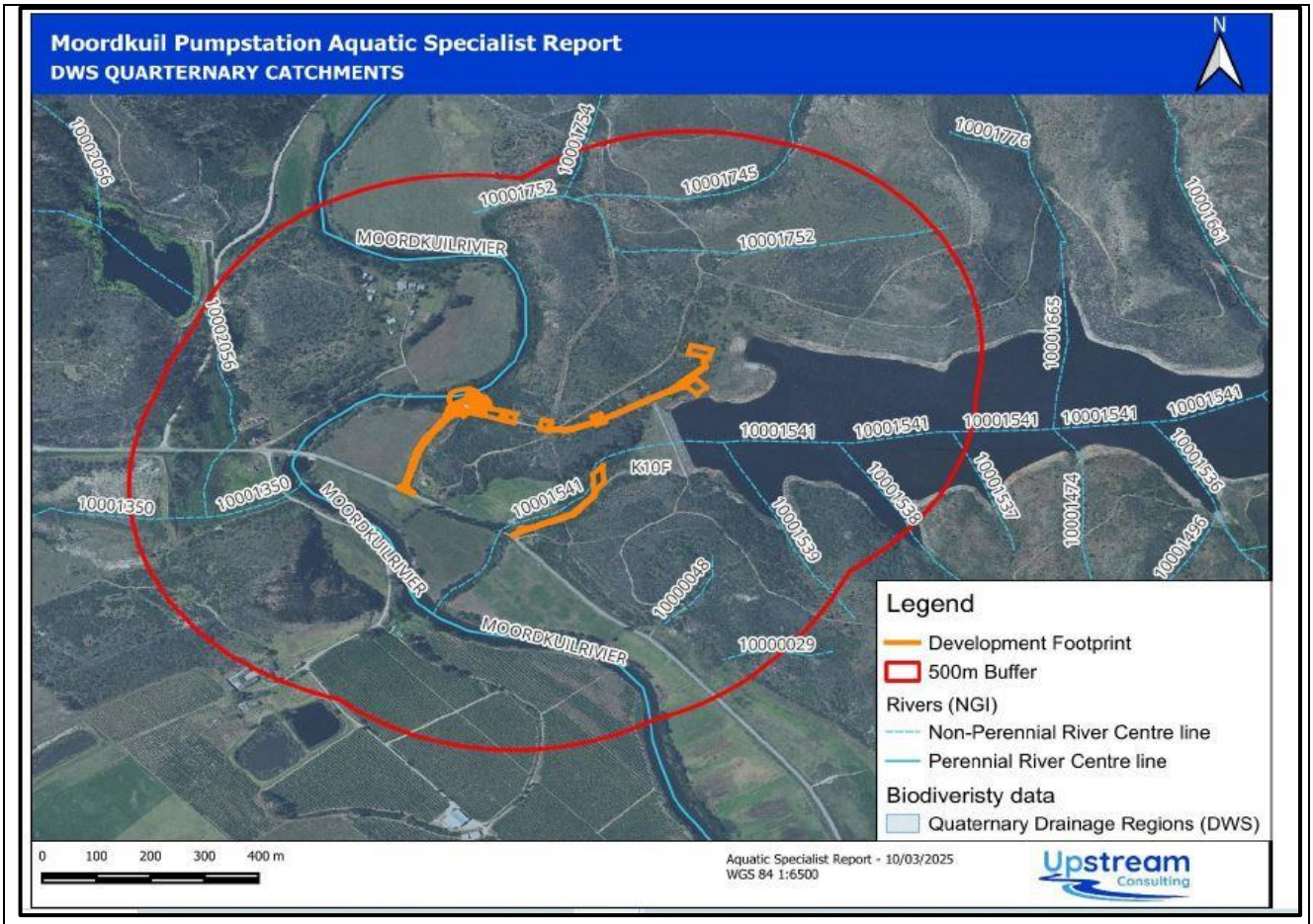

Figure 10: Map of the site in relation to SWSAs and quaternary catchments.

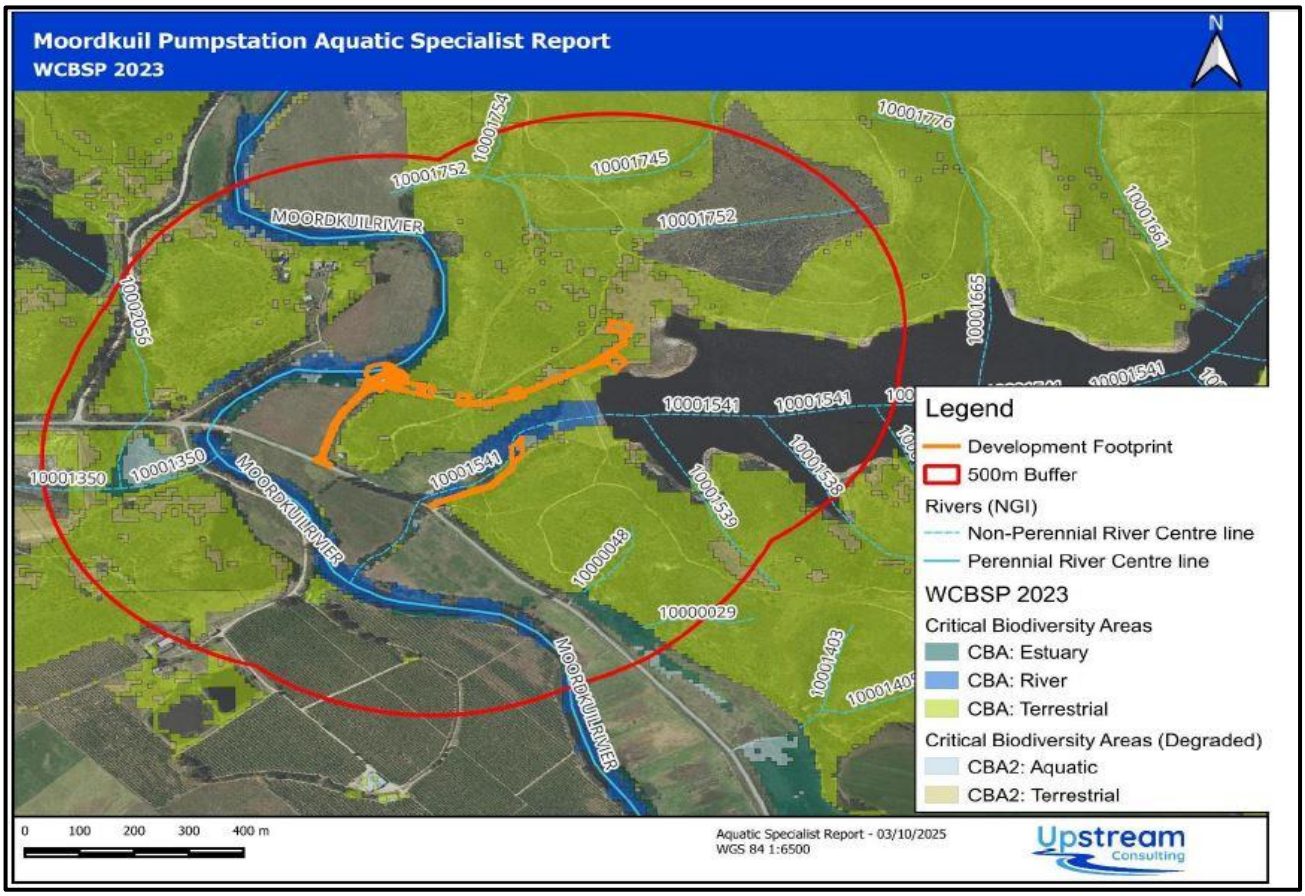

Figure 11: Map of the site in relation to the WCSBP conservation priority areas.

Aquatic Assessment:

Following the contextualisation of the study area with the available desktop data, a site visit was conducted to groundtruth the findings and delineate the aquatic habitat within study area. The Moordkuil Perennial River (PR) Hydrogeomorphic (HGM) unit 1 is the system within which the abstraction point for the pumpstation is located and the only system that will be impacted by the construction of the facilities, HGM 3 will be impacted by the establishment of construction of site camp 2. In total there are ten different HGM units identified and mapped within the 500m study area. The additional information collected in the field allowed for the development of an improved baseline river and wetland delineation map (Figure 8).

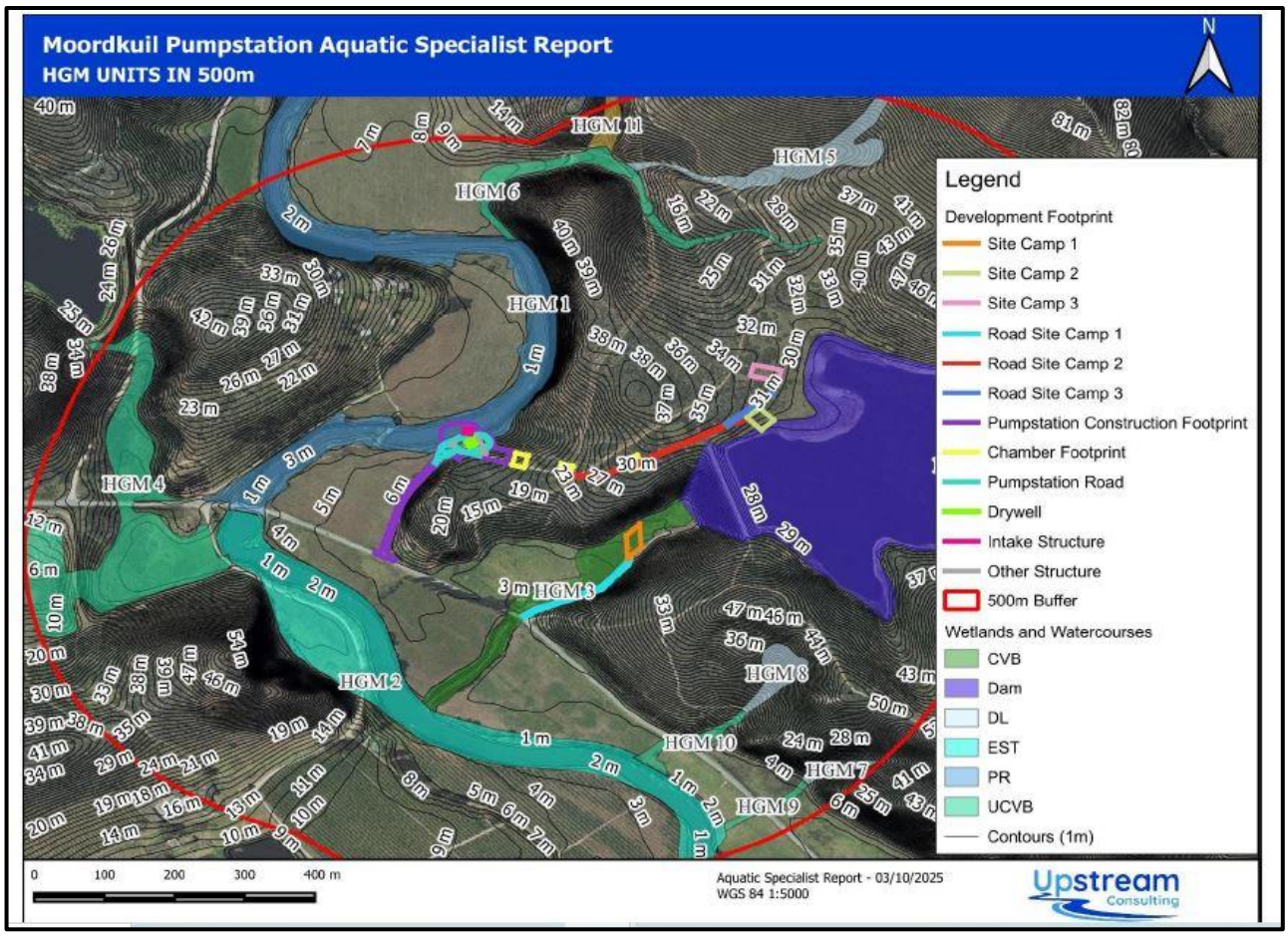

Figure 12: Map of delineated aquatic habitat within the study area following site verification.

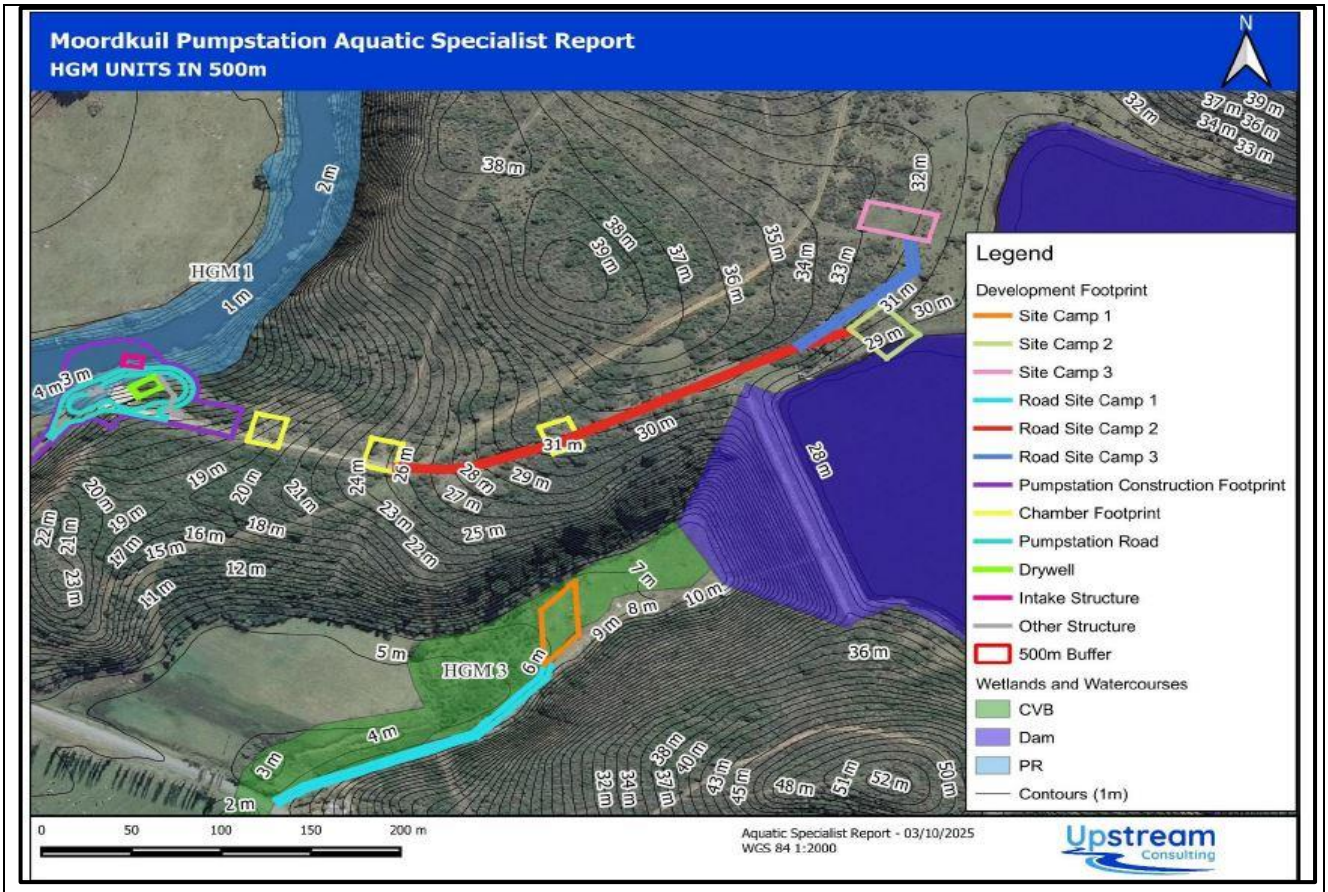

Figure 13: A map of the delineated aquatic habitat relative to the development footprint at a larger scale to illustrate scope of works relative to the aquatic habitat.

Present Ecological State:

The Present Ecological State (PES) of a river or wetland represents the extent to which it has changed from the reference or near pristine condition (Category A) towards an impacted system which can be critically modified at Category F. The PES of the four impacted systems for this project were determined. The three wetland systems were classified according to the WET Health V2 tool (Macfarlane et al., 2020) and the two River systems were classified according to the rapid Index of Habitat Integrity (IHI) tool (Kleynhans, 1996).

Riparian PES

Table 1: HGM units 1 Present Ecological State:

Resource	IHI Score (Average % Intact)	Class	Rationale
HGM 1	60,00	C	The system has been largely impacted by flow, and bank condition modifications. The majority of the system has being impacted through water abstraction and agricultural activities. The riparian zone has been subjected to habitat loss due to clearance and a high level of alien plant infestation. A large loss of natural habitat, biota and basic ecosystem functions has occurred.

Wetland PES

Table 2: HGM 3 Present Ecological State:

	Wetland PES Summary			
Wetland name	HGM 3			
Assessment Unit	Channelled VB wetland			
Areal extent (Ha)	48,5 Ha			
PES Assessment	**Hydrology**	**Geomorphology**	**Water Quality**	**Vegetation**
Impact Score	6,1	5,1	4,2	5,5
PES Score (%)	39%	49%	58%	45%
Ecological Category	E	D	D	D
Trajectory of change	→	→	→	→
Combined Impact Score	5,5			
Combined PES Score (%)	45%			
Combined Ecological Category	D			

ECOSYSTEM SERVICES AND EIS

Wetlands are globally threatened ecosystems and are well-recognized for the ecosystem services which they supply. Furthermore, these ecosystems make potentially important ecosystem services contributions to several broad-scale imperatives of government, including water resource management; biodiversity conservation; human safety and disaster resilience; socio-economic development and poverty elimination; and climate change mitigation and adaptation. Individual wetland/riparian areas differ according to their characteristics, contexts and the suite of ecosystem services which they supply to society (Kotze et al. 2020). Thus, there is a need to assess and compare wetland areas in terms of ecosystem services delivery.

A WET-Ecoservices (Version 2) (Kotze et al., 2020) is a field-based assessment was undertaken to assess the ecosystem services supplied by the different wetland and riparian systems. The assessment technique has recently been revised and now distinguishes clearly both ecosystem services' supply and the demand for all ecosystem services. This helps determine the potential of the wetland for delivering ecosystem services, by understanding its capacity to produce a service while also considering the societal demand for that service.

The Ecological Importance and Sensitivity (EIS) assessment method, as outlined by Rountree and Kotze (2013), provides a structured, scientifically grounded approach for evaluating the capacity of a wetland to support biodiversity, maintain ecological processes, and sustain ecosystem resilience. EIS determines the significance of a watercourse in terms of conservation priority and its sensitivity to disturbances or changes in land use. The EIS score guides decision-making during environmental assessments by identifying wetlands that warrant higher protection, even if they are degraded, due to their irreplaceable ecological functions. It ensures that development planning aligns with ecosystem sustainability principles as outlined in the National Water Act and NEMA.

HGM 3 system

Table 3: Summary of Ecosystem Services Assessment for the HGM 3 wetland.

	ECOSYSTEM SERVICE	Present State			
		Supply	Demand	Importance Score	Importance
REGULATING AND SUPPORTING SERVICES	Flood attenuation	1,3	0,2	0,0	Very Low
	Stream flow regulation	0,0	4,0	1,2	Low
	Sediment trapping	2,3	0,0	0,8	Very Low
	Erosion control	0,8	4,0	1,3	Low
	Phosphate assimilation	2,3	0,0	0,8	Very Low
	Nitrate assimilation	2,3	0,0	0,8	Low
	Toxicant assimilation	3,8	0,0	2,3	Moderately High
	Carbon storage	1,9	2,7	1,7	Moderate
	Biodiversity maintenance	1,9	4,0	2,4	Moderately High
PROVISIONING SERVICES	Water for human use	4,0	4,0	4,0	Very High
	Harvestable resources	3,0	0,3	1,7	Moderately Low
	Food for livestock	1,5	1,3	0,7	Very Low
	Cultivated foods	1,8	4,0	3,0	High
CULTURAL SERVICES	Tourism and Recreation	3,5	0,3	2,2	Moderate
	Education and Research	1,8	0,3	0,4	Very Low
	Cultural and Spiritual	3,0	0,0	1,5	Moderately Low

Table 4: Summary of EIS score for the HGM3 wetland system.

SUMMARY	HGM 3	
	Score (out of 4)	**Rating**
BIODIVERSITY IMPORTANCE	2,33	Moderate
FUNCTIONAL/HYDROLOGICAL IMPORTANCE	1,84	Low-Moderate
DIRECT BENEFITS TO SOCIETY	2,85	Moderate
Ecological Importance and Sensitivity (EIS)	**2,34**	**Moderate**

EIS – HGM 1

Table 5: Summary of Ecosystem Service Assessment for the HGM 1 Moordkuil River:

RIPARIAN SYSTEM	ECOLOGICAL IMPORTANCE AND SENSITIVITY CATEGORY (EIS)	RATIONALE
HGM 1 – Moordkuil River	HIGH EC=B	*There are rare and endangered fish species, but minimal diversity of habitat types, no sensitivity to water quality changes, medium species richness. Remaining patches of indigenous riparian vegetation provide refuge for animals and a short corridor between the valley bottom and hilltops. The site is also classified as CBA.*

Aquatic Buffer Zones:

An aquatic buffer zones are defined as a zone of vegetated land designed and managed so that sediment and pollutant transport carried from source areas via diffuse surface runoff is reduced to acceptable levels (Macfarlane and Bredin 2016). A buffer area between activities and watercourses can assist with managing a variety of potential impacts and protecting the system from PES and EIS deterioration.

Currently there are no formalised riverine or wetland buffer distances provided by the provincial authorities and as such the buffer model as described Macfarlane and Bredin (2017) for wetlands, rivers and estuaries was used. Using the buffer tool, it was determined that a 28m buffer zone should be adopted around the HGM 3 system for Site Camps 2 and 3. Site Camp 1 and the pumpstation are already located within the extent of the HGM 1 and HGM 3 respectively and no further encroachment outside of the construction footprint should be permitted.

Adopting aquatic buffer zones between development activities and watercourses can significantly reduce potential impacts. Therefore, the buffer zones (28m in width) shown in Figure 11 are recommended for this project.

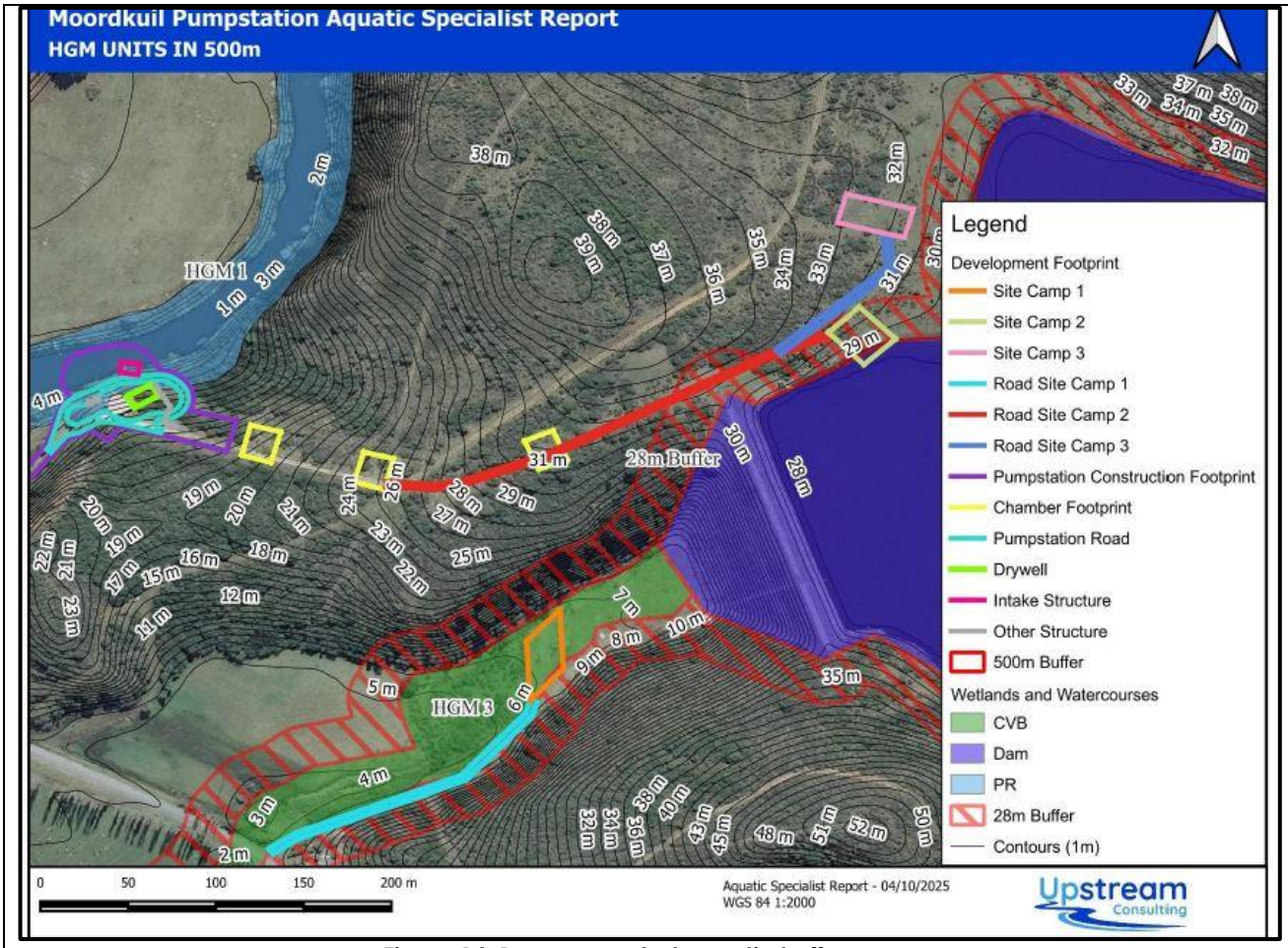

Figure 14: Recommended aquatic buffer zones.

<u>Recommendations and Mitigations Measures:</u>

Given the proposed scope of works for the three site camps, only Site Camp 3 is deemed feasible. Both Site Camps 1 and 2 are within the extent of HGM 3 and would require significant additional implementation of mitigation hierarchy, beyond standard mitigation measures as these camps would result in the net loss of wetland habitat. Site Camp 3 is acceptable, provided all the mitigation measures are strictly implemented and monitored. Therefore, Site Camp 3 will be used during the construction phase.

Due to the potential impacts of the proposed upgrades, the aquatic specialist has included the following mitigation measures:

Impact 1 – Disturbance/ loss of aquatic biota:

Design Phase:

- A construction method statement must be compiled and available on site. It must consider the no go area and include methods to avoid unnecessary disturbance.

Construction Phase:

- Any contractor found working within No-Go areas must be fined as per fining schedule/system setup for the project.
- It is the contractor's responsibility to continuously monitor the area for newly established alien species during the contract and establishment period, which if present must be removed. A list of these species needs to be added with photos into the EMPr. Removal of these species shall be undertaken in a way which prevents any damage to the remaining indigenous species and inhibits the re-infestation of the cleaned areas. Any use of herbicides in removing alien plant species is required to be investigated by the ECO before use.
- Where vegetation has been cleared in the riparian area it is recommended that cover components be reinstated appropriately. Only indigenous species are to be considered.
- Monitoring by an independent ECO during construction in all phases.

- The construction of both interim and permanent structures within the river channel should be minimized wherever possible, ensuring minimal disruption to flow patterns. In particular, the implementation of erosion control measures on the opposite bank should be avoided.

Operational Phase:

- In the long term, the maintenance and management of the infrastructure should follow an approved Environmental Management Plan for the Operational Phase, which must include the removal of invasive alien vegetation in the riparian zone adjacent to the pump station and access road.

Impact 2 – changes to the hydrological regime

Design Phase Considerations:

- Optimized Placement & Orientation – Where possible position the cofferdam to minimize disruption to the main flow path and align it with the natural flow direction to reduce turbulence.
- Permeability Considerations – If necessary, utilise a slotted or porous section to allow controlled water passage and reduce sudden pressure changes.
- Energy Dissipation Structures – Where necessary consider including stepped weirs, baffles, or flow deflectors to prevent excessive velocity increases and turbulence.
- Scour and Erosion Protection – Where necessary design reinforced edges with riprap, gabions, or concrete aprons to prevent localized scour.
- Sediment Transport Management – Where necessary ensure the structure allows for natural sediment movement to prevent excessive upstream deposition or downstream erosion.

Site Preparation Phase:

- Establish Controlled Access Routes: Limit disturbance to water flow and minimize construction related runoff.
- Flow Diversion & Bypass Measures: If possible install a controlled bypass system (e.g., pipes or channels) to maintain continuous downstream flow. Ensure the bypass capacity matches or exceeds expected base flow conditions.
- Contaminant Spill prevention measures: Store fuels, cement and chemicals away from the river and have containment measures in place.

Construction Phase:

- Control Water Flow During Construction: Carefully manage the rate and timing of water released during construction to avoid surges and ensure consistent downstream flow.
- Regular ECO Water Quality Monitoring: Conduct monitoring of water quality to track turbidity and contamination levels.
- Limit Water Diversion Duration: Minimize the time the flow is disrupted by construction activities to reduce impact on aquatic ecosystems.
- Controlled Dewatering: If contaminated, remove contaminated water onto shore and treat accordingly. Do not discharge untreated contaminated water back into the system.
- Efficient Temporary River Channel Construction: If required, implement bypasses and pumps with minimal disruption to the river's natural hydrology.

Operational Phase:

- Flood Control Measures: Regularly assess river levels and implement flood mitigation measures as required.
- Maintenance work: Any work associated with the maintenance of the water column infrastructure should be minimized in both spatial extent and duration. Preferably such work should take place during the drier months (December to April) to reduce hydrological impacts.
- Emergency infrastructure repair: Any flood damaged infrastructure should be repaired as soon as it is safe, and possible, to do so, to prevent further degradation and hydrological impacts.

Impact 3 – Geomorphological changes from erosion and sedimentation

Design phase considerations:

- Optimized Placement & Orientation – Where possible position the cofferdam to minimize disruption to the main flow path and align it with the natural flow direction to reduce turbulence.
- Permeability Considerations – If necessary, utilise a slotted or porous section to allow controlled water passage and reduce sudden pressure changes.

- Energy Dissipation Structures – Where necessary consider including stepped weirs, baffles, or flow deflectors to prevent excessive velocity increases and turbulence.
- Scour and Erosion Protection – Where necessary design reinforced edges with riprap, gabions, or concrete aprons to prevent localized scour.
- Sediment Transport Management – Where necessary ensure the structure allows for natural sediment movement to prevent excessive upstream deposition or downstream erosion.

Site Preparation Phase:

- Establish sediment control barriers: Install sediment fences, silt curtains, or berms around construction zones to contain sediment and prevent it from reaching water bodies.
- Stabilise disturbed areas: Apply erosion control techniques such as mulching, vegetation, or geotextiles to stabilize disturbed soils and reduce sediment runoff.

Construction Phase:

- Sediment trapping measures: Install sediment traps or basins at strategic points along construction sites to capture and manage sediment and minimise downstream contamination.
- Minimize disturbed areas: Limit the footprint of the construction zone and avoid unnecessary soil disturbance to reduce the potential for sediment mobilization.
- Monitor sedimentation: ECO monitor turbidity levels upstream and downstream of construction site to confirm the efficiency of mitigation measures and make adjustments as needed.
- Water diversion techniques: Divert clean water away from construction areas using berms or temporary channels to prevent sediment-laden water from entering watercourses.
- Control stormwater runoff: Use temporary sediment control measures, such as erosion mats or check dams, to control runoff and prevent excessive sedimentation during heavy rainfall events.

Operational Phase:

- Maintain natural water column sediment levels: Regularly clean and maintain coffer dam, and filtration systems to ensure they continue functioning effectively in capturing sediment and returning captured sediment back to the water column.
- Vegetative stabilization: Promote the growth of native vegetation in areas susceptible to erosion to stabilize soil and reduce sediment generation over time.
- Revegetation of exposed soils: In any areas that have been disturbed, replant vegetation and apply soil stabilisation techniques to prevent erosion and further sediment loss.
- Flood Control Measures: Regularly assess river levels and implement flood mitigation measures as required.
- Maintenance work: Any work associated with the maintenance of the water column infrastructure should be minimized in both spatial extent and duration. Preferably such work should take place during the drier months (December to April) to reduce hydrological impacts.
- Emergency infrastructure repair: Any flood damaged infrastructure should be repaired as soon as it is safe, and possible, to do so, to prevent further degradation and hydrological impacts.

Impact 4 – Water quality deterioration

Site Preparation & Construction Phase:

- Pollution Prevention:
    - Establish designated fuelling and maintenance areas away from the watercourse to prevent fuel and oil spills.
    - Store hazardous materials (e.g., cement, fuels, chemicals) in bunded areas away from the river.
    - Implement spill response procedures and have spill kits on-site.
    - Ensure proper waste disposal, including construction debris and domestic waste, to prevent contamination.
- Stormwater Management:
    - Design temporary stormwater control measures to prevent runoff from carrying pollutants into the river.
    - Use infiltration trenches or constructed wetlands to filter runoff before it enters the watercourse.

Operational Phase:

- Monitoring & Maintenance:
  - Regularly monitor water quality parameters (e.g., turbidity, dissolved oxygen, nutrients, heavy metals) to detect any degradation.
  - Implement adaptive management strategies if water quality deteriorates over time.
- Vegetative Buffer Zones:
  - Maintain or restore riparian vegetation to filter runoff, stabilize banks, and improve water quality.
  - Prevent livestock access to the river and site camps near infrastructure to reduce nutrient loading and bank erosion.
- Long-Term Pollution Control:
  - Establish protocols for handling accidental spills or contamination events.
  - Ensure all waste is deposed of at a registered waste disposal site.

3. Biodiversity

4.1.	Were specialist studies conducted?	**YES**	NO
4.2.	Provide the name and/or company who conducted the specialist studies.		
	• Terrestrial Faunal and Avifaunal Species Compliance Statement Report – Dr. Jaco Visser: Blue Skies Research • Botanical Impact Assessment – Dr. Mike Berry		
4.3.	Explain which systematic conservation planning and other biodiversity informants such as vegetation maps, NFEPA, NSBA etc. have been used and how has this influenced your proposed development.		

Source: Terrestrial Faunal and Avifaunal Species Compliance Statement Report for the Upgrade of the Raw Water Abstraction Works and Pump Station on Portion 15, 24 and 25 of the Farm Klipheuvel, Mossel Bay Local Municipality. Complied by Dr. Jacobus H. Visser of Blue Skies Research. Botanical Impact Assessment: Proposed Upgrading of Moordkuil Pump Station, Mossel Bay. Complied by Dr. Mark Berry of MB Botanical Surveys.

DEA Screening Tool: The Department of Environmental Affairs online Environmental Screening Tool was applied to determine the Relative Terrestrial Biodiversity Theme Sensitivity and Plant Species Theme Sensitivity.

Vegetation Map: A product of The Vegetation of South Africa, Lesotho and Swaziland (VEGMAP) (Mucina & Rutherford, 2006). The South African National Biodiversity Institute (SANBI) has updated the VEGMAP 2018 (VEGMAP 2024 BETA), both these shapefiles were used (2018 and 2024 Beta).

According to the Terrestrial Biodiversity Compliance Statement, Vegetation across study area landscape is mapped as Garden Route Granite Fynbos which is currently classified as "Critically Endangered". Part of the project footprint also overlaps the Moordkuil River Channel which is mapped as harbouring Groot Brak Dune Strandveld vegetation. Importantly, the project footprint (including the alternative site camp locations) currently overlap existing cleared or modified areas with no remaining natural vegetation.

Vegetation across the site: (*as described by Dr. Mark Berry, Appendix G1*):
The study site is located in a renosterveld-thicket environment on the Southern Cape coastal plain. The indigenous species recorded on site are typical renosterveld and thicket species, such as Elytropappus rhinocerotis, Eriocephalus africanus, Sideroxylon inerme, Mystroxylon aethiopicum and Azima tetracantha. The 2018 SA Vegetation Map has incorrectly mapped the main vegetation type on site as Garden Route Granite Fynbos, with the pump station area encroaching on Groot Brak Dune Strandveld (Figure 4-4). Vlok has mapped it as Brandwag Fynbos-Renoster-Thicket (see CapeFarmMapper online data). The main vegetation type here should rather be mapped as Mossel Bay Shale Renosterveld, with strong elements of Albany Thicket. This error is repeated in the 2024 beta version of the SA Vegetation Map. Mossel Bay Shale Renosterveld occurs on the undulating hills and valleys from the Kruisrivier near Riversdale to Botterberg, west of the Robinson Pass, centred on the Gouritz River (Mucina, 2006). The renosterveld is described as a medium dense, medium tall

cupressoid-leaved shrubland dominated by renosterbos (Mucina, 2006). Thicket patches are common within the unit.

Being part of the Fynbos Biome, Mossel Bay Shale Renosterveld is maintained by a regular fire regime. Unfortunately, landscape fragmentation is disrupting this 'maintenance' requirement, often leading to localised species loss and bush encroachment or alien infestation (pers. obs.). Due to its transformed state, Mossel Bay Shale Renosterveld is currently listed as Critically Endangered in the Revised National List of Threatened Ecosystems (DEA, 2022). Only about 38% of Mossel Bay Shale Renosterveld is still left, while 0.2% is currently protected2. A large percentage of it has been transformed in the past for pastures and croplands (Mucina, 2006). The ecosystem is also degraded by erosion and overgrazing (Mucina, 2006). The unit is narrowly distributed with high rates of habitat loss in the past 30 years, placing it at risk of collapse.

Biodiversity Planning: The 2023 Western Cape Biodiversity Spatial Plan (CapeNature, 2023) GIS (Geographical Information System) shapefiles were used for determining the conservation importance of the designated habitat. The entire project area falls inside the Western Cape biodiversity network, with most of the site and surrounding area mapped as a terrestrial critical biodiversity area (CBA) or degraded critical biodiversity area (CBA2). Small areas that encroach on the watercourses have been mapped as aquatic CBA's. Reasons for the mapped units include the presence of a climate adaption corridor, ecological processes (FEPA river corridor), threatened vegetation type (albeit the wrong type), threatened vertebrate habitat (bontebok), estuary (Klein Brak Estuary), river types (ephemeral upper foothill river & permanent lower foothill river), wetland types (channelled & unchannelled valley bottom wetlands) and water resource protection (Southern Coastal Belt).

Site Boundary: these and other resource layers were used to define the site boundary and to compile several maps. This information is available on the CapeFarmMapper website (Department of Agriculture: gis.elsenberg.com).

Site Ecological Importance: Site ecological importance (SEI) of the affected (receptor) area has been determined by applying the criteria described in the Species Environmental Assessment Guideline (SANBI, 2020).

Important Species: The presence or absence of threatened (i.e., species of conservation concern) and ecologically important species informs the ecological condition and sensitivity of the site. This was checked by using the SANBI Red List of Threatened Ecosystems shapefile on CapeFarmMapper, Revised National List of Threatened Ecosystems (DEA, 2022) and the IUCN Red List of Threatened Species.

4.4.	Explain how the objectives and management guidelines of the Biodiversity Spatial Plan have been used and how has this influenced your proposed development.

The entire project area falls inside the Western Cape biodiversity network, with most of the site and surrounding area mapped as a terrestrial critical biodiversity area (CBA) or degraded critical biodiversity area (CBA2). Small areas that encroach on the watercourses have been mapped as aquatic CBA's. Reasons for the mapped units include the presence of a climate adaption corridor, ecological processes (FEPA river corridor), threatened vegetation type (albeit the wrong type), threatened vertebrate habitat (bontebok), estuary (Klein Brak Estuary), river types (ephemeral upper foothill river & permanent lower foothill river), wetland types (channelled & unchannelled valley bottom wetlands) and water resource protection (Southern Coastal Belt). It was previously noted that most of the intact vegetation in the Mossel Bay interior is found on the steeper hill slopes. These areas are thus considered of great value in the biodiversity network. The CBA2's correspond with transformed areas, such as pastures and roads. The Moordkuil River has been mapped as an aquatic CBA. The closest protected area to the site is the Doring River Wilderness Area, located 15 km away to the north.

CBA's are defined as areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure (Pool-Stanvliet, 2017). These sites are selected for meeting national targets for species, habitats and ecological processes (Pool-Stanvliet, 2017). Many of these areas support known occurrences of threatened plant species, and/or may be essential elements of designated ecological corridors. Loss of designated CBA's is therefore not

recommended. ESA's, on the other hand, are supporting zones required to prevent the degradation of CBA's and Protected Areas.

Figure 15: Extract of the Western Cape Biodiversity Network Map.

4.5.	Explain what impact the proposed development will have on the site specific features and/or function of the Biodiversity Spatial Plan category and how has this influenced the proposed development.

Source: Botanical Impact Assessment: Proposed Upgrading of Moordkuil Pump Station, Mossel Bay. Complied by Dr. Mark Berry of MB Botanical Surveys.

Site Ecological Importance:

In order to demonstrate the biodiversity sensitivity of the project area, a site ecological importance (SEI) map was prepared. This map considers the biodiversity importance of the receptor area and its resilience to impacts. The receptor area is described as the affected habitats (i.e. transformed/degraded areas, Moordkuil River & thicket/renosterveld). Most of the project footprint scored a Very Low value, while the thicket/renosterveld and riverine areas scored High and Medium values, respectively. These values were influenced by the size of areas in question, threat status and condition of the vegetation, potential presence of SCC, and connectivity with the biodiversity network. The results of the SEI analysis are presented in Table 5.

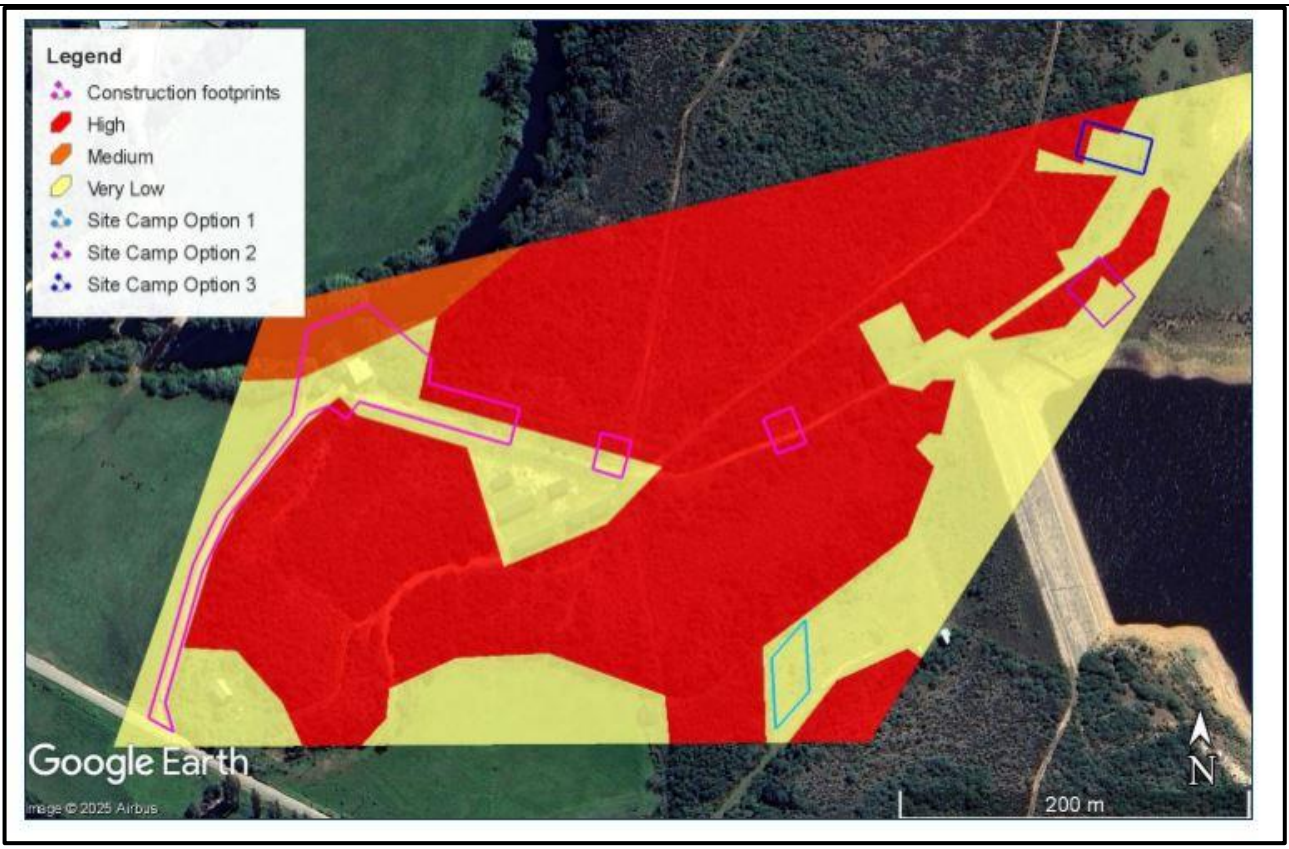

Figure 16: Site Ecological Importance map of the project area.

Table 6: SEI Analysis:

	CI	FI	BI	RR	SEI
Medium to good quality thicket/renosterveld	High	High	High	Medium	High
Moordkuil River corridor	High	High	High	High	Medium
Transformed or highly degraded areas	Low	Low	Low	Very High	Very Low

Terrestrial Biodiversity:

With the information in hand, it is impossible to determine how much natural vegetation will be affected by the project. However, encroachments of thicket/renosterveld and riverine vegetation is expected. Fortunately, most of these encroachments will occur in degraded or regrowth vegetation next to existing infrastructure and farm roads. Post construction recovery is also expected to be quick if allowance is made for rehabilitation and alien control. Pioneer tree and shrub species, such as Vachellia karroo, Searsia spp, Dicerothamnus rhinocerotis, Eriocephalus africanus and Athanasia trifurcata, will populate the disturbed areas again within a couple of years. The affected vegetation is also well represented on the surrounding hills. With regards to the design alternatives for the pump station, the current preferred alternative will not result in a significantly greater impact than the previous alternative (Alternative B).

With regards to the site camp options, options 1 and 3 are more degraded or disturbed, and mainly covered by grasses and scattered pioneer shrubs/trees. Site option 2 contains considerably more vegetation and plant species. It is therefore recommended that site options 1 and/or 3 be considered for the site camp. Proper fencing will be needed around the site camp to prevent damage to the adjacent vegetation. In the case of option 1 below the dam wall, consideration must be given to an

adjacent watercourse/wetland. During the construction phase care must be exercised to avoid the unnecessary disturbance of the adjacent vegetation. Proper fencing will be needed in this regard. As an indirect impact, earthworks will provide ideal conditions for the establishment of invasive alien species. The presence of aliens, such as black wattle, wild tobacco and a plethora of herbaceous species, will exacerbate this impact.

The project area is located partly inside a CBA corridor that runs along the foothills of theMossel Bay interior and connects with Outeniquas (Doringrivier Wilderness Area & Ruitersbos Nature Reserve) to the north. Apart from providing a backbone to the local biodiversity network, the corridor serves as an important passage along which fauna can migrate between the mountain and the foothills and along the foothills itself. With the project located close to the southern edge of the corridor one can expect a temporary impact on its functionality. The only mitigation measures would be to rehabilitate the disturbed areas post construction, encourage the re-establishment of indigenous vegetation on the disturbed surfaces (where practical), and implement alien control.

Plant Species:
The impact on plant species, including potential SCC and protected tree species, is also expected to be of low significance, with mitigation. This is due to the presence of mostly widespread and common thicket/renosterveld species. Two SCC were recorded on site, namely Hermannia lavandulifolia (VU) and Freesia cf fergusoniae (VU). Both observed occurrences can be avoided. Polygala pubiflora (VU) and Trichodiadema burgeri (VU) were also recorded by the author on an adjacent farm. Fortunately, all of them are still frequently encountered in suitable habitats in the Mossel Bay area. Given their habitat preferences and known iNaturalist records, the probability of SCC listed in the Screening Report to occur on site is indicated in Annexure 1. Seven species, including four sensitive species which names are withheld, have a medium to high probability to occur on the site or surrounding area. The probability that any of these species will be impacted by the project will be less due to the degraded state of the project footprint. To mitigate the impact, topsoil from the construction areas should be protected and replaced after construction as part of the rehabilitation process. As a duty of care measure, consideration could also be given to search and rescue (S&R) of suitable species (e.g. bulbs and succulents). Of course, any replanting of rescued plant material must be done in matching habitats from which the plants originate. Two protected tree species will probably be affected, namely Sideroxylon inerme and Pittosporum viridiflorum. A permit will be needed for their removal.

The cumulative botanical impact of the project is expected to be equivalent to the impact on terrestrial biodiversity and plant species described above, i.e. the continued erosion of Albany thicket and/or Mossel Bay Shale Renosterveld, the biodiversity network, as well as the loss of plant species. In this instance, the slight loss of biodiversity and resultant cumulative impact will be acceptable (with mitigation), due to the transformed or degraded state of the affected vegetation and the nature of the project. A large part of the site can be rehabilitated and some of the vegetation restored.

The botanical specialist has recommended the following mitigation measures:

Construction Phase Mitigation Measures:

Impact on terrestrial biodiversity:

- Fence off the construction areas. The thicket/renosterveld outside the construction areas must not be disturbed in any way.
- With regards to the site camp options, preference should be given to options 1 and 3. Site option 2, which contains considerably more vegetation and plant species, should not be selected. In the case of site camp option 1 (below the dam wall), a buffer of sufficient width must be maintained between the camp and nearby watercourse.
- To mitigate the impact of vegetation clearing, topsoil and seedbearing plant material from the construction areas must be protected and replaced after construction as part of the rehabilitation process. As a duty of care measure, consideration should also be given to S&R of suitable species (e.g. bulbs & succulents). Of course, any replanting of rescued plant material must be done in matching habitats from which the plants originate. Bulbs should be

removed along with some soil, placed in gel, bagged and then taken to a nursery for temporary storage or transplanted directly in the receiving area. S&R should be done at an appropriate time of the year, preferably when the soil is wet during the raining season. Ideally, bulbs should be salvaged during leaf fall, but before or after flowering. Please note that a CapeNature permit is needed for the relocation of indigenous plant species.

- Allow at least 24 months for the monitoring of rehabilitation success and alien infestation post construction. Keep the project footprint as well as an additional strip of 10-15 m wide clear of invasive aliens.

Impact on flora, SCC and protected tree species

- Fence off the construction areas. The thicket/renosterveld outside the construction areas must not be disturbed in any way.
- With regards to the site camp options, preference should be given to options 1 and 3. Site option 2, which contains considerably more vegetation and plant species, should not be selected. In the case of site camp option 1 (below the dam wall), a buffer of sufficient width must be maintained between the camp and nearby watercourse.
- To mitigate the impact of vegetation clearing, topsoil and seedbearing plant material from the construction areas must be protected and replaced after construction as part of the rehabilitation process. As a duty of care measure, consideration should also be given to S&R of suitable species (e.g. bulbs & succulents). Of course, any replanting of rescued plant material must be done in matching habitats from which the plants originate. Bulbs should be removed along with some soil, placed in gel, bagged and then taken to a nursery for temporary storage or transplanted directly in the receiving area. S&R should be done at an appropriate time of the year, preferably when the soil is wet during the raining season. Ideally, bulbs should be salvaged during leaf fall, but before or after flowering. Please note that a CapeNature permit is needed for the relocation of indigenous plant species.
- Allow at least 24 months for the monitoring of rehabilitation success and alien infestation post construction. Keep the project footprint as well as an additional strip of 10-15 m wide clear of invasive aliens.

Operational Phase Mitigation Measures:

Impact on terrestrial biodiversity and Impact on flora, SCC and protected tree species:

- Monitor the construction footprint and all areas disturbed during construction for rehabilitation success and erosion. Where needed, rehabilitate/revegetate disturbed surfaces expediently. Erosion prevention measures may be needed on steep slopes, such as silt fences, logs or netting, to slow down runoff and potential erosion. Mulching and seeding with indigenous thicket/renosterveld seed may also be needed.
- As a long-term maintenance requirement, continue with alien clearing on and around the project footprint, focussing on invasive species such as black wattle, rooikrans, common thorn apple, prickly pear, wild tobacco, castor-oil plant, bugweed and spear thistle. These species are category 1b and 2 invaders that require compulsory control as part of an invasive species control programme. Please note that it is a legal requirement for landowners to clear alien vegetation on their land.

4.6.	If your proposed development is located in a protected area, explain how the proposed development is in line with the protected area management plan.

The development is not located in a protected area.

4.7.	Explain how the presence of fauna on and adjacent to the proposed development has influenced your proposed development.

Source: Terrestrial Faunal and Avifaunal Species Compliance Statement Report for the Upgrade of the Raw Water Abstraction Works and Pump Station on Portion 15, 24 and 25 of the Farm Klipheuvel, Mossel Bay Local Municipality. Complied by Dr. Jacobus H. Visser of Blue Skies Research.

While the proposed project is unlikely to have any major impacts on terrestrial faunal and avifaunal species, a temporary platform will be constructed through soil infill material behind the sheet piling

accommodate a temporary platform for the piling rig in order to construct the concrete inlet hopper within the Moordkuil River. Because this temporary platform will intersect a sensitive freshwater environment, any such scope of works should follow recommendations from the freshwater specialist. Aside from overlap with the freshwater ecosystem of the Moordkuil River, all other project footprints and site camp locations under both Preferred Alternative layout A and Alternative layout B are located in less sensitive areas from a terrestrial faunal and avifaunal perspective and are unlikely to impact on ecological processes or biodiversity patterns at either local or regional scales. Both these development layouts and associated activities are therefore supported from a terrestrial faunal and avifaunal biodiversity perspective (Please refer to Appendix G3 for the report).

4. Geographical Aspects

Explain whether any geographical aspects will be affected and how has this influenced the proposed activity or development.
No geographical aspects will be affected by the upgrades.

5. Heritage Resources

6.1.	Was a specialist study conducted?	**YES**	NO
6.2.	Provide the name and/or company who conducted the specialist study.		
Jonathan Kaplan Prof. Marion Bramford			
6.3.	Explain how areas that contain sensitive heritage resources have influenced the proposed development.		

Prof. Marion Bramford confirmed that the palaeosensitivity listed in the DFFE Screening Tool Reports are contested and that since here is no chance of fossils of any importance occurring in the project footprint, she requested exemption from any further palaeontological impact assessment. As far as the palaeontology is concerned there is no preferred site for the camp site. (Please refer to Appendix G5 for the Palaeosensitivity Statement).

A Notice of Intent to Develop was submitted to Heritage Western Cape, the matter was discussed at the Heritage Officers Meeting held on 2 June 2025 and it was determined that there is no reason to believe that the proposed upgrade of the raw abstraction works and pumpstation on Farm 143 Portions 15; 24; 25, Klipheuvel, Moordkuil Raw Water Extraction Works and Pump Station, Klein Brak River will impact on heritage resources, and no further action under Section 38 of the National Heritage Resources Act (Act 25 of 1999) is required.

However, should any heritage resources, including evidence of graves and human burials, archaeological material and paleontological material be discovered during the execution of the activities above, all works must be stopped immediately, and Heritage Western Cape must be notified without delay.

6. Historical and Cultural Aspects

Explain whether there are any culturally or historically significant elements as defined in Section 2 of the NHRA that will be affected and how has this influenced the proposed development.

Prof. Marion Bramford confirmed that the palaeosensitivity listed in the DFFE Screening Tool Reports are contested and that since here is no chance of fossils of any importance occurring in the project footprint, she requested exemption from any further palaeontological impact assessment. As far as the palaeontology is concerned there is no preferred site for the camp site. (Please refer to Appendix G5 for the Palaeosensitivity Statement).

A Notice of Intent to Develop was submitted to Heritage Western Cape, the matter was discussed at the Heritage Officers Meeting held on 2 June 2005 and it was determined that there is no reason to believe that the proposed upgrade of the raw abstraction works and pumpstation on Farm 143 Portions 15; 24; 25, Klipheuvel, Moordkuil Raw Water Extraction Works and Pump Station, Klein Brak River will impact on heritage resources, and no further action under Section 38 of the National Heritage Resources Act (Act 25 of 1999) is required.

However, should any heritage resources, including evidence of graves and human burials, archaeological material and paleontological material be discovered during the execution of the activities above, all works must be stopped immediately, and Heritage Western Cape must be notified without delay.

7. Socio/Economic Aspects

8.1.	Describe the existing social and economic characteristics of the community in the vicinity of the proposed site.

Source: Western Cape Government: #Knowyourmunicipality: 2023 Socio Economic Profile: Mossel Bay Municipality and Western Cape Government: 2024-25 Municipal Economic Review and Outlook: Garden Route District.

In the context of the Census 2022 findings, Mossel Bay Municipality's population amounted to 140 075 individuals in 2022, positioning it as the second largest population in the Garden Route after George (294 929). Projections indicate that this number is expected to grow to 147 220 people by 2027, reflecting an average annual growth rate of 1.0 percent during this timeframe.

The available data suggests that in the Mossel Bay municipal area, there is a lower representation of males compared to females, with a distribution of 48.3 percent for males and 51.7 percent for females. The sex ratio in Mossel Bay has exhibited a gradual downward trend in the years leading up to 2022, according to census 2022 results. This phenomenon may be attributed to diverse factors, including a demographic changes, health and environmental factors, etc.

In terms of age representation, the largest share of the population, consist of the working age population (15 - 64 years) at 66.7 per cent, followed by the young children (0-14 years) aged cohort at 17.9 per cent and the elderly 15.4 per cent. The significant working-age population can contribute to higher economic productivity are more engaged in the labour force, leading to increased output and economic growth.

Within the Mossel Bay municipal area encompassing 52 985 households, 92.5 percent had access to formal housing, surpassing the Garden Route District's mean of 89 percent. Mossel Bay exhibited a diminished share of informal dwellings, constituting 5.8 percent, in contrast to the district-wide average of 9.6 percent for informal housing. This discrepancy in housing types implies distinct socio-economic dynamics within Mossel Bay, potentially influencing various economic and social indicators in comparison to the broader Garden Route District.

Service access levels within the Mossel Bay municipal area exceeded the access to formal housing in certain cases. Approximately 90.2 per cent of households had access to piped water either inside the dwelling/yard or through communal/neighbour's taps. 97.1 per cent had access to flush toilets or chemical toilets, and 98.2 per cent had access to electricity (including generators) for lighting. Additionally, local authorities removed refuse at least weekly for 92.5 per cent of households in the area. These disparities in housing and service access have socio-economic implications, impacting the living conditions and quality of life for the local population.

Mossel Bay is the second-largest economy in the GRD, contributing R8.1 billion to GDPR in 2023, which accounts for 17.5 per cent of the region's total economic output. The town also plays a key role in

employment, providing 15.9 per cent of the District's jobs, amounting to 35 974 positions. The employment profile in Mossel Bay is notable for its higher share of skilled and semi-skilled workers, with 36.0 per cent of jobs classified as skilled, 40.0 per cent semi-skilled, and 24.0 per cent low-skilled.
The economy of Mossel Bay is diverse and well-balanced, with substantial contributions from both the tertiary and secondary sectors. The largest contributor to the local GDPR is the finance, insurance, real estate, and business services sector, which accounts for 38.6 per cent. This is followed by wholesale and retail trade, catering, and accommodation (13.3 per cent), and transport, storage, and communication (9.9 per cent). Together, these sectors form the core of Mossel Bay's service economy. The secondary sector, though smaller, still plays a critical role, with manufacturing contributing 12.7 per cent and construction adding another 2.9 per cent to the local GDPR. The primary sector, including agriculture, forestry, and fishing, accounts for 4.8 per cent of the economy, though it remains an important part of the region, particularly in rural areas. Mossel Bay's evolving economy is increasingly characterised by a shift toward skilled employment, particularly in sectors such as finance, public administration, and natural gas extraction. This transition reflects the town's growing importance as a hub for business services and industrial activity in the GRD, marking its position as a vital economic centre in the region.

8.2.	Explain the socio-economic value/contribution of the proposed development.

The proposed development will result in more water being available from the Klipheuwel dam for treatment which will reduce the risk of water restrictions and the risk of the municipality not being able to provide the basic service of water supply to the community.

8.3.	Explain what social initiatives will be implemented by applicant to address the needs of the community and to uplift the area.

The proposal is to increase the pumping capacity of the Moordkuil Raw Water Pump Station to pump more water to the Klipheuvel dam which will result in more water being available from the Klipheuwel dam for treatment which will reduce the risk of water restrictions and the risk of the municipality not being able to provide the basic service of water supply to the community. The project will also contribute a total amount of R48,986,952, of which a percentage will be allocated to SMME's and local labour will be utilised. This percentage will be aligned with current policies.

8.4.	Explain whether the proposed development will impact on people's health and well-being (e.g. in terms of noise, odours, visual character and sense of place etc) and how has this influenced the proposed development.

It is not expected that the proposed upgrades will have any significant negative impacts on people's health and well-being in terms of noise, or odours. The visual character and sense of place will not be impacted on as the pump station has been at this site since 1980. The proposed upgrades will therefore not change the current character of the site.

SECTION H: ALTERNATIVES, METHODOLOGY AND ASSESSMENT OF ALTERNATIVES

1. Details of the alternatives identified and considered

1.1.	Property and site alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts.

Provide a description of the preferred property and site alternative.

The site spans across three properties: Portion 25 of the Farm Klipheuvel No. 143, Portion 15 of the Farm Klipheuvel No. 143 and Portion 24 of the Farm Klipheuvel No. 143. The properties are situated approximately 3km north of the coastal towns Kleinbrak and Rheebok, on the Moordkuil River bank located in the Mossel Bay Municipality in the Western Cape.

As the proposal is for the upgrade of the existing Moordkuil raw water abstraction works, no property or site alternatives exist.

Provide a description of any other property and site alternatives investigated.

No property or site alternatives are being investigated as the proposal is for the upgrade of an existing facility.

Provide a motivation for the preferred property and site alternative including the outcome of the site selectin matrix.

The pump station has been at this site for more than 40 years. It will not make sense to move the whole site somewhere else. This pump station serves the residential area around it and there is no other property or site suitable for it.

Provide a full description of the process followed to reach the preferred alternative within the site.

N/A – delete?

Provide a detailed motivation if no property and site alternatives were considered.

No site alternatives have been assessed because it makes logical sense in terms of cost and environmental impact not to consider location alternatives but to rather refurbish the existing raw water abstraction works, pump station and associated access road, mostly within the existing development footprint. The Moordkuil raw water abstraction works has been at the site since 1980, and therefore it will not make sense to reconstruct the pump station at another site along the Moordkuil River. Most of the upgrades will occur within the existing footprint, which is already established, therefore choosing to construct the pump station at a different site along the Moordkuil river will cause a much more significant disturbance and incur significant additional costs.

The overarching objective of the development proposal is to increase the quantity of water abstraction back to the originally designed capacity by decommissioning the pumping infrastructure that is outdated and no longer functional.

List the positive and negative impacts that the property and site alternatives will have on the environment.

Not Applicable because no site alternatives exist.

1.2.	Activity alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts.

Provide a description of the preferred activity alternative.

The overarching objective of the development proposal is to increase the quantity of water abstraction back to the originally designed capacity by decommissioning the pumping infrastructure that is outdated and no longer functional. It is proposed to build a pump station that will not require continued maintenance and security of water supply – no other activities would yield the desired outcome.

Provide a description of any other activity alternatives investigated.

The proposal is to upgrade the Moordkuil Pumpstation to increase its abstraction capacity from 400 l/s to the intended design capacity of 800 l/s, as such no other feasible activity alternatives exist.

Provide a motivation for the preferred activity alternative.

No feasible alternatives.

The desired activity is to increase water abstraction to the originally designed capacity – no other activities would yield the desired outcome.

Provide a detailed motivation if no activity alternatives exist.

The overarching objective of the development proposal is to increase the quantity of water abstraction back to the originally designed capacity by decommissioning the pumping infrastructure that is outdated and no longer functional. It is proposed to build a pump station that will not require continued maintenance and security of water supply – no other activities would yield the desired outcome.

List the positive and negative impacts that the activity alternatives will have on the environment.

Not Applicable because no feasible activity alternatives exist.

1.3.	Design or layout alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts

Provide a description of the preferred design or layout alternative.

Please refer to the Engineering Report and Engineering Options (Appendix J).

Three different options were explored regarding the upgrade of the Moordkuil Pump Station.

Preferred Alternative (Alternative A):
The preferred alternative entails relocating the intake structure directly onto the rock outcrop. This presents significant technical and economic advantages which include:

- Improved Foundation Conditions: Relocating the intake would result in more favourable geotechnical conditions, potentially yielding a cost saving of approximately R1.7 million.
- Operational Continuity: By situating the intake upstream at the rock outcrop, it may be possible to maintain operation of the existing pump station throughout the construction period.
- Minimal Disruption to Adjacent Infrastructure: The nearby farmers' pump station, located just downstream of the existing station, would remain unaffected.

Should the existing pump station remain operational during construction, an estimated cost saving of approximately R24.5 million could be realized over the 18-month construction period by avoiding the need to purchase water from the Wolwedans Dam and the associated saving in chemicals at the water treatment works.

A new dry well pump station could be constructed at an estimated cost of approximately R2.4 million. This facility would enable continuous operation of the existing pump station with minimal interruption of the water abstraction during the construction phase. An additional benefit of constructing a permanent dry well is that it would allow the end-suction pumps to be installed at a lower elevation. This could possibly eliminate the requirement for immersible pumps within the intake structure in the future and enable the use of foot valves in combination with a priming system. A new dry well will also provide additional space for the installation of the proposed electrical equipment as the existing MCC room is very small.

Based on the abovementioned, Option 3 from the Concept and Viability Design Report (wetwell on rock outcrop with drywell next to pump station, Concept Layout 2) is recommended for implementation for the Moordkuil Pump Station upgrade, as it offers the lowest capital and operational costs, best operational reliability, and acceptable environmental impact (Please refer to the Concept and Viability Design Report – Appendix G6).

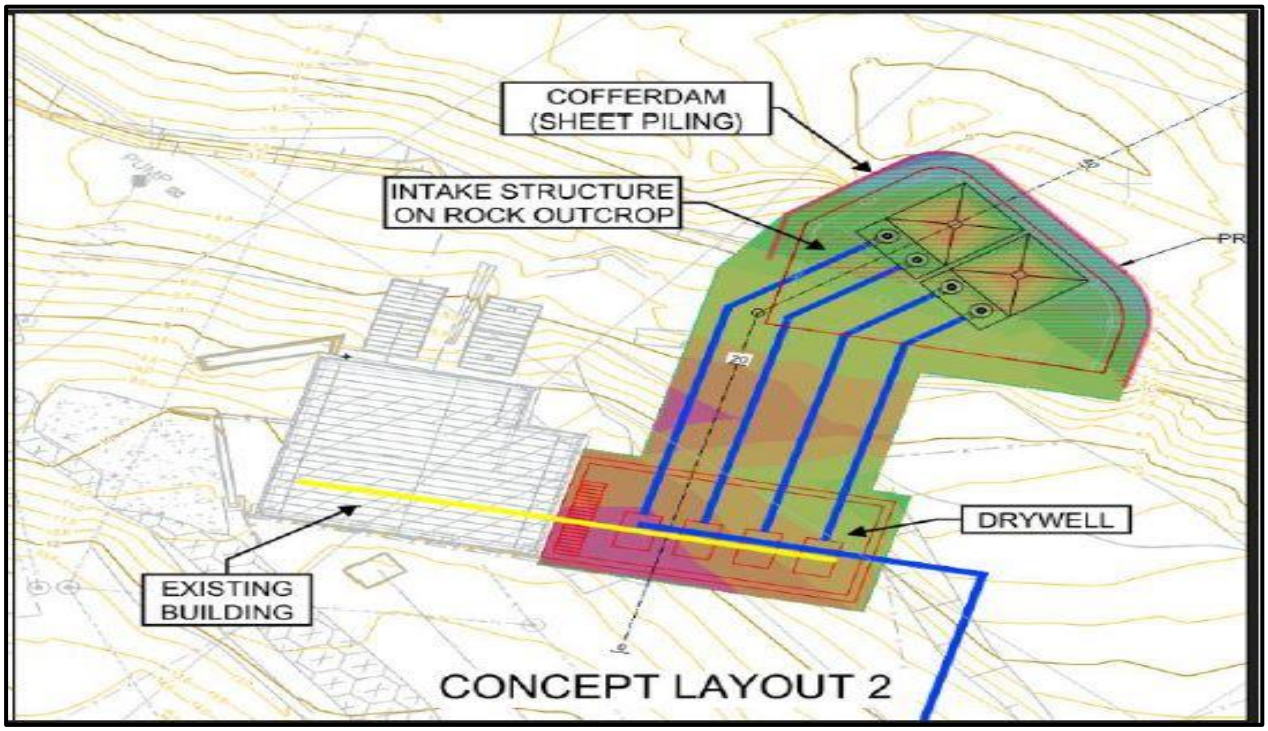

Figure 17: Option 3 – Concept Layout 2.

Provide a description of any other design or layout alternatives investigated.

Alternative B

Alternative B entails having the intake structure across the existing pump station, the rock outcrop identified will have to be removed. It will require pile foundations for the intake structure and restricted construction for the drywell between the existing pump station and the river. The existing pump station will also be taken out of operation for the entire construction period. Relocation of the farmers pumps downstream of the intake structure will be required to prevent the intakes from silting up.

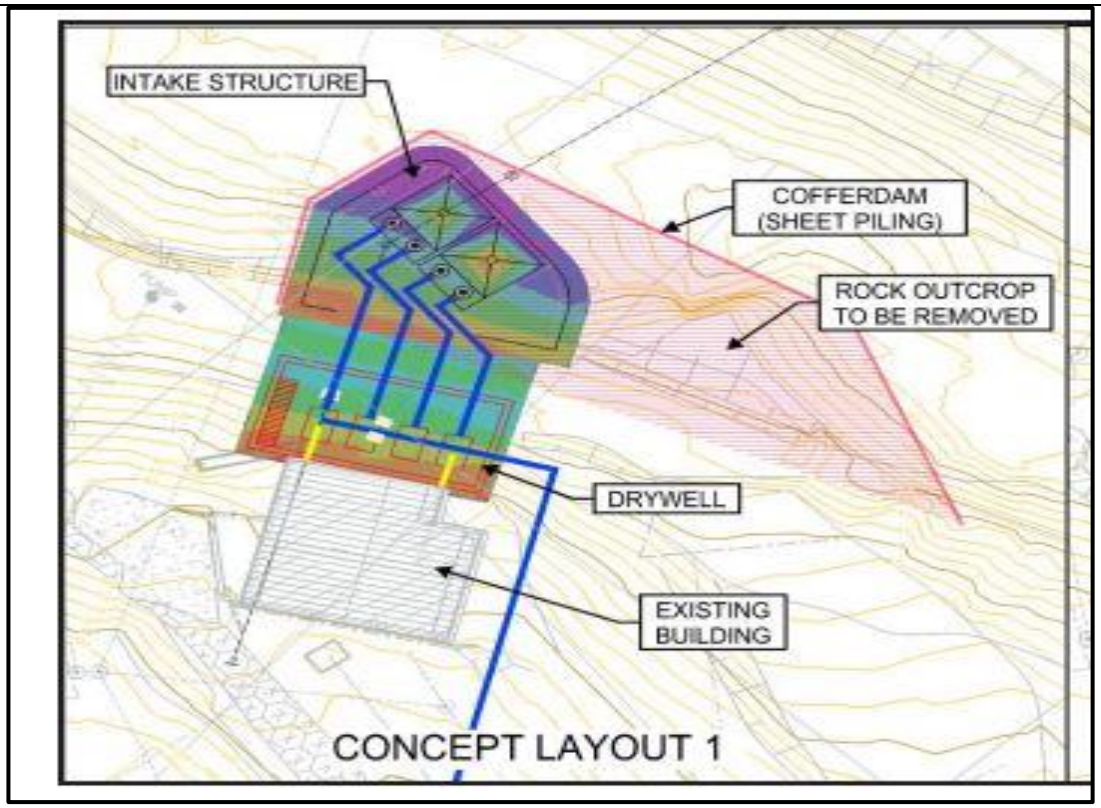

Figure 18: Concept Layout 1

Provide a motivation for the preferred design or layout alternative.

presents several technical and economic advantages:

- Improved Foundation Conditions: Relocating the intake would result in more favourable geotechnical conditions, potentially yielding a cost saving of approximately R1.7 million.
- Operational Continuity: By situating the intake upstream at the rock outcrop, it may be possible to maintain operation of the existing pump station throughout the construction period.
- Minimal Disruption to Adjacent Infrastructure: The nearby farmers' pump station, located just downstream of the existing station, would remain unaffected.
- Intake structure location on the rock outcrop minimises the narrowing and potential impact on river dynamics,

Should the existing pump station remain operational during construction, an estimated cost saving of approximately R24.5 million could be realized over the 18-month construction period by avoiding the need to purchase water from the Wolwedans Dam and the associated saving in chemicals at the water treatment works.

Provide a detailed motivation if no design or layout alternatives exist.

List the positive and negative impacts that the design alternatives will have on the environment.

Table 7: Advantages and Disadvantages of Preferred Alternative A

Advantages	Disadvantages
Preferred Alternative A	
Minimises narrowing of river and potential impact on river dynamics	Larger construction footprint
Less disturbance in the river if rock outcrop is not removed.	
Smaller coffer dam required	

Table 8: Advantages and Disadvantages of Alternative B

Advantages	Disadvantages
Alternative B	
Smaller construction footprint	Larger degree of disturbance in the river to remove the rock outcrop – could require blasting

	Requires pile foundations in the river for intake structure to be constructed.
	Intake structure narrows the existing river and can potentially negatively impact on river dynamics
	Larger coffer dam required

1.4.	Technology alternatives (e.g., to reduce resource demand and increase resource use efficiency) to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts.

Provide a description of the preferred technology alternative:

Not Applicable to this proposal.

Provide a description of any other technology alternatives investigated.

Not Applicable to this proposal.

Provide a motivation for the preferred technology alternative.

Not Applicable to this proposal.

Provide a detailed motivation if no alternatives exist.

Not Applicable to this proposal.

List the positive and negative impacts that the technology alternatives will have on the environment.

Not Applicable to this proposal.

1.5.	Operational alternatives to avoid negative impacts, mitigate unavoidable negative impacts and maximise positive impacts.

Provide a description of the preferred operational alternative.

Not Applicable to this proposal.

Provide a description of any other operational alternatives investigated.

Not Applicable to this proposal.

Provide a motivation for the preferred operational alternative.

Not Applicable to this proposal.

Provide a detailed motivation if no alternatives exist.

Not Applicable to this proposal.

List the positive and negative impacts that the operational alternatives will have on the environment.

Not Applicable to this proposal.

1.6.	The option of not implementing the activity (the 'No-Go' Option).

Provide an explanation as to why the 'No-Go' Option is not preferred.

The status quo remains that the pump station only abstract 400 litres per second because parts to fix the broken axial pumps are unobtainable. The pump station infrastructure could be washed away in the next flood and then no water can be abstracted from the river.

1.7.	Provide a concluding statement indicating the preferred alternatives, including the preferred location of the activity.

Taking the finding of the specialists into account, the impacts associated with Alternatives A and B are very similar, however Alternative B will require a larger degree of disturbance in the river due to the removal of the rock outcrop (which could possibly require blasting to remove it) and larger coffer dam.
According to the Concept and Viability report the relocation of the intake structure onto the rock outcrop (Option 3 Concept and Viability Report) will present several technical and economic advantages such as Improved Foundation Conditions: Relocating the intake would result in more favourable geotechnical conditions, potentially yielding a cost saving of approximately R1.7 million; Operational Continuity: By situating the intake upstream at the rock outcrop, it may be possible to maintain operation of the existing pump station throughout the construction period; Minimal Disruption to Adjacent Infrastructure: The nearby farmers' pump station, located just downstream of the existing station, would remain unaffected. This alternative is also significantly cheaper to construct as opposed to Alternative B.

Should the existing pump station remain operational during construction, an estimated cost saving of approximately R24.5 million could be realized over the 18-month construction period by avoiding the need to purchase water from the Wolwedans Dam and the associated saving in chemicals at the water treatment works.

Therefore Option 3 from the Concept and Viability Report is the Preferred Alternative.

2. "No-Go" areas

Explain what "no-go" area(s) have been identified during identification of the alternatives and provide the co-ordinates of the "no-go" area(s).

Only the development footprint and the smallest reasonable working area around the footprint must be used. All areas outside of the development footprint which contains indigenous vegetation, or triggers listed activities which are not authorised, must be regarded as No-Go areas.

Figure 19: No-Go Map.

3. Methodology to determine the significance ratings of the potential environmental impacts and risks associated with the alternatives.

Describe the methodology to be used in determining and ranking the nature, significance, consequences, extent, duration of the potential environmental impacts and risks associated with the proposed activity or development and alternatives, the degree to which the impact or risk can be reversed and the degree to which the impact and risk may cause irreplaceable loss of resources.

The assessment criteria utilised in this environmental impact assessment is based on, and adapted from, the Guideline on Impact Significance, Integrated Environmental Management Information Series 5 (Department of Environmental Affairs and Tourism (DEAT), 2002) and the Guideline 5: Assessment of Alternatives and Impacts in Support of the Environmental Impact Assessment Regulations (DEAT, 2006).

Determination of Extent (Scale):

Site specific	On site or within 100 m of the site boundary, but not beyond the property boundaries.
Local	The impacted area includes the whole or a measurable portion of the site and property, but could affect the area surrounding the development, including the neighbouring properties and wider municipal area.
Regional	The impact would affect the broader region (e.g., neighbouring towns) beyond the boundaries of the adjacent properties.
National	The impact would affect the whole country (if applicable).

Determination of Duration:

Temporary	The impact will be limited to the construction phase.
Short term	The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than 8 months after the completion of the construction phase.

Medium term	The impact will last up to the end of the construction phase, where after it will be entirely negated in a period shorter than 3 years after the completion of construction activities.
Long term	The impact will continue for the entire operational lifetime of the development but will be mitigated by direct human action or by natural processes thereafter.
Permanent	This is the only class of impact that will be non-transitory. Such impacts are regarded to be irreversible, irrespective of what mitigation is applied.

Determination of Probability:

Improbable	The possibility of the impact occurring is very low, due either to the circumstances, design or experience.
Probable	There is a possibility that the impact will occur to the extent that provisions must therefore be made.
Highly probable	It is most likely that the impacts will occur at some stage of the development. Plans must be drawn up to mitigate the activity before the activity commences.
Definite	The impact will take place regardless of any prevention plans.

Determination of Significance (without mitigation):

No significance	The impact is not substantial and does not require any mitigation action.
Low	The impact is of little importance but may require limited mitigation.
Medium	The impact is of sufficient importance and is therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.
Medium-High	The impact is of high importance and is therefore considered to have a negative impact. Mitigation is required to manage the negative impacts to acceptable levels.
High	The impact is of great importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.
Very High	The impact is critical. Mitigation measures cannot reduce the impact to acceptable levels. As such the impact renders the proposal unacceptable.

Determination of Significance (with mitigation):

No significance	The impact will be mitigated to the point where it is regarded to be insubstantial.
Low	The impact will be mitigated to the point where it is of limited importance.
Medium	Notwithstanding the successful implementation of the mitigation measures, the impact will remain of significance. However, taken within the overall context of the project, such a persistent impact does not constitute a fatal flaw.
High	Mitigation of the impact is not possible on a cost-effective basis. The impact continues to be of great importance, and taken within the overall context of the project, is considered to be a fatal flaw in the project proposal.

Determination of Reversibility:

Completely Reversible	The impact is reversible with implementation of minor mitigation measures
Partly Reversible	The impact is partly reversible but more intense mitigation measures

Barely Reversible	The impact is unlikely to be reversed even with intense mitigation measures
Irreversible	The impact is irreversible, and no mitigation measures exist

Determination of Degree to which an Impact can be Mitigated:

Can be mitigated	The impact is reversible with implementation of minor mitigation measures
Can be partly mitigated	The impact is partly reversible but more intense mitigation measures
Can be barely mitigated	The impact is unlikely to be reversed even with intense mitigation measures
Not able to mitigate	The impact is irreversible, and no mitigation measures exist

Determination of Loss of Resources:

No loss of resource	The impact will not result in the loss of any resources
Marginal loss of resource	The impact will result in marginal loss of resources
Significant loss of resources	The impact will result in significant loss of resources
Complete loss of resources	The impact will result in a complete loss of all resources

Determination of Cumulative Impact:

Negligible	The impact would result in negligible to no cumulative effects
Low	The impact would result in insignificant cumulative effects
Medium	The impact would result in minor cumulative effects
High	The impact would result in significant cumulative effects

Determination of Consequence significance:

Negligible	The impact would result in negligible to no consequences
Low	The impact would result in insignificant consequences
Medium	The impact would result in minor consequences
High	The impact would result in significant consequences

4. Assessment of each impact and risk identified for each alternative

Note: The following table serves as a guide for summarising each alternative. The table should be repeated for each alternative to ensure a comparative assessment. The EAP may decide to include this section as Appendix J to this BAR.

Development/Construction Phase Impacts:

Alternative:	Preferred Alternative A	Alternative B	No-Go Alternative
PLANNING, DESIGN AND DEVELOPMENT PHASE			
SOCIO-ECONOMIC IMPACT 1			
Potential impact and risk:	**JOB CREATION:** • **Estimated 10 employment opportunities will be created during the construction of the proposed facilities.** • **Approximately 100% of these opportunities will accrue to historically disadvantaged individuals from the surrounding communities.**		
Nature of impact:	**Positive**	**Positive**	**NO IMPACT**
Extent and duration of impact:	**Local – short term**	**Local – short term**	
Consequence of impact or risk:	**N/A**	**N/A**	
Probability of occurrence:	**Definite**	**Definite**	
Degree to which the impact may cause irreplaceable loss of resources:	**No loss**	**No loss**	
Degree to which the impact can be reversed:	**N/A**	**N/A**	
Indirect impacts:	**N/A**	**N/A**	
Cumulative impact prior to mitigation:	**Low (+)**	**Low (+)**	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (+)**	**Low (+)**	
Degree to which the impact can be avoided:	**N/A**	**N/A**	
Degree to which the impact can be managed:	**N/A**	**N/A**	
Degree to which the impact can be mitigated:	**N/A**	**N/A**	
Proposed mitigation:	**SEE BELOW**		
Residual impacts:	**Negligible**	**Negligible**	
Cumulative impact post mitigation:	**Low (+)**		
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (+)**	**Low (+)**	**NO IMPACT**

Mitigation Measures:

No mitigation required for this positive benefit. However, preference should be given to previously disadvantaged individuals from the local community when appointing contractors/ workers. All construction employees/ contractors must be appointed according to the relevant BBBEE and employment equity requirements of the Applicant.

Alternative:	Preferred Alternative A	Alternative B	No-Go Alternative
PLANNING, DESIGN AND DEVELOPMENT PHASE			
BOTANICAL ASSESSMENT IMPACT 1			
Potential impact and risk:	**IMPACT ON TERRESTRIAL BIODIVERSITY:** • **Clearing of mostly degraded thicket/renosterveld.** • **Temporary impact on the functionality of biodiversity network.** • **Increased opportunity for alien infestation.** • **Pollution of aquatic systems.**		
Nature of impact:	Negative	Negative	**NO IMPACT**
Extent and duration of impact:	Site Specific - Medium	Site Specific - Medium	
Probability of occurrence:	High	High	
Degree to which the impact may cause irreplaceable loss of resources:	Medium	Medium	
Degree to which the impact can be reversed:	Medium	Medium	
Indirect impacts:	None identified.	None identified.	
Cumulative impact prior to mitigation:	Medium-Low	Medium-Low	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium-Low (-)**	**Medium-Low (-)**	
Proposed mitigation:	**SEE BELOW**		
Cumulative impact post mitigation:	Low	Low	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**	**Low (-)**	**NO IMPACT**

Mitigation Measures:

- Fence off the construction areas. The thicket/renosterveld outside the construction areas must not be disturbed in any way.
- With regards to the site camp options, preference should be given to options 1 and 3. Site option 2, which contains considerably more vegetation and plant species, should not be selected. In the case of site camp option 1 (below the dam wall), a buffer of sufficient width must be maintained between the camp and nearby watercourse.
- To mitigate the impact of vegetation clearing, topsoil and seedbearing plant material from the construction areas must be protected and replaced after construction as part of the rehabilitation process. As a duty of care measure, consideration should also be given to S&R of suitable species (e.g. bulbs & succulents). Of course, any replanting of rescued plant material must be done in matching habitats from which the plants originate. Bulbs should be removed along with some soil, placed in gel, bagged and then taken to a nursery for temporary storage or transplanted directly in the receiving area. S&R should be done at an appropriate time of the year, preferably when the soil is wet during the raining season. Ideally, bulbs should be salvaged during leaf fall, but before or after flowering. Please note that a CapeNature permit is needed for the relocation of indigenous plant species.
- Allow at least 24 months for the monitoring of rehabilitation success and alien infestation post construction. Keep the project footprint as well as an additional strip of 10-15 m wide clear of invasive aliens.

Alternative:	Preferred Alternative A	Alternative B	No-Go Alternative
PLANNING, DESIGN AND DEVELOPMENT PHASE			
BOTANICAL ASSESSMENT IMPACT 2			
Potential impact and risk:	**IMPACT OF THE PROJECT ON FLORA, SCC & PROTECTED TREE SPECIES:** • **Loss of indigenous flora, potential SCC and protected tree species.**		
Nature of impact:	**Negative**	**Negative**	**NO IMPACT**
Extent and duration of impact:	**Site Specific - Medium**	**Site Specific - Medium**	
Probability of occurrence:	**High**	**High**	
Degree to which the impact may cause irreplaceable loss of resources:	**Medium**	**Medium**	
Degree to which the impact can be reversed:	**Medium**	**Medium**	
Indirect impacts:	**None identified.**	**None identified.**	
Cumulative impact prior to mitigation:	**Medium-Low**	**Medium-Low**	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium-Low**	**Medium-Low**	
Cumulative impact post mitigation:	**Low**	**Low**	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**	**Low (-)**	**NO IMPACT**

Mitigation Measures:

- Fence off the construction areas. The thicket/renosterveld outside the construction areas must not be disturbed in any way.
- With regards to the site camp options, preference should be given to options 1 and 3. Site option 2, which contains considerably more vegetation and plant species, should not be selected. In the case of site camp option 1 (below the dam wall), a buffer of sufficient width must be maintained between the camp and nearby watercourse.
- To mitigate the impact of vegetation clearing, topsoil and seedbearing plant material from the construction areas must be protected and replaced after construction as part of the rehabilitation process. As a duty of care measure, consideration should also be given to S&R of suitable species (e.g. bulbs & succulents). Of course, any replanting of rescued plant material must be done in matching habitats from which the plants originate. Bulbs should be removed along with some soil, placed in gel, bagged and then taken to a nursery for temporary storage or transplanted directly in the receiving area. S&R should be done at an appropriate time of the year, preferably when the soil is wet during the raining season. Ideally, bulbs should be salvaged during leaf fall, but before or after flowering. Please note that a CapeNature permit is needed for the relocation of indigenous plant species.
- Allow at least 24 months for the monitoring of rehabilitation success and alien infestation post construction. Keep the project footprint as well as an additional strip of 10-15 m wide clear of invasive aliens.

Alternative:	Preferred Alternative A	Alternative B	No-Go Alternative
SITE PREPARATION AND CONSTRUCTION PHASE			
AQUATIC ASSESSMENT IMPACT 1			
Potential impact and risk:	**DISTURBANCE/LOSS OF AQUATIC BIOTA:** • **The disturbance or loss of aquatic fauna and flora from direct physical destruction or disturbance which can result in further deterioration of aquatic habitat integrity, habitat fragmentation, and a reduction in the supply of ecosystem services.**		
Nature of impact:	**Negative**	**Negative**	**NO IMPACT**
Extent and duration of impact:	**Local and long-term**	**Site Specific – Long term**	
Consequence of impact or risk:	**Moderate**	**Low**	
Probability of occurrence:	**Highly probable**	**Probable**	
Degree to which the impact may cause irreplaceable loss of resources:	**Low**	**Low**	
Degree to which the impact can be reversed:	**Recoverable**	**Recoverable**	
Indirect impacts:	**Probable**	**Probable**	
Cumulative impact prior to mitigation:	**Low**	**Low**	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium (-)**	**Low (-)**	
Degree to which the impact can be avoided:	**Barely**	**Partially**	
Degree to which the impact can be managed:	**High**	**High**	
Degree to which the impact can be mitigated:	**Can be mitigated**	**Can be mitigated**	
Proposed mitigation:	**SEE BELOW**		
Residual impacts:	**Low**	**Very Low**	
Cumulative impact post mitigation:	**Low**	**Low**	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**	**Very Low (-)**	**NO IMPACT**

<u>Mitigation Measures:</u>

Design Phase:

- A construction method statement must be compiled and available on site. It must consider the no go area and include methods to avoid unnecessary disturbance.

Construction Phase:

- Any contractor found working within No-Go areas must be fined as per fining schedule/system setup for the project.
- It is the contractor's responsibility to continuously monitor the area for newly established alien species during the contract and establishment period, which if present must be removed. A list of these species needs to be added with photos into the EMPr. Removal of these species shall be undertaken in a way which prevents any damage to the remaining indigenous species

and inhibits the re-infestation of the cleaned areas. Any use of herbicides in removing alien plant species is required to be investigated by the ECO before use.

- Where vegetation has been cleared in the riparian area it is recommended that cover components be reinstated appropriately. Only indigenous species are to be considered.
- Monitoring by an independent ECO during construction in all phases.
- The construction of both interim and permanent structures within the river channel should be minimized wherever possible, ensuring minimal disruption to flow patterns. In particular, the implementation of erosion control measures on the opposite bank should be avoided.

Operational Phase:

- In the long term, the maintenance and management of the infrastructure should follow an approved Environmental Management Plan for the Operational Phase, which must include the removal of invasive alien vegetation in the riparian zone adjacent to the pump station and access road.

Alternative:	Preferred Alternative A	Alternative B	No-Go Alternative
SITE PREPARATION, CONSTRUCTION			
AQUATIC ASSESSMENT IMPACT 4			
Potential impact and risk:	**WATER QUALITY DETERIORATION:** • **Changes to the natural water quality parameters resulting in reduced ecosystem integrity and decreased biodiversity.**		
Nature of impact:	**Negative**	**Negative**	**NO IMPACT**
Extent and duration of impact:	**Local and short term**	**Local and medium term**	
Consequence of impact or risk:	**Medium**	**Medium**	
Probability of occurrence:	**Improbable**	**Probable**	
Degree to which the impact may cause irreplaceable loss of resources:	**Marginal loss**	**Marginal loss**	
Degree to which the impact can be reversed:	**Barely Reversible**	**Barely Reversible**	
Indirect impacts:	**Probable**	**Probable**	
Cumulative impact prior to mitigation:	**Low**	**Low**	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**	**Medium (-)**	
Degree to which the impact can be avoided:	**Partially**	**Barely**	
Degree to which the impact can be managed:	**Can be managed**	**Partially**	
Degree to which the impact can be mitigated:	**Can be barely mitigated**	**Can be mitigated**	
Proposed mitigation:	**SEE BELOW**		
Residual impacts:	**Low**	**Low**	
Cumulative impact post mitigation:	**Negligible**	**Low**	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**	**Low (-)**	**NO IMPACT**

Mitigation Measures:

Site Preparation & Construction Phase:

- **Pollution Prevention:**
  - Establish designated fuelling and maintenance areas away from the watercourse to prevent fuel and oil spills.
  - Store hazardous materials (e.g., cement, fuels, chemicals) in bunded areas away from the river.
  - Implement spill response procedures and have spill kits on-site.
  - Ensure proper waste disposal, including construction debris and domestic waste, to prevent contamination.
- **Stormwater Management:**
  - Design temporary stormwater control measures to prevent runoff from carrying pollutants into the river.
  - Use infiltration trenches or constructed wetlands to filter runoff before it enters the watercourse.

Operational Phase:

- **Monitoring & Maintenance:**
  - Regularly monitor water quality parameters (e.g., turbidity, dissolved oxygen, nutrients, heavy metals) to detect any degradation.
  - Implement adaptive management strategies if water quality deteriorates over time.
- **Vegetative Buffer Zones:**
  - Maintain or restore riparian vegetation to filter runoff, stabilize banks, and improve water quality.
  - Prevent livestock access to the river and site camps near infrastructure to reduce nutrient loading and bank erosion.
- **Long-Term Pollution Control:**
  - Establish protocols for handling accidental spills or contamination events.
  - Ensure all waste is deposed of at a registered waste disposal site.

Construction and Operational Phase Impacts:

Alternative:	**Preferred Alternative A**	**Alternative B**	**No-Go Alternative**
DESIGN PHASE, SITE PREPARATION, CONSTRUCTION AND OPERATIONAL PHASE			
AQUATIC ASSESSMENT IMPACT 2			
Potential impact and risk:	**CHANGES TO THE HYDROLOGICAL REGIME:** • **Changes to the natural movement of water flow through the Moordkuil River, by construction of infrastructure within the water column and riparian habitat. These changes can result in altered flow patterns, sediment transport, and erosion. Localized scour, sediment deposition upstream, and increased downstream velocity is possible to occur around water column infrastructure. There are risks of improperly designed infrastructure causing water column turbulence and vortex formation.**		
Nature of impact:	**Negative**	**Negative**	**NO IMPACT**
Extent and duration of impact:	**Site Specific and permanent**	**Site and permanent**	
Consequence of impact or risk:	**Low**	**Low**	

Probability of occurrence:	**Highly probable**	**Definite**	
Degree to which the impact may cause irreplaceable loss of resources:	**Marginal loss**	**Marginal loss**	
Degree to which the impact can be reversed:	**Reversible**	**Barely reversible**	
Indirect impacts:	**Improbable**	**Highly probable**	
Cumulative impact prior to mitigation:	**Negligible**	**Low**	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**	**Low (-)**	
Degree to which the impact can be avoided:	**Barely**	**Cannot be avoided**	
Degree to which the impact can be managed:	**Can be managed**	**Partially**	
Degree to which the impact can be mitigated:	**Can be mitigated**	**Can be mitigated**	
Proposed mitigation:	**SEE BELOW**		
Residual impacts:	**Negligible**	**Low**	
Cumulative impact post mitigation:	**Negligible**	**Low**	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Very Low (-)**	**Low (-)**	**NO IMPACT**

Mitigation Measures:

Design phase considerations:

- **Optimized Placement & Orientation** – Where possible position the cofferdam to minimize disruption to the main flow path and align it with the natural flow direction to reduce turbulence.
- **Permeability Considerations** – If necessary, utilise a slotted or porous section to allow controlled water passage and reduce sudden pressure changes.
- **Energy Dissipation Structures** – Where necessary consider including stepped weirs, baffles, or flow deflectors to prevent excessive velocity increases and turbulence.
- **Scour and Erosion Protection** – Where necessary design reinforced edges with riprap, gabions, or concrete aprons to prevent localized scour.
- **Sediment Transport Management** – Where necessary ensure the structure allows for natural sediment movement to prevent excessive upstream deposition or downstream erosion.

Site Preparation Phase:

- **Establish Controlled Access Routes:** Limit disturbance to water flow and minimize construction-related runoff.
- **Flow Diversion & Bypass Measures:** If possible, install a controlled bypass system (e.g., pipes or channels) to maintain continuous downstream flow. Ensure the bypass capacity matches or exceeds expected base flow conditions.
- **Contaminant Spill prevention measures:** Store fuels, cement and chemicals away from the river and have containment measures in place.

Construction Phase:

- **Control Water Flow During Construction:** Carefully manage the rate and timing of water released during construction to avoid surges and ensure consistent downstream flow.
- **Regular ECO Water Quality Monitoring:** Conduct monitoring of water quality to track turbidity and contamination levels.

- **Limit Water Diversion Duration:** Minimize the time the flow is disrupted by construction activities to reduce impact on aquatic ecosystems.
- **Controlled Dewatering:** If contaminated, remove contaminated water onto shore and treat accordingly. Do not discharge untreated contaminated water back into the system
- **Efficient Temporary River Channel Construction:** If required, implement bypasses and pumps with minimal disruption to the river's natural hydrology.

Operational Phase:

- **Flood Control Measures:** Regularly assess river levels and implement flood mitigation measures as required.
- **Maintenance work**: Any work associated with the maintenance of the water column infrastructure should be minimized in both spatial extent and duration. Preferably such work should take place during the drier months (December to April) to reduce hydrological impacts.

Alternative:	Preferred Alternative	Alternative B	No-Go Alternative
DESIGN PHASE, SITE PREPARATION, CONSTRUCTION AND OPERATIONAL PHASE			
AQUATIC ASSESSMENT IMPACT 3			
Potential impact and risk:	**GEOMORPHOLOGICAL CHANGES FROM EROSION AND SEDIMENTATION:** • **Changes to the form and geomorphological processes from clearing riparian vegetation and construction within the watercourse due to potential erosion and sedimentation from hydrological changes and increased sediment inputs.**		
Nature of impact:	**Negative**	**Negative**	**NO IMPACT**
Extent and duration of impact:	**Site Specific and short term**	**Local and short term**	
Consequence of impact or risk:	**Low**	**Moderate**	
Probability of occurrence:	**Probable**	**Probable**	
Degree to which the impact may cause irreplaceable loss of resources:	**Marginal loss**	**Marginal loss**	
Degree to which the impact can be reversed:	**Partially reversible**	**Barely Reversible**	
Indirect impacts:	**Improbable**	**Highly Probable**	
Cumulative impact prior to mitigation:	**Low**	**Medium**	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**	**Moderate (-)**	
Degree to which the impact can be avoided:	**Medium**	**Low**	
Degree to which the impact can be managed:	**High**	**High**	
Degree to which the impact can be mitigated:	**Can be mitigated**	**Can be mitigated**	
Proposed mitigation:	**SEE BELOW**		
Residual impacts:	**Low**	**Medium**	
Cumulative impact post mitigation:	**Low**	**Low**	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Very Low (-)**	**Low(-)**	**NO IMPACT**

Mitigation Measures:

Design phase considerations

- **Optimized Placement & Orientation** – Where possible position the cofferdam to minimize disruption to the main flow path and align it with the natural flow direction to reduce turbulence.
- **Permeability Considerations** – If necessary, utilise a slotted or porous section to allow controlled water passage and reduce sudden pressure changes.
- **Energy Dissipation Structures** – Where necessary consider including stepped weirs, baffles, or flow deflectors to prevent excessive velocity increases and turbulence.
- **Scour and Erosion Protection** – Where necessary, design reinforced edges with riprap, gabions, or concrete aprons to prevent localized scour.
- **Sediment Transport Management** – Where necessary ensure the structure allows for natural sediment movement to prevent excessive upstream deposition or downstream erosion.

Site Preparation Phase:

- **Establish sediment control barriers:** Install sediment fences, silt curtains, or berms around construction zones to contain sediment and prevent it from reaching water bodies.
- **Stabilise disturbed areas:** Apply erosion control techniques such as mulching, vegetation, or geotextiles to stabilize disturbed soils and reduce sediment runoff.

Construction Phase:

- **Sediment trapping measures:** Install sediment traps or basins at strategic points along construction sites to capture and manage sediment and minimise downstream contamination.
- **Minimize disturbed areas:** Limit the footprint of the construction zone and avoid unnecessary soil disturbance to reduce the potential for sediment mobilization.
- **Monitor sedimentation:** ECO monitor turbidity levels upstream and downstream of construction site to confirm the efficiency of mitigation measures and make adjustments as needed.
- **Water diversion techniques:** Divert clean water away from construction areas using berms or temporary channels to prevent sediment-laden water from entering watercourses.
- **Control stormwater runoff:** Use temporary sediment control measures, such as erosion mats or check dams, to control runoff and prevent excessive sedimentation during heavy rainfall events.

Operational Phase:

- **Maintain natural water column sediment levels:** Regularly clean and maintain coffer dam, and filtration systems to ensure they continue functioning effectively in capturing sediment and returning captured sediment back to the water column.
- **Vegetative stabilization:** Promote the growth of native vegetation in areas susceptible to erosion to stabilize soil and reduce sediment generation over time.
- **Revegetation of exposed soils:** In any areas that have been disturbed, replant vegetation and apply soil stabilisation techniques to prevent erosion and further sediment loss.
- **Flood Control Measures:** Regularly assess river levels and implement flood mitigation measures as required.
- **Maintenance work:** Any work associated with the maintenance of the water column infrastructure should be minimized in both spatial extent and duration. Preferably such work should take place during the drier months (December to April) to reduce hydrological impacts.
- **Emergency infrastructure repair:** Any flood damaged infrastructure should be repaired as soon as it is safe, and possible, to do so, to prevent further degradation and hydrological impacts.

Operational Phase Impacts:

Alternative:	Preferred Alternative	Alternative B	No-Go Alternative
OPERATIONAL PHASE			
SOCIO-ECONOMIC IMPACT 2			
Potential impact and risk:	**SECURITY OF AVAILABILITY OF WATER SUPPLY:** • **The proposed development, if authorised, will have a positive cumulative socio-economic impact in terms of securing water storage and supply capacity, especially in times of drought.** • **The benefits of security of water supply are far reaching for all. The additional water supply capacity could support further urban (and economic) development in Mossel Bay.** • **The additional water supply capacity could support further urban (and economic) development in Mossel Bay.** • **Further development may be associated with positive socio-economic benefits and growth for the surrounding community.**		
Nature of impact:	**Positive**	**Positive**	**Negative**
Extent and duration of impact:	**Local – short term**	**Local – short term**	**Local – short term**
Consequence of impact or risk:	**N/A**		
Probability of occurrence:	**Definite**	**Definite**	**Definite**
Degree to which the impact may cause irreplaceable loss of resources:	**No loss**	**No loss**	**No loss**
Degree to which the impact can be reversed:	**N/A**	**N/A**	**N/A**
Indirect impacts:	**N/A**	**N/A**	**N/A**
Cumulative impact prior to mitigation:	**Medium (+)**	**Medium (+)**	**Medium (-)**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium (+)**	**Medium (+)**	**Medium (-)**
Degree to which the impact can be avoided:	**N/A**	**N/A**	**N/A**
Degree to which the impact can be managed:	**N/A**	**N/A**	**N/A**
Degree to which the impact can be mitigated:	**N/A**	**N/A**	**N/A**
Proposed mitigation:	**SEE BELOW**		
Residual impacts:	**Negligible**	**Negligible**	**Negligible**
Cumulative impact post mitigation:	**Medium (+)**	**Medium (+)**	**Medium (-)**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium (+)**	**Medium (+)**	**Medium (-)**

Alternative:	Preferred Alternative	Alternative B	No-Go Alternative
OPERATIONAL PHASE			
BOTANICAL ASSESSMENT IMPACT 1			
Potential impact and risk:	**IMPACT ON TERRESTRIAL BIODIVERSITY:** • **Increased alien infestation.** • **Erosion due to poor rehabilitation efforts.**		
Nature of impact:	Negative	Negative	**NO IMPACT**
Extent and duration of impact:	Site Specific - Medium	Site Specific - Medium	
Probability of occurrence:	Medium	Medium	
Degree to which the impact may cause irreplaceable loss of resources:	Medium-Low	Medium-Low	
Degree to which the impact can be reversed:	High	High	
Indirect impacts:	None identified.	None identified.	
Cumulative impact prior to mitigation:	Low	Low	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**	**Low (-)**	
Proposed mitigation:	**SEE BELOW**		
Cumulative impact post mitigation:	Low	Low	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**	**Low (-)**	**NO IMPACT**

Mitigation Measures:

- Monitor the construction footprint and all areas disturbed during construction for rehabilitation success and erosion. Where needed, rehabilitate/revegetate disturbed surfaces expediently. Erosion prevention measures may be needed on steep slopes, such as silt fences, logs or netting, to slow down runoff and potential erosion. Mulching and seeding with indigenous thicket/renosterveld seed may also be needed.
- As a long-term maintenance requirement, continue with alien clearing on and around the project footprint, focussing on invasive species such as black wattle, rooikrans, common thorn apple, prickly pear, wild tobacco, castor-oil plant, bugweed and spear thistle. These species are category 1b and 2 invaders that require compulsory control as part of an invasive species control programme. Please note that it is a legal requirement for landowners to clear alien vegetation on their land.

Alternative:	**Preferred Alternative**	**Alternative B**	**No-Go Alternative**
OPERATIONAL PHASE			
BOTANICAL ASSESSMENT IMPACT 2			
Potential impact and risk:	**IMPACT OF THE PROJECT ON FLORA, SCC & PROTECTED TREE SPECIES:** • **Loss of indigenous flora, potential SCC and protected tree species.**		
Nature of impact:	**Negative**	**Negative**	**NO IMPACT**
Extent and duration of impact:	**Site Specific - Medium**	**Site Specific - Medium**	
Probability of occurrence:	**High**	**High**	
Degree to which the impact may cause irreplaceable loss of resources:	**Medium**	**Medium**	

Degree to which the impact can be reversed:	**Medium**	**Medium**	
Indirect impacts:	**None identified.**	**None identified.**	
Cumulative impact prior to mitigation:	**Medium-Low**	**Medium-Low**	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium-Low**	**Medium-Low**	
Cumulative impact post mitigation:	**Low**	**Low**	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low (-)**	**Low (-)**	**NO IMPACT**

Mitigation Measures:

- Monitor the construction footprint and all areas disturbed during construction for rehabilitation success and erosion. Where needed, rehabilitate/revegetate disturbed surfaces expediently. Erosion prevention measures may be needed on steep slopes, such as silt fences, logs or netting, to slow down runoff and potential erosion. Mulching and seeding with indigenous thicket/renosterveld seed may also be needed.
- As a long-term maintenance requirement, continue with alien clearing on and around the project footprint, focussing on invasive species such as black wattle, rooikrans, common thorn apple, prickly pear, wild tobacco, castor-oil plant, bugweed and spear thistle. These species are category 1b and 2 invaders that require compulsory control as part of an invasive species control programme. Please note that it is a legal requirement for landowners to clear alien vegetation on their land.

SECTION I: FINDINGS, IMPACT MANAGEMENT AND MITIGATION MEASURES

1.	Provide a summary of the findings and impact management measures identified by all Specialist and an indication of how these findings and recommendations have influenced the proposed development.

Table 9 below summarises the potential Impacts associated with the proposed upgrades of the Moordkuil Pump Station post mitigation. Please refer to the Section I (2) for the proposed mitigation measures to ensure the corresponding rating post mitigation.

Table 9: Summary of Impacts:

Impact	Preferred Alternative A	Alternative B	No-Go Alternative
CONSTRUCTION PHASE			
JOB CREATION	Low (+)	Low (+)	No Impact
IMPACT ON TERRESTRIAL BIODIVERSITY	Low (-)	Low (-)	No Impact
IMPACT OF THE PROJECT ON FLORA, SCC & PROTECTED TREE SPECIES	Low (-)	Low (-)	No Impact
DISTURBANCE/LOSS OF AQUATIC BIOTA:	Low (-)	Very Low (-)	No Impact
WATER QUALITY DETERIORATION	Low (-)	Low (-)	No Impact
CONSTRUCTION AND OPERATIONAL PHASE			
CHANGES TO THE HYDROLOGICAL REGIME	Very Low (-)	Low (-)	No Impact
GEOMORPHOLOGICAL CHANGES FROM EROSION AND SEDIMENTATION	Very Low (-)	Low (-)	No Impact
OPERATIONAL PHASE			
SECURITY OF AVAILABILITY OF WATER SUPPLY:	Medium (+)	Medium (+)	Medium (-)
IMPACT ON TERRESTRIAL BIODIVERSITY	Low (-)	Low (-)	No Impact
IMPACT OF THE PROJECT ON FLORA, SCC & PROTECTED TREE SPECIES	Low (-)	Low (-)	No Impact
CHANGES TO THE HYDROLOGICAL REGIME	Very Low (-)	Low (-)	No Impact
GEOMORPHOLOGICAL CHANGES FROM EROSION AND SEDIMENTATION	Very Low (-)	Low (-)	No Impact

Specialists Reports Conclusions:

Aquatic Impact Assessment, Appendix G1 :

The aquatic habitats within 500m of the project footprint were identified and mapped on a desktop level using available data. Following this, a site assessment was conducted to confirm desktop findings, gather additional information, and define the boundaries of the aquatic habitat. The groundtruthed findings are largely in alignment with the information of the desktop databases.

Risk assessment determined that there are two potentially impacted HGM units, namely the riparian system of the Moordkuil River, which is a perennial system, and HGM unit 3 which is a channelled valley bottom system. The Moordkuil River is the existing abstraction point and is already subjected to impacts

from abstraction activities and is the location where both alternatives. However, the remaining habitat still provides important ecosystem services. It was recommended that no further deterioration of the habitat must be allowed outside of the designated construction footprint.

Impact assessment determined that after mitigation, Alternatives 1 and 2 both have similarly low impacts (after mitigation). The lowest impacts were from the No-Go Alternative. Mitigation should focus on minimising construction footprint and reduction of impacts on the hydrological and geomorphological characteristics of the watercourse. A robust monitoring programme should be developed and audited annually by a SACNASP registered ecologist.

In conclusion, there are fatal flaws associated with the proposed establishment of Site Camp 1 and 2 as the principals of impact avoidance (if possible), should have been implemented. The No-Go Alternative has the lowest impacts and therefore is the preferred alternative (from a freshwater perspective), but Site Camp 3 is acceptable, provided all the mitigation measures are strictly implemented and monitored. The proposed project requires water use authorisation in terms of Chapter 4 and Section 21 of the National Water Act No. 36 of 1998, prior to the commencement of activities.

Botanical Impact Assessment, Appendix G2 :

The site proposed for the project lies inside transformed or degraded Albany thicket and Mossel Bay Shale Renosterveld. The latter is currently listed as Critically Endangered. The site is also partly located inside the Western Cape biodiversity network, with most of it mapped as terrestrial and aquatic critical biodiversity areas (CBA) or degraded critical biodiversity areas (CBA2). Two SCC were recorded on site, namely Hermannia lavandulifolia (VU) and Freesia cf fergusoniae (VU). Both observed occurrences can be avoided. Two protected tree species (Sideroxylon inerme & Pittosporum viridiflorum) are also present on the site. Given the transformed or degraded state of the vegetation, the impact on terrestrial biodiversity and plant species is of medium-low significance, prior to mitigation. With mitigation, this impact can be lowered further.

It is therefore recommended that the proposed project be considered for approval, but subject to the proposed mitigation measures listed above.

Terrestrial Faunal and Avifaunal Species Compliance Statement Report, Appendix G3 :

While the proposed project is unlikely to have any major impacts on terrestrial faunal and avifaunal species, the a temporary platform will be constructed through soil infill material behind the sheet piling accommodate a temporary platform for the piling rig in order to construct the concrete inlet hopper within the Moordkuil River. Because this temporary platform will intersect a sensitive freshwater environment, any such scope of works should follow recommendations from the freshwater specialist. Aside from overlap with the freshwater ecosystem of the Moordkuil River, all other project footprints and site camp locations under both Preferred Alternative layout A and Alternative layout B are located in less sensitive areas from a terrestrial faunal and avifaunal perspective and are unlikely to impact on ecological processes or biodiversity patterns at either local or regional scales. Both these development layouts and associated activities are therefore supported from a terrestrial faunal and avifaunal biodiversity perspective.

Palaeontology Sensitivity Statement, Appendix G4 :

The Moordkuil River Pumpstation project lies entirely on the Quaternary sands and alluvium along the river valley that is indicated as moderately sensitive. The area is highly disturbed from agriculture and present thick vegetation so it is very unlikely that any transported Quaternary fossils occur there. In addition, any fossil material would be fragmented and unidentifiable, plus it would be out of primary context. The true palaeosensitivity should be low.

Both proposed sites for the camp site are on the Enon Formation and indicated as very highly sensitive. This palaeosensitivity is also contested because the Enon Formation is a conglomerate with boulders,

pebbles and sands and is a "dump" for such sediments that were deposited from the Cretaceous to the Tertiary which means there are no fossils that could assist with the dating. Furthermore, both sites are also highly disturbed from previous agriculture and clearing.
Since there is no chance of fossils of any importance occurring in the project footprint, we request exemption from any further palaeontological impact assessment. As far as the palaeontology is concerned there is no preferred site for the camp site.

Agricultural Compliance Statement, Appendix G5 :

The overall conclusion of this assessment is that the proposed development is acceptable because it leads to no loss of future agricultural production potential.

This assessment disputes the high and very high sensitivity classification of the site by the screening tool and verifies the entire site as being of low to medium agricultural sensitivity because of its assessed cropping potential.

Although the climate, terrain, and soil suitability may allow for viable crop production, other factors constrain the potential of the site to practically deliver agricultural produce and therefore limit its agricultural production potential.

This is primarily because the location and use of the site will serve the purpose of upgrading the existing raw bulk water abstraction works. For this reason, the site is highly unlikely to ever be viably utilised for agricultural production, and its potential is therefore assessed here as very low

An agricultural impact must by definition cause a change to the future agricultural production potential of land. If there is no change, there is no impact. In this case, the entire development footprint is considered to be below the threshold for needing to be conserved as agricultural production land because of the limitations that make it unsuitable as viable cropland. The proposed development on this land will result in no loss of future agricultural production potential in terms of national food security.

Due to the facts that the proposed development will not occupy scarce, viable cropland, the overall negative agricultural impact of the development (loss of future agricultural production potential) is assessed here as being of low significance and as acceptable.

From an agricultural impact point of view, it is recommended that the proposed development be approved. The conclusion of this assessment on the acceptability of the proposed development and the recommendation for its approval is not subject to any conditions.

2.	List the impact management measures that were identified by all Specialist that will be included in the EMPr

Aquatic Assessment Mitigation Measures:

Construction Phase:

Impact to mitigate	Mitigation
Disturbance/loss of aquatic biota	**Design Phase:** • A construction method statement must be compiled and available on site. It must consider the no go area and include methods to avoid unnecessary disturbance. **Construction Phase:** • Any contractor found working within No-Go areas must be fined as per fining schedule/system setup for the project. • It is the contractor's responsibility to continuously monitor the area for newly

	established alien species during the contract and establishment period, which if present must be removed. A list of these species needs to be added with photos into the EMPr. Removal of these species shall be undertaken in a way which prevents any damage to the remaining indigenous species and inhibits the re-infestation of the cleaned areas. Any use of herbicides in removing alien plant species is required to be investigated by the ECO before use. • Where vegetation has been cleared in the riparian area it is recommended that cover components be reinstated appropriately. Only indigenous species are to be considered. • Monitoring by an independent ECO during construction in all phases. • The construction of both interim and permanent structures within the river channel should be minimized wherever possible, ensuring minimal disruption to flow patterns. In particular, the implementation of erosion control measures on the opposite bank should be avoided. **Operational Phase:** • In the long term, the maintenance and management of the infrastructure should follow an approved Environmental Management Plan for the Operational Phase, which must include the removal of invasive alien vegetation in the riparian zone adjacent to the pump station and access road.
Water quality deterioration	**Site Preparation & Construction Phase:** • **Pollution Prevention:** o Establish designated fuelling and maintenance areas away from the watercourse to prevent fuel and oil spills. o Store hazardous materials (e.g., cement, fuels, chemicals) in bunded areas away from the river. o Implement spill response procedures and have spill kits on-site. o Ensure proper waste disposal, including construction debris and

	domestic waste, to prevent contamination. • **Stormwater Management:** o Design temporary stormwater control measures to prevent runoff from carrying pollutants into the river. o Use infiltration trenches or constructed wetlands to filter runoff before it enters the watercourse. **Operational Phase:** • **Monitoring & Maintenance:** o Regularly monitor water quality parameters (e.g., turbidity, dissolved oxygen, nutrients, heavy metals) to detect any degradation. o Implement adaptive management strategies if water quality deteriorates over time. • **Vegetative Buffer Zones:** o Maintain or restore riparian vegetation to filter runoff, stabilize banks, and improve water quality. o Prevent livestock access to the river and site camps near infrastructure to reduce nutrient loading and bank erosion. • **Long-Term Pollution Control:** o Establish protocols for handling accidental spills or contamination events. o Ensure all waste is deposed of at a registered waste disposal site.

Construction and Operational Phase:

Impact to mitigate	Mitigation
Changes to the hydrological regime	**Design phase considerations:** • **Optimized Placement & Orientation** – Where possible position the cofferdam to minimize disruption to the main flow path and align it with the natural flow direction to reduce turbulence. • **Permeability Considerations** – If necessary, utilise a slotted or porous section to allow controlled water passage and reduce sudden pressure changes. • **Energy Dissipation Structures** – Where necessary consider including stepped weirs, baffles, or flow deflectors to

	prevent excessive velocity increases and turbulence. • **Scour and Erosion Protection** – Where necessary design reinforced edges with riprap, gabions, or concrete aprons to prevent localized scour. • **Sediment Transport Management** – Where necessary ensure the structure allows for natural sediment movement to prevent excessive upstream deposition or downstream erosion. **Site Preparation Phase:** • **Establish Controlled Access Routes:** Limit disturbance to water flow and minimize construction-related runoff. • **Flow Diversion & Bypass Measures:** If possible, install a controlled bypass system (e.g., pipes or channels) to maintain continuous downstream flow. Ensure the bypass capacity matches or exceeds expected base flow conditions. • **Contaminant Spill prevention measures:** Store fuels, cement and chemicals away from the river and have containment measures in place. **Construction Phase:** • **Control Water Flow During Construction:** Carefully manage the rate and timing of water released during construction to avoid surges and ensure consistent downstream flow. • **Regular ECO Water Quality Monitoring:** Conduct monitoring of water quality to track turbidity and contamination levels. • **Limit Water Diversion Duration:** Minimize the time the flow is disrupted by construction activities to reduce impact on aquatic ecosystems. • **Controlled Dewatering:** If contaminated, remove contaminated water onto shore and treat accordingly. Do not discharge untreated contaminated water back into the system • **Efficient Temporary River Channel Construction:** If required, implement bypasses and pumps with minimal disruption to the river's natural hydrology. **Operational Phase:**

	• **Flood Control Measures:** Regularly assess river levels and implement flood mitigation measures as required. • **Maintenance work**: Any work associated with the maintenance of the water column infrastructure should be minimized in both spatial extent and duration. Preferably such work should take place during the drier months (December to April) to reduce hydrological impacts.
Geomorphological changes from erosion and sedimentation	**Design phase considerations** • **Optimized Placement & Orientation** – Where possible position the cofferdam to minimize disruption to the main flow path and align it with the natural flow direction to reduce turbulence. • **Permeability Considerations** – If necessary, utilise a slotted or porous section to allow controlled water passage and reduce sudden pressure changes. • **Energy Dissipation Structures** – Where necessary consider including stepped weirs, baffles, or flow deflectors to prevent excessive velocity increases and turbulence. • **Scour and Erosion Protection** – Where necessary, design reinforced edges with riprap, gabions, or concrete aprons to prevent localized scour. • **Sediment Transport Management** – Where necessary ensure the structure allows for natural sediment movement to prevent excessive upstream deposition or downstream erosion. **Site Preparation Phase:** • **Establish sediment control barriers:** Install sediment fences, silt curtains, or berms around construction zones to contain sediment and prevent it from reaching water bodies. • **Stabilise disturbed areas:** Apply erosion control techniques such as mulching, vegetation, or geotextiles to stabilize disturbed soils and reduce sediment runoff. **Construction Phase:**

	• **Sediment trapping measures:** Install sediment traps or basins at strategic points along construction sites to capture and manage sediment and minimise downstream contamination. • **Minimize disturbed areas:** Limit the footprint of the construction zone and avoid unnecessary soil disturbance to reduce the potential for sediment mobilization. • **Monitor sedimentation:** ECO monitor turbidity levels upstream and downstream of construction site to confirm the efficiency of mitigation measures and make adjustments as needed. • **Water diversion techniques:** Divert clean water away from construction areas using berms or temporary channels to prevent sediment-laden water from entering watercourses. • **Control stormwater runoff:** Use temporary sediment control measures, such as erosion mats or check dams, to control runoff and prevent excessive sedimentation during heavy rainfall events. **Operational Phase:** • **Maintain natural water column sediment levels:** Regularly clean and maintain coffer dam, and filtration systems to ensure they continue functioning effectively in capturing sediment and returning captured sediment back to the water column. • **Vegetative stabilization:** Promote the growth of native vegetation in areas susceptible to erosion to stabilize soil and reduce sediment generation over time. • **Revegetation of exposed soils:** In any areas that have been disturbed, replant vegetation and apply soil stabilisation techniques to prevent erosion and further sediment loss. • **Flood Control Measures:** Regularly assess river levels and implement flood mitigation measures as required. • **Maintenance work:** Any work associated with the maintenance of the water column infrastructure should be minimized in both spatial extent and

	duration. Preferably such work should take place during the drier months (December to April) to reduce hydrological impacts. • **Emergency infrastructure repair:** Any flood damaged infrastructure should be repaired as soon as it is safe, and possible, to do so, to prevent further degradation and hydrological impacts.

Botanical Assessment Mitigation Measures:

Construction Phase:

Impact to mitigate	Mitigation
Impact on terrestrial biodiversity	• Fence off the construction areas. The thicket/renosterveld outside the construction areas must not be disturbed in any way. • With regards to the site camp options, preference should be given to options 1 and 3. Site option 2, which contains considerably more vegetation and plant species, should not be selected. In the case of site camp option 1 (below the dam wall), a buffer of sufficient width must be maintained between the camp and nearby watercourse. • To mitigate the impact of vegetation clearing, topsoil and seedbearing plant material from the construction areas must be protected and replaced after construction as part of the rehabilitation process. As a duty of care measure, consideration should also be given to S&R of suitable species (e.g. bulbs & succulents). Of course, any replanting of rescued plant material must be done in matching habitats from which the plants originate. Bulbs should be removed along with some soil, placed in gel, bagged and then taken to a nursery for temporary storage or transplanted directly in the receiving area. S&R should be done at an appropriate time of the year, preferably when the soil is wet during the raining season. Ideally, bulbs should be salvaged during leaf fall, but before or after flowering. Please note that a CapeNature permit is needed for the relocation of indigenous plant species.

	• Allow at least 24 months for the monitoring of rehabilitation success and alien infestation post construction. Keep the project footprint as well as an additional strip of 10-15 m wide clear of invasive aliens.
Impact on flora, SCC and protected tree species	• Fence off the construction areas. The thicket/renosterveld outside the construction areas must not be disturbed in any way. • With regards to the site camp options, preference should be given to options 1 and 3. Site option 2, which contains considerably more vegetation and plant species, should not be selected. In the case of site camp option 1 (below the dam wall), a buffer of sufficient width must be maintained between the camp and nearby watercourse. • To mitigate the impact of vegetation clearing, topsoil and seedbearing plant material from the construction areas must be protected and replaced after construction as part of the rehabilitation process. As a duty of care measure, consideration should also be given to S&R of suitable species (e.g. bulbs & succulents). Of course, any replanting of rescued plant material must be done in matching habitats from which the plants originate. Bulbs should be removed along with some soil, placed in gel, bagged and then taken to a nursery for temporary storage or transplanted directly in the receiving area. S&R should be done at an appropriate time of the year, preferably when the soil is wet during the raining season. Ideally, bulbs should be salvaged during leaf fall, but before or after flowering. Please note that a CapeNature permit is needed for the relocation of indigenous plant species. • Allow at least 24 months for the monitoring of rehabilitation success and alien infestation post construction. Keep the project footprint as well as an additional strip of 10-15 m wide clear of invasive aliens.

Operational Phase:

Impact to mitigate	Mitigation
Impact on terrestrial biodiversity	• Monitor the construction footprint and all areas disturbed during construction for rehabilitation success and erosion. Where needed, rehabilitate/revegetate disturbed surfaces expediently. Erosion prevention measures may be needed on steep slopes, such as silt fences, logs or netting, to slow down runoff and potential erosion. Mulching and seeding with indigenous thicket/renosterveld seed may also be needed. • As a long-term maintenance requirement, continue with alien clearing on and around the project footprint, focussing on invasive species such as black wattle, rooikrans, common thorn apple, prickly pear, wild tobacco, castor-oil plant, bugweed and spear thistle. These species are category 1b and 2 invaders that require compulsory control as part of an invasive species control programme. Please note that it is a legal requirement for landowners to clear alien vegetation on their land.
Impact on flora, SCC and protected tree species	• Monitor the construction footprint and all areas disturbed during construction for rehabilitation success and erosion. Where needed, rehabilitate/revegetate disturbed surfaces expediently. Erosion prevention measures may be needed on steep slopes, such as silt fences, logs or netting, to slow down runoff and potential erosion. Mulching and seeding with indigenous thicket/renosterveld seed may also be needed. • As a long-term maintenance requirement, continue with alien clearing on and around the project footprint, focussing on invasive species such as black wattle, rooikrans, common thorn apple, prickly pear, wild tobacco, castor-oil plant, bugweed and spear thistle. These species are category 1b and 2 invaders that require compulsory control as part of an invasive species control programme. Please note that it is a legal requirement for landowners to clear alien vegetation on their land.

Terrestrial Faunal and Avifaunal Species Compliance Statement Mitigation Measures:

Construction Phase:

Impact to mitigate	Mitigation
Direct mortality of, or displacement of fauna	• The direct mortality of, or displacement of fauna is expected to be "Insignificant" to the receiving environment under both Preferred Alternative layout A and Alternative layout B. It is however advocated that every effort should be made to save and relocate any mammal, reptile, amphibian, bird, or invertebrate that cannot flee of its own accord, encountered during site preparation (i.e., to avoid and minimise the direct mortality of faunal species). These animals should be relocated to an area immediately outside of the project footprint, but under no circumstances any further away.
Contamination of ground water through chemical spills or leaching of chemicals	• Storage of fuel, chemicals and other hazardous substances should be done in suitable secure weatherproof containers with impermeable and bunded floors to limit pilferage or spillage into the environment. • Clean-up of any spillages (e.g. oil, fuel hazardous chemicals and cement) should proceed immediately and the contaminated soil should be removed and disposed of appropriately.

3.	List the specialist investigations and the impact management measures that will **not** be implemented and provide an explanation as to why these measures will not be implemented.
N/A. All mitigation recommended will be implemented.	
4.	Explain how the proposed development will impact the surrounding communities.
The proposed development will not have an impact on the surrounding communities.	
5.	Explain how the risk of climate change may influence the proposed activity or development and how has the potential impacts of climate change been considered and addressed.
while climate change is expected to alter the hydrological and geomorphological characteristics. The changes in rainfall patterns and flood intensity, interspersed with prolonged droughts, are expected to impact both surface and groundwater systems in the region. Engineering designs for the pumpstation specifically need to be designed to account for increase in intense flooding events which may initiate erosion and loss of infrastructure.	
6.	Explain whether there are any conflicting recommendations between the specialists. If so, explain how these have been addressed and resolved.
No conflicting recommendations.	
7.	Explain how the findings and recommendations of the different specialist studies have been integrated to inform the most appropriate mitigation measures that should be implemented to manage the potential impacts of the proposed activity or development.
All specialists' recommendations have been included in the EMPr requirements and informed the preferred location and layout alternatives as proposed.	
8.	Explain how the mitigation hierarchy has been applied to arrive at the best practicable environmental option.

Table 10: Mitigation Hierarchy

1	**AVOID IMPACTS**	THE TEMPORARY IMPACTS TO THE BIOPHYSICAL ENVIRONMENT ARE UNAVOIDABLE

2	**MINIMISE IMPACTS**	THE IMPACTS WILL BE MINIMISED THROUGH THE IMPLEMENTATION OF THE MITIGATION MEASURES WITHIN THE EMPR
3	**RECTIFY**	THE DISTURBANCES CREATED BY THE CONSTRUCTION PHASE WILL BE REHABILITATED IN ACCORDANCE WITH THE EMPR
4	**OFFSET**	NONE NECESSARY

SECTION J: GENERAL

1. Environmental Impact Statement

1.1.	Provide a summary of the key findings of the EIA.

Table 11 below summarises the potential Impacts associated with the proposal. Please refer to the Section I (2) for the proposed mitigation measures to ensure the corresponding rating post mitigation. The findings of the Specialists have been taken into consideration in this BAR and the impact management measures identified by all the Specialists have been incorporated into the EMPr and will thus ensure that, through the implementation of the EMPr that the potential impacts are mitigated to the significance ratings as shown in Table 10 and that impacts to the environment for the proposal are minimised and that the proposal is undertaken in a sustainable manner.

Table 11: Summary of Impacts:

Impact	Preferred Alternative A	Alternative B	No-Go Alternative
CONSTRUCTION PHASE			
JOB CREATION	Low (+)	Low (+)	No Impact
IMPACT ON TERRESTRIAL BIODIVERSITY	Low (-)	Low (-)	No Impact
IMPACT OF THE PROJECT ON FLORA, SCC & PROTECTED TREE SPECIES	Low (-)	Low (-)	No Impact
DISTURBANCE/LOSS OF AQUATIC BIOTA:	Low (-)	Very Low (-)	No Impact
WATER QUALITY DETERIORATION	Low (-)	Low (-)	No Impact
CONSTRUCTION AND OPERATIONAL PHASE			
CHANGES TO THE HYDROLOGICAL REGIME	Very Low (-)	Low (-)	No Impact
GEOMORPHOLOGICAL CHANGES FROM EROSION AND SEDIMENTATION	Very Low (-)	Low (-)	No Impact
OPERATIONAL PHASE			
SECURITY OF AVAILABILITY OF WATER SUPPLY:	Medium (+)	Medium (+)	Medium (-)
IMPACT ON TERRESTRIAL BIODIVERSITY	Low (-)	Low (-)	No Impact
IMPACT OF THE PROJECT ON FLORA, SCC & PROTECTED TREE SPECIES	Low (-)	Low (-)	No Impact
CHANGES TO THE HYDROLOGICAL REGIME	Very Low (-)	Low (-)	No Impact
GEOMORPHOLOGICAL CHANGES FROM EROSION AND SEDIMENTATION	Very Low (-)	Low (-)	No Impact

Specialists Reports Conclusions:

Aquatic Impact Assessment, Appendix G1 :

The aquatic habitats within 500m of the project footprint were identified and mapped on a desktop level using available data. Following this, a site assessment was conducted to confirm desktop findings, gather additional information, and define the boundaries of the aquatic habitat. The groundtruthed findings are largely in alignment with the information of the desktop databases.

Risk assessment determined that there are two potentially impacted HGM units, namely the riparian system of the Moordkuil River, which is a perennial system, and HGM unit 3 which is a channelled valley bottom system. The Moordkuil River is the existing abstraction point and is already subjected to impacts from abstraction activities and is the location where both alternatives. However, the remaining habitat still provides important ecosystem services. It was recommended that no further deterioration of the habitat must be allowed outside of the designated construction footprint.

Impact assessment determined that after mitigation, Alternatives 1 and 2 both have similarly low impacts (after mitigation). The lowest impacts were from the No-Go Alternative. Mitigation should focus on minimising construction footprint and reduction of impacts on the hydrological and geomorphological characteristics of the watercourse. A robust monitoring programme should be developed and audited annually by a SACNASP registered ecologist.

In conclusion, there are fatal flaws associated with the proposed establishment of Site Camp 1 and 2 as the principals of impact avoidance (if possible), should have been implemented. The No-Go Alternative has the lowest impacts and therefore is the preferred alternative (from a freshwater perspective), but Site Camp 3 is acceptable, provided all the mitigation measures are strictly implemented and monitored. The proposed project requires water use authorisation in terms of Chapter 4 and Section 21 of the National Water Act No. 36 of 1998, prior to the commencement of activities.

Botanical Impact Assessment, Appendix G2 :

The site proposed for the project lies inside transformed or degraded Albany thicket and Mossel Bay Shale Renosterveld. The latter is currently listed as Critically Endangered. The site is also partly located inside the Western Cape biodiversity network, with most of it mapped as terrestrial and aquatic critical biodiversity areas (CBA) or degraded critical biodiversity areas (CBA2). Two SCC were recorded on site, namely Hermannia lavandulifolia (VU) and Freesia cf fergusoniae (VU). Both observed occurrences can be avoided. Two protected tree species (Sideroxylon inerme & Pittosporum viridiflorum) are also present on the site. Given the transformed or degraded state of the vegetation, the impact on terrestrial biodiversity and plant species is of medium-low significance, prior to mitigation. With mitigation, this impact can be lowered further.

It is therefore recommended that the proposed project be considered for approval, but subject to the proposed mitigation measures listed above.

Terrestrial Faunal and Avifaunal Species Compliance Statement Report, Appendix G3 :

While the proposed project is unlikely to have any major impacts on terrestrial faunal and avifaunal species, the a temporary platform will be constructed through soil infill material behind the sheet piling accommodate a temporary platform for the piling rig in order to construct the concrete inlet hopper within the Moordkuil River. Because this temporary platform will intersect a sensitive freshwater environment, any such scope of works should follow recommendations from the freshwater specialist. Aside from overlap with the freshwater ecosystem of the Moordkuil River, all other project footprints and site camp locations under both Preferred Alternative layout A and Alternative layout B are located in less sensitive areas from a terrestrial faunal and avifaunal perspective and are unlikely to impact on ecological processes or biodiversity patterns at either local or regional scales. Both these development layouts and associated activities are therefore supported from a terrestrial faunal and avifaunal biodiversity perspective.

Palaeontology Sensitivity Statement, Appendix G4 :

The Moordkuil River Pumpstation project lies entirely on the Quaternary sands and alluvium along the river valley that is indicated as moderately sensitive. The area is highly disturbed from agriculture and present thick vegetation so it is very unlikely that any transported Quaternary fossils occur there. In addition, any fossil material would be fragmented and unidentifiable, plus it would be out of primary context. The true palaeosensitivity should be low.

Both proposed sites for the camp site are on the Enon Formation and indicated as very highly sensitive. This palaeosensitivity is also contested because the Enon Formation is a conglomerate with boulders, pebbles and sands and is a "dump" for such sediments that were deposited from the Cretaceous to the Tertiary which means there are no fossils that could assist with the dating. Furthermore, both sites are also highly disturbed from previous agriculture and clearing.

Since there is no chance of fossils of any importance occurring in the project footprint, we request exemption from any further palaeontological impact assessment. As far as the palaeontology is concerned there is no preferred site for the camp site.

Agricultural Compliance Statement, Appendix G5 :

The overall conclusion of this assessment is that the proposed development is acceptable because it leads to no loss of future agricultural production potential.

This assessment disputes the high and very high sensitivity classification of the site by the screening tool and verifies the entire site as being of low to medium agricultural sensitivity because of its assessed cropping potential.

Although the climate, terrain, and soil suitability may allow for viable crop production, other factors constrain the potential of the site to practically deliver agricultural produce and therefore limit its agricultural production potential.

This is primarily because the location and use of the site will serve the purpose of upgrading the existing raw bulk water abstraction works. For this reason, the site is highly unlikely to ever be viably utilised for agricultural production, and its potential is therefore assessed here as very low

An agricultural impact must by definition cause a change to the future agricultural production potential of land. If there is no change, there is no impact. In this case, the entire development footprint is considered to be below the threshold for needing to be conserved as agricultural production land because of the limitations that make it unsuitable as viable cropland. The proposed development on this land will result in no loss of future agricultural production potential in terms of national food security.

Due to the facts that the proposed development will not occupy scarce, viable cropland, the overall negative agricultural impact of the development (loss of future agricultural production potential) is assessed here as being of low significance and as acceptable.

From an agricultural impact point of view, it is recommended that the proposed development be approved. The conclusion of this assessment on the acceptability of the proposed development and the recommendation for its approval is not subject to any conditions.

1.2.	Provide a map that that superimposes the preferred activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers. (Attach map to this BAR as Appendix B2)
	Please refer to Appendix B2.

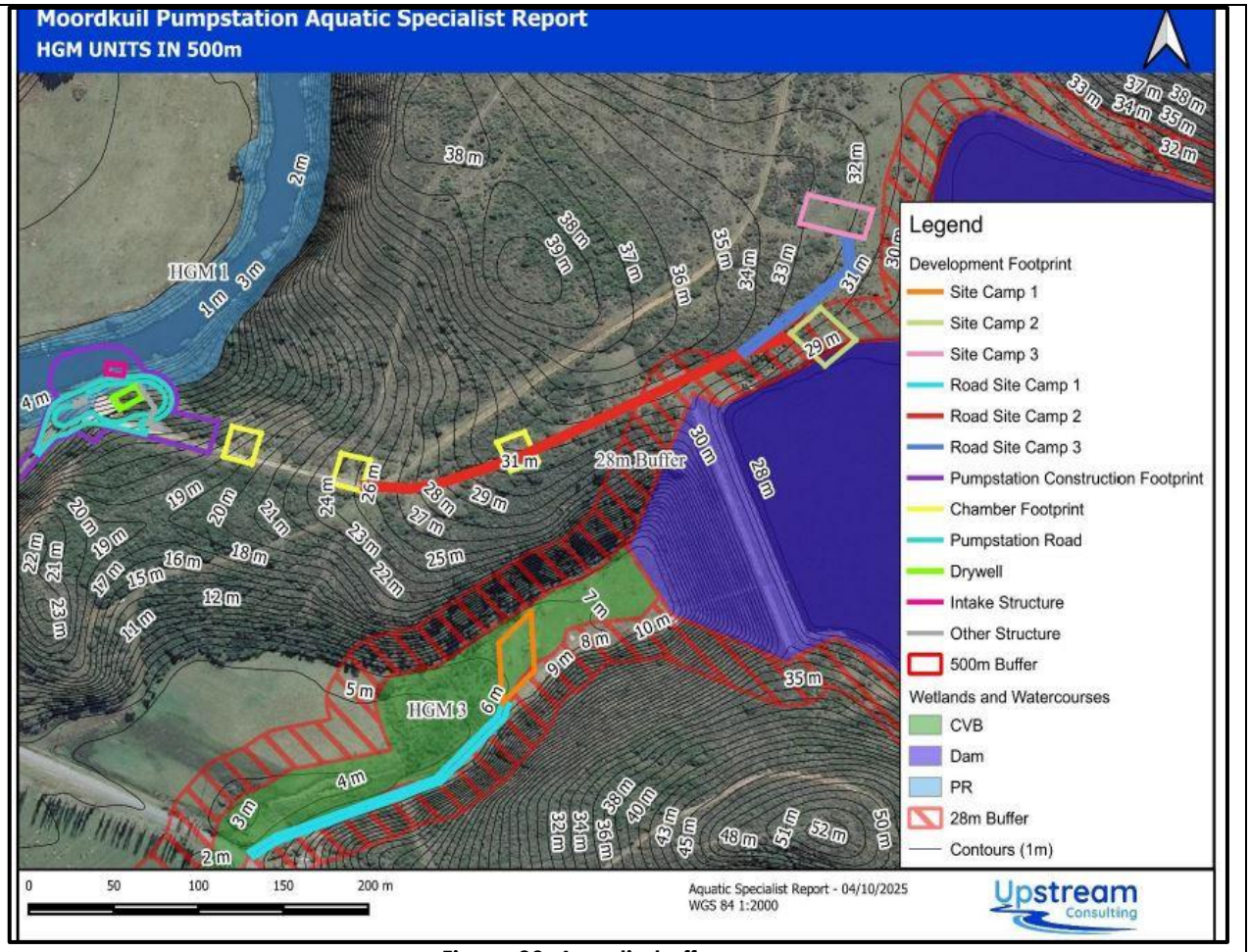

Figure 20: Aquatic buffer zones.

Figure 21: Extract of the Western Cape Biodiversity Network Map.

1.3.	Provide a summary of the positive and negative impacts and risks that the proposed activity or development and alternatives will have on the environment and community.

Positive

- Temporary job opportunities during the construction phase
- Increased pumping capacity for the pump station
- Increased water supply to Klipheuval Dam
- Capital expenditure in Mossel Bay

Negatives

- Temporary noise and construction related inconveniences.
- Temporary disturbance and impacts to the natural environment

2. Recommendation of the Environmental Assessment Practitioner ("EAP")

2.1.	Provide Impact management outcomes (based on the assessment and where applicable, specialist assessments) for the proposed activity or development for inclusion in the EMPr

In order to obtain/reach the impact management objects the corresponding mitigation measures prescribed in the BAR and EMPr must be implemented.

The Impact monitoring will be undertaken by an appointed and independent ECO.

The impact management outcomes will be monitored by the appointed ECO, in addition to the implementation of mitigation measures during the duration of the development, if all management mitigation measures are implemented successfully the resulting impact management outcomes will mean that the develop was undertaken with no significant or avoidable impacts to the environment. Impact management objectives and impact management outcomes included in the EMPr

PRE-CONSTRUCTION PHASE	
IMPACT MANAGEMENT OBJECTIVES	**IMPACT MANAGEMENT OUTCOMES**
To appoint a suitably qualified and experienced Environmental Control Office	The conditions of Environmental Authorisation and the requirements of the EMPr are implemented and monitored during all phases of the development, which will promote sound environmental management on site.
To ensure the EMPr adheres to the requirements of the Environmental Authorisation and makes provision for the final detailed site layout	Good environmental management is promoted on site.
Identify and demarcate no-go areas, working areas and site facilities	Future construction activities will be restricted to within the designated areas & environmentally sensitive areas (no-go areas) will be protected from disturbance.
To set up and equip the site camp and associated site facilities in a manner that will promote good environmental management.	Site camp facilities do not impact significantly on environment. The equipment required to implement the provisions of the EMPr are provided on site.

Environmental Control Officer to conduct an inspection prior to the commencement of construction activities on site	Good environmental management is promoted and enforced by the ECO during the full pre-construction and construction phases. Site facilities are appropriately located on site. Construction workers receive environmental awareness training before commencing work on site
CONSTRUCTION PHASE	
To limit the impact on terrestrial biodiversity from the construction site.	Impact on terrestrial biodiversity is limited to the construction footprint and only to what is required to undertake the activities.
To limit the loss of indigenous flora and SCC during the construction process.	Only the approved footprint and a reasonable working corridor is disturbed by construction activities.
To prevent the direct mortality of, or displacement of fauna during the construction process.	Any animals encountered during construction are relocated to an area outside the construction footprint.
To prevent the contamination of ground water through chemical spills or leaching of chemicals during construction.	No ground water is contaminated through chemical spills or leaching of chemicals.
To prevent/limit the geomorphological changes from erosion and sedimentation during construction.	Sedimentation and erosion during construction is limited.
To prevent/limit changes to the hydrological regime of the Moordkuil River during construction.	Changes to the hydrological regime of the Moordkuil River is limited to the construction footprint.
To prevent/limit the disturbance of the aquatic habitat during construction.	Disturbance of the aquatic habitat is limited to the construction footprint.
To prevent/limit water quality deterioration during construction.	Water quality deterioration during construction is limited.
To create employment opportunities with potential for skills transfer, for members of the local community.	The local community benefits from the employment opportunities created during the construction phase.
POST CONSTRUCTION REHABILITATION PHASE	
To rehabilitate all areas disturbed by construction activities in an environmentally sensitive manner.	The site is neat and tidy and all exposed surfaces are suitably covered/ stabilised. There is no construction-related waste or pollution remaining on site.
To prevent the impact on terrestrial biodiversity during site closure and rehabilitation.	Impact on terrestrial biodiversity is prevented.

	Prevent erosion due to poor rehabilitation efforts.
To prevent the loss of indigenous flora and SCC during site closure and rehabilitation.	Alien infestation and resulting displacement of indigenous flora is prevented.
To prevent/limit changes to the hydrological regime of the Moordkuil River during site closure and rehabilitation.	Changes to the hydrological regime of the Moordkuil River is limited.
To prevent/limit the geomorphological changes from erosion and sedimentation during site closure and rehabilitation.	Sedimentation and erosion is limited.

2.2.	Provide a description of any aspects that were conditional to the findings of the assessment either by the EAP or specialist that must be included as conditions of the authorisation.

The EMPr must be implemented, this is however a standard condition of Environmental Authorisation.

All mitigation measures from the specialists have been incorporated into the EMPr and as such are conditional to the environmental authorisation.

2.3.	Provide a reasoned opinion as to whether the proposed activity or development should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be included in the authorisation.

The preferred Alternative A should be authorised.

As seen in the body of this Basic Assessment Report, the negative impacts associated with the construction phase can be mitigated to that of a low significance. As the proposal is to upgrade a section of the existing sewerage pipeline the negative impacts associated with the proposal are far outweighed by the positive impact of maintaining and upgrading existing sewerage infrastructure.
Proposed Conditions of Authorisation:

- The EMPr must be implemented.
- An ECO must be appointed to monitor compliance with the EMPr

2.4.	Provide a description of any assumptions, uncertainties and gaps in knowledge that relate to the assessment and mitigation measures proposed.

It is assumed that the proposed mitigation measures as listed in this report and the EMPr (Appendix H) will be implemented and adhered to as the significance of impacts ratings are conditional on implementation of the mitigation measures.

2.5.	The period for which the EA is required, the date the activity will be concluded and when the post construction monitoring requirements should be finalised.

Time required to undertake the activities:

1 year for tendering purposes
2 years construction and rehabilitation phase
2 years for follow up alien clearing and rehabilitation monitoring

Total proposed validity period of EA: **5 years**

3. Water

Since the Western Cape is a water scarce area explain what measures will be implemented to avoid the use of potable water during the development and operational phase and what measures will be implemented to reduce your water demand, save water and measures to reuse or recycle water.
Proposal will not use water.

4. Waste

Explain what measures have been taken to reduce, reuse or recycle waste.

Only packaging waste will be generated by materials brought to site. An integrated waste management system must be adopted on site in accordance with the EMPr. Unrecyclable items will be taken to the municipal landfill site.

5. Energy Efficiency

8.1.	Explain what design measures have been taken to ensure that the development proposal will be energy efficient.
Not applicable to the proposal.	

SECTION K: DECLARATIONS

DECLARATION OF THE APPLICANT

Note: Duplicate this section where there is more than one Applicant.

I Mr. S. Naidoo, ID number 6210245252084 in my personal capacity or duly authorised thereto hereby declare/affirm that all the information submitted or to be submitted as part of this application form is true and correct, and that:

- I am fully aware of my responsibilities in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA"), the Environmental Impact Assessment ("EIA") Regulations, and any relevant Specific Environmental Management Act and that failure to comply with these requirements may constitute an offence in terms of relevant environmental legislation;
- I am aware of my general duty of care in terms of Section 28 of the NEMA;

- I am aware that it is an offence in terms of Section 24F of the NEMA should I commence with a listed activity prior to obtaining an Environmental Authorisation;

- I appointed the Environmental Assessment Practitioner ("EAP") (if not exempted from this requirement) which:
  - meets all the requirements in terms of Regulation 13 of the NEMA EIA Regulations; or
  - meets all the requirements other than the requirement to be independent in terms of Regulation 13 of the NEMA EIA Regulations, but a review EAP has been appointed who does meet all the requirements of Regulation 13 of the NEMA EIA Regulations;

- I will provide the EAP and any specialist, where applicable, and the Competent Authority with access to all information at my disposal that is relevant to the application;

- I will be responsible for the costs incurred in complying with the NEMA EIA Regulations and other environmental legislation including but not limited to –
  - costs incurred for the appointment of the EAP or any legitimately person contracted by the EAP;
  - costs in respect of any fee prescribed by the Minister or MEC in respect of the NEMA EIA Regulations;
  - Legitimate costs in respect of specialist(s) reviews; and
  - the provision of security to ensure compliance with applicable management and mitigation measures;

- I am responsible for complying with conditions that may be attached to any decision(s) issued by the Competent Authority, hereby indemnify, the government of the Republic, the Competent Authority and all its officers, agents and employees, from any liability arising out of the content of any report, any procedure or any action for which I or the EAP is responsible in terms of the NEMA EIA Regulations and any Specific Environmental Management Act.

Note: If acting in a representative capacity, a certified copy of the resolution or power of attorney must be attached.

29/10/2025

Signature of the Applicant: Date:

Mossel Bay Municipality

Name of company (if applicable):

DECLARATION OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER ("EAP")

I .....Michael Jon Bennett....., EAP Registration number ...2021/3163.. as the appointed EAP hereby declare/affirm the correctness of the:

- Information provided in this BAR and any other documents/reports submitted in support of this BAR;
- The inclusion of comments and inputs from stakeholders and I&APs;
- The inclusion of inputs and recommendations from the specialist reports where relevant; and
- Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties, and that:
- In terms of the general requirement to be independent:
  - other than fair remuneration for work 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 EAP that meets the general requirements set out in Regulation 13 of NEMA EIA Regulations has been appointed to review my work (Note: a declaration by the review EAP must be submitted);
- In terms of the remainder of the general requirements for an EAP, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- I have disclosed, to the Applicant, the specialist (if any), the Competent Authority and registered interested and affected parties, all 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 prepared or to be prepared as part of this application;
- I have ensured that information containing all relevant facts in respect of the application was distributed or was made available to registered interested and affected parties and that participation will be facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments;
- I have ensured that the comments of all interested and affected parties were considered, recorded, responded to and submitted to the Competent Authority in respect of this application;
- I have ensured the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;
- I have kept a register of all interested and affected parties that participated in the public participation process; and
- I am aware that a false declaration is an offence in terms of Regulation 48 of the NEMA EIA Regulations;

Signature of the EAP: Date: 29 October 2025

Sharples Environmental Services cc

Name of company (if applicable):

DECLARATION OF THE REVIEW EAP

I ……, EAP Registration number …….. as the appointed Review EAP hereby declare/affirm that:

- I have reviewed all the work produced by the EAP;
- I have reviewed the correctness of the information provided as part of this Report;
- I meet all of the general requirements of EAPs as set out in Regulation 13 of the NEMA EIA Regulations;
- I have disclosed to the applicant, the EAP, the specialist (if any), the review specialist (if any), the Department and I&APs, all material information that has or may have the potential to influence the decision of the Department or the objectivity of any Report, plan or document prepared as part of the application; and
- I am aware that a false declaration is an offence in terms of Regulation 48 of the NEMA EIA Regulations.

Signature of the EAP: Date:

Name of company (if applicable):

DECLARATION OF THE SPECIALIST

Note: Duplicate this section where there is more than one specialist.

I ……, as the appointed Specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that:

- In terms of the general requirement to be independent:
  - other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the development proposal or application and that there are no circumstances that may compromise my objectivity; or

  - am not independent, but another specialist (the "Review Specialist") that meets the general requirements set out in Regulation 13 of the NEMA EIA Regulations has 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, have throughout this EIA process met all of the requirements;

- I have disclosed to the applicant, the EAP, the Review EAP (if applicable), the Department and I&APs all material information that has 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; and

- I am aware that a false declaration is an offence in terms of Regulation 48 of the EIA Regulations.

Signature of the EAP: Date:

Name of company (if applicable):

DECLARATION OF THE REVIEW SPECIALIST

I ……, as the appointed Review Specialist hereby declare/affirm that:

- I have reviewed all the work produced by the Specialist(s):
- I have reviewed the correctness of the specialist information provided as part of this Report;
- I meet all of the general requirements of specialists as set out in Regulation 13 of the NEMA EIA Regulations;
- I have disclosed to the applicant, the EAP, the review EAP (if applicable), the Specialist(s), the Department and I&APs, all material information that has or may have the potential to influence the decision of the Department or the objectivity of any Report, plan or document prepared as part of the application; and
- I am aware that a false declaration is an offence in terms of Regulation 48 of the NEMA EIA Regulations.

Signature of the EAP: Date:

Name of company (if applicable):