



THE AQUATIC BIODIVERSITY COMPLIANCE STATEMENT FOR THE PROPOSED TETRA4 PRODUCTION RIGHT EXTENSION

Free State Province, South Africa

11/06/2024

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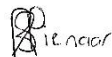

Report Name	THE AQUATIC BIODIVERSITY COMPLIANCE STATEMENT FOR THE PROPOSED TETRA4 PRODUCTION RIGHT EXTENSION	
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Declaration	<p>The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2017. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.</p>	

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1 Introduction

1.1 Background

The Biodiversity Company was appointed to complete an Aquatic Biodiversity compliance statement for the proposed Tetra4 Production Right Extension Drilling Collar (ER 32 & 94), located within the Matjhabeng (ER 32) and Masilonyana (ER 94) local municipalities, Free State Province, South Africa. This development area (Figure 1-1) is referred to as the 500 m Regulated Area. In addition, a map highlighting the project components are shown in Figure 1-2 and Figure 1-3.

This assessment was conducted in accordance with the amendments to the Environmental Impact Assessment Regulations, 2014 (GNR 326, 7 April 2017) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The approach has taken cognisance of the recently published Government Notices (GN) 320 (20 March 2020): "Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation" (Reporting Criteria). The National Web based Environmental Screening Tool has characterised the aquatic theme sensitivity as "Very High" and "Low" for the Project Footprint (Figure 1-4 and Figure 1-5). Figure 1-4 is a map created to show the screening tool of the different properties for the ER 32 drilling collar and Figure 1-5 show the screening tool for the ER 94 drilling collar properties. Section 3.3 confirms the site sensitivity.

The purpose of conducting the specialist study is to provide relevant input into the overall Environmental Authorisation application process, with a focus on the proposed project activities and their associated impacts. This report, after taking into consideration the findings and recommendations provided by the specialist herein, should inform and guide the Registered Environmental Assessment Practitioner (EAP) and regulatory authorities, enabling informed decision making as to the ecological viability of the proposed project.

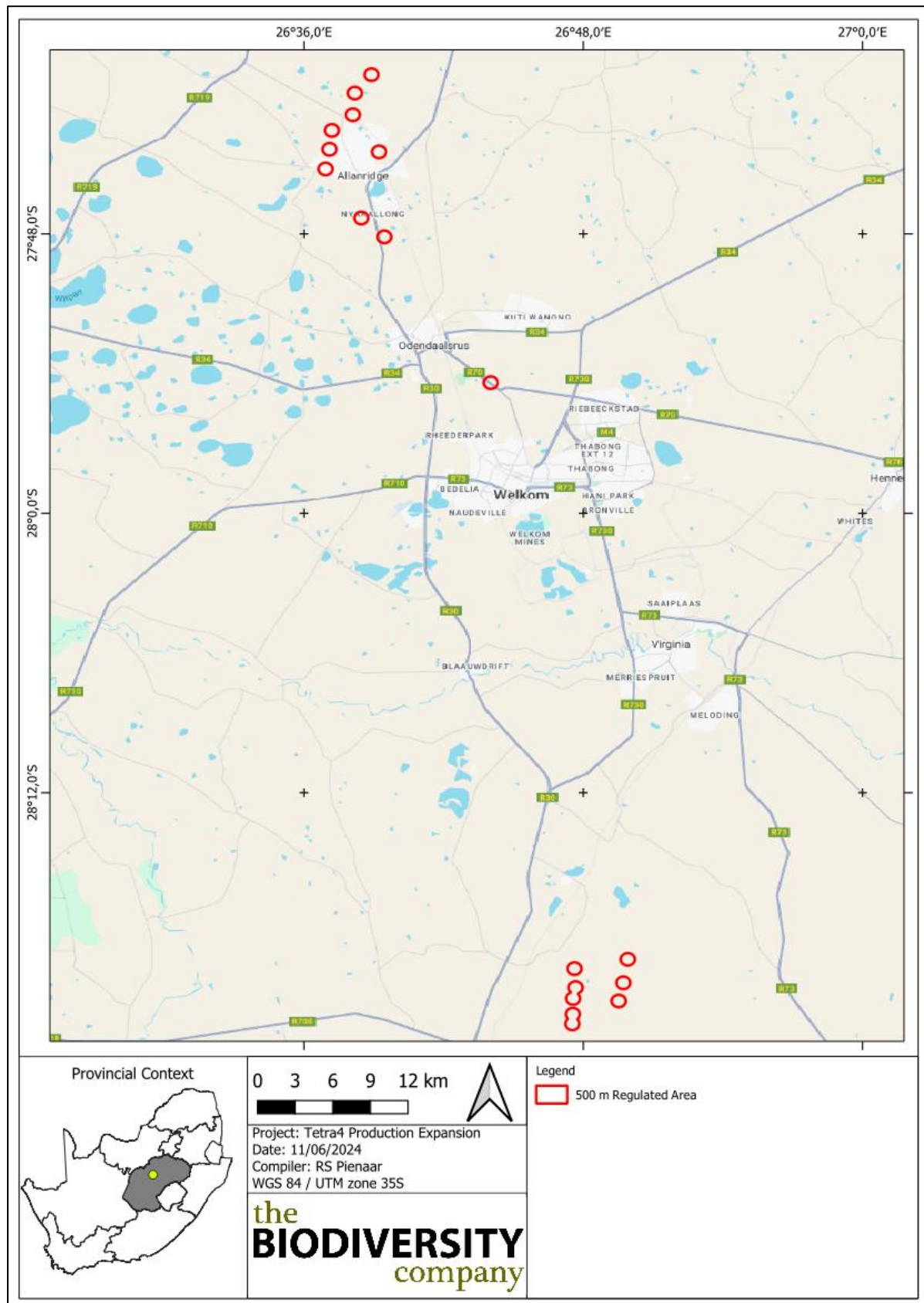


Figure 1-1 The Project Area of Influence in proximity to the nearby towns

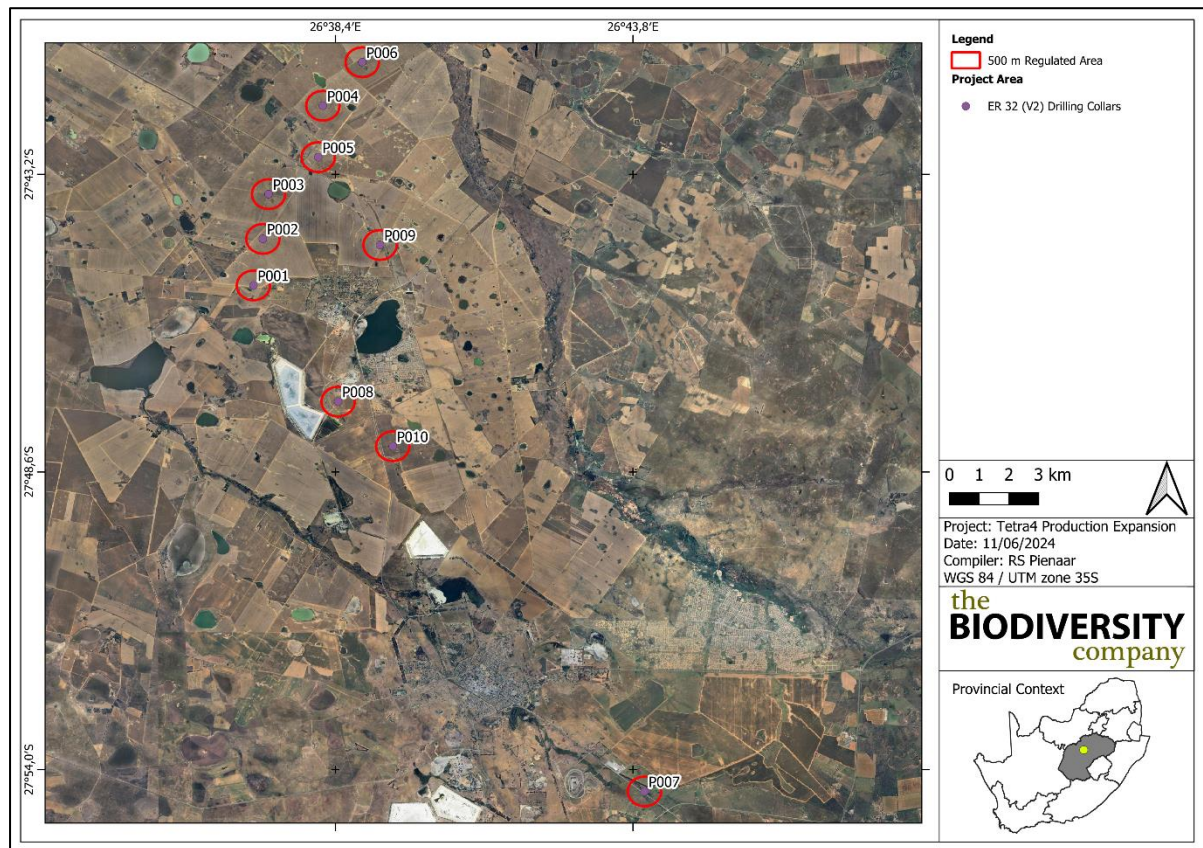


Figure 1-2 Map of Project Components for ER 32 drilling collars

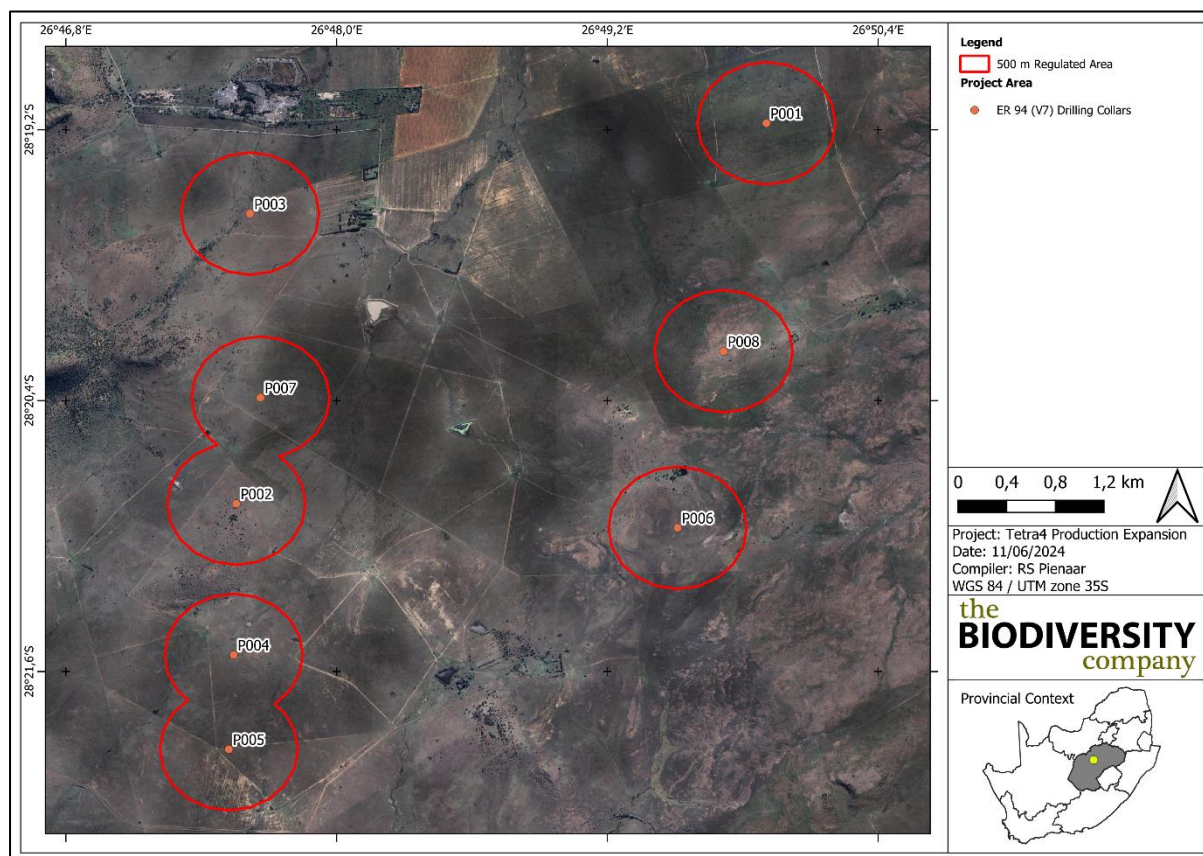


Figure 1-3 Map of Project Components for ER 94 drilling collars

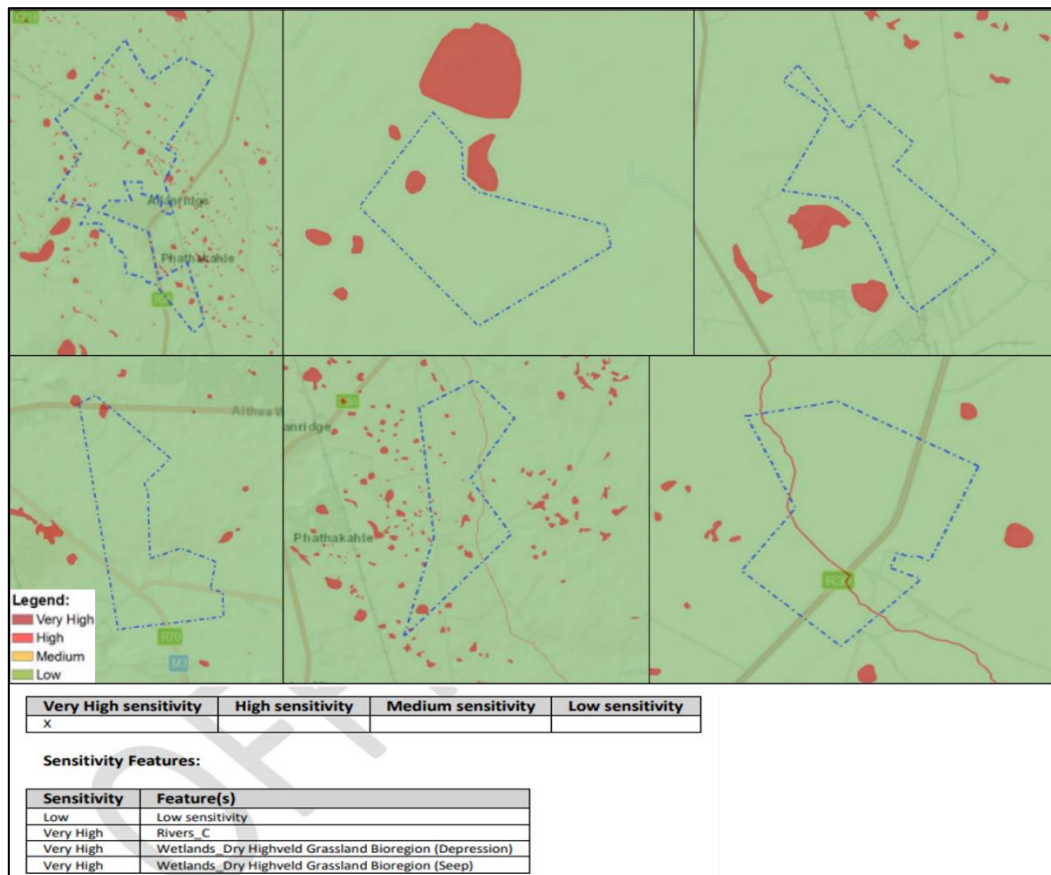


Figure 1-4 The aquatic biodiversity theme sensitivity for the ER 32 drilling collar properties

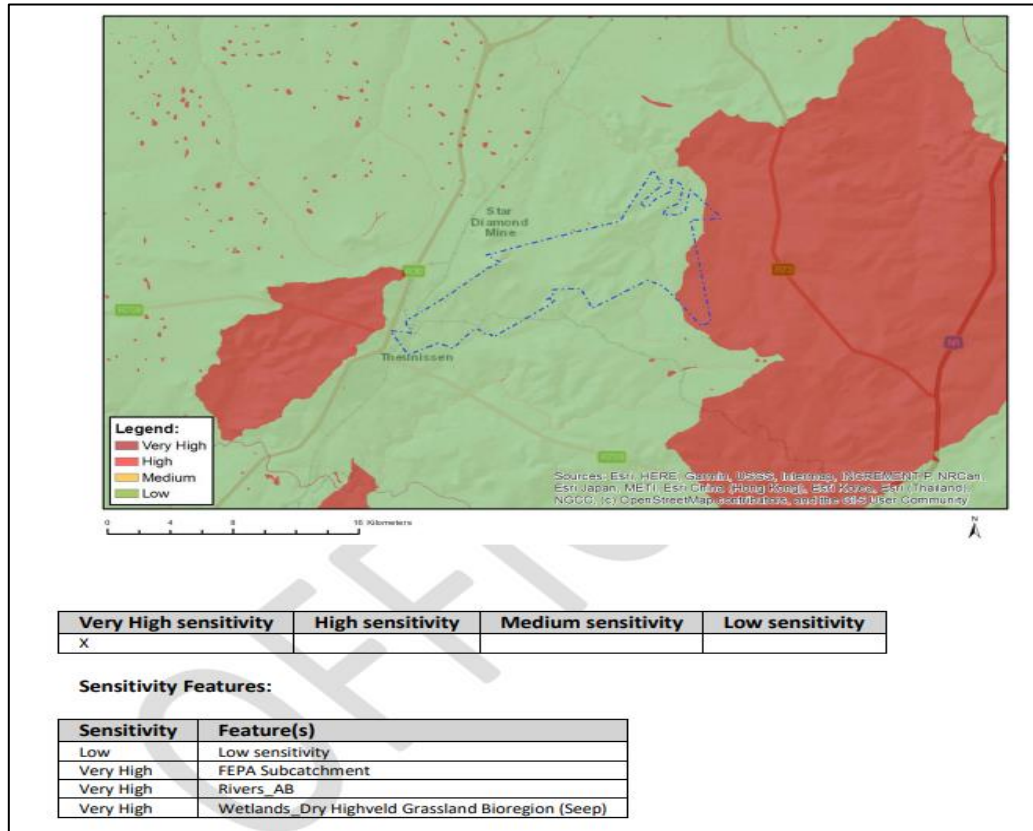


Figure 1-5 The aquatic biodiversity theme sensitivity for the ER 94 drilling collar

1.2 Project Description

Tetra4 is the operator and holder of existing Exploration Rights (ERs) and a Production Right (PR), in the Matjhabeng and Masilonyana Local Municipalities, in terms of the Mineral and Petroleum Resources Development Act (No. 28 of 2002 - MPRDA). In 2012, a Production Right (Ref: 12/4/1/07/2/2) was granted which spans approximately 187 000 hectares for the development of natural gas (Helium and Methane) production operations around the town of Virginia in the Free State Province. Within the approval of the Production Right, the 2010 Environmental Management Programme (EMPr) was approved which is applicable to a large portion of the Production Right area.

The activities in the Production Right include:

- Continued exploration activities;
- Drilling and establishment of further production wells throughout the entire production area (260 production wells);
- Installation of intra-field pipelines throughout the entire production area (~500km);
- Installation of boosters and main compressors; and
- Central gas processing plant (not approved in the original EIA and approved EMPr).

On 21 September 2017, the Department of Mineral Resources and Energy (DMRE) issued an integrated environmental authorisation ("Cluster 1 EA") (reference: 12/04/07) to Tetra4 in terms of the NEMA. The Cluster 1 EA (as amended by Cluster 1 EA amendments dated 26 August 2019 and 1 September 2020) authorises the development of "Cluster 1" of the Project. In this EA approval, various new wells and pipelines, booster and compressor stations, a Helium and LNG Facility and associated infrastructure was approved which comprises the first gas field for development within the approved Production Right area. The Cluster 1 EA also authorises certain waste management activities as per the List of Waste Management Activities (Government Notice 921, as amended) published under the National Environmental Management: Waste Act 59 of 2008 (NEMWA).

On 13 July 2023, the Department of Mineral Resources and Energy (DMRE) issued an integrated environmental authorisation ("Cluster 2 EA") (reference: 12/04/007) to Tetra4 in terms of the NEMA. The Cluster 2 EA authorises the development of "Cluster 2" of the Project. The Cluster 2 EA authorised up to 300 new production wells, gas transmission pipelines and associated infrastructure, 3 compressor stations and an additional new combined Liquid Natural Gas (LNG) and Liquid Helium (LHe) plant ("LNG/LHe Plant") and associated infrastructure, as well as powerlines as part of the Cluster 2 expansion of the Project in order to meet the future production requirements. The Cluster 2 EA also authorises certain waste management activities as per the List of Waste Management Activities (Government Notice 921, as amended) published under the National Environmental Management: Waste Act 59 of 2008 (NEMWA).

Tetra4 was granted two Exploration Rights (ER32 and ER94) in 2015/2016 which span combined area of approximately 18 700 hectares for the development of natural gas (Helium and Methane) exploration operations near the towns of Theunissen / Winburg and Odendaalsrus / Allanridge in the Free State Province. Further to the above project history and resource tenure background, Tetra4 now wishes to consolidate the two ERs into the greater PR area. The consolidation of the ERs into the PR area will include the drilling of up to 18 exploration wells. This consolidation will incorporate ~78 farm portions near the towns of Theunissen and Winburg in the south of the PR area and Odendaalsrus and Allanridge in the north of the PR area (comprising the Exploration Rights) into the Production Right. The ER32 located north of the Production Right is approximately 7.2 km Northwest of Welkom and the ER94 to the south of the Production Right is approximately 19.2 km South of Virginia. An MPRDA Section 102 application shall be lodged to consolidate ER 32 and ER 94 (with associated exploration activities) into the Production Right and this process will also require an Environmental Authorisation application in terms of the National Environmental Management Act (Act 107 of 1998).

1.3 Legislative Framework

In line with the protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity, as per Government Notice 320 published in terms of NEMA, dated 20 March 2020: “Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation” – the following has been assumed:

- An applicant intending to undertake an activity identified in the scope of this protocol on a site identified on the screening tool as being of:
- “Low Sensitivity” for aquatic biodiversity, must submit an Aquatic Biodiversity Compliance Statement.
- Where the information gathered from the site sensitivity verification differs from the screening tool designation of “very high” aquatic biodiversity sensitivity, and it is found to be of a “low” sensitivity, an Aquatic Biodiversity Compliance Statement must be submitted.

An Aquatic Biodiversity Compliance Statement must contain the information as presented in Table 1-1 below.

Table 1-1 *Aquatic Biodiversity Compliance Statement information requirements as per the relevant protocol, including the location of the information within this report*

Information to be Included (as per GN 320, 20 March 2020)	Report Section
contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae	7
a signed statement of independence by the specialist	7.1
a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment	2 / 3.3
a baseline profile description of biodiversity and ecosystems of the site	3.3
the methodology used to verify the sensitivities of the aquatic biodiversity features on the site including the equipment and modelling used where relevant;	2
where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr	N/A
a description of the assumptions made as well as any uncertainties or gaps in knowledge or data	2.9
any conditions to which this statement is subjected	N/A

A signed copy of the compliance statement must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.

2 Methodology

A site visit was conducted on the 4th and 5th of June 2024, which is considered a suitable (dry) season to undertake a freshwater assessment.

2.1 Identification and Mapping

The wetland areas were delineated in accordance with the DWAF (2005) guidelines, a cross section is presented in Figure 2-1. The outer edges of the wetland areas were identified by considering the following four specific indicators:

- The Terrain Unit Indicator helps to identify those parts of the landscape where wetlands are more likely to occur;
- The Soil Form Indicator identifies the soil forms, as defined by the Soil Classification Working Group (1991), which are associated with prolonged and frequent saturation.
 - The soil forms (types of soil) found in the landscape were identified using the South African soil classification system namely; Soil Classification: A Taxonomic System for South Africa (Soil Classification Working Group, 1991);
- The Soil Wetness Indicator identifies the morphological "signatures" developed in the soil profile as a result of prolonged and frequent saturation; and
- The Vegetation Indicator identifies hydrophilic vegetation associated with frequently saturated soils.

Vegetation is used as the primary wetland indicator. However, in practice the soil wetness indicator tends to be the most important, and the other three indicators are used in a confirmatory role.

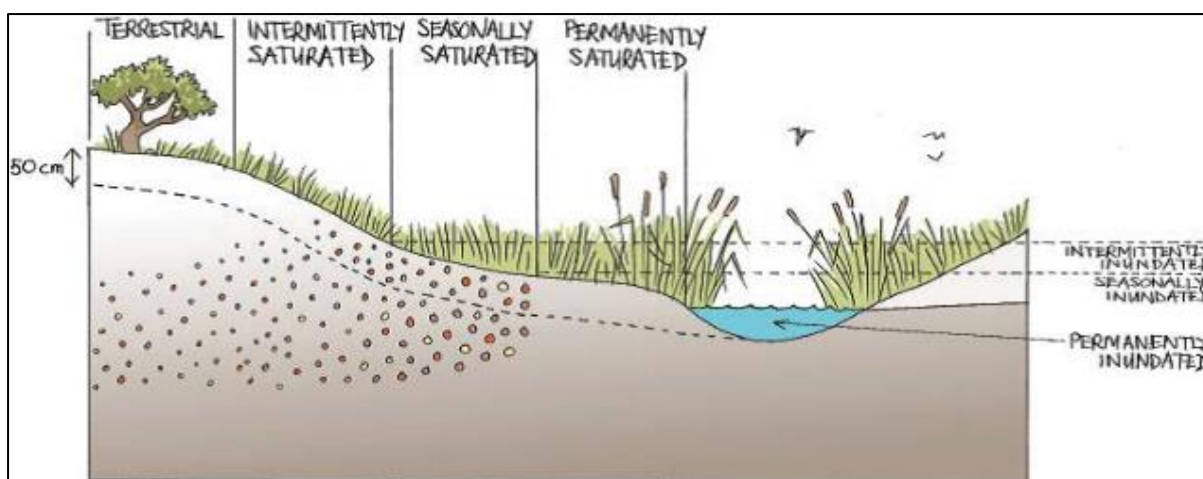


Figure 2-1 Cross section through a wetland, indicating how the soil wetness and vegetation indicators change (Ollis et al. 2013)

The DWAF (2005) manual separates the classification of watercourses into three (3) separate types of channels or sections defined by their position relative to the zone of saturation in the riparian area. The classification system separates channels into:

- those that do not have baseflow ('A' Sections);
- those that sometimes have baseflow ('B' Sections) or non-perennial; or
- those that always have baseflow ('C' Sections) or perennial.

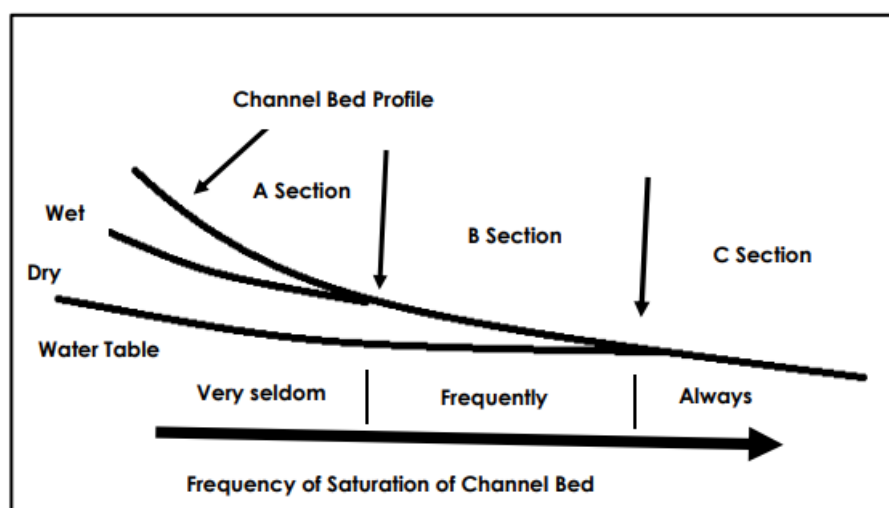


Figure 2-2 The watercourse classifications (DWAF, 2005)

2.2 Ecological Classification and Description

The National Wetland Classification Systems (NWCS) developed by the South African National Biodiversity Institute (SANBI) will be considered for this study. This system comprises a hierarchical classification process of defining a wetland based on the principles of the hydrogeomorphic (HGM) approach at higher levels, and then also includes structural features at the lower levels of classification (Ollis *et al.*, 2013).

2.3 Functional Assessment

Wetland Functionality refers to the ability of wetlands to provide healthy conditions for the wide variety of organisms found in wetlands as well as humans. Eco Services serves as the main factor contributing to wetland functionality.

The assessment of the ecosystem services supplied by the identified wetlands was conducted per the guidelines as described in WET-EcoServices (Kotze *et al.* 2008). An assessment was undertaken that examines and rates the following services according to their degree of importance and the degree to which the services are provided (Table 2-1).

Table 2-1 Classes for determining the likely extent to which a benefit is being supplied

Score	Rating of likely extent to which a benefit is being supplied
< 0.5	Low
0.6 - 1.2	Moderately Low
1.3 - 2.0	Intermediate
2.1 - 3.0	Moderately High
> 3.0	High

2.4 Present Ecological Status

The overall approach is to quantify the impacts of human activity or clearly visible impacts on wetland health, and then to convert the impact scores to a Present Ecological Status (PES) score. This takes the form of assessing the spatial extent of impact of individual activities/occurrences and then separately assessing the intensity of impact of each activity in the affected area. The extent and intensity are then combined to determine an overall magnitude of impact. The Present State categories are provided in Table 2-2.

Table 2-2 The Present Ecological Status categories (Macfarlane, et al., 2008)

Impact Category	Description	Impact Score Range	PES
None	Unmodified, natural	0 to 0.9	A
Small	Largely Natural with few modifications. A slight change in ecosystem processes is discernible and a small loss of natural habitats and biota may have taken place.	1.0 to 1.9	B
Moderate	Moderately Modified. A moderate change in ecosystem processes and loss of natural habitats has taken place, but the natural habitat remains predominantly intact.	2.0 to 3.9	C
Large	Largely Modified. A large change in ecosystem processes and loss of natural habitat and biota has occurred.	4.0 to 5.9	D
Serious	Seriously Modified. The change in ecosystem processes and loss of natural habitat and biota is great, but some remaining natural habitat features are still recognizable.	6.0 to 7.9	E
Critical	Critical Modification. The modifications have reached a critical level and the ecosystem processes have been modified completely with an almost complete loss of natural habitat and biota.	8.0 to 10	F

2.5 Importance and Sensitivity

The importance and sensitivity of water resources is determined to establish resources that provide higher than average ecosystem services, biodiversity support functions or are particularly sensitive to impacts. The mean of the determinants is used to assign the Importance and Sensitivity (IS) category as listed in Table 2-3.

Table 2-3 Description of Importance and Sensitivity categories

IS Category	Range of Mean	Recommended Ecological Management Class
Very High	3.1 to 4.0	A
High	2.1 to 3.0	B
Moderate	1.1 to 2.0	C
Low Marginal	< 1.0	D

2.6 Recommended Ecological Category and Recommended Management Objective

The Recommended Ecological Category (REC) and Recommended Management Objective (RMO) was determined based on the results obtained from the PES and ecological IS of the assessed wetlands, with the objective of recommending how a water resource should be managed. This is achieved by either maintaining or improving the ecological integrity of the wetland in order to ensure continued ecological functionality (DWA, 1999).

Table 2-4 Recommended Ecological Category (REC) and Recommended management objectives (RMO) scores

			Ecological Importance and Sensitivity			
			Very High	High	Moderate	Low
PES	A	Pristine	A Maintain	A Maintain	A Maintain	A Maintain
	B	Natural	A Improve	A/B Improve	B Maintain	B Maintain
	C	Good	A Improve	B/C Improve	C Maintain	C Maintain
	D	Fair	C Improve	C/D Improve	D Maintain	D Maintain
	E/F	Poor	D Improve	E/F Improve	E/F Maintain	E/F Maintain

2.7 Buffer Requirements

The “Preliminary Guideline for the Determination of Buffer Zones for Rivers, Wetlands and Estuaries” (Macfarlane *et al.*, 2014) was used to determine the appropriate buffer zone for the proposed activity.

2.8 Risk Assessment

The Department of Water and Sanitation (DWS) risk matrix assesses impacts in terms of consequence and likelihood. The significance (product of the likelihood and consequence) of the impact is then rated according to Table 2-5.

Table 2-5 Significance ratings (DWS, 2016)

Rating	Class	Management Description
1 – 55	(L) Low Risk	Acceptable as is or consider requirement for mitigation. Impact to watercourses and resource quality small and easily mitigated. Wetlands may be excluded.
56 – 169	M) Moderate Risk	Risk and impact on watercourses are notably and require mitigation measures on a higher level, which costs more and require specialist input. Wetlands are excluded.
170 – 300	(H) High Risk	Always involves wetlands. Watercourse(s) impacts by the activity are such that they impose a long-term threat on a large scale and lowering of the Reserve.

2.9 Limitations

The following limitations should be noted for the assessment:

- The assessment area was based on the spatial file provided by the client and any alterations to the development area may affect the results;
- Only a 100 m buffer around the proposed drilling site was groundtruthed with the remaining areas of the 500 m regulated area on high level desktop; and
- The seasonality of the site survey is not considered to be a limiting factor for this project.

3 Receiving Environment

3.1 South African Inventory of Inland Aquatic Ecosystems

The South African Inventory of Inland Aquatic Ecosystems (SAIIAE) wetland dataset is a recent outcome of the National Biodiversity Assessment (NBA, 2018) and, was a collaborative project by the South African National Biodiversity Institute (SANBI) and the Council for Scientific and Industrial Research (CSIR). The SAIIAE dataset provides further insight into wetland occurrences and extents building on the information from the NFEPA, as well as other datasets. Multiple systems were identified within the 500 m regulated area of the ER 32 drilling collars (see Figure 3-1). These systems were identified as being depression wetlands. No wetlands were identified within the 500 m regulated area of the ER 94 drilling collar (see Figure 3-2).

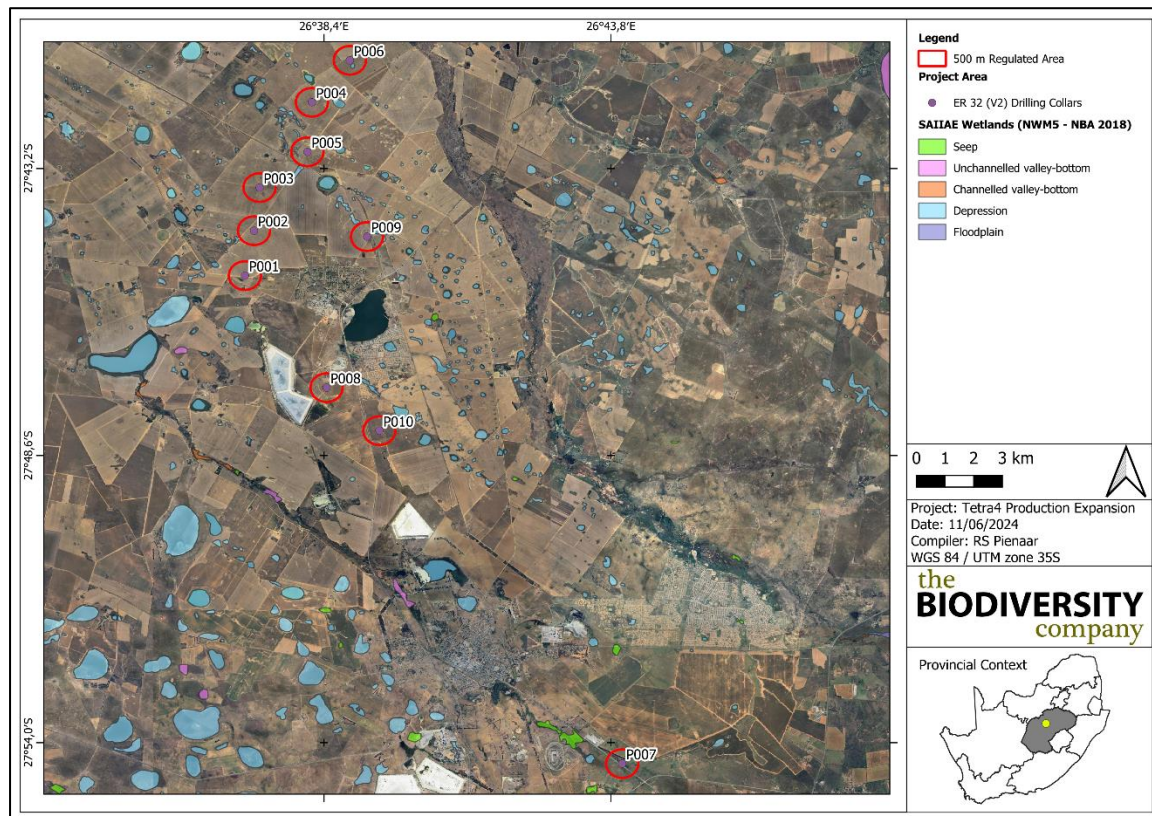


Figure 3-1 South African Inventory of Inland Aquatic Ecosystems for the ER 32 drilling collar

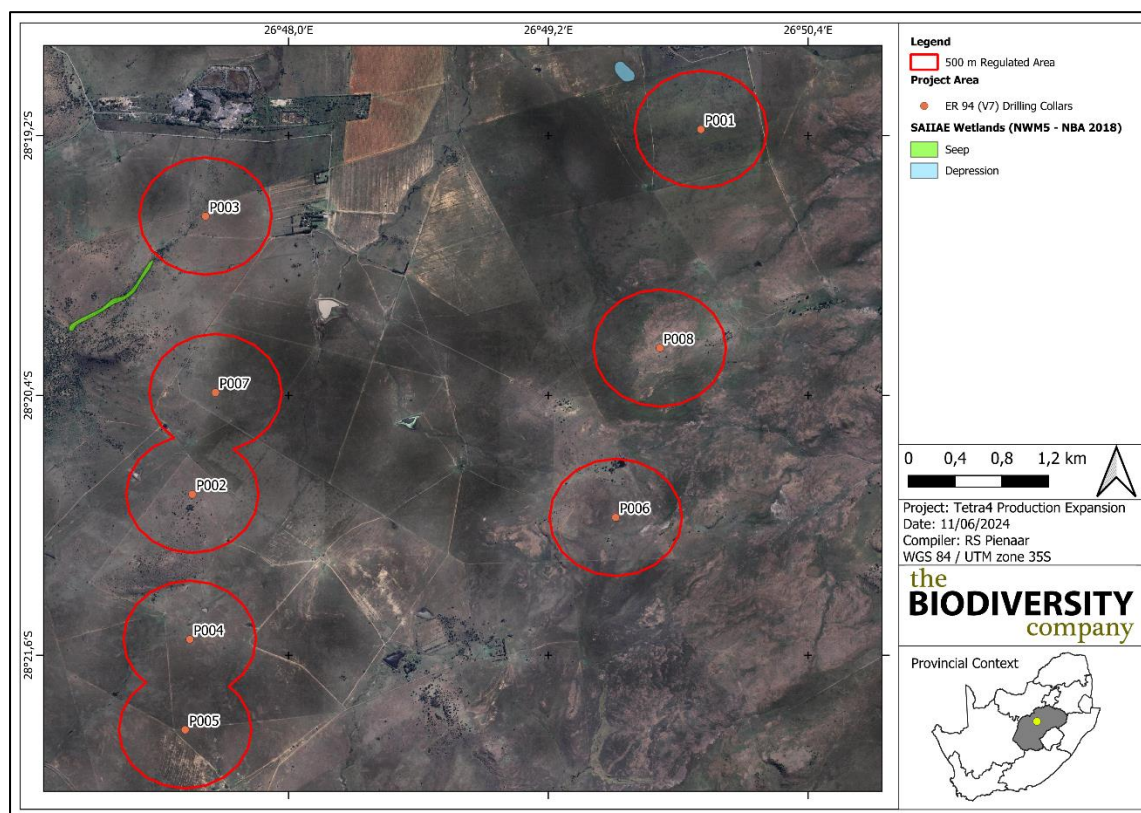


Figure 3-2 South African Inventory of Inland Aquatic Ecosystems for the ER 94 drilling collar

3.2 National Freshwater Ecosystem Priority Areas

The National Freshwater Ecosystem Priority Areas (NFEPA) database forms part of a comprehensive approach to the sustainable and equitable development of South Africa's scarce water resources. This database provides guidance on how many rivers, wetlands and estuaries, and which ones, should remain in a natural or near-natural condition to support the water resource protection goals of the National Water Act (Act 36 of 1998) (NWA). This directly applies to the NWA, which feeds into Catchment Management Strategies, water resource classification, reserve determination, and the setting and monitoring of resource quality objectives (Nel *et al.*, 2011). The NFEPA are intended to be conservation support tools and envisioned to guide the effective implementation of measures to achieve the biodiversity goals of the National Environment Management Biodiversity Act (NEM:BA) (Act 10 of 2004), informing both the listing of threatened freshwater ecosystems and the process of bioregional planning provided for by this Act (Nel *et al.*, 2011). Multiple NFEPA wetland systems are located within the 500 m regulated area of the 001, 004, 005, 006, 007, 008 and 009 drilling sites for ER 32 (see Figure 3-3). As well as wetland seeps located within the 500 m regulated area of 002 and 00 of the ER 94 drilling sites (see Figure 3-4).

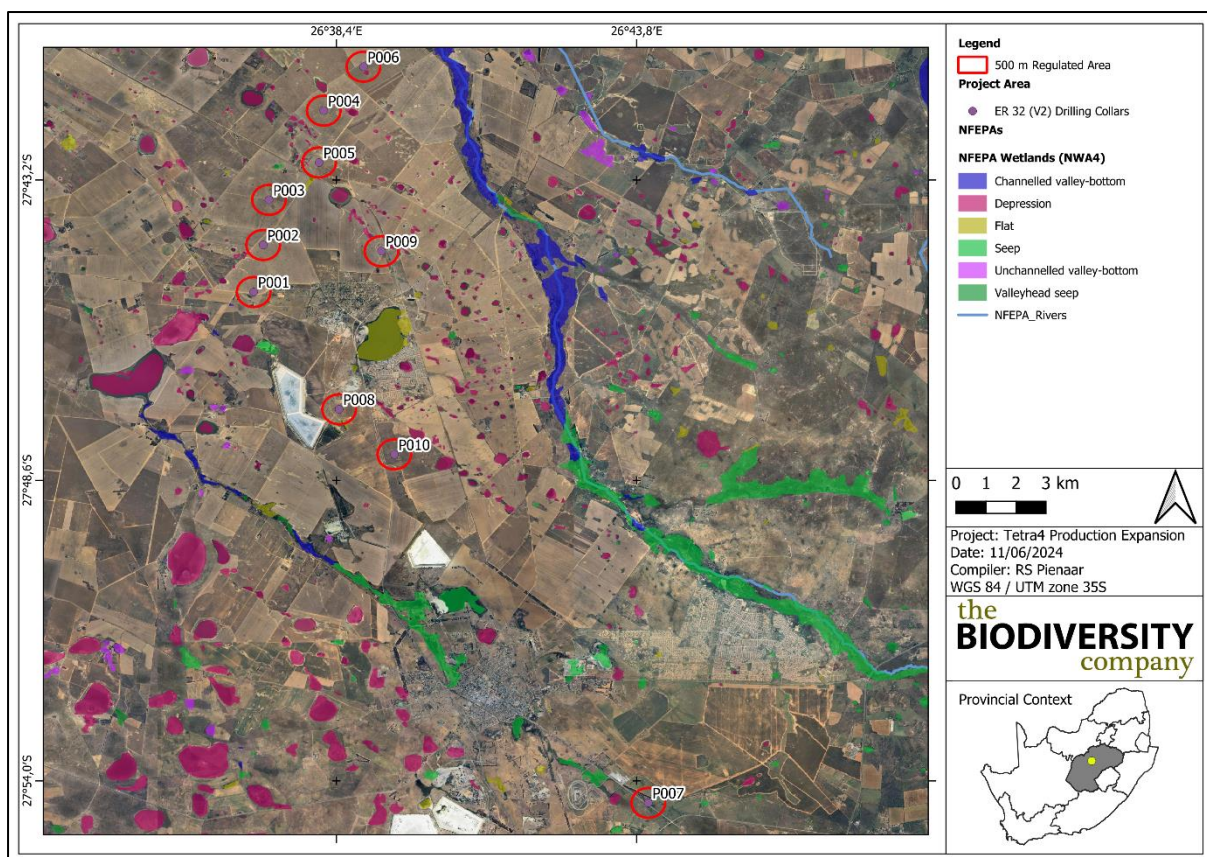


Figure 3-3 NFEPA Wetlands in the ER 32 drilling collar

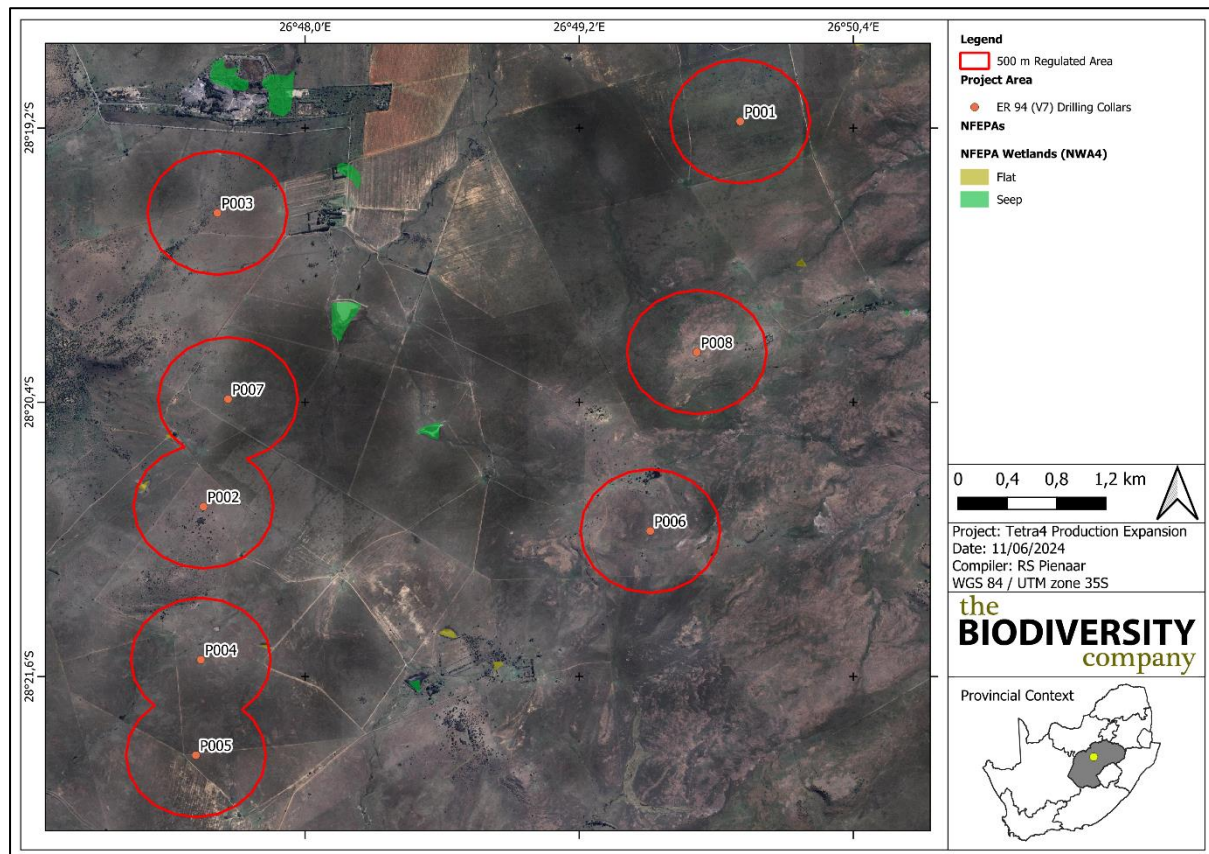


Figure 3-4 NFEPA Wetlands in the ER 94 drilling collar

3.3 Survey Results

The water resources were delineated in accordance with the DWAF (2005) guidelines. A site visit was conducted on the 4th and 5th of June 2024, this would constitute a dry season survey. The development area was traversed on foot, with several checks being undertaken to identify any soil wetness indicators, and to determine the local soil forms.

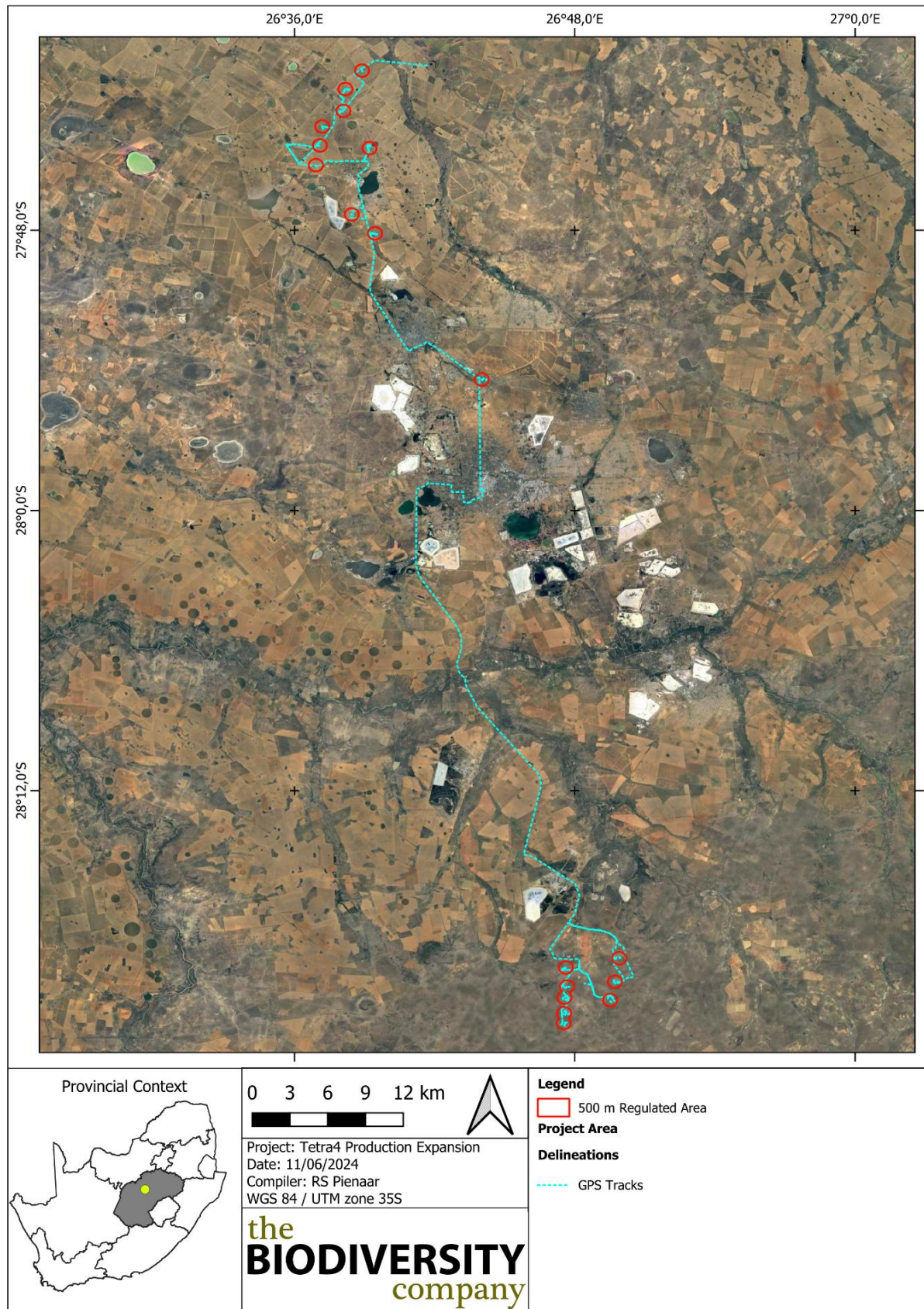


Figure 3-5 **GPS tracks**

During the site visit multiple wetlands were identified within the 500 m regulated area and grouped into different hydrogeomorphic (HGM) units according to wetland type, function and impacts. The wetlands were group into fifteen different HGM units comprising of Unchannelled Valley Bottoms (HGM 1, 2, and 3), Depression wetlands (HGM 4, 5, 7, 8, 10, 14 and 15), and Seep wetlands (HGM 6, 9, 11, 12, and 13).

Along with the natural wetlands, some artificial wetlands (off-channel dams) and drainage features were also identified and delineated. According to Ollis *et al.* (2013) a dam is classified as: “*artificial body of water created specifically for the storage of water, and which is not located along the course of a river*”. Due to the artificial characteristics of these systems, no further assessment has been undertaken.

Although multiple natural wetlands were identified within the 500 m regulated area it was determined that due to the location of the wetlands and the low impact nature of prospecting drilling there are no foreseeable impacts on the wetlands. Thus, no functional assessment has been undertaken for this project.

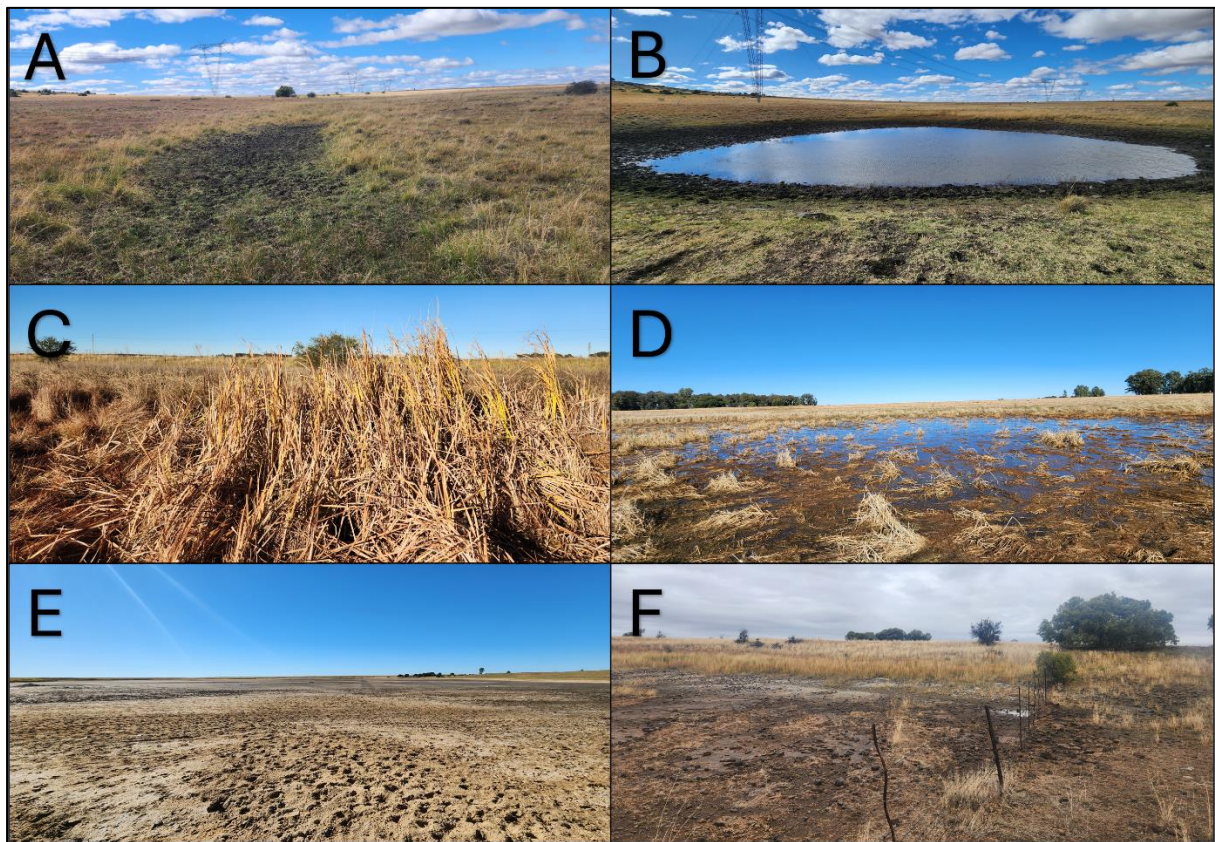


Figure 3-6 **Photographical examples of the different water resources found within the 500 m regulated area, A) Unchannelled valley bottom, B) Artificial dam, C) Seep wetland, D) Depression wetland, E) Depression pan and F) Drainage feature.**

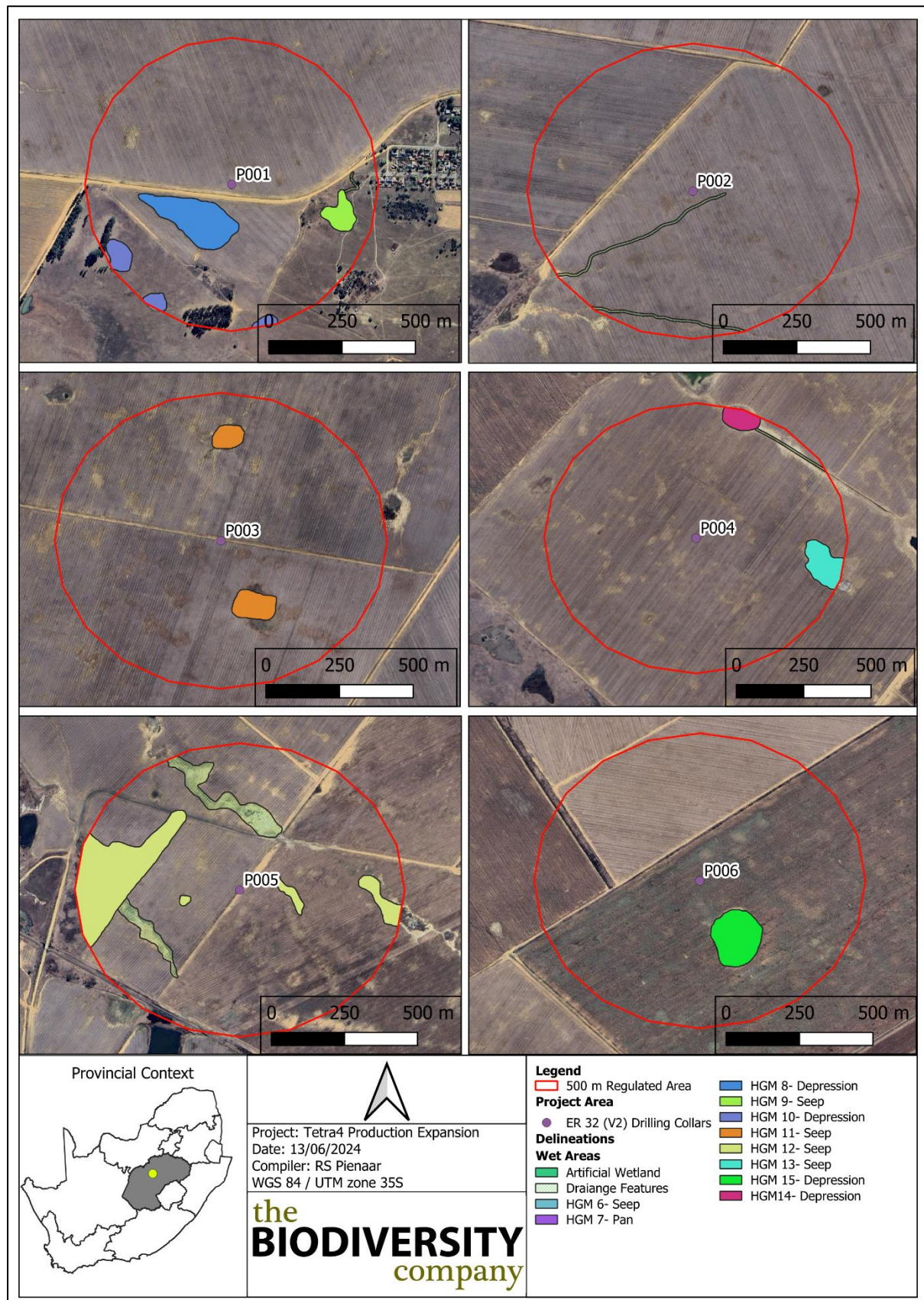


Figure 3-7 The delineated systems of the first 6 drilling holes for ER 32

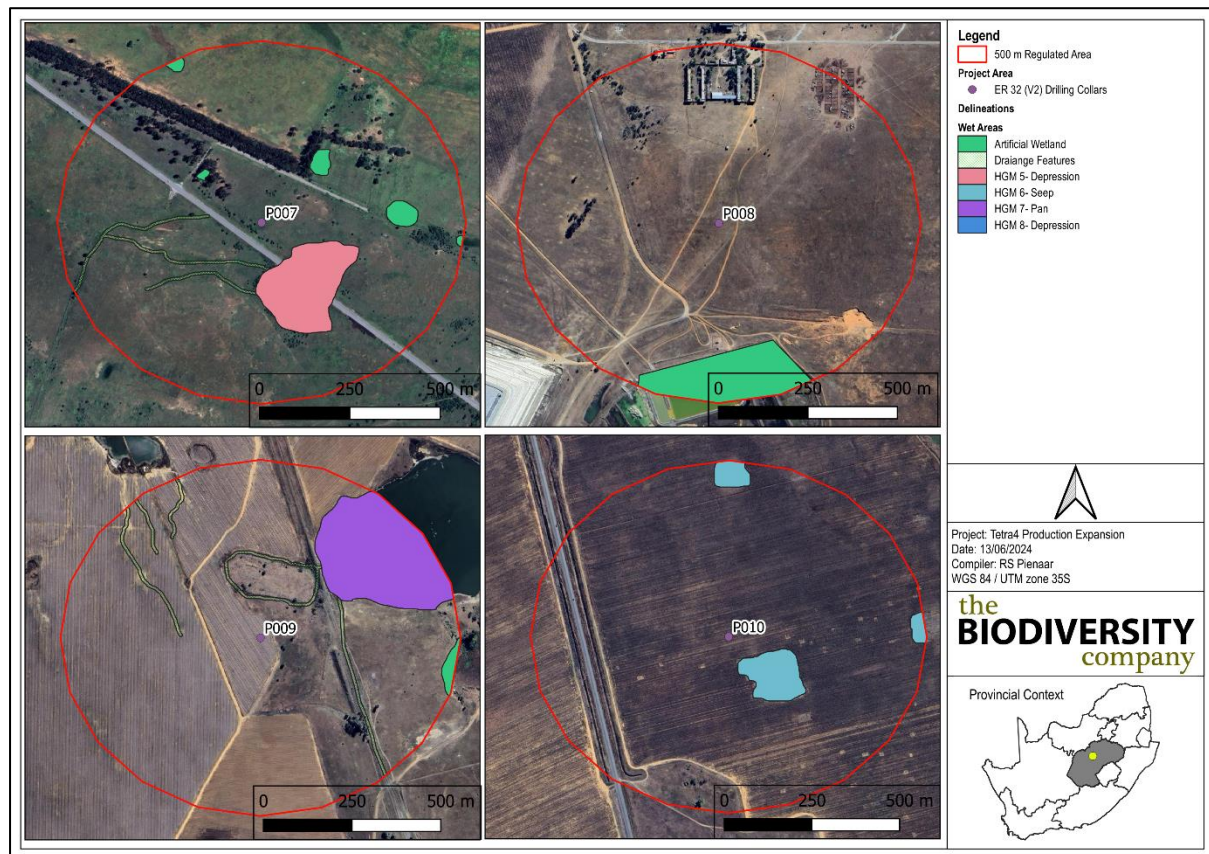


Figure 3-8 The delineated systems of the last 4 drilling holes for ER 32

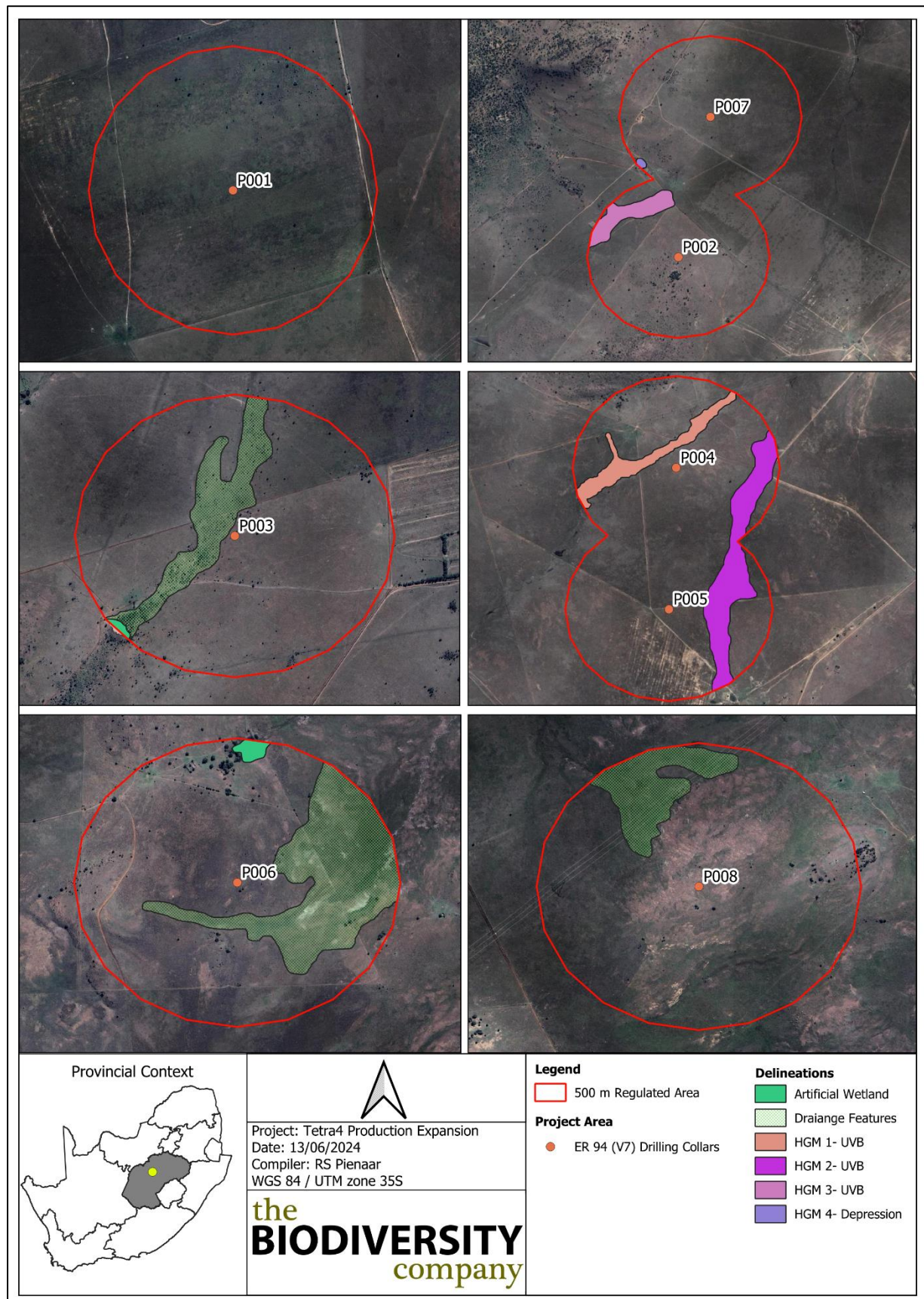


Figure 3-9 The delineated systems of the drilling holes for ER 94

Unchannelled valley bottom wetlands are typically found on valley floors where the landscape does not allow high energy flows. Figure 3-10 presents a diagram of a typical unchannelled valley bottom wetland, showing the dominant movement of water into, through and out of the system.

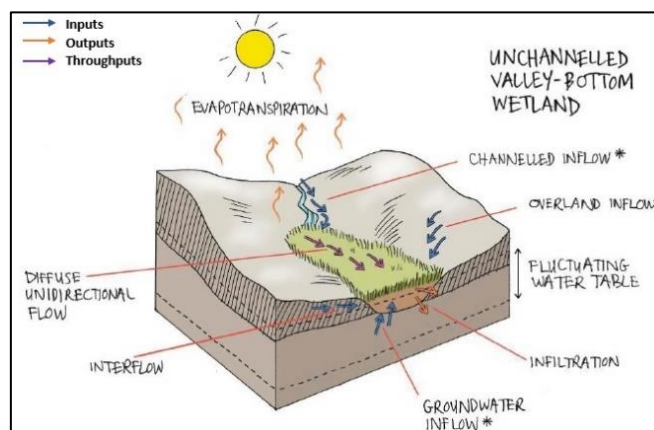


Figure 3-10 Amalgamated diagram of a typical unchannelled valley bottom, highlighting the dominant water inputs, throughputs and outputs, SANBI guidelines (Ollis et al. 2013)

Depression wetlands are located on the “slope” landscape unit. Depressions are inward draining basins with an enclosing topography which allows for water to accumulate within the system. Depressions, in some cases, are also fed by lateral sub-surface flows in cases where the dominant geology allows for these types of flows. Figure 3-11 presents a diagram of a typical depression wetland, showing the dominant movement of water into, through and out of the system.

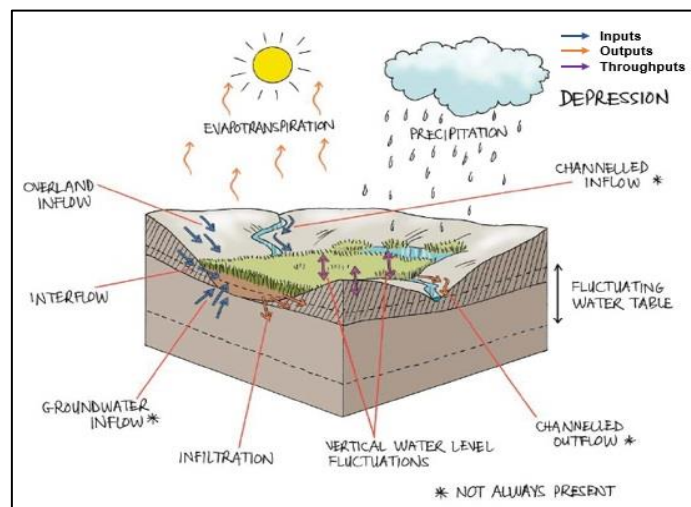


Figure 3-11 Amalgamated diagram of atypical depression wetland, highlighting the dominant water inputs, throughputs and outputs, SANBI guidelines (Ollis et al. 2013)

A typical hillslope seep is located within slopes, as mentioned in Figure 3-12. Isolated hillslope seeps are characterised by colluvial movement of material. These systems are fed by very diffuse sub-surface flows which seep out at very slow rates, ultimately ensuring that no direct surface water connects this wetland with other water courses within the valleys. Figure 3-12 illustrates a diagram of the hillslope seeps, showing the dominant movement of water into, through and out of the system.

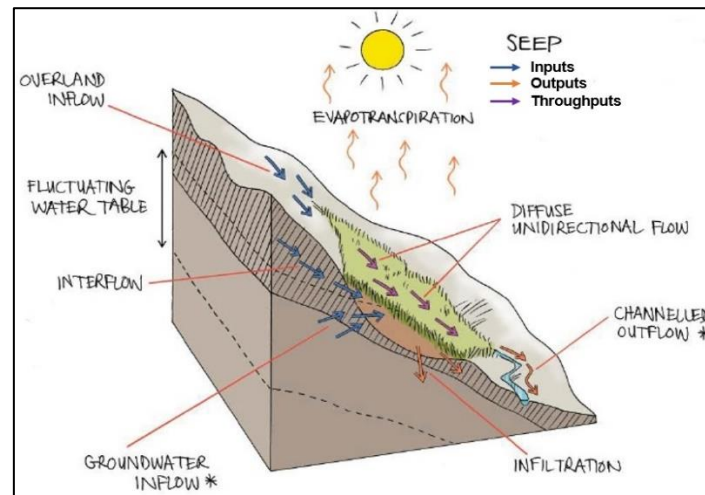


Figure 3-12 Amalgamated diagram of a typical hillslope seep, highlighting the dominant water inputs, throughputs and outputs, SANBI guidelines (Ollis et al. 2013)

The DWAF (2005) manual separates the classification of watercourses into three (3) separate types of channels or sections defined by their position relative to the zone of saturation in the riparian area. The classification system separates channels into:

- those that do not have baseflow ('A' Sections);
- those that sometimes have baseflow ('B' Sections) or non-perennial; or
- those that always have baseflow ('C' Sections) or perennial.

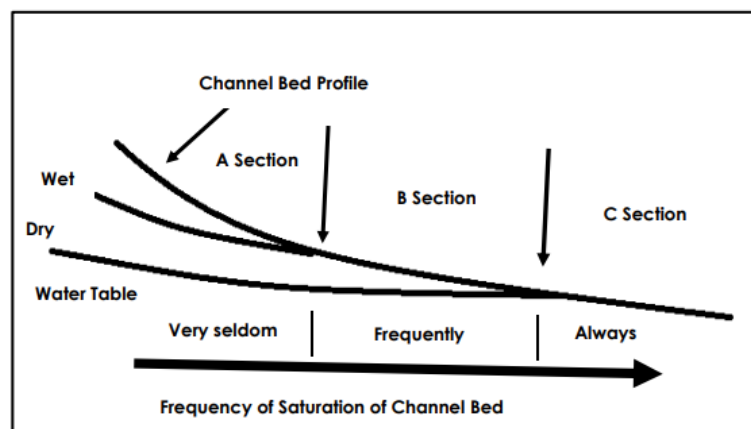


Figure 3-13 The watercourse classifications (DWAF, 2005)

3.3.1 Buffer Requirements

The "Buffer zone guidelines for wetlands, rivers and estuaries" (Macfarlane et al., 2014) was used to determine the appropriate wetland buffer zone for the proposed project.

Buffer zones have been used in land-use planning to protect natural resources and limit the impact of one land-use on another. A buffer zone has been prescribed for this project to serve as a "barrier" between the proposed development and the wetland systems. This buffer area would only be applicable to wetland areas that will not be lost or where infrastructure is required to traverse a system due to the project.

The wetland buffer zone tool was used to calculate the appropriate buffer required for the proposed Tetra4 Production Expansion project. A post-mitigation buffer of 10 m and 20 m is recommended for the drainage features and natural wetlands, respectively.

Table 3-1 Post-mitigation buffer requirement

Required Buffer after mitigation measures have been applied	
Drainage Features	10 m
Natural Wetlands	20 m

The proposed development will take place outside of all the delineated buffers and thus, if done correctly, will have no impacts on any wetlands.

3.4 Ecological Sensitivity

The National Web based Environmental Screening Tool has characterised the aquatic theme sensitivity of the development footprint as “Low” sensitivity while the larger regulated area traverse “Very High” sensitivity.

Table 3-2 provides a comparison between the Environmental Screening Tool and the specialist determined Site Ecological Importance (SEI) of the project. The specialist-assigned sensitivity ratings are based largely on the SEI process.

Table 3-2 Summary of the Screening Tool Sensitivity versus the Specialist assigned Site Ecological Importance (SEI) for the Field Survey Area of the Project Area

Screening Tool Theme	Screening Tool	System	Specialist	Tool Validated or Disputed by Specialist - Reasoning
Aquatic Biodiversity Theme	Very High	Wetlands	Moderate	Disputed – Much of the area within the wetlands has been historically modified through livestock grazing, agricultural field and road development. The proposed activities are not anticipated to significantly modify the hydrological characteristics of the entire area; therefore a “Moderate” sensitivity has been assigned for these areas in relation to freshwater biodiversity.
	Low	Terrestrial	Low	Validated – No natural surface water features were identified within the rest of the project area of influence.

4 Mitigation Measures

Several impacts were identified for the aquatic ecology and wetland assessment completed by Imperata Consulting CC (2017), which were also considered for the Cluster 2 gas exploration project. The impacts and mitigation measures from Cluster 1 & 2 that are still relevant/adequate for the proposed project.

5 Conclusions

The development area was traversed on foot, with several checks being undertaken to identify any soil wetness indicators, and to determine the local soil forms.

Multiple natural wetlands are located within the proposed development footprint. These wetlands were grouped into fifteen HGM units comprising of Unchannelled Valley Bottoms (HGM 1, 2, and 3), Depression wetlands (HGM 4, 5, 7, 8, 10, 14 and 15), and Seep wetlands (HGM 6, 9, 11, 12, and 13).

Along with the natural wetlands some artificial wetlands (off-channel dams) and drainage features were also identified and delineated. According to Ollis *et al.* (2013) a dam is classified as: “*artificial body of water created specifically for the storage of water, and which is not located along the course of a river*”. Due to the artificial characteristics of this system, no further assessment has been undertaken for the dam.

The wetland buffer zone tool was used to calculate the appropriate buffer required for the proposed Tetra4 Production Expansion project. A post-mitigation buffer of 10 m and 20 m is recommended for the drainage features and natural wetlands, respectively.

It is evident that the proposed development will take place outside all the buffers, and with the low impact of the proposed activity there are no risks foreseen.

5.1 Ecological Sensitivity

Screening Tool Theme	Screening Tool	System	Specialist	Tool Validated or Disputed by Specialist - Reasoning
Aquatic Biodiversity Theme	Very High	Natural wetlands	Moderate	Disputed – Much of the area within the wetlands has been historically modified through livestock grazing, agricultural field and road development. The proposed activities are not anticipated to significantly modify the hydrological characteristics of the entire area; therefore a “Moderate” sensitivity has been assigned for these areas in relation to freshwater biodiversity.
	Low	Terrestrial	Low	Validated – No natural surface water features were identified within the rest of the project area of influence.

5.2 Specialist Statement

Several impacts were identified for the aquatic ecology and wetland assessment completed by Imperata Consulting CC (2017), which were also considered for the Cluster 2 gas exploration project. The impacts and mitigation measures from Cluster 1 & 2 that are still relevant/adequate for the proposed project. The proposed development can be favourably considered for authorisation.

6 References

Department of Water Affairs and Forestry (DWAF). 2005a. A Practical Field Procedure for Identification and Delineation of Wetlands and Riparian Areas.

Kotze, D.C., Marneweck, G.C., Batchelor, A.L., Lindley, D.C., and Collins, N.B. 2009. A Technique for rapidly assessing ecosystem services supplied by wetlands, Mondi Wetland Project.

Macfarlane, D.M., Bredin, I.P., Adams, J.B., Zungu, M.M., Bate, G.C. and Dickens, C.W.S. 2014. Preliminary guideline for the determination of buffer zones for rivers, wetlands and estuaries. Final Consolidated Report. WRC Report No TT 610/14, Water Research Commission, Pretoria.

Macfarlane, D.M., Kotze, D.C., Ellery, W.N., Walters, D., Koopman, V., Goodman, P. and Goge, C. 2007. A technique for rapidly assessing wetland health: WET-Health. WRC Report TT 340/08.

Nel J.L. and Driver A. 2012. South African National Biodiversity Assessment 2011: Technical Report. Volume 2: Freshwater Component. CSIR Report Number CSIR/NRE/ECO/IR/2012/0022/A, Council for Scientific and Industrial Research, Stellenbosch.

Nel JL, Murray KM, Maherry AM, Petersen CP, Roux DJ, Driver A, Hill L, Van Deventer H, Funke N, Swartz ER, Smith-Adao LB, Mbona N, Downsborough L and Nienaber S. 2011. Technical Report for the National Freshwater Ecosystem Priority Areas project. WRC Report No. K5/1801.

Ollis DJ, Snaddon CD, Job NM, and Mbona N. 2013. Classification System for Wetlands and other Aquatic Ecosystems in South Africa. User Manual: Inland Systems. SANBI Biodiversity Series 22. South African Biodiversity Institute, Pretoria.

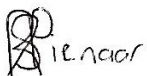
SANBI. 2009. Further Development of a Proposed National Wetland Classification System for South Africa. Primary Project Report. Prepared by the Freshwater Consulting Group (FCG) for the South African National Biodiversity Institute (SANBI).

7 Appendix Items

7.1 Appendix A – Specialist Declaration of Independence

I, Rian Pienaar, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Rian Pienaar

Ecologist

The Biodiversity Company

June 2024

I, Rowan Buhrmann, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Rowan Buhrmann

Ecologist

The Biodiversity Company

June 2024

7.2 Appendix B – Specialist CVs

Rian Pienaar

M.Sc. Environmental Science

Pri Sci Nat (135544)

Cell: +27 78 0505 0201

Email: rian@thebiodiversitycompany.com

Identity Number: 9405235011089

Date of birth: 23 May 1994



Profile Summary

Working experience throughout Southern Africa

Specialist experience with mining, construction and agriculture.

Specialist expertise include wetlands resources, aquatic ecology, parasitology and ecotoxicology.

Areas of Interest

Mining, Oil & Gas, Renewable Energy & Bulk Services Infrastructure Development, Farming, Land Contamination, Sustainability and Conservation.

Key Experience

- Environmental Impact Assessments (EIA)
- Environmental Management Programmes (EMP)
- Wetland delineations and ecological assessments
- Rehabilitation Plans and Monitoring
- Soil classification
- Agriculture potential assessments
- Land contamination assessments

Country Experience

South Africa
Mozambique
Botswana

Nationality

South African

Languages

English – Proficient

Afrikaans – Proficient

Qualifications

- MSc (North-West University of Potchefstroom) – Environmental Science (Cum Lauda)
- BSc Honours (North-West University of Potchefstroom) – Environmental Science with Aquatic ecosystem health.
- BSc Environmental sciences
- Pri Sci Nat (135544)

Rowan Buhrmann

MSc Biology (Plant Ecophysiology)
Pr Sci Nat (136853)

Cell: +27 78 558 1124

Email: rowan@thebiodiversitycompany.com

Identity Number: 9111085091086

Date of birth: 08 November 1991



Profile Summary

Working experience throughout KwaZulu-Natal (South Africa).

Experience in Environmental Consulting as an EAP (EIAs and WULA).

Environmental Control Officer (ECO).

Specialist expertise in Climate Change (elevated temperatures) and Botany.

Areas of Interest

Aquatic Ecology and Water Resource Management.

Renewable Energy.

Sustainability and Conservation.

Landscape rehabilitation.

Geographic Information Systems.

Experimental Design.

Key Experience

- Environmental Impact Assessments and Water Use Licence Applications
- Vegetation Assessments
- Wetland delineations and ecological assessments
- Rehabilitation Plans and Monitoring

Countries worked in

South Africa

Nationality

South African

Languages

English – Proficient

Qualifications

- MSc (University of KwaZulu-Natal) – Plant EcoPhysiology.
- BSc Honours (University of KwaZulu-Natal) – Biology
- BSc (University of KwaZulu-Natal) – Biology
- Certificate of Competence: Wetland WET-Health (V2)
- Pr Sci Nat (136853)