<u>Aquatic Scoping Assessment Report</u>:

Impofu West Wind Farm,

Eastern Cape Province

Prepared for:

AURECON SOUTH AFRICA (PTY) LTD

Prepared by:

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1 Rossini Road
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June 2018

SPECIALIST STATEMENT DETAIL

This aquatic assessment has been prepared with the requirements of the Environmental Impact Assessment Regulations and the National Environmental Management Act (Act 107 of 1998), any subsequent amendments and any relevant other National and / or Provincial Policies related to biodiversity assessments in mind.

Report prepared by: Dr. Brian Colloty Pr.Sci.Nat. (Ecology) / Certified EAP / Member SAEIES & SASAqS

Expertise / Field of Study: BSc (Hons) Zoology, MSc Botany (Rivers), Ph.D Botany Conservation Importance rating (Estuaries) and interior wetland / riverine assessment consultant from 1996 to present.

I, **Dr. Brian Michael Colloty** declare that this report has been prepared independently of any influence or prejudice as may be specified by the National Department of Environmental Affairs

Signed:… …… Date:…3 June 2018……

EXECUTIVE SUMMARY

Scherman Colloty & Associates (SC&A) were appointed by Impofu West Pty Ltd to conduct an aquatic scoping assessment, followed by an aquatic assessment report for the proposed Impofu West Wind Farm near Humansdorp in the Eastern Cape. The Impofu West Wind Farm is one of three proposed adjoining wind farms being assessed for the Impofu Wind Farms Project. The aquatic assessment includes the delineating of any natural waterbodies remaining on the properties in question. This was based on information collected during site visits in September, November and December 2017 while adhering to the assessment criteria contained in the DWAF 2005 / 2007 delineation manuals and the Wetland Classification System found in the Appendix 1. Several national spatial databases and project specific wetland / waterbody spatial database layers were also used in this phase of the assessment. A similar and more detailed investigation of the proposed layout was also conducted in March 2018, which will inform the Scoping and EIA process.

The proposed development occurs within the following catchments within the South Eastern Coastal Belt Ecoregion located within the Mzimvubu-Tsitsikamma Water Management Area

- K80E –Tsitsikamma River (Existing DR01774 district road only)
- K80F – Klipdrift River (Wind Farm)
- K90D – Krom River (Existing district road only)

These catchments are characterised by perennial, non-perennial water courses and drainage lines associated with these mainstem systems listed above. The majority of the development activities such as access roads and the placement of turbines, hard stand areas, sub/switching stations and internal cables will occur within the K80F (Klipdrift catchment).

According to the National Freshwater Ecosystems Priority Area (NFEPA) wetland data, and the National Wetland Inventory Data being updated by CSIR/ SANBI (currently version 5.2) indicated several wetlands could occur within the study area. These were classified as follows:

1. Valley bottom wetlands – unchannelled
2. Valley bottom wetlands – channelled
3. Endorheic pan / depressions
4. Artificial or man-made systems such as dams, reservoirs / irrigation balancing dams

The presence of these wetlands was confirmed during this assessment, and where necessary due to changes over time, the wetlands were either re-digitized at a finer scale and / or reclassified, with the final natural wetland map shown in Figure 3 based on the site visit data.

Maps in this report indicate the typical watercourses observed within the site. Any activities within these areas or the 32 m buffer (or the 1:100 floodline, whichever is the greatest) will require a Section 21 c and i Water Use License (mostly likely a General Authorisation (GA) if all other Section 21 uses are below the GA thresholds). In this regard as shown in Figure 4 the development layout has made use of as many existing farm tracks and as far as possible to minimise any new impacts on these or the wetland systems. Further, crossings were selected and verified by this report's author, to ascertain if any of the crossings and/or road upgrades required would impact on any sensitive aquatic environments. This also included verifying that environments such as steep valleys, that would pose a threat to the aquatic environment (i.e. a poorly placed road would create a high risk of sedimentation or erosion), would be avoided or designs would have taken cognisance of this.

It is thus evident that the study area systems are largely functional but are impacted upon as a result of current land use practices. Current impacts are mostly associated with conversion of the natural landscape to grazing, livestock trampling, the large number of farm dams and alien tree infestation (*Acacia* species).

This was confirmed for each of the affected reaches located within the development footprint and in particular the areas that would be crossed by the proposed road layout (4 new river crossings within the wind farm footprint and 2 potential crossing upgrades on the DR01774). In other words, the systems observed are modified, with either small or narrow riparian zones, or associated with Valley Bottom (Channelled or Unchannelled) wetlands.

A final analysis of the Present Ecological State and Ecological Importance and Ecological Sensitivity of the study area will be included in the EIA phase of this assessment, together with an assessment of important flora and or fauna associated with these aquatic systems. However, the information collected in this phase of the assessment is sufficient to assist with the finalisation of the layout for the EIA, but it is anticipated that this would not alter the current issue and impact findings.

The following direct and indirect impacts have been assessed based on the available layout, dated 29 March 2018:

- Loss of aquatic species of special concern
- Wetland loss as natural wetlands were observed
- Loss of riparian systems and water courses
- Impact on aquatic systems through the possible increase in surface water runoff on form and function - Increase in sedimentation and erosion
- Potential impact on localised surface water quality
- Cumulative impacts
- No-Go option

However, if the following is adhered to it is anticipated that the overall impacts with mitigation would be low.

- HIGH SENSIVITY AREAS = No Go for all activities and wind turbines inclusive of buffer of 50 m or whichever is greater as rated by bird or bat specialists
- MEDIUM SENSITIVITY AREAS = internal roads and underground cables are acceptable, but no wind turbines, temporary works areas or substations – or whichever is greater as rated by bird or bat specialists
- LOW SENSITIVITY = Access roads (haul roads), internal roads and underground cables are acceptable.

The only exception being that when an existing road or cattle walkway bisects any HIGH (no-go areas) and then these areas can be used (with rehab/monitoring conditions).

The proposed facility would have a limited impact on the aquatic environment as the structures will avoid the delineated natural wetlands (which delineation includes a 50 m buffer applied to each), with a limited number of new water course crossings, i.e. the layout makes use of any of the existing roads and where crossing upgrades will be an improvement to current conditions (e.g. pipe culverts are replaced with box culverts). Thus, presently no objection to the development taking place is made.

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1 - Introduction

Scherman Colloty & Associates (SC&A) were appointed by Impofu West Pty Ltd to conduct an aquatic scoping assessment, followed by an aquatic assessment report for the proposed Impofu West Wind Farm near Humansdorp in the Eastern Cape. The Impofu West Wind Farm is one of three proposed adjoining wind farms being assessed for the Impofu Wind Farms Project. The aquatic assessment includes the delineating of any natural waterbodies remaining on the properties in question. This was based on information collected during site visits in September, November and December 2017 while adhering to the assessment criteria contained in the DWAF 2005 / 2007 delineation manuals and the Wetland Classification System found in the Appendix 1. Several national spatial databases and project specific wetland / waterbody spatial database layers were also used in this phase of the assessment. A similar and more detailed investigation of the proposed layout was also conducted in March 2018, which will inform the Scoping and EIA process.

This report thus provides the delineations of the observed waterbodies that have assisted in finalising the placement of the wind turbines and then secondly develop the associated internal roads, underground transmission line cable routes and the final positioning of the required substation/switching station for the Impofu West Wind Farm during the conceptual design phase of the project. This was carried out firstly to minimise the number of potential impacts through impact avoidance, but secondly to reduce the number of potential Section 21 c & i Water Use License Applications that will be required.

An analysis of the remaining potential impacts of the proposed facility, as well as the proposed District Road 01774 upgrades, on the aquatic environment is presented in this report, as well as a preliminary assessment of any cumulative impacts that may be present.

2 – Approach to Study

2.1 Scope

It is our understanding that the proposed Impofu West Wind Farm project, has triggered the undertaking of an environmental impact assessment in terms of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998) and potential applications under the National Water Act (Act 36 of 1998), where required. The potential impacts on the surrounding water bodies therefore need evaluation, with specific attention drawn to the likelihood of any changes to the regional hydrology and how this could impact on these systems and recommend suitable mitigation measures to reduce any potential impacts. SC&A understands the study area well and has worked on several projects, which includes all of the constructed Wind Farms (namely, Jeffrey's Bay, Kouga, Gibson Bay, and Tsitsikamma Community Wind Farms) as well as new overhead transmission lines within the region and therefore possess a high level of information.

The following potential issues were thus assessed, and then used as criteria when ranking the specific sensitivity of any of the delineated waterbodies:

- Potential loss of riverine and wetland habitat (road and services crossings and crossing upgrades).
- Increase in stormwater runoff and the potential to increase the amount of erosion in the catchments
- Supplying the water requirements for construction and operation phases of the development, should a natural resource be considered as the supply source
- Cumulative impact of additional turbines, roads or associated infrastructure

2.2 Terms of reference

The following was extracted from the TOR provided by Aurecon, while a detailed description of the methods used is contained in Appendix 1.

"A focussed and relevant description of all baseline characteristics and conditions of the receiving environment (e.g.: site and/or surrounding land uses including urban and agricultural areas as applicable) in relation to the Specialist's field of interest, based on all relevant available data, reports and maps, and information obtained from any field work investigations undertaken to date (to be acquired by Specialist).

A detailed evaluation of the predicted impacts of the project on the receiving environment, or of the receiving environment on the project as per the methodology to be prescribed by Aurecon, that uses the criteria of extent, duration and intensity to quantify the significance of the potential impact (refer to excel spreadsheet 'Impofu_EIA_Impact Assessment.xlsx'). The evaluation of impacts should include:

- An assessment of impacts for all phases of the life-cycle of the project, namely construction, operation, and decommissioning phases, as well as the direct and indirect impacts;
- An assessment of the probability of each impact occurring, the reversibility of each impact and the level of confidence in each potential impact;
- An assessment of the significance of each impact before and after mitigation;

- The identification of any residual risks that will remain after implementation of design and planning mitigation; and
- An assessment of the No-Go option.

Refer to the Aurecon standard assessment methodology (to be provided by Aurecon) as well as any discipline specific methodology that was used to inform the assessment of impacts.

Consider and evaluate the cumulative impacts in terms of the current and proposed activities in the area. Refer to Section 4.3 below for more information.

Recommendations to avoid negative impacts. Where this will not be possible then provide feasible and practical mitigation, management and/or monitoring options to reduce negative impacts and enhance positive impacts that can be included in the Environmental Management Programme.

Identify any additional measures to ensure that the project contributes towards sustainability goals or provides a positive contribution to the environment.

Where relevant, recommendations and instructions regarding any additional authorisation, permitting or licensing procedures, or any other requirements pertaining to legislation and policies relevant to the Specialist's field of interest.

In the instances where more information/ data is required, provide a suitable methodology and Plan of Study for EIA. This should include:

- A list of further field work/research/monitoring activities/consultation that may be required to complete the study in the EIA Phase, or whether no further studies is required must be stated.

An outline of recommended measures to manage residual impacts (i.e. impacts that remain after optimisation of design and planning) for the construction, operational and decommissioning phases with an indication of the following:

- Who should be responsible for implementation of mitigation;
- Details of frequency of implementation of each measure; and
- Envisaged outcome of each action.

Recommendation of a monitoring plan for the relevant aspects associated with the specialist's field of expertise, if required. In your recommendation, provide an indication of what the monitoring plan should comprise, for example:

- Aspects to be measured;
- Responsible person/body;
- Frequency of monitoring actions;
- Standards to be met; and
- Reporting requirements.

The conditions, in respect of the Specialist's field of interest, for inclusion in the Environmental Authorisation.

A reasoned opinion as to whether the proposed activity, or portions of the activity should be authorised. Include a table upfront in the Specialist Scoping Report listing the

requirements of Appendix 6 of NEMA, and where this information is detailed in the specialist report."

Furthermore, the following checklist as per the NEMA specialist assessment requirements was also adhered to:

Regulation GNR 326 of 4 December 2014, as amended 7 April 2017, Appendix 6	**Section of Aquatic Report**
(a) details of the specialist who prepared the report; and the expertise of that specialist to compile a specialist report including a *curriculum vitae*;	**Page 3 and Appendix 2 of this report**
(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	**Appendix 3 of this report**
(c) an indication of the scope of, and the purpose for which, the report was prepared;	**Section 2 of this report**
(A) an indication of the quality and age of base data used for the specialist report;	**Yes – data included ranged from 2017 to present which is also been incorporated into the National SANBI database**
(B) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	**Yes Section 5 -10**
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	**Yes Section 3**
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	**Yes – See Appendix 1**
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternative;	**Yes – See Appendix 1**
(g) an identification of any areas to be avoided, including buffers;	**Yes – See Section 8 and 9**
(h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	**Yes – See Section 9**
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	**Yes – Section 2.3 of this report**
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment, or activities;	**Yes – Section 5, 6, 7 and 8 of this report**
(k) any mitigation measures for inclusion in the EMPr;	**Yes – Section 11**
(l) any conditions for inclusion in the environmental authorisation;	**Yes – Section 9 and 11**
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	**Yes – Section 9 and 11**
(n) a reasoned opinion— i. as to whether the proposed activity, activities or portions thereof should be authorised; ii. Regarding the acceptability of the proposed activity or activities; and iii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr or Environmental Authorization, and where applicable, the closure plan;	**Yes – Section 11 of this report**
(o) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	**N/A**
(p) any other information requested by the competent authority	**N/A**
Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	**Yes – This report also meets the DWS requirements in terms of GN 267 (40713) of March 2017**

2.3 Assumptions and limitations

In order to obtain a comprehensive understanding of the dynamics of both the flora and fauna of both the aquatic communities within a study site, as well as the status of endemic, rare or threatened species in any area, assessments should always consider investigations at different time scales (across seasons/years) and through replication. However, due to time constraints these long-term studies are not feasible and are mostly based on instantaneous sampling. This site was assessed after a period of spring and early summer rainfall, although the study area has been visited during other years and seasons by the author. This provides the author of this report with an understanding of the region and the aquatic environment.

It should be emphasised that information, as presented in this document, only has reference to the study area as indicated on the accompanying maps. Therefore, this information cannot be applied to any other area without detailed investigation.

For the purposes of this report it is assumed that any existing roads, cattle walkways and tracks within the wind farm boundary will be upgraded, while the new roads have avoided or span the observed water courses with a High Sensitivity. A further assumption is that water required for the various phases of the project will be sourced from a licensed resource and not illegally abstracted from any surrounding water courses, particularly if dust suppression is required.

With regard to the potential crossing upgrades the following assumptions have been made, which for the purposes of this report have also been included in the mitigations to assist for any future design criteria:

- The crossings, where required will be upgraded to allow for heavy vehicles to pass, will be raised using correctly sized culverts, and all pipe culverts will be removed.
- River levels, regardless of the current state of the river / water course will be reinstated thus preventing any impoundments from being formed. The related designs must be assessed by an aquatic specialist during a post EIA walkdown, prior to commencement of the construction phase.
- Approach road embankments especially where large cut and fill areas will be required must be rehabilitated during the construction process, to minimise erosion.
- Suitable stormwater management systems must be installed and monitored during the first few months of use. Any erosion / sedimentation must be prevented.
- If any of the delineated wetlands occur within 50 m of the existing crossings, then a detailed monitoring plan must be developed.

2.4 Relevant legislation and policy

Locally the South African Constitution, seven (7) Acts and two (2) international treaties allow for the protection of wetlands and rivers. These systems are protected from the destruction or pollution by the following:

- Section 24 of The Constitution of the Republic of South Africa;
- Agenda 21 – Action plan for sustainable development of the Department of Environmental Affairs and Tourism (DEAT) 1998;
- The Ramsar Convention, 1971 including the Wetland Conservation Programme (DEAT) and the National Wetland Rehabilitation Initiative (DEAT, 2000);
- National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998) inclusive of all amendments, as well as the NEM: Biodiversity Act;
- National Water Act, 1998 (Act No. 36 of 1998);
- Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983); and
- Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).
- Nature and Environmental Conservation Ordinance (No. 19 of 1974)
- National Forest Act (No. 84 of 1998)
- National Heritage Resources Act (No. 25 of 1999)

The following possible Section 21 Water Uses are anticipated, and will thus require a License or General Authorisation as deemed by the Department of Water and Sanitation:

- Section 21 a – Abstraction of water from boreholes and rivers or dams
- Section 21 b – Storage of water (dams or reservoirs)
- Section 21 c – Impeding or diverting flows when construction occurs within a water course or within 500 m of a wetland
- Section 21 g – Storage of domestic waste in conservancy tanks
- Section 21 i – Alteration of the bed or banks of water course of ay activities within 500 m of a wetland.

3 – Project description

The proposed wind farm will consist of 41 turbines and it is assumed that the turbines will be approximately 3 - 5 MW.

The supporting infrastructure within the site includes roads, underground and overhead medium voltage (MV) power lines (33 kV or lower) and substation. The internal gravel roads will be approximately 6 m wide with potential side drains along the side and of a specification to accommodate the abnormal trucks that will deliver the turbine components. Where possible existing roads will be used and upgraded to avoid additional clearance of natural or agricultural land cover. In exceptional circumstances short sections of the roads may be surfaced with bitumen or concrete if they are excessively steep. Two small river crossings on District Road 01774, just south of the Tsitsikamma Community Wind Farm, may need to be upgraded for the transportation of abnormal loads to the Impofu West site, although not located within the Impofu West Wind Farm boundary. The proposed upgrade activities will include the upgrading to appropriately sized culverts at these crossings, road levelling and resurfacing.

The wind farm application will include the 33 or lower kV MV lines that would transfer the power generated from the turbines to the on-site substations (with a transformer). These lines would predominantly be in the form of underground cables, but in cases where they have to cross complex terrain such as drainage lines or steep valleys, they would be short sections of overhead power lines.

The substation and associated switching station for the Impofu West Wind Farm, as well as the overhead 132 kV transmission lines that connect the on-site substation to the collector switching station, have been considered in this assessment. Since the switching station component will be owned by Eskom, there will be a physical barrier between the two components in the form of a fence. The total footprint of each substation is approximately 150 x 75 m (11,250 m^2) and the adjoining Eskom switching stations would be of a similar size. The substation area will include all the standard substation electrical equipment such as transformers and bus bars, and the area will also house the control, operation, workshop, storage buildings / areas.

4 - Methods

A detailed specialist assessment method is included in the Appendices of this report, which is based on best practice methods developed in conjunction with other wetland and aquatic specialists and the Department of Water and Sanitation. This methodology has been used in the assessment of approximately 120 renewable energy projects alone by the author in the past 5 years. This includes the assessment of several of the current and proposed/future wind farms surrounding the proposed wind farm (Tsitsikamma Community Wind Farm, Gibson Bay Wind Farm, Oyster Bay Wind Farm, Jeffreys Bay Wind Farm, Banna Ba Pifhu Wind & Solar farms, Ubuntu Wind Farm), as well as a large number of transmission lines needed for these projects. The impact assessment methodology

provided by Aurecon was used to complete the assessment of potential impacts discussed in Section 9 of this report.

5 - Study area description

The proposed development occurs within the following catchments within the South Eastern Coastal Belt Ecoregion located within the Mzimvubu-Tsitsikamma Water Management Area (Figure 1)

- K80E –Tsitsikamma River (Existing DR1774 road only)
- K80F – Klipdrift River (Wind Farm)
- K90D – Krom River (Existing district road only)

These catchments are characterised by perennial, non-perennial water courses and drainage lines associated with these mainstem systems listed above. The majority of the development activities such as access roads and the placement of turbines, hard stand areas, sub/switching stations and internal cables will occur within the K80F (Klipdrift catchment).

In terms of the National Freshwater Ecosystems Priority Areas (NFEPA) assessment, all of watercourses within the Impofu West Wind Farm site have been assigned a condition score ranging from C to D (Nel *et al.* 2011), indicating that they are moderately to largely modified but with some biological significance. This is largely due to the high degree of transformation that has taken place within the catchments of these systems through to conversion of the natural fynbos to pasture. The only remaining riparian zones were expected within the steep river valleys associated with the larger Impofu Wind Farms study area, but most of which have been lost to alien tree invasion. However, several wetlands remain as these areas are too wet for agricultural production or grazing or are being maintained by agricultural return flow as most pastures are being irrigated.

Several existing wind farms (Kouga, Gibson Bay and Tsitsikamma Community Wind Farms) have already been constructed in the region and are considered as part of the baseline environment for the Impofu West Wind Farm study area. Note that the existing Jeffreys Bay Wind Farm has not been considered as part of the baseline as it is too far removed from the Impofu Wind Farms site to be of any significance to this assessment from an aquatic environment standpoint. The Impofu West Wind Farm project will make use of some of the roads that have already been upgraded to access this site, as well as the proposed upgrades to two small river crossings on existing road DR01774. It is anticipated that the Impofu West Wind Farm development could affect localised wetlands and watercourses required for crossings, but these occur in new areas, where impacts mentioned above already occur.

Simply stated there would be no additional impact as the development would make use of existing major access routes with the exception of the required, while other impacts such as erosion or sedimentation would be small scale and localised. This coupled to limited connectivity due to the high number of dams, and abstraction for agriculture, has further reduced the potential for additional cumulative impacts. See Section 9 for further details.

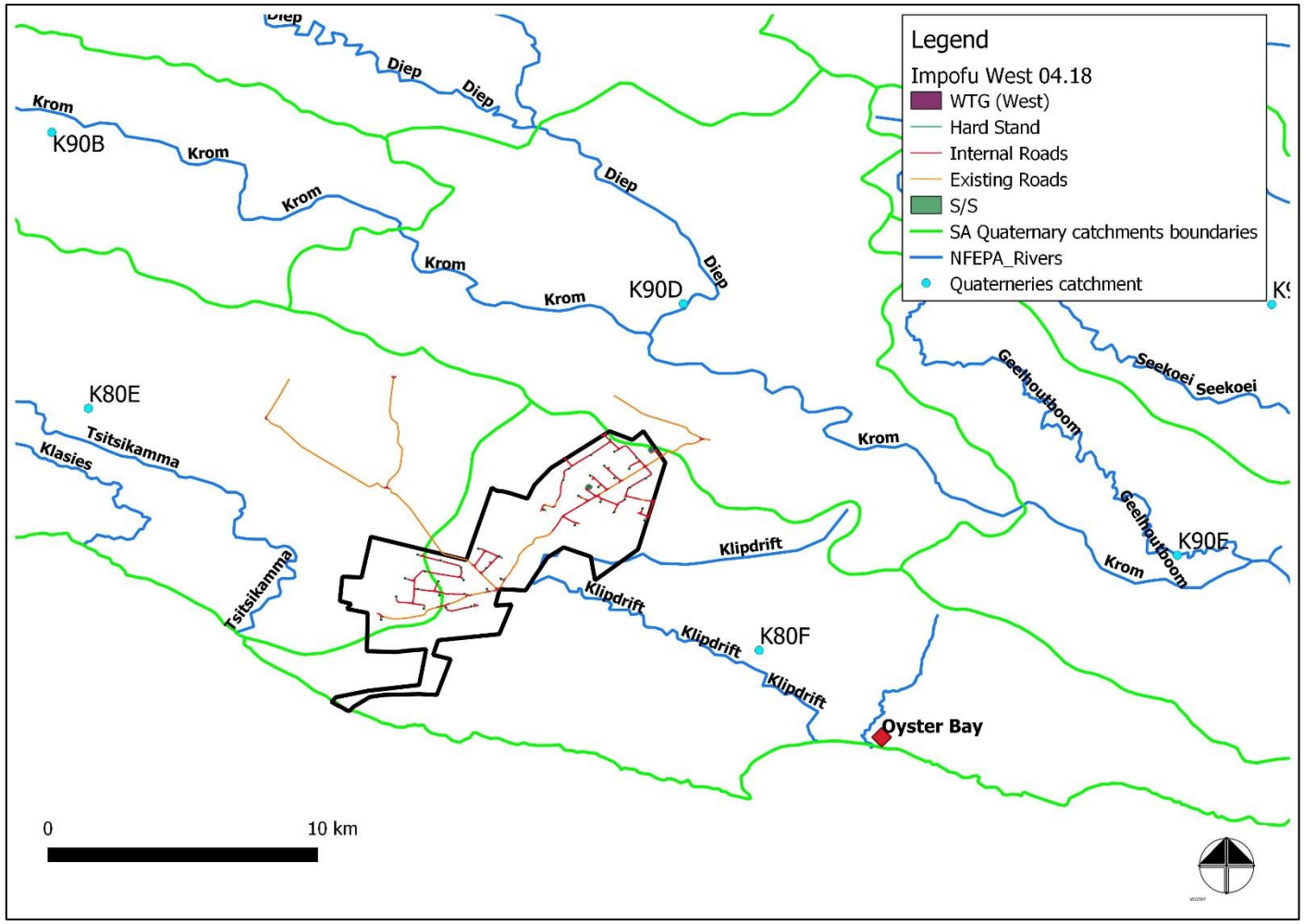

Figure 1: Project locality map indicating various quaternary catchments and mainstem rivers within the region (NFEPA & DWS)

6 – Waterbody delineation & classification

The water body delineation and classification was conducted using the standards and guidelines produced by the DWA (DWAF, 2005 & 2007) and the South African National Biodiversity Institute (SANBI, 2009, Ollis *et al.*, 2013). These methods are contained in the attached Appendix 1, which also includes wetland definitions, wetland conservation importance and Present Ecological State (PES) assessment methods that will be used in the EIA phase report. Reference is also included with regard relevant legislation related to the protection of waterbodies and the minimum requirements in terms of prescribed buffers that were supplied to the developer in the screening phase that have been incorporated into the layout option to date.

For reference the following definitions are as follows:

- **Drainage line**: A drainage line is a lower category or order of watercourse that does not have a clearly defined bed or bank. It carries water only during or immediately after periods of heavy rainfall i.e. non-perennial, and riparian vegetation may not be present.
- **Perennial and non-perennial:** Perennial systems contain flow or standing water for all or a large proportion of any given year, while non-perennial systems are episodic or ephemeral and thus contains flows for short periods, such as a few hours or days in the case of drainage lines.
- **Riparian**: the area of land adjacent to a stream or river that is influenced by stream-induced or related processes. Riparian areas which are saturated or flooded for prolonged periods would be considered wetlands and could be described as riparian wetlands. However, some riparian areas are not wetlands (e.g. an area where alluvium is periodically deposited by a stream during floods but which is well drained).
- **Wetland**: land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which under normal circumstances supports or would support vegetation typically adapted to life in saturated soil (Water Act 36 of 1998); land where an excess of water is the dominant factor determining the nature of the soil development and the types of plants and animals living at the soil surface (Cowardin *et al*., 1979).
- **Water course**: as per the National Water Act means -

  (a) a river or spring;

  (b) a natural channel in which water flows regularly or intermittently;

  (c) a wetland, lake or dam into which, or from which, water flows; and

  (d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks

According to the National Freshwater Ecosystems Priority Area (NFEPA) wetland data, and the National Wetland Inventory Data being updated by CSIR/ SANBI (currently version 5.2) indicated several wetlands could occur within the study area. These were classified as follows as shown in Figure 2:

1. Valley bottom wetlands – unchannelled (Plate 1)
2. Valley bottom wetlands – channelled (Plate 2)
3. Endorheic pan / depressions (Plate 3)
4. Artificial or man-made systems such as dams, reservoirs / irrigation balancing dams (Plate 4)

The presence of these wetlands was confirmed during this assessment, and where necessary due to changes over time, the wetlands were either re-digitized at a finer scale and / or reclassified, with the final natural wetland map shown in Figure 3 based on the site visit data.

Figure 4 indicates the typical watercourses observed within the site. Any activities within these areas or the 32 m buffer (or the 1:100 floodline, whichever is the greatest) will require a Section 21 c and i Water Use License (mostly likely a General Authorisation (GA) if all other Section 21 uses are below the GA thresholds). In this regard as shown in Figure 4 the development layout has made use of as many existing farm tracks and as far as possible to minimise any new impacts on these or the wetland systems. Further, crossings were selected and verified by this report's author, to ascertain if any of the crossings and/or road upgrades required would impact on any sensitive aquatic environments. This also included verifying that environments such as steep valleys that would pose a threat to the aquatic environment (i.e. a poorly placed road would create a high risk of sedimentation or erosion) would be avoided or designs would have taken cognisance of this.

7 - Present Ecological State and conservation importance

The Present Ecological State of a river or wetland represents the extent to which it has changed from the reference or near pristine condition (Category A) towards a highly impacted system where there has been an extensive loss of natural habit and biota, as well as ecosystem functioning (Category E).

The national Present Ecological Score or PES scores have been revised for the country and based on the new models, aspects of functional importance, as well as direct and indirect impacts that have been included (DWS, 2014). The new PES system also incorporates EI (Ecological Importance) and ES (Ecological Sensitivity) separately as opposed to EIS (Ecological Importance and Sensitivity) in the old model. Although the new model is still heavily centred on rating rivers using broad fish, invertebrate, riparian vegetation and water quality indicators. The Recommended Ecological Category (REC) is still contained within the new models, with the default REC being B, when little or no information is available to assess the system or when only one of the above-mentioned parameters is assessed or then overall PES is rated between a C or D.

The Present Ecological State scores (PES) for the drainage lines and the rivers in the Impofu Wind Farm study area were rated as follows (DWS, 2014 – where D = Largely Modified & C = Moderately Modified):

Subquaternary Catchment Number	Present Ecological State	Ecological Importance	Ecological Sensitivity
9127	D	Moderate	Medium
9201	D	Medium	High
9152	C	High	High

It is thus evident that the study area systems are largely functional but are impacted upon as a result of current land use practices. Current impacts are mostly associated with conversion of the natural landscape to grazing, livestock trampling, the large number of farm dams (See Figure 4) and alien tree infestation (*Acacia* species – Plate 5).

This was confirmed for each of the affected reaches located within the development footprint and in particular the areas that would be crossed by the proposed road layout shown in Figure 3 and 4 (6 new river crossings including the 2 on DR01774). In other words, the systems observed are modified, with either small or narrow riparian zones, or associated with Valley Bottom (Channelled or Unchannelled) wetlands.

A final analysis of the Present Ecological State (PES) and Ecological Importance (EI) and Ecological Sensitivity (ES) of the study area will be included in the EIA phase of this assessment, together with an assessment of important flora and or fauna associated with these aquatic systems. However, the information collected in this phase of the assessment is sufficient to assist with the finalisation of the layout for the EIA, but it is anticipated that this would not alter the current issue and impact findings.

It should be noted that the Ecological Importance and Ecological Sensitivity ratings for these systems, was rated Medium or High respectively, even though the Present Ecological State was low (C or D). This was attributed to the presence of the high number of wetlands within the region, coupled to land use pressures and the potential for important fish or invertebrates to occur within the region. The Tsitsikamma Region (Tsitsikamma River to Salt River, Natures Valley) is considered a biogeographical break between western and eastern aquatic invertebrate populations. The isolation of the deep river valleys in certain parts has led to creation of unique / endemic aquatic invertebrates in the region (De Moor, et al., 2003).

In considering this, the current wind farms within the region have adhered to the principle that the layouts and designs of any water course crossings, should not reduce or impact on either the PES, EI or ES of the region. This includes the study area of this wind farm and the two others being proposed (Impofu North and Impofu East). Thus, the cumulative impact of the wind farms on the region PES, EI and ES has been negligible when compared to current farming activities.

Aquatic plant species within this region are limited to a small number of grass, sedge and restio species, while riverine forests, contained very few riparian obligates due to the high levels of alien plants.

Typical aquatic species included:
PNCO = Provincial Nature Conservation Ordinance

Species	**Protection Status**
Miscanthus capensis	
Disa chrysostachya	Protected PNCO - Orchid
Phragmites australis	
Cyperus textilis	
Isolepis spp	
Eleocharis limosa	
Ficinia nodose	
Juncus lomatophyllus	
Leersia hexandra.	
Paspallum distichum,	
Pycreus polystachyos	
Typha capensis	
Setaria spacellata	
Stenotaphrum secundatum	
Cynodon dactylon	
Centella asiatica	
Conyza scabrida	
Elegia tectorum	

A detailed species list will be included in the EIA report, but it should be noted that several terrestrial species that are protected were found in the river valleys, which included Milkwoods (*Sideroxylon inerme* – National Forestry Act) and Aloes (PNCO)

Alien invasive species in the riparian / instream areas included:

- *Lantana camara*
- *Acacia longifolia*
- *Pinus spp*
- *Eucalyptus spp*
- *Populus X canescens*
- *Cortaderia selloana*
- *Pennisetum clandestinum*

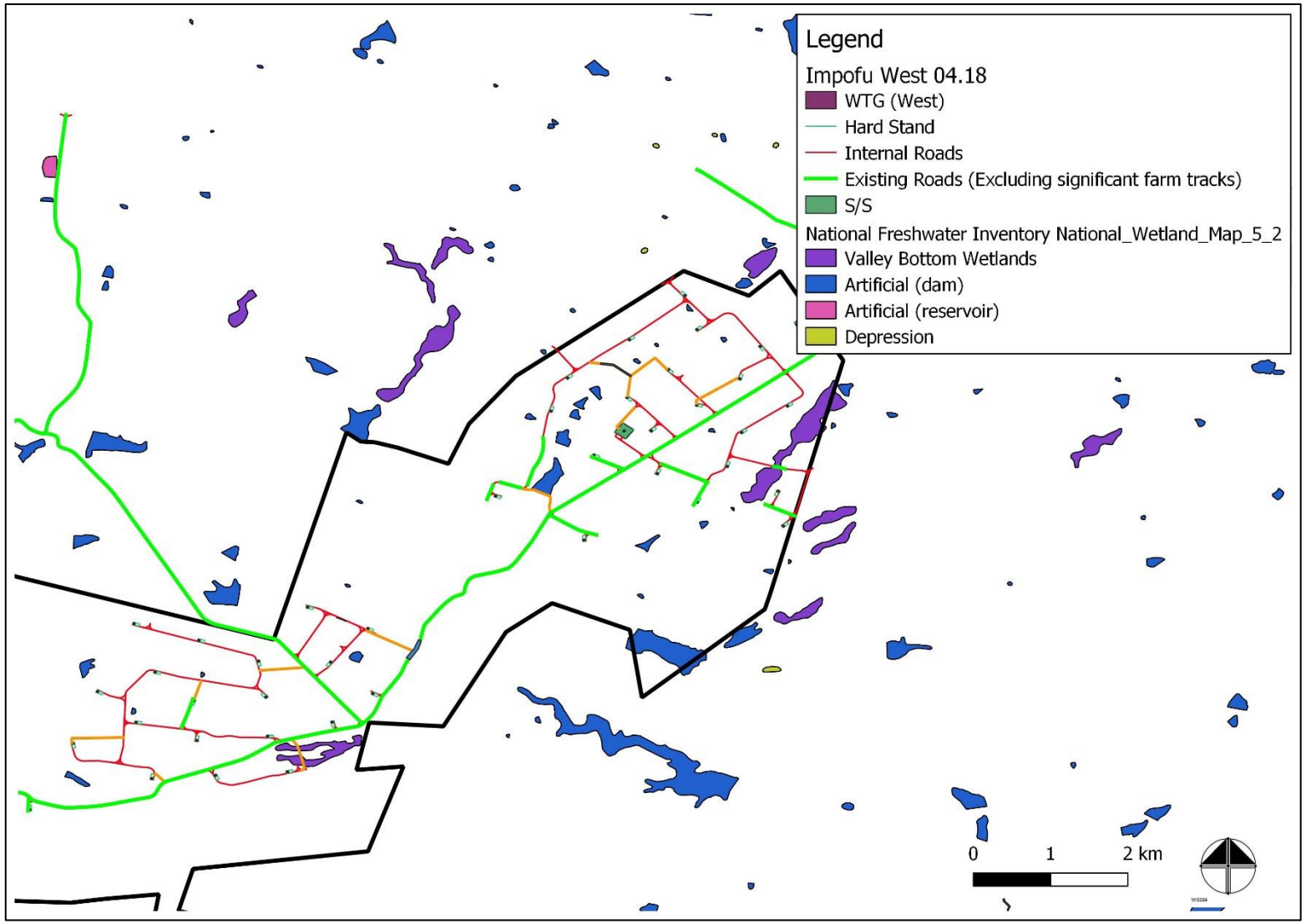

Figure 2: Potential wetlands according to the National Wetland Inventory (SANBI, Ver 5.2) in relation to the proposed layout

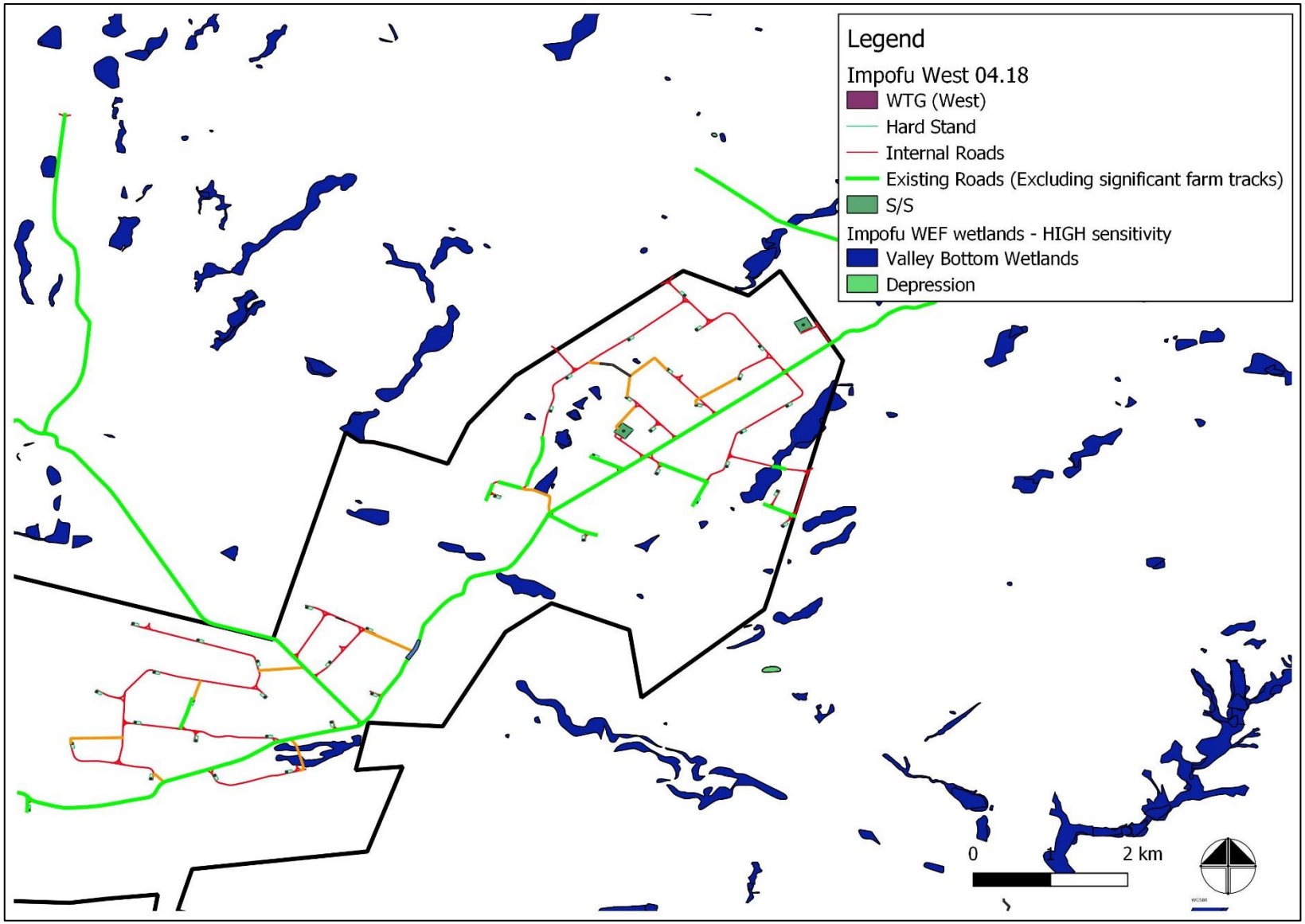

Figure 3: Final delineated natural wetland map for the Impofu West Wind Farm area

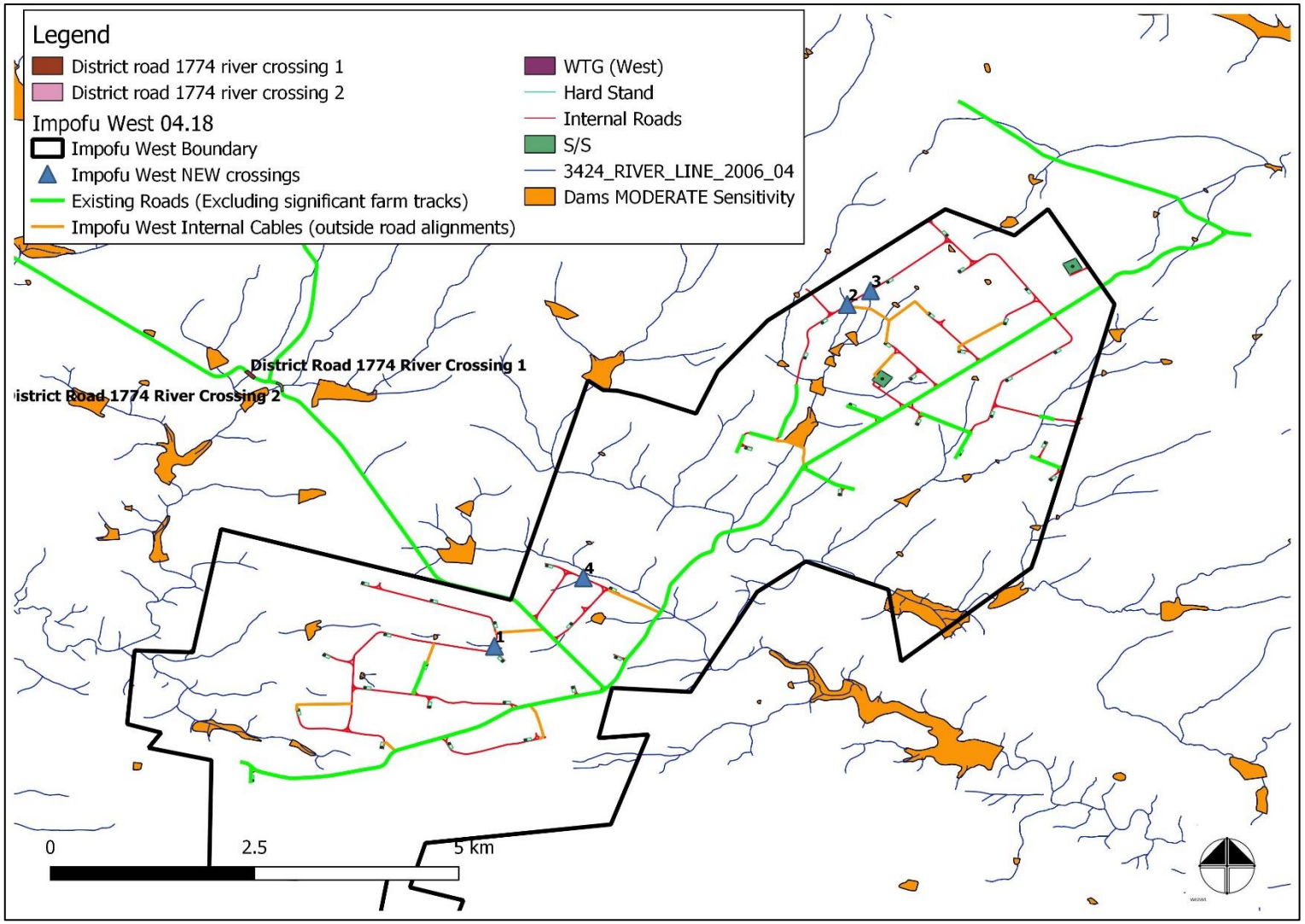

Figure 4: The 1:50 000 water courses and dams known for the site with four river crossings indicated by blue triangles

8 - Recommended buffers

Presently there are no prescribed riverine buffers other than those proposed in the recommendations by Desmet and Berliner (2007). These were applied (Table 1) by the design engineers, i.e. 32 m for this development, during the planning and conceptual design of the layout, while using as many existing roads and crossings as possible.

With regard to wetlands, a minimum of a 50 m buffer was proposed as this will protect the wetlands from any further changes, as most of the catchments have already been altered.

Table 1: Recommended buffers for rivers, with those applicable to the project highlighted in blue

River criterion used	Buffer width (m)	Rationale
Mountain streams and upper foothills of all 1:500 000 rivers, i.e. rivers mapped at this scale by DWS	▪ 50	▪ These longitudinal zones generally have more confined riparian zones than lower foothills and lowland rivers and are generally less threatened by agricultural practices.
Lower foothills and lowland rivers of all 1:500 000 rivers i.e. rivers mapped at this scale by DWS	▪ 100	▪ These longitudinal zones generally have less confined riparian zones than mountain streams and upper foothills and are generally more threatened by development practices.
All remaining 1:50 000 scale streams, i.e. all systems that appear on the topo-cadastral maps	▪ 32	▪ Generally smaller upland streams corresponding to mountain streams and upper foothills, smaller than those designated in the 1:500 000 rivers layer. They are assigned the riparian buffer required under South African legislation.

All these buffers, were applied by the design team during this phase of the project, resulting in avoidance of the sensitive wetland areas, and locating any services and infrastructure in previously disturbed areas.

Plate 1: A view of an unchannelled Valley Bottom wetland located within Impofu West Wind Farm adjacent to an existing access road just south east off WTG 28

Plate 2: A view of a channelled Valley Bottom wetland located within Impofu West Wind Farm near WTG 16

Plate 3: A small pan / endorheic depression found North of the site, but will not be affected by this development as no activities are located within close proximity

Plate 4: One of several farm dams located within the Impofu Wind Farm study area, with a view towards the Tsitsikamma Community Wind Farm in the background

Plate 5: A view of the typical alien Acacia tree infestation within one of the streams between WTG 21 and 23

9 – Potential impact and sensitivity assessment

The following direct and indirect impacts have been assessed based on the available layout, dated 29 March 2018:

- Loss of aquatic species of special concern
- Wetland loss as natural wetlands were observed
- Loss of riparian systems and water courses
- Impact on aquatic systems through the possible increase in surface water runoff on form and function - Increase in sedimentation and erosion
- Potential impact on localised surface water quality
- Cumulative impacts
- No-Go option

However, if the following is adhered to it is anticipated that the overall impacts with mitigation would be low (Figure 5):

- HIGH SENSIVITY AREAS = No Go for all activities and wind turbines inclusive of buffer of 50 m or whichever is greater as rated by bird or bat specialists
- MEDIUM SENSITIVITY AREAS = internal roads and underground cables are acceptable, but no wind turbines, temporary works areas or substations – or whichever is greater as rated by bird or bat specialists
- LOW SENSITIVITY = Access roads (haul roads), internal roads and underground cables are acceptable.

The only exception being that when an existing road or cattle walkway bisects any HIGH (no-go areas) and then these areas can be used (with rehab/monitoring conditions).

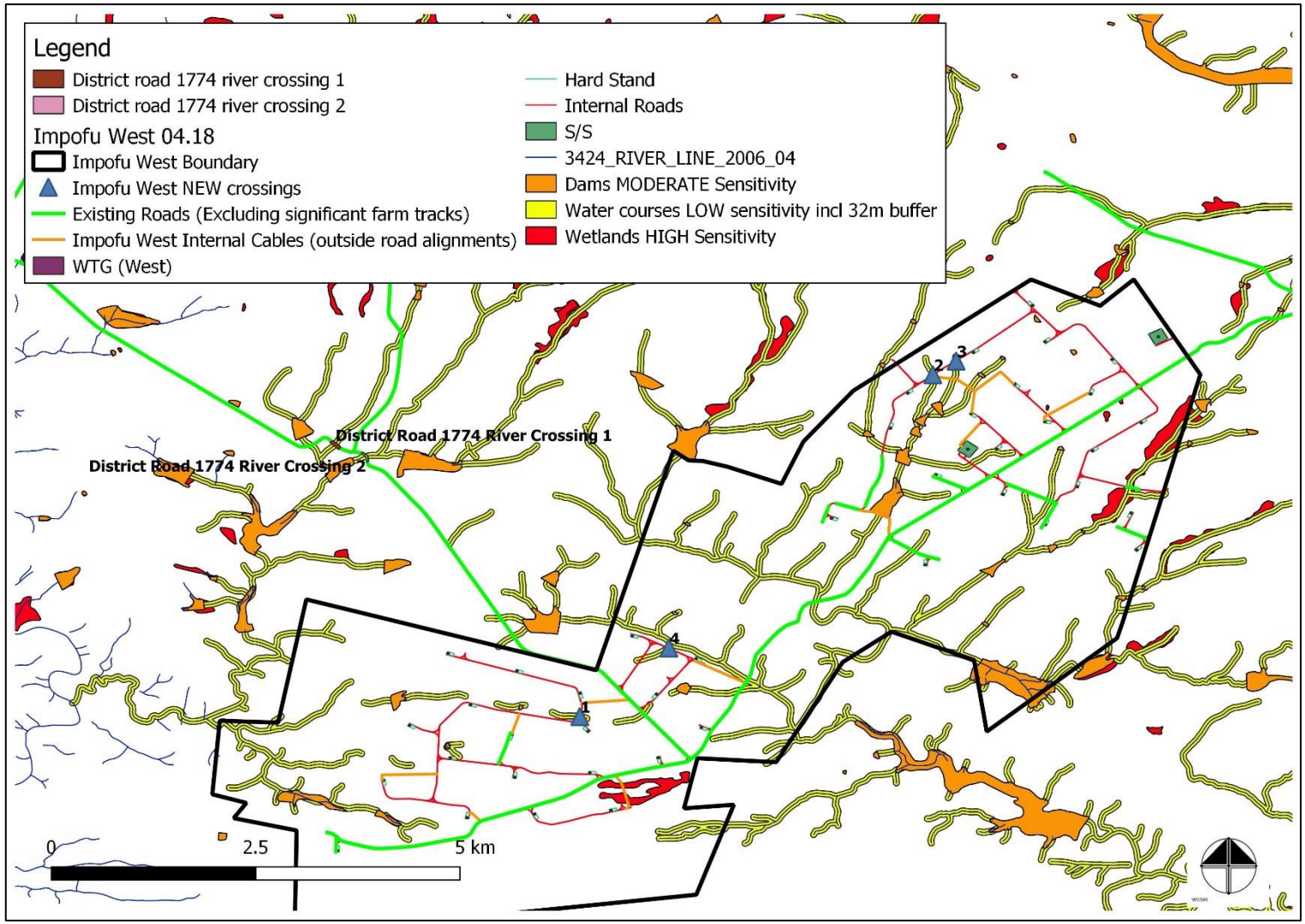

Figure 5: Aquatic sensitivity map for the Impofu West Wind Farm area

With this in mind the impacts were assessed as follows:

Project phase	**Construction**			
Impact	**Loss of aquatic species of special concern**			
Description of impact	**During construction vegetation near or within watercourses will be disturbed which may contain species of special concern. However due to the state of the current systems, and the proposed localities of the river crossing and road upgrades inclusive of the proposed crossing upgrades on DR 1774, this impact is unlikely. This is due to the lack of any such species within the proposed alignments. It should be noted that a number of PNCO / NFA species do occur and the appropriate permits from DEDEAT and DAFF must be obtained prior to disturbing this plants / trees. Species included *Eulophia* (orchids), *Sideroxylon inerme* (Milkwoods).**			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	**A final pre-construction walkdown should be conducted, as part of a Plant Search and Rescue plan, with the appropriate permits in place.** **All alien plant re-growth, which is currently high within the greater region must be monitored and should it occur, these plants should be eradicated within the project footprints and especially in areas near the proposed crossings.** **Where any roads and crossings will be upgraded, the following applies:** ○ **All pipe culverts must be removed and replaced with suitably sized box culverts, where road levels are raised.** ○ **River levels, regardless of the current state of the river / water course will be reinstated thus preventing any impoundments from being formed. The related designs must be assessed by an aquatic specialist during a post EIA walkdown, prior to commencement of the construction phase.** ○ **Approach road embankments especially where large cut and fill areas will be required must be rehabilitated during the construction process, to minimise erosion.** ○ **Suitable stormwater management systems must be installed and monitored during the first few months of use. Any erosion / sedimentation must be prevented.** ○ **If any wetlands occur within 50 m of the existing crossings, then a detailed monitoring plan must be developed.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Medium term	Impact will last between 5 and 10 years	Short term	impact will last between 1 and 5 years
Extent	Limited	Limited to the site and its immediate surroundings	Limited	Limited to the site and its immediate surroundings
Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Probable	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact

Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Negligible - negative**	
Comment on significance	The current layout has avoided sensitive water courses and wetlands as far as possible, thus the impacts would be limited to areas that are already disturbed, thus the derived impact significance above is found acceptable.			
Cumulative impacts	Due to the state of the surrounding landscape (farming and alien trees) the cumulative impact would be Negligible. This coupled to the fact that the majority of the current and future wind farms have wetland and water course monitoring and rehabilitation plans in place, with sites such as the TCWF seeing an improvement in the wetlands within their site after development.			

Project phase	**Construction**			
Impact	**Loss of remaining wetlands with High sensitivity**			
Description of impact	**Construction could result in the loss of wetlands that are still functional and provide an ecosystem service within the site and/or any required access road upgrades (e.g. DR01774)**			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	**The layout planning has taken cognisance of the sensitivity layers as shown in Figure 5, to avoid these areas or cross such areas using existing tracks or roads and cattle walkways. A walkdown has been conducted to ensure none of the proposed structures are located within any of these areas including the buffers. A final walkdown should also be conducted post authorisation to assist with the development of the stormwater management plan and Wetland Rehabilitation and Monitoring plan.** **All alien plant re-growth, which is currently high within the greater region must be monitored and should it occur, these plants should be eradicated within the project footprints and especially in areas near the proposed crossings** **Where any roads and crossings will be upgraded, the following applies:** ○ **All pipe culverts must be removed and replaced with suitably sized box culverts, where road levels are raised.** ○ **River levels, regardless of the current state of the river / water course will be reinstated thus preventing any impoundments from being formed. The related designs must be assessed by an aquatic specialist during a post EIA walkdown, prior to commencement of the construction phase.** ○ **Approach road embankments especially where large cut and fill areas will be required must be rehabilitated during the construction process, to minimise erosion.** ○ **Suitable stormwater management systems must be installed and monitored during the first few months of use. Any erosion / sedimentation must be prevented.** ○ **If any wetlands occur within 50 m of the existing crossings, then a detailed monitoring plan must be developed.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	impact will last between 1 and 5 years	Brief	Impact will not last longer than 1 year
Extent	Local	Extending across the site and to nearby settlements	Limited	Limited to the site and its immediate surroundings
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Probable	The impact has occurred here or elsewhere and could therefore occur	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Negligible - negative**	

Comment on significance	With the above in mind the derived impact significance above is found acceptable.
Cumulative impacts	Due to the state of the surrounding landscape (farming and alien trees) the cumulative impact would be Negligible. This coupled to the fact that the majority of the current and future wind farms have wetland and water course monitoring and rehabilitation plans in place, with sites such as the TCWF seeing an improvement in the wetlands within their site after development.

Project phase	**Construction**			
Impact	**Loss of riparian systems and water courses**			
Description of impact	**Construction could result in the loss of riparian systems that are still functional and provide an ecosystem service within the site and or any required access road upgrades (e.g. DR01774)**			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	**The layout planning has taken cognisance of the sensitivity layers as shown in Figure 5, to avoid these areas or cross such areas using existing tracks or roads and cattle walkways. A walkdown has been conducted to ensure none of the proposed structures are located within any of these areas including the buffers. A final walkdown should also be conducted post authorisation, prior to the construction phase, to assist with the development of the stormwater management plan and Wetland Rehabilitation and Monitoring plan. All alien plant re-growth, which is currently high within the greater region must be monitored and should it occur, these plants should be eradicated within the project footprints and especially in areas near the proposed crossings.** **Where any roads and crossings will be upgraded, the following applies:** ○ **All pipe culverts must be removed and replaced with suitably sized box culverts, where road levels are raised.** ○ **River levels, regardless of the current state of the river / water course will be reinstated thus preventing any impoundments from being formed. The related designs must be assessed by an aquatic specialist during a post EIA walkdown, prior to commencement of the construction phase.** ○ **Approach road embankments especially where large cut and fill areas will be required must be rehabilitated during the construction process, to minimise erosion.** ○ **Suitable stormwater management systems must be installed and monitored during the first few months of use. Any erosion / sedimentation must be prevented.** ○ **If any wetlands occur within 50 m of the existing crossings, then a detailed monitoring plan must be developed.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Medium term	Impact will last between 5 and 10 years	Short term	impact will last between 1 and 5 years
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Probable	The impact has occurred here or elsewhere and could therefore occur	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Negligible - negative**	

Comment on significance	With the above in mind the derived impact significance above is found acceptable
Cumulative impacts	Due to the state of the surrounding landscape (farming and alien trees) the cumulative impact would be Negligible. This coupled to the fact that the majority of the current and future wind farms have wetland and water course monitoring and rehabilitation plans in place, with sites such as the TCWF seeing an improvement in the wetlands within their site after development.

Project phase	**Construction**			
Impact	**Potential impacts on localised water quality**			
Description of impact	**During construction a number of materials as well as chemicals will be required. Any spills during transport or while works is conducted within any watercourses has the potential to affect the surrounding biota**			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	**All construction materials including fuels and oil should be stored in demarcated areas that are contained within berms / bunds to avoid spread of any contamination. Washing and cleaning of equipment should also be done in berms or bunds, in order to trap any cement and prevent excessive soil erosion. Mechanical plant and bowsers must not be refuelled or serviced within or directly adjacent to any channel. It is therefore suggested that all construction camps, lay down areas, batching plants or areas and any stores should be more than 50 m from any demarcated water courses. Chemicals used for construction must be stored safely on site and surrounded by bunds. Chemical storage containers must be regularly inspected so that any leaks are detected early; Littering and contamination of water sources during construction must be prevented by effective construction camp management; Emergency plans must be in place in case of spillages onto road surfaces and water courses; No stockpiling should take place within a water course; All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds; Stockpiles must be located away from river channels; The construction camp and necessary ablution facilities meant for construction workers must be beyond the 32 m buffer described previously**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Medium term	Impact will last between 5 and 10 years	Brief	Impact will not last longer than 1 year
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	High	Natural and/ or social functions and/ or processes are notably altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Likely	The impact may occur	Probable	The impact has occurred here or elsewhere and could therefore occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Negligible - negative**	
Comment on significance	Spills do occur, and these should be minimised through avoidance or immediate clean up, however with the above in mind the derived impact significance above is found acceptable			
Cumulative impacts	When compared to the surrounding Wind Farms (roads and infrastructure - operational), this impact would be negligible as they have shown limited impacts have occurred when compared to other land use activities within the region			

Project phase	Operation			
Impact	**Impact on aquatic systems through possible increase in surface water runoff - downstream erosion and sedimentation within the site and any of the access roads that will be upgraded.**			
Description of impact	**Increase in hard surface areas, and roads that require stormwater management will increase through the concentration of surface water flows. These higher volume flows, with increased velocity result in downstream erosion and sedimentation**			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	**A stormwater management plan must be developed post EA, detailing the structures and actions that must be installed to prevent the increase of surface water flows directly into any natural systems. This should then be inspected on an annual basis to ensure these are functional. Effective stormwater management must include effective stabilisation (gabions and Reno mattresses) and the re-vegetation of any disturbed riverbanks**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Long term	Impact will last between 10 and 15 years	Short term	impact will last between 1 and 5 years
Extent	Local	Extending across the site and to nearby settlements	Limited	Limited to the site and its immediate surroundings
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Probable	The impact has occurred here or elsewhere and could therefore occur	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	High	The affected environmental will be able to recover from the impact
Resource irreplaceability		#N/A		#N/A
Significance	**Minor - negative**		**Negligible - negative**	
Comment on significance	With effective stormwater management all the potential impacts can be minimised			
Cumulative impacts	When compared to the surrounding Wind Farms (roads and infrastructure - operational), this impact would be negligible as they have shown that with stormwater management limited impacts have occurred when compared to other land use activities within the region			

10 – Cumulative Impacts

In the assessment of this project, the surrounding projects within a 30 km radius of the site were assessed, which included Kouga, Tsitiskamma Community Wind Farm, Gibson Bay, Oyster Bay, Jeffreys Bay, Banna Ba Phifu and Ubuntu WEFs. From an aquatic environment standpoint, it is felt that only Kouga, Tsitsikamma Community Wind Farm, Gibson Bay, Oyster Bay wind farms share the same catchments as the proposed wind farm and would thus have a potential for any cumulative impacts. Also included in this assessment is the two other potential Impofu Wind Farm projects being proposed by the applicant. Any other project is too far removed or would not share any roads, as it has been shown in the past that the access roads have always had some form of impact on aquatic systems, while internal structures (hard stands and turbines) to a lesser degree.

Of these projects (Kouga, Tsitiskamma Community Wind Farm, Gibson Bay, Oyster Bay, Jeffreys Bay, Banna Ba Bifu and Ubuntu WEFs), this report author has been involved in the aquatic assessments or has managed / assisted with the Water Use License process for all these projects. The author has also assisted in all the required transmission lines and or road upgrades for these projects.

Presently, no significant cumulative impacts with regard to the proposed turbine placement, hardstands and associated underground cabling were identified as these are also located outside of the delineated aquatic systems and their buffers for the proposed site.

The cumulative impact with regards to the additional internal and access roads will be assessed in greater detail in the EIA phase based on the site inspection undertaken in March 2018. The project has the potential to have a positive impact should any of the water course crossings and wetlands area near the infrastructure required be rehabilitated.

Project phase	Operation			
Impact	Cumulative Impact			
Description of impact	**The potential cumulative impacts of this wind farm would only result should additional impacts proposed by the layout affect the aquatic environment. However, with the exception of the few internal crossings within already degraded areas, the wind farm itself would not add any additional impacts. The only potential impacts would include the roads and services with water course crossings shared with other surrounding wind farms**			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	**Development and implementation of wetland and watercourse rehabilitation plan post Environmental Authorisation, i.e. Once the final number of turbines and roads layouts, and access roads has been finalised. This would reduce, and possibly improve the state of affected aquatic environment at any of the proposed crossings, especially those shared with wind farms within the region. This could also be integrated into any further plans or strategies that groups such as the Greater Kromme Stewardship Project**			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Positive	
Duration	Brief	Impact will not last longer than 1 year	Long term	Impact will last between 10 and 15 years
Extent	Limited	Limited to the site and its immediate surroundings	Local	Extending across the site and to nearby settlements
Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Moderate	Natural and/ or social functions and/ or processes are moderately altered
Probability	Probable	The impact has occurred here or elsewhere and could therefore occur	Likely	The impact may occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	Negligible - negative		Minor - positive	
Comment on significance	A positive contribution to the local area could be made if rehabilitation is initiated			
Cumulative impacts	N/A			

11 – No-Go Option

The potential for rehabilitation of wetland areas is particularly important with regard the No-Go option as current land use (agriculture) is increasing in intensity within the region. This was seen on several occasions during the site visits, as an increase in the number of irrigation pivots, or land being cleared or converted to grazing. An example of this is shown in Plate 6, where a landowner is currently (March 2018) clearing a watercourse to increase his grazing. Thus, continued clearing as well as other impacts such as water abstraction and changes to water quality (agricultural return flow), would be seen as a High impact significance in the region, as the number of wetlands lost, and changes to streams / rivers noted over time has resulted in a deterioration of these systems over time. In initial assessments of other projects, most systems were rated with a Present Ecological State of C (Moderately Modified) to D (largely Modified) during the period 2010-2014. With an increase in the number of intensive grazing pivots, coupled to an increased livestock, the aquatic systems are being degraded and most of the study area systems are now PES = D Largely Modified to E (Critically modified). This detail and subsequent PES ratings will be expanded upon during the EIA phase of the assessment, based on the site information collected for this project to date as well as long-term monitoring data collected for the Gibson Bay and Tsitsikamma Community Wind Farms.

Plate 6: A water course that has been cleared to increase grazing near the Impofu West / North Boundary

12 – Environmental Management Plan – Construction and Operational Phase

Objective	Potential Impact	Mitigation Measures	Indicator	Responsibility	Timeframes
Loss of aquatic species of concern	» Loss of rare, endemic or protected species	» A final pre-construction walkdown should be conducted, as part of a Plant Search and Rescue plan, with the appropriate permits in place. » All alien plant re-growth, which is currently high within the greater region must be monitored and should it occur, these plants should be eradicated within the project footprints and especially in areas near the proposed crossings. » Where any roads and crossings will be upgraded, the following applies: 1. All pipe culverts must be removed and replaced with suitably sized box culverts, where road levels are raised. 2. River levels, regardless of the current state of the river / water course will be reinstated thus preventing any impoundments from being formed. The related designs must be assessed by an aquatic specialist during a post EIA walkdown, prior to commencement of the construction phase. 3. Approach road embankments especially where large cut and fill areas will be required must be rehabilitated during the construction process, to minimise erosion. 4. Suitable stormwater management systems must be installed and monitored during the first few months of use. Any erosion / sedimentation must be prevented. 5. If any of the delineated wetlands occur within 50 m of the existing crossings, then a detailed monitoring plan must be developed.	» No activity in identified no-go areas » Acceptable level of activity within disturbance areas, as determined by ECO » Where required all applicable permits and or water use licenses should be in place	ECO Contractor	Preconstruction and during site establishment
Loss of any functional wetland habitat, i.e. those that were rated as having a high sensitivity	» Loss of functional habitat within the site and near any of the required crossing upgrades	» The layout planning has taken cognisance of the sensitivity layers as shown in Figure 5, to avoid these areas or cross such areas using existing tracks or roads and cattle walkways where possible. A walkdown has been conducted to ensure none of the proposed structures are located within any of these areas including the buffers. A final walkdown should also be conducted post authorisation to assist with the development of the stormwater management plan and Wetland Rehabilitation and Monitoring plan.	» No activity in identified no-go areas » Acceptable level of activity within disturbance areas, as determined by ECO » Where required all applicable permits and or water use licenses should be in place	ECO Contractor	Preconstruction and during site establishment

Objective	Potential Impact	Mitigation Measures	Indicator	Responsibility	Timeframes
		» All alien plant re-growth, which is currently high within the greater region must be monitored and should it occur, these plants should be eradicated within the project footprints and especially in areas near the proposed crossings » Where any roads and crossings will be upgraded, the following applies: 1. All pipe culverts must be removed and replaced with suitably sized box culverts, where road levels are raised. 2. River levels, regardless of the current state of the river / water course will be reinstated thus preventing any impoundments from being formed. The related designs must be assessed by an aquatic specialist during a post EIA walkdown, prior to commencement of the construction phase. 3. Approach road embankments especially where large cut and fill areas will be required must be rehabilitated during the construction process, to minimise erosion. 4. Suitable stormwater management systems must be installed and monitored during the first few months of use. Any erosion / sedimentation must be prevented. 5. If any of the delineated wetlands occur within 50 m of the existing crossings, then a detailed monitoring plan must be developed.			
Loss of riparian habitat	» Construction could result in the loss of riparian systems	» The layout planning has taken cognisance of the sensitivity layers as shown in Figure 5, to avoid these areas or cross such areas using existing tracks or roads and cattle walkways where possible. A walkdown has been conducted to ensure none of the proposed structures are located within any of these areas including the buffers. A final walkdown should also be conducted post authorisation, prior to the construction phase, to assist with the development of the stormwater management plan and Wetland Rehabilitation and Monitoring plan. » All alien plant re-growth, which is currently high within the greater region must be monitored and should it occur, these plants should be eradicated within the project footprints and especially in areas near the proposed crossings.	» No activity in identified no-go areas » Acceptable level of activity within disturbance areas, as determined by ECO » Where required all applicable permits and or water use licenses should be in place	ECO Contractor	Preconstruction and during site establishment

Objective	Potential Impact	Mitigation Measures	Indicator	Responsibility	Timeframes
		» Where any roads and crossings will be upgraded, the following applies: 1. All pipe culverts must be removed and replaced with suitably sized box culverts, where road levels are raised. 2. River levels, regardless of the current state of the river / water course will be reinstated thus preventing any impoundments from being formed. The related designs must be assessed by an aquatic specialist during a post EIA walkdown, prior to commencement of the construction phase. 3. Approach road embankments especially where large cut and fill areas will be required must be rehabilitated during the construction process, to minimise erosion. 4. Suitable stormwater management systems must be installed and monitored during the first few months of use. Any erosion / sedimentation must be prevented. 5. If any of the delineated wetlands occur within 50 m of the existing crossings, then a detailed monitoring plan must be developed.			
Soil erosion control, water quality management at potential road crossings	» Erosion and soil loss within **watercourses** » Disturbance to or loss of **watercourses** » Sedimentation of **watercourse areas** » Loss of indigenous vegetation cover, particularly in **watercourse areas** » Increased runoff into rivers potentially associated with accelerated erosion in **watercourses**	» Identify and demarcate construction areas for general construction work and restrict construction activity to these areas. Prevent unnecessary destructive activity within construction areas (prevent over-excavations and double handling) » Stockpile topsoil for re-use in rehabilitation phase. Maintain stockpile shape and protect from erosion. All stockpiles must be positioned at least 30 m away from water courses, unless agreed otherwise with the ECO. Limit the height of stockpiles as far as possible in order to reduce compaction. » Any excavation, including those for cables, must be supervised by the ECO. Disturbance of vegetation and topsoil must be kept to a practical minimum. » Rehabilitate disturbance areas as soon as construction in an area is completed.	» No activity in identified no-go areas » Acceptable level of activity within disturbance areas, as determined by ECO » Acceptable level of soil erosion around site, as determined by ECO » Acceptable level of increased siltation in water courses, as determined by ECO » Acceptable level of soil degradation, as determined by ECO » Acceptable state of excavations, as determined by Resident Engineer & ECO	ECO Contractor	During site establishment, construction and operational phase
Objective	**Potential Impact**	**Mitigation Measures**	**Indicator**	**Responsibility**	**Timeframes**
Successful waste and	» The watercourse areas could be impacted via:	» Identify and demarcate construction areas for general construction work and restrict construction activity to these areas. Prevent unnecessary	» No chemical spills outside of designated storage areas	ECO Contractor	During site establishment, construction

Objective	Potential Impact	Mitigation Measures	Indicator	Responsibility	Timeframes
pollutant management	1. Release of contaminated water from contact with spilled chemicals 2. Generation of contaminated wastes from used chemical containers 3. Inefficient use of resources resulting in excessive waste generation 4. Litter or contamination of the site or water through poor waste management practices	destructive activity within construction areas (prevent over-excavations and double handling). » Any excavation, including those for cables, must be supervised by the ECO. Disturbance of vegetation and topsoil must be kept to a practical minimum. » Stockpile topsoil for re-use in rehabilitation phase. Maintain stockpile shape and protect from erosion. All stockpiles must be positioned at least 30 m away from water courses. Limit the height of stockpiles as far as possible in order to reduce compaction. » Storage areas must be located more than 50 m away from the watercourse, unless agreed otherwise with the ECO. » The storage of flammable and combustible liquids such as oils must be in designated areas which are appropriately bunded, and stored in compliance with material safety datasheet (MSDS) files, as defined by the safety, health and environment (SHE) Representative / ECO. » Any storage and disposal permits/approvals which may be required must be obtained, and the conditions attached to such permits and approvals must be complied with. » Routine servicing and maintenance of vehicles is not to take place on-site (except for emergency situations or large cranes which cannot be moved off-site). If repairs of vehicles must take place on site, an appropriate drip tray must be used to contain any fuel or oils. » Transport of all hazardous substances must be in accordance with the relevant legislation and regulations. » Disposal of waste must be in accordance with relevant legislative requirements, including the use of licensed contractors. » Waste disposal records must be available for review at any time. Documentation (waste manifest) must be maintained detailing the quantity, nature and fate of any hazardous waste. » Construction contractors must provide specific detailed waste management plans to deal with all waste streams. » Specific areas must be designated on-site for the temporary management of various waste streams, i.e. general refuse, construction waste (wood and	» No water or soil contamination by chemical spills » No complaints received regarding waste on site or indiscriminate dumping » Internal site audits ensuring that waste segregation, recycling and reuse is occurring appropriately » Provision of all appropriate waste manifests for all waste streams » Firefighting equipment and training provided before the construction phase commences » No activity in identified no-go areas » Acceptable level of activity within disturbance areas, as determined by ECO » Acceptable level of soil erosion around site, as determined by ECO » Acceptable level of increased siltation in water courses, as determined by ECO » Acceptable level of soil degradation, as determined by ECO » Acceptable state of excavations, as determined by Resident Engineer & ECO		and operational phase

Objective	Potential Impact	Mitigation Measures	Indicator	Responsibility	Timeframes
		metal scrap) and contaminated waste. Location of such areas must seek to minimise the potential for impact on the surrounding environment, including prevention of contaminated runoff, seepage and vermin control. » Where possible, construction and general wastes on-site must be reused or recycled. Bins and skips must be available on-site for collection, separation and storage of waste streams (such as wood, metals, general refuse etc.). Supply waste collection bins at construction equipment and construction crew camps. » Under no circumstances may solid waste be burnt or buried on site. » Hydrocarbon waste must be contained and stored in sealed containers within an appropriately bunded area. » Waste and surplus dangerous goods must be kept to a minimum and must be transported by approved waste transporters to sites designated for their disposal. » Hazardous and non-hazardous waste must be separated at source. Separate waste collection bins must be provided for this purpose. These bins must be clearly marked and appropriately covered. » Construction equipment must be refuelled within designated refuelling locations, or where remote refuelling is required, appropriate drip trays must be utilised. » All stored fuels to be maintained within a bund and on a sealed surface. Fuel storage areas must be inspected regularly to ensure bund stability, integrity and function. » Construction machinery must be stored in an appropriately sealed area. » An incident/complaints register must be established and maintained on-site. » Corrective action must be undertaken immediately if a complaint is received, or potential/actual leak or spill of polluting substance identified. This includes stopping the contaminant from further escaping, cleaning up the affected environment as much as practically possible and implementing preventive measures.			

Objective	Potential Impact	Mitigation Measures	Indicator	Responsibility	Timeframes
		» Appropriate emergency training (e.g. firefighting) must be given to team prior to the construction period. » Any spills must receive the necessary clean-up action. If required, bioremediation kits are to be kept on-site and used to remediate any spills that may occur. Appropriate arrangements to be made for appropriate collection and disposal of all cleaning materials, absorbents and contaminated soils (in accordance with a waste management plan). » Oily water from bunds at the substation must be removed from site by licensed contractors. » Any contaminated/polluted soil removed from the site must be disposed of at a licensed hazardous waste disposal facility. » Spilled cement or concrete must be cleaned up as soon as possible and disposed of at a suitably licensed waste disposal site. » In the event of a major spill or leak of contaminants, the relevant administering authority must be immediately notified as per the notification of emergencies/incidents. » Upon the completion of construction, the area will be cleared of potentially polluting materials. » Rehabilitate disturbance areas as soon as construction in an area is completed.			

13 - Conclusion and recommendations

The proposed facility would have a limited impact on the aquatic environment as the structures will avoid the delineated natural wetlands (which delineation includes a 50 m buffer applied to each), with a limited number of new water course crossings, i.e. the layout makes use of any of the existing roads (Figures 4 and 5), as far as practicable. Thus, presently no objection to the development taking place is made. This includes any of the access roads that are indicated in this report, including the proposed two river crossings on DR01774 outside of the site boundary, together with the assumptions and mitigations listed.

Figure 4 further indicates the affected water courses and those that would trigger the need for a Water Use License application (a potential GA) in terms of Section 21 c and i of the National Water Act, should any construction take place within these areas. Should any of the present road crossings need to be upgraded then the opportunity exists to improve the current state (lack of habitat continuity) for example by replacing pipe culverts with box culverts, while also reducing the height of the bridge footings (culvert bases) to reinstate natural water course levels. This was mostly observed along the district roads within the area, but in line with other projects within the region.

As the proposed activities have the potential to create erosion the following recommendations and assumptions are reiterated:

- Vegetation clearing should occur in a phased manner in accordance with the construction programme to minimise erosion and/or run-off. Large tracts of bare soil will either cause dust pollution or quickly erode and then cause sedimentation in the lower portions of the catchment.
- All construction materials including fuels and oil should be stored in demarcated areas that are contained within berms / bunds to avoid spread of any contamination. Washing and cleaning of equipment should also be done in berms or bunds, in order to trap any cement and prevent excessive soil erosion. Mechanical plant and bowsers must not be refuelled or serviced within or directly adjacent to any channel. It is therefore suggested that all construction camps, lay down areas, batching plants or areas and any stores should be more than 32 m from any demarcated water courses, unless agreed otherwise with the Environmental Control Officer (ECO).
- It is also advised that an ECO, with a good understanding of the local flora be appointed during the construction phase. The ECO should be able to make clear recommendations with regards to the re-vegetation of the newly completed / disturbed areas, using selected species detailed in this report.
- All alien plant re-growth must be monitored, and should it occur these plants should be eradicated. The scale of the operation does however not warrant the use of a Landscape Architect and / or Landscape Contractor.

It is further recommended that a comprehensive rehabilitation plan be implemented from the project onset within areas of disturbance (inclusion of buffers) to ensure a net benefit to the aquatic environment. This should from part of the suggested pre-construction

walkdown post EIA as part of the final EMPr preparation. The walkdown is required as the final cut/fill and embankments for roads and other structures could not be provided at this point, thus it would be important to evaluate in terms of the aquatic environment and evaluate the need for a Water Use License / GA for these areas.

14 – Way Forward

This scoping report will be followed by the final EIA phase aquatic assessment and will include further details of the results of the final walkdown survey conducted in March 2018. The additional detail will include:

- Final delineation of any aquatic environments (if required)
- Update and finalisation of the Present Ecological State and Ecological Importance & Sensitivity scores for respective aquatic systems
- Final confirmation of impact assessment significance ratings contained, including cumulative impact, in this report and amend any mitigations or recommendations.

15 - References

Agenda 21 – Action plan for sustainable development of the Department of Environmental Affairs and Tourism (DEAT) 1998.

Agricultural Resources Act, 1983 (Act No. 43 of 1983).

Batchelor, A. (2009). Wetland Riparian delineation and sensitivity analysis for the proposed Eskom powerline Honingklip 88kV, Muldersdrift Wetland Consulting Services (Pty) Ltd for KV 3 Engineers

Berliner D. and Desmet P. 2007. Eastern Cape Biodiversity Conservation Plan: Technical Report. Department of Water Affairs and Forestry Project No 2005-012, Pretoria. 1 August 2007

Davies, B. and Day J., (1998). Vanishing Waters. University of Cape Town Press.

De Moor I, Day JA, De Moor FC (2003) Guide to the freshwater invertebrates of southern Africa, vols 7–8, Insecta I, II. Water Research Commission, Pretoria, South Africa

Department of Water Affairs and Forestry - DWAF (2005). A practical field procedure for identification and delineation of wetland and riparian areas Edition 1. Department of Water Affairs and Forestry , Pretoria.

Department of Water Affairs and Forestry - DWAF (2007). Manual for the assessment of a Wetland Index of Habitat Integrity for South African floodplain and channelled valley bottom wetland types by M. Rountree (ed); C.P. Todd, C. J. Kleynhans, A. L. Batchelor, M. D. Louw, D. Kotze, D. Walters, S. Schroeder, P. Illgner, M. Uys. and G.C. Marneweck. Report no. N/0000/00/WEI/0407. Resource Quality Services, Department of Water Affairs and Forestry, Pretoria, South Africa.

Duthie, A. (1999) Section E: Procedure for the Intermediate Determination of RDM for Wetland Ecosystesm, Oryx Environmental on behalf of the Department of Water Affairs and Forestry 10 September 1999

Ewart-Smith J.L., Ollis D.J., Day J.A. and Malan H.L. (2006). National Wetland Inventory: Development of a Wetland Classification System for South Africa. WRC Report No. KV 174/06. Water Research Commission, Pretoria.

Germishuizen, G. and Meyer, N.L. (eds) (2003). Plants of southern Africa: an annotated checklist. Strelitzia 14, South African National Biodiversity Institute, Pretoria.

Kleynhans C.J., Thirion C. and Moolman J. (2005). A Level 1 Ecoregion Classification System for South Africa, Lesotho and Swaziland. Report No. N/0000/00/REQ0104. Resource Quality Services, Department of Water Affairs and Forestry, Pretoria.

Kotze D.C., Marneweck G.C., Batchelor A.L., Lindley D.S. and Collins N. (2008). WET-EcoServices A technique for rapidly assessing ecosystem services supplied by wetlands. WRC Report No: TT 339/08.

Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), as amended.

Mitsch, J.G. and Gosselink, G. (2000). Wetlands 3rd End, Wiley, New York, 2000, 920 pg.

National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

National Water Act, 1998 (Act No. 36 of 1998), as amended

Nel, J., Maree, G., Roux, D., Moolman, J., Kleynhans, N., Silberbauer, M. and Driver, A. 2004. South African National Spatial Biodiversity Assessment 2004: Technical Report. Volume 2: River Component. CSIR Report Number ENV-S-I-2004-063. Council for Scientific and Industrial Research, Stellenbosch.

Ollis, D.J., Snaddon, C.D., Job, N.M. & Mbona, N. 2013. Classification System for Wetlands and other Aquatic Ecosystems in South Africa. User Manual: Inland Systems. SANBI Biodiversity Series 22. South African National Biodiversity Institute, Pretoria.

Parsons R. (2004). Surface Water – Groundwater Interaction in a Southern African Context. WRC Report TT 218/03, Pretoria.

Ramsar Convention, (1971) including the Wetland Conservation Programme (DEAT) and the National Wetland Rehabilitation Initiative (DEAT, 2000).

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).

SANBI (2012). National Wetland Inventory of the South African National Biodiversity Institute (SANBI). www.bgis.sanbi.org/wetmap/map.asp, 12 March 2012.

16 – Appendix 1: Wetland assessment methods

The assessment was initiated with a survey of the pertinent literature, past reports and the various conservation plans that exist for the study region. Maps and Geographical Information Systems (GIS) were then employed to ascertain, which portions of the proposed development, could have the greatest impact on the wetlands and associated habitats.

Several site visits were conducted to ground-truth the above findings, thus allowing critical comment of the development when assessing the possible impacts and delineating the wetland areas.

Wetland and riparian areas were then assessed on the following basis:

- Vegetation type – verification of type and its state or condition based, supported by species identification using Germishuizen and Meyer (2003), Vegmap (Mucina and Rutherford, 2006 as amended) and the South African Biodiversity Information Facility (SABIF) database.
- Plant species were further categorised as follows:
    - Terrestrial: species are not directly related to any surface or groundwater base-flows and persist solely on rainfall
    - Facultative: species usually found in wetlands (inclusive of riparian systems) (67 – 99% of occurrences), but occasionally found in terrestrial systems (non-wetland) (DWAF, 2005/2007)
    - Obligate: species that are only found within wetlands (>99% of occurrences) (DWAF, 2005/2007)
- Assessment of the wetland type based on the National Wetland Classification System (NWCS) method discussed below and the required buffers
- Mitigation or recommendations required

National Wetland Classification System (Ollis *et al*., 2013)

Since the late 1960s, wetland classification systems have undergone a series of international and national revisions. These revisions allowed for the inclusion of additional wetland types, ecological and conservation rating metrics, together with a need for a system that would allude to the functional requirements of any given wetland (Ewart-Smith *et al*., 2006). Wetland function is a consequence of biotic and abiotic factors, and wetland classification should strive to capture these aspects.

The South African National Biodiversity Institute (SANBI) in collaboration with a number of specialists and stakeholders developed the newly revised and now accepted National Wetland Classification Systems (NWCS, 2014). This system comprises a hierarchical classification process of defining a wetland based on the principles of the Hydrogeomorphic (HGM) approach at higher levels, including structural features at the finer or lower levels of classification.

Wetlands developed in a response to elevated water tables, linked either to rivers, groundwater flows or seepage from aquifers (Parsons, 2004). These water levels or flows then interact with localised geology and soil forms, which then determines the form and function of the respective wetlands. Water is thus the common driving force, in the formation of wetlands (DWAF, 2005/2007). It is significant that the HGM approach has

now been included in wetland classification as the HGM approach has been adopted throughout the water resources management realm with regard the determination of the Present Ecological State (PES) and Ecological Importance and Sensitivity (EIS) and WET-Health assessments for aquatic environments. All of these systems are then easily integrated using the HGM approach in line with the Eco-classification process of river and wetland reserve determinations used by the Department of Water and Sanitation (DWS). The Ecological Reserve of a wetland or river is used by DWS to assess the water resource allocations when assessing water use license applications (WULA).

The NWCS process is provided in more detail in the methods section of the report, but some of the terms and definitions used in this document are present below:

Definition Box

Present Ecological State is a term for the current ecological condition of the resource. This is assessed relative to the deviation from the Reference State. Reference State/Condition is the natural or pre-impacted condition of the system. The reference state is not a static condition, but refers to the natural dynamics (range and rates of change or flux) prior to development. The PES is determined per component - for rivers and wetlands this would be for the drivers: flow, water quality and geomorphology; and the biotic response indicators: fish, macroinvertebrates, riparian vegetation and diatoms. PES categories for every component would be integrated into an overall PES for the river reach or wetland being investigated. This integrated PES is called the EcoStatus of the reach or wetland.

EcoStatus is the overall PES or current state of the resource. It represents the totality of the features and characteristics of a river and its riparian areas or wetland that bear upon its ability to support an appropriate natural flora and fauna and its capacity to provide a variety of goods and services. The EcoStatus value is an integrated ecological state made up of a combination of various PES findings from component EcoStatus assessments (such as for invertebrates, fish, riparian vegetation, geomorphology, hydrology and water quality).

Reserve: The quantity and quality of water needed to sustain basic *human needs* and *ecosystems* (e.g. estuaries, rivers, lakes, groundwater and wetlands) to ensure ecologically sustainable development and utilisation of a water resource. The *Ecological Reserve* pertains specifically to aquatic ecosystems.

Reserve requirements: The quality, quantity and reliability of water needed to satisfy the requirements of basic human needs and the Ecological Reserve (inclusive of instream requirements).

Licensing applications: Water users are required (by legislation) to apply for licenses prior to extracting water resources from a water catchment.

Ecological Water Requirements: This is the quality and quantity of water flowing through a natural stream course that is needed to sustain instream functions and ecosystem integrity at an acceptable level as determined during an EWR study. These

then form part of the conditions for managing achievable water quantity and quality conditions as stipulated in the Reserve Template

Water allocation process (compulsory licensing): This is a process where all existing and new water users are requested to reapply for their licenses, particularly in stressed catchments where there is an over-allocation of water or an inequitable distribution of entitlements.

Ecoregions are geographic regions that have been delineated in a top-down manner on the basis of physical/abiotic factors. • NOTE: For purposes of the classification system, the 'Level I Ecoregions' for South Africa, Lesotho and Swaziland (Kleynhans *et al.* 2005), which have been specifically developed by the Department of Water Affairs & Forestry (DWAF) for rivers but are used for the management of inland aquatic ecosystems more generally, are applied at Level 2A of the classification system. These Ecoregions are based on physiography, climate, geology, soils and potential natural vegetation.

Wetland definition

Although the National Wetland Classification System (2014) is used to classify wetland types it is still necessary to understand the definition of a wetland. Wetland definitions as with classification systems have changed over the years. Terminology currently strives to characterise a wetland not only on its structure (visible form), but also to relate this to the function and value of any given wetland.

The Ramsar Convention definition of a wetland is widely accepted as **"areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres"** (Davis 1994). South Africa is a signatory to the Ramsar Convention and therefore its extremely broad definition of wetlands has been adopted for the proposed NWCS, with a few modifications.

Whereas the Ramsar Convention included marine water to a depth of six metres, the definition used for the NWCS extends to a depth of ten metres at low tide, as this is recognised seaward boundary of the shallow photic zone (Lombard *et al*., 2005). An additional minor adaptation of the definition is the removal of the term 'fen' as fens are considered a type of peatland. The adapted definition for the NWCS is, therefore, as follows:

WETLAND: an area of marsh, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed ten metres.

This definition encompasses all ecosystems characterised by the permanent or periodic presence of water other than marine waters deeper than ten metres. The only legislated definition of wetlands in South Africa, however, is contained within the National Water Act (Act No. 36 of 1998) (NWA), where wetlands are defined as "land which is transitional

between terrestrial and aquatic systems, where the water table is usually at, or near the surface, or the land is periodically covered with shallow water and which land in normal circumstances supports, or would support, vegetation adapted to life in saturated soil." This definition is consistent with more precise working definitions of wetlands and therefore includes only a subset of ecosystems encapsulated in the Ramsar definition. It should be noted that the NWA definition is not concerned with marine systems and clearly distinguishes wetlands from estuaries, classifying the latter as a water course (NWCS, 2014). The DWS is however reconsidering this position with regard the management of estuaries due to the ecological needs of these systems with regard to water allocation. Table 1 provides a comparison of the various wetlands included within the main sources of wetland definition used in South Africa.

Although a subset of Ramsar-defined wetlands was used as a starting point for the compilation of the first version of the National Wetland Inventory (i.e. "wetlands", as defined by the NWA, together with open waterbodies), it is understood that subsequent versions of the Inventory include the full suite of Ramsar-defined wetlands in order to ensure that South Africa meets its wetland inventory obligations as a signatory to the Convention (NWCS, 2014).

Wetlands must therefore have one or more of the following attributes to meet the above definition (DWAF, 2005/2007):

- A high water table that results in the saturation at or near the surface, leading to anaerobic conditions developing in the top 50cm of the soil.
- Wetland or hydromorphic soils that display characteristics resulting from prolonged saturation, i.e. mottling or grey soils
- The presence of, at least occasionally, hydrophilic plants, i.e. hydrophytes (water loving plants).

It should be noted that riparian systems that are not permanently or periodically inundated are not considered true wetlands, i.e. those associated with the drainage lines.

Table 1: Comparison of ecosystems considered to be 'wetlands' as defined by the proposed NWCS, the National Water Act (Act No. 36 of 1998), and ecosystems are included in DWAF's (2005) delineation manual.

Ecosystem	NWCS "wetland"	National Water Act wetland	DWAF (2005) delineation manual
Marine	▪ YES	▪ NO	▪ NO
Estuarine	▪ YES	▪ NO	▪ NO
Waterbodies deeper than 2 m (i.e. limnetic habitats often described as lakes or dams)	▪ YES	▪ NO	▪ NO
Rivers, channels and canals	▪ YES	▪ NO[1]	▪ NO
Inland aquatic ecosystems that are not river channels and are less than 2 m deep	▪ YES	▪ YES	▪ YES

[1] Although river channels and canals would generally not be regarded as wetlands in terms of the National Water Act, they are included as a 'watercourse' in terms of the Act

Ecosystem	NWCS "wetland"	National Water Act wetland	DWAF (2005) delineation manual
Riparian[2] areas that are permanently / periodically inundated or saturated with water within 50 cm of the surface	▪ YES	▪ YES	▪ YES[3]
Riparian[2] areas that are not permanently / periodically inundated or saturated with water within 50 cm of the surface	▪ NO	▪ NO	▪ YES[3]

Wetland importance and function

South Africa is a Contracting Party to the Ramsar Convention on Wetlands, signed in Ramsar, Iran, in 1971, and has thus committed itself to this intergovernmental treaty, which provides the framework for the national protection of wetlands and the resources they could provide. Wetland conservation is now driven by the South African National Biodiversity Institute, a requirement under the National Environmental Management: Biodiversity Act (No 10 of 2004).

Wetlands are among the most valuable and productive ecosystems on earth, providing important opportunities for sustainable development (Davies and Day, 1998). However, wetlands in South Africa are still rapidly being lost or degraded through direct human induced pressures (Nel *et al.,* 2004).

The most common attributes or goods and services provided by wetlands include:

- Improve water quality;
- Impede flow and reduce the occurrence of floods;
- Reeds and sedges used in construction and traditional crafts;
- Bulbs and tubers, a source of food and natural medicine;
- Store water and maintain base flow of rivers;
- Trap sediments; and
- Reduce the number of water borne diseases.

In the past wetland conservation has focused on biodiversity as a means of substantiating the protection of wetland habitat. However not all wetlands provide such motivation for their protection, thus wetland managers and conservationists began assessing the importance of wetland function within an ecosystem.

[2] According to the National Water Act and Ramsar, riparian areas are those areas that are saturated or flooded for prolonged periods would be considered riparian wetlands, opposed to non –wetland riparian areas that are only periodically inundated and the riparian vegetation persists due to having deep root systems drawing on water many meters below the surface.

[3] The delineation of 'riparian areas' (including both wetland and non-wetland components) is treated separately to the delineation of wetlands in DWAF's (2005) delineation manual.

Table 2 summarises the importance of wetland function when related to ecosystem services or ecoservices (Kotze *et al*., 2008). One such example is emergent reed bed wetlands that function as transformers converting inorganic nutrients into organic compounds (Mitsch and Gosselink, 2000).

Table 2: Summary of direct and indirect ecoservices provided by wetlands from Kotze *et al.*, 2008.

Ecosystem services supplied by wetlands	Indirect benefits	Hydro-geochemical benefits	Flood attenuation	
			▪ Stream flow regulation	
			Water quality enhancement benefits	▪ Sediment trapping
				▪ Phosphate assimilation
				▪ Nitrate assimilation
				▪ Toxicant assimilation
				▪ Erosion control
			▪ Carbon storage	
		▪ Biodiversity maintenance		
	Direct benefits	▪ *Provision of water for human use*		
		▪ *Provision of harvestable resources*[2]		
		▪ *Provision of cultivated foods*		
		▪ *Cultural significance*		
		▪ *Tourism and recreation*		
		▪ *Education and research*		

National Wetland Classification System method

During this study due to the nature of the wetlands and watercourses observed, it was decided that the newly accepted National Wetlands Classification System (NWCS) be adopted. This classification approach has integrated aspects of the HGM approached used in the WET-Health system as well as the widely accepted eco-classification approach used for rivers.

The NWCS (SANBI, 2009) as stated previously, uses hydrological and geomorphological traits to distinguish the primary wetland units, i.e. direct factors that influence wetland function. Other wetland assessment techniques, such as the DWAF (2005) delineation method, only infer wetland function based on abiotic and biotic descriptors (size, soils & vegetation) stemming from the Cowardin approach (SANBI, 2009).

The classification system used in this study is thus based on SANBI (2009) and is summarised below:

The NWCS has a six tiered hierarchical structure, with four spatially nested primary levels of classification (Figure 1). The hierarchical system firstly distinguishes between Marine, Estuarine and Inland ecosystems (**Level 1**), based on the degree of connectivity the particular systems has with the open ocean (greater than 10 m in depth). Level 2 then categorises the regional wetland setting using a combination of biophysical attributes at the landscape level, which operate at a broad bioregional scale.

This is opposed to specific attributes such as soils and vegetation. **Level 2** has adopted the following systems:

- Inshore bioregions (marine)
- Biogeographic zones (estuaries)
- Ecoregions (Inland)

Level 3 of the NWCS assess the topographical position of inland wetlands as this factor broadly defines certain hydrological characteristics of the inland systems. Four landscape units based on topographical position are used in distinguishing between Inland systems at this level. No subsystems are recognised for Marine systems, but estuaries are grouped according to their periodicity of connection with the marine environment, as this would affect the biotic characteristics of the estuary.

Level 4 classifies the hydrogeomorphic (HGM) units discussed earlier. The HGM units are defined as follows:

(i) Landform – shape and localised setting of wetland
(ii) Hydrological characteristics – nature of water movement into, through and out of the wetland
(iii) Hydrodynamics – the direction and strength of flow through the wetland

These factors characterise the geomorphological processes within the wetland, such as erosion and deposition, as well as the biogeochemical processes.

Level 5 of the assessment pertains to the classification of the tidal regime within the marine and estuarine environments, while the hydrological and inundation depth classes are determined for the inland wetlands. Classes are based on frequency and depth of inundation, which are used to determine the functional unit of the wetlands and are considered secondary discriminators within the NWCS.

Level 6 uses of six descriptors to characterise the wetland types on the basis of biophysical features. As with Level 5, these are non-hierarchal in relation to each other and are applied in any order, dependent on the availability of information. The descriptors include:

(i) Geology;
(ii) Natural vs. Artificial;
(iii) Vegetation cover type;
(iv) Substratum;
(v) Salinity; and
(vi) Acidity or Alkalinity.

It should be noted that where sub-categories exist within the above descriptors, hierarchical systems are employed, thus are nested in relation to each other.

The HGM unit (Level 4) is the **focal point of the NWCS**, with the upper levels (Figure 2 – Inland systems only) providing means to classify the broad bio-geographical context for grouping functional wetland units at the HGM level, while the lower levels provide more descriptive detail on the particular wetland type characteristics of a particular HGM unit. Therefore Level 1 – 5 deals with functional aspects, while Level 6 classifies wetlands on structural aspects.

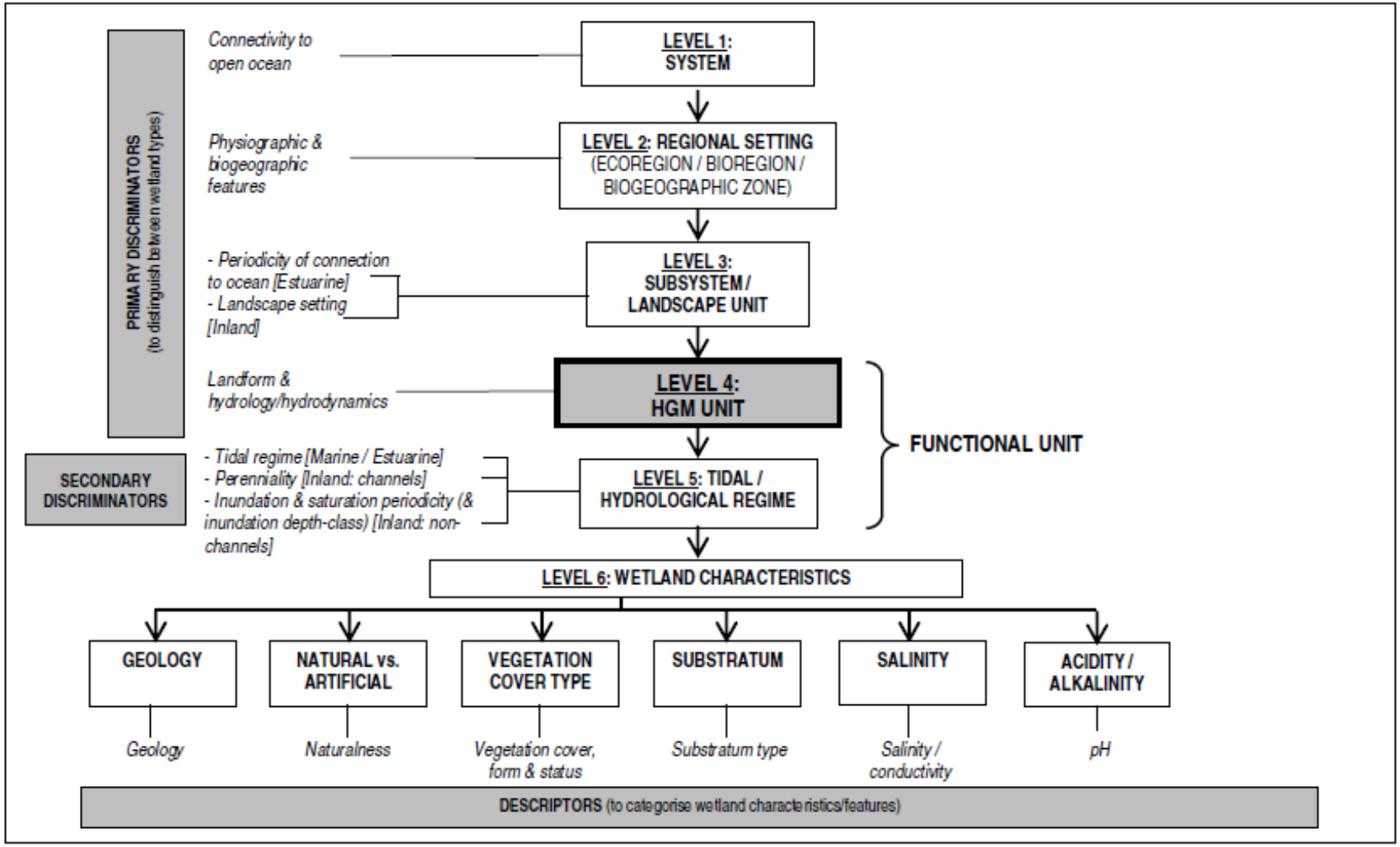

Figure 1: Basic structure of the National Wetland Classification System, showing how 'primary discriminators' are applied up to Level 4 to classify Hydrogeomorphic (HGM) Units, with 'secondary discriminators' applied at Level 5 to classify the tidal/hydrological regime, and 'descriptors' applied at Level 6 to categorise the characteristics of wetlands classified up to Level 5 (From SANBI, 2009).

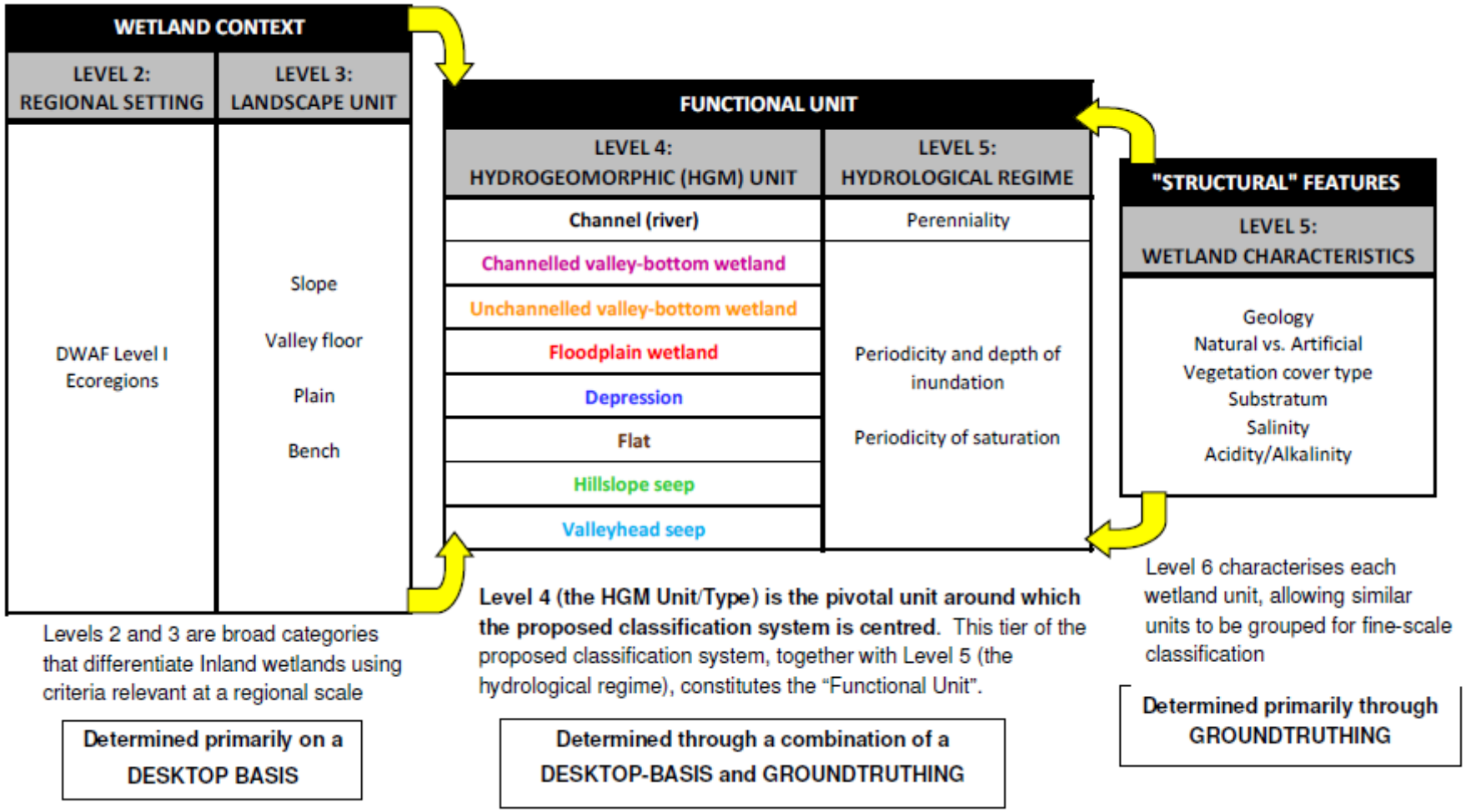

Figure 2 Illustration of the conceptual relationship of HGM Units (at Level 4) with higher and lower levels (relative sizes of the boxes show the increasing spatial resolution and level of detail from the higher to the lower levels) for Inland Systems (from SANBI, 2009).

Wetland condition and conservation importance assessment

To assess the Present Ecological State (PES) or condition of the observed wetlands, a modified Wetland Index of Habitat Integrity (DWAF, 2007) was used. The Wetland Index of Habitat Integrity (WETLAND-IHI) is a tool developed for use in the National Aquatic Ecosystem Health Monitoring Programme (NAEHMP), formerly known as the River Health Programme (RHP). The output scores from the WETLAND-IHI model are presented in the standard DWAF A-F ecological categories (Table 4), and provide a score of the PES of the habitat integrity of the wetland system being examined. The author has included additional criteria into the model based system to include additional wetland types. This system is preferred when compared to systems such as WET-Health – wetland management series (WRC 2009), as WET-Health (Level 1) was developed with wetland rehabilitation in mind, and is not always suitable for impact assessments. This coupled to degraded state of the wetlands in the study area, a complex study approach was not warranted, i.e. conduct a Wet-Health Level 2 and WET-Ecosystems Services study required for an impact assessment.

Table 4: Description of A – F ecological categories based on Kleynhans *et al.*, (2005).

ECOLOGICAL CATEGORY	ECOLOGICAL DESCRIPTION	MANAGEMENT PERSPECTIVE
A	Unmodified, natural.	Protected systems; relatively untouched by human hands; no discharges or impoundments allowed
B	Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged.	Some human-related disturbance, but mostly of low impact potential
C	Moderately modified. Loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged.	**Multiple disturbances associated with need for socio-economic development, e.g. impoundment, habitat modification and water quality degradation**
D	Largely modified. A large loss of natural habitat, biota and basic ecosystem functions has occurred.	
E	Seriously modified. The loss of natural habitat, biota and basic ecosystem functions is extensive.	**Often characterized by high human densities or extensive resource exploitation. Management intervention is needed to improve health, e.g. to restore flow patterns, river habitats or water quality**
F	Critically / Extremely modified. Modifications have reached a critical level and the system has been modified completely with an almost complete loss of natural habitat and biota. In the worst instances the basic ecosystem functions have been destroyed and the changes are irreversible.	

The WETLAND-IHI model is composed of four modules. The "Hydrology", "Geomorphology" and "Water Quality" modules all assess the contemporary ***driving processes*** behind wetland formation and maintenance. The last module, "Vegetation Alteration", provides an indication of the intensity of human landuse activities on the wetland surface itself and how these may have ***modified*** the condition of the wetland. The integration of the scores from these 4 modules provides an overall PES score for the wetland system being examined. The WETLAND-IHI model is an MS Excel-based model, and the data required for the assessment are generated during a rapid site visit.

Additional data may be obtained from remotely sensed imagery (aerial photos; maps and/or satellite imagery) to assist with the assessment. The interface of the WETLAND-IHI has been developed in a format which is similar to DWAF's River EcoStatus models which are currently used for the assessment of PES in riverine environments.

Conservation importance of the individual wetlands was based on the following criteria:

- Habitat uniqueness
- Species of conservation concern
- Habitat fragmentation with regard ecological corridors
- Ecosystem service (social and ecological)

The presence of any or a combination of the above criteria would result in a HIGH conservation rating if the wetland was found in a near natural state (high PES). Should any of the habitats be found modified the conservation importance would rate as MEDIUM, unless a Species of conservation concern was observed (HIGH). Any systems that was highly modified (low PES) or had none of the above criteria, received a LOW conservation importance rating. Wetlands with HIGH and MEDIUM ratings should thus be excluded from development with incorporation into a suitable open space system, with the maximum possible buffer being applied. Wetlands which receive a LOW conservation importance rating could be included into stormwater management features, but should not be developed so as to retain the function of any ecological corridors.

17 - Appendix 2: Specialist CV

CURRICULUM VITAE
Dr Brian Michael Colloty
7212215031083

1 Rossini Rd
Pari Park
Port Elizabeth, 6070
brian@itsnet.co.za
083 498 3299

Profession: Ecologist & Environmental Assessment Practitioner (Pr. Sci. Nat. 400268/07 & EAPSA certified). Member of the South African Wetland Society
Specialisation: Ecology and conservation importance rating of inland habitats, wetlands, rivers & estuaries
Years experience: 21 years

SKILLS BASE AND CORE COMPETENCIES

- 21 years experience in environmental sensitivity and conservation assessment of aquatic and terrestrial systems inclusive of Index of Habitat Integrity (IHI), WET Tools, Riparian Vegetation Response Assessment Index (VEGRAI) for Reserve Determinations, estuarine and wetland delineation throughout Africa. Experience also includes biodiversity and ecological assessments with regard sensitive fauna and flora, within the marine, coastal and inland environments. Countries include Mozambique, Kenya, Namibia, Central African Republic, Zambia, Eritrea, Mauritius, Madagascar, Angola, Ghana, Guinea-Bissau and Sierra Leone. Current projects also span all nine provinces in South Africa.
- 12 years experience in the coordination and management of multi-disciplinary teams, such as specialist teams for small to large scale EIAs and environmental monitoring programmes, throughout Africa and inclusive of marine, coastal and inland systems. This includes project and budget management, specialist team management, client and stakeholder engagement and project reporting.
- GIS mapping and sensitivity analysis

TERTIARY EDUCATION

- 1994: B Sc Degree (Botany & Zoology) - NMMU
- 1995: B Sc Hon (Zoology) - NMMU
- 1996: M Sc (Botany - Rivers) - NMMU
- 2000: Ph D (Botany – Estuaries & Mangroves) – NMMU

EMPLOYMENT HISTORY

- 1996 – 2000 Researcher at Nelson Mandela Metropolitan University – SAB institute for Coastal Research & Management. Funded by the WRC.
- 2001 – January 2003 Training development officer AVK SA (reason for leaving – sought work back in the environmental field rather than engineering sector)
- February 2003- June 2005 Project manager & Ecologist for Strategic Environmental Focus (Pretoria) – (reason for leaving – sought work related more to experience in the coastal environment)
- July 2005 – June 2009 Principal Environmental Consultant Coastal & Environmental Services (reason for leaving – company restructuring)
- June 2009 – present Owner / Ecologist of Scherman Colloty & Associates cc

SELECTED RELEVANT PROJECT EXPERIENCE

World Bank IFC Standards

- Kenmare Mining Pilivilli, Mozambique - wetland (mangroves, peatlands and estuarine) assessment and biodiversity offset analysis - current
- Botswana South Africa 400kv transmission line (400km) biodiversity assessment on behalf of Aurecon - current
- Farim phosphate mine and port development, Guinea Bissau – biodiversity and estuarine assessment on behalf of Knight Piesold Canada – 2016.
- Tema LNG offshore pipeline EIA – marine and estuarine assessment for Quantum Power (2015).
- Colluli Potash South Boulder, Eritrea, SEIA marine baseline and hydrodynamic surveys co-ordinator and coastal vegetation specialist (coastal lagoon and marine) (on-going).
- Wetland, estuarine and riverine assessment for Addax Biofeuls Sierra Leone, Makeni for Coastal & Environmental Services: 2009
- ESHIA Project manager and long-term marine monitoring phase coordinator with regards the dredge works required in Luanda bay, Angola. Monitoring included water quality and biological changes in the bay and at the offshore disposal outfall site, 2005-2011

South African

- Wetland specialist appointed to update the Eastern Cape Biodiversity Conservation Plan, for the Province on behalf of EOH CES appointment by SANBI – current. This includes updating the National Wetland Inventory for the province, submitting the new data to CSIR/SANBI.

Dr Brian Colloty 1

- Nelson Mandela Bay Municipality Baakens River Integrated Wetland Assessment (Inclusive of Rehabilitation and Monitoring Plans) for CEN IEM Unit - Current
- Rangers Biomass Gasification Project (Uitenhage), wetland assessment and wetland rehabilitation / monitoring plans for CEM IEM Unit – current.
- Gibson Bay Wind Farm implementation of the wetland management plan during the construction and operation of the wind farm (includes surface / groundwater as well wetland rehabilitation & monitoring plan) on behalf of Enel Green Power - current
- Gibson Bay Wind Farm 133kV Transmission Line wetland management plan during the construction of the transmission line (includes wetland rehabilitation & monitoring plan) on behalf of Eskom – 2016.
- Tsitsikamma Community Wind Farm implementation of the wetland management plan during the construction of the wind farm (includes surface / biomonitoring, as well wetland rehabilitation & monitoring plan) on behalf of Cennergi – completed May 2016.
- Alicedale bulk sewer pipeline for Cacadu District, wetland and water quality assessment, 2016
- Mogalakwena 33kv transmission line in the Limpopo Province, on behlaf of Aurecon, 2016
- Cape St Francis WWTW expansion wetland and passive treatment system for the Kouga Municipality, 2015
- Macindane bulk water and sewer pipelines wetland and wetland rehabilitation plan for the Indwe 2015
- Eskom Prieska to Copperton 132kV transmission line aquatic assessment, Northern Cape on behalf of Savannah Environmental 2015.
- Joe Slovo sewer pipeline upgrade wetland assessment for Nelson Mandela Bay Municipality 2014
- Cape Recife Waste Water Treatment Works expansion and pipeline aquatic assessment for Nelson Mandela Bay Municipality 2013
- Pola park bulk sewer line upgrade aquatic assessment for Nelson Mandela Bay Municipality 2013
- Transnet Freight Rail – Swazi Rail Link (Current) wetland and ecological assessment on behalf of Aurecon for the proposed rail upgrade from Ermelo to Richards Bay
- Eskom Transmission wetland and ecological assessment for the proposed transmission line between Pietermaritzburg and Richards Bay on behalf of Aurecon (2012).
- Port Durnford Exarro Sands biodiversity assessment for the proposed mineral sands mine on behalf of Exxaro (2009)
- Fairbreeze Mine Exxaro (Mtunzini) wetland assessment on behalf of Strategic Environmental Services (2007).
- Wetland assessment for Richards Bay Minerals (2013) – Zulti North haul road on behalf of RBM.
- Biodiversity and aquatic assessments for 85 renewable projects in the past four years in the Western, Eastern, Northern Cape, KwaZulu-Natal and Free State provinces. Clients included RES-SA, RedCap, ACED Renewables, Mainstream Renewable, GDF Suez, Globeleq, ENEL, Abengoa amongst others. Particular aquatic sensitivity assessment and Water Use License Applications on behalf of Mainstream Renewable Energy (8 wind farms and 3 PV facilities.), Cennergi / Exxaro (2 Wind farm), WKN Wind current (2 wind farms & 2 PV facilities), ACED (6 wind farms) and Windlab (3 Wind farms) were also conducted. Several of these projects also required the assessment of the proposed transmission lines and switching stations, which were conducted on behalf of Eskom.
- Vegetation assessments on the Great Brak rivers for Department of Water and Sanitation, 2006 and the Gouritz Water Management Area (2014)
- Proposed FibreCo fibre optic cable vegetation assessment along the N2, PE to Cape Town, 2012 on behalf of SRK (2013).

18 - Appendix 3: Signed declaration

environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF SPECIALIST AND DECLARATION OF INTEREST

	(For official use only)
File Reference Number:	12/12/20/ or 12/9/11/L
NEAS Reference Number:	DEA/EIA
Date Received:	

Application for integrated environmental authorisation and waste management licence in terms of the-

(1) National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014; and

(2) National Environmental Management Act: Waste Act, 2008 (Act No. 59 of 2008) and Government Notice 921, 2013

PROJECT TITLE

Impofu West Wind Farm EIA

Specialist:	Scherman Colloty and Associates		
Contact person:	Dr Brian Colloty		
Postal address:	1 Rossini Rd Pari Park PE		
Postal code:	6070	Cell:	0834983299
Telephone:	0413662077	Fax:	-
E-mail:	Brian@itsnet.co.za		
Professional affiliation(s) (if any)	SACANASP Ecologist 400268/07, SASAqs and Member of South African Wetland Society		

Project Consultant:	**Aurecon South Africa (Pty) Ltd**		
Contact person:	**Ms Mieke Barry**		
Postal address:	**PO Box 494, Cape Town**		
Postal code:	**8000**	Cell:	-
Telephone:	**021 526 6025**	Fax:	-
E-mail:	**Mieke.barry@aurecongroup.com**		

4.2 The specialist appointed in terms of the Regulations_

I, Brian Colloty declare that -- General

declaration:

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 48 and is punishable in terms of section 24F of the Act.

Signature of the specialist:

SCHERMAN COLLOTY AND ASSOCIATES
Name of company (if applicable):

8 April 2018
Date: