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## WETLAND DELINEATION AND RISK ASSESSMENT

*Proposed Gauging Weir at Esperanza Pump Station, KwaZulu-Natal*

*10 August 2018*



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## Declaration

I **Andrew Briggs**, declare that –

- I act as the independent specialist in this matter;
- I do not have and will not have any vested interest (either business, financial, personal or other) in the undertaking of the proposed activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014;
- 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 National Environmental Management Act (Act 107 of 1998), (NEMA), regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the NEMA Act, regulations and all other applicable legislation;
- As a registered member of the South African Council for Natural Scientific Professions in terms of the Natural Scientific Professions Act, 2003 (Act No. 27 of 2003), I will undertake my professional duties in accordance with the Code of Conduct of the Council, as well as any other societies of which I am a member; and
- 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 report are true and correct.

**Signature of the specialist:**



**Date: 10 August 2018**

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## Declaration

I, **Andrew Husted** declare that -

- I act as the independent review specialist in this application;
- I do not have and will not have any vested interest (either business, financial, personal or other) in the undertaking of the proposed activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014;
- 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 undertaking this review;
- I have expertise in undertaking the review of this report, including knowledge of the applicable Acts, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with these Acts, 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 am aware that a person is guilty of an offence in terms of Regulation 48 (1) of the EIA Regulations, 2014, if that person provides incorrect or misleading information. A person who is convicted of an offence in terms of sub-regulation 48(1) (a)-(e) is liable to the penalties as contemplated in section 49B (1) of the National Environmental Management Act, 1998 (Act 107 of 1998).

Signature of the specialist:



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## Executive summary

Afzelia Environmental Consultants (Pty) Ltd was appointed by Umgeni Water to undertake a wetland delineation and risk assessment of wetlands within a 500m radius (i.e. the DWS regulated area for water use) of the respective locations of four separate gauging weirs within KwaZulu-Natal that may receive direct or indirect construction or operational impacts. The proposed gauging weirs and their approximate locations are as follows:

1. The Umzinto Dam gauging weir, located approximately 7km west of Umzinto immediately below the Umzinto Dam, Ugu District Municipality, KZN;
2. The EJ Smith Dam gauging weir, located approximately 1.5km south-east of Umzinto immediately below the EJ Smith Dam, Ugu District Municipality, KZN; and
3. The Imvutshane Dam gauging weir, located approximately 30km north-west of KwaDukuza immediately below the Imvutshane Dam, iLembe District Municipality, KZN.
4. The Esperanza Pump Station gauging weir, located approximately 3km south-west of Umzinto, Ugu District Municipality, KwaZulu-Natal

This report deals exclusively with the results of the wetland delineation and risk assessment for the proposed gauging weir at the Esperanza Pump Station. The main findings of this report have been summarised below:

1. After onsite sampling of potential watercourses mapped at a desktop scale within the DWS 500m regulated area for watercourses, it was determined that no wetlands stand to receive negative impacts from the construction or operation of the proposed gauging weir.
2. Two wetlands were noted within a 500m radius of the proposed gauging weir site, however, these wetlands were located a considerable distance upslope of the proposed site indicating that they will not be impacted by the proposed development.
3. A risk assessment was not completed as part of this study as no wetland habitat will be affected by the proposed development although it must be noted that riparian areas in close proximity to the proposed gauging weir site will require complete impact and risk assessments as stipulated by DWS as these areas are likely to receive impacts associated with construction and operation of the weir.

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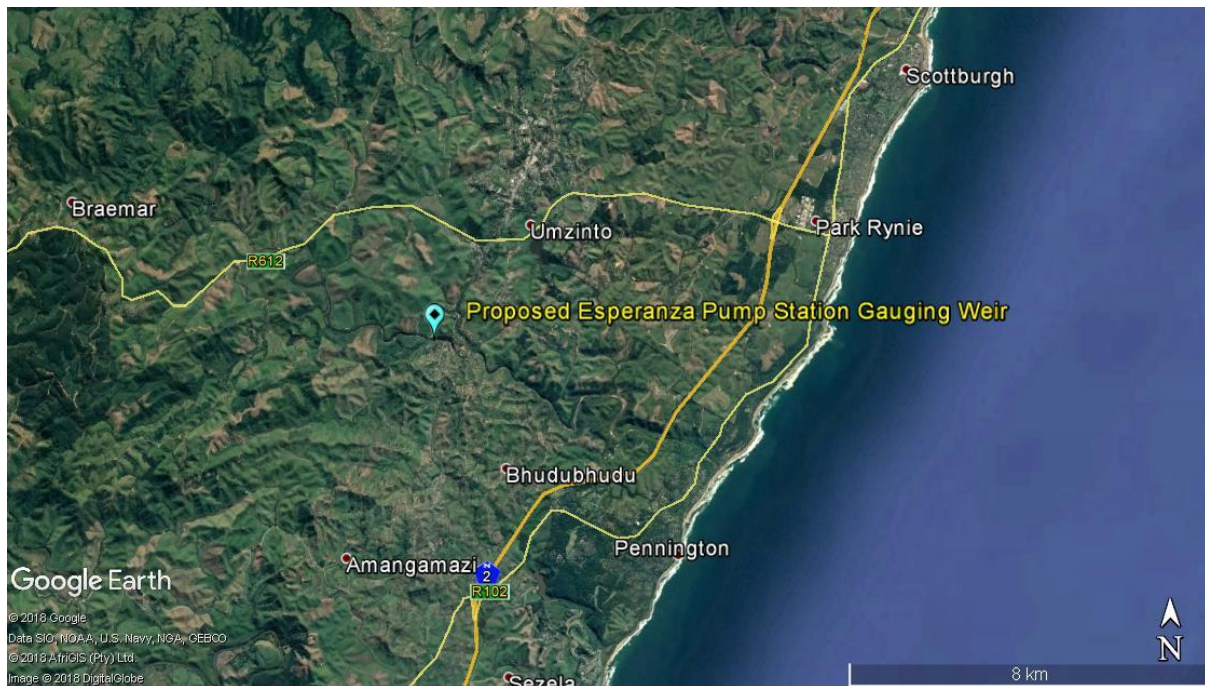
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## 1. INTRODUCTION

### 1.1. Background and locality of the assessment

Afzelia Environmental Consultants (Pty) Ltd was appointed by Umgeni Water to undertake a wetland delineation and risk assessment of wetland habitat located within a 500m radius (i.e. DWS regulated area for water use) for a proposed gauging weir located at the Esperanza Pump Station, approximately 3km south-west of Umzinto, Ugu District Municipality, KwaZulu-Natal (KZN).



**Figure 1:** Locality map showing the approximate location of the proposed gauging weir located at the Esperanza Pump Station within KZN.

### 1.2. Project description

The increased pressure on countrywide water resource management as a result of the recent drought conditions has fast tracked the need to efficiently monitor and accurately measure environmentally mandated release of water from certain dams in KwaZulu-Natal. Umgeni Water proposes the construction of four gauging weirs below three dams and one pump station in KwaZulu-Natal, namely;

- The Umzinto Dam,
- The EJ Smith Dam,
- The Imvutshane Dam, and
- The Esperanza Pump Station

The effects of low river levels, particularly during dry seasons, have been known to disrupt the life cycles of aquatic organisms on the downstream side of dams. The proposed gauging weirs will assist in monitoring the release of



certain volumes of water that is deemed necessary for the maintenance of the life cycles of these aquatic organisms, whilst keeping in-mind the conservation of water for use by humans.

Note that this study deals exclusively with the proposed Esperanza Pump Station gauging weir and its surrounding environment.

### **1.3. Scope of work**

The scope of work entailed the following:

- Desktop contextualisation of the study area using all available and relevant conservation planning datasets and background biophysical context.
- Desktop mapping and screening of wetland habitat within a 500m radius of the proposed weir using available imagery, contour data and relevant spatial information (e.g. NFEPA Datasets).
- Field visit to delineate the outer boundary of any wetland habitat within a 500m radius of the proposed weir that may be potentially impacted by activities associated with construction and operation, according to methods contained in 'A Practical Field Procedure for Identification and Delineation of Wetland and Riparian Areas' (DWAF, 2005a).
- Analytical description and classification of wetland habitat, vegetation and soils onsite, including a description of any potential impacts currently affecting the wetlands.
- Identification of potential negative construction and operational impacts on any wetland(s) which may be affected by the proposed weir and assessment of the significance of these impacts (DWS Risk Assessment).

### **1.4. Assumptions and Limitations**

- The findings, results, observations, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge.
- The hand-held Garmin GPSmap 60Cx used to delineate the wetland habitat and record various points of interest had an accuracy of  $\leq 3\text{m}$ .
- Only wetlands that were likely to be impacted by proposed development activities were assessed in the field. Wetlands located within a 500m radius of the sites but not in a position within the landscape to be measurably affected by the developments were not considered as part of this assessment.
- Riparian zones were mapped using the best available desktop spatial datasets as well as onsite data from the aquatic assessment report compiled by The Biodiversity Company (2018).

## 2. BIOPHYSICAL CONTEXT

The following table (Table 1) summarizes the biophysical attributes of the study area.

Table 1: The biophysical attributes of the study area.

<b>General description</b>	<b>Site</b>	Esperanza Pump Station
	<b>GPS coordinates</b>	30°20'22"S 30°38'38"E
	<b>Land use within study area</b>	Coastal forest surrounded by intensive sugarcane agriculture
	<b>Climate</b> (Schulze, 1997; DWAF, 2005b)	The mean annual precipitation is ~1011.3mm; potential evapotranspiration is ~1161.1mm with a simulated mean annual run-off of ~260.7 mm. Rain falls primarily in early summer and late summer with highly infrequent winter rainfall. Maximum temperatures vary between 24-28°C in February and 20-24°C in July whilst minimum temperatures are between 16-20°C in February and 6-10°C in July.
	<b>MAP/PET</b> (Schulze, 1997)	0.87
	<b>Simulated annual run-off</b> (Schulze, 1997)	260.7mm
	<b>Geology</b> (Department of Agriculture Land Types Database)	The study site is underlain by Gneiss.
	<b>Quaternary catchment</b>	U80H
	<b>River system</b>	Umzinto River
<b>National Classification and status</b>	<b>Vegetation types</b> (Mucina & Rutherford, 2006)	KwaZulu-Natal Coastal Belt (CB3)
	<b>Conservation Status</b> (Mucina & Rutherford, 2006)	Endangered
	<b>Wetland Vegetation Group</b> (Driver et al. 2011)	Indian Ocean Coastal Belt Group 2
	<b>Wetland Vegetation Group Ecosystem threat and protection status</b>	Critically Endangered and moderately protected

	<b>FEPA features</b>	None
	<b>FEPA Unit ID</b>	5109
<b>Provincial vegetation classification</b>	<b>Vegetation type</b> (Scott-Shaw & Escott, 2011)	KwaZulu-Natal Coastal Belt Grassland (critically endangered)
<b>Provincial status</b>	<b>Ezemvelo KZN Wildlife Aquatic Conservation Plan</b> (EKZNW, 2007)	Available (ID 4172)

### 3. METHODOLOGY

#### 3.1. Wetland Delineation

All wetlands within 500 meters of the proposed development were delineated using combination of desktop and the DWAF (2005a) field delineation procedure. No wetlands were located within 32 meters of the proposed developments and therefore no systems were delineated in field at a high resolution.

#### 3.2. Impact Identification Risk Assessment

The risk assessment followed the approach prescribed by the Department of Water and Sanitation (DWS) Notice 509 of 2016 (General Authorisation in terms of Section 39 of the National Water Act (36 of 1998) for water uses as defined in Section 21 (c) and (i). Two wetlands were located during the field visit which could not possibly be impacted, despite being within 500m of the proposed gauging weir, and were therefore excluded from any assessment. A sufficient explanation was provided in this regard.

### 4. RESULTS

#### 4.1. Wetland Delineation

##### 4.1.1. Proposed Esperanza Pump Station Gauging Weir

Upon investigation of the site in close proximity to the proposed Esperanza Pump Station gauging weir, as well as within the 500m DWS regulated area for water use, two wetland units were identified approximately 80m and 100m upstream of the proposed Pump Station gauging weir site. These wetland units, being located a considerable distance upstream of the proposed site, will not receive any impacts from the construction or operation of the proposed gauging weir and, as such, will not require a DWS mandated Risk Assessment. The general study area comprised primarily of riverine areas and drainage lines. The steep topography, which characterised the study area (20-40%), does not lend itself to wetland formation. The Classification System for Wetlands and Other Aquatic

Ecosystems in South Africa, compiled by Ollis *et al.* (2013), states that a characteristic longitudinal gradient of higher than 10% is applicable to Mountain headwater streams. The longitudinal gradient of wetland units is typically gentler than 10% (i.e. 0.5% to 5%), however, seepage wetlands frequently occur on steeper slopes (Ollis *et al.* 2013).

The wetland units, classified as seepage wetlands, were partially invaded by sugarcane agriculture (*Saccharum officinarum*) which was also prevalent throughout the left hand bank catchment in the vicinity of the proposed site. The majority of the wetland vegetation, however, comprised a mix of obligate wetland vegetation including *Leersia hexandra*, *Cyperus dives* and *Ludwigia octovalvis*. The edges of the wetland units comprised primarily invasive alien plants including *Rubus cuneifolius*, and *S. officinarum*. Soils within the wetland units generally comprised medium grey loamy sand with a moderate abundance of orange mottles at a depth of approximately 20cm-50cm.

The drainage lines and ephemeral riparian areas within the vicinity of the proposed site comprised primarily of *S. officinarum* agriculture and a mix of alien shrubs such as *Lantana camara*, *Ageratum conyzoides*, *Solanum mauritianum*, *Senna didymobotrya* and localised clumps of *Eucalyptus* sp. Soils within the these areas generally comprised medium brown sand, which is indicative of non-wetland habitat.

It must be noted that the Umzinto River, specifically, did not form part of this assessment due to its location within a riparian zone. The assessment of this riverine unit is included within the study compiled by The Biodiversity Company (2018).



**Photo 1:** View from a point on the left hand bank of the Umzinto River near to the site of the proposed gauging weir looking upstream showing the active channel as well as distinct riparian habitat.



**Photo 2:** View from the lower extent of a drainage line within the study area showing the extent of sugarcane cultivation as well as the level of alien plant invasion within these drainage lines, which in this case, was dominated by *L. camara*.



**Photo 3:** Medium brown sandy terrestrial soils extracted from within an ephemeral riparian zone within the study area, note the absence of wetland indicators (i.e. mottling or grey soil matrix).



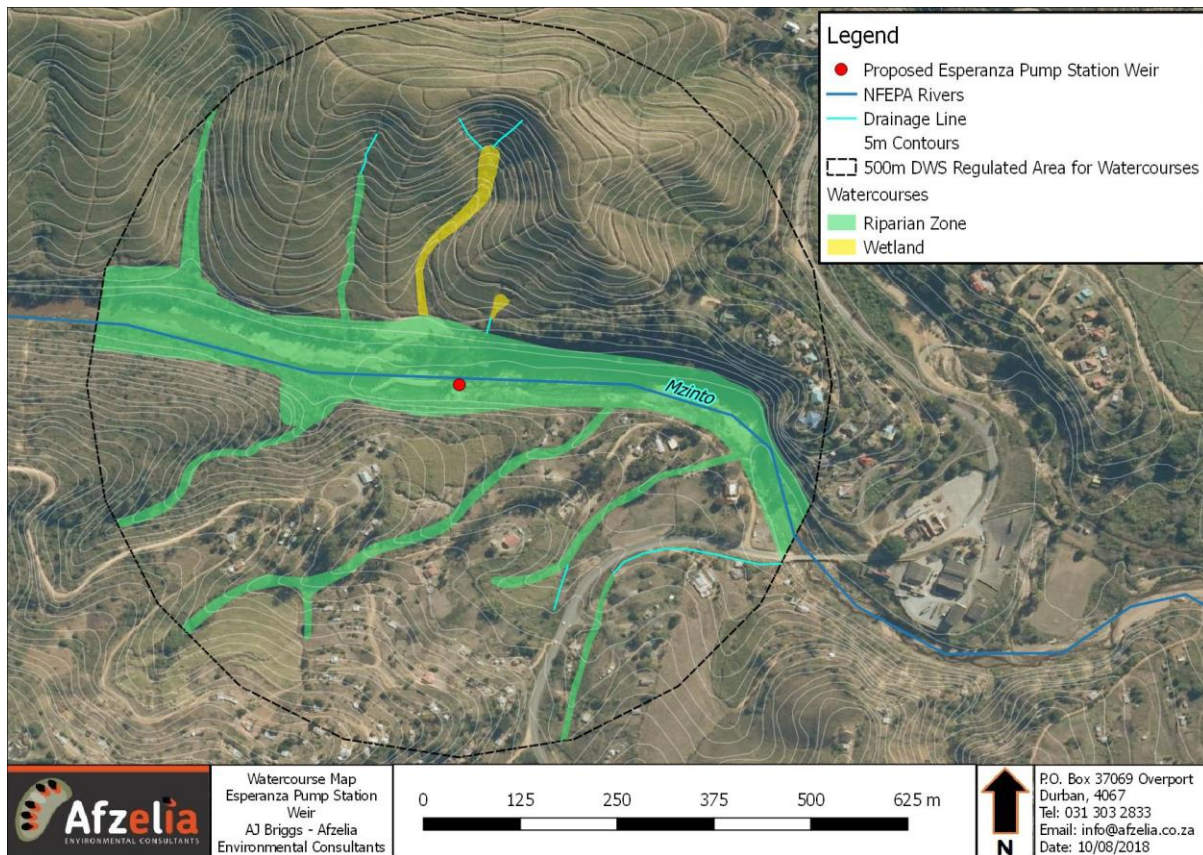
**Photo 4:** View from the left hand bank of the Umzinto River looking from north to south across the river showing the proposed site of the new gauging weir which will be mounted on the existing infrastructure.



**Photo 5:** View looking from south to north of a seepage wetland in the vicinity of the proposed site. This wetland, as well as the other identified wetland, is located a considerable distance upslope of the proposed site and therefore will not receive any impacts.



**Photo 6:** An example of a seasonal wetland soil found onsite. Note the grey matrix and orange mottling which are important wetland soil indicators.



**Figure 2:** Watercourse map showing the riparian units in the vicinity of the proposed Esperanza Pump Station Gauging weir.

## 5. IMPACT AND RISK ASSESSMENT

The Department of Water and Sanitation (DWS) Notice 509 of 2016 (General Authorisation in terms of Section 39 of the National Water Act 36 of 1998) for water uses as defined in Section 21 (c) and (i) stipulates that a risk assessment must be conducted for all wetlands within 500m (wetland regulated area of a watercourse) of a development. The GA also stipulates that a risk assessment must be conducted for all riparian habitats should the activity fall within the delineated boundary of the river or within the 1:100 year floodline of the river.

There were two wetlands identified within a 500m radius of the proposed Esperanza Pump Station gauging weir site. These wetlands are located a considerable distance upslope of the proposed weir site (>80m) and therefore will not derive any impacts from the proposed gauging weir construction and operation, which alleviates the requirement for an impact or risk assessment.

It must be noted that an impact and risk assessment will be necessary for the riparian habitat of the Umzinto River as this habitat will likely derive certain negative impacts from the proposed gauging weir construction.

## 6. CONCLUSION

Umgeni Water is proposing to construct four gauging weirs below three dams and one pump station in KwaZulu-Natal, namely; The Umzinto Dam, the EJ Smith Dam, the Imvutshane Dam and the Esperanza Pump Station. Afzelia Environmental Consultants were appointed to conduct a wetland delineation and risk assessment for wetlands within a 500m radius of the proposed gauging weir sites where it was determined that no wetlands stand to be negatively impacted by the proposed developments.

The majority of watercourse units located within the respective study areas were riparian zones, although many invaded drainage lines were also present. Two wetlands were identified a considerable distance upslope of the Umzinto River and were not formally assessed due to their respective locations as they will not receive any impacts from the proposed gauging weir construction.

No risk assessment was completed as part of this report due to the fact that no definable wetland habitat was identified in a position within the landscape where it may receive impacts from the proposed weir developments. It must be noted that riparian areas in close proximity to the proposed gauging weir site will require complete impact and risk assessments as stipulated by DWS.

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