

29 March 2019

Chief Director  
Department of Environmental Affairs  
Private Bag x 447  
Pretoria  
0001

## **CONSTRUCTION OF GAUGING WEIRS AT EJ SMITH & ESPERANZA PUMPSTATION**

### **1. PURPOSE**

The purpose for this submission is to provide the background and motivation in terms of GN R982 of 2014 as to why no alternative sites were selected for EJ Smith Dam and Esperanza Pump Station Abstraction Weir.

### **2. BACKGROUND**

The water supply to the Middle South Coast area has been affected for a number of years due to limited water resources. During below average rainfall periods, dams draw down to levels where they cannot sustain demands. Umgeni Water implemented an emergency scheme to augment the raw water supply from nearby catchment, Mpambanyoni River, as a result of the droughts experienced over the recent years. As a result it became clear that water storage of the dams must be managed efficiently, hence the reason to construct flow gauging weirs downstream of each storage dams inclusive of Umzinto and EJ Smith dams to measure the outflows.

### **3. MOTIVATION FOR SITE LOCATION**

The Umzinto River system which housed Esperanza Pumpstation Abstraction Weir is located within the quaternary catchment U80H and includes the incremental catchments of Umzinto Dam and EJ Smith Dam.

#### **UMGENI WATER**

HEAD OFFICE • P.O.Box 9 • Pietermaritzburg 3200  
310 Burger Street • Pietermaritzburg 3201 • Republic of South Africa  
Telephone (033) 341-1111 • Fax (033) 341-1084  
E-mail: [Info@umgeni.co.za](mailto:Info@umgeni.co.za)  
Internet: <http://www.umgeni.co.za>

Chief Executive: Mr. TB Hlongwa

Non-Executive Directors: Z Mathenjwa (Chairperson) • N Chamane • D Dikoko • Z Manase • V Reddy • M Tshivhase

The purpose of these weirs is to measure low flows from EJ Smith and Umzinto dams so as to improve dam operating rules, water resources planning initiatives and to monitor water quality of the dams as part of the Umzimayi and Umzinto catchment management forum. Technically gauging weir must be built at the end of straight river reach to allow for uniform stable flow and on competent founding conditions. In addition, there must be easy access to the site to allow personnel to take readings regularly.

- **Esperanza Pump Station Abstraction Weir**

The scope of work for this site is simply to refurbish an existing abstraction weir at the Esperanza Raw Water Pump Station including installation of a V-Notch to gauge the actual amount of water flowing past the weir with the design flow of 1521m<sup>3</sup>/day as seen in **Figure 1**. In addition, the existing concrete wall will be refurbished to prevent further leak was during site inspections. This was considered to be the best option as opposed to venturing in an undisturbed greenfield site where environmental impacts plus financial implication would be high.



**Figure 1: Existing Esperanza Raw Water Pump Station Abstraction Weir**

**UMGENI WATER**

HEAD OFFICE • P.O.Box 9 • Pietermaritzburg 3200  
310 Burger Street • Pietermaritzburg 3201 • Republic of South Africa  
Telephone (033) 341-1111 • Fax (033) 341-1084  
E-mail: [Info@umgeni.co.za](mailto:Info@umgeni.co.za)  
Internet: <http://www.umgeni.co.za>

Chief Executive: Mr. TB Hlongwa

Non-Executive Directors: Z Mathenjwa (Chairperson) • N Chamane • D Dikoko • Z Manase • V Reddy • M Tshivhase

- **EJ Smith Dam**

The proposed type of weir is a crump weir with a V-notch about 50 m downstream of EJ Smith Dam as next to an existing low lift raw water pump station as seen in **Figure 2**. The site is situated on straight river reach, solid rock, easy access and a short distance from the dam to allow for relatively accurate measurement low flow release from the dam for Ecological Water Releases (EWR). The V-Notch crump weir was selected as the best solution because the pattern of stream lines over a v- notch crump weir is smooth. This minimizes energy losses in the upstream pool thereby providing enough energy for sediment to be transported over the weir instead of being deposited in front of it.



**Figure 2: Proposed Site for EJ Smith Dam Gauging Weir**

- **Envisaged Construction Time Frames**

It is planned that the construction at both sites will take place concurrently.

No	Site	Duration (Month)
1	Esparanza Raw Water Pump station Abstraction Weir	5
2	EJ Smith Dam Gauging Weir	8

**UMGENI WATER**

HEAD OFFICE • P.O.Box 9 • Pietermaritzburg 3200  
 310 Burger Street • Pietermaritzburg 3201 • Republic of South Africa  
 Telephone (033) 341-1111 • Fax (033) 341-1084  
 E-mail: [Info@umgeni.co.za](mailto:Info@umgeni.co.za)  
 Internet: <http://www.umgeni.co.za>

Chief Executive: Mr. TB Hlongwa

Non-Executive Directors: Z Mathenjwa (Chairperson) • N Chamane • D Dikoko • Z Manase • V Reddy • M Tshivhase

Should you have any queries pertaining to the contents of this letter, please do not hesitate to contact Mr P Sithole at telephone number (033) 341 1380.

Yours faithfully

**Kind regards,**

**Sibusiso Mjwara, PrTechEng |MIMESA |MSAICE | MWISA**  
Executive – Infrastructure Development

cc. Ms P Molefe (UW)

**UMGENI WATER**

HEAD OFFICE • P.O.Box 9 • Pietermaritzburg 3200  
310 Burger Street • Pietermaritzburg 3201 • Republic of South Africa  
Telephone (033) 341-1111 • Fax (033) 341-1084  
E-mail: [Info@umgeni.co.za](mailto:Info@umgeni.co.za)  
Internet: <http://www.umgeni.co.za>

Chief Executive: Mr. TB Hlongwa

Non-Executive Directors: Z Mathenjwa (Chairperson) • N Chamane • D Dikoko • Z Manase • V Reddy • M Tshivhase