**Vortex Settling Basin (VSB) Demonstration Handover Event**

**Date: Thursday 12 June**

**Time: 10:00 – 14:00**

**Venue: Thukela River abstraction works in Middledrift, Madungela, Nkandla, KwaZulu-Natal**

**Event Overview:**

The Vortex Settling Basin (VSB) Demonstration Handover Event will mark the official start of the demonstration period for the VSB technology at the Thukela River abstraction works in Middledrift, Madungela, KwaZulu-Natal. The event will celebrate the culmination of the research and development phase of the VSB prototype, developed as part of the National Dam Siltation Management (NatSilt) Programme. The demonstration will showcase the innovative, low-cost solution for mitigating the effects of river siltation, specifically for the removal of fine non-cohesive sediment at small river abstraction works. The handover will involve a formal presentation, a guided tour of the site, and the operational commencement of the VSB plant.

**Addressing the Siltation Challenge**

South Africa's rivers and dams are increasingly impacted by sediment accumulation, which threatens water quality, reduces storage capacity, and increases the cost of water treatment. The Thukela River system is no exception; it plays a critical role in supplying water to local communities and downstream users but faces persistent challenges linked to land degradation, erosion, and sediment-laden inflows.

Siltation leads to:

- Blockages in water infrastructure such as inlets and pumps
- Increased energy and chemical requirements in water treatment
- Higher maintenance costs for municipalities
- Reduced storage capacity in downstream reservoirs and dams

The VSB technology addresses this issue by enabling on-site removal of sediment before it enters the treatment system. This helps extend the life of infrastructure, protect water quality, and reduce operational costs for water utilities.

The benefits of demonstrating in Madungela KwaZulu-Natal site is preferred due to the following:

- Large contributing catchment downstream of existing Spioenkop Dam, this high sediment concentrations. Great for robust demonstration and analysis

- The pump station abstracts raw water directly from the Thukela River and has no gravel trap, thus VSB supply will be at the hydro-cyclones with a tap-off from the raw water rising main from the river.
- The current sediment extrusion is by hydro-cyclones, therefore a good comparison with VSB performance will be possible.
- Located in a secure location, with an available platform to place the VSB
- Proximity to Durban airport and good access road


**Technology benefits**

The VSB benefits a wide range of stakeholders, particularly those reliant on surface water abstraction for agricultural, municipal, and industrial purposes. Rural communities and small-scale farmers benefit from improved access to cleaner water, reducing sediment-related damage to irrigation systems and water pumps. Water utilities and municipalities gain a cost-effective, energy-efficient solution for sediment removal, ensuring a reliable water supply with minimal maintenance**.** Irrigation schemes benefit from reduced clogging of sprinklers and pipelines, leading to more efficient water distribution and lower operational costs. Additionally, environmental agencies and conservationists benefit as the VSB promotes sustainable water management practices by reducing reliance on high-energy solutions like hydro-cyclones and decreasing overall water loss. By providing a low-maintenance, scalable, and eco-friendly alternative, the VSB supports water security, infrastructure longevity, and resource efficiency in both developing and established water systems.

**Objectives:**

- Demonstrate the operational effectiveness of the VSB: Officially start the demonstration phase of the VSB plant and illustrate its performance in removing fine sediment at the Thukela River abstraction works.

- Share insights and findings: Highlight the results of the WRC research prototype model and share key findings related to the VSB's benefits, including high sediment removal, low energy requirements, and scalability.
- Provide operational guidelines: Present design and operational guidelines for the VSB, focusing on its use in river abstraction stations and water treatment works.
- Encourage knowledge dissemination: Facilitate knowledge sharing with stakeholders, including government agencies, water sector professionals, and local communities.
- Promote future replication: Discuss the VSB technology's replicability and scalability in other dam catchments, with a focus on sustainable water resource management.
- Facilitate multi-stakeholder engagement and knowledge exchange.
- Promote awareness of siltation as a national issue and the importance of preventative sediment management strategies.

Programme Director: Dr Stanley Liphadzi, WRC

**Programme:**

| **Time** | **Activity** | **Responsible** |
|---|---|---|
| **SESSION 1** | | |
| 09:20 - 10:00 | Registration | Event Coordinators |
| 10:00 – 10:15 | Welcome address | Mayor, King Cetshwayo DM |
| 10:15 – 10:30 | Remarks | Local Tribal Authority |
| 10:30 – 10:50 | Opening Remarks | WRC CEO – Dr Jennifer Molwantwa |
| 10:50 – 11:05 | Water Resource Management, Regional perspective | DWS Regional Head |
| 11:05 – 11:20 | Project Overview | NatSilt Senior Project Manager – Ms Lesego Gaegane |
| 11:20 – 11:40 | Q&A and Discussion | NatSilt Senior Project Manager & technical team |
| 11:40 – 12:10 | Keynote Address | DWS Deputy Minister - Mr. David Mahlobo |
| **SESSION 2** | | |
| 12:10 - 12:25 | Live Demonstration of VSB Plant | ASP Technology |
| 12:25 - 12:35 | Handover of the Technology | WRC - DWS and District Municipality |
| 12:35 - 12:45 | Closing Remarks | WRC Technology Transfer Manager - Thabo Mthombeni |

| Time | Activity | Responsible |
|---|---|---|
| 12:45 - 14:00 | Networking and Refreshments | All Participants |