



water affairs

Department:
Water Affairs
REPUBLIC OF SOUTH AFRICA

Directorate: National Water Resource Planning

STRATEGY STEERING COMMITTEE OF THE VAAL RIVER SYSTEM PROGRESS REPORT - April 2012

1. INTRODUCTION

The sixth meeting of the strategy steering committee (SSC) was held on 18 April 2012 to discuss the progress with the implementation of the Reconciliation Strategy for the Vaal River System (VRS).

The meeting was attended by stakeholders representing key national and provincial government departments, municipalities, water service providers, industry and civic organisations as well as agriculture.

The SSC, which meets every six months, decided the October meetings should put more emphasis on updating the Reconciliation Strategy while the April meetings will be used to report back on each action.

Comprehensive progress feedback on each strategy action was given by representatives of the responsible organisations. The conclusions from these presentations still indicate that sufficient water can be made available until the year 2050, but **only** if all the actions are implemented and the set targets are achieved.

The strategic actions needed are:

- Eradicate unlawful irrigation water use by the year 2013, or soon thereafter;
- Continue with the implementation of Water Conservation and Water Demand Management (WC/WDM) to achieve further targeted savings by the year 2015;
- Implement Phase 2 of Lesotho Highlands Water Project (LHWP) to deliver water by the year 2020; and
- Integrated Water Quality of the Vaal River System must be adequately addressed. The studies to address facets of the Integrated Water Quality Management are progressing, but progress in dealing with nutrient enrichment is not supported by monitoring evidence. The feasibility study to deal with Acid Mine Drainage over the long term is in progress.

A summary of the progress with each action is given below.

2. IMPLEMENTATION OF STRATEGY

2.1. Eradication of unlawful irrigation water use in the Vaal River System

Regulations to enforce the measurement of water abstraction for irrigation purposes is a prerequisite for efficient and effective action against unlawful water users, as this will reduce the

responsible authority's burden of proof. Until such regulations have been published, action against partially unlawful water users would be problematic.

The Minister requested further stakeholder engagements before the draft Regulations (submitted for approval during November 2011) are published for comment and a team has been appointed to drive this process.

Good progress has been made with the Validation and Verification of water use in all three the Vaal Water Management Areas (WMAs). The eradication of unlawful irrigation water use in the VRS will, however, not be met as planned by the end of 2012, but the aim is to address 66% of possible unlawful use by May 2013.

Table 1: Project targets (surface water)

Description	Up to Mar 2012	Apr - Jun 2012	Jul - Sep 2012	Oct - Dec 2012	Jan - Mar 2013	Jan - May 2013
Unlawful use addressed ($m^3 * 10^6$)	24	25	25	25	25	10
Cumulative unlawful use addressed ($m^3 * 10^6$)	24	49	74	99	124	134
% of unlawful use addressed	12	24	36	49	61	66

The SSC is concerned about the delay in some of the actions, but significant reduction has already been achieved in unlawful water use.

2.2. Reduction in municipal water use by 15% through Water Conservation and Water Demand Management

The Minister of Water and Environmental Affairs requested a meeting with the Big 4: the three Gauteng Metros and Emfuleni Local Municipality to discuss the pollution in the Upper Vaal and Crocodile (West) Marico Water Management Area and also to discuss water conservation and water demand management (WC/WDM). A planning meeting was held on 5 April 2012 between the DWA, the three Gauteng Metros and Sedibeng District Municipality.

The following background perspective was provided at the meeting: A study was done to investigate the potential for WC/WDM across all sectors: industry, mining, agriculture and domestic (municipal). It was found that the municipal sector has the highest potential for water savings. All municipalities within VRS were assessed for their potential contribution towards WC/WDM, including costs.

Rand Water usage is the largest in the VRS – 41% - thereafter the Vaal-Harts irrigation scheme in the Lower Vaal. The current focus is therefore on the Rand Water users. There is a potential for WC/WDM in all municipalities of 200 million cubic meters per annum which equates to roughly 15% reduction in annual demand – Project 15%! The greatest potential for WC/WDM lies within the four biggest metros/municipality, therefore the current emphasis on Johannesburg, Tshwane, Ekurhuleni and Emfuleni Municipality.

Some of the issues to be discussed with the Minister are:

- Big 4 need to indicate understanding of the seriousness of the water situation;

- Big 4 need to re-commit, re-prioritise municipal activities, re-prioritise budget and step up implementation of WCWDM;
- All Metros had to submit Consolidated Action Plans by 13 April 2012 to the DWA. These plans cover time frames, municipal funding plans, sourcing of funds, (sufficient to show impact), monitoring mechanism that must be measurable; and
- SALGA must indicate the role they can play in addressing some of the problems highlighted in the meeting.

Each of the four municipalities (Johannesburg, Tshwane, Ekurhuleni and Emfuleni) presented how they are meeting their target savings as well as what strategies and plans are being implemented. The SSC commended the efforts being taken by the municipalities, however, the fact that no saving is shown on the total Rand Water supply is still a major concern. According to the municipal representatives the most important factor hampering achievement of the targets is a lack of sufficient budget for WC/WDM implementation.

2.3. Implementation of Phase 2 of the Lesotho Highlands Water Project

South Africa and Lesotho signed an agreement in Maseru in August 2011 for the implementation of the second phase of the Lesotho Highlands Water Project (LHWP). Phase 2 of the LHWP will consist of the building of the Polihali Dam and a water delivery system to supplement the water in the VRS.

The agreement has not yet been ratified by Parliament, but the project is still on schedule and the project should deliver water by 2020.

The SSC is concerned that the agreement has not yet been ratified, but remains confident that the 2020 target of water delivery to the VRS will be met.

2.4. Progress of the Water Quality Management Strategy and the management of Acid Mine Drainage

The Integrated Water Quality Management (IWQM) Strategy is facing some obstacles but the Acid Mine Drainage (AMD) problem in Gauteng is being managed by a set of short term and long term interventions which look very promising.

Stage 1 of the immediate solution (the refurbishment of the water treatment plant at Rand Uranium) has been commissioned on 20 April 2012 which increased treatment capacity from 12 to 24 ML/day. The Stage 2 commissioning by the end of April 2012 will achieve the maximum capacity of ~35 ML/day. Agreements with Rand Uranium (for the positioning of the treatment plant) and Mogale Gold (positioning of the sludge disposal site) will be finalised by the end of April 2012

Short-term treatment solutions for each basin have been conceptualised and construction works in the Central and Western basins should commence in June 2012. Four bids for short-term solutions were received and the evaluation of the bids will be finalised by 20 April 2012. The TCTA, which was appointed by the DWA, will recommend plausible options to DWA that falls within the current funding (R433 million). The TCTA intends to award the bid by mid-May 2012 and construction is projected to commence by the end of May 2012.

Some of the challenges facing this project are:

- There is only R433 million currently available while an estimated R1 billion is needed to complete the short term solution; and
- Access to land – The DRD mine is only prepared to make South West Vertical Shaft and land available with specific conditions. Expropriation is currently being investigated by the TCTA, but National Treasury is against this option. Meetings will be held with DRD to try and solve this problem.

Aurecon SA, SRK Consulting and Turner Townsend were appointed as lead consultants on 30 January 2012 to investigate and recommend a feasible long term solution to the AMD problems emerging in the study area, in order to ensure long term water supply security and continuous fitness for use of Vaal River water.

Meetings have been held with key stakeholders such as the Federation for a Sustainable Environment, Universities, Rand Water, Treasury, etc. The first Study Stakeholder Committee meeting is scheduled for May 2012.

Desalination of AMD is driven by the possible reduced assurance of supply in the VRS that will be caused by excess releases from Vaal Dam for dilution purposes and this leads to the need to implement the long term solution by 2014/15. Because there is a serious risk of delays if conventional project implementation processes are followed after the completion of the Feasibility Study, alternate fast-tracked implementation methods will be needed.

A feasible solution (one that is environmentally sustainable, technically sound, economically viable, institutionally feasible and legally acceptable) is being sought as a matter of urgency.

The aim of the IWQM Strategy is:

- Maintaining or improving the water quality of the water resources within the VRS for the benefit of all recognised water users and beneficial water uses in order to assist in securing ecologically sustainable development, while also promoting justifiable social and economic development;
- Managing the water resources of the VRS in order to comply with the determined integrated Resource Water Quality Objectives (RWQOs);
- Controlling the salinity, eutrophication and microbiological contamination levels in the VRS, and major tributaries, as the key water quality issues identified;
- Improving source management controls and measures as a means to limit and control point and diffuse sources that significantly impact on the water resources of the System; and
- Improving management of the water resources of the VRS by more effective monitoring, assessment, reporting and management participation.

Summary of salinity status:

- Total Dissolved Solids (TDS) data limited in places;

- General reduction in TDS concentrations (95th %tile measured over a period of 10 months minimum) in the Bloemhof Dam from 601 mg/l in 2005 to 482 mg/l in 2011. (It is suspected that this is due to the limited mine water discharges during this period);
- Vaal Barrage and Middle Vaal improvement due to mine discharges stopping; and
- The Level 1 RWQOs are met in most instances.

Summary of nutrients status:

- Phosphate data are limited;
- Average phosphate concentrations are high;
- The upper reaches of the Vaal River is in an oligotrophic state;
- Vaal Dam has deteriorated;
- Vaal Barrage to Bloemhof Dam reach is hypertrophic and requires urgent attention; and
- Nutrient balance studies must be undertaken to understand contributions from sources so management actions can be devised and taken.

The first Vaal River Integrated Water Quality Management SSC meeting is scheduled for July 2012.

The SSC is concerned about the water quality in the VRS, but there are good plans to solve the situation. Releases are still needed from the Vaal Dam for dilution purposes and this will increase once treated mine water is discharged into the system. On a more positive note; work has commenced on the long-term AMD strategies and the short term AMD projects are being implemented.

2.5. Vaal River System Classification Study

The classification of significant water resources in the three Vaal Water Management Areas (WMAs) is on target. The goal of the study is the implementation of the Water Resource Classification System (WRCS) in the three Vaal WMAs according to the 7-step process of the WRCS.

Since the last SSC meeting, Step 4 has been completed. This step entailed the identification of Ecological Sustainable Based Configuration scenarios (ESBC) which is the minimum level of protection to maintain ecosystem health.

During Step 5, eight different scenarios have been formulated for analysis and a subset will be evaluated with the assistance of stakeholders during Step 6. The next meeting of this study's Project Steering Committee takes place on 17 May 2012.

The classification of water resources will help in maintaining the desired state of the water resources by setting a Management Class (MC) for every water resource. A MC facilitates the balance between protection and use of the water resources. A MC is defined by taking into account the social, economic & ecological landscape and the process requires co-operation and transparency with all stakeholders.

The SSC is confident that this project will ensure that a balance will be kept between the need to protect and sustain water resources on one hand and the need to develop and use them on the other.

2.6. Reconciliation Scenarios Review

The water balance and reconciliation scenarios are constantly being revised as information changes. No changes were made and the Strategy therefore remains as it was at the previous meeting. The Strategy will be updated for discussion at the next meeting in October to include possible changes due to the risk of some of the key target dates not being met.

The following strategic interventions are vital for the future of the VRS:

- Eradication of unlawful water use by 2013, or soon thereafter;
- Implementation of WC/WDM (Project 15%) – achieve target savings by 2015;
- Implementation of Phase 2 of LHWP by 2020;
- Mine water effluent treatment and use by 2014;
- Plan yield replacement scheme in Orange – 2034;
- Manage uncertainties regarding the Crocodile (West) System and the Olifants System.

Crocodile (West) System Water Balance

The VRS is the source of purified water for a large portion of the urban water users located in the adjacent Crocodile West River System. The treated effluent from these urban areas represents more than 70% of the available water in the Crocodile West System and is also the intended source to augment the long term water needs of the planned energy related projects in the Lephalale Area (Waterberg Coal Fields).

The long term development plans for coal mining and electricity power generation on the Waterberg Coal Field are dynamic and **Figure 1** presents a summary of the water requirement scenarios that are being considered.

The Mokolo River and Crocodile West River Systems water balances are currently being revised based on the “Unconfirmed March 2012 Scenario” for the Lephalale Area. Initial calculations show that that additional raw water transfers in the form of treated wastewater will be required from the VRS to maintain a positive water balance in the Crocodile West River System over the long term.

The timing and volume of the transfers will be incorporated in the water balance and presented at the next SSC meeting.

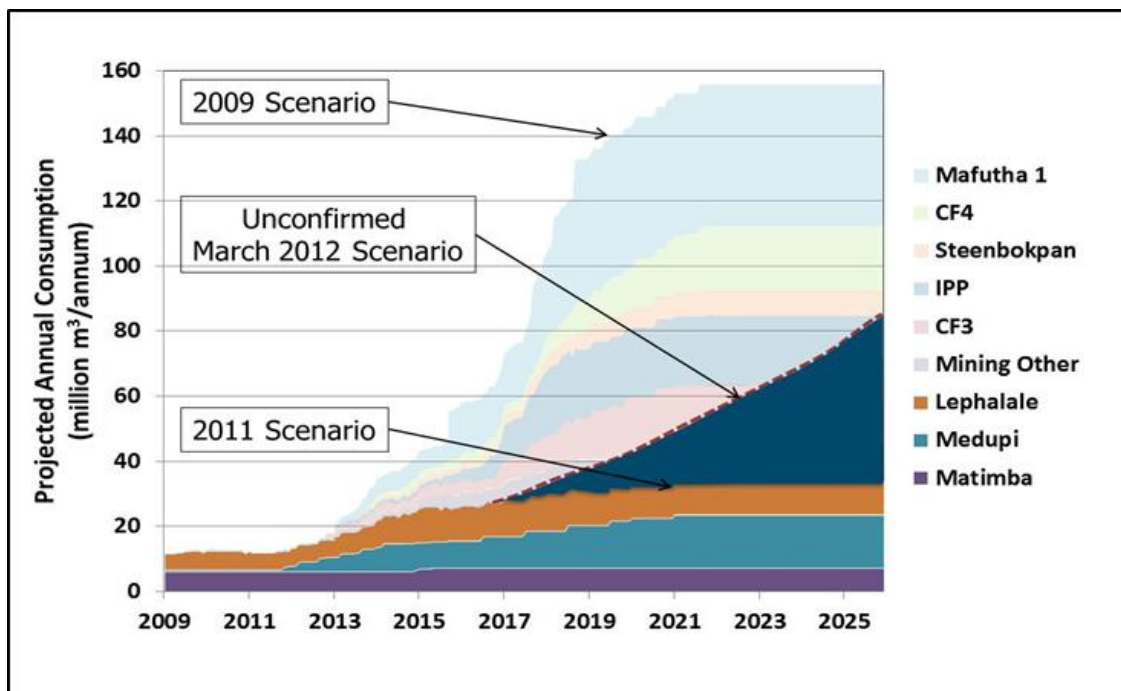


Figure 1: Water Requirement Scenarios Lephale Area

Risk Analysis

Scenarios were evaluated for flushing releases from the Vaal Dam for algae management in and downstream of the Vaal Barrage. It was found that releases of about 26 million cubic metres per annum are possible without affecting the date when Phase 2 of the LWHP will be required. Releases were however not made due to changes in the environmental conditions on the river as well as precautions taken to protect the construction of a weir in the affected river reach.

Information under review

- Revised water use figures for the 2011/2012 planning year are being collected and summarised for monitoring purposes;
- The final results from the verification study will be applied to the scenarios when available;
- The Orange River Reconciliation Strategy Study has been commissioned to determine the best long term water management solutions that will ensure both the Vaal and Orange systems have sufficient water for the next thirty years; and
- Revision of long term water requirements and return flow scenarios with data from Census 2011 is recommended.

3. GENERAL INFORMATION

Detailed progress reports on the water resource management strategies can be found at the following link: www.dwa.gov.za/Projects/VaalWRMS/documents.aspx. The Study Manager for this project is Mr Seef Rademeyer, Chief Engineer at the Directorate: National Water Resource Planning (Central). The next meeting of the Strategy Steering Committee is on 10 October 2012.