

CHIEF DIRECTORATE: INTEGRATED WATER RESOURCE PLANNING DIRECTORATE: NATIONAL WATER RESOURCE PLANNING

DEVELOPMENT OF A RECONCILIATION STRATEGY FOR THE OLIFANTS RIVER WATER SUPPLY SYSTEM

MINUTES OF THE 3rd STUDY STEERING COMMITTEE MEETING HELD AT FOREVER RESORT, LOSKOP DAM ON 25 MAY 2011 FROM 09:30 TO 13:00

In Attendance:

NATIONAL DWA

Nditwani Tendani (TN) - Chair Jezewski Witek (WJ) Van den Berg Ockie (OvdB) Van Rooyen Johan (JvR) Nyamande Tovho (TNy) Van Zyl Fred (FvZ)

water affairs

REPUBLIC OF SOUTH AFRICA

Department:

Water Affairs

REGIONAL DWA

Macevele Stanford (SMa) Mathebe Rodney (RM) Mashaba Manto (MMa) Van Aswegen Johann (JvA)

NATIONAL DEPARTMENTS

Mametja Edwin (EM)

PROVINCIAL DEPARTMENTS

Batchelor Garth (GB) De Witt Pieter (PdW) Mannya KCM (KCMM)

LOCAL GOVERNMENT

Mahlangu Vusi (VM) Makhwenyane Moses (MM) Mohlabine Levert (LM)

WATER BOARDS

Le Roux Roelf (RL) Nokeri Norman (NN)

ASSOCIATIONS

Bierman Bertus (BB) Gyedu-Ababio Thomas (TGA) Kruger Dirko (DK) Mabelane Reginald (RM) Rossouw Ossie (OR) Shaw Vicki (VS) Mpumalanga Region Limpopo Region Mpumalanga Region Mpumalanga Region

Dept. Agriculture, Forestry and Fisheries (National)

Dept. Economic Development, Environment & Tourism, (Mpumalanga) Dept. Agriculture, Forestry and Fisheries, (Limpopo) Dept. Agriculture, Forestry and Fisheries, (Limpopo)

Nkangala District Municipality Ehlanzeni District Municipality Nkangala District Municipality

Magalies Water Lepelle Water

Anglo American Platinum SANPARKS-KNP AGRI South Africa Chamber of Mines Lebalelo WUA Transvaal Landbou Unie

CONSULTANT TEAM

Beumer Johnny (JB) Levin Mannie (ML) Mallory Stephen (SM) Masogo Cornelia (CM) Baker Terry (TB) Van Veelen Martin Dr. (MvV)

Apologies

NATIONAL DWA Mosefowa Kganetsi (KMo)

REGIONAL DWA

Keet Marius (MK) Kobe Lucy (LK) Mabuda Mpho (MMp) Raphalalani Israel (IR)

LOCAL GOVERNMENT

Burger Johan (JB) Madisha Klaas (KM) Opperman Nic (NO)

ASSOCIATIONS

Meintjies Louis (LM) Wessels Piet (PW)

WATER BOARDS

Leballo Labane (LL) Schmahl Carel (CS)

AURECON Timm Dale (DT)

Aurecon

ACCRONYMS	
AMD	Acid Mine Drainage
CMA	Catchment Management Agency
CSIR	Council for Scientific and Industrial Research
DWA	Department of Water Affairs
EC	Ecological Category
EWR	Environmental Water Requirements
IDP	Integrated Development Plan
IWRMP	Integrated Water Resource Management Plan
OWAAS	Olifants Water Availability Assessment Study
PES	Present Ecological State
REC	Recommended Ecological State
RSA	Republic of South Africa
RS	
SADC	Southern African Development Community

Aurecon Aurecon IWR Water Resources Aurecon ILISO ILISO

Gauteng Region

Limpopo Region

Limpopo Region

Limpopo Region

Ehlanzeni District Municipality Capricorn District Municipality AGRI South Africa

National Water Form TAU SA Olifants River Forum

Lepelle Water Lepelle Water

SSC	Study Steering Committee		
WCDM	Water Conservation and Water Demand Management		
Agenda	Subject		
point			
1	Opening and Welcome		
	No. Tendeni Nelitureni of DNAA sheined the meeting. He undermodell measure and elected the		
	INF Tendani Nottwani of DWA chaired the meeting. He welcomed all present and alerted the		
	participants to the study and meeting objectives as stated below.		
2	Introduction of attendees		
	The chairperson called upon all present to introduce themselves. The attendees are listed		
	above.		
3	Study Objectives		
	The study objectives are to:		
	Address growing water demands;		
	 Address serious water quality problems; Identify reconciliation interventions, both structural and administrative or regulatory. 		
	 Identify reconciliation interventions, both structural and administrative or regulatory to address water demands and water quality problems and 		
	 Develop a dynamic reconciliation strategy to sequence the necessary actions for a 		
	planning horizon of 30 years.		
4	Meeting Objectives		
	The objectives of this meeting are to:		
	 Report back on progress with identified issues that needed further attention 		
	Recap on the preliminary reconciliation strategy		
	• Strengthen partnership between Department of Water Affairs and key stakeholders ;		
	and • Determine way forward for the study		
5	Adoption of Agenda		
	The proposed agenda was accepted without changes. The agenda is attached (Appendix 1).		
6	Minutes of the meeting held on 24 November 2010		
	Approval		
	The minutes were accented with Mr Mannya's suggestion that on page 1 under provincial		
	departments, the province being represented should be specified.		
	JVR proposed acceptance of the minutes and was seconded by JvA.		
	Matters Arising		
	The suggested list of seven was included in the minutes of the manifold was time		
	 The suggested list of acronyms was included in the minutes of the previous meeting. It was agreed that international obligations would be addressed as part of the 		
	• It was agreed that international obligations would be addressed as part of the presentations. The situation is briefly as follows:		
	\circ In 1971 Portugal and South Africa agreed to raise Massingir Dam with no compensation		
	pavable to South Africa. Portugal accepted that water in the Olifants River will		
	decrease. South Africa may not use Massingir water except for domestic and stock		
	drinking purposes.		
	\circ Previous agreements between South Africa and Portugal still remain and in terms of		

	 these agreements, there are no limitations to further developments in the catchment by South Africa. The Government of South Africa is also a signatory to the Revised Protocol on Shared Watercourse Systems in the Southern African Development Community (SADC) Region. The character of this protocol promotes inter alia the sustainable, equitable and reasonable utilisation of shared watercourse systems and avoiding to cause any negative impact to the neighbouring state. There are specific provisions in terms of which State Parties shall exchange information and consult each other and, if necessary, negotiate the possible effects of planned measures on the condition of a shared watercourse It was agreed that representation at SSC meetings and public engagement would be addressed after the presentations. 	
7	PRESENTATIONS	
	Moving from a Preliminary Reconciliation Strategy to a Final Reconciliation Strategy (Presented by Johnny Beumer (JB)	
	This presentation was an anchor for the presentations to follow.	
	JB reminded the participants that the Preliminary Strategy was presented at the 2 nd SSC meeting held on 24 November 2010. He pointed out that the purpose of the preliminary strategy was to understand the water situation in the study area; describe possible interventions; choose between those possible and not possible; sequence these interventions and pave the way for the final reconciliation strategy. He also emphasised that further investigations are needed in order to move from the preliminary strategy towards the final strategy. Hence the presentations during the meeting will also cover the work that required finalising the strategy.	
	He went through the overview of the study procedure as contained in the presentation pack (Appendix 2).	
	The flow of the presentations and the presentations are contained in Appendix 2.	
7.1	The ReservePresented by Dr Martin van Veelen (MvV)	
	MvV pointed out that the comprehensive Reserve study was undertaken in 1999. 18 EWR sites were selected for the study. The study included a qualitative assessment of the ecological state to determine the ecological categories, the setting of recommended ecological categories (ECs) with the Building Block Methodology and the setting of environmental water requirements (EWRs) for a range of ecological categories at each of the 18 chosen sites. Since 1999 the methodology has changed and the current study aims to determine what has changed and where the changed methodology would impact on the results. Fieldwork and a limited specialist workshop were undertaken. The aim of the workshop and fieldwork were to	
	find out whether the change was due to a change in the river or as a result of the methodology. It was found that some of the original sites were not accessible or were changed due to human intervention or flooding.	
	In the upper reaches there was a small change, which was driven by the water quality. Findings show that the recommended ecological category (REC) has dropped one class in the upper reaches. Furthermore, the REC for the lower Olifants (i.e. KNP) is one class higher as it was previously a C and is now a B.	
	Fundamentally, if the system is managed to achieve the REC, it affects the yield of the system.	

The original Reserve had an impact of 221 million m^3/a on the available yield. If the floods are removed from the rule tables associated with the Reserve, the impact reduces to 124 million m^3/a . The motivation for this change is twofold: In the first place the outlet capacity of the dams in the Olifants River is not sufficient to release the floods, and in the second place the incremental catchment downstream of the dams will generate floods naturally. It is therefore only a relatively short reach of the river downstream of the dams that will be affected.

If the present ecological state (PES) is accepted as a management objective i.e. no deterioration and no management for improvement, the impact on the available yield is 83 million m^3/a . A compromise between the impact on the yield for the REC (124 million m^3/a) and the PES (83 million m^3/a), might be the route to follow. This implies that an impact of approximately 100 million m^3/a , (i.e. 132 million m^3/a with the EWR of De Hoop Dam added) should be used in the water balance calculations.

Discussion

The following issues were raised during the discussion:

- Classification becomes an extremely important process.
- At the time most dams were built there was no requirement for ecological releases. Outlets of most dams do not have the capacity to release floods. De Hoop can release a relative large flow rate to flush the river (also called a freshet) of 1:1 (or 50% probability). The floods under discussion are about 1:5 year floods. The large ones of 1:20, 1:50 will happen, with or without dams. A major problem is situated in the middle Olifants, downstream of Flag Boshielo where the dam's outlet capacity is inadequate to release freshets and no significant tributaries downstream add any freshets to the river either.
- There should be a differentiation between quantity and quality in terms of the Reserve as the water quantity might be sufficient for Basic Human Needs and for maintaining the ecology but not the water quality. It was pointed out that some physical deterioration was due to water quality. The water quality problems need to be solved at the source. Classification has to determine the functionality of the rivers.
- The point was made that it will be difficult to implement the Reserve for maintaining the REC since attempts to implement the Reserve had been unsuccessful up to now. During Classification process stakeholders will convene and will decide on the class which comes down to balancing the ecological state with people's needs.

7.2	Water Quality	Presented by Dr Martin van Veelen MvV	
	Previous studies found that the cat Identified problems are defunct mine overloaded waste water treatment w	chment is experiencing localised water quality problems. As discharging acid mine drainage water and nutrients from a orks and irrigation return flows.	
	Middelburg Dam's pH, levels of am under pressure. This could be becar and electric conductivity values are s catchment are oligotrophic (nutrient and nutrients in its water, but rich i which is in a hypertrophic (extremely are becoming eutrophic.	monia, as well as nitrite and nitrate levels show that it is use it is impacted by mines and urban areas. Phosphates lightly high but within tolerable ranges. Most dams in the poor and oxygen rich, i.e. containing very little plant life n dissolved oxygen) except for the Bronkhorstspruit Dam y eutrophic) state. The Olifants River and the Loskop Dam	
	Future impact with continued activit the water taste but wouldn't be harm	ies will likely be the increase of chloride which will impact Iful to human health.	
	Most water quality problems are as solved at source and not by dilution	sociated with activities outside of the river and must be . The water balance is therefore not affected by impacts	

	resulting from water quality issues.	
	AMD treatment is essential to maintain water quality, if treatment is not done, it will impact on the river and the Loskop Dam. Water treatment will make more water available and at the same time solve the water quality problem.	
	Discussion	
	The discussion which ensued after the presentation highlighted and clarified the following issues:	
	• If water effluent is treated sufficiently at source before it is released into the resource so that the water quality in the resource is acceptable for the water users with the most stringent water quality requirements, then it can indeed be said that the water availability will not be affected by the water quality in the resource.	
	• Doubts were expressed whether it will always be cost effective to treat water at source. The following comments were raised in this regard:	
	 A detailed study considered the cost and practicality of AMD treatment. Pollution prevention should always be the preferable option above resource treatment. 	
	• When the "Polluter Pays" principle is applied, it should be considered who the polluter is – in the case of coal mining, the mining company or the end beneficiary (e.g. electricity user)	
	 This study should not focus on solving problems relating to detailed treatment of mine effluent. These need to be dealt with in a different study for which a separate steering committee needs to be established. 	
	• The Olifants, Levuvhu, Letaba and Inkomati Water and Environment Oversight Forum are currently dealing inter alia with water quality and quantity. Interaction with that forum through Mr Pieter Viljoen of DWA was suggested. The progress and findings of this study	NA14/
	should also be communicated with the forum on a regular basis.	
7.3	Groundwater Presented by Dr Mannie Levin (ML)	
	The catchment has 3 forms of aquifers; inter-granular (sand and alluvium) covering 0,5 % of the Olifants Water Management Area, inter-granular and fractured (weathered and hard rock) covering 96% and fractured and karst (dolomite) covering 3.5% of the total area.	
	The dolomites area in Bapsfontein is stressed as over abstraction from the aquifer is taking place for the purposes of irrigation, resulting in structural problems due to sinkholes. Zebediela is over exploited while the escarpment is not fully exploited.	
	Ground water availability in the catchment show that evaporation losses are high, potential availability is approximately 70 million m ³ per annum and it is distributed over a wide area.	
	Ground water availability in the catchment show that evaporation losses are high, potential availability is approximately 70 million m ³ per annum and it is distributed over a wide area. Possible groundwater options could be the management and control of over exploited resources such as the Delmas area; use of groundwater from decommissioned coal mines; development of under exploited resources such as unused dolomite; use of groundwater and surface water conjunctively as well as surface water recharge where there is aquifer availability.	

	would supply 95% of the plant's capacity to the STLM for distribution to the local communities and to release the remaining 5% into the river for the maintenance of the ecology. So far 1.1 million m^3 per annum is being supplied to STLM for water supply to Hendrina and KwaZamokuhle.	
	ML shared statistics of excess mine water volumes decanting in the Middelburg and Witbank Dam catchments. He showed graphs indicating that decant water volumes are expected to grow dramatically in future and that up to 45 million m ³ /a can become available in the next 25 to 30 years in the Middelburg and Witbank dam catchments. He mentioned that different information is being used for the eMalahleni future demands. The current All Towns study indicates much lower growth rates than the Integrated Water Resource Management Plan (IWRMP) of 2008. In conclusion he said depending on how the upper reaches of the Olifants River are managed, there could be between 25 and 40 million m ³ additional yield available by 2035 from the decanting coal mine fields in the catchments due to growth in eMalahleni and a detailed groundwater modelling is required to confirm the future decant.	
7.4	Surface WaterPresented by Stephen Mallory (SM)	
	SM presented a map showing the three sub-catchment areas, the Lower, Middle and Upper Olifants. He gave a summary of the available yield as per the Preliminary Reconciliation Strategy and a summary of the yield as updated recently. He further shared the latest information on the Phalaborwa Barage yield:	
	The Barage yield was not evaluated as part of the OWAAS study thus it was not included in the Preliminary Strategy. Under current conditions, the barrage's historic yield is estimated at 42 million m ³ per annum and the 1:50 year yield is estimated at 49 million m ³ per annum after allowing for the agreed release to the Kruger National Park.	
	He further presented updated graphs and tables on current water use and new information on mining water requirements. Water requirements projections for Mokopane and Polokwane, as well as the total urban and rural growth in water demand, the high growth scenario as per the Preliminary Reconciliation Strategy as well as the updated total growth in water demand for all sectors were also presented.	
	Discussion	
	 Several questions were raised on how the water balances had been set up. The following clarifications were given: Water requirements of municipalities are based on the figures in the All Towns study. The reduction in available water as a result of the Reserve is 132 million m³/a in total, i.e. 	
	 without the flood component of the Reserve. The latest yield figures of De Hoop and Flag Boshielo dams have been used, i.e. in accordance with the assessment done under this study. 	
	 Groundwater is not included in the water balance, neither small rural requirements. The latest water requirements obtained from the platinum mines were used. 	
	Mr FvZ, who was surprised about Polokwane's relatively low water requirements undertook to check his data and to confirm whether his data show any differences.	FvZ
	SM will contact mines that are not included in his list to confirm their water requirements.	SM
	The team will include groundwater use and availability in future presentations and in the final strategy.	ML SM

The Preliminary Reconciliation Strategy results pr	, , , , , ,
after revision of the water requirements and th 78 million m^3/a , and will probably end up at appro to be reconciled and as point of departure, the follo	redicted a shortage of 245 million m ³ /a and le Reserve quantity, the deficit reduced to ximately 100 million m ³ /a. The deficit needs owing assumptions were made:
• For the Reserve, at least the current ecolo maintained and improved where possible.	gical status of the Olifants River needs to be
• The ecological water requirements must 8 years.	be met as soon as practical phased in over
Water for strategic use and the country generation, must receive priority;	ry's benefit e.g. water supply for power
 No further increase in irrigation allocation. Water for economic growth, within the provided. 	e government's policy parameters, will be
 Basic principles for water reconciliation are: the need to recognise South Africa's inter Revised Protocol on Shared Water Courses, ensure efficient water usage, and 	ernational obligations in terms of the SADC
• eliminate unlawful water use.	
Possible intervention options are those that will r will increase the water supply.	educe water requirements and options that
These options can be divided into two groups, i.e less capital intensive), and development options (N construction of a dam).	e. management options (which are normally which can require large sums of capital – e.g.
Three scenarios were analysed and the water boot options commencing over the 30 year planning how	palance for each was tested with different rizon.
Connerio 1.	
Scenario I:	
The high water requirement projections were	assumed.
 The high water requirement projections were The impact of the Reserve on the total availa 200 million m³/a. Implementation starting in 2 Management options implemented as follows: 	assumed. ble yield is such that it reduces the yield by 2017 and phased in over 8 years.
 The high water requirement projections were The impact of the Reserve on the total availa 200 million m³/a. Implementation starting in 2 Management options implemented as follows: Water conservation and water demand mining sectors starting in 2012 and a 20 million m³/a and 7 million m³/a respection. 	assumed. ble yield is such that it reduces the yield by 2017 and phased in over 8 years. : management for the irrigation, urban and chieving full savings of 34 million m ³ /a, vely in 5 years' time. 2 and implemented in 2013 increasing the
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Scenario 2:

Same as Scenario 1, with the exception that a further water transfer from the Vaal Catchment is assumed instead of Godwinton Dam.

A water balance could also be achieved over the full planning period for Scenario 2.

Scenario 3:

Same as Scenario 1 with the Reserve implemented without the flood component, thus reducing the total available yield by 132 million m^3/a instead of 200 million m^3/a . Furthermore, Godwinton Dam is not assumed for this scenario.

A water balance can just be achieved on condition that all savings/increases in supply will be achieved for all the management interventions.

Based on the three scenarios, JB highlighted the possible recommendations that could possibly go into the final Reconciliation Strategy. They are:

- Unlawful Water Use must receive immediate attention;
- River Losses must be reduced;
- Increased yield from defunct coal mines must be investigated further;
- Extent of Invasive Alien Plants must be determined;
- A thorough investigation into the Reserve: The 1999 study should be updated using improved methodologies;
- All the possible management options to reduce water requirements should be implemented as soon as possible;
- The validation and verification process should be accelerated;
- Groundwater development in unstressed sub-catchments must be encouraged;
- Bulk water abstraction from the Malmani aquifer where it crosses the Olifants River must be investigated together with the possibility of artificial recharge with surface water;
- A possible water transfer from the Crocodile (West) system should be investigated further at pre-feasibility level;
- Water trading should be encouraged;
- A geohydrological study needs to be done to study the interaction between groundwater and surface water more accurately in the escarpment dolomitic aquifer;
- The impacts of all interventions must be continuously monitored.

Discussion:

The discussion that followed touched on several issues to which the team should pay attention. The following issues were raised:

Governmental Cooperation:

- Cognisance should be taken of the Growth and Development strategies as presented by the Premier of Limpopo.
 JB, MvV
- There is a need for improved governance. The acceleration of the establishment of the CMA was emphasised.

Water Conservation and Water Demand Management:

- ESKOM should also contribute to WCDM in accordance with the energy saving strategy's promise to halve the water use by 2020.
- The 50% water loss as in the DWA report on WCDM for Emalahleni was determined in 2005 and may have improved since then.
- The team must make sure that the water requirements for Emalahleni does not already include the WCDM measures, otherwise it could be double counting the WCDM water saving.

JB,

MvV

SM

SM

	Water for the Irrigation Sector:		
	• The message of no further water allocation to the irrigation sector should be clearly communicated.	JB, TN	
	 There was not complete agreement on the issue of no further irrigation allocations – it was felt that food security should also be prioritised. This issue was however debated and it was pointed out that food security is different from food self-sufficiency. Food security does not necessarily mean that you have to grow your food for the catchment in the catchment. There could be potential to grow food under rainfall conditions on a large scale in other parts of the region. 		
	 Assurance of supply of 80% for the irrigation sector as assumed by the team might be too high. Depending on the percentage permanent crops, 70% assurance of supply will be more realistic. 	SM	
	 Validation and verification results are long overdue. Water trading is already taking place. The effectiveness of the current water trading should be investigated. 	JvA JvA	
	 Reserve: The recommendation by the team that the Reserve should be re-investigated was seen as unnecessary. Methodologies might have changed since 1999 but the 1999 Reserve has been signed off and never had a chance to be implemented. 	Noted	
	 Water Transfer from Crocodile (West) Catchment: Magalies Water should be involved in a pre-feasibility study should any of the water transfer options from the Crocodile (West) catchment be considered. 	DT	
8.	Public Engagement Presented by Cornelia Masogo (CM)		
	The original approach was to hold two public participation meetings and to produce two newsletters. A change is now recommended due to the technical nature of the reconciliation strategy and the need to access relevant stakeholders.		
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	The final strategy will be presented at the next meeting but the document will be distributed to the members for comment and consolidation before the meeting.	
	The next meeting date was scheduled for 16 November 2011 at a venue to be sourced and advised. Nkangala District Municipality is earmarked. CM was tasked to manage the logistics.	СМ
10.	Closure	
	TN thanked all present and invited the participants to lunch. The meeting adjourned at 13:00	