The Hartbeespoort Dam is the most significant dam in the economic hub of the Crocodile West Marico Water Management Area for domestic, agricultural, industrial and recreational purposes. However, it is in a hypertrophic state (excessive nutrients are trapped in the dam). For many years, the Crocodile river has been pouring an increasing load of phosphorus (about 166 000 kilograms per year) into Hartbeespoort Dam, causing high levels of nutrients and eutrophication of the water. Nine wastewater treatment works discharge their 620 million litres per day of purified effluent into the Crocodile River and very high loads of waste water effluents, with polluted stormwater from the catchment, intensify the occurrence of blue-green algae or cyanobacteria.

The Water Information Network (WIN-SA) spoke to Petrus Venter - Deputy Regional Director: Water Resource Management: Croc (West) Marico about how the Department of Water Affairs and Forestry (DWAF) is developing a plan to deal with this issue of catchment pollution. He said that the conditions of the Hartbeespoort Dam are like the symptoms of a very sick person. In the same way that a sick person needs to heal the imbalances in his/her life that may be causing the sickness, the relevant authorities have to assess the causes for the dam’s “illness” and implement the appropriate “cures” for these.

I believe that the dam’s sickness is a symptom of modern lifestyles and consumers need to assess their respective lifestyles if natural resources are to survive for the next 50 years. The negative impacts and demands of a growing population and modern civilization on the Hartbeespoort Dam ecosystem are the main challenges to address.

It has been established that sometimes 80% of the cyanobacteria algae on the dam is toxic and proof that the ecosystem is unhealthy and unbalanced. Fish and vegetation life has become distorted and human and environmental health is increasingly threatened by the unclean waters. The dam is still in a sick state despite DWAF’s ongoing efforts to deal with the polluted water by implementing the Special Phosphate Standard during the past 30 years. Studies on the algae and phosphorous loads have proven that much more needs to be done to effectively address the problem.

As a result, my department, DWAF, and the North West Department of Agriculture, Conservation and Environment (NWDAEC) have initiated the development of a Resource Management Plan (RMP) as part of the implementation an integrated biological remediation project. The focus of the Hartbeespoort Dam Remediation Project is the management of phosphate through natural uptake in a food chain and re-establishing a biological balance within the dam waters. Rand Water, as implementing agent on behalf of DWAF, is working with the Hartbeespoort Dam Implementing Task Team (HDITT) in the preparation of the RMP. This is based on the Integrated Water Resource Management approach which advocates for a coordinated approach to the management of water and related resources in order to maximize the resultant social and economic benefits.

Known as Harties Metsi A Me (Harties my water), the Project aims to unlock local job creation and will cost about R60m during the first two years, taking three years altogether to reach its first expected / tangible results. Through this project, integrated initiatives including physical, chemical and biological action plans will ensure that the dam is biologically stable and free from toxic algae in future.

My colleague, DWAF project manager for the RMP, Cilliers Blaauw, has indicated that such actions are in line with Chapter 2 of the National Water Act (No 36 of 1998). Harties Metsi A Me is therefore focusing on the principles of integrated catchment management and the establishment of a Water Users’ Association for future management. It must also incorporate the region’s plans for clean water provision, biodiversity and cultural heritage conservation, eco-tourism development and environmental education about waste management.

We recognize that the challenges, upstream of the catchment...
In summary, through this Remediation programme, we are calling for an investigation into different aspects to improve water quality at the dam. Various identified activities include:

1. the development of a Resource Management Plan, the first public meeting for which took place on 12 September 2007 at the Hartbees Fisheries;
2. the reconstruction of the fish population (removal of a bulk amount of carp, catfish, and canary kurper);
3. the restoration of the shoreline vegetation in order to reconstruct the food web in the dam;
4. the control and physical removing of algae and Hyacinths on the dam;
5. the pre-impoundment and treatment for water upstream of the dam basin;
6. the rehabilitation of existing wetlands and the reconstruction of new artificial wetlands;
7. the removal of sediment and the reduction / treatment of the inflow of nutrients (phosphates and nitrogen);
8. the improvement of storm water and long term monitoring of the water quality.

We believe that all stakeholders, including municipalities, must participate in the implementation and regulation of the plan according to the relevant legislation, which activities they want on the dam and who will implement the plan.

DWAF requires municipalities to comply with the standards of water quality and to control sewage spills into the water, but this alone will not change the conditions of the dam if the phosphate levels and total load can not be decreased dramatically. We are confident that Rand Water will also sensitize and gain the support of the public, local municipalities (water users) and large water consumers (industry & mining, etc) through communication, awareness and education of the programme objectives.

We are also working with the Hartbeespoort Dam Water Action Group (HWAG), a non-profit Section 21 Company, formed by people living around the Hartbeespoort Dam who want to address the causes of the algae problem (unbalanced nutrients and ecology) and physically remove the excessive algae on the surface. Founded in 2001, HWAG is also working with the local municipality and has assisted relevant national and provincial governmental authorities with the proposal for the Hartbeespoort Dam Remediation Project.

I feel that it is important to ensure that implementing one aspect does not impact negatively on another, as the problem is then moved and not solved. For example, the reconstruction of the fish population cannot start if there is no improvement in the food chain to feed the desired fish species.

The upstream and downstream programme also recommends: (i) enhanced sewage disposal systems both upstream and in new developments; (ii) minimising the scope of development and land-use change, using the principles of conservation development (storm water retentions, wetland development & protection and sustaining diversity); (iii) farmers using water conservation tillage & preserving / increasing organic material in soil to improve soil moisture content, integrated nutrient and pesticide management, and pasture management as well as cropping patterns and crop rotation cycles, with attention to the specific topography, hydrology, and soil characteristics for each farm; and (iv) reducing pollutant loadings from household and commercial sites.

Conclusion

The Hartbeespoort Dam is a valuable water resource with a major economy around recreation & tourism attractions. It is also part of the Heritage route to the World Heritage site (Cradle of Humankind). People and businesses are moving into the area, contributing to its economic growth. Therefore an effective reservoir management programme for Hartbeespoort Dam, based upon the recommendations of the RMP, will ensure clean water for human and environmental health. The RMP could be an example to other polluted catchments in the country. The National Water Act (Act No 36, 1998) Chapter 2


The development of: 1. National water resource strategy - to provide the framework for the protection, use, development, conservation, management and control of water resources for the country as a whole, it also provides a framework for regional development, conservation, management and control of water resources within a water management area or catchment, in defined water management areas. 2. Catchment management strategies - for the water resources within a water management area in harmony with the national Water resource strategy and setting principles for allocating water to existing and prospective users, taking into account all matters relevant to the protection, use, development, conservation, management and control of water resources.