

# Water and mining

## Connecting research and policy - Three WRC research reports taken up in new mining and environment policies

*Government needs effective research on which to base decisions. The Water Research Commission (WRC) and its research partners are leading the way in ensuring that its research and projects impact on relevant water policies. In the latest example, government's new water use licence application regulations reference the WRC's water, wetlands and mining guides.  
Article by Kim Trollip.*



Wetlands ecosystems are vital ecological infrastructure that provide valuable services to people and are important biodiversity assets. By virtue of their positions in the landscape and relationship to drainage networks, wetlands are frequently impacted by coal-mining activities, especially opencast methods. The impacts are ongoing, since coal is a strategic resource and will continue to be mined to support the country's development. The new water use application regulations that reference the WRC reports now insist that mines avoid, minimise and mitigate their impacts on wetlands.

Dr Jo Burgess, WRC mine-water treatment and management research manager, says she is absolutely delighted at the policy uptake. "These particular publications, the *High Risk Wetlands Atlas*, the *Wetland offsets: A best practice guideline for South*

*Africa* and the *Wetland rehabilitation in mining landscapes: An introductory guide* are superb examples of how successful a collaboration between government organisations and the private sector can be." The project was a multiyear collaborative effort between the WRC, CSIR, South African National Biodiversity Institute (SANBI), Working for Wetlands (WfWET), and the Coaltech Research Association. The project delivered an innovative suite of products to limit and mitigate the impact of coal-mining on wetlands.

### Connecting research and policy

Globally, the link between academics and policy-makers has been described as fragile, and key disparities can limit how effective academic research can be for policy-makers. Common problems raised are around communication, priorities and

openness. So what did the WRC do to ensure that these important reports were actually taken up in the new regulations?

“Right from the beginning of the research phase of this project, we took great care to include as many representatives from the mining industry as possible in the project’s Reference Group,” explains Dr Burgess. “This meant that the guidelines would not be developed out into something that is completely impractical or impossible to implement. We also included all relevant government departments in the Reference Group – that meant that the resulting guides would fit the regulatory frameworks, and be enforceable.”

Her colleague, John Dini, WRC water governance research manager, agrees. Dini was with project partner SANBI when the research kicked off and he says, “What has been particularly rewarding is to see the rewards of the deliberate approach we took in this project, namely assembling a team that consisted not only of researchers, but also policy advisors. This resulted in an approach with one foot in the technical content and the other in the policy landscape. Coupling the strong multi-disciplinary scientific capacity with an ability to understand and navigate the entry points in the policy landscape proved to be a powerful recipe. The relationships and networks that each team member brought to the project were as important as the knowledge that they brought. This does not mean that working successfully along the science-policy-practice continuum is easy, so when we do get it right and see such a direct uptake of research outcomes in policy, in the form of regulations in this case, it is very rewarding.”

Dini adds, “At least in this case we know that the hard work that went into doing the research will not end up just sitting in a set of reports that a limited set of people will read. It demonstrates how research has the potential to contribute to tackling real world problems, rather than just being an academic endeavour.”

Project partner and CSIR senior researcher, Dr Arno de Klerk, concurs, “The success of these research reports is a good example of how different organisations can come together to produce really high impact products, utilising the different sets of expertise that they can offer. It required everyone to work together, think outside of the box, interact with stakeholders to make sure we keep on track and, most importantly, that the

products being developed are actually relevant, not only for the regulator, but also for industry. I think this made a huge difference ensuring that these products will actually be taken up and used.”

During the research phase, the actions set out in the guides for things such as rehabilitation activities were presented by biodiversity and environmental protection experts from organisations like CSIR, SANBI and the Endangered Wildlife Trust as conservatively as possible. Workshop processes were then used to make these activities enforceable, by discussion and adjustment by the team with inputs from government, and implementable by negotiation with the mines, a relationship enabled by the Chamber of Mines.

The result is a set of best practice guides that the industry thinks is not lenient enough, but is achievable, and which the regulator thinks is too lenient, but is possible to enforce. At the same time, the environmental experts who participated think that by adhering to these guides, the mining industry will afford wetlands adequate protection.

After conclusion of the research phase, the guides were presented as many times as possible to as many audiences as could be reached – the mining industry, the water sector, regulators’ forums, the research community – to make as many people as possible aware of them and their potential use. The Department of Water and Sanitation (DWS) was included fully in the Reference Group, and went on to champion the inclusion of the guides in the new water use licence application regulations as applicable to the National Water Act (NWA). They went through their internal processes, and now the guides have been identified in the Government Gazette of 24 March 2017.

Dini believes the magic ingredient was the good working relationship between key individuals in the project team and several officials in DWS. These relationships preceded the project. Engagements between these individuals, around taking up some of the research outputs into the regulations, continued long after the completion of the project. The existence of these champions within DWS, who could take content from the project team and inject it into the relevant policy processes within the department, made all the difference.

**The reports listed below contain the standardised and accepted methods that must be used for determining the various aspects of assessments during the WUA process related to wetlands:**

- 1) Wetland and riparian habitat delineation document (DWS report on DWS website);
- 2) Wetland Buffer Guideline (SANBI WRC project and Report, on DWS website)
- 3) Wetland Offset (WRC report TT660/16; on DWS website)
- 4) High Risk Wetland Atlas (WRC Report TT659/16, on DWS website)
- 5) Wetland Rehabilitation in mining landscapes (WRC Report TT658/16, on DWS website)
- 6) Risk Assessment Protocol and associated Matrix (DWS document on DWS Website)

*The above excerpt is taken from the recently gazetted document regulations and references the three WRC research reports.*

John Dini



Mining and wetlands can coexist if measures are taken to minimise and mitigate impact. The image shows the Mooifontein wetland.

*“I really hope that these products can be used not only to help protect our wetlands, because our wetlands are very valuable resources, but also to assist industry and add to South Africa’s economic growth. Furthermore, I also hope that this will help to streamline the whole authorisation process so that everyone works from the same available information.”*

*Dr Arno de Klerk, CSIR*

Beyond the organisations involved was the community of practice that developed around the project. The coal mining industry, through Coaltech and its members, was a strong driver behind the initiation of this work. The mining companies that are members of Coaltech were keen to do the right thing, but felt that some of the information that they needed, for example, to enable them to avoid more sensitive and valuable wetlands that would trigger more stringent conditions of authorisation or no authorisation at all, was not readily available. Representatives from the DWS were involved right from the beginning of the project and had expressed their needs. A level of trust was formed by having these different parties working together, which made the next step of taking some of the outcomes into policy that much easier.

### **Importance and relevance of this new policy guideline**

In addition to their ecological role mentioned above, wetlands help to buffer flood waters, soak up water to release more gradually over time, filter sediments, purify water, and provide forage for livestock and refuge for numerous species. While remarkably resilient in many ways, they are vulnerable to a range of direct, indirect and cumulative impacts. In mining landscapes changes in landscape hydrology and water quality often impact upon downstream water resources and associated users with various consequences for people and biodiversity.

The current state of wetland ecosystems in South Africa is such that impacts on remaining wetlands have cumulative, and sometimes significant consequences. There are indications that the cumulative loss or deterioration of services derived from



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The project Reference Group was carefully selected to include members from both government and industry.

wetlands is undermining the ability of the affected landscapes to deliver these functions, which in turn has social, economic and ecological implications. This is of direct relevance to the mining sector.

Impacts on wetlands should be avoided and minimised whenever possible. Where wetland impacts or degradation do take place, wetland rehabilitation should form part of the mitigation of these impacts.

The *Wetland offsets: A best practice guideline for South Africa* serves as a practical tool to aid in the consistent application of wetland offsets in South Africa. The guideline is primarily aimed at wetland offsets required as part of water use authorisation processes (e.g. in an application for a Water Use Licence under the NWA) where compensatory actions are required to achieve water resource management and biodiversity conservation objectives. The guideline is equally relevant for use in environmental impact assessment processes (e.g. as part of the environmental authorisation process in terms of the National Environmental Management Act or in an application for a mining licence or development of an Environmental Management Programme under the Mineral and Petroleum Resources Development Act.

The *Wetland rehabilitation in mining landscapes: An introductory guide* is structured to provide users with the core principles that should inform planning and decision-making at different phases of wetland rehabilitation, namely planning, implementation, and monitoring and long-term management phases. Key elements integral to wetland rehabilitation in each phase are summarised in easy-reference checklists that help users ensure that the guidelines provided in this document are adhered to. An overview of legal considerations for wetland rehabilitation in the mining landscape is also provided.

By consolidating existing guidance on wetland rehabilitation in mining landscapes, this introductory guide aims to promote the standardised application of tools in wetland rehabilitation and improve clarity with respect to wetland rehabilitation planning, design and implementation in mining landscapes. In particular the guidance is intended to provide appropriate practical and strategic approaches to wetland rehabilitation, and to support the development of wetland rehabilitation and management commitments and license conditions that are realistic, achievable and can be monitored. Well planned and

implemented wetland rehabilitation can help to avoid a range of risks for proponents, government and affected communities and ensure compliance with environmental legislative provisions and authorisation requirements.

“Where impacts cannot be avoided and are sanctioned by the regulators, we hope to see the implementation of offsets that are sustainable and adequately compensate for the impacts to wetlands caused by the mining,” adds Dini. “Lastly, through the guidance on wetland rehabilitation in mining landscapes, we hope to see post-mining landscapes that achieve, as far as possible, better ecological and hydrological functioning and connectivity than is currently the case.”

The bottom line is that trade-offs inevitably have to be made when extracting a strategic resource like coal in areas that are also important for water and biodiversity. The tools provided through the research work help to ensure that the information at the disposal of mining companies and regulators provides the full picture of all the costs and benefits of proposed mining activities, so that decisions on trade-offs can be made on this basis.

As well as the three printed guides, there is a software tool as referred to in the WRC report *High Risk Wetlands Atlas: Reference Guide to the Mpumalanga Mining Decision Support Tool*, which Dr Burgess says is one of the most valuable resources the WRC has produced yet.

The *Reference Guide* report provides the required information for users to install the atlas and access the underlying spatial data, as well as to provide supporting information on the preparation and content of the spatial data.

The atlas provides access to other key data that were not developed by the project but that are very useful for mining planners, such as the new Mpumalanga Biodiversity Sector Plan, updated Protected Area data, revised Strategic Water Source Data, revised Freshwater Ecosystem Protection Area (FEPA) data, and the new wetland data for Mpumalanga.

### The way forward

Dr De Klerk is positive about the future, but says work still needs to be done in the ecological infrastructure space to ensure environmental protection, as well as sustainable development and economic growth. “One such priority area we are now working on is the development of guidelines for pans (depressional wetlands) in South Africa. It will be great if this can also be taken up in policy, so that all stakeholders can work off the same available information.”

Dr Burgess adds that she hopes to see all future mining activity fully comply with the best practice. “I never want to see a wetland on a pedestal, surrounded by mined out land, again. I very much hope that as more and more mining companies find out about the guides and the requirement to use them the number of poorly cared for wetlands declines to none. I hope that DWS officials are now better equipped to make good decisions on water use licence applications, and that even if some mines do transgress, we now have three new books to throw at them.”



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Rehabilitation efforts can also result in employment opportunities.

*“In addition to their ecological role mentioned above, wetlands help to buffer flood waters, soak up water to release more gradually over time, filter sediments, purify water, and provide forage for livestock and refuge for numerous species.”*

### Regulations:

National Water Act: Regulations: Procedural requirements for water use licence applications and appeals: <http://www.gov.za/documents/national-water-act-regulations-procedural-requirements-water-use-licence-applications-and>

Mineral and Petroleum Resources Development Act: <http://www.gov.za/documents/mineral-and-petroleum-resources-development-act>

### Related project reports

- *Wetland Rehabilitation in Mining Landscapes: An Introductory Guide (Report No. TT 658/16)*
- *High Risk Wetlands Atlas: Reference Guide to the Mpumalanga Mining Decision Support Tool (Report No. TT 659/16)*
- *Wetland offsets: A best practice guideline for South Africa (Report No. TT 660/16)*
- *High Risk Wetlands Atlas: Reference Guide to the Mpumalanga Mining Decision Support Tool (Report No. TT 659/16)*

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