

**IN THE WATER TRIBUNAL OF SOUTH AFRICA
HELD AT PRETORIA**

Appeal No: WT 03/22/MP

In the matter between:

MAFUBE COAL MINING (PTY) LTD

Appellant

And

**CHIEF DIRECTOR: WATER USE LICENCE
MANAGEMENT DEPARTMENT OF WATER
AND SANITATION**

First Respondent

DEPARTMENT OF WATER AND SANITATION

Second Respondent

APPEAL DECISION

Corum:

T. Murombo
(Additional Member of Tribunal - Panel Chair)

U. Mbeki
(Additional Member of Tribunal)

Heard:

13-14 July; 13 September 2023.

Delivered:

4 December 2023.

Appearances:

For the Appellant:
Instructed by:

Adv. A Mckenzie
Nupen Staude De Vries Inc/NSDV (L Nupen
& L Maraschin)

For 1st and 2nd Respondent:
Instructed by:

Adv. N. Seleso with J. Mulaudzi
The State Attorney, Pretoria
M. Teffo DWS Legal Services.

INTRODUCTION

1. The facts of this appeal appear more fully from the record¹ and our interlocutory judgment dated 28 April 2023. In summary, Mafube Coal Mining (Pty)Ltd,(the Appellant) conducts coal mining operations in the Steve Tshwete Local Municipality in the Nkangala District. This ongoing mining takes place by virtue of a mining right granted to the Appellant in terms of the Mineral and Petroleum Resources Development Act 28 of 2002 (the MPRDA) (ref: MP30/5/1/2/2/172MR). Current water uses associated with the mining activities are authorised in terms of two water use licenses, number 24084722, issued on 14 January 2010 (amended 14 December 2018), and number 04/B12C/CI/8328, issued on 21 September 2018. Mafube mine is located approximately 17 kilometres north of the Arnot Power Station and 23 kilometres east of the town of Middelburg, Steve Tshwete Local Municipality, in Mpumalanga Province of South Africa. The mining operations fall within quaternary catchment B12C of the Olifants Water Management Area. As part of its mining operations, the Appellant also operates an existing discard facility where coarse and fine discard from its mining operations are disposed of in accordance with the water use licences noted above.
2. What prompted the water use licence application which is subject of this appeal is that the design and operating capacity of the Appellant's discard facilities have steadily depleted and may soon reach full design capacity. In fact the record

¹ Record (ROR) p966.

states that it would have reached full capacity by August 2020. The result is that the Appellant will be unable to continue with its mining activities unless a new discard facility is designed, approved, and constructed urgently.

3. The development of this new discard dump, known as the Mafube Discard Dump Extension (“Mafube Coal MRD”), and related infrastructure, requires various authorisations and licenses. These may include, among others, water use licence, environmental authorisation, waste management licences, and various plans as required by relevant legislation. The construction of the proposed new discard dam triggers several water uses as defined in section 21 of the NWA.²

On 23 June 2020 the Appellant applied for a water use licence for the construction of a new discard dump for its mining activities (Integrated Water Use Licence Application (IWULA) reference number 27/2/2/6312/11/3). The application and specialist reports were considered and declined by the respondent on 10 May 2022,³ and reasons for decision were availed to the Appellant on 28 September 2022. Unsatisfied by the decision and the reasons, the Appellant lodged an appeal 8 June 2022. The appeal was initially addressed to the Minister of Water and Sanitation but subsequently amended to be directed to the Water Tribunal.

² Record (ROR) p966; Section 21(c) Impeding or diverting the flow of water in a watercourse, section 21(g) disposing of waste in a manner which may detrimentally impact on a water resource, and section 21(i) Altering the bed, banks, course or characteristics of a watercourse.

³ Record (ROR) p968.

4. The Respondent declined the water use licence application based on two main reasons. The reasons pertained to geohydrological issues and the civil engineering design of the liner system. The letter of decline stated that,

- a) The proposal not to line the discard dump with a Class C liner but to rather make use of a semi permeable compacted discard and scavenger boreholes is not acceptable as it promotes the concept of pollution and remediation rather than pollution prevention or containment. This places a greater risk on the environment especially in cases where all the pollutant is not pumped out due to for instance, model inaccuracies.
- b) The existing groundwater pollution in the area possibly emanated from the existing unlined discard dump and the backfilled pit. Due to shallow groundwater table the proposed discard dump is regarded as potential source of groundwater pollution. Therefore, an alternative site for the proposed extension of the discard dump should be identified.⁴

5. Apart from these geohydrology and civil engineering concerns, the other internal specialist of the Respondents recommended issuance of the water use licence subject to various conditions.⁵ A section 27 (1) motivation⁶ and report demonstrates that there were no major issues with the other factors considered before the decision was taken. There is an acknowledgement by all the parties, which we concur with, that while mining activities of the Appellant are contributing to the social and economic development – locally and nationally – these activities are also taking place in an environmentally sensitive area with

⁴ Articulated in detail in the ROR- Record p976 (*our emphasis*)

⁵ Record (ROR) p976-978.

⁶ Record (ROR) p979.

already degraded water and environmental quality.⁷ There is also agreement that mitigation measures proposed to protect wetlands are adequate.⁸ The first reason for decline of the licence speaks to potential pollution of the groundwater on the site due to the proposed liner design.

6. The activities for which water use is required are ongoing and the proposed discard facility are additional and aimed at enabling the Appellant to continue mining until the life of mine is reached. The site on which the new discard facility is earmarked is a rehabilitated, previously mined area within the mining complex. In other words, it is a brownfield development as opposed to a greenfield project where the site is undisturbed.
7. Confronted by the letter of rejection and the reasons stated above, the grounds of appeal are that the Respondent,
 - 7.1. failed to consider the risk-based approach provided for in Regulations Regarding the Planning and Management of Residue Stockpiles and Residue Deposits from a Prospecting, Mining, Exploration or Production Operation, as amended (GN R632 of 24 July 2015);
 - 7.2. failed to consider the scientific and specialist information provided to it by the Appellant, in particular that:

⁷ Record p133-135 and p980-981.

⁸ Record (ROR) p973, see also p320-340, Mafube Mine Residue Project Integrated Water and Waste Management Plan (IWWMP.)

- i. the barrier that the Appellant proposes to line its new discard dump with, does not place the environment at a greater risk of pollution than the use of a Class-C liner (as defined in the National Norms and Standards for Disposal of Waste to Landfill (GN R636 of 23 August 2013); and
 - ii. despite various feasibility studies undertaken, there were no alternative sites available to the Appellant for the construction of its proposed new discard dump, which sites posed less of a risk to water resources;
- 7.3. failed to consider the prejudice to the Appellant's continued operation of its mining activities; and
- 7.4. is irrational as it promotes ongoing and potential pollution.⁹

THE ISSUES BEFORE THE TRIBUNAL

8. In the context of the reasons for decision and the grounds of appeal raised by the Appellant we believe that the main legal issues for decision in this appeal are as follows,

- 8.1. Whether the Respondent failed to apply a risk-based approach, as required by law, in determining that the alternative barrier design (semi permeable compacted discard and scavenger boreholes) proposed by the Appellant was not equivalent to, or better than, a Class C HDPE lined barrier?

⁹ Record p989 - Amended Notice of Appeal.

- 8.2. Whether the Respondent was correct in deciding that the site chosen by the Appellant for the new discard dump was unsuitable given existing pollution, low water table, and the risk of groundwater pollution.
- 8.3. Whether the decision to decline the application is prejudicial to the Appellant's continued operation of its mining activities.
- 8.4. Whether the decision is irrational in that it promotes ongoing and potential pollution.
- 8.5. In the context of the National Water Resources Strategy III (NWRS III),¹⁰ the National Water Act 36 of 1998 (the NWA), the principles in section 2(4) of the National Environmental Management Act 107 of 1998 (the NEMA), the specialist reports submitted by the Appellant and expert testimony thereon, the respondent's submissions and witness testimony – whether the Appellant is entitled to a water use licence as applied for.
9. Issues 8.3 and 8.4. are ancillary and do not go to the core of the dispute between the parties. We now deal with these issues and the related grounds appeal in sequence in the rest of this decision, considering the reports before us and evidence led by the parties.

¹⁰ Department of Water and Sanitation, Republic of South Africa, *National Water Resources Strategy III* (March 2023) (NWRS III) < [https://www.dws.gov.za/Documents/Gazettes/Approved%20National%20Water%20Resource%20Strategy%20Third%20Edition%20\(NWRS3\)%202023.pdf](https://www.dws.gov.za/Documents/Gazettes/Approved%20National%20Water%20Resource%20Strategy%20Third%20Edition%20(NWRS3)%202023.pdf) >

THE LAW

10. Before we address the grounds of appeal and submission made by the parties it is necessary to highlight the legal context of decision-making for the Water Tribunal for the record. The appeal by the Appellant was lodged in terms of section 148(f) of the NWA, and in adjudicating this appeal the Water Tribunal panel steps into the shoes of the Respondents. We address the grounds of appeal in the context of the reasons provided by the Respondents and assess these in the context of the evidence led before us and the specialists' reports filed of record. Our decision is a new decision which replaces the one made decision by the Respondents.

11. In arriving at our decision we are guided by, and have considered, the rights in section 24 of the Constitution of South Africa that guarantee every person the right to "an environment that is not harmful to their health or wellbeing". Yet we are equally alert to the qualification in section 24(b) that legislation and other measures to protect the environment, should not only prevent pollution and ecological degradation, and promote conservation, but also that they should "secure ecologically sustainable development and use of natural resources, while promoting justifiable economic and social development." This composite right entreats us to balance environmental protection and protection of water resources and justifiable ecologically sustainable and beneficial use of water.

12. The National Water Resources Strategy III (NWRS III) sets out what it terms the three overarching objectives, “namely that water must be protected, used, developed, managed and controlled sustainably and equitably, that water and sanitation must support development and the elimination of poverty and inequality, and contribute to the economy and job creation.”¹¹

Section 7 of the NWA requires us to give effect to these strategic objectives.

13. Reconciling the duty to protect water resources, while ensuring that the same water resources are developed sustainably and equitably, contributing to the economy is a difficult balancing task. Nevertheless, the NWA, building upon the NEMA, provides for the framework and tools to attempt this balance, chief among which is the requirement to consider specialist studies and reports supporting the factors in section 27(1) of the NWA.¹²

SUBMISSIONS BY THE PARTIES ON THE ISSUES

14. *Whether the Respondent failed to apply a risk-based approach, as required by law, in determining that the alternative barrier design (semi permeable*

¹¹ National Water Resources Strategy III (2023) p5.

¹² Respondents’ Submission at Record p 1136-1137; Section 27(1) in relevant part states that we should consider including: *a*) existing lawful water uses; *b*) the need to redress the results of past racial and gender discrimination; *c*) efficient and beneficial use of water in the public interest; *d*) the socioeconomic Impact (i) of the water use or uses if authorised; or (ii) of the failure to authorise the water use or uses; *e*) any catchment management strategy applicable to the relevant water resource; *f*) the likely effect of the water use to be authorised on the water resource and on other water users; *g*) the class and the resource quality objectives of the water resource; *h*) investments already made and to be made by the water user in respect of the water use in question; *i*) the strategic importance of the water use to be authorised; *j*) the quality of water in the water resource which may be required for the Reserve and for meeting international obligations; and *k*) the probable duration of any undertaking for which a water use is to be authorised.

compacted discard and scavenger boreholes) proposed by the Appellant was not equivalent to, or better than, a Class C HDPE lined barrier?

The question of the risk-based approach.

15. The Appellant called four (4) witnesses: the Registered Environmental Assessment Practitioner (EAP) who is also a Mining Engineer, a Geohydrologist, a Civil and Geotechnical Engineer, another Civil and Environmental Engineering.

16. The overall sense of the expert witness was that the Respondents failed or improperly applied the risk-based approach required by law, when considering the application and evaluating the proposed civil designs for the discard facility for mine residue and stockpiles. Upon receiving the water use licence application lodged by the Appellant, the Respondents requested for more information on the proposal by the Appellant to use a barrier design other than the typical Class C liner design which was mandated by the National Norms and Standards for Disposal of Waste to Landfill (GN R636 of 23 August 2013) (Norms and Standards).¹³

¹³ Regulation 3(1) of GN636 provides that “The containment barriers of landfills for the disposal of waste in terms of section 4 of these Norms and Standards must comply with the [given] minimum engineering design requirements.” The regulations then provide for Class A to D specific design requirements for each class of waste. Regulation 4 then provides that “Type 3 waste may only be disposed of at a Class C landfill designed in accordance with section 3(1) and (2) of these Norms and Standards, or, subject to section 3(4) of these Norms and Standards, may be disposed of at a landfill site designed in accordance with the requirements for a GLB+ landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2nd Ed., DWAF, 1998).”

17. The Norms and Standards are promulgated in terms of the National Environmental Management: Waste Act (NEMWA). Together with other norms and standards, they provide for a system to classify waste, assessment of waste, and to determine the design of landfills for the disposal of such waste. The National Norms and Standards for the Assessment of Waste for Landfill Disposal (GN R635 in GG 36784 of 23 August 2013) deal with the assessment of waste prior to disposal to landfill. Then the Waste Classification and Management Regulations, 2013 (GN R634 in GG 36784 of 23 August 2013) regulate the classification and management of waste, prescribe requirements for the disposal of waste to landfill, and among others, the procedure for the listing of waste management activities that do not require a Waste Management Licence. GN 634 and 636 read together lay down mandatory requirements for the design of waste disposal facilities for specified types of waste.

18. However, the Appellant highlighted that Reg 3(4) of GN636 provides that,

Notwithstanding section 3(3) of these Norms and Standards, waste may be disposed of in terms of section 4(1), (2), (3) and (4) of these Norms and Standards at landfills with the liner design requirements for landfills contained in the Minimum Requirements for Waste Disposal by Landfill (2nd Edition, 1998; Department of Water Affairs and Forestry), or at landfills with an alternative liner design approved by the competent authority for the life-span of the operational cell...

19. Apart from the above three sets of regulations and the exception in Regulation 3(4) of GN 636, specific regulations were made later in 2015 to provide for the specific management and disposal of mine residue and stockpiles. These are

the Regulations regarding the Planning and Management of Residue Stockpiles and Residue Deposits, 2015 (GN R632 in GG 39020 of 24 July 2015), as amended by GN 990 in GG 41920 of 21 September 2018. The Appellant's expert witnesses gave evidence that these later regulations fundamentally depart from the prescriptive nature of GN636 and the dogmatic requirement for a composite Class C HDPE barrier design for Type 3 Waste in all cases. In particular, Regulation 5 of GNR 632 provides that;

- (1) Residue stockpile and residue deposit must be classified by a competent person.
- (2) A risk analysis must be conducted and documented on all residue stockpiles and residue deposits to be established.
- (2A) The risk analysis contemplated in subregulation (2) must be undertaken by a competent person.¹⁴

20. On 29 June 2016 upon request by the Chamber of Mines the then, Deputy Director General- Water Sector Regulation in the Respondent's department issued an undertaking. Among other concessions the letter states that,

The Chamber of Mines proposed that the Department follow a risk based approach, on a case by case basis, in order to allow for representations on an alternative barrier system based on a risk assessment. This shall enable an evaluation of the efficacy of the alternative barrier system to prevent pollution as required in terms of Section 19 (1) and (2) of the Act, thus informing a decision on an application for a water use licence for the related facilities.

¹⁴ A "competent person" is defined as a person who-

- (i) is qualified by virtue of his or her knowledge, expertise, qualifications, skills and experience; and
- (ii) is knowledgeable with the provisions of the National Environmental Management Act 107 of 1998, National Environmental Management: Waste Act 59 of 2008, Mineral and Petroleum Resources Development Act, 2002 and other related legislation;
- (iii) has been trained to recognise any potential or actual problem in the performance of the work; and
- (iv) is registered with the legislated regulatory body for the natural scientific profession or an appropriate legislated professional body.

The Department accepts the proposal by the Chamber of Mines provisionally that the decision on the affected water use licence application will be based on the Department's satisfaction that the alternative proposed barrier system will achieve the objective of preventing pollution of the water resources or be the equivalent of the prescribed barrier system. The Department's engineers who provide specialist comments on Water Use Licence Applications will be informed of this decision so that they implement the decision from the date of signing this letter. The need for amendment of the relevant Regulations by the Department of Environmental Affairs (DEA) is acknowledged.

Accordingly, this decision will be communicated to DEA to ensure alignment in our decisions in this regard and to appraise them of the need to amend the related regulations accordingly.¹⁵

21. Following the outcome of engagements between the mining industry and the Respondents' department, GN 990 in GG 41920 of 21 September 2018 was further introduced to legislate the undertakings by the Deputy Director General. It provides that pollution control measures must be determined on a case-by-case basis, based on risk analysis conducted by a competent person. The risk analysis is based on the characteristics and classification of waste to determine the appropriate management and mitigation measures. It also requires identification and assessment of environmental impacts in line with the NEMA EIA provisions.¹⁶ In the Appellant's view the later, more specific, regulations that introduced the need for a risk-based approach supersede the previous regime where a composite Class C HDPE Lined Barrier was routinely required especially in the context of mine residue and mine waste. The

¹⁵ Record p604.

¹⁶ Record p1136. However, while we are bound by the principles in section 2(4) of the NEMA in our decision-making, this process should not encroach on the consideration of the environmental authorisations by the competent authority (*cf.* Record p1136-1138.)

introduction of the risk-based approach recognises the difference between various types of waste, and the design of ordinary landfills as distinguished from disposal facilities for mining activities.

22. The Appellant obtained the services of competent persons who prepared specialist reports motivating for the departure from a composite Class C HDPE Lined Barrier. The engineers, geohydrologists, and hydrologists prepared the following reports, which, among other reports, we reviewed and tested through the testimony of the authors involved. The reports presented included the following (Annexures to the Record¹⁷):

Mafube Coal (Pty) Ltd: Mafube Mine Residue Project: SWMP Design Development Report for WUL Amendment Design Assumptions & Operational Procedures, dated October 2020 ("SWMP Design Development Report - Annexure "M3");

Mafube Coal Mine Extension of Discard Dump and Pollution Control Dam Geotechnical Investigation Report, dated January 2020 ("Appendix A to the SWMP Design Development Report")- Annexure "M4";

Mafube Coal (Pty) Ltd: Integrated Water and Waste Management Plan for the Mafube Mine Residue Project: Springboklaagte Section, dated October 2020 ("IWWMP")- Annexure "M5";

Mafube Coal (Pty) Ltd: Mafube Mine Residue Project: Design Development Report with Feasibility Investigation and Conceptual Designs in Support of the Amended Water Use Licence (WUL), dated October 2020 ("Design Development Report")-Annexure "M6"

¹⁷ Record p34-523 inclusive.

23. The SWMP Design Development Report shows that the mine waste at issue in this appeal was classified and characterized as Type 3 Waste.¹⁸ This classification, and in terms of the National Norms and Standards for Disposal of Waste to Landfill (GN R636 of 23 August 2013) such waste type may be disposed of on a composite Class C HDPE Lined landfill designed in accordance with section 3(1) of the National Norms and Standards.
24. Various scenarios were mapped and tested for the design of an appropriate barrier systems for the proposed new discard dump given the peculiar characteristics of the site, namely that it is a brownfield previously mined and backfilled.
25. Appellant led evidence from expert witnesses to demonstrate that the composite Class C HDPE Lined Barrier system mandated by GN 636 was not suitable for the site selected for the new discard dump. Evidence was led from civil engineers which to demonstrate that the HDPE liner would likely tear due to differential settlement of the discard deposit because the site is previously mined and backfilled, but the backfill was not compacted.¹⁹ Evidence was led to show that the tensile strength of the HDPE liner, an integral part of composite Class C Barrier, will be tested beyond its capacity if there is differential settlement of 1.5 and 1.6 meters in different places. This would lead to

¹⁸ That is aligned to the Waste Classification and Management Regulations (GN R634 of 23 August 2013) (“the Waste Classification Regulations”).

¹⁹ Record p582 and 601.

underground water pollution and the engineer swore that they never sign off a design which, in their professional judgement would not work as intended.²⁰

This is because apart from the HDPE liner the next secondary layer of protection is one 300mm layer of compacted clay.²¹

26. The expert witnesses for the Appellant provided evidence that laboratory tests were conducted to evaluate the seepage and permeability, comparing the legislated composite Class C Barrier and the alternative design proposed by the Appellant.²² The Appellant submitted, through its experts, that once it is accepted that the HDPE Liner can tear due to differential settlement, the one layer of clay below the liner offers little protection to underground water- a total failure of the barrier would occur.

27. The tests demonstrated that the clay layer in a composite Class C HDPE Lined Barrier system had a permeability of 1.73 l/m²/ per day, which leads to 17 300 l/ha/day. On the other hand the proposed alternative design of 5 metres of compacted fine and coarse discards, with added bentonite had a permeability of between 0.86 l/m²/day to 0.92 l/m²/day depending on the constant head²³ (100mm and 300mm respectively). This translates to 8 660 l/ha/day and 9 160

²⁰ Record p601-602.

²¹ This is made of two layer of 150mm compacted layers of clay. (see Reg (3)(1)(b) of GN 636).

²² Record p177-200, test pit locations on Record p209.

²³ “The constant head permeability test is a common laboratory testing method used to determine the permeability of granular soils like sands and gravels containing little or no silt. This testing method is made for testing reconstituted or disturbed granular soil samples.” ‘Constant head permeability test’ GeotechData <
<https://www.geotechdata.info/geotest/constant-head-permeability-test#:~:text=The%20constant%20head%20permeability%20test,or%20disturbed%20granular%20soil%20samples.>>

l/ha/day respectively, which is below the permeability of the Class C clay layer by some magnitude.²⁴

28. The above laboratory results were collated to on-site tests from sample boreholes sunk and test pits excavated on site. The experts concluded that the alternative design was as good, if not better, than the design. This is so because the alternative design is composed of multiple layers of compacted semi permeable discard²⁵ and scavenger boreholes.

29. In summary, on the comparability of the alternative design the Appellant submitted that, unlike the composite Class C HDPE Lined barrier which offers two level of protection (HDPE and clay layer), their alternative was better because it provided for six levels of protection of groundwater against pollution. These were presented as;

Level 1: Substantial high-rate drainage on the discard to reduce water head (Passive System),

Level 2: 5m thick compacted Discards with low permeability comparable with the clay layer in conventional clay layer,

Level 3: Deep settlement of spoils below the 5m thick discard surcharge load will reduce settlement & also contribute towards reduced flows through the spoils,

Level 4: Void 3 pumping used for 2 x Pivot projects (Currently ongoing at the Mine),

Level 5: Scavenger boreholes to manage the pollution plume (Recommended), and

Level 6: Existing Water Treatment Plant at Nooitgedacht. (Expand to Springboklaagte for Closure).²⁶

²⁴ Record p557-558 and 582-583.

²⁵ Transcript (13.09.2023) p14.

²⁶ Record p553.

30. The Respondents led evidence from one witness only. This was the expert who evaluated the geotechnical aspects of the proposed alternative.²⁷ The witness gave evidence that they did not regard the prescriptions of GN 636 of 2013 as mandatory and to be blindly applied in all cases as a one-size-fits all standard. However, they stated that the Respondents evaluated the proposed alternative designs, in the context of the specialist studies submitted and numerous presentations made by the Appellant, and then concluded that it was not equivalent or better than a composite Class C HDPE Lined barrier.

31. Evidence was led by the Respondents to show that the tensile strength of the HDPE liner was considerable, and that it could withstand differential settlement to the extent suggested by the Appellant. The Respondents provided several academic publications in support of its contention.²⁸ The publications tended to show that geomembrane liners have become the standard in the design of waste disposal facilities. Some of the studies consisted of tests of the tensile strength of geomembranes (HDPE liners) and the circumstances under which they may fail. However, the context of the academic studies did not account for

²⁷ Record p976 reference to letters drafted by the witness recommended a decline of the licence and providing reasons therefor.

²⁸ Chen, Y. M., et al. 'Performance-based design for geosynthetic liner systems in landfills.' (2011) 42 *Geotechnical Engineering* 67; Yu, Y., & Rowe, R. K. 'Development of geomembrane strains in waste containment facility liners with waste settlement.' (2018) 46 *Geotextiles and Geomembranes*, 226-242; Giroud, J. P., Bonaparte, R., Beech, J. F., & Gross, B. A. 'Load-carrying capacity of a soil layer supported by a geosynthetic overlying a void.' In *International geotechnical symposium on theory and practice of earth reinforcement* (1988), 185-190; Giroud, J. P., Bonaparte, R., Beech, J. F., & Gross, B. A. 'Design of soil layer-geosynthetic systems overlying voids.' (1990) 9 *Geotextiles and Geomembranes*, 11-50; Chen, Y., Gao, D., & Zhu, B. 'Controlling strain in geosynthetic liner systems used in vertically expanded landfills.' (2009) 1 *Journal of Rock Mechanics and Geotechnical Engineering*, 48-55.

the peculiarities of the site at Mafube, and the results are not necessarily applicable as such.

32. The Respondents in considering the possibility of an alternative design, led evidence to show that the issue is, not only with the design of the barrier, but also the waste type to be disposed of in the discard dump. They submitted that,

The risk analysis indicated that [according to RN636] ... this is type 3 type of material. This type of material has the potential to cause pollute the discard dump.

What is questionable here is whether the measures put by the Appellant were appropriate.

The Respondent states that the mitigation and management measures that were proposed and put into place by the Appellant are not sufficient to protect the water resource.²⁹

33. The Respondents further led evidence to show that the Appellant could have done more testing on the proposed site by drilling more boreholes and test pits to add the confidence of the modelling and laboratory tests. To this the Appellant responded that they took a risk averse approach and assumed the worst in their design. Secondly a water modelling specialist gave evidence that the experts are fully aware of the type of material that was used to backfill the proposed site and its geochemical properties. Models of the plume from the current discard dumps were presented and it was demonstrated that the new discard dump, in the unlikely event, that it leads to underground water pollution, the plume would not reach pristine water sources in the area.³⁰

²⁹ Record p1001-1002. Mitigation measures for groundwater are dealt with by Delta H report at Record p832-835, with recommended conditions at p835. *Updated Delta H report* p900 (para 7.3 conditions).

³⁰ Record p72-78, see also Transcript (14.07.2023) p93.

Is the composite Class C HDPE lined barrier the only standard?

34. Specialist reports filed of record and the submissions by the parties show that while for Type 3 Waste, a composite Class C HDPE Lined barrier is often used – particularly for general landfill design. That the legislature saw it fit to later develop specific regulations for mine residue and stockpiles demonstrates that a different nuanced approach is necessary when it comes to dealing with waste material that require specialist attention. The introduction of the risk-based approach implies that there is no automatic requirement to insist on the composite Class C HDPE Lined barrier in all cases. Consideration of the recommendations by the competent persons as required by the regulations is important. The Respondents must demonstrate that they considered the recommendations by the experts involved in this case and validate a decision to depart from their recommended designs.

35. The purpose of evaluating specialist reports and recommendations by competent experts is not to debunk or disprove their recommendations or methods used to arrive at such recommendations. The reports and recommendations are part of a larger body of reports and legislative requirements that must holistically be assessed and evaluated in determining whether the proposed alternative to a composite Class C Barrier enables the productive and sustainable use of water while protecting water resources from significant pollution. In other words, the assessment should focus on whether

any predicted environmental impacts have been investigated and evaluated and whether adequate mitigation measures have been included in the design of the barrier system.

36. The Respondents' evidence sought to demonstrate that the modelling by the Appellant's expert had a low confidence and that the type of discard material we are dealing with is toxic, and therefore should not be used in the barrier design. Yet there was insufficient information provided to controvert the evidence and recommendations by the Appellant's experts in relation to what the peculiar site in this case required. It was not demonstrated that the alternative barrier design is not as good as, or better than, a composite Class C HDPE Lined barrier. This is in a context where the Respondents also could not demonstrate with certainty that there will be no substantial differential settlement to cause the HDPE liner to fail.

37. On this issue and related ground of appeal we find that the Appellant made a good case for why the alternative barrier design promotes better environmental outcomes. Insisting on a composite Class C HDPE Lined barrier when it is demonstrated that it is likely to tear, fail, and lead to immediate groundwater pollution is not consistent with the risk-based approach mandated by the mine residue and stockpiles regulations.

Whether the Respondent was correct in deciding that the site chosen by the Appellant for the new discard dump was unsuitable given existing pollution, low water table, and the risk of groundwater pollution.

38. Much was made by the Respondents from that the Appellant's could not find an alternative site to locate the new discard facility. The Appellant led evidence and expert reports demonstrating that extensive studies and test were done to identify the most appropriate site for the new discard facility. Altogether five(5) sites were considered ranging from greenfield and other brownfield areas within the Mafube complex. The specialists note that locating the discard facility on any greenfield would cause more environmental damage than on a rehabilitated previously mined area within the complex. Several studies were provided showing how the surrounding area has many wetlands that would be at risk should the siting be on any other area other than the one chosen by the Appellant.³¹

39. The Mafube Mine – Extension of discard dump Geotechnical Investigation Report³² provided extensive information on all five possible sites and why most of them presented a greater danger to the environmental and wetlands than the selected site. Over 20 test pits were dug and sampled across the four potential sites.³³ The studies included geochemical evaluation of the sites in

³¹ Record p12 and 590-597.

³² Record p135.

³³ Record p138.

addition to the wetland and pedological studies also undertaken on the sites.

The report recommends that,

“From a purely geotechnical perspective (disregarding environmental and other operational perspectives), the Option 2 and 3 areas must be preferred over Option 1 for the establishment of the discard dump. The primary reason for this recommendation is that the discard dump within the Option 1 area will be wholly, or at least partially, underlain by a thick ‘mattress’ of highly compressible (and somewhat collapsible), mass backfill material. Total and hence differential settlements can reasonably be expected to be much higher within the Option 1 area as opposed to corresponding settlements within the Options 2 and 3 areas where the discard dump will be established on/ within naturally occurring formations, possibly underlain at relatively shallow depth by ‘incompressible’ soft rock or harder formations.”³⁴

40. The Appellant in one of their presentation, as confirmed by witness evidence during the hearing, explained the challenges with all possible locations.³⁵

Regarding site selection, GN 632 provides in Regulation 6 that,

- (1) The process of investigation and selection of a site for residue stockpiling and residue deposit must entail-
 - (a) the identification of a sufficient number of possible candidate sites.
 - (b) qualitative evaluation and ranking of all alternative sites;
 - (c) qualitative investigation of the top ranking sites to review the ranking done in terms of paragraph (b);
 - (d) a feasibility study on the highest ranking site or sites, involving-
 - (i) a preliminary health and safety classification;

³⁴ Record p153, Read with Record p590-597.

³⁵ Record p524, 538-541 and 607. It was stated that “Several alternative sites were considered, however, they displayed wetlands and heritage structures which would be affected by the proposed discard dump. Thus, “Alternative 1” was still the preferred site.”

- (ii) an environmental classification;
 - (iii) geotechnical investigations; and
 - (iv) hydrological investigations.
- (2) A geotechnical investigation must include the-
- (a) characterisation of the soil and rock profiles over the entire area to be covered by the residue stockpile facility and associated infrastructure to define the spatial extent and depth of the different soil horizons; and
 - (b) characterisation of the relevant engineering properties of foundations soils and the assessment of strength and drainage characteristics.
- (3) A hydrological investigation...
- (4) A preferred site must be identified based on the investigations contemplated in subregulations (1), (2) and (3).
- (5) Further investigation on the preferred site, must include-
- (a) land use;
 - (b) topography and surface drainage;
 - (c) infrastructure and man-made features;
 - (d) climate;
 - (e) flora and fauna;
 - (f) soils;
 - (g) ground water morphology, flow, quality and usage; and
 - (h) surface water.
- (6) The investigations, laboratory test work, interpretation of data and recommendations for the identification and selection of the most appropriate and suitable site for the disposal of all residue that has the potential to generate leachate that could have a significant impact on the environment and groundwater must be conducted by a competent person.

41. On the record, and in expert testimony, we were provided with the reports that address the requirements in Regulation 6. The Respondents did not dispute the findings and recommendations in most of these reports, apart from the issues of the barrier design and potential groundwater pollution. The insistence

by the Respondents on an alternative sites suggests that the Respondents, to some extent, agree that on the chosen site a composite Class C HDPE Lined barrier may fail and lead to groundwater contamination.

42. Where the proposed discard facility impacts wetlands and potentially infringes GN704,³⁶ the Appellant has, concurrently filed of record, the necessary application for exemptions supported by relevant motivations as required by regulations GN704.³⁷

Overall Findings

Should the Appellant be granted the water use licence and why?

43. On balance of probabilities the Appellant provided us with sufficient information, reports and expert testimony confirming such reports which demonstrate that the proposed new discard facility will not have significant impact of the environment and water resources that cannot be mitigated. The specialist reports identify potential impacts on water resources, and proffer reasonable measures to guard against the pollution of underground water.

³⁶ Regulations on Use of Water for Mining and Related Activities aimed at the Protection of Water Resources, GN707 in GG 20119 published 4 June 1999. The regulations provide in Reg 4(c) that, “No person in control of a mine or activity may place or dispose of any residue or substance which causes or is likely to cause pollution of a water resource, in the workings of any underground or opencast mine excavation, prospecting diggings, pit or any other excavation...” Reg 3 of GN704 provides for exemptions from these prohibitions on proof that an applicant has developed measures based on best practicable guidelines to prevent water pollution.

³⁷ Record p242-243, see also p623.

44. It was the Appellant's experts who, while having worked with HDPE liners for years identified a material challenge with using this design where the proposed site is a brownfield previously mined backfilled open pit which could lead to failure of the HDPE liner and threat to groundwater. The geohydrologists presented reports and models demonstrating that given that this is an area already polluted, the transport model shows that there will be no greater plume diffusion with the alternative barrier design. The existing and predicted plume modelling showed that even the composite Class C HDPE Lined barrier would lead to greater or equal plume diffusion. Not only this, but the experts then recommended specific measures to altogether mitigate the potential of leachate and groundwater pollution. Therefore a suitable groundwater management plan can provide sufficient mitigation. We disagree with the submissions made on behalf of the Respondents³⁸ that the expert witnesses and their evidence exceeded the role expected of them in a matter such as this one. The experts were neither biased nor unduly supportive of the Appellant's case.

45. When it is considered that the Appellant require the new discard facility to complete the remaining life of their operations, we reflected on what would constitute the most beneficial and sustainable use of water resources in the circumstances. We counterbalanced this with the identified potential effects on water resources and the proposed mitigation measures. The Appellant's

³⁸ Record p1140.

activities have contributed to social and economic development. Indeed, environmental impacts are inevitable when such activities are undertaken, therefore over the life of the mine, the Appellant has also caused some environmental contamination for which environmental and water management plans have been developed - as part of monitoring under the two existing water use licenses and the mining licence.³⁹ This is not to condone any ongoing pollution or environmental effects of the mining activities – which are more appropriately matters for enforcement agencies.

46. We have considered, and agree with, the motivation for the granting of the licence in terms of section 27(1) conducted by the Appellant and endorsed by the Respondents, except for the two main issues dealt with in this appeal. We find no fault in the section 27(1) evaluation and associate ourselves with the findings recorded in the Appellant's application and the record of recommendations in this regard.

47. Regarding the claim by the Appellant that the decision to decline the water use licence is causing it prejudice, we find against the Appellant. We note that the construction of the new discard facility and associated infrastructure are listed activities in terms of the NEMA EIA regulations. The Appellant lodged an application for an environmental authorisation and waste management licence

³⁹ Record p25-1 and 909.

with the competent authority on 20 February 2020.⁴⁰ The Department of Mineral Resources and Energy acknowledged receipt of the application on 9 March 2021 and decisions are pending. Therefore, there is no question of the Appellant suffering prejudice because of the decision appealed against. With or without the water use licence, the Appellant may not commence with the intended listed activities until the other applications are finalised, and the determination of those applications is not contingent on our decision in terms of the NWA.

48. Lastly, we find that while the first Respondent made some errors of fact and law in arriving at the prior decision to decline the application, such decision was not per se irrational, but merely legally flawed. There is no basis for the Appellant's claim that the decision was irrational.

The order.

49. We therefore find that the appeal must succeed.

50. The decision by the first Respondent to decline the water use licence application reference number 27/2/2/B312/11/3 is hereby set aside.

51. The Respondents are hereby ordered to issue the Appellant with a water use licence applied for under Integrated Water Use Licence Application (Ref:

⁴⁰ Record p353.

27/2/2/B312/11/3) subject to such appropriate conditions as are recommended in the Record of Recommendation, and the specialist studies filed of record with the respondent.

52. The Respondents may not include conditions beyond those based on the documents, reports, and pleadings filed of record as part of application number 27/2/2/B312/11/3 and proceedings before the Tribunal.

53. The water use licence shall be issued on or before the 31st of January 2024.

HANDED DOWN AT PRETORIA ON THE 4th DAY OF DECEMBER 2023.



Tumai Murombo
Additional Member, Panel Chairperson

I agree and so it is ordered:



Unathi Mbeki
Additional Member