



the federation for a sustainable environment

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COMMENTS ON THE PROPOSED RECLAMATION AND REPROCESSING OF THE
CITY DEEP DUMPS IN JOHANNESBURG, GAUTENG PROVINCE
DRAFT SCOPING REPORT

DMR REFERENCE: GP 185 MR

The following preliminary comments are submitted on behalf of the Federation for Sustainable Environment (FSE). The FSE is a federation of community based civil society organisations committed to the realisation of the constitutional right to an environment that is not harmful to health or well-being, and to having the environment sustainably managed and protected for future generations. Their mission is specifically focussed on addressing the adverse impacts of mining and industrial activities on the lives and livelihoods of vulnerable and disadvantaged communities who live and work near South Africa's mines and industries.

APPLICANT

The Draft Scoping Report informs us on page (vi) that Ergo Mining (Pty) Ltd, a wholly owned subsidiary of DRD Gold, is the holder of the Mining Right and Applicant.

In the dump reclamation activities of the Blyvooruitzicht Gold Mining Company (BGMC) of which DRD Gold was the majority shareholder, and Mintails SA (Pty) Ltd, which acquired Mining License 9/2000 from DRD Gold¹, the re-mining of the dumps was not completed and only the value from profitable portions of the dumps were extracted without the rehabilitation of the footprints.

The bankrupt BGMC left in its wake a number of un-rehabilitated footprints of reclaimed tailings storage facilities, containing toxic and radioactive water and soil, radioactive

¹ Reference: DRD Gold's Application for the Conversion of an Old Order Mining Right (ML 9/2000). In terms of the Parliamentary Committee on Mineral Resources' Oversight Report, "a section 11 was lodged to transfer the Mining Right to Mintails SA but this never happened." (13 – 14 September 2018)

infrastructure, tailings storage facilities without vegetation, retainer walls and functional toe paddocks and penstocks, and total liabilities of R891 098 234. R36 947 540 was held in trust for rehabilitation at the time.

Mintails Mining SA and Mintails Gold SA was placed into final liquidation by the Johannesburg High Court in September, 2018 with an unfunded environmental liability of R460 367 811.07², and clusters of unrehabilitated open pits, partially reclaimed tailings storage facilities, unrehabilitated footprints, radioactive and toxic dams, etc.

These past experiences of reclamation activities need to be considered and addressed by the Applicant and the Regulators in this new application. The application should only be approved if it involves the removal of entire residue deposits; progressive rehabilitation of the remaining footprints; ploughing some of the value of the reprocessing activities back into the rehabilitation of the entire mining area; and adequate financial provisions for latent and residual impacts, including the pumping and treatment of extraneous or polluted water in terms of the requirements of the *Regulations for Financial Provisions for Prospecting, Exploration, Mining and Production Operations* (2015)³.

In determining the financial provision, the Applicant must adopt the precautionary approach and consider the following risks pertaining not only to its proposed reclamation operations but also to the Ergo Beneficiation Plant and the Brakpan/Withok TSF for ultimate disposal:

- The near certainty of contaminated water, which will require some form of decontamination treatment (Pilson et al., 2000; Hodgson et al., 2001)
- The near certainty of sulphate, chloride, metal and NORM contamination of soils and sediments from seepage, tailings spillage and plant discharges, and the potential for contamination of downstream / downwind soils and sediments (Witkowski and Weiersbye, 1998; Rosner and Van Schalkwyk, 2000; Rosner et al., 2001; Mphefu et al., 2004; Tutu et al., 2003; 2004; 2005.)
- The near certainty of sulphate, chloride, metal and NORM contamination of surface water bodies and their sediments, and ground water, by seepage tailings spillages, plant discharges (Cogho et al. 1992; Coetzee 1995; Pulles et al., 1996; Hodgson et al., 2001; Winde, 2001; Coetzee et al., 2004; Winde et al., 2004a; b; c). In addition the potential contamination of surface soils overlying shallow polluted groundwater via evaporative pathways during dry seasons (Naiker et al., 2003; Tutu et al., 2004)
- The potential for salt, sulphate, chloride, metal and NORM contamination of crop soils irrigated with contaminated surface water or contaminated groundwater (Sutton et al., 2006, Philips, 2007)

² Thursday, 22 November 2018. ANNOUNCEMENTS, TABLINGS AND COMMITTEE REPORTS NO 174–2018. FIFTH SESSION, PARLIAMENT OF THE REPUBLIC OF SOUTH AFRICA
ANNOUNCEMENTS, TABLINGS AND COMMITTEE REPORTS

³ In terms of section 5 of the above Regulations, “An applicant or holder of right or permit must make financial provision for— (c) remediation and management of latent or residual environmental impacts which may become known in future, including the pumping and treatment of polluted or extraneous water”

- The concomitant loss of genetic/biodiversity and potentially ecosystem goods and services on disturbed, fragmented or polluted properties (Angus, 2005; O'Connor and Kuyler, 2007; Weiersbye and Witkowski, 2007)
- The potential for bioaccumulation of some metals and NORMS by flora and fauna (Weiersbye et al, 1999; Weiersbye and Witkowski, 2003; Cukrowska and Tutu, 2004; Steenkamp et al., 2005b; McIntyre et al., 2007)
- The potential for exposure of fauna and humans to bioaccumulated pollutants (Steenkamp et l., 2005b; Weiersbye and Cukrowska, 2007)
- The potential for acute and latent toxicity impacts of bioaccumulated pollutants on humans (Steenkamp et al., 2005a); and the potential for radioactivity impacts from NORMS on humans (Philips, 2007)
- The potential for human disease as a result of exposure to windblown dust from TSFs (CoM 2001)
- The potential for uncontrolled future land uses on, or within the zone of influence of TSFs, footprints and mineral processing facilities, such as human settlements and recreation, food crops and home vegetable gardens, livestock grazing and informal remining or scavenging, all of which are incompatible with safety and the fragile status of lands under rehabilitation and could exacerbate liabilities for mining post closure (Sutton, 2007; Reichardt and Reichardt, 2007)

HEALTH AND WELL-BEING

We concur with the statement on page v of the Draft Scoping Report (DSR) that the impacts of a proposed development must consider not only the impacts on the health of the people but also on the comfort and psychological state (“well-being”⁴) of the people that inhabit it. Recent court judgments in the Constitutional and High Courts confirmed the rights of communities in this regard.

Since the land use immediately surrounding the dumps include the residential area of Elandspark to the south, (p 70 of the DSR), the impacts of the reclamation operations on the health *and the well-being* of these communities ought to be assessed.

POLICY AND LEGISLATIVE CONTENT

The legal matrix must include a consideration of:

1. The National Nuclear Regulator Act (47 of 1999)
2. NNR’s Radon Regulations
3. NNR’s Position Paper on Remediation Criteria and Requirements (September 2015)
4. NNR’s Plan for Remediation of Contaminated Sites (PLN-SARA-15-012)
5. The NEM:Air Quality Act – National Dust Control Regulations

⁴ Section 24 of the Constitution of the Republic of South Africa.

6. The DEA's Regulations for Financial Provisions for Prospecting, Exploration, Mining and Production Operations (2015)

From a reading of the Policy and Legislative Content on pages 21 to 34 of the DSR, it appears that the above Acts, Policies and Regulations were not included. We call for the consideration of these legal requirements in the assessment of the Project's impacts.

RADIOACTIVITY AND DUST

The deposits consist of gold, uranium and sulphur bearing sand dumps and slimes dams (p vi of the DSR). Since the intention of the Applicant is to reprocess and reclaim gold and not sulphur and uranium the National Nuclear Regulator Act (47 of 1999) has relevance since the residue will contain uraniferous waste.

As a consequence of the uraniferous nature of the ore, Witwatersrand tailings and other mining residues often contain significantly elevated concentrations of uranium and its daughter radionuclides, with the decay series of ²³⁸U being dominant⁵.

Academic and government reports found that the Witwatersrand mines pose a number of hazards to surrounding communities. One of the major primary pathways by which contamination can enter the environment from a mine site is the airborne pathway, where radon gas and windblown dust disperse outwards from mine sites⁶.

The Gauteng Department of Agriculture and Rural Development's "*Feasibility Study on Reclamation of mine Residue Areas for Development Purposes: Phase II Strategy and Implementation Plan*" (2011) identified dust pollution, including radioactive dust, as one of the three main issues relating to mine residue areas located in Gauteng.

The National Nuclear Regulator (NNR) reported in its Report – TR-RRD-07-0006 titled "*Radiological Impacts of the Mining Activities to the Public in the Wonderfonteinspruit Catchment Area*" (12 July 2007) the deposition of radioactively contaminated dust on leaves of vegetable and forage plants can cause radiation exposures exceeding those from the "*inhalation of contaminated dust*" substantially, being in the order of dose contribution of the so-called '*water pathways*'".

The health effects of uranium particles inhaled are described in the Water Research Commission Report No 1214/1/06 titled "*An Assessment of Sources, Pathways, Mechanisms and Risks of Current and Potential Future Pollution of Water and Sediments in Gold-Mining Areas of the Wonderfonteinspruit Catchment*" (Report, WRC, H Coetzee et al, Council for Geoscience, 2004) as follows:

⁵ Reference: Institute for Water Quality Studies, 1995; Institute for Water Quality Studies, 1999, Department of Water Affairs and Forestry, 2003. Radiometric Surveying in the Vicinity of Witwatersrand Gold Mines. H. Coetzee. Mine Closure. 2008

⁶ Reference: Land-Use after Mine Closure – Risk Assessment of Gold and Uranium Mine Residue Deposits on the Eastern Witwatersrand, South Africa. M. W. Sutton. Mine Closure. 2008

Small particles are carried by the inhaled air stream all the way into the alveoli. Here the particles can remain for periods from weeks up to years depending on their solubility. Highly insoluble uranium compounds may remain in the alveoli, whereas soluble uranium compounds may dissolve and pass across the alveolar membranes into the bloodstream, where they may exert systemic toxic effects. In some cases, insoluble particles are absorbed into the body from the alveoli by phagocytosis into the associated lymph nodes. “Insoluble” particles may reside in the lungs for years, causing chronic radiotoxicity to be expressed in the alveoli.

In view of the abovementioned findings, it is essential that a radiological assessment and health assessment be conducted during the EIA phase of the Project since the reprocessing activities will exacerbate the dust fallout during the operational phase as the crust and vegetation cover will be removed from the tailings storage facilities and dams to allow for hydraulic mining.

On p 70 of the DSR we are informed that the dumps are also located immediately adjacent to the Highveld Priority Area for air quality. The cumulative impacts upon the air quality must be assessed.

The gold mining industry should have gained enough experience from the silicosis catastrophe in South Africa to justify application of the precautionary principles in respect of latent health impacts.

NEED AND DESIRABILITY

The positive contribution of the reclamation operations to the environment, economy and the people can only be justified if the re-mining of the dumps is completed, which involves the removal of the entire residue deposit and the rehabilitation of the remaining footprints. If this is not the case, rather than removing and consolidating contaminated sites, the reprocessing activities will result in the creation of additional contaminated sites.

REHABILITATION

P 19 of the DSR informs us that the reclaimed dumps will be rehabilitated to red earth.

We respectfully state that rehabilitation to red earth is insufficient. The footprints of the reclaimed dumps must be left ecologically and geophysically stable and must not pose an economic, social or environmental liability to the local community and the state now or in the future.

Furthermore, in terms of Appendix 5 (1) (d) (“content of a closure plan”) of the EIA Regulations, a closure plan must include “*measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity and associated closure to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development, including a handover report, where applicable...*”

(Emphasis added.)

The Applicant, in partnership with communities, has to ensure that the interests of both current and future generations are not compromised, that current and future generations’ livelihood

opportunities and their quality of life are not reduced by unsustainable sequential land-use (with associated resources, such as water).

Before a decision is taken on which measures to implement for remediation and closure, the objectives that need to be achieved with the implementation of such measures must be established and agreed upon

Such objectives would include, from a generic perspective, the following:

- Immediate harm to human health and safety must be eliminated
- Groundwater must be fit for current and future domestic and other uses consistent with agreed current and future land use
- Surface water must be fit for current and future basic human needs and aquatic ecosystems requirements
- Risk of harm to non-aquatic organisms (vegetation) must be eliminated
- Soil (property) must be fit for use consistent with current and future land use

Radiometric surveys over the previously reprocessed mine residue deposit footprints have, in some cases, shown elevated levels of residual radioactivity in the soils. In these cases, it must be accepted that some areas will never be suitable for unrestricted development and that these areas will need to be demarcated as such, and appropriate land-uses proposed and implemented.⁷

In view of the aforesaid, we request that the future land use be assessed in the EIA in the above context and in the context of societal expectations.

BEST PRACTICABLE ENVIRONMENTAL OPTION AND FUTURE LAND USE

The NEMA defines “*best practicable environmental option*” to mean the option that proves the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term. The BPEO is thus the outcome of a systematic consultative and decision-making process that emphasises the protection of the environment across land, air and water and that establishes, for a given set of objectives the option that provides the most benefit or least damage to the environment as a whole at acceptable cost in the short as well as long term.

Therefore, since they are the ultimate recipients of potential, ongoing and historical pollution and the potential future land users, the requirement of MPRD Regulation 62 must be involved in the agreements regarding future land use of affected areas and thus in the decisions regarding the establishment of objectives for such future land use, as well as in discussing the alternatives for engineering interventions, where decisions regarding such options will affect future land use.

⁷ Van Tonder, DM et al. South Africa’s Challenges Pertaining to Mine Closure – The Concept of Regional Mining and Closure Strategies. Mine Closure 2008. AB Fourie et al (eds.)

Regulation 56 of the MPRDA Regulations prescribes that the closure of mining operations incorporates a process which must start at the commencement of the operation and continue throughout the life of the operation. In this context it is therefore impossible to conduct progressive rehabilitation with the aim of achieving mine closure unless the future land use has been determined and the objectives for remediation have been agreed upon.

In the light of the above legal requirements, we strongly recommend that broad based consultation and participation regarding future land use be conducted with IAPs and not only with municipalities and political leaders.

KEY ISSUES AND IMPACTS TO BE ADDRESSED AND INVESTIGATED

Remobilisation of metals

There is evidence for the remobilization of contaminants such as uranium and cyanides during disturbance of old tailings deposits (Mphefu, 2004, Tutu et al, 2004).

The risk should be assessed.

Water

We are informed that the groundwater is usually dominated by sulphate. This is an indication of groundwater impacted by mining activities (p 62 of the DSR).

Page 60 of the DSR furthermore informs us that the dumps which are to be reclaimed drain into the Natalspruit, which flows into the Elsburgspruit (tributary to the Klip River) and thereafter into the Vaal River immediately above the Vaal Barrage.

The cumulative impacts of the reclamation operations in addition to the current impacts on the surface and groundwater ought to be assessed.

In substantiation:

The Central and East Rand AMD Treatment Plants currently discharge approximately 85 million litres and 110 million litres respectively of neutralised AMD per day into the Vaal River. The neutralised AMD contains sulphate levels of between 2 000 and 2500 mg/l and manganese levels of between 3 and 7 mg/l for the Central Basin and sulphate levels of between 1 280 and 1 460mg/l for the Eastern Basin⁸.

The possible contribution of tailings reclamation activities on surface has, so far, not been fully appreciated. The contribution to ingress is likely to be considerable as old tailings are hydraulically mined using high-pressure water cannons. This introduces large volumes of

⁸ Response by the Chief Director: Mine Water Management to the Federation for a Sustainable Environment/Department of Water and Sanitation: Application for Access to Information in terms of the Promotion of Access to Information Act, 2000 (Ref. 16/2/7/C231/C068). 31 January 2017.

additional water into a highly disturbed area where surface mining and subsequent filling resulted in exceptionally high infiltration rates⁹.

As the residue material containing sulphur (and uranium) are to be deposited on the unlined Brakpan/Withok tailings facility for ultimate disposal (page vi of the Draft Scoping Report), it is anticipated that significant volumes of tailings seepage will be generated adding to the current ingress, which may flow directly into the underlying mine void. In view of the aforesaid we request that an assessment be conducted regarding the above-mentioned risk.

While we concur that waste management by integration (centralization) may be the best practicable environmental option, the long term risk of AMD generation from the Brakpan/Withok tailings facility ought to be quantitatively assessed. It calls for the monitoring of contaminant plumes, the geohydrological regime, the extent of the contamination, preferential pathways and predictions regarding long-term migration.

The secondary source of contaminants that remain in the soil after a dump has been removed appears to be universally ignored and it is assumed that removal of the dump removes all potential for pollution from that site. We recommend an assessment of this risk.

Biodiversity

The short time period for assessment, participation and decision-making is strenuously argued in the DSR. This accelerated EIA under the one environmental system, which may not be conducted in the appropriate season and for the biologically relevant time period, may under-represent biodiversity by almost 95%.

We therefore request that sufficient time be allowed for the assessment of the biodiversity. The influence of seasonality on detection of flora and fauna, and evaluation of biodiversity, is well recognised worldwide. For example in the Grassland Biome (p 64: the proposed project area is situated within the Soweto Highveld Grassland), most plant species and smaller fauna experience seasonal dormancy, whereas some avian species are migratory.

NFEPA

Several wetlands were classified under the National Freshwater Ecosystem Priority Area (NFEPA) status (p68 of the DSR). P64 of the DSR found that the project area overlaps with ecosystems that are listed as Critically Endangered.

This appraisal ought to be conducted with the guidance of *inter alia* the Mining Biodiversity Guideline and the taking into consideration of the opportunity costs.

According to the Mining and Biodiversity Guideline the importance of the biodiversity features in these areas and the associated ecosystem services is sufficiently high to prohibit mining in these areas. Given the very high biodiversity importance, the Guideline states that an EIA

⁹ Winde F. "Desktop assessment of the risk for basement structures of buildings of Standard Bank and ABSA in central Johannesburg to be affected by rising mine water levels in the Central Basin". Final Report. May 2011. Volumes I-III, pp. 267, 166, 13)

conducted in respect of such NFEPAs should include the strategic assessment of optimum, sustainable land-use for a particular area which should determine the significance of the impact on biodiversity. The EIA must take into account the environmental sensitivity of the area, the overall environmental and socio-economic costs and benefits of mining as well as the potential strategic importance of the minerals to the country.

The Guideline states that the EIA “*needs to identify whether mining is the optimal land use, whether it is in the national interest for that deposit to be mined in that area and whether the significance of unavoidable impacts on biodiversity are justified. It is important that a risk averse and cautious approach is adopted. This implies strongly avoiding these biodiversity priority areas, given the importance of the receiving environment and the probability that the proposed activity would have significant negative impacts*”.

When considering mining these biodiversity priority areas, the Guideline prescribes a set of filters that should be sequentially applied and mining should only be considered if:

- a. It can be clearly shown that the biodiversity priority area coincides with mineral or petroleum reserves that are strategically in the national interest to exploit.
- b. There are no alternative deposits or reserves that could be exploited in areas that are not biodiversity priority areas or less environmentally sensitive areas.
- c. It can be demonstrated that there are spatial options in the landscape that could provide substitute areas of the same habitat conservation, to ensure that biodiversity targets would be met.
- d. A full economic evaluation of mining compared with other reasonable/feasible alternative land uses, undertaken as a necessary component of the EIA, shows that mining would be the optimum sustainable land use in the proposed area.
- e. A detailed assessment and evaluation of the potential direct, indirect and cumulative impacts of mining on biodiversity and ecosystem services shows that there would be no irreplaceable loss or irreversible deterioration, and that minimising, rehabilitating, and offsetting or fully compensating for probable residual impacts would be feasible and assured, taking into account associated risks and time lags.
- f. A risk averse and cautious approach, taking into account the limits of current knowledge about the consequences of decisions and actions, can be demonstrated both in the assessment and evaluation of environmental impacts, and in the design of proposed mitigation and management measures.

The Guideline states further that

“The above filters should form the basis for deciding on whether or not, and how and where, to permit mining. This means that based on the significance of the impact, some authorisations may well not be granted. If granted, authorisation may set limits on allowed activities and

impacts, and may specify biodiversity offsets that would be written into licence agreements and/or authorisations”.

While we take cognisance that the project does not involve mining within greenfields, we nonetheless recommend that the above-mentioned recommendations be considered in the proposed reclamation of the existing City Deep Dumps (4L3, 4L4 and 4L6.)

We also recommend consideration of the attached Paterson and Cooke’s report on the Best Practice for Pipeline Crossings. The Report was prepared for the FSE. It has relevance to pipeline crossings in wetlands.



PATERSON AND
COOKE 11-2301-00-1

SUBMITTED BY:

A handwritten signature in black ink, appearing to read 'M. Liefferink'.

Mariette Liefferink.

CEO: FEDERATION FOR A SUSTAINABLE ENVIRONMENT

26 November 2018.