Sappi Ngodwana Mill

Andile Mbatha
andile.mbatha@sappi.com

WASTE ASSESSMENT & CLASSIFICATION REPORT

PER

WASTE CLASSIFICATION AND MANAGEMENT REGULATIONS, SOUTH AFRICA

FOR

WASTE MIXTURE: SOLID
NGODWANA MILL: GRITS/ DREGS MIX

Laboratory sample description:	**Black moist solid**
Additional information, odour:	**Earthy**
Laboratory sample reference:	**W00915/23**
Laboratory certificate of analysis:	**003702/23**

ASSESSMENT & CLASSIFICATION SUMMARY

GN R634 A1(2)(a)	**Listed General Waste**	**None identified**
GN R634 A1(2)(b)	**Listed Hazardous Waste**	**None identified**
GN R636 (5)	**Disposal Prohibitions, Restrictions ***	**(1)(a), (1)(b), (1)(q)(ii)**
GN R636 (5)	**Future Prohibitions, Restrictions ***	**(1)(r)(iv)**
GN R634	**Overall Waste Disposal to Landfill**	**Type 0 Waste | Prohibited Waste (per GN R636 (5) above)**
GN R635 (7)	* Waste Type (Chemistry only)	* Type 3 Waste (54% moisture content as-received analysis)
GN R636 (4)(1)	* Landfill Class (Chemistry only	* Class C Landfill (GLB+)

* Subject to treatment arising from GN R636 (5)(1) prohibition(s), and re-assessment per GN R634 (4)(5), if applicable.

SANS 10234:2019	**GHS Classification**	**Hazardous: H290, H314, H318**
SANS 10228:2012	**Dangerous Goods (Road & Rail)**	**Regulated: UN No. 1759, Class 8, PG I**

CLASSIFICATION DATE: 2023/05/26

Rferences, Regulations, Norms and Standards refered to herein:

GN R634	Waste Classification and Management Regulations
GN R635	National Norms and Standards for the Assessment of Waste for Landfill Disposal, Partial Analysis in terms of S(6)
GN R636	National Norms and Standards for Disposal of Waste to Landfill
SANS 10234:2019	Globally Harmonized System of classification and labelling of chemicals (GHS)
SANS 10228:2012	The identification and classification of dangerous goods for transport by road and rail modes
Manual of Tests and Criteria	Unless specifically stated herein that testing of physical hazards was undertaken, no such assessment was conducted.

1 Chemical Assessment for Landfill Disposal

1.1 Chemical Assessment Overview

Preliminary and chemical assessments for Landfill Disposal were undertaken in accordance with:

- Waste Management and Classification Regulations 2013 (GN R634);
- National Norms and Standards for the Assessment of Waste for Landfill Disposal (GN R635);
- National Norms and Standards for Disposal of Waste to Landfill (GN R636).

These regulations, norms and standards specify hazardous wastes, chemical constituents in a substance or mixture otherwise intended for waste disposal that determine the disposal endpoint (Landfill Class), and listed, current or future restricted or prohibited wastes or prohibited disposal activities.

1.2 Preliminary Assessment: Prohibitions & Restrictions

Preliminary assessment in terms of GN R634 and GN R636 concluded:

Reference	Clause	Applicability
GN R634 A1.2(a)	Listed General Waste	None identified
GN R634 A1.2(b)	Listed Hazardous Waste	None identified
GN R636 S.5	**Current Prohibition/Restriction from Disposal**	**Y (1)(a), (1)(b), (1)(q)(ii)**
GN R636 S.5	**Future Prohibition/Restriction from Disposal**	**Y (1)(r)(iv)**

Note: No treatment or stabilization of the waste has been advised.

Listed general waste per GN R634 Annexure 1 (2)(a):

- No applicable waste constituent, characteristic, property, or hazard was identified.

Listed hazardous waste per GN R634 Annexure 1 (2)(b):

- No applicable waste constituent, characteristic, property, or hazard was identified.

Currently prohibited or restricted waste in terms of disposal per GN R636 (5):

- Type 0, Prohibited Waste per GN R636 (5)(1)(a) Waste which, in the conditions of a landfill, is explosive, corrosive, oxidizing (according to SANS 10234 or SANS 10228). Prohibited from Aug 2013. See explanatory note in the bulleted paragraph below.
  (1)(b) Waste with a pH value of <6 or >12. Analytical value of: 13.3 pH.
  (1)(q)(ii) Waste with a moisture content >40% or that liberates moisture under pressure in landfill conditions, and which has not been stabilised by treatment. Analytical value of: 54 %.

Waste listed in GN R636 Section 5 (1) and (2), with future prohibition from or restriction to disposal:

- Future Prohibited Waste per GN R636 (5)(1)(r)(iv) >6% Total Organic Carbon (TOC). Hazardous waste with analytical value of: 10 %. (Prohibited from: Aug 2028)

1.3 Chemical Assessment: Waste Type & Landfill Class

The waste stream, due to its physical make-up and/or formational process(es) was subjected to the below analyses per GN R635 S(6), where "F" was full and "P" partial analysis, and "X" was excluded entirely. Refer to Annex A of this report for details.

F Metal Ions (Total)	F Anions (Total)	F Organics (Total)	P Pesticides (Total)
F Metal Ions (Leach)	F Anions (Leach)	F Organics (Leach)	P Pesticides (Leach)

The above chemical determination of waste type for landfill disposal according to GN R635, in conjunction with the waste acceptance criteria for disposal to landfill according to GN R636, concluded:

Reference	Waste Type	Waste Risk Level	Landfill Class (per GN R636 S.4)
GN R635 S.7	**Type 0 Waste ***	**Very high risk**	**Y Prohibited from Disposal ****
GN R635 S.7	Type 1 Waste *	High risk	Class A Landfill (Hazardous - H:H, H:h)
GN R635 S.7	Type 2 Waste	Moderate risk	Class B Landfill (General B+)
GN R635 S.7	Type 3 Waste	Low risk	** Class C Landfill (General B+)
GN R635 S.7	Type 4 Waste	Inert waste	Class D Landfill (General B-)

Notes:

* Confirmatory analysis is required for Type 0 and Type 1 wastes treated in order to achieve a lower final Waste Type and Landfill Class. Where applicable, this Waste Assessment and Classification report and associated Safety Data Sheet will be updated.

** Prohibited or restricted under GN R636 (5) Waste Disposal Restrictions, but assessed as a different waste type under GN R635 (7). Subject to waste treatment and re-assessment per GN R634, the prohibition or restriction may be excluded.

Type 0 Waste *:

- Based on GN R635 (7)(2), the waste is chemically assessed as a Type 3 waste; however waste is classed Type 0 per prohibited characteristics GNR 636 (5)(1)(a), (5)(1)(b) and (5)(1)(q)(ii) - refer to section 1.2 of the classification report.

Additional comments:

- Waste had a pH value of 13.3 and moisture content of 54%.

Refer to the Talbot Certificate of Analysis referenced on page 1 of this report for specific analytical information and results.

2 Globally Harmonized System (GHS) Classification

2.1 GHS Classification Overview

Substances and mixtures, including waste, must be assessed for hazardous properties for their safe handling and use. The assessment was conducted in accordance with SANS 10234:2019 Globally Harmonized System of classification and labelling of chemicals.

2.2 SANS 10234:2019 Harmonized Classification

The waste stream appears to be a black moist solid.

Classification in accordance with SANS 10234:2019 concluded:

Hazard :	Code	**	Class *	Statement **
Physical	H290	1	Corrosive To Metals	May be corrosive to metals
Health	H314	1A	Skin Corrosion	Causes severe skin burns and eye damage
	H318	1	Serious Eye Damage	Causes serious eye damage
Environment	-	-	None identified	-
Conclusion	**Hazardous - by way of above properties and/or effects.**			

Notes:

* GH Hazard Class and Hazard Statements that include an asterisk have been abbreviated for report formatting purposes. Refer to the Safety Data Sheet for further information.

* Where a Hazard Statement above is prefixed with the word "Deemed", explanation is provided in the relevant hazard(s) paragraphs below this note.

** GHS Hazard Category, Type or Division - as applicable to the Hazard Class.

Physical hazards:

- H290, Category 1, by means of Existing hazard classification. Based on pH 13.3

Health hazards:

- H314, Category 1A, by means of Cut-off value(s) exceeded by additivity method. Based on pH 13.3
  H318, Category 1, by means of Cut-off value(s) exceeded by additivity method. Based on pH 13.3

Environment hazards:

- No applicable waste constituent, characteristic, property, or hazard was identified.

The intended use is disposal.
Further information is available in the accompanying Safety Data Sheet (SDS).

3 Dangerous Goods Class: Transport by Road and Rail Modes

3.1 Dangerous Goods Class Overview

Goods intended for transportation by road and rail in South Africa are assessed in terms of their risk to health and safety, or property and the environment. The assessment was conducted in accordance with SANS 10228:2012 (Edition 6).

3.2 SANS 10228:2012 Classification for Transport

Classification in accordance with SANS 10228:2012, The identification and classification of dangerous goods for transport by road and rail modes, concluded:

Class (*)	UN Number	Proper Shipping Name (Road & Rail Modes)	PG **
8	**1759**	**CORROSIVE SOLID, N.O.S**	**PG I**

Notes:

* Subsidiary class, if applicable.

** Packing Groups I, II or III. Not applicable for Classes 1, 2, 4.1 Self-reactives, 5.2, 6.2, 7.

Dangerous Goods classification:

- Classed under UN 1759 based on corrosive properties.

Refer to Section 14 in the accompanying Safety Data Sheet (SDS).

4 Disclaimer & Reserved Rights

This assessment and classification report has been prepared according to provided and/or quantifiable information, in accordance with the various regulations, norms and standards, and references noted herein.

Within the context of the precautionary principle contained in the references, every effort has been made to output accurate and measured conclusions. Should additional, supporting, or contrary information be identified to that which is contained herein, Talbot and the contact person noted in Section 1 must be informed immediately.

The observations and recommendations made herein, and any other information or statements contained in the accompanying SDS, if applicable, must be applied with common sense. This report is not a substitute for a quantitative toxicological risk study, standard operating procedure, risk assessment, license for handling, storage, transportation, or disposal, or a waste manifest.

Neither Talbot, the author of this report, nor the architect of the waste pack accept any liability whatsoever associated with the generation or use of this report or the information, observations, statements, or conclusions contained herein.

Talbot reserves all rights to modify at any time this or related reports should new waste information be provided.

Annex A: Schedule of GN R635 Chemical Analyses and Assumed Element Complexes for SANS 10234:2019 (GHS)

Metal Ions	assessed for GHS as	TC (mg/kg)	ASLP1 Acetate pH 2.9 (P/NP) LC (mg/l)
Arsenic (As)	As2O5	✓	✓
Boron (B)	B2O3	✓	✓
Barium (Ba)	BaO	✓	✓
Cadmium (Cd)	CdO	✓	✓
Cobalt (Co)	CoO	✓	✓
Chromium-total (tCr)	Cr2O3	✓	✓
Chromium-VI (Cr6)	CrO3	✓	✓
Copper (Cu)	Cu2O	✓	✓
Mercury (Hg)	HgO	✓	✓
Manganese (Mn)	MnO2	✓	✓
Molybdenum (Mo)	MoO3	✓	✓
Nickel (Ni)	NiO	✓	✓
Lead (Pb)	PbO2	✓	✓
Antimony (Sb)	Sb2O5	✓	✓
Selenium (Se)	SeO3	✓	✓
Vanadium (V)	V2O5	✓	✓
Zinc (Zn)	ZnO	✓	✓

Anions	TC (mg/kg)	LC (mg/l)
Total Dissolved Solids (TDS)	N/A	✓
Chloride (Cl)	N/A	✓
Sulphate (SO4)	N/A	✓
Nitrate-N (NO3-N)	N/A	✓
Fluoride (F)	✓	✓
Cyanide-total (CN)	✓	✓

Organics	TC (mg/kg)	LC (mg/l)
Benzene	✓	✓
Benzo(a)pyrene	✓	✓
Carbon tetrachloride	✓	✓
Chlorobenzene	✓	✓
Chloroform	✓	✓
2-Chlorophenol	✓	✓
Di (2 ethylhexyl) phthalate	✓	✓
1,2-Dichlorobenzene	✓	✓
1,4-Dichlorobenzene	✓	✓
1,2-Dichloroethane	✓	✓
1,1-Dichloroethylene	✓	✓
1-2-Dichloroethylene	✓	✓
Dichloromethane	✓	✓
2,4-Dichlorophenol	✓	✓
2,4-Dinitrotoluene	✓	✓
Ethylbenzene	✓	✓
Formaldehyde	✓	✓
Hexachlorobutadiene	✓	✓
Methyl ethyl ketone	✓	✓
Methyl t-butyl ether	✓	✓
Nitrobenzene	✓	✓
PAHs-total	✓	NA
Petroleum H/Cs, C6 to C9	✓	NA
Petroleum H/Cs, C10 to C36	✓	NA
Phenols-total, non-halogenated	✓	✓

Polychlorinated biphenyls	✓	✓
Styrene	✓	✓
1,1,1,2-Tetrachloroethane	✓	✓
1,1,2,2-Tetrachloroethane	✓	✓
Tetrachloroethylene	✓	✓
Toluene	✓	✓
Trichlorobenzenes-total	✓	✓
1,1,1-Trichloroethane	✓	✓
1,1,2-Trichloroethane	✓	✓
Trichloroethylene	✓	✓
2,4,6-Trichlorophenol	✓	✓
Vinyl Chloride	✓	✓
Xylenes-total	✓	✓

Pesticides	TC (mg/kg)	LC (mg/l)
Aldrin + Dieldrin	✓	✓
DDT + DDD + DDE	✓	✓
2,4-D	×	×
Chlordane	✓	✓
Heptachlor	✓	✓