6 August 2020

ENVIRONMENTAL LEGAL COMPLIANCE AUDIT REPORT

TRONOX KZN

HILLENDALE MINE

DMR REF: KZN30/5/1/2/2/124MR
KZN30/5/1/2/2/125MR
KZN30/5/1/2/2/178MR
KZN30/5/1/2/2/150MR

Compiled for

TRONOX

R34, Melmoth Rd, Empangeni, 3880

Compiled by

EXIGENT

PO Box 9614, Richards Bay, 3900

ENVIRONMENTAL MANAGEMENT PROGRAMME EXTERNAL AUDIT

August 2020

Hillendale mine, KwaZulu-Natal

DMR REF: KZN30/5/1/2/2/125MR
KZN30/5/1/2/2/124MR
KZN30/5/1/2/2/178MR
KZN30/5/1/2/2/150MR

Action	Designation	Date	Signature
Compiled by:	**Exigent** Jacolette Adam (Pr. Sci. Nat., EAPASA) MSc, LLM (Environmental Law) Sihle Nkomo (BSocSc)	6 August 2020	Adam
Submitted to:	**Tronox** Isaac Ndhlazi (Manager: Environment) Dinesh Moodley (Environmental Practitioner, SHEQ Fairbreeze Mine)		

EXECUTIVE SUMMARY

Exigent Engineering Consultants CC (hereafter referred to as Exigent) has been appointed by Tronox Pty) Ltd to conduct the environmental legal compliance audit in terms of Regulations 34 of GN326 of 2017, for the Hillendale mine

Table 1: Assessment Summary

Client:	Tronox Pty Ltd
Site/Facility:	Hillendale mine
Audit Type:	Legal compliance audit reports in line with the requirements of Regulation 34 of GN326 of 2017
Phase:	Closure phase
Audit Specification:	Approved EMPR and other applicable licenses and permits issued
Audit dates:	17 June 2020
Tronox Representative(s):	Isaac Ndlanzi, Dinesh Moodley
Auditor and Representative:	Exigent Engineering Consultants represented by Jacolette Adam, Charleen Smuts and Siphesihle Nkomo
Issues identified:	1. The Rehabilitation plan for Hillendale Mine needs to be updated with specific timeframe, and planning actions to certain aspects such as the vegetation growth on the RSF and grassing on the spillway walls to limit potential negative impacts such as erosion. 2. Stormwater management is crucial to ensure that erosion does not occur on localized steep slopes and roads/footpaths throughout the mine. 3. Fencing/limiting access to the mine area is imperative to limit liability prior to obtaining closure. 4. Closure planning is in process and should include discussions with regards to the final end land-use and infrastructure responsibilities with the proposed beneficiaries. 5. Records should be kept of reports sent to competent authority.

TABLE OF CONTENTS

LIST OF TABLES

APPENDICES

1. INTRODUCTION

Exigent Engineering Consultants CC (hereafter referred to as Exigent) has been appointed by Tronox Pty Ltd as an independent environmental consultant to undertake Legal compliance Auditing of the Hillendale mine Environmental Management Programme Report (EMPR) and various other licenses. The Auditing will involve the review the conditions of the licenses and permits and determine the level of compliance.
The Hillendale mine is under closure phase therefore only activities that are applicable to closure phase have been assessed.

Regulation 34 of GN. 326 of 2017 stated the following:
(1) The holder of an environmental authorisation must, for the period during which the environmental authorisation and EMPr, and where applicable the closure plan, remain valid—

a) ensure that the compliance with the conditions of the environmental authorisation and the EMPr, and where applicable the closure plan, is audited and
b) submit an environmental audit report to the relevant competent authority.

2. METHODOLOGY

2.1. Environmental auditor

Exigent was requested by Tronox (Pty) Ltd to conduct the external audit of the Hillendale Mine, located near Richards Bay, KZN. Jacolette Adam from Exigent conducted the audit and was supported by Charleen Smuts and Siphesihle Nkomo. The CVs is included in Appendix A and a summary of experience included below:

AUDITOR	QUALIFICATION	EXPERIENCE
Ms Jacolette Adam Pr. Sci. Nat Environmentalist and Team Leader	MSc LLM in Environmental Law	20 years of professional experience in the environmental sector and has been a certified Professional Natural Scientist since 2002 (400088/02). She is also a Fellow member of the Water Institute of South Africa (WISA), the International Association for Impact Assessment South Africa (IAIASA) and has successfully completed numerous environmental assessments and closure provisions throughout South Africa and Internationally for a wide range of clients.
Charleen Smuts	Pri. Sci. Nat. MSc	Charleen has 7 years' experience in the environmental field and is registered as a Professional Natural Scientist (Reg No 115412) in the Botanical Science field of study and is a member of the South African Affiliate of the International Association for Impact Assessment, the South Africa Wetland Society. She has obtained her BSc in 2005 and has since gained a MSc from the University of Pretoria. She has been involved in a wide range of projects, including mixed-use housing developments, pipelines, large scale developments, land use change projects, low cost housing developments, golf estate developments and numerous linear activities.
Siphesihle Nkomo	BSocSc	Siphesihle has 1 year of professional experience in the environmental sector and has a BSocSc in Environmental Management she has also been actively involved with numerous legislated environmental processes. she is also a member of the International Association for Impact Assessment South Africa (IAIASA).

2.2. Audit methodology

Exigent has provided a proposed findings category for use during the audit. These findings actions are listed in Table 1.

Table 1. Audit Finding categories

Rating	Findings
1	Non-compliant
2	Partially compliant
3	Compliant
4	Not applicable

These above described ratings were applied to all the conditions of the EMPR.

A summary of the total list of ratings and findings and a summary of the audit outcome findings are listed in Table 3.

Table 2: Audit of the Hillendale Environmental management programme (EMPR)

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
Soil						
Minimise the loss of a soil resource	1	Steep slopes are vegetated to minimize the loss of soil in heavy rainfall events.	2	All slopes have been vegetated to prevent the loss of soil during rain events.	Steep slopes have been vegetated; however, soil erosion is evident in some areas.	Follow up on erosion mitigation measures followed.
	2	The areas to be disturbed (servitudes and areas affected by mining) will be kept as small as possible.	4	Not Assessed	Hillendale is under the Closure phase and all disturbed areas are in the process of being rehabilitated.	N/A
Land capability						
Minimise the loss of land with agricultural potential	3	Following backfilling, the landform will be shaped to the extent where it will be possible to farm on the area.	2	All landform shaping has been completed to support the intended land use and be visually similar to the general landscape.	Same findings	N/A
	4	The rehabilitation of the soil moisture retention characteristics will take place so that the original or current land use can be supported and long-term recharge to ground water.	2	Although soil moisture retention has been reduced various investigations and reports addressed soil moisture retention. Fine materials were added to the surface soils in most areas to aid in soil moisture retention.	Same findings	N/A
	5	2 to 3 years before decommissioning a small (~1 ha) sugar cane trial plot will be established to evaluate the most effective cane farming methods	3	Test plot work was completed finding that sugar cane was only viable with the addition of fertilizer. Sugarcane was found to be a marginal crop for this area if not under irrigation. All further sugarcane experiments have been stopped.	Same findings	N/A

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
Land use						
Prevent long term changes in land use	6	The post-mining land use will be agriculture, specifically sugar cane.	4	See 6.2.4.1	All sugar cane areas have been planted with Eucalyptus trees, and Casuarina on the RSF.	N/A
Vegetation						
Minimise loss of vegetation within the mining footprint	7	The identified wetlands and riparian area will be protected against disturbance (declared no-go areas) with respect to mining equipment.	4	Not Assessed	Hillendale is under the closure phase, there is no disturbances of no-go areas occurring.	N/A
	8	The mine will rehabilitate all disturbed land throughout the life of the mine as soon as the disturbing force is removed.	2	Rehabilitation commenced subsequent to mining activities coming to an end with minor works being completed at the end of 2018 after which "all" intended works would have been completed.	Rehabilitation is still necessary on some areas of the RSF as there is slow growth of vegetation cover.	Implement updated Rehabilitation Plan.
Animal life						
Minimise disturbance of ecology due to loss of habitat and noise/visual/dust	9	Mining-associated traffic will be restricted to the roads and remain out of sensitive areas.	3	Traffic is limited to LDV's (security and onsite personnel) and tractors busy with final rehabilitation works and which is restricted to a single demarcated single circular route.	Traffic is only limited to security and fire breaks maintenance vehicles.	N/A
Surface water						
Minimise or prevent deterioration in surface water quality due to mining activities	10	Water quality and flow monitoring within the freshwater will be undertaken in accordance with TSA's monitoring programme. The results will be used in the development of the closure plan	4	This aspect is not applicable to Hillendale although surface water monitoring and bio-monitoring is undertaken at regular intervals and the outcomes submitted to the DMR	The last report submitted for 2019 is the Water Quality Report, Tronox KZN - Hillendale Mine Monthly Water Quality Update, Report Nr MON-WQR-281-HD-16_17 (19-12),	Investigate effluent pipe entering the river. Follow up on erosion mitigation measures followed.

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		remediation and monitoring programme.		upon request. Monthly Water Quality updates are being undertaken by ENVASS which reported annually to the DMR. The last report submitted is the *Water Quality Report, Tronox KZN - Hillendale Mine Monthly Water Quality Update, Report Nr MON-WQR-281-HD-16_17, September 2018.*	December 2019. Any runoff from the rehabilitated areas should promote diffuse flow to increase the retention time, and thus reduce the potential contaminates from entering the downstream system.	
	11	Clean water diversions and dirty water collection facilities will be established before land clearing and mining commences, to prevent clean rainfall runoff becoming contaminated by construction or operational activities. The measures envisioned are simple soil berms to prevent clean runoff entering dirty areas and others to divert dirty water to settlement paddocks.	4	Not Assessed	These activities were concluded during operational phase.	N/A
	12	Dirty water drains will be sized to manage the 'dirty' water generated by a 1:50 year storm arising on contaminated areas. Dirty water will be directed to retention ponds, from where it can be returned to the mine or process water circuit. The storage facilities	4	Not Assessed	These activities are not applicable to the current Closure phase.	N/A

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		will have a minimum freeboard of 0.8m above full supply level. The width and height of the drains will be determined to ensure compatibility with identified hydraulic requirements of the drain.				
	13	All water used for mining and mineral processing to be kept in a closed circuit.	4	Not Assessed	These activities are not applicable to the current Closure phase	N/A
	14	The PWP has bunds around it to contain any possible spillage.	4	Not Assessed	The primary wet plant (PWP) area has to date been totally decommissioned The PWP maintenance workshop area has partially been decommissioned; some areas left for aftercare purposes (MCL-REP-109-18_19 HD)	N/A
	15	The water levels in the dirty water storage facilities will be kept low by recycling into process water circuit. This ensures that the facility has enough capacity in the event of another severe rainfall event.	4	Not Assessed	These activities are not applicable to the current Closure phase.	N/A
	16	The mine will keep water systems clear of obstructions. Drains will be inspected regularly. Unless problems are encountered during these inspections, the drains will be cleaned and maintained as necessary.	4	Not Assessed	These activities are not applicable to the current Closure phase.	N/A

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
	17	Spillage from pipelines will be contained by bunds. These will direct spillage to areas where it may be cleaned up and returned to the process. A contingency plan will be implemented to enable early detection of burst pipelines.	4	Not Assessed	These activities are not applicable to the current Closure phase.	N/A
	18	The mine will use its incident reporting system to ensure appropriate measures are taken in the event of incidents.	4	Not Assessed	No work is being done as Hillendale is under closure.	N/A
	19	The mine will ensure that temporary toilet facilities do not cause any water pollution or a health hazard.	3	Not Assessed	The only toilet facility still in use are those at the offices, which are used by the security personal. These are regularly cleaned with a honeysucker.	N/A
	20	The flocculant used will be such that both the flocculant and its decay products will not be to the detriment of downstream water users. The dosage of excessive amounts of flocculant will be avoided. The selection of a flocculant will be made from a toxicological point of view, that is, possible flocculants will be tested before hand in terms of possible impacts on the aquatic ecosystem or environment.	4	Not Assessed	These activities are not applicable to the current Closure phase.	N/A
	21	Should contamination or excessive flow be detected, the	3	No residual contamination has been detected onsite and recent	Any runoff from the rehabilitated areas should promote diffuse	Follow up on implementation of

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		mine will immediately notify relevant authorities. The mine will then: identify the source of the contamination; identify, and if necessary, implement, measures for the prevention of this contamination (short and long term); determine, and if necessary, implement any remediation measures.		reports reflect an overall improvement in water quality.	flow to increase the retention time, and thus reduce the potential contaminates from entering the downstream system. WQ (19-11).	erosion mitigation measures.
	22	The PWP has bunds around it to contain any possible spillage. Bunds to be checked regularly for cracks and leakages.	4	Not Assessed	The primary wet plant (PWP) area has to date been totally decommissioned (MCL-REP-109-18_19 HD).	N/A
Minimise impact of residue dam on water quality	23	The residue dam embankments are maintained at an elevation sufficient to contain a 1:100 year 24-hour storm event and still have 0.8 m freeboard. The residue dam is regularly inspected by suitably qualified consultant engineers who devise a system of checks and management principles to ensure that the stability of the dam remains within acceptable limits. The residue dam starter walls were constructed from a sandy material. The outer surface of the walls is vegetated with grass to prevent surface erosion. The dam is inspected after every major	4	Not Assessed	The RSF return water dam was opened and rehabilitated *(MCL-REP-109-18_19 HD).* Shaping / modification for stormwater discharge is complete: • Most of the floor of the dam is still covered with reed growth.	Ongoing Rehabilitation needs to occur at the RSF to ensure full vegetation cover as per the final rehabilitation programme.

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		storm event and any repairs to it made as necessary. If certain areas experience high velocities (in excess of 2 m/s) due to swirling, protective measures such as *Reno* mattresses or *Armourflex* will be used to prevent repeated flood damage. A facility to recirculate return water to the thickeners when the suspended solids level is too high has not been installed as suspended solids in the process water have not been a problem. Toe paddocks were constructed and are maintained. The residue dam starter walls were built higher than the 1:100 year flood level to lessen the chances of flooding. Process and rain water is pumped into a return water dam which is capable of containing the volume of water generated by a reasonably large rainstorm.				
Minimise impact of residue dam on water quality	24	The return water dam was constructed with only one compartment instead of two as initially envisaged in order to gain maximum storage volume in the available area. When cleaning of settled solids is required it will	2	The decommissioned return water dam was altered to drain freely and remain as a wetland area with well-established natural vegetation. It was noted that a visible amount of waste material is still	Shaping / modification for stormwater discharge at the return water dam is complete. Most of the floor of the dam is still covered with reed growth. Construction of the spillways was completed at the end of	N/A

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		either be done by means of dredging system while operation is in process or a temporary facility will be installed to return water to the PWP while the dam is cleaned. The storm water running off the dune above the residue dam is contained in the closed circuit and aids in reducing the water requirement from the Mhlathuze River. The residue dam embankments are maintained at an elevation sufficient to contain a 1:100-year 24-hour storm event and still have 0,8m freeboard.		lying around the dam perimeter. It was also observed that the neighbouring community are excavating and removing some of the dam lining material. The construction of the spillways was completed and the specified freeboard is therefore no longer applicable due to the subsiding of the RSF surface. The penstock drain vents have been lowered to accommodate the subsiding of the RSF surface level thus allowing water to drain freely.	2018. Small trees are growing on the spillway where the HDPE liner was installed – Tronox to remove the trees on a regular basis. Grassing on the walls next to the spillways need to be redone – these areas are at risk of being eroded.	
Minimise risk of erosion from either increased base flow or mining operations	25	To minimise impact on the receiving water bodies, the mine will optimise the removal of return water from backfilling operations.	4	Not Assessed	These activities are not applicable to the current Closure phase.	N/A
	26	Water systems, such as drains, and canals will be designed to prevent pollution and minimise erosion or sedimentation.	4	Not Assessed	These activities are not applicable to the current Closure phase.	N/A
Minimise risk of erosion from either increased base flow or mining operations	27	Linear infrastructure (roads and pipelines) will be inspected on a regular basis (ideally monthly) to check that the associated water management infrastructure is effective in controlling erosion. If any of the inspections identify	2	Construction of the final ring-road was completed, inclusive of erosion control measures, and a large turning / loading zone was established at the northern section. The necessary slopes and	Roads are in a passable condition with only minor erosion damage in some areas. Occasional repairs of these areas are recommended to avoid significant damage during heavy rains.	Follow up on implementation of erosion mitigation measures.

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		eroded areas, these will be repaired where necessary as soon as practicable.		channels were established. The final road infrastructure layout will be surveyed as per Regulatory requirements for closure. The remaining roads are inspected on a regular basis and repaired when required.	Some of the dirt roads will remain post-closure to serve as access roads (MCL-REP-109-18_19 HD.	
	28	All surface water management infrastructure constructed from soil (berms, canals and bunds) will be inspected on a regular basis, with more frequent inspections during periods of high rainfall and after major rainfall events. If any of the inspections identify eroded areas, these will be repaired where necessary as soon as practicable.	3	The water management structures are well established in maintained. The new formal bulk stormwater control infrastructures will be completed by the end of 2018.	Aftercare of storm water management structures particularly on the UVS and Chennel properties is still taking place (MCL-REP-109-18_19 HD).	Follow up on implementation of erosion mitigation measures.
	29	Energy dissipaters will be constructed at points where there are concentrated discharges of water to the environment that can cause significant erosion. Where necessary, energy dissipaters will also be placed within water channels to slow the speed of water (for example in the clean water diversions). The effectiveness of these dissipaters will be checked on a regular basis. If any of the inspections identify eroded areas, these will be	3	Energy dissipaters, inclusive of Reno-matrasses, are included in the infrastructure being finalised.	All infrastructure for Hillendale has been finalised	N/A

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		repaired where necessary as soon as practicable.				
	30	Energy dissipaters will be placed in footpaths where there are signs of erosion. The footpaths will be inspected on a regular basis, with more frequent inspections during periods of high rainfall and after major rainfall events. If any of the inspections identify eroded areas, these will be repaired where necessary as soon as practicable.	2	No formal footpaths for use by rehabilitation operations remain on site. It was noted that the adjacent community cross the rehabilitated area and RSF through various informal paths which lead to erosion during rainfall events as the soils are not yet fully stabilised.	Fencing/breaking of the fence theft continues to be an issue at the RSF and rehabilitated areas.	Fencing/breaking of the fence theft continues to be an issue at the RSF and rehabilitating areas.
Minimise impact of reside dam on surface water quantity	31	Flange covers are to be installed to prevent spraying of material. Pipelines are monitored continuously for pressure drops by means of flow meters. Maintenance programme includes regular visual inspection of pipelines.	4	Not Assessed	These activities are not applicable to the current Closure phase.	N/A
	32	Contain all water falling on the mining area, and thereby prevent runoff.	3	Stormwater is being managed through existing and new structures to prevent erosion and control runoff. Problems have been experienced in recently rehabilitated areas and along trespasser footpaths.	Stormwater infrastructure is being managed to prevent erosion and control runoff.	Follow up on implementation of erosion mitigation measures.
	33	Water systems are designed so that as little surface water as possible ponds on the mining	4	Not Assessed	These activities are not applicable to the current Closure phase.	N/A

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		area.				
Groundwater						
Minimise change in ground water quantity and quality	34	See Surface Water (ref 10 - 22) for monitoring, water use optimisation and pollution control requirements.	2	Not Assessed	Monthly Water Quality updates are being done by ENVASSE, the last report submitted for 2019 is the Water Quality Report, Tronox KZN - Hillendale Mine Monthly Water Quality Update, Report Nr MON-WQR-281-HD-16_17 (19-12), December 2019. Any runoff from the rehabilitated areas should promote diffuse flow to increase the retention time, and thus reduce the potential contaminates from entering the downstream system.	Investigate effluent pipe entering the river.
	35	There are a number of uncertainties regarding the groundwater model input parameters so improve the model a monitoring programme consisting of the following should be conducted, and the groundwater models updated prior to mining in order to ensure that the conservative estimates are refined further: the use of soil moisture probes or other relevant instrumentation to determine unsaturated zone conditions;	2	Not Assessed	None of the installed piezometers are in place anymore – they have been stolen. This is not a viable option.	N/A

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		piezometer data used to monitored to establish the shape of the current groundwater mound accurately.				
	36	Construction of trenches as required on the edges of the mining areas to collect any seepage which might emanate due to the mining operation.	1	Not Assessed	Construction of trenches was completed during the construction phase.	N/A
	37	To ensure maximum water retention after mining, as much slimes as possible is added to the sand fraction being replaced on the dune.	2	Not Assessed	The deposition of the smelter slag has been completed, the areas has been covered with topsoil, grassed and planted with Eucalyptus trees.	N/A
Air quality						
Air emissions will be managed to minimise nuisance effects and prevent health effects.	38	The mine will continuously update the Air Pollution Control System (APCS). This APCS includes detailed management plans, mitigation measures and monitoring and operational procedures developed for each significant source to ensure reductions in emissions. Some of the matters to be included in the APCS are listed below.	1	Not Assessed	An Air Management Plan was drafted for Hillendale in January 2018, and is being implemented.	N/A
	39	The indicated maximum speed limits will be observed on all dirt roads.	3	Not Assessed	Road use is only limited to security and fire breaks maintenance vehicles.	N/A
	40	Dust will be minimised by the use of grass or cane cover, or dune	3	Dust levels at the remaining final operations and areas newly	Dust Monitoring only occurs at the UVS and PWP weather	N/A

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		coating (which can achieve higher efficiencies that vegetation in the short term). This will necessitate the establishment of dedicated entry and exit routes to the actively mined void and the routine monitoring of vegetation cover to determine the effectiveness of the rehabilitation protocols that have been employed.		planted areas are low and within the acceptable residential limits.	station only and the levels are within the acceptable residential limits.	
	41	The rehabilitation (vegetation) or dust suppression measures of the backfilled area will take place as soon as the previously mined void has been filled.	4	The re-establishment of vegetation has taken place once the voids were filled during the 2017 programme.	Same findings	N/A
	42	Dust suppression will be used on unpaved roads to achieve a maximum control efficiency of 85% (using either water sprays or chemical suppressants).	1	See 5.2.1.1	No dust suppression methods are currently being conducted; the roads are only used during maintenance works.	N/A
	43	Source based performance indicators for the mining operations will include visible reductions in fugitive dust resulting from mining activities.	4	No mining activities apart from final rehabilitation are being undertaken. No active dust control activities are being undertaken anymore.	Same findings	N/A
	44	Source based performance indicators for sources of wind erosion will include: vegetation cover up to 1m from the top (applicable to the residue dam and topsoil pile); vegetation	2	Vegetation cover was completed by the end of 2018.	Vegetation cover is less dense at the RSF and further vegetation is required.	Ongoing Rehabilitation needs to occur at the RSF to ensure full vegetation cover as per the final

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		density to be at least 80% on backfilled areas; and dustfall immediately downwind from the source to be < 1 200 mg/m²/day.				rehabilitation programme.
Noise						
Minimise noise disturbance	46	The mine will use road rather than rail transport to convey the HMC from Hillendale to the CPC in Empangeni.	4	Not Assessed	No transportation of minerals is being carried out as Hillendale is under the Closure phase.	N/A
	47	Bulldozing operations will be limited to daytime hours	4	All works are restricted to normal working hours.	No more works are taking place at the mine.	N/A
Archaeology						
Manage the loss of archaeological or culturally sites	48	A regular monitoring program to record and assess potential sites/artefacts that were missed due to the dense vegetation or that were below the surface at the time of the survey will be undertaken.	4	Not Assessed	These activities are not applicable to the current Closure phase.	N/A
	49	Destruction permits will be obtained for any unrecorded sites that may be recorded during the monitoring program, in terms of the KwaZulu Natal Heritage Act of 1997.	4	Not Assessed	These activities are not applicable to the current Closure phase.	N/A
Visual						
Minimise visual disturbance	50	The following mitigation measures are in place for minimizing the impact of the view from the N2: Retain existing plantations on the	2	The original Eucalyptus plantation was retained and it remained the property of the original owner. Screens were planted at various	Establishment of the vegetable gardens is still an ongoing issue.	N/A

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		south side of the N2 which already provides a visual screen. Plant new visual screens of the same vegetation, i.e. Eucalyptus, pines and indigenous vegetation close to the road to screen the view. In view of the short mining period (approximately ten years) fast-growing indigenous species will be preferred. A substantial number of indigenous trees were planted to ensure that the passing viewer would be presented with a barrier. Further activities relating to the rehabilitation of the residue dam will be initiated during the closure phase. Containment walls are built surrounding the area which are grassed and vegetated and have slopes no steeper than 1:2. This allows re-vegetation and they fit in with the surrounding landform. These barrier berms were constructed prior to any deposition of tailings behind them and are periodically raised so that there is always a vegetated stable slope presented to the passing viewer.		locations and the indigenous trees which have sprouted along the RSF walls are well established. The N2 facing areas have a well-established indigenous tree barrier. A well-established indigenous tree barrier interspersed with indigenous grass and reeds have created a visual barrier of the RSF walls. The grass along the mine slopes also obscures previous mining activities. Five to nine different indigenous tree species were planted on the western slopes, according to elevation, of the rehabilitated areas. The increasing in number of informal vegetable gardens established along some of the western and steep slopes was noted. This is of great concern in respect of erosion risk, illegal hunting and future claimant risks. It was reported that local Councillors were asked to intervene and that subsequent to their visit to the fields, the situation remained the same.		

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
	51	The following mitigation measures are in place for minimizing the impact of the view from other access roads: Retain all existing vegetation between the mining site and the road. From a practical perspective little can be done to mitigate impacts in the active mining area. The focus is therefore on constraining the active mining area to as little a footprint as possible and rehabilitating available areas as soon as possible. The existing vegetation comprises Eucalyptus and indigenous trees. More indigenous, fast growing trees (because of the short mine life) were planted along this edge. A reclamation and rehabilitation process was developed which utilises waste material in order to build up a new landform behind the advancing face, which is then shaped, top-soiled and revegetated.	3	Trees and grasses were planted in accordance with the land use plan.	The vegetation between the mining site and the road was not disturbed.	N/A
Socio-economic						
Minimise changes in the demographics of the area	52	The mine and its sub-contractors will employ people strictly from the TSA offices in Empangeni, or an employment agency elsewhere.	4	Not Assessed	No mining activity is currently taking place, therefore the only people at the mine office is security personal.	N/A
	53	Issues such as the development	3	Not Assessed	No informal settlements have	N/A

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		of informal settlements will be addressed via the relevant Forums.			occurred in the mined area	
	54	Where possible Ticor South Africa will employ people from the local District (Uhtungulu District Municipality). The TSA policy is to employ at least 60% of the people from the local district and the remainder of the workforce from anywhere. This was approved by the HR&R Board Committee. The Community Forum consists of representatives from Amakhosi and Councillors. People from outside this area will only be employed if the necessary skills required are not available in the local area.	4	Not Assessed	No mining activity is still taking place, therefore the only people at the mine office is security personal.	N/A
	55	If suitably trained employees are not available from within the surrounding communities, Ticor South Africa will, in accordance with the TSA Social and Labour Plan, introduce training programmes focused on raising the skill levels of the local residents.	4	Not Assessed	No mining activity is still taking place, therefore the only people at the mine office is security personal.	N/A
	56	TSA will not allow establishment of informal settlements on its land.	3	Not Assessed	No informal settlement has formed in the mining area, security is on guard on a daily basis.	N/A

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
Maximise possible contributions to the economy	57	The mine procurement policy will encourage the establishment of sustainable businesses from which goods are obtained, in accordance with the targets as set out in the TSA Social and Labour Plan.	4	No longer applicable	Same findings	N/A
Interested and affected parties						
Maintain positive and transparent relationships with TSA's stakeholders	58	EXXARO KZN Sands South Africa will maintain communication channels with I&AP's through the following forums: Greater Mhlathuze Environmental Forum (quarterly); Community Forum (quarterly); Employee Forum (quarterly); Greater Mtunzini Communications Forum (quarterly); Regulatory authority meeting (quarterly); Amakhosi information meeting (quarterly); and Councillors information meeting (quarterly).)		The following meetings have continued post mining: Quarterly Amakhozi Meetings Annual Rehabilitation Meeting (the last 11 April 2018) Annual SHERQ meeting with the Greater Neighbouring Communities Forum A rehabilitation and closure progress report back meeting was held with the DMR on the 8th of February 2018.	Not reviewed due to outstanding information.	
	59	Forums will be maintained until mine closure.		See above	Not reviewed due to outstanding information.	
Submission of information						
Provide stakeholders with relevant information	60	All information as described in the relevant sections will be made available to interested and affected parties via the communication channels outlined in Ref 58.		Feedback in respect of relevant information is provided at the aforementioned meetings (Annual Rehabilitation Meeting, Annual SHERQ meeting with the Greater Neighbouring	Not reviewed due to outstanding information.	

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
				Communities Forum).		
	61	Authorities will be provided with information as specified in the relevant legislation or authorisation.	3	See 6.2.5	See 6.2.5	N/A
Miscellaneous environmental management						
Environmental management will be undertaken in accordance with TSA's environmental policy.	62	The Environmental Management System (EMS) of EXXARO KZN SANDS will be used to audit, track, and manage mitigation measures.	4	No longer applicable	Same findings	N/A
	63	The maintenance of mitigation measures is described in the relevant sections above.	2	Dedicated staff have been assigned to Hillendale to give effect to the final mitigation measures implemented.	The final rehabilitation plan should be implemented	Implement updated rehabilitation plan.
	64	Good housekeeping will be maintained to minimise the risk of pollution. The mine will operate in such a way as to prevent uncontrolled releases of potentially polluting material. A contamination clean-up plan will be developed to ensure that any spills are cleared as soon as possible and to ensure disposal of spilt material in an appropriate way.	2	Activities are limited to final rehabilitation plantings erosion control and repairs. Any residual pollution risk as a result of these activities and mine litter will be removed prior to closure. It was observed that some demolished cement structures remained at the "MTN Tower" area which needs to be removed as part of final closure.	General waste has been tipped over, adjacent to the eroded mine fence. The lack of fencing on the mine has allowed for the community to dump waste adjacent to the mining area.	These issues will remain problematic, and potentially could increase. Tronox remains responsible for management of the mining area until closure, therefore adequate measures should remain in place.
	65	The mine will ensure that relevant equipment is well maintained and fully operational.	3	The only remaining Tronox equipment will be the Fairbreeze bulk water pumps and which is and will be maintained by the	Same findings	N/A

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
				Fairbreeze maintenance staff.		
	66	Non-mining waste materials will be classified according to the minimum requirements for the handling and disposal of waste as published by the Department of Water Affairs and Forestry. Classified waste materials will be placed in containers specifically identified for this purpose and disposed in appropriate disposal sites. Hydrocarbons in particular will be disposed in a licensed H:h disposal site. All spills will be treated as per the approved TSA procedure.	3	Not Assessed	Waste is not being generated on site.	N/A
	67	The approved EXXARO KZN SANDS Emergency Procedure will be applied during the all phases of mining.	3	The existing Fire Response Team will remain operational during the closure phase.	The existing Fire Response Team will remain operational during the closure phase.	N/A
	68	All employees and contractors will receive basic training in environmental awareness as well as the applicable sections of the Emergency Procedure. The environmental awareness training will include reference to the following: identified environmental risks in the workplace; Environmental Management Plans related to the specific risks; provisions and commitments	4	Not Assessed	No environmental awareness has taken place as no work is being conducted onsite	N/A

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		contained in this Section of the EMPR; incident identification and reporting.				
Environmental management will be undertaken in accordance with TSA's environmental policy. – cont.	69	Performance assessments relating to the contents of this section will be conducted every two years.	3	Not Assessed	Environmental performance assessment was conducted in November 2018 and submitted to the CA.	N/A
	70	The mine will carry out regular risk assessments to ensure that potentially hazardous materials are appropriately stored, labelled and handled.	4	Not Assessed	No hazardous chemicals or materials are being handled onsite.	N/A
	71	To minimise the risk of pollution arising from the use of mobile equipment, drivers (both mine and contractors) will be trained on how to deal with accidents involving hydrocarbons and other potential contaminants. Emergency action plans will be drawn up to deal with serious spills on the road in order to minimise the impact on water resources.	4	The existing Hydrocarbon Spill Clean-up Plan applies, see Ref # CPDOC-40-72	Same findings	N/A
	72	Hazardous chemicals (paint and hydrocarbons) will be kept in an appropriate store at the PWP. Vehicles will not be refuelled on site, except in an emergency. In the event that a vehicle is refuelled on site, appropriate measures will be taken to ensure that all spills are cleaned up in	4	No hazardous chemicals are being retained onsite.	No hazardous chemicals are being retained onsite.	N/A

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		accordance with EXXARO KZN SANDS procedures.				
Further investigation						
Undertake further investigations prior to the commencement of mining to confirm predictions made in this report	73	Detailed engineering design for the final mitigation plans for the impacts identified during the environmental impact assessment process.	4	Not Assessed	These activities are not applicable to the current Closure phase.	N/A
	74	Air quality monitoring as per the specialist study recommendations (Airshed Professionals, 2004) – see ref 43-44.	3	Not Assessed	Dust fallout is still being measured at two stations (PWP and UVS weather station). The dust level is within acceptable limits.	N/A
Roads, railways and power lines						
Roads	5.2.1.1	Depending on the requirements of the land owner, the road on the mine sites could either revert to him or be demolished. Should the latter option be chosen then the surface and sub base will be removed, the ground will be scarified and contoured and shaped to conform to the topography. Topsoil will then be distributed and grass sown on the area.	3	The roads on the mine were never graveled just graded. Construction of the final ring-road was completed with lying of a G5 layer. A large turning / loading zone was also established at the northern section. The necessary slopes and channels were established. The final road infrastructure layout will be surveyed as per Regulatory requirements for closure.	The final road infrastructure layout will be surveyed as per Regulatory requirements for closure.	N/A
Railway	5.2.1.2	There are no railways	4	Not Assessed	Not applicable	N/A
Power lines	5.2.1.3	The pylon foundations will be removed and the ground	4	All structures have been demolished and removed.	Same findings	N/A

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		rehabilitated. The surface and groundwater flows will stabilize to pre-mining conditions. There will be a short-term impact on air quality and noise due to the use of construction equipment. Should the surface structures not be removed there will be a remaining visual impact. Comment/mitigation: The impacts will be of short term, therefore no mitigation required.		No pylons were used during mining operations as the 11Kva lines were wooden poles. These poles have all been removed and transferred to Fairbreeze Mine.		
Solid waste management facilities						
Residue Dam	5.2.2.1	The walls of the residue dam will be planted with kikuyu grass or suitable indigenous grass species on a continuous basis to reduce the visual impact and assist erosion prevention.	2	The walls were initially sodded and were superseded by natural species which now dominate the cover interspersed with wooden species which is well established along the western and northern wall Knight Piesold / Fumani, as service provider, conducts geotechnical evaluations and erosion checks annually. The last inspection was carried out during 15/04/2018. See 6.2.3.3; 5.4.2; 6.2.3.3 Two spillways have been constructed within the northern wall of the Residue Dam. The cement structures have been "painted" with slime fines in	There is evidence of extensive grass and shrub coverage on the outer slopes of the RSF. Grassing on the walls next to the spillways need to be redone – these areas are at risk of being eroded. The annual RSF inspection was conducted in February 2019.	Follow up on grassing of the spillways. Follow up on implementation of erosion mitigation measures, where necessary.

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
				order to make it blend into the environmental and thus be less obtrusive from the N2 freeway.		
Soil	5.2.3	The soil removed during the construction phase was stockpiled for use on the residue dam walls and the surface will be covered with soil and grassed during decommissioning. Sugar cane can then be re-established. Comment/mitigation: The impact on topography will remain as it is a permanent structure, however the land will be able to be used for sugarcane, similar as pre-mining.	2	The bulk of the mining area has been landscaped and vegetated. Sporadic erosion on newly rehabilitated areas is dealt with on a case by case basis. It was observed that significant erosion gullies existed along the norther slopes of the rehabilitated areas. The surface of the RSF was partially covered and the rest of the surface is being left to vegetate naturally, which is successful. Experimental Eucalyptus (123 000 planted) and Casuarina plots established on the RSF proofed to be more successful as was verified by Dr. Smith. The last reports are supportive thereof and for future Fairbreeze reference are: - *Rehabilitation options for the Fairbreeze Mine; Dr. C. Smith; dated 5 July 2017* - *Tree growth following various rehabilitation techniques at Hillendale; Dr. C. Smith; dated 9 January 2018*	*With Reference to: Tree growth following various rehabilitation techniques at Hillendale; Dr. C. Smith; dated 9 January 2018* Final findings suggest that to achieve successful rehabilitation for tree growth the soil medium requires a minimum quantity of clay and silt for soil cohesion and some organic matter to enhance soil nutrition and water availability. Further rehabilitation needs to continue at the RSF as vegetation growth is slow in some areas of the RSF.	Follow up on the success rate of vegetation cover on the RSF

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
				In summary the findings reflect that topsoil is the key to successful rehabilitation and that with the addition of fertilizer the requirements for commercialization will be achieved. See 6.2.3.3 It is noted that the aim of the RSF rehabilitation was to create a trafficable surface with potential future commercial viability.		
Land capability	5.2.4	Rehabilitation measures followed during rehabilitation will continue for disturbed areas, until all areas have been rehabilitated. The land capability will then return to its pre-mining potential. Comment/mitigation: The rehabilitation will continue after mining has ceased, until all disturbed areas have returned to its pre-mining land capability.	3	Rehabilitation was completed with monitoring of its success continuing during final closure (2019). It was noted that the continued uncontrolled access of residents from neighbouring communities increase both erosion and fire risks to the rehabilitated areas.	Rehabilitation is still being monitored.	N/A
Land Use	5.2.5	A suitable capping cover must be placed on the residue dam to ensure that it can carry farming machinery, making it possible to return the area to sugar cane farming, following decommissioning. Comment/mitigation: The land use after mining will be sugarcane	2	The final aim of the RSF rehabilitation was to create a trafficable surface with potential future commercial viability. This was achieved in that 98% of the surface area has been covered with vegetation to create a dry trafficable area with minimum dust generation and erosion risk.	Same findings	Follow-up on the success rate of vegetation cover on the RSF.

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		farming, as it has been prior to mining		The current state indicates that there are areas where the plots established are successful and areas where the plots are less successful. Evidence suggests that the unsuccessful plots may be as a result of high-water content, to high sand content, competition from other species especially *Phragmites*. More than 15 indigenous wetland species have been identified.		
Noise	5.2.6	Noise generated by earthmoving equipment will be within the standard noise requirements. However, it will impact on surrounding settlements. Some additional noise will be generated on local roads by vehicles transporting HMC to the smelter site and returning rejects from the smelter to the mine site. Similar considerations apply for the increased traffic transporting personnel to and from the mine sites. Comment/mitigation: Noise will be generated from various equipment during decommissioning; however standard noise regulations will be adhered to.	4	Noise monitoring stopped during 2015/2016 when the plant was finally relocated. No significant noise generation activities are associated with the remaining activities and the perceived noise levels are equivalent to that of agriculture.	No significant noise generation activities are associated with the remaining activities and the perceived noise levels are equivalent to that of agriculture.	N/A

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
Natural vegetation /plant life	5.2.9	One of the possible effects of decommissioning is the infestation of disturbed sites by alien weed species. This will require monitoring and control for some time during decommissioning and post closure. Comment/mitigation: An alien invasive species removal programme should be implemented to ensure infestation on disturbed areas is managed and thereby eradicated in the long term.		A contracted service provider was appointed (TKS2035) on a 3-year basis to control alien weeds and plant trees on the mine property. A monthly program was established and which continues till closure. Very little evidence was found of alien infestation, with evidence found mostly along the neighbouring community boundary. Five to nine different indigenous tree species were planted on the western slopes, according to elevation, of the rehabilitated areas.	Not reviewed due to outstanding information.	
Animal life	5.2.10	Decommissioning could result in disturbance to the fauna due to increased traffic and noise. Thereafter colonies will re-establish themselves, however due to the limited natural habitat this impact is of low significance and therefore does not require mitigation. Comment/mitigation: No mitigation necessary as the impact is of temporary nature and the site is to be used for commercial agriculture, therefore	2	All constant disturbances have stopped. It was reported that the illegal hunting within the mining area has escalated whilst evidence was also observed during the inspection of where dogs chased rabbits. The illegal access is a matter of concern.	Illegal access by the community remains a matter of concern and should be management by Tronox.	Illegal access by the community remains a matter of concern and should be management by Tronox.

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		natural habitat for animals is limited.				
Air quality	5.2.11	Some dust may be generated during decommissioning of the mine and residue dam. This can be alleviated by watering down and the effects are seen as insignificant.	3	Negligible dust generation is limited to a few remaining areas where grass cover has not yet established in full. It is anticipated that these areas will be well covered at the end of the current raining season. Current dust fallout reflects that the ambient dust levels are below the threshold established for residential areas.	The dust fallout observed at the PWP and the UVS show that the dust levels are below the residential threshold.	N/A
Infrastructure decommissioning						
Central processing plant rejects	5.3.1	These discard products are placed in the rehabilitated dunes during decommissioning and prior to closure. The base of the dump is scarified, the residue placed in the sand tailings and the area contoured, top-soiled and grassed. The mine sites embody a number of structures. There are steel structures to house cyclones and spirals and a conveyor system to the HMC stockpile. The above ground structures will be demolished and removed during decommissioning or alternatively taken over by the farmer pending conformance to		Vegetation of the waste tailing stockpile area was completed.	Not reviewed due to outstanding information	

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		relevant legal requirements. Concrete rubble will be buried below ground.				
Water pollution management facilities						
Sewage plant	5.3.2.1	Should this not be utilized the sludge will be removed and deposited in the sand dunes prior to rehabilitation. The structure will be demolished, the excavation backfilled with earth, contoured, top-soiled and planted with grass.	3	No sewage plant was established and sewage was disposed via the municipal sewage management operations. The concrete conservancy tank is still in use and is cleaned once per month. The future use of the office building, to be determined during the final closure negotiation process, will dictate whether the tank will be removed or remain.	The concrete conservancy tank is still in use and is cleaned once per month.	N/A
Potable water plant	5.3.2.2	This will be removed as part of the mineral processing plant.	4	No processing plant was established as municipal supplied water was and is being used.	Same findings	N/A
Process water supply system	5.3.2.3	Should the dams not be required, they will be demolished, backfilled, contoured and top-soiled and rehabilitated. The debris will be placed in the dunes prior to rehabilitation.	3	The process water dams established continue to function as part of the Fairbreeze Mine's raw water supply. Raw water is received from uMhlatuze Water and transferred from the process water dams via the Bulk Water Pipeline to the Fairbreeze process water dams. The Hillendale process water	Same findings	N/A

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
				dams have been fenced as a continued security and safety measure.		
Mineral processing plants	5.3.3	Whilst the plant will be of modular construction it will be mounted on concrete foundations. The base will be removed, and the piles cut down to one meter below the final elevation of the rehabilitation surface. The excavations will be backfilled, contoured, top-soiled and planted with grass. The HMC stockpile will be processed before decommissioning. The base will be demolished, scarified and the residue will be deposited in the rehabilitated dunes. The base will be then contoured, top-soiled and grassed.	2	The mine intents to provide for the re-use of the plant area and offices in future. To this end surface piles have been demolished whilst the subsurface structures have been covered with soil and grassed. These areas have been well established with grass cover. Apart from the workshop and office infrastructure no other plant infrastructure is visible anymore	Same findings	N/A
Workshops, administration and other buildings	5.3.4	Should these not be required by the land owner, they will be demolished and rehabilitated as described above.	3	The mine intents to provide for the re-use of the plant area (workshop) and offices in future and a decision will be made in due course during the final closure negotiation process.	Administration block (permanent building and temporary containers) of which the containers have been removed, the office buildings remained due for a third-party handover agreement yet to be finalized (MCL-REP-109-18_19 HD).	N/A
Housing, recreation and employee facilities	5.3.5	EXXARO KZN Sands did not build any houses or employee facilities for the mining project. It is up to employees to purchase, rent and	3	Staff were notified from 2008 to 2013 through various meetings in respect of the mines position and close down process. A	Same findings	N/A

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		dispose of properties as they see fit. However, timeous advice of closure of operations should be given to employees to allow them to make suitable arrangements.		record of these meetings is available. No staff were retrenched as a result of the mine closure.		
Storm water	5.3.7	It may be advantageous to leave storm water diversion measures in place to avoid any further disturbance to surface and groundwater. The drains would be removed, backfilled, contoured, top-soiled and grassed.	3	The final construction of post-mining stormwater infrastructure, in the form of canals, attenuation structures and spillways were competed (Contract # 4600001663). Wash-aways occurred in some areas during the May 2018 heavy rains. These high rainfall events have highlighted areas of weak rehabilitation and erosion control. The majority of the above have been improved and repaired with some minor works still being undertaken. This is part reason why the final closure has been postponed to 2019.	Post-mining construction of stormwater infrastructure was completed (Contract # 4600001663).	Follow up on implementation of erosion mitigation measures, where necessary.
Closure	5.4	The mining area will be rehabilitated on a continuous basis. However, it would have to be demonstrated that there is no continuum in terms of water to the rest of the mine.		This is interpreted to mean that the watershed will be a free draining area according to the topography and not a continuum towards the dirty water caissons used during the mining operations. Water still enters the caissons which are channelled towards a	Not reviewed due to outstanding information.	

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
				water retention area. The bulk of the stormwater drainage enters the uMhlatuze River through formal earthen channels and free seepage areas.		
Long-term impacts on groundwater	5.4.1	The groundwater table in the rehabilitated mining area will be slightly lower than before mining due to the increased permeability of the dune due to the removal of the slimes fraction. The total seepage rate out of the rehabilitated dunes will not differ much from that at present. Slightly more of the total seepage will flow to Lake Cubhu than to the Mhlathuze River at Hillendale. The groundwater recharge will not be significantly altered. The permeability of the residue dam is very low hence the groundwater level in this area will be just below the surface. It will thus be raised from the pre-mining situation.	3	ENVASS, specialist water service providers, monitor both ground and surface water Quality, see: *- Water Quality Report, Tronox KZN - Hillendale Mine Monthly Water Quality Update, Report Nr MON-WQR-281- HD-16_17, September 2018* *- Ecological Report, Bio-monitoring Report for Tronox KZN's - Hillendale Mine (Wet Season), Report Nr BIM-REP-281-HD-16_17 (Wet)* The Water Quality Report reflects that the ground water quality below the mined area is better that what it is above the mine, specifically in respect of Nitrates, which is the result of agriculture. The Report further reflects that the Iron levels at the boreholes near the RSF dam were elevated but similar to pre-mining conditions due to existing geology. The biomonitoring Report	Ground and surface water Quality is monitored by ENVASS, Water Quality Report, Tronox KZN - Hillendale Mine Monthly Water Quality Update, Report -*Water Quality Report, Tronox KZN - Hillendale Mine Monthly Water Quality Update, Report Nr MON-WQR-281-HD-16_17 (19-12)* *- Bio-monitoring Report for Tronox KZN's - Hillendale Mine (Wet Season), Report Nr BIM-REP-281-16_17 (HD- WET 2019)* The bio-monitoring report reflects that the surrounding land-use practices, specifically the sugarcane crops, were having more of a negative impact on the downstream uMhlathuze River than the currently non-operational Hillendale Mine. No additional recommendations were presented in the report.	N/A

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
				reflects that no decline is detected from pre-mining to post mining conditions, seen in respect of land use (agric) context the mine's influence was negligible. No long-term impacts have been identified, although this will be confirmed by specialist investigating reports as part of the final closure process.		
Long term stability of rehabilitation ground and residue deposits	5.4.2	The rehabilitated ground at Hillendale will be planted to sugar cane. The residue dam should be regularly inspected by suitably qualified engineers who will devise a system of checks and management principles to ensure that the stability of the dams remains within acceptable limits. The stacked sand tailings will also require monitoring for stability during decommissioning and for a period post closure.	2	The sugar cane established in various experimental blocks on the RSF and other mined areas was partially successful as the success was dependent on the application of fertiliser. Experimental Eucalyptus and Casuarina plots established on the RSF and other mined areas continue to be more successful as was verified by Dr. Smith in his last 2018 updated annual report, see: - *Tree growth following various rehabilitation techniques at Hillendale; Dr. C. Smith; dated 9 January 2018* In summary the findings reflect that topsoil is the key to successful rehabilitation and that with the addition of fertiliser the	*According to the report Tree growth following various rehabilitation techniques at Hillendale; Dr. C. Smith; dated 9 January 2018, where there was no topsoil applied the growth of Tree was slow as compared to areas where it was applied.* Planting Eucalypts and Casuarinas are an option for rehabilitating the RSF through a combination of soil improvement and soil drying.	Follow-up on the success rate of vegetation cover on the RSF.

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
				requirements for commercialisation will be achieved. Further to the above it was found that the trees contribute to the nutrient cycle, protect the grass established for future grazing potential, and contribute to the drying out of the surface soils. See 5.2.3 Knight Piesold, as service provider, conducts geotechnical evaluations and erosion checks annually. The last inspection was carried out during 15/04/2018. Post-mining waste tailings which were stockpiled on site and shaped, was covered with topsoil and planted with Eucalyptus trees as part of completing the rehabilitation process.		
Decommissioning phase and closure						
	6.2.1	Closure objectives - To rehabilitate the mine site to the extent where the previous land use is not compromised in terms of value unlocked. - To minimise any residual environmental impacts resulting	3	The management of the post mining landscape aims to ensure that future land use remains sustainable which drives the rehabilitation process. The rehabilitation approach is to provide for sustainable	UVS land has been handed over to UVS.	N/A

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		from the mining operations To minimise the social impacts following mine closure through sustainable development with education, vocational training and the establishment of local businesses.		agriculture opportunities with due cognisance of the effect of mining. See: - *Rehabilitation options for the Fairbreeze Mine; Dr. C. Smith; dated 5 July 2017* - *Tree growth following various rehabilitation techniques at Hillendale; Dr. C. Smith; dated 9 January 2018* The post mining social discourse in respect of the future land use is still active and options are being evaluated for conclusion of the final closure process. It is estimated that the final property handover will take place during 2021.		
Infrastructure areas	6.2.2	Depending on the requirements of the land owner it may be beneficial not to demolish certain structures which could be useful for agricultural purposes. The mine sites will embody a number of structures. There will be steel structures to house cyclones and spirals and conveyor system to the HMC stockpile will be removed. Buildings such as change rooms,	3	The majority of re-usable and refurbishable materials were transferred to Fairbreeze during the initial rehabilitation process. The mine intents to provide for the re-use of the plant area and offices in future. To this end surface piles have been demolished whilst the subsurface structures have been covered with soil and grassed. These areas have been well established with grass	it is envisioned that the store areas will be handed back for farming uses and that the old office buildings will be handed over to a third-party possibly to use as a training facility of sort. The exact application of the building will be discussed with the affected parties during the closure process in the public participation phase. (MCL-REP-109-18_19 HD).	N/A

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		offices and workshops could be used for agricultural purposes. Some of the piping systems could be similarly used. Should any of the buildings not devolve to the land owner, they will be removed, the foundations demolished and backfilled, contoured, top-soiled and re-vegetated. Where piles have been used, these will be put down to 1m below the final ground level. Similar considerations apply to power lines if above ground. If buried they may be abandoned. The debris removed will be buried in the sand dunes, prior to final rehabilitation.		cover. Apart from the workshop and office infrastructure on other plant infrastructure is visible anymore.		
Mine residue deposits						
Disposal facilities	6.2.3.1	Any infrastructure that is considered necessary to sustain the rehabilitated area will be left in place, e.g. storm diversion structures. Facilities that can be used by the farmer will be left subject to legal responsibilities and requirements. These facilities will devolve to the land owner, the maintenance becoming his responsibility. All	3	See previous comments in respect of future land and facility use options. The status of the land-use transfer process which only commenced in 2018 is as follows: - one lease agreement is currently under negotiation - one leased property was handed back to the original owner	UVS land has been handed over to UVS. The rehabilitation plan needs to be updated to reflect on schedule and monitoring of progress of rehabilitation.	Follow-up on the success rate of vegetation cover on the RSF.

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		unnecessary pipes will be removed.		- The rest of the property is being handled as part of closure process Present discussions underway in respect of various crop opportunities identified during the rehabilitation research lean towards commercial forestry. A Liability Document template available from the DMR is used as a guideline in respect of the future land use options.		
Ongoing seepage, control of rainwater	6.2.3.2	These will be controlled by maintaining the associated structures.	3	The stormwater controls and spillways constructed at the RSF by RODCOL (Contract # 4600001663) were completed.	Same findings	N/A
Long term stability	6.2.3.3	Re-vegetation and maintenance of the drainage structure will provide long term stability of the deposit. The side walls will be "battered" off to a suitable slope and contoured. However, stability analyses must be carried out by suitably qualified personnel on a long-term basis and any necessary remedial measures undertaken on a long-term maintenance basis. It must be ensured that the surface of the dam can carry farming machinery by suitably engineering the capping layer.	2	The RSF walls were secured and grassed. Knight Piesold, as service provider, conducts geotechnical evaluations and erosion checks annually. The last inspection was carried out during 15/04/2018. See 5.2.2.1; 5.4.2 The aim of the RSF rehabilitation is to create a trafficable surface with potential future commercial viability. Experimental Eucalyptus (140 000 planted) and Casuarina plots established on the RSF proofed to be successful as was	The rehabilitation plan needs to be updated to reflect on schedule and monitoring of progress of rehabilitation.	Follow-up on the success rate of vegetation cover on the RSF.

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
				verified by Dr. Smith in his last 2018 updated annual report. Evidence suggests that the experimental tree plots has effectively contributed to the drying of the surface with more and more deep fissures in the clay soil being evident. Some plots were not as successful due to competition from Phragmites and grasses. It is however believed that once the trees reach a certain high the competition will no longer affect them.		
Final rehabilitation	6.2.4	As stated earlier, should roads not be required for farming operations then they will be removed, contoured, backfilled and rehabilitated. No final void will remain, as it will be backfilled, contoured and revegetated.	3	See 5.2.2.1 The last void ("kidney") was backfilled, shaped and grassed and then as a final step planted with Eucalyptus.	Same findings	N/A
Residue dam	6.2.4.1	This will be achieved as follows: - The upper 1m of the dam must be a mixture of sand and slime suitable for sugar cane cultivation. Two to three years before mining operations cease, or earlier, a small area (1 ha) will be used to plant sugar cane. This can be used to evaluate which farming	3	All sugar cane areas have been planted with Eucalyptus trees, and Casuarina on the RSF. The NNR requirements have been met with material being diluted and dispersed. The levels of the CPC radioactive waste which was disposed of at Hillendale and the smelter underflow deposition	The rehabilitation plan needs to be updated to reflect on schedule and monitoring of progress of rehabilitation.	Follow-up on the success rate of vegetation cover on the RSF.

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		methods are the most effective for returning the larger parts of the residue dam back to optimum sugar cane carrying capacity. A local farmer will be contracted for this job. - Replace stored topsoil The phosphate level is very low (1mg/kg) and will have to be raised to about 10mg/kg before planting by the addition of 2t/ha of superphosphate. Planting of vegetation will control erosion and dust emissions. The CPC waste will have been dispersed in the stacked sand tailings and the residue dam slimes according to NNR requirements.		areas has not recently been checked but will be re-checked prior to final closure.		
Final rehabilitation – haul ramps, road, final voids	6.2.4.2	As stated earlier, should roads not be required for farming operations then they will be removed, contoured, backfilled and rehabilitated. No final void will remain, as it will be backfilled, contoured and revegetated.	3	See 5.2.1.1 See 6.2.4 The final void was infilled and grassed.	Same findings	Follow up on implementation of erosion mitigation measures, where necessary as well as implementation of rehabilitation programme.
Submission of information	6.2.5	This will entail the following: Water monitoring and submission of data; Monitoring for NNR requirements; *Hillendale Mine Page: 152 -*		The following reports have been submitted to the relevant authority: DMR (submitted on 8 February	<u>The following reports have been submitted to the relevant authority:</u> DWS	Proof of documentation sent to the relevant authority.

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		(Timetable for maintenance) Environmental Management Programme– May 2009 Slope stability analysis; Residue dam; and Rehabilitated ground. All commitments made in Section 6.1 should also be adhered to.		2018) EMPR Performance Assessment Report *(Compliance Audit, Closure Phase, November 2017 - Thorn-Ex)* Annual Environmental Monitoring Reports *(MCL-REP-143-17_18_HD - ENVASSE)* Closure Trust Annual Financial Statement *(The signed 2016 Rehabilitation Trust document was endorsed by DMR in a letter)* Progress Report for work completed during 2016 *(annual presentation to DMR)* External Financial Liability Assessment Report *(Closure Liability Assessment for Hillendale Mine 2017 & Financial Statement for Closure Trust)* Mine Closure Plan & Risk Report The Residue Dam inspection reports are retained on record NNR Reports are no longer compiled.	1. Environmental monitoring reports 25 March 2019	
Maintenance	6.2.6	The rehabilitated area will have to be maintained in terms of the following for a period of 3 years	2	See 5.4.2 See Control Burn Procedure Ref #: MINIGDOC-57-21	It was noted that sporadic fires were experienced in the Chennel area. Parts of the	Follow-up on the success rate of vegetation cover on

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		following decommissioning to closure: Successful re-establishment of a commercial crop i.e. sugar cane. Provision of fire breaks Removal of alien and invasive plants and weeds Prevention of poaching Stability of the rehabilitated land, including slope stability and prevention of water erosion and dust emission Maintenance of infrastructure such as clean water / dirty water diversions (while still applicable) and fencing (where relevant).		A fire was reported during late summer on the northern rehabilitated areas. See 5.2.9 Evidence of continued external poaching with dogs and theft of trees was found during the inspection. Land and slope stability is monitored in respect of the Knight Piesold / Fumani contract. Dirty water is no longer produced and the storm water structures were finalised. Minor repairs, as a result of heavy rainfalls, continue. Most of the fencing has been removed by neighbouring communities and the mine has stopped replacing the fencing.	western walls have a steep embankment and could over time be prone to wind and water erosion. (MCL-REP-109-18_19 HD).	the RSF. Follow up on implementation of erosion mitigation measures, where necessary.
Financial provision	6.4.3	All rehabilitation costs will be funded from the budgeted project cost or from the EXXARO KZN Sands KZN Rehabilitation Trust Fund. The EXXARO KZN Sands KZN Rehabilitation Trust Fund is a fund established with the aim to make pecuniary provision for final rehabilitation at the end of the life of a mine or project. The different mines or projects, deposits a monthly (calculated) amount into	3	The total accumulated fund at December 2013 was R 176 Million, in respect of the required of R 91 Million. The bulk of the funds have been spent with remaining funds earmarked for dam management. Calculations undertaken in respect of the previous Regulations reflect that as at December 2017 the Total Available Provision was	The last estimate of the final closure cost as updated during December 2013 was approximately R 174 million. In 2014 rehabilitation work estimated at R52 million was done and funded from the closure trust fund.	Implement closure plan as per commitment to DMR.

Objective	Ref.	Measures, criteria, or principles	Category	Previous findings	Current findings	Follow up action
		the fund which on their turn manage and invest the accumulated amount. EXXARO KZN Sands KZN has budgeted R52 000 per month that will add up to approximately R15 million at the end of the mines' life for final rehabilitation. This amount does not make provision for continuous rehabilitation during the operational phase of the project. The cost for continuous rehabilitation forms part of the operational cost.		R87 417 099 The fund status is annually reported on in the Annual Closure Trust Financial Statement.		

2.3. Summary of findings from audit

Based on the above audit table, Table 3 below provides a summary of findings.

Table 3. Summary of audit actions

Finding number	Number of findings	Comments
1	3	Non-compliance, further action is required
2	22	Partial compliance this may be a result of a change in the arrangement/planning but does not cause a non-compliance. Further action may be required
3	35	Full compliance, actions are being implemented.
4	38	Not Applicable

3. CONCLUSION AND WAY FORWARD

A performance assessment was conducted on the Hillendale EMPR dated 27 July 2009 and according to Regulation 34 of GN326 of 2017, the holder of an environmental authorisation must, for the period during which the environmental authorisation and EMPr remains valid, submit an environmental audit report to the relevant competent authority. This Report provides the audit results of the EMPr and the performance of the Hillendale mine.

Rehabilitation
Attention needs to be paid to the RSF as vegetation growth is regressing in selected patches of the RSF. This should be included in the final rehabilitation programme which requires to be updated to reflect the planning and timeframes and actions during the final planning phase of the closure process. Grassing on the walls next to the spillways need to be re-done as this area are a risk to erosion.

Stormwater
Stormwater management is crucial to ensure that erosion does not occur in localized steep slopes. Public access of the mined area remains an issue as this creates footpaths which are susceptible to creating erosion. The road leading to the RSF has succumbed to erosion, occasional repairs of the roads is recommended to avoid potential significant damage during heavy rainfall events.

Security
Fencing of the mine area is imperative to ensure that the community does not have access to the mining area especially where land has not been handed over to the landowner.

General
Discussions with regards to the final end land-use should be initiated with the proposed beneficiaries to facilitate the closure planning. Negotiation for the use of the office building post-mine closure should be initiated. It is our understanding that this process is underway with an appointed service provider.

A list of documents submitted to the relevant authority should be available for ease of reference.

4. REFERENCES

An update of the quantum of closure related financial provision for 2019 – Tronox KZN sands ltd Hillendale. (October 2019)

Biannual Aquatic Biomonitoring report for the Tronox Hillendale mine: wet season report 2019 (BIM REP-281-16_17 (HD- WET 2019)) (February 2019)

Exxaro KZN Sands Hillendale mine. Environmental Management Programme. (July 2009)

Hillendale Ambient perimeter monitoring-dust fallout. (December 2019)

Hillendale Mine Closure Plan and Risk Report. Acer. (January 2015)

Hillendale mine RSF stability review 2020. (15 April 2020)

Tree growth following various rehabilitation techniques at Hillendale Dr C. Smith. (January 2018)

Tronox KZN – Hillendale Mine – Monthly Water Quality Update. MON-WQR-281-HD-16_17 (19-12) (December 2019)

Tronox Hillendale Residue Storage Facility (RSF) meeting minutes. (February 2019)

TX_C069 Environmental Compliance Report: Hillendale Mine Closure Phase. (November 2018)