GeT Alloys, Parow – Scrap Aluminium and Copper Expansion: Impact Assessment

Note:

1) The impact assessment entails assessing the development proposal, including all specialist-recommended and best-practice mitigation measures (i.e. the preferred alternative) against the No-Go Option.
2) The expansion of the foundry will not entail any construction-type activities which are in any way different from the heavy industrial activities taking place currently on site and on neighbouring sites in the Beaconvale industrial area. The expansion will entail assembling and installing equipment on a fully-developed site.
3) There are no plans to decommission the foundry. However, should the facility be decommissioned in the future, impacts will be very similar to those associated with the operational phase – being noise; dust; waste (rubble and scrap should the buildings be demolished). The management measures applicable to the operational phase (lawful and best practice waste management; dust control; noise abatement as far as possible and necessary given the industrial surrounds) are considered suitable for a possible decommissioning phase.

1. Impact assessment methodology

Describe the methodology to be used in determining and ranking the nature, significance, consequences, extent, duration of the potential environmental impacts and risks associated with the proposed activity or development and alternatives, the degree to which the impact or risk can be reversed and the degree to which the impact and risk may cause irreplaceable loss of resources.

Enviroprac impact assessment methodology:

Introduction

The assessment of the significance of predicted impacts associated with the aluminium and copper scrap plant expansion is based on the Department of the Environment, Forestry and Fisheries' 1998 *Guideline on the Implementation of Sections 21, 22 & 26 of ECA*; on the DEFF's 2006 *Guideline on Assessing Impacts & Alternatives*; on the DEA&DP's 2005 *Guideline for Involving Biodiversity Specialists in EIA*; and on T Hacking's 1998 IAIA SA Conference Paper, *An Innovative Approach to Structuring EIA Reports*.

The impact assessment is based on specialist input where required, as well as on the EAP's research as required, and past experience and professional judgement.

Nature of impact

The source of a potential impact needs to be clearly defined, as well as what particular aspect of the receiving environment would be impacted. The nature of the impact should also include whether the impact is positive or negative; to what degree the impact is reversible; during which phase of the development life cycle the impact will occur; and whether the impact is direct or indirect; and whether the impact is cumulative:

Table 1 Nature of impact

Nature of impact	
Source	Particular aspect of the development proposal that could give rise to the impact.
Aspect of environment impacted	▪ Socio-economic ▪ Biophysical (freshwater, geohydrological, botanical, etc.) ▪ Heritage & cultural – historical ▪ Visual & landscape

	▪ Ambient noise levels ▪ Ambient air quality
Positive	An aspect of the receiving environment benefits.
Negative	An aspect of the receiving environment is adversely affected.
Degree of reversibility	The possibility or difficulty or impossibility of returning the affected aspect of the environment to its original state after an impact has occurred -either with or without human intervention.
Lifecycle phase in which impact will occur	▪ Planning and design phase* ▪ Construction phase ▪ Operational phase ▪ Decommissioning phase *It should be noted that impacts can arise during the construction and operational phases if the planning and design of the development does not adequately factor in required impact mitigation and management
Intermittent or continuous; immediate or delayed	An indication should be given of whether the impact will only occur intermittently; and whether the impact will be experienced immediately or on a delayed basis.
Direct	The impact is a direct result of development activities.
Indirect	Downstream, secondary or "knock-on" impacts resulting from a direct impact.
Cumulative	A cumulative impact adds to similar impacts already experienced in the receiving environment.

Parameters used to predict impact significance

In the methodology used here, impact significance is a function of consequence and probability of occurrence, where consequence considers the duration, spatial extent and magnitude (or severity or intensity) of the identified impact.

The following rankings have been used for the parameters which factor into determining **consequence**:

Table 2 Parameters used to determine consequence

Consequence			
Parameter	**Ranking**		
	Low	**Medium**	**High**
Spatial extent	Localised Within site boundary Site	Fairly widespread Beyond site boundary Local	Widespread Far beyond site boundary Regional/national
Duration	Quickly reversible Less than the project life Short-term	Reversible over time Life of the project Medium-term	Permanent Beyond closure Long-term
Magnitude (or severity or intensity): negative	Minor deterioration. Nuisance or minor irritation. Where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected.	Moderate deterioration. Discomfort. Where the affected environment is altered by natural, cultural and social functions and processes continue albeit in a modified way.	Substantial deterioration. Death, illness or injury. Where natural, cultural or social functions or processes are altered to the extent that it will temporarily or permanently cease.
Magnitude (or severity or intensity): positive	Minor improvement.	Moderate improvement.	Substantial / significant improvement.

Once the parameters that determine an impact consequence have been ranked, the overall consequence of impacts can be determined as follows (from Hacking):

Table 3 Overall consequence of impacts

Magnitude (or intensity or severity): Low				
Duration	**High**			
	Medium			
	Low			
	Severity/intensity	**Low**	**Medium**	**High**
		Spatial Extent		

Magnitude (or intensity or severity): Medium				
Duration	**High**			
	Medium			
	Low			
	Severity/intensity	**Low**	**Medium**	**High**
		Spatial Extent		

Magnitude (or intensity or severity): High				
Duration	**High**			
	Medium			
	Low			
	Severity/intensity	**Low**	**Medium**	**High**
		Spatial Extent		

The probability of an impact occurring is ranked as follows:

Table 4 Probability rankings

Probability	
Improbable	Where the possibility of the impact to materialise is very low either because of design or historic experience;
Probable	Where there is a distinct possibility that the impact will occur
Definite	Where the impact will occur regardless of any prevention measures.

Methodology for predicting impact significance

In the methodology used, predicted impact significance is a function of the impact consequence considered together with the probability of the impact occurring. Impact significance is ranked as follows:

Table 5 Impact significance ranking

Impact significance	
Low	Will never exceed legislation or standards. Unlikely to cause significant negative impacts. Where it will not have an influence on the decision.
Medium	Has characteristics that could cause negative impacts. Where it should have an influence on the decision unless it is mitigated.
High	Will always/often exceed legislation or standards. Has characteristics that could cause significant negative impacts. Where it would influence the decision regardless of any possible mitigation.

Impact significance, as a function of consequence and probability, is determined as follows:

Table 6 Determination of impact significance

Probability				
	Definite			
	Probable			
	Unlikely			
		Low	**Medium**	**High**
		Consequence		

Degree of confidence

When predicting environmental impacts, the level of confidence of the practitioner in making the prediction should be provided. Confidence can be affected by the availability and quality of data and any assumptions that need to be made. Confidence is ranked as follows:

Table 7 Confidence ranking

Degree of confidence	
Low	Where there is little confidence in the prediction, due to inherent uncertainty about the likely response of the receiving environment, or inadequate information.
Medium	Where there is a moderate level of confidence in the prediction.
High	Where the impact can be predicted with a high level of confidence.

Mitigation hierarchy

Once impacts have been identified associated with a development proposal, any significant negative impacts need to be mitigated in such a way as to reduce these impacts to acceptable levels.

The hierarchy of mitigation should be as follows, in order of priority:

Table 8 Mitigation hierarchy

Mitigation hierarchy	
1	Avoiding or preventing the impact.
2	Mitigating (reducing or minimizing) negative impacts and enhancing (maximising) benefits, by considering alternatives.
3	Rectifying negative impacts by restoring the affected environment to its previous condition, or rehabilitating it for a different land use.
4	Providing an offset to compensate for the residual negative impact, to ensure that there is 'no net loss' of ecosystem resources / environmental attributes.

It can be noted that both avoiding and minimising negative impacts, should be factored into the consideration by the proponent of alternative means of achieving the development goals. In this way, the development proposal put before the authorities for their decision-making purposes, should have the minimum possible residual (i.e. after-mitigation) impacts on the environment.

The investigation of alternatives that was undertaken during the development planning process, as far as possible considered avoiding and minimising adverse impacts associated with the aluminium and copper foundry expansion. **Section H** of the Basic Assessment Report provides more detail on the investigation of alternatives in order to determine a low impact development proposal.

2. Impact assessment – Development Proposal: operational phase

OPERATIONAL PHASE	
Potential impact and risk:	**Soil and groundwater contamination; freshwater contamination**
Nature of impact:	Hydrocarbons are toxic to aquatic systems. Contamination of natural resources could occur due to leaks and spills and failure of storage and handling infrastructure. Poor on-site stormwater management (clean and dirty pathways). Poor containment of dirty stormwater on-site – resulting in contamination of adjacent properties / environments. Pollution and contamination of the municipal stormwater system due to poor on-site stormwater management.
Extent and duration of impact:	Medium (beyond site boundary; local) without mitigation. Medium (beyond site boundary; local) with mitigation. Medium-term (reversible over time) without mitigation. Short-term (quickly reversible) with mitigation.
Intensity / severity / magnitude	Medium (Where the affected environment is altered by natural, cultural and social functions and processes continue albeit in a modified way) without mitigation. Low (Where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected) with mitigation.
Consequence of impact or risk:	Medium without mitigation. Low with mitigation.
Probability of occurrence:	Probable without mitigation. Improbable with mitigation.
Confidence	High
Degree to which the impact may cause irreplaceable loss of resources:	Medium. Contamination can be remediated with rapid response.
Degree to which the impact can be reversed:	Medium. Impacts on soil, groundwater and freshwater from contamination can be reversed with rapid response.
Indirect impacts:	Direct impacts: contamination of soil, groundwater, water resources, and the municipal stormwater system. Indirect impacts: adverse impacts on aquatic organisms in the watercourses, on freshwater resources linked to the watercourses, and possibly on groundwater users in the area through contamination of the municipal stormwater systems. Impacts on downstream users may include financial losses, poor health, illness and potential death of human, livestock, and crops due to contaminated water resources.
Cumulative impact prior to mitigation:	The impact is cumulative: there are other sources of potential contamination in the area, e.g., the nearby fuel depot.
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium**
Degree to which the impact can be avoided:	High
Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	High
Proposed mitigation:	The storage and handling of fuel will be done on an impermeable surface (area for fuel storage is bunded). This inherently reduces the risk of soil and ground water

OPERATIONAL PHASE	
Potential impact and risk:	**Soil and groundwater contamination; freshwater contamination**
	contamination. However, the on-site management of clean and dirty stormwater must be effectively managed to ensure that the potential risk of contamination of the municipal system is prevent and mitigated effectively when necessary. In addition, all refuelling of machinery and related activities, as well as refuelling vehicles in an unbunded area or against refuelling procedures / methods also pose a risk of contamination, which should be minimized with the best-practice design and management of these areas, e.g.: – Ensure that fuel storage tanks are adequately bunded and the installation complies with SANS 10131: Above-ground storage tanks for petroleum products. – Designated refuelling areas and procedures to reduce spills, leaks, infrastructure failure. Educate employees in correct handling and refuelling procedures. – A spill response kit appropriate to hydrocarbons will be available on site. Hydrocarbon contaminated material will be disposed of as hazardous waste – A Standard Operating Procedure (SOP) for all activities relating to Fossil Fuel storage, refilling, handling and use in processing must be compiled to minimise associated health, safety, and environmental risks. – Staff must be trained in the SOP, with records of staff competency retained
Residual impacts:	Minor, acceptable
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low**

OPERATIONAL PHASE	
Potential impact and risk:	**Ambient air quality impacts**
Nature of impact:	Particulate matter and gaseous emissions from aluminium and copper scrap oil-fired furnaces. Fugitive particulate matter emissions from dross handling. Vehicle exhaust emissions from on-site vehicles.
Extent and duration of impact:	Medium, beyond site boundary but local, without mitigation. Low, mostly on-site, with mitigation.
Intensity / severity / magnitude	Low (minor deterioration) without mitigation. Low (minor deterioration) with mitigation.

OPERATIONAL PHASE	
Potential impact and risk:	**Ambient air quality impacts**
Consequence of impact or risk:	Low without mitigation. Low with mitigation.
Probability of occurrence:	Definite without mitigation. Probable with mitigation.
Confidence	High
Degree to which the impact may cause irreplaceable loss of resources:	Low
Degree to which the impact can be reversed:	High
Indirect impacts:	Direct impacts: nuisance, health, and wellbeing of receptors. Indirect impacts: none
Cumulative impact prior to mitigation:	Cumulative impacts in exceedance of NAAQS unlikely off-site at sensitive receptors.
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Medium**
Degree to which the impact can be avoided:	Low
Degree to which the impact can be managed:	Medium
Degree to which the impact can be mitigated:	Medium
Proposed mitigation	

- As per the planned Turnkey Modular air pollution control system design, all furnaces must be fitted with fume extraction, both from the furnaces itself and via hoods to capture fumes during charging and/or tapping. Fugitive emissions must furthermore be extracted from the foundry building roof at its apex as well as the dross recovery plant. The system design must ensure the PM concentration in the plume exiting the 30 m stack meets the MES of 30 mg/Nm3.
- Fugitive PM emissions should be minimised to avoid off-site exceedances of NAAQS. See Fugitive Emissions Management Plan appended to Basic Assessment Report.
- Good housekeeping, e.g., avoiding and cleaning up spillages of fine materials such as baghouse dust and dross.
- Keep vehicle driveways clean and free of dust to avoid entrainment.
- Avoid unnecessary handling of dry fine materials such as dross as it is removed from the foundry to the cooling bay to the recovery plant.
- Ensure cooling dross stockpiles are not exposed to wind to avoid windblown dust.
- Fugitive ammonia emissions must be avoided by keeping dross dry i.e., covered within the cooling bay dross recovery building.
- To reduce vehicle exhaust emissions, avoid unnecessary idling of vehicles on-site.

In terms of compliance monitoring, the periodic compliance emissions monitoring will be required from GeT Alloys under section 21(1)(b) of NEMAQA. The requirements for periodic emissions monitoring are as follows:

- The averaging period shall be expressed on an hourly average basis or as prescribed in the AEL.
- Emission measurement must be conducted in accordance with the methods listed in Annexure A of section 21(1)(b) of NEMAQA.
- Measurements shall take place on, at least, an annual basis unless otherwise prescribed in the AEL.
- Sampling will take place under normal operating conditions using the permitted feed-stock or raw material.
- All tests will be conducted by South African National Accreditation System (SANAS) accredited laboratories or laboratories accredited by similar foreign authorities.

<table>
<tr><td colspan="2">OPERATIONAL PHASE</td></tr>
<tr><td>Potential impact and risk:</td><td>Ambient air quality impacts</td></tr>
<tr><td colspan="2">An air quality monitoring programme can confirm both baseline and project related air pollution levels and provide information useful in assessing the effectiveness of emissions management strategies. After careful consideration of the dispersion simulations, the following is recommended:

– Visual inspection and reporting of dust emissions sources annually and in response to complaints. Photographic records can be useful. Visible dust and fumes escaping from foundry or dross recovery building would be an indication of ineffective building extraction.
– Passive diffusive sampling of ammonia within the dross recovery building upon commencement of production to confirm assumptions with regards to the formation and emissions of ammonia. A specialist should be consulted in the methodology.
– Dustfall sampling in accordance with NDCR, that meets sampler location requirements, will most likely not be possible given the size and built-up nature of the site and is therefore not currently recommended. Fugitive dust monitoring will be reliant on visual inspection and reporting as recommended above.</td></tr>
<tr><td>Residual impacts:</td><td>Some fugitive emissions are unavoidable even with the implementation of mitigation measures.</td></tr>
<tr><td>Cumulative impact post mitigation:</td><td>Low</td></tr>
<tr><td>Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)</td><td>Low</td></tr>
</table>

<table>
<tr><td colspan="2">OPERATIONAL PHASE</td></tr>
<tr><td>Potential impact and risk:</td><td>Traffic impacts</td></tr>
<tr><td>Nature of the impact</td><td>Increase in traffic of heavy vehicles due to deliveries of raw materials (inputs) and collection of finished product / waste etc.
Possible traffic congestion, adverse impacts on road safety, and wear and tear on roads infrastructure.
The roads infrastructure is designed to accommodate the surrounding industrial area.</td></tr>
<tr><td>Extent and Duration of the Impact</td><td>Medium (beyond site boundary; fairly widespread; local - surrounding road network) without mitigation.
Medium (beyond site boundary; fairly widespread; local - surrounding road network) with mitigation.
Medium-term (life of project) without mitigation.
Medium-term (life of project) with mitigation.</td></tr>
<tr><td>Intensity/severity/magnitude</td><td>Low (minor deterioration) without mitigation.
Low (minor deterioration) with mitigation.</td></tr>
<tr><td>Consequence of impact or risk</td><td>Low without mitigation.
Low with mitigation.</td></tr>
<tr><td>Probability of occurrence:</td><td>Improbable without mitigation.
Improbable with mitigation.</td></tr>
<tr><td>Confidence:</td><td>High</td></tr>
<tr><td>Degree to which the impact may cause irreplaceable loss of resources:</td><td>Low</td></tr>
<tr><td>Degree to which the impact can be reversed:</td><td>High</td></tr>
<tr><td>Indirect Impact</td><td>Impacts associated with additional truck trips are all direct on the surrounding community and road network.</td></tr>
<tr><td>Cumulative impact prior to mitigation:</td><td>The truck routes to the site are observed to be well-trafficked routes servicing the industrial area and so the impact is cumulative.</td></tr>
</table>

Significance rating of impact prior to mitigation:	**Low**
Degree to which the impact can be avoided:	Low
Degree to which the impact can be managed:	Medium
Degree to which the impact can be mitigated:	Medium
Proposed Mitigation:	– No specific mitigation required.
Residual Impacts	None
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation:	**Low**

OPERATIONAL PHASE	
Potential impact and risk:	**Health and safety risks**
Nature of impact:	The foundry has significant associated risks in terms of health and safety of workers (working with extreme temperature machinery and molten metal; furnace emissions in the workplace; handling hazardous dross (corrosive; skin and lung irritant; potential for harmful and explosive fumes when wet). Hydrocarbons are a flammable and so there are health and safety risks (toxic; aspiration hazard; skin irritant) and risk of fire and explosion associated with storage and handling of the hydrocarbons. Dross management – various health risks have been identified with the handling of dross, such as: in contact with water releases toxic and flammable gas; causes skin irritation; may cause breathing difficulties if inhaled; may form combustible dust concentrations in air.
Extent and duration of impact:	Medium (beyond site boundary; local) without mitigation. Medium (beyond site boundary; local) with mitigation. Medium-term (for the life of the project) without mitigation. Medium-term (for the life of the project) with mitigation.
Intensity / severity / magnitude	High (substantial deterioration) without mitigation. Low (minor deterioration) with mitigation.
Consequence of impact or risk:	High without mitigation. Low with mitigation.
Probability of occurrence:	Probable without mitigation. Improbable with mitigation.
Confidence	High
Degree to which the impact may cause irreplaceable loss of resources:	High – serious injury and death can result.
Degree to which the impact can be reversed:	Low.
Indirect impacts:	Direct impacts: damage to property, injury, death. Indirect impacts: none. Indirect impacts: unforeseen opportunity costs, potential loss of income, life or family as a result of exposure related illness.
Cumulative impact prior to mitigation:	The impact is cumulative: there are many other industrial facilities utilizing fuel and hazchems in bulk volumes nearby.
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**High**

OPERATIONAL PHASE	
Potential impact and risk:	**Health and safety risks**
Degree to which the impact can be avoided:	High
Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	High
Proposed mitigation	
– The management and mitigation of the employees' exposure to these health and safety risk factors is through sound implementation and compliance to the requirements of the Occupational Health and Safety Act and applicable Regulations, as well as best practice management and mitigation measures to minimize these potential impacts. – The applicant should compile Standard Operating Procedures and Preventative Maintenance Plans for all aspects of the operation where significant health and safety risks are attendant, including a Dross Management Procedure to ensure adequate ventilation of dross-handling areas, weatherproofing of dross handling areas, etc. The Dross Management Procedure should address all hazards and risks identified in available Material Safety Data Sheets for dross. See Fugitive Emissions Management Plan appended to Basic Assessment Report.	
Residual impacts:	Minor; acceptable
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low**

OPERATIONAL PHASE	
Potential impact and risk:	**Noise (wellbeing) impacts**
Nature of impact:	Noise from on-site activities causing disturbance to sensitive receptors
Extent and duration of impact:	Medium (beyond site boundary; local) without mitigation. Medium (beyond site boundary; local) with mitigation. Medium-term (lifetime of the project) without mitigation. Medium-term (lifetime of the project) with mitigation.
Intensity / severity / magnitude	Low (nuisance / disturbance) without mitigation. Low (nuisance / disturbance) with mitigation.
Consequence of impact or risk:	Low without mitigation. Low with mitigation.
Probability of occurrence:	Definite without mitigation. Improbable with mitigation.
Confidence	High
Degree to which the impact may cause irreplaceable loss of resources:	Low
Degree to which the impact can be reversed:	High (noise will cease when operations cease)
Indirect impacts:	Direct impacts – noise disturbance and impact on receptor wellbeing. Indirect impacts – none.
Cumulative impact prior to mitigation:	The impact is cumulative since there are other sources of noise in the area (industrial, traffic, community).
Significance rating of impact prior to mitigation	**Medium**
Degree to which the impact can be avoided:	Low
Degree to which the impact can be managed:	Medium
Degree to which the impact can be mitigated:	Medium
Proposed mitigation:	▪ Developing a mechanism to record and respond to complaints

OPERATIONAL PHASE	
Potential impact and risk:	**Noise (wellbeing) impacts**
	▪ In the event of a compliant being lodged, investigate through specialist site visit and noise monitoring to determine cause, and implement any recommended remedial measures to resolve complaint. ▪ Avoid unnecessary revving of engines and switch off equipment/vehicles/trucks when not required. ▪ Managing the impact of reverse warning signals by removing the need for reversing by using drive through pathways. ▪ Maintain internal road surfaces and avoid steep road gradients. ▪ Avoid excessive use of exhaust brakes. ▪ Maintain machinery and equipment to minimise noise.
Residual impacts:	Minor; acceptable
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation	**Low**

OPERATIONAL PHASE	
Potential impact and risk:	**Waste management**
Nature of impact:	The operation of the foundry will generate only small quantities of general waste such as office and some kitchen waste. This will be disposed of in the municipal waste stream. The following aspects of the foundry operation are considered to be part of the waste-to-value chain, and to entail waste management activities: ▪ The activity itself is a general waste (scrap metal) recovery activity. Impacts associated with this waste recovery process have been discussed elsewhere and entail mainly air emissions and health and safety risks. These can be readily minimised by implementing fit-for-purpose emissions abatement and best practice health and safety operating protocols. ▪ A significant waste stream associated with the recovery of aluminium is a substance called dross. Dross is the unwanted material that forms on the surface of molten metal. Dross is considered hazardous, especially when it is wet as it releases high concentrations of hydrogen and ammonia.
Extent and Duration of impact:	Medium (beyond site boundary; local) without mitigation. Medium (beyond site boundary; local) with mitigation. Medium-term (reversible over time) without mitigation. Short-term (quickly reversible) with mitigation.
Intensity / severity / magnitude	Medium (Where the affected environment is altered by natural, cultural, and social functions and processes continue albeit in a modified way) without mitigation. Low (Where the impact affects the environment in such a way that natural, cultural, and social functions and processes are not affected) with mitigation.
Consequence of impact or risk:	Medium without mitigation. Low with mitigation.
Probability of occurrence:	Probable without mitigation. Improbable with mitigation.

OPERATIONAL PHASE	
Potential impact and risk:	**Waste management**
Confidence	High
Degree to which the impact may cause irreplaceable loss of resources:	Medium
Degree to which the impact can be reversed:	Medium
Indirect impacts:	Unforeseen opportunity costs due to illness – loss of work / employment, poor health, potential death.
Cumulative impact prior to mitigation:	Refer to *health and safety risk* impact table above.
Significance rating of impact prior to mitigation	**Medium**
Degree to which the impact can be avoided:	High
Degree to which the impact can be managed:	High
Degree to which the impact can be mitigated:	High
Proposed mitigation:	– Impacts associated with this waste recovery process have been discussed elsewhere and entail mainly air emissions and health and safety risks. These can be readily minimised by implementing fit-for-purpose emissions abatement and best practice health and safety operating protocols. – Weatherproofing of the dross and best practice health and safety operating protocols are essential for minimizing the impacts associated with this waste management activity. – The applicant should compile a dross management procedure and train staff accordingly. See Fugitive Emissions Management Plan appended to the Basic Assessment Report
Residual impacts:	Minor; acceptable
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation	**Low**

OPERATIONAL PHASE	
Potential impact and risk:	**Socio-economic benefits**
Nature of impact:	– Parow is known as an industrial town. The area of Beaconville Industria is thus designated as an Industrial Zone. This means that industrial development in this zone is generally supported. – Industrial development in this area has therefore been recognised as beneficial for the region's economy. – Given the country's current economic position and its high unemployment rate, investment into an expanded industrial enterprise that will contribute to job creation is desirable. – The foundry expansion will enable the foundry to employ a total of up to about 50 staff – including general managers, furnace operators, maintenance staff and office staff. industrial

<table>
<tr><td></td><td>development in the Beaconvale area, can therefore be considered a social benefit.
– GeT Alloys will increase their market share and profitability. This should entail knock-on benefits for Get Alloys staff in terms of job and income security, and income to the owners
– GeT Alloys provides a service to downstream production and construction industries. These are essential industries which support human activities.
– It can be argued that successful businesses in the Beaconvale industrial area, could attract additional investment into the area: businesses which provide goods and services to GeT Alloys, the scrap providers (companies and individuals), and construction-related businesses which use GeT Alloys’ aluminium alloy and copper in their manufacturing and construction processes.
– An expanded and financially stable and profitable industry generates tax revenue for the government, which is an essential aspect of the economy.
– The metal recovery process has significant benefits in terms of the waste-to-value chain and diversion of waste from landfill and avoiding the impacts associated with mining and processing of virgin materials.</td></tr>
<tr><td>Extent and duration of impact:</td><td>Extent: medium (local; fairly widespread)
Duration: medium-term (life of the project).</td></tr>
<tr><td>Intensity / severity / magnitude:</td><td>Medium (moderate improvement).</td></tr>
<tr><td>Consequence of impact or risk:</td><td>Medium</td></tr>
<tr><td>Probability of occurrence:</td><td>Definite</td></tr>
<tr><td>Confidence:</td><td>High</td></tr>
<tr><td>Degree to which the impact may cause irreplaceable loss of resources:</td><td rowspan="4">Not applicable to a benefit</td></tr>
<tr><td>Degree to which the impact can be reversed:</td></tr>
<tr><td>Indirect impacts:</td></tr>
<tr><td>Cumulative impact prior to mitigation:</td></tr>
<tr><td>Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)</td><td>Medium</td></tr>
<tr><td>Degree to which the impact can be avoided:</td><td rowspan="7">Mitigation is not applicable to a benefit.</td></tr>
<tr><td>Degree to which the impact can be managed:</td></tr>
<tr><td>Degree to which the impact can be mitigated:</td></tr>
<tr><td>Proposed mitigation:</td></tr>
<tr><td>Residual impacts:</td></tr>
<tr><td>Cumulative impact post mitigation:</td></tr>
<tr><td>Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)</td></tr>
</table>

3. Impact assessment – No-Go Option: operational phase

The no-go option is the alternative of not proceeding with the expansion of an existing scrap aluminium foundry situated on Erf 23631 and Erf 12399. The no-go option includes the site remaining in its current state.

Summary of no-go option [advantages vs disadvantages] associated with the GeT Alloys' Parow foundry

ADVANTAGES	DISADVANTAGES
ENVIRONMENTAL ATTRIBUTES	
The additional air emissions and possible fugitive dust emissions associated with the proposed foundry would not occur associated with the no-go option. The proposed development design, including appropriate process and abatement technology, as well as dust control measures, however, are expected to reduce emissions to within statutory and therefore acceptable limits. This benefit is not considered significant enough to warrant not developing the plant. .	Impacts resulting from proceeding with the development proposal could impact negatively on the ambient air quality. However, through effective mitigation, monitoring and management the effects are not significant enough to warrant not expanding the foundry. Increased pressure on the aluminium industry for the continued mining of virgin aluminium to the detriment of the environment and natural stocks. From the investigation of the need and desirability of the development that has been undertaken in **Annexure J**, the no-go option does not support the regional planning imperatives for the Beaconvale industrial area in terms of investment in Germiston. The no-go option represents only limited contribution to the circular (waste-to-value) economy and to diversion of scrap metal from landfill.
SOCIO-ECONOMIC ASPECTS	
The identified health and safety risks associated with operating a larger-scale foundry would not occur. But these impacts can be readily avoided with standard, best-practice measures and adherence to statutory requirements contained in the Occupational Health and Safety Act. This benefit is therefore not considered significant enough to warrant not developing the foundry.	**Employment opportunities:** The no-go option does not represent additional jobs and associated income, to the benefit of the surrounding Beaconvale community. **Economic growth:** There is market demand from the construction and manufacturing sectors for GeT Alloys' product, namely recycled aluminium alloy and copper. The no-go option would mean that necessary support for these sectors would not be realised. **Industry investment:** The South African scrap aluminium recovery industry would not receive much-needed investment and growth with the establishment of a technologically advanced, larger-scale foundry. The scrap could potentially need to be transported to other countries for processing. **Market viability:** The no-go option could curtail the profitability and therefore financial stability of GeT Alloys.

4. Impact statement

4.1. Summary of key findings of the EIA

The development proposal (including the technology, site and activity alternatives that were found on investigation to be the best practicable options for the minimisation of health, safety, and environmental impacts) was assessed against the no-go option, or the option of not establishing a foundry on Erf 23631 and Erf 12399.

OPERATIONAL PHASE IMPACTS

1. Potential risk of soil, groundwater, and surface water contamination (Indirect)

Handling and storage of hydrocarbons, as well as fuel and refuelling activities to be done in accordance with standard operating procedures will result in a Low significance impact with mitigation.

2. Impacts on air quality / pollutants

Increased particulate matter and gaseous emissions may occur from aluminium scrap pre-heating and oil-fired furnaces, resulting in poor ambient air quality. At sufficiently high concentrations, these pollutants may result in potential health, nuisance, dust, and odour impacts without mitigation. Regional air quality may be negatively affected as a result of the cumulative impacts associated with these emissions. This may lead to a potentially more widespread negative impact for residents within proximity to the facility. A Low significance impact is expected with mitigation.

3. Increase traffic and congestion – nuisance

The foundry will have associated additional trucks on the road, transporting scrap aluminium and copper to the plant while also transporting alloy to customers. This will add to the cumulative impacts associated with the movement of heavy vehicles within the industrial area and localised surrounds. Effects are likely to only be felt on a localised level and in keeping with the design capacity of the surrounding road network. Low significance impacts are predicted.

4. Adverse occupational health effects on staff due to significant levels and periods of exposure

The foundry has significant associated risks in terms of health and safety of workers (working with extreme temperature machinery and molten metal; furnace emissions in the workplace; handling hazardous dross (corrosive; skin and lung irritant; potential for harmful and explosive fumes when wet). The facility needs to be designed and operated in such a way as to effectively avoid and manage health and safety risks.

Get Alloys will need to prepare standard operating procedures for the various foundry processes (e.g., furnace charging, tapping, casting, dross handling and storage), as well as prepare preventative maintenance plans for all infrastructure associated with the foundry activities, in order to ensure that best-practice health and safety measures are implemented, and that infrastructure does not become derelict and unsafe to operate. With the implementation of mitigation, the impact is expected to be of Low significance.

5. Noise resulting in nuisance factors / potential complaints

Potential noise impact related to the operation of the facility. This may be significant at start up and shut sown procedures but is compatible with the existing land use planning objectives for the property (zoned for industrial use).

6. Waste impacts

The operation of the foundry will generate small quantities of general waste such as office and some kitchen waste. This will be disposed of in the municipal waste stream [normal solid waste collection services as provided by the Municipality in the area].

The dross that remains after 10 -15% aluminium recovery (the recovery process also includes separating out of steel and magnetic metals from the dross for resale) is disposed of to landfill. With the dross recovery process and with implementation of best practice waste management methods, the impact is expected to be of Low significance.

7. <u>Socio-economic benefits</u>

The components making up the socio-economic benefits are highlighted below – the result of the associated impacts is expected to a have a Medium positive impact.

8. <u>Socio-economic (employment opportunities)</u>

GeT Alloys will increase their market share and profitability. Not only will there be knock-on benefits for Get Alloys' staff in terms of job and income security, and benefits to the owners of GeT Alloys, but the expansion will allow for a total of about 50 staff members.

9. <u>Socio-economic (contribution to capital investment)</u>

GeT Alloys provides a service to downstream production and construction industries. These are essential industries which support human activities.

It can be argued that successful businesses in the Beaconvale industrial area, could attract additional investment into the area: businesses which provide goods and services to GeT Alloys, the scrap providers (companies and individuals), and construction-related businesses which use GeT Alloys' aluminium alloy and copper in their manufacturing and construction processes.

10. <u>Socio-economic (contribution to the economy)</u>

An expanded and financially stable and profitable industry generates tax revenue for the government, which is an essential aspect of the economy.

11. <u>Contribution to green economy and national waste diversion from landfill objectives and targets</u>

The operation of the facility will result in a positive impact on the use of natural resources:

Both aluminium and copper are non-renewable / finite natural resources. The proposed development thus addresses this through the smelting and moulding of scrap aluminium and copper, thereby reducing the demand for mining of these metals. Recovering aluminium and copper from scrap is commonly known to have a smaller carbon footprint and to be less energy intensive than mining these virgin ores.

In addition, scrap metal will be diverted from landfill, thereby saving on scarce landfill airspace. The foundry will therefore have environmental benefits. Also, the furnaces to be installed shall use fossil fuel, such as low sulphur oil (LSO). The consideration of replacing hydrocarbon furnace oil with a biofuel, provided that the quality, performance, competitive costs, and security of supply can be assured, has been assured by the Applicant.

A summary of the findings of the impact assessment is contained in **Table 9**. It has been found that any negative impacts associated with expanding and operating the existing foundry can be avoided altogether or can be reduced to acceptable levels through appropriate mitigation. All of the negative impacts are of **low significance**.

The identified benefits associated with the proposed foundry were found to be of **medium benefit** during the operational phase.

The activity proposal has been assessed against the no-go option, which is the option of not to expand the existing foundry. The no-go option has thus provided a baseline against which to assess the benefits and drawbacks of expanding the existing foundry.

With the no-go option, no benefits of sufficient significance were identified to warrant not expanding the foundry.

However, the no-go option has the drawback of constraining GeT Alloy's service offering to the construction industry, as well as their profitability. The no-go option also represents the loss of potential investment, income, job opportunities and service to downstream industries, which could be realised with the expansion of the existing facility.

Table 9: Summary of operational phase impacts associated with the GeT Alloys' Parow foundry expansion

Impact	Before mitigation	After mitigation
Ambient air quality	**Medium (-ve)**	**Low (-ve)**
Traffic	**Low (-ve)**	**Low (-ve)**
Soil and groundwater contamination	**Medium (-ve)**	**Low (-ve)**
Health and safety risk	**High (-ve)**	**Low (-ve)**
Noise	**Medium (-ve)**	**Low (-ve)**
Waste management	**Medium (-ve)**	**Low (-ve)**
Socio-economic benefits	**Medium (+ve)**	

Table 10: Summary of no-go option [advantages vs disadvantages] associated with the GeT Alloys' Parow foundry

ADVANTAGES	DISADVANTAGES
ENVIRONMENTAL ATTRIBUTES	
The additional air emissions and possible fugitive dust emissions associated with the proposed foundry would not occur associated with the no-go option. The proposed development design, including appropriate process and abatement technology, as well as dust control measures, however, are expected to reduce emissions to within statutory and therefore acceptable limits. This benefit is not considered significant enough to warrant not developing the plant.	Impacts resulting from proceeding with the development proposal could impact negatively on the ambient air quality. However, through effective mitigation, monitoring and management the effects are not significant enough to warrant not expanding the foundry. Increased pressure on the aluminium industry for the continued mining of virgin aluminium to the detriment of the environment and natural stocks. From the investigation of the need and desirability of the development that has been undertaken in Annexure J, the no-go option does not support the regional planning imperatives for the Beaconvale industrial area in terms of investment in Germiston. The no-go option represents only limited contribution to the circular (waste-to-value) economy and to diversion of scrap metal from landfill.
SOCIO-ECONOMIC ASPECTS	

The identified health and safety risks associated with operating a larger-scale foundry would not occur. But these impacts can be readily avoided with standard, best-practice measures and adherence to statutory requirements contained in the Occupational Health and Safety Act. This benefit is therefore not considered significant enough to warrant not developing the foundry.	**Employment opportunities:** The no-go option does not represent additional jobs and associated income, to the benefit of the surrounding Beaconvale community. **Economic growth:** There is market demand from the construction and manufacturing sectors for GeT Alloys' product, namely recycled aluminium alloy and copper. The no-go option would mean that necessary support for these sectors would not be realised. **Industry investment:** The South African scrap aluminium recovery industry would not receive much-needed investment and growth with the establishment of a technologically advanced, larger-scale foundry. The scrap could potentially need to be transported to other countries for processing. **Market viability:** The no-go option could curtail the profitability and therefore financial stability of GeT Alloys.

4.2. Uncertainties, assumptions, and gaps in knowledge

The following uncertainties, assumptions and gaps in knowledge pertain to this impact assessment:

- It has been assumed that the specialist findings are accurate and impartial; that mapping data from sources including Google Earth and the Council for Geosciences is accurate, and that information on all aspects of the proposed a new aluminium alloy and copper scrap foundry provided by the applicant is accurate.
- Besides the above, there are no assumptions, uncertainties or gaps in knowledge that are material to this application.

4.3. Recommendations of the EAP and conditions to be included in the environmental authorisation (EA)

The Environmental Practice recommends that the proposed expansion of an aluminium and copper foundry on Erf 23631 and Erf 12399 **should be authorized**. This recommendation is based on the outcome of the impact assessment process, which has been informed by Enviroprac's professional experience in environmental management as well as on specialist input and detailed process information provided by the Applicant.

The facility should be designed and operated with the implementation of all the mitigation measures recommended by the specialists and required by the commenting authorities. All of these measures are contained in the EMPr. The implementation of the EMPr should therefore be the condition of the environmental authorisation.

All ongoing emissions monitoring and other ongoing management measures contained in the EMPr should be reported on to the DEA&DP's Waste Management Directorate and to the City of Cape Town's Air Quality branch by the applicant on the basis reflected in the environmental authorisation. On a five-yearly basis, the facility should be audited against the conditions of the EMPr by an independent Environmental Control Officer (ECO). These audit reports should be submitted to the DEA&DP for their record-keeping purposes.

These recommendations for monitoring and auditing of operations against the EMPr are contained in the EMPr and should therefore be a condition of authorisation.

Ambient air quality [1]

- As per the planned Turnkey Modular air pollution control system design, all furnaces must be fitted with fume extraction, both from the furnaces itself and via hoods to capture fumes during charging and/or tapping. Fugitive emissions must furthermore be extracted from the foundry building roof at its apex as well as the dross recovery plant. The system design must ensure the PM concentration in the plume exiting the 30 m stack meets the MES of 30 mg/Nm3.
- Fugitive PM emissions should be minimised to avoid off-site exceedances of NAAQS.
- Good housekeeping, e.g., avoiding and cleaning up spillages of fine materials such as baghouse dust and dross.
- Keep vehicle driveways clean and free of dust to avoid entrainment.
- Avoid unnecessary handling of dry fine materials such as dross as it is removed from the foundry to the cooling bay to the recovery plant.
- Ensure cooling dross stockpiles are not exposed to wind to avoid windblown dust.
- Fugitive ammonia emissions must be avoided by keeping dross dry i.e., covered within the cooling bay dross recovery building.
- To reduce vehicle exhaust emissions, avoid unnecessary idling of vehicles on-site.

Health and safety impacts

- The management and mitigation of the employees’ exposure to these health and safety risk factors is through sound implementation and compliance to the requirements of the Occupational Health and Safety Act and applicable Regulations, as well as best practice management and mitigation measures to minimize these potential impacts.
- The applicant should compile Standard Operating Procedures and Preventative Maintenance Plans for all aspects of the operation where significant health and safety risks are attendant, including a Dross Management Procedure to ensure adequate ventilation of dross-handling areas, weatherproofing of dross handling areas, etc. The Dross Management Procedure should address all hazards and risks identified in available Material Safety Data Sheets for dross.

Noise

- Developing a mechanism to record and respond to complaints
- In the event of a compliant being lodged, investigate through specialist site visit and noise monitoring to determine cause, and implement any recommended remedial measures to resolve complaint.
- Avoid unnecessary revving of engines and switch off equipment/vehicles/trucks when not required.
- Managing the impact of reverse warning signals by removing the need for reversing by using drive through pathways.
- Maintain internal road surfaces.
- Avoid excessive use of exhaust brakes.
- Maintain machinery and equipment to minimise noise.
- A complaints register must be kept.

Waste

- Impacts associated with this waste recovery process have been discussed elsewhere and entail mainly air emissions and health and safety risks. These can be readily minimised by implementing fit-for-purpose emissions abatement and best practice health and safety operating protocols.
- Weatherproofing of the dross and best practice health and safety operating protocols are essential for minimizing the impacts associated with this waste management activity.
- The applicant should compile a dross management procedure and train staff accordingly.

---

[1] Recommended inclusions in EA from Nicolette von Reiche, Soundscape. Full ambient air quality impact mitigation measures are included in impact assessment and in EMP.

Freshwater, soil and groundwater contamination

- Ensure that fuel storage tanks are adequately bunded and the installation complies with SANS 10131: Above-ground storage tanks for petroleum products.
- Designated refuelling areas and procedures to reduce spills, leaks, infrastructure failure. Educate employees in correct handling and refuelling procedures.
- A spill response kit appropriate to hydrocarbons will be available on site. Hydrocarbon contaminated material will be disposed of as hazardous waste
- A Standard Operating Procedure (SOP) for all activities relating to Fossil Fuel storage, refilling, handling and use in processing must be compiled to minimise associated health, safety, and environmental risks.
- Staff must be trained in the SOP, with records of staff competency retained.