

Appendix K

Impact Assessment

PROJECT IMPACT ASSESSMENT, SIGNIFICANCE AND MITIGATION MEASURES SUMMARY

The following impact rating approach used by Enviro Africa CC is a basic exponential rating system to assess actual and potential negative environmental impacts.

Positive environmental impacts are also listed. All positive impacts need to be enhanced or increased where possible but positive impacts are not rated or given a score since the rating is based on risks.

Environmental activities or aspects are identified, based on:

- the phases of the project,
- the nature (or description) of the actual and potential impacts of the activities.

For every project activity or aspect, various environmental impacts are listed. Every negative impact is allocated a value as per each of the following criteria:

- Likelihood (Probability)
- Extent (Severity)
- Duration (Frequency)
- Consequence (Receiving Environment and Toxicity)

Once a value is allocated for each of the criterion, the scores are averaged to determine the final impact rating see Table 1 below.

Enviro Africa then further assesses environmental significance, based on the nature of the impact, as per the score and colour key which forms part of Table 1 below. This results in impacts having either a low (indicated in green), medium (indicated in yellow) or high (indicated in orange and red) significance.

- Note:**
- i. One environmental aspect or project activity e.g. site clearance may have multiple impacts in different areas.
 - ii. The various impacts per aspect/project activity are documented in the Quantification of Aspects and Impact/s Significance Rating form (Table 2 Annexure B).
 - iii. As a baseline, impact rating values/scores are allocated taking the **worst case** scenario into account i.e. with no mitigation. The baseline rating is compared with those after mitigation has been taken into account i.e. the post-mitigation rating. Post mitigation rating is used for the actual impact assessment.

SIGNIFICANCE CRITERIA	Very High	Moderately High	Medium	Moderately Medium	Low	Very Low	Score
Value	32	16	8	4	2	1	
Likelihood / Probability (L/P)	Impact will definitely occur	Very likely for impact to occur	Impact may occur once annually	Impact may occur less than once annually but at least twice every five years	Impact may occur one to two times (maximum) in project's life	Very unlikely for impact to occur / Impact will not occur	
Extent / Severity (E/S)	Impact potentially reaches beyond national boundaries	Impact has definite provincial potential national consequences	Impact will potentially affect neighbouring province	Impact confined to local province	Impact confined to local region but not province wide	Impact confined to project property / site	
Duration / Frequency (D/F)	Continual / daily occurrence	Impact will occur once a week	Impact will occur once a month	Impact will occur once a year	Impact will occur once every ten years	Possible that impact will never occur in Project's	
Consequence: Receiving environment (C: RE)	Very sensitive, pristine area – protected site or species permanently or seasonally present	Unused industrially zoned area containing only indigenous fauna / flora species	Unused industrially zoned area containing indigenous and alien fauna / flora species	Semi-disturbed area already rehabilitated / recovered from prior impact	Disturbed area undergoing rehabilitation / recovering from prior impacts	Disturbed area, already in need of rehabilitation prior to impact	
Consequence: Toxicity (C:T)	Impact is poisonous to natural environment and is not contained - no rehabilitation possible - permanent irreversible impact	Impact is potentially poisonous to natural environment and is not contained – only partial rehabilitation possible – potential permanent irreversible impact	Impact is potentially poisonous to natural environment and is partially contained – some rehabilitation possible and is potentially reversible	Impact is potentially poisonous to natural environment and is partially contained – complete rehabilitation possible	Impact is potentially poisonous to natural environment but is completely contained	Impact is not poisonous to natural environment	
FINAL RATING (average score)							

ENVIRONMENTAL RATING SIGNIFICANCE KEY:

SIGNIFICANCE	RATING	Final rating score / value range
Very Significant	Very High	25 to 32
Significant	High	19 to <25
	Medium	13 to <19
Insignificant	Moderately Medium	6 to <13
	Low	3 to <6
	Very Low	1 to <3




Table 1: Environmental Significance Rating Methodology (rating criteria and significance key)

A. ASPECT / ACTIVITY: Transport of Equipment / Material to Site (pre-construction site establishment)

No.	IMPACT	L/P	E/S	D/F	C: RE	C: T	Pre-Mitigation Score (Baseline)	L/P	E/S	D/F	C: RE	C: T	Post-Mitigation Score (Impact)	Short Description of Mitigation Measures
1	Particulate and gaseous emissions due to use of vehicles/machinery	16	32	32	1	16	19,4	16	16	32	1	16	16,2	Vehicles to be serviced regularly/well maintained. Vehicles not allowed to idle for extended periods. Routine site and vehicle checks. Dust suppression to be used if possible, should continuous dust emissions occur. Fugitive particulate emissions minimised by enforcing speed limits on dirt roads and by limiting excavation to non-peak traffic period on local regional (dirt) road to avoid dust clouds over public roads.
2	Potential impedance of normal traffic flow on main access road	16	8	4	4	2	6,8	16	8	4	2	2	6,4	Comply with legislative requirements. If necessary, use traffic controllers. Avoid transpotation of sand during peak traffic times.
3	Animal/human interaction/accident with vehicles	6	1	16	18	1	8,4	6	2	1	8	2	3,8	Training regarding road safety. Routine checks to ensure vehicles in good condition.
4	Vehicle accidents	16	8	4	1	2	6,2	8	8	4	1	2	4,6	Training and awareness regarding road safety. Routine checks to ensure vehicles in good condition.
5	Spillages of fuel/oil/HCSs from vehicles/vehicle loads	32	2	4	32	4	14,8	16	2	4	32	4	11,6	Training and awareness regarding use and storage of fuel/oil/HCSs. Adequate drip trays and spill clean up kits provided. Routine monitoring of vehicle loads and vehicles for leaks.
6	Noise from heavy vehicles	32	2	16	1	1	10,4	16	1	16	1	1	7	Ensure vehicle exhaust pipes in good condition. Vehicles not to be used outside of normal working hours.
7	Potential littering along route from drivers/personnel in vehicles	32	16	16	8	1	14,6	16	2	16	2	1	7,4	Training and awareness regarding littering. Provision of rubbish bags for inside vehicle when travelling.
8	Impact of slowed traffic due to trucks transporting sand on public roads	16	16	8	1	1	8,4	8	16	4	1	1	6	Limit transport of trucks to non-peak traffic times if possible. Avoid built up areas during peak traffic times.
9	Aesthetic/visual impact of stored/parked vehicles and equipment	32	1	32	1	1	13,4	16	1	16	1	1	7	Park vehicles and daily store of equipment at designated areas on site using natural topography/vegetation/buildings as screens.
10	Environmental training/awareness e.g. at on-site start up													

B. ASPECT / ACTIVITY: Site Clearance/Topsoil

No.	IMPACT	L/P	E/S	D/F	C: RE T	Pre-Mitigation Score (Baseline)	L/P	E/S	D/F	C: RE T	Post-Mitigation Score (Impact)	Short Description of Mitigation Measures		
1	Negative impact on protected trees/plants/fauna during site clearance	32	1	32	32	25,8	16	1	4	8	16	Demarcation of protected trees/trees to be avoided, or for which permits must be applied to allow correct removal and/or relocation (as per biodiversity specialist report). Designation of no-go areas on site to protect flora/trees to be defined at on-site start up meeting. Environmental awareness/training. Routine site compliance checks.		
2	Gaseous emissions due to use of vehicles/machinery	16	32	32	1	19,4	16	16	32	1	16	Vehicles serviced regularly/well maintained. Vehicles not allowed to idle for extended periods. Routine site and vehicle checks.		
3	Dust (particulate) emission generation	32	8	32	1	21	16	4	32	1	16	Utilisation of dust suppression to be used if possible, should continuous dust emissions occur. Fugitive particulate emissions minimised by enforcing speed limits on dirt roads. Vehicles confined to roads only. Vehicles serviced regularly/well maintained. Vehicles not allowed to idle for extended periods. Routine site and vehicle checks.		
4	Clearance of indigenous vegetation	32	2	16	32	8	18	32	1	4	8	1	9,2	Demarcation of protected trees/trees to be avoided, or for which permits must be applied to allow correct removal and/or relocation (as per biodiversity specialist report). Designation of no-go areas on site to protect flora/trees to be defined at on-site start up meeting. Environmental awareness/training. Routine site compliance checks.
5	Clearance of alien vegetation													
6	Topsoil removal/stockpiling	32	2	16	8	1	11,8	32	1	16	8	1	11,6	Topsoil management plan to be in place at on-site start up meeting in line with specialist reports. Routine site checks to ensure compliance.
7	Habitat loss (effect on fauna)	32	1	4	8	1	9,2	32	1	4	8	1	9,2	Due to the nature of the development, habitat loss will take place irrespective of mitigation measures.
8	Animal interaction/fatalities	6	1	16	8	1	6,4	6	1	4	8	1	4	Designation of no-go areas on site to be defined at on-site start up meeting. Environmental awareness/training. Routine site compliance checks.
9	Heritage discovery (archaeological or palaeontological) due to excavation	8	1	4	8	1	4,4	2	1	2	8	1	2,8	Designation of no-go areas on site to be defined, if required at site meeting. Environmental awareness/training. Routine site compliance checks as per EMPr.
10	Visual impact of site clearance/dust	32	2	32	1	1	13,6	16	2	32	1	1	10,4	Utilisation of dust suppression on roads if required. Fugitive particulate emissions minimised by enforcing speed limits on dirt roads. Vehicles confined to roads only. Vehicles serviced regularly/well maintained. Vehicles not allowed to idle for extended periods. Routine site and vehicle checks.
11	Local employment opportunities													Current employees (2-4 persons) of CA Konstruksies will be provided with further employment.
12	Environmental training/awareness e.g. at on-site start up meeting													

C. ASPECT / ACTIVITY: Construction and Operation

No.	IMPACT	L/P	E/S	D/F	C: RE	C: T	Pre-Mitigation Score (Baseline)	L/P	E/S	D/F	C: RE	C: T	Post-Mitigation Score (Impact assessment)	Short Description of Mitigation Measures
1	Poor access control/fencing	32	1	32	8	1	14,8	2	11	4	8	1	5,2	Secure fencing of site to take place before any materials/equipment brought to site. Access to be controlled via locked gate and security services.
2	Ablutions for site labour (non-adherence to designated areas)	32	2	32	1	8	15	32	1	16	1	1	10,2	Training and awareness regarding designated ablation areas and need for adherence. Provision of sufficient ablutions area in line with legal requirements on site. Ad hoc site visits to check compliance in line with training.
3	Littering	32	16	16	8	1	14,6	16	2	16	2	1	7,4	Training and awareness regarding littering. Provision of sufficient rubbish bins/bin bags on site and routine removal of bins/bags to a registered waste site. Ad hoc checks to ensure compliance in line with training.
4	Habitat loss (effect on fauna)	32	1	4	8	1	9,2	32	1	4	8	1	9,2	Due to the nature of the development, habitat loss will take place irrespective of mitigation measures.
5	Animal interaction/fatalities	6	1	16	8	1	6,4	6	1	4	8	1	4	Designation of no-go areas on site to be defined at on-site start up meeting. Environmental awareness/training. Routine site compliance checks.
6	Aesthetic impact during construction	32	2	2	1	1	7,6	16	2	2	1	1	4,4	Park vehicles and temporary/daily use storage of equipment at designated areas on site using natural topography/vegetation as screens. Fugitive particulate emissions minimised by enforcing speed limits on dirt roads and using dust suppression on roads, if required. Vehicles confined to roads only. Routine site and vehicle checks.
7	Disturbance to eastern drainage line by plant and vehicles	32	25	25	16	1	19,8	32	13	25	5	1	15,2	The access road to be constructed across the drainage line located eastwards of the site must be maintained and the banks of the drainage line reinforced as per the recommendations contained in the freshwater specialist report. Training of staff to be conducted regularly so that mining and associated activities are kept clear of all the other on-site drainage lines. Regular checks for compliance to be done.
8	Resource use: land	32	2	32	8	1	15	32	1	32	2	1	13,6	Training and awareness regarding land management on site. Ad hoc checks to ensure compliance in line with training and management plans/programmes.
9	Resource use: hydrocarbons/fuels	32	2	32	8	16	18	32	2	32	8	2	15,2	Training regarding efficient fuel/hydrocarbon use. Checks for compliance with management plans/programmes to be conducted.
10	Recycling of waste products where possible													
11	Storage of fuels/hazardous chemical substances	32	2	4	32	4	14,8	16	2	4	32	4	11,6	Training and awareness regarding use and storage of fuel/oil/HCSs. Adequate drip trays and spill clean up kits provided. HCSs and fuel stores stored in line with legal requirements. Routine monitoring of vehicle loads and vehicles for leaks.
12	Noise from heavy vehicles	32	2	16	1	1	10,4	16	1	16	1	1	7	Ensure vehicle exhaust pipes in good condition. Vehicles not to be used outside of normal working hours.
13	Training/Skills transfer													
14	Local employment opportunities													

D. ASPECT / ACTIVITY: Operation and Maintenance

No.	IMPACT	L/P	E/S	D/F	C: T	RE	Pre-Mitigation Score (Baseline)	L/P	E/S	D/F	C: T	RE	Post-Mitigation Score (Impact assessment)	Short Description of Mitigation Measures
1	Poor access control/fencing	32	1	32	8	1	14,8	2	11	4	8	1	5,2	Secure fencing of site to take place before any materials/equipment brought to site. Access to be controlled via locked gate and security services.
2	Demarcation of areas to be excavated	32	2	8	1	1	8,8	32	1	4	1	1	7,8	Excavation 'blocks' or 'strips' must be clearly defined before any material/equipment arrives on site. Excavation areas to be in-line with specialist recommendations. Routine site inspection for adherence to demarcated area parameters.
3	Ablutions for site labour (non-adherence to designated areas)	32	2	32	1	8	15	32	1	16	1	1	10,2	Training and awareness regarding designated ablation areas and need for adherence. Provision of sufficient ablutions area in line with legal requirements on site. Ad hoc site visits to check compliance in line with training.
4	Littering	32	16	16	8	1	14,6	16	2	16	2	1	7,4	Training and awareness regarding littering. Provision of sufficient rubbish bins/bin bags on site and routine removal of bins/bags to a registered waste site. Ad hoc checks to ensure compliance in line with training.
5	Habitat loss (effect on fauna)	32	1	4	8	1	9,2	32	1	4	8	1	9,2	Due to the nature of the development, habitat loss will take place irrespective of mitigation measures.
6	Animal interaction/fatalities	16	6	16	8	1	9,4	9	1	4	8	1	4,6	The granite outcrop area to be mined must be kept inaccessible by a perimeter wall of boulders and also fenced off with small diameter wire mesh. This will limit the likelihood of animals falling into the mining pit.
7	Aesthetic impact during construction	32	2	2	1	1	7,6	16	2	2	1	1	4,4	Park vehicles and temporary/daily use storage of equipment at designated areas on site using natural topography/vegetation as screens. Fugitive particulate emissions minimised by enforcing speed limits on dirt roads and using dust suppression on roads, if required. Vehicles confined to roads only. Routine site and vehicle checks.
8	Disturbance to eastern drainage line by vehicles	32	32	25	25	1	23	32	6	32	2	1	14,6	The access road to be constructed across the drainage line located eastwards of the site must be maintained and the banks of the drainage line reinforced as per the recommendations contained in the freshwater specialist report. Training of staff to be conducted regularly so that mining and associated activities are kept clear of all the other on-site drainage lines. Regular checks for compliance to be done.
9	Resource use: land	32	2	32	8	1	15	32	1	32	2	1	13,6	Training and awareness regarding land management on site. Ad hoc checks to ensure compliance in line with training and management plans/programmes.
10	Resource use: hydrocarbons/fuels	32	2	32	8	16	18	32	2	32	8	2	15,2	Training and awareness regarding efficient fuel/hydrocarbon use. Ad hoc checks to ensure compliance in line with training and management plans/programmes.
11	Recycling of waste products where possible													
12	Storage of fuels/hazardous chemical substances	32	2	4	32	4	14,8	16	2	4	32	4	11,6	Training and awareness regarding use and storage of fuel/oil/HCSs. Adequate drip trays and spill clean up kits provided. HCSs and fuel stores stored in line with legal requirements. Routine monitoring of vehicle loads and vehicles for leaks.
13	Noise from heavy vehicles	32	2	16	1	1	10,4	16	1	16	1	1	7	Ensure vehicle exhaust pipes in good condition. Vehicles not to be used outside of normal working hours.
14	Training/Skills transfer													
15	Local employment opportunities													

E. ASPECT / ACTIVITY: Decommissioning/Demolition

No.	IMPACT	L/P	E/S	D/F	C: RE	C: T	Pre-Mitigation Score (Baseline)	L/P	E/S	D/F	C: RE	C: T	Post-Mitigation Score (Impact assessment)	Short Description of Mitigation Measures
1	Poor access control/fencing	32	1	32	8	1	14,8	2	11	4	8	1	5,2	Ensure site is securely fenced before any materials/equipment is removed from site. Access to be controlled via locked gate and security services.
2	Ablutions for site labour (non-adherence to designated areas)	32	2	32	1	8	15	32	1	16	1	1	10,2	Training and awareness regarding designated abluion areas and need for adherence. Provision of sufficient ablutions area in line with legal requirements on site. Ad hoc site visits to check compliance in line with training.
3	Littering	32	16	16	8	1	14,6	16	2	16	2	1	7,4	Training and awareness regarding littering. Provision of sufficient rubbish bins on site. Ad hoc checks to ensure compliance in line with training.
4	Effect on fauna (continued habitat loss)	32	1	4	8	1	9,2	8	1	4	8	1	4,4	Rehabilitation and revegetation/seeding programme to be finalised before decommissioning takes place. Routine site checks/visits to ensure rehabilitation plan implemented to regain natural habitat.
5	Animal interaction/fatalities	16	6	16	8	1	9,4	9	1	4	8	1	4,6	Designation of no-go areas on site to be defined at on-site start up meeting. Environmental awareness/training. Routine site compliance checks.
6	Aesthetic impact during demolition/decommissioning	32	2	2	1	1	7,6	16	2	2	1	1	4,4	Use natural topography where possible to screen final layout of solar PV panels. Panels low to the ground to avoid excessive visual impact. Park vehicles and store equipment at designated areas on site using natural topography/vegetation/buildings as screens. Fugitive particulate emissions minimised by enforcing speed limits on dirt roads and using dust suppression on roads. Vehicles confined to roads only. Routine site and vehicle checks.
7	Disturbance to drainage lines	32	1	32	2	1	13,6	32	1	32	2	1	13,6	Training and awareness regarding sound water use/management. Storm water management plan in place at on-site start up meeting. Ad hoc checks to ensure compliance in line with training and management plans/programmes.
8	Resource use: land	32	1	32	2	1	13,6	32	1	32	2	1	13,6	Training and awareness regarding land management on site. Ad hoc checks to ensure compliance in line with training and management plans/programmes.
9	Resource use: hydrocarbons/fuels	32	2	32	8	16	18	32	2	32	8	2	15,2	Training and awareness regarding efficient fuel/hydrocarbon use. Ad hoc checks to ensure compliance in line with training and management plans/programmes.
10	Recycling of waste products where possible													
11	Storage of fuels/hazardous chemical substances	32	2	4	32	4	14,8	16	2	4	32	4	11,6	Training and awareness regarding use and storage of fuel/oil/HCSs. Adequate drip trays and spill clean up kits provided. HCSs and fuel stores stored in line with legal requirements. Routine monitoring of vehicle loads and vehicles for leaks.
12	Noise from heavy vehicles	32	2	16	1	1	10,4	16	1	16	1	1	7	Ensure vehicle exhaust pipes in good condition. Vehicles not to be used outside of normal working hours.
13	Training/Skills transfer													
14	Local employment opportunities													