

	SIGNIFICANCE PRE-MITIGATION							SIGNIFICANCE POST MITIGATION							MITIGATION TYPE	MITIGATION
Aspect, Activity & Potential Impact	Status	Probability	Extent	Duration	Intensity	Significance Score	Rating	Status	Probability	Extent	Duration	Intensity	Significance Score	Rating	(Modify, Remedy, Control, Stop)	Mitigation Measure
INVASIVE PROSPECTING & BULK SAMPLING																
Impact on Geology																
Removal of geological bulk samples for testing at a legal maximum volume of 500 000 tons/annum result in geology and soils	Negative	3	1	2	2	15	Moderate	Negative	3	1	2	2	15	Moderate	None	No Mitigation
Impact on soils																
Stockpiling of topsoil following site preparation (excavation) may result in loss of topsoil resource	Negative	2	1	2	1	8	Low	Negative	1	1	2	1	4	Very Low	Control	<ul style="list-style-type: none"> Topsoil needs to be protected and returned for rehabilitation as soon as possible Implement good stockpiling practice and storm water control to avoid soil erosion
Establishment of prospecting sites, site camp, vehicle traffic, material storage may result in soil erosion, compaction of soils by heavy machinery, contamination of soils due to hydrocarbon spillages	Negative	2	1	2	2	10	Low	Negative	2	1	2	1	8	Low	Remedy	<ul style="list-style-type: none"> Restrict vehicle access to designated areas Provide drip trays for standing equipment Clean up hydrocarbon spillages, contaminants must be properly disposed of using correct solid/hazardous waste facilities. Contaminated soil must be removed and the affected area rehabilitated. Do not place the site camp infrastructure where it can cause pollution to sensitive areas (drainage lines, steep slopes)
Generation, storage and disposal of waste can contaminate soil due to improper disposal	Negative	2	1	2	3	12	Low	Negative	1	1	2	2	5	Low	Control	<ul style="list-style-type: none"> Provide water proof waste receptacles for general and hazardous waste at the site camp/prospecting sites Dispose hazardous and general waste at a registered waste site No prospecting is to be undertaken within 50metres of riparian and wetland zones, no activity is to take place within the riparian zone of the Limpopo River and the north eastern section of the study site is regarded as a no-go zone
Impact on Fauna and Flora (Ecological Impact)																
Clearing of vegetation and topsoil as site preparation for prospecting sites, site camp and bulk sampling will result in loss of habitat	Negative	2	1	3	6	20	Moderate	Negative	1	1	2	4	7	Low	Control	<ul style="list-style-type: none"> The northeastern section of the study site should be regarded as a no-go area for prospecting due to existence of unique habitat; Target Areas 1 and 21 should be regarded as no-go zones for prospecting as they correspond to unique habitat and the Limpopo River riparian zone; Exotic and invasive plant species must not establish onsite; Footprints at prospecting target areas need to be confined to a narrow strip to have the least possible edge effects on the ecosystem; A 50 metre buffer zone must be upheld from wetland and riparian zones and regarded as no-go areas for any prospecting; also needs to be fenced off with appropriate material;

Loss of sensitive species due to site establishment for site camp and prospecting activities	Negative	2	1	5	6	24	Moderate	Negative	1	1	5	2	8	Low	Control	<ul style="list-style-type: none"> Remainder of target sites at point of impact must be inspected and likely absence of protected trees, localised plant species, nests of vultures&raptors, baboon spider colonies confirmed; Footprints need to be kept to a minimum so larger mammals can roam freely; Necessary caution must be adhered to due to large animals onsite to avoid conflict as a result of human activity (Elephants, Lion, Leopard); Each target area needs to be inspected for nests in trees of raptors and vultures which are threatened and could be resident/visitors such as the White Backed Vulture (nationally critically endangered), Hooded Vulture (critically endangered) and Bateleur (vulnerable); Removal of nests, if possible or practicle, in case of any removal of nests, should be done by qualified bird specialist; Each target site should be inspected for baboon spiders (horned baboon). If there are burrows and resident spiders in area these are to be removed and translocated by a specialist; <p>Protected Trees</p> <ul style="list-style-type: none"> Apply for protected tree permits from DAFF if any protected trees are to be damaged/removed; Each target are must first consider avoiding damage/removal to protected trees (Baobab, Shepard's Tree, Leadwood, Apple-Leaf, Marula) It is recommended that prospecting avoid removal of large protected species (Baobab in particular)
Site clearance for drill, sampling and camp site will impact on Habitat Connectivity and Open Space	Negative	2	2	4	6	24	Moderate	Negative	1	2	4	2	8	Low	Control	<ul style="list-style-type: none"> Exotic and invasive species of plants must not establish, so that quality and functionality of conservation corridors are enhanced; Rubble and waste must be removed during and after prospecting; Confine footprint to narrow strip to have the least possible edge effects on ecosystems A 50 metre buffer zone must be upheld from wetland and riparian zones and regarded as no-go areas for any prospecting; also needs to be fenced off with appropriate material; Prospecting at rocky ridges should be avoided. If it cannot be avoided , footprints must be limited to a minimum on rocky ridges;
Establishment of access tracks and driving off existing tracks may cause destruction and damage to flora & fauna	Negative	3	1	2	4	21	Moderate	Negative	1	1	2	2	5	Low	Control	<ul style="list-style-type: none"> Use existing access roads Restrict vehicle access to designated areas
Noise from drilling equipment, machinery, vehicle movement may disturb fauna (wild animals, birds, large mammals, livestock) and result in it to vacate the area	Negative	2	2	2	6	20	Moderate	Negative	1	1	2	2	5	Low	Control	
Faunal fatalities from direct contact with prospecting equipment, supplies (vehicle, dozers, chemicals, waste)	Negative	1	1	5	8	14	Moderate	Negative	1	1	2	2	5	Low	Control	<ul style="list-style-type: none"> A 50 metre buffer zone must be upheld from wetland and riparian zones and regarded as no-go areas for any prospecting; also needs to be fenced off with appropriate material; Implement concurrent rehabilitation No mammals species are to be disturbed, trapped, hunted or killed during prospecting; Confine footprint areas Avoid spills and infiltration of petroleum fuels, chemical pollutants into soils during prospecting.
Overall impact from prospecting on ecologically	Negative	2	1	2	6	18	Moderate	Negative	1	1	2	4	7	Low	Control	
Impact on Aquatic Ecosystems																

During establishment of site camp, drilling pads, excavations and bulk sampling may result in impact on aquatic ecosystems due to risk of contamination from to hydrocarbon spillages, oil and of fuel.	Negative	2	2	1	8	22	Moderate	Negative	1	2	1	8	11	Low	Remedy	<ul style="list-style-type: none"> • Proper storage and handling of hydrocarbons and chemicals need to be ensured. Fuel, oil and chemicals must be stored in designated areas outside wetland and riparian buffer zones • Storage containers for hydrocarbons and chemicals must be regularly inspected as to prevent leaks • Uphold a 50m buffer zone from riparian zones and wetlands; also needs to be fenced off with appropriate material; • Portable toilets must be placed on impervious level surfaces that are lined to prevent spillages
Prospecting within unique habitat (wetland, possible forests) in northeastern section of site upstream of Makuleke Wetland may impact on Ramsar wetland function	Negative	2	6	3	10	38	High	Negative	0	5	2	0	0	Very Low	Stop	<ul style="list-style-type: none"> • Target Area 1 regarded as a no go zone for prospecting and is omitted from the prospecting target areas, • North-eastern section of the study site is considered a no-go zone for prospecting
Creation and clearing of target areas including vehicle movement may cause erosion and sediment deposition into aquatic ecosystems	Negative	2	1	2	6	18	Moderate	Negative	1	1	2	4	7	Low	Control	<ul style="list-style-type: none"> • Implement erosion, sediment and stormwater control, waste management from, site camps, drill pads and bulk sampling site (sandbags) • Concurrent rehabilitation of disturbed areas must be undertaken • Uphold a 50m buffer zone from riparian zones and wetlands; also needs to be fenced off with appropriate material;
Heritage and Cultural Impact																
There is a potential to impact on heritage sites situated at the old Gumbu Graphite Mine due site preparation, site camp establishment and prospecting activities. Sites are 76 years old and protected by NHRA of 1999	Negative	2	2	5	4	22	Moderate	Neutral	1	1	5	2	8	Low	Control	<ul style="list-style-type: none"> • Planning of prospecting target sites, site camp including design and siting of access roads must avoid heritage sites • Sites at the old Graphite mine must be documented and mapped in event that its affected by prospecting; • Permits must be obtained from the Provincial Heritage Authority if heritage sites at the graphite mine are affected
Potential impact on graves, graveyards, stone walled sites, historic homesteads, sacred pools and trees due site preparation and prospecting activities.	Negative	1	1	5	3	9	Low	Neutral	1	1	1	1	3	Very Low	Control	<ul style="list-style-type: none"> • Planning of prospecting target sites including design and siting of access roads must avoid heritage sites. Uphold a 50m buffer zone from any heritage sites • Graves must be avoided and protected insitu • Prospecting close to hut floors must be done with great caution as it was used as burial sites
Damage to cultural and or heritage sites during prospecting activities may result in conflict with local community	Negative	1	2	2	4	8	Low	Neutral	0	2	2	0	0	Very Low	Control	<ul style="list-style-type: none"> • heritage sites. Uphold a 50m buffer zone from any heritage sites • Graves must be avoided and protected insitu • Prospecting close to hut floors must be done with great caution as it was used as burial sites • There are further stone walls and grave sites on top of rocky outcrops within the military area which could not be accessed for survey. If prospecting extends to this area a full assessment of the target area is required before proceeding with prospecting
Potential unearthing of heritage resources during prospecting excavations	Negative	1	1	5	4	10	Low	Negative	1	1	2	2	5	Low	Remedy	<ul style="list-style-type: none"> • Cease work in the vicinity of the heritage feature find; • Demarcate the area with barrier tape/other visible means; • Report the find to the South African Heritage Resources Agency (SAHRA) and Limpopo Provincial Heritage Resources Agency (LIHRA) immediately; • Accredited archaeologist (ASAPA registered) must be commissioned to assess the find and determine the mitigation measures.
Noise Impact																

During drilling, trenching an bulk sampling noise will be generated from use of drilling and excavation machinery and vehicles travelling in the project site causing a nuisance to communities, SANDF and may result in fauna to vacate the area	Negative	3	2	2	2	18	Moderate	Negative	2	2	2	1	10	Low	Control	<ul style="list-style-type: none"> • Limit invasive activities to day time; • Ensure all machinery, drilling and excavation equipment are well maintained; • Provide employees with earplugs to protect their ears (PPE); • Ensure that drill equipment is equipped with appropriate dust suppression systems • Notify affected communities and SANDF where they can lodge a noise compliant prior to commencement of prospecting activities; • Generators must be switched off when not in use; • Regular maintenance of vehicles and equipment is required. Repair and attend to worn and broken equipment.
Air Quality & Dust																
Site establishment and prospecting activities will result in wind blown dust from bare target area surfaces and entrained dust from vehicles/machinery travelling on gravel roads.	Negative	3	1	2	2	15	Moderate	Negative	3	1	2	1	12	Low	Control	<ul style="list-style-type: none"> • Do not undertake drilling, trenching and bulk sampling activities during high winds which can carry dust far offsite; • Ensure that drill equipment is equipped with appropriate dust suppression system; • Apply wet dust suppression where necessary to manage dust emissions from vehicle movement • Control vehicle speeds along unpaved roads 40km/hour.
Visual Impact																
Site clearance and prospecting activities will result in unsightly views due to exposed surfaces and presence of machinery on site	Negative	3	1	2	1	12	Low	Negative	2	1	2	1	8	Low	Remedy	<ul style="list-style-type: none"> • Implement concurrent rehabilitation of drill, trench and bulk sampling sites • Implement good house keep rules at each drill and sampling site • Limit target site footprints to a narrow strip to minimise vegetation clearance and exposed areas
Land use impact																
Prospecting proposed in military training and border control area. Prospecting activities within UXO contaminated area is a liability to SANDF also would impact on daily training activities within the corridor	Negative	3	1	2	8	33	High	Negative	2	1	2	6	18	Moderate	Control	<ul style="list-style-type: none"> • Sweep identified target sites for unsafe (UXO) elements up to 4m below ground level as per SANDF requirements; • MOU between SANDF and SAMIN on method statement for prospecting within military zone • Alternatively request military aide when prospecting target areas within unsafe zones; • Alternatively reposition target areas outside the unsafe
Prospecting within protected area is prohibited and will impact on the nature reserve and biodiversity	Negative	2	1	2	6	18	Moderate	Negative	1	1	2	4	7	Low	Remedy	<ul style="list-style-type: none"> • Minimise removal of vegetation, where possible work on barren parts of site; • Rehabilitate and re-vegetate denuded areas as soon as possible • The north-eastern section of the study site must be regarded as a no-go zone for prospecting activities due to its unique habitat; Implement all mitigation measures proposed for Aquatic Ecosystems and Ecological identified impacts to minimise the impact on biodiversity onsite • Obtain consent from the MEC of Limpopo Department of Economic Development, Environment & Tourism (LEDET) to prospect in declared nature reserve
Groundwater Impact																
Groundwater contamination from fuel and hydrocarbons spillages from vehicles and storages which infiltrate groundwater	Negative	2	1	3	3	14	Moderate	Negative	2	1	1	2	8	Low	Remedy	<ul style="list-style-type: none"> • Storage fuel, oil and chemicals safely in designated areas • Provide drip trays for standing equipment • Clean up hydrocarbon spillages • Inspect vehicles and machinery on a daily basis for fuel and oil leakages.
Surface & Groundwater																
Depletion of natural resources due to water requirement for prospecting activities (human consumption & drilling operations). 1000 litres/day for site camp and 10m3/day for drilling operations. (Surface & Groundwater)	Negative	2	2	2	1	10	Low	Negative	1	2	2	1	5	Low	Control	<ul style="list-style-type: none"> • No water may be abstracted from any surface water body unless permitted. A Water Use License is to be obtained from DWS for the abstraction of water from a surface water body • Monitor water consumption and ensure that all possible use is accounted for ; • Ensure water abstraction points do not degrade or erode

Quality of surface water may be impacted by poor storage of chemicals, fuel spills, inappropriate waste disposal	Negative	2	2	2	3	14	Moderate	Negative	1	1	2	2	5	Low	Remedy	<ul style="list-style-type: none"> Uphold the 50m buffer zone from wetland and riparian zones as no go zones for prospecting. Target area 21 must be omitted from the identified target areas; Location ablution facilities outside buffer zones Control run off and erosion from prospecting target areas Collect and treat dirty water from prospecting operations Storage fuel, oil and chemicals safely in designated areas Provide drip trays for standing equipment Clean up hydrocarbon spillages Implement concurrent rehabilitation and landscape rehabilitated target areas to mimic pre-
Impact on Traffic																
Increased traffic due to prospecting vehicles, machinery using local gravel roads. Prospecting crew will set up site camp at the old graphite mine which the main focus for prospecting. This will restrict the need for excessive movement of vehicles and machinery in the study site	Neutral	3	2	2	2	18	Moderate	Neutral	1	2	2	1	5	Low	Control	<ul style="list-style-type: none"> Limit unnecessary vehicle movement Relocation of prospecting machinery must not be undertaken during peak traffic times along main gravel roads
Safety and Crime																
Safety risk to prospecting crew when undertaking prospecting activity (excavations, pitting and drilling) in military zone contaminated with UXO's 1metre below ground level. Prospecting activities could detonate unexploded ammunition.	Negative	2	1	2	4	14	Moderate	Neutral	1	1	2	2	5	Low	Control	<ul style="list-style-type: none"> Sweep the specific areas targeted for prospecting including site camp for unexploded ammunition up to the SANDF specified depth of 4 meters below ground, to make the area safe for prospecting activities; Obtain consent from Minister of Defence Force to prospect in the restricted military zone
Risk of increased crime due to presence of machinery, batteries and fuel onsite which are resources that attract thieves.	Negative	1	1	2	3	6	Low	Negative	1	1	2	1	4	Very Low	Stop	<ul style="list-style-type: none"> Establish a fenced off site camp at Gumbu Mine and establish temporary camps at trenching, drilling and sampling sites Security lights can be installed at site camp and temporary camp sites with the addition of security guards;
External contractors may pose a risk for violent crimes against woman	Negative	2	1	2	2	10	Low	Neutral	1	1	2	1	4	Very Low	Stop	<ul style="list-style-type: none"> Contractors would be not be allowed near villages and would be accommodated within the prospecting crew site camp at the old Gumbu Mine; Ensure that employment criterion for the prospecting crew be made public in advance to deter unqualified job seekers from moving into the area; Employ as far as possible, local labour during the prospecting phase
Socio-economic impacts																
Increased traffic and prospecting activities in livestock grazing areas may increase the livestock mortalities including livestock falling into pit areas directly affecting community member livelihoods	Negative	1	1	5	4	10	Low	Neutral	0	1	2	0	0	Very Low	Stop	<ul style="list-style-type: none"> Communicate with respective communities regarding grazing of livestock in prospecting target areas and request that these areas are avoided during invasive activities; Fence off sampling sites/demarcate sampling sites to restrict access by public and livestock;

