No	Project activity	Impact description	Informed by	SIGNIFICANCE WITHOUT MITIGATION							SIGNIFICANCE WITH MITIGATION (REVERSABILITY)						
				Status	Probability	Extent	Duration	Intensity	Significance Score	Rating	Status	Probability	Extent	Duration	Intensity	Significance Score	Rating
CONSTRUCTION																	
1 TRAFFIC IMPACT																	
1,1	Bringing machinery, equipment, heavy vehicles, construction material, containerised mobile units, stock, and supplies to Grasdrift	Increased traffic movement through RNP over Helskloof Pass	Known, SanParks	Negative	3	3	2	3	24	Moderate	Negative	2	3	2	1	12	Low
1,2	Movement of construction staff on and off site every 14 days	Increased movement of light vehicles (LDVs) over Helskloof Pass.	Known, SanParks	Negative	3	3	2	1	18	Moderate	Negative	2	3	2	0	10	Low
2 TERRESTRIAL BIODIVERSITY																	
2,1	**Use of Helskloof Pass, haul and maintenance roads:** Movement of heavy vehicles, construction material, containerised mobile units, stock, and supplies to Grasdrift including movement of staff on and off site	Destruction, further loss and fragmentation of the habitats, ecosystems and vegetation communities, within a Protected area, including erosion, pollution and edge effects	Known, SanParks, Ecologist	Negative	3	2	4	4	30	High	Negative	3	2	2	2	18	Moderate
2,2		Introduction of alien invasive species, especially plants		Negative	2	1	4	3	16	Moderate	Negative	1	1	2	2	5	Low
2,3		Direct loss and displacement of faunal community (incl. SCC) due to habitat loss, mortality and disturbance (road collisions, noise, dust, vibration), including reduced dispersal/migration of faunal.		Negative	2	2	4	3	18	Moderate	Negative	1	1	2	2	5	Low
2,4		Erosion created by surface run-off due to increase in impervious surfaces		Negative	2	1	4	3	16	Moderate	Negative	1	1	2	2	5	Low
2,5	Placement of most infrastructure within existing or historic mining areas and associated activities has the same direct impact on natural habitats and associated fauna as the existing land use. **However there is a notable**	Destruction, further loss and fragmentation of the habitats, ecosystems and vegetation community.	Ecologist	Negative	3	1	5	4	30	High	Negative	2	1	2	4	14	Moderate
2,6		Introduction of alien invasive species, especially plants	Ecologist	Negative	2	1	4	3	16	Moderate	Negative	1	1	2	2	5	Low

2,7	**risk expected due to Meso-Terrace mining in proximity to the river and riparian habitat.**	Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, dust, vibration, poaching)	Ecologist	Negative	2	2	4	3	18	Moderate	Negative	1	1	2	2	5	Low
3 SOIL AND LAND CAPABILITY/ AGRICULTURAL POTENTIAL																		
3,1	The mine operation will have limited to no impacts on the agricultural potential of land. It should be noted that an Agricultural Compliance Statement is not required to formally rate agricultural impacts by way of impact assessment tables. No rating is therefore provided																	
4 TOPOGRAPHY																		
4,1	Establish site infrastructure incl. contractors area, containerized accommodation, parking, offices ablution, processing plants, fuel storage, waste storage, generators, water storage	Change in drainage patterns	Known	Negative	3	1	4	1	18	Moderate	Negative	2	1	4	1	12	Low
5 HYDROPEDOLOGY																		
5,1	The proposed Grasdrift Alluvial Diamond Mine and associated infrastructure located within the recharge hydropedological type is not expected to affect the hillslope hydrology in any manner during either of the project phases i.e., construction, operation, closure. No impact rating table is therefore necessary.																	
6 HYDROLOGY (SURFACE WATER IMPACT)																		
6,1	Footprint clearance, excavations and development of the proposed Grasdrift Mine infrastructure	Lead to erosion and sediment (suspended solids and silt) in runoff water (only likely in the event of a rare storm event.	Hydrologist	Negative	3	1	1	2	12	Low	Negative	1	1	1	1	3	Very Low
6,2		Dust generated by construction activities could both impact on air quality and also settle in areas where it would be taken up in surface runoff and contribute to sediment loads in the Orange River.	Hydrologist	Negative	3	1	1	2	12	Low	Negative	1	1	1	1	3	Very Low
6,3		A flood risk will be present during construction during rare events of flash floods where Grasdrift Project infrastructure intersects with local drainage paths. This can cause potential impact on infrastructure stability and subsequently downstream water quality as sediments / waste may be washed away by storm water within these drainage lines	Hydrologist	Negative	1	5	3	4	12	Low	Negative	1	5	1	0	6	Low

6,4	The transport, handling and storage of fuels, chemicals, construction material and waste could lead to contamination of soil surfaces and water resources.	Cotamination of soil surfaces and water resources	Hydrologist	Negative	3	1	1	2	12	Low	Negative	1	1	1	1	3	Very Low
7 GEOHYDROLOGY (GROUNWATER IMPACT)																	
7,1	**Site establishment:** Establishment of diesel storage areas including transportation, handling and storage of fuels, refuelling, chemicals, construction material and waste. Use of Diesel Generators. Infrastructure assembly and erection.	Cotamination of soil surfaces due to spills, leaks of fuel and hydrocarbons.	GeoHydrologist	Negative	2	2	4	2	16	Moderate	Negative	1	2	1	2	5	Low
7,2	Waste water management from concrete batching plant	Runoff from conrete batchiing plants can infiltrate the soil and cause contamination	GeoHydrologist	Negative	1	1	4	1	6	Low	Negative	1	1	1	1	3	Very Low
8 AQUATIC ECOSYSTEMS																	
8,1	Bringing heavy vehicles (HME's) to site across the Orange River.	Minor disturbance to section of the Orange River gravel floodplain and riparian vegetation (but the vegetation recovers quickly)	Known	Negative	3	1	1	3	15	Moderate	Negative	3	1	1	1	9	Low
8,2	Installlation of water pumps at Orange River and water transfer pipelines for Section 2 and 3 mining areas from the river to plant areas.	Physical alteration (cutting, reshaping) and excavation of watercourse and riparian area for water abstraction infrastructure		Negative	3	1	2	3	18	Moderate	Negative	3	1	2	3	18	Moderate
8,3	Removal of vegetation, including riparian areas and buffer zones for project infrastructure			Negative	3	2	2	2	18	Moderate	Negative	2	2	2	1	10	Low
8,4	Physical alteration of surface topography and cover for infrastructure (mining areas, storage dams, road network, pipelines			Negative	2	2	3	2	14	Moderate	Negative	2	2	2	1	10	Low
8,5	Operation of vehicles, equipment and machinery in watercourse and riparian areas.	Alteration of hydro-dynamics along footprint. Pollution of water resources due to dust effects, improper storage of chemicals and spills, construction machinery, fuel		Negative	3	1	2	2	15	Moderate	Negative	3	1	2	2	15	Moderate

8,6	Operation of vehicles, equipment and machinery in adjacent areas	and machinery leaks. Disturbance/displacement/loss of riparian, marginal and instream riverine habitat of water resources. Erosion in key areas (steep and or exposed areas). Increase in sediment inputs & turbidity and assocated smothering (sedimentation) and loss of watercourse habitat. Input of toxicants from construction activities. Displacement/loss of flora and fauna (incl. SCC). Alteration / degradation of riparian and instream habitat integrity and lowered biodiversity potential and ecosystem services.	Aquatic Ecologist	Negative	2	2	2	1	10	Low	Negative	1	2	2	2	6	Low
8,7	Establishment of additional roads, with drainage line crossings			Negative	2	2	2	3	14	Moderate	Negative	2	2	2	2	12	Low
8,8	Excavation of trenches for pipelines			Negative	2	1	2	1	8	Low	Negative	2	1	2	0	6	Low
8,9	Soil and building material stockpile management			Negative	2	1	3	1	10	Low	Negative	1	1	3	1	5	Low
8,10	Waste and ablution facilities			Negative	2	1	4	1	12	Low	Negative	1	1	4	1	6	Low
8,11	Use of concrete and other building materials			Negative	2	1	2	1	8	Low	Negative	1	2	2	1	5	Low
8,12	Storage and chemicals, mixes, fuel and associated spillages			Negative	3	2	2	2	18	Moderate	Negative	3	2	2	2	18	Moderate
8,13	Indiscriminate dumping of waste products			Negative	2	3	2	2	14	Moderate	Negative	2	2	2	1	10	Low
8,14	Final landscaping and concurrent rehabilitation			Negative	2	2	4	2	16	Moderate	Negative	1	2	4	1	7	Low
9 AIR QUALITY IMPACT																			
9,1	Bringing machinery, equipment, construction material, containerised mobile units, stock, and supplies to Grasdrift	Increased dust deposition, PM10 and PM2,5 concentrations due to vehicle movement across Helskloof Pass associated with construction.	Known, SanParks, Air Quality Specialists	Negative	2	1	2	1	8	Low	Negative	2	1	2	1	8	Low
9,2	Current prospecting operations at Grasdrift and movement of fuel bowser, supply truck, staff vehicles (bakkies) over Helskloof Pass to Grasdrift.	Increased exposure to PM10 and PM2,5 for current mine operation (prospecting activity and haul roads)	Air Quality Specialist	Negative	2	1	2	4	14	Moderate	Negative	2	1	2	1	8	Low
9,3		Deposition of dust for current prospecting operation (mining and haul roads)	Known, Air Quality Specialist, I&APs	Negative	2	1	2	1	8	Low	Negative	2	1	2	0	6	Low
10 NOISE IMPACT																			

10,1	Establish site infrastructure incl. contractors area, containerized accommodation, parking, offices ablution, processing plants, fuel storage, waste storage, generators, water storage, use of existing access and haul roads, clearing of footprint areas.	Generation of noise by machinery, excavations and vehicles will result in incraese noise levels at NSA	Noise Specialist, I&APs, Known	Negative	3	6	2	3	33	High	Negative	3	6	2	3	33	High
10,2	Landingstrip at Grasdrift already exists.	Only used once per month. Impact insignficant	None														
11 VISUAL AND LANDSCAPE IMPACT																		
11,1	Clearing of topsoil will result in the change of surface cover notable to receptors on the Namibian bank of the Orange River	Areas stripped of topsoil will be visible to receptors on the Namibian bank of the Orange River	Known, Visual Specialist	Negative	3	2	2	2	18	Moderate	Negative	3	1	2	1	12	Low
11,2	Lighting will be required at the construction laydown area and staff accommodation	Any light is likely to be visible to receptors on the Namibian bank of the Orange River	Known, Visual Specialist	Negative	3	2	2	2	18	Moderate	Negative	3	1	2	1	12	Low
12 HERITAGE AND PALAEONTOLOGICAL FEATURES																		
12,1	Excavations and establishment of site infrastructure	Potential impact on heritage resources within the Orange River floodplain i.e., Late Stone Age Resources RGD 004 (low signficance), RGD 016 - 019, RGD 020, 023, 024, 028, 032 and 033.; Historical period resources RGD 011 (high signficance).	Archaeologist	Negative	3	1	5	4	30	High	Negative	1	1	1	1	3	Very Low
12,2		Potential impact on graves located within the Orange River floodplain and an unmarked grave located at section 1 of mining. All graves are of high local signficance.	Archaeologist	Negative	3	1	5	4	30	High	Negative	1	1	1	4	6	Low
12,3		Important fossil site may be impacted	SanParks, Palaeontologist	Negative	1	1	5	1	7	Low	Negative	1	1	1	1	3	Very Low
13 SOCIO-ECONOMIC IMPACTS																		
13,1	Movement of mine vehicles along Helskloof Pass / Akkedis Pass	Impact on road use by tourists and overall tourist experience of RNP along Helskoof Pass	Known, SanParks	Negative	2	3	2	3	16	Moderate	Negative	2	3	2	1	12	Low
13,2		Creation of job opportunities	Known	Positive	3	3	2	1	18	Moderate	Positive						

13,3	Site establishment	Potential impact on existing livelihoods (farm, tourism)	Known, Specialist, I&APs	Negative	3	3	2	4	27	High	Negative	2	2	2	2	12	Low
13,4		Potential impact on sense and spirit of place due to conflicting land use	Known, Specialist, I&APs	Negative	3	3	2	4	27	High	Negative	2	2	2	2	12	Low
14 COMMUNITY HEALTH																	
14,1	Movement of construction vehicles to Grasdrift	Potential safety impact on local roads due to construction vehicles and haulage of abnormal mine equipment to site	Specialist	Negative	2	2	2	3	14	Moderate	Negative	1	2	2	2	6	Low
14,2	Site establishment: clearing topsoil, overbuden and establishment of infrastructure	Increase in dust levels will create nuisance impact and lead to health problems i.e. sinusitus, silicosis.	Specialist	Negative	2	1	5	4	20	Moderate	Negative	1	1	5	1	7	Low

					SIGNIFICANCE PRE-MITIGATION							SIGNIFICANCE POST MITIGATION						
No	Project activity	Impact description		Informed by	Status	Probability	Extent	Duration	Intensity	Significance Score	Rating	Status	Probability	Extent	Duration	Intensity	Significance Score	Rating
OPERATION																		
1 GEOLOGY																		
1,1	Removal of overburden, excavation of gravel and processing	The removal of 19-17Ma and 5-2Ma diamond bearing gravels will result in the permanent removal of the availiable economic reserve of allluvial diamonds at Grasdrift a geological feature of the RNP.		Known, Geologist	Negative	3	1	5	3	27	High	Positive	3	1	4	1	18	Moderate
2 TOPOGRAPHY																		
2,1	Removal of overburden and excavation to a depth of 20m below ground level to access bedrock (trapsites). Including mining first 20-25m of perched Proto terraces	Temporary change in natural land topography until backfilled in the previously mined out areas as part of concurrent rehabilitation. Proto terraces probably only be shaped to mimic previous gravel terrace form.		Known	Negative	3	1	4	1	18	Moderate	Negative	1	1	4	2	7	Low
2,2	Temporary stockpiling of overburden at waste dump for subsequent use as backfill into mined out areas. Creation of ramps to processing plants to tip gravel material into hopper including waste tailings from plant.																	
3 CURRENT LAND USE IMPACT																		
3,1	Mine at Grasdrift	Impact on SANParks implementation of alien invasive species control Programme along the Orange River	Loss of grazing area for nomadic stock farmers at Grasdrift	EAP, SANParks, Farmers	Negative	2	1	4	2	14	Moderate	Neutral	1	1	4	1	6	Low
4 SOIL AND LAND USE/AGRICULTURAL POTENTIAL																		
4,1	The mine operation will have limited to no impacts on the agricultural potential of land. It should be noted that an Agricultural Compliance Statement was conducted due to the 'Low' potential of the land and is not required to formally rate agricultural impacts by way of impact assessment tables. No rating is therefore provided.			Soil Specialist														
5 HYDROPEDOLOGY																		
5,1	The proposed Grasdrift Alluvial Diamond Mine and associated infrastructure located within the recharge hydropedological type is not expected to affect the hillslope hydrology in any manner during either of the project phases i.e., construction, operation, closure. No impact rating table is therefore necessary.			Hydropedology Specialist														
6 VISUAL AND LANDSCAPE IMPACT																		

6,1	Presence of mine infrastructure particularly three gravel processing plants, material stockpiles (waste dump), buildings, offices, accommodation and mineral extraction areas moving around the project site impacting different areas over the mining period.	**Loss of natural landscape:** The infrastructure could be visible up to 11.3km. However, at this distances it is unlikely to be visually discernible from the background. The project will impact negatively on a protected area of international importance visitors to the RNP and Ai-Ais National Park. It will also affect the following local areas: Orange River corridor, road users (local/business travellers of the C13 (Aussenkehr), residents and visitors of the resorts on the Namiban bank of the Orange River	Visual specialist, I&APs	**Negative**	**3**	**2**	**5**	**3**	30	High	**Negative**	**1**	**2**	**4**	**1**	7	Low
		Visual impact on C13 access route used by people travelling through the Aussenkerh area: Mining will be visible intermittently from the road. Visible approximately 16.5km away, but if mitigated effectively, is unlikely to be obvious.		**Negative**	**1**	**2**	**5**	**3**	10	Low	**Negative**	**1**	**1**	**4**	**1**	6	Low
		Mineral extraction operations will be highly obvious to a **limited number of local homesteads and two resorts close to the Namibian bank of the Orange River**		**Negative**	**3**	**2**	**5**	**2**	27	High	**Negative**	**2**	**2**	**4**	**2**	16	Moderate
		Could impact visually on local homesteads away from Orange River and within grape plantations: A limited number of homestead within the Aussenkehr grape growing area's views could be impacted, however the grape plantations will screen most views of the mining area from the view. Only occasion views of the mining area would therefore be possible.		**Negative**	**1**	**2**	**5**	**1**	8	Low	**Negative**	**1**	**1**	**4**	**1**	6	Low
		Visual impact affecting views of people living in Aussenkehr		**Negative**	**1**	**2**	**5**	**4**	11	Low	**Negative**	**1**	**2**	**4**	**1**	7	Low
		Visual impact affecting views of people visiting protected areas. Only the RNP will be affected - Impact will consist of ongoing disturbance of varying areas in the project site and at the three processing plant sections. However the visual impact on views from within the RNP is unlikely.	Visual specialist	**Negative**	**0**	**2**	**5**	**4**	0	Very Low	**Negative**	**0**	**2**	**4**	**2**	0	Very Low
6,2	Mineral extraction operations close to the Orange River bank.	**Visual impact on recreational activities within the Orange River corridor** for the entire length of the river	Visual specialist, I&APs	**Negative**	**2**	**2**	**5**	**4**	22	Moderate	**Negative**	**1**	**2**	**4**	**1**	7	Low
6,3	Use of floodlighting at processing plants and contractors areas	**Lighting associated with the project could impact negatively on local receptors:** The mining operation will be obvious at night from surrounding areas with glare making floodlighting more apparent. The glare from floodlighting could cause a nuisance for residents living close to the riverbank.	Visual specialist	**Negative**	**2**	**2**	**4**	**2**	16	Moderate	**Negative**	**1**	**2**	**4**	**1**	7	Low
7 NOISE IMPACT																	
7,1	Use of LDV's and HME's at mineral extraction areas and travelling along the internal access road																

7,2	**Offlaoding and handling of bulk ore. This is the most signficant noise source from the mine site. It is a impulse noise occuring for short durations at rondom intervals.**	Increase noise levels and impact on noise sensitive receptors/areas on the Namibian Bank of the Orange River.	Noise specialist, I&APs	**Negative**	**2**	**6**	**4**	**3**	26	High	**Negative**	**2**	**4**	**4**	**2**	20	Moderate
7,3	Aircraft land and takeoff at existing landingstrip.																
7,4	Processing plant operations at section 1, 2 and 3.																
7,5	Water pumps abstracting water from river and piped to processing plants																
8 AIR QUALITY IMPACT																	
8,1	**Movement of general and light mine vehicle through the RNP.**	Deposition of vehicle entrained dust on vegetation along Helskloof Pass Predicted dustfall deposition, PM10 and PM2,5 concentrations due to vehicle movement across Helskloof Pass are low and within limits	Air Quality Specialist	Negative	1	1	4	1	6	Low	Negative	1	1	4	1	6	Low
8,2	Mining operation dust sources i.e. Stripping of topsoil to perimeter of terrace for later use in rehabilitation. Removal of overburden to waste dump for later use as backfill	Increased exposure to PM10 and PM2,5 for proposed mining activities and haul roads	Air Quality Specialist, Known	Negative	2	1	3	4	16	Moderate	Negative	1	1	3	1	5	Low
8,3	Tipping of material into dump trucks and subsequently into mobile screen Screening of material inpit (mobile screening plant) Loading and hauling material to processing plant Tipping gravel concentrate into processing plant hopper	Increased deposition of dust (TSP) from mining activities and haul roads	Air Quality Specialist, Known	Negative	2	1	3	4	16	Moderate	Negative	1	1	3	1	5	Low
9 HYDROLOGY (SURFACE WATER IMPACT)																	
9,1	Capturing and reuse of dirty runoff over the mine infrastructure areas at Grasdrift.	**Impact on surface water quantity:** Potential runoff reduction. However, virtually no runoff occurs except during rate flash flood events	Hydrologist, I&APs	Negative	1	1	1	1	3	Very Low	Negative	1	1	1	1	3	Very Low
9,2	Abstraction of 1.2 million m3/annum of raw water from Orange River for use at processing plant areas and contractors area	**Impact on surface water quantity:** During period of drough, increased water shortage for downstream water users is likely to be experienced during (extreme) low flow periods of the Orange River once in 5 to 10 years. Users alos include transboundary users in Namibia, which also need to be considered.	Hydrologist, I&APs	Negative	2	6	3	4	26	High	Negative	2	2	3	3	16	Moderate

9,3	Surface water runoff from dirty water areas i.e. processing plants, slimes dams and overburden dumps.	**Impact on surface water quality:** Impact on Orange River water quality due to dirty surface water runoff (**seepage) with high salt content emanating from slimes dams, overburden dumps.**	Hydrologist, I&APs	Negative	2	6	3	3	24	Moderate	Negative	1	2	1	2	5	Low
9,4	Silt and sedimentation from strippping of topsoil, excavation of gravels, stockpiling of materials.	**Impact on surface water quality:** Potential increased sedimentation and silt load to the Orange River.	Hydrologist	Negative	1	2	2	2	6	Low	Negative	1	2	1	1	4	Very Low
9,5	Dust generated from mineral extraction areas, overburden dumps may settle in areas where it could be taken up in surface runoff.	**Impact on surface water quality:** Dust fallout may contribute to sediment loads to the Orange River.	Hydrologist	Negative	3	2	1	2	15	Moderate	Negative	3	1	1	2	12	Low
9,6	A flood risk may be present **during a rare event of flash floods** where mine infrastructure intersect with local drainage paths.	**Impact on surface water quality:** Impact on infrastructure stability and increased sediment load and waste may be washed away by stormwater within these drainage paths.	Hydrologist	Negative	1	6	2	4	12	Low	Negative	1	1	1	1	3	Very Low
9,7	Transport, handling and storage of fuels, chemicals, materials and waste.	**Impact on surface water quality:** May lead to contamination of soil surfaces and water resources.	Hydrologist	Negative	1	2	1	2	5	Low	Negative	1	1	1	2	4	Very Low
9,8	Movement of vehicles and machinery	Uncontrolled movement of mine vehicles and equipment within the Orange River and floodplain can result in accidential spillages of fuel, oil leaks into the river impacting on the river water quality.	Known	Negative	2	2	1	4	14	Moderate	Negative	1	2	1	2	5	Low
10 GEOHYDROLOGY (GROUNDWATER IMPACT)																	
10,1	Topsoil removal, clearing of overburden, inpit screening, backfilling of mined out areas including hauling of gravel to the processing plant	**Impact on groundwater quality:** Potential oil, fuel leak, hydrocarbon spills from mine vehicles, screening plant, HME's.	Known, Hydrologist	**Negative**	**2**	**1**	**4**	**1**	12	Low	**Negative**	**2**	**1**	**1**	**2**	8	Low
10,2	Gravel processing at processing plants, use of HME's and Generators in plant area	**Impact on groundwater quality:** Potential oil, fuel leak, hydrocarbon spills from mine vehicles, generators, plant and equipment.	Known, Hydrologist	**Negative**	**3**	**1**	**4**	**2**	21	Moderate	**Negative**	**3**	**1**	**1**	**2**	12	Low
10,3	Storage, handing of fuel at the bunded Diesel Storage tanks including refuelling	Fuel spillages from vehicles and mine equipment and or oil leaks	Known, Hydrologist	Negative	3	1	**4**	**3**	24	Moderate	Negative	2	1	1	3	10	Low
10,4	Use of conservancy tanks to temporarily dispose of waste water (sewage, washwater) at contractors area, mine sections, amenities and labour accommodation areas.	**Impact on groundwater quality:** Potential sewage spills may impact the underlaying groundwater resources.	Known, Hydrologist	**Negative**	**2**	**2**	**4**	**2**	16	Moderate	**Negative**	**1**	**2**	**1**	**2**	5	Low
10,5	Operation of sewage treatment package plant and disposal of treated water via dust suppression (irrigation)	Impact on groundwater quality of underlaying groundwater resources expected to be low. Irrigation volumes < 28 800 liters/day which is well below evapotranspiration rates. Sensitivity to operation of package plant is low.	Hydrologist	**Negative**	**1**	**1**	**4**	**1**	6	Low	**Negative**	**1**	**1**	**4**	**0**	5	Low

10,6	Handling, temporary storage of solid waste at waste storage areas	Potential leachate generated from waste storage areas due to improper storage and handling of waste, delayed removal from the mine.	Known, Hydrologist	**Negative**	2	**2**	**4**	**2**	16	Moderate	**Negative**	**2**	**1**	**1**	**2**	8	Low
10,7	Servicing and washing of vehicles and equipment at Workshop and Washbay.	Possible fuel, oil leakages, spills may contaminate groundwater if not property managed.	Known, Hydrologist	**Negative**	**2**	**2**	**4**	**1**	14	Moderate	**Negative**	**1**	**1**	**1**	**0**	2	Very Low
10,8	Disposal of fine tailings to slimes dam	Infiltration of high salt load seepage from slimes dams to groundwater resource.	Known, Hydrologist	**Negative**	2	2	4	1	14	Moderate	**Negative**	**2**	**1**	**1**	**1**	6	Low
10,9	Use of pollution control dams, unsafe storage, handling, use and disposal of hazardous substances.	**Impact on groundwater quality:** Potential seepage into the underlaying groundwater resources.	Hydrologist	**Negative**	2	2	5	4	22	Moderate	**Negative**	**1**	**1**	**1**	**0**	2	Very Low
11 AQUATIC ECOSYSTEMS																	
11,1	Operation of Helskloof Pass and associated spillages	Alteration of surface drainage and runoff from project footprint. Alteration of volumes and patters in flows in watercourse. Erosion in key areas (steep and/or exposed areas and discharged areas.). Increase in sediment inputs and turbidity. Water quality impairment. Solid waste disposal. Displacment/loss of flora and fauna (incl. SCC). Alteration / degradation of riparian and instream habitat integrity and lowered biodiversity potential and ecosystem services.	Aquatic Ecologist	Negative	**2**	3	4	2	18	Moderate	Negative	2	3	4	1	16	Moderate
11,2	Abstraction of water from Orange River during normal flow conditions			Negative	**2**	3	4	1	16	Moderate	Negative	2	3	4	1	16	Moderate
11,3	Abstraction of water from Orange River during drought conditions			Negative	**3**	**3**	**4**	**3**	30	High	Negative	2	3	1	3	14	Moderate
11,4	Topsoil removal and excavation of deposits with infield removal of bounders from gravel.			Negative	**2**	**2**	**4**	**1**	14	Moderate	Negative	1	2	4	1	7	Low
11,5	Load and haul remaining gravel concentrate to processing plant.			**Negative**	**2**	**2**	**4**	**1**	14	Moderate	Negative	1	2	4	1	7	Low
11,6	Operation of processing plant (mineral processing and diamond recovery from slimes and gravel concentrate).			**Negative**	**2**	**1**	**4**	**2**	14	Moderate	Negative	1	1	4	1	6	Low
11,7	Operation of dirty water infrastructure (slimes dams and pumping of tailings).			**Negative**	**2**	**2**	**4**	**2**	16	Moderate	Negative	2	1	4	2	14	Moderate
11,8	Concurrent rehabilitation (backfilling of mine voids with solid, pan and sand tailings).			**Negative**	**2**	**2**	**4**	**1**	14	Moderate	Negative	1	2	4	1	7	Low
11,9	Establishing of alien plant species on disturbed areas.			**Negative**	**2**	**2**	**4**	**1**	14	Moderate	Negative	2	2	2	2	12	Low
12 TERRESTRIAL ECOLOGY																	
12,1		Destruction, further loss and fragmentation of the habitats, ecosystems and vegetation communities, within a Protected area, including erosion, pollution and edge effects	Ecologist	Negative	3	2	4	4	30	High	Negative	3	2	2	2	18	Moderate
12,2		Introduction of alien invasive species, especially plants	Ecologist	Negative	2	1	4	3	16	Moderate	Negative	1	1	2	2	5	Low

12,3	Use of Helskloof Pass, haul and maintenance roads	Direct loss and displacement of faunal community (incl. SCC) due to habitat loss, mortality and disturbance (road collisions, noise, dust, vibration), including reduced dispersal/migration of faunal.	Ecologist	Negative	2	2	4	3	18	Moderate	Negative	1	1	2	2	5	Low
12,4		Erosion created by surface run-off due to increase in impervious surfaces	Ecologist	Negative	2	1	4	3	16	Moderate	Negative	1	1	2	2	5	Low
12,5	Dust generation, mine drainage runoff, sensory disturbances (noise, light, traffic, dust, vibrations, pollution) from earth moving machinery, generators and excavations	Continued encroachment and displacement of the natural vegetation community due to alien invasive plant species, dust, erosion and edge effects.	Ecologist	Negative	3	1	4	3	24	Moderate	Negative	2	1	2	1	8	Low
		Continued displacement and direct mortalities of faunal community (incl. SCC) due to disturbance (road collisions, noise, light, dust, vibrations) including disruption/alteration of ecological life cycles.	Ecologist	Negative	2	1	4	2	14	Moderate	Negative	2	1	2	1	8	Low
		Environmental pollution due to water/mine drainage runoff.	Ecologist	Negative	2	2	4	4	20	Moderate	Negative	1	1	2	2	5	Low
13 HERITAGE AND PALAEONTOLOGICAL RESOURCES																	
13,1	Removal of topsoil, overburden and excavation of gravel, movement of mine vehicles below gravel terraces or in floodplain, inpit screening of materials including backfilling operations.	Potential impact on graves located within Orange River floodplain and an unmarked grave located at section 1 of mining, all of high signficance.	Archaeologist	Negative	3	1	5	4	30	High	Negative	1	1	1	4	6	Low
13,2		Potential impact on late stone age resources within Orange River floodplain including one historical period resource.	Archaeologist	Negative	3	1	5	4	30	High	Negative	1	1	1	1	3	Very Low
13,3		Potential impact on fossilized arthropods contained in Dwyka tillite pavements at Grasdrift recovered in tailings and screening operations. It must however be noted that the entire site was walked and driven. No fossils were observed. It could have been removed or buried due to past prospecting (1980's). The impact is therefore possible but unlikely.	EAP literature review, Archaeologist/Palaeontologist	Negative	1	1	5	3	9	Low	Negative	1	1	1	1	3	Very Low
		Possible impact on prominent slate formation which could possibly host fossils as part of the 'important fossil site' at section 3 of mining.	EAP, SanParks, Archaeologist / Palaeontologist	Negative	2	1	5	3	18	Moderate	Negative	1	1	5	3	9	Low
13,4		Potential impact on living heritage, the 'sense of place' and sacred connotation of Richtersveld to Nama-Khoi.	Archaeologist	Negative	3	2	4	2	24	Moderate	Negative	2	1	4	2	14	Moderate
14 SOCIO-ECONOMIC IMPACTS																	
14,1	Operation of the mine in the far eastern corner of the RNP (public access restricted)	Impact on conservation spaces and resources. It is however not expected that mining at Grasdrift would lead to financial loss of tourists to the Park or loss of revenue.	Specialist	Negative	2	4	4	2	20	Moderate	Positive	2	4	3	2	18	Moderate
14,2	Movement of mine vehicles over Helskloof Pass	Increased traffic along Helskloof Pass may have a negative impact on visitors / tourists experience of the RNP	SanParks, Known	Negative	2	3	1	4	16	Moderate	Negative	1	3	4	1	8	Low
		Purchase of goods and services at the Park (incl. accommodation at Sendelingsdrift camp). SANParks would also experience some relief in terms of their surface lease agreement paid to RCPA for the Park. SANParks surface lease would be reduced by the amount paid by Nabas for Grasdrift.	Known	**Positive**	3	2	4	2	24	Moderate	Positive						

14,3	Operation of the mine	The RCPA aka Richtersveld community will benefit from the mine by receiving monthly lease, 20% share hold in the mine through Nabas Trust and will benefit from SLP contributions including skills development.	Known, SLP, Specialist	**Positive**	3	3	4	3	30	High	Positive						
		Creation of 150 jobs (90% sourced from Richtersveld community) and will help alleviate poverty		**Positive**	3	3	4	4	33	High	Positive						
		Increased opportunities for SMME's including purchase of local goods and supplies from the local communities		**Positive**	**3**	**3**	**4**	**3**	30	High	Positive						
14,4		Fear of potential increase in crime due to an increase in people movement at Grasdrift		Negative	1	6	4	3	13	Moderate	Negative	1	1	4	1	6	Low
14,5		Increased social tensions, conflict or divisions within the Richtersveld community, especially about distribution of benefits		Negative	2	3	4	3	20	Moderate	Negative	2	3	1	2	12	Low
14,6		Potential impacts on livelihoods (Aussenkehr farms, tourist establishments, and nomadic farmers - related to dust, noise, accessiblity and sense of spirit of place)		Negative	2	6	4	1	22	Moderate	Negative	1	6	4	1	11	Low
14,7		Gender relations impacts i.e. job opportunities for women in mining		Negative	2	3	4	2	18	Moderate	Negative	1	3	4	1	8	Low
14,8		Vulnerability of the Aussenkehr community to potential air pollution i.e. dust fallout		Negative	2	6	4	1	22	Moderate	Negative	1	6	4	0	10	Low
14,9		Reduced actional personal safety and increased hazard exposure		Negative	2	6	4	1	22	Moderate	Negative	1	6	4	1	11	Low
14,10	Abstraction of water for mining process and domestic use from the Orange River	Impact on water availability to downstream water users (during drought periods) i.e., human consumption, agriculture, mining. All industries along Nambian and SA bank of Orange River are heavily reliant on water availability from the river. Any shortages will influence such economic activity.	EAP, Specialist, Hydrologist	Negative	3	6	3	3	36	High	Negative	2	2	2	3	14	Moderate
15 COMMUNITY HEALTH																	
15,1	Movement of labour between communities and into the proposed Grasdrift Project area	Pose an increased risk for communicable diseases due to mine workers in close proximity to each other in enclosed environment allows the TB bacteria to spread easily. HIV is not a concern listed for the communities but related illnesses such as TB was noted for Lekkersing village.	Community Health Specialist, Air Quality Specialist	Negative	2	2	4	2	16	Moderate	Negative	1	1	4	1	6	Low
15,2		Possible increased risk for STIs, including HIV/AIDS due to destructive behaviour by labourers likely to take back home or from community to labour accommodation.		Negative	2	3	4	4	22	Moderate	Negative	1	3	4	1	8	Low
15,3	Operation of machinery, equipment, transporting of goods and personnel to service needs of Grasdrift project. Transport of staff at shift changes to different communities, light vehicle traffic tu support general requirements of Grasdrift project.	Potential increase in accident/injuries (safety risk) at the workspace and mine motor vehicle accidents		Negative	3	3	4	4	33	High	Negative	2	3	4	1	16	Moderate
15,4	Handling of hazardous materials and waste, noise from mine machinery	Mine staff exposure to potentially hazardous materials, noise and malodours		Negative	2	1	4	2	14	Moderate	Negative	1	1	4	1	6	Low

15,5	Removal of topsoil, overburden, mineral extraction, inpit screening of gravel. Movement of mine vehicles along haul road.	Dust fallout from the mine to the surrounding area (i.e. potentially Aussenkehr) could result in an increased incidences of mild/sinusitis, asthma/or bronchitis sometimes even pink eye.However the predicted impact from dustall fallout is predicted to be site specific (mine property) therefore unlikely that emissions from the propoposed mine operation at Grasdrift will contribute signficantly to ambient concentrations beyond the mine area. It is therefore unlikely that emissions from Grasdrift would result in human health impacts for Aussenkehr with the implementation of dust control measures.		Negative	2	1	4	2	14	Moderate	Negative	1	1	4	1	6	Low
15,6	Removal of topsoil, overburden, mineral extraction, inpit screening of gravel and mineral processing during day and night shift.	SANS night time noise limits will be exceeded at NSA 1-3 and 6 (noise disturbance). Prolonged exposure to noise can affect mental well-being of individuals and lead to sleep disturbance.	Community Health Specialist, Noise Specialist	Negative	2	2	4	3	18	Moderate	Negative	2	1	4	3	16	Moderate

					SIGNIFICANCE PRE-MITIGATION							SIGNIFICANCE POST MITIGATION						
No	Project activity	Impact description		Informed by	Status	Probability	Extent	Duration	Intensity	Significance Score	Rating	Status	Probability	Extent	Duration	Intensity	Significance Score	Rating
FINAL REHABILITATION AND CLOSURE																		
1	**HYDROLOGY (SURFACE WATER IMPACTS)**																	
1,1	Remaining sources of surface contamination post-closure, due to potentially contaminated seepage (salt) are the processing plants and mining infrastructure, slimes dams and overburden.	Impact on surface water quality		Rehabilitation and Closu	Negative	2	2	3	3	16	Moderate	Negative	1	1	3	3	7	Low
1,2	Dust generated by activities post-closure on open pits, haul roads, slimes dams and overburden areas could both impact on both air quality and settle in areas where it could be taken up in surface runoff.	Impact on surface water quality - increased sediment load to Orange River.		Hydrologist, Rehabilitation and Closure Specialist	Negative	2	2	3	3	16	Moderate	Negative	1	2	1	1	4	Very Low
1,3	Heavy rainfall events	Erosion of trenches and berms allowing polluted water to enter the environment and siltation of Orange River.		Rehabilitation and Closure Specialist	Negative	3	3	3	2	24	Moderate	Negative	1	2	2	2	6	Low
1,4	Cease of water pumping from Orange River at Grasdrift Mine	Increase in surface water flow downstream of closed mine		Hydrologist	**Positive**	3	6	5	2	39	High							
2	**GEOHYDROLOGY AND SOIL (GROUNDWATER AND SOIL IMPACTS)**																	
2,1	Dismantling of fuel storage tanks, removal of diesel generators	Potential soil and groundwater pollution from hydrocarbon spillages, waste disposal practice		Known, Geohydrologist	Negative	2	1	2	2	10	Low	Negative	1	1	1	1	3	Very Low
2,2	Use of machinery and equipment to dismantle of old equipment /cut infrastructure for scrap, HME's to backfill mined out areas and grade site.				Negative	2	1	2	1	8	Low	Negative	1	1	1	1	3	Very Low
2,3		Benign effect on groundwater availability (continuous surface to groundwater recharge potential created by Orange River).		Geohydrologist	**Positive**	2	1	5	2	**16**	**Moderate**							
2,4	Cease of water pumping from Orange River at Grasdrift Mine	Impact on groundwater quality below mining area caused by decant of groundwater (salt load)		Rehabilitation and Closure Specialist	Negative	2	3	3	3	18	Moderate	Negative	2	2	2	1	10	Low
3	**TRAFFIC**																	
3,1	Removal of yellow fleet , equipment, scrap etc.	Increased traffic through RNP over Helskloof Pass		Known	Negative	3	3	1	2	18	Moderate	Negative	3	2	1	1	12	Low
4	**NOISE IMPACT**																	
4,1	Use of machinery and equipment to demolish and dismante infrastructure, rip and shaping of landscape and Proto terraces.	Generation of noise by machinery, excavations and vehicles will result in increased noise levels at NSA		Known	Negative	3	2	2	1	15	Moderate	Negative	1	1	2	2	5	Low
5	**AIR QUALITY IMPACT**																	
5,1	Backfill of mined out areas , shaping of landscape, dismantle, demolish of infrastructure.	Increased dust fallout in surrounding environment		Known	Negative	3	2	2	1	15	Moderate	Negative	3	1	1	2	12	Low

5,2	Use of existing access and haul roads for movement of vehicles, equipment and trucks	Vehicle entrained dust from vehicle from the northern to the southern extreme of the site will result in increased dust fallout in the surrounding environment	Known, Air Quality Specialist, I&APs	Negative	3	1	2	1	12	Low	Negative	1	1	2	2	5	Low
5,3	Remaining dumps cause wind erosion	Dust pollution to surrounding agricultural land	Rehabilitation and Closure Specialist	Negative	2	1	2	1	8	Low	Negative	1	1	2	1	4	Very Low
6	**TERRESTRIAL BIODIVERSITY IMPACT**																	
6,1	Decommissioning activities i.e., earthworks, vehicle collisions and persecution	Mortality of fauna, destruction of vegetation, encroachment and displacement of natural vegetation community due to alien invasive plant specie, erosion and edge effects	Ecologist	Negative	3	1	4	2	21	Moderate	Negative	2	1	2	1	8	Low
6,2	Disturbance created during decommissioning	Area vulnerable to erosion and alien plant invasion for several years.	Ecologist, Rehabilitation and Closure Specialist	Negative	2	2	4	3	18	Moderate	Negative	2	1	1	1	6	Low
6,3	Removal and eradication of alien invader species along Orange River floodplain and on rehabilitated areas.	Improve habitat integrity	Known	**Positive**	3	1	2	2	15	Moderate							
7	**TOPOGRAPHY**																	
7,1	Backfilling of reshaping of mined out areas, covered with coarse tailings to mimic desert pavement (pebble deflation surface)	Altered natural profile	Rehabilitation and Closure Specialist	Negative	1	1	5	1	7	Low	Negative	1	1	2	1	4	Very Low
7,2	Any excess material left after backfilling/stockpiling will be shaped and covered with coarse tailings i.e. excess overburden and Proto terraces (not mined to ground)	Excess overburden dumps (if any surplus material) will remain in the landscape after mining	Rehabilitation and Closure Specialist	Negative	1	1	5	1	7	Low	Negative	1	1	2	1	4	Very Low
8	**AQUATIC BIODIVERSITY IMPACT**																	
8,1	Similar to site establishment. Refer to site establishment.																	
9	**VISUAL IMPACT**																	
9,1	Rehabilitation of natural landscape	Landscape returning to natural state on completion of mining	Visual specialist	Positive	3	3	5	2	30	High							
10	**SOCIO-ECONOMIC IMPACTS**																	
10,1	Downscaling and closure of mine	Loss of jobs and associated income	Known, Rehabilitation and Closure Specialist, Social Specialist	Negative	3	3	3	2	24	Moderate	Negative	2	2	2	1	10	Low
10,2		Reduced quality of living standards															
10,3		Changes in community's economic structure (business opportunities, employment)															
10,4		Reduced buying power in Richtersveld															
10,5	Retain and convert existing mine buildings to tourist facilities and transferred ownership to RCPA	Increase in RCPA assets	Known	Positive	3	2	5	2	27	High	Neutral						
11	**HEALTH AND SAFETY IMPACTS**																	
11,1	Poor decommissioning and rehabilitation efforts	Safety risk in mining area	Rehabilitation and Closure Specialist	Negative	2	1	2	1	8	Low	Negative	1	1	2	1	4	Very Low