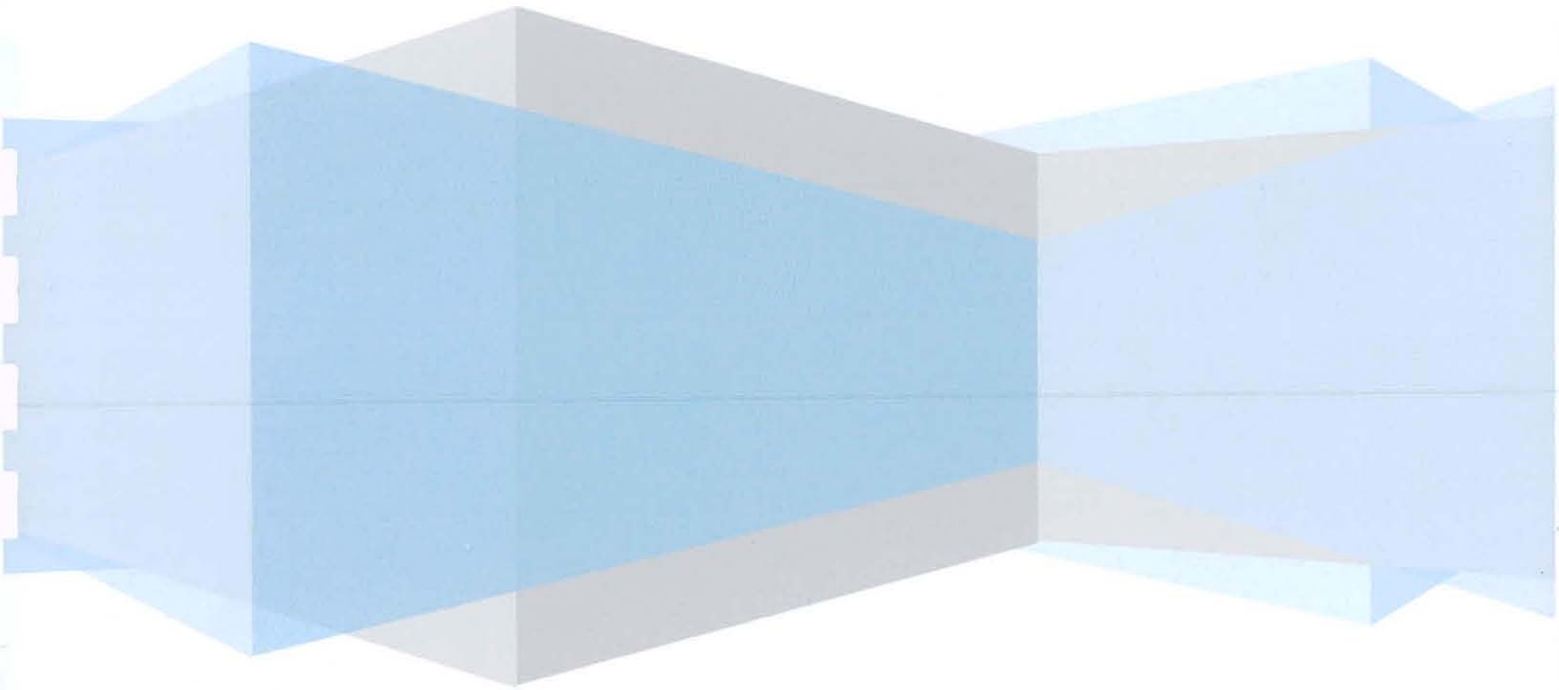
236MR.

So Ver Diamond Mine (Pty) Ltd

Environmental Management Plan

EMP

July 2009



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Executive Summary

The Department of Mineral Resources requested submission of a revised EMP after acceptance of the Conversion of an old Order Mining Right application for Sover Mine (Pty) Ltd. This request was issued in line with the provisions of Section 39 and Regulation 51, 54 of the Mineral and Petroleum Resources Development Act(Act 28 of 2002)

The tailings to be retreated are the result of mining operations of kimberlite fissures on the properties which were mined by Loxton Exploration (Pty) Ltd.

Due to the remote location of this mine and already established mining environment and infrastructure, the environmental impacts are not likely to be experienced by the public.

The mining activities of Sover Mine (Pty) Ltd will not affect the Environmental Impacts negatively as the existing mining dump which have been deposited over years is mined under more controlled environmental management principles thus improving the environmental impacts resulting from previous mining operations.

The rehabilitated mining environment is aesthetically acceptable as a number of tailings dumps exists in the area and would remain there for the foreseeable future and form part of the environment as a whole.

The management and rehabilitation program objective is to ensure the environment is disturbed minimally as a result of the Tailings Dump Recovery mining activities proposed by Sover Mine (Pty) Ltd.

Management of Sover Mine (Pty) Ltd will endeavour to improve the environment during the mining period resulting in the land being left in an improved fertile condition.

Some details of the mining activities and applicant particulars are repeated in this EMP document for information purposes. Full details of the project is described in the main Older Order Mining Right Conversion Application and in the previously approved EMP.

1 Particulars of Applicant

1.1 Name and address of mine

Name of Mine	: So Ver Mine (Pty) Ltd
Registration Number	: 1965/004442/07
Postal Address	: PO Box 11137 Hadison Park Kimberley, NC 8306
Physical Address	: So Ver / Doornkloof Farms Barkley West Northern Cape
Telephone Number	: (011) 664 8703
Facsimile Number	: (011) 664 8714
Cellular Phone	: 072 509 0969
Mine Manager	: Mr Dean R Del Frari
Responsible Person for EMP	: Mr Dean R Del Frari
Tel No.	: (072) 509 0969

1.2 Regional setting

Magisterial district	:	Barkley West
Regional Service Council	:	Diamantveld

1.3 Direction and distance to adjacent towns

The nearest communities are Holpan - 17.5 km southwest, Windsorton - 26 kilometer east-south-east, Delportshoop - 31 kilometers southwest and Barkley West - 33 kilometers south of the mine.

The capital of the Northern Cape, Kimberly is 61 kilometers south-east of the mine.

1.4 Surface infrastructure

The mine is served by a secondary public gravel road (R371) as well as Eskom power lines (11 kV) and a Telkom phone line.

No railway lines can be found near the mine and the nearest rail connection is along the R31 (26km west) and the R29 (35km east).

Current surface infrastructure on the farm include secondary gravel roads, old quarries, a number of underground shafts and workings and numerous buildings and structures.

1.5 Servitude's

Eskom and Telkom line servitudes are enforced.

Another servitude, No. 2/1947 is registered whereby the owners of the property are entitled

to the use of certain water rights and dumping sites.

Servitude K 14/1993S & K19/1953S entitles the surface owner to convey water from the Hartsriver by means of an underground pipeline over the remaining extent of Portion 5 of the farm Spitskop as it forms part of the Government irrigation Area - The Vaal River Development Scheme in the Division of Barkly West. Portion 3, Portion of Portion 2 of Farm No. 89 is also subject to certain conditions contained in the Deed Of Grant (Griqualand West Quitrents Volume 10, Folio 2).

1.6 Ownership of Adjacent Land

Table 1:

Farm Name	Owner	Address and Tel. No.	Land Use
Dampoort – Portion 2 & 3 of Spitskop	Mr DG Swan	PO Box 135 Barkly West 8375 Tel: 053 551 0276 Cell: 082 978 2094	Crop planting & live stock grazing
Plot no 3752	Loxton Exploration (Pty) Ltd	PO Box 170 Barkly West 8375 Tel: 053 551 0360	Mining
Doornkloof #89	Mr PA Versluis	Emerald Street Barkly West 8375 Tel: 053 0188	Live stock farming

1.7 River catchment area

The mine falls in the quaternary catchment area C33C – part of the Lower Vaal Management Area

1.8 Description of the mining environment

1.8.1 Mineral deposit

The target mineral, diamonds, are found in surface tailings dumps that resulted from mining operation by Loxton Exploration (Pty) Ltd during the 1980/90's. These dumps are known as Sover-, Ardo- Du Plessis- and Mithchemandskraal dumps. The dumps vary in size from 5000 to 1 million tons and originally totalled 2.4 million tons. The dumps consist of a varying mixture of fragments of kimberlite, shale and Venterdorp lava in a size range of 5 – 500 mm.

1.8.2 Mine products

Diamonds of different carat sizes and quality are the mine product.

1.8.3 Ore reserves

Estimated tailings is 1.4 million tonnes
Grade 0.1 to 7 cpht

1.8.4 Mining method

The dump material and tailings is excavated by a front end loader and transported to

the plant by a combination of tip trucks. The material is then crushed to -6mm. Through a conventional rotary diamond pan and grease tables from where the diamonds are extracted. The tailings is deposited onto an existing tailings dump and the -1mm material to the slimes dams.

1.8.5 Overburden

No overburden needs to be removed.

2. Description of the Different Environments

2.1 Geology

2.1.1 Stratigraphy

The basement rocks around So Ver Mine consists of andesitic Ventersdorp lavas (Val – green, Fig. 5), up to 3800 meters thick and related pyroclastics which overly the Witwatersrand Strata. These lavas are covered by younger shale of the Ecca group of the Karoo Super group. Numerous dolerite dykes and sills are also found intruded into the Karoo formations. The area falls within the Kaapvaal Craton, although near to its inferred western margin. The intrusive dolerite is mainly in the form of concordant sills and outcrops over large areas.

No natural surface cover material, that could lead to a risk of groundwater pollution, is disturbed by the mining of the old tailings dumps. The removal and rehabilitation of the old tailings dumps in fact results in a lower risk of water pollution.

2.1.2 Structural geology

The main structural features are associated with the deposits are the dolerite sills which intruded concordant with the Karoo formations. The dolerite sill is highly resistant to weathering and forms all the topographic high areas and protecting the underlying Karoo shale.

Intruding into all these formations are discordant kimberlite dyke swarms parallel in pattern, striking northeast and dipping near vertical. These dykes are the target resources of diamonds and are mined by all the mines in the immediate area. The range in width from 20cm to 200cm.

There are no known faults ore lineaments in the area

There are a number of sink holes situated along the strike length of the main kimberlite fissure. These sink holes and their formation are related to mining activity and are not a natural feature.

2.2 Climate

2.2.1 Regional climate

The mine is located in a semi-arid region, receiving on average about 250mm of rain in the west to 500mm on its eastern boundary. It is situated within the Sn climate region. Most of the rainfall is due to showers and thunderstorms falling in the summer months October to March. The peak of the rainy season is normally March or February. The summers are very hot with cool winters.

The nearest weather station to the mine is at Barkly West #0290032 with a record dating back to 1884. Due to the limited range of information available from this station and the number of periods with broken records, the data from the weather stations at Kimberley were used during the EMP preparation.

2.2.2 Average monthly and annual rainfall for the site and number of days per month with measureable precipitation.

Table 2:
Average monthly rainfall data and number of days per month with measureable precipitation.

Month	Rainfall Average	Number of Rainy Days		
	mm	>0,1 mm	>1,0 mm	>10 mm
January	57	9.8	6.7	1.6
February	76	9.8	6.9	2.3
March	65	10.2	7.1	2.2
April	49	7.6	5.5	1.6
May	16	3.3	2	0.4
June	7	2.5	1.2	0.2
July	7	1.5	0.9	0.3
August	7	1.8	1.3	0.2
September	12	3.1	1.7	0.4
October	30	6.1	4	0.9
November	42	7.7	5.3	1.3
December	46	7.9	5.6	1.7
ANNUAL	**414**	**71**	**48**	**13**

Source: Directorate: Climatology South African Weather Bureau
Station: 02940468 – Kimberley

2.2.3 Maximum rainfall intensities

Table 3

Month	60 Minutes	24 Hours	24 Hours in 50 Years	24 Hours in 100 Years
January	35.8	57	65.1	73.8
February	70.1	82	58.9	66.5
March	63.7	67.8	72.1	81.4
April	25.7	51.6	65.9	75.2
May	14.6	54.6	36.8	42.4
June	19.1	67.5	26	30.4
July	12	26.7	26.6	31
August	17	58.2	23.4	27.3
September	16.3	26.7	24.1	28
October	37.6	59.2	53.8	61.8
November	25.2	60.1	41.2	46.7
December	59.9	64.5	70.7	80.9

Source : South Africa (WB42)
Station: 0290468 – Kimberley

2.2.4 Average monthly maximum and minimum temperatures

Table 4

Month	Daily Maximum °C	Daily Minimum °C
January	32.8	17.9
February	31.0	17.3
March	28.8	15.2
April	24.8	10.9
May	21.4	6.5
June	18.2	3.2
July	18.8	2.8
August	18.8	2.8
September	21.3	4.9
October	25.5	8.9
November	27.8	11.9
December	30.2	16.6
Year	**26.1**	**10.9**

Source: Directorate: Climatology South African Weather Bureau
Station : 0290468 – Kimberley

2.2.5 Wind

The prevailing wind direction for the area is north to north-north-west for the months January to September and changing from month to sometimes westerly.

Winds during October to December averaging 3.5 m/s (Kimberley 01/01/1990 – 31/08/200. Station 0290468)

2.2.6 Humidity

Monthly relative humidity in the region

Table 5:

Month	Average (%)	Maximum (%)	Minimum (%)
January	47	91	8
February	54	94	12
March	57	96	15
April	60	96	16
May	56	96	16
June	54	97	15
July	49	97	13
August	42	94	10
September	36	91	8
October	39	89	8
November	42	92	8
December	43	90	7
YEAR	48	98	5

Source: Directorate: Climatology South African Weather Bureau © 2000
Station: 0290468 – Kimberley

2.2.7 Average monthly evaporation

Table 6:

Month	Evaporation in mm Symons Pan
January	365.6
February	279.1
March	235.8
April	169.1
May	135.1
June	108.6
July	130.1
August	181.2
September	252.6
October	314.9
November	345.5
December	378.6
YEAR	**2,896.0**

Source: South Africa Weather Bureau
Station : 0290468 – Kimberley

2.2.8 Incidence of extreme weather conditions

Hail: Hail is sometimes associated with thunderstorms and mainly occurs in early to late summer (November to February). It occurs on average three times a year and although these storms may sometimes be severe and cause much damage, they usually impact on a relatively small area.

Frost: The period during which frost can be expected lasts for about 120 days (May to August). With extreme minimum temperatures to below -8°C at night in the winter, frost development can be severe.

Droughts: Droughts are common and may vary from mild to severe. During these periods dust storms sometimes occur, depending mainly on denudation of the surface.

Wind: High winds are unusual but when they do occur can uproot trees and take of roofs.

2.3 Topography

The mining area lies on a flat topography area surrounded by small table mountain hills that rises up to 80metres from the surrounding landscape. The nearest hill to the mine is a small Spitskop that rises 36 metres above the landscape. There are no hills on the mining area and the only disruption to the otherwise smooth topography are the numerous old mine dumps and slime dams.

2.4 Soil.

2.4.1 Soil types

It must be stressed that no mining will take place that will disturb the soil profile of any area. All mining will take place in the recent tailings- and waste rock deposits from previous mining activities. The greatest part of the permanent infrastructure like the tailings dump and slime dam areas are already established, no further impact over

new areas are expected.

The mining area in general exhibit almost no well developed soil horizons but where found it is limited to the Mispah soil form. The greatest part is covered by a hard layer of calcrete overlying weathered shale (Fig.1 & 2, Mispah form - Steinkopf family). A hard calcrete layer (Mispah form - Steinkopf family) can be found above the intruded dykes and dolerite sills. The greenish-gray carbonaceous shale weathers white and in the top weathered layer pieces of impure sandstone of the greywacke type is visible. A narrow band of well developed orthic A horizons is present along the margins of the weathered drainage lines. These soils are still classified as Mispah form and only the Orthic A horizon is better and deeper developed (Fig.3) and not calcareous and not bleached (Family Myhili). An extensive part of the mining area's topsoil has been disturbed to such an extent that the topsoil now consist mainly of tailings, silt and waste rock material. These soils are still classified as Mispah form and only the orthic A horizon is better and deeper developed and not calcareous and not bleached (Family Myhill).

An extensive part of the mining area's topsoil has been disturbed to such an extent that the topsoil now consist mainly of tailings, silt and waste rock material.

Figure 1: Surface profile of soil

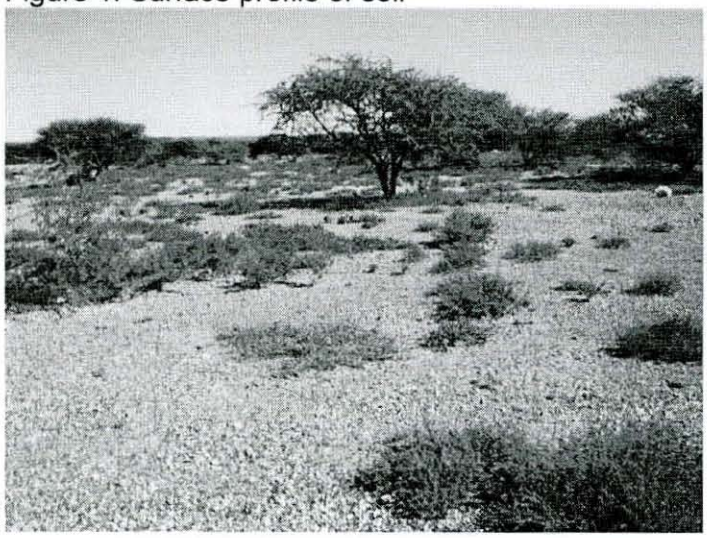


Figure 2: Typical soil profile

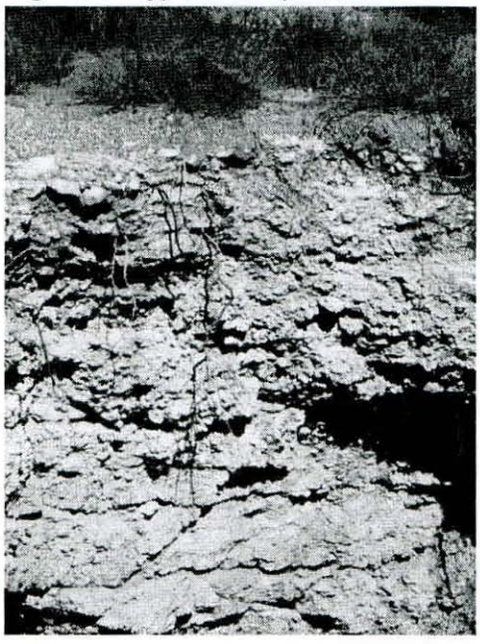
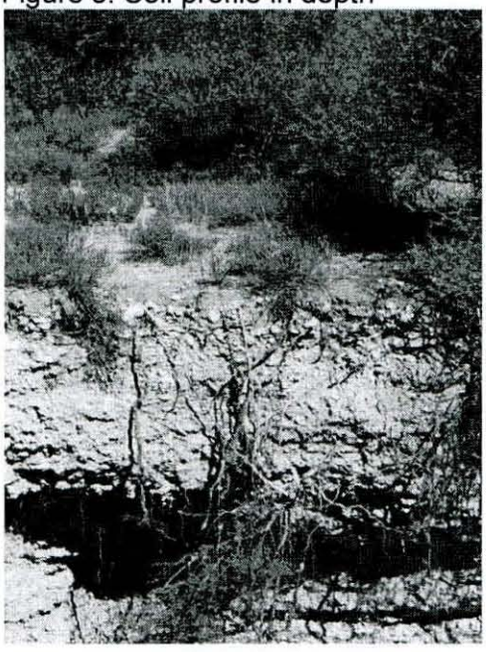


Figure 3: Soil profile in depth



2.4.2 Soil Fertility, Erosion and Depth

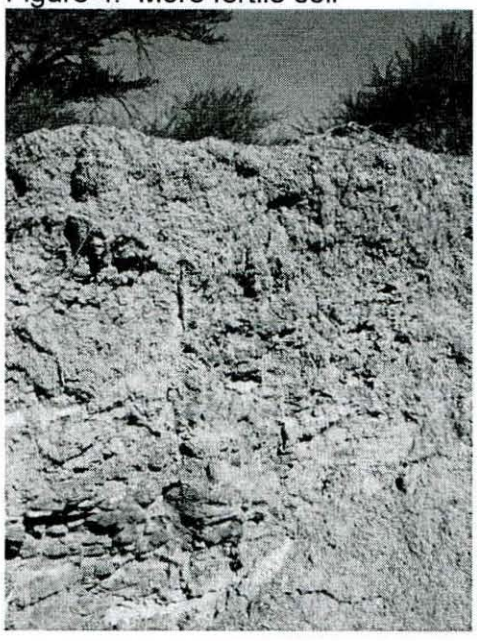
The dolerite exhibits a higher degree of weathering (Fig.4) than the shale that were baked by the intruded dolerite sills and exhibit a medium to low fertility.

The hard, impervious flat-lying shale is not conducive to the formation of a weathered soil. The lack of distinct vertical channels limits water penetration and offers extreme resistance to root development. Soil associated with the shale has a very low fertility.

Only the soil found along the drainage margins exhibit a high degree of fertility as is evident from the number of crop plantations. These soils do not have a high water holding capacity and therefore has no dry land production potential. Their irrigation potential is sufficiently high to make it economically viable.

All the soil forms have a low sensitivity to water and wind erosion.

Figure 4: More fertile soil



2.5 Land capability before mining

The land capability correlates directly with the different soil forms:

Before mining in the area commenced and before the irrigation canals where built, the whole area's land capability was limited to grazing.

No new impact on the land's grazing capability is as mining is limited to the existing tailings dumps and temporary buildings already on the site.

2.6 Land use

2.6.1 Land use before mining

Before mining in the area started, only stock farming was practised. Along the eastern and northern margins of the mining areas (Fig.5) limited irrigation farming were done, after the irrigation canals were build. Some fields in the area are still being planted with Lucerne and Wheat. Currently most of the immediate area's around and to the south and southwest of the mine are still being exploited for mining purposes.

Figure 5 shows typical land use for crops before the mining activity in the area commenced. Most of the wilderness area was used for mining purposes and agricultural land has diminished as a result.

Figure 5: Agricultural production

2.6.2 Historical agricultural production

Due to the low rainfall, surrounding land use is almost exclusively stock farming. The carrying capacity of the veld is low,12 to 15 ha per unit of large stock and 3 to 5 ha per unit of small stock. Sheep and cattle farming is still common on the surrounding farms, mainly for meat production. Game farming seems to becoming more popular on some of the farms. On the low laying areas near the Hartsrivier and its related drainage channels the land capability allows the planting of irrigation crops. Numerous irrigation fields can be found where the irrigation canals of the Vaal River Development Scheme has been established.

2.6.3 Evidence of abuse

Previous mining practises resulted in numerous areas of mismanagement of the land. Old tailing dumps, workings and waste rock dumps appear un-rehabilitated and no sign of topsoil stockpiling can be found. Old erosion gullies and the related formation of sink holes on the mining area's indicates no storm water management.

Industrial waste dumps did not exist and waste can be found strewn in the area.
No rehabilitation of the old mine shafts and related infrastructure and buildings have taken place (Fig.6). Ithough these structures and their rehabilitation are the responsibility of Loxton Mining, they are located in the proposed mining area.

2.7 Natural vegetation (compiled by Dr Hugo Bezuidenhout)

Broad scale vegetation of the study area

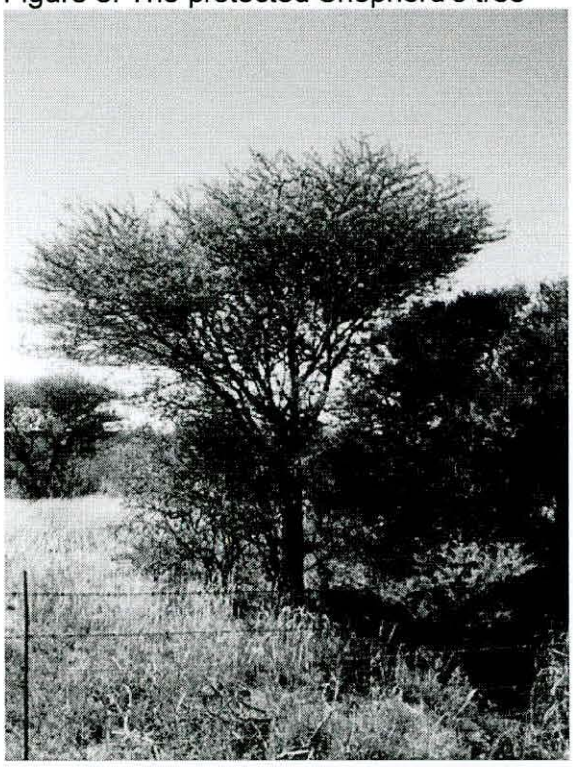
The mine is located in the Kimberley Thorn Bushveld (Savanna Biome) (Veld Type 32). Approximately 55% of this vegetation type is transformed.

Four broad vegetation-cum-habitat units were noted and the dominant plant species that were recorded, are as follows:

Acacia Tortilis Sparse Shrubland

Habitat: This midslope habitat has lost most of its topsoil. A "natural" habitat has established with its own unique plant species. The rock/soil complex is described as Coega soil form with rock. Small stones (calcrete, shale etc.) cover most (80 – 90% of the soils surface. The habitat is disturbed.

Figure 8: The protected Shepherd's tree



Bredenkamp, G.J. & van Rooyen, N. 1996. Kimberley Thorn Bushveld. In: Low, A.B. & Rebelo, A.G. (eds) Vegetation fo South Africa, Lesotho and Swaziland. Dept. Environmental Affairs & Tourism, Pretoria.

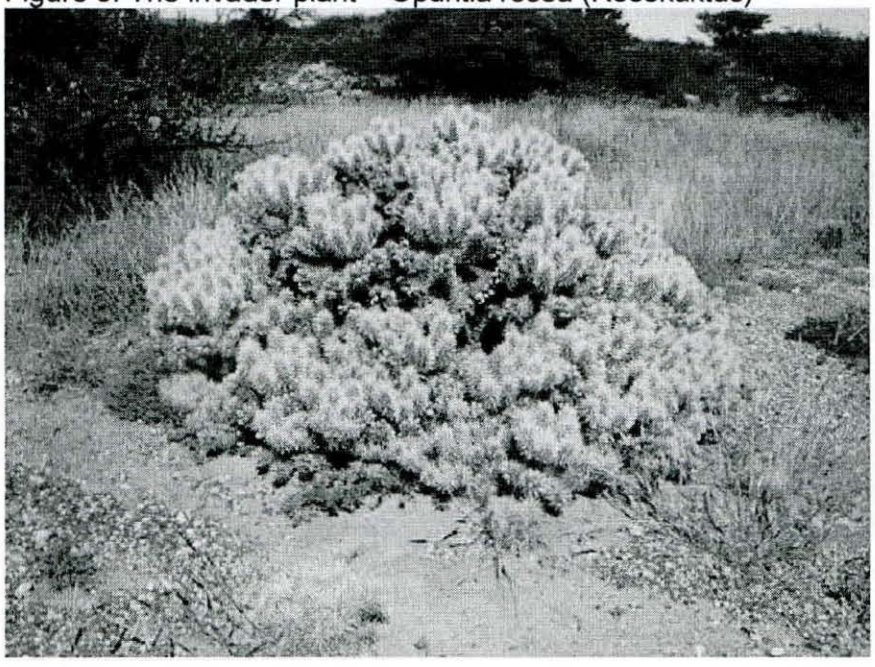
2.7.1 Natural vegetation

Trees: *Acacia tortilis* (Umbrella Thorn) and *Boscia albitrunca* (Shepherd's Tree, Fig. 7).

Shrubs: Acacia tortilis (Umbrella Thorn).

Grasses: Enneapogon scaber (Rock nine awned Grass) and Phragmites australis (Common Reed).

Figure 9: The invader plant – Opuntia rosea (Rosekaktus)



Acacia mellifera – Acacia tortilis Shrubland
Habitat: Shallow (0.3 m), Stony soil. Patches very disturbed.

Phragmites australis Reedland

Habitat: Slime dams. Very disturbed

Concluding remarks

The impact of old mining activities are clearly visible with the presence of the exotic and invader plant species.

Protected plant species were recorded and the ordinance (No 19 of 1974) states clearly that a valid permit form Northern Cape Nature Conservation is needed to remove these plant species. The trees Acacia karroo, Rhus lancea, Ziziphus mucronata and Acacia toritlis are protected plant species according to the Forest act No. 122 of 1894. nobody may cut, injure or destroy these trees, except if the applicant is in possession of an approved written application as set out in Schedule B of the Forest Act.

According to Ordinance No 19 of 1974 Nanathus aloides (Mesembryanthemaceae), Orbeopsis lutea (Asclepiadaceae), Aloe grandidentata (Ashphodelaceae) and Titanopsis calcarea are listed as protected plant species and nobody without a valid permit may buy, sell, donate, pick, import or export any of these plants. Although Euphorbia decepta (Euphorbiaceae) is not protected in the Northern Cape, it is classified as Rare / Vulnerable and therefore Northern Cape Nature Conservation should be contacted regarding further procedures.

On the area of expected mining impact, no evidence of agricultural production can be found.

The control of the invader or exotic species is subject to the Conservation of Agricultural Resources Act (Act no. 43 of 1983). Declared invaders must be controlled on farm/business units if their occurrence is or could be to the detriment of

the potential of the natural agricultural resources. The following control methods may be used:

(i) "The plants can be uprooted, felled or cut off and can be destroyed completely by burning or any other suitable method".

(ii) "The plants can be treated with a herbicide that is registered for use in connection therewith in accordance with the directions for the use of such a herbicide".

2.8 Natural fauna

2.8.1 Common species

The fauna listed below is already found in the mining area or may be found there as rehabilitation proceeds.

Birds:

Due to the highly disturbed nature of the environment, natural animal life is limited, but one can still expect to find the following birds on occasion in the surrounding veld.

Cardinal Woodpecker	-	Dendropicos fuscescens
Piep Barbet	-	Lybius leucomelas
Crested Barbet		Trachyphonus vaillantii
Hoopoe		Upupa epops
Kalahari Robins		Erythropygia paena
Cape rock pigeon	-	Columba guinea
Whitebacked Mousebird		Co lius co lius
Redfaced Mousebird	-	Colius indicus
Red Bishop	-	Euplectes orix
Melba Finch	-	Pytilia melba
Violeteared Waxbill	-	Uraeginthus granatinus
Laughing Dove	-	Streptopelia senegalensis
Sociable Weaver		Philetairus socius
Dusky Sunbird	-	Nectarinia fusca
Red-winged Starling	-	Onychognathus morio
Sabota lark	-	Mirafra sabota
Familiar chat	-	Cercomela familiaris
Cape Weaver	-	Ploceus capensis
Helmeted Guinea-fowl	-	Numida meleagris
Common Quail		Coturnix coturnix

Mammals:

The mammal life on the mine is even more limited than the bird life but the following animals can still be expected to be found on the surrounding farms.

Suncus infintesimus	- Least dwarf shrew
Crocidura cyanea	- Reddish-grey musk shrew
Chlorotopha sclater	- Golden Mole
Tadarida aegyptiaca	- Egyptian free-tailed bat
Eptesicus capensis	- Cape serotine bat
Nycteris thebaica	- Common slit-faced bat
Rhinolophus clivosus	- Geoffroy's horseshoe bat
Tatera lencogaster	- Bushveld gerbil

Tatera brantsii	- Highveld gerbil
Gerbillurus paeba	- Hairy-footed gerbil
Desmodillus auricularis	- Short-tailed gerbil
Mus musculus	- Domestic mouse
Rhabolomys pumilio	- Striped field-mouse
Saccostomus campestris	- Pouches mouse
Malacothrix typical	- Large-eared mouse (on calcrete)
Graphiurus ocularis	- Spectacled dormouse
Mus minutoides	- Pygmy mouse
Aethomys namaquensis	- Namaqua rock mouse
Parotomys brontsii	- Bronts' whistling rat
Otomys unisulcatus	- Karoo bushrat
Thallomys nigricauda	- Black-tailed tree rat (camael-thom)
Cryptomys hottentotus	- Common mole rat
Rattus rattus	- Domestic rat
Lepus capensis	- Cape hare
Lepus saxatilis	- Shrub hare
Pedetes capensis	- Springhare
Pronologus rupestris	- Smith's red rock rabbit
Helogale parvula	- Dwarf mongoose
Cynictis penicillata	- Yellow mongoose
Atilax paludinosus	- Water mongoose
Ictonyx striatus	- Striped polecat
Genetta genetta	- Small spotted genet
Xerus inauris	- Ground squirrel
Atelerix frontalis	- Cape hedgehog
Sylvicapra grimmia	- Common duiker
Raphicerus campestris	- Steenbok
Pelea capreolus	- Grey rhebok
Tragelaphus strepsiceros	- Kudu
Felis caracal	- Caracal
Felis lybica	- African wild cat
Felis nigripes	- Small spotted cat
Otocyan megalotis	- Bat-eared fox
Vulpes chama	- Cape Fox
Canis mesomelas	- Black-backed jackal
Pronolagus rupestris	- Smith's red rock rabbit
Hystrix africaeaustralis	- Procupine
Suricata suricatta	- Meerkat

2.8.2 Endangered species

Endangered species which would be found in the Sover area according to the Red Data Book (Smithers 1989 & Branch 1998).

Animal		State
Orycteropus aer (Antebear)	-	vulnerable
Atelerix frontalis (Cape hedgehog)	-	rare
Rock-Catfish in the Hartriver	-	rare
Naja nigricollis woodi (Black spitting cobra)		rare
Felis nigripes nigripes (Small spotted cat)		rare

Vulnerable means: Taxa of which all or most populations are decreasing because of overexploitation, extensive destruction or degradation of their habitat or other environmental disturbances.

Rare means: Taxa with small populations which are not presently endangered or vulnerable, but which are potentially at risk.

2.9 Surface water

2.9.1 Quantity of surface water

The mining area is located in the catchment area of the Hartswater, drainage region C33 near the drainage margin of the Vaalriver. The mining area is drained by one significant drainage channel that drains a localised catchment area of 1575ha in size.

This non-perennial channel drains over a distanceof 5 kilometres in a north-westerly direction where it flows into the Hartsriver. Over most of this distance the drainage channel is not well developed and does not constitude a significant drainage line although all storm water from the mining area is expected to be drained by this channel. From the Hartsriver the water drains in a southwesterly direction over a distance of 35 kilometres where it meets the Vaalriver at Delportshoop.

2.9.1.1 The average annual run-off

The sub-catchment area is 1575ha. Depending on the soil-type, precipitation period and veld type, run-off range between 6 and 13%. Using an average of 10% of run-off an annual rainfall of 414mm will result in 650 000m^3 of run-off water.

Due to the presence of the Doornkloof dam most of the runoff is contained in this dam and only the run-off from the smaller northern drainage area in the sub-catchment is expected to flow in the drainage channel over the mine area. This area is only 425 ha in size and only 175,000m^3 of annual run-off can therefore be expected.

2.9.1.2 Normal dry-weather run-off

As the main drainage channel also receives excess water from the mines in the area, some surface water flow can be found in the affected channel right through the year. The volume would depend on mining activity but is normally limited to a slow trickle of water.

No natural surface runoff can be found in the catchment area during dry weather.

2.9.1.3 Flood levels and volumes

With the affected channel having a surface area of 26,000m^2 the maximum flood level should never exceed a depth of 1.3 metres even over a 60minute storm event (45.4 mm every 100 years). In the event that the Doornkloof dam cannot accommodate such an event the flood level could rise to almost 3 metres in the affected drainage channel.

Table 7

Period	Sub Catchment m^3	In Affected Channel m^3
1:25	99,000	27,000
1 : 50	114,000	31,000
1:100	128,000	35,000

2.9.2 Quality of surface water

One sample was taken from surface water in the affected drainage channel. The water analyses (Table 7) reflect the water to be highly saline, of a potential corrosive nature associated with severe scaling problems and not fit for human consumption or even recommended for industrial use. The very high concentrations of sulphate (9160mg/l) ,where sea water has a concentration of just over 900mg/l, and high magnesium concentrations indicates a potential pollution source in the area. It must be stressed that this surface water as is currently found is of a highly undesirable nature.

Table 8: Chemical analysis of surface water

Na	K	Ca	Mg	Cl	SO4	NO_3	T.alk	HCO_3	pH	EC
2460	105	276	266	150	9160	<0.5	209	28	7.8	1257

Based on the Piper diagram, the water is of and older nature moving to a stagnant classification. It has a sulphate- and saline nature, indicating possible pollution.

2.9.3 Drainage density

The mining area has a medium drainage density of 0,8 km per square kilometer surface area.

2.9.4 Use of surface water

Except for the Hartsriver no surface water is being abstracted out of the drainage channels in the affected area. No person is currently making use of water out of the affected drainage channel. All the mining and farming water needs in the area is supplied by the network of government irrigation canals, associated furrows and the Hartsriver. The water in the canals are also used for irrigation purposes on crop fields. Some of the smaller earthen dams north of the mine are used for live stock watering.

2.9.5 Water authority

The Department of Water Affairs and Forestry - Kimberley, falling under the Lower Vaal Water Management area.

The system of irrigation canals forms part of the Government irrigation Area namely the Vaal River Development Scheme in the Division of Barkly West district.

2.9.6 Wetlands

No natural wetlands occur on the mine or surrounding properties although a number of reed growth habitats are associated with the slimes dams and process water collection dams from the mines.

2.10 Groundwater

2.10.1 Depth of the water table

There is currently only one production borehole on the mining area, right on the northern border near the old farmhouse (Fig. 1& 6). The water table is only 11.20 metres from surface as can be expected as the borehole is located very near to a surface dam. Although the depth of the water table in the mining area and

fissure environment could not be determined, readings taken in the old mine shafts indicates a water table depth in excess of 50 metres.

A borehole of Loxton mining near the office complex has a water table depth of only 21 metres.

These figures indicate the amount of dewatering in the kimberlite fissure with almost no connection between this aquifer and the country rock aquifers.

2.10.2 Location of boreholes, fountains and yields

There are no fountains on or near the mining area. The one borehole on the property has an inferred yield of 2 l/s.

2.10.3 Groundwater quality

A sample was taken from the production borehole and the chemical results can be seen in Table 8.

Table 9

Na	K	Ca	Mg	Cl	SO_4	NO3	T.alk	HCO_3	pH	EC
41	1.3	72	41	39	85	1	290	8	8.2	76.1

The groundwater from the borehole was taken to indicate the quality of the water used for the mines domestic supply and as such does not reflect the quality or type of water found in the underground mining environment. As mining will not take place underground and is not expected to impact on the groundwater quality or yield of the area this sample reflects the undisturbed hydro geological environment. Although the water can be classified as alkaline and slightly hard (slight scaling may occur), it is very fresh with a very low salinity. There is no indication of pollution of any sort (chemical or bacteriological) and the water is fit for human consumption.

Based on the Piper diagram, the water is classified as recent and of a carbonate nature.

2.10.4 Groundwater usage

The one borehole on Sover supply the mineworkers and staff as well as the farmer with domestic water. The mine is supplying 60 people with water and the farmer around 10 people. At a maximum usage of 200 litres per person per day at least 14,000 litres per day are abstracted from this borehole.

As the current farmer does not have surface rights he will vacate the farm in December 2000. It is expected that even less water will then be abstracted.

Based on historical abstraction data and the current watertable (11.2m), it is expected that the borehole is able to cope with the demand. It is not the less recommended that the water table be monitored on a monthly basis.

2.10.5 Groundwater zones

No impact to the hydro geological environment will take place due to mining activity from Sover mine. As the main impact is from current mining operations by Loxton exploration, the hydro geological environment will none the less be discussed.

The basement rock, Ecca shales, is not known to be a favourable aquifer due to the shale layer being impermeable and the distinct bad quality water normally found in these shales (saline). The main aquifers are related to the intruded kimberlite fissure and if present, discordant dykes. Although yields could be substantial in these secondary aquifers (up to 10l/s), in this area it will only be at depths below 50 metres. These aquifers are therefore classified as poor and of minor importance as a source of groundwater.

No groundwater users will experience a impact due to mining activity.

2.10.6 Change of rivers

None planned.

2.11 Air quality

With reference to the Scheduled processes under the Second Schedule to the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965):

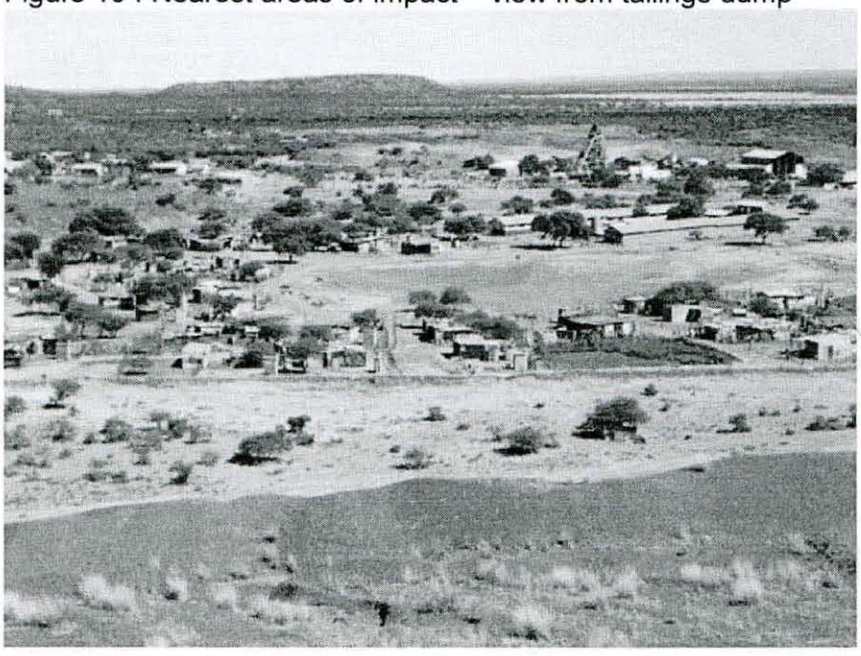
No scheduled process relates to any proposed mining activity at Sover Mine.

The current source of air pollution in the area stems from mining operations by Loxton mining, mining at Frank Smith mine (Anglo minerals) the previous mining operations at Sover by Trans Hex mining, the gravels roads serving the area and limited farming operations.

The only source of air pollution at Sover mine is nuisance dust generated by the plant (belts and crushing, the tailings dump as well as dumping and transport of mined material by truck on the dirt roads. Gas emissions from machinery is within legal limits.
The nearest potential areas of impact from fall-out dust are the compound and workers houses of Loxton mining and the squatter camp just below the new tailings dumps (Fig.10). All these areas are within 300 to 400 metres from the plant and even the main offices of Loxton exploration are less than 900 metres away. As the mining area, including Sover mine is shared by more than one mining company, dust generation could be substantial.

The nearest other source of dust pollution in the area is Frank Smith diamond mine 4 kilometres south of Sover mine.

Figure 10 : Nearest areas of impact – view from tailings dump



2.12 Noise

Noise is generated at the plant at the crusher. The sound pressure level is expected to be below 5OdB(A) at the boundaries of the Sover Mine Operation. Some mining noise at the different old tailing dumps is generated due to vehicle movement and loading activity.

Current source of noise pollution in the area is general mining noise from the different shafts of Loxton and their plant. Limited shock waves are being generated from underground blasting activity by Loxton mining.

Some vehicle noise can be heard coming from the public road the R371.

Although no substantial noise generation is expected, background mining noise could potentially be heard from the informal settlement and workers houses of Loxton. These noises is a combination of sound from Sover and Loxton's mining operations.

2.13Areas of cultural-historical or archaeological interest

The only area of interest is an old graveyard consisting of 46 graves (Fig.11 and 12) and associated residential area. This area is protected.

A full report of the above and the archaeological investigation by Dr. David Morris of the McGregor Museum, Kimberley can be found in Annexure 1.

Figure 11 Graveyard

Figure 12 Personal items on graves

2.14 Sensitive landscapes

"Sensitive environments" is classified as the following:

1. Limited development areas (section 23 of the Environment Conservation Act, 1989 (Act 73 of 1989)
2. Protected natural environments and national heritage sites.
3. National, provincial, municipal and private nature reserves.
4. Conservation areas and sites of conservation significance.

5. National monuments and gardens of remembrance.

6. Archaeological and paleontological sites.

7. Graves and burial sites

8. Lake areas, offshore islands and the admiralty reserve.

9. Estuaries, lagoons, wetlands and lakes.

10. Streams and river channels, and their banks.

11. Dunes and beaches.

12. Caves and sites of geological significance.

13. Battle and burial sites.

14. Habitat and /or breeding sites of Red Data Book species.

15. Areas or sites of outstanding natural beau.

16. Areas or sites of special scientific interest.

17. Areas or sites of special social, cultural or historical interest.

18. Declared national heritage sites

19. Mountain catchment areas

20. Areas with eco-tourism potential

The only sensitive environment is the graveyard and surrounding area with a high density of protected plant species.

2.15 Visual Aspects

2.15.1 Visibility of the mine from existing roads

A number of the tailing dumps to be mined are visible from the public R371 road including the highly visible final tailings dump. The visual impact of Sover mine is dominated by the already highly visible mining activity of Loxton mining. As the public gravel road serves mainly the farming communities there is very little impact on any potential tourist route.

2.15.2 Visibility of the mine from residential areas

No residential areas are located in the vicinity of Sover mine and even dust generation will not visually impact on any large population.

2.15.3 Visibility of dust being generated

If any dust is generated it is visible from the gravel road that serves the area and from the compound and houses of Loxton mining.

2.16 Socio-economic structure of the region

2.16.1 Population density, growth and location

South Africa as a whole boasts a population of forty-and-a-half million people (Census '96). If all people in South Africa took hands, they would circle the earth once and a bit.

The Northern Cape is the largest province and covers 29,7% of South Africa by area, but have only 2% of the total population (840 000- Census `96), of which 71,7% lives in urban areas and 28,3% in rural areas. The Northern Cape has a 49,1/50,9 male/female gender ratio. Kimberley is the provincial capital of the Northern Cape with an average summer temperature of 25,3° C and 10,8° C in the winter. The inhabitants of the Northern Cape have a life expectancy at birth of 62,7 years compared to the lowest of 59,7 years in the North west and the highest in the Western Cape of 67,7 years.

2.16.2 Social infrastructure: schools, hospitals, sport- and recreation facilities, shops, police and civil administration

There are and is no social infrastructure development on the mine itself. All the normal social infrastructures can be found in the capital city of Kimberley 61 km and at Windsorton - 26km from the mine.

2.16.3 Water supply

Water is available to almost 50% of the population in the Northern Cape in the form of water piped to their dwelling. The next most used source of water supply is piped water on-site or in yards, which is available to around 33% of the population.

Surface water from the Harts-, Vaal- and Orange river is the major source of water in the region, although some smaller communities are totally dependent on groundwater for supply.

The production water for to the mine is from the Hartsriver via pipeline and water for domestic use from the one borehole near the farmhouse.

2.16.4 Power supply

All infrastructure in the region, including Sover Mine, obtains their power supply from ESKOM.

2.17 Interested and Affected Parties.

Table 10: Adjacent Land Owners

Farm Name	**Owner**	**Address & Tel**
Dampoort - Portion 2& 3 of Spitskop 91	Mr DG Swan	PO Box 135 Barkly West 8375 Te1:053 551 0276 Se1:082 978 2094
Plot No. 3752	Loxton Exploration (PTY) LTD	PO Box 696 Postmasburg 8420 Te1:053 313 1689 Se1:083 522 3934
Doornkloof No. 89	Mr PA Versluis	Emerald Street Barkly West 8375 Te1:053 0188

A full list of the interested and affected parties were published in the original approved EMPR.

3. Motivation of the Continuation of the Project

3.1 Positive contributions of the mine

3.1.1 Where will the product be sold

The diamonds is sold internationally and locally by tender on the Johannesburg diamond exchange.

3.1.2 Cost of establishment of the mine

No establishment cost as all infrastructure are in place. 3.1.3

Forecast of yearly expenditure: Annual yearly expenditure s estimated to be five million rand at a cost of R10/t treated ore. This cost includes mining, processing and overhead expenses.

3.1.3 Number of workers to be employed

Approximately 50 to 60 workers including mine management are expected to be employed on a contract basis.

3.1.4 Impact on local economy

Only local labourers and expertise is used as far as possible. As the mine has been operational for a number of years, no new impact on the local economy is expected. A multiplication factor of 4 is found to be the norm in this area.

3.2 Alternatives to the mine

3.2.1 Alternative mining method

No alternative treatment method can economically be developed at this stage in the mining operation.

3.2.2 Alternative mineral processing plant

No alternative mineral processing plant has been considered as the current plant have proved itself through years of operating. Only the grease tables could be phased out with x-ray machinery if the need arises.

3.2.3 Alternative transport routes

Due to the high density of mining activity and number of existing roads no new transport routes is considered.

3.2.4 Alternative water resources

None are available for large scale industrial use. Use will only be made of surface water from the Hartsriver as the groundwater aquifers are poorly developed in the area. If other groundwater resources are developed it will only be able to supply in the domestic demand.

3.2.5 Alternative mine infrastructure

Substantial mine infrastructure are already established. Any alternative areas for infrastructure development would impact to higher degree on the environment.

3.2.6 Alternative tailing areas

As the old tailing dumps are to be reworked the end result is one large new tailing dump. As the proposed area is highly disturbed and being used in this regard, no new or alternative tailings area is being planned. The current tailing area is located near the slimes dams in an already highly disturbed area. The tailing dump area is limited as not to develop over existing mine fence boundaries or infrastructure like roads, telephone- or power lines or buildings..

The waste rock area is limited to already disturbed areas where waste rock have been dumped during previous mining activities.

3.2.7 Alternative domestic and industrial waste site areas

Due to the large disturbed area available from previous mining activity a number of potential waste areas can be found on the mine. The security risk associated over such a large area limits the industrial waste site to an area near the plant and administration building. The domestic waste area is also better located near the compound as to limited transport of waste and for ease of disposal. All these areas are already disturbed and being used in this regard.

3.2.8 Alternative housing

As a housing area and compound for the miners are already established it is not practical to establish a new site with totally new infrastructure.

3.2.9 Alternative end of use plans

Due to distance from residential areas, stock farming or the planting of irrigation crops are the only practical end use plans.

4. Detailed Description of the Present Project

4.1 Surface infrastructure

See list of infrastructure described earlier in this document. Infra structure already exists for recovery of diamonds from old tailings dump.

4.1.1 Roads, railways and power lines

The existing roads and power lines on the mine is used during mining operations.

No railway lines exist or are planned for the mine.

4.1.2 Management of solid waste

4.1.2.1 Industrial and domestic waste

All industrial waste from mining activities is to be stored on a fenced and dedicated waste area on the mine property. The industrial waste is removed on a continuous bases during the life of the mine by a specialist company like WasteTech. Part of the industrial waste area will contain a salvage yard where material that can potentially be

re-used is stored.

All used oil, grease, hydraulic fluids and their containers/filters is stored in suitable covered receptacles on the industrial waste site The content of these receptacles is removed from the site on a regular basis for disposal at a recognised land disposal facility or recycling depot.

Oil, grease, hydraulic fluid and diesel spills which occur in these areas, is cleaned up immediately by removing all contaminated soil and disposing thereof in a waste disposal receptacle bin.

All non-biodegradable refuse such as glass bottles, plastic bags and metal scrap is stored in a container in the industrial waste area and collected on a regular basis and disposed of at a recognised disposal facility.

All domestic and biodegradable refuse generated from the office site, crusher site, vehicle yard, storage area or any other area will either be handled as indicated above or be buried in a pit excavated for this purpose and be covered with layers of soil, incorporating a final *0.5* meter thick layer of topsoil. This pit is monitored in case of subsidence.

There is a standard penalty enforced by Sover Mining (Pty) Ltd onto any person that dump waste outside any of the above dedicated waste areas.

4.1.2.2 Mine residue disposit sites

As the resource mining material is from old dumps, numerous small dumps is left after mining as portions of each original dump will not be mined or removed, being either waste rock or waste tailings. These waste material dumps is smoothed to blend in with the natural environment and the slopes rehabilitated to 18°.

A relatively large tailings dump and a number of slimes dams is the result of new mining activity. As mining from the original dumps is highly selective, no new waste rock dump is created and any waste rock is transported back to its respective original dump.

The current new tailing dump contains ±450 000m^3 or 1.1 million tonnes of material (Current height 28metres, length 350m, width 120 metres at base, Fig. 28). If the original estimate in 1992 by Trans Hex was correct there should be at least 1.3 million tonnes of material left to be mined or as inferred by Sover mine - 1.4 million tonnes. If mined 90% of this material iscome new tailings creating the need to accommodate another 1.26 million tonnes.

A total of 2.4 million tonnes will need to be accommodated at the new tailings area. The surface space available is 550m x 120m and if the slopes need to be rehabilitated to an angle of 18° only 1.6 million tonnes can be accommodated before an alternative dumping site must be found.

As it is planned to rehabilitate the tailings dump over the existing slimes dams, a potential area of 200 000m^2 is available. Taking into consideration the 400 000m^3 space occupied by the slimes dams, this area can accommodate up to 9 million tonnes of tailings. If a total of 2.4 million tonnes of tailings are dumped on this area, if will only rise to a maximum height of 23 metres after being rehabilitated to 18°.

Figure 13: The new tailings dump

The mines five slimes dams had an original combined capacity of 400 000m^3. The current capacity is t 100000m^3. It is expected that new mining activity will produce 126 000 tonnes or 50 000m^3 of slimes material and that the current slimes dams is able to accommodate this.

4.1.3 Management of Water Pollution

4.1.3.1Sewage plant

No new sewerage system or plant is constructed as the compounds, house and office area have established septic tanks that were constructed more than ten years ago. These tanks used to accommodate the sewage from between 100 and 200 people. With the current workforce of between 50 and 60 people the available capacity is more than sufficient.

All these tanks are located in the dolerite sill or shale which is generally regarded as impermeable with good assimilative capacity for pollutants. Potential pollution problems are therefore severely limited as is also evident from the water quality sample from the mines borehole.

4.1.3.2 Pollution control dams, overflow dams and evaporation dams

No new slimes dams or overflow dams is constructed as five slimes dams have already been constructed. A small overflow dam was constructed from where process water is recovered and pumped to a collection dam. The overflow dam has a capacity of 16,000m^3 and the collection dam – 4,000m^3.

Figure 14: Slimes dams

Figure 15: Overflow dam

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4.1.3.3 Treatment of polluted water

The only point of water pollution during the mining process would be at the plant where suspended solids will contaminate the process water. These suspended solids will settle out of the water in the slimes dam. No treatment of process water will therefore be done.

All effluent water from the camps washing facility is currently disposed of in a properly constructed French drain which is situated far from any stream, river, pan, dam or borehole. Only domestic type wash water is allowed to enter this drain and any effluents containing oil, grease or other industrial substances is collected in a

receptacle and removed from the site, either for resale or for appropriate disposal at a recognised facility.

An existing washing and service bay for vehicles and equipment is used. Any oil and fuel spills is contained by the concrete slab which will incorporate an appropriately designed oil and grease trap.

4.1.4 Plant for potable water

Groundwater is used for the provision of potable water. As can be seen from the chemical analysis of the water, it is fit for human consumption and no treatment of the water is needed. The water is pumped by submersible pump to a 10 000 litre PVC tank(Fig. 10) from where it gravity feeds to the houses, compound and washing facilities.

Water for the plant area and administration office are obtained from treated water via a pipeline from Loxton mine. If the need arises a small chlorination treatment plant that is on site can also be used.

Figure 16: Storage tank for potable water

4.1.5 Process water supply system

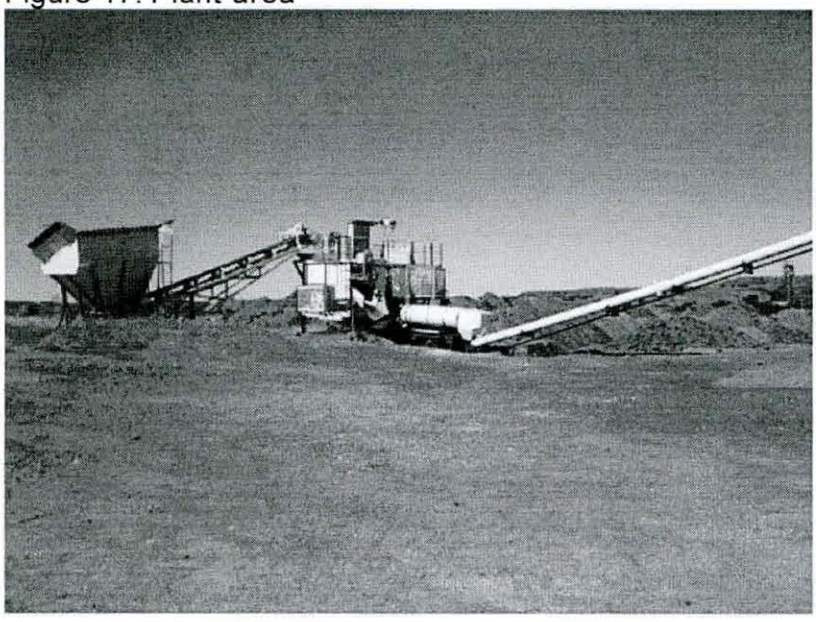
The water for use in the production plant is obtained from the Hartsriver via a pipeline and from the government irrigation canal. Water will mainly be used to wash the gravels during screening and in the rotary diamond pans. There are two abstraction points available on the canal, one at Ardo and one at Du Plessis. A total of 60 000m^3 per year is available from the canal by contractual agreement on the water allocation rights to Loxton exploration. The plant uses up to 120 000litres per hour or almost 700 000m^3 per year. The balance of water needed, is pumped from the Hartsriver. If need be, Sover mine can also make use of the allocation rights to 18 ha irrigation land from the canal. Process water is stored in the two reservoirs, each with a capacity of 300m^3, or the new collection dam - capacity 3600m^3. From here it is pumped up into the plant.

4.1.6 Mineral processing plant

An existing 40000 tonnes/month or 480 000 tonnes per annum pan plant is used during the life of the project. See Fig 11.

Mined material is dumped in a feeder bin where all the +50mm material is screened. From here the -50mm material is fed by conveyer belt up into the plant where the material is screened again. The -15mm goes to the first of three 14 feet rotary diamond concentration pans and the +15mm material to a Barmac crusher. From the crusher the material is also pumped to the first 14 feet pans. After the three primary rotary pans the pod is concentrated by another three 14 feet secondary pans and finally by four 10 feet sump pans. The final concentrate will then move over eight grease tables for final recovery.

Figure 17: Plant area



4.1.7 Workshops and administrative buildings

The vehicle maintenance yard and secured storage areas are found outside the flood plain, above the 1 in 50 year flood level mark within the boundaries of the mining area.

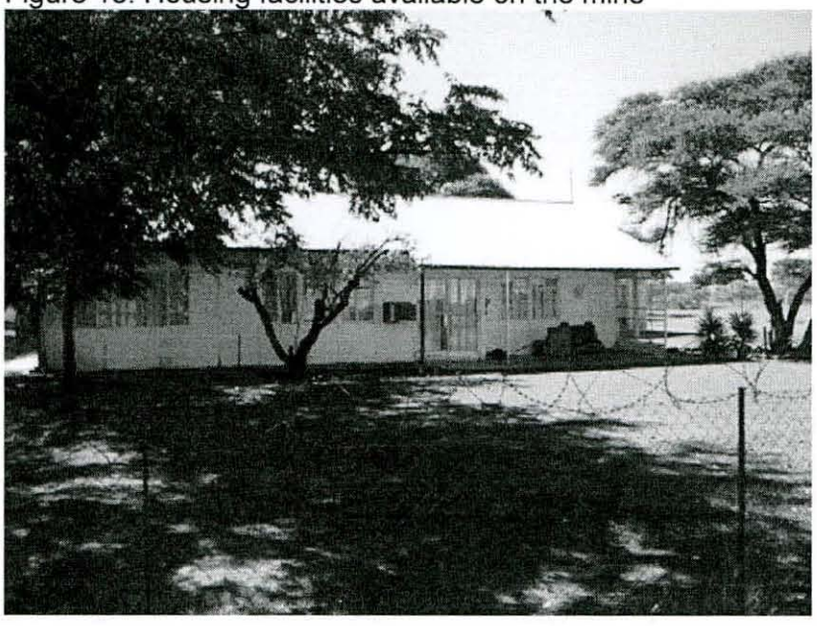
The storage areas/buildings are all securely fenced and all hazardous substances and stocks such as diesel, oils, detergents, gas etc. is stored in a secured building

All equipment and spares are stored in a secured storage area A thin concrete slab, to prevent soil and water pollution, are found in these storage areas/buildings. The workshop and washing has a separate sump to contain any oil or diesel substances.

4.1.8 Housing and recreation

There are five mine houses on the premises. Fig 12 show one of the houses. The remainder is a farmhouse with workers houses and a large compound available to provide accommodation for up to 150 people. No recreational structures are provided as these can be found less than one kilometre away at Loxton explorations's facilities.

Figure 18: Housing facilities available on the mine



4.1.9 Transport

The access road from the mining site to the public road is 300 meters away from the mine. This road is also used by workers of Loxton Exploration for access to their mine shafts and housing area.

Transport is provided to workers of Sover mining on the mine site. Workers make use of public own transport from the mine to their home towns.

4.1.10 Water balance diagram

The water balance diagram is included as annexure 3. It must, howvere be noted that more than one slimes dam is used at a time, very little water is flowing into the overflow dam resulting in almost no water being recycled.

The full production need of 2,880m^3/day is abstracted from the Hartsriver or from the irrigation canal.

4.1.11 Alteration of water courses

None

4.1.12 Storm water

As the plant area is surrounded by either a tailings dump or slimes dam all storm water is directed to the newly constructed collection dam it functions as a dirty water system where all run-off from the plant area is contained on site and no water comes into contact with the natural drainage system.

A system of weirs around the plant area, slimes dams and tailings dump functions as a clean water system directing all storm water away from the above areas into the clean and natural drainage channels.

No additional storm water management precautions is required as a result of the current mining activities.

4.2 Construction phase

The main activity during the construction phase were the following:

A clean & dirty water system of weirs and a collection dam that collects all surface run-off water from the plant area.

Where old waste was found it was sorted and stored on the new industrial and domestic waste area.

4.3 Operating phase

4.3.1 Soil utilisation guide

As previous indiscriminate mining and dumping of waste have taken place without regard for rehabilitation, it is difficult to predict the state of topsoil under the dumps. Where tailings are removed down to ground level, the surface is ripped to a depth of 300mm or to the average depth of soil which is only 100mm.

Current mining activity is not impacting on any new area or topsoil. As no stockpiling have taken place it will not be possible to establish a natural soil profile for any of the old dumps, new tailings dump or slimes dams.

No stockpiling of topsoil will therefore take place as the mining activities are concentrated on the existing tailings dumps and new ground is not exposed or impacted upon.

4.3.2 Surface layout of the mine

A copy of the plan is available at the mine offices for scrutiny when required.

The plan is updated on a regular basis with regard to the actual progress of the establishment of surface infrastructure, mining operations and rehabilitation. A copy of the updated plan is forwarded to the Director, Mineral Development on a regular basis.

No new access roads is constructed.

Access to workings

No new access roads is constructed.

Structures to be affected by blasting vibrations

No blasting activity is undertaken.

Subsidence

None

With regard to the existing sink holes in the area, formed by the mining of the kimberlite fissure, the following rules are currently enforced by contractual agreement between Sover mine and Loxton exploration:

1. No tailings are to be removed from a minimum distance of 3 metres horizontally

from the edge of any sink hole.

2. Where tailings need to be removed near any fissure and a surface drainage channel is found, a meeting must be held between the responsible persons from Sover mine and Loxton mine to discuss the potential for surface flow of the tailings or water into underground workings.

Structures and drainage affected by subsidence

None that relates to mining activity by Sover mine.

4.3.3 Mineral processing

Mined material is dumped in a feeder bin where all the +50mm material is screened. From here the -50mm material is fed by conveyer belt into the plant where the material is screened again. The -15mm goes to the first of three 14 feet rotary diamond concentration pans and the +15mm material to a Barmac crusher. From the crusher the material is also pumped to the first 14 feet pans. After the three primary rotary pans the pod is concentrated by another three 14 feet secondary pans and finally by four 10 feet sump pans. The final concentrate is then moved over eight grease tables for final recovery.

No major dust pollution is expected due to a large part of the process being a wet process and the whole plant being contained inside a building. Where some dust can be generated is the dumping of mining material into the tip bins and at the conveyer transfer points.

Some noise generation at the tip bins is expected and protective Hearing Protection is enforced.

The water used in the plant is contaminated with silt material at the rotating drum scrubbers and concentrating pans.

4.3.4 Dumping of plant waste

Plant waste:

All plant waste is dumped on the existing tailings dump near the plant. At a rate of 1800 tonnes per day, at least 1 620 tonnes of tailings is dumped daily. The current new tailing dump contains ±450 000m^3 or 1.1 million tonnes of material (Current height 28metres, length 350m, width 120 metres at base). An estimated 1.3 million tonnes of material was available to be mined by Sover mine of the dumped 1.4 million tonnes. If mined 90% of this material become new tailings creating the need to accommodate another 1.26 million tonnes.

A total of 2.4 million tonnes will need to be accommodated at the new tailings area. The surface space available is 550m x 120m and if the slopes need to be rehabilitated to an angle of 18° only 1.6 million tonnes can be accommodated before an alternative dumping site must be found.

As it is planned to rehabilitate the tailings dump over the existing slimes dams, a potential area of 200 000m^2 is available. Taking into consideration the 400 000m^3 space occupied by the slimes dams, this area can accommodate up to 9 million tonnes of tailings. If a total of 2.4 million tonnes of tailings are dumped on this area, if will only rise to a maximum height of 23 metres after being rehabilitated to 18°.

Slimes dams

Some 9% of the mined material is washed out fines and is pumped to the slimes dam. This constitutes 162 tonnes of slime material (9% x 1800t/day) for every 2865m^3 of water pumped to the slimes dam.

The mine's five slimes dams had an original combined capacity of 400 000m^3. The current capacity is ± 100 000m^3. It is expected that new mining activity will produce 126,000 tonnes or 50,000m^3 of slimes material during the life of the mine and that the current slimes dams is able to accommodate this.

Not one of the slimes dams have any engineered drainage system.

4.3.5 Transport to the market

As with any diamond transporting the exact time and method is changed from time to time. In general the final product is transported by a private security company to Kimberley airport for final destination.

4.3.6 River diversions

No river or drainage channel is diverted.

5. Environmental Impact Assessment (EIA)

The following terms of reference is used during the impact assessment

Significance

The significance rating scale is as follows:

Very high Of the highest order possible within the bounds of impacts which could occur. In the case of negative impacts, there would be no possible mitigation and/or remedial activity to offset the impact at the spatial or time scale for which it was predicted. In the case of positive impacts, there is no real alternative to achieving the benefit.

High Impacts of a substantial order. In the case of negative impacts, mitigation and/or remedial activity would be feasible but difficult, expensive, time-consuming or some combination of these. In the case of positive impacts, other means of achieving this benefit would be feasible, but these would be more difficult, expensive, time-consuming or some combination of these.

Moderate Impact would be real but not substantial within the bounds of those which could occur. In the case of negative impacts, mitigation and/or remedial activity would be both feasible and fairly easily possible. In the case of positive impacts, other means of achieving this benefits would be about equal in time, cost and effort.

Low Impact would be of a low order and with little real effect. In the case of negative impacts, mitigation and/or remedial activity would be either easily achieved or little would be required, or both. In case of positive impacts, alternative means for achieving this benefit would likely be easier, cheaper, more effective, less time-consuming, or some combination of these.

Very low Impact would be negligible. In the case of negative impacts, almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would be easy, cheap and simple. In the case of positive impacts, alternative means would almost all likely to be better, in one or a number of ways, than this means of achieving the benefit.

No effect There would be no impact at all - not even a very low impact on the system or any of its parts.

Certainty

Definite More than 90% sure of a particular fact. Substantial supportive data exist to verify the assessment.

Probable Over 70% sure of a particular fact, or of the likelihood of that impact occurring.

Possible Only over 40% sure of a particular fact or of the likelihood of an impact occurring.

Unsure Less than 40% sure of a particular fact or the likelihood of an impact occurring.

Duration

Short term - 0 to 5 years
Medium - 6 to 20 years
Long-term - more than 20 years

Magnitude

Site	- within the mine boundaries
Local	- within the relevant district
Regional	- within the relevant province or region

5.1 Construction phase

The impact during the construction phase is very low and even positive in some places as industrial- and domestic waste is cleaned up.

5.2 Operating phase

5.2.1 Geology

No impact to the geology is expected as no opencast or underground mining will take place.

No potential for subsidence exist that relates to the removal of the old tailings. A potential for subsidence relates to the change in surface drainage direction of water over or near to the mined fissure

Significance	Certainty	Duration	Magnitude
No effect	Definite	Long term	Site

5.2.2 Topography

No impact to the natural topography will take place. The existing tailings dumps is removed and rehabilitated resulting in a more pleasing and natural topography. The creation of a large single tailings dump over an area of 400m x SOOm will have a visual impact as it rises to a maximum height of 23 metres above the surrounding landscape. This will still be more pleasing than the current tailings dump which rises almost 35 metres above the landscape.

Significance	Certainty	Duration	Magnitude
High positive	Definite	Long	Site

5.2.3 Structures

The impact of building structures are temporary unless by agreement with the surface owner (Loxton exploration) it will become permanent. There has been no stockpiling of topsoil during previous mining activity.

Significance	Certainty	Duration	Magnitude
Low negative	Definite	Long term	Site

5.2.4 Storm Water Control

The one storm weir around the plant area is of such small scale and depth as to have no impact on the topography.

Significance	Certainty	Duration	Magnitude
Low negative	Definite	Long term	Site

5.2.5 Slimes

The slimes dams near the plant have only a temporary impact to a change in topography as they are to be covered with tailings during rehabilitation.

The two slimes dams on portion 3 of Doornkloof will have a permanent impact as it rises almost 4 metres above the surrounding landscape.

Significance	Certainty	Duration	Magnitude
Low negative	Definite	Long term	Site

5.2.6 Soils

No negative impacts to the natural soil or its capability is expected as all impacts have occurred during the original dumping of the tailings and waste rock. All infrastructure is already established and no new impacts are expected. The new tailings- and waste rock area is already highly disturbed and no new areas is incorporated. The removal of the old tailings will result in a positive impact to the old soil surface areas.

Some contamination of the soil around the workshop, washing bay and diesel and oil storage facilities have occurred during previous mining activities. Contamination of soil at the industrial waste area is a possibility as can be expected at any waste area.

The impact and rehabilitation of existing roads are the responsibility of Loxton exploration.

Significance	Certainty	Duration	Magnitude
High positive	Definite	Long	Site

5.2.7 Land capability

The mining area is currently not used for grazing or any agricultural activities and is in fact classified as wilderness. The land capability will therefore not change during or after mining by Sover mining as Loxton exploration will continue their own mining operations. The areas where tailings are to be removed and the new tailings area will have its land capability returned to its pre-mining capability, namely grazing after rehabilitation.

Significance	Certainty	Duration	Magnitude
High positive	Probable	Long term	Site

5.2.8 Land utilisation

The proposed mining area is currently utilised for mining purposes and as such no impact or change to the land utilisation will occur.

Significance	Certainty	Duration	Magnitude
No effect	Definite	Short	Site

5.2.9 Vegetation

No impact to vegetation from mining activity is expected as very little vegetation has established themselves on the old tailings dumps. No new or undisturbed areas with vegetation is impacted on.

Significance	Certainty	Duration	Magnitude
Very low negative	Definite	Medium	Site

As numerous parts of the mining area have been disturbed during previous mining activities, potential negative impacts have already occurred. Some invader species have established themselves as discussed earlier.

The potential impact of fire wood collection by workers of Sover mine has been addressed during the IAP process and will only be allowed on the property of Sover mine.

5.2.10 Fauna - Animal life

Mining and farming related activities and infrastructure over the past century has lead to the destruction and impact on the natural animal habitats on the mine. Very few animal or even bird life have been observed around the old mine dumps although the surrounding farm land still has abundant small animal life.

Any form of poaching is strongly prohibited and stiff penalties is enforced by management of Sover mine. Only workers and not their families is allowed to stay at the mining compound.

Significance	Certainty	Duration	Magnitude
Very Low	Definite	Medium	Site

5.2.11 Surface water

As no permanent surface water can be found on the mining area, no impact on surface water quality and yield is expected outside storm water drainage. No impact on the general surface drainage pattern of the area is expected as rehabilitation will follow the natural bedrock drainage channels. Mining will also take place outside the 1: l00 year floodline of the drainage channels.

Significance	Certainty	Duration	Magnitude
Very low negative	Definite	Short	Site

The impact of potential surface pollution areas are as follows:

5.2.12 Slimes dams:

The bedrock of the slimes dams are either an impermeable dolerite sill or a thick shale formation and very little if any water will seep into the bedrock. It is highly possible that water used to seep out along the dolerite sill or shale contact with the retaining walls of the slimes dam. Due to the age and degree of sedimentation of the slimes dams, this no longer occurs.

Significance	Certainty	Duration	Magnitude
Low negative	Possible	Medium	Site

5.2.13 The plant processing area:

If any surface water pollution does take place in the plant area, it is contained by the collection dam where all surface runoff at the plant will drain to.

Significance	Certainty	Duration	Magnitude
Very low negative	Definite	Short	Site

5.2.14 The workshop, washing bays and diesel & oil storage area:

All these facilities have been designed to prevent and contain any surface pollutants and no pollution is therefore expected.

Significance	Certainty	Duration	Magnitude
No effect	Definite	Short	Site

5.2.15 The domestic and industrial waste sites:

None of the sites are located in the 1:50 year flood line and all potential pollutants are kept in suitable containers. No surface contamination is therefore expected.

Significance	Certainty	Duration	Magnitude
Very low negative	Definite	Short	Site

5.2.16 Surface water quality

Although the water in the drainage channel is currently polluted it is highly unlikely that this relates to mining activity by Sover mining. As water from dewatering activity by Loxton exploration are being pumped into this drainage channel, this source must first be investigated and addressed by their respective EMPR.

5.2.17 Groundwater

Water Table and Yield

No impact on the areas groundwater is expected as mining does not take place below the groundwater table. All process water is abstracted from the Hartsriver or Vaalriver. Water for domestic use is supplied from one production borehole which is monitored during the life of the mine.

Significance	Certainty	Duration	Magnitude
Very Low negative	Probable	Medium	Local

5.2.18 The sewerage facilities

As the septic tanks are constructed in a dolerite sill or shale formation which is generally regarded as impermeable with good assimilative capacity for pollutants. Potential groundwater pollution problems are therefore effectively limited. The depth to the groundwater table (> 50 metres) also limits the potential risk of pollution to the groundwater aquifers.

Significance	Certainty	Duration	Magnitude
Very low negative	Definite	Short	Site

5.2.19 Groundwater Quality

The biggest risk to groundwater pollution in the area relates to the high pyrite content of the kimberlite fissure and tailings. As most of the tailings are being reworked and rehabilitated this risk should become less as the tailings are no longer exposed to free oxygen and surface water.

Significance	Certainty	Duration	Magnitude
Moderate Negative	Possible	Long – medium	Site - Local

5.2.20 Air quality

Dust from plant area

As the whole diamond extraction process is a wet process, no significant dust generation is expected except where the material is dumped into the tip bins and the conveyer transfer points. The plant is enclosed and this will limit dust generation. No crushing of material will take place.

Significance	Certainty	Duration	Magnitude
Very low negative	Probable	Medium	Site

Dust from tailings dump

Due to the size and height of the tailings dump, it constitute the highest risk to air pollution in the form of nuisance dust and at the shoot at end of the conveyer belt.

Significance	Certainty	Duration	Magnitude
Moderate Negative	Probable	Medium	Site

Dust from roads and mining activity

The biggest potential area of dust creation is on the roads, where the material is first screened and by the loading of trucks. The roads is regularly watered to minimise the occurrence of dust liberation.

5.2.21 Noise

No blasting is done and the only noise generation is expected to be at the plant and the mining site by machinery. Very little noise is being generated by the conveyer belt system.

The mining area is far from any residential areas and any new noise levels is dominated by the current surrounding mining activity.

Significance	Certainty	Duration	Magnitude
Very low negative	Definite	Medium	Site

5.2.22 Cultural-historical aspects

From investigations by Dr David Morris. from the McGregor Museum, Kimberley(Annexure 2) it is known that very few sensitive areas are found on and around the mining site. As no impacts to these sites are expected very little mitigation action needs to be taken.

Significance	Certainty	Duration	Magnitude
No effect	Definite	Long	Site

5.2.23 Sensitive landscapes

Except for the graveyard, no sensitive landscapes are found on the mining areas.

Significance	Certainty	Duration	Magnitude
No effect	Definite	Long	Site

5.2.24 Visual aspects

The existing mining environment is already visible from the gravel road that serves the area. No major change in the already negative visual impact is expected during mining, but after rehabilitation it is expected that the mining area would reflect a more environmental and visually friendly picture.

5.2.25 Permanent structures

The permanent structure of the final tailings dump is already highly visible in the area due to its current height of ±35 metres. After rehabilitation this dump is not expected to rise higher than 23 metres and will cover the existing slimes dams around it. Although the numerous small tailing dumps are also highly visible they will disappear through being reworked.

Significance	Certainty	Duration	Magnitude
Low positive	Definite	Long	Local

5.2.26 Temporary structures

The temporary structures like the plant, buildings and clean-dirty water system are not visible to the public.

Significance	Certainty	Duration	Magnitude
Low negative	Definite	Medium	Site

5.2.27 Socio-economical aspects

With the mine located in a farming and mining area with severe job shortages the creation of more work opportunities is a tremendous boost to the local economy.

The generation of any wealth contributes positively to the regional economy of the area.

Significance	Certainty	Duration	Magnitude
Very high positive	Definite	Medium	Regional

5.2.28 Interested and affected parties

All regulatory authorities have been involved in the evaluation and planning of the mine and this document and will continue to be involved.

The adjacent landowners are the IAP's to be most directly influenced by mining activities and personal meetings had been held with them.

The Following state Departments were also identified as IAP's and consulted as required:

The Department of Minerals and Energy
The Department of Water Affairs and Forestry
The Department of Agriculture

Table 11:
IAP's Impact & Complaints

IAP	Address & Tel	Impact	Concerns
Mr DG Swan Dampoort - Portion 2& 3 of Spitskop 91	PO Box 135 Barkly West 8375 Tel:053 551 0276 Se1:082 978 2094	None	Water pipe over his property creates problems - see annexure 3
Loxton Exploration (Pty) Ltd, Plot No.3752	PO Box 696 Postmasburg 8420 Tel:053 313 1689 Se1:083 522 3934	Dust Shared access	None

IAP	Address &	Impact	Concerns
Mr PA Versluis	Emerald Street	Dust	Dust pollution from vehicles
Doornkloof # 89	Barkly West 8375 Tel: 053 0188		

5.3 Decommissioning phase

No intention exists to apply for partial closure in respect of any portion of Sover mine. At the end of the mine life application for a closure certificate in terms of the Mineral and Petroleum Resources Development Act, Act 28 of 2002, will be made for the mined tailing areas and new tailings dump.

5.3.1 Geology

No additional negative impacts are expected during the decommissioning phase.

5.3.2 Topographical

No additional negative impacts are expected during the decommissioning phase.

5.3.3 Soil

No additional negative impacts are expected during the decommissioning phase.

5.3.4 Land Capability

No additional negative impacts are expected during the decommissioning phase.

5.3.5 Land utilisation

No additional negative impacts are expected during the decommissioning phase.

5.3.6 Vegetation

No additional negative impacts are expected during the decommissioning phase.

5.3.7 Fauna - Animal life

No additional negative impacts are expected during the decommissioning phase.

5.3.8 Surface Water

No additional negative impacts are expected during the decommissioning phase.

5.3.9 Ground Water

No additional negative impacts are expected during the decommissioning phase.

5.3.10 Air Quality

During the decommissioning phase additional dust is generated from trucks and other

heavy equipment as the plant is removed and rehabilitation of slime dams, tailing dumps and mining area occur.

5.3.11 Noise

During the decommissioning phase, temporary noise is created from trucks and other heavy equipment as the plant is removed and rehabilitation of slime dams, tailing dumps and mining area occur.

5.3.12 Cultural-historical aspects

No additional negative impacts are expected during the decommissioning phase.

5.3.13 Sensitive Landscapes

No additional negative impacts are expected during the decommissioning phase.

5.3.14 Visual aspects

No additional negative impacts are expected during the decommissioning phase as the plant area and slimes dam are rehabilitated. .A more aesthetically pleasing view will exist when the infrastructure is removed and the disturbed area is rehabilitated.

5.3.15 Socio-Economic Issues

During and after the decommissioning phase of the mine, less work is available and therefore fewer people would be employed. The impact is negative.

5.3.16 Interested and Affected Parties

The aim with the decommissioning of the mine is to create an acceptable post-mine environment and land-use. Therefore all agreed commitments are implemented by Mine Management.

5.4 After-effects following closure

5.4.1 Acid mine drainage

Some potential for acid and bad quality leachate development exist as a high percentage of the mined material contains pyrite mineralisation. As the area exhibits a negative climatic water balance there should be no significant leachate generation out of the residu deposits. The natural alkaline nature of the area also inhibits the formation of acidic leachate as is evident from the surface water sample which contains very high concentrations of sulphate but the pH is still above 7.9.

5.4.2 Long term impact on ground water.

No long term impact on the groundwater yield or quality is expected as mining will not impact on the areas aquifer. The water table from the production borehole should recover a bit and rise as less people makes use of it.

5.4.3 Long-term stability of rehabilitated land

One of the main aims of any rehabilitated ground is to obtain a self-sustaining and stable end result in part by sloping all dumps to 18°. As the end use of the mining land

is grazing, the rehabilitated land will have long term stability.

5.4.4 Long-term influence of river diversions

No river diversions are planned.

6. Environmental Management Plan (EMP)

Sover mining (PTY)Ltd recognises its legal responsibility regarding any mining activity and a management system is developed to comply with the objectives and principles set out in this chapter. Sover Mine further binds itself to the principles of Integrated Environmental Management (IEM) which will include internal EMP performance assessment and reporting to DME and a final EMP performance assessment at closure.

6.1 Construction phase

This phase is already completed.

6.2 Operational phase

All rehabilitation referred to in this section is done concurrent to operation as far as possible.

6.2.1 Geology

A potential for subsidence relates to the change in surface drainage direction of water over or near to the mined fissure

Management Standards

The manager is responsible to monitor the extraction ratio. It is further his responsibility to mark movement of dumps on a plan provided for the purpose.

Management action:

No material is mined or disturbed unnecessarily and mining is done to accepted international mining methods.

No tailings are to removed from a minimum distance of 3 metres horisontally from the edge of any sink hole. If tailings are to be removed near any fissure where a surface drainage channel is found, a meeting will have to be held between the responsible Manager at Sover mine and the responsible mining officials at Loxton mine to discuss the potential for surface run/flow of the tailings or water into underground workings.

6.2.2 Topography

Expected impact

A permanent single large tailings dump and two permanent slimes dams.

Management standards:

The management action is subjected to the guidelines in the Code of Practice for Mine Residue Deposits as contemplated in the instruction in this regard by the Chief Inspector.

Management action:

No unnecessary features e.g. stockpiles is created and care is taken that no structure will change the original topography permanently.

All dumps is rehabilitated to slope of 18°, taking care not to impact on any new areas around the dumps. Sampling and analysis of the stockpiles is done during rehabilitation and if necessary, soil amelioration is done. Compacted areas is ripped and levelled in order to re-establish a growth medium.

All temporary structures like the plant, buildings, storm water weirs and topsoil stockpiling is removed, the area ripped to a depth of 300mm and the topsoil returned (where available) to its original depth to provide a growth medium. If per agreement the surface owner wants to keep the buildings, the relevant authorities is informed.

6.2.3 Soils

Expected Impact

Some contamination of the soil around the workshop, washing bay, diesel & oil storage facilities and industrial waste area.

Management standards.

The management action is subjected to the guidelines in the Code of Practice for Mine Residue Deposits as contemplated in the instruction in this regard by the Chief Inspector. A zero tolerance attitude towards soil pollution has been adopted.

Management action

All new areas where topsoil is to be impacted on is removed and stockpiled. The maximum height of stockpiles is 2.5 meters. The topsoil and subsoil is stockpiled separately as to prevent destruction of the natural soil profile for each area.

Management takes responsibility to ensure that no unnecessary land with grazing potential is lost or impacted on during mining activity.

The topsoil is used during the rehabilitation of any impacted areas, after sloping to 18° or less, to regain a growth medium in order to re-establish the same land capability. No rectification of topsoil is expected as no soil should be contaminated during mining.

Sampling and analysis of selected topsoil areas will again be done after rehabilitation to determine if soil amelioration (cultivation) is necessary.

Any compacted areas are ripped to a depth of 300mm and levelled in order to re-establish a growth medium

Erosion control in the form of re-vegetation and contouring of slopes is implemented on mined areas and where found necessary during the rehabilitation of the mining areas.

On all new areas of infrastructure development, the topsoil is removed and stockpiled for rehabilitation purposes. Where the soil is compacted due to vehicle movement the soil will he ripped or ploughed. This is limited as existing roads and infrastructure is used.

If any soil is contaminated during the life of the mine or during closure, it is removed together with the contaminant and placed in acceptable containers to be removed with the industrial waste to a recognised facility or company.

6.2.4 Land capability

Expected impact

The areas where tailings are to be removed and the new tailings area will have its land capability returned to its pre-mining capability, namely grazing after rehabilitation.

With reference to the original pre-mining land capability of the mine, an area of at least 25 hectares will only have a limited grazing capability after rehabilitation.

No change in land capability will occur during mining.

Management standards:

The management action is subjected to the Chamber of Mines Guidelines for Environmental protection. The Engineering Design, Operation and of Metalliferous, Diamond and Coal Residue Deposits, Sections 8 to 13.

The land capability is not to be further limited except where unavoidable.

Management action:

All management action is directed to prevent any change in the land capability by limiting all unnecessary surface disturbance.

Final rehabilitation, through a process of reclamation, reseeding and the removal of erosion gullies and invader plants, will result in the restoration of the mined areas land capability.

Due to a shortage of topsoil, full rehabilitation of the tailings dumps will probably not take place and only a limited grazing land capability is expected after closure.

6.2.5 Land use

Expected impact:

Land use will not change and will stay mining even after rehabilitation.

Management standards:

No area of the land is mined before an Environmental Assessment is done.

Management action:

Rehabilitation is done to such a standard as to ensure that land use revert to its pre-mining use.

6.2.6 Vegetation

Expected impact:

No impact to the vegetation is expected as previous mining activity has already disturbed large areas of the natural vegetation. Previous mining activity in the area has already impacted on the type of plant species found and invader or exotic species have established themselves.

Management standards:

Mineral and Resources Development Act and Regulations, Act 28 of 2002.

Atmospheric pollution Act (Act 45 of 1965) Sections 8, 28, 29 and 30.

Management action:

All areas disturbed by mining activities is monitored over a period of two rainy seasons. If the natural vegetation are not found to establish themselves the topsoil is seeded with a seed mixture reflecting the natural vegetation as is currently found. If this is not found to be feasible during rehabilitation a general seed mixture as provided by Eco-Rehab of Potchefstoom University, is used.

Management will also take responsibility to control declared invader or exotic species. The following control methods are used:

(i) "The plants is uprooted, felled or cut off and can be destroyed completely by burning or any other suitable method".

(ii) "The plants is treated with a herbicide that is registered for use in connection therewith in accordance with the directions for the use of such a herbicide".

The end objective of the vegetation program is to achieve a self-sustaining habitat unit.

Vegetation on flat surfaces is established using the dry lands technique requiring no irrigation.

Monitoring of the rehabilitation will take place annually after the rainy season using a wheel-point apparatus. Special attention is given to basal and crown cover, species diversity and the vitality of the vegetation.

All workers of Sover mine have strict instructions that any collection of wood for fire is not allowed except where provided for by mine management.

6.2.7 Fauna

Expected impact:

Animal life has already been effected by previous mining activity and will continue to be affected by any new mining. As mining activity decreases and closure is foreseen,

most of these species will re-establish themselves due to the expected high quality of rehabilitation.

Management standards:

Any form of poaching by workers of Sover mine will result in the maximum form of punishment as allowed by law.

If species diversity does not reflect the surrounding non-mining area after closure, suitable action is taken if deemed necessary by the Department of Nature Conservation.

6.2.8 Surface water

Expected impact:

No impact on surface water is expected as no perennial surface water is found on the mining area.

Management standards:

DWAF SA Water Quality Guidelines - Vol 3 Industrial use National
Water Act, 1998 (Act 36 of 1998)

Management action:

A clean water system, consisting of a number of weirs and channels is constructed. This system is able to divert run-off from the peak precipitation event of 1:100 years recurrence interval around the plant- , tailings dump and slimes dams area.

A dirty water system collect all contaminated process water from the plant and slimes dam area(seepage water) to the collection dam and is used in a closed recycle circuit. A sample from the toe trench of the slimes dams is taken annually to monitor its sulphar and heavy metal content.

The seepage water from the slimes dams report to the trench, from where it is pumped to the collection dam, thus forming part of the dirty water system.

6.2.8.1 Water balance

During the screening and sorting process of the plant, water is used to facilitate the process. The water is contaminated with silt, clay minerals and other suspended solids. This will impact mainly on the turbidity of the water. No chemicals is used in the mining process and no heavy metal pollution can therefore be expected.

The process water is pumped to the slimes dams where most, if not all, the suspended solids will settle out. A system of toe trenches will recover all subsurface seepage to a collection dam.

A proper closed dirty water system is implemented and managed in such a way that no water from the plant and workshop area enters the natural hydrological system.

6.2.8.2 Storm water,

Storm water drains and weirs are constructed where necessary. These structures and

ones like, trenches and embankments are inspected and evaluated at regular intervals. The water from these structures is canalised into the natural surface drainage path. The investigation and mapping of the 1:100 year 24 hour storm areas is used in the construction of these structures.

The slimes dam is monitored continuously untill closure to determine if it is silted beyond the 1:100 year storm water containment capacity. All components of the water management system is designed to retain run-off from a 24 hour duration storm event with a 100 year recurrence interval plus freeboard. The capacity to retain the event is over and above the normal operating facility.

The minimum freeboard which is required to accommodate water on top of the tailings dam, is 0.5 metres over and above the normal water deposition with the tailings and the 1:100 year 24 hour rainfall event.

The tailings dam is classified for safety purposes, which includes the stability, according to hazard criteria to indicate the potential harm as a consequence of failure.

From such a classification each deposit is classified as either a high, medium or low hazard.

The toe trenches of the slimesdams is constructed so as to take into account a 1:100 year storm event.

Each trench is dug to the depth of bedrock (normally not deeper than 500mm) along the length of the slimes dams.

6.2.8.3 Surface rehabilitation

All compacted areas are ripped and levelled in order to re-establish a growth medium. This is done as so to prevent erosion on slopes. Flow patterns are re-constructed in such a way that surface water flow is towards the natural drainage area.

6.2.8.4 Surface water users

None along the affected drainage channel.

6.2.8.5 River diversions

No river diversions are planned.

6.2.9 Groundwater

6.2.9.1 Surface rehabilitation

It is expected that the mining activity by Sover mine will not have any effect on the groundwater quality of the area. Nonetheless care is taken that a stable and self-sustaining rehabilitated surface is created and surface impact be minimised.

All water used in the mining process is abstracted from the Hartsriver and Vaalriver irrigation canals in consultation with the Department of Water Affairs and Forestry.
The maintenance of vehicles and equipment used for any purpose during the crushing operation will only take place within the maintenance yard area.

Equipment used in the crushing operation is adequately maintained, so that during operation they do not spill oil, diesel, grease or hydraulic fluid that could contaminate groundwater resources.

6.2.9.2 The legitimate ground water users

No impact to the regional water table or water quality is expected.

6.2.10 Air quality

Expected impact:

As mining activity would be opencast, some impact in the form of dust and noise can be expected.

Dust generation at the mine site, on roads, where dumping occurs on the screens and tip bins, the final tailings dump and all conveyer transfer points would constitute the main areas of concern.

Management standards:

The Atmospheric Prevention Pollution Act (Act 45 of 1965) Sections 9,28, 29 and 30

The Mine Health and Safety Act (Act 29 of 1996) as amended by the Mine and Health and Safety Amendment Act (Act 12 of 1997), Chapter 2

Environmental Act and Regulations

Mineral Petroleum and Resources Development Act

Management actions

All dust created from the screening of tailings is controlled by either a dust collecting unit, spraying of water or a other environmentally friendly dust allaying agent. The release of dust into the atmosphere is limited as far as practicable.

All roads are sprayed with water or an environmentally friendly dust allaying agent at regular intervals to ensure that dust is adequately suppressed.

Where screening takes place the area or building is adequately ventilated and the floor and other surfaces as well as the machinery, is regularly cleaned so as to prevent the accumulation of dust.

If necessary extinction system with dust filters is installed in the plant area.

Rock and tailings dumps are rehabilitated and vegetated as an ongoing process during mining to further prevent any dust source.

6.2.11 Noise

Expected impact

All mining activity is associated with noise generation. Where the noise level is at high levels over 85 dB(A), this can lead to permanent hearing loss.

Management standards

All the relevant legislation is made applicable to this operation. The statutory acts and regulations are not repeated further as they all remain applicable through-out the mining process, from cradle to grave.

Management actions

The management objective is to reduce any level of noise, shock and lighting that may have an effect on persons or animals, both inside the mining area and that which may migrate outside the mining area, to an acceptable minimum level.

When the equivalent noise exposure, as defined in the South African Bureau of Standards Code of Practice for the Measurement and Assessment of Occupational Noise for Hearing Conservation Purposes, SABS 083 as amended, in any place at or in any mine or works where persons may travel or work, exceeds 85 dB(A), the Manager will take the necessary steps to reduce the noise exposure below this level.

Hearing protection is available for all employees where attenuation cannot be implemented.

Mechanical equipment:

All mechanical equipment is in good working order and vehicles will adhere to the relevant noise requirements of the Road Traffic Act.

All vehicles in operation are equipped with a silencer on their exhaust system.

Where necessary appropriate lubricants are applied to ensure that surfaces which interact during mechanical movement do not generate undesirable noise levels.

Safety measures which generate noise such as reverse gear alarms on large vehicles are appropriately calibrated/adjusted.

Screening/Migration control:

Appropriate measures will specifically be installed and or employed at the plant to act as screen and to reflect/reduce the noise.

Appropriate non-metallic washers/isolation is used with any joining apparatus to join screens such as corrugated iron to other structures and to each other. Such screens is maintained in a fixed position.

Blasting :

No blasting is done.

6.2.12 Sensitive landscapes

The only sensitive landscape is the graveyard which is located away from any planned mining area. This area was declared a protected area and clearly identified through fencing and demarcation. No mining development is allowed within 100m from the graveyard.

6.2.13 Visual aspects

Expected impact:

It is mainly the new tailings dump that is visible from the public gravel roads.

Management standards:

Aesthetic considerations apply.

Management actions:

Temporary structures:

Buildings are repainted and maintained during the mined operating life. After mine closure these buildings are demolished if no further use is found for them. Any new infrastructure will take into account the visual impact this might have on the public.

Permanent structures:

The slime dams and tailings area is rehabilitated and vegetated as to blend in with the surrounding landscape. They is sloped at an angle of 18° to be aesthetically more pleasing and stable. They will however always be visible as elevated areas.

6.2.14 Regional socio-economic structures

The mine has a positive impact on the socio-economic upliftment of the local communities.

Mine management joined forces with the Regional Service Council in addressing the long term socio-economic issues of the immediate area.

The mining activities creates immediate employment opportunities for at least 60 locally skilled and unskilled workers.

6.2.15 Interested and affected parties

Table 12: IAP's : Mitigation measures

IAP	COMPLAINTS	MITIGATION MEASURES
Mr DG Swan Dampoort – Portion 2 & 3 of Spitskop 91	• Water pipe leaks • Fence damaged • Dumping of tailings over fence • Damage to electrical cable • Trespassing of workers	• Pipe has been repaired • Fence has been repaired • Tailings has been cleared • Electrical cable to be repaired • No trespassing is allowed
Loxton Exploration (PTY) LTD Plot no 3752	None	
Mr PA Versluis Doornkloof #89	None	

6.2.16 Presentation of information

Annually

A performance assessment report is submitted to the DME. An EMP review is submitted to the DME.

Quarterly

A water monitoring report is submitted to DWAF.

Personal dust sampling results are submitted to the DME. Sampling is conducted as per sampling schedule as depicted in the Code of Practice for Airborne Pollutants applicable at the mine.

Personal noise sampling results are submitted to the DME. Sampling is conducted as per sampling schedule as depicted in the Code of Practice for Noise Exposure applicable at the mine.

Fall out dust sampling is conducted and thirty day periods are sampled and reports generated to establish the extend, if any, of airborne pollutants that could pollute over the mining borders.

6.2.17 Maintenance (Aftercare)

Maintenance of the following items will continue until the Department of Minerals and Energy issues a closure certificate.

6.2.17.1 Rehabilitated land

Any disturbed area, which was rehabilitated is monitored every 6 months to ensure that no erosion is taking place. If signs of erosion are detected, it is repaired and if necessary, design changes made. These actions are included in the annual report to the Department of Minerals and Energy.

Further monitoring with regard to the re-establishment of plant species is done after every rainy season. Special attention is given to the control of invader species and remedial action taken.

6.2.17.2 Water pollution control structures

Water control structures are monitored every 6 months in order to check for signs of damage. After a heavy rainstorm, these structures are monitored and any damage repaired immediately. The slimes dam will also be monitored and maintained every six months to ensure that it will not lose its capacity. These actions are included in the annual report to the Department of Minerals and Energy.

6.2.17.3 Rehabilitated residue deposits

The potential for long term deterioration in water quality as well as the potential leachate development from the tailings dump is insignificant due to the negative water balance of the area.

The main maintenance that will therefore be done on the tailings-, waste rock dumps and slimes dams will include monitoring the vegetation growth and the 18° gradient of the slope every 6 months.

These actions is included in the annual report to the Department of Minerals and Energy.

6.3 Clean-up Phase and Closure

6.3.1 Closure Objectives

The main closure objective of Sover Mine is to restore the site to the original land capability, using the best available technology not entailing excessive cost (BATNEEC). Another main objective is to manage and limit any impact to the groundwater aquifers in such a way that an acceptable water quality and yield can still be obtained, when a closure certificate is issued.

Management is further aware of the requirements of Regulation 61 of the Mineral Petroleum Resources Development Act and Regulations Act 28 of 2002 which state:

Closure objectives form part of the draft environmental management programme or environmental management plan, as the case may be, and must –

(a) identify the key objectives for mine closure to guide the project design, development and management of environmental impacts;

(b) provide broad future land use objective(s) for the site; and

(c) provide proposed closure costs.

Management at Sover Mine (Pty) Ltd is further aware of the contents of a Closure Plan as contemplated in Regulation 62 of the Act:

A closure plan contemplated in section 43(3)(d) of the Act, forms part of the environmental management programme or environmental management plan, as the case may be, and must include –

(a) a description of the closure objectives and how these relate to the prospecting or mine operation and its environmental and social setting:

(b) a plan contemplated in regulation 2(2), showing the land or area under closure;

(c) a summary of the regulatory requirements and conditions for closure negotiated and documented in the environmental management programme or environmental management plan, as the case may be;

(d) a summary of the results of the environmental risk report and details of identified residual and latent impacts;

(e) a summary of the results of progressive rehabilitation undertaken;

(f) a description of the methods to decommission each prospecting or mining component and the mitigation or management strategy proposed to avoid, minimize and manage residual or latent impacts;

(g) details of any long-term management and maintenance expected;

(h) details of a proposed closure cost and financial provision for monitoring, maintenance and post closure management;

(i) a sketch plan drawn on an appropriate scale describing the final and future land use proposal and arrangements for the site;

(j) a record of interested and affected persons consulted; and

(k) technical appendices, if any.

6.3.2 Infrastructure areas

On completion of the mining operation, the various surfaces, including a portion of the access road, the office and residential sites, vehicle maintenance yard, storage areas and the plant site, will finally be rehabilitated as follows: All tailings or other material on the surface will be removed to the original topsoil level. The material will then be dumped on the tailings dump. Any compacted areas will be ripped to a depth of 300mm, the topsoil returned and landscaped.

All infrastructure, equipment, plant, temporary housing and other items used during the operational period will be removed from the site.

Rehabilitation of the vehicle maintenance yard and secured storage areas

On completion of the mining operation, the above areas will be cleared of any remaining contaminated soil which will be placed in acceptable containers and removed with the industrial waste to a recognised waste deposite facility or by a waste removal company.

The surface will be ripped or ploughed to a depth of at least 300 mm and the topsoil, previously stored adjacent to the site, will be distributed evenly to its original depth over the whole area. The area will then be fertilised if necessary (based on a soil analysis).

The site will be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.

Any other disturbed areas will be rehabilitated as described under the relevant activities.

6.3.3 Mine residue deposits

6.3.3.1 Disposal facilities

Waste material of all description inclusive of receptacles, scrap, rubble and tyres is removed entirely from the mining area and disposed of at a recognised landfill facility. It will not be permitted to be buried or burned on the site.

The different waste disposal facilities will also be rehabilitated.

6.3.3.2 Ongoing seepage, control of rain water.

No potential negative impacts are expected, but water management will be done in conjunction with rehabilitation.

6.3.3.3 Long term stability

It is the objective of mine management to ensure the long term stability of all rehabilitated areas. This is done by the monitoring of all areas until a closure certificate has been issued.

6.3.3.4 Final rehabilitation in respect of erosion and dust control

A self sustaining vegetation as planned which will control erosion and dust and no further rehabilitation is planned.

6.3.4 Sealing of underground workings and rehabilitation of dangerous excavations

N/a

6.3.5 Final rehabilitation of opencast mine-haul ramps and roads and final **voids.**

After rehabilitation has been completed, all roads are ripped or ploughed, fertilised and seeded, providing the new landowner does not want them to remain that way and with written approval from the Director Mineral Development of the Department of Minerals and Energy.

6.3.6 Submission of information

Reports on rehabilitation and monitoring is submitted annually to the Department of Minerals and Energy – Kimberley.

6.3.7 **Maintenance** (Aftercare)

Maintenance after closure will mainly concern the regular inspection and/or completion of the re-vegetation programme, which might still be incomplete at that stage.

The aim of the environmental management plan is for rehabilitation to be self-sufficient, so that the least possible aftercare is required.

6.4 Time schedules

6.4.1 Prospecting projects

No new drilling exploration program is planned.

6.4.2 Mining projects

6.4.2.1 Submission of mining EMP and applications for mining authorisation.

The final EMP is submitted before December 2009.

6.4.2.2 Start and duration of construction period

n/a to this project. Operational Phase in progress.

6.4.2.3 Proposed start of mining, full production- and ceasing of production dates

Mining has started in June 2000.

6.4.2.4 Proposed rehabilitation program

The restoration of the environment is continuous during mining activities which is currently in full operation.

This form part of the operational phase and rehabilitation should be completed at the end of the decommissioning phase.

6.5 Financial provision

Sover Mining (Pty) Ltd undertakes to adhere to the following principles:

1. The quantum of the financial provision is based on the requirements stipulated in the approved EMPR. See **Annexure 1** for details of Financial Provision lodged with the DME.

2. Ongoing rehabilitation costs is provided form working costs during the life of the mine as set out in the approved EMPR.

3. The obligation to make provision will apply from the date of approval of the EMPR to the date of issue of the closure certificate.

4. The initial quantum of provision is calculated by management band approved by the DME after consultation with all governmental departments who may be affected.

5. The quantum of provision is revised on a regular basis.

6. The rehabilitation funds will only be utilised for the purpose for which they were originally intended and no cross-subsidisation for rehabilitation between different operations, companies or persons is permitted.

7. The funds is safe from seizure in case of the liquidation of Sover Mining (Pty) Ltd.

8. The financial provision will at all times be to the satisfaction of the Director: Mineral Development.

Financial provision for the rehabilitation of land disturbed by mining is made in the form of a guarantee by an acceptable financial institution in which the institution guarantees the availability of an acceptable sum of money payable on demand to the DME.

7. Conclusion

When the closure objectives are met, the general overall net impact on the environment will be as follows:

* A slightly different relief and topographical features after rehabilitation.

8. Confidential Material

None

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Annexure 1

Revised EMP
Quantum of financial provision

August 2009

REHABILITATION COST ESTIMATE FOR SO VER MINE: 2003 EMPR

When the EMPR was accepted and approved in June 2003 the estimated total cost of rehabilitation work at So Ver Mine was R1 194 920. Since that time much of the rehabilitation work has been completed, including the dismantling and removal of almost the entire mine site infrastructure as it was redundant and there was a need to move to a smaller, more cost effective mining method.

REHABILITATION COST ESTIMATE FOR WORK COMPLETED SINCE 2003

As such the following rehabilitation and costs associated with it have been completed since the 2003 approved EMPR:

Dismantling and removal of the stationary processing plant from the mine site. Approximate cost: R125 000

Dismantling and removal of conveyor belts and supporting infrastructure from mine site. Approximate cost of: R 75 000

Destruction and removal costs for temporary buildings from mine site. Approximate cost:

Office:	R 15 000
Storeroom and workshop:	R 20 000
Screens and feed bins:	R 20 000
Site fencing, electric cables, retaining walls:	R 15 000

Backhauling of dirt and spreading and contouring areas previously covered by tailings. Approximate cost: R250 000

Covering over slimes damns with tailings. Approximate cost: R100 000

Removal of pipeline from Harts River and filling up of old storm water weirs and drains. Approximate cost: R 50 000

Partial sloping and contouring of waste tailings dump located at mine site. Approximate cost: R 50 000

Total Estimated funds spent on rehabilitation work since 2003: R720 000

REHABILITATION COST ESTIMATE FOR WORK YET TO BE COMPLETED

In December 2007 the company had an independent valuation company compile a valuation report on the company owned property. At that time it was determined that the residential houses, compound and related buildings added a value of more than R440 000 to the value of the land and should therefore NOT be destroyed.

In the EMPR approved in 2003 a destruction and removal cost for these buildings of approximately **R35 000** was included. This cost should therefore be eliminated from the total estimated rehabilitation cost.

The last major area of rehabilitation work yet to be completed is with the contouring and reseeding of the waste tailings and slimes area. As mentioned above, of the 5 slimes damns that were built to accommodate the mining operation, 2 have already been covered with tailings and contoured, the 2 smaller ones are covered by natural growth and should be considered rehabilitated. There is really only one slimes damn to be covered.

Also, part of the large waste tailings dump was sloped using a bulldozer and is considered to be 20% contoured. Work was stopped so that testing could be done to determine whether the reprocessing of this dump for the further recovery of diamonds is feasible. Only once this is determined can rehabilitation work begin again.

Therefore the estimated rehabilitation costs (based on the 2003 approved EMPR) for work yet to be completed can be determined as follows:

Rehabilitation of tailings and slimes damn area (2003 estimated costs):	R656 000
Reseeding of final tailings area (2003) estimated costs):	R190 000
Estimated 2003 total cost:	R846 000
Less 30% for work already completed on tailings dumps and slimes:	R253 800
Estimated total at 2003 costs:	R592 200
Less amount included in 2003 EMPR for destruction of buildings:	- R 35 000
So Ver Mine total estimated current rehabilitation cost:	**R557 200**

REHABILITATION GUARANTEES IN PLACE FOR WORK TO BE COMPLETED

As per the letters from the Department of Minerals and Energy and copy of the 31 March 2009 So Ver Mine call account statement (funds ceded to DME for rehabilitation), the total amounts So Ver Mine (Pty) Ltd has made available to complete the necessary rehabilitation work at So Ver Mine is as follows:

Amount deposited with and held by DME:	R268 937
Amount in So Ver Standard Bank call account ceded to DME:	R308 847
Total amount of funds available for rehabilitation work:	**R577 784**

The rehabilitation costs will be audited internally on an annual basis and the financial guarantees adjusted accordingly. At present though, the amount either deposited with, or ceded to DME should be sufficient to cover the costs of rehabilitation at So Ver Mine.