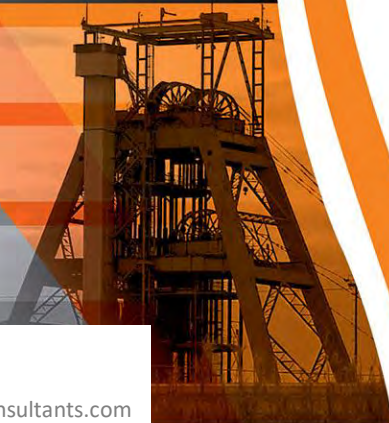




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**SITE CLEARANCE AND MINE  
CLOSURE ESTIMATE:  
REPORT**

**QS:**

Compiled: AW Calder  
Chartered Quantity Surveyor

**APRIL 2018**

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## 1. Preamble

We thank you for the opportunity to assist you with and submit the Site Clearance, Rehabilitation and new proposed infrastructure mine closure Estimate and report for the West Wits mining operations.

The following facilities have been considered in this estimate:

- Kimberley Reef East; and
- Bird Reef Central

## 2. Methodology

### 2.1 Quantification

Site visits were undertaken to assess the current infrastructure on site for each of the areas listed above. The current infrastructure will need to be cleared, in order for the construction of the new proposed Infrastructure layout designed by Barra Consulting.

The site visits were accompany by a mining representative (Eddie), who indicated to the site team which structures needs to be surveyed for site clearance.

A detailed ground survey was conducted by SGH Surveyors. All rubble and partial infrastructure components were surveyed and indicated on drawings – Refer to **Appendix A** – Site Clearance drawings for the detailed mapped drawings for Bird Reef Central and Kimberley Reef East.

The West Wits office compound was an addition added to our scope and a site visit was conducted to manually measure and quantify the West Wits Compound. However, the compound is not included in the final calculation as part of this report because it is owned by a 3<sup>rd</sup> party, who take responsibility of the infrastructure and the maintenance thereof.

Previous arial surveys were conducted by others. EPCM compared these arial surveying data with the data obtained from the ground survey, in order to determine any rubble or partial infrastructure components which might have been excluded from this site clearance and mine closure estimate.

We have mapped the existing structures on the terrain and each structure was measured and quantified, by EPCM Consultants, either as an area or a volume. Each site measurement pertains to linear meter, area and/or volume with appropriate elemental factors applied as listed in the assumptions. In **Appendix A** – Site Clearance drawings, the current rubble and partial infrastructure is indicated on the mapped drawings.

The photos contained in the mapped drawings of the rubble and partial infrastructure is referenced back to the quantification sheets for each of the areas

We have received a proposed new infrastructure layout from Barra Consultants (Pty) Ltd. Barra Consultants also issued a breakdown of each of the required new infrastructure for each area in linear meters (m), areas (m<sup>2</sup>) and volume (m<sup>3</sup>). Included in the proposed new infrastructure received from Barra Consulting, the type of infrastructure was also indicated based on prefabricated structures, clad structural steel structures and the height for each new structure.

The received information from Barra Consulting was measured and quantified, by EPCM Consultants, either as an area or a volume. Each site measurement pertains to linear meter, area and/or volume with appropriate elemental factors applied as listed in the assumptions. The drawings of the proposed layouts and infrastructure is contained in **Appendix B**: Barra proposed Layouts and Infrastructure detail.

The quantification sheets are contained in **Appendix C** – Quantification. These quantification sheets will be prepared into formal Bills of Quantities (BOQ's) once the project team is into the next phase of the overall design phase of the project. These detailed BOQ's will then be send to the market to obtain current and tendered rates to execute the site clearance and mine closure projects, as well as the most suitable Contractual Strategy for the execution phase of the mine closure projects.

### 3. Rates

The rates utilised for the Estimates is based on escalated database rates for rehabilitation, demolition, closure and salvage costs for structural steel, which was tendered previously for similar projects. The initial rates were obtained from an appropriate experienced third party and escalated accordingly.

#### 3.1 Definitions

- **Gross Demolition Cost:** This is the cost to demolish structures and remove the demolished material to a waste facility or salvage facility as appropriate.
- **Scrap Value:** This is a credit payable by a contractor to the Client to remove certain materials from the Client's premises.

### 4. Notes

- The Estimate is based on site measurements taken on the West Wits operations and the new proposed layout for future infrastructure;



- The existing infrastructure was quantified as per the indications of the mine representative; and
- In so far as is possible, the numbering system of the structures on the aerial map was referenced back to the structures contained in the Bills of Quantities (BOQ), for each area, refer to Annexure A – Site Clearance drawings.

## 5. Assumptions and Exclusions

The following exclusions have been specifically excluded from this Estimate:

- 1.1.1 The estimate is based on the element that all Mechanical and Electrical Equipment will be the responsibility of the Mine and will be removed at the start of the rehabilitation process.
- 1.1.2 Carport type structures with IBR roof covering Structural Steelwork is based on a factor of 15kg/m<sup>3</sup>;
- 1.1.3 Workshop type structures with IBR roof covering and IBR side cladding; Structural Steelwork is based on a factor of 30kg/m<sup>3</sup>;
- 1.1.4 Large multi-level buildings with IBR roof coverings and side claddings: Structural Steelwork is based on a factor of 45kg/m<sup>3</sup>;
- 1.1.5 The rate for the rehabilitation placement of topsoil is based on hauling the topsoil to the placement area from a borrow pit (to be identified) and covered by means of hydro seeding;
- 1.1.6 All filling and levelling of the existing site, for each area, is specifically excluded from this Estimate;
- 1.1.7 The current tailings facility, at Bram Fischer is also excluded from this Estimate;
- 1.1.8 The value for the salvage of Structural Steelwork is an estimated value only due to the volatility of the scrap steel market;
- 1.1.9 Preliminary and General cost of 5% for Fixed Charge Items and 10% for Time-Related Items, on the demolition cost for each BoQ, are included for each area;
- 1.1.10 Due to the current level of detailed Engineering and state of the current site, a Contingency value of 10% was allowed for each area, for both the site clearance and new infrastructure demolition;
- 1.1.11 Concrete are assumed to be from surface beds and foundations except where indicated differently;
- 1.1.12 The existing head gear on site will be refurbished and the demolition of such, is included in the mine closure cost of the proposed new infrastructure. Steelwork is based on a factor of 85kg/m<sup>3</sup>;
- 1.1.13 The removal and salvage of all Mechanical Equipment, Plastic Tanks, Cabling, Galvanised piping, Sign Board and poles, Railway Lines, Farmland clearings, high mast lighting etc;
- 1.1.14 The removal and or rehabilitation of all stockpiles and dumps included in the rehabilitation estimate;

- 1.1.15 Any underground services, facilities and / or areas;
- 1.1.16 Detailed Bills of Quantities (BOQ) will only be prepared for the detailed project study and phasing. The detailed BoQ will be utilised for tendering purposes; and
- 1.1.17 Any items or structures not clearly visible, with special reference to the infrastructure measurements and dense shaft areas.

## 6. Summary

The summary of the new proposed infrastructure mine closure and rehabilitation costs are contained in **Table 1** below, whereas the site clearance cost is contained in **Table 2**.

The 15% Preliminary and General and 10% Contingencies costs are included in the values below.

A more detailed summary of the quantities for each area is contained in **Appendix C – Quantification** and the Excel spreadsheet, referenced **Annexure B: EPCM Closure estimate for the infrastructure complexes**.

**Table. 1 – OVERALL NEW PROPOSED INFRASTRUCTURE MINE CLOSURE AND REHABILITATION COST:**

<b>Summary West Wits Infrastructure and Mine Closure Cost</b>	
<b>Bird Reef Central - Infrastructure</b>	
<b>SUB-TOTAL Bird Reef Central - Infrastructure</b>	<b>9 363 440,70</b>
<b>PRELIMINARY AND GENERAL COST (5% Fixed cost and 10% Time Related cost)</b>	<b>1 404 516,11</b>
<b>CONTINGENCY (10%)</b>	<b>1 076 795,68</b>
<b>TOTAL Bird Reef Central - Infrastructure (6% escalation CPI applied)</b>	<b>12 555 437,64</b>
<b>Kimberley Reef East - Infrastructure</b>	
<b>SUB-TOTAL Kimberley Reef East - Infrastructure</b>	<b>5 381 121,05</b>
<b>PRELIMINARY AND GENERAL COST (5% Fixed cost and 10% Time Related cost)</b>	<b>807 168,16</b>
<b>CONTINGENCY (10%)</b>	<b>618 828,92</b>
<b>TOTAL Kimberley Reef East - Infrastructure (6% escalation CPI applied)</b>	<b>7 215 545,22</b>
<b>Mine Closure : Steel Salvage cost</b>	
<b>TOTAL Bird Reef Central: Steel Salvage cost</b>	<b>- 3 686 447,63</b>
<b>TOTAL Kimberley Reef East - Site Clearance: Steel Salvage cost</b>	<b>- 440 697,91</b>
<b>TOTAL: Steel Salvage cost for proposed new infrastructure</b>	<b>- 4 127 145,55</b>
<b>GRAND Total West Wits Infrastructure and Mine Closure Cost</b>	
	<b>19 770 982,86</b>

**Table. 2 – OVERALL SITE CLEARANCE COST:**

<b>OVERALL Summary West Wits Site Clearance Cost</b>	
<b>Bird Reef Central - Site Clearance</b>	
<b>SUB-TOTAL Bird Reef Central - Site Clearance</b>	<b>2 804 916,33</b>
<b>PRELIMINARY AND GENERAL COST (5% Fixed cost and 10% Time Related cost)</b>	420 737,45
<b>CONTINGENCY (10%)</b>	322 565,38
<b>TOTAL Bird Reef Central - Site Clearance</b>	<b>3 761 112,30</b>
<b>Kimberley East Reef - Site Clearance</b>	
<b>SUB-TOTAL Kimberley East Reef - Site Clearance</b>	<b>1 856 914,42</b>
<b>PRELIMINARY AND GENERAL COST (5% Fixed cost and 10% Time Related cost)</b>	278 537,16
<b>CONTINGENCY (10%)</b>	213 545,16
<b>TOTAL Kimberley East Reef - Site Clearance</b>	<b>2 489 936,55</b>
<b>Bird Reef Central - Site Clearance : Steel Salvage cost</b>	
<b>TOTAL Bird Reef Central - Site Clearance: Steel Salvage cost</b>	- 34 178,95
<b>TOTAL Bird Reef Central - Site Clearance: Steel Salvage cost</b>	- 34 178,95
<b>GRAND Total West Wits Site Clearance Cost</b>	
	<b>6 251 048,85</b>

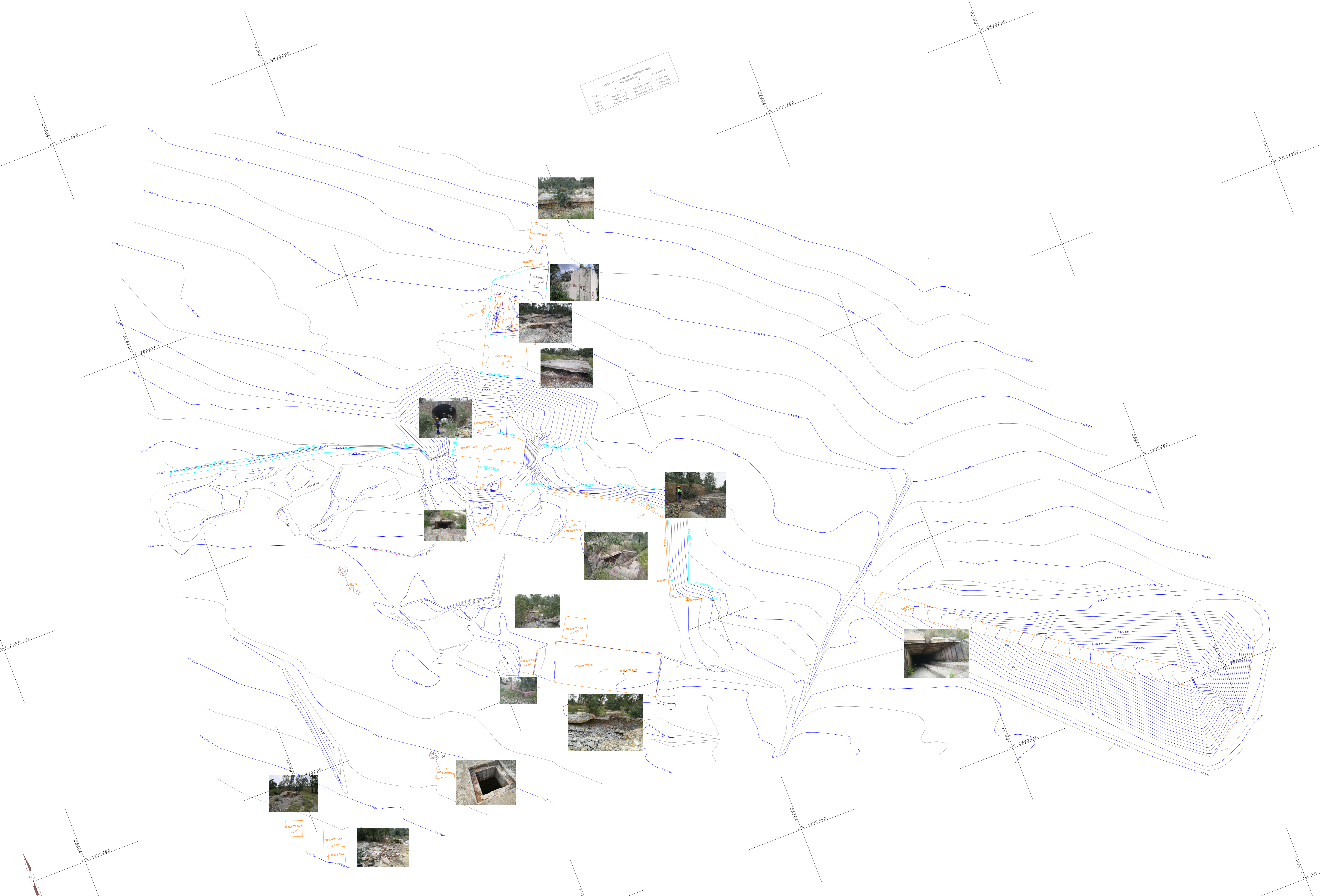


**APPENDIX A: Site Clearance drawings**

**Kimberley Reef East measurement photos.pdf**



WEST WITS RADIANT BRANCH LINES		ELEVATION
Code	DESCRIPTION	
1	100% CONCRETE	1700.00
2	75% CONCRETE	1700.00
3	50% CONCRETE	1700.00
4	25% CONCRETE	1700.00
5	0% CONCRETE	1700.00



DRAWN BY  
SCH SURVEYORS  
0828704778

FOR  
EPCM

PROJECT  
WEST WITS - RADIANT  
SCALE 1/300  
DATE 7/3/2018

NOTES  
ASSUILD SURVEY  
180228





**Bird Reef Central measurement photos.pdf**





WEST WITS - CIRCULAR - BENCH MARKS  
SYSTEM WG 27

Code	Y	X	Elevation
BM1	-86134.948	2897172.744	1729.773
BM2	-86292.049	2896671.065	1728.987
BM3	-86304.117	2896641.359	1729.399





## APPENDIX B: Bara proposed Layouts and Infrastructure detail

### Kimberley Reef East Infrastructure:

ID	DESCRIPTION	AREA/LENGTH	HEIGHT	CONSTRUCTION
1	Drop off zone	NA	NA	
2	Security office at main gate	54	3	Brick Structure, Pitched Roof (17°) corrugated
3	Parking Area	180	NA	Gravel
4	Main office complex	504	3	Prefabricated, Pitched Roof (17°) corrugated
5	Change house and walkway	315	5	Prefabricated, Pitched Roof (17°) corrugated
6	Main Stores	300	8	Steel Cladded, Pitched Roof (17°) corrugated
7	Lamp room	126	3	Prefabricated, Pitched Roof (17°) corrugated
8	Headgear	155	25	Steel Structure
9	Winder house	150	8	Steel Cladded, Pitched Roof (17°) corrugated
10	Medical centre	62	3	Prefabricated, Pitched Roof (17°) corrugated
11	Donkey Adits	1260	NA	Excavation
12	Laydown area, yard store and bioremediation	2436	NA	Gravel
13	Banksman cabin and proto room	144	6	Prefabricated, Pitched Roof (17°) corrugated
14	Potable water tanks	11	3	Steel Structure
15	Main Workshop and waste yard	300	8	Steel Cladded, Pitched Roof (17°) corrugated
16	Sewage Collection, pump station and explosives off-loading	46	3	Lean to Covering
17	Laundry	8	3	Prefabricated, Pitched Roof (17°) corrugated
18	Adit Pump Station	9	2	Lean to Covering
19	Store Yard	400	NA	Gravel
20	Access, Internal and Haul Roads	600 (m)	NA	Gravel
21	Perimeter Fence	901 (m)	2.4	Chain Mesh

### Kimberley Proposed Infrastructure: Layout drawings

Figure 3-9 (SLR) - Kimberley Reef East - Proposed Surface Infrastructure.pdf

**Bird Reef Central Proposed Infrastructure:**

ID	DESCRIPTION	AREA/LENGTH	HEIGHT	CONSTRUCTION
1	Drop off zone	NA	NA	Gravel
2	Parking Area	150	NA	Gravel
3	Security office at main gate	57	3	Brick Structure, Pitched Roof (17°) Corrugated
4	Change house and walkway	189	5	Prefabricated, Pitched Roof (17°) Corrugated
5	Lamp room	204	3	Prefabricated, Pitched Roof (17°) Corrugated
6	Medical centre	60	3	Prefabricated, Pitched Roof (17°) Corrugated
7	Banksman cabin and proto room	144	6	Prefabricated, Pitched Roof (17°) Corrugated
8	Headgear	155	25	Steel Structure
9	Winder house	163	8	Steel Cladded, Pitched Roof (17°) Corrugated
10	Laydown area, yard store & bioremediation	800	NA	Gravel
11	Main Store and laundry	300	8	Steel Cladded, Pitched Roof (17°) Corrugated
12	Workshop, store yard and waste yard	300	8	Steel Cladded, Pitched Roof (17°) Corrugated
13	Main office complex	408	3	Prefabricated, Pitched Roof (17°) Corrugated
14	Parking	216	NA	Gravel
15	Sewage collection and pump station	46	3	Lean to Covering
16	Potable water tanks	11	3	Steel Structure
17	Winder house	159	8	Steel Cladded, Pitched Roof (17°) Corrugated
18	Refurbished Circular Shaft	155	25	Steel Structure
19	Reef silo	7	NA	Gravel
20	Banksman cabin	81	3	Prefabricated, Pitched Roof (17°) Corrugated
21	Explosives handling / off loading	18	3	Lean to Covering
22	Perimeter fence	949 (m)	2.4	Chain Mesh
23	Internal Access Roads	600 (m)	NA	Gravel

**Bird Reef Central Proposed Infrastructure layout drawings:**

**Figure 3-8 (SLR) - Bird Reef Central - Proposed Surface Infrastructure.pdf**



## **APPENDIX C: Quantification**

**New proposed infrastructure mine closure and rehabilitation Quantification Sheets:**

**KIMBERLEY REEF EAST:**

Soweto DTM REHABILITATION ESTIMATE					
Bird Reef Central - Infrastructure					
DATE: 09/04/2018					
SHAFTS AND INFRASTRUCTURE					
TOTAL ESTIMATED MINE CLOSURE / REHABILITATION COST FOR SHAFT AND INFRASTRUCTURE					9 363 440,70
Single story Security office at main gate					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	56,70	497,64	28 216,19	
Concrete Slab - 300mm	m3	17,01	1 976,80	33 625,37	
One brick wall	m3	-	incl		
IBR Roof sheeting	m2	59,54	18,37	1 093,66	
TOTAL Security Office at main gate					62 935,21
Main office complex (prefabricated)					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	408,00	497,64	203 037,12	
Concrete Slab - 300mm	m3	122,40	1 976,80	241 960,32	
TOTAL Main office complex					444 997,44
Medical Centre (prefabricated)					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	60,00	497,64	29 858,40	
Concrete Slab - 300mm	m3	18,00	1 976,80	35 582,40	
TOTAL Medical centre					65 440,80
Double story Banksmans cabin and proto room (prefabricated)					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	143,55	995,28	142 872,44	
Concrete Slab - 300mm	m3	43,07	1 976,80	85 130,89	
TOTAL Double story Banksmans cabin and proto room					228 003,34
Banksmans cabin (prefabricated)					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	80,75	995,28	80 368,86	
Concrete Slab - 300mm	m3	24,23	1 976,80	47 887,98	
TOTAL Banksmans cabin					128 256,84
Stores - Side Cladded structure					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	300,00	995,28	298 584,00	
Concrete Slab - 300mm	m3	90,00	1 976,80	177 912,00	
One brick wall	m2	-	incl		
IBR Roof sheeting	m2	315,00	18,37	5 786,55	
IBR Cladding	m2	640,00	18,37	11 756,80	
Structural steel	t	72,00	1 075,72	77 451,84	
TOTAL Stores - Side Cladded structure					571 491,19
#7 Winder house - Side Cladded structure					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	162,75	995,28	161 981,82	
Concrete Slab - 500mm	m3	81,38	1 976,80	160 862,10	
One brick wall	m2	-	incl		
IBR Roof sheeting	m2	170,89	18,37	3 139,20	
IBR Cladding	m2	420,48	18,37	7 724,22	
Structural steel	t	39,06	1 075,72	42 017,62	
TOTAL #7 Winder house - Side Cladded structure					375 724,96

<b>#8 Winder house - Side Cladded structure</b>					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	158,55	995,28	157 801,64	
Concrete Slab - 500mm	m3	79,28	1 976,80	156 710,82	
One brick wall	m2	-	incl		
IBR Roof sheeting	m2	166,48	18,37	3 058,19	
IBR Cladding	m2	413,76	18,37	7 600,77	
Structural steel	t	38,05	1 075,72	40 933,30	
<b>TOTAL #8 Winder house - Side Cladded structure</b>				<b>366 104,72</b>	
<b>Workshop - Side Cladded structure</b>					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	300,00	995,28	298 584,00	
Concrete Slab - 300mm	m3	90,00	1 976,80	177 912,00	
One brick wall	m2	-	incl		
IBR Roof sheeting	m2	315,00	18,37	5 786,55	
IBR Cladding	m2	640,00	18,37	11 756,80	
Structural steel	t	72,00	1 075,72	77 451,84	
<b>TOTAL Workshop - Side Cladded structure</b>				<b>571 491,19</b>	
<b>Roads, laydown area &amp; yard store, Store yard and parking areas</b>					
Description	Unit	Quantity	Rate	Total	
Internal roads (gravel) - Rip and scarify - 6m wide	m2	3 600,00	23,78	85 608,00	
Laydown area and yard store (gravel) - Rip and scarify	m2	800,00	23,78	19 024,00	
Reef Silo (gravel) - Rip and scarify	m2	7,07	23,78	168,09	
Parking area (gravel) - Rip and scarify	m2	366,00	23,78	8 703,48	
<b>TOTAL Roads, laydown area &amp; yard store, Store yard and parking areas</b>				<b>113 503,57</b>	
<b>Change house (Prefabricated structure) - Double Story</b>					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	189,00	995,28	188 107,92	
Concrete Slab - 150mm	m3	28,35	1 976,80	56 042,28	
750mm wiide concrete pavers - walkways	m	57,80	42,68	2 466,90	
<b>TOTAL Change house (Prefabricated structure)</b>				<b>246 617,10</b>	
<b>Lamp room (Prefabricated structure)</b>					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	204,00	497,64	101 518,56	
Concrete Slab - 150mm	m3	30,60	1 976,80	60 490,08	
750mm wiide concrete pavers - walkways	m	60,80	42,68	2 594,94	
<b>TOTAL Lamp room (Prefabricated structure)</b>				<b>164 603,58</b>	

Potable water tanks					
Description	Unit	Quantity	Rate	Total	
500mm Concrete Slab	m3	5,38	1 976,80	10 627,38	
Fire Water tank 6mm Thick Plate work - 1 of 3m high	t	4,78	1 075,72	5 142,38	
<b>TOTAL Potable water tanks</b>				<b>15 769,76</b>	
Sewage treatment plant (Lean to structure)					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	45,50	incl		
Concrete Slab - 250mm	m3	11,38	1 551,90	17 652,86	
IBR Roof sheeting	m2	47,78	18,37	877,63	
One brick bund wall	m2	14,50	62,08	900,10	
Structural steel	t	1,07	1 075,72	1 150,21	
<b>TOTAL Sewage treatment plant (Lean to structure)</b>				<b>20 580,80</b>	
Explosives handling (Lean to structure)					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	18,00	incl		
Concrete Slab - 250mm	m3	4,50	1 551,90	6 983,55	
IBR Roof sheeting	m2	18,90	18,37	347,19	
One brick bund wall	m2	9,00	62,08	558,68	
Structural steel	t	0,42	1 075,72	455,03	
<b>TOTAL Explosives handling (Lean to structure)</b>				<b>8 344,46</b>	
#7 Headgear					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	155,00	incl		
Concrete Slab - 500mm	m3	77,50	1 551,90	120 272,25	
Structural steel	t	2 042,13	1 075,72	2 196 754,71	
<b>TOTAL #7 Headgear</b>				<b>2 317 026,96</b>	
#8 Headgear					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	155,00	incl		
Concrete Slab - 500mm	m3	77,50	1 551,90	120 272,25	
Structural steel	t	2 042,13	1 075,72	2 196 754,71	
<b>TOTAL #8 Headgear</b>				<b>2 317 026,96</b>	
Perimeter Fence - chain mesh					
Description	Unit	Quantity	Rate	Total	
2,40m High Perimeter Fence - chain mesh	m	949,00	44,56	42 287,44	
<b>TOTAL Sewage treatment plant (Lean to structure)</b>				<b>42 287,44</b>	



TOP SOIL & GENERAL						
					<b>TOTAL COST TOP SOIL</b>	<b>1 303 234,38</b>
Top soil & General						
Description		Unit	Quantity	Rate	Total	
1,8m High Razor wire fence around #7 and #8 shaft incl warning signs		m	80,00	2 090,00	167 200,00	
35mPa/19mm Mass Concrete in blocking-off shaft		m3	216,00	4 200,00	907 200,00	
Permanent Formwork in Decline Shaft		m2	72,00	800,00	57 600,00	
Top Soil (overall area - Total infrastructure)		m2	7 209,87	23,75	171 234,38	
<b>TOTAL TOP SOIL &amp; GENERAL COST</b>					<b>1 303 234,38</b>	
STEELWORK SALVAGE COST						
					<b>TOTALSALVAGE COST</b>	<b>- 3 686 447,63</b>
Description		Unit	Quantity	Rate	Total	
Structural steel and steelwork		t	4 311,63	855,00	<b>3 686 447,63</b>	

**BIRD REEF CENTRAL:**

Soweto DTM REHABILITATION ESTIMATE					
Kimberley Reef East - Infrastructure					
					DATE: 09/04/2018
SHAFTS AND INFRASTRUCTURE					
TOTAL ESTIMATED MINE CLOSURE / REHABILITATION COST FOR SHAFT AND INFRASTRUCTURE					5 381 121,05
Single story Security office at main gate					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	54,18	497,64	26 962,14	
Concrete Slab - 300mm	m3	16,25	1 976,80	32 130,91	
One brick wall	m3	-	incl		
IBR Roof sheeting	m2	56,89	18,37	1 045,05	
TOTAL Security Office at main gate					60 138,09
Main office complex (prefabricated)					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	504,00	497,64	250 810,56	
Concrete Slab - 300mm	m3	151,20	1 976,80	298 892,16	
TOTAL Main office complex					549 702,72
Medical Centre (prefabricated)					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	62,40	497,64	31 052,74	
Concrete Slab - 300mm	m3	18,72	1 976,80	37 005,70	
TOTAL Medical centre					68 058,43
Double story Banksmans cabin and proto room (prefabricated)					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	400,00	995,28	398 112,00	
Concrete Slab - 300mm	m3	120,00	1 976,80	237 216,00	
TOTAL Double story Banksmans cabin and proto room					635 328,00
Stores - Side Cladded structure (Double Story)					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	300,00	995,28	298 584,00	
Concrete Slab - 300mm	m3	90,00	1 976,80	177 912,00	
One brick wall	m2	-	incl		
IBR Roof sheeting	m2	315,00	18,37	5 786,55	
IBR Cladding	m2	640,00	18,37	11 756,80	
Structural steel	t	72,00	1 075,72	77 451,84	
TOTAL Stores - Side Cladded structure					571 491,19
Winder house - Side Cladded structure					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	150,00	995,28	149 292,00	
Concrete Slab - 500mm	m3	75,00	1 976,80	148 260,00	
One brick wall	m2	-	incl		
IBR Roof sheeting	m2	157,50	18,37	2 893,28	
IBR Cladding	m2	400,00	18,37	7 348,00	
Structural steel	t	36,00	1 075,72	38 725,92	
TOTAL Winder house - Side Cladded structure					346 519,20

Workshop - Side Cladded structure					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	300,00	995,28	298 584,00	
Concrete Slab - 300mm	m3	90,00	1 976,80	177 912,00	
One brick wall	m2	-	incl		
IBR Roof sheeting	m2	315,00	18,37	5 786,55	
IBR Cladding	m2	640,00	18,37	11 756,80	
Structural steel	t	72,00	1 075,72	77 451,84	
<b>TOTAL Workshop - Side Cladded structure</b>				<b>571 491,19</b>	
Roads, laydown area & yard store, Store yard and parking areas					
Description	Unit	Quantity	Rate	Total	
Haul roads (gravel) - Rip and scarify - 6m wide	m2	3 600,00	23,78	85 608,00	
Laydown area and yard store (gravel) - Rip and scarify	m2	2 436,00	23,78	57 928,08	
Store yard (gravel) - Rip and scarify	m2	400,00	23,78	9 512,00	
Parking area (gravel) - Rip and scarify	m2	180,00	23,78	4 280,40	
<b>TOTAL Roads, laydown area &amp; yard store, Store yard and parking areas</b>				<b>157 328,48</b>	
Change house (Prefabricated structure) - Double Story					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	315,00	995,28	313 513,20	
Concrete Slab - 150mm	m3	47,25	1 976,80	93 403,80	
750mm wide concrete pavers - walkways	m	83,00	42,68	3 542,44	
<b>TOTAL Change house (Prefabricated structure)</b>				<b>410 459,44</b>	
Lamp room (Prefabricated structure)					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	126,00	497,64	62 702,64	
Concrete Slab - 150mm	m3	18,90	1 976,80	37 361,52	
750mm wide concrete pavers - walkways	m	32,00	42,68	1 365,76	
<b>TOTAL Lamp room (Prefabricated structure)</b>				<b>101 429,92</b>	
Laundry room (Prefabricated structure)					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	7,50	497,64	3 732,30	
Concrete Slab - 150mm	m3	1,13	-	-	
750mm wide concrete pavers - walkways	m	12,00	42,68	512,16	
<b>TOTAL Lamp room (Prefabricated structure)</b>				<b>4 244,46</b>	

Potable water tanks					
Description	Unit	Quantity	Rate	Total	
500mm Concrete Slab	m3	5,52	1 976,80	10 916,54	
Fire Water tank 6mm Thick Plate work - 1 of 3m high	t	4,78	1 075,72	5 142,38	
<b>TOTAL Potable water tanks</b>				<b>16 058,92</b>	
Sewage treatment plant (Lean to structure)					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	45,50	incl		
Concrete Slab - 250mm	m3	11,38	1 551,90	17 652,86	
IBR Roof sheeting	m2	47,78	18,37	877,63	
One brick bund wall	m2	14,50	62,08	900,10	
Structural steel	t	1,07	1 075,72	1 150,21	
<b>TOTAL Sewage treatment plant (Lean to structure)</b>				<b>20 580,80</b>	
Adit pump station (Lean to structure)					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	9,00	incl		
Concrete Slab - 250mm	m3	2,25	1 551,90	3 491,78	
IBR Roof sheeting	m2	9,45	18,37	173,60	
One brick bund wall	m2	6,00	62,08	372,46	
Structural steel	t	0,21	1 075,72	227,51	
<b>TOTAL Adit pump station (Lean to structure)</b>				<b>4 265,34</b>	
Perimeter Fence - chain mesh					
Description	Unit	Quantity	Rate	Total	
2,40m High Perimeter Fence - chain mesh	m	901,00	44,56	40 148,56	
<b>TOTAL Sewage treatment plant (Lean to structure)</b>				<b>40 148,56</b>	
Headgear					
Description	Unit	Quantity	Rate	Total	
Building Area	m2	155,00	incl		
Concrete Slab - 500mm	m3	77,50	1 551,90	120 272,25	
Structural steel	t	329,38	1 075,72	354 315,28	
<b>TOTAL Headgear</b>				<b>474 587,53</b>	
TOP SOIL & GENERAL					
				<b>TOTAL COST TOP SOIL 1 349 288,78</b>	
Top soil & General					
Description	Unit	Quantity	Rate	Total	
1,8m High Razor wire fence around shaft incl warning signs	m	40,00	2 090,00	83 600,00	
35mPa/19mm Mass Concrete in blocking-off shaft	m3	108,00	4 200,00	453 600,00	
Permanent Formwork in Decline Shaft	m2	36,00	800,00	28 800,00	
Top Soil (overall area - Total infrastructure)	m2	9 044,58	23,75	214 808,78	
Fencing off Adit area - 1,8m High Razor wire fence around Adit area incl warning signs	m	272,00	2 090,00	568 480,00	
<b>TOTAL TOP SOIL &amp; GENERAL COST</b>				<b>1 349 288,78</b>	
STEELWORK SALVAGE COST					
				<b>TOTALSALVAGE COST - 440 697,91</b>	
Description	Unit	Quantity	Rate	Total	
Structural steel and steelwork	t	515,44	855,00	440 697,91	



**Site Clearance Quantification Sheets:**  
**KIMBERLEY REEF EAST:**

Soweto DTM REHABILITATION ESTIMATE					
Kimberley Reef Shaft - SITE CLEARANCE					
					DATE: 09/04/2018
SHAFTS AND INFRASTRUCTURE					
TOTAL ESTIMATED MINE CLOSURE / REHABILITATION COST FOR SHAFT AND INFRASTRUCTURE					1 856 914,42
Area 1 (Buildings)					
Description	Unit	Quantity	Rate	Total	
Concrete Slab- 300mm - Five slabs (m3) - 22.38 (C1)+28 (C2) +27.6 (C3) +57.7 (C5) +0.75 (C4)	m3	136,43	1 800,20	245 601,83	
Half brick wall	m2	30,00	42,35	1 270,50	
TOTAL AREA 1					246 872,33
Area 2 (Buildings)					
Description	Unit	Quantity	Rate	Total	
Concrete Slab- 300mm - 5 Five slabs m3 - 10.8 (D1) +6.9 (D2) +90.7 (D3) +12.6 (D4) +5.9 (D5)	m3	126,90	1 800,20	228 445,89	
Brick / Dump rock Retaining wall - various heights. AVG 1,2m high	m2	36,00	56,78	2 044,08	
Half brick wall	m2	17,50	42,35	741,13	
Mass Concrete - various concrete components demolished - Estimated	m3	2,90	1 440,16	4 176,47	
TOTAL AREA 2					235 407,57
Area 3 (Hoist Boxes, Tunnel, Rock Retaining Wall & Pipe Chamber)					
Description	Unit	Quantity	Rate	Total	
Concrete Slab- 300mm - 6 Six slabs: m3 - 15.6 (E1 - Bridge) +39.4 (E1 - Bridge) +17.6 (E2) +8.1 (E3) +15.4 (E1 - Bridge) +95.3 (E4 - Decline)	m3	191,40	1 800,20	344 559,05	
Rock Retaining wall -1000mm - F1	m2	653,00	56,78	37 077,34	
Half brick wall	m2	48,00	42,35	2 032,80	
Mass Concrete - various concrete components demolished - Estimated	m3	12,80	1 440,16	18 434,09	
TOTAL Area 3					402 103,27
TOP SOIL & GENERAL					
TOTAL COST TOP SOIL					972 531,25
Top soil					
Description	Unit	Quantity	Rate	Total	
35mPa/19mm Mass Concrete in Closure of Valve Chamber	m3	2,00	4 200,00	8 400,00	
1,8m High Razor wire fence around shaft incl warning signs	m	-	2 890,00	-	
35mPa/19mm Mass Concrete in blocking-off shaft	m3	-	4 200,00	-	
Permanent Formwork in Decline Shaft	m2	-	800,00	-	
Top Soil (overall area - Total site area)	m2	40 595,00	23,75	964 131,25	
TOTAL TOP SOIL COST					972 531,25
STEELWORK SALVAGE COST					
TOTALSALVAGE COST					
Description	Unit	Quantity	Rate	Total	
Structural steel and steelwork	t		1 638,81	-	



**BIRD REEF CENTRAL:**

Soweto DTM REHABILITATION ESTIMATE						
Bird Reef Central - Site Clearance						
						DATE: 09/04/2018
SHAFTS AND INFRASTRUCTURE						
TOTAL ESTIMATED MINE CLOSURE / REHABILITATION COST FOR SHAFT AND INFRASTRUCTURE						2 804 916,33
Terrace 1						
Description	REF NO		Unit	Quantity	Rate	Total
Building Concrete Slab Foundation - 300mm			m3	110,80	1 800,20	199 462,60
Half brick wall			m	21,00	42,35	889,35
Mass Concrete - various concrete components demolished - Estimated	A1		m3	15,76	1 440,16	22 696,97
Perimeter Fence - 2,40m high Diamond Mesh and Razor wire fence			m	228,00	28,80	6 567,14
			m			-
TOTAL TERRACE 1						229 616,07
Terrace 2						
Description			Unit	Quantity	Rate	Total
Building Concrete Slab Foundation - 300mm			m3	60,60	1 800,20	109 092,36
Mass Concrete - various concrete components demolished - Estimated	A2		m3	12,89	1 440,16	18 563,66
Brick / Dump rock Retaining wall - various heights. AVG 2,6m high			m2	213,20	56,78	12 105,50
TOTAL TERRACE 2						139 761,52
Terrace 3						
Description			Unit	Quantity	Rate	Total
Building Concrete Slab Foundation - 300mm			m3	37,24	1 800,20	67 039,60
Brick / Dump rock Retaining wall - various heights. AVG 800mm high			m2	19,20	56,78	1 090,18
Dump Rock Retaining wall -1000mm			m2	36,00	56,78	2 044,08
Mass Concrete - various concrete components demolished - Estimated			m3	7,43	1 440,16	10 700,39
TOTAL TERRACE 3						80 874,24
Terrace 4						
Description			Unit	Quantity	Rate	Total
Building Concrete Slab Foundation - 300mm			m3	8,60	1 800,20	15 481,75
Dump Rock Retaining wall -1000mm			m2	60,00	56,78	3 406,80
Half brick wall			m2	9,00	42,35	381,15
Mass Concrete - various concrete components demolished - Estimated			m3	3,80	1 440,16	5 472,61
TOTAL TERRACE 4						24 742,31
Terrace 5						
Description			Unit	Quantity	Rate	Total
Building Concrete Slab Foundation - 300mm			m3	3,70	1 800,20	6 660,74
Dump Rock Retaining Wall - 300mm			m2	21,00	56,78	1 192,38
Dump Rock Retaining wall -500mm			m2	40,00	56,78	2 271,20
Half brick wall			m2	40,00	42,35	1 694,00
Mass Concrete - various concrete components demolished - Estimated			m3	1,70	1 440,16	2 448,27
Building Area 34.9m2			m2	34,90	434,53	15 165,17
Concrete Slab - 500mm			m3	17,45	1 800,20	31 413,49
One brick wall					incl	
TOTAL TERRACE 5						60 845,25

Terrace 6						
Description	Unit	Quantity	Rate	Total		
Concrete Stairway Slabs- 300mm - Estimated - outside of indicated mining area	m3	60,00	1 800,20	108 012,00		
Half brick wall	m2	60,00	42,35	2 541,00		
Mass Concrete - various concrete components demolished - Estimated	m3	2,20	1 440,16	3 168,35		
Building Area 52m2	m2	52,00	434,53	22 595,66		
Concrete Slab - 500mm	m3	26,00	1 800,20	46 805,20		
One brick wall			incl			
<b>TOTAL TERRACE 6</b>				<b>183 122,22</b>		
Left Hand Side and Rear of Shaft						
Description	Unit	Quantity	Rate	Total		
Concrete Slab- 300mm - 8 Eight slabs (m3) - 42.2 (B1) +92.2 (B2) +54.4 (B3) +14.3 (B4) +3.8 (B5) +6.1 (B6) +0.7 (B7) +63.1 (B8) + 4.1 (B9) + 3.9 (B10)	m3	284,80	1 800,20	512 696,96		
Rock Wall -1000mm wide	m2	54,00	56,78	3 066,12		
Half brick wall	m2	15,00	42,35	635,25		
Mass Concrete - various concrete components demolished - Estimated	m3	9,34	1 440,16	13 451,09		
<b>TOTAL LEFT HAND SIDE AND REAR OF SHAFT</b>				<b>529 849,42</b>		
Inside Shaft Perimeter Fence						
Description	Unit	Quantity	Rate	Total		
Concrete Slab- 300mm	m3	405,45	1 800,20	729 891,09		
Half brick wall	m2	56,00	42,35	2 371,60		
Mass Concrete - various concrete components demolished - Estimated	m3	3,80	1 440,16	5 472,61		
<b>TOTAL INSIDE SHAFT PERIMETER FENCE</b>				<b>737 735,30</b>		
Building 1 - Side Cladded structure						
Description	Unit	Quantity	Rate	Total		
Building Area	m2	34,90	995,28	34 735,27		
Concrete Slab - 300mm	m3	10,47	1 976,80	20 697,10		
One brick wall	m2	-	incl			
IBR Roof sheeting	m2	36,65	18,37	673,17		
IBR Cladding	m2	-	18,37			
Structural steel	t	8,38	1 075,72	9 010,23		
<b>TOTAL Building 1 - Side Cladded structure</b>				<b>65 115,77</b>		
Building 2 - Side Cladded structure						
Description	Unit	Quantity	Rate	Total		
Building Area	m2	52,00	995,28	51 754,56		
Concrete Slab - 300mm	m3	15,60	1 976,80	30 838,08		
One brick wall	m2	-	incl			
IBR Roof sheeting	m2	54,60	18,37	1 003,00		
IBR Cladding	m2	-	18,37			
Structural steel	t	12,48	1 075,72	13 424,99		
<b>TOTAL Building 2 - Side Cladded structure</b>				<b>97 020,63</b>		
Building 3 and additional building						
Description	Unit	Quantity	Rate	Total		
Building Area	m2	77,80	995,28	77 432,78		
Concrete Slab - 300mm	m3	23,34	1 976,80	46 138,51		
One brick wall	m2	-	incl			
IBR Roof sheeting	m2	-	18,37			
IBR Cladding	m2	-	18,37			
Structural steel	t	-	1 075,72			
<b>TOTAL Building 3</b>				<b>123 571,30</b>		

Description			Unit	Quantity	Rate	Total
General rubble heaps identified on site. Consisting of Rock, mass concrete, bricks, reinforcement, Fill material, etc.		NO ALLOWANCE	m3	-	1 354,00	-
Circular permant formwork in shaft		INCL IN MINE CLOSURE ESTIMATE	m2	-	850,00	-
35mPa/19mm Mass Concrete in blocking-off shaft		INCL IN MINE CLOSURE ESTIMATE	m3	-	4 200,00	-
1,8m High Razor wire fence around shaft incl warning signs		INCL IN MINE CLOSURE ESTIMATE	m	-	2 890,00	-
Top Soil (overall area - Total site area)			m2	23 867,00	23,75	566 841,25
<b>General</b>						<b>566 841,25</b>
<b>STEELWORK SALVAGE COST</b>						
<b>TOTALSALVAGE COST</b>						<b>34 178,95</b>
Description			Unit	Quantity	Rate	Total
Structural steel and steelwork			t	20,86	1 638,81	34 178,95

# **ANNEXURE C: ENVIRONMENTAL RISK ASSESSMENT**

**May 2019**

**WEST WITS MINING PROJECT**

REGISTRATION NUMBER 2018/343416/07

226 VISAREND / FISH EAGLE STREET, LEEUWFOONTEIN ESTATES, DERDEPOORT PARK, GAUTENG, 0186  
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**ENVIRONMENTAL RISK ASSESSMENT REPORT  
FOR**

**WEST WITS MINING:  
May 2019**

**in respect of the**


**WEST WITS MINING PROJECT**

**REF:**

**DMR Reference Number:  
GP 30/5/1/2/2 (10073) MR**

**STRICTLY PRIVATE AND CONFIDENTIAL**

This report is prepared solely for purposes of use for the EIA regulatory process

<b>DOCUMENT CONTROL</b>	
Document title	The Financial Provisioning for the proposed West Wits Mining Project DMR reference number: GP 30/5/1/2/2 (10073) MR
Client	West Wits (MLI) (Pty) Ltd
Submitted to	Marline Medallie Environmental Assessment Practitioner SLR Consulting (Pty) Ltd Email: <a href="mailto:mmedallie@slrconsulting.com">mmedallie@slrconsulting.com</a>
Report Number	WESTWITS_FP_001_0418
Distribution	FORMS PART OF THE EIA REGULATORY PROCESS
<b>Consolidated findings from specialists</b>	
Authorized by	<b>Robyn S Mellett</b>
Designation	Environmental Advisor for the Project 16 years' experience
Signature	
Date	19 May 2019



## ABBREVIATIONS

Abbreviation	Description
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DMR	Department of Mineral Resources
DWS	Department of Water and Sanitation
ECA	Environmental Conservation Act (Act 73 of 1989)
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Environmental Impact Assessment Report
EMPR	Environmental Management Programme
GNR	Government Notice Regulation
GN 1147	Government Notice 1147
I&APs	Interested and Affected Parties
LOM	Life of Mine
MPRDA	Mineral and Petroleum Resources Development Act (Act 28 of 2002)
MRA	Mining Right Application
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NEMWA	National Environmental Management: Waste Act (Act 59 of 2008)
NHRA	National Heritage Resources Act (Act 25 of 1999)
NWA	National Water Act (Act 36 of 1998)
PCD	Pollution Control Dam
ROM	Run of Mine
RVI	Riparian Vegetation Index
RWD	Return Water Dam
SABS	South African Bureau of Standards
SANS	South African National Standard
SHERQ	Safety, Health, Environmental, Risk and Quality

## EXECUTIVE SUMMARY

### **Introduction**

The financial provision update has been prepared in accordance with GNR 1147 of the National Environmental Management Act (107/1998): *Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations*, published 20 November 2015 (Financial Provisioning Regulations, 2015), as amended.

As part of the financial provision, an applicant must also determine potential latent impacts by completing a risk assessment –

- a) *Remediation of latent or residual environmental impacts which may become known in the future, as per Appendix 5 of the above-mentioned regulations*

### **Relevance of the respective sections to the Legal Framework**

<b>GNR 1147</b>	<b>Appendix 5</b>	<b>Relevant section in the report</b>
<b>Environmental Risk Assessment</b>		
3 (a)	Details of – i) the person or <i>Refepersons</i> that prepared the plan; ii) the professional registrations and experience of the prepares	Refer to the list of specialists in <b>section 1</b> of the EIA/EMP. The EAP qualifications are attached as Appendix A and the specialists have all attached their qualifications as part of their specialist reports. In addition, refer to <b>Appendix A</b> in this report for RS Mellett Curriculum Vitae
3 (b)(i)	Details of the assessment process used to identify and quantify the latent risks	Refer to <b>Table 6.11</b> , in <b>section 6.6</b> of the EIA/EMP for list of risks identified during the operational phase
	Inclusive of risk identification	Refer to <b>Figure 2</b> in this report
	Inclusive of risk quantification	Refer to <b>Figure 2</b> of this report
3 (b)(ii)	Latent risk substantiation	Refer to <b>Figure 2</b> of this report
3 (b)(iii)	Risk drivers that result in the manifestation of the risks	Refer to <b>Figure 2</b> of this report
3 (b)(iv)	Description of expected timeframe	No latent risks yet quantified, ongoing monitoring will assist with the quantification hereof and this will be addressed and included as part of the annual updates
3 (b)(v)	Risk triggers – measures used to be able to identify whether the risk is imminent	No latent risks yet quantified, ongoing monitoring will assist with the quantification hereof and this will be addressed as part of the annual updates
3 (b)(vi)	Risk assessment results and findings	Refer to <b>Figure 2</b> of this report
3 (b)(vii)	Changes to risk assessment results as applicable on an annual basis	None required at this point in the process
3 (c)(i)	Monitoring of results and findings to inform adaptive or corrective	Management will form part of the implementation planning

	management and / or risk reduction activities	
3 (c)(ii)-(iv)	Alternative mitigation measures with motivation the approach will work and an explanation of how to implement it	None yet identified, as this is not yet required because no activities have commenced
3 (d)(i)-(iii)	Cost estimation	Completed in detailed by Golder, refer to <b>Annexure A</b> , for the opencast pits and by EPCM, refer to <b>Annexure B</b> , for the proposed surface infrastructure
3 (d)(i)	Inclusive of methodology	Refer to <b>Annexure A &amp; Annexure B</b> reports
	Auditable calculations per activity for the opencast pits	Refer to <b>Annexure A, Appendix C</b>
	Auditable calculations per activity for the vertical shafts	Refer to <b>Annexure B, Appendix C</b>
	Cost assumptions and monitoring costs	Refer to <b>Table 2</b> , below
3 (d)(ii)	Where appropriate, differentiation between capital, operating, replacement and maintenance costs	All five (5) of the opencast pits and Kimberley Reef East vertical shaft will be rehabilitated with operational costs, the monitoring and aftercare and maintenance costs in the 3-5 years post closure of the pits will also form part of the operational costs. Only Bird Reef Central shaft may require costs to fall outside of the planned operational costs for purposes of rehabilitation.
3 (d)(iii)	Percentage accuracy for the open cast pits	Cost estimate accurate +/- 90% accurate because LOM is less than 5 years
	Percentage accuracy for the vertical shafts	Conceptual estimate +/- 70% accurate, because LOM is less than 30 years
3 (e)	Monitoring, auditing and reporting	As per license conditions and applicable legislation, as well as per identified risk areas

### **Sourced information**

The environmental risk assessment was aligned to the findings made in:

- Section 1, section 8, section 26, section 27 and Appendix D, of the EIA/EMP (SLR, 2019);
- Conceptual post mining landform and initial volumetric assessment for costing purposes, inclusive of the Annual Rehabilitation plan (Golder, 2019); and
- Bill of Quantities undertaken by a Quantity surveyor for current site clearance calculations and for proposed surface infrastructure dismantling and demolition (EPCM, 2018),

### ***Latent risk identification & quantification process***

The process used to identify the latent risks is depicted in **Figure 2** below. The quantification of the risks will have to be measured annually to improve accuracy thereof.

### ***Management activities***

Refer to section 8, 26, 27 and Appendix D in the EIA/EMP for detailed management measures that will prevent latent impacts from occurring

### ***Costing estimation and assumptions made***

The assumptions made for purposes of costing potential latent impacts include:

- The drivers of potential latent risks include:
  - Mining methods e.g. type of explosive used underground
  - Proximity of the mining and rehabilitation activities from a water resource
  - Poor successful functional rehabilitation
  - Vandalism and theft
- Due to the drivers above the potential latent risks are:
  - Water pollution plume movement
  - Seepage of polluted water from the Klip river into the backfilled rehabilitated areas
  - Poor plant growth and / or landscaping of topography
  - High levels of poverty

Therefore, the only potential latent cost to be provided for to measure the triggers would be to monitor surface and ground water and to undertake ongoing rehabilitation monitoring assessments.

Therefore, the estimated financial provision required for potential latent impacts is:

- LoM / Latent closure liability (estimated liability post completion of rehabilitation):  
**R 7 261 112,30** (including VAT)

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**APPENDIX A: Curriculum Vitae – Robyn Sally Mellett**



## 1. INTRODUCTION

The financial provision update has been prepared in accordance with GNR 1147 of the National Environmental Management Act (107/1998): *Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations*, published 20 November 2015 (Financial Provisioning Regulations, 2015), as amended.

As part of the financial provision, an applicant must also determine potential latent impacts by completing a risk assessment –

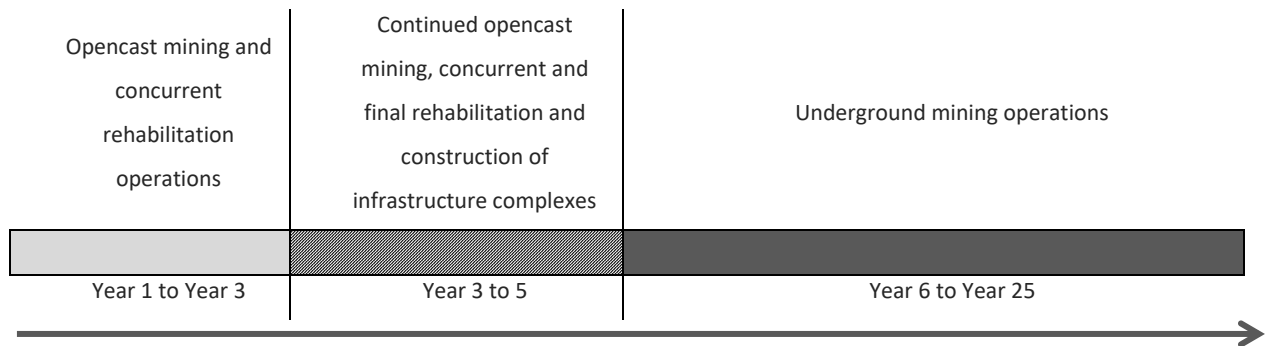
- a) *Remediation of latent or residual environmental impacts which may become known in the future, as per **Appendix 5** of the above-mentioned regulations*

The proposed project would involve the development of five open pit mining areas (referred to as the Mona Lisa Bird Reef Pit, Roodepoort Main Reef Pit, Rugby Club Main Reef Pit, 11 Shaft Main Reef Pit and Kimberley Reef East Pit on **Figure 1**) and refurbishment of two existing infrastructure complexes (referred to as the Bird Reef Central Infrastructure Complex and Kimberley Reef East Infrastructure Complex on **Figure 1**) to access the existing underground mine workings. Refer to **Table 1**, below for sequence of mining activities.

The project would also include the establishment of run of mine (ROM) ore stockpiles, topsoil stockpiles and waste rock dumps as well as supporting infrastructure including material storage and handling facilities (for fuel, lubricants, general and hazardous substances), general and hazardous waste management facilities, sewage management facilities, water management infrastructure, communication and lighting facilities, centralised and satellite offices, workshops, wash bays, stores, change houses, lamp rooms, vent fans and security facilities.

*Table 1. Sequence of mining activities*

No.	Sequence of mining activities	Year Rehab starts
1	Roodepoort Pit	1
2	Rugby Club Pit	1
3	Mona Lisa Pit	2
4	11 Shaft Pit	2
5	Kimberley East Pit	3
6	Kimberley Reef East Infrastructure Complex	15
7	Bird Reef Central Infrastructure Complex	25
3- 5 years	Care & Maitenance	Year 4, Year 16 & Year 26
3 - 5 years	Monitoring post mining	Year 4, Year 16 & Year 26



The final post closure land uses have been identified in consultation with landowners and will include mixed land uses, residential, commercial, industrial, infrastructure as well as green belts and parks.

SLR Consulting (South Africa) (Pty) Ltd (SLR) has been appointed as the independent environmental assessment practitioner (EAP) responsible for undertaking the EIA for the project. RS Mellett (Pty) Ltd (hereafter referred to as RSM) has been appointed by West Wits (MLI) (Pty) Ltd to further summarise all risks identified by the independent EAP and specialists in one consolidated risk assessment report and consolidate the list of potential latent impacts and assumptions made.

## 2. SOURCED INFORMATION

- Section 1, section 8, section 26, section 27 and Appendix D, of the EIA/EMP (SLR, 2019)
- Conceptual post mining landform and initial volumetric assessment for costing purposes, inclusive of the Annual Rehabilitation plan (Golder, 2019); and
- Bill of Quantities undertaken by a Quantity surveyor for current site clearance calculations and for proposed surface infrastructure dismantling and demolition (EPCM, 2018)

## 3. LATENT RISK IDENTIFICATION & QUANTIFICATION PROCESS

In order to determine whether or not an activity would result in a potential latent risk or not, a process of elimination was undertaken, all activities that physical items that were made of steel or concrete were removed from the list of potential risk because these items would be either demolished or dismantled completely and the area rehabilitated and therefore these item should not pose any potential risk of becoming a latent risk post mining and rehabilitation.

However, the biophysical items such as water, waste and biodiversity require further investigation and these activities were investigated further. Potential drivers were identified, thereafter potential triggers were recommended. This method of processing the information gives a strong indication of which activities could potentially result in a latent impact and would require continued monitoring to ensure that should this be the case; additional mitigation measures can be implemented to ensure prevention. Refer to **Figure 2** below.



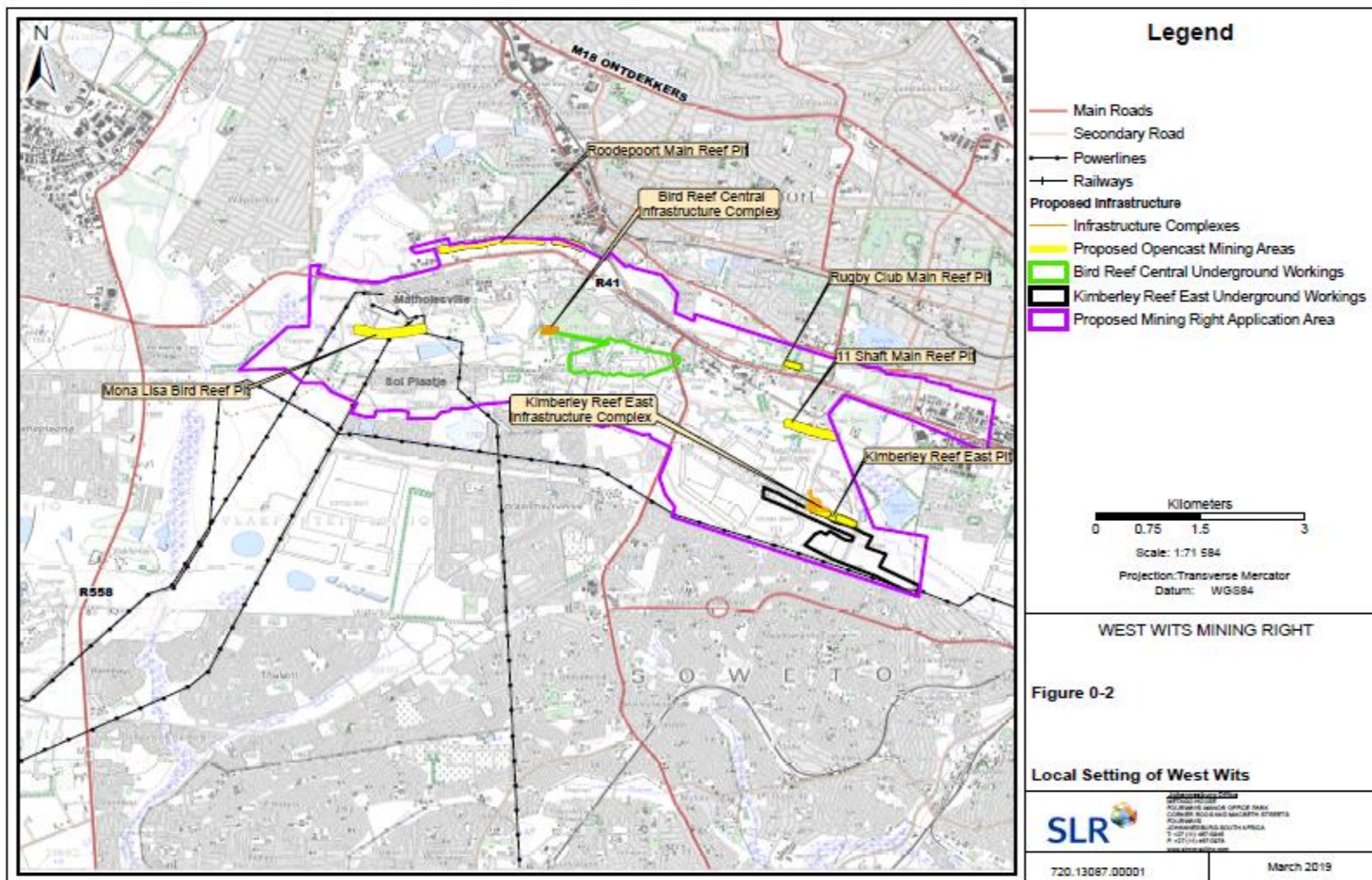


Figure 1. Local setting of the five (5) proposed opencast pits and the two (2) vertical shafts

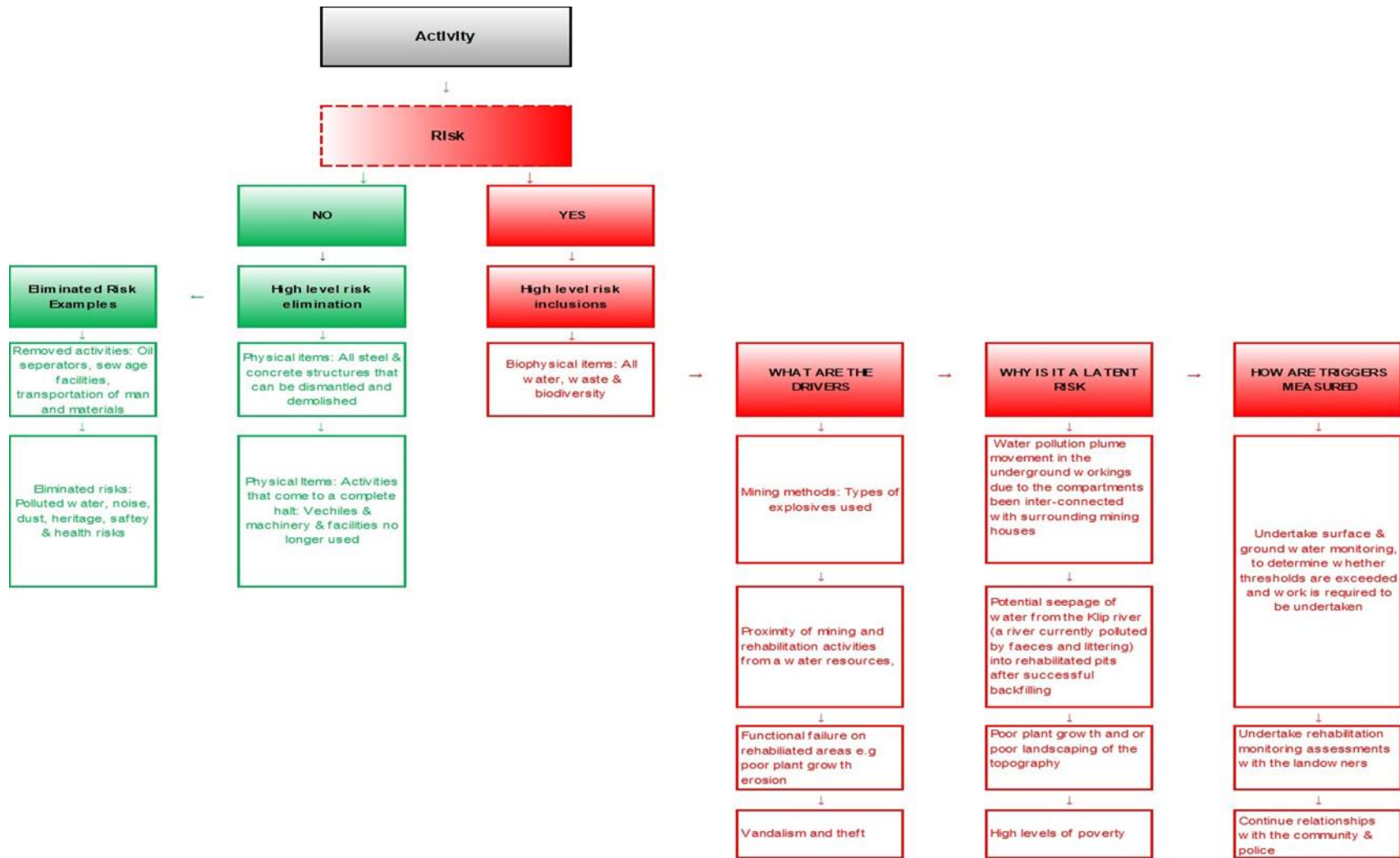


Figure 2. The potential latent risks identified for the proposed West Wits Project

## 4. MANAGEMENT ACTIVITIES

Refer to section 8, 26, 27 and Appendix D in the EIA/EMP for detailed management measures that will prevent latent impacts from occurring.

## 5. COSTING ESTIMATION AND ASSUMPTIONS MADE

The summary below is a consolidated closure cost estimate for the two (2) existing vertical shaft infrastructure facilities, the refurbishment of the shaft areas and the five (5) proposed opencast pits, as calculated by Golder and EPCM in **Annexure A** and **Annexure B**. The care and maintenance costs and monitoring costs post mining have been included to address the potential latent risks identified.

Table 2. Consolidated Financial Provisioning

CONSOLIDATED FINANCIAL PROVISION QUANTUM								
Applicant: West Wits (MLI) (Pty) Ltd								
Evaluators: Gus Calder, Anthony Lamb & Robyn Mellett								
No.	Description	Year Rehab starts	A	B	B	C	D	E
			Golder	EPCM Proposed Infrastructure	EPCM Existing infrastructure	Risk Assessment Latent Impacts	Premature closure cost (Rands)	LOM / Latent closure cost (Rands)
Totals include P&G's & Contingencies								
1	Mona Lisa Pit	2	R5 565 148,88				R5 565 150,88	R0,00
2	11 Shaft Pit	2	R4 477 474,50				R4 477 476,50	R0,00
3	Rodepoort	1	R7 297 741,43				R7 297 742,43	R0,00
4	Rugby Club	1	R967 003,03				R967 004,03	R0,00
5	Kimberley East Pit	3	R1 451 153,86				R1 451 156,86	R0,00
6	Kimberley Reef East Infrastructure Complex	15		R7 215 545,22	R2 489 936,54		R9 705 481,76	R0,00
7	Bird Reef Central Infrastructure Complex	25		R12 555 437,64	R3 761 112,30		R16 316 549,94	R3 761 112,30
3- 5 years	Care & Maintenance	Sum				R2 000 000,00	R2 000 000,00	R2 000 000,00
3 - 5 years	Monitoring post mining	Sum				R1 500 000,00	R1 500 000,00	R1 500 000,00
						<b>R49 280 562,40</b>	<b>R7 261 112,30</b>	

The assumptions made for purposes of costing potential latent impacts include:

- The drivers of potential latent risks include:
  - Mining methods e.g. type of explosive used underground
  - Proximity of the mining and rehabilitation activities from a water resource
  - Poor successful functional rehabilitation
  - Vandalism and theft
- Due to the drivers above the potential latent risks are:
  - Water pollution plume movement
  - Seepage of polluted water from the Klip river into the backfilled rehabilitated areas
  - Poor plant growth and / or landscaping of topography
  - High levels of poverty

Therefore, the only potential latent cost to be provided for to measure the triggers would be to monitor surface and ground water and to undertake ongoing rehabilitation monitoring assessments.

Therefore, the estimated financial provision required for potential latent impacts is:

- LoM / Latent closure liability (estimated liability post completion of rehabilitation): **R 7 261 112,30** (including VAT)

# CURRICULUM VITAE

## Robyn Sally Mellett BSc (Hons)



<b>FULL NAME</b>	: <b>ROBYN SALLY MELLETT</b>
<b>POSITION</b>	: <b>Director &amp; Independent Consultant</b>
<b>HOME ADDRESS</b>	: 226 Fish Eagle St, Leeuwfontein Estate, Pretoria, GAUTENG, 0039
<b>POSTAL ADDRESS</b>	: Mellett Trust, Fotonet Suite, Private Bag X8, Lynn East, GAUTENG, 0039
<b>TELEPHONE NUMBER</b>	: +27 (0)11 718 4600
<b>CELL NUMBER</b>	: +27 (0)79 494 7771
<b>E-MAIL ADDRESS</b>	: robyn.mellett@environmentalstrategies.co.za
<b>NATIONALITY</b>	: South African
<b>IDENTITY NUMBER</b>	: 8006130223083
<b>GENDER</b>	: Female

### PERSONAL PROFILE

She is a focused and dedicated professional with over fifteen years' experience in project management for an array of environmental related projects in the mining, agriculture & residential sectors. She has an in-depth knowledge of the mining sector in three (3) countries, namely: South Africa, Botswana and Zimbabwe, with long standing relationships with their regulators. She has further played an advisory role in research, education, awareness and outreach in five (5) countries, namely: Afghanistan, Lesotho, South Africa, Swaziland and Taiwan. She is currently Director of her own company and was recently selected as a team member for the Inkomati–Usuthu Catchment Management Agency Panel of Professional Engineering Consultants.

During her mining career, she has provided in-house support both strategically and operationally to seven (7) mining houses, namely: Aquarius Platinum (SA) (Pty) Ltd, Kumba Iron Ore a subsidiary of Anglo American, African Rainbow Minerals (Pty) Ltd: Nkomati Joint Venture, Sibanye-Stillwater: Platinum Division, Barplats Mine (Pty) Ltd, West Wits Mining and Theta Gold Mines. Her responsibilities as in-house support has included facilitating public relation campaigns and public meetings, undertaking in-house due diligences prior to purchasing, preparing for and rolling-out integration after sale and guiding the operational teams through operational readiness during ramp up in preparation for start-up. She has successfully provided technical solutions and assisted in drafting settlement proposals with land owners and developers etc., mitigating further litigation and / or potential future appeals.

She has further undertaken environmental legal compliance auditing for several mining houses covering a variety of commodities, namely: Platinum Group Metals (PGMs), iron ore, gold, uranium, silver, diamond, dolomite, lime, ferromanganese, coal, copper, nickel, cobalt, chrome, argonate and cement. Her passion is rehabilitation and closure.

***A successfully implemented environmental strategy will save operational and capital costs whilst still ensuring environmental compliance and mitigating environmental risk***



# CURRICULUM VITAE

## Robyn Sally Mellett BSc (Hons)



### CAREER SUMMARY

1. **Director** June 2018 - Present  
RS Mellett (Pty) Ltd
2. **Independent Consultant** Jun 2017 – Present  
MERA (Pty) Ltd
3. **Training, Education and Outreach (TEO) Advisor** Mar – Aug 2017  
Wildlife Conservation Society (WCS), Afghanistan
4. **Platinum Division: Environmental Manager** Mar 2016 – Feb 2017  
Sibanye-Stillwater
5. **Group Environmental Manager** Apr 2011 – Mar 2016  
Aquarius Platinum (SA) (Pty) Ltd
6. **Environmental Consultant / Superintendent** Jun 2009 – Apr 2011  
Nkomati Joint Venture, African Rainbow Minerals (Pty) Ltd & Norilsk Nickel Africa
7. **Senior Environmental Consultant** Jun 2009 – Dec 2010  
Shangoni Management Services (Pty) Ltd
8. **Group Environmental Advisor** Jan 2009 – May 2009  
MSA Environmental, Legal & Mining Services  
Seconded to Kumba Iron Ore Limited
9. **Environmental Coordinator** May – Dec 2008  
Aquarius Platinum (SA) (Pty) Ltd
10. **Environmental Scientist** Sep 2006 – Apr 2008  
Bokamoso landscape architects, environmental consultants & Scientific Aquatic Services (SAS)
11. **Learner professional officer and Junior Lecturer** Jan 2005 – Aug 2006  
**Qwa Qwa Campus, University of Free State, QwaQwa campus**  
Centre for Environmental Management & Geography Department:
  - Subjects: (a) 1st year: Physical Geography, (b) 2nd year: Urban Geography, (c) 3rd Year: Applied Environmental studies, Environmental management & Urban Geography, and (d) Post Graduate Level: Research skills and philosophy



# CURRICULUM VITAE

Robyn Sally Mellett BSc (Hons)

# MELLETT

Environmental Strategic Advisors

## EDUCATION AND QUALIFICATIONS

- Structured Magister Scientiae in Environmental Management 2005 – 2006  
**Centre for Environmental Management, University of the Free State (UFS),**  
Passed all exams, *mini-dissertation outstanding*
- Baccalaureus Scientiae Honores (**Geography**) 2003  
**University of the Free State (UFS),** Majors: (a) Geographical Information Systems  
(b) Environmental Management (c) Tourism (d) Urban Geography
- Baccalaureus Scientiae 2003  
**University of the Free State (UFS),** Majors: Geography Sub Majors: (a) Zoology  
(b) Geology

## COURSES AND CERTIFICATES

The following courses were completed at the Centre for Environmental Management at the University of Free State (UFS), The Success Academy, EOH Legal Services and Werksmans Attorneys:

- Mining and Environmental Law 2016
- Environmental Legal Training 2016
- Environmental Legal training 2015
- Negotiation skills training 2011
- Project Management Jan 2010
- Public Participation Jan 2006
- Social Impact Assessment Jan 2006
- Project Management for EIA Jan 2006
- Environmental Management for Biodiversity and Conservation Jan - Feb 2006
- Introduction to Environmental Management Jan 2005
- Environmental Sustainability July 2005
- Development Planning and Environmental Sustainability July 2005
- Physical Environment Jan 2005
- Biological Environment Jan 2005

## PUBLICATIONS AND CONFERENCES

1. Hoogendoorn, G., Mellett, R. and Visser, G. 2005: *Second Home as Urban Tourism: case studies from South Africa*. Urban Forum 16(2/3), 112-154.
2. Visser, G., Barker, C. and Mellett, R. 2003: *Trekking South Africa – A Survey of Backpacker Tourism*. Published Report for Backpacker Tourism South Africa, June, pp.38. ISBN 0-86886-675-X.
3. Guest Presenter: The Mine closure and rehabilitation conference in 2011 and 2012; and at the IAIA conference in 2005.

# CURRICULUM VITAE

## Robyn Sally Mellett BSc (Hons)



4. Guest Lecturer: Subject - Sustainability and the Influence that Environmental Legislation has on Location, for the Architectural Department, University of the Free State in March 2010 and September 2010.
  - Short courses for teachers & tour operators: (a) How to teach and present geographical topics and, (b) How to manage and coordinate tour groups in Lesotho

### REFERENCES

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