TRINITY METALS

NYAKABINGO PROJECT
COSTING STUDY

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1. INTRODUCTION

Obsideo International (Pty) Ltd ("Obsideo") has been appointed by Trinity Metals Ltd to conduct a costing study to assess the liberation and ore beneficiation processes on the Nyakabingo mine.

The project site is located at °51'46.0"S and 29°58'16.8"E which is around 13km northwest of Rwanda's capital Kigali. The geographical area which is covered by the current mining concession is located in the south of the Byumba highlands as shown in Figure 1.

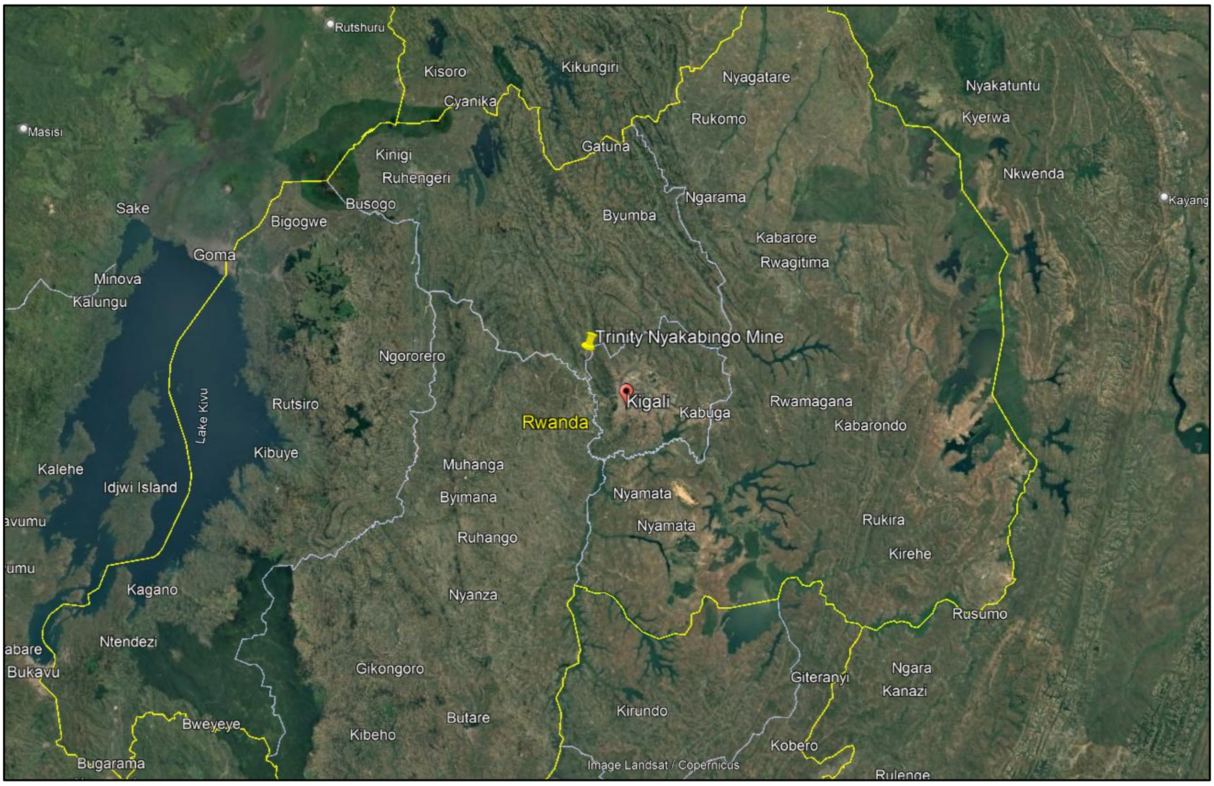


FIGURE 1: NYAKABINGO MINE LOCATION

2. ACCESSIBILITY & SITE CONDITIONS

The following site conditions were used for this study.

Site Data	Units / Type	Value / Comment
Country		Rwanda
Nearest Town		Kigali
Design Altitude - AMSL	m	1567
Climate Description		Tropical Highland
Annual average precipitation	mm	1182.6
Minimum monthly average precipitation	mm	14.5
Maximum monthly average precipitation	mm	148.4
Rainy Season		September - May
Annual average temperature	°C	20.0
Minimum monthly average temperature	°C	12.24
Maximum monthly average temperature	°C	19.4
Lowest Temperature	°C	11.5
Highest Temperature	°C	26.7
Coldest month		July
Hottest month		October

The project area is subject to a tropical highland climate with distinct wet and dry periods. The dry season typically extends for two to four months (June–September), while the major rainfall period occurs from March to May. These climatic conditions have direct implications for both construction scheduling and operational logistics.

Site access is currently provided via two primary routes:

- The first route, approximately 12 km in length, approaches the concession from the northern upper slopes. Due to its steep gradient and limited manoeuvrability, this route is not suitable for the reliable movement of heavy equipment.

- The second route connects directly to the national road and proceeds into the concession area. However, this corridor requires upgrading and civil works before it can accommodate heavy-duty vehicles such as haul trucks, cranes, and abnormal loads.

The concession is situated within mountainous terrain characterised by a mean ground gradient of 25%, with localized slopes reaching up to 75%. The topography consists of deep, well-drained valleys interspersed with ridgelines, presenting challenges for infrastructure placement and material haulage. The average elevation at the site is approximately 1,963 m above mean sea level, which should be factored into equipment performance assessments and construction methodologies.

3. GEOLOGY

Three types of quartz veins were identified. The first type is described as small, folded bedding-parallel veins. They are small (up to 5 cm thick) and sometimes show intense buckling. These veins are always hosted by grey to black shales, with a small alteration zone of a few centimetres' observable at the contact points between the veins and the surrounding rock. These veins do not display any visible tungsten mineralisation.

The second type consists of thicker bedding-parallel veins (PV). These veins typically range from 10 to 200 cm in thickness and can occasionally reach up to 9 m. They are parallel to the bedding or foliation. The contact zones between these veins and the host rock are altered, with limited lateral extent (a few centimetres) and are characterised by the presence of muscovite and clay minerals.

Both small, folded, bedding-parallel veins and thick bedding-parallel veins are often crosscut by mineralised subvertical veins (CV) that form at a high angle to the bedding. Their thickness can range from a few centimetres to several metres. The dip of the CV (especially when the thickness is below 20cm) depends on lithology. In the competent quartzitic layers, the veins are at a high angle to the bedding. In the metapelitic layer, the veins are generally thinner and nearly parallel to the bedding. A narrow (few centimetres) alteration zone, dominated by muscovite, can be observed at the contact between the vein and host rock.

4. BASIS OF DESIGN

This section will discuss the fundamentals of the process design. The anticipated plant recovery values were derived from a combination of the following metallurgical reports as summarized in this section:

TABLE 1: METALLURGICAL REPORTS

Company	Report
Horizon Blue Investments	New Tungsten Concentration Plan Cost Study for Nyakabingo Mine in Rwanda (12.2012)
Cronimet	Preliminary Economic Assessment Study Tinco Rwanda (PEA)
Coremet	C24_14_DAS_02_01A_01 MGS Rougher Test Work
Coremet	C24_14_DAS_02_01A_02 MGS Cleaner Test Work
SGS	Report 24- 4143
Maelgwyn	REP 24-078 Trinity Metals Wolframite Test Work- Preliminary R0

4.1 MULTI SHAFT MILL vs WET BALL MILL

Four composite samples were sent to Maelgwyn for test work. These samples were first processed in a jaw crusher and then a cone crusher to reduce the particle size to 1.7mm. Afterwards, an assay by size was conducted Table 2 shows a summary of the assay conducted on the -38µm size fraction.

TABLE 2: ASSAY BY SIZE ON CONE CRUSHER PRODUCT

Composition	Percentage of mass in the -38um fraction	Discrete Grade (%)
1	17.42	38.61
2	18.84	24.26
3	22.4	36.37
4	30.54	23.15

The table clearly shows that compression crushing results in a large proportion of material smaller than 38µm. Additionally, the smaller size fraction contains a significant amount of tungsten. Milling is expected to further increase the tungsten-bearing minerals within the 38µm size fraction.

Table 3 shows a summary of the crushing test work conducted to compile the PEA report, it assessed a hammer mill, double roll crusher and wet ball mill.

TABLE 3: PEA CRUSHING TEST WORK SUMMARY

Type	Circulating load at Steady State	Grade WO3 [%]	WO3 % in -20µm
Hammer Mill	365%	1.1	7.6
	304%	0.9	10.1
	231%	0.9	11.4
Rolls Crusher	340%	0.7	22.8
	207%	0.7	21.3
	124%	0.6	29.7
Ball Mill	356%	0.6	41.8
	238%	0.6	39.9
	112%	0.7	46.1

The PEA report yields similar results, with a minimum of 39.9% of the tungsten contained in the -20 µm size fraction after milling. The hammer mill performed the best, with a maximum of 11.4% of the tungsten contained in the -20 µm size fraction. This indicates that impact crushers are best suited for liberating tungsten containing minerals.

A multi-shaft mill was selected as the primary mill due to the following key factors

- Selective breakage: Larger particles break, but smaller ones may escape further impact.
- Short residence time: Particles exit quickly, limiting fine generation.
- Shattering vs. grinding: Impact causes fragmentation, not abrasion.
- High reduction ratio limiting the recirculating load.
- Test work conducted at EDS with other tungsten-bearing minerals from an anonymous operation also showed similar positive results.

Table 4 shows the PSD that used for the plant feed during the process design.

TABLE 4: PLANT FEED DESIGN PSD

Size (um)	Cumulative passing
500	100.0
300	85.3
150	62.0
75	35.0
45	15.2
19	9.0
8	6.0*

***The PEA report indicated that approximately 3.8% of the total tungsten in the feed is lost to the slimes fraction; for this costing study mass balance it was assumed that 5.6% of the total tungsten in the feed from the jig circuit is lost to the slimes fraction**

4.2 JIGGING

Jigging test work was conducted on a Alljig machine from Allmineral. The test work results are shown in the PEA report. One jigging test was done for each particle size fraction 1-5mm and 5-10mm. The results regarding mass yield and wolframite recovery of the jigging test work are shown in Figure 2

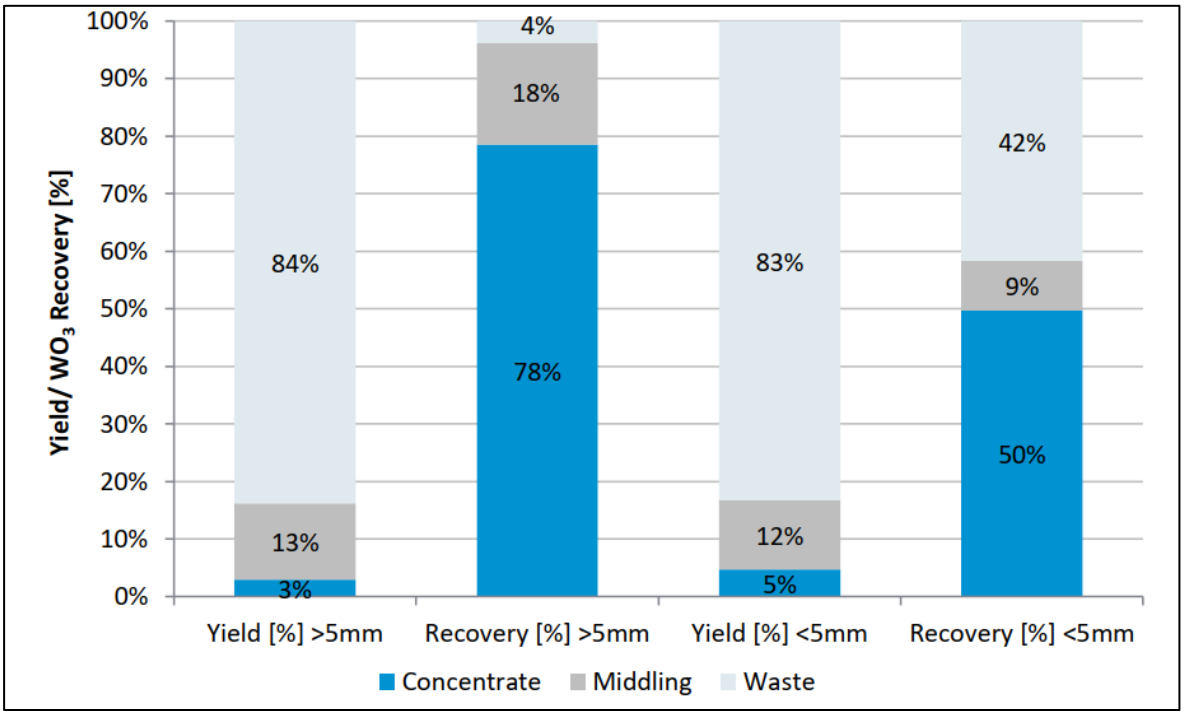


FIGURE 2: PEA JIGGING TEST WORK SUMMARY

A concentrate, a middling and a waste fraction were produced at each test. Depending on whether the focus is rather on increasing the concentrate grade and reducing the mass yield or rather on reducing the mass yield while maintaining maximum recovery, the middling fraction can be accounted to the concentrate or discarded with the waste.

For the +5mm test work, around 800g of about 29kg reported to the concentrate fraction, which corresponds to a yield of approximately 3%. The concentrate grade increased from 0.22% to just above 6% while maintaining a WO3 recovery of 78%. The middling fraction had a yield of 13%, a WO3 grade of 0.3% and would increase overall recovery by an additional 18%. Therefore, the maximum recovery would be 96% while pulling 16% of the mass to concentrate and increasing the WO3 grade from 0.22% to 1.3%. An illustration of the test results can be seen in Figure 53.

For the 1-5mm fraction the head feed grade was calculated to be 0.19% WO3 and around 1.4kg of about 30kg reported to the concentrate fraction with a grade of 2.06% WO3. This corresponds to a yield of 5% and a recovery of around 50%. The middling fraction had a yield of 12% and a WO3 Grade of 0.14%. 9% of the tungsten were recovered in the middlings fraction.

Adding the middling fraction to the concentrate would increase the recovery up to 59% while decreasing the grade to 0.68% WO3.

The jigging test work indicates that coarse jigging is as effective as a primary concentrator, as it achieved a recovery of 96% with a yield 16%. Coarse jigging was included in the process design; however, the size range was increased to 3-10mm. This decision was based on extensive experience with dense medium separation processes, whereby the separation curves of fraction 3mm and larger are similar.

For the combined milling and jigging circuit a mass balance was completed for a coarse feed PSD and a fine feed PSD. The coarse PSD was obtained by using a coarse ROM PSD as input to a two-stage crushing circuit simulation conducted by one of the crusher vendors. The percentage 10-3mm particles contained with this coarse feed PSD was 33%. For this coarse PSD scenario the tails rejected by the jig circuit was 14.8 t/h. The fine PSD was obtained by adjusting the coarse PSD to better align with the tailings dump PSD’s received. For the finest tailings dump PSD received the percentage 10-3mm particles was 21.1%. For the mass balance a worst case scenario of 18% 10-3mm particles was assumed for the fine PSD. For this fine PSD scenario the tails rejected by the jig circuit was 8.2 t/h. The rest of the mass balance was completed assuming the fine PSD, since this results in the highest throughput going to the gravity separation circuit.

Mass balances without a jig were also completed for the above mentioned coarse and fine PSD. Comparison if these mass balances with the mass balances that has the jig included indicated that the inclusion of a jig also has the benefit of keeping the total feed to the multi-shaft mill to a minimum (by the rejection of tails before the mill). For the circuit without a jig the total feed to the multi-shaft mill (including recirculation) was 130.8 t/h for the coarse PSD. For the circuit that includes a jig the total feed to the multi-shaft mill (including recirculation) was 82.7 t/h for the coarse PSD.

4.3 X-RAY SORTING

Sensor based sorting technology is becoming more prevalent in the mining industry. Using specialised sensors, various types of minerals and metals can be identified and distinguished from one another. By identifying an element of interest in the material to undergo sorting, several options become available. Using X-Ray transmission (XRT) technique enables the separation of individual particles in a mass stream by identifying different atomic densities. It is assumed that the different atomic densities correlate with different material classes which then can be distinguished and separated from each other.

The test work was done on a KSS LI XT from STEINERT with the size fraction 10-30mm which was screened and prepared in Rwanda during the sampling campaign in 2018. Over 3000 pieces of the samples were scanned to obtain their respective R-Ray intensities and images. The relative absorption characteristics of the samples were examined using the dual energy X-Ray principle. The results of the test work are shown in Figure 3

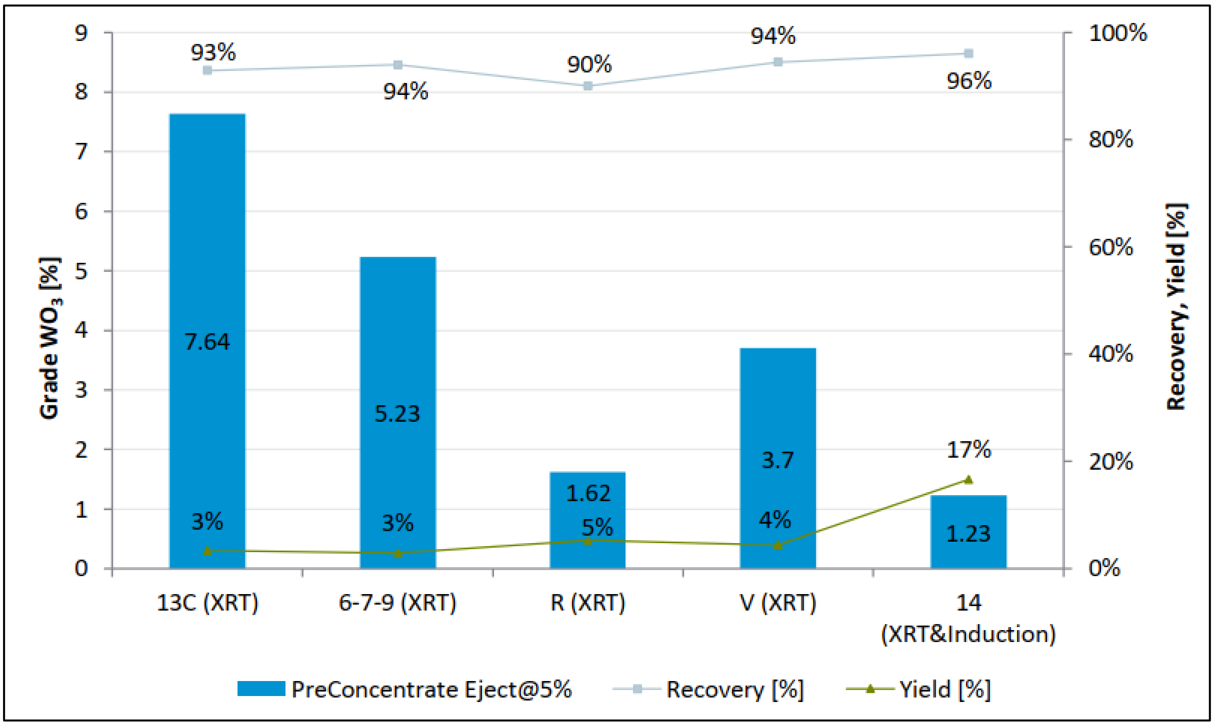


FIGURE 3: PEA X-RAY SORTING TEST WORK RESULTS

The V (XRT) shows a recovery of 94% with a mass pull of 4%. The test work resulted in concentrate grades ranging from 1.2 to 7.6% WO3, which increases the Wolframite grade by 6 to 40 times and reduces the mass to be treated downstream by approximately 95% for this 10-30mm portion of the plant feed.

The sensor-based sorting is shown to be effective in concentrating a coarser fraction of the feed; the sensor-based sorting of the coarser fraction was excluded from the costing study for the following reasons:

- For the finest tailings dump PSD received only 17.3% of the feed falls within the 10-30mm size range, so the reduction of required downstream throughput capacity is not significant (since one must cater for the worst case, i.e. fine PSD scenario)
- The area required for the installation of the sensor-based is currently not available. It was also deemed infeasible to increase the size of the existing terraces to accommodate the X-ray sorter as the cost of the earthworks is expected to be more than the x-ray sorter.

- Both the jigging test work and x-ray sorting test work showed similar recoveries, with the jig' yielding 12% more material in its concentrate stream. The jig gives similar advantages to the process flow, but at a lower cost than x-ray sorting.

4.4 COARSE SPIRALS

Spiral test work was conducted at Maelgwyn in 2024 and at Multotec in 2012.

Maelgwyn

The MIT MD 6.3 spiral separator was used for the spiral tests, and the test work was carried out with material sized at +150µm -500µm.

Water was added to the bulk-screened coarse sample to form a slurry containing 20% solids. The slurry was then transferred to the pump, feeding the spiral separator, and the slurry was circulated until the distribution on the spiral was steady. Once steady, the circulation valve was closed, and samples were taken from the spiral while feed was continually fed until all the material had passed through the spiral. The summary of the results is shown inTable 5: Maelgwyn Spiral Test Work Table 5

TABLE 5: MAELGWYN SPIRAL TEST WORK

Stage: Rougher			
Fraction	**Mass Distribution (%)**	**Recovery (%)**	**Grade (%)**
Feed			0.65
a-d	72.25	90.56	0.82
e-h	27.75	9.44	0.69

It should be noted that there was no visual difference in the sample reporting to the different cuts during the spiral run. The spirals achieved a Recovery of 90.56 with a yield of 72.25%

Multotec

The SC20/7 LG spiral separator was used for the spiral tests, and the test work was carried out with material sized at +45µm -1000µm.

The representative samples were mixed with water to achieve solids concentrations ranging from 29.9% to 46.5% by mass. These slurries were fed into the spiral feed box via a distributor with an overflow to maintain consistent feed conditions during the test. The test material flowed through the spiral, where separation occurred.

Water was added to the bulk-screened coarse sample to create a slurry with 29.9 to 46.5% solids. Each spiral stage ran for a few minutes to reach steady state before collecting the simultaneous timed samples (Fraction A to H) from the mouth organ.

After the timed sample was collected, the remaining feed was processed through the rougher spiral to produce the bulk concentrate and tailings fractions. These fractions then served as feed for the subsequent cleaner and scavenger stages, respectively. Timed sampling, as described above, was again undertaken on each of these spiral stages. Since this is a batch process, recycling streams cannot be examined directly Table 6 shows a summary of the test work results.

TABLE 6: MULTOTEC SPIRAL TEST WORK

Fraction	Mass Distribution (%)	Recovery (%)	Grade (%)
Stage: Rougher			
Feed			0.086
a-f	73.3	89.1	0.105
G	24.4	5.7	0.020
H	2.4	5.2	0.190
Stage: Cleaner			
Feed			0.086
a-e	29.8	93.6	0.409
f-h	70.2	6.4	0.011
Stage: Scavenger			
Feed			0.037
a-c	21.8	15.4	0.026
d-h	78.2	84.6	0.032

The spirals achieved an overall recovery of 82.4% with a yield of 29.8%.

The Multotec test work aligned with Maelgwn’s test work, confirming that spirals are effective as a pre-concentration step with an expected recovery of 82.4% and a yield of 29.8%. Multotec attained comparable recoveries using a feed size ratio of 1:22, whereas Maelgwn’s feed size ratio was 1:3. This suggests that the SG20/7 LG is better suited and is likely to provide improved recoveries and lower yields when processing +150-500um material.

4.5 FINE SPIRALS

Maelgwyn

The MIT MD 6.3 spiral separator was used for the spiral tests, and the test work was carried out with material sized at -150µm. Water was added to the bulk-screened coarse sample to form a slurry containing 25-30% solids. The slurry was then transferred to the pump, feeding the spiral separator, and the slurry was circulated until the distribution on the spiral was steady. Once steady, the circulation valve was closed, and samples were taken from the spiral while feed was continually fed until all the material had passed through the spiral. Due to the poor results, the sample was recombined, and a single batch test at 15% solids was carried out to determine if the separation would improve with a more dilute sample. There was no significant improvement when the feed to the spiral was diluted to 15% solids compared to the test at 25-30% solids.

The MIT MD 6.3 spirals proved ineffective in separating the tungsten-containing minerals; however, the Multotec UX7 spiral was included in the study as it was designed to handle feed with a top size of 150µm. For the purpose of the study, it was assumed that the UX7 spiral would achieve similar recoveries and yields as the coarse spiral.

4.6 COARSE SHAKING TABLES

Maelgwyn

The Holman-Wilfley 800 shaking table was used for the tests, which were carried out with material sized between +150µm and 500µm. The shaking table tests included a rougher shaking table, with the middling being cleaned by the middling cleaner shaking table. Table 7 show the results of Maelgwyn's shaking table test work.

TABLE 7: MAELGWN SHAKING TABLE TEST WORK RESULTS

Description	Cum Mass %	Assays W, %	Distribution W, %	Recovery W, %
Rougher Test				
Shake table conc	2.37	25.41	63.26	63.26
Shake table Midds	60.34	0.48	29.20	92.46
Shake Table Tails	100	0.18	7.54	100
Total		0.95		
Midds Cleaner Test				
Shake table conc	1.36	10.27	35.37	35.37
Shake table Midds 1	17.66	0.21	8.80	44.17
Shake table Midds 2	36.24	0.52	24.43	68.60
Shake Table Tails	100	0.20	31.40	100
Total		0.40		
Overall				
Total Conc	3.165	10.27	21.62	75.63

The rougher shaking tables achieved a recovery of 63.26% with a yield of 2.37%. The midds cleaner shaking table achieved a recovery of 35.37% with a yield of 1.36%. The midds cleaner shaking table's middlings and tailings fractions contain a large portion of tungsten-bearing material. Conducting an additional QEMSCAN on this fraction will provide valuable information to understand better and improve the poor recovery. Overall, the coarse shaking table circuit increased the grade from 0.95% to 10.27% with a recovery of 75.63% and a yield of 3.165%.

To further increase the grade, an additional cleaner stage is required on the final concentrate stream.

Fine shaking table test work was also conducted on material with a size of -150um, resulting in a recovery of 41.34%, a yield of 17.16%, and an upgrade ratio of 3.3. The fines shaking table test performed poorly compared to the MGS test work.

PEA

The feed for the shaking table test work consisted solely of the -1mm size fraction of the original sample; concentrates from sensor-based sorting and jigging tests were added to the feed after being ground, considering the weighted mass distributions of the individual fractions. The test work on the shaking tables was carried out in three stages. Before the shaking table, the -1mm fraction was screened on a tumbling screen at 0.5mm to minimise the size range on the shaking table. The grain size ranges of 0-0.5mm and 0.5-1mm were treated separately. The 0-0.5mm fraction underwent a rougher, scavenger, and cleaner process stages, while the 0.5-1mm fraction underwent a rougher and two cleaner process stages. For the purpose of this document, we are only comparing the 0.5-1mm size fraction. A summary of the test work is shown in Table 8 below.

TABLE 8: PEA SHAKING TABLE TEST WORK SUMMARY

Stream	Yield (%)	WO3 Grade	WO3 Recovery (%)
Rougher			
Shake table Conc	3.70	11.4	90.94
Shake table Mids	12.61	0.27	4.17
Shake table Tails	83.53	0.03	4.89
Midds Cleaner			
Shake table Conc	2.70	5.5	64.10
Shake table Mids	13.51	0.33	17.95
Shake table Tails	83.78	0.06	17.95
Concentrate Cleaner			
Shake table Conc	15.56	47.89	69.01*
Shake table Tails	84.44	2.11	30.99*

***Concentrate cleaner test work was conducted on a feed with a size range of 0-1mm**

The rougher shaking table achieved a recovery of 90.94% with a yield of 3.7%, with the midds cleaner shaking table achieving a recovery of 64.10% with a yield of 2.7%. The concentrate cleaner achieved a recovery of 69.01% with a yield of 15.56% and a grade of 47.89%.

When comparing the PEA results with those of Maelgwn, it is evident that the PEA achieved a significantly higher recovery in the rougher and cleaner shaking tables. Table 9 shows the comparison

TABLE 9: MAELGWN VS PEA SHAKING TABLE TEST WORK

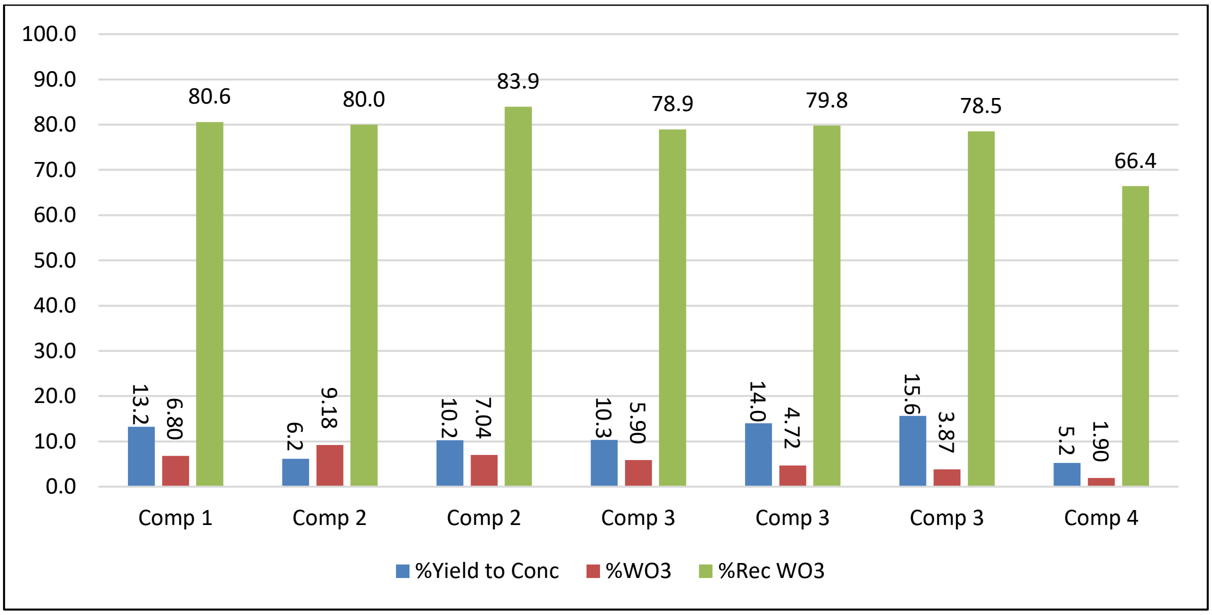
	Maelgwyn		PEA	
Description	**Cum Mass %**	**Recovery W, %**	**Cum Mass %**	**Recovery W, %**
Rougher Test				
Shake table conc	2.37	63.26	3.69	90.94
Shake table Midds	60.34	92.46	16.30	95.11
Shake Table Tails	100	100	100	100
Total				
Midds Cleaner Test				

Shake table conc	1.36	35.37	2.70	64.10
Shake table Midds 1	17.66	44.17	16.22	82.05
Shake table Midds 2	36.24	68.6		
Shake Table Tails	100	100	100	100
Total				
Overall				
Total Conc	3.165	75.63	4.04	96.67

The PEA test campaign achieved 21.04% higher recoveries than Maelgwyn's tests. The increased mass yield in the PEAs' rougher shaking table test explains this difference, possibly because Maelgwyn sent part of the concentrate to the middlings. However, in the middlings cleaner test work, Maelgwyn was unable to recover a significant amount of concentrate. The difference in the test work results indicates that additional analysis is required on the middlings portions to understand better why the material is not being beneficiated. For the purposes of the costing study, the recoveries of Maelgwn were used for the rougher and cleaner shaking tables, while the concentrate cleaners' recoveries were sourced from the PEA report.

4.7 MGS

Multi gravity separators (MGS) were used for the tests, which were carried out with material sized at -150µm. The MGS tests included a rougher test and a concentrate cleaner test. Figure 4 and Figure 5 shows the rougher and cleaner test work, respectively.



The rougher MGS achieved a maximum recovery of 83.9% with a yield of 10.02% and a grade of 7.04%.

FIGURE 4: MGS ROUGHER TEST

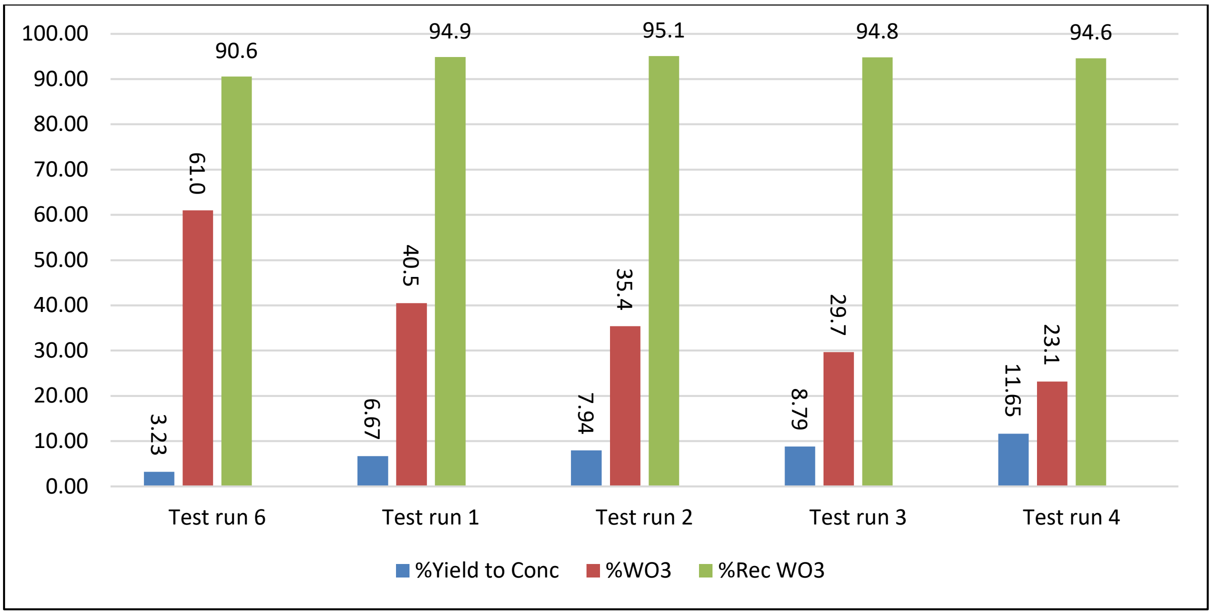


FIGURE 5: MGS CLEANER TEST

The cleaner MGS achieved the required grade of 61% during test run 6, with a recovery of 90.6% and a yield of 3.23%. Overall, the MGS circuit achieved a recovery of 76.01%. The MGS was selected to perform the concentration of the fine fraction due to it performance compared to other test work.

4.8 KNELSON CONCENTRATOR

Maelgwyn conducted various Knelson concentrator tests, with the tests performed in comp 4 being the most comprehensive. One kilogram each of the coarse fraction and fines fraction was passed through the Knelson concentrator. Figure 6 shows the 5-stage Knelson test conducted on the Comp 4 +150-500 µm size fraction with a feed grade of 0.81%.

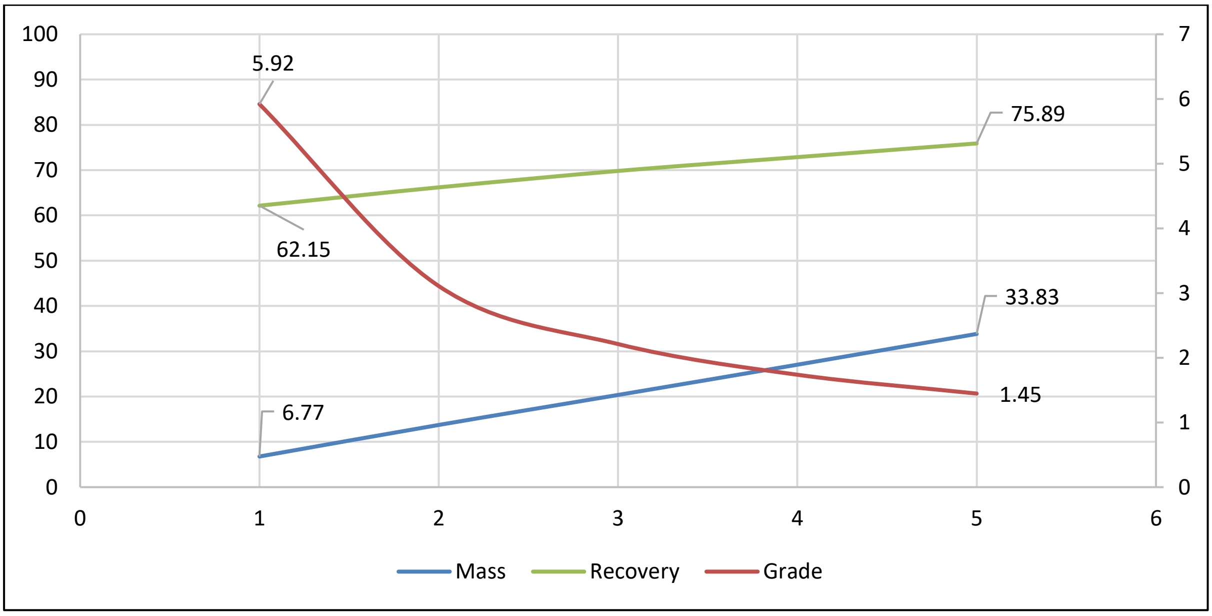


FIGURE 6: KNELSON CONCENTRATOR TEST WORK COMP 4 +150-500UM

The 5-stage Knelson test on the Comp 4 +150 µm fraction resulted in a tungsten recovery to the concentrates, increasing from 62% to 76% at grades ranging from 7.47% WO3 to a cumulative grade of 1.82% WO3. Table 10 shows a comparison between the Knelson contractor and rougher and midds cleaner shaking table test work conducted by Maelgwn.

TABLE 10: KNELSON CONCENTRATOR VS SHAKING TABLE

Description	Knelson Concentrator	Shaking Table
Recovery (%)	75.89	75.63
Upgrade Ratio	1.8	10.81
Yield (%)	33.83	3.165

Both the Knelson contractor and the shaking table test delivered similar recoveries; however, the shaking tables have a superior upgrade ratio and a significantly lower yield. For this reason, Knelson concentrators were not included in the process design.

Figure 7 shows the 5-stage Knelson test conducted on the Comp 4 -150 µm size fraction with a feed grade of 0.52%.

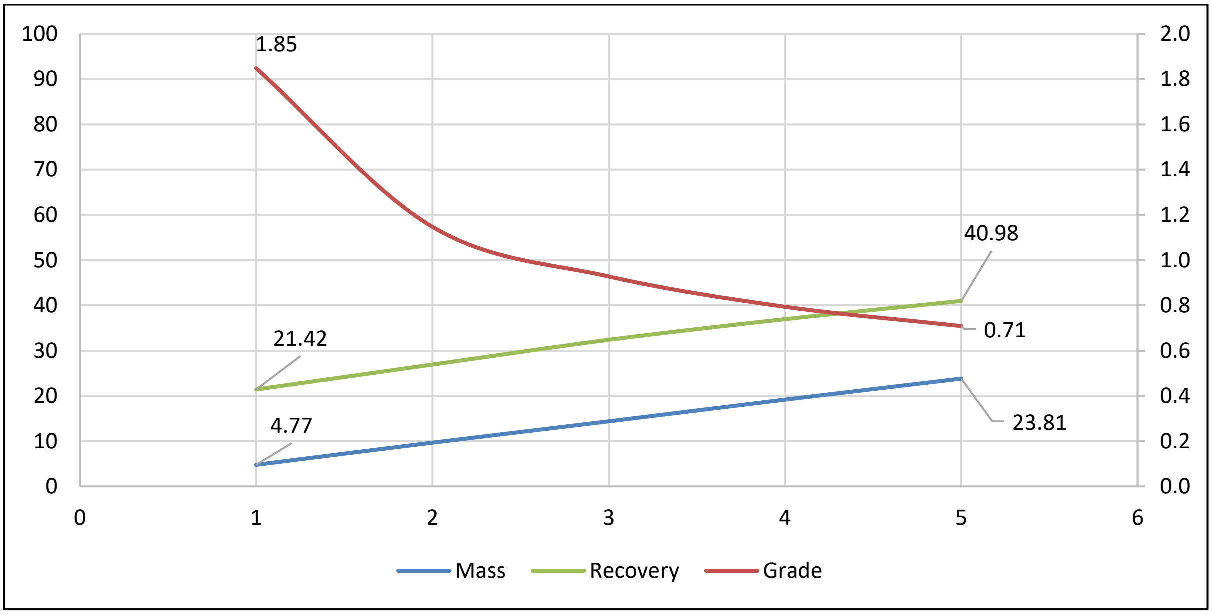


FIGURE 7: KNELSON CONCENTRATOR TEST WORK COMP 4 -150UM

The 5-stage Knelson test on the Comp 4 -150 µm fraction resulted in a tungsten recovery to the concentrates increasing from 21% to 41% at grades ranging from 2.33% WO3 to a cumulative grade of 0.71% WO3. The Knelson concentrator performed poorly in recovering and upgrading the fine feed.

4.9 FALCON CONCENTRATOR

PEA

The -106µm fraction, with a head grade of 0.57% WO3, was upgraded 2.74 times into a concentrate grading at 1.56% WO3. A two-stage cleaning process using the Falcon and MAT achieved a final re-cleaner concentrate with a tungsten grade of up to 71.0% WO3, with a recovery into the re-cleaning MAT concentrate and middlings of 35.3%. The Falcon concentrator performed poorly when compared to the MGS test work at a similar size fraction.

Maelgwyn

Maelgwyn conducted Falcon concentrator test work on the -150um feed fraction and noted that there was no upgrade to the concentrate in any of the eight cycles. They also performed a coarse test using -2mm material, and similarly, there was no upgrade of the tungsten to the concentrates when the whole ore was passed through the Falcon in the unfluidized bed test.

4.10 FLOATATION TEST WORK

Maelgwyn carried out sulphide and wolframite flotation test work. Generally, neither flotation test was successful in upgrading the tungsten. The sulphide float was unsuccessful due to low sulphide content in the feed, as the test work was conducted on unconcentrated feed. The sulphide and wolframite flotation test work needs to be re-investigated once a wolframite concentrate is produced.

4.11 MAGNETIC TEST WORK

PEA

Additional test work was performed at Mintek South Africa to recover tungsten in the -106+25µm size fraction was conducted for the PEA report. The test work utilised a vertically pulsating high-gradient magnetic separator (VPHGMS) in the form of an SLon. Overall, a 20% WO3 magnetic concentrate grade can be achieved at a mass yield of 0.89% and approximately 45% tungsten recovery at a magnetic field strength of 1.0T. The Slon performed poorly when compared to the MGS test work and will thus not be considered in this study.

Maelgwyn

Maelgwn also conducted high-intensity magnetic test work on the -150um size fraction with a magnet set to 0.8T. Overall, 48% of the tungsten was recovered in the magnetic concentrate (based on calculated grade) at a grade of 7.34% WO3, resulting in a mass pull of 3.41%. The high-intensity magnetic test work performed poorly when compared to the MGS test work and will thus not be considered in this study.

4.12 DESIGN RECOVERIES

Table 11 shows the recoveries and grades that were used for this study. It should be taken into consideration that the recovery values from test work do not account for scale-up or operability factors; therefore, a reduction of 5% (relative percentage, not absolute) was applied to each stage's recovery values.

TABLE 11: RATIONALISED RECOVERY VALUES

Stream No.	Circuit	Unit Description	WO3 Grade (%)	WO3 Recovery (%)
19	Jigging	Jig Concentrate	8.46	90.25
86	Coarse Spirals	Rougher Concentrate & Middlings	1.64	85.50
45		Cleaner Concentrate & Middlings	4.33	88.92
55		Scavenger Concentrate	0.58	18.00
Overall Coarse Spiral Circuit Recovery				**78.35**
62	Shaking Table	Rougher Concentrate	24.85	60.10
63		Rougher Middlings	2.81	27.74
64		Rougher Tails	1.55	12.16
68		Scavenger Concentrate	10.22	40.00
73		Cleaner Concentrate	59.19	65.55
74		Cleaner Middlings	11.08	12.00
75		Cleaner Tails	8.22	22.45
Overall Shaking Table Circuit Recovery				**61.83**
92	Fine Spirals	Rougher Concentrate & Middlings	1.64	85.50
96		Cleaner Concentrate & Middlings	4.33	88.92
104		Scavenger Concentrate	0.58	18.00
Overall Fine Spiral Circuit Recovery				**78.35**
117	MGS	Rougher MGS Concentrate	15.75	76.00
118		Rougher MGS Tails	0.84	24.00
122		Cleaner MGS Concentrate	59.32	87.40
123		Cleaner MGS Tails	2.58	12.60
Overall MGS Circuit Recovery				**66.42**
141	LIMS	Non-Magnetics	60.80	99.50
Overall Recovery				**56.28**

4.13 FOCUS AREAS FOR PHASE 2

This section outlines the key focus areas for Phase 2 of the project, emphasising the strategic priorities and operational elements that will guide the next stage of the project's lifecycle. These focus areas are vital for ensuring alignment with project objectives and reducing potential risks as the project advances.

Wet Ball Milling vs Multi Shaft Mill

The largest contribution to maintenance costs is the multi-shaft mill. The multi-shaft has an expected annual operating cost of $1,293,876. It is essential that the equipment selection is based on test work and trade-off studies, where the gain in tungsten product and the cost of ownership is compared to a lower tungsten production rate and the reduced ownership cost of a wet ball mill. This study should include a desktop evaluation of other impact crushers available on the market, such as a combination of equipment, including a HSI, VSI, and/or Hammer Mill.

Detailed Assessment on The Requirements of the Access Road

A detailed assessment of the southern access road is required, based on survey data and visual inspection. The widening of the road in certain areas could pose a risk due to road infringement on locally owned land, potentially resulting in increased costs and delays.

Site Services and Infrastructure

A block plan should be generated early that covers the complete design scope of the project, including construction laydown areas and crane pads, to verify that all assumptions made in this study.

Geotechnical & Topographical Integration

Due to the steep topographical nature of the area and existing terraces, it is essential that the layout is positioned based on an as-built survey of the region. A geotechnical investigation is also required to assess the extent of the earthwork needed to support the processing plant and surrounding infrastructure. At this stage, we have assumed that only levelling, hard padding and local excavations are required for the processing plant and that the southern access road will be upgraded.

Insurer Requirements

The insurance requirements play a critical role in defining the fire rational design, as the monthly instalment directly relates to the extent of the fire installation. At this stage, only a basic fire suppression system was included in the cost estimate. This system covers fire hydrants, hose reels, fire extinguishers, and a dedicated pumping system comprising an electric fire water pump, jockey pump, and diesel fire water pump. The requirements of the insurer should be investigated at the early stages of the next phase.

Execution Contractual Model

The project execution strategy needs to be defined to determine what contractual model will be used during the execution phase. These models include, but are not limited to, EPC, EPCM, hybrid or turnkey.

Risk and Sensitivity-Based Costing Analysis.

Specific risks are currently present within the process design that could influence the project's CAPEX estimate. A risk-based sensitivity analysis should be conducted to assess the project's impact. These risks include:

- The proposed Multotec UX7 spirals are untested; if these spirals prove ineffective in separating the heavy mineral, five additional MGS units will be required. It is estimated that this risk can increase the costs associated with the MGS processing area by 62-71%
- The fines generation of the multi-shaft mill was based on simulations and similar ore. Testing can result in better or worse results.
- Historically, fresh ROM material has not undergone test work, and the effects of the material on the equipment selection and recovery are unknown at this stage. The characterisation test work will indicate if the material is similar to that of the sluice tailings.
- The SGS report and test work results show that the sulphur-containing ore is discarded during gravity separation. If a flotation circuit is required, this could increase the project cost by an estimated $ 340,729.45. Similarly, if a final tungsten float is required, it will incur similar costs.
- Currently, the fine tailings (-150 µm) are being stacked 500 metres away from the processing plant using stacking cyclones. In cases where the tailings are too wet to be used in the tailings storage facility, a larger filter press and thickener will be required to dewater the combined streams.

Recovery Improvements

Based on historical test work, the processes with the lowest recoveries are associated with the middling scavenger and cleaner concentrate shaking tables. The reason for the low recoveries is unknown at this stage; additional QUEMSCAN work on Maelgwn's backup samples can shed light on the cause. This could result in a small regrind mill being installed on the streams before they are recycled back into the system.

Raw Water Make-up

Site wide water balance is required to determine the source of the raw water make-up.

4.14 FUTURE TEST WORK

The previous test work on Nyakabingo resources focused solely on recovering tungsten from sluice tailings. The flow sheet from the PEA report was based on a plant feed size of 0-1000um, processed into three size ranges: -100um, 100-500um, and 500-1000um. The -100um and 100-500um ranges are similar to the streamlined flow sheet proposed here. Nonetheless, variations in the material blend and pre-concentration process necessitate a final test campaign to validate and derive a process guarantee. The section below outlines the planned test work and should be reviewed together with the test workflow sheet as shown in Annexture 0

Fresh ROM Sample Preparation

In July 2025, a bulk sampling program was conducted on unmined quartz veins at Nyakabingo to support metallurgical testing (MET). These veins, identified through underground geological mapping, are located in the working tunnels BV13C, BV18, BV20, and BV22. The sampled veins include both cross-cutting and bedding-parallel types on each level. Figure 8 shows BC13C shaft with its mined and unmined veins.

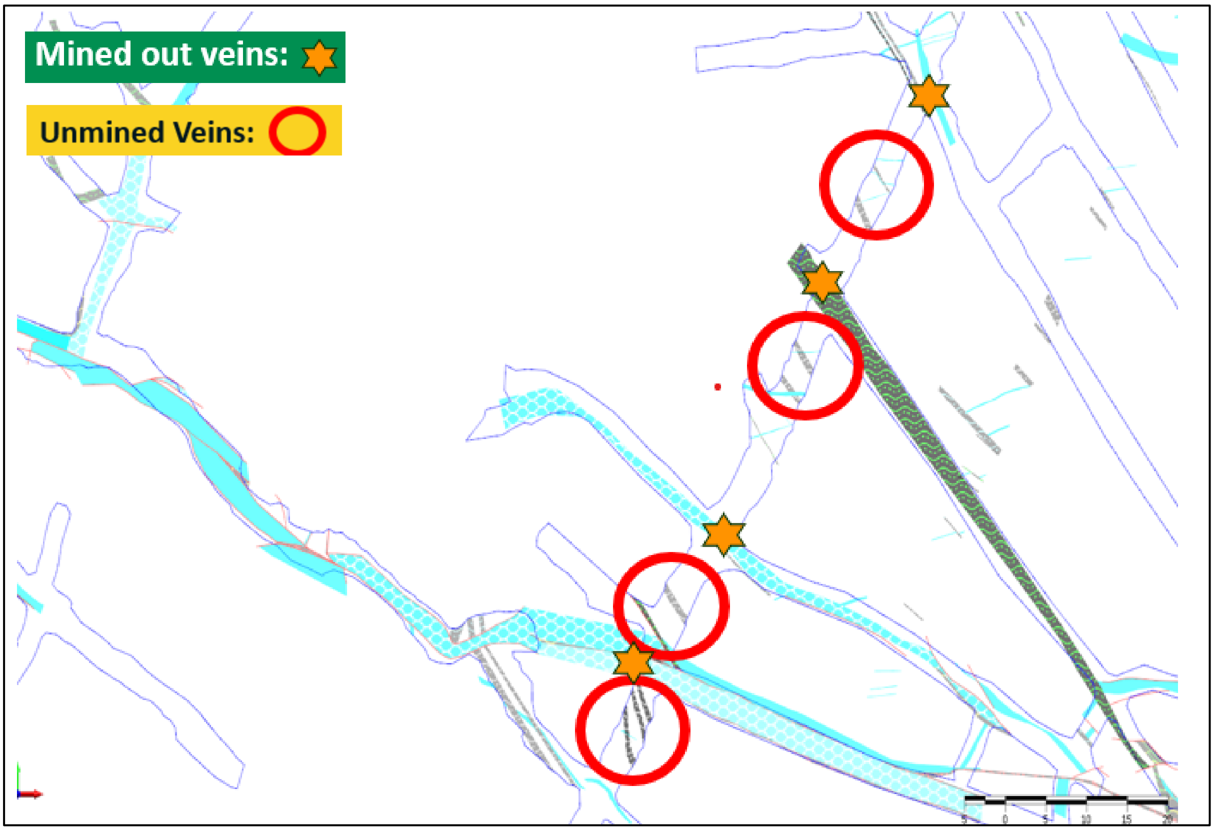


FIGURE 8: BV13C SHAFT

During sampling, veins are identified within the main drive and marked after measuring their orientation, primarily strike and dip. A 1 by 1 m face on the vein is marked to obtain a representative sample, which is then blasted. The following day, 50 kg samples are taken from the blasted faces for metallurgical testing. These samples are combined into a 1-ton batch. Samples are collected from all blasted material, including veins and the surrounding host rock, using the exact dimensions.

The samples are packed in labelled 25 kg bags with sample IDS and transported to the Nyakabingo processing laboratory for further preparation and analysis, before shipment to South Africa.

Two samples will be prepared: one with the high-grade tungsten ore nuggets removed and the other containing all material.

Fresh ROM Sample Characterisation & Comminution Test Work

The fresh ROM samples will undergo characterisation and comminution test work that includes the following:

- XRF (fused bead) and XRF Trace (powder pellet) on the head sample.
- XRF, XRF (trace), XRD and Qemscan PMA on the 0x30um, 30x150um and 250x1000um fractions.

- SAG Mill Comminution Test Work (SMC).
- Bond Low Energy Impact test (BLEI).
- Bond Abrasion Test (BAi).
- Bond Rod Work Index (BRWi).
- Bond Ball Mill Grind Test (BBWI).

Fresh ROM Milling Test Work

Given the costs associated with operating the multi-shaft mill, it is recommended to conduct wet milling test work using a high recirculation load to reduce fines production. Multi-shaft milling tests will be performed simultaneously to determine the plant feed PSD based on the current flow sheet. These tests will also help assess the wear rate of the equipment, providing better insight into the operational costs involved vs the potential loss in recovery due to slimes generation.

Fresh ROM Gekko Jig

It is proposed that the historical jigging test work be verified using a Gekko jig. Gekko utilises DMS cyclone test work to assess the separation performance of the jig, which allows for a broader particle size range to be tested. It is proposed that the test work be carried out on material with sizes ranging from +1 to -20mm.

Formation Of A Master Composite

The plant has been designed to operate at a nominal feed grade of 1.05%. This grade will be achieved by blending fresh ROM with sluice tailings. Approximately 465 kg of +150-500 µm and 902 kg of -150 µm sluice tailings are available at Maelgwyn's facilities. The material will be mixed with the fresh ore to produce sufficient sample for the -150 µm and +150-500um test work.

Coarse Spiral Test Work

The coarse spiral test work on the +150-500 µm size fraction should be conducted using the Multotec SC20/7 LG spirals, as good results were achieved in 2012 with a feed size of +45-1000 µm. It is anticipated that cyclone recoveries and yields will improve due to the narrow size range being fed. The test work will include rougher, cleaner, and scavenger spiral tests.

Shaking Table Test Work

Shaking table tests on the spiral concentrate will follow, with the cleaner spiral concentrate being fed to the rougher shaking table. A magnetic pick-up wand should be used to determine the split, as nearly all the magnetic material needs to report to the concentrate stream. The middlings fractions from the rougher shaking table will be cleaned using a scavenger table, and the concentrate will be combined with that from the rougher table. The concentrates from both shaking tables will be mixed, homogenised, and fed into a cleaner shaking table, where the concentrate will be cut to produce high-grade tungsten concentrate.

Fine Spiral Test Work

The feed to the fine spiral circuit will be screened to remove the -30um material. The +30-150um material will undergo spiral test work using Multotec's UX7 spirals. The spirals will have a typical rougher, cleaner, and scavenger configuration. The concentrate produced by the cleaner spiral will be collected and combined with the -30um screened out material to form the MGS feed sample.

MGS Test Work

MGS test work will follow with two stages of cleaning, namely the rougher MGS and Cleaner MGS stages.

LIMS Test Work

Both the concentrate produced by the fine and coarse circuits will be combined and fed into a LIMS to remove any magnetic material from the concentrate, raising the grade to the required level.

Floatation Test Work

The analysis of the LIMS non-magnetic concentrate will determine if sulphide or wolframite flotation is necessary.

5. PROCESS DESCRIPTION

The processing circuit consists of the following key processes:

- Crushing circuit
- Plant feed stockpile and tunnel
- Combined mill and jig circuit
- Feed sizing
- Coarse and fine spiral circuit
- Shaking table circuit
- MGS circuit
- Magnetic separation
- Product dewatering
- Coarse tailings stacking
- Fine tailings stacking
- Slimes thickening and dewatering
- Plant services and fire water

Figure 9 shows the block flow diagram. A detailed process description for each section is provided below. These sections must be read in conjunction with the process flow diagrams and mass balances appended to this report within Annexure B and C. Two mass balances are appended to this report, a mass balance for the maximum expected feed grade and a mass balance for the minimum expected feed grade. The nominal throughput capacity of the respective circuits is indicated under section 6.

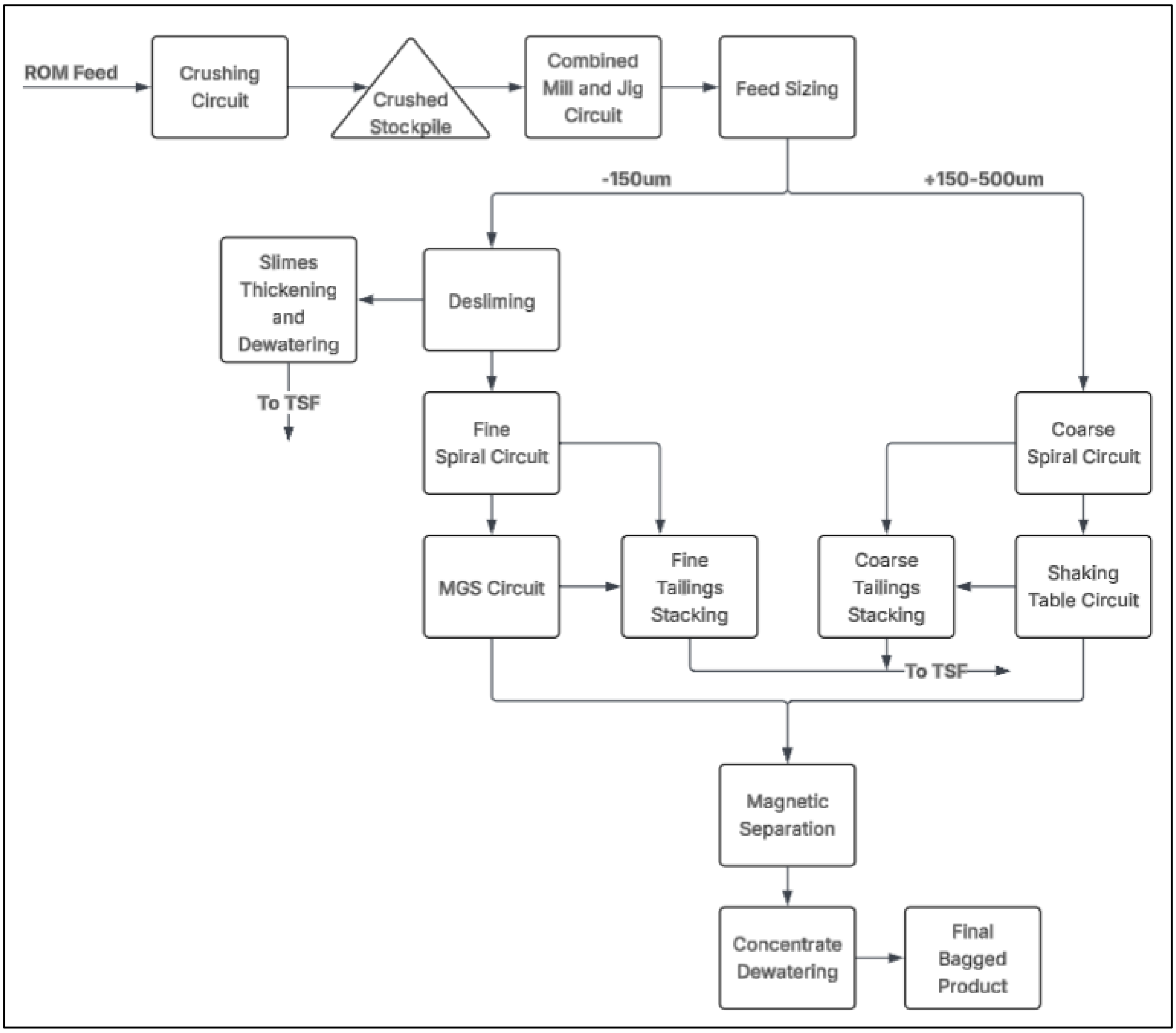


FIGURE 9: BLOCK FLOW DIAGRAM

5.1 CRUSHING CIRCUIT

Run-of-mine (ROM) material will be stockpiled near the crushing circuit feed bin. The crushing circuit was designed to handle material with a maximum size of 300mm. The stockpiled material will be collected by a Front-End Loader (FEL) and dumped into the crushing circuit feed bin. The feed bin is fitted with a vibrating grizzly feeder (VGF) that will extract material at a controlled feed rate. The apertures of the VGF will be set at 75mm. Oversize material from the VGF will be discharged into a jaw crusher, which will reduce it to -75mm. The primary jaw crusher will discharge onto the dry screen feed conveyor. The undersize from the VGF will also be collected on the dry screen feed conveyor.

The dry sizing screen will cut at 30mm. The -30mm material will be collected on the stockpile feed conveyor located beneath the screening structure, which will transfer the crushed material to the plant feed stockpile. The +30mm material will be conveyed to a secondary jaw crusher. A stationary magnet will be positioned on the secondary crusher feed conveyor to protect the crusher from foreign materials. The secondary jaw crusher will operate at a close side setting (CSS) of 25mm and will crush down to a P95 of 32mm. The secondary jaw crusher will discharge onto the dry screen feed conveyor, ensuring the crushing circuit remains in a closed loop.

A generic coarse particle size distribution (PSD) was used for the sizing of the crushing circuit. Figure 10 shows the simulation performed on the crushing circuit.

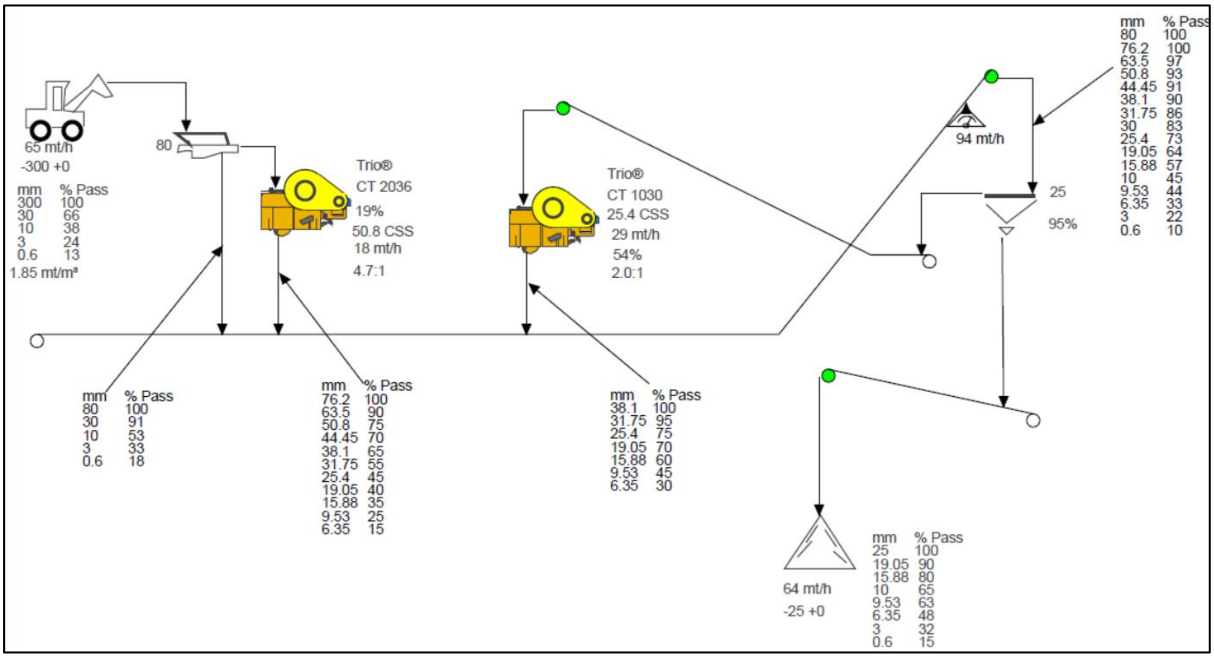


FIGURE 10: CRUSHING CIRCUIT SIMULATION

Figure 11 below shows the crushing circuit configuration.

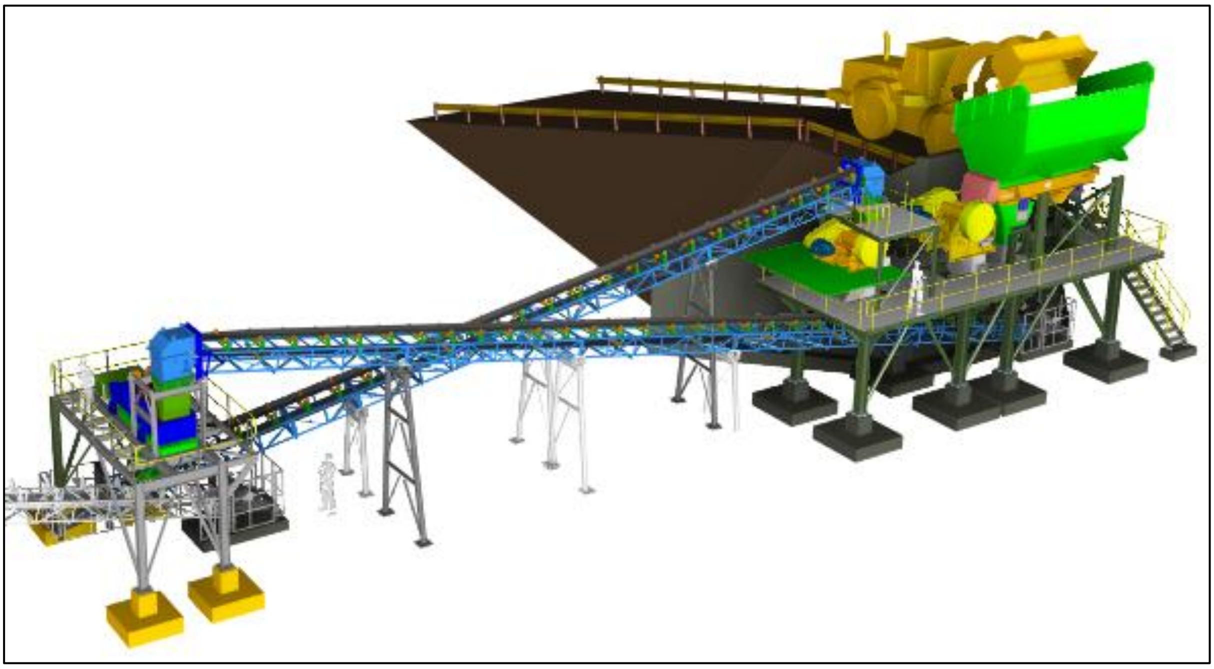


FIGURE 11: CRUSHING CIRCUIT

5.2 PLANT FEED STOCKPILE AND TUNNEL

Plant feed material will be extracted from the plant feed stockpile at a controlled rate the by stockpile tunnel belt feeder, which will discharge onto the stockpile tunnel extraction conveyor. The layout of the stockpile tunnel is shown in Figure 12 below.

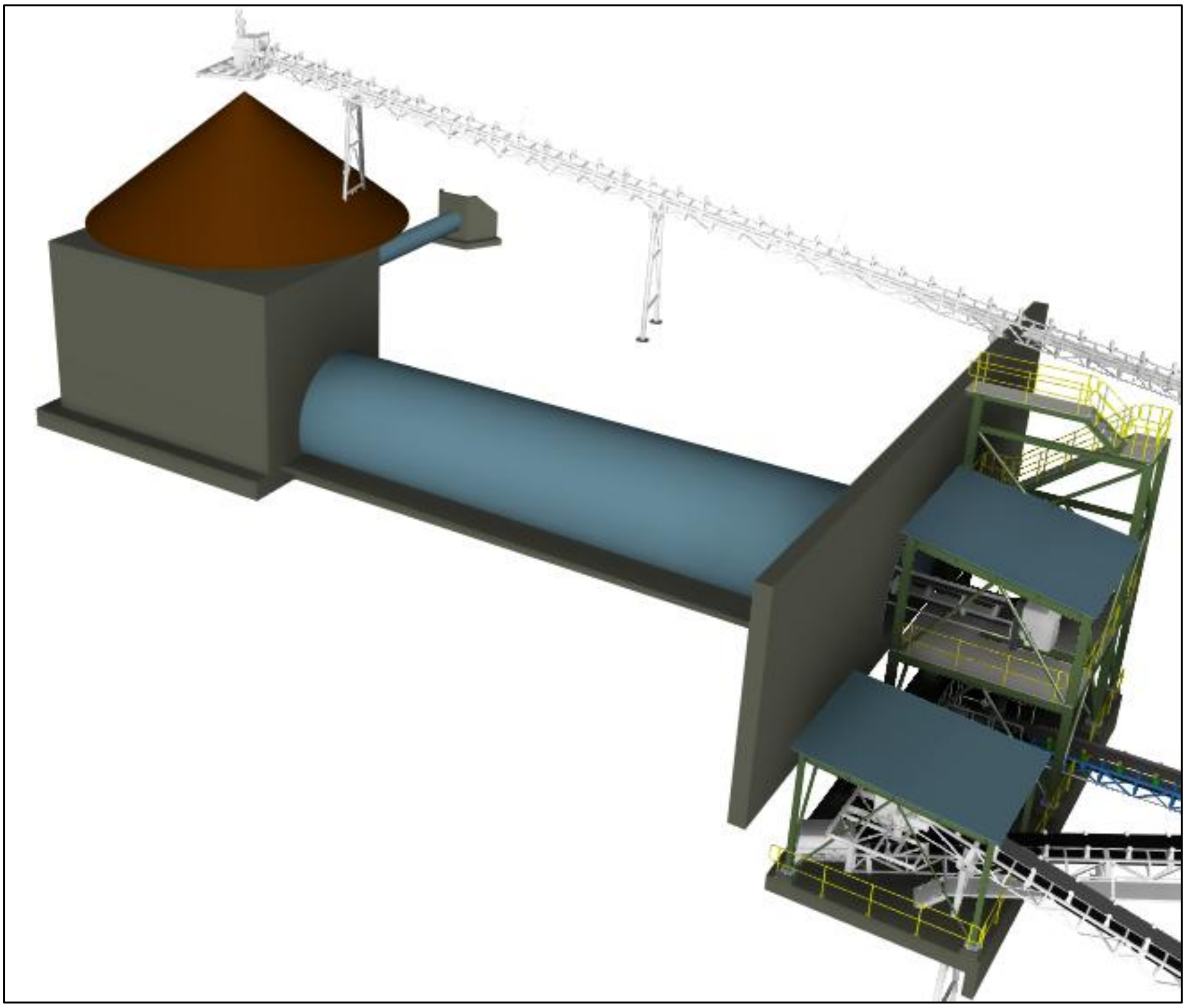


FIGURE 12: PLANT FEED STOCKPILE

5.3 COMBINED MILL AND JIG CIRCUIT

The stockpile tunnel extraction conveyor will discharge onto the coarse sizing screen feed conveyor which will feed the coarse sizing screen, which will be a double-deck screen cutting at 10mm and 3mm. The top deck oversize (+10mm) will be conveyed via three conveyers to the feed chute of the multi-shaft mill. There will be a standby and a duty multi-shaft mill so that the wear parts can be replaced when needed without stopping the plant. The crushed product from the multi-shaft mill will discharge onto the coarse sizing screen. The bottom deck oversize (-10+3mm) will be collected in a tank and pumped to the pre-concentration jig. The concentrate and tailings from the jig will discharge onto a combined dewatering screen with a divider in the middle to keep the streams apart. The dewatered jig tailings will be stacked via conveyor, and the jig concentrate will be conveyed to the feed chute of the multi-shaft mill. The undersize of the coarse sizing screen (-3mm) will be pumped to the mill HF screens, which will cut at 0.5mm. The oversize of the mill HF screens will be pumped to the feed chute of the multi-shaft mill and the undersize will be pumped to the pre-screen cyclone which will be located within the spiral building. Figure 13 below shows the layout of the mill and jig circuit.

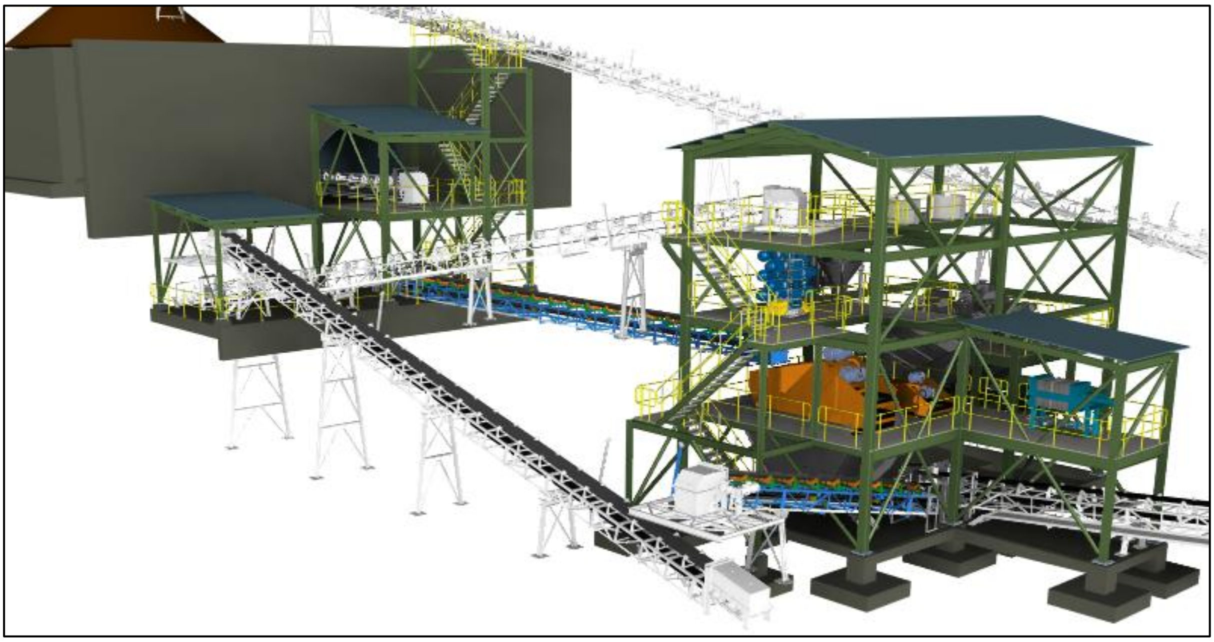


FIGURE 13: COMBINED MILL AND JIG CIRCUIT

5.4 FEED SIZING

The overflow of the pre-screen cyclone will report to the HF sizing screen undersize tank, and the underflow will discharge onto the HF sizing screen, which will cut at 150um. The oversize (-500+150um) of the HF sizing screen will be pumped to the coarse rougher spirals, and the undersize (-150um) will be pumped to the fine sizing cyclone. The layout of the feed sizing circuit is shown in Figure 14 below.

FIGURE 14: FEED SIZING CIRCUIT

5.5 COARSE AND FINE SPIRAL CIRCUIT

The coarse spiral circuit will follow a typical rougher, scavenger and cleaner spiral circuit with the intention to pre-concentrate the feed to the shaking table circuit. The overflow of the scavenger dewatering cyclone will be used as process water within the spiral plant (via a process water headbox). The tailings from the coarse spiral circuit will be pumped to the coarse tailings tank. The concentrate from the coarse spiral circuit will be pumped to the rougher shaking tables.

The fine spiral circuit will also follow a typical rougher, scavenger and cleaner spiral circuit with the intention to pre-concentrate the feed to the multi-gravity separator (MGS) circuit. The feed to the fine spiral circuit will first be pumped to the fine sizing cyclone. The underflow of the fine sizing cyclone will have a size range of -150+30um and this stream will report to the fine rougher spirals. The overflow of the fine sizing cyclone will be collected and pumped to the desliming cyclone cluster. The overflow of the desliming cyclone cluster (-9um) will gravitate to the thickener and the underflow will gravitate to the rougher MGS feed tank. The tailings from the fine spiral circuit will be pumped to the fine tailings tank. The concentrate from the fine spiral circuit will gravitate to the rougher MGS feed tank. The layout of the coarse and fine spiral circuit is shown in Figure 15 below.

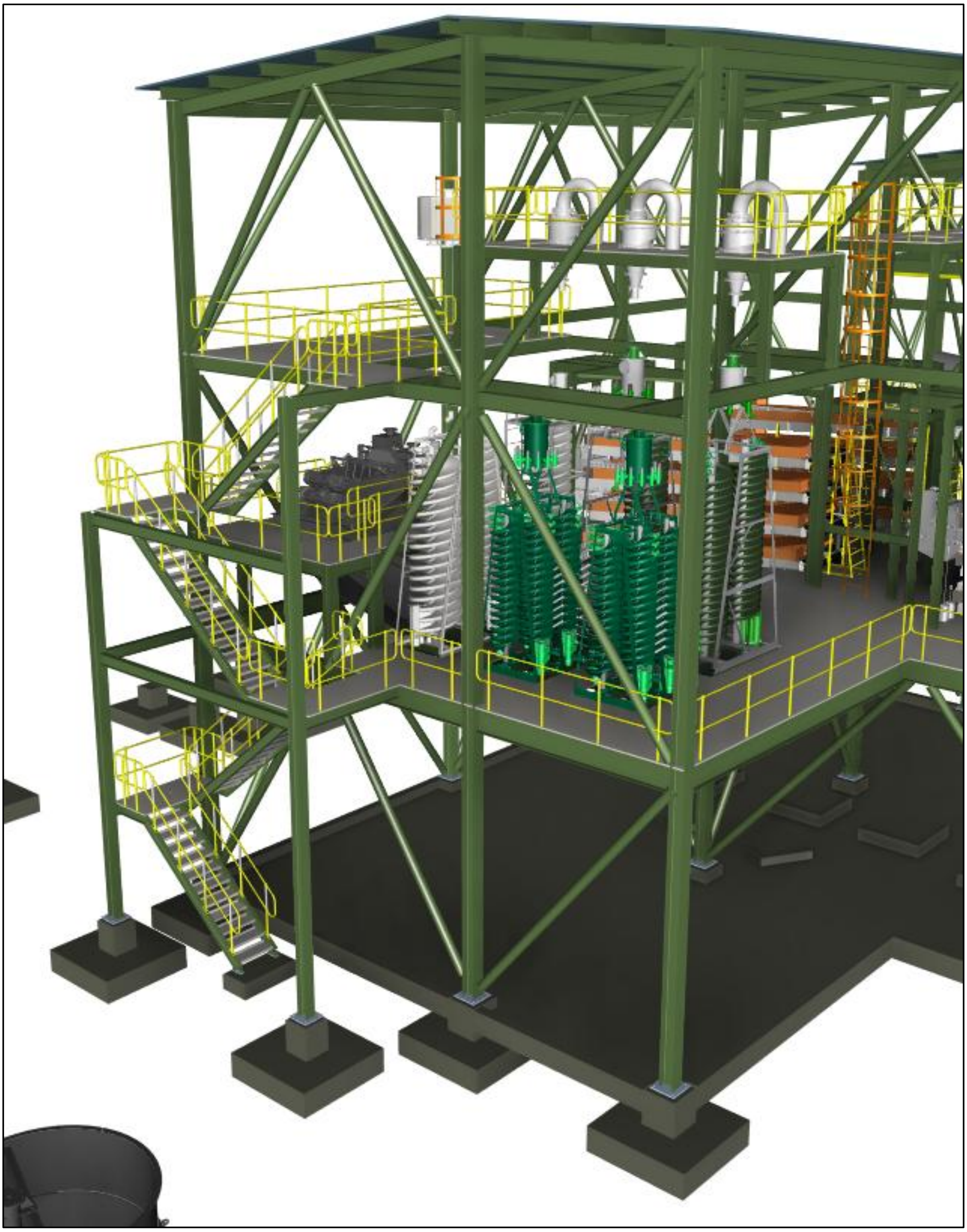


FIGURE 15: COARSE AND FINE SPIRAL CIRCUIT

5.6 SHAKING TABLE CIRCUIT

The material collected in the rougher shaking table feed tank will be pumped to the rougher shaking tables. The shaking table circuit will consist of a typical rougher, scavenger and cleaner configuration. The middlings and tailings from the cleaner shaking table will be recycled back to the rougher shaking table feed tank. The tailings from the rougher shaking table will gravitate to the coarse tailings tank and the content of this tank will be pumped to the coarse tailings stacking cyclone. For this study allowance was made to pump the coarse tailings 500m away from the plant. The concentrate from the cleaner shaking table will be pumped to the concentrate magnetic separator (LIMS). The tailings from the concentrate magnetic separator will also be collected in the coarse tailings tank. The layout of the shaking table circuit is shown in Figure 16 below.

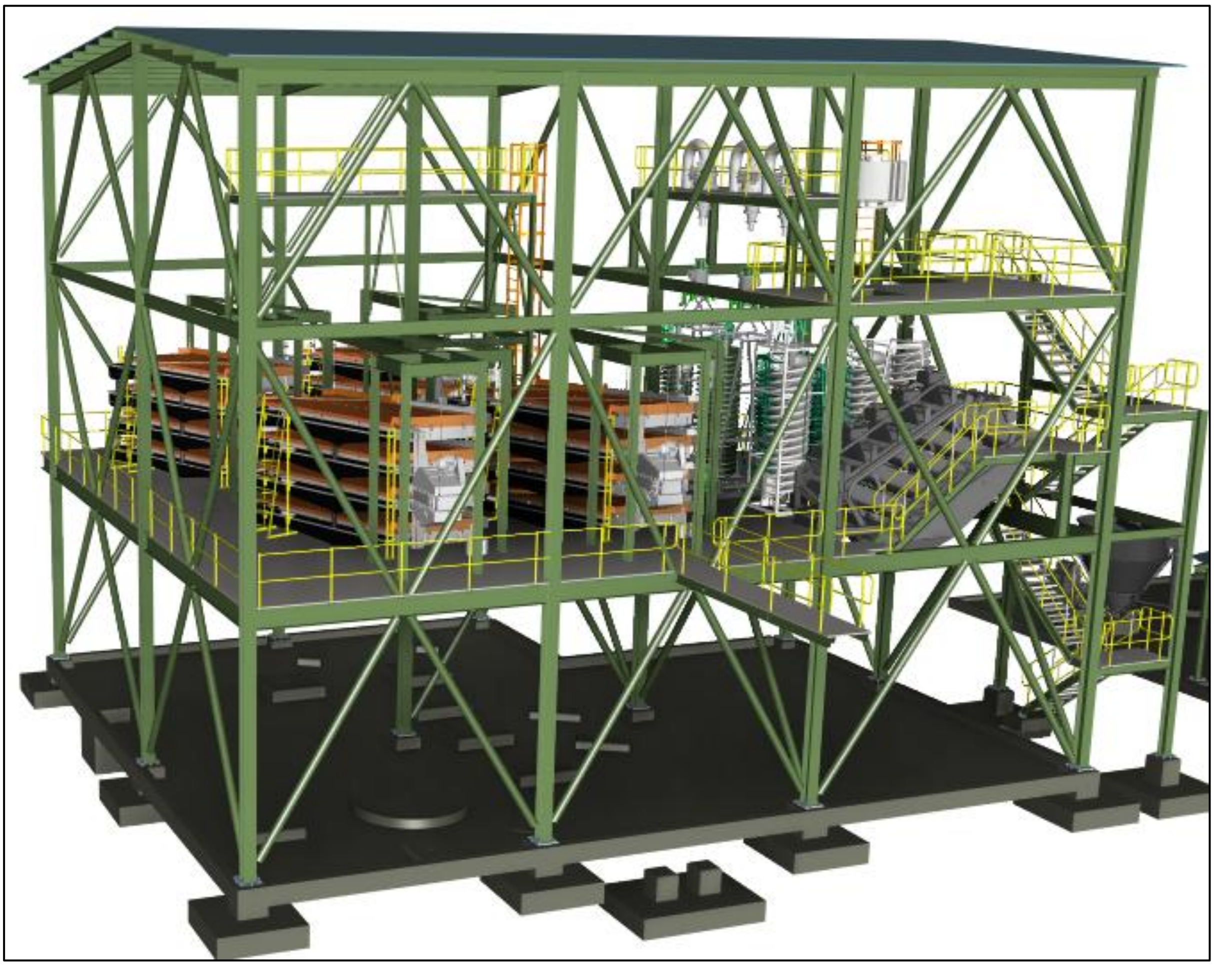


FIGURE 16: SHAKING TABLE CIRCUIT

5.7 MGS CIRCUIT

The content of the rougher MGS (multi-gravity separator) feed tank will be pumped to the rougher MGS's. The tailings from the rougher MGS's will gravitate to the fine tails tank and the content of this tank will be pumped to the fine tails stacking cyclone cluster. For this study allowance was made to pump the fine tailings 500m away from the plant. The concentrate from the rougher MGS's will be pumped to the cleaner MGS. The tailings from the cleaner MGS will be recycled back to the rougher MGS feed tank via a dewatering cyclone. The overflow of this dewatering cyclone will be used as part of the wash water supply to the rougher MGS's. Figure 17 shows the MGS circuit.

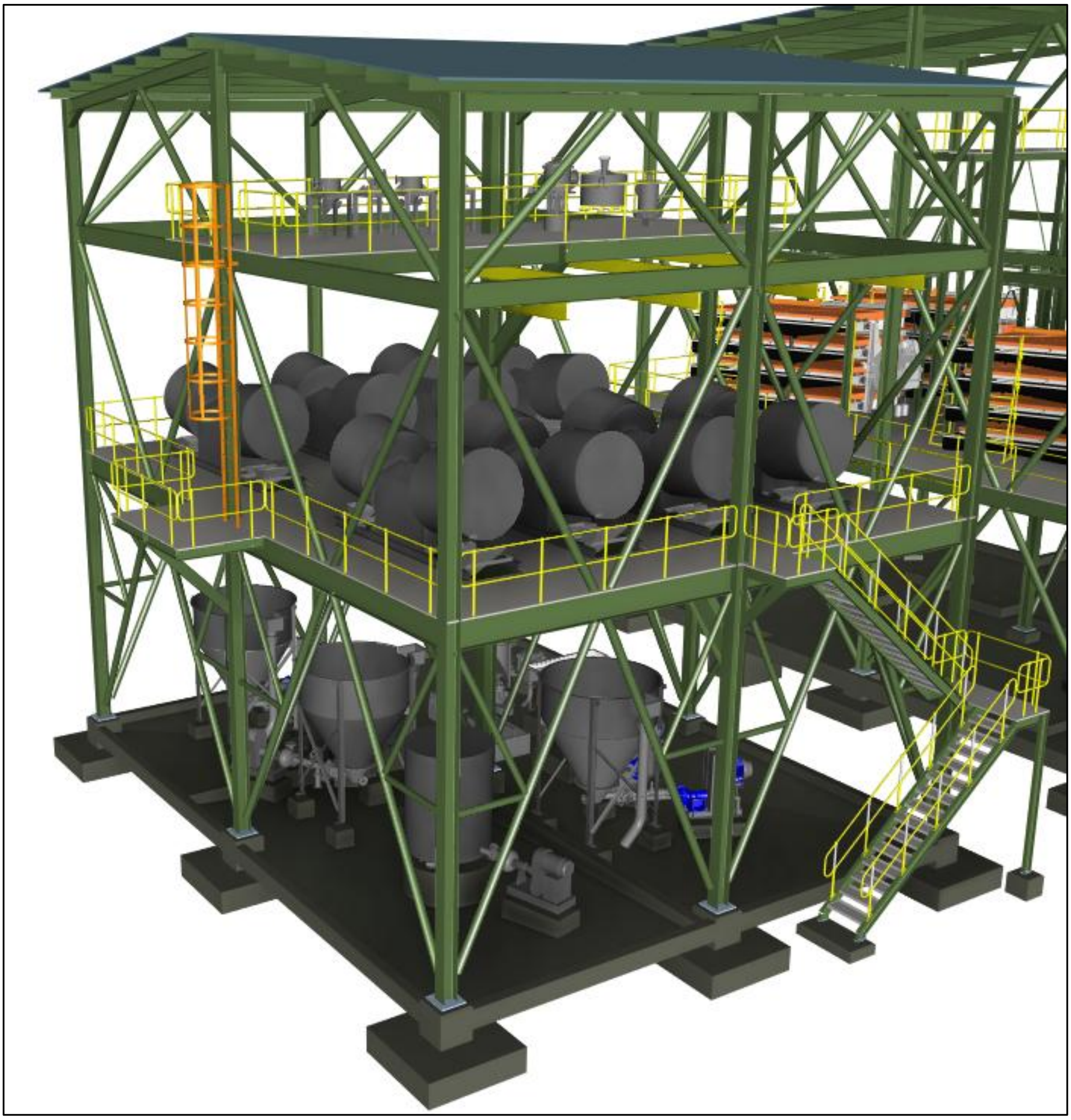


FIGURE 17: MGS CIRCUIT

5.8 FINAL CONCENTRATION AND PRODUCT DEWATERING

The concentrate from the cleaner shaking tables and from the cleaner MGS will be pumped to a tundish that will feed the low intensity magnetic separator (LIMS). The LIMS will separate strongly magnetic material from non-magnetic material. The non-magnetic stream is the final concentrate that will be produced in the beneficiation plant.

The strongly magnetic material will be reporting the coarse tailings tanks located in the shaking table area with the non-magnetic material reporting to the filter press feed tank. The filter press feed tank will pump the final concentrate to the filter press circuit where the concentrate will be dewatered. The filter cakes generated by the filter press will be discharged into a bunker. The effluent from the filter press plant will be pumped to the thickener using the filter press spillage pump. The filter cakes can then be furthered dried using a dryer and bagged into 1 ton bulk bags for shipment.

Figure 18 shows the product shed that will house the filter press and drying circuit

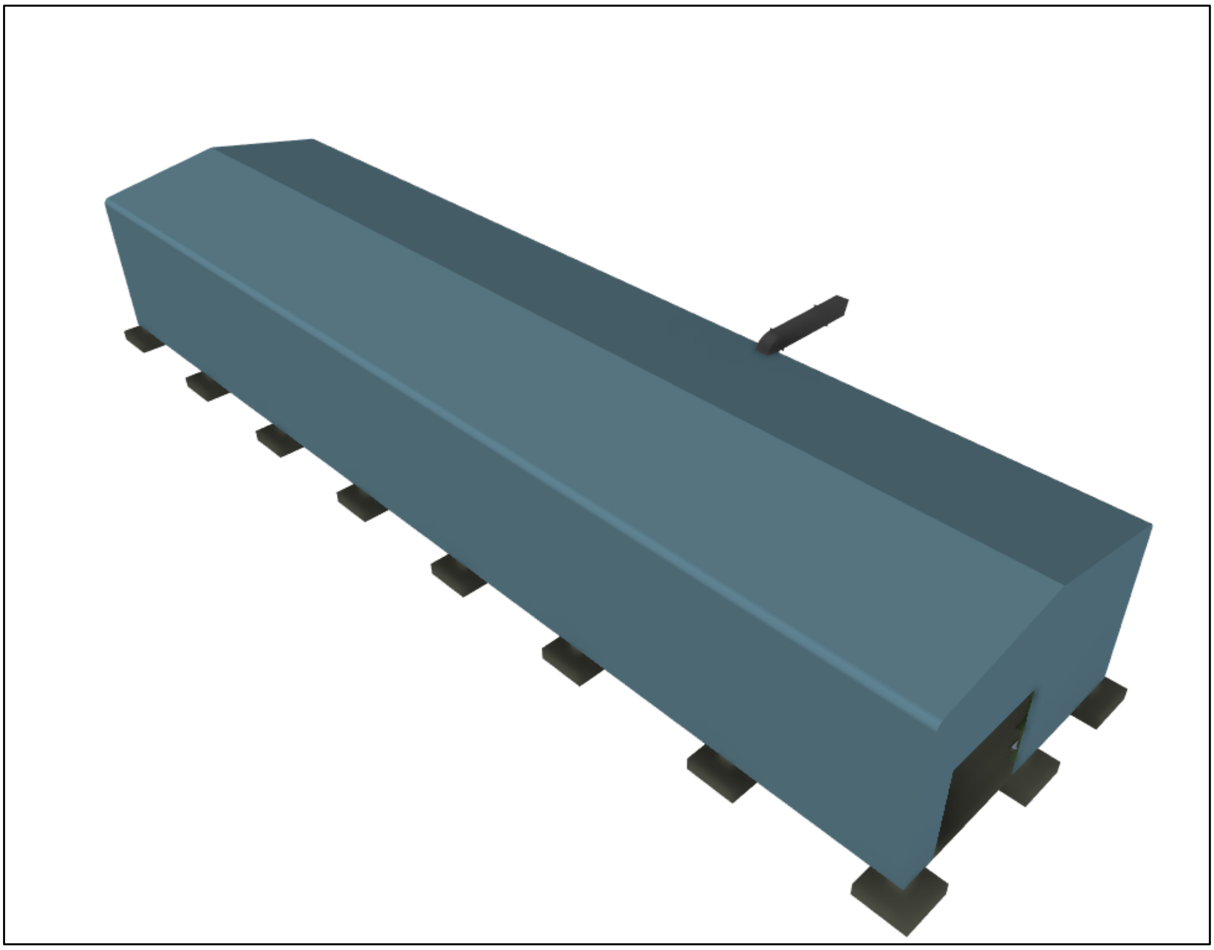


FIGURE 18: PRODUCT SHED

5.9 TAILINGS

The material in the MGS fine tailings tank will be pumped to fines discard stacking cyclone. The cyclone's underflow will be stacked on a concrete pad with the cyclones overflow reporting to the fine cyclone overflow tank. The fine tailings pad will be equipped with a spillage pump to pump the stockpile drainage water to the fine cyclone overflow tank. The material in the fines cyclone overflow tank will be pumped to the tailings thickener feed box.

The material in the coarse tailings tank will be pumped to coarse discard stacking cyclone. The cyclone's underflow will be stacked on a concrete pad with the cyclones overflow reporting to the coarse cyclone overflow tank. The coarse tailings pad will be equipped with a spillage pump to pump the stockpile drainage water to the coarse cyclone overflow tank. The material in the coarse cyclone overflow tank will be pumped to the tailings thickener feed box. The a typical layout that will be used for both the coarse and fine tailings stacking is shown in Figure 19 below.

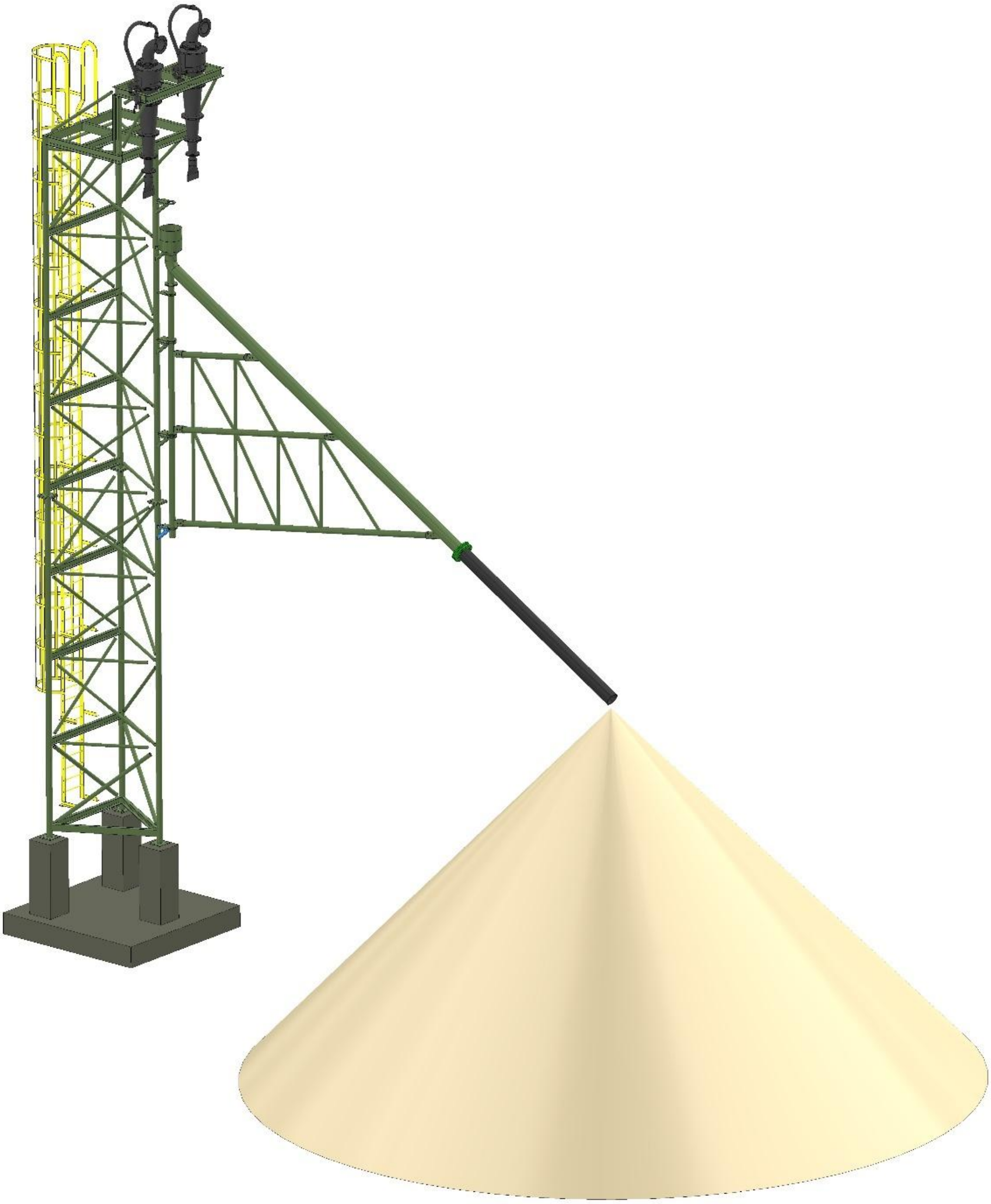


FIGURE 19: COARSE AND FINE TAILINGS STACKING AREA

The thickener feed box will also collect the desliming cyclones overflow, flocculant and the effluent from the tailings and concentrate filter press. The thickener feed box will feed the thickener, with the thickener's overflow reporting to the process water tank, with the underflow being pumped to the tailings filter press. The tailings filter press will discharge on the jig tailings stockpile conveyor.

An automatic batching flocculant plant will produce a flocculant concentrate; the flocculant concentrate will be pumped to the thickener feed box. The layout of the slimes thickening area is shown in Figure 20 below.

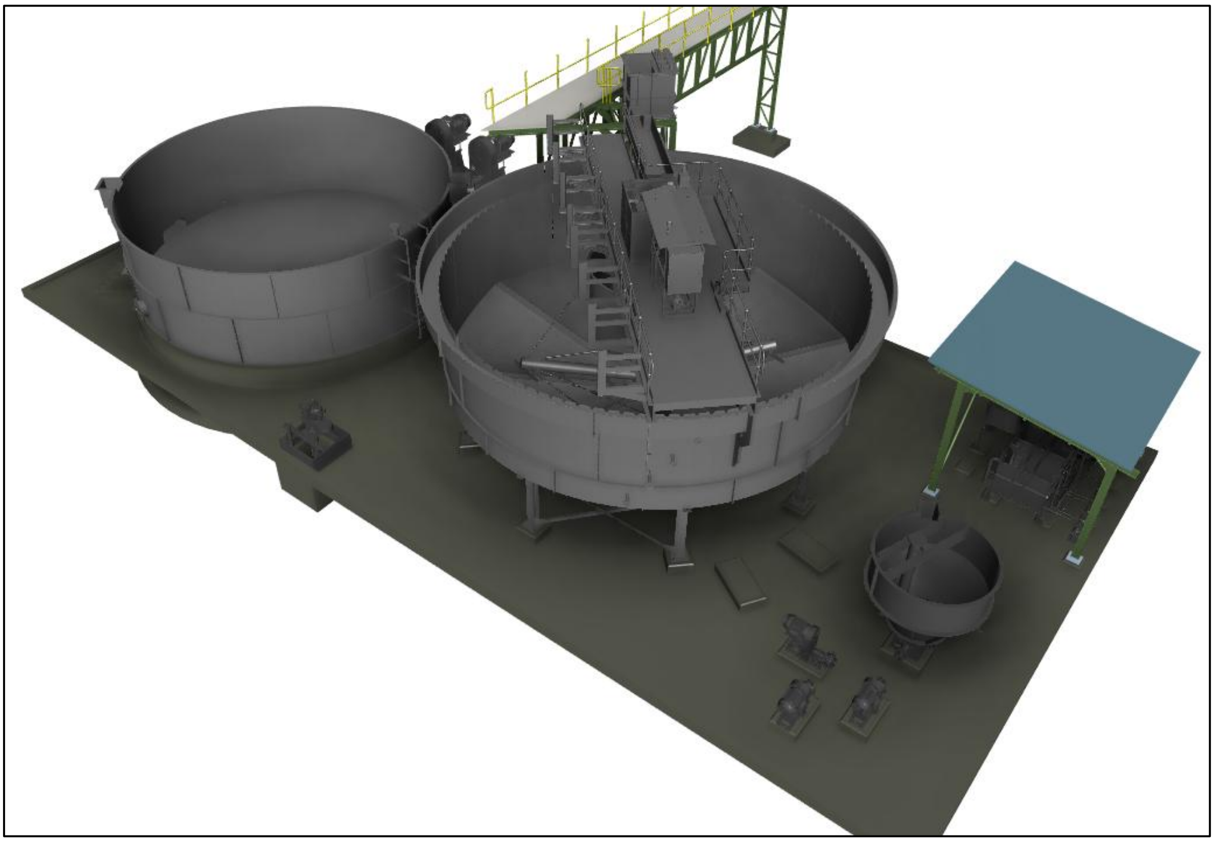


FIGURE 20: SLIMES THICKENING AREA

5.10 PLANT SERVICES

Plant services were allowed to support the processing plant; these services include:

- Process water pump.
- A containerised fire water container is also connected to the raw water tank. The container includes a fire water pump, a jockey pump, and a diesel pump. The CAPEX estimated includes hydrants, hose reels, and fire extinguishers.
- An air compressor supplies compressed air to the plant, with an air receiver included in the supply.

6. PLANT CONSUMPTION, PRODUCTION & FEED GRADE

Table 12 shows the plant consumption, production and feed grade values. This section must be read in conjunction with the process flow diagrams and mass balances appended to this report within Annexure B and C. Two mass balances are appended to this report, a mass balance for the maximum expected feed grade and a mass balance for the minimum expected feed grade. As explained in section 4.2; both the above-mentioned mass balances were completed assuming a fine mill/jig feed PSD, since this results in the highest throughput going to the gravity separation circuit.

TABLE 12: PLANT CONSUMPTION

Consumption		
Description	**Unit**	**Value**
Flocculant	g/ton	50
Make-up raw water	m^3/h	15.6*
Dryer Fuel (Diesel/Paraffin)	l/h	62
Absorbed electrical load	kVA	1,883
Production		
Description	**Unit**	**Value**
Assumed monthly production time	hours	500
Crushing Circuit Feed	ton/h	65
Plant Feed	ton/h	50
Plant Feed Grade	% WO_3	0.6-1.5
Jig Tailings	ton/h	8.21-14.8
Coarse Tailings	ton/h	15.79
Fine Tailings	ton/h	22.63
Tailings Filter Cake**	ton/h	3.45
Final Concentrate (60.8% WO_3)***	ton/h	0.278-0.694

***The calculated raw water make-up is 13m³/h, however a 20% allowance was added to account for spillages, evaporation and other factors**

****Tailings thickener and filter press designed for a maximum of 5.0 ton/h dry solids**

*****Depending on the plant feed grade**

7. ELECTRICAL DESCRIPTION

The single line diagram for the study is shown in Figure 21 and should be read in conjunction with the sections below (it is also appended within Annexure K).

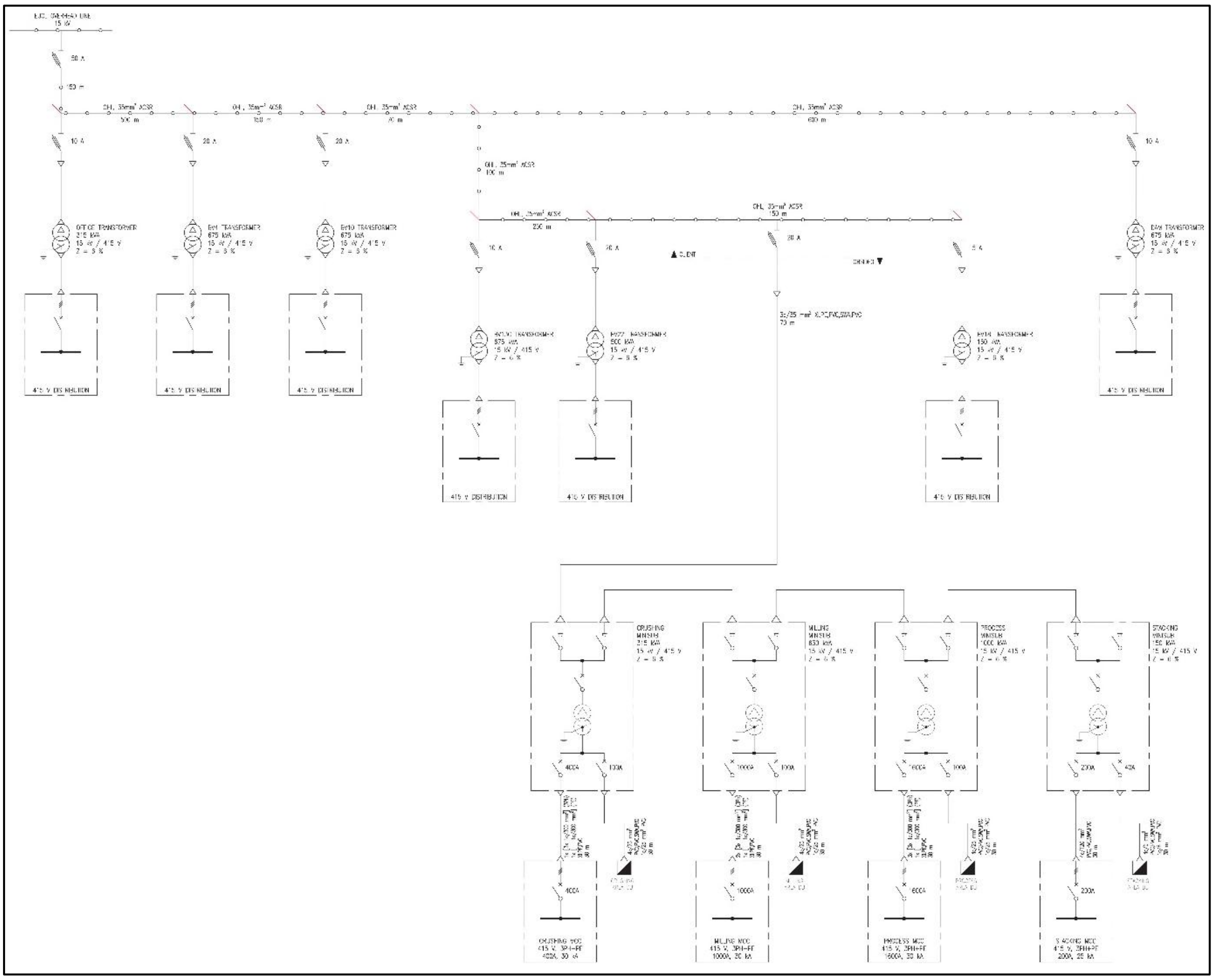


FIGURE 21: SINGLE LINE DIAGRAM

7.1 PLANT POWER DISTRIBUTION

The plants power will be supplied by tying into the existing 15kV overhead headline, from the tie-in point a MV trailing cable will be installed to feed the 315 kVA crushing circuit minisub. The 630 kVA milling circuit minisub, 1000kVA processing circuit minisub and 150kVA stacking circuit minisub will all be connected in series to the crushing circuit minisub.

Each minisub is equipped with a 15kV to 415V transformer, and two feeders one of which will the areas MCC and the other will be used to feed the areas distribution boards.

8. INFRASTRUCTURE DESCRIPTION

The infrastructure strategy involves supplying all required infrastructure, equipment, and machinery for the maintenance and operation of the plant upfront. This shift in strategy delivers several key advantages:

- Avoids duplicate activities by eliminating the need to build and dismantle temporary housing and supporting infrastructure during the construction phase; instead, a more equipped long-term camp will be constructed for the construction phase, and subsequently serve the operational needs once construction is completed.
- Fast-track project readiness by providing durable, high-quality facilities and equipment to serve both construction and operations teams at the beginning of the construction phase.
- Closes the gap between operations and maintenance as it ensures all required equipment and machinery are available on the day after the plant is handed over.
- Reduces overall CAPEX and OPEX through shared use of infrastructure.

The strategy involves constructing a single camp that will be used by both contractors and operational personnel, rather than maintaining separate temporary contractor camps and permanent operational camps.

Figure 22 shows a layout of the proposed camp.

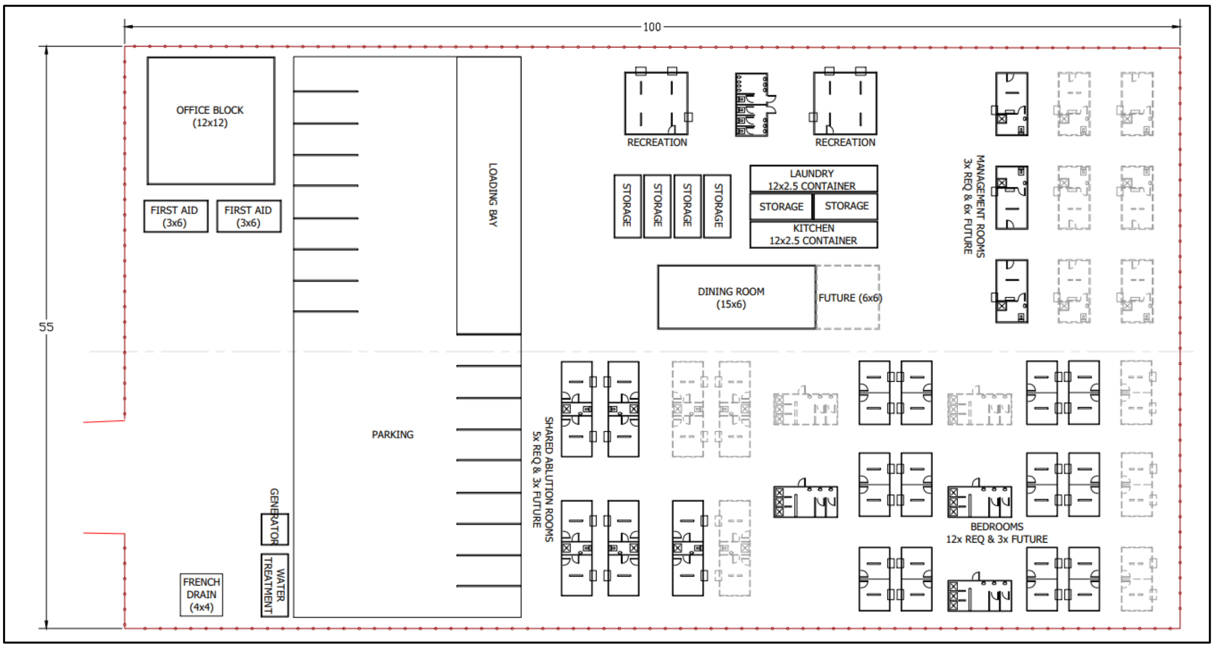


FIGURE 22: THE PROPOSED CAMP LAYOUT

Figure 23 shows a typical layout of containerised workshops.

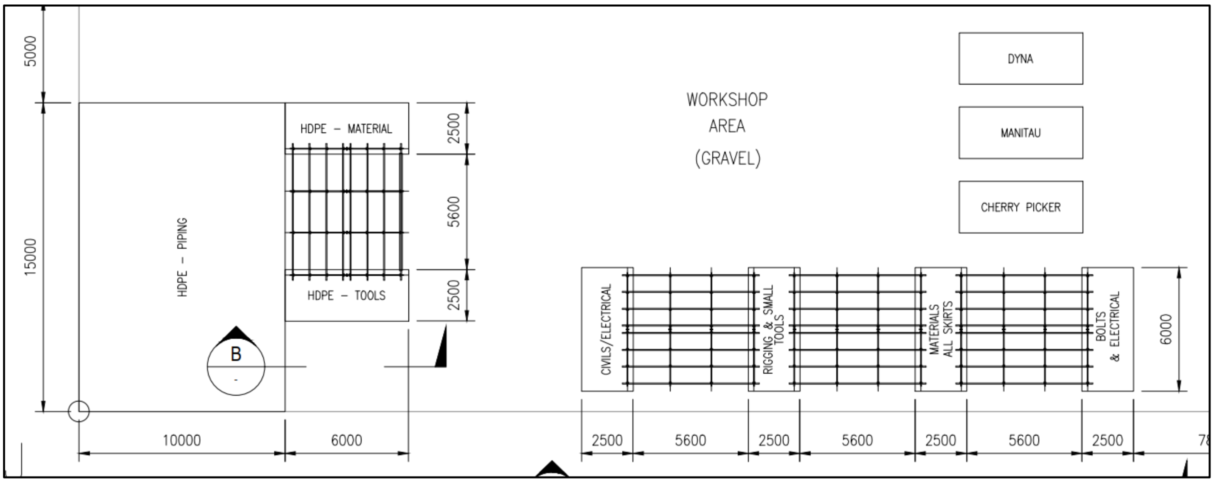


FIGURE 23: TYPICAL WORKSHOPS

9. FACILITY DESCRIPTION

The detail of facilities is summarised as follows:

Circuit: Crushing Circuit	
Mechanical Equipment Includes: • Vibrating Grizzly Feeder with • Jaw Crusher (Primary Crusher) • Jaw Crusher (Secondary Crusher) • Sizing Screen • Static Belt Magnet • Sizing Screen Feed Conveyor • Secondary Crusher Feed Conveyor • Stockpile Feed Conveyor • Sizing Screen Feed Conveyor Weightometer • Secondary Crusher Feed Conveyor Weightometer	**Steel Work Includes:** • Gantries and structures • Access staircase • Access and maintenance platforms • Handrailing
Plate Work Includes: • Feed chutes • Discharge chutes • Plant Feed Hopper • Static Grizzly	

Circuit: Stockpile Tunnel and Area	
Mechanical Equipment Includes: • Belt Feeder • Stockpile Tunnel Extraction Conveyor • Weightometer	**Steel Work Includes:** • Gantries and structures • Access staircase • Access and maintenance platforms • Handrailing

Plate Work Includes: • Feed bin and Spile Bar Arrangements • Feed chutes • Discharge chutes	

Circuit: Tailings Spirals	
Mechanical Equipment Includes: • Coarse Sizing Screen Feed Conveyor • Coarse Sizing Screen • Coarse Sizing Screen Oversize Conveyor • Oversize Transfer Conveyor • EDS Feed Conveyor • EDS Multishaft Mill (Duty) • EDS Multishaft Mill (Standby) • Mill HF Screen (Duty) • Mill HF Screen (Standby) • De-Watering Screen • Jig Tailings Conveyor • Jig Feed Pump A (Duty) • Jig Feed Pump B (Standby) • Pulping Water Pump • HF Screen Feed Pump • Mill Feed Pump • Pre-Screen Cyclone Feed Pump • Pre-concentration Jig	**Steel Work Includes:** • Gantries and structures • Access staircase • Access and maintenance platforms • Handrailing • Plant Roof Structure and Sheeting
Plate Work Includes: • Feed chutes • Discharge chutes • Oversize chutes • Launders	**Piping Includes:** • All suction and delivery piping within the circuit including: o Pipes and Fittings o Pipe Supports o Valves

Circuit: Spirals and Shaking Tables	
Mechanical Equipment Includes: • Rougher Shaking Table A (Duty) • Rougher Shaking Table B (Duty) • Scavenger Shaking Table • Cleaner Shaking Table • Coarse Rougher Spirals Feed Pump • Fines Sizing Cyclone Feed Pump • Coarse Cleaner Spirals Feed Pump • Rougher Shaking Tables Feed Pump • Coarse Scavenger Cyclone Feed Pump • Coarse Spirals Tails Pump • Scavenger Shaking Tables Feed Pump • Cleaner Shaking Tables Feed Pump • Cleaner Shaking Tables Tails Pump • Coarse Tailings Cyclone Feed Pump	**Steel Work Includes:** • Gantries and structures • Access staircase • Access and maintenance platforms • Handrailing • Plant Roof Structure and Sheeting

• Pre-Screen Cyclone • Coarse Scavenger Cyclone • Sizing HF Screen • Coarse Rougher Spiral • Coarse Scavenger Spiral • Coarse Cleaner Spiral • Screening and Spiral Area Spillage Pump • Shaking Table Area Spillage Pump	
Plate Work Includes: • Sizing HF Screen Oversize Tank • Sizing HF Screen Undersize Tank • Rougher Conc Tank • Rougher Shaking Table Feed Tank • Rougher Tails Tank • Coarse Spirals Tails Tank • Coarse Rougher Spiral • Rougher Shaking Tables Mids Tank • Cleaner Shaking Table Feed Tank • Cleaner Shaking Table Mids Tank • Cleaner Shaking Table Concentrate Tank • Coarse Tailings Tank	**Piping Includes:** • All suction and delivery piping within the circuit including: o Pipes and Fittings o Pipe Supports o Valves

Circuit: Magnetic Separation and Tailings Spirals	
Mechanical Equipment Includes: • Fine Sizing Cyclone • Fine Rougher Spiral • Fine Scavenger Spiral • Fine Cleaner Spiral • Desliming Cyclone Feed Pump • Fine Cleaner Spirals Feed Pump • Rougher MGS Feed Pump • Fine Cleaner Spirals Tails Pump • Fines Scavenger Cyclone Feed Pump • Fine Spirals Tails Pump • MGS Area Spillage Pump • Cleaner Tails Dewatering Cyclone • Rougher MGS 1 • Rougher MGS 2 • Rougher MGS 3 • Rougher MGS 4 • Rougher MGS 5 • Rougher MGS 6 • Rougher MGS 7 • Cleaner MGS Feed Pump • MGS Concentrate Pump • Cleaner Tails Dewatering Cyclone Feed Pump • Fine Tailings Cyclone Feed Pump	**Steel Work Includes:** • Gantries and structures • Access staircase • Access and maintenance platforms • Handrailing • Plant Roof Structure and Sheeting

Plate Work Includes: • Fine Sizing Cyclone Overflow Tank • Rougher Concentrate Tank • MGS Feed Tank • Fine Cleaner Tails Tank • Rougher Tails Tank • Fine Spirals Tails Tank • Rougher MGS Concentrate Tank • Cleaner MGS Concentrate Tank • Cleaner MGS Tails Tank • MGS Fine Tailings Tank	**Piping Includes:** • All suction and delivery piping within the circuit including: ○ Pipes and Fittings ○ Pipe Supports ○ Valves

Circuit: Concentrate Area	
Mechanical Equipment Includes: • Concentrate Magnetic Separator • Final Concentrate Pump • Concentrate Area Spillage Pump • Concentrate Filter Press	**Steel Work Includes:** • Gantries and structures • Access staircase • Access and maintenance platforms • Handrailing
Plate Work Includes: • Final Concentrate Tank	**Piping Includes:** • All suction and delivery piping within the circuit including: ○ Pipes and Fittings ○ Pipe Supports ○ Valves

Circuit: Tailings Thickener Process Water and Flocculant Plant	
Mechanical Equipment Includes: • Fine Tailings Stacking Cyclone • Coarse Tailings Stacking Cyclone • Tailings Thickener • Tailings Filter Press • Flocculant Plant • Fine Tailings Cyclone Overflow Pump • Coarse Tailings Cyclone Overflow Pump • Thickener Underflow Pump A (Duty) • Thickener Underflow Pump B (Standby) • Process Water Pump • RAW Water Transfer Pump • Thickener Area Spillage Pump • Fine Tailings Stacking Spillage Pump • Coarse Tailings Stacking Spillage Pump	**Steel Work Includes:** • Gantries and structures • Access staircase • Access and maintenance platforms • Handrailing • Flocculant Plant Roof Structure and Sheeting
Plate Work Includes: • Fine Tailings Cyclone Overflow Return Tank • Coarse Tailings Cyclone O/F Return Tank • Process Water Tank • Raw Water Tank	**Piping Includes:** • All suction and delivery piping within the circuit including: ○ Pipes and Fittings ○ Pipe Supports ○ Valves

Circuit: Plant Services	
Mechanical Equipment Includes: • Process Water Pump • Raw Water Pump • Fire Water Pump • Fire Water Jockey Pump • Fire Water Diesel Pump • Plant Air Compressor 1 • Plant Air Compressor 2 • Plant Air Receiver	**Steel Work Includes:** • Gantries and structures • Access staircase • Access and maintenance platforms • Handrailing
Plate Work Includes: • Raw Water Tank • Process Water Tank	**Piping Includes:** • All suction and delivery piping within the circuit including: ○ Pipes and Fittings ○ Pipe Supports ○ Valves

Electric and Instrumentation	
Electric Supply Includes: • 3B formfactor containerised MCCs • Electric panels powder-coated • Main DB Boards • Lighting DBs • Cabling from electric panels to all electrical motors, lights and small power • Cable Glands • Cable Racks • LED Plant Lights • E-stop stations	**Instrumentation Includes:** • PLC and SCADA • Belt alignment switch • Belt weigher • Flow meter • Flow switch • Hydrostatic level transmitter • Modulating control valve • Nuclear Density Meter • On/Off pneumatic actuated control valve • Pressure gauge • Pressure transmitter • Pull cord switch • Radar level transmitter • Siren / strobe light combo • Speed switch • Tilt Switch

Earthworks and Concrete Works	
Earthworks Includes: • Restricted excavations for foundations	**Concrete Works Includes:** • Concrete foundations for all structures, including reinforcement steel and holding down bolts as required • Surface slab and bund walls

Supporting Infrastructure

- Contractors Camp
    - 3 off Management VIP Rooms
    - 5 off Management Rooms
    - 30 off Double Bedrooms (up to 4 people per room)
    - 4 off Ablutions
    - 2 off Open Plan Dining Rooms
    - 4 off Shower Ablutions
    - 2 off Recreation (Open Plan)
    - 2 off Kitchen Containers
    - 1 off Laundry Container
    - 1 off Open Plan First Aid Room
    - 6 off Storage Containers
    - Limited Furniture
    - Fencing and Gates
    - Client Admin Office
    - Admin Block Furniture

- External Lights
- Generator (Back-up Power)
- Water Treatment Plant
- Limited Upgrading of Construction and Access Roads
- Site Vehicles (to be transferred to operations after project completion)
    - 1 off 50T Crane (Used)
    - 2 off 4T Telehandlers (Used)
    - 1 off 8T Hi-up Truck
    - 4 off LDV's
    - 1 off 16-Seater Bus

10. LOGISTICS

The logistics cost estimate has been developed to ensure reliable, timely, and secure delivery of all materials and equipment to the Nyakabingo site. Assumptions are based on site access constraints, typical African project logistics experience, and supplier-provided equipment sizing and tonnage data.

10.1 TRANSPORT METHODOLOGY

- **Primary Transport (Ocean Freight):** Ocean freight has been selected as the primary mode of transport due to its cost-effectiveness for containerised cargo. Shipments will be consolidated in Johannesburg and dispatched via the Port of Durban to Mombasa, Kenya. From Mombasa, containers will be trucked to site via Taveta (Kenya–Tanzania) and the Rwanda–Tanzania border. Estimated duration is approximately 20 days including border delays.

- **Secondary Transport (Road Freight):** Certain cargo requiring urgent delivery or unsuitable for containerisation will be routed via Beitbridge (Zimbabwe), Zambia, Tanzania, Burundi, and into Rwanda. Estimated duration is approximately 20 days.

The Figure 24 shows the above-described routing.

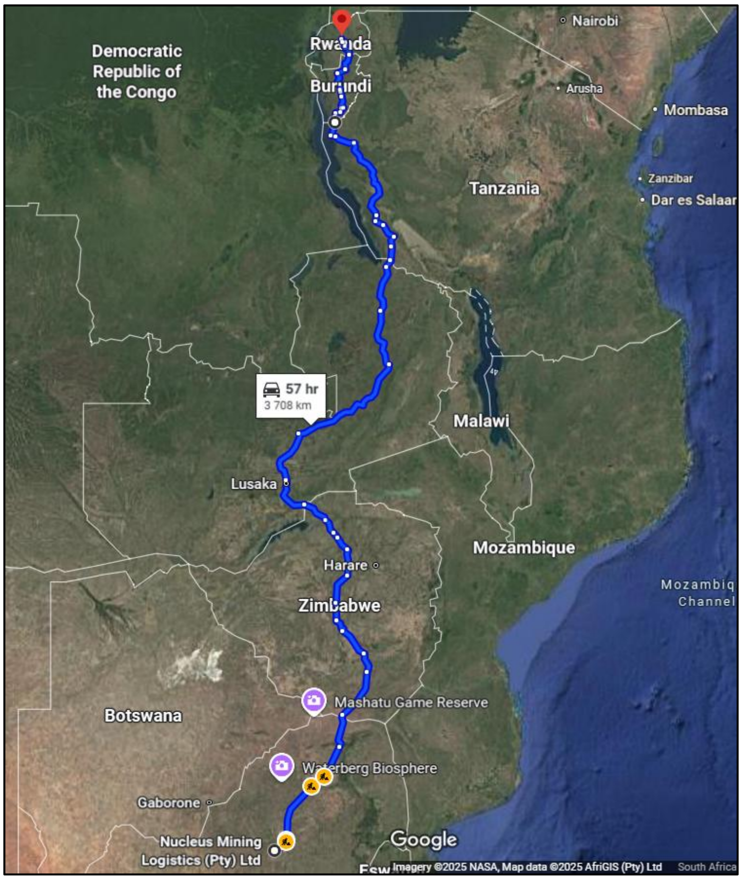


FIGURE 24: PLANNED ROUTING

10.2 CONTAINERISATION AND EQUIPMENT HANDLING

- Due to the steep gradients and verticality of the site, 20-foot general purpose (GP) containers are assumed for all shipments.
- A total of 101 x 20’ GP containers are included in the estimate; no 40’ containers are currently planned.
- Break-bulk handling will be applied for out-of-gauge equipment (e.g., mills, generators, cranes), with low-bed haulage and route surveys included.

10.3 LOAD TYPES AND REQUIREMENTS

- Construction materials: steel sections, electrical, piping, platework.

- Mechanical components: generators, pumps, screens, shaking tables.
- Sensitive/high-value items: transported in secured containers with inspection protocols.
- Road freight operations are expected to require ~150 triaxle trucks from South Africa.

10.4 CONSTRAINTS AND RISK FACTORS

- Seasonal rainfall (Mar–May): may disrupt gravel or secondary road access; dry season scheduling preferred.
- Border bureaucracy/customs: delays possible; COMESA/SADC-experienced clearing agents assumed.
- Re-handling: all international shipments will be offloaded in South Africa for consolidation before dispatch.

10.5 CONSOLIDATION AND QUALITY ASSURANCE

- A consolidation yard in South Africa is included in the cost estimate, providing shipment dispatch, container management, and freight coordination.
- BV inspections: Freight forwarder to coordinate Bureau Veritas inspections at vendor yards or consolidation yards prior to shipment release.
- Packing QA: Each container to include signed packing list, equipment list, loadmaster QA report, and tracking sheet.
- Cargo Tracking: All cargo tracked by the appointed freight forwarder.

11. EPCM SERVICES

The Engineering, Procurement and Construction Management services required to execute the Nyakabingo project spans across all engineering disciplines, procurement of equipment and materials, fabrication, construction, construction management, and commissioning. The estimate supports budget planning, resource allocation and resource management across the full project lifecycle.

The estimation approach was primarily based on utilizing discipline-specific design & inputs, historical benchmarks, vendor quotes, and productivity norms.

11.1 ENGINEERING

11.1.1 PROCESS ENGINEERING

- Development and sign-off of Process Design Criteria (PDC).
- Updates to BFDs, PFDs, P&IDs, Mass & Water Balances.
- Mechanical Equipment List and Process Data Sheets.
- Control Philosophy, Functional Design Specification, Alarm & Trip Lists.
- Cause-and-Effect Matrix and Utility Consumption.
- 2D Drafting of process diagrams.

11.1.2 MECHANICAL ENGINEERING

- Mechanical design criteria.
- Equipment calculations (pumps, conveyors).
- Mechanical General Arrangements (GAs).
- Layouts, plot plans, BMHS, substations, buildings.
- Water service designs (gland, process, fire, raw).
- Equipment schedules (spares, tanks, pumps, conveyors).
- Platework and bolting design.
- Procurement specifications and QA documentation.
- BOQ input and 2D/3D drafting.

11.1.3 PIPING ENGINEERING

- Piping design criteria.
- Piping scope and procurement specifications.
- Piping schedules (pipeline ID, inline equipment, valves, tie-ins).
- Pipe support details and GA drawings.
- Valve data sheets (ball, butterfly, check, gate, diaphragm, knife gate).

11.1.4 ELECTRICAL ENGINEERING

- Electrical design criteria.
- Equipment specifications and cable diagrams.
- Cable schedules, termination plans, circuit diagrams.
- MV/LV distribution SLDs and equipment lists.
- Load lists, plot plans, QA documentation.
- Drafting of electrical drawings (SLDs, lighting, power).
- Vendor adjudication and RFQ documentation.

11.1.5 CONTROL AND INSTRUMENTATION ENGINEERING

- Control system design criteria and architecture.
- Instrument sizing and interfacing.
- Instrumentation drawings (loop, hook-up, cabinet connections).
- Instrument index and I/O list.
- SCADA/DCS/PLC requirements.
- QA documentation and vendor integration.
- RFQ documentation and tender scope.

11.1.6 CIVIL ENGINEERING

- Civil design criteria.
- Geotechnical input and report review.

- Foundation and slab designs (rebar and bending schedules).
- Bund wall designs.
- Earthworks and concrete BOQs.

11.1.7 STRUCTURAL ENGINEERING

- Structural steel design criteria.
- 3D modelling and load assessments.
- GA drawings and platework designs.
- Structural steel BOQs.

11.2 PROCUREMENT

- RFQs and scope of work documents.
- Commercial terms and technical specifications.
- Procurement register setup.
- Vendor document requirement lists (VDRLs).
- Evaluation of vendor proposals.
- Adjudication reports for client review and sign-off.

11.3 FABRICATION MONITORING

- Pre-fabrication meetings and inspection protocols.
- Package tracking and progress reporting.

11.4 CONSTRUCTION MANAGEMENT

- General construction management and site procedures:
    - Site instructions and contract variations.
    - Technical query management.

- Manage and coordinate:
    - Concrete works.
    - Structural steel erection.
    - Platework installation.
    - Mechanical equipment installation.
    - Piping installation.
    - Electrical systems installation.
    - Control & instrumentation systems installation.
    - Commissioning support.

11.5 PROJECT MANAGEMENT AND SUPPORT SERVICES

A structured rationale for the projected costs, resources, and timelines associated with delivering project services includes:

- Project Scheduling.
- Expediting & Coordination.
- Information Transfer & Communication.
- Safety, Health & Environment (SHE).
- Quality Assurance & Control (QA/QC).
- Commissioning.

11.6 RISK MANAGEMENT

The basis of the estimate account for uncertainties and potential cost and/or time impacts associated with risks during the execution phase of a project. To ensure risks are managed effectively and develop possible opportunities, the following principles are adhered to:

11.6.1 IDENTIFICATION OF RISKS

- Technical risks.
- Schedule risks.
- Cost risks.
- External risks.

11.6.2 RISK ASSESSMENT

- Qualitative analysis: categorizing risks by likelihood and impact.
- Quantitative analysis: assigning probabilities and cost ranges to risks.

11.6.3 CONTINGENCY ESTIMATION:

- A calculated allowance added to the base estimate.
- Based on risk exposure.
- Often expressed as a percentage of total cost or specific work package.

11.6.4 MITIGATION STRATEGIES

- Outline planned actions to reduce risk likelihood or impact.
- May influence contingency levels if mitigation is robust.

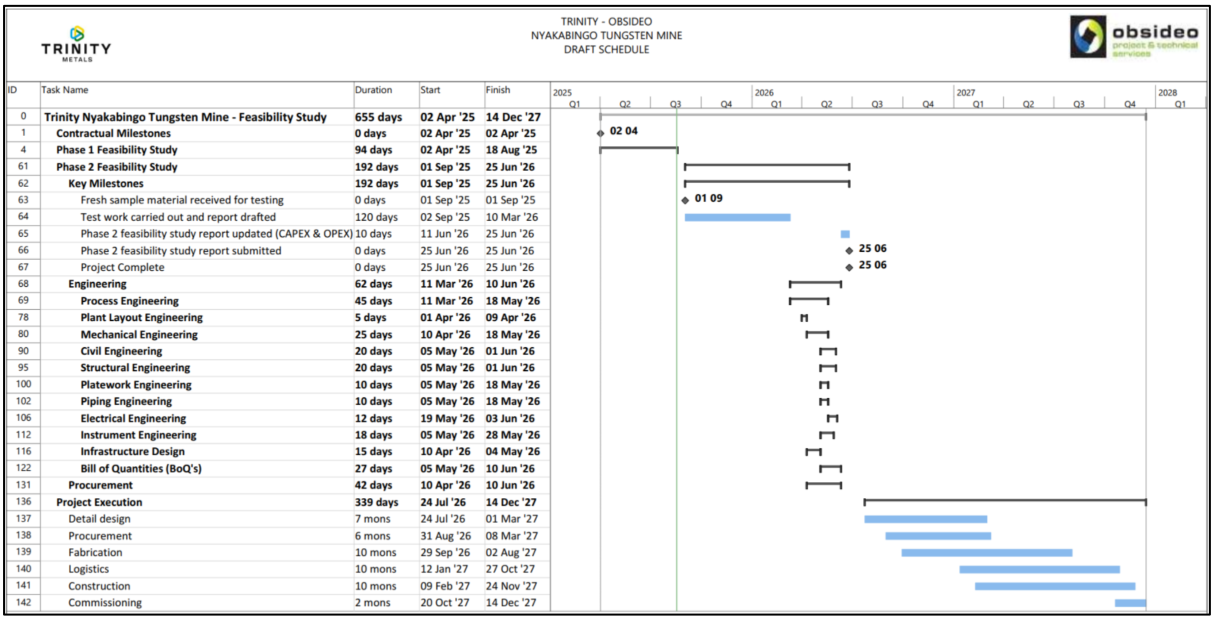
11.6.5 DOCUMENTATION & TRACEABILITY

- All risk-related assumptions, data sources, and methods should be documented.
- Enables transparency and future updates as project evolves.

This study report includes several critical risks identified to date documented as per the described principles and appended within Annexure S.

12. PROJECT IMPLEMENTATION SCHEDULING

The combined Phase 2 & execution schedule as appended in Annexure P details the various activities that will be completed by Obsideo and will be consolidated into the final phase two feasibility study report.



TRINITY - OBSIDEO
NYAKABINGO TUNGSTEN MINE
DRAFT SCHEDULE

ID	Task Name	Duration	Start	Finish
0	**Trinity Nyakabingo Tungsten Mine - Feasibility Study**	**655 days**	**02 Apr '25**	**14 Dec '27**
1	**Contractual Milestones**	**0 days**	**02 Apr '25**	**02 Apr '25**
4	**Phase 1 Feasibility Study**	**94 days**	**02 Apr '25**	**18 Aug '25**
61	**Phase 2 Feasibility Study**	**192 days**	**01 Sep '25**	**25 Jun '26**
62	**Key Milestones**	**192 days**	**01 Sep '25**	**25 Jun '26**
63	Fresh sample material received for testing	0 days	01 Sep '25	01 Sep '25
64	Test work carried out and report drafted	120 days	02 Sep '25	10 Mar '26
65	Phase 2 feasibility study report updated (CAPEX & OPEX)	10 days	11 Jun '26	25 Jun '26
66	Phase 2 feasibility study report submitted	0 days	25 Jun '26	25 Jun '26
67	Project Complete	0 days	25 Jun '26	25 Jun '26
68	**Engineering**	**62 days**	**11 Mar '26**	**10 Jun '26**
69	**Process Engineering**	**45 days**	**11 Mar '26**	**18 May '26**
78	**Plant Layout Engineering**	**5 days**	**01 Apr '26**	**09 Apr '26**
80	**Mechanical Engineering**	**25 days**	**10 Apr '26**	**18 May '26**
90	**Civil Engineering**	**20 days**	**05 May '26**	**01 Jun '26**
95	**Structural Engineering**	**20 days**	**05 May '26**	**01 Jun '26**
100	**Platework Engineering**	**10 days**	**05 May '26**	**18 May '26**
102	**Piping Engineering**	**10 days**	**05 May '26**	**18 May '26**
106	**Electrical Engineering**	**12 days**	**19 May '26**	**03 Jun '26**
112	**Instrument Engineering**	**18 days**	**05 May '26**	**28 May '26**
116	**Infrastructure Design**	**15 days**	**10 Apr '26**	**04 May '26**
122	**Bill of Quantities (BoQ's)**	**27 days**	**05 May '26**	**10 Jun '26**
131	**Procurement**	**42 days**	**10 Apr '26**	**10 Jun '26**
136	**Project Execution**	**339 days**	**24 Jul '26**	**14 Dec '27**
137	Detail design	7 mons	24 Jul '26	01 Mar '27
138	Procurement	6 mons	31 Aug '26	08 Mar '27
139	Fabrication	10 mons	29 Sep '26	02 Aug '27
140	Logistics	10 mons	12 Jan '27	27 Oct '27
141	Construction	10 mons	09 Feb '27	24 Nov '27
142	Commissioning	2 mons	20 Oct '27	14 Dec '27

As part of the optimization initiative, a level four execution schedule will be developed, detailing all necessary work activities required to successfully design and execute the project within the timeline showed above. The above start date for the project execution is based on the client reviewing the submitted study report for roughly one month before contract award for the execution phase.

Progress of work activities will be measured, and the schedule updated against the baseline activities to report planned, actual, and forecast status of scheduled activities.

13. BATTERY LIMITS

The battery limits associated with the study are described below.

13.1 INCOMING BATTERY LIMITS

Table 13 shows the incoming battery limits associated with the study.

TABLE 13: INCOMING BATTERY LIMITS

Description	Battery Limit
Feed material	Feed the ROM material into the crushing circuit feed bin
Power	Tie-in to the existing 33kV overhead line located near the consumers.
Raw Water	Discharge of the raw water supply line into the raw water tank
Fire Water	Discharge of the raw water supply line into the fire water tank
Flocculant	Top of flocculant hopper
Diesel	Inlet of the drier fuel storage tank
Access	Entrance to the southern access road

13.2 OUTGOING BATTERY LIMITS

Table 14 shows the outgoing battery limits associated with this study.

TABLE 14: OUTGOING BATTERY LIMITS

Description	Battery Limit
Concentrate	Discharge of concentrate in bulk bags
Coarse Tails	Coarse tailings stacking pad
Fine Tails	Fine tailings stacking pad
Slime filter cakes	Discharge chute of the combined dry tailings conveyor
Jig tailings	Discharge chute of the combined dry tailings conveyor
Sewage	Tie into the existing sewage system.

14. QUALIFICATIONS

This cost estimates are subject to the following qualifications:

- It is assumed that a consistent bearing pressure of 150kPa will be found at a level of 1.2 meters below natural ground level.
- Visa and work permits have been allowed at $ 1500 (USD)
- Client will assist with community liaising to provide local labour.
- It is assumed that a South African medical certificate will be sufficient to execute the project; we have not made provision for medical certificates for local labour

- No provision has been made for any taxes and labour-related costs not known at the time of this Study.
- The majority of the unskilled workforce will be from the surrounding community, and expat skilled workers will be used where specific skills are required.

15. EXCLUSIONS

The following are excluded from this study:

- Process performance guarantees (to be developed with updated test work results).
- Geotechnical survey and associated report.
- All environmental approvals and licencing by others.
- Stormwater design.
- Fuel storage and supply of fuel.
- Bulk earthworks.
- Supply of spares.
- Sewerage treatment from contractors' camp.
- Supply of crushed and screened materials for the mixing of Concrete on-site.
- Site security.
- Laboratory equipment.
- VAT & withholding tax.
- Duties & other costs associated with importing of goods.
- Process Historian, MES, MIS, ERP, Access Control, CCTV.
- IT systems, radio systems, internet access, satellite communications.
- Remote PCS access.

16. PROJECT COST ESTIMATE

The project estimate is based on an Engineering, Procurement, Construction Management (EPCM) contracting strategy with a Contingency allowance of 30%.

16.1 CAPEX

The capital cost estimate is summarized as follows:

TABLE 15: CAPITAL COST SUMMARY

CAPITAL COST ESTIMATE SUMMARY TRINITY TUNGSTEN PROJECT			
Description	**Sub Total (USD)**	**Contingency (USD)**	**Total (USD)**
Equipment Supply	$ 8,340,267.85	$ 2,458,574.08	**$ 10,798,841.92**
Concrete Works	$ 2,095,219.68	$ 628,565.90	**$ 2,723,785.59**
Structural Steel Works	$ 1,713,877.34	$ 514,163.20	**$ 2,228,040.55**
Platework	$ 693,386.40	$ 208,015.92	**$ 901,402.32**
Piping and Valves	$ 233,994.38	$ 70,198.32	**$ 304,192.70**
Electrical and Instrumentation	$ 2,095,199.69	$ 628,559.91	**$ 2,723,759.59**
Preliminaries	$ 2,168,485.00	$ 650,545.50	**$ 2,819,030.50**
Logistics	$ 2,015,779.84	$ 604,733.95	**$ 2,620,513.79**
Project Engineering and Management	$ 2,304,859.99	$ 691,458.00	**$ 2,996,317.99**
Infrastructure and Buildings	$ 3,692,389.76	$ 1,107,716.93	**$ 4,800,106.69**
Total Project	**$ 25,309,953.66**	**$ 7,606,037.98**	**$ 32,915,991.64**

Annexure R presents the detailed breakdown of the cost estimate, supporting the summary values provided in this report.

16.2 TAKEOUT ITEMS

In this section, the various takeout items will be discussed:

16.2.1 DRYER AND BAGGING STATION

The dryer and bagging station were based on the following scope:

- Feed hopper.
- Screw feeder x2.
- Dryer feed conveyor.
- Rotary kiln dryer.
- Bagging station feed conveyor.

- Loading hopper.
- Belt feeder.
- Platform scale.
- Weigh controller.

It is estimated that the power plant will cost approximately **$ 1,588,216.84.**

16.2.2 GENERATOR PLANT

A budget estimation was done to provide a cost estimate for a power plant to supply power to the processing plant.

The budget estimation was based on the following scope:

- 2 x 1000kW prime-rated generator units.
- Synchronisation substation.
- Containerised generator units.
- Supervision installation allowance from the OEM.
- 15kV step-up transformer and necessary changeover switching.

It is estimated that the power plant will cost approximately **$1 570 796.33.** Figure 25 shows a depiction of the power plant.

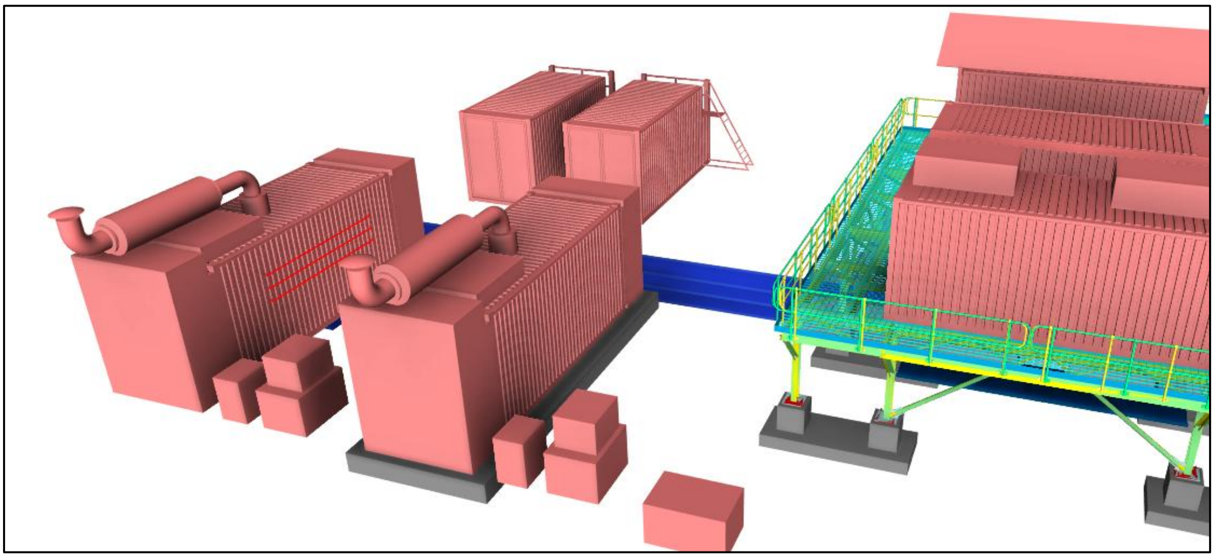


FIGURE 25: DEPICTION OF ELECTRICITY GENERATION PLANT

16.3 OPEX

The operations and maintenance estimate of the plant includes for management, supervision and labour as well as the spares, reagents, and consumables. The opex estimate is based on the plant operating 24 hours a day, 7 days a week.

16.3.1 SUPPORT SERVICES

The OPEX estimate includes for HR and administration services which typically includes the following:

- Operations readiness including:
    - Operations policies and procedures.
    - Implementation of procurement, maintenance, and SHE systems.
    - Training.
        - Safety.
        - Operations.
        - Stores management.
        - Maintenance.
- Payroll and payroll taxes.
- IR and employment equity / skill development management.
- Procurement including:
    - Approve site documents (quotes, orders, invoices).
    - Paying suppliers from head office.
    - Suppliers reconciliations.
    - Cost and expenditure reports – Sage Pastel.
- Stores and inventory control:
    - Stock management and control.
    - Generating purchase requisitions to the procurement department for stock replacement.
    - Spares and consumable dispatch control.
    - Updating of recommended spares and consumables levels based on actual frequency of replacement.
- Preventative maintenance:
    - System support.
    - Planning.
    - Data capturing.
- Metallurgical / Process support.

16.3.2 PROPOSED ORGANOGRAM

The proposed organogram for the plant is as indicated in Figure 26 below.

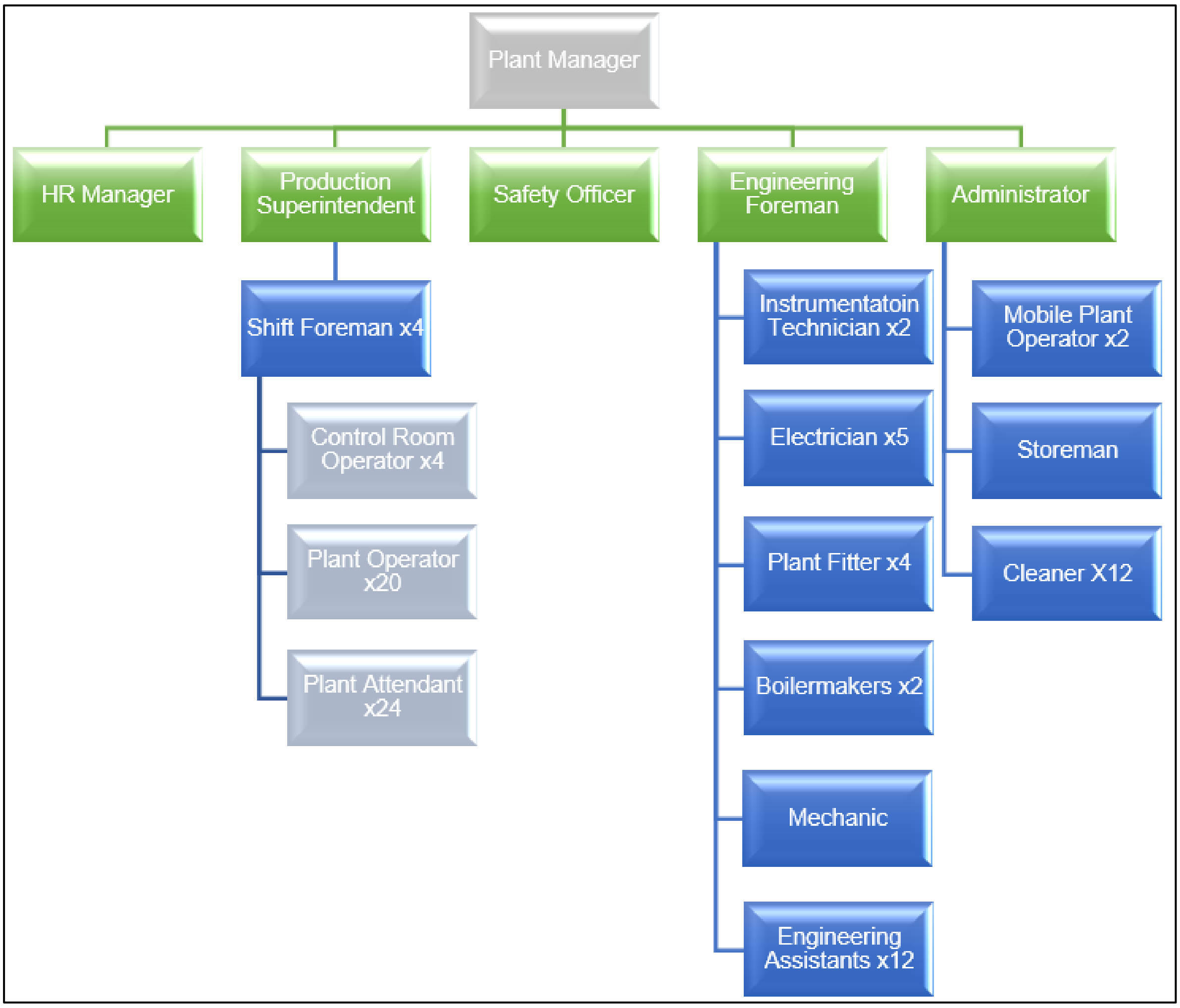


FIGURE 26 PROPOSED OPERATIONS ORGANOGRAM

16.3.3 MOBILE PLANT

The following mobile plant will be required full-time for the project to support the operations and maintenance services:

- 2 off Front End Loader (FEL) x 2
- 1 off Skidsteer
- 1 off Telehandler
- 3 off 1t LDV (x3)
- 1 off 55t mobile crane
- 1 off 8-tonne Hi-Ab truck

With the exception of the FEL and skid steer, the capital cost for purchasing the specified mobile plant has already been accounted for in the CAPEX budget, and no additional costs for these items have been included as part of the operational cost, except for general maintenance thereof.

16.3.4 OPEX KEY DRIVERS

Operating Expenditure (OPEX) plays a critical role in the financial health and operational efficiency. It encompasses the ongoing costs required to run the facility, including labour, maintenance, utilities, raw materials, and administrative expenses. Understanding and managing OPEX is essential not only for budgeting and cost control. The following key drivers for the OPEX of the plant were identified.

Multi Shaft Mill Maintenance Requirements

The multi-shaft mill is the most wear-prone piece of equipment in the design, requiring maintenance approximately every 4 days. For this reason, a standby multi-shaft mill is included in the CAPEX estimate. The estimated monthly running cost associated with the multi-shaft mills is $107,823.

Dryer Fuel

The dryer consumes approximately 62 litres of diesel or paraffin per hour. The estimated monthly running cost is $ 38,130.

Insurance Costs

The insurance requirements play a critical role in defining the fire rational design, as the monthly instalment directly relates to the extent of the fire installation. At this stage, only a basic fire suppression system was included in the cost estimate. This system covers fire hydrants, hose reels, fire extinguishers, and a dedicated pumping system comprising an electric fire water pump, jockey pump, and diesel fire water pump.

Dry Tailings Storage Facility

The expenses associated with acquiring, maintaining, and operating the earth-moving vehicles needed for material transport and tailings storage facility upkeep have not been evaluated. The CAPEX requirement to construct the tailings storage facility was not evaluated at this stage.

16.3.5 OPEX COSTING

The operational and maintenance cost for the plant is divided into a fixed and variable portion as follows:

Fixed Monthly Cost

The fixed monthly cost totals **$ 451,241** per month and is inclusive of:

- Support Services, Accommodation, Food, Travel ($ 106,510);
- Management and labour associated with the operation and maintenance of the plant ($ 259,100); and
- Mobile Plant ($ 85 631).

Variable Cost

The variable cost is calculated at **$ 12.94** per feed tonne and is inclusive of:

- A labour component of $ 2.09 / ROM tonne
- Maintenance & reagents of $ 5.01 / ROM tonne
- Dryer fuel of $ 1.52 / ROM tonne
- EDS Mill of $ 4.32 / ROM tonne

Total Cost

The total monthly operations and maintenance cost at full production totals to **$ 774,741**.

At full production (500 hours per month), the total operational and maintenance cost per feed tonne adds to **$ 30.98**.

16.4 BASIS OF CAPEX COST ESTIMATE

The capital cost estimate has been developed with the methodology and data sources applied as follows:

Mechanical Equipment
Costs for major mechanical equipment (crushers, mills, screens, pumps, shaking tables, MGS units, filter presses, etc.) are based on vendor budget quotations obtained during the study. Where direct quotes were not available, prices were benchmarked against our project costing database of similar processing plants.

Structural Steel, Platework, and Piping
Structural steel and platework quantities were derived from preliminary layouts and engineering designs with unit rates benchmarked against current market-related steel pricing rates. Piping and valves were costed using a combination of supplier inputs and factored estimates relative to mechanical equipment costs.

Electrical and Instrumentation (E&I)
E&I costs have been developed from quantities derived from preliminary single line diagrams, load lists, and equipment schedules. Pricing has been applied using our costing database, which reflects recent market benchmarks for transformers, MCCs, distribution equipment, cabling, and instrumentation.

Civil and Concrete Works
Quantities were developed from preliminary layouts, with cost inputs benchmarked against mark-related rates in the. Earthworks and foundations were estimated using factored allowances relative to equipment and structural loads, due to limited geotechnical data at this stage.

Indirect Costs and Project Support

Indirect costs (engineering, procurement, construction management, and commissioning) were estimated as a percentage of direct capital costs, benchmarked against comparable Obsideo project data.

Logistics

Logistics cost estimates are based on ocean freight as the primary transport route and road freight as the secondary route. Containerisation is based on the use of 20-foot containers, selected due to the verticality of the site and associated movement constraints. Estimated load quantities have been derived from equipment sizing and overall bulk tonnages, with allowances for consolidation, handling, and border clearance factored into the estimate.

Contingency

A contingency allowance was applied to account for design development and vendor pricing variability. Table 16 shows the standards and specifications that were used throughout the cost estimate.

TABLE 16: STANDARDS AND SPECIFICATIONS

Document	Document
Mine Health and Safety Act	Act 29 of 1996
Occupational Health and Safety Act	Act 85 of 1993
South African National Standards	SANS (as of June 2025)
Minerals Act	Act 50 of 1991
Obsideo Paint Specification	5037-0000-RSPE-001.01

16.5 FOREIGN EXCHANGE EXPOSURE

The capital and operating cost estimates are presented in United States Dollars (USD). However, a significant portion of the expenditure will be incurred in other currencies, creating exposure to exchange rate fluctuations.

TABLE 17: FOREIGN EXCHANGE EXPOSURE

Currency	Rate	ROE Portion	Percentage Exposure
ZAR	USD 1.00 = ZAR 17.50	$ 23,841,430.60	94%
GBP	USD 1.00 = GBP 0.75	$ 1,299,086.15	5%
AUD	USD 1.00 = AUD 1.53	$ 212,943.18	1%

17. LIST OF ANNEXURES

The above study report and associated cost estimate for the implementation of the project is supported by the following list of engineering deliverables:

ANNEXURE A – OVERALL CONCEPT PROCESS FLOW DIAGRAM

ANNEXURE B – CONCEPT PROCESS FLOW DIAGRAMS

ANNEXURE C – CONCEPT MASS & WATER BALANCE

ANNEXURE D – CONCEPT BLOCK PLAN

ANNEXURE E – CONCEPT 3D NAVIS MODEL

ANNEXURE F – PUMP SCHEDULE & DATA SHEETS

ANNEXURE G – MECHANICAL EQUIPMENT LIST

ANNEXURE H – CIVIL, STRUCTURAL & MECHANICAL DESIGN CRITERIA

ANNEXURE I – ELECTRICAL DESIGN CRITERIA

ANNEXURE J – SINGLE LINE DIAGRAM

ANNEXURE K – ELECTRICAL LOAD LIST

ANNEXURE L – E&I CABLE LIST

ANNEXURE M – ELECTRICAL DATA SHEETS

ANNEXURE N – INSTRUMENT LIST

ANNEXURE O – TEST WORK REPORTS

ANNEXURE P – PHASE 2 TEST WORK PLAN

ANNEXURE Q – PHASE 2 & EXECUTION SCHEDULE

ANNEXURE R – CAPEX DETAILED BREAKDOWN

ANNEXURE S – RISK REGISTER