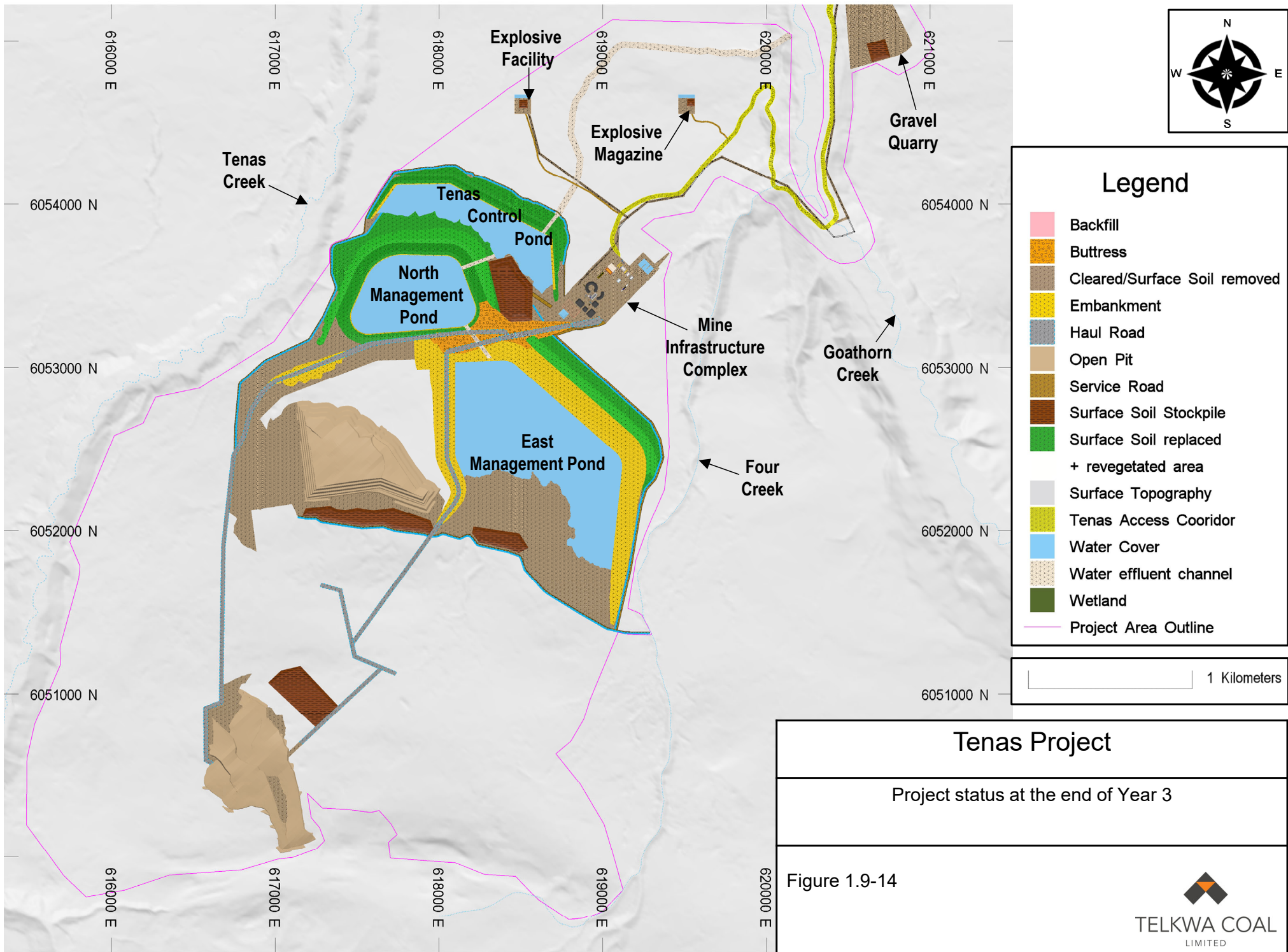
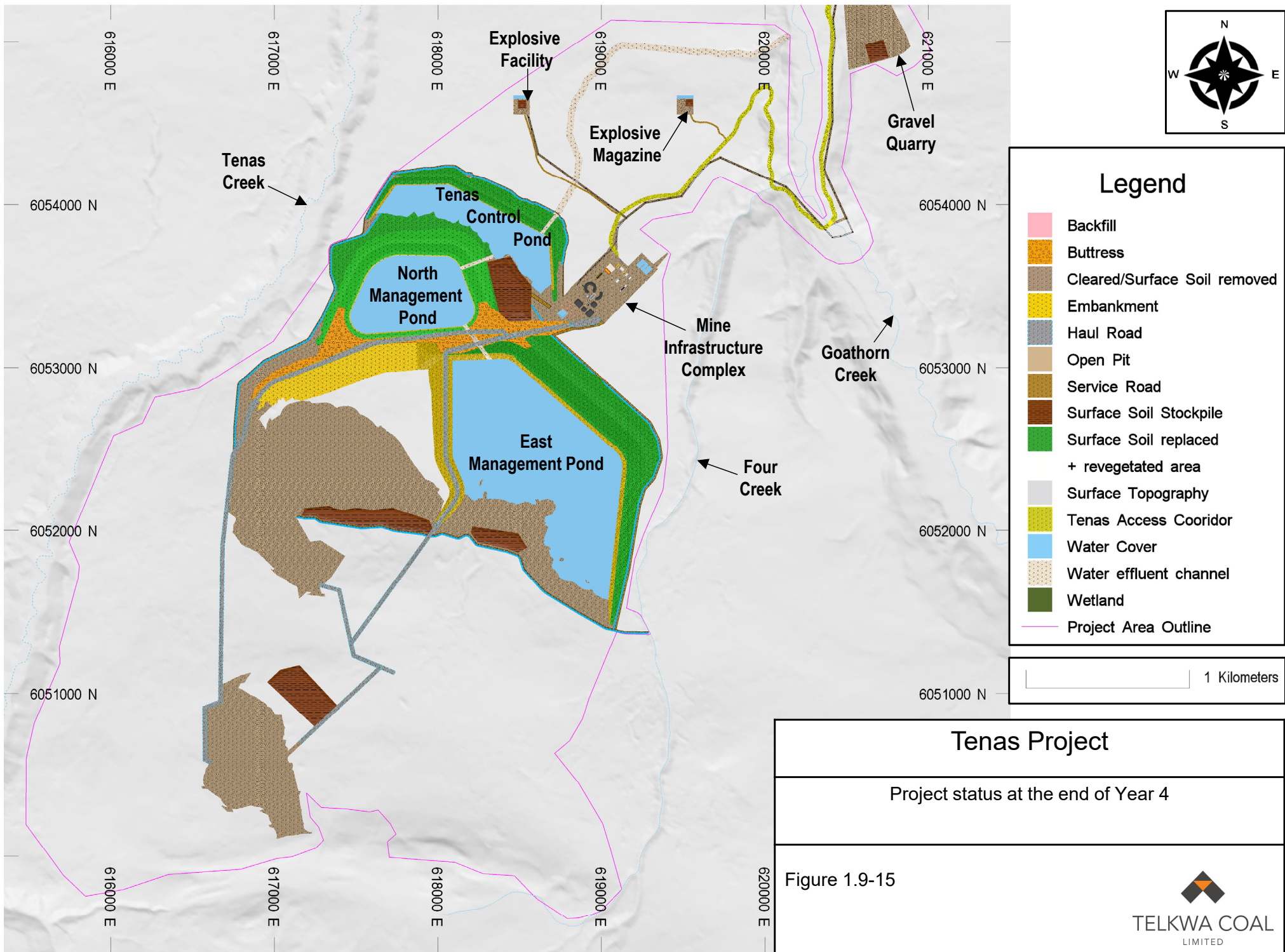
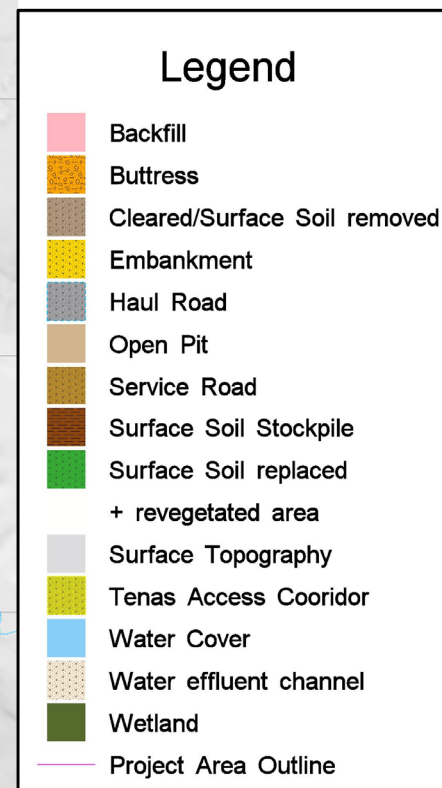
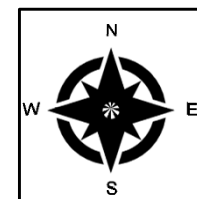






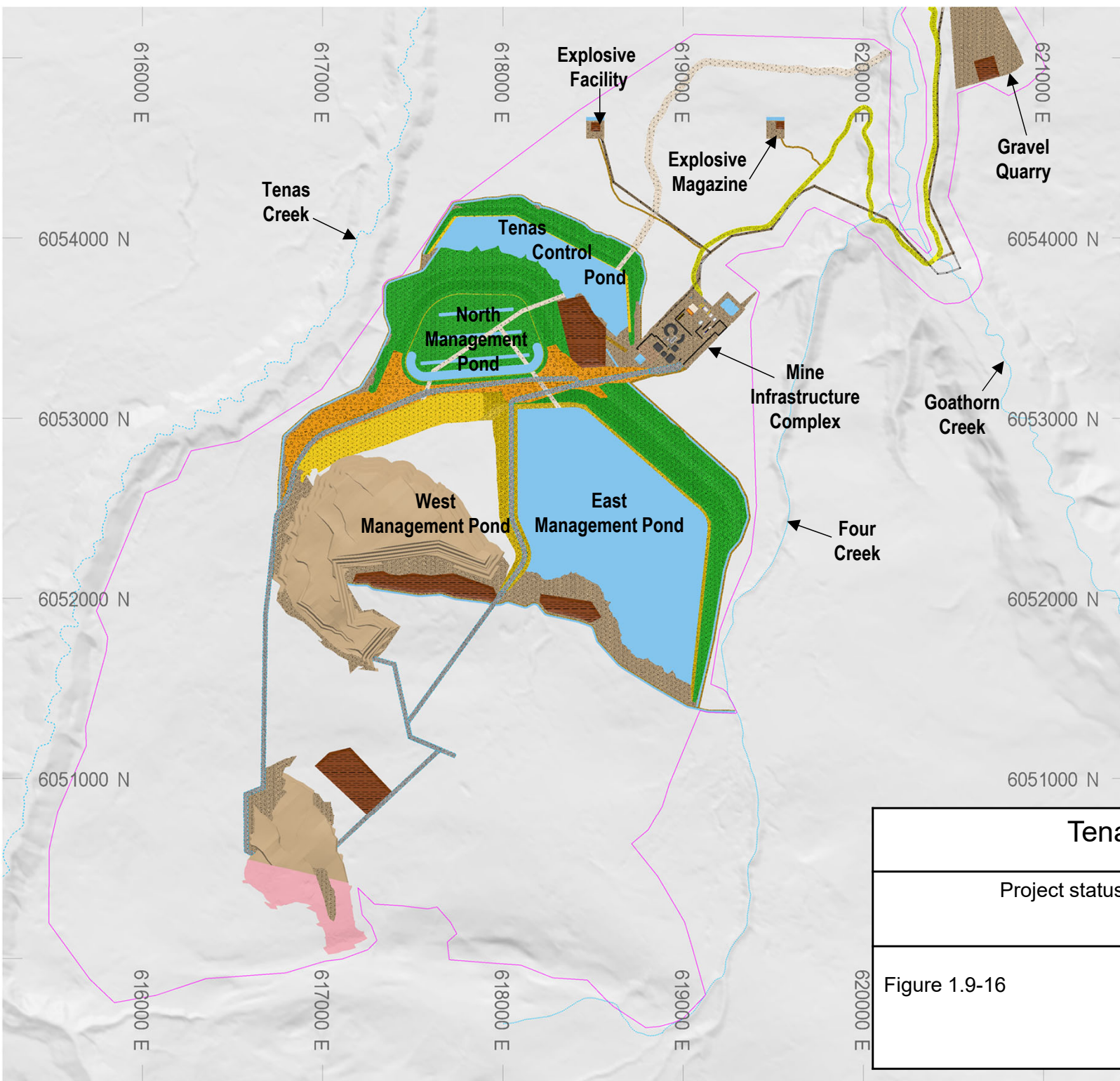


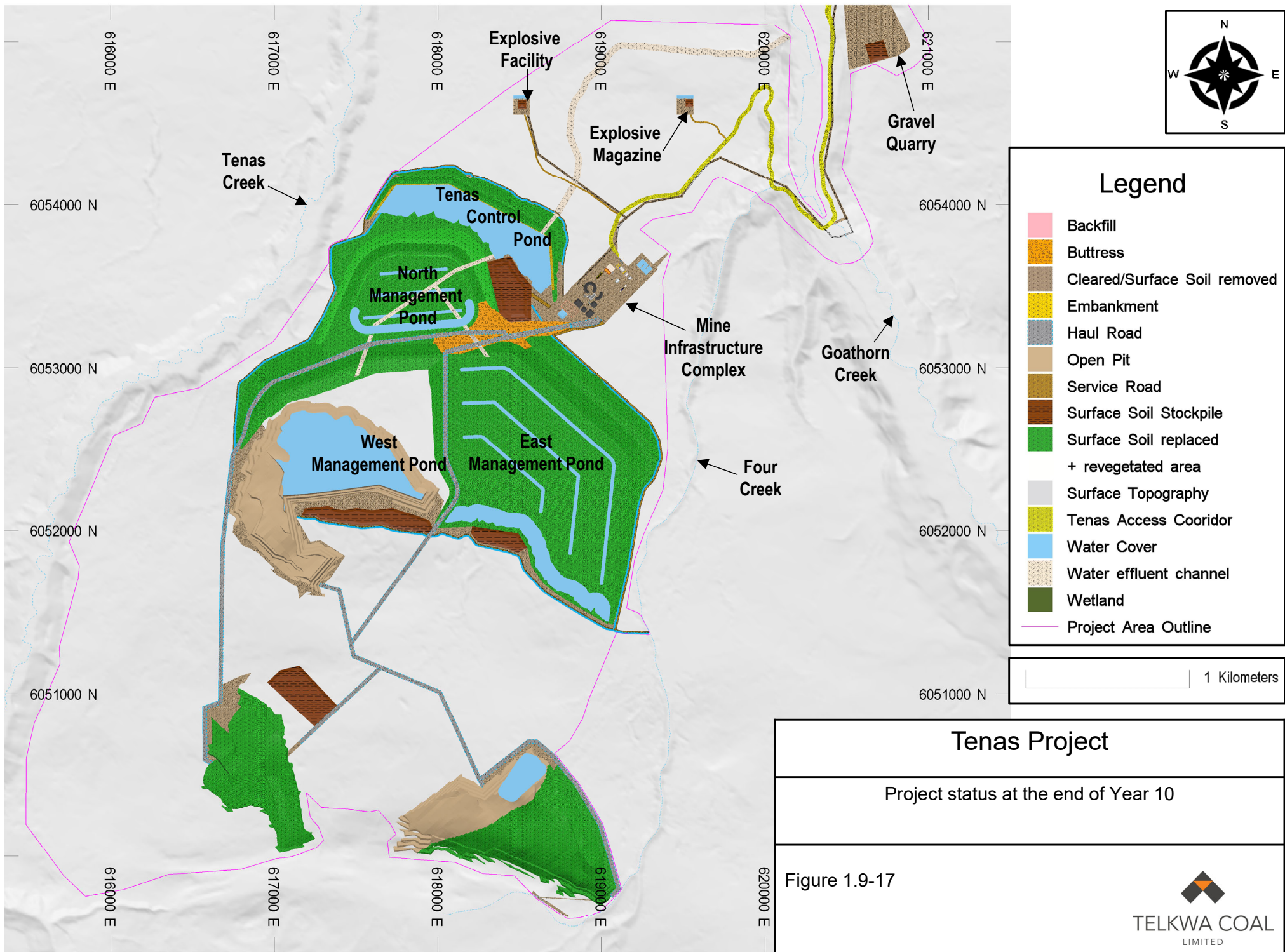
Tenas Project

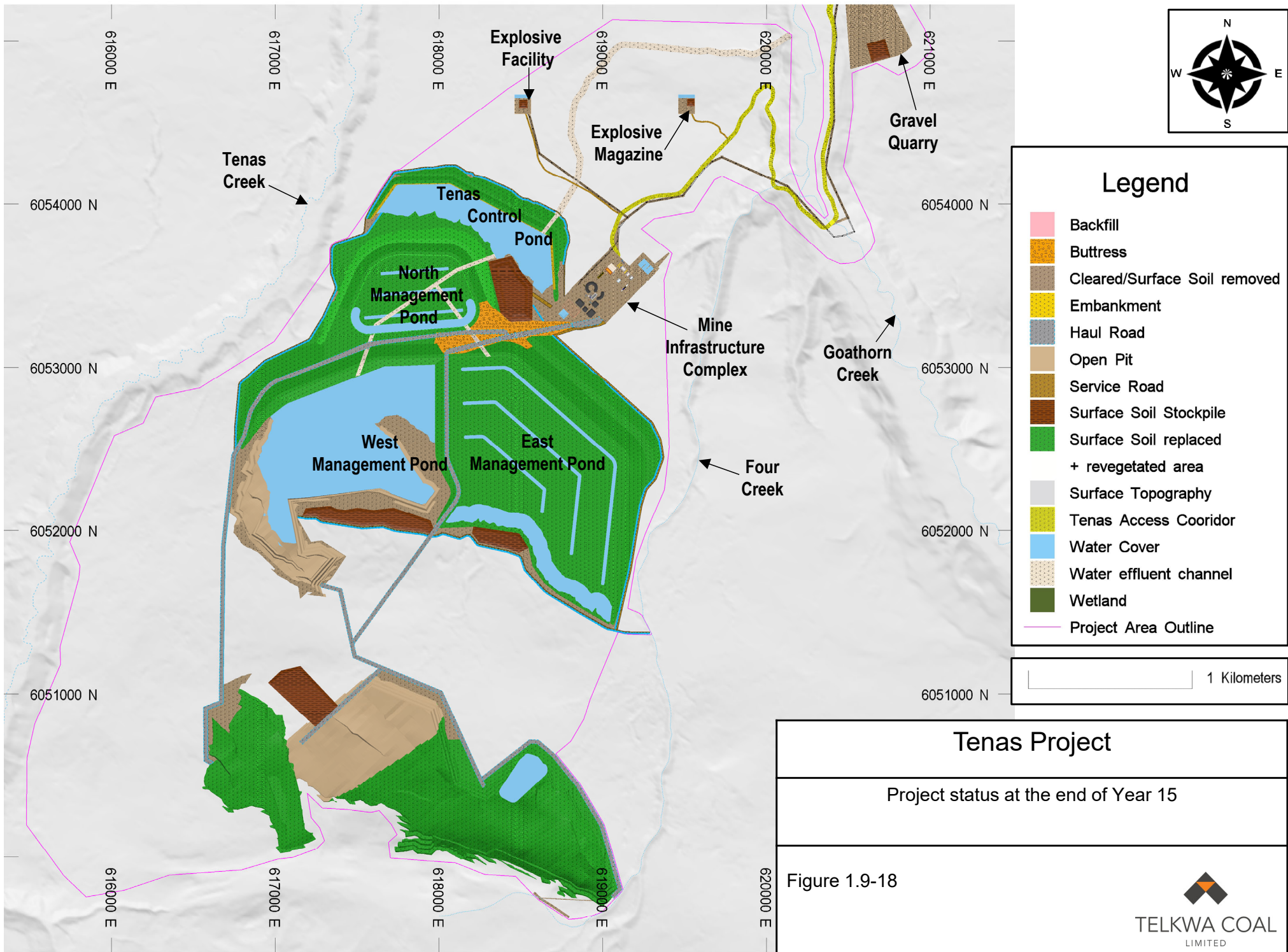
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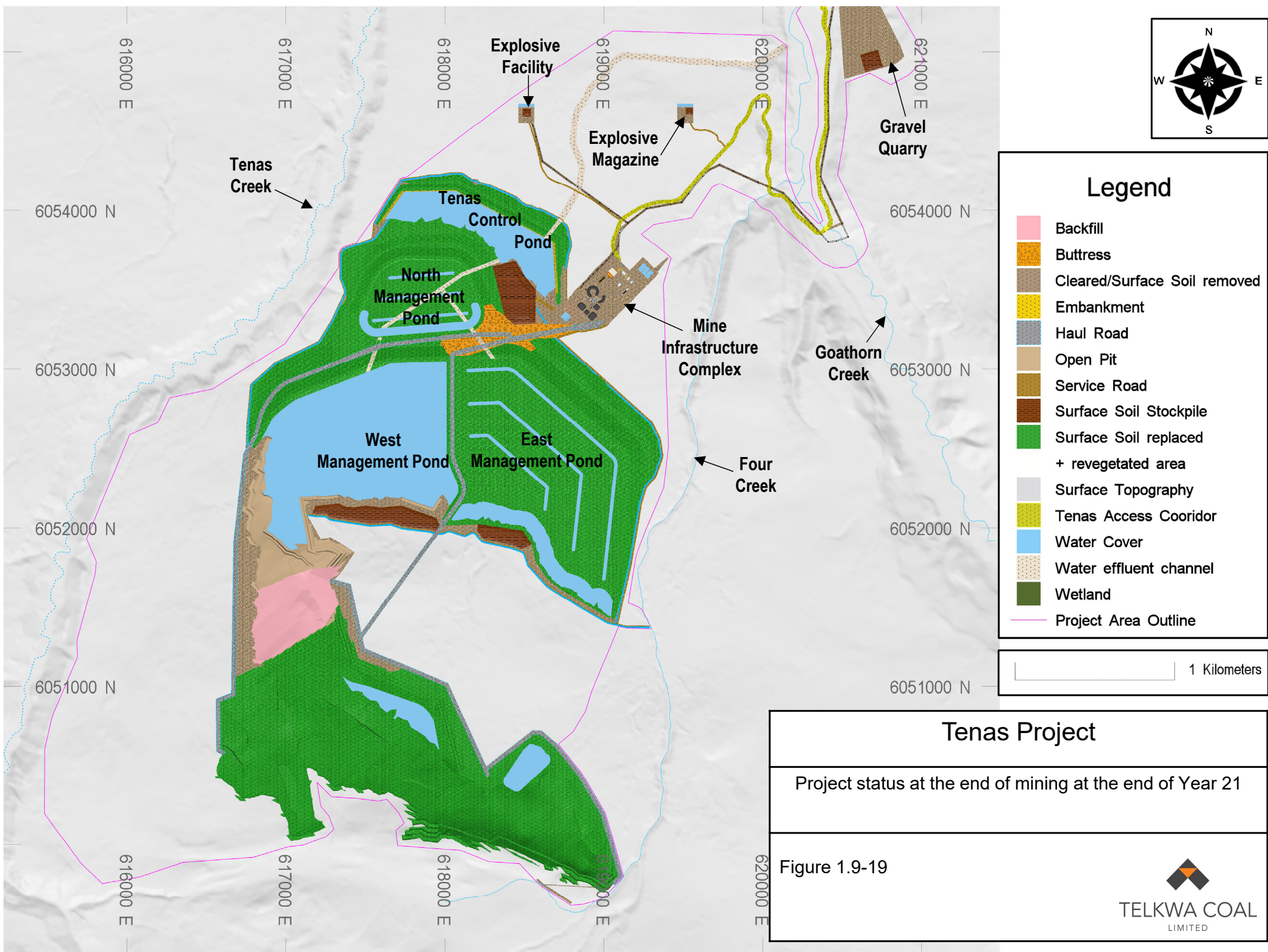
Figure 1.9-16

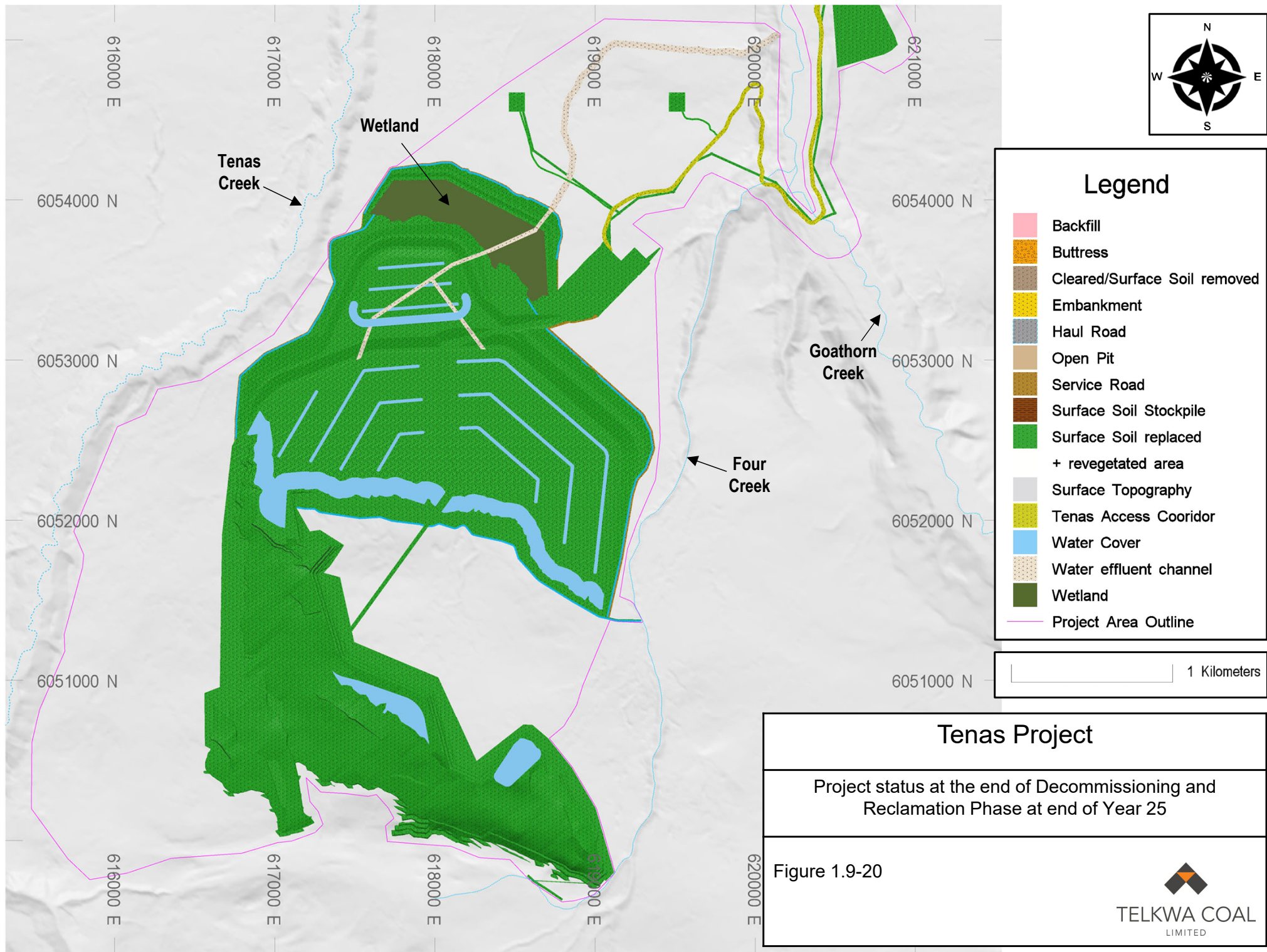
TELKWA COAL LIMITED

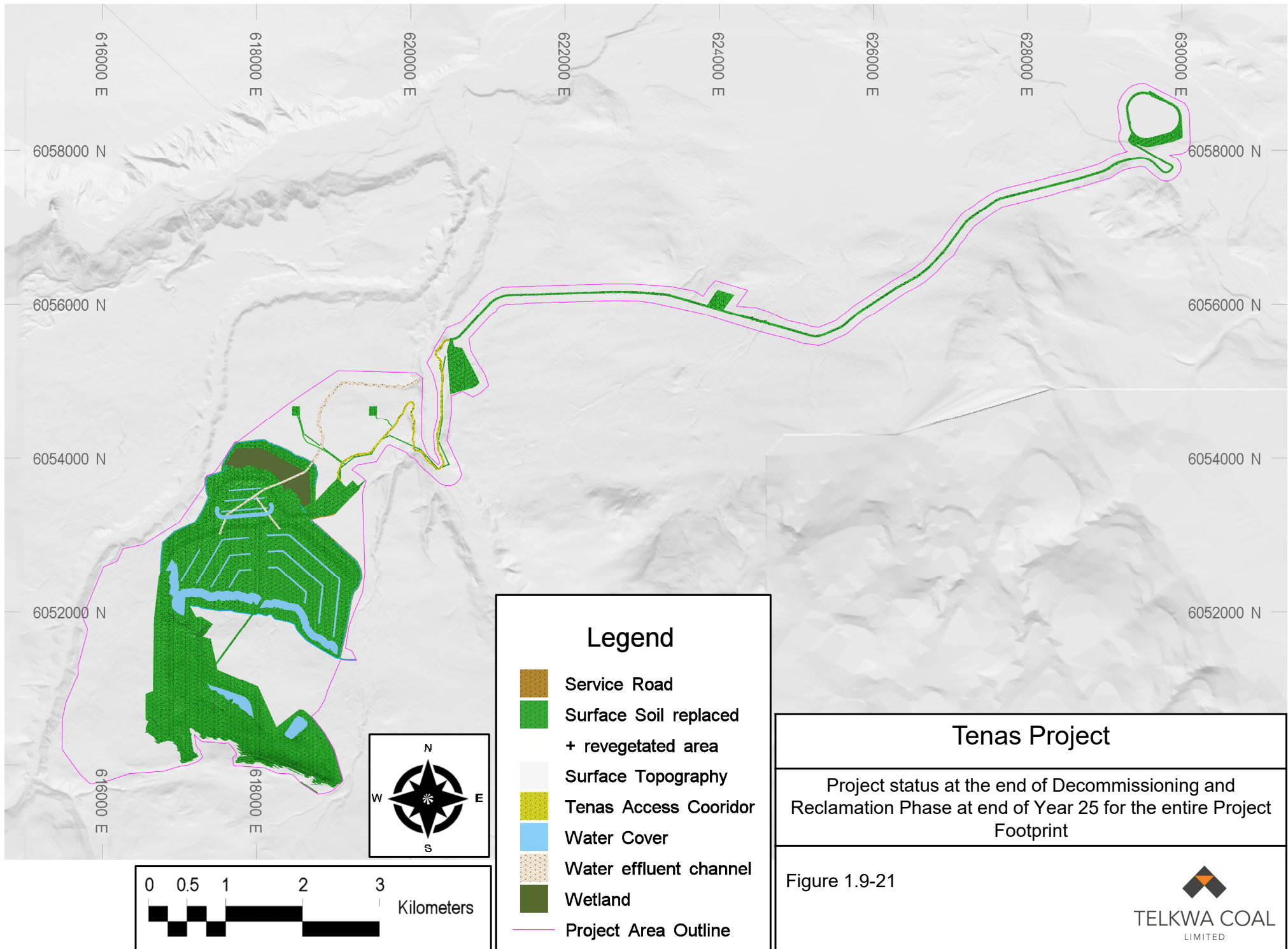


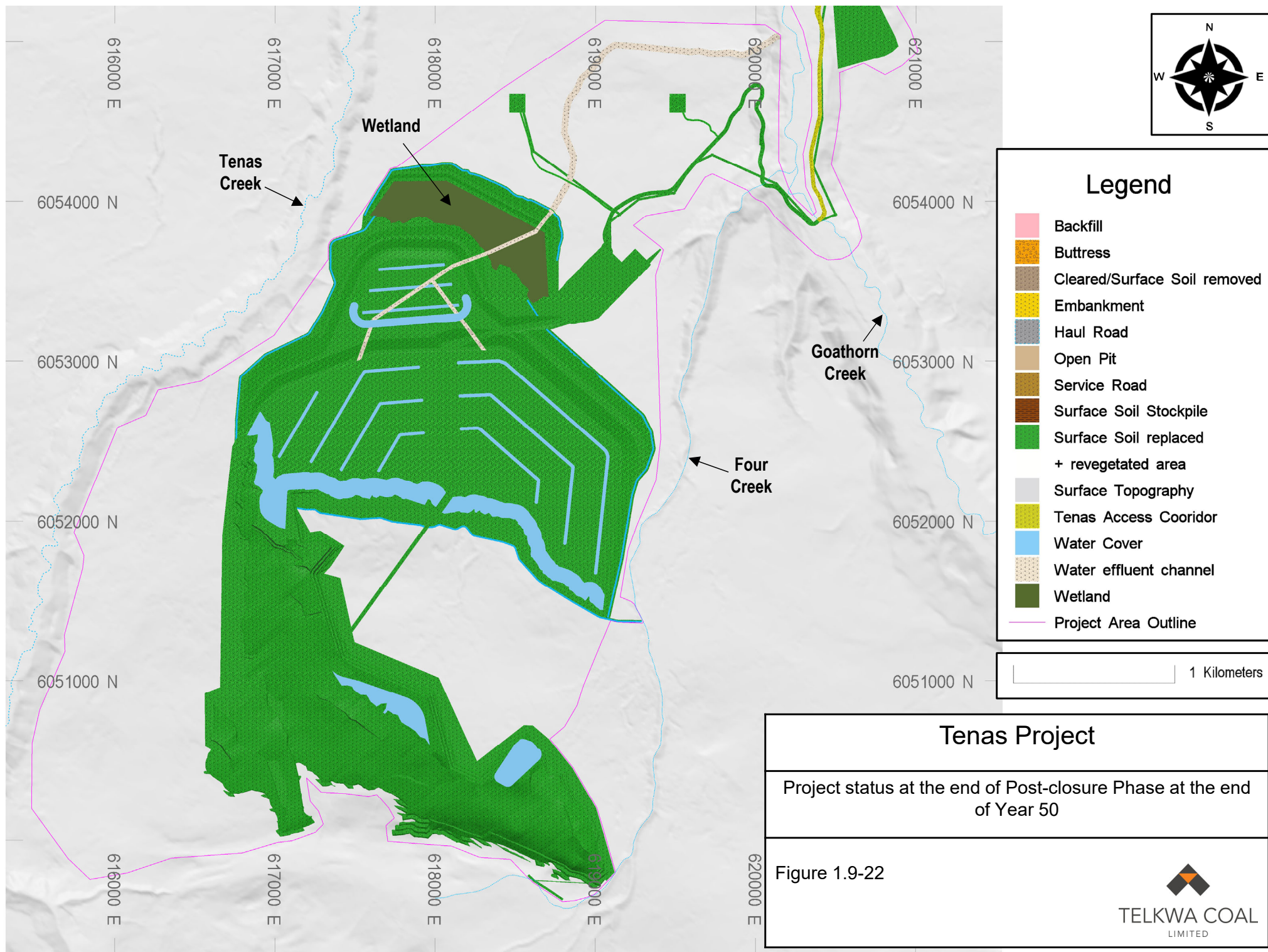












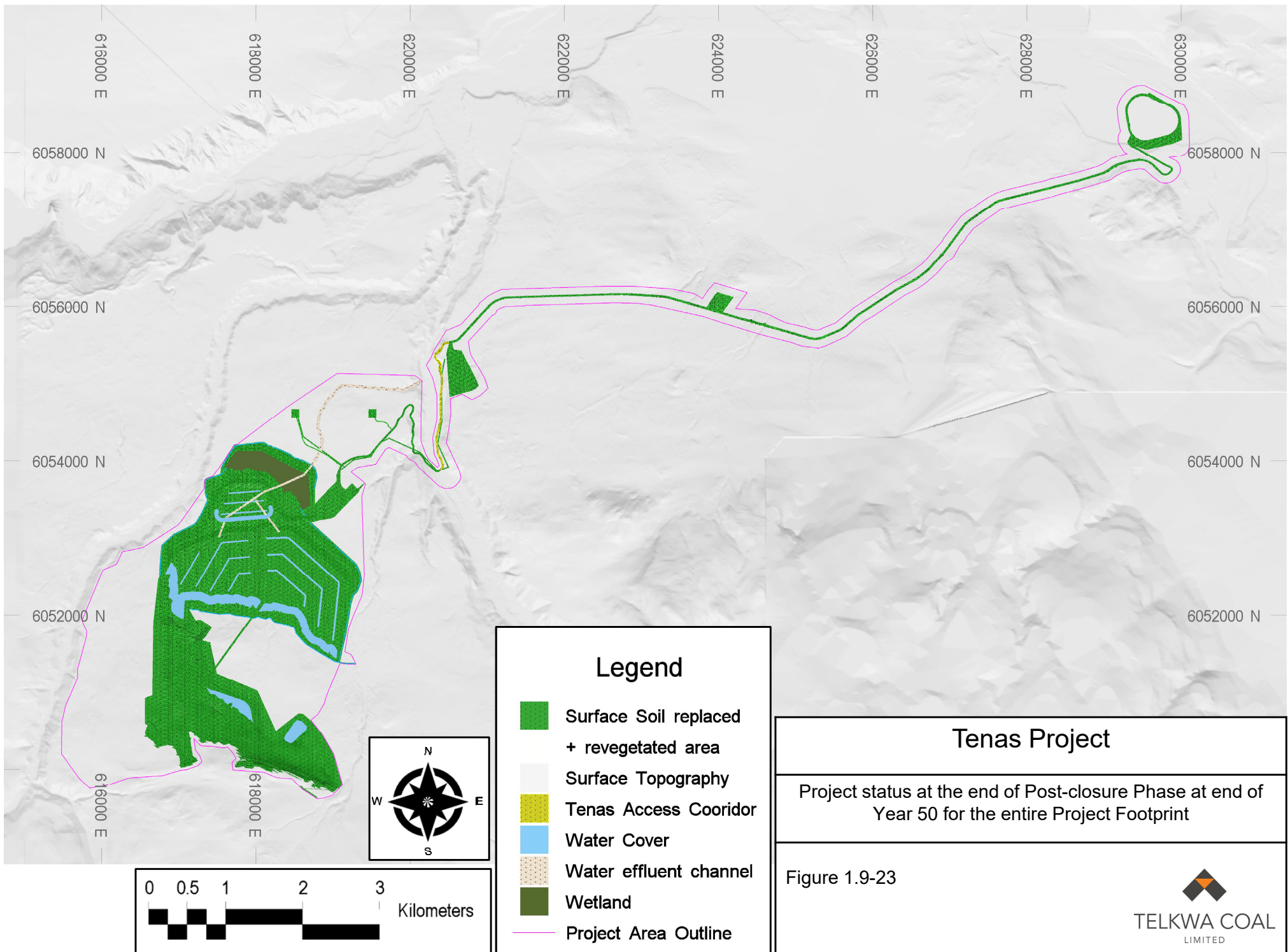


Table 1.9-3 a-d below provide an annual summary of the current long range life-of-mine schedule based on the constraints previously listed.

Table 1.9-3 a-d: Tenas Project Life-of-mine Plan Years -0.5 through to 21

a: Years -0.5 to 5

Year / Materials	Year -0.5	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Reclamation Materials for entire Project (surface soils) (BCM)	797,257	83,283	140,186	365,868	139,931	28,295	24,096	1,578,917
Overburden including road volume, excluding reclamation materials within the open pit (BCM)	1,548,252	1,207,034	1,149,447	3,795,708	1,735,427	953,944	815,055	11,204,868
Non-PAG rock including rehandle (BCM)	15,483	15,342	363,787	700,665	1,789,915	775,341	1,278,832	4,939,364
PAG rock (BCM)	-	327,142	1,214,012	1,549,453	1,711,526	1,769,042	1,980,006	8,551,181
ROM coal (@ 5% moisture) (tonnes)	-	262,500	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	5,512,500
ROM ash (%)	-	23.56%	24.80%	25.01%	22.13%	24.28%	24.19%	24.00%
Processed rock (m3)	-	38,120	161,075	163,254	141,081	158,023	157,314	818,868
Strip ratio (BCM:ROM)	-	5.8	2.6	5.7	4.9	3.3	3.8	4.4
Strip ratio (BCM:Processed coal)	-	7.8	3.5	7.8	6.5	4.5	5.2	5.9
Plant yield (@ 10% moisture) (Processed coal / ROM coal)	-	74.59%	73.15%	72.79%	76.49%	73.66%	73.78%	74.08%
Processed coal (@ 10% moisture) (tonnes)	-	195,791	768,118	764,306	803,108	773,459	774,700	4,079,482

Notes: @=at; BCM=bank cubic metre; m³=cubic metre; PAG=potentially acid generating; %=percent; ROM=run-of-mine

b: Years 6 to 11

Year / Materials	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Total
Reclamation Materials for the entire Project (surface soils) (BCM)	38,848	38,848	38,848	38,848	38,848	58,412	252,650
Overburden including road volume, excluding reclamation materials within the open pit(BCM)	1,755,822	692,184	305,792	688,996	798,867	1,288,814	5,530,474
Non-PAG rock including rehandle (BCM)	1,839,175	1,663,301	1,850,156	1,705,487	2,920,138	1,997,882	11,976,138
PAG rock (BCM)	1,771,013	1,760,650	1,131,103	1,717,486	1,438,692	1,857,219	9,676,163
ROM coal (@ 5% moisture) (tonnes)	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	6,300,000
ROM ash (%)	23.38%	24.80%	27.83%	25.50%	24.55%	23.75%	24.97%
Processed rock (m3)	150,307	161,259	185,047	167,105	159,651	153,633	977,001
Strip ratio (BCM:ROM)	5.1	3.9	3.2	3.9	4.9	4.9	4.3
Strip ratio (BCM:Processed coal)	6.8	5.3	4.5	5.4	6.6	6.5	5.8
Plant yield (@ 10% moisture) (Processed coal / ROM coal)	75.0%	73.1%	69.2%	72.2%	73.4%	74.4%	72.86%
Processed coal (@ 10% moisture) (tonnes)	786,962	767,797	726,168	757,567	770,612	781,142	4,590,248

Notes: @=at; BCM=bank cubic metre; m³=cubic metre; PAG=potentially acid generating; %=percent; ROM=run-of-mine

c: Years 12 to 16

Year / Materials	Year 12	Year 13	Year 14	Year 15	Year 16	Total
Reclamation Materials for the entire Project (surface soils) (BCM)	58,412	58,412	58,412	58,412	39,732	273,379
Overburden including road volume, excluding reclamation materials within the open pit(BCM)	1,235,463	998,707	867,140	318,447	485,013	3,904,769
Non-PAG rock including rehandle (BCM)	1,451,254	1,331,509	1,283,119	1,569,388	1,842,889	7,478,159
PAG rock (BCM)	1,832,260	1,147,199	1,327,156	1,589,580	1,159,155	7,055,350
ROM coal (@ 5% moisture) (tonnes)	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	5,250,001
ROM ash (%)	24.78%	22.25%	20.44%	22.23%	22.66%	22.47%
Processed rock (m3)	162,004	142,462	130,266	144,190	147,740	726,661
Strip ratio (BCM:ROM)	4.3	3.3	3.3	3.3	3.3	3.5
Strip ratio (BCM:Processed coal)	5.8	4.3	4.2	4.3	4.4	4.6
Plant yield (@ 10% moisture) (Processed coal / ROM coal)	73.0%	76.3%	78.3%	76.0%	75.4%	75.8%
Processed coal (@ 10% moisture) (tonnes)	766,494	800,692	822,034	797,668	791,456	3,978,342

Notes: @=at; BCM=bank cubic metre; m³=cubic metre; PAG=potentially acid generating; %=percent; ROM=run-of-mine

d: Years 17 to 21

Year / Materials	Year 17	Year 18	Year 19	Year 20	Year 21	Total
Reclamation Materials for the entire Project (surface soils) (BCM)	39,732	39,732	39,732	39,732	0	158,927
Overburden including road volume, excluding reclamation materials within the open pit(BCM)	305,442	416,470	319,644	278,633	0	1,320,188
Non-PAG rock including rehandle (BCM)	1,941,378	1,368,295	1,127,149	691,087	0	5,127,909
PAG rock (BCM)	1,240,237	1,702,292	1,207,014	1,474,232	922,124	6,545,899
ROM coal (@ 5% moisture) (tonnes)	1,050,000	1,050,000	1,050,000	1,050,000	753,105	4,953,105
ROM ash (%)	22.08%	25.88%	27.92%	24.92%	21.51%	24.46%
Processed rock (m3)	140,999	171,393	186,722	161,357	97,591	758,062
Strip ratio (BCM:ROM)	3.4	3.4	2.6	2.4	1.2	2.6
Strip ratio (BCM:Processed coal)	4.4	4.7	3.7	3.2	1.6	3.5
Plant yield (@ 10% moisture) (Processed coal / ROM coal)	76.50%	71.43%	68.88%	73.11%	77.32%	73.45%
Processed coal (@ 10% moisture) (tonnes)	803,252	750,063	723,236	767,625	582,320	3,626,497

Notes: @=at; BCM=bank cubic metre; m³=cubic metre; PAG=potentially acid generating; %=percent; ROM=run-of-mine

1.9.4.2.8.1 Material Balance for the Life of the Construction and Operation Phase

The following **Table 1.9-4** provides the material balance for the life of the Project. Please note the Rail Infrastructure and TAC are not included in these volumes and are provided for in the sections on these components.

Table 1.9-4: Life-of-mine Material Balance

Material Types	Management and Tenas Control Pond Embankments and Buttresses	Open Pit Backfill	Management Ponds	Stockpiles or Direct Place	Total
Reclamation Materials for the entire Project (surface soils for entire Project) (kBCM)	-	-	-	2,264	2,264
Overburden including road volume, excluding reclamation materials within the open pit (kBCM)	11,193	-	1,926	8,841	21,960
PAG rock (kBCM)	-	-	31,829	-	31,829
Non-PAG rock including rehandle (kBCM)	4,462	20,871	3,373	825	29,522
ROM coal (@ 5% moisture) (ktonnes)	-	-	-	22,016 (40,000 tonnes in stockpile at one [1] time)	22,016
Processed rock (kcm ³)	-	-	3,281	(5,000 tonnes in stockpile at one [1] time)	3,281
Processed coal (@ 10% moisture) (ktonnes)	-	-	-	16,275 (35,000 tonnes in stockpile at one [1] time)	16,275

Notes: @=at; BCM=bank cubic metre; kBCM=thousand bank cubic metres; ktonnes=kilotonnes; m³=cubic metre; PAG=potentially acid generating; %=percent; ROM=run-of-mine.

The following subsections provide dimensions for each pile, management pond embankment, backfills, and stockpiles.

1.9.4.2.8.2 *External Material Pile Development for Life-of-mine Plan*

There are no external piles for any phase of this Project and all material is either placed internal to the management ponds, and/or within the management pond embankments and/or within the open pit backfills.

1.9.4.2.8.3 *Management, Sedimentation, Wastewater, Potable Water, Soil Treatment Facility, and Tenas Control Pond Embankment and/or Excavation Development for Life-of-mine Plan*

The following **Table 1.9-5** provides information on the embankments and excavated storage facilities at the end of the Operation Phase. **Figures 1.9-24 through 1.9-36b** illustrate each embankment and excavation at the end of the Operation Phase.

Management pond operation will involve the following steps:

- ▶ Area will be logged and cleared of any large vegetation;
- ▶ Reclamation materials (surface soils) will be salvaged within the footprint of the management pond;
- ▶ Embankment and buttress are constructed using both overburden and non-PAG rock to keep the elevation of the embankment's crest at least 3 m above the elevation of the saturated PAG materials;
- ▶ Liner is constructed by blending bentonite into the existing overburden at the designed rate by mass;
- ▶ As the Project continues all three structures (embankment, buttress, PAG material) are raised in sequence with the embankment first, the buttress following close behind and finally followed by the PAG material being placed on the constructed liner;
- ▶ As these components are raised water is added to the PAG material from pumping from the Tenas Control Pond, open pit, other management ponds, sedimentation ponds, and/or directing contact water into the management pond;
- ▶ The sequence continues until the PAG material reaches the design elevation within the management pond;
- ▶ Once PAG material reaches the design elevation, a 1.5-m lift of non-PAG rock is placed on top of the saturated PAG material. As this lift is being placed water will be pumped out of the management pond to keep the water level 1 meter above the PAG material;
- ▶ After the non-PAG rock is placed, the water level will be lowered to match the top of the non-PAG material and a 1.5-to-3-m lift of overburden will be placed on top of the non-PAG material to create a dry landform;
- ▶ Next reclamation materials (surface soils) are then placed in an approximate lift height of 30 cm; and
- ▶ Lastly, the water level will be raised to the final designed elevation for the water level which will be at least 2 m above the PAG level.

Table 1.9-5: Life-of-mine (LOM) Embankments and Excavations

Embankment and/or Excavation	Type	Centerline Embankment Length (m)	Maximum Height at Centerline or depth (m)	Average Crest Width Embankment (m)	Buttress Crest Width (m)	Embankment and Buttress Volume / Excavated volume (m ³)
Tenas Control Pond	Embankment	1,709	14.5	20	20	1,146,801
West Management Pond	Embankment	1,365	29.5	20	6	5,094,546
East Management Pond	Embankment	3,566	30.0	20	50	10,522,822
North Management Pond	Embankment	2,174	16.0	20	30	3,086,105
Coal Processing Plant Sedimentation Pond	Excavation	403	-3	5	NA	36,614
Rail Infrastructure Sedimentation Pond	Excavation	312	-5	NA	NA	7,575
Explosive Facility Sedimentation Pond	Excavation	117	-3.1	5	NA	2,873
Explosive Magazine Sedimentation Pond	Excavation	87	-3.1	5	NA	1,420
Wastewater Storage Pond	Excavation	180	-4	NA	NA	4,284
Potable Water Storage Pond	Excavation	381	-6.8	NA	NA	20,736
Soil Treatment Facility	Embankment	158	2	1	NA	3,240

Note: m=metre; m³=cubic metre