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Technical Report

South Crofty PEA
Cornish Metals Inc.

Cornwall, United Kingdom

In accordance with the requirements of National Instrument 43-101 “Standards of Disclosure for Mineral Projects” of the Canadian Securities Administrators

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1 Summary

1.1 Introduction

This Technical Report (South Crofty Technical Report, Technical Report or Report) provides the results of a Preliminary Economic Assessment (PEA) for Cornish Metals Inc. (Cornish Metals) on the South Crofty Tin (copper-zinc) Property (Property) in Cornwall, United Kingdom. This Technical Report has been prepared by AMC Consultants (UK) Limited (AMC) on behalf of Cornish Metals.

Cornish Metals is a mineral exploration and development company listed on both the Canadian TSX Venture Exchange (TSX-V: CUSN) and the Alternative Investment Market of the London Stock Exchange (AIM: CUSN). Cornish Metals is incorporated federally in Canada under the Canada Business Corporations Act (CBCA) with registered number 423627-1. Major shareholders of the company are Vision Blue Resources holding 25.95% of issued share capital, Barkerville Gold Mines, a subsidiary of Osisko Development Corp., holding 8.57% of issued share capital, and Lansdowne Partners at 6.23%. The flagship projects held by Cornish Metals are the South Crofty Tin (copper-zinc) and the United Downs copper-tin projects, both situated in Cornwall, United Kingdom.

The Technical Report has been prepared in accordance with the requirements of National Instrument 43-101 (NI 43-101), "Standards of Disclosure for Mineral Projects" of the Canadian Securities Administrators (CSA) for lodgement on CSA's "System for Electronic Document Analysis and Retrieval" (SEDAR).

The effective date of this Technical Report is 8 April 2024.

The Qualified Persons (QPs) for the PEA are Mr Nicholas Szebor, MCSM, CGeol, EurGeol, FGS, Regional Manager (UK) and Principal Geologist (AMC); Mr Dominic Claridge, FAusIMM, Principal Mining Engineer (AMC); Mr Barry Balding, P.Geo., EurGeol, Technical Director – Mining Advisory Europe (SLR); Mr Steve Wilson, ACSM, C.Eng., FIMMM, Managing Director: Europe (P&C); Mr Mike Hallewell, FIMMM, FSAIMM, FMES, C.Eng. (Independent Consultant); and Dr Barrie O'Connell, ACSM, FIMMM, C.Eng. (Independent Consultant). QPs under NI 43-101 and Competent Persons as defined under the JORC Code (2012).

1.2 Property description

The South Crofty Project is a former producing tin mine located in the town of Pool in the historic Cornwall tin mining district of South West England. The Project has a long history of operation until closure in March 1998, at which point the pumps were switched off and the mine was left to flood. The mine has been flooded since closure, except near-surface workings which are situated above the drainage adit level.

Since 2016, Cornish Metals has obtained all the necessary permissions to dewater the mine and is progressing studies in advance of a production decision.

The Project's extensive 1,490 hectare (ha) underground permissions extend over 26 historic mining operations. The current South Crofty Project comprises the former producing South Crofty and Dolcoath mines, referred herein singularly as South Crofty or South Crofty Project. The Project's underground permissions include five Mineral Rights, which are registered with the Land Registry, as well as areas of Mineral Rights that are leased or unregistered.

The Project has permissions that were granted in 2011 and 2013 that largely replace historic planning permissions granted in 1952 and updated in 2006 with environmental conditions imposed but remain extant. The new planning permissions for surface and underground developments were granted by Cornwall Council, the Local Planning Authority (LPA), and have increased the Project area to 1,490 ha with a working depth of 1,500 metres (m) below surface. The underground mining permission is valid until 2071. Cornish Metals also has approximately 7.65 ha (18.9 acres) of surface ownership.

Current infrastructure supports the ongoing care and maintenance of the Property and will help support any future developments. More recent infrastructure advancements, including the servicing of shafts, and construction of the mine water treatment plant (MWTP), have been implemented to support access into the historical mine. Access into the mine will facilitate additional investigations and does not reflect a production decision by Cornish Metals.

The Project site is located within an industrial area with highly developed power supply and regional distribution, has two 33 kilovolt (kV) overhead power lines which cross the Property, and a dedicated 11 kV power supply to the New Cook's Kitchen (NCK) shaft. The NCK shaft comprises one of seven main shafts accessing the mine workings, and historically was the main hoisting shaft. The Project also has ready access to fresh water supplied by the South West Water utility. Site infrastructure from prior mining and development operations includes office and warehouse buildings, and the partially refurbished NCK shaft. A modern decline extends to a vertical depth of 120 m at an average gradient of -16%, the west branch provides access to the Upper Mine mineralisation while the east branch, mined in the 1980s, was being developed to provide trackless vehicle access / secondary egress into the South Crofty Mine. Mill and concentrator facilities from prior operations have been dismantled and removed.

The Project has good transport connections with access to the national road network via a junction with the A30 road which links the city of Exeter with the town of Penzance. Flights to the region are available from London, Gatwick Airport to Newquay, Cornwall Airport. Newquay airport is located 30 kilometres (km) north-east of the Project. Train services between London and Penzance on the First Great Western line extend to Redruth and Camborne.

1.3 Ownership of the Property

The South Crofty Project is located in the highly mineralised Central Mining District of Cornwall. The modern ownership history started in 1906 when South Crofty Limited (SCL) was founded in order to exploit the tin deposits located beneath historic copper mines in the area. There have been multiple periods of ownership since 1906 through to the present day, which are summarised in Section 6.2.

Cornish Metals (previously known as Strongbow Exploration) acquired a 100% interest in the project and its associated mineral rights in 2016 when they took the previous operating company, Western United Mines Ltd (WUM) – out of administration.

On 16 September 2016 the TSX Venture Exchange Inc. confirmed it accepted for filing the purchase and sale agreement entered into by Cornish Metals with the administrator managing the affairs of SCL and Cornish Minerals Limited (UK) (CML). In February 2021, Cornish Metals was granted admission to AIM, resulting in shares for the company being traded both on the TSX-V and AIM markets.

1.4 History

The Project has historically seen extensive mining activity. Average annual production in the period 1984 to 1998 at the South Crofty Mine amounted to 191,200 tonnes at an average grade of 1.31% Sn. A total of 9,976,171 tonnes at an average grade of 1.00% Sn was mined between 1906 and 1998. In addition to the South Crofty Mine production, the adjacent Dolcoath Mine operated as an independent mine from 1895 to 1921. During this period 2,135,470 tonnes of ore was processed at a grade of approximately 2% Sn. Due to the extensive history of mining at the Property, records of the full total volume of material extracted are incomplete.

The South Crofty Project has a large historical database with approximately 3,000 drillholes (87,000 m) and 45,000 underground channel samples that have been compiled by Cornish Metals. A closure estimate was completed for the South Crofty Property in 1998 (Owen et al., 1998). This estimate included Proven and Probable "reserves" of 730,750 tonnes at 1.48% Sn plus Inferred resources of 2,172,850 tonnes at 1.48% Sn. The estimate was based on longitudinal section calculations using a 1% Sn cut-off and minimum 1.0 m mining width.

The historical mine closure estimate was prepared according to the mine's operational policy at the time of closure in 1998. The estimate predates the introduction of NI 43-101.

Diamond drilling from 2008 to 2013 in the Upper Mine and the increase in resources there, rendered the 1998 estimate out of date.

Micromine Limited (Micromine), UK, was engaged by Celeste Copper Corp. (Celeste) to produce NI 43-101 Resource Estimates and Technical Reports in 2011 and 2012 (Hogg, 2011 & 2012). These estimates incorporated results of drilling by WUM and focused on the Upper Mine, west of the Great Crosscourse fault and above approximately 400 m depth from surface.

The QP has not done sufficient work to classify the historical estimates discussed in this section as current Mineral Resources or Mineral Reserves, and Cornish Metals is not treating the historical estimates as current Mineral Resources or Mineral Reserves.

1.5 Geology and mineralisation

The geology of Cornwall is dominated by granitic intrusions that are part of Permian Cornubian batholith, and Devonian metasedimentary and metavolcanics, known locally as "killas", that form the metamorphic aureole and host rocks of the intrusions. The sedimentary and volcanic package was deformed during the Variscan Orogeny. Crustal thickening of the package during the initial phase of the orogeny followed by subsequent lithospheric extension and crustal subsidence resulted in anatexis of the metasedimentary package and formation of the Cornubian batholith.

The South Crofty Project area is situated on the north side of the Permian Carn Brea Granite that is thought to be connected with the Cornubian batholith at depth. The South Crofty Project area is underlain by a series of metasedimentary and metavolcanic rocks (killas) and associated hornfels and skarns, that occur in close proximity to the granite contact. At depth, the granite underlies the whole Project area.

Mineralisation occurs in "lodes" or vein-type structures that generally strike east-north-east and parallel the strike of the granite / killas contact. The lodes occur in both the granite and the overlying killas and the character of the lodes changes depending on the host rocks. Within the granite, the principal mineral of economic significance is cassiterite, whereas above the granite contact, copper and zinc sulphide mineralisation is also developed. The Great Crosscourse is a late fault that bisects the South Crofty Project area and is associated with an approximately 100 m of strike slip movement. The Great Crosscourse had a significant influence on the historical mine development of the South Crofty Project dividing the mine into two areas: east and west.

The South Crofty tin deposit is an intrusion-related, structurally controlled, vein-hosted mineralisation type.

1.6 Exploration and drilling

WUM re-established the decline at the Project and in 2008 extended the existing decline a further 380 m to a total depth of 120 m below surface at an average gradient of 1-in-6. At a depth of 120 m, a spine drive was commenced and progressively developed to a length of 130 m. The decline extends in a south-westerly direction through the Great Crosscourse above the historical Dolcoath workings and provides exploration access to the Upper Mine. The decline and spine drive has served as an access point for the 31,000 m underground drill programme conducted by WUM between 2008 and 2013.

Tin Shield Production Inc. (Tin Shield) conducted limited exploration assaying, approximately 720 samples, from drill core intersecting the Upper Mine (Dolcoath lodes). These assays were collected from holes drilled by WUM in late 2012 and 2013 and have been incorporated into the assay database.

In 2022, SCL commenced drilling in order to collect samples for a metallurgical testwork programme. The planned drilling included directional drilling from three new surface parent holes, one existing surface parent hole (SDD20_001), and two new parent holes drilled from underground. These parent holes then had multiple daughter holes drilled in "clusters" in order to collect enough sample mass for the testwork. A total of 10,312 m were drilled in order to complete the programme which resulted in the collection of 1,162 kilograms (kg) of material for testing. In addition, approximately 1-in-5 drillholes were assayed to give an indication of likely grades in that "cluster" of drillholes. Assays for lodes No. 1, No. 4, No. 8, Roskear B Footwall (FW), and the North Pool Zone (NPZ) have been used in the Mineral Resource estimates.

1.7 Quality assurance and quality control (QAQC)

A review of the duplicate assay results for both the Upper Mine (2008-2013 drilling) and the Lower Mine (2020 and 2022-2023 drilling) shows comparable results. Field duplicates show a poor level of precision which is markedly improved following the crushing and pulverisation stages of sample preparation. The results indicate that mineralisation is inherently nuggety and homogenization of the samples is achieved only following the crushing stage. Based on the pseudo-twinning analysis, and the review of the duplicate assay results, the QP is of the opinion that grade variability is likely a function of the inherent compositional and distributional heterogeneity of mineralisation rather than a sampling issue. The crushed and pulverised duplicate samples show precision increasing through the sample preparation process, indicating improved homogenization of samples at each sample reduction stage.

Where blank samples have been submitted for the 2008-2013 drilling works and the Cornish Metals 2020 and 2022-2023 drilling, no evidence of significant sample contamination has been identified. There are a few instances identified in 2023 which show potential low-level contamination in sample preparation of very high-grade Sn samples; however, this is not considered material. Certified reference material (CRM) submissions for the 2008-2013 drilling and the Cornish Metals 2020 and 2022-2023 drilling show good levels of analytical accuracy.

The digitisation of historical sample and survey data by Cornish Metals has been undertaken in a diligent manner with no evidence of significant transcription of digitisation errors noted.

Prior to the use of X-ray fluorescence spectroscopy (XRF) in 1974, assays for Sn were conducted using the vanning assay method. To check for bias by either assay method, the QP has carried out a vanning versus XRF comparison. The QP has reviewed the sample data on a lode-by-lode basis to ascertain areas where there are coincident intervals of vanning and XRF assays. The QP has selected areas where samples are situated within discrete shoots and therefore less susceptible to bias from the inherent heterogeneity of the mineralisation.

The vanning and XRF comparisons show comparable grade populations with no evidence of significant bias noted. The mean grades for the vanning assays are typically slightly lower than the corresponding XRF assays, potentially indicating that the vanning assays are more conservative than the XRF.

The QP has reviewed sample preparation, analysis, security protocols and quality assurance and quality control (QAQC) employed at the South Crofty Project by previous and present operators. Based on the this work the QP is of the opinion that the sample data is suitable for use in the Mineral Resource estimation.

1.8 Metallurgical testing

In 2022, Cornish Metals engaged Wardell Armstrong International (WAI), an independent consultancy, to test samples and provide data in support of the South Crofty Project. Testwork is currently ongoing, however Phase One work has been completed to provide characterisation and variability testing on each of the predominant five lode areas prior to composting for flowsheet development.

The 2022-2024 flowsheet development draws on the robust Wheal Jane flowsheet as a base case due to the excellent metallurgical recoveries and concentrate grades that were historically reported, specifically post 1993. Metallurgical improvements were realised post 1993 with the installation of a hydrosizer in the secondary gravity circuit and by replacing column flotation with Multi Gravity Separation (MGS). This produced final concentrate grades between 55-58% Sn. No deleterious elements of significance have been observed in any of the past metallurgical testwork or production records.

The new flowsheet includes previous historical unit processes that were present at the South Crofty Concentrator but not available at the Wheal Jane Concentrator, such as mineralisation pre-concentration prior to grinding and spiral concentration. The amenability of the most predominant lodes tested to pre-concentration using a mixture of X-ray transmission (XRT) Ore Sorting for the -50+15 millimetres (mm) and Dynamic Dense Media Separation (DMS) for the -15+0.85 mm is excellent. As a consequence, the new flowsheet includes a pre-concentration step ahead of the already proven Wheal Jane historical flowsheet.

Improvements to the flowsheet are also being evaluated including:

- Spiral concentration; performed efficiently in the historic South Crofty Concentration plant in the 1980s.
- MGS replacement of Holman Shaking tables; the finer (nominally -106 microns) will be evaluated in both primary and secondary gravity circuits due to the low table capacity at these sizes and the potentially enhanced gravity recoveries that MGS will provide over single gravity shaking tables.
- Use of Modern high G-force continuous Multi Gravity Separators (MGS) in the desliming and roughing stage; the deslime, tin sulphide scavenger and tin flotation process employed at Wheal Jane was developed during the 1980s and 1990s to become an extremely efficient process. However, the section was expensive to operate and suffered from downsides, being difficult to operate due to its susceptibility to poor desliming, water temperature, water quality, susceptibility to dilution from fluorspar and this also precluded the use of flocculants in crusher fines thickening.

The characterisation testing on all five predominant lodes can be summarised as follows:

Physical characteristics: All five lode samples were tested as diluted mineralisation with waste rock as would be received to the processing plant so that the resultant pre-concentrated mineralisation physical competence can be established by difference.

All lodes ranked as ‘difficult’ to crush, are; ‘moderate to very abrasive’, have “moderate to hard” Rod Mill Work Index and “hard” Ball Mill Work Index. In general, the waste rocks that will be rejected in the pre-concentration stage were less abrasive and marginally softer than the pre-concentrated mineralisation.

Chemistry and mineralogy: All five lode samples were assayed using a full suite of elements and a mineralogical study conducted on all samples with the following summary highlights:

- The average grain size of all lodes is relatively coarse which permits traditional gravity concentration techniques (spirals and tables) to be utilised for the bulk of the tin recovery. This supports all historical metallurgical flowsheet developments at South Crofty and Wheal Jane. Dolcoath had the finest grain size and poorer liberation characteristics in comparison of the five lodes tested.
- Liberation characteristics support a three-stage grinding approach; rod milling to d80 800-900 µm, primary grinding to d80 = 180-150 µm and secondary grinding to d80 = 125 µm, where the bulk of the mineralisation is liberated.

- NPZ was identified as containing higher levels of fluorspar, which is a potential diluent in tin flotation concentrates, and also tungsten mineralisation. NPZ is the only lode that contains potentially recoverable tungsten as coarser grained liberated wolframite series group, all other lodes tend to be predominantly very fine grained and complexly locked scheelite making any tungsten recovery extremely challenging.

Tin deportment: All five lode samples were ground to three different grind sizes to characterise the deportment of tin as a function of grind size, and specifically to identify if the cassiterite is susceptible to producing -6 µm slime cassiterite which would ultimately adversely affect tin recovery. All five lodes consistently showed extremely low propensity to produce -6 µm slime cassiterite and gave consistent tin deportment by size.

Gravity release analysis (GRA): All five lode samples are amenable to recovery using traditional gravity techniques to recover the majority of the cassiterite present. Due to the finer grain size and lower liberation characteristics of Dolcoath mineralisation, it was the worst performer of the five lode samples tested to traditional gravity separation recovery.

An allowance has been made for processing of the Upper Mine polymetallic (Cu, Zn, Sn) mineralised material using a bulk sulphide flotation followed by differential Cu-Zn flotation circuit, as employed successfully at Wheal Jane treating Wheal Jane ore. At this time, no metallurgical testing has been conducted, or is proposed to be conducted, on this type of material unless this higher Upper Mine material is deemed to be part of the subsequent phases of the project.

1.9 Mineral Resources

The Mineral Resource is split into two sections: The Upper Mine Mineral Resource, which is predominantly polymetallic Sn-Cu-Zn mineralisation hosted in metasedimentary country rock, and the Lower Mine Mineral Resource which is tin-only and hosted predominantly in granite. The Upper Mine Mineral Resource is defined from a drill programme carried out by WUM from 2008 to 2013 comprising 31,000 m of diamond drilling. The Lower Mine Mineral Resource is defined from underground channel sampling, drilling data collected during the mine's operation which ceased in March 1998, and limited drilling completed by Cornish Metals in 2020 and 2022-2023.

The Upper Mine was originally estimated by P&E Mining Consultants Inc. (P&E) on 26 February 2016 (Puritch et al., 2016). The resource methodology and data remain unchanged as there has been no material change since the P&E Mineral Resource estimate in 2016; however, the block tin equivalent (SnEq) grades have been recalculated reflecting current metal prices. During the original review of the Upper Mine by the QP in 2021, part of the Dolcoath Upper Main Lode was identified as being over extrapolated and lacking supporting data. This area of the lode was subsequently depleted.

Cornish Metals undertook a Mineral Resource estimate on many of the main tin lodes in the Lower Mine at South Crofty in 2021. Since then, it has undertaken to build on that estimate by modelling and estimating the remaining principal lodes in the Lower Mine. The updated Lower Mine Mineral Resource estimate incorporates historical channel samples that have been compiled by Cornish Metals, and additional diamond drilling completed by Cornish Metals in 2020, and 2022-2023.

The estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues. The Property is a previously operating mine situated in a mining friendly jurisdiction. The United Kingdom is a politically stable jurisdiction, and socio-political factors are unlikely to affect the Mineral Resource.

Both the Upper and Lower Mine Mineral Resources have been reviewed by the QP, Mr Nicholas Szebor, MCSM, MSc, BSc, CGeol, EurGeol, FGS, of AMC, who takes responsibility for the estimates. The QP is not aware of any factors which would materially affect the Mineral Resources disclosed herein.

The Upper Mine Mineral Resources reviewed by the QP and based on the P&E 2016 estimate with an updated metal equivalent cut-off grade (COG) is provided in Table 1.1, Mineral Resources are reported at a cut-off grade of 0.6% SnEq and a minimum mining width (MMW) of 1.2 m.

Table 1.1 Upper Mine Mineral Resource estimate at 0.6% SnEq cut-off as of 6 September 2023[1-12]

Lode / zone	Mass (kt)	Grade				Contained tin equivalent (t)
		% Sn	% Cu	% Zn	% SnEq	
Dolcoath Middle	90	0.72	0.88	0.16	1.01	904
Dolcoath Middle Branch	37	0.89	0.34	0.02	1.00	367
Dolcoath Upper Main	-	-	-	-	-	-
Dolcoath Upper South-South Branch	-	-	-	-	-	-
Dolcoath NVC	-	-	-	-	-	-
Dolcoath Little NW	12	0.69	0.16	0.87	0.81	99
Dolcoath Little NW FW	-	-	-	-	-	-
Dolcoath Little NE	-	-	-	-	-	-
Dolcoath South Entral	122	0.62	0.91	1.05	1.00	1,213
Total Indicated	**260**	**0.69**	**0.78**	**0.59**	**0.99**	**2,583**
Dolcoath Middle	22	0.75	0.05	0.01	0.77	171
Dolcoath Middle Branch	-	-	-	-	-	-
Dolcoath Upper Main	271	0.61	0.60	0.22	0.82	2,210
Dolcoath Upper South-South Branch	88	0.50	0.73	1.83	0.88	778
Dolcoath NVC	36	0.75	1.09	0.15	1.10	395
Dolcoath Little NW	-	-	-	-	-	-
Dolcoath Little NW FW	1	0.81	0.03	0.25	0.84	8
Dolcoath Little NE	47	1.15	0.55	1.43	1.45	677
Dolcoath South Entral	-	-	-	-	-	-
Total Inferred	**465**	**0.66**	**0.63**	**0.63**	**0.91**	**4,239**

Notes:
1 The Mineral Resource estimate is reported in accordance with the requirements of the Joint Ore Reserves Committee of the Australian Institute of Mining and Metallurgy, the JORC Code (2012).
2 The QP for this Mineral Resource estimate is Mr Nicholas Szebor, MCSM, MSc, BSc, CGeol, EurGeol, FGS, of AMC.
3 Mineral Resources for the Upper Mine are estimated by conventional 3D block modelling based on wireframing at 0.5% SnEq cut-off grade and a minimum width of 1.2 m and estimated by inverse distance to the power of 3 (ID^3) grade interpolation.
4 SnEq is calculated using the formula: SnEq% = Sn% + (Cu% x 0.314) + (Zn% x 0.087). Cornish Metals has used metal prices of US$24,500/tonne Sn, US$8,000/tonne Cu, and US$2,700/tonne Zn. Assumptions for process recovery are 88.5% for Sn, 85% for Cu, and 70% for Zn.
5 For the purpose of this Mineral Resource estimate, assays were capped by lode for the Upper Mine at 6% for Sn, 4% for Cu, and 20% for Zn.
6 Bulk densities of 2.77 t/m^3 and 3.00 t/m^3 have been applied for resource volume to tonnes conversion for the granite-hosted and killas-hosted Mineral Resources, respectively.
7 Mineral Resources are estimated from near-surface to a depth of approximately 350 m.
8 Mineral Resources are classified as Indicated and Inferred based on drillhole and channel sample distribution and density, interpreted geological continuity, and quality of data.
9 The Mineral Resources have been depleted for past mining; however, they contain portions that may not be recoverable pending further engineering studies.
10 Mineral Resources which are not Mineral Reserves do not have demonstrated economic viability. The estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.
11 Effective date 6 September 2023.
12 Totals presented in the table are reported from the resource model are subject to rounding and may not sum exactly.

The Lower Mine Mineral Resources estimated by Cornish Metals in 2023 and reviewed by the QP are provided in Table 1.2.

Table 1.2 South Crofty Lower Mine Mineral Resource estimate at 0.6% Sn cut-off as of 6 September 2023 (inclusive of remnants)[1-14]

Lode / zone	Classification	Mass (kt)	Grade % Sn	Contained tin (t)
No. 1/2	Indicated	479	1.31	6,281
No. 3	Indicated	164	1.26	2,070
No. 4	Indicated	488	1.76	8,595
No. 8	Indicated	113	2.00	2,264
No. 9	Indicated	98	1.47	1,442
Dolcoath	Indicated	466	1.39	6,464
Main / Intermediate / North / Great	Indicated	61	1.09	662
North Pool Zone	Indicated	283	1.35	3,814
Providence	Indicated	-	-	-
Pryces / Tincroft	Indicated	347	1.18	4,092
Roskear	Indicated	397	1.99	7,889
Total Indicated		**2,896**	**1.50**	**43,573**
No. 1/2	Inferred	580	1.21	7,029
No. 3	Inferred	183	1.13	2,079
No. 4	Inferred	293	1.53	4,467
No. 8	Inferred	149	2.08	3,103
No. 9	Inferred	103	1.55	1,597
Dolcoath	Inferred	304	1.31	3,993
Main / Intermediate / North / Great	Inferred	276	1.16	3,214
North Pool Zone	Inferred	185	1.30	2,391
Providence	Inferred	98	1.55	1,520
Pryces / Tincroft	Inferred	177	1.34	2,375
Roskear	Inferred	278	2.01	5,596
Total Inferred		**2,626**	**1.42**	**37,364**

Notes:

1 The Mineral Resource estimate is reported in accordance with the requirements of the Joint Ore Reserves Committee of the Australian Institute of Mining and Metallurgy, the JORC Code (2012).
2 The QP for this Mineral Resource estimate is Mr Nicholas Szebor, MCSM, MSc, BSc, CGeol, EurGeol, FGS, of AMC.
3 Mineral Resources for the Lower Mine are estimated by conventional block modelling based on wireframing at 0.4% Sn threshold whilst honouring lode continuity and by ordinary kriging (OK) or ID^3 grade interpolation.
4 Assumptions for process recovery are 88.5% for Sn.
5 Cornish Metals has used a metal price of US$24,500/tonne Sn.
6 For the purpose of this Mineral Resource estimate, assays were capped by lode for the "Lower Mine" between 1.5% Sn and 23% Sn.
7 Bulk densities of 2.77 t/m^3 have been applied for volume to tonnes conversion for the Lower Mine.
8 Mineral Resources for the Lower Mine have had a minimum mining width of 1.2 m applied using 0.0% Sn dilution.
9 Mineral Resources are estimated from a depth of approximately 350 m to a depth of approximately 870 m.
10 Mineral Resources are classified as Indicated and Inferred based on drillhole and channel sample distribution and density, interpreted geological continuity, and quality of data.
11 The Mineral Resources have been depleted for past mining; however, they contain portions that may not be recoverable pending further engineering studies.
12 Mineral Resources which are not Mineral Reserves do not have demonstrated economic viability. The estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.
13 Effective date 6 September 2023.
14 Totals presented in the table are reported from the resource model are subject to rounding and may not sum exactly.

1.10 Mining

South Crofty is proposed to be mined as an underground operation using sub-level open stoping (SLOS) methods from historic infrastructure. Underground optimisation has been completed using Deswik stope optimisation (SO) software and both Indicated and Inferred Mineral Resources.

A target production rate of 1,400 tonnes per day (t/d) has been planned over an operating life of 16-years that will extract 6.0 million tonnes (Mt) of mineralised material. Underground operations will utilise the existing NCK main shaft and existing main levels, spaced approximately every 45 m. New development is planned via ramps, providing mobile fleet access throughout the mine. All material from the Lower Mine will be hoisted through the NCK shaft, Upper Mine material will be trucked using extensions from the existing surface decline.

Ground conditions from historic reports and recent investigations are shown to be excellent, with very good ground conditions. Stope stability assessments and historic mining show that open spans of over 100 m are possible without comprising stability.

Level design utilises ramp access from the 290 ftm and 400 ftm levels and strips out existing development to allow larger equipment access between levels. Stoping areas will be accessed from rehabilitation of existing development and new development where required. Production access for drilling and mucking is planned to use the existing heading dimensions, where truck access is required, existing development will be stripped or sized for the equipment.

SLOS methods are planned to be used, a sub-level between main levels will be utilised with both up / downholes drilled from the sub-level to minimise drill length. Paste backfill will be used to backfill existing mining voids, in-cycle backfill is not required.

1.11 Mineral processing

Historical gravity-only processing at the South Crofty processing plant of Lower Mine ore grading at 0.84% Sn resulted in average Sn recovery of 73%. From 1988 to 1998, South Crofty ore was processed at the nearby Wheal Jane mill which achieved 88.5% recovery (1997) by recovering Sn in fine fractions by froth flotation in addition to gravity recovery of coarse Sn.

The Wheal Jane process achieved significantly improved efficiency following improvements (installation of hydrosizer in the secondary gravity circuit and replacing column flotation with MGS) producing final concentrate grades between 55-58% Sn. The concentrator tin recovery was and will always remain closely linked with %Sn in concentrator feed.

The Wheal Jane Concentrator, incorporating key metallurgical improvements made in 1993, was utilised as the basis for the flowsheet development with inclusion of previous historical unit processes that were present at the South Crofty Concentrator but not available at Wheal Jane Concentrator. This includes mineralisation pre-concentration prior to grinding and spiral concentration, with the addition of further modern pre-concentration techniques, XRT Ore Sorting in a pre-concentration plant. The process plant incorporates:

- Underground primary single stage crushing.
- Two stage secondary crushing and XRT / DMS separation.
- Tertiary crushing of XRT products to produce nominal -15 mm material for grinding.
- Open circuit rod mill followed by closed circuit ball mill in closed circuit with screens.
- (Option): Polymetallic flotation.
- Classification and primary gravity concentration using a combination of shaking tables and MGS.
- Regrinding of primary gravity tailings followed by secondary gravity concentration using a combination of shaking tables and MGS.

- Tertiary ultrafine gravity separation using a combination of Falcon "Continuous" Concentrators and MGS.
- Tin Dressing to remove sulphides from gravity concentrates and filter the final product for shipment for smelting.

The 2023 pre-concentrator tin recovery is 97.6% based on the life-of-mine (LOM) run-of-mine (ROM) grade of 0.94% Sn. In conjunction with the pre-concentration results forecasts, a concentrator feed grade of 1.79% Sn, and using the historic Wheal Jane process recovery / feed grade relationship, the concentrator stage recovery is forecast at 90.1%. Therefore, overall tin recovery at 0.94% Sn is estimated to be 87.9%. This methodology has been used for financial modelling allowing tin recovery to vary for different time periods depending upon the %Sn in the feed.

1.12 Infrastructure

The South Crofty Project benefits from infrastructure associated with the previous mining operations as well as recent construction. Existing site general infrastructure comprises a modern office block with adjoining warehouse and workshop buildings and further offices and a workshop located adjacent to the NCK shaft, fully equipped with changing and washing facilities.

As part of the ongoing mine dewatering, part of the former mine change-house has been converted to house the electrical installations associated with the mine dewatering pumps and an accompanying control room. Recently completed infrastructure has included the MWTP, 11 kV switchroom, refurbishment of the South winder house and installation of a new mine winder, refurbishment of the South headframe, and installation of a new emergency winder and temporary building to support access into the historical mine. Access into the mine will facilitate additional investigations and does not reflect a production decision by Cornish Metals.

The main project site is bisected by two 33 kV overhead power lines. Medium-pressure gas mains are present at various locations across the site, with fresh water supplied by South West Water utility via a six-inch mains water-line that crosses the site.

1.13 Environment and social impact

The South Crofty Mine is situated in the Town of Pool between Camborne and Redruth in Cornwall, United Kingdom. It is part of the Cornwall and West Devon Mining Landscape, and is partly within a United Nations Educational, Scientific and Cultural Organization (UNESCO) designated World Heritage Site comprised of mining landscapes in Cornwall and West Devon.

Conditional planning permissions for the surface development and underground workings were granted by Cornwall Council, the LPA, in 2011 and 2013 respectively. On 23 October 2017, Cornish Metals announced that it had received Permit EPR/PP3936YU from the United Kingdom Environment Agency (EA) allowing the discharge of up to 25,000 m^3 of treated water per day from the South Crofty Mine. In January 2020, abstraction licence SW/049/0026/005 was awarded to the Company by the EA. This permit allows up to 25,000 m^3 per day of raw mine-water to be abstracted from the mine and pumped to the process plant. This has enabled the construction of a MWTP, which was commissioned in November 2023, and the subsequent dewatering of South Crofty Mine.

Atkins Engineering Limited completed two environmental statements (ES) for the below-ground and above-ground works at the South Crofty Mine in support of applications for planning permission.

The UK planning process involves a consultation period where the application is open to public comment, including support and objection. The project as proposed in 2011 was not materially objected to, with one exception. In 2012, UNESCO initially expressed its opposition to the Project as proposed in 2011. It is worthy to note that UNESCO has no jurisdiction over planning decisions in the UK and its statement of opposition was made after the conditional planning permission had been granted.

Cornish Metals carries out quarterly liaison meetings with stakeholders to provide updates on the progression of the Project. Regular contact with parish councils in the Project areas is also made to inform on operational activities. In addition to this, Cornish Metals employs a designated Community Liaison Manager to consult directly with local stakeholders on operations which might impact them and ensure open lines of communication exist between Cornish Metals and local residents and businesses. The company also carries out community liaison open days which are scheduled to inform the community of new projects and significant milestones of the project development. These events share the company's progress and plans in order to engage and receive feedback from the local community.

1.14 Operating and capital cost estimates

LOM capital costs for the South Crofty project total £185 million (M), consisting of the following distinct phases:

- Pre-production capital costs – Includes all costs to develop South Crofty to a 1,400 t/d production rate. Initial capital costs total £142M and are expended over an 18-month pre-production period on engineering, construction, and commissioning activities.
- Sustaining capital costs – Includes all costs related to the acquisition, replacement, or major overhaul of assets during the mine life required to sustain operations. Sustaining capital costs total £43.5M and are expended in operating Years 1 through 14.

The capital cost estimate (CAPEX) is summarised in Table 1.3.

Table 1.3 Capital cost summary

Capital costs	Pre-production cost (£M)	Sustaining cost (£M)	Project total cost (£M)
Mining	52.7	35.1	87.8
Site development	2.7	0.0	2.7
Mineral processing	45.2	7.0	52.2
Tailings management	10.5	0.0	10.5
Surface infrastructure	5.5	0.0	5.5
Owner's costs	4.6	0.0	4.6
Contingency	20.6	1.4	22.0
Total CAPEX	**142**	**43.5**	**185**

Source: Cornish Metals, 2024.

The operating cost estimate in this study includes the costs to mine, cost to pump and treat mine water and process the mineralised material to produce metal concentrates, along with general and administrative expenses (G&A), including mine closure. These items total the Project operating costs and are summarised in Table 1.4. The total operating cost is estimated to be £82/t processed. No allowance for inflation or contingency has been applied to operating costs.

Table 1.4 Operating cost breakdown

Operating costs	Avg. annual (£M)	£/t processed	LOM (£M)
Mining & hoisting	22.0	51.7	308.1
Pumping & water treatment	1.0	2.4	14.0
Processing	8.5	19.9	118.3
G&A including closure fund	3.5	8.2	48.5
Total	**34.9**	**82.1**	**489.0**

Source: Cornish Metals, 2024.

The main operating cost component assumptions are outlined in Table 1.5.

Table 1.5 Main operating cost component assumptions

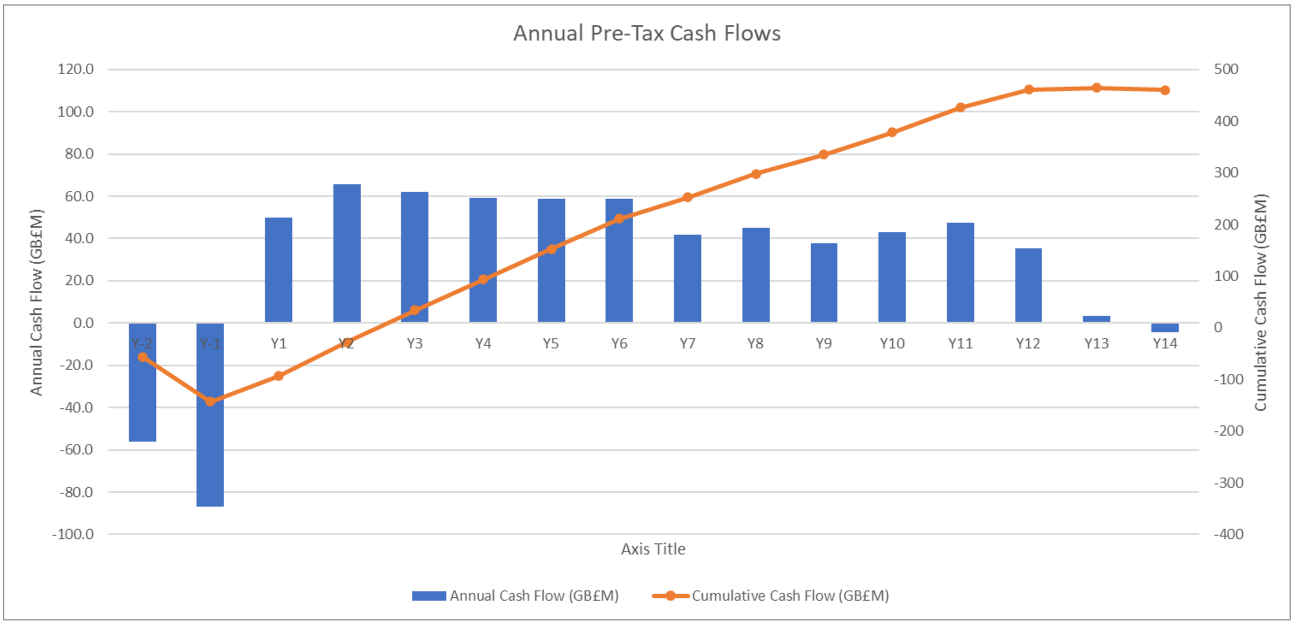
Item	Unit	Value
Electrical power cost	£/kWh	0.20
Average power demand	kW	6,536
Fuel cost (delivered) (HVO diesel)	£/litre	1.37
LOM average workforce	Employees	291

Source: Cornish Metals, 2024.

1.15 Economic analysis

The South Crofty Project economic evaluation indicates positive free cashflow, resulting in a base case post-tax internal rate of return (IRR) of 30% and a net present value (NPV) using an 8% discount rate ($NPV_{8\%}$) of £161M (US$201M). Figure 1.1 shows the projected cash flows, and Table 1.6 summarises the economic results of the Project.

Figure 1.1 Annual post-tax cashflow



Source: Cornish Metals, 2024.

Table 1.6 Summary of results

Summary of results	Unit	Value
All-in sustaining cost (AISC)	£ Sn/t (US$ Sn/t)	10,930 (13,660)
Capital & revenue		
Pre-production capital	£M	142
Development & sustaining capital	£M	43
Total capital investment prior to payback	£M	149
Gross revenue	£M	1,250
Royalties	£M	27
Treatment & refining costs	£M	89
Net revenue	£M	1,134
Total operating costs	£M	489
Pre-tax cash flow	£M	459
Taxes	£M	102
Post-tax cashflow	£M	358
Economic results		
Pre-tax $NPV_{8\%}$	£M	211
Pre-tax IRR	%	33
Pre-tax Payback	Years	2.9
Post-tax $NPV_{8\%}$	£M	161
Post-tax IRR	%	30
Post-tax payback	Years	3.0

Source: Cornish Metals, 2024.

A univariate sensitivity analysis was performed to examine which factors most affect the Project economics when acting independently of all other cost and revenue factors. Each variable evaluated was tested using the same percentage range of variation, from -30% to +30%. The results of the sensitivity analyses are shown in Table 1.7.

Table 1.7 Sensitivity analysis

Variable	Pre-tax $NPV_{8\%}$ (£M)		
	-30% variance	0% variance	+30% variance
Tin Metal price	18	211	405
Tin Head grade	5	211	422
Processing recovery	31	211	-
OPEX	289	211	133
CAPEX	256	211	166

Source: Cornish Metals, 2024.

1.16 Conclusions

It is concluded that the South Crofty works completed to date, including exploration and study work leading to the current Mineral Resource estimate, and the PEA summarised within this Technical Report, supports the ongoing advancement of the Project.

The PEA is preliminary in nature, it includes Inferred Mineral Resources that are considered too speculative geologically to have economic considerations applied to them that would enable them to be categorised as Mineral Reserves, and there is no certainty that the PEA will be realised.

1.16.1 Permitting

Permitting for the Project is well advanced, with Surface and Underground Planning Permissions active (underground mining permitted until 2071). Permits to abstraction, treatment, and discharge for the dewatering have all been granted. South Crofty have made significant progress in securing the necessary environmental permits and licences for the proposed operations at the South Crofty mine.

1.16.2 Mineral Resources

It is the opinion of the QP that the information and analysis described in this Technical Report are sufficient for reporting Mineral Resources for the Upper and Lower Mine areas of the South Crofty Project.

Work has been undertaken to check the veracity of historical drilling, channel sampling, and assay methods to support its inclusion within the Mineral Resource estimates. This has included additional drilling completed by Cornish Metals in 2020 and 2022-2023.

Whilst the review work performed by the QP is sufficient to allow the reporting of Inferred and Indicated Mineral Resources, further, QAQC activities are required to add further confidence to the sample data before assigning a Measured classification.

1.16.3 Metallurgical recovery

Significant metallurgical testwork and analysis has been undertaken to confirm the process design and substantiate historic plant performance and projected recoveries. Cornish Metals have validated historical data from the Wheal Jane processing plant and completed additional confirmatory testwork, included pre-concentration and optimisation of the historic flowsheet. The QP is confident that the pre-concentration stage will add significant value to the project and the close correlation between historical production data and the latest testwork results provides confidence that the proposed flowsheet is fit for purpose. No deleterious elements of significance have been observed in any of the past metallurgical testwork or production records.

An allowance has been made for processing of the Upper Mine polymetallic (Cu, Zn, Sn) mineralised material using a bulk sulphide flotation followed by differential Cu-Zn flotation circuit as employed successfully at Wheal Jane treating Wheal Jane ore. At this time, no metallurgical testing has been conducted or is proposed to be conducted on this type of material unless this higher Upper Mine material is deemed to be part of the subsequent phases of the project.

1.16.4 Metal sales

South Crofty will produce a tin concentrate that is expected to be marketable to a large number of downstream smelters, traders and sales agents who the project has been in discussions with. The mine will also produce copper and zinc concentrates when processing Upper Mine polymetallic areas.

1.16.5 Mining

The South Crofty project has been designed to continue previous underground mining; the project includes dewatering and pre-production phases prior to commencing production. Mine dewatering is currently underway, and the mine plan detailed in this Technical Report consists of an 18-month pre-production period prior to a 14-year mine life.

Mine designs have been completed based on Indicated and Inferred material from the Mineral Resource block models with a 1.5 m minimum mining width and a cut-off grade above 0.45% Sn. Underground mining by SLOS is confirmed as the most appropriate underground method for the Project and was historically used with excellent results.

In-cycle cemented paste fill is not required in active mining areas for ground stabilisation and tailings will be processed for underground disposal into existing mine voids.

1.16.6 Infrastructure

The project has recently constructed a MWTP to treat pumped mine water, from two installed large dewatering pumps in NCK Shaft. Other infrastructure includes refurbishment of the South Winder House, Winder and Headframe, a new emergency Winder House and Winder has also been installed.

Project works have included installation of a new 11 kV 5 MVA power supply and switchroom, the site has 33 kV overhead lines passing with an additional 7 MVA agreed capacity.

The site surface facilities have planning permission and have been designed to support the mining operations.

1.16.7 Capital and operating costs and financial model

Direct costs were developed from a combination of budget quotes, material take-offs, existing contracts, project specific references and historical benchmarks or reference costs. Indirect and owners costs were estimated using a combination of existing commitments, calculated project requirements and historical benchmarks. Contingency was applied to each cost item in the estimate based on the level of engineering and reliability of its unit rates.

The capital cost estimate does not include sunk costs. Total pre-production capital cost is estimated to be £142M (US$177M) and total operating cost over the LOM is estimated to be £489M (US$611M). Project cashflows indicate an IRR of 30% on a post-tax basis with the project long-term tin price of $31,000/t. The post-tax NPV for the project is estimated to be £161M (US$201M) using a discount rate of 8%, with a payback of the capital expenditure achieved in 3.0 years from the start of commercial production.

1.16.8 Environmental

The environmental studies completed conclude that during construction and operations there are site specific impacts, however the impacts will be managed through best-practices and international standards through to mine closure.

1.17 Recommendations

Results of the PEA support the ongoing development of the South Crofty Project, and the following recommendations are made to support the Project advancement.

1.17.1 Mineral Resources

- Additional work be undertaken to collate the outstanding historical sample data into the database to further inform the Mineral Resource estimates.
- Further confirmation sampling, preferably from underground following mine dewatering.
- Continued implementation of a robust QAQC programme.

1.17.2 Metallurgical testwork

- Metallurgical testwork is currently ongoing. Upon completion of this testwork programme the results should be reviewed to provide trade off studies for optimisation of the flowsheet alternatives.
- Additional metallurgical sampling and variability testwork should be completed on the Upper Mine as mine dewatering progresses and provides access, if this mineralisation were to be included in future phases of the project.

1.17.3 Mining

- Following dewatering, a programme of checking the mine surveys should be undertaken to provide additional support to the historical digitised mine survey data.
- Additional geotechnical data should be collected to confirm the rock mass characterisation.
- The next stage of technical studies will include updating the mine design and production schedule based on Measured or Indicated Mineral Resources only.

1.17.4 Mineral processing

- The plant design process should continue to draw on robust historical designs but look for enhanced recovery and / or rationalisation of capital / operating costs using new design and technologies.
- Trade-off studies are recommended to support flowsheet development logic so as to ensure the new unit processes employed are fully justified.

1.17.5 Paste backfill

- Continuation of feasibility paste backfill design and testing.

1.17.6 Environmental

- Ongoing testing and associated works, including discussions with the environment agency and local regulators is recommended to be continued to complete permitting on remaining operating activities and review any further permitting obligations.

1.17.7 Mine closure

- Annual review of the closure plan to ensure assumptions remain correct, that there have been no changes in legislation, that there have been no advancements in the industry that impact on the plan, and that the costings remain up to date and accurate.

Contents

Tables

Figures

List of units

Unit	Description
%	per cent
$; US$	United States Dollar
/	per
£; GBP	UK Pounds Sterling
″	inches
°	degrees
°C	degrees Celsius
cm	centimetres
ft	feet
ftm	fathom (1 fathom = 6 feet = 1.83 metres)
g	grams
g/cm^3	grams per cubic centimetre
g/t	grams per tonne
GWh	gigawatt hour
h/d	hours per day
ha	hectares
kg	kilogram
km	kilometre
km^3	cubic kilometres
kPa	kilopascal
kt	thousand tonnes
ktpa	kilotonnes per annum
kV	kilovolt
kVA	kilovolt ampere
kW	kilowatt
kWh/t	kilowatt hours per tonne
lb	pound
lbs/ton	pounds per ton
lbs/tonne	pounds per tonne
M	million
m	metres
m/d	metres per day
m/hr	metres per hour
m^2	square metre
m^3	cubic metres
Ma	million years
masl	metres above sea level
mm	millimetres
mm^2	square millimetres
Mm^3	million cubic metres
MPa	Megapascal
Mt	million tonnes
MVA	megavolt ampere
Pa	Pascal
ppb	parts per billion

Unit	Description
ppm	parts per million
t or tons	tonnes (metric)
t/d	tonnes per day
t/m	tonnes per metre
t/m^3	tonnes per cubic metre
TKM	tonnes x kilometres
tpa	tonnes per annum
µm	micrometre
V	volt

List of abbreviations

Abbreviation	Definition
≈	Approximately equal to
>	Greater than
<	Less than
±	Plus-minus
3D	Three-dimensional
ACSM	Associate of the Camborne School of Mines
Ag	Silver
AGAT	AGAT Laboratory
AIM: CUSN	London Alternative Investment Market (Ticker Symbol CUSN)
AISC	All-in sustaining cost
ALS	ALS Laboratories
AMC	AMC Consultants (UK) Limited
AMD	Above mine datum
ANFO	Ammonium nitrate fuel oil
As	Arsenic
AusIMM	Australasian Institute of Mining and Metallurgy
Baseresult	Baseresult Holdings Limited
BLEI	Bond Low Energy Impact
Ca	Calcium
CaF_2	Calcium fluoride
Carnon	Carnon Consolidated Ltd.
CAPEX	Capital expenditure
CBCA	Canada Business Corporations Act
CCTV	Closed-circuit television
Celeste	Celeste Copper Corp.
Charter	Charter Consolidated Ltd.
CIM	Canadian Institute of Mining, Metallurgy and Petroleum
CML	Cornish Minerals Limited (UK)
CMLB	Cornish Minerals Limited (Bermuda)
CO_2	Carbon dioxide
COG	Cut-off grade
Cornish Metals; client; Issuer	Cornish Metals Inc.
Crew	Crew Natural Resources of Canada
CRM	Certified reference material
CSA	Canadian Securities Administrators
CSM	University of Exeter's Camborne School of Mines

Abbreviation	Definition
Cu	Copper
CV	Coefficient of variation
CWi	Crushing Work Index
DLOS	Double lift open stoping
DMS	Dense Media Separation
DRC	Democratic Republic of Congo
DTI	Department of Trade and Industry
EA	Environment Agency
EDPXRF	Energy Dispersive Polarised X-Ray Fluorescence
EIA	Environmental Impact Assessment
EP	Environmental Permit
EPC	Engineering, procurement, and construction
EPCM	Engineering, procurement, and construction management
EPR	Environmental Permitting Regulations
ES	Environmental Statement
EU	European Union
EW	East-west
FAusIMM	Fellow of the Australasian Institute of Mining and Metallurgy
Fe	Iron
FGS	Fellow of the Geological Society
FIMMM	Fellowship of the Institute of Materials, Minerals and Mining
FSAIMM	Fellowship of the Southern African Institute of Mining and Metallurgy
FW	Footwall
G&A	General and administration
GRA	Gravity release analysis
GSSF	Galena Special Situations Fund
HARD	Half absolute relative difference
HDS	High-density sludge
Hg	Mercury
HHP	High-heat producing
HLS	Heavy liquid separation
HMI	Human machine interface
HNO_3	Nitric acid
HR	Hydraulic radius
HSE	Health and Safety Executive
HW	Hangingwall
ICMM	International Council on Mining and Metals
ICP	Inductively Coupled Plasma
ICP - AES	Inductively Coupled Plasma – Atomic Emission Spectrometry
ICP/ICP - MS	Inductively Coupled Plasma – Mass Spectroscopy
ICP - OES	Inductively Coupled Plasma – Optical Emission Spectroscopy
ID	Identification
ID^3	Inverse distance cubed
IDW^3	Inverse distance weighting cubed
IDW^4	Inverse distance weighting to the power four
IEC	Inter-Element Correction
In	Indium
IRR	Internal rate of return
JORC	Joint Ore Reserves Committee

Abbreviation	Definition
Jw	Joint water (Norwegian Geological Institute) Rock Mass Classification
LCS	Local Control Station
LHD	Load haul dump
LIMS	Laboratory information management system
LME	London Metal Exchange
LOM	Life-of-mine
LPA	Local Planning Authority
MCA	Multi-channel analyser
MCF	Mine Call Factor
MCSM	Master of the Camborne School of Mines
MEP	Mineral Engineering Processes Limited
MGS	Multi Gravity Separator
MIBC	Methyl isobutyl carbinol
Micromine	Micromine Limited
MIMMM	Member of Institute of the Materials, Minerals, and Mining
MMW	Minimum mining width
MRTPI	Member of the Royal Town Planning Institute
MSH	Multispigot hydrosizer
MSO	Mineable shape optimisation
MWTP	Mine water treatment plant
N	North
NCK	New Cook's Kitchen
NE	North-east
NI 43-101	National Instrument 43-101 (Standards of Disclosure for Mineral Projects), Form 43-101F1 and the Companion Policy Document 43-101CP
NMA	Non-material amendment
No.	Number
NORM	Naturally occurring radioactive materials
NPA	North Pool A
NPB	North Pool B
NPC	North Pool C
NPQ	North Pool Quartzites
NPV	Net present value
NPZ	North Pool Zone
NSR	Net smelter return
OEM	Original equipment manufacturer
OK	Ordinary kriging
OPC	Ordinary Portland Cement
OPEX	Operating expenditure
ORE	Ore Research and Exploration Pty. Ltd.
OS	Ordnance Survey
P&C	Paterson & Cooke (UK) Ltd
P&E	P&E Mining Consultants Inc.
Pb	Lead
PEA	Preliminary Economic Assessment
PLC	Programmable Logic Controller
PPE	Personal protective equipment
Property	South Crofty Tin (copper-zinc) Property
PVC	Polyvinyl chloride

Abbreviation	Definition
pxFA	px Fairport
Q; Q′	Rock Mass Classification Rating (Norwegian Geological Institute)
QAQC	Quality Assurance and Quality Control
QMS	Quality Management System
QMR	Qualified for Minerals Reporting
QP	Qualified Person
ROM	Run-of-mine
RQD	Rock Quality Designation
RTZ	Rio Tinto Zinc
SCL	South Crofty Limited
SEDAR	System for Electronic Document Analysis and Retrieval
SEX	Sodium ethyl xanthate
SG	Specific gravity
SGS	SGS Cornwall
SI	International System of Units
SLOS	Sub-level open stoping
SLR	SLR Consulting
Sn	Tin
SnEq	Tin equivalent
SnO_2	Tin oxide
SO	Stope optimisation
South Crofty	South Crofty Project
SRF	Stress reduction factor (Norwegian Geological Institute) Rock Mass Classification
The Report	NI 43-101 Mineral Resource Report on the South Crofty Project, UK, prepared for Cornish Metals Inc. with an effective date of 8 April 2024
Tin Shield	Tin Shield Production Inc
TSF	Tailings Storage Facility
TSX-V: CUSN	Canadian TSX Venture Exchange
UCS	Uniaxial compressive strength
UK	United Kingdom
UNESCO	United Nations Educational, Scientific and Cultural Organization
VFD	Variable Frequency Drives
W	Tungsten; West
WAI	Wardell Armstrong International
WHIMS	Wet high-intensity magnetic separation
WUM	Western United Mines Ltd
XRF	X-ray fluorescence spectroscopy
XRT	X-ray transmission
Zn	Zinc

2 Introduction

2.1 General and terms of reference

This Technical Report (South Crofty Technical Report or Technical Report) on the South Crofty Tin (copper-zinc) Property (Property) has been prepared by AMC Consultants (UK) Limited (AMC) of Maidenhead, UK, on behalf of Cornish Metals Inc. (Cornish Metals or the Issuer), of Vancouver, Canada. The Property is in Cornwall, United Kingdom.

This Technical Report provides the results of a Preliminary Economic Assessment (PEA) for the Property. The PEA builds upon the updated Mineral Resource report in the previous Technical Report "South Crofty Tin Project – Mineral Resource Update" completed by AMC, with an effective date of 14 September 2023 (AMC, 2023).

This report has been produced in accordance with the Standards of Disclosure for Mineral Projects, effective 9 June 2023, as contained in National Instrument 43-101 (NI 43-101), and as per accompanying policies and guidelines. Mineral Resources are classified in accordance with the JORC Code (2012). The confidence categories assigned under the JORC Code were reconciled to the confidence categories in the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards – for Mineral Resources and Mineral Reserves May 2014 (the CIM Definition Standards). The confidence categories between CIM and JORC are the same, and therefore there is no requirement for modification of the confidence categories.

2.2 The Issuer

Cornish Metals is a dual-listed company (TSX-V:CUSN, AIM:CUSN) focused on advancing the South Crofty high-grade, underground tin project as well as exploring its additional mineral rights, all located in Cornwall, South West England. Cornish Metals' mineral rights have potential for the discovery of tin, copper, lithium, tungsten, zinc, and silver mineralisation.

2.3 Qualifications of authors

The names and details of persons who have prepared or assisted the Qualified Persons (QPs) in the preparation of this Technical Report are listed in Table 2.1. The QPs meet the requirements of independence as defined in NI 43-101.

Table 2.1 Persons who prepared or contributed to this Technical Report

Qualified Person	Position	Employer	Independent of Cornish Metals	Date of site visit	Professional designation	Sections of report
Qualified Persons responsible for the preparation of this Technical Report						
Mr N Szebor	Regional Manager (UK) / Principal Geologist	AMC Consultants (UK) Limited	Yes	14 Jul 2023 & 4 Feb 2020	MCSM, M.Sc., B.Sc., CGeol (London), EurGeol, FGS	2-12, 14, 23, 24, 27 and part of 1, 25, and 26
Mr D Claridge	Principal Mining Engineer	AMC Consultants (UK) Limited	Yes	29-31 Aug 2023	FAusIMM	15, 16, 19, 22 and part of 1, 18, 21, 25, and 26
Mr B Balding	Technical Director	SLR Environmental Consulting (Ireland) Ltd	Yes	30 Nov 2023	P.Geo., EurGeol	20 and part of 1, 21, 25, and 26
Mr S Wilson	Managing Director	Paterson & Cooke (UK) Ltd	Yes	Ongoing 7 May 2024	B.Eng., ACSM, C.Eng., FIMMM	Part of 16, 21, and 25
Mr M Hallewell	Consultant	MPH Minerals Consultancy Ltd	Yes	Ongoing 20 Mar 2024	B.Sc., FIMMM, FSAIMM, FMES, C.Eng.	13, and part of 1, 17, 18, 21, 25, and 26
Dr B O'Connell	Consultant	Tech Mill Services Ltd.	Yes	11-24 Apr 2024	PhD, C.Eng., B.Eng. (Hons), ACSM, FIMMM	Part of 17 and 21
Other experts who assisted the Qualified Persons						
Ms A Collins	Principal Planner	SLR Environmental Consulting (Ireland) Ltd	Yes	None	Dip BA MRTPI	Part of 20
Mr A Wilkins	Chief Geologist	Cornish Metals Inc.	No	Ongoing	CGeol (London), EurGeol, FGS	1-14
Mrs L Beveridge	Senior Resource Geologist	Cornish Metals Inc.	No	Ongoing	AusIMM, CP (Geo)	1-14
Mr O Mihalop	Chief Operating Officer	Cornish Metals Inc.	No	Ongoing	MIMMM (C.Eng.)	1-14 and 21-22
Mr S Holley	Feasibility Study Manager	Cornish Metals Inc.	No	Ongoing	MCSM, M.Sc., B.Sc., C.Eng., MIMMM, QMR	1-26

Note: Where QPs are indicated as having part responsibility, that responsibility reflects their individual area of expertise.

2.4 Sources of information

In generating and / or supervising the preparation of this Technical Report, the QPs have relied on various geological maps, cross-sections, reports, and other technical information provided by Cornish Metals. The QPs have reviewed and analysed the data provided and drawn their own conclusions, augmented by their site visits and prior knowledge of the Project and communications with Cornish Metals personnel. Specific documents referenced in this report are listed in Section 27.

2.5 Effective date

The Technical Report is effective 8 April 2024.

2.6 Units

All units of measurement used in this Technical Report are metric unless otherwise stated. Tonnages are reported as metric tonnes (t), and base metal values (tin, copper, lead, and zinc) are reported in weight percent (%) or ppm. Other references to geochemical analysis are in ppm or parts per billion (ppb) as reported by the originating laboratories. All currency amounts and commodity prices are in US dollars (US$) unless otherwise stated.

This report includes the tabulation of numerical data, which involves a degree of rounding for the purpose of Mineral Resource estimation. AMC does not consider any rounding of the numerical data to be material to the Project.

3 Reliance on other experts

The QP has relied, in respect of legal aspects, upon the work of the Expert listed below. To the extent permitted under NI 43-101, the QP disclaims responsibility for the relevant section of the Technical Report.

- The following disclosure is made in respect to information provided by Cornish Metals personnel led by Mr Owen Mihalop, Chief Operating Officer, Cornish Metals.
- Report, opinion, or statement relied upon: Information on mineral tenure and status, title issues, royalty obligations, etc.
- Extent of reliance: Full reliance following a review by the QP.
- Portion of Technical Report to which disclaimer applies: Section 4.2 and Section 4.3.

The QP has relied, in respect of taxation and royalty aspects, upon the work of the Expert listed below. To the extent permitted under NI 43-101, the QP disclaims responsibility for the relevant section of this Technical Report:

- Expert: Mr. Owen Mihalop, Chief Operating Officer, Cornish Metals. South Crofty 2024 PEA_Financial Model_v9.2.xlsx (Cornish Metals consolidated financial model).
- Report, opinion or statement relied upon: Information on taxation and royalties in England used as inputs to the financial model.
- Extent of reliance: Full reliance following review by QP.
- Portion of Technical Report to which the disclaimer applies: Section 22.

4 Property description and location

4.1 Property location

The South Crofty Project is a past-producing underground tin mine located in the historic Central Mining District of Cornwall, United Kingdom, situated in the parish of Pool, between the towns of Camborne and Redruth.

The Project is located at latitude 50° 13′ 21″ N longitude 5° 16′ 32″ W (UTM Coordinates WGS84 30U 337,679 mE 5,565,836 mN) and located approximately 390 km west-south-west of London, UK, and is approximately 4.5 km south of the north coast of Cornwall and the Celtic Sea (Figure 4.1).

Figure 4.1 Location of South Crofty Project

Source: Cornish Metals, 2023. Modified after Ordnance Survey, 2022.

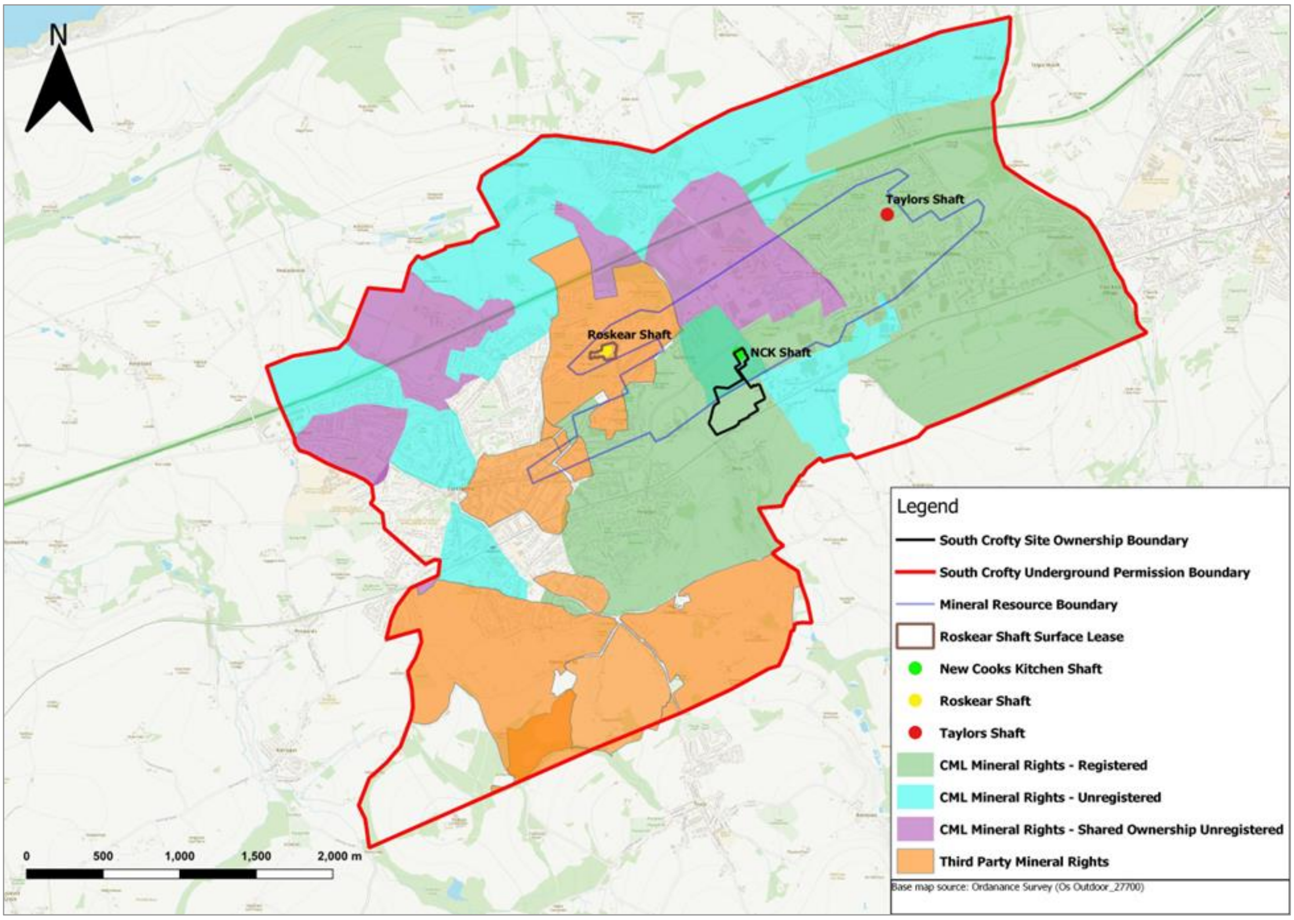
Underground workings extend beneath Pool and the neighbouring towns. The South Crofty Project and past-producing mines extend 3.3 km east-west along-strike from Camborne toward Redruth in the east and 800 m north-south from the main A30 trunk road to the main South West railway line in the south, with some workings extending to a depth of 885 m below surface.

4.2 Property description and tenure

Cornish Metals Inc. (formerly Strongbow Exploration Inc.) acquired the South Crofty Project from administration on 11 July 2016. Cornish Metals holds its 100% interest in the project through a subsidiary company, South Crofty Limited (SCL) (formerly Western United Mines Ltd (WUM)). At the same time as acquiring SCL, Cornish Metals also acquired a 100% interest in Cornish Minerals Limited (Bermuda) (CMLB). CMLB holds title to the underground mineral rights and SCL holds the licences, permits, and freehold surface land that form the South Crofty Project. Replacement planning applications for surface and underground developments were approved by Cornwall

Council in 2011 and 2013 which has increased the Project area to 1,490 ha with a working depth of 1,500 m below surface. The underground mining permission is valid until 2071. The Project's extensive 1,490 ha underground mining Permission Area extends over 26 historic mining operations. The current South Crofty Project comprises the former producing South Crofty and Dolcoath mines, referred herein singularly as South Crofty. The mining operations were historically separated by the Great Crosscourse fault, which follows the course of the Red River as its surface feature. The underground Permission Area and the geographical context of the Project is shown in Figure 4.2 below.

Figure 4.2 Underground permissions area and the geographical context of the Property



Source: Cornish Metals, 2023. Modified after Ordnance Survey, 2022.

The Project underground Permission Area includes five Mineral Rights which are registered at the Land Registry as well as areas of Mineral Rights that are unregistered. The registered Mineral Rights have the following title numbers:

- CL169822
- CL169823
- CL188226
- CL188227
- CL188228

Unregistered Mineral Rights pertain to those rights which are held by Cornish Metals, but which have yet to be publicly registered at the Land Registry. There is currently no requirement in the UK to register Mineral Rights. Registered and unregistered Mineral Rights are held in perpetuity by Cornish Metals with no expiration date.

Certain Mineral Rights within the underground Permission Area are leased from third party mineral owners. These include Roskear Minerals LLP and the Vyvyan family of Trelowarren in Cornwall. Both lease agreements are valid for a period of 25 years up until 6 March 2046 and February 2047, respectively, with a further right to renew prior to the end of the lease. The terms of the leases require Cornish Metals to pay an annual rent, plus a net smelter royalty on production of any minerals recovered from the leased areas.

Those Mineral Right areas classed as shared ownership (unregistered), refer to Mineral Rights where Cornish Metals has a shareholding in an undivided mineral right, and a third party holds the remaining share. In the majority of cases, Cornish Metals retains the "Power to Work" any minerals contained within the shared area but is in discussions with the other parties regarding putting a formal lease in place to cover their share of the minerals. As part of the agreements, Cornish Metals is likely to be required to pay a royalty to the third party. Should an agreement not be reached Cornish Metals still retains the right to work the minerals in the majority of the shared ownership areas, but it may be necessary to set aside funds for future royalty payments should it be demanded. If the third party owners are unknown or unwilling to enter into a lease agreement, then Cornish Metals is able to apply to the Secretary of State for Business and Trade for permission to settle any dispute in accordance with the rights set out in the Mines (Working Facilities and Support) Act, which can confer powers of compulsory purchase and other ancillary rights.

In the UK, mineral ownership extends to the centre of the earth. The Project operates under several planning permissions that were granted in 1952 and updated in 2006 with environmental conditions imposed. These remain extant but have largely been superseded by two new planning permissions for the proposed modernisation of South Crofty Mine to allow for the continuation of "winning" and working of minerals. Winning is defined as making a mineral available or accessible to be removed from the land. The new surface planning permission and the new underground planning permission were approved by Cornwall Council in 2011 and 2013 respectively. The underground planning permission has increased the Project area to 1,490 ha with a working depth of 1,500 m below ground level. SCL has approximately 7.65 ha (18.9 acres) of surface ownership. Independent legal opinion regarding tenure, rights and easements, restrictions, stipulations, incumbrancers, existing use, taxes, charges, and fees dated 27 March 2022, was conducted by Stephens Scown LLP, a law firm specializing in UK mineral law and solicitors to Cornish Metals. This opinion is an update to previous opinions by Stephens Scown LLP dated 5 February 2021 and 24 May 2017. The March 2022 letter of opinion was supplied prior to a significant investment into the company by Vision Blue Resources Ltd, whilst the February 2021 letter of opinion was supplied for Cornish Metals listing on the Alternative Investment Market (AIM) of the London Stock Exchange.

In addition to the mineral rights discussed above, Cornish Metals also has a 1.5% net smelter return (NSR) royalty agreement with Osisko Development Corporation on all production from within the Permissions Area. Osisko Development Corporation being a major shareholder of Cornish Metals.

4.3 Permitting and environmental liabilities

Cornwall Council, the Local Planning Authority (LPA), issued a Grant of Conditional Planning Permission for Project-related surface activities in 2011 (PA10/04564) and another for Project-related underground activities in 2013 (PA10/05145) based on the scope described in the applications submitted by SCL. These two permissions enable mining and processing operations to 2071. Under the Town and Country Planning Act 1990, Schedule 5, Part 1, s.1(2) the winning and working of minerals or the deposit of mine waste must cease not later than 60 years after the date of the permission, unless extended prior to that date.

Atkins Engineering Limited completed two environmental statements (ES) for the below-ground and above-ground works at the South Crofty Mine in support of its applications for planning permission.

Under the terms of the surface permission, the permitted surface development was to be commenced by 3 November 2016. In September and October 2016, eight key-surface conditions (numbers 6, 7, 8, 9, 10, 11, 12, and 32) were discharged by Cornwall Council which allowed construction work to commence. A 5 m section of concrete kerb was then installed along the main road into the Project site and a Certificate of Lawfulness for Proposed Use or Development was issued by Cornwall Council dated 30 January 2017, effective 18 November 2016. The Certificate of Lawfulness states that development has materially commenced in connection with PA10/04564 and that permission is therefore considered to be extant. The Grant of Conditional Planning Permission extends to 30 June 2071.

On 23 October 2017, Cornish Metals announced that it had received Permit EPR/PP3936YU from the United Kingdom Environment Agency (EA) allowing the discharge of up to 25,000 m^3 of treated water per day from the South Crofty Project. Untreated water from historical mining operations (pre-Cornish Metals) currently flows directly into the Red River. Cornish Metals' new permit allows the Company to proceed with construction of a mine water treatment facility that will lead to an improvement in the quality of water discharged. In January 2020, abstraction licence SW/049/0026/005 was awarded to the Company by the EA. This permit allows up to 25,000 m^3 per day of raw mine water to be abstracted from the mine and pumped to the process plant. The need for this additional permit was brought about by a change in legislation after the 2017 discharge permit was issued. Previously, abstraction of groundwater for the purposes of mine dewatering had been an exempted activity.

Waste rock and thickened tailings could be used to backfill mined-out workings. The underground permission requires tailings leach testing and LPA approval before tailings can be used for underground backfilling. The permissions will also likely require other non-material amendments (NMAs) to the current LPA approvals as the Project is advanced.

The mine would be closed in an orderly manner based on a closure plan that would be regularly updated and refined over the life of the Project. As defined in the surface permission, a surface restoration scheme is required to be submitted for approval at least two years prior to the expiration of the date in the permission or within two years of the permanent cessation of mineral working, whichever is the sooner. A restoration scheme for the surface features and shafts needs to be submitted for approval by the LPA at least two years prior to the expiration of the permission or within two years of the permanent cessation of mining activity.

To the extent known to the QP, all the permits that must be acquired to conduct the work proposed for the Property have been obtained.

4.4 Conclusions

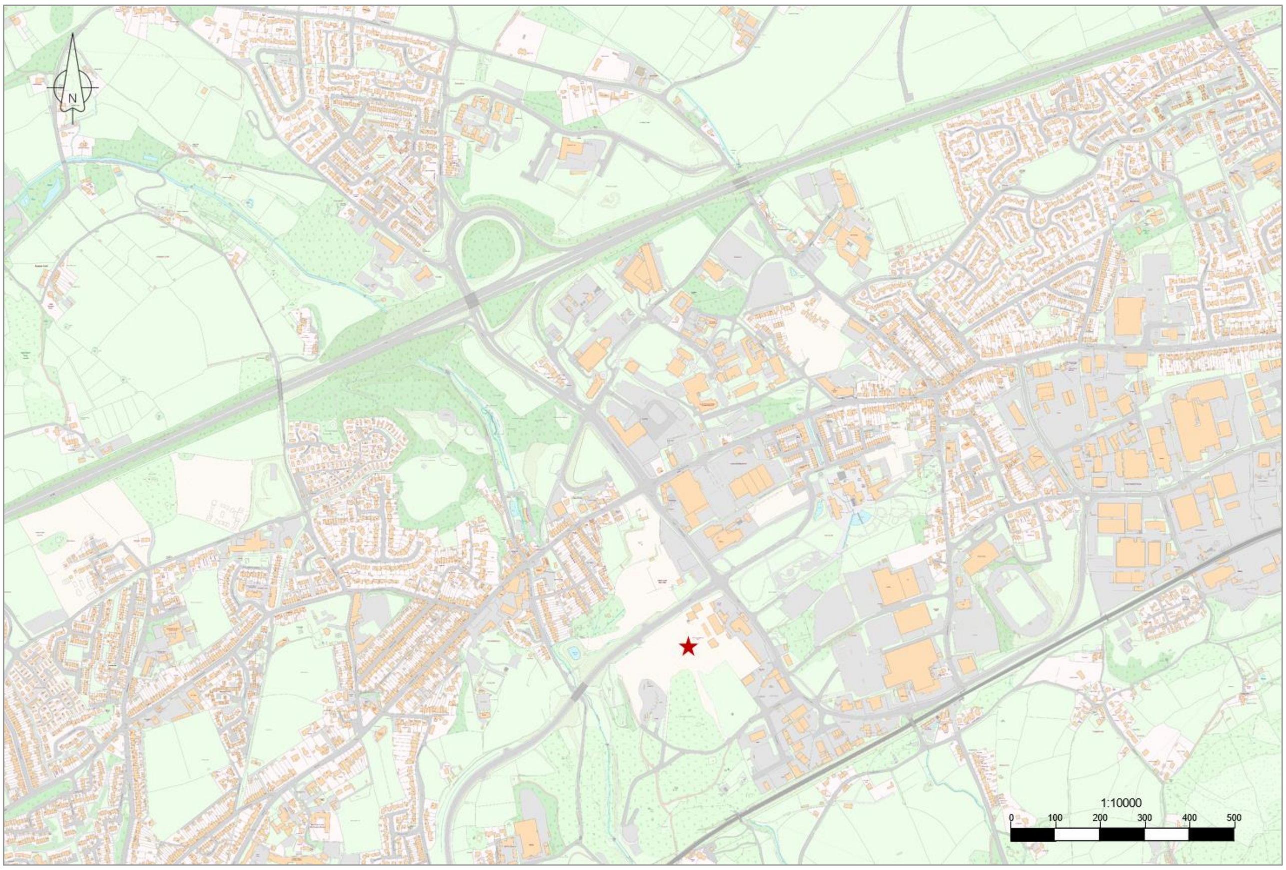
To the QP's knowledge, there are not any other significant factors or risks that may affect access, title, or the right or ability to perform work on the Property.

5 Accessibility, climate, local resources, infrastructure, and physiography

5.1 Access

The South Crofty Property and the underground workings are largely within and underneath the town of Pool, situated between the towns of Redruth and Camborne. The Property is located in an urban and semi-urban area and, as a consequence, existing transport infrastructure is well developed. This is shown in Figure 5.1 below.

Figure 5.1 Location and infrastructure of the South Crofty Property area



Source: Cornish Metals, 2024. Using Ordnance Survey.

The South Crofty Property is situated 1 km south of the main A30 trunk road from London to Land's End, Cornwall. The towns of Redruth, Camborne, and Pool are all accessed from the A30 road. Flights to the region are available from London, Gatwick Airport to Newquay, Cornwall Airport. Newquay airport is located 30 km north-east of the Project. Train services between London and Penzance on the First Great Western train line extend to Redruth and Camborne.

5.2 Climate

Cornwall has a temperate oceanic climate with average annual temperatures of approximately 10°C. Climate data for 2022, Camborne, Cornwall, located to the west of South Crofty, are provided in Table 5.1.

Table 5.1 Weather observations for Camborne, 2023 (latitude 50.218 longitude -5.327)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average high (°C)	9.7	10.0	10.7	12.5	15.8	19.9	18.5	18.6	19.9	16.0	11.8	11.2
Average Low (°C)	4.9	5.2	6.3	7.2	9.6	13.8	13.8	14.0	14.3	11.5	7.9	7.6
Rainfall (mm)	138.0	19.4	150.0	80.4	48.6	20.4	113.0	73.4	72.0	130.2	154.2	169.8

Source: Met Office, 2024.

Typically, June, July, and August are the warmest months with average high temperatures of approximately 20°C and January is the coldest month with average lows of 3°C. The wettest months tend to be through the winter.

The length of the operating season is 12 months of the year.

5.3 Local resources

The extensive history of mining in the region and the ongoing China clay industry has resulted in a number of mining-related enterprises being established in Cornwall. Mining-based enterprises include equipment and service providers, and the University of Exeter's Camborne School of Mines (CSM).

The Camborne, Pool, and Redruth area has a population of approximately 55,650, with the potential to contribute to the Project's workforce.

5.4 Infrastructure

The site has excellent transportation infrastructure, including the A30 trunk road located less than 1 km north of the Property and the national railway line that borders the Property to the south. There are modern active port facilities at Falmouth approximately 17 km to the south-east.

The Property is located within an industrial area with highly developed power supply and regional distribution. The site has two 33 kV overhead power lines which cross the Property. Capacity is sufficient for future mining operations. The Property also has ready access to fresh water supplied by the South West Water utility, with a six-inch main water-line crossing the site location.

Site infrastructure from prior mining and development operations includes office and warehouse buildings, the partially refurbished New Cook's Kitchen (NCK) shaft, and a water treatment plant that is nearing completion. A modern decline extends to a depth of 120 m at an average gradient of -16%. The decline extends in a south-westerly direction through the Great Crosscourse fault above the historical Dolcoath mine workings and provides access to the Upper Mine – Dolcoath mineralisation. Section 18 discusses the site infrastructure in more detail.

Processing facilities from prior operations have been dismantled and removed.

Although the Property is bordered by urban residential and industrial areas to the north, east, and west, Cornish Metals owns approximately 7.65 ha (18.9 acres) of freehold surface land over which the surface permission is granted, providing sufficient surface area for production requirements.

5.5 Physiography

The topography of the Camborne and Redruth district, including the site consists of a broad plateau, with the site elevation being approximately 102 m to 116 m asl. The plateau slopes gently north toward the north Cornish coast (Figure 5.2). The plateau is cut by north-north-west trending valleys with 5 m to 10 m of local relief that are drained by north flowing streams, including the Red River valley that borders the site to the immediate west. The south of the plateau is flanked by the Carn Brea Granite which forms an east-north-east trending ridge with a height of 228 m.

Figure 5.2 View of Property looking north-west from Carn Brea hill

Note: Looking north-west from Carn Brea hill, Celtic Sea is visible in background.
Source: Steve Holley, 2024.

The topography in the immediate area of the site has been modified by dumping of mine waste rock over many years and by urbanisation. The vegetation which develops on the modified sites is generally typical of the surrounding area, and is composed of gorse scrub, willow, acid grassland, heathland, bare ground, and wetlands. In Cornwall, gorse and willow scrub typically take the place of woodland.

Figure 5.3 Photograph of the NCK headframe

Note: Looking north-west of the NCK headframe showing its location in semi-industrial setting.
Source: Steve Holley, 2024.

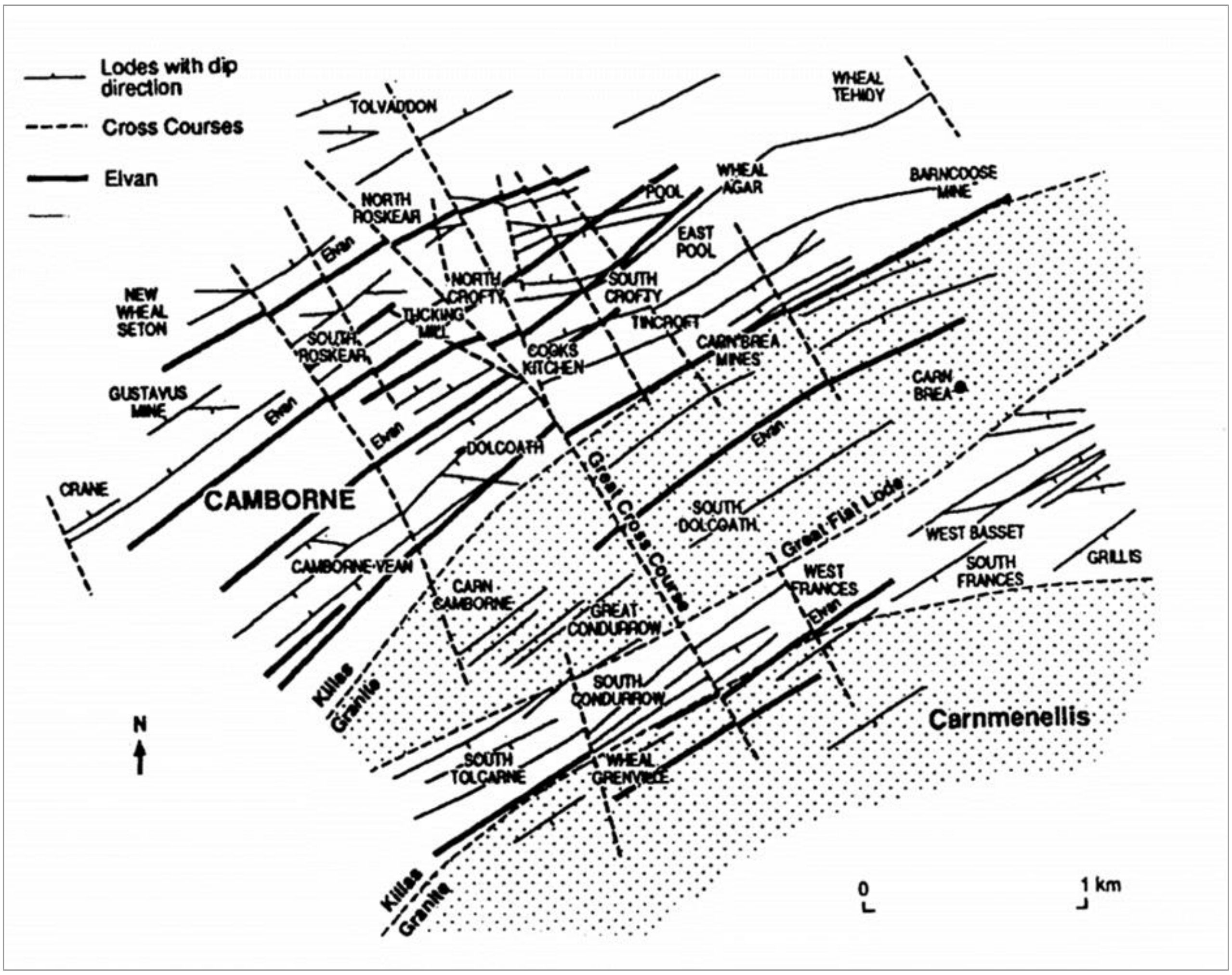
6 History

6.1 Project history

Historical records show that mining has taken place in the Camborne – Redruth district since the 1670s up until the closure of South Crofty in March 1998. The South Crofty Project is an amalgamation of many ancient mining leases (setts) and mines, including North Wheal Crofty, Dudnance, Longclose, Wheal Susan, and NCK. Included within the mining permissions are the historical mines of Dolcoath, Tincroft, Cook's Kitchen, East Pool and Agar, and part of the Carn Brea Mines, amongst several others. These mines have been worked for various minerals through different periods including tin, copper, arsenic, and zinc.

A plan of the historical mine locations within the Project area is shown in Figure 6.1. The historical mines collectively form the current South Crofty Project.

Figure 6.1 Map showing historical mine locations



Notes: Location map showing the main geological features and the old mines which now collectively form the South Crofty Project. The Great Crosscourse is shown running from the north-west to the south-east.
Source: Dominy et al., 1994.

The modern South Crofty Mine, which ceased operations in March 1998, was formed following the conversion of the cost book company to that of limited liability. A new vertical shaft named Robinsons had already commenced from surface during 1900 and with the sinking of NCK vertical shaft starting during 1907, South Crofty Mine entered a phase of working that continued almost without interruption until 1998. It should be noted that during the period from approximately 1920 to 1998, the neighbouring mines of Dolcoath and Carn Brea were closed and remained flooded whilst the modern South Crofty Mine was operational.

Where reference is made to the lodes of Dolcoath North, South, and South-South Branch in the Lower Mine, these structures are not part of the original Dolcoath Mine further south and are not connected with any of the old workings on that mine.

The modern mine workings which form the Lower Mine are located at depth (generally depths greater than 300 m below surface) and situated within the granite, on the northern flank of the outcropping granite ridges of Carn Brea and Carn Entral. The workings extend laterally from the centre of Camborne in the west, to the Tolskithy valley in the east. The modern mine exploited predominantly tin mineralisation.

The surface of the site has numerous historical shafts, many of which date from the eighteenth and nineteenth century. The majority are capped but some are retained infrastructure for the working of the modern mine.

6.2 Ownership

The modern ownership history may be considered as starting in 1906 when SCL was founded in order to exploit the tin deposits located beneath historic copper mines in the area. In 1967, SCL became a wholly owned subsidiary of Siamese Tin Syndicate Ltd and Siamese Tin's subsidiary, St. Piran Ltd. In 1969, a GBP1 million programme to increase ore hoisting capacity and make substantial improvements to the mill was undertaken. By 1975, the mill was processing more than 200,000 tonnes of ore annually (including some from Pendarves Mine) to yield approximately 1,500 tonnes of tin concentrate annually.

Due to the extensive history of mining at the Property, records of the full total volume of material extracted are incomplete, particularly for mining prior to 1906. Average annual production in the period 1984 to 1998 at the South Crofty Mine amounted to 191,200 tonnes at an average grade of 1.31% Sn. A total of 9,976,171 tonnes at an average grade of 1.00% Sn was mined between 1906 and 1998. In addition to the South Crofty Mine production, the adjacent Dolcoath Mine operated as an independent mine from 1895 to 1921. During this period 2,135,470 tonnes of ore were processed at a grade of approximately 2% Sn.

In mid-1982, the company was acquired from St. Piran by Charter Consolidated Ltd. (Charter), which subsequently disposed of 40% of its holdings to Rio Tinto Zinc (RTZ). These holdings were vested in a new holding company, Wheal Crofty Holdings Ltd, with the same proportion of ownership. Then in 1984, RTZ acquired Charter's 60% interest and South Crofty became part of Carnon Consolidated Ltd. (Carnon).

In October 1985, the price of tin dropped dramatically on the world markets following the collapse of the International Tin Agreement. Carnon rationalised the operations, involving closure of the nearby Pendarves Mine which had supplied ore to the South Crofty mill. With a diminishing ore supply, this mill was progressively shut and by 1988 all South Crofty ore was trucked for processing at Wheal Jane mill.

As well as a reduction in manpower, the mines were rationalised and a programme of modernisation, started by RTZ before the price crash, was partly continued. This was made possible by the cooperation and financial support of the Department of Trade and Industry (DTI) in the form of loans for the capital improvement. The majority of this capital was put into the South Crofty Project. In addition, RTZ also provided a loan to fund the operating losses.

Carnon became privately owned in June 1988 when the business and assets of the group were purchased from RTZ through a management buy-out. A trust was established for the benefit of the employees who received 20% of the equity. Carnon Holdings Limited was incorporated at this time.

In February 1991, the DTI stopped all further support of capital projects. The company substantially reduced costs by again reducing labour which, coupled with a small rise in the tin price, allowed the mine to continue operating at a small loss. These losses were funded through the sale of surplus land and redundant assets. In 1994, South Crofty was purchased by Crew Natural Resources (Crew) of Canada, and around this same time, the New Roskear shaft took over from the Robinson shaft as the secondary egress shaft.

During the last years of operation, the mine effectively became partly trackless with two conveyor declines driven below the bottom of the main vertical shaft (NCK) to the north and west to access the Roskear 1 to 6 lodes. The focus of operations thus became deeper and further removed from the main South Crofty workings to the east and south.

After twelve years of depressed tin prices, SCL announced in August 1997 that closure was imminent, and closure was completed by March 1998 with the mine was allowed to flood. At the time of its closure in 1998, South Crofty was the last remaining tin mine working in Cornwall.

6.2.1 Ownership post-1998 mine closure

The following section is compiled from Hogg (Hogg, 2012), information in the public domain, and material provided by SCL.

The South Crofty Project was acquired by Baseresult Holdings Limited (Baseresult) in 2001. Baseresult was a private company formed by a group of investors to develop the project. CMLB, a sister company to Baseresult held the mineral rights to South Crofty.

Subsequent to the acquisition by Baseresult, the South West Regional Development Agency, established by the UK Government, concluded that the region should no longer be investing in mining. Several years of negotiation followed, with the regulatory authorities favouring complete cessation of mining activity at South Crofty and redevelopment of the site. In 2007, this concept was overturned and the mining permits effectively reconfirmed.

In November 2007, Baseresult formed a 50-50 joint venture with Galena Special Situations Fund (GSSF) with GSSF providing financing through Cassiterite Ltd, a special purpose company. Ownership of the Project was transferred to WUM, owned by Cassiterite Ltd and Baseresult.

In 2011, Celeste Copper Corp. (Celeste), a Canadian publicly listed company, entered into a joint venture agreement with WUM on the South Crofty Project. The earn-in resulted in the incorporation of a new entity, Cornish Minerals Limited (UK) (CML), which held 100% of WUM and was to be funded by staged investments by Celeste. In 2013, due to poor market conditions, Celeste failed to meet its commitments under the terms of the joint venture, consequently GSSF placed WUM and CML into administration to protect the Project assets. However, CMLB was not put into administration.

GSSF was the only secured creditor under administration. In 2014, GSSF reached an agreement with a Vancouver-based private company, Tin Shield Production Inc (Tin Shield), whereby Tin Shield had the right to acquire a 100% interest in WUM / CML and CMLB. Tin Shield funded ongoing operational costs under the administration process in order to maintain the underground mining permissions in good standing and funded CMLB to ensure it also remained in good standing.

In March 2016, Strongbow Exploration (now Cornish Metals) announced that it had reached agreement with GSSF and Tin Shield to acquire a 100% interest in WUM / CML (now SCL) and CMLB (collectively the Companies) by funding WUM's exit from administration. Cornish Metals acquired from administration a 100% interest in WUM / CML (now SCL) and acquired a 100% interest in CMLB on 11 July 2016.

On 23 October 2017, Cornish Metals announced that it had received Permit EPR/PP3936YU from the EA allowing the discharge of up to 25,000 m^3 of treated water per day from the South Crofty Mine. Under the terms of the agreement with GSSF / Tin Shield this was a milestone for Cornish Metals to issue 1,000,000 common shares to GSSF / Tin Shield upon receipt of this permit. The issuance of shares was announced on 6 November 2017.

On 16 September 2016 the TSX Venture Exchange Inc. confirmed it accepted for filing the purchase and sale agreement entered into by Cornish Metals with the administrator managing the affairs of SCL and CML.

6.3 Historical sampling

6.3.1 Historical exploration

Historical sample exploration data comprises data spanning from the 1920s up to closure in 1998. Historical data includes channel samples from the backs of drives, face sheet samples, and diamond drillhole samples. Throughout the nineteenth century and up to closure in 1998, the exploration for new resources in the narrow-vein South Crofty Mine has predominantly been conducted by on-lode development rather than by diamond drilling. Typically, the narrow lode structure was maintained in the face with at least some of the hangingwall granite contact visible. Where the lode was wider than the face (e.g.: Pryces / Tincroft lodes), the footwall of the structure was identified and sampled by follow-up infill bazooka drilling (typically the length of such drillholes being 5-20 m).

Areas designated for stoping were delineated by means of ongoing thorough channel sampling campaigns on the lode drives followed by additional sampling of raises, sublevels, and stoping fronts.

6.3.2 Historical channel sampling

Prior to approximately 1988, sampling of the lode drive was conducted on the same day that the fortnightly contract survey was measured for driveage by the drilling crew; in order to establish advance meterage for payment purposes. At the same time as establishing advance meterage, the survey crew would measure drive off-set from a centre line between the back and front pegs in order to provide the geologist with drive width at any point.

The geologist accompanied by a two-man sampling crew would at the same time as the surveyors, sample the roof / back of the drive at average strike intervals of 3.0 m (occasionally 1.5 m). The geologist would initially paint the hangingwall and footwall contacts on the drive roof and then mark the interval to be sampled within lode based on lithotype (maximum width typically 1.0 m and minimum of 0.1 m). Further samples were taken outside the main lode contacts either in alteration or barren host granite to ensure additional ore-grade bearing zones were not missed. The geologist would thereafter map the roof the drive. On surface the geology of the roof would be entered onto a proforma drive sample sheet, and grade values entered on return of assays. At each sample point the samplers would initially clean the roof off from contamination and with hammer and moil cut a 1.5 cm by 10 cm channel out of the allocated length, collecting the sample in a bucket and placing into a calico bag. This sample bag was labelled on the outside with the hole number and sample ID; whilst a corresponding paper sample tag was inserted into each sample bag containing details of the identical hole number and sample ID.

After the major cost-cutting exercises introduced by management circa 1988, the sampling of on-lode development drives was reduced to face sampling on a daily or two-day basis. The geologist alone would mark-up the hangingwall and footwall contacts, sampling intervals perpendicular to the dip orientation of the lode, measure the width of the intervals, and take a chip channel groove sample through that interval. All data collected underground by the section geologist would then be transposed onto a proforma face sheet log, showing the mapped face, salient structural, and lithological features, the distance sampled from a line peg and the width and grade of each interval. From this the width and weighted average grade of the lode could be derived; whether the dirt blasted was of ore or waste grade and if the lode was narrower than 1.4 m (the minimum mining width (MMW) at the time) – what the lode grade would be expanding it to MMW by application of dilution at 0% Sn.

6.3.3 Historical drilling

Historically there has been limited surface drilling at the South Crofty Project, and much of the underground exploration drilling in the twentieth century was essentially horizontal, or at a slight downward inclination from workings. The limited drilling therefore encouraged horizontal development along-strike or down-dip. It is of note that the lodes last worked by South Crofty in the western part of the mine (the "Roskears" were all discovered by essentially horizontal drilling and had not been explored at higher levels). The majority of exploration development headings were positioned on lower levels and ahead of the immediate drive on the same structure on the level above. Drilling from the exploration drives to test mineralisation extensions was often limited owing to the position of the drives relative to the lodes. In addition, drilling from a drive on one lode to an adjacent lode was precluded owing to the distance between lodes.

Diamond drillhole sampling comprises a mixture of resource definition drilling, using primarily Boyles bazooka pneumatic drill rigs, drilling EW (25.2 mm) core, whilst longer holes (generally greater than 15 m) were drilled using either; Boyles V.A.G. (pneumatic), Atlas Copco Diamec 250, or Diamec 260 (electro-hydraulic) diamond drill rigs. Some longer exploration holes were surveyed using Tropari downhole survey instruments. However, the majority of holes (typically 10 m-30 m) from the pre-closure data do not have downhole survey. Given the relatively short drillhole lengths, and the competency of the host rock, the QP is of the opinion that no material drillhole deviations would be anticipated.

Core was transported to the surface sample preparation facility for logging and core splitting/cutting, with the half core in drill boxes stored in racks in a secure building.

After the tin crisis and the implementation of cost-cutting measures through all areas of the operation, all core was logged and sampled by the section geologist underground, with individual samples bagged and transported to surface to the sample preparation facility for processing.

Core sampling was undertaken on those portions of the core with observable mineralisation, and/or alteration. Waste rock up to 2.0 m either side of the defined mineralised intersection may also have been sampled.

Sample intervals were determined by the geologist with the maximum core interval being approximately 1.0 m and minimum of 0.1 m. Altered, and non-mineralised zones were also sampled at appropriate intervals, which were up to 1.0 m into the barren zone. The sample bag was labelled on the outside with the hole number and sample ID; whilst a corresponding paper sample tag was inserted into each sample bag containing details of the identical hole number and sample ID. Within each core sample batch no quality assurance and quality control (QAQC) samples were submitted.

On surface, the geologist transposed the underground log sheet onto a master paper copy (and in the latter years (1994-1998) into an Excel™ spreadsheet for processing in Surpac™ modelling software). Sample numbers were also recorded ready for insertion of assay results upon receipt from the laboratory. The samples were not weighed; nor were density determinations undertaken.

6.4 Historical estimates

The QP has not done sufficient work to classify the following estimates, outlined in this and following subsections of Section 6, as current Mineral Resources or Mineral Reserves and Cornish Metals is not treating the following historical estimates as current Mineral Resources of Mineral Reserves.

6.4.1 Closure estimate – Owen and Leboutillier (1998)

Upon closure of South Crofty in 1998, M. Owen, Chief Geologist and N. LeBoutillier, Senior Mine Geologist, completed a closure estimate for the South Crofty Mine (Owen et al., 1998). The estimate was prepared according to the mines reporting policy at the time of closure in 1998. The estimate predates the introduction of most current industry standard reporting codes and uses a different methodology for reporting results, with the most notable difference being the application of "payability" factors to defined blocks of mineralised material. Also, the classification of mineralised material uses different criteria to current reporting standards. As such it is difficult to compare tonnages and grades with modern estimates and a direct comparison of mineralised volumes is not possible. Therefore, it is not possible to quote these as current Mineral Resources or Mineral Reserves and the numbers must be treated as historical.

The historical estimate is based on a variety of sampling methods, including drilling, chip, and channel sampling from within drives, crosscuts, raises, and other areas surrounding stopes planned for mining. The estimate also contains old pillars and other remnants in the totals. The estimate is based on a longitudinal sectional calculation method, then summarised into a tabular format for final reporting.

Underground production at South Crofty ceased on Friday 6 March 1998 at the end of the night-shift and the historical closure estimate as of that date is summarised in Table 6.1 below.

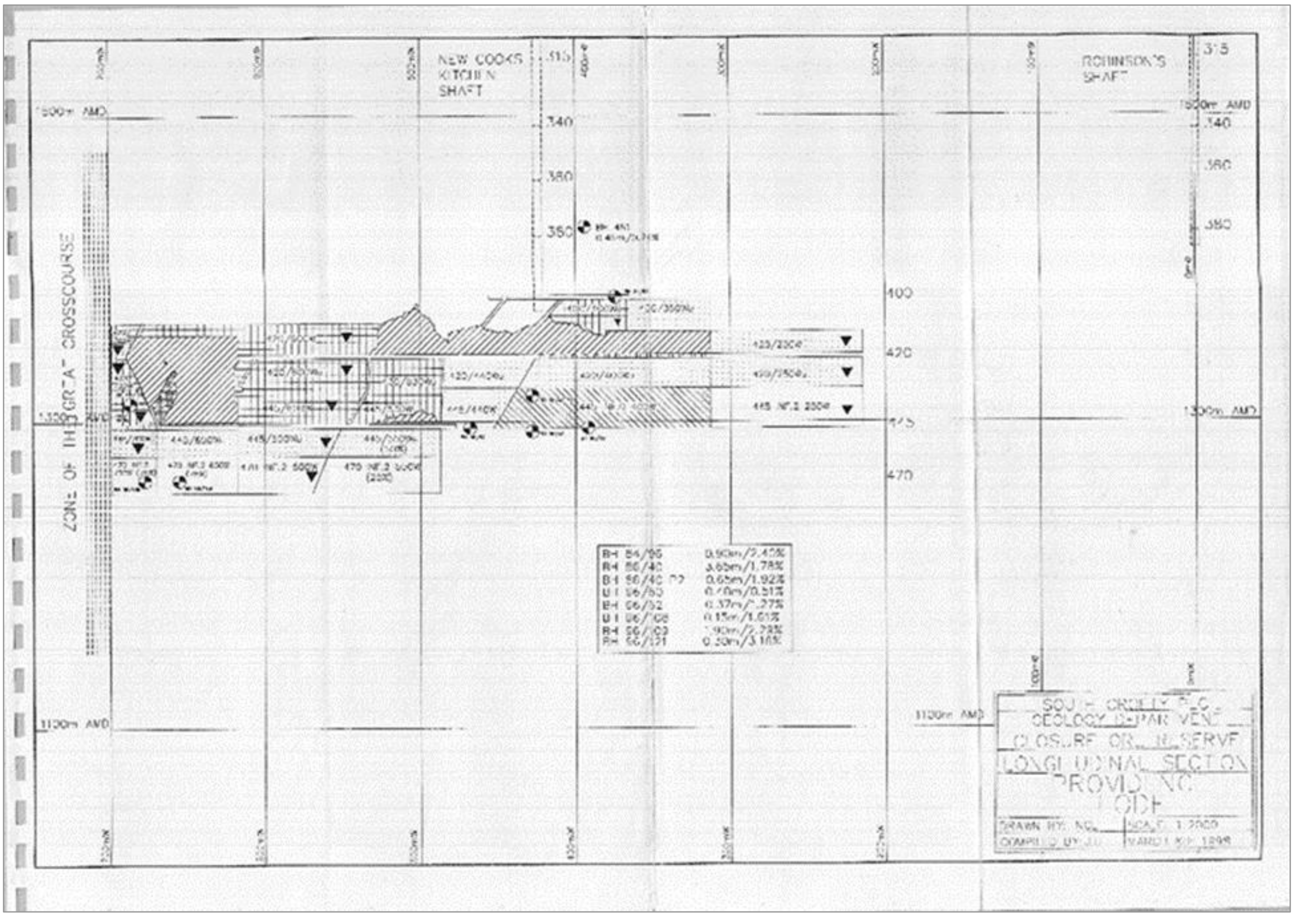
Table 6.1 South Crofty Closure Reserve (1998) at 1% Sn cut-off (historical estimate)

Demonstrated (Measured+Indicated)			Inferred 1/DD			Inferred 2			Total		
True width (m)	Sn (%)	Tonnes (t)	True width (m)	Sn (%)	Tonnes (t)	True width (m)	Sn (%)	Tonnes (t)	True width (m)	Sn (%)	Tonnes (t)
1.4	1.48	730,750	1.5	1.57	806,500	1.3	1.42	1,366,350	1.4	1.48	2,903,600

Note: "Reserve" classifications are not reported in accordance with any current international reporting code, and are reported based on the historical US Geological Survey circular No.831. These cannot be considered as Mineral Resources or Reserves.

The Owen and LeBoutillier (1998) estimate includes detailed tables of tonnage and grade for individual resource blocks that are identified on longitudinal sections for each of the mineralised lodes. An example longitudinal section is shown in Figure 6.2. The estimate uses definitions outlined in US Geological Survey circular No. 831 as a basis of classification.

Figure 6.2 Example longitudinal section from the South Crofty Closure Estimate (1998)



Notes: This page is of the Providence Lode in the Lower Mine.
Source: Owen and LeBoutillier, 1998.

Owen and LeBoutillier (1998) define Measured reserve blocks as those that are fully sampled and evaluated and ready for mining, whilst Indicated reserve blocks as being partially developed and partially sampled, and notes that indicated blocks may extend above and rarely below the lode drive. Inferred blocks have no development or incomplete development and are based on available lode intersections and assumed continuity based on geological evidence.

The Owen and LeBoutillier (1998) estimate was prepared based on a cut-off grade (COG) of 1.00% Sn and a MMW of 1.0 m true width. Where lode widths were less than 1.0 m, wall rock grade was applied to achieve MMW. High-grade assay cutting was used on a lode-by-lode basis and ranged from a low of 4.0% Sn to a maximum of 10.0% Sn. A bulk density of 2.77 t/m^3 was used for granite-hosted lodes and a bulk density of 2.85 t/m^3 was used for killas (metasedimentary) hosted lodes.

The mine closure estimate represents the entire Project area. All subsequent Mineral Resource estimates have only assessed subsets of the South Crofty Project area. This is largely due to the large area the project covers and the time constraints for carrying out validation works on the historical data.

6.4.2 Post mine-closure estimates – Micromine

The Project has had one post mine-closure historical estimate. An estimate and subsequent update was produced by Micromine Limited (Micromine) in 2011 and 2012 respectively as outlined in Hogg (Hogg, 2011 & 2012). These estimates focused on the polymetallic mineralisation in near-surface areas defined by drilling conducted from 2008 onwards.

Micromine in London, UK, was engaged by Celeste to produce Mineral Resource estimates and Technical Reports in accordance with NI 43-101 in 2011 and 2012. These estimates incorporated results of drilling by WUM and focused on the Upper Dolcoath lodes, west of the Great Crosscourse fault and above approximately 400 m depth. The Dolcoath "Upper Mine Lodes" were the focus of exploration for WUM who considered they offered the most immediate potential to advance. It is important to note that the Micromine 2011 report (Hogg, 2011) and Micromine 2012 report (Hogg, 2012) considered only the Upper Mine Dolcoath Lodes and therefore represent only a subset of the mineralisation considered in the historical Owen and Leboutillier (Owen et al., 1998) closure "reserve". Furthermore, the 2011 Micromine (Hogg, 2011) and 2012 Micromine (Hogg, 2012) resource estimates used 0.3% tin equivalent (SnEq) and 0.2% SnEq cut-off grades, respectively. These cut-off grades are considerably below the 1% Sn cut-off used in 1998 estimate.

The 2011 Micromine Report (Hogg, 2011) estimated the Upper Mine Dolcoath resource at 1,331,000 t at a grade of 0.44% Sn, 1.08% Cu, and 0.66% Zn, or 0.88% SnEq in the Inferred Category at a 0.30% SnEq cut-off (Table 6.2). This estimate was based on 62 diamond drillholes drilled between 2008 and 2011 for 1,261 samples, and two channels for 53 samples.

Table 6.2 Historical Micromine Dolcoath resource estimate – March 2011

Category	Cut-off grade %SnEq.	Tonnes	Density	%SnEq	Sn %	Cu %	Zn %
Inferred	0.3	1,330,982	3.06	0.88	0.44	1.08	0.66

The SnEq calculation for the Micromine (Hogg, 2011) estimates was calculated using the formula: SnEq% = Sn% + (Cu% x 0.354) + (Zn% x 0.091). The metal equivalent formula is based on prices of US$25,430/tonne Sn, US$8,990/tonne Cu, and US$2,318/tonne Zn. Assumptions for process recovery are 60% for Sn, 60% for Cu, and 60% for Zn.

In 2012, Celeste engaged Micromine for an updated Dolcoath Mineral Resource estimate and Technical Report. The 2012 estimate included the results of 121 diamond drillholes for 23,067 m, and two underground channels cut for 53 m. The 2012 Micromine Mineral Resource (Table 6.3) updated the initial June 2011 Mineral Resource estimate and utilised the data from 59 additional drillholes.

Table 6.3 Micromine Dolcoath resource estimate – March 2012

Category	Cut-off grade %SnEq	Tonnes	Density	%SnEq.	Sn %	Cu %	Zn %
Inferred	0.2	2,469,000	3.03	0.68	0.46	0.54	0.23

The SnEq calculation for the Micromine (Hogg, 2012) Mineral Resource was calculated using the formula: SnEq% = Sn% + (Cu% x 0.354) + (Zn% x 0.091). The metal prices used in the metal equivalent formula are US$21,675/tonne Sn, US$7,883/tonne Cu, and US$2,101/tonne Zn were used. Assumptions for process recovery are 85% for Sn, 85% for Cu, and 85% for Zn.

A total of seven areas were modelled for tin (Dolcoath Middle, Dolcoath South, Dolcoath South South Branch, Dolcoath "Flat", Dolcoath North Entral, Dolcoath South Entral, and Dolcoath Main). Eight areas were modelled for Cu and Zn (Dolcoath North, Dolcoath Middle, Dolcoath South, Dolcoath South-South Branch, Dolcoath "Flat", Dolcoath North Entral, Dolcoath South Entral, and Dolcoath Main).

Grade domain modelling was completed for Sn, Cu, and Zn, with a minimum width of approximately 1.0 m. Where appropriate, geology was used in combination with grade values to assist in lode interpretation.

Mineral Resources were reported for a marginal cut-off grade of 0.2% SnEq based on the cost of mining and processing the mineralisation and the selling price of the final product. Metal prices were based on London Metal Exchange (LME) three-year trailing averages as of 16 July 2012, which were US$21,675/tonne Sn, US$7,883/tonne Cu, and US$2,101/tonne Zn. The cut-off grade for reporting of resources at Dolcoath was established using Sn equivalent grade (%SnEq), and block revenue factors, including metal recovery adhering to best practices and NI 43-101 reporting requirements in order to satisfy the criterion of “reasonable prospects of eventual economic extraction”.

The QP has not done sufficient work to classify the historical estimates as current Mineral Resources and Cornish Metals is not treating these historical estimates as current Mineral Resources.

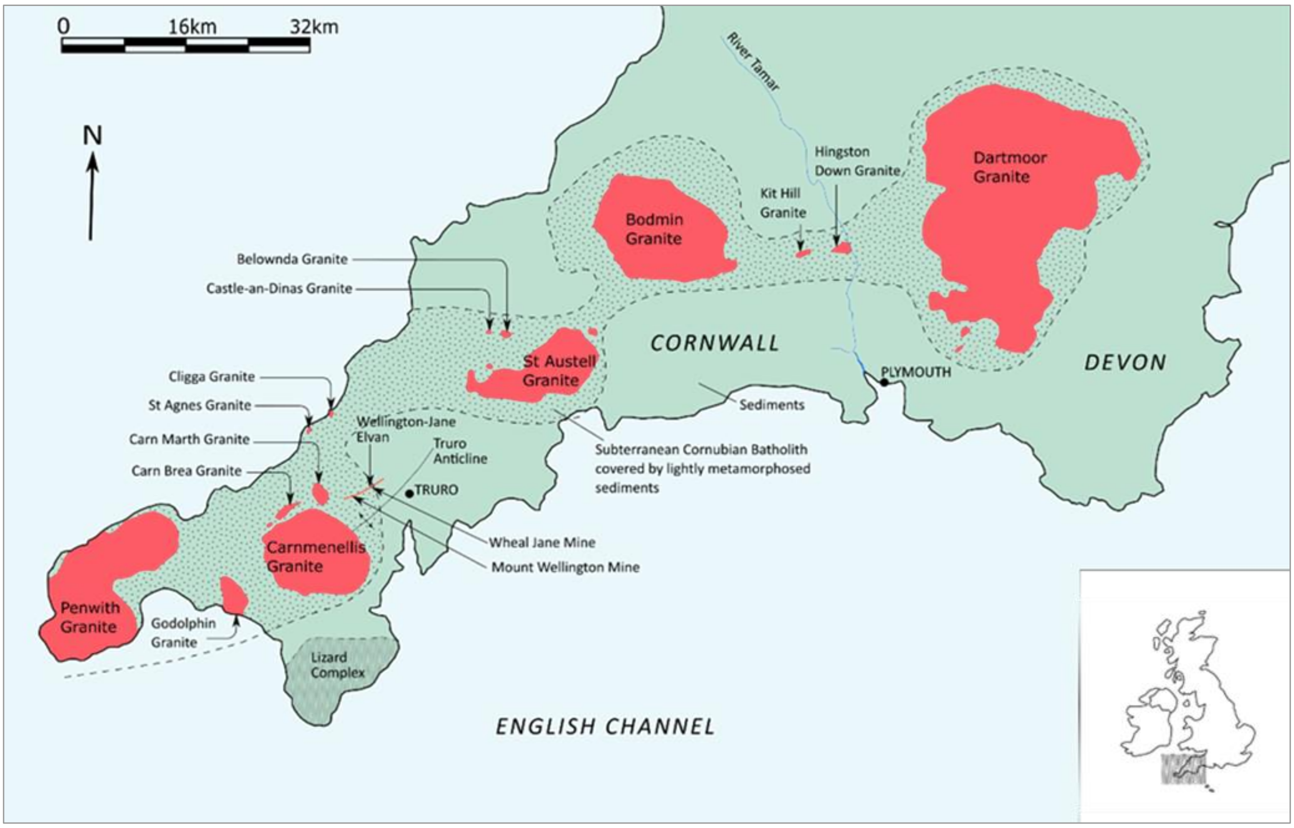
7 Geological setting and mineralisation

7.1 Regional geology

The geology of South West England comprises a sequence of weakly metamorphosed Devonian to Carboniferous argillaceous and arenaceous sedimentary and meta volcanic rocks which are flanked to the south by metamorphic and igneous complexes of the Lizard and Start Point domains (Figure 7.1). The sequence has been intruded by an east-north-east trending 200 km chain of Permo-carboniferous granitic intrusions which represent the surface expression of the Cornubian batholith.

The Devonian to Carboniferous sedimentary and volcanic package was deformed during the Variscan Orogeny. Crustal thickening of the package during the initial phase of the orogeny followed by subsequent lithospheric extension and crustal subsidence resulted in anatexis of the metasedimentary package and formation of the Cornubian batholith.

Figure 7.1 Regional geology

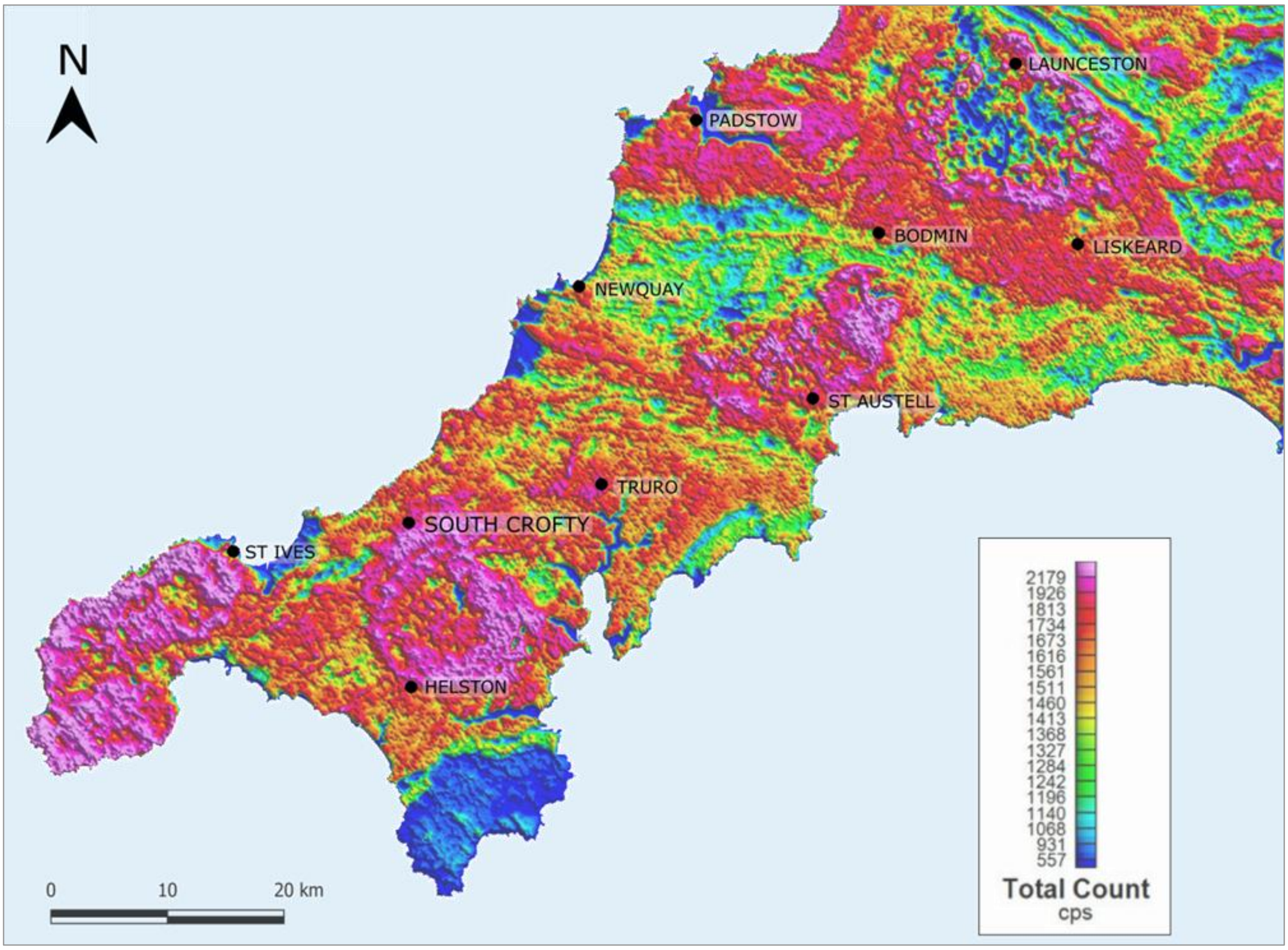


Source: Cornish Metals, 2023. Modified after Rayment et al, 1971.

The Cornubian granite is coarse-grained and enriched in a variety of elements including potassium, lithium, uranium, thorium, tin, tungsten, copper, chlorine, fluorine, and rare earth elements. The enrichment in radiogenic elements such as potassium, uranium, and thorium and strong thermal activity has resulted in it being classified as a high-heat producing (HHP) granite. Figure 7.2 presents a total count radiometric map resulting from an airborne radiometric and total field magnetic surveys over South West England completed by the British Geological Survey as part of the TELUS SW programme in 2014. This map shows a strong correlation between radiometric peaks and granitic intrusions.

Metal deposits in Cornwall are directly related to the HHP granites. Slow crystallisation and possible internal reheating of the granites are considered to have resulted in fractionation of metals which were transported and concentrated by late-stage meteoric fluids.

Figure 7.2 Airborne radiometric map of South West England



Source: After British Geological Survey "TELUS SW Project", 2014.

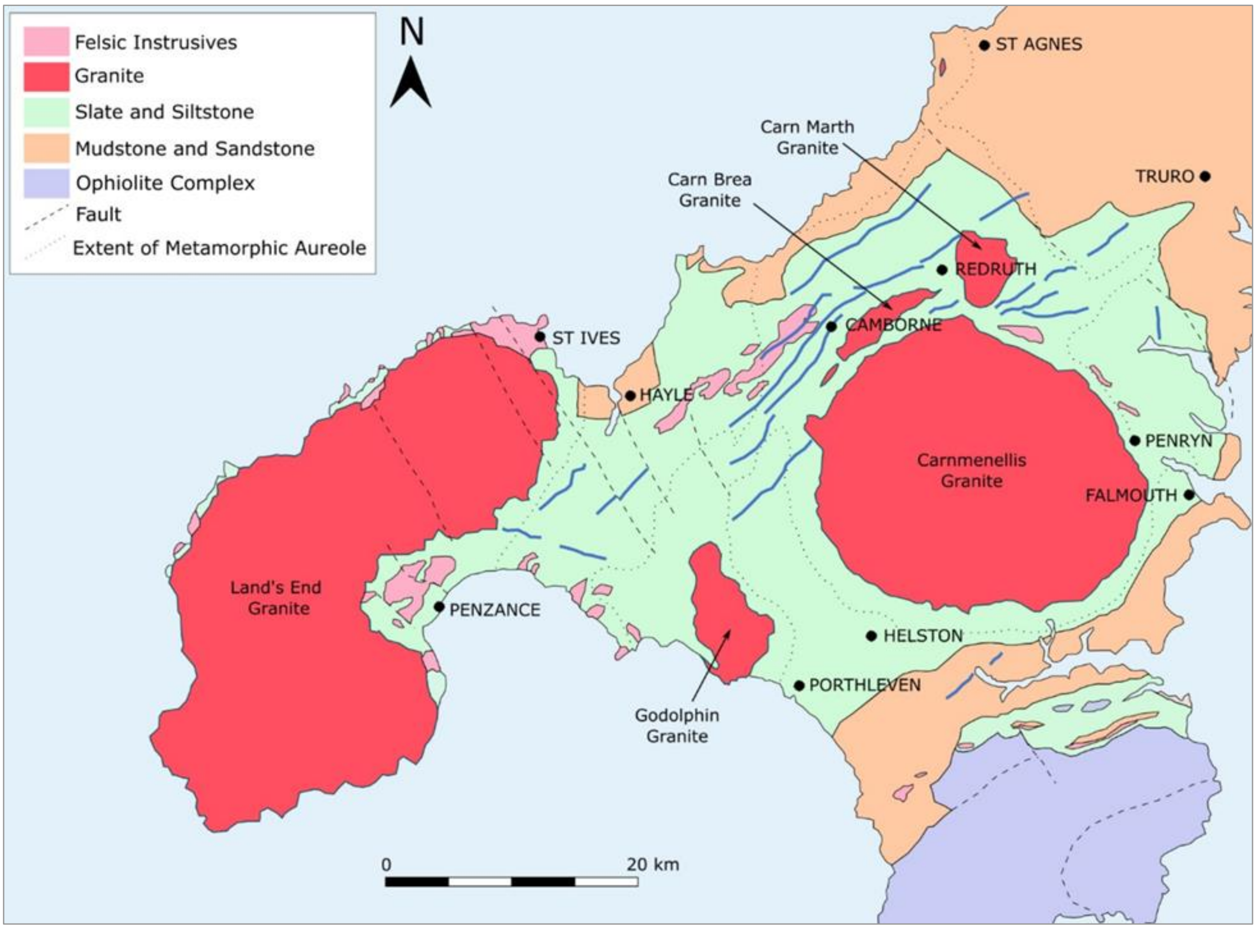
7.2 Local geology

The following geological summary is based on the work of Hogg (2012).

The geology of the South Crofty Project area consists of metasedimentary and minor metavolcanic rocks of the Mylor Slate formation, locally known as "killas" and granite of the Cornubian batholith (Figure 7.3). The Project area is located on the north-western flank the Permian Carn Brea granite, the outcrop of which forms the hills of Carn Brea, Carn Arthen, and Carn Entral. The Carn Brea granite is a satellite of the main Carnmenellis granite which is the major pluton of the district. The Carnmenellis granite is part of the larger Cornubian batholith. The country rock (killas) primarily comprises slate and siltstone and is intruded by Devonian metamorphosed mafic rocks and associated hornfels and skarns, that occur in close proximity to the granite contact. The contact of the Carn Brea granite dips to the north-west, with the contact surface striking east-north-east and dipping to the north-north-west at 30° to 40°. Rolls and ridges along the granite contact are thought to have significant influence on the location of mineralisation.

The mineralised structures in the district (locally termed "lodes") which have been exploited historically by numerous mines generally strike east-north-east and parallel the strike of the granite / killas contact. Within the granite, the principal mineral of economic significance is cassiterite, whereas above the granite contact, copper, and zinc sulphide mineralisation is developed. A series of north-west trending faults with associated mineralisation, locally known as "Crosscourses" are considered to be related to Triassic rift basin development at 240 Ma to 220 Ma. The Great Crosscourse is a late fault that bisects the South Crofty Project area and is associated with an approximately 100 m strike slip movement. The Great Crosscourse had a significant influence of the historical mine development of the South Crofty Project. South Crofty Mine was developed on the east side of the fault and the Dolcoath Mine was developed on the west side of the fault. The two mines were not physically or hydraulically connected.

Figure 7.3 Geology of West Cornwall



Source: Cornish Metals, 2023.

7.3 Deposit geology

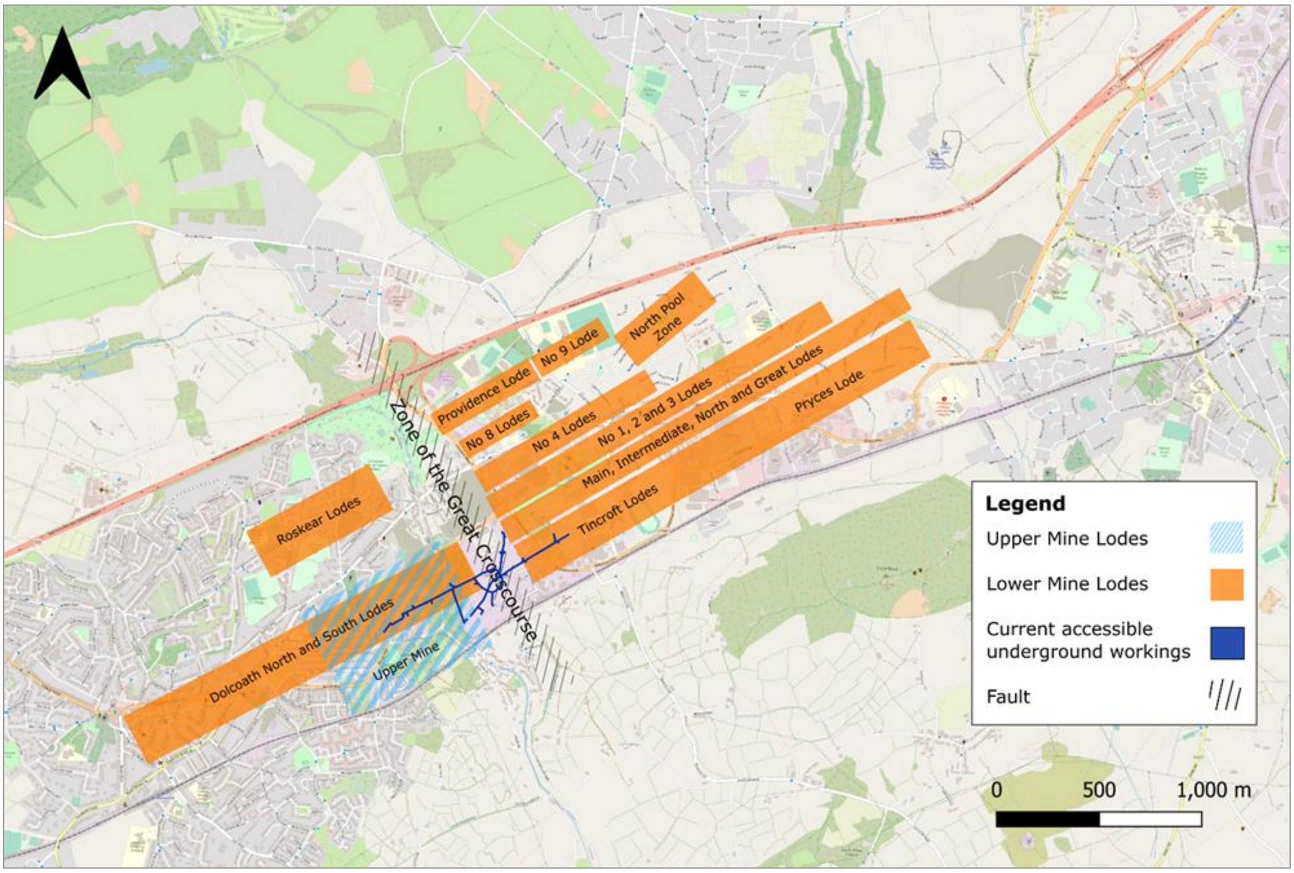
The South Crofty Project extends 3.3 km along-strike (ENE-WSW) and 800 m across-strike (NNW SSW), with the deepest workings being 885 m below surface.

The surface workings of South Crofty Project are situated on a series of metasediments (predominantly slates) belonging to the Mylor Slate Formation, of Upper Devonian (Famennian) age. These metasediments (killas) overlie the Carn Brea Granite, with the contact in the South Crofty Project area being approximately 271 m below surface. The contact dips to the north-west and as such is deeper in the north-western area of the Project. The Carn Brea granite, outcrops at approximately 500 m to the south-east and forms the prominent hills of Carn Brea, Carn Arthen, and Carn Entral, close to the mine site.

The mine exploits a series of subparallel fissure veins (lodes) that trend ENE-WSW, and dip subvertically. Figure 7.4 presents a plan view of some of the major mineralised structures and their lateral extents. Details of the more significant mineralised lodes can be found in Table 7.1.

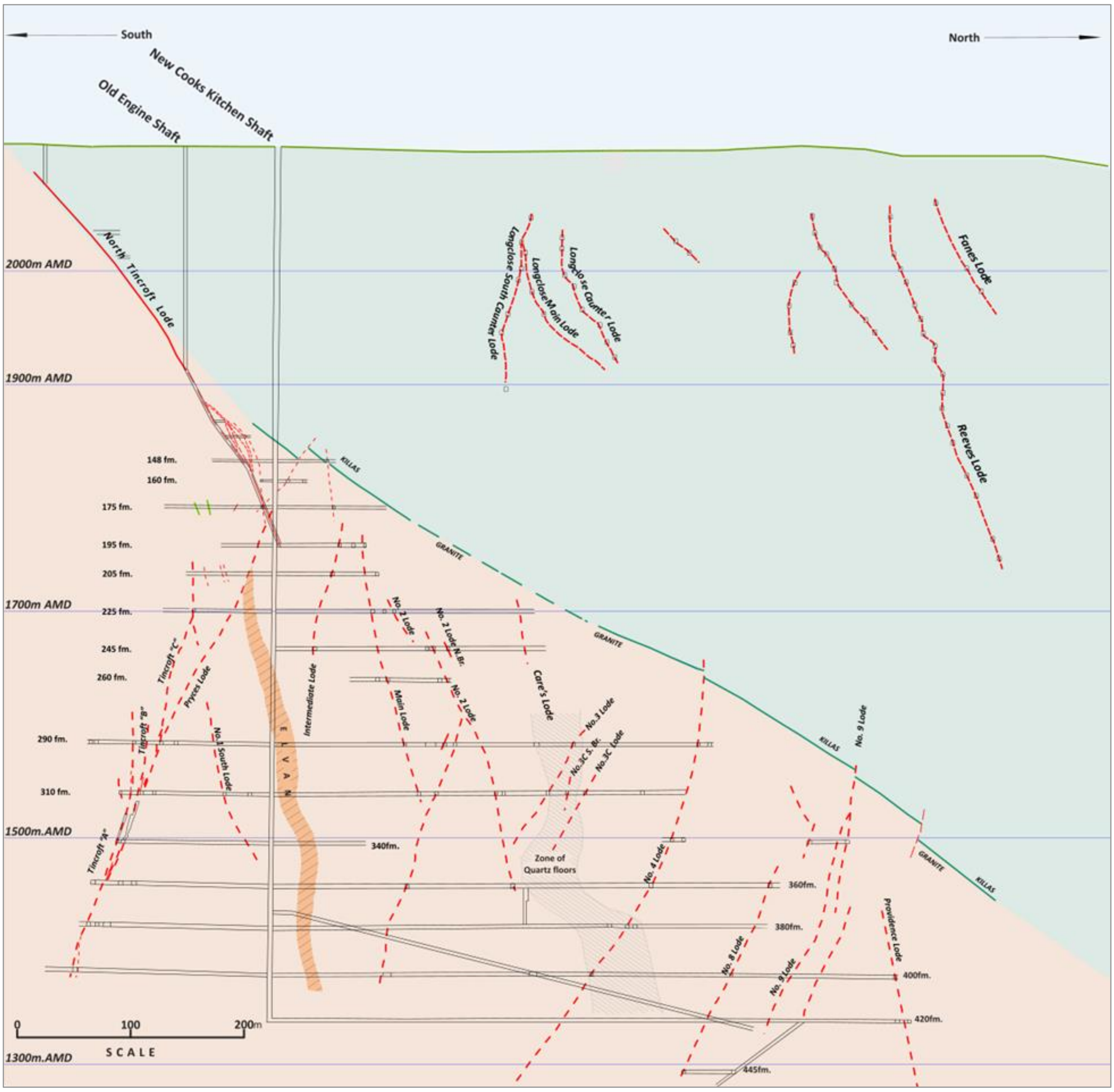
Lode structures can persist up to 2 km along-strike and over 800 m down-dip, and have average widths ranging from 0.6 m to 3.3 m. Figure 7.5 shows a cross-section through the main NCK Shaft and demonstrates the complex nature of the mineralised structures. The Mine is split into an eastern area and western area by the major, regional NW-SE striking fault, locally known as the Great Crosscourse (indicated by the black hatched area in Figure 7.4).

Figure 7.4 Plan view of the major mineralised structures and their lateral extents



Source: Cornish Metals, 2023.

Figure 7.5 Cross-section through NCK Shaft



Source: Cornish Metals, 2023.

Historically the structures were mined for copper and minor amounts of lead / zinc and iron. Near-surface within the metasediments, polymetallic mineralisation becomes less dominant towards the contact between the metasedimentary rocks and the granite. Within the granite, higher-temperature chlorite-tourmaline tin-bearing assemblage becomes the dominant mineralisation.

7.4 Mineralisation

Five main phases of mineralisation have been identified at the South Crofty Project (Kneebone, 2008). These are summarised in order from oldest to youngest:

"*1* *An early black tourmaline (schorl) phase, with thin, tin-bearing stringers of schorl emplaced throughout the fracture zones. The tungsten-bearing (greisen-type mineralization) subhorizontal quartz veins "floors" and pegmatites of Pegmatite Lode and the North Pool Zone are of similar age.*

2 *Tourmaline to Chlorite phase consisting of:*

- *A blue tourmaline phase that carries the majority of the tin mineralization in the form of fine-grained cassiterite, which may be in discrete seams, veinlets or disseminated* *grains. This phase shows evidence of very rapid crystallization and often displays brecciation textures related to explosive decompression.*

— *A chlorite phase. In this phase (which often overprints the 2a phase), dark green crystalline chlorite is the dominant gangue mineral. It often carries coarsely crystalline cassiterite, as disseminations and seams.*

3 *A tin barren fluorite phase that occupies sections of the lodes with "caunter east-west trending orientation", where the lodes have been faulted by later tensional wrench faults. These intralode segments (having the same strike as east-west trending caunter lodes) have been infilled with a fluorite / haematite / earthy chlorite / quartz paragenesis, in substitution for absent earlier tin rich phases of mineralization.*

4 *A caunter lode phase that represent later mesothermal / epithermal mineralization emplaced in east–west trending fractures. These lodes are typically poor in cassiterite, carrying a gangue of early amorphous chlorite -haematite- fluorite- quartz, with copper- lead- zinc- bismuth base metal mineralization. These lodes commonly fault and offset earlier lodes, often with considerable displacement.*

5 *A late crosscourse phase with displacement and mineralization that post-dates phases 1 to 4. Crosscourses have a rough north-west orientation and carry an epithermal paragenesis of chalcedonic silica with earthy chlorite, haematite, and minor amounts of marcasite and occasional copper and bismuth sulphides."*

As described by Kneebone (2008) the lodes of the mine can be subdivided as follows:

"I *Type I Lodes - These are lodes predominantly showing phase 2a. mineralization. They are typified by certain sections of Dolcoath South Lode, North Lode and Roskear A Lode.*

II *Type II Lodes - These lodes show a higher proportion of hematite / chlorite / fluorite enrichment as well as having mineralization phases 2a. and 2b present. They show areas consisting largely of phase 3 type mineralization. They are typified by certain sections of Providence Lode, Dolcoath North Lode, Roskear B Lode, Roskear D Lode and Roskear South Lode.*

III *Type III Lodes - "Caunter" or "Guide" lodes which carry an assemblage of chlorite / hematite / fluorite with minor cassiterite and variable copper, lead, zinc, and bismuth phases. These structures were sometimes worked for copper in the shallower Upper Mine. A typical example is the Reeve's Lode.*

IV *Type IV Lode Zones - Lode zones that resemble stockwork veins and are characterized by quartz / cassiterite / tourmaline assemblages. The wallrocks are pervasively altered and often carry significant mineralization. They are typified by certain sections of No. 2 Complex, 3ABC Complex, 3B Pegmatite Lode, and North Pool Zones."*

Table 7.1 presents a summary of significant mineralised lodes (structures) identified at the South Crofty Property.

Table 7.1 Significant mineralised structures at the South Crofty Property

Zone	Lode name (wireframes)	Dip / dip direction	Strike length (m)	Dip extent (m)	Average lode width (m)	Continuity	Lode type
Upper Mine (polymetallic lodes generally hosted in meta-sediment)	Dolcoath Little North East	43/330	175	80	2.00	Not open	Polymetallic
	Dolcoath South Entral	83/330	320	135	2.64	Curved, open at depth	Polymetallic
	Dolcoath North Valley Caunter (NVC)	85/125	240	100	2.57	Mined at depth	Type III
	Dolcoath Upper South-South Branch	85/350	275	175	2.72	Open at depth	Polymetallic
	Dolcoath Main	80/150	180	285	3.32	Footwall portion of previously mined lode.	Polymetallic
	Dolcoath Little North West	67/150	210	65	1.60	Open to the west	Polymetallic
	Dolcoath Little Northwest Footwall	75/330	70	35	1.41	Open at depth	Polymetallic
	Dolcoath Middle	75/140	170	135	1.65	Potentially open at depth.	Type I
	Dolcoath Middle Branch	75/130	300	175	1.36	Extends down into granite.	Type I
Lower Mine (tin only lodes generally hosted in granite)	No. 1 (4)	65/145	1,430	350	0.77	Cross-cuts No. 2	Type I
	New North, Little Middle, 2 East	87/140	850	165	0.87	Upright	Type II
	No. 2 (3)	65/325	820	435	1.16	Cut-off by No. 4 at depth.	Type II
	No. 2 2nd South Dipper	80/155	165	250	1.02	Cut-off by No. 2 at the top, open at depth.	Type II
	No. 3 (5)	70/145	1285	260	0.47	Focused on a Type IV zone.	Type I and IV
	No. 4 & 5 (5)	70/145	1,050	400	1.58	Interleaved lodes, open at depth.	Type II
	No. 8 (2)	55/148	315	275	1.74	Partially open at depth, open to the east.	Type I
	No. 9 (3)	70/138	620	195	1.41	Interleaved lodes, split by fault.	Type II
	Main, Intermediate. North, Great (6)	75/325	2,130	280	0.97	Interleaved lodes	Type II
	Dolcoath South	71/150	1,000	275	0.75	Continuous single structure, open to the west and at depth.	Type I
	Dolcoath South-South Branch	73/335	225	185	0.64	Cut off by Docloath South at depth.	Type I
	Dolcoath North (4)	75/158	770	200	0.96	Interleaved lodes, open to the west and at depth.	Type I
	North Pool Zone No.6	64/322	420	100	1.22	Meets No. 6 North Branch at depth, open to the east.	Type II
	North Pool Zone No. 6 North Branch (3)	64/144	360	145	1.16	Open to the west and at depth.	Type II
	North Pool Zone Pegmatite Lodes (2)	85/160	140	75	1.18	Cross-cut by other NPZ lodes.	Type II
	North Pool Zone Other Lodes (7)	65/319	400	130	1.82	Interleaved lodes, several dip south.	Type IV
	Providence (2)	80/325	360	100	1.83	Discontinuous	Type II
	Roskear A	60/140	260	195	1.53	Open at depth.	Type I
	Roskear B (3)	65/152	500	270	2.43	Interleaved, hangingwall dips north and hinges into main lode.	Type II

Zone	Lode name (wireframes)	Dip / dip direction	Strike length (m)	Dip extent (m)	Average lode width (m)	Continuity	Lode type
	Roskear South	80/140	400	175	1.23	Dips towards quartz porphyry, unknown relationship.	Type II
	Tincroft (3)	75/145	700	300	2.35	Discontinuous, interleaved.	Type II
	Pryces (4)	60/150	1,500	320	1.93	Discontinuous	Type II

Wallrock mineralisation within the South Crofty Project is widespread, although not ubiquitous (Kneebone, 2008).

Wallrock alteration comprises the following:

- Tourmalinization (both pervasive replacement and veining).
- Chloritization (usually involving predominantly micas and, to a lesser extent, feldspars).
- Hematization (often as hematization of chlorite, micas, and felspars or as later hematization of earlier pervasive chloritization).

Pervasive albitization has also been noted in association with zones of interaction of certain Lodes, Quartz "Floors", and "Pegmatite Zones".

Cassiterite (tin) mineralisation is often, though not always, present in these wallrock alteration zones occurring as veinlets, and disseminations. These incidences of mineralisation are usually seen to be associated with reactivation of lode fissures and / or later mineralisation phases within the lode fissures.

Mineralised wallrock can constitute a major component of the mineralised structure or be the main mineralised zone rather than the lode itself.

The mineralisation encountered at South Crofty was developed during different phases and can display differing characteristics warranting different domaining for Mineral Resource estimation work.

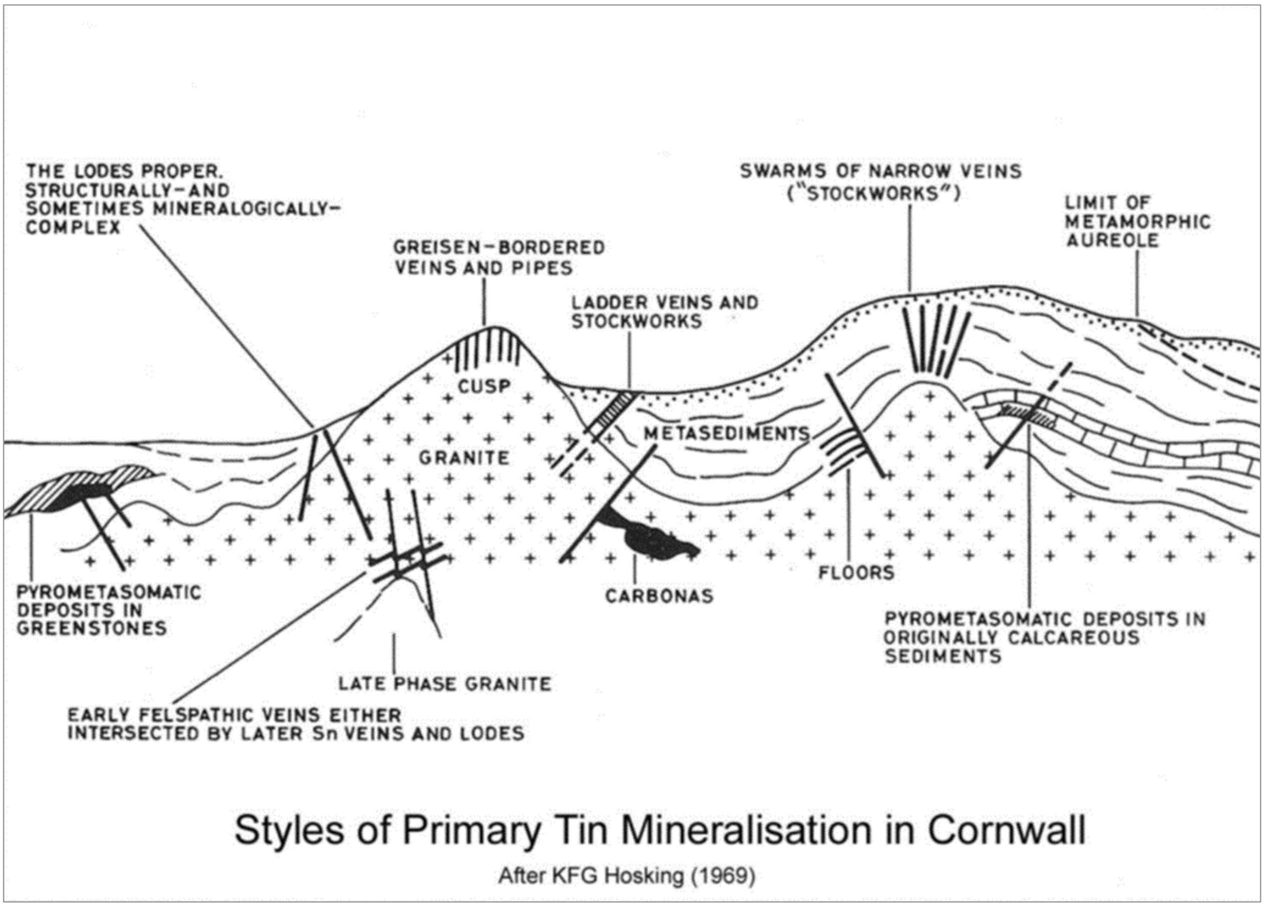
8 Deposit types

Cornish tin deposits have been extensively explored and researched. The majority of Cornish tin projects are related to the emplacement and subsequent cooling of the granites. The South Crofty deposit genetic model is an intrusion-related, structurally controlled, vein-hosted mineralisation type.

The geological model for the deposit type is described by Kneebone (2008) and Selwood et al., 1999. The main phase of mineralisation was protracted, lasting well over 20 Ma, and comprising multiple events. Hot brines can still be encountered at depth within the granite, as experienced by miners on the 380-fathom level of the former South Crofty Mine.

Styles of primary tin mineralisation in Cornwall are shown in Figure 8.1.

Figure 8.1 Styles of primary tin mineralisation in Cornwall



Source: Hosking, 1969.

Cornish tin mineralisation is considered to have commenced at approximately 285 Ma with the onset of intrusion related hydrothermal activity. A simplified description of the sequence of mineralising events is provided by Selwood et al., 1999, comprising:

- *"Subhorizontal "floors" of quartz and wolframite, with griesened margins, also some wolframite-bearing veins of pegmatitic aspect.*
- *Fe-rich tourmaline (schorl) veinlets, carrying some cassiterite and mostly forming steeply dipping swarms.*
- *The main economic Sn-bearing veins in steeply dipping fractures trending ENE-WSW. The dominant mineralogy is of very finely crystalline tourmaline ("blue peach"), with aggregates and discrete grains of fine-grained cassiterite. Brecciation is a common feature of these veins.*

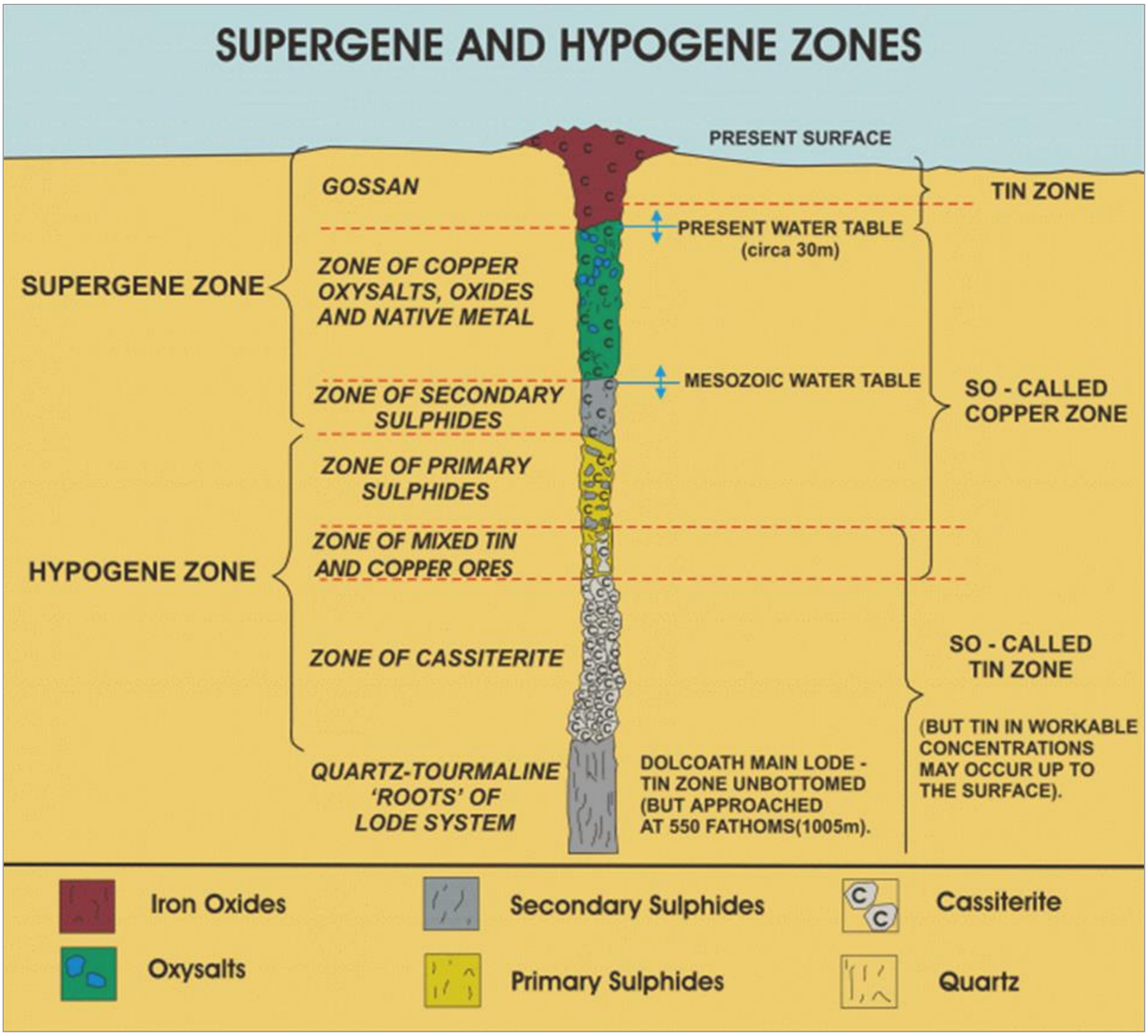
- *The blue peach veins are overprinted in places by chlorite ("green peach"); there is some remobilization and recrystallization of cassiterite, which in this assemblage commonly occurs as coarsely crystalline grains and aggregates.*
- *Steeply dipping, WNW-ESE-trending fractures are infilled with assemblages of fluorite, quartz, earthy chlorite, and hematite [sic.]. These fractures may form individual veins ("caunter lodes") or form crosscutting zones within the earlier peach lodes. Cassiterite in these structures is scarce or absent, and the caunter lodes may carry Cu-Pb-Zn-Bi minerals.*
- *Chalcedony and clay filled wrench faults of NW-SE to NNW-SSE trend, associated with extensive kaolinization. The principal example of this type is a major fracture complex, catted the Great Crosscourse, which has a displacement of more than 100 m, and physically divides the mine into two distinct compartments.*
- *Extensional fractures of roughly N-S trend, typically infilled with comb-layered quartz and fluorite. These veins may carry minor amounts of low-temperature sulphide minerals, and are not commonly associated with kaolinitic alteration."*

The principal Sn-bearing vein mineralisation phase was coeval with the second magmatic event approximately 270 Ma. This phase was more diverse than the first phase and gave rise to the extensive hydrothermal vein system of the Cornish mineralisation. The main tin-bearing veins (lodes) strike ENE-WSW and are steeply dipping.

The mixing of magmatic, meteoric, and connate fluids via convection cells brought in a great volume of metals, together with boron, and sulphur leached from the killas (metasediments). The increase of fluid pressure resulted in the fracturing of the granite carapace and the rapid movement of mineral-depositing vapors and fluids along these fissure systems. With the deposition of minerals, the fracture became sealed until the fluid pressure reached a high enough level to cause failure along the plane again. This repetition of "crack sealing" and hydraulic failure events gave rise to highly brecciated lode textures displaying characteristics of multiphase deposition. Early high-temperature minerals deposited in the lodes within and adjacent to the granite / killas contact comprise pegmatite style of mineralisation, and associated quartz, feldspar, wolframite, arsenopyrite / löllingite, cassiterite, and tourmaline.

Mineralisation at depth is dominated by tin mineralisation with pervasive tourmalinization of the wallrock. At higher levels, copper mineralisation becomes dominant with the deposition of a mesothermal assemblage, including chalcopyrite, chalcocite, chlorite, fluorite, and sphalerite. At higher levels again, there is a gradual change to an epithermal suite with the deposition of galena, stibnite, haematite, and siderite. A section through a typical Sn-Cu lode showing vertical zonation exhibited in some major structures (Hosking, 1988) is shown in Figure 8.2. Combined with historical plans and sections of previously producing mines, the zonation model allows potential tin-rich zones to be targeted underneath historical eighteenth- to twentieth-century copper mines.

Figure 8.2 Cross-section through a typical Sn-Cu lode showing vertical zonation exhibited in some major structures



Source: Hosking, 1988.

A change in stress conditions in the Lower Permian resulted in the development of a second fracture system trending north-west-south-east. These are the "caunter lodes" that displace earlier vein systems and are dominantly mesothermal in character and are steeply dipping, and trend WNW-ESE. The caunter lodes can be infilled with fluorite, quartz, chlorite, and haematite. Whilst tin can be rare in the caunter lodes, they can be associated with copper, lead, zinc, and bismuth mineralisation.

Late extensional crosscourse faults locally offset many of the lodes. These faults may be infilled with clay or chalcedony, quartz, haematite, and chlorite. Some crosscourses are mineralised, carrying a mesothermal to epithermal suite of minerals, including galena, chalcopyrite, marcasite, barite, and fluorite.

Exploration activities to date have included on-lode development with channel sampling, providing assay information and definition of lode geological continuity along-strike and down-dip. Underground drilling, and limited surface drilling has been conducted targeting the main lode orientations along-strike and down-dip.

The geological continuity of the lodes, and the extensive understanding of geological controls on mineralisation has helped govern the approach to exploration. Metallurgical drilling completed in 2023 further supported the geological interpretation. The 2023 metallurgical holes were drilled from surface and targeted down-dip extensions of known lodes, confirming the extents of lodes No. 1, No. 4 C, 8 A, North Pool B (NPB), North Pool Quartzites (NPQ), Roskear B Footwall (FW), Roskear, and the Main, Intermediate, North and Great Zone Intermediate Lode.

9 Exploration

Cornish Metals has carried out no exploration to date. Work completed since 2008 by previous issuers is described below. Exploration completed prior to mine closure in 1998, including underground sampling, is discussed in Section 6.

9.1 Channel sampling

Details of historical channel sampling are provided in Section 6.3.2.

Cornish Metals undertook a programme of digitisation and verification checks of the pre-1998 channel sampling.

During digitisation of the database by Cornish Metals, channel collars were located by identifying the known point on the digital mine development model and measuring along drive the corresponding distance for each channel. The location in national grid X and Y coordinates and mine elevation was recorded as the collar for each channel sample. Face sheets which record the face mapping and face samples were located in much the same way although when the sample was collected the sample was taken from across the development face, rather than the back of the drive.

9.2 WUM programme 2008-2013

In 2008, WUM re-established the decline at the Project site and extended it a further 380 m for a total depth of 120 m below surface, with an average gradient of 1-in-6. The decline trends to the south-west, through the Great Crosscourse providing access to the Upper Mine (Dolcoath) lodes. At the base of the decline a spine drive was developed to a length of 130 m. The decline and spine drive was used to facilitate a 31,000 m underground drilling programme conducted by WUM.

9.3 Tin Shield programme 2012-2013

Exploration works by Tin Shield comprised the assaying of 720 drill core samples obtained from the WUM drilling in 2012 and 2013.

9.4 Mine survey

The UK Mines and Quarries act of 1954 and subsequent versions, including the Mines Regulations 2014, states that a mine operator must ensure that there are accurate plans of all the workings within a mine (abandoned or not) and sections of the seams or vein systems currently being worked. They must be prepared and revised at suitable intervals by the surveyor of the mine, marked with the date, and permanently and clearly drawn or printed on suitable and durable material, and maintained in good condition. The regulations provide clear guidance as to the responsibilities for maintaining the mine surveys. This includes stipulating that the scale and features defined are sufficient for the safe operation of a mine. The surveys should also provide accurate information on the position and conditions of existing workings and, so far as practicable, workings that have been discontinued or abandoned.

The South Crofty Mine archive also holds many calculation books in which all the coordinates for each survey station are computed. During the latter years of the 1980s and early years of the 1990s the process of survey station computation was transferred from paper sheets and computation books to a large computer database into which the observations from the field books were entered. A copy of this database was recovered at mine closure in 1998 along with much of the paper records.

During the QP site visit in July 2023, the QP visited the Cornish Metals archive and was shown the mine survey plans and sections, along with the original survey calculation books first-hand. The survey documents are stored securely in a dedicated archive room with restricted access.

Prior to the 1980s all the survey stations are relative to the South Crofty Mine Grid system, whose origin was the Robinsons shaft. At some stage during the 1980s the decision was made to transfer all surveys from the mine grid to the Ordnance Survey (OS) National Grid. At this stage, all the original mine plans were redrawn level-by-level onto the new sheets. The use of the OS National Grid continued until closure in 1998 and forms the base grid system from which the Mineral Resource model has been created.

To create the three-dimensional (3D) computer representation of the South Crofty Mine workings, the level plans were digitised and elevated using the information stored within either the modern survey peg database or from original paper records. Due to the current flooding of mine workings, it is not possible to re-survey the underground. Historically, there has been a process of checking the computations, whereby each survey station was computed by one member of the survey department and checked by another before being accepted as correct. Known errors in the survey, which appear in the calculation books, were rectified by re-survey. Thus, it is believed that the mine survey as plotted on the level plans and transformed into the 3D computer model is as accurate as the data held by Cornish Metals will allow.

Along with the digitisation of the mine survey the longitudinal stoping survey sections were also digitised. This information was transformed into its correct location in 3D space. The stope sections form the basis of the depletion models.

10 Drilling

The SCL database comprises two data sets, the pre-closure data discussed in Section 6.3.3, and the more-recent diamond drilling conducted between 2008 and 2013 (WUM), and by Cornish Minerals in 2020. Drilling completed prior to mine closure in 1998 is discussed in Section 6.

These two data sets represent spatially different areas of the Project and intercept generally different mineral assemblages, with the 2008-2013 programme largely focused on near-surface polymetallic mineralisation in the Upper Mine. The pre-closure data set is principally located in the Lower Mine and comprises predominantly tin mineralisation and is generally limited to tin only assays.

The diamond drilling carried out in 2020 by Cornish Metals targeted lodes below the deeper workings with the aim of confirming the position and continuity of mineralisation. The results of the 2020 assay programme are described herein. From 2022 to 2023, Cornish Metals conducted a metallurgical drilling programme, with the aim of obtaining sufficient sample material from Lower Mine lodes for metallurgical testwork.

10.1 WUM programme 2008-2013 drilling

Between 2008 and 2013, WUM carried out a programme of diamond core drilling in the Upper Mine part of the South Crofty Project. The total amount of drilling comprised 157 drillholes totalling 31,000 m. Due to the extensive amount of surface development, WUM opted to drill from underground using the decline and spine drive described in Section 9.2. Collars for the 2008-2013 drillholes in the decline and spine drive were surveyed by WUM surveyors using conventional underground survey methods.

The core recovered from the drillholes ranged from PQ (85 mm core) to NQ (48 mm core) in size but was typically HQ (64 mm core). The drillholes were collared at ten underground locations along the decline over a strike length of approximately 750 m (Puritch et al., 2017).

Drillhole lengths range from 4.2 m to 450 m, averaging 197 m. To prevent water ingress into the mine following drilling through old, flooded parts of the mine valves were used on the drillhole collars. These enabled the holes to be sealed off following the completion of drilling.

Core recovery was reported as being in excess of 95% except in areas where voids or old mine workings were intersected. Some holes were terminated due to poor ground conditions associated with the old mine workings.

Downhole surveys were typically taken on 6 m intervals; however, in some instances holes were only surveyed at the end of hole. Holes were drilled on azimuths of between either 300° to 360° or between 130° and 204°, Inclination ranges between +24.6° and -78.9°. Downhole surveys were conducted using a Reflex EZ-TRAC™ tool with an accuracy of 0.25° for inclination measurements and ±0.35° for azimuth.

A total of 6,591 m was sampled and assayed with samples typically taken on 1 m intervals in mineralised areas. Whilst assaying was predominantly undertaken in areas considered mineralised some sampling outside of mineralised areas was also undertaken, typically on 2 m intervals. Samples honour lithological boundaries with a minimum permissible length of 20 cm.

The 2008-2013 drilling targeted the Upper Mine lodes with the aim of providing additional information pertaining to geological and grade continuity. The interpreted lodes conform to the established mineralised structures in the area, typically dipping north at 60° to 80°, occasionally dipping south at 60° to 80° with conjugate structures at flatter dips. There are some shallow (30°) dipping lodes in this area. With the mineralisation style, and the drilling angles, several intersections were drilled along the structures and in these cases apparent thicknesses are in excess of the known true thickness from other historically worked lodes in the system (Puritch et al., 2016).

Significant intercepts from the WUM drilling programme at interval lengths >1 m and greater than 0.5% SnEq are presented in Table 10.1. A number of the drillholes in Table 10.1 had core loss due to old workings. The drillholes were reported by Celeste during the joint venture with WUM. All drillholes were located south of the decline and intersected the South Central, Dolcoath Main, Dolcoath South-South, and Interstitial Lodes (Puritch et al., 2017).

Table 10.1 Significant drill intercepts from the WUM underground drilling programme reported by Celeste in 2012 and 2013

Hole	Az. / dip of hole	From (m)	To (m)	Width (m)	Sn (%)	Cu (%)	Zn (%)	SnEq[1] (%)	Lode interpretation[2]
0908	174/-14	165.30	166.35	1.05	0.10	1.05	0.12	0.50	Dolcoath Main
0909	174/-26	105.56	108.56	3.00	2.13	1.02	0.02	2.50	South Entral
1210	158/-30	103.81	112.81	9.00	0.37	0.97	0.05	0.72	South Entral
1211	158/-45	121.97	124.97	3.00	0.55	0.75	0.03	0.82	South Entral
		165.97	167.97	2.00	0.49	0.05	<0.01	0.51	South Entral
		171.97	176.97	5.00	0.21	0.78	0.02	0.50	South Entral
		281.93	283.93	2.00	0.57	0.93	0.02	0.91	Main Lode
1213	196/-25	113.44	118.44	5.00	0.32	1.20	0.02	0.75	South Entral
		286.51	290.11	6.50	0.18	0.95	0.87	0.61	Main Lode
1214	173/-35	103.25	106.25	3.00	0.18	1.40	0.83	0.77	South Entral
		131.83	133.83	2.00	0.30	2.10	0.01	1.06	South Entral
1215	171/-44	116.23	118.23	2.0	0.71	0.59	0.10	0.93	South Entral
1215	171/-44	246.0	247.0	1.0	0.22	2.64	0.08	1.18	Dolcoath South South
1215	171/-44	306.64	307.43	0.79	1.52	0.44	0.03	1.68	Main Lode
1216	191/0	144.09	150.00	5.91	0.57	0.11	0.22	0.63	Interstitial Lode
1216	191/0	182.37	184.12	1.75	0.44	0.11	3.00	0.76	Dolcoath South South
1217	190/-14	90.22	93.72	3.70	0.11	1.12	5.30	1.09	South Entral

Notes: Intersections are selected from Celeste press releases dated 18 December 2012 and 18 January 2013 with minimum 1.0 m and 0.5% SnEq.
[1] SnEq% = Sn% + (Cu% x 0.359) + (Zn% x 0.0927).
[2] Lode interpretations by WUM / Celeste as reported in Celeste press releases.

10.2 Cornish Metals 2020 drilling

In 2020, Cornish Metals conducted additional diamond drilling from surface during a "Proof of Concept" drill programme designed to test down-dip extensions of lodes No. 4 and No. 8. Additionally, the programme was designed to test the suitability of directional drilling combined with wedges to produce multiple intersections of vein structures from a single surface or underground parent drillhole. A total of 1,694 m was drilled from one parent hole and two daughter holes (Figure 10.1). The parent hole was started at PQ diameter to keep the hole as straight as possible and switched to HQ diameter rods at 251.86 m. NQ rods were used from 725.58 m as the directional equipment was configured for NQ diameter holes. The drillhole collar and azimuth were surveyed using a Leica GS08 GNSS rover tool, for the parent hole oriented at 63° dip towards 331°.

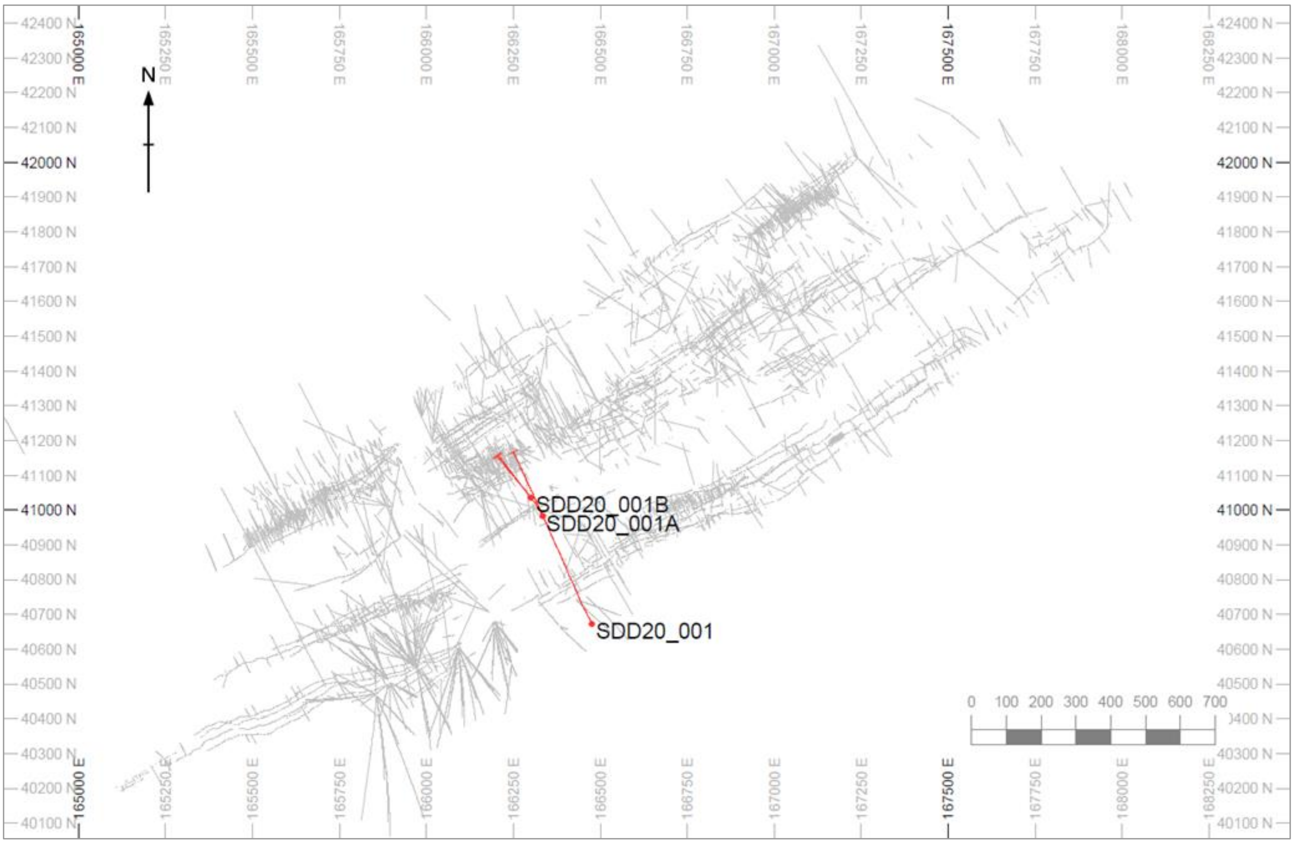
During standard diamond drilling, single-shot surveys were carried out at the end of every shift with Reflex downhole survey tools. Once directional drilling started, surveys were carried out every 3 m to ensure the hole path did not deviate from the planned path through historical workings.

Core recoveries ranged from 30% to 100% with one interval erroneously logged with a recovery of 113% in drillhole SDD020_001. Average core recovery was good with parent and daughter drillhole recovery averages of >99%. Mineralised intervals used in the Mineral Resource estimates all have good core recoveries of 100%.

Figure 10.2 presents a cross-section of parent drillhole SDD20-01 and daughter holes SDD20-01a and SDD20-01b. Significant intersections annotated on this figure are summarised in Table 10.2.

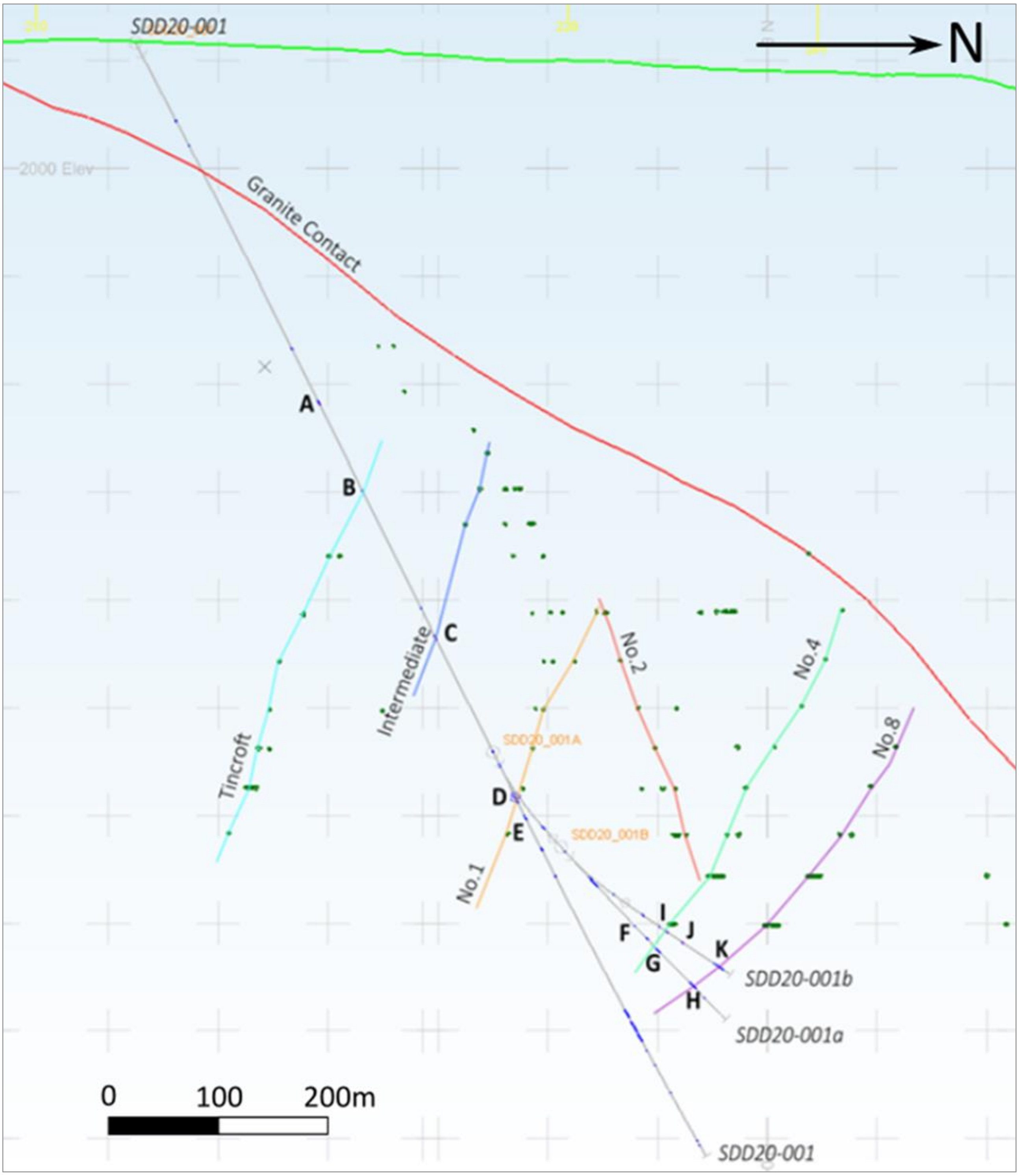
The QP is not aware of any drilling, sampling, or recovery factors that could materially impact the accuracy and reliability of the results.

Figure 10.1 Drillhole plan showing location of Cornish Metals 2020 drilling



Source: Cornish Metals, 2021.

Figure 10.2 Cross-section view looking west of drillhole trace of SDD20



Source: Cornish Metals, 2021.

Table 10.2 Highlights from the SDD20 drilling programme

Hole ID	Lode name	From (m)	To (m)	Length (m)	True width (m)	Grade			Ref.
						(Sn %)	(Cu%)	(W %)	
SDD20_001	South Tincroft	376.55	378.77	2.22	1.15	0.77	2.69	1.73	A
	including	*378.04*	*378.77*	*0.73*	*0.38*	*1.58*	*5.16*	*3.43*	
	Tincroft	470.35	472.52	2.17	1.66	1.34	-	-	B
	including	*471.79*	*472.52*	*0.73*	*0.56*	*2.5*	-	-	
	Intermediate	620.6	623.26	2.66	1.85	2.19	-	-	C
	No. 1	788.87	789.89	1.02	0.72	1.87	-	-	D
	No. 1 FW	810.59	811.15	0.56	0.4	1.08	-	-	E
SDD20_001A	New Wolfram Lode	949.58	950.68	1.1	0.76	-	-	0.26	F
	Including	*950.34*	*950.68*	*0.34*	*0.19*	-	-	*1.07*	
	No. 4	976.52	977.82	1.3	1.27	0.39	-	-	G
	Including	*976.52*	*976.87*	*0.35*	*0.34*	*1.06*	-	-	
	No. 8	1,028.76	1,029.96	1.2	1.19	0.92	-	-	H
	Including	*1,029.10*	*1,029.48*	*0.38*	*0.38*	*2.77*	-	-	
SDD20_001B	No. 4	974.2	976.8	2.6	2.6	10.33	-	-	I
	Including	*975.38*	*976.23*	*0.85*	*0.85*	*30.35*	-	-	
	No.4 Footwall	993.8	996.06	2.26	2.25	1.26	-	-	J
	No. 8	1,034.38	1,035.59	1.21	1.16	1.78	-	-	K
	Including	*1,034.38*	*1,035.21*	*0.83*	*0.8*	*2.48*	-	-	

Note: Drillholes are shown in plan view on Figure 10.1 and interval locations are shown in cross-section on Figure 10.2.

10.3 Cornish Metals 2022-2023 metallurgical drilling

In 2022, SCL commenced drilling in order to collect samples for a metallurgical testwork programme. A sample mass of 750 kg of material was required for X-ray transmission (XRT) ore sorting, processing, and paste backfill testwork. The planned drilling included directional drilling from three new surface parent holes, one existing surface parent hole (SDD20_001), and two new parent holes drilled from underground. These parent holes then had multiple daughter holes drilled in "clusters" in order to collect enough sample mass for the testwork. This involved wedging and directional drilling to get a spread of samples with enough variability for the process testwork.

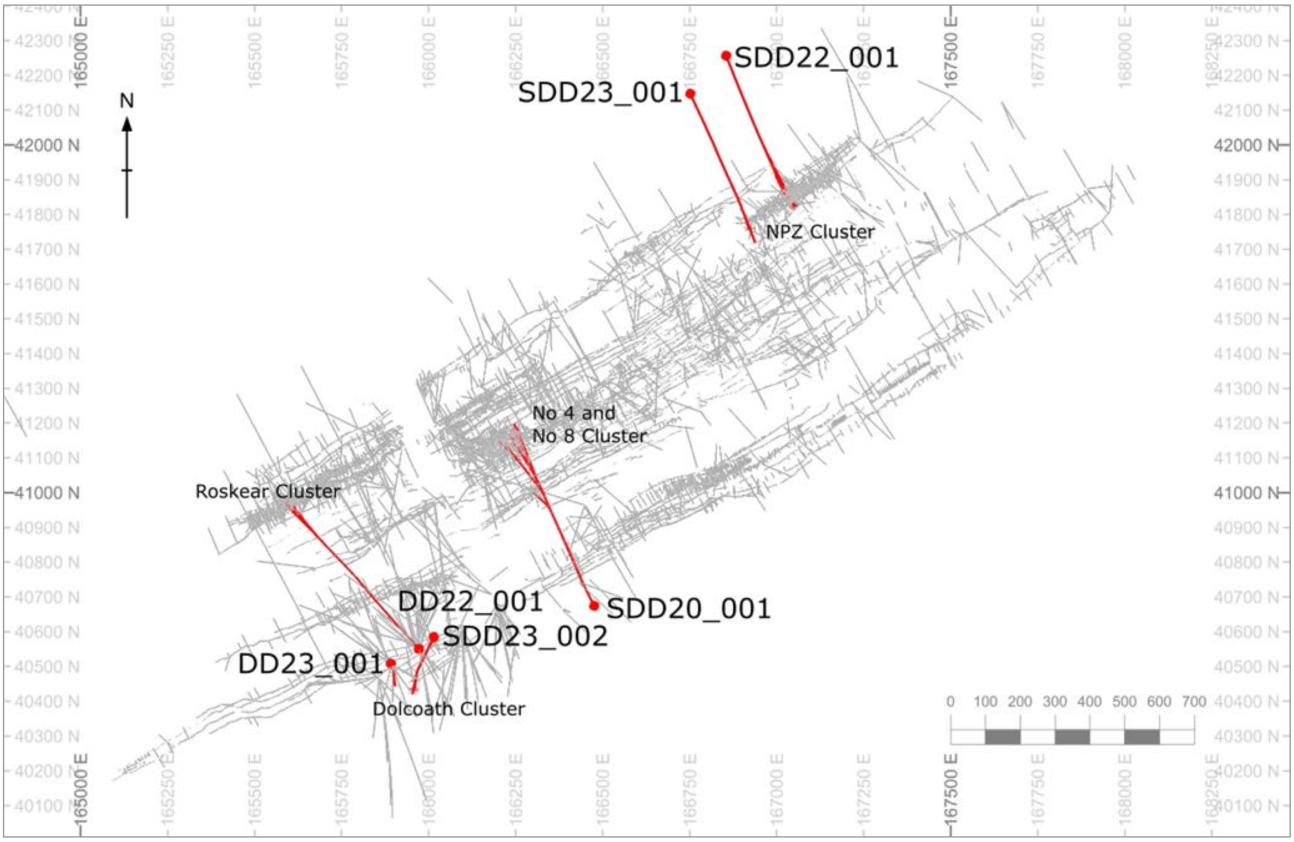
A total of 10,312 m were drilled in order to complete the programme which resulted in the collection of 1,162 kg of material for testing. In addition to this approximately 1-in-5 drillholes were assayed to give an indication of likely grades in that "cluster" of drillholes.

All samples were obtained using NQ size core and drillholes were surveyed with EZ-TRAC™ single-shot surveys every shift, with a multi-shot survey carried out at drillhole completion. IMDEXHUB-IQ was used to directly upload surveys from the drill site. Drilling was carried out by the contractor Priority Drilling Ltd of Killimor, Ireland.

A total of 13 intervals from drillholes SDD22_001 and SDD23_002 have recovered zero recovery. In the case of drillhole SDD23_002 the intervals with zero recovery are at the drillhole collar. For drillhole SDD22_001 the zero recovery intervals are within the first 54 m of the drillhole collar. Intervals with zero recoveries are not associated with mineralised intervals used within the Mineral Resource estimates. Excluding the zero recoveries, the core recoveries ranged from 5% to 100%. Average core recovery was good with average recoveries ranging between 74% and 100%, with an overall average recovery of >99%. Mineralised intervals used in the Mineral Resource estimates all have good core recoveries of 100%.

A plan showing the locations of the metallurgical drillholes is provided in Figure 10.3 below.

Figure 10.3 Plan View of 2022 metallurgical drilling programme



Source: Cornish Metals, 2023.

The metallurgical drillholes were planned to target the down-dip extensions of known lodes. The completed drillholes showed mineralised intercepts close (<5 m) to the planned intercept depths supporting the geological interpretation of the lodes.

Intervals logged as mineralised lodes have been used to guide and refine the lode interpretation wireframes. Assays for lodes No. 1, No. 4, No. 8, Roskear B FW, and the North Pool Zone have been used in the Mineral Resource estimates. At this time, assays were still outstanding for the Dolcoath South and Dolcoath South-South Branch areas lodes. The total number of assays outstanding is 46, which equates to approximately 2% of the total number of samples used in the Mineral Resource estimates for the Dolcoath South and Dolcoath South-South Branch areas lodes.

A summary of mineralised intercepts from the 2020-2023 drilling, which have been assayed and subsequently used in the Mineral Resource estimates is provided in Table 10.3.

Table 10.3 Summary of 2020-2023 assayed intervals used in the Mineral Resource estimates

Parent hole ID	Daughter hole ID	Lode	From (m)	To (m)	Azimuth (degrees)	Dip (degrees)	Sn (%)
SDD22_001	SDD22_001B1B	North Pool Zone- NPB	844.61	844.92	154	57	2.31
SDD22_001	SDD22_001B1B6	North Pool Zone- NPB	844.87	845.87	156	60	0.95
SDD23_001	SDD23_001D	North Pool Zone- PEGW	750.57	752.85	160	52	1.33
SDD23_001	SDD23_001	North Pool Zone- PEGW	752.33	755.86	159	54	0.02
DD22_001	DD22_001	Roskear B FW	917.78	921.00	317	50	0.01
DD22_001	DD22_001C1	Roskear B FW	920.11	921.73	322	48	4.66
DD22_001	DD22_001C1F	Roskear B FW	920.21	924.08	324	49	2.06
SDD20_001	SDD20_001C1	No 8	1039.07	1040.68	316	34	1.01
SDD20_001	SDD20_001B	No 8	1034.38	1035.59	321	34	1.78
SDD20_001	SDD20_001E	No 8	1030.95	1031.50	327	35	0.11
SDD20_001	SDD20_001D	No 8	1031.15	1033.97	339	28	1.09
SDD20_001	SDD20_001D	No 4	982.28	982.56	338	32	7.37
SDD20_001	SDD20_001E	No 4	980.44	982.74	328	37	3.24
SDD20_001	SDD20_001B	No 4	974.20	976.80	321	34	10.33
SDD20_001	SDD20_001C1	No 4	977.19	978.28	316	35	0.01
SDD20_001	SDD20_001A	No 4	976.52	977.82	323	46	0.39
SDD20_001	SDD20_001	No 1	788.87	790.86	336	43	0.96
SDD20_001	SDD20_001F	No 1	796.85	797.99	311	64	0.31

Note: Collar locations are shown on Figure 10.3.

10.4 Cornish Metals 2023-2024 South Carn Brea drilling

Exploration drilling is currently being conducted by SCL, targeting the mineralisation potential of an area to the south of Carn Brea hill, Redruth. The area under investigation is situated approximately 1 km to the southeast of the South Crofty mine site offices, and is located outside of the current underground permissions boundary, but within an exploration area supported by Mineral Rights.

A total of 14 surface diamond drillholes of predominantly NQ diameter core have been planned, of which 9 drillholes (7,200 m) have been completed as of 15 April 2024 with samples submitted for assay.

The 2023-2024 South Carn Brea drilling has not been included within the Mineral Resources reported herein.

10.5 Conclusions

The QP is not aware of any drilling, sampling, or recovery factors that could materially impact the accuracy and reliability of the results.

11 Sample preparation, analyses, and security

11.1 Pre-mine-closure (pre-1998)

The following information regarding the sampling and assaying methodology at South Crofty prior to closure, has been obtained via a mixture of historical mine reports and personal communications provided to Cornish Metals from personnel working at South Crofty during operations, namely: Mark Owen, Chief Geologist, Allan Reynolds, Mine Surveyor, and Clifford Rice, Senior Chemist.

11.1.1 Sample preparation

Sample preparation was conducted in a dedicated building with appropriate lighting and dust extraction to reduce sample contamination. Core and face samples were prepared for assay in the same manner.

The sample flowsheet was as follows:

- Samples are logged in onto a daily log sheet by the laboratory technician and assigned a dedicated laboratory sample number.
- Samples were then placed into stainless-steel trays and dried at 105°C for two hours.
- Each sample (3 kg-5 kg for drill core and 1 kg-1.5 kg for individual face samples) in turn was then crushed to <10 mm in a jaw crusher and returned to the stainless-steel tray.
- Each sample was split into two using a Johnsons splitter.
- One half of the sample was then cone crushed in a Sala Mill to 2 mm.
- This sample was then split again in a smaller Johnsons splitter prior to being reduced down to a pulp with 80% passing 75 µm in a Tema Mill.
- Approximately 100 g was then split out again using a smaller Johnsons splitter and placed in a seal-easy bag with the appropriate dedicated laboratory sample number.
- The batch of samples were placed into a stainless-steel tray and sent to a dedicated assay room for analysis.

11.1.2 Sample analysis

11.1.2.1 Vanning assay

Until the advent of reliable X-ray fluorescence spectroscopy (XRF) assay methods during the late 1960s, the principal method of determining lode value in the Cornish mines was the vanning assay.

From the face sheets and contract sample sheets the approximate date / year that assaying at South Crofty turned over from vanning to XRF assay is 1974. Relative proportions of each analysis type vary between lodes and the database does not contain complete information for the channels on each lode. From the existing data it is estimated that approximately 60% of channel assays are vanning assays and 40% XRF assays. Approximately 93% of drillholes were assayed using XRF, but it is worth noting that most of the drilling carried out in the 1980s and 1990s were short production drillholes carried out to define lode boundaries.

The vanning assay depended on the mechanical separation of the heavy, valuable minerals from the waste and was carried out on a "vanning shovel" normally manufactured from light sheet iron.

A carefully weighed amount of prepared sample is placed on the shovel and covered with water, the shovel is then swirled round and the lighter material is allowed to run off with the water, more water is scooped with the hand onto the shovel and the process repeated until the sample is clean, most of the water is allowed to trickle off the edge of the shovel, and after a few further swirls to bring the clean material to the centre of the shovel, a few deft forward flicks throws the heavier particles in a crescent further up the blade than the lighter gangue.

Careful manipulation of the lighter material into a pool in the centre of the blade where it is further rubbed over by a light, flat-headed hammer to liberate material still contained within the waste. The sampled is then washed over again, once more a few deft forward flicks concentrating the material into a single head and ensuring that all recoverable ore is present. The remaining waste is then dropped off the shovel with a skilful sideways flip.

The shovel is then dried and the product weighed on a chemical balance, these weights being in direct ratio to the original weighed sample.

Occasionally samples are shown to contain sulphides, usually copper and arsenic, in this case the assayer will carry out the first phase, dry the product and then roast the residue to drive off the sulphides. The sample is then returned to the vanning shovel, and the process quoted above continued until the recoverable head is recognised.

A vanning assay gives recoverable grades using a simplified process that mimics operations in the processing plant.

Following the introduction of chemical assays, a conversion factor was formulated in order to convert recoverable grades (SnO_2 lbs/tonne) to percentage grades. This was used following the introduction of chemical assays circa 1975 and historical assays converted to % when required. This conversion was deemed reliable and fit-for-purpose. The conversion equation is given below:

$$\frac{lbs\ \mathrm{SnO2} * 1.1}{22.4} = Sn\%$$

11.1.2.2 XRF assay

Samples assayed during the 1990s were carried out utilising a bench-top XRF analyser (namely an Asoma Model No.8620 containing a Cadmium 109 source).

On a daily basis, the XRF was calibrated at the start of the shift using several certified "Standard" pellets of known %Sn concentration, prior to running sample analysis.

Each pulp was pelletized and assayed. The results were then written into a dedicated assay sample sheet for each batch containing the dedicated laboratory sample numbers for that batch.

This sample sheet was then copied, with one copy kept at the laboratory and the other copy sent to the geology department for insertion of grades either onto the core log or face sheet.

11.2 Vanning versus XRF methods

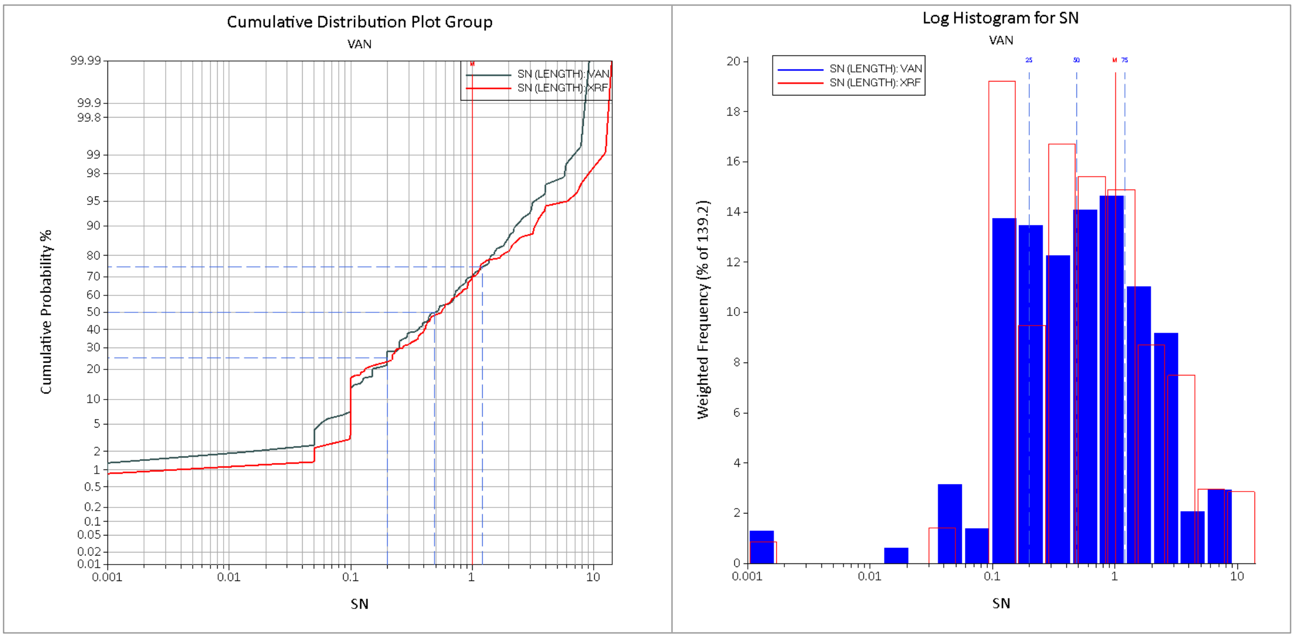
Prior to the use of XRF in 1974 assays for Sn were conducted using the vanning assay method. To check for bias by either assay method, the QP has carried out a vanning versus XRF comparison.

The QP has reviewed the sample data on a lode-by-lode basis to ascertain areas where there are coincident intervals of vanning and XRF assays. The QP has selected areas where samples are situated within discrete pay shoots and therefore less susceptible to bias from the inherent heterogeneity of the mineralisation. Areas selected for comparison include lodes 9N, 9S, 2D, and WET.

A direct comparison between individual vanning and XRF assays is not possible due to the samples having been taken in different splays of the main lode structures. Sample population comparisons were therefore undertaken.

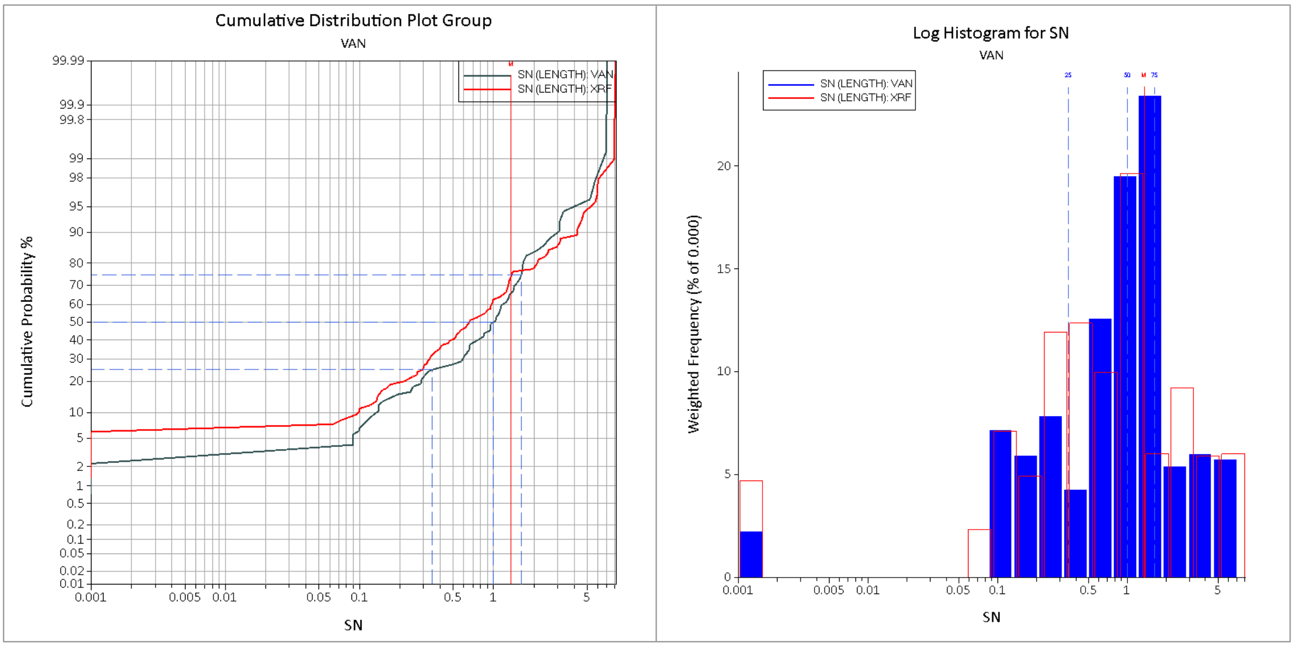
The results for the vanning versus XRF statistical population comparisons are shown in Figure 11.1 to Figure 11.4.

Figure 11.1 Vanning versus XRF comparison for lode 9N



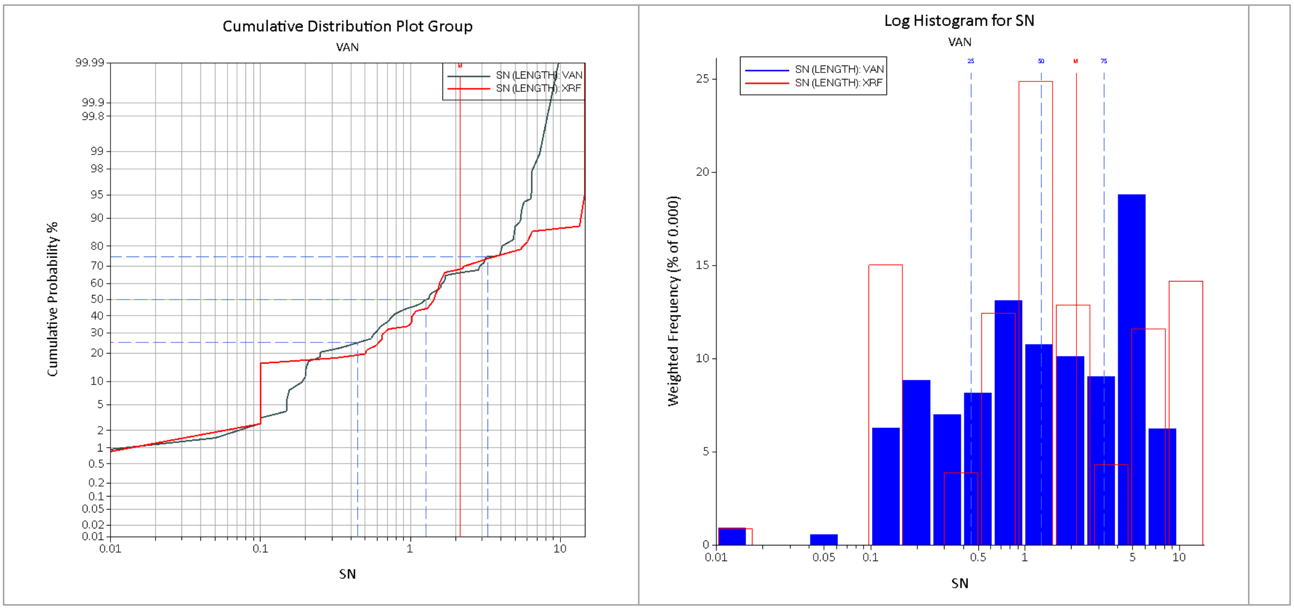
Source: AMC, 2023.

Figure 11.2 Vanning versus XRF comparison for lode 9S



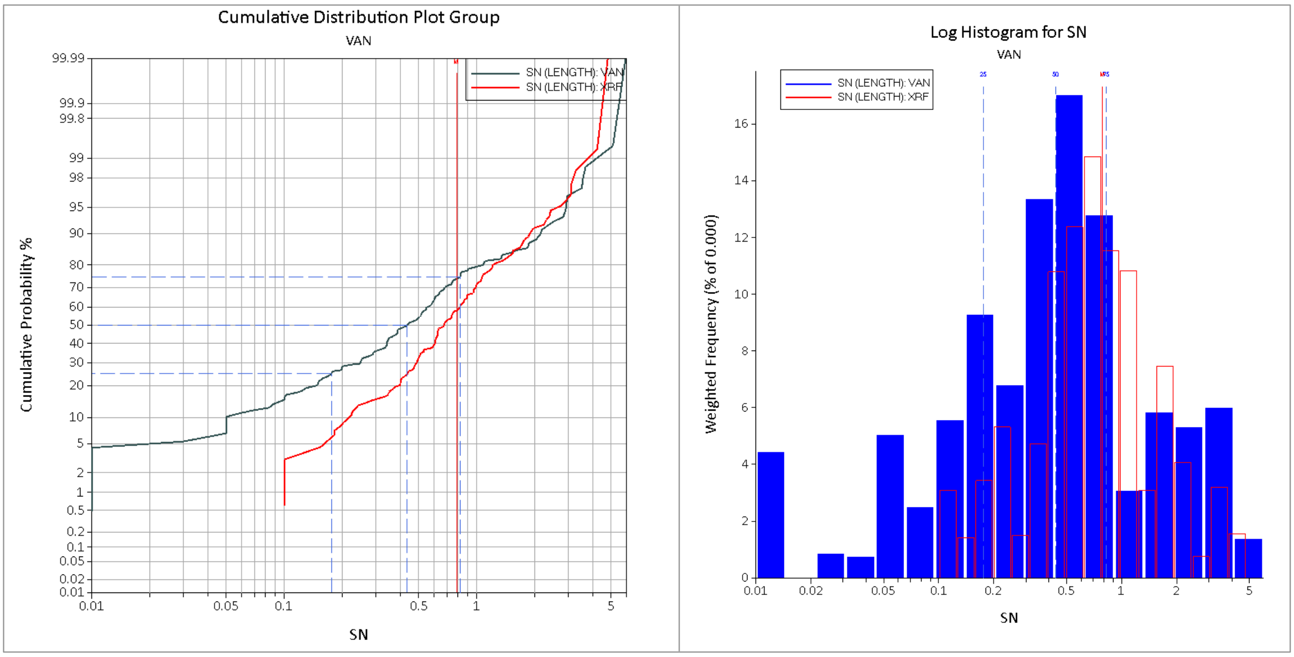
Source: AMC, 2023.

Figure 11.3 Vanning versus XRF comparison for lode 2D



Source: AMC, 2023.

Figure 11.4 Vanning versus XRF comparison for lode WET



Source: AMC, 2023.

The vanning and XRF comparisons show comparable grade populations with no evidence of significant bias noted. The mean grades for the vanning assays are typically slightly lower than the corresponding XRF assays, potentially indicating that the vanning assays are more conservative than the XRF.

11.3 WUM (2008-2014)

11.3.1 Sample preparation and security

The following summary regarding the 2008-2014 sample preparation is taken from the P&E 2016 report (Puritch et al., 2016) which in turn references work of Hirst et al. (2014) and Hogg (2012).

The preparation of samples for analysis begins on-site with mark-up of the core and recording of core recovery. During drilling, boxes are marked up by the geologist as the core is recovered for the following:

- Sample From and To
- Lithological breaks
- Natural fractures
- Handling breaks
- Losses

Care is taken to ensure that the core is inserted the correct way round and all the pieces fit together. The box is marked with depth from and depth to, as well as with a direction of drilling. Wooden blocks are inserted to mark the end of each core run as well as mark any areas of loss, with the estimated loss recorded in these cases. Drill core runs prior to the beginning of 2011; however, were not marked at all. The lithology and mineralisation of the core is described. Rock Quality Designation (RQD) and fracture count are recorded in the logs. Logging is entered using a Compaq iPaq directly into Excel™ spreadsheets by the geologist. No paper logs or field books are used.

Core boxes are then brought to surface in batches of eight to ten and delivered under supervision by the geologist to the core shed. Once in the core shed the box marking is checked. An axis perpendicular to the orientation of mineralisation is marked on the core ready for sawing. Care is taken to halve the core along the axis of mineralisation, to ensure the mineralisation in the sample for analysis is representative of the whole.

The core is sawn in half in batches by the geologist, or by a geological technician under the geologist's supervision. The boxes are then marked with the sample identification for the half core to be analysed, so the samples can be traced to their exact location in the boxes.

The saw used is a Vancon core saw. It is water-lubricated during sawing and washed down before and after use. It is washed down thoroughly between samples of different lithology, or different levels of mineralisation, but not between samples of the same type, to minimise potential cross contamination. There is no compressed air or ventilation to manage dust, but the area is washed down and swept regularly.

Half core is retained in the boxes and stored in the core shed. The core shed is generally kept locked, with access from a standard door and a large sliding vehicle door.

Before being stored, the core was photographed wet and dry on a photo board.

The half core submitted for analysis is broken to fit in heavy-duty polythene sample bags. The polythene bags are marked with the sample ID, but no other identifying marks. Reconciliation between the sample ID and true information is kept by the geologist so the exact sample location and details can be recalled from the sample ID. The openings in the bags are twisted, taped, folded, then zip-tied over to ensure no spillage during handling or transit.

The samples are then delivered in batches to an independent laboratory for analysis. Once samples had been prepared, the coarse rejects and pulps were returned for storage in the core shed.

Three laboratories were used for the preparation of samples of WUM drillholes as summarised below:

- Initial holes (batches SD01 to 47) were prepared at Wardell Armstrong International Laboratories (WAI), a then unaccredited laboratory (however, now accredited) facility in Cornwall, United Kingdom.

- From January 2012 (SD48 to 104) samples were prepared at AGAT Laboratory (AGAT), an accredited laboratory facility in Mississauga, Ontario, Canada.
- The remaining 720 samples (SD105 to 135) were prepared at SGS Cornwall (SGS) and analysed by SGS in either their Toronto or Vancouver facilities.

11.3.2 Sample analysis

11.3.2.1 WAI Laboratory / X-Ray Minerals Laboratory

The WAI sample preparation procedure comprises allocating a unique WAI sample ID before oven drying and weighing the sample. Samples were subsequently crushed using a jaw crusher to 10 mm-12 mm, then crushed to passing -1.0 mm using a balanced roll crusher, and riffle-split to obtain a subsample of approximately 150 g. The 150 g split subsample was then pulverised to 100% passing 100 µm, with half of this sample dispatched for XRF analyses and the remaining half stored as a reference sample.

The prepared sample pulps were sent to X-Ray Minerals Laboratory, of Colwyn Bay, Wales, United Kingdom for analysis. Upon receipt of samples, X-Ray Minerals Laboratory dried samples (as required) in an oven at 80°C and then milled with an agate ball mill approximately 20 g of the sample at 500 rpm for five minutes in order to produce two pellets for quality-control purposes. Milled samples were then weighed out to 10 g (+/- 0.2 g) and then combined in a plastic beaker with a polyvinyl alcohol (1% Moviol) or wax binder before being pressed at 15 tonnes for two minutes, using polished stainless-steel platens to produce a 32 mm pellet. The pelleted samples were oven-dried at 80°C for at least two hours before being analysed by XRF for a multi-element array, including Sn, Cu, and Zn. XRF analysis was completed using a Spectro X-Lab Energy Dispersive Polarised X-Ray Fluorescence (EDPXRF) Analyser. The XRF device is calibrated using International Rock, Soil, Ore, Sediment, Ash, Oil, Plastic, Organic, and Water standards to ensure repeatable and accurate analysis.

Internal laboratory quality-control comprised the use of duplicate samples and internal certified reference materials (CRMs). Duplicate samples at a rate of 1:10 were used to ascertain sample precision. To check for analytical accuracy a CRM was analysed at the beginning of each working day, during active sample analyses, and at the end of each working day. The measured value for each target analyte was targeted to be within +/-5 percent of the true value for the calibration verification check to be considered acceptable. If a measured value falls outside this range, then the CRM was reanalysed. If the value continues to fall outside the acceptance range, the instrument's multi-channel analyser (MCA) is then re-calibrated, and the batch of samples analysed before the unacceptable calibration verification is reanalysed.

11.3.2.2 AGAT Laboratory

Commencing in January 2012, sample preparation and analyses was carried out by AGAT.

Samples received by AGAT were logged into the laboratory information management system (LIMS) and any discrepancies reported to the client. Samples were then dried to 60°C, before crushing to 75 % passing 10 mesh (2 mm) and split to 250 g using a Jones riffle splitter or rotary split. Samples were then pulverised to 85% passing 200 mesh (75 µm), dried, and then shaken on an 80-mesh sieve with the plus fraction stored and the minus fraction sent for analysis.

Equipment was cleaned using quartz blank material and compressed air. Internal QAQC submissions by AGAT included blanks, duplicates, and internal reference materials (both aqueous and geochemical standards).

Assays were performed using a peroxide fusion followed by an Inductively Coupled Plasma - Optical Emission Spectroscopy (ICP - OES) finish for Sn, and four acid-digest followed by Inductively Coupled Plasma – Mass Spectroscopy (ICP/ICP-MS) finish for multi-elements, including Cu and Zn. Assays were performed using PerkinElmer 7300DV and 8300DV ICP-OES and PerkinElmer Elan9000 and NexION ICP-MS instruments. Inter-Element Correction (IEC) techniques were used to correct for any spectral interferences.

At the time of assaying AGAT maintained ISO registrations (ISO 9001:2000) and accreditations, providing independent verification that they have, and implement, a Quality Management System (QMS).

11.3.2.3 SGS Laboratory

Commencing in August 2012 (batch SD105 onwards), sample preparation and analyses were carried out by SGS Laboratories. Sample preparation was undertaken at SGS, and sample pulps shipped to SGS Vancouver or SGS Toronto for analysis.

Samples were delivered via courier, to SGS for preparation, where they were received by SGS personnel and samples were then logged into the laboratory's LIMS system. Samples were crushed to a nominal minus 10 mesh (2 mm), before being mechanically split via a riffle splitter to provide a 250 g subsample for analysis. The remainder of the crushed material was stored. The 250 g subsample was pulverised to 85% passing 75 µm (200 mesh) or otherwise specified by client.

After transfer of pulps to the analytical laboratory in Canada, samples were fused by sodium peroxide in graphite crucibles and dissolved using diluted HNO_3. During digestion the sample is split into two; half is submitted for Inductively Coupled Plasma – Atomic Emission Spectrometry (ICP-AES) and the other half is sent for ICP-MS analysis. Samples were analysed against known calibration materials to provide quantitative analysis of the original sample.

At the time of assaying, SGS was ISO 17025 accredited by the Standards Council of Canada. Quality assurance procedures operated by SGS include standard operating procedures for all aspects of the processing and also include protocols for training and monitoring of staff. Online LIMS is used for detailed worksheets, batch and sample tracking, including weights and labelling for all the products from each sample.

11.4 Cornish Metals (2020-2023)

All core was handled on-site at South Crofty following standard operating procedures for processing diamond drill core. A summary of project-specific activities is presented below.

Drill results for the Cornish Minerals drilling programmes are described in Sections 10.2 and Section 10.3 of this Technical Report. Assay results received up to 30 July 2023 have been included in the Mineral Resource estimate described in Section 14. This includes assays for No. 1, No. 4, No. 8, Roskear B FW, and the North Pool Zone. At this time, assays were still outstanding for the Dolcoath South and Dolcoath South-South Branch lodes. A total of 46 assays are outstanding, equating to approximately 2% of the total number of assays used in the current Mineral Resource estimates for the Dolcoath South and Dolcoath South-South Branch lodes.

11.4.1 Core logging

Core was transported directly from the drill site to the core logging shed using a utility vehicle, and either loaded directly onto the logging tables or stacked ready for logging. The following logging process was then carried out:

- Core box mark-up checked, and any mistakes reported to the drillers.
- Photography (wet and dry).
- Logged for core recovery, geotechnics, lithology, alteration, mineralisation, and structural measurements.
- Specific gravity (SG) measurements.
- Sample mark-up.

All data was entered into MX Deposit logging system. MX Deposit is a cloud-based drillhole and sample data-management platform which uses advanced industry-recognised security protocols to ensure privacy and confidentiality.

11.4.2 Sample cut sheet and core cutting (2020)

After core was marked up, geotechnical data gathered, and the hole geologically logged, a sample cut sheet was prepared and the core marked for sampling. Samples were marked up based on expected mineralisation content, respecting lithological or alteration boundaries, with shoulder samples of non-mineralised core added.

The sample cut sheet documents all sample intervals and lengths to be cut. The geologist pre- assigned which samples should have twin duplicates created, and where to insert standards and blanks for QAQC purposes.

All samples were submitted as half core with any duplicates being quarter-core cut from the retained half. The remaining core is retained on-site. Cutting was carried out using a manual diamond core saw which was cleaned regularly. A total of 209 samples were taken for assay purposes. The minimum sample length was 0.20 m and the maximum sample length was 1.62 m, with an average of 0.78 m. Sample intervals were recorded in a ticket book with tear-off tabs recording the sample number. The original sample ticket books are stored at Cornish Metals' South Crofty Project offices.

11.4.3 Sampling and core cutting (2022-2023)

The primary focus of the 2022-2023 drilling programme was to obtain samples for metallurgical testwork, whole core samples were taken from the five targeted lodes (No. 4, No. 8, Roskear, North Pool Zone (NPZ), Dolcoath). Samples sent for metallurgical testing were recorded in a separate table on MX Deposit database, to distinguish the samples from standard assay data. Each sample was separated into one of six different categories needed for the testwork: Mineralised Lode, Mineralised Hangingwall, Mineralised Footwall, and their unmineralised variants.

To ensure maximum sample mass from each hole, whole core was taken from the lodes leaving the interval empty in the core box. For every wedge cluster or area of lode targeted by the parent / daughter drillholes, one hole was selected for assay. From the outset, the strategy was to quarter-core assay the centre / parent hole of each cluster and have the wedges providing the majority of the metallurgical samples.

Core was cut into a quarter for assay, and the remaining three quarters bagged for metallurgical testing. The core was placed into a polythene bag with a sample ticket inside and sample number written on the outside.

For sampling core, a cut sheet was prepared that matched the sample intervals marked on the core. Samples were marked up based on expected mineralisation content, respecting lithological or alteration boundaries, with shoulder samples of non-mineralised core added. The geologist pre-assigned which samples should have twin duplicates created, and where to insert standards and blanks for QAQC purposes (often every tenth sample). A total of 708 samples were collected for assay with an average length of 0.78 m, and a minimum and maximum length of 0.27 m and 1.7 m, respectively.

Cutting was carried out using a Vancon diamond core saw which was cleaned regularly, particularly after intervals of intense hematization or sulphide mineralisation to reduce the chance of cross-contamination.

For mineralised zones in the metallurgical test areas, the same sampling procedure was followed as per the 2020 drilling campaign as described in Section 11.3.2.

11.4.4 Sample dispatch

Samples were bagged with the sample ticket tear-off tab stapled inside the bags before being stapled closed. Between four and six samples were included in larger poly sacks, which were closed using double cable-ties. The sample sacks were packed into a sealed container before being transported by tracked courier (Pallet Network) to the laboratory. Once dispatched, the samples were placed into the laboratory's chain of custody system.

On site, sample records and dispatch sheets are securely kept digitally in the MX Deposit database system and as paper copies. The dispatch sheets include information on batch numbers, details of the geologist submitting the samples, the number of samples, sample numbers, sample type, and the preparation and analytical codes required.

The 2020 samples for drillhole SDD20 and the 2022-2023 quarter-core assays were submitted to ALS Laboratories in Loughrea, Co. Galway, Ireland. ALS's QMS includes inter-laboratory test programmes and regularly scheduled internal audits that meet all requirements of ISO/IEC 17025:2017 and ISO9001:2015.

Samples were assayed using ALS method ME-XRF15b, where samples are analysed by XRF following a lithium borate fusion with the addition of strong oxidising agents to decompose sulphide-rich ores. Elements analysed include Cu, Zn, As, Sn, and W for the 2020 programme. A broader ME-ICP61 multi-element analysis was also carried out on all samples comprising 33 elements.

For the 2022-2023 programme, Sn was analysed using ME-XRF15b with the broader ME-ICP61 multi-element analysis also carried out on all samples for 33 elements. Any over-limit Cu, Zn, W samples from the ICP results were re-assayed using the ME-XRF15b technique.

A summary of detection limits is presented in Table 11.1. Any samples assaying over upper detection limits for Sn were re-assayed using analytical code ME-XRF15c, which has an upper detection limit of 79% Sn.

Table 11.1 Summary of detection limits for the main analytical techniques used in the Cornish Metals 2020 programme

Analysis	Cu (%)	Zn (%)	As (%)	Sn (%)	W (%)
ME-XRF15b	0.005-20	0.005-20	0.1-100	0.005-20	0.001-15.9
ME-XRF15c	-	-	-	0.01-79	-

Source: ALS Geochemistry Fee Schedule, 2020.

11.4.5 Density procedures

Samples obtained during the 2020 drilling were selected for SG measurements based on a nominal two per tray throughout the entire drillhole. A total of 872 measurements were carried out. The wet density method was used which consists of weighing the dry competent and nonporous core directly on a scale and then weighing the core suspended in a cradle underneath the scales submersed in water. The following formula was used to calculate the SG:

$$Specific\ Gravity = \frac{(Dry\ Weight)}{(Dry\ Weight - Wet\ Weight)}$$

The average from the 814 samples was 2.67 t/m^3, with a maximum value of 3.21 t/m^3. This includes samples from non-mineralised areas as well as sampled mineralised zones.

For the 2022-2023 metallurgical drilling programme, density measurements were carried out on all sections selected for both metallurgical testing and any additional assays. Any sections with vughs or noticeable porosity (particularly Roskear Zone) were waxed and the following calculation has been used to calculate the SG:

$$\rho_d = \frac{M_s}{((M_s + wax) - (M_s + wax\ in\ water)) - \frac{M_{s+wax} - M_s}{\rho_{wax}}}$$

Where Pd is sample density, Pwax is density of wax, Ms is dry weight. The density of wax (paraffin) used is 0.845 t/m^3.

11.5 Quality assurance and quality control (QAQC)

The following section describes the QAQC procedures implemented by previous and current operators at the South Crofty Project.

11.5.1 WUM (2010-2012) Upper Mine

Note that for WUM, drilling started in 2008, but samples were not assayed until 2010.

WUM's QAQC programme included the use of CRM and locally sourced blanks material. The blank material used was from a local granite source, initially thought to be barren but subsequently identified as part of the mineralised system.

QAQC procedures are summarised below by sample submission:

- SD01-28: Only internal laboratory blank and duplicates were submitted. WAI inserted one blank and one pulp duplicate sample into sample stream of each batch.
- SD29-104: WUM inserted two blanks, one CRM and one field, coarse reject, and pulp duplicate into sample stream of each batch.
- SD105-135: WUM inserted two blanks, two CRMs and one field, coarse reject, and pulp duplicate into sample stream of each batch.
- Batch sizes ranged from 28 to 91 samples, averaging 46 samples.

11.5.1.1 Blanks (WAI, 2010-2011)

Blank material comprised locally sourced granite, which was subsequently noted to be from the same mineralised system and containing some elevated low grades. The average grades of the blank material submitted during this period based on the 88 submissions comprised:

- Sn = 25 ppm
- Cu = 27 ppm
- Zn = 60 ppm

The blank assay results were compared against the average blank grades noted above with the majority of results falling close to the average blank grade. The maximum returned blank assays were 117.7 ppm Sn, 379.6 ppm Cu, and 360 ppm Zn.

Given the lack of true blank material, and the relatively low grades returned, the QP is of the opinion that there is no evidence of significant sample contamination that might impact the Mineral Resource estimate.

11.5.1.2 Blanks (AGAT, 2012)

The same blank granite material as used by WUM in 2010-2011 was used for checking sample contamination at AGAT in 2012. The average grades of the 102-granite blank submissions for this period comprised:

- Sn = 185 ppm
- Cu = 11 ppm
- Zn = 41 ppm

The majority of blank assay results fall close to the average grades stated above for the granite blank. The maximum returned blank assays were 420 ppm Sn, 67 ppm Cu, and 181 ppm Zn.

Given the lack of true blank material, and the relatively low grades returned, the QP is of the opinion that there is no evidence of significant sample contamination that might impact the Mineral Resource estimate.

11.5.1.3 Blanks (SGS, 2012)

The same blank granite material as used by WUM in 2010-2011 was used for checking sample contamination at the SGS laboratory in 2012. The average grade of the 102-granite blank submissions for this period comprised:

- Sn = 46 ppm
- Cu = 55 ppm
- Zn = 123 ppm

Overall, four results returned elevated grade values, which were noted by P&E (Puritch et al., 2016) as being:

- Cu sample C1215105 from batch SD118, at 830 ppm, which was located in a relatively low-grade interval and there were also nine other non-problematic blanks in this batch and no follow-up was considered necessary.
- Sn sample C1222009 from batch SD126, at 4,210 ppm, which followed a very high-grade sample and showed high contamination. No follow-up was considered necessary.
- Zn samples C1304162 and C1304174 from batch SD134, at 2,980 ppm Zn and 2,530 ppm Zn respectively, were positioned in relatively low-grade intervals and there were also four other non-problematic blanks in this batch. No follow-up action was considered necessary.

11.5.1.4 CRMs (WAI, 2010-2011)

Prior to sample batch SD29, CRMs only comprised internal submissions by WAI. From batch SD29 WUM inserted its own CRM submissions to check analytical accuracy. Two CRMs were submitted by WUM, both sourced from Ore Research and Exploration Pty. Ltd. (ORE):

- OREAS-140 (5 submissions)
- OREAS-141 (14 submissions)

The results for CRM OREAS-140 show reasonable levels of accuracy for Sn, Cu, and Zn, with Cu showing a slight high-bias and Zn a slight low-bias.

The results for CRM OREAS-141 show reasonable accuracy for Sn and Cu. CRM results for Zn show assay results under-reporting relative to the target value.

11.5.1.5 CRMs (AGAT, 2012)

As part of the QAQC submissions to AGAT in 2012, a further 27 OREAS-140, and 29 OREAS-141 CRMs were inserted into the sample stream.

Three OREAS-140 CRM samples failed low for Sn with results below three standard deviations. OREAS-141 submissions returned one failure for Sn, one failure for Cu, and four failures for Zn, all failures falling just below (outside) the 3 standard deviation threshold.

11.5.1.6 CRMs (SGS, 2012)

As part of the sample submissions to SGS in 2012, a range of CRMs were used, supplied by ORE:

- OREAS-36: Certified for Cu and Zn (13 submissions).
- OREAS-111: Certified for Cu and Zn (19 submissions).
- OREAS-140: Certified for Sn, Cu, and Zn (12 submissions).
- OREAS-141: Certified for Sn, Cu, and Zn (20 submissions).
- OREAS-142: Certified for Sn, Cu, and Zn (7 submissions).

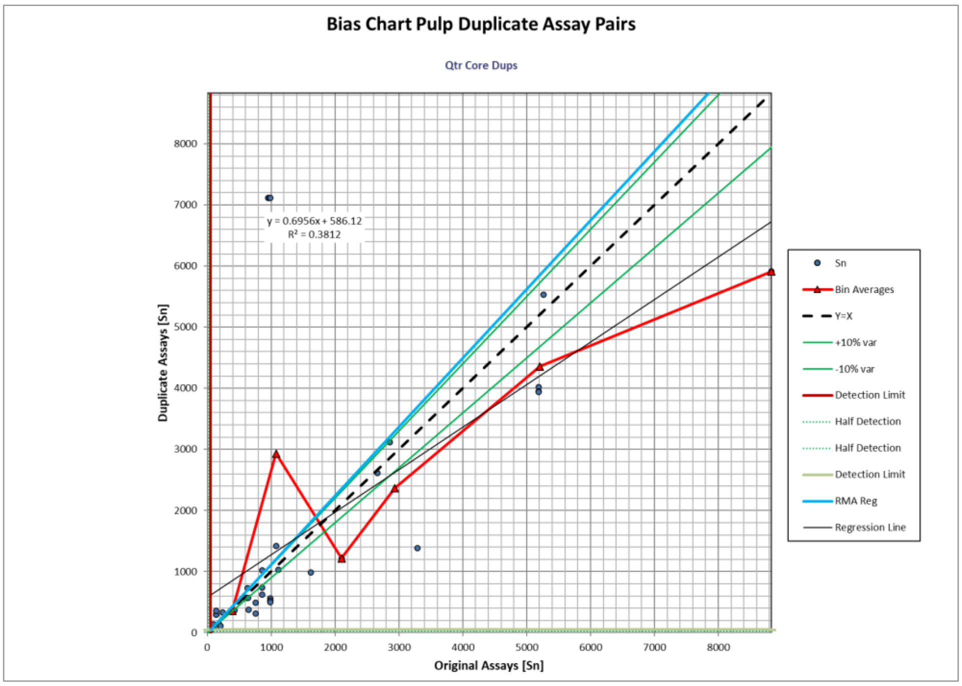
Overall, the SGS CRM submissions show reasonable levels of analytical accuracy with only two Zn assays falling below 3 standard deviations for OREAS 36. All other CRM results were returned within 3 standard deviations of the target value.

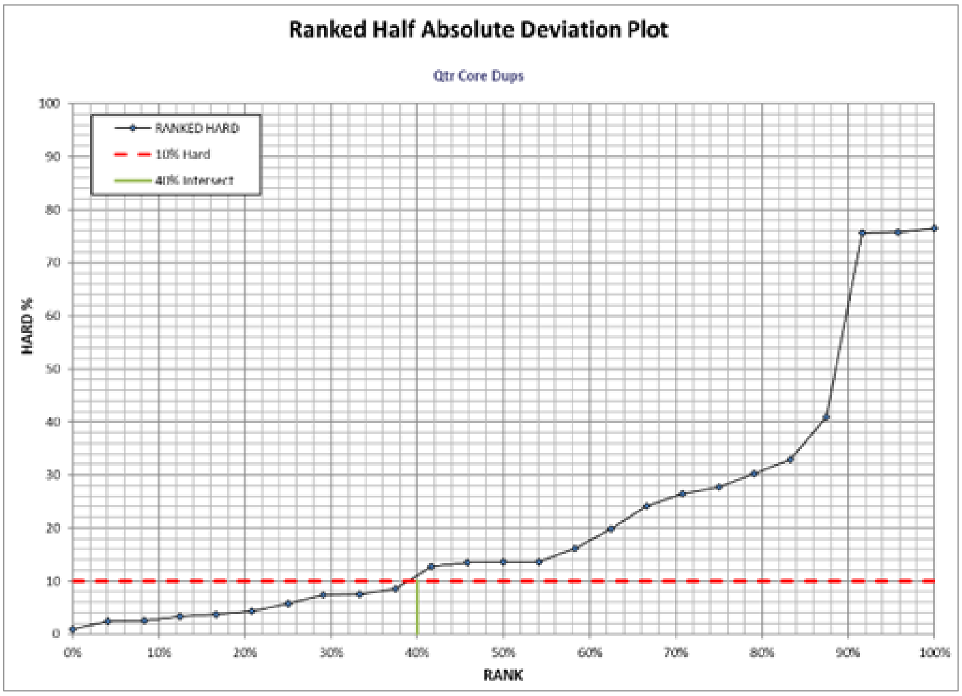
11.5.1.7 Field duplicates

As part of the 2008-2013 drilling works, field duplicates comprising quarter core were submitted into the sample stream. The QP has been provided with the results for 43 field duplicates.

The field duplicate results have been correlated against the original assay results. The scatter plot and rank half absolute relative difference (HARD) plot results shown in Figure 11.5 show the moderate to low levels of repeatability associated with the field duplicates.

Figure 11.5 Field duplicate scatter and rank HARD plot results for Sn





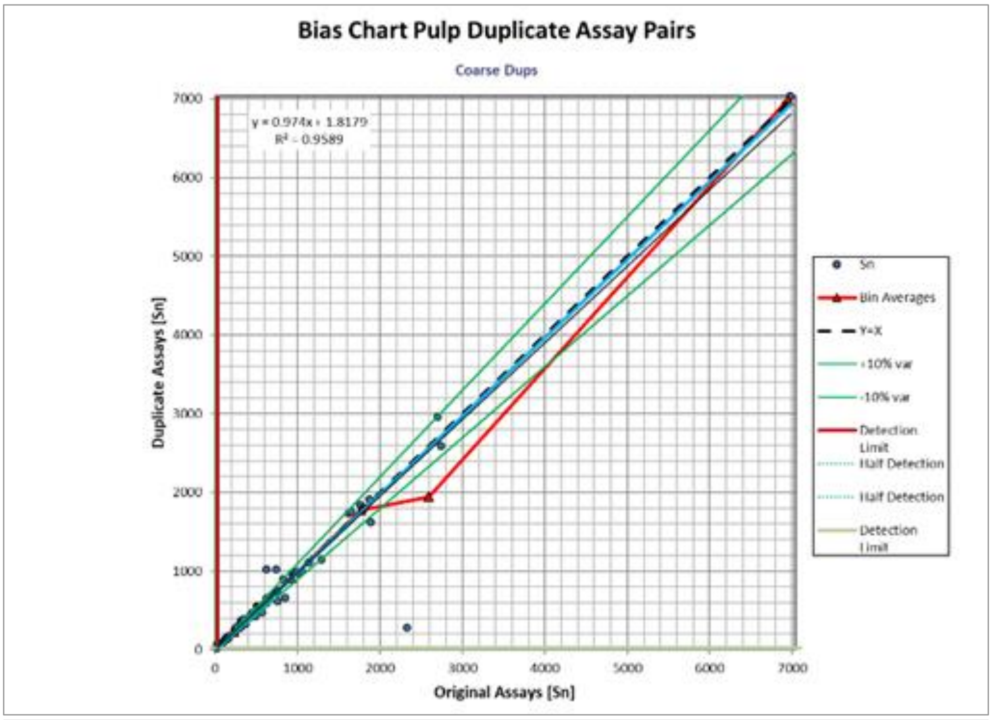
Source: AMC, 2021.

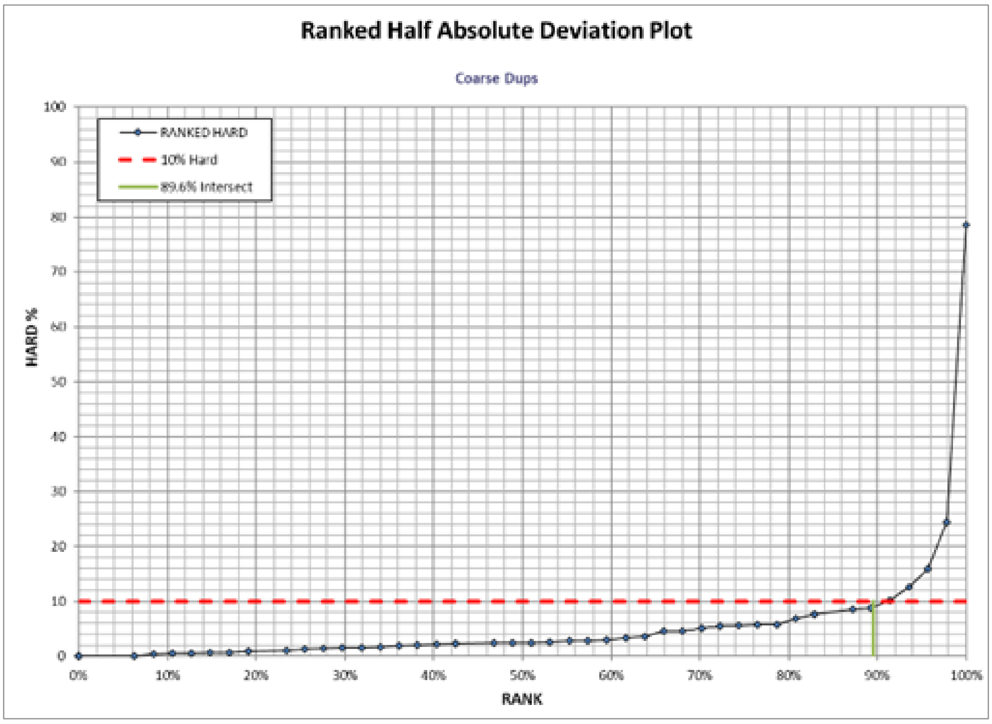
11.5.1.8 Coarse duplicates

Coarse duplicates taken following the crushing stages of the sample preparation process, and prior to pulverisation were also submitted as part of the QAQC procedures. The QP has been provided with results for 92 coarse duplicate submissions.

The results of the comparison between the coarse duplicates and original assays are shown in Figure 11.6. The analysis shows there is a marked improvement in sample precision compared to the field duplicates, indicating that the sample material during the initial crushing stages is being sufficiently homogenized to provide representative subsamples.

Figure 11.6 Coarse duplicate scatter and rank HARD plot results for Sn





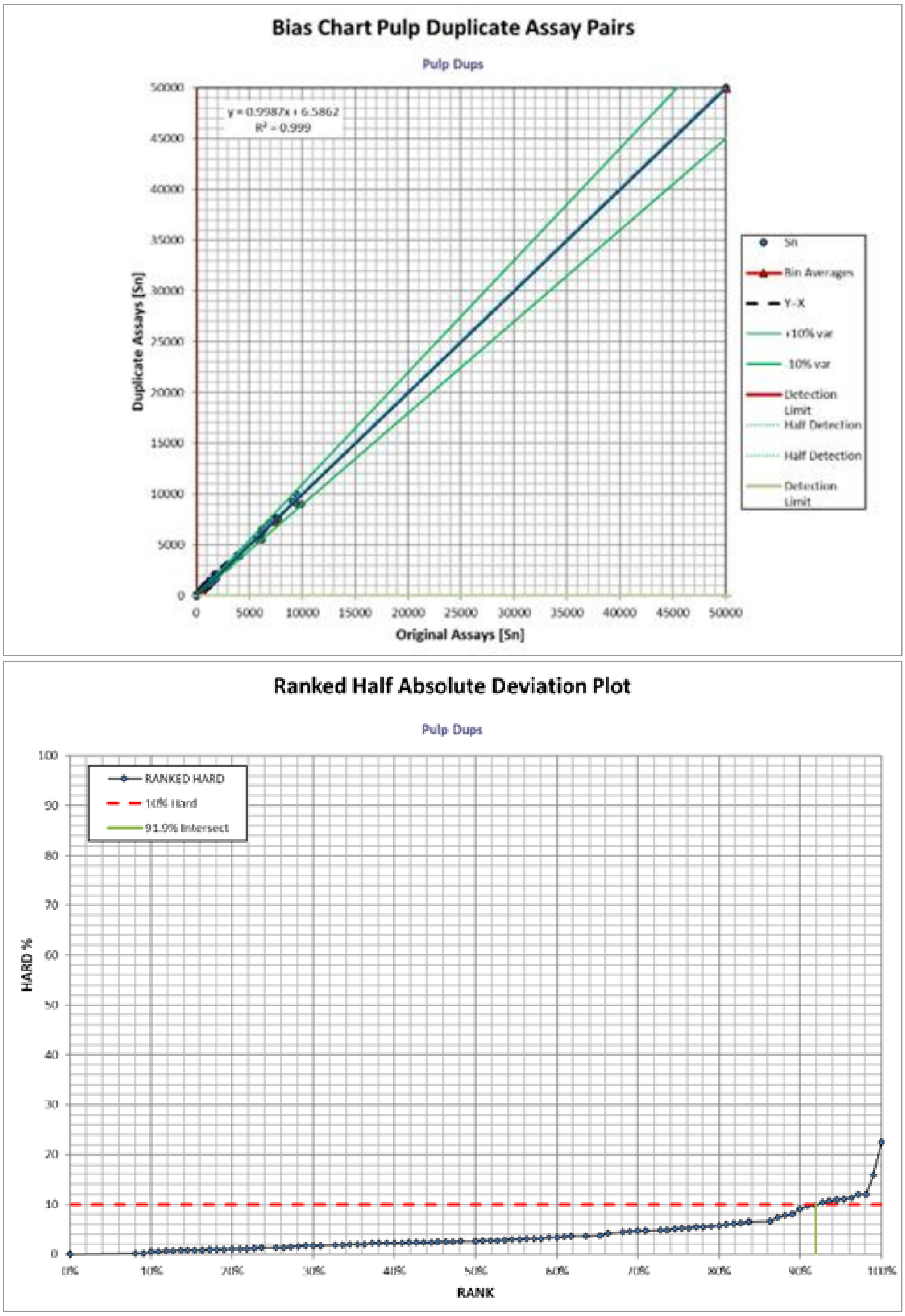
Source: AMC, 2021.

11.5.1.9 Pulp duplicates

A total of 234 pulp duplicate results from the 2008-2013 QAQC submissions have been provided to the QP. Pulp duplicate samples were taken following the crushing and pulverisation stages of sample preparation.

The pulp duplicate results compared to the original assays are shown in Figure 11.7. The analysis shows good repeatability and a slight improvement in precision relative to the coarse duplicates, indicating further homogenization of the samples.

Figure 11.7 Pulp duplicate scatter and rank HARD plot results for Sn



Source: AMC, 2021.

11.5.1.10 Check samples

Various check analyses have been carried out by external laboratories to evaluate the accuracy of the primary laboratories.

A total of 142 samples were analysed in 2012 by Activation Laboratories for Sn, Cu, and Zn to check the accuracy of the WAI assays. A good correlation between the primary and external duplicate results is noted.

In September of 2012, a total of 204 WUM drillhole samples were submitted to AGAT for Sn, Cu, and Zn. A good correlation to the original primary assays is recorded.

Check analyses of randomly selected samples for Sn, Cu, and Zn were undertaken in 2012 at the OMAC laboratory, Ireland. A total of 40 samples were sent for analysis and, aside from one Sn result, all other results showed a good correlation.

11.5.2 Cornish Metals (2020)

A total of 241 samples were submitted from Cornish Metals 2020 drilling project, including 32 QAQC samples comprising CRMs, blank material, and twin core duplicates. CRMs and blanks were generally inserted every ten samples to ensure enough QAQC was obtained from the small batch size.

11.5.2.1 CRMs

Two different CRMs were included in the sample batches: OREAS-141 and OREAS-142. Both OREAS-141 and OREAS-142 are high-grade Sn oxide ore CRMs prepared by ORE. The material was sourced from the Doradilla Project located in north central NSW, Australia. The Project area consists of a large Sn laterite deposit underlain by Sn silicate skarn with potential for copper, nickel, indium, and zinc mineralisation.

Table 11.2 summarises the certified values and standard deviations for OREAS-141 and OREAS 142.

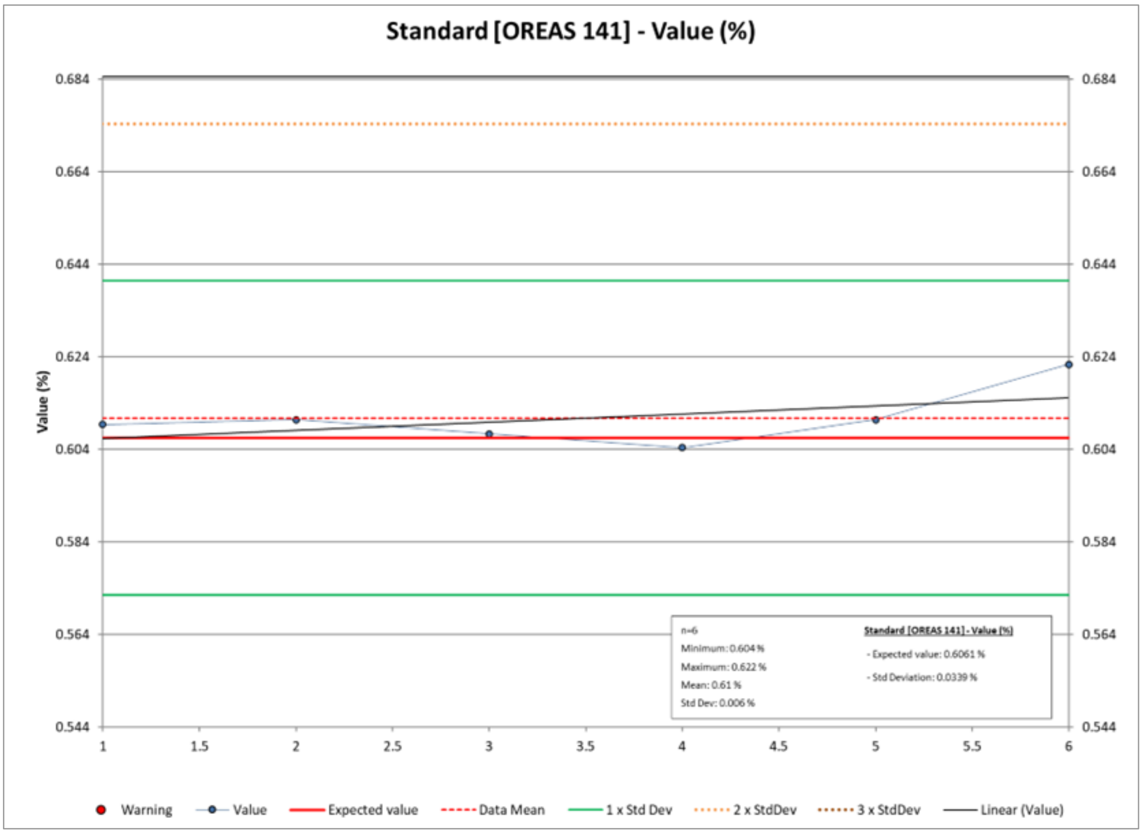
Table 11.2 Certified values and standard deviations for OREAS-141 and OREAS-142 using XRF analysis

CRM	Analyte	**Certified** value	1 S.D.	95% Confidence Interval Low	95% Confidence Interval High
OREAS-141	Cu (ppm)	2,453	98	2,387	2,518
	Sn (wt. %)	6.31	0.26	5.94	6.68
OREAS-142	Cu (ppm)	1,466	65	1,420	1,512
	Sn (wt. %)	1.04	0.05	1.01	1.07

Source: OREAS website ore.com.au accessed November 2020.

OREAS-141 was used six times, and OREAS-142 was used four times for this programme. All results passed QAQC checks, the Sn results for OREAS-141 can be seen in Figure 11.8.

Figure 11.8 OREAS 141 CRM results chart for Sn (2020)



Source: AMC, 2023.

11.5.2.2 Blank material

Blank material was obtained from Carnsew Quarry near Falmouth and consists of barren tourmaline granite. A total of six field blanks were submitted with the Cornish Metals 2020 samples to assess cross-contamination during preparation. These were generally inserted every ten samples; however, some discretion was used in order to place blanks after suspected high-grade samples.

The returned XRF values of the blank assays are as follows:

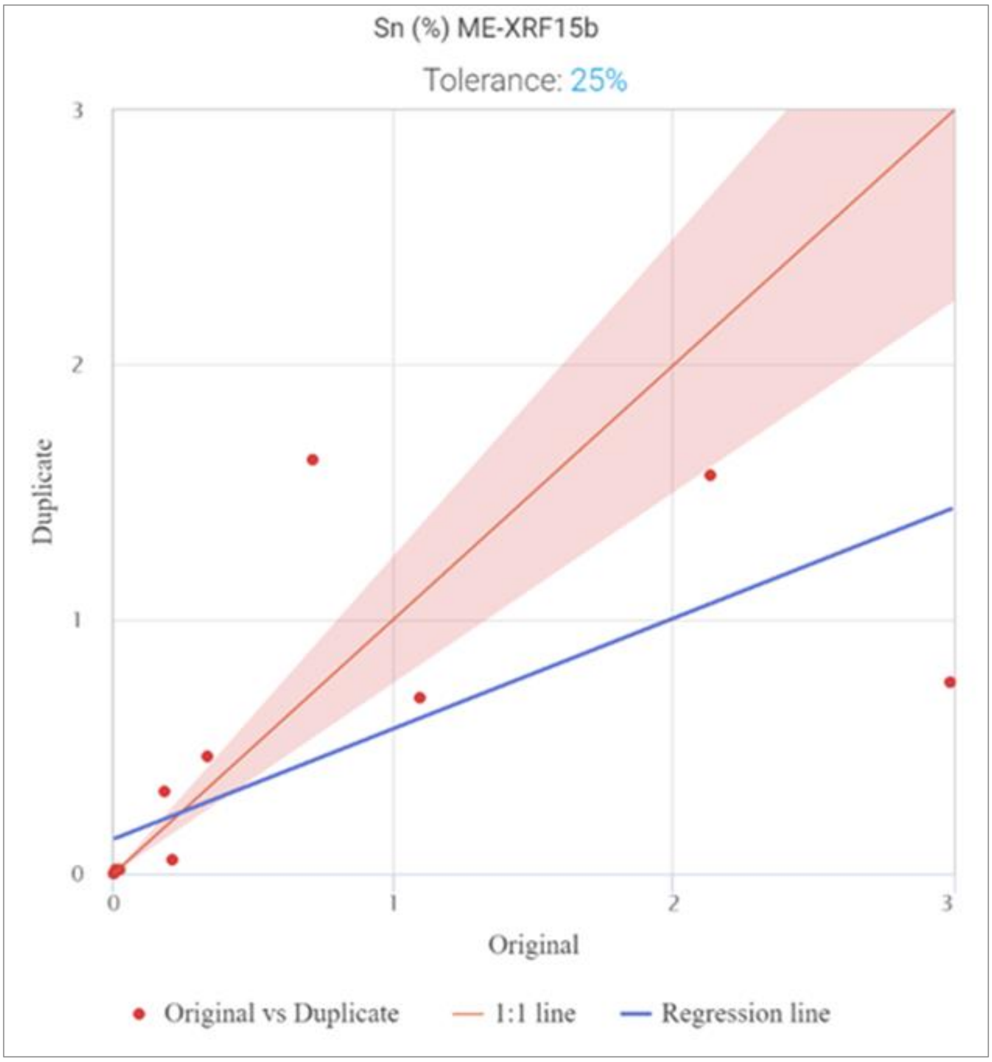
- All Sn values below ten times the detection limit of 0.005% Sn.
- All Cu values below the detection limit of 0.005% Cu.
- All Zn values below ten times the detection limit of 0.005% Zn.

Two of the blanks were placed after samples with Sn grades of 1.12% and 0.19%, both returned Sn assays of 0.005%. An anomalous value is considered above ten times the detection limit of the analytical technique.

11.5.2.3 Duplicates

Sixteen (16) twin samples were submitted during the Cornish Metals 2020 project. These were quarter-core samples corresponding to half-core original samples. Charts for Sn and Zn comparisons can be seen in Figure 11.9 and Figure 11.10. Intervals for duplicate analysis were based on estimated moderate levels of mineralisation. Particularly friable sections were not selected for duplicate samples due to the difficulty in cutting an accurate quarter-core.

Figure 11.9 Scatter chart for Sn twin duplicate samples

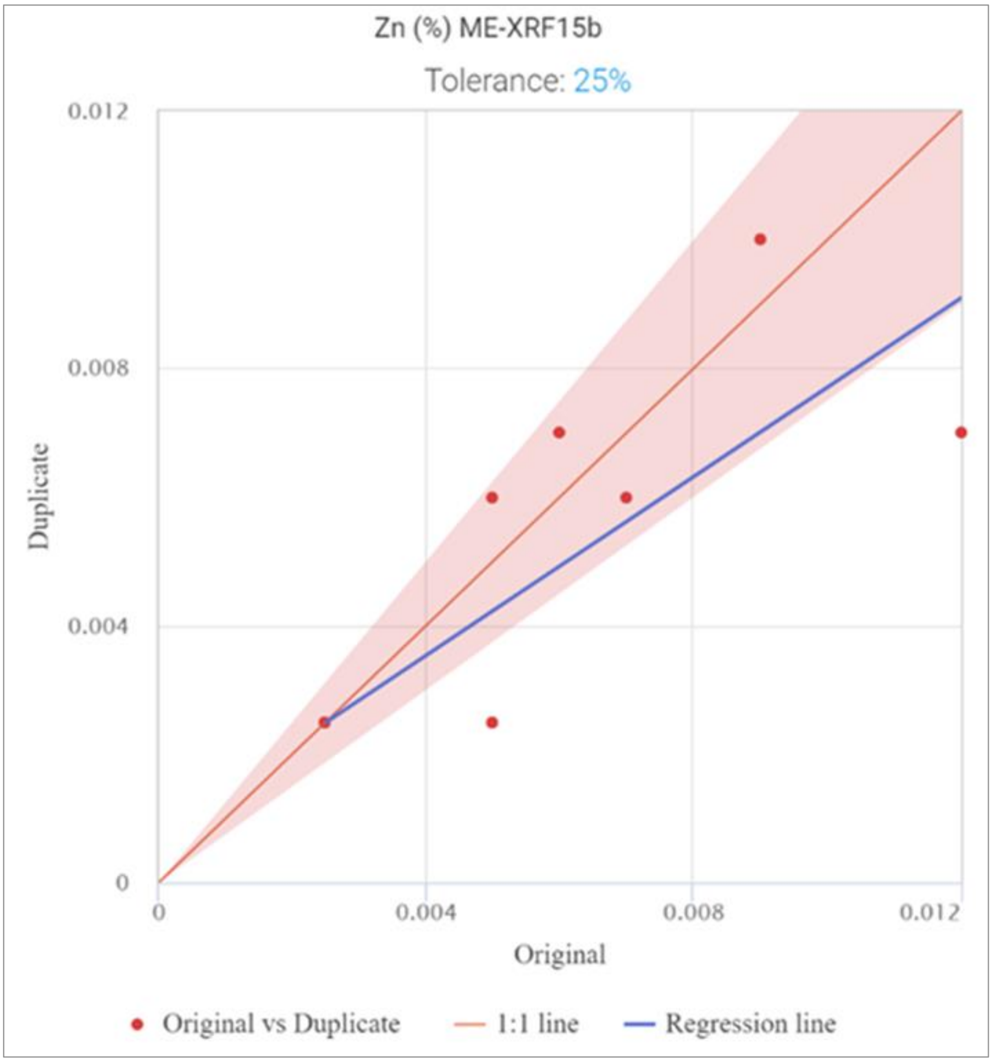


Source: Cornish Metals, 2021.

The Sn chart shows a generally poor correlation which is expected due to the heterogeneity of mineralisation (relatively high nugget). Visible cassiterite distribution in the core confirms this analysis as distribution can be patchy and occur in clusters.

The Zn chart shows a better correlation although it is worth taking into account the low levels of Zn content in general.

Figure 11.10 Scatter chart for Zn twin duplicate samples



Source: Cornish Metals, 2021.

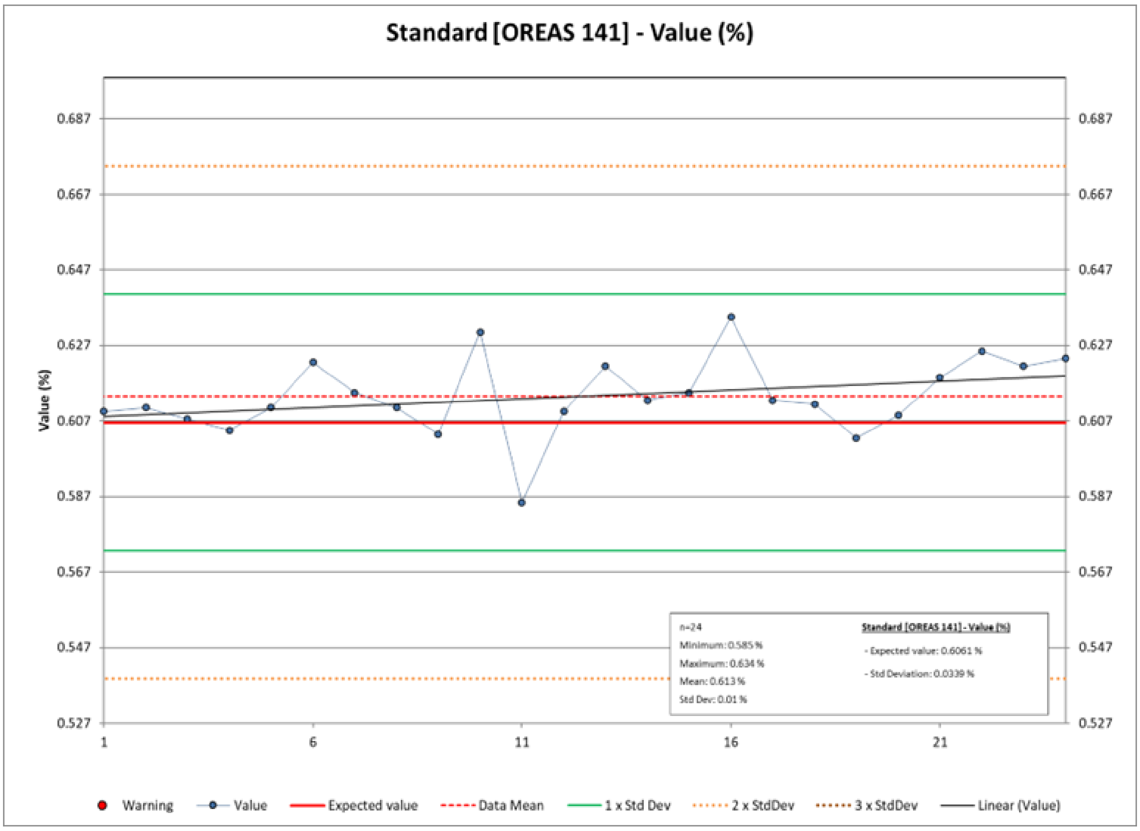
11.5.3 Cornish Metals (2022-2023)

A total of 789 samples were submitted from the Cornish Metals 2022-2023 metallurgical drilling project, including 132 QAQC samples comprising CRMs, blank material, and quarter-core duplicates. This excludes the samples taken from the Dolcoath Zone which remain outstanding at the time of writing. CRMs and blanks were generally inserted at a rate of 1:20 samples respectively, to ensure enough QAQC was obtained from the small batch size.

11.5.3.1 CRMs

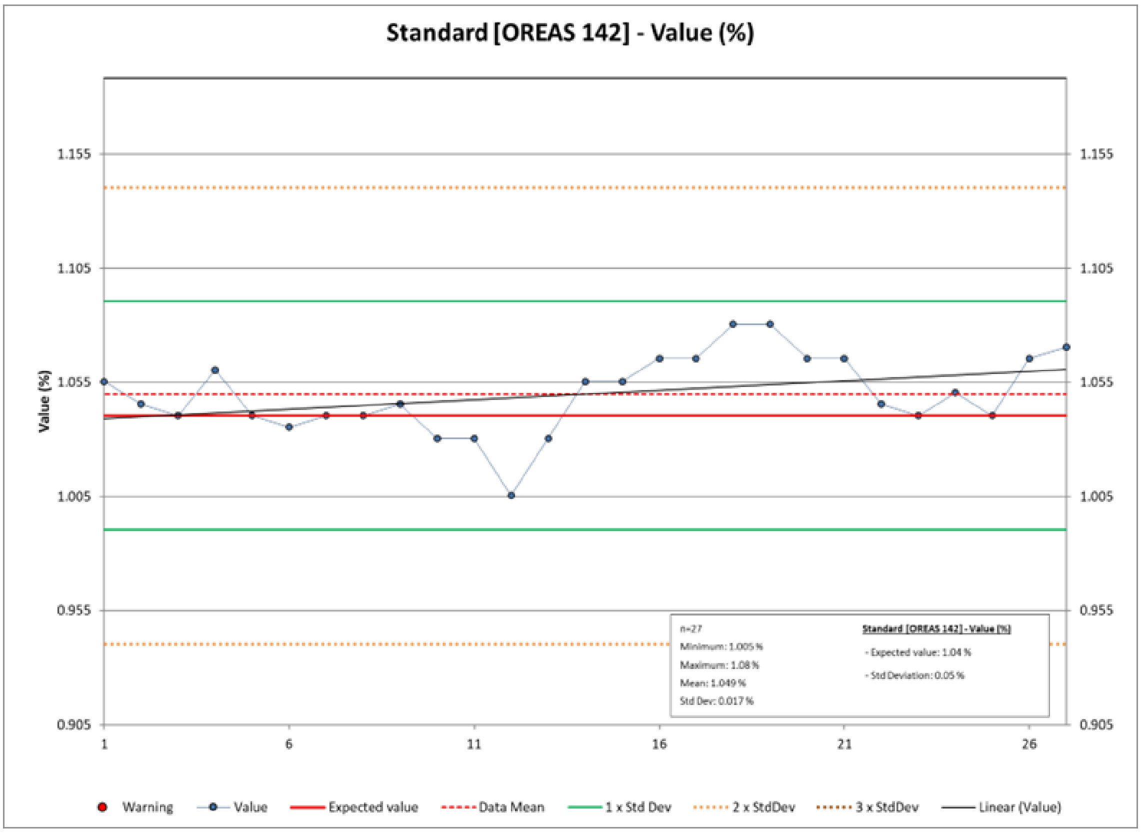
A total of 41 CRM samples were submitted during the 2022-2023 programme. These comprised a mixture of tin mineralisation: OREAS 141 and OREAS 142. No sulphide CRM was used as the mineralisation at the South Crofty Lower Mine area is known to be predominately cassiterite. All CRM samples for Sn showed results falling within ± 1 standard deviation of the target value using the primary assay method ME-XRF15b (Figure 11.11 and Figure 11.12). Cu and Zn performed adequately considering they used an ICP assay technique. Zn had two samples with warnings outside 2 standard deviations namely: AA-03940 and AB-03620. Both samples were OREAS 142 (2,436 ppm) and were undermeasured (2,240 ppm and 2,270 ppm).

Figure 11.11 Sn CRM results for OREAS-141 (2022/2023)



Source: AMC, 2023.

Figure 11.12 Sn CRM results for OREAS-142 (2022/2023)

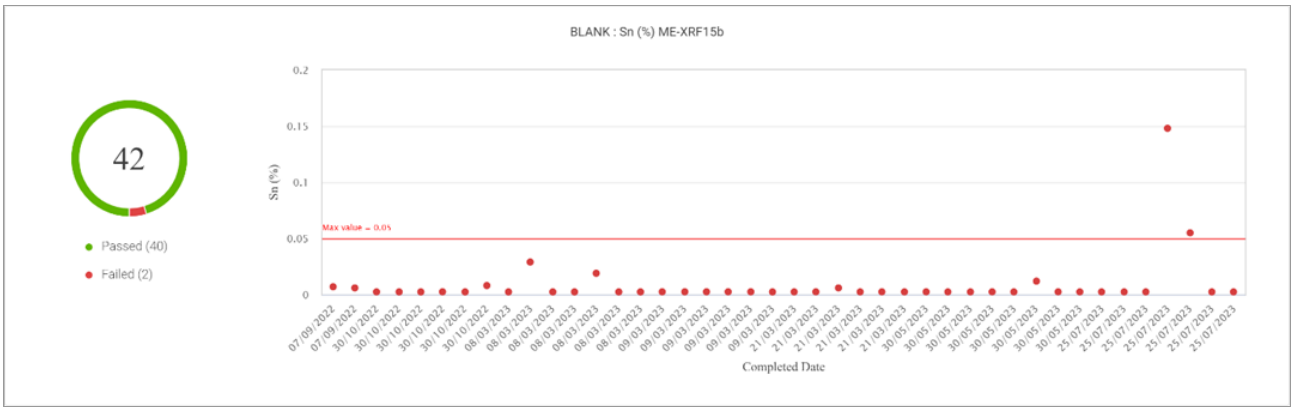


Source: AMC, 2023.

11.5.3.2 Blanks

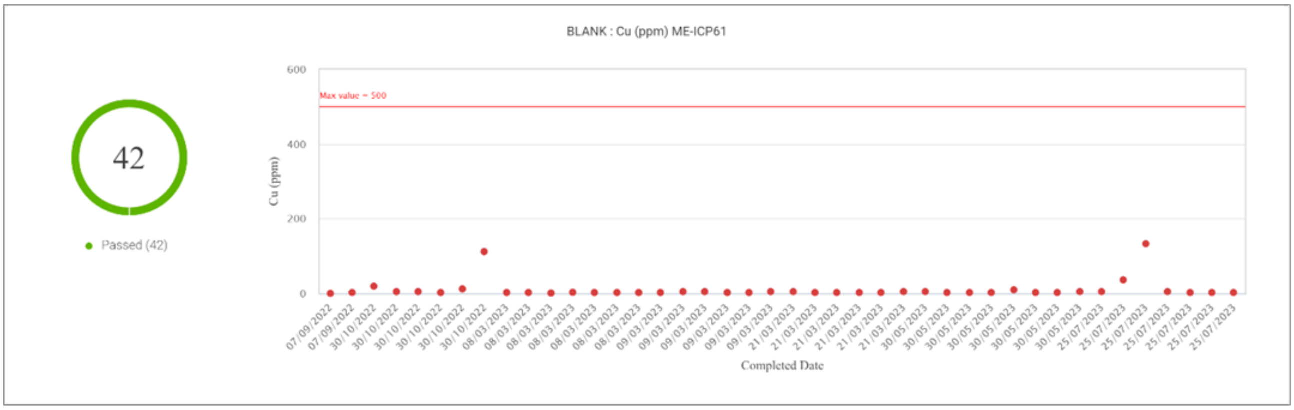
Blanks comprising 42 samples of a crushed granite aggregate from a local quarry were used during the drill programme. Analysis for Cu passed on all 42 samples (Figure 11.14) but Zn and Sn had failures (values above 500 ppm). Zn had one failure in sample AA-03885 (Figure 11.15), and Sn had two in samples AB-04650 and AB-04670 (Figure 11.13).

Figure 11.13 Sn (%) in blank material using ME-XRF15b



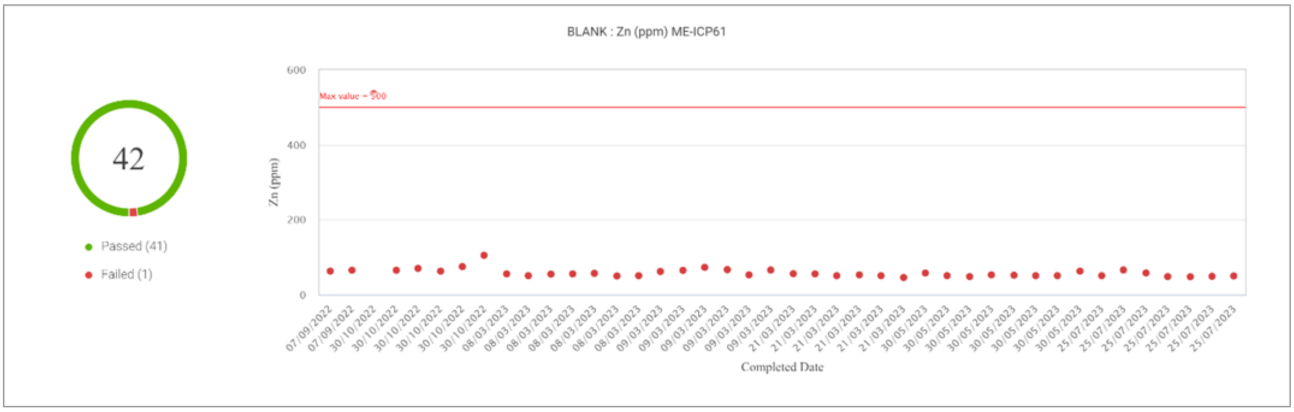
Source: Cornish Metals, 2023.

Figure 11.14 Cu (ppm) in blank material using ME-ICP61



Source: Cornish Metals, 2023.

Figure 11.15 Zn (ppm) in blank material using ME-ICP61



Source: Cornish Metals, 2023.

For the Sn failures, the blank sample followed two very high-grade samples (31.4% and 23% Sn). ALS internal procedure dictates that <1% sample carryover post-cleaning between samples, is acceptable and so does not fail ALS internal QAQC procedures. Though they aim for 0.1% carryover. In the two blank samples above, there is no carryover above 0.6% across the pulverising and crushing process so they deem it a successful clean. This is the first instance of failed blanks in the QAQC programme and as such the cleaning process with ALS is currently under review.

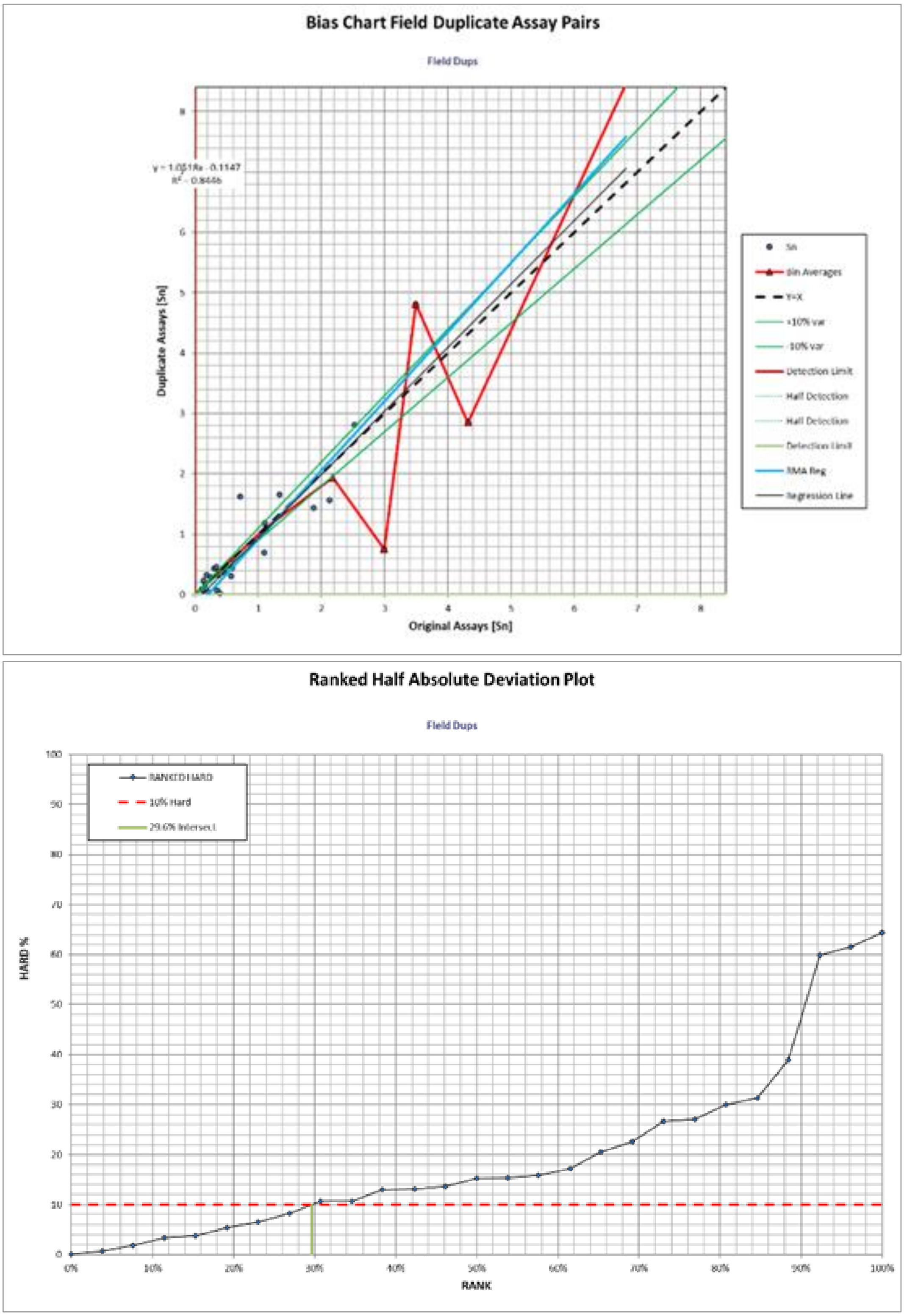
Similarly for the Zn failure, there were several high-grade zinc assays around AA-03885 that were likely pulverised in the same bowl, leading to a carryover / smearing affect into the blank material.

11.5.3.3 Field duplicates

The QP has been provided with results for 29 quarter-core duplicate samples that were taken over the duration of the metallurgical drilling programme.

Overall, the field duplicates show poor precision (Figure 11.16) comparable to the field duplicate results from 2008-2013 (Section 11.5.1.7) particularly for higher grades.

Figure 11.16 Field duplicate scatter and rank HARD plot results for Sn (2023)



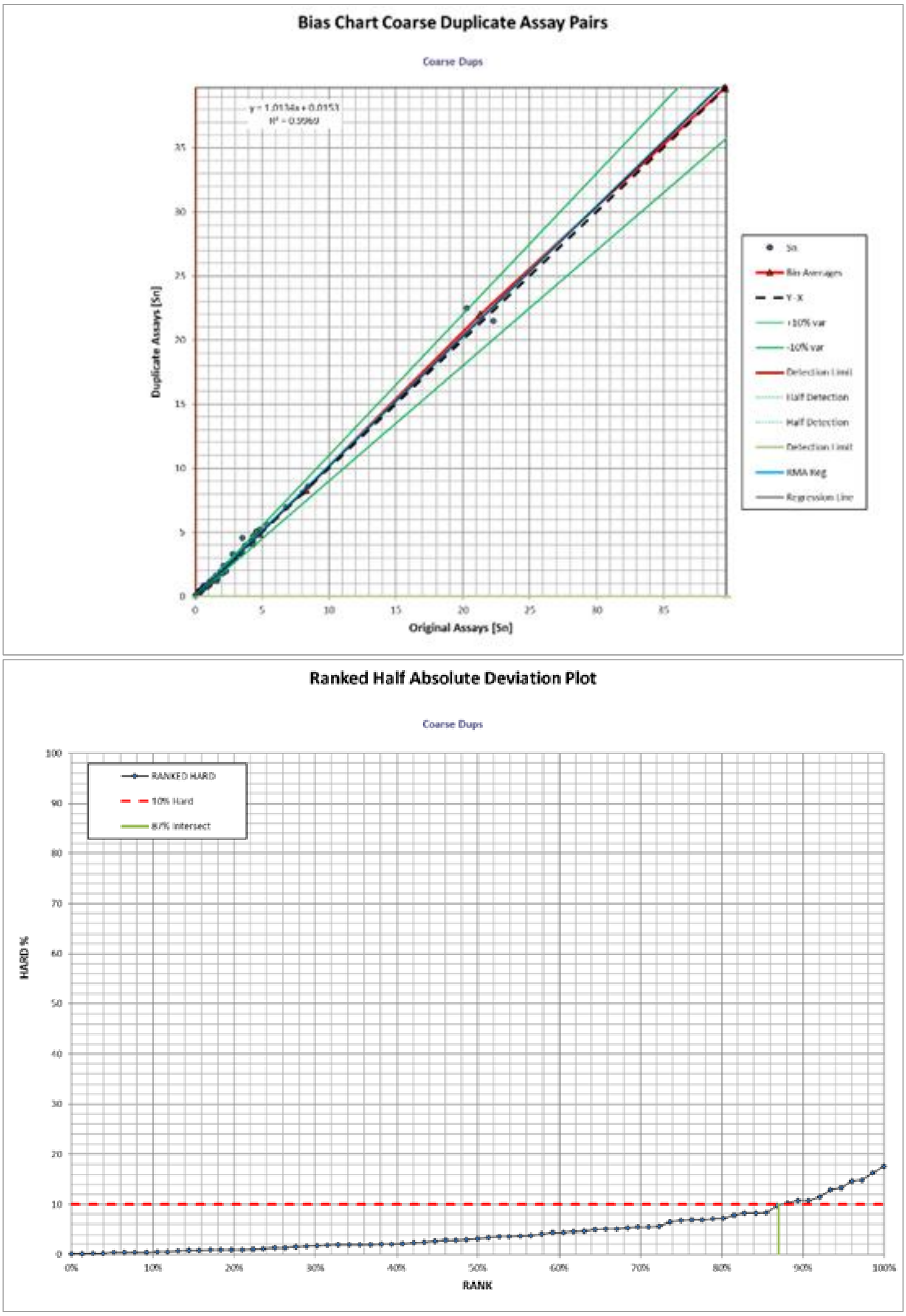
Source: AMC, 2023.

11.5.3.4 Coarse reject duplicates

Seventy-nine (79) coarse rejects were selected for duplicate analysis in order to identify the inherent variability in the mineralisation. Correlation of these to the original assays was excellent, with an R2 value of 0.9969 as shown in Figure 11.17.

The 79 coarse rejects comprised material crushed splits of the sample material from the original half-core assays as well as the corresponding quarter-core field duplicates (Figure 11.16). The results indicate that at the crushing stage of sample preparation process, the sample material becomes homogenized, enabling representative splits to be obtained.

Figure 11.17 Coarse duplicate scatter and rank HARD plot results for Sn (2023)

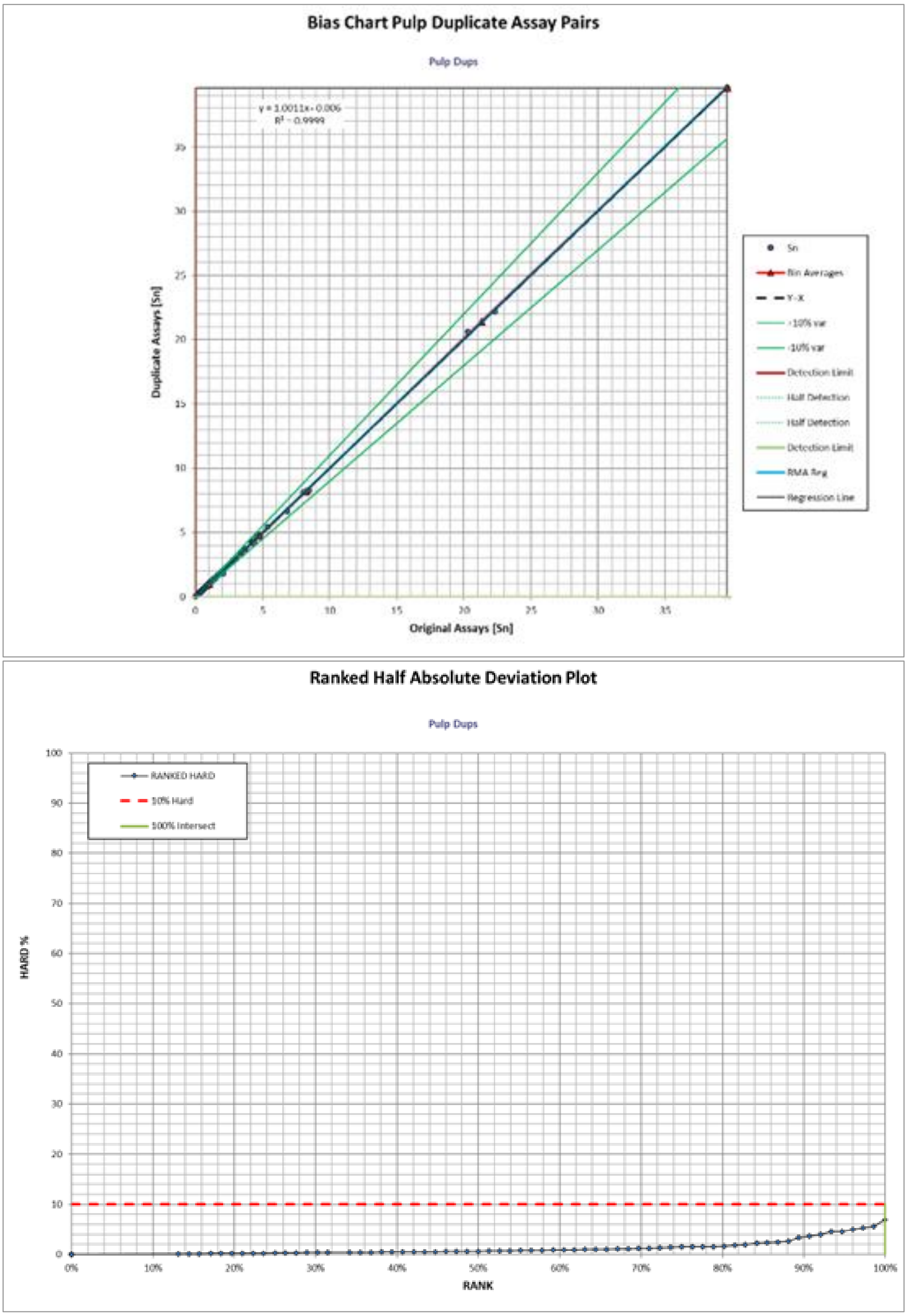


Source: AMC, 2023.

11.5.3.5 Pulp duplicates

A total of 79 sample pulps, corresponding to the same sample intervals for the coarse duplicates discussed previously (Section 11.5.3.4) were selected for analysis. The correlation of pulp duplicates was excellent, with an R2 value of 0.999 as shown in Figure 11.18.

Figure 11.18 Pulp duplicate scatter and rank HARD plot results for Sn (2023)



Source: AMC, 2023.

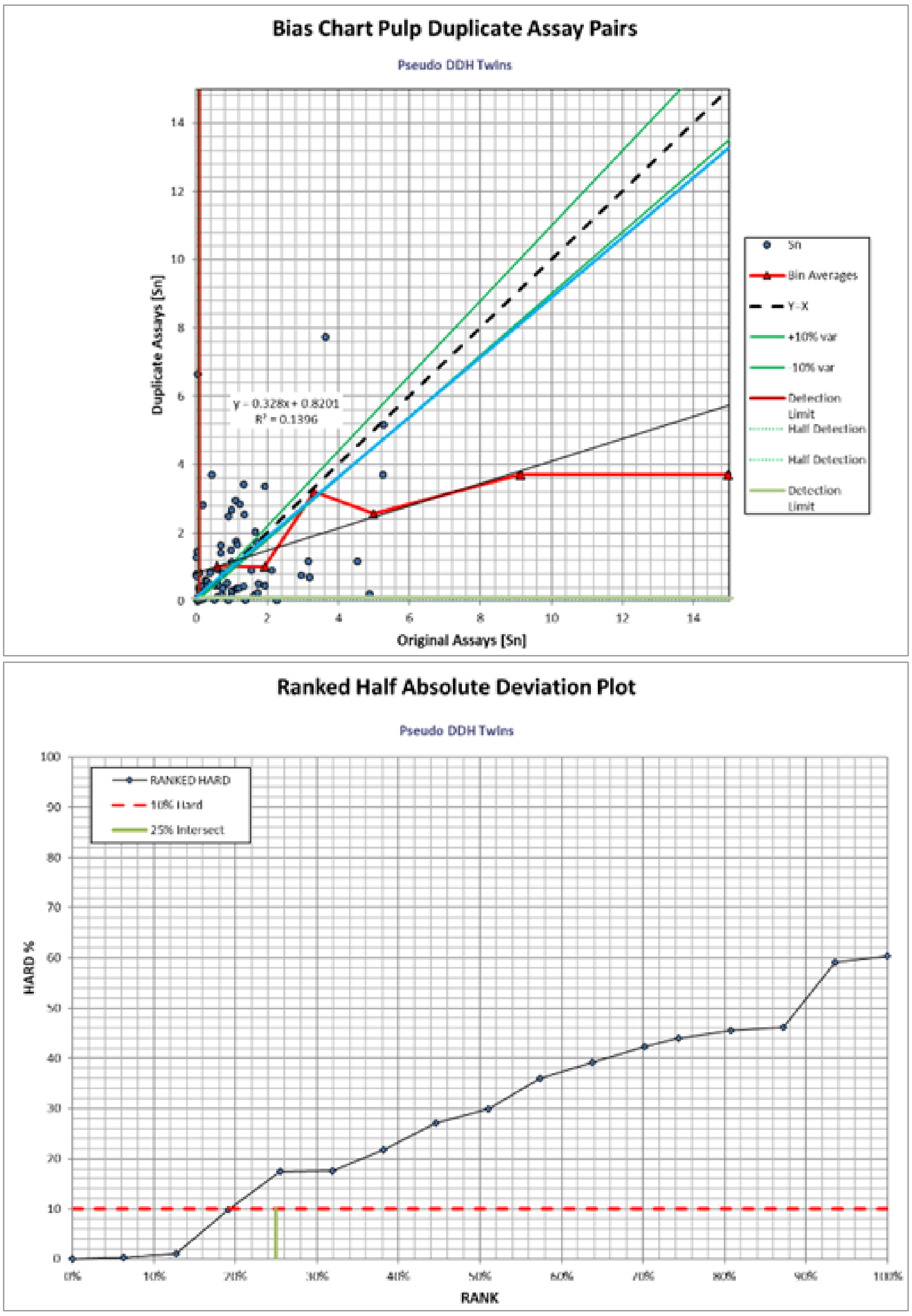
11.6 Twinning analysis (Upper and Lower Mine)

Due to a lack of QAQC submissions for the Lower Mine the QP opted to assess grade variability at a small-scale between drillholes, and between drillholes and channel samples. Whilst no dedicated twin sampling has been reported at the Project, a pseudo-twinning approach was taken.

Initially a comparison was undertaken comparing adjacent drillholes with sample spacings of <5 m. A total of 216 sample pairs were identified with spacings of <5 m.

A scatter plot and rank HARD plot of the twinning results is shown in Figure 11.19. Based on the results there is a high variability and poor repeatability between the twinned samples. The degree of variability is greater than that achieved by the 2008-2013 field duplicates (Figure 11.5).

Figure 11.19 Pseudo drillhole-to-drillhole twinning analysis, Sn



Source: AMC, 2021.

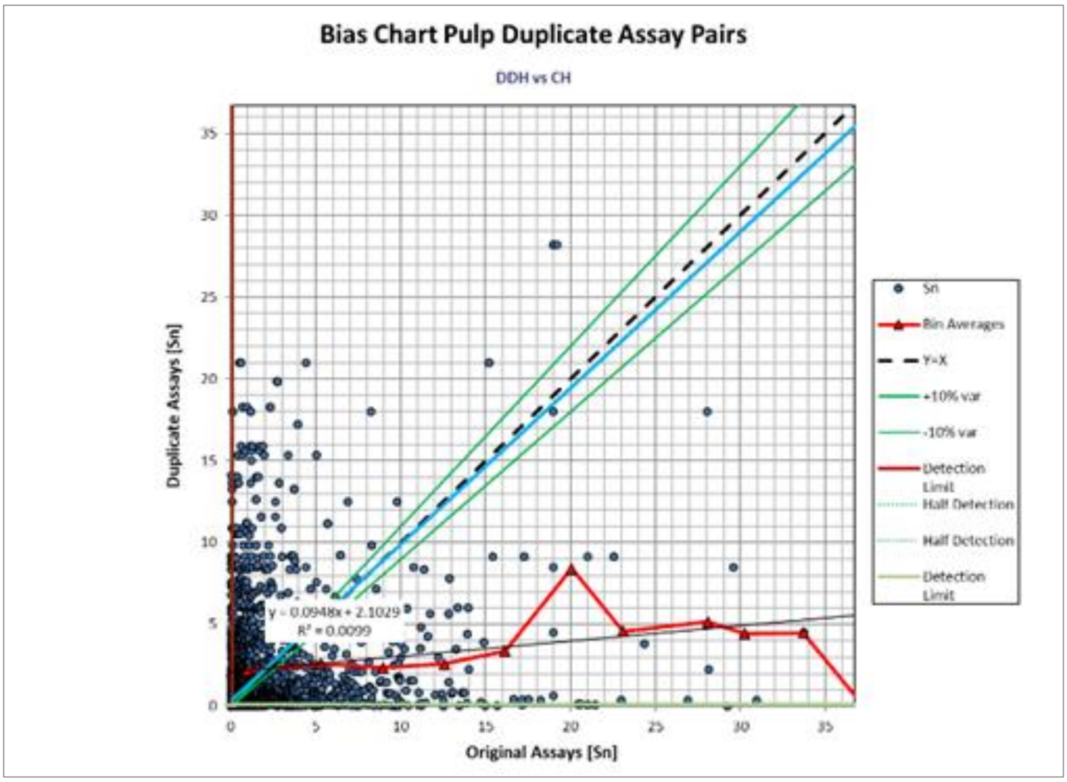
A second pseudo-twinning analysis was undertaken comparing drillholes to channel samples, with sample pairs selected on a spacing of <5 m. This comparison was undertaken to ascertain if any bias is present between the channel and drillhole sampling methods. A total of 3,474 sample pairs with a sample spacing of <5 m was identified for the analysis.

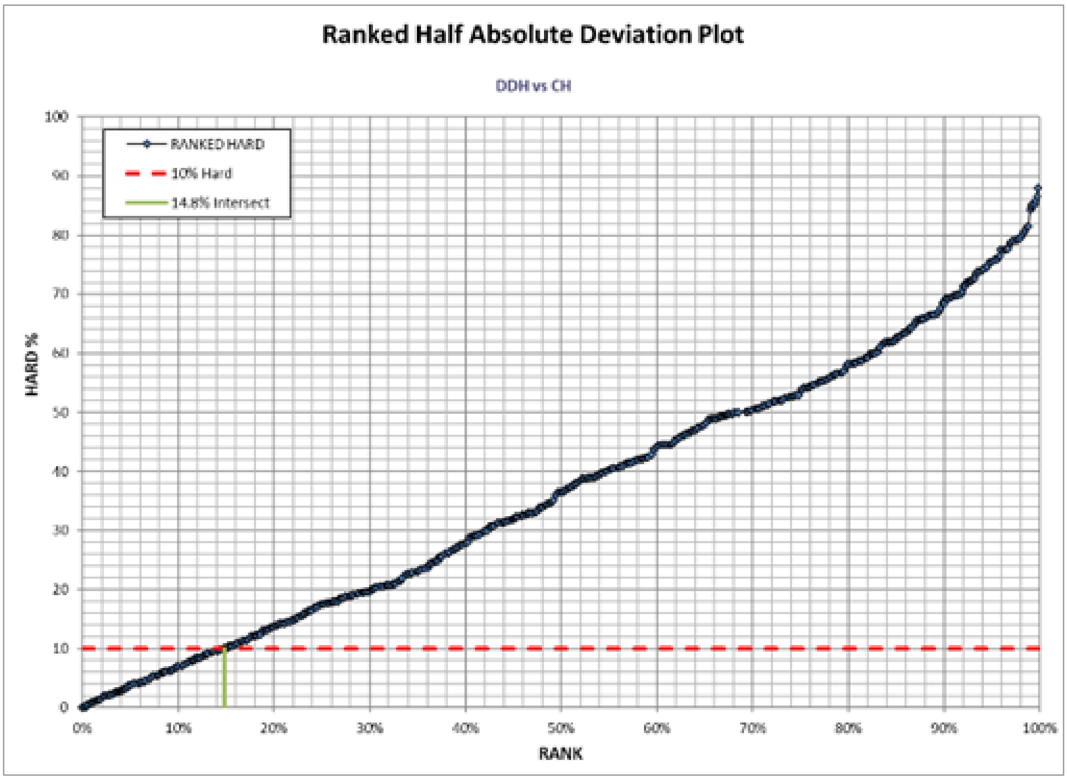
Results of the pseudo-twinning analysis are provided in Figure 11.20.

The QP has considered the poor repeatability of the pseudo-twinning in relation to the field, crushed, and pulverised sample duplicates. Taken in conjunction with one another the results indicate that there is significant small-scale variability within the deposit at both the pseudo twin hole, and field duplicate scales. Following crushing sample precision and repeatability increases significantly, with further slight improvements following pulverisation. The results are comparable with other nuggety styles of mineralisation (narrow-vein gold deposits, etc.) that the QP has worked on.

The QP is of the opinion that the poor repeatability of the pseudo-twinning reflects the inherent compositional and distributional heterogeneity of the mineralisation rather than a sampling error. The QP therefore considers the historical sample data suitable for use in a Mineral Resource estimate.

Figure 11.20 Pseudo drillhole-to-channel twinning analysis, Sn





Source: AMC, 2021.

11.7 Conclusions

A review of the duplicate assay results for both the Upper Mine (2008-2013 drilling) and the Lower Mine (2020 and 2022-2023 drilling) show comparable results. Field duplicates show a poor level of precision which is markedly improved following the crushing and pulverisation stages of sample preparation. The results indicate that mineralisation is inherently nuggety and homogenization of the samples is achieved only following the crushing stage.

Based on the pseudo-twinning analysis, and the review of duplicate assay results, the QP is of the opinion that grade variability is likely a function of the inherent compositional and distributional heterogeneity of mineralisation rather than a sampling issue. The pseudo twin hole results show variability that would be anticipated from a nuggety deposit with corresponding increases in precision as the sample is subjected to crushing and pulverisation. The improvement in precision post-crushing is in line with the QPs experience of other nuggety styles of mineralisation.

The inherent compositional and distributional heterogeneity of the mineralisation is further supported by the metallurgical drilling conducted by Cornish Metals in 2022-2023. The use of directional and wedge drilling to provide clusters of drillholes intercepting the lodes, provides further examples of grade variability at a short spatial scale. Table 10.3 summarises some of the 2022-2023 mineralised intercepts that were assayed and used in the Mineral Resource estimates. The results show that even between close-spaced holes assays can be highly variable. In lode No. 4 drillhole SDD20_001B has a composite length weighted grade of 10.33% Sn, with individual interval grades ranging from 0.178% Sn to 39.60% Sn. In contrast, drillhole SDD20_001C1 located 4 m from drillhole SDD20_001B has a grade of 0.01% Sn.

Where blank samples have been submitted for the 2008-2013 drilling works and the Cornish Metals 2020 and 2022-2023 drilling, no evidence of significant sample contamination has been identified. There are a few instances identified in 2023 which show potential low-level contamination in sample preparation of very high-grade Sn samples; however, this fits in acceptable limits for ALS internal QAQC checks. The sample equipment cleaning procedure is currently under review by Cornish Metals.

CRM submissions for the 2008-2013 drilling and the Cornish Metals 2020 and 2022-2023 drilling show good levels of analytical accuracy.

The digitisation of historical sample and survey data by Cornish Metals has been undertaken in a diligent manner with no evidence of significant transcription of digitisation errors noted.

The QP has reviewed sample preparation, analysis, security protocols, and QAQC employed at the South Crofty Project by previous and present operators. Based on this work the QP is of the opinion that the sample data is suitable for use in the Mineral Resource estimation.

12 Data verification

12.1 Introduction

The sample data used in the current Mineral Resource estimate is reliant on a significant portion of historical data obtained prior to the mine closure in 1998, and a lesser amount of sample data obtained from the 2008-2013 drilling for the Upper Mine, and drilling from 2020-2023 for the Lower Mine.

The QP has focused on verifying the exploration data available and ascertaining the support as to the validity and suitability of the data for use in a Mineral Resource estimate. The QP has therefore undertaken the following verification checks:

- Site visit.
- Review of assay certificates against the sample database.

12.2 Site visit

Site visits have been completed to the Property on 14 July 2023, and 4 February 2020 by AMC Principal Geologist, Mr Nick Szebor, MCSM, MSc, BSc, CGeol, EurGeol, FGS, to undertake the following:

- Discussions with the site geologists regarding:
  - The data digitisation and verification works undertaken to digitise the sample data.
  - Review of a selection of historical documentation.
  - The availability of QAQC data.
  - Geological setting of the Project.
  - Geological modelling and interpretation works.
  - Block modelling and grade estimation activities.
- Visit to the mine offices, mine archive, core yard, water treatment plant, and NCK Shaft and headframe.
- Due to flooding of the mine workings, access to the underground development was not possible.

A site visit was conducted by AMC Principal Mining Engineer, Mr Dominic Claridge, FAusIMM on 30 August 2023 who visited all the key mining infrastructure locations on surface and accessible parts of the underground prior to commencement of de-watering.

12.3 Core review

No core was available at the time of the site visit for correlation against assay certificates owing to the submission of the whole core for the metallurgical testwork programme. Whilst the QP was able to observe recovered drill core for drillhole TN21-001, the drillhole was awaiting logging and therefore no detailed log sheets or assays were available. Other drillholes completed at the time of the site visit as part of the 2022-2023 metallurgical drilling had already been logged and split into sample bags for submission to the laboratory for the metallurgical testwork.

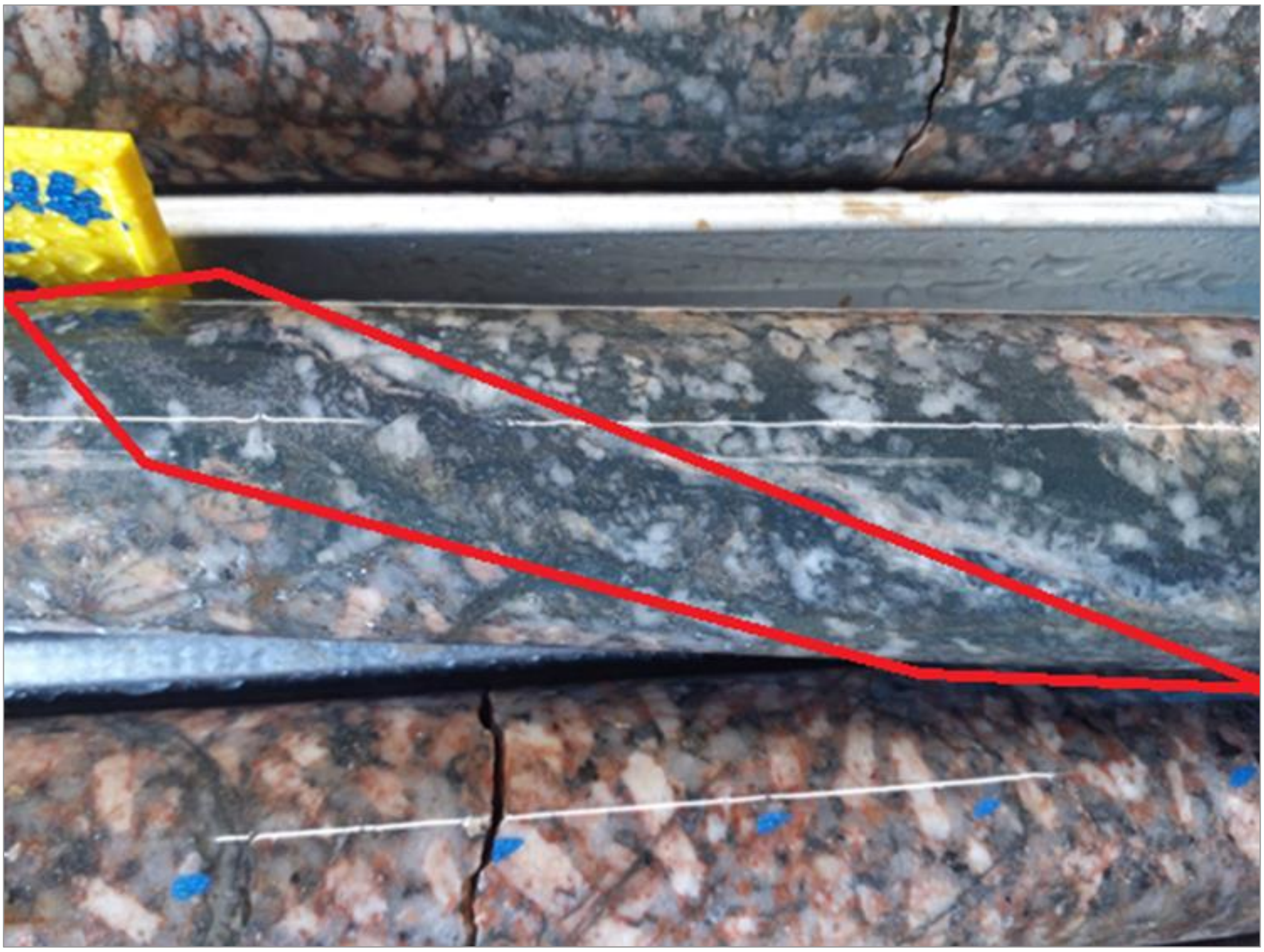
Samples bagged and awaiting shipment to the laboratories for testing comprised samples for drillholes:

- SDD23_001
- SDD22_001B1B
- SDD22_001B1B4
- SDD22_001B1B5
- SDD22_001B1B8
- DD22_001C1F

Core photos (wet and dry) were provided to the QP for the completed 2022-2023 metallurgical drillholes. The QP has reviewed the core photos against the mineralised intercepts informing the Mineral Resource estimates, as summarised in Table 10.3.

Assay results were checked against the core photos, and for the key mineralised intercepts visible cassiterite mineralisation was noted in the core photos (Figure 12.1).

Figure 12.1 Tin mineralisation in drillhole SDD22_001B1B at 844.75 m



Source: Cornish Metals, 2023.

12.4 Assay certificate checks

The QP has independently completed assay certificate checks against the sample database used in the Mineral Resource estimate. Checks have been carried out on a selection of drillhole and channel samples for several lode areas.

Assay certificates for a total of 70 drillholes were compared against the sample database used in the Mineral Resource estimate. The selected drillholes included seven holes drilled between 2008 and 2013, with the remaining holes drilled prior to the mine closure in 1998. Assay certificates from the external laboratories were supplied by Cornish Metals as scanned PDF documents.

In reviewing the drillhole assay data the QP noted the following:

- Hole 85/E1, 7.7 m to 8.5 m a value of 7.95% Sn is recorded in the sample database compared to 1.95% Sn in the original assay certificates, reflecting a data transcription error.
- In holes 86E/197 and 85E/303 not all data at the end of holes has been digitised.

- Data for hole 86E/168 has been entered twice for both hole 86E/168 and hole 86E/169.
- Hole 86E/17a is missing a value for the interval 28.9 m to 29.6 m (0.06% Sn).
- Some inconsistent use of 0.01% Sn and 0% Sn to denote assays below detection limits.

For the channel sample assays the QP was supplied with scanned copies of the mine ledgers. The mine ledgers comprise level plans of the mine development, showing the spatial position of each channel sample. The ledgers also record the tin assay grade and the channel length. Ledgers for those channel samples assayed using the vanning method record the assay results in SnO_2 lbs/tonne, and the channel length in feet (Figure 12.2). Ledgers recording assays using the XRF method disclose assays in Sn% and channel lengths in metres (Figure 12.3).

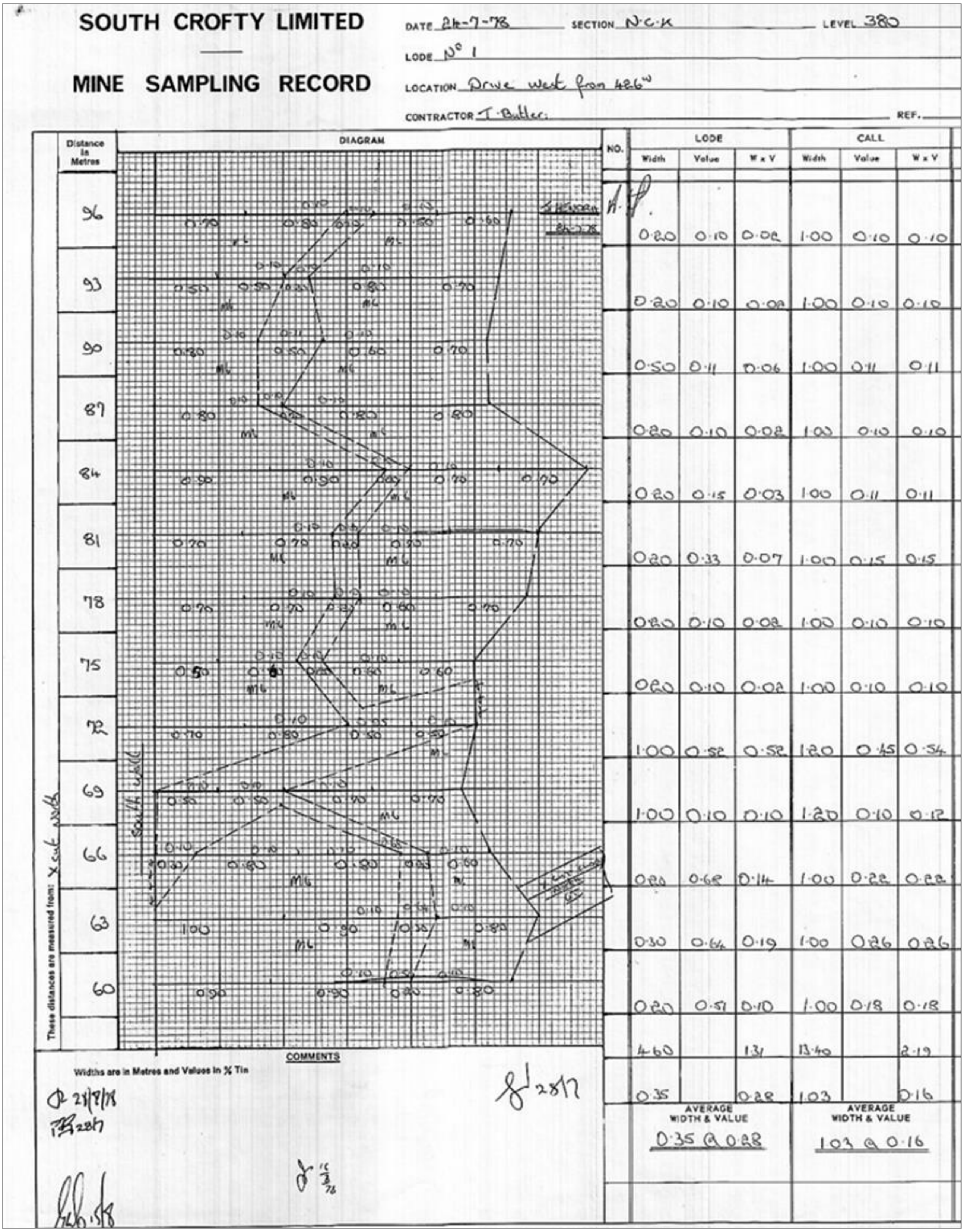
The QP reviewed a total of 416 channel sample assays from the original mine ledgers against the sample database for lodes No. 1 & 2, No.3, and Main, Intermediate, North, and Great. Each ledger clearly states the lode and level where the channel samples are situated. The QP spatially located the channel samples in Datamine Studio RM, and correlated the position to that shown in the ledgers. Each channel sample assay and channel length in the ledgers was then compared against the records within the sample database. For those ledgers containing vanning assay results the QP carried out a conversion of SnO_2 lbs/ton to Sn%, as well as conversion of sample length from feet to metres.

A total of 99% of the ledger results checked correspond to the channel sample intervals recorded in the sample database used in the Mineral Resource estimates. The QP notes the following:

- Main lode (Main, Intermediate, North, and Great lode area), channel sample M/CH/195/354W, interval 0 m-0.4 m, appears to be from a different lode or sub load relative to samples further along-strike.
- Main lode (Main, Intermediate, North, and Great lode area), channel sample M/CH/290/390W, interval 2.3 m-2.8 m, recorded as trace value but database shows a grade of 0.5% Sn.
- Lode 2E (No. 1 and No. 2 lode area), channel sample 2/CH/290/306.5E, interval 1.16 m-1.52 m, database records an assay of 0.59% Sn but ledger shows it should be 0.39% Sn.
- WET lode (No. 1 and No. 2 lode area): One interval illegible in the ledger.

A summary of the ledger review for the Lower Mine is provided in Table 12.1.

Figure 12.2 Example channel sample ledger for vanning assays, No. 1 lode, Level 380



SOUTH CROFTY LIMITED

MINE SAMPLING RECORD

DATE 24-7-78 SECTION N.C.K LEVEL 380

LODE No 1

LOCATION Drive west from 426W

CONTRACTOR T. Butler. REF.

Distance in Metres	NO.	Lode Width	Lode Value	Lode W x V	Call Width	Call Value	Call W x V
96		0.20	0.10	0.02	1.00	0.10	0.10
93		0.20	0.10	0.02	1.00	0.10	0.10
90		0.50	0.11	0.06	1.00	0.11	0.11
87		0.20	0.10	0.02	1.00	0.10	0.10
84		0.20	0.15	0.03	1.00	0.11	0.11
81		0.20	0.33	0.07	1.00	0.15	0.15
78		0.20	0.10	0.02	1.00	0.10	0.10
75		0.20	0.10	0.02	1.00	0.10	0.10
72		1.00	0.52	0.52	1.20	0.45	0.54
69		1.00	0.10	0.10	1.20	0.10	0.12
66		0.20	0.68	0.14	1.00	0.22	0.22
63		0.30	0.64	0.19	1.00	0.26	0.26
60		0.20	0.51	0.10	1.00	0.18	0.18
		4.60		1.31	13.40		2.19
		0.35		0.28	1.03		0.16
		AVERAGE WIDTH & VALUE	0.35 @ 0.28		AVERAGE WIDTH & VALUE	1.03 @ 0.16	

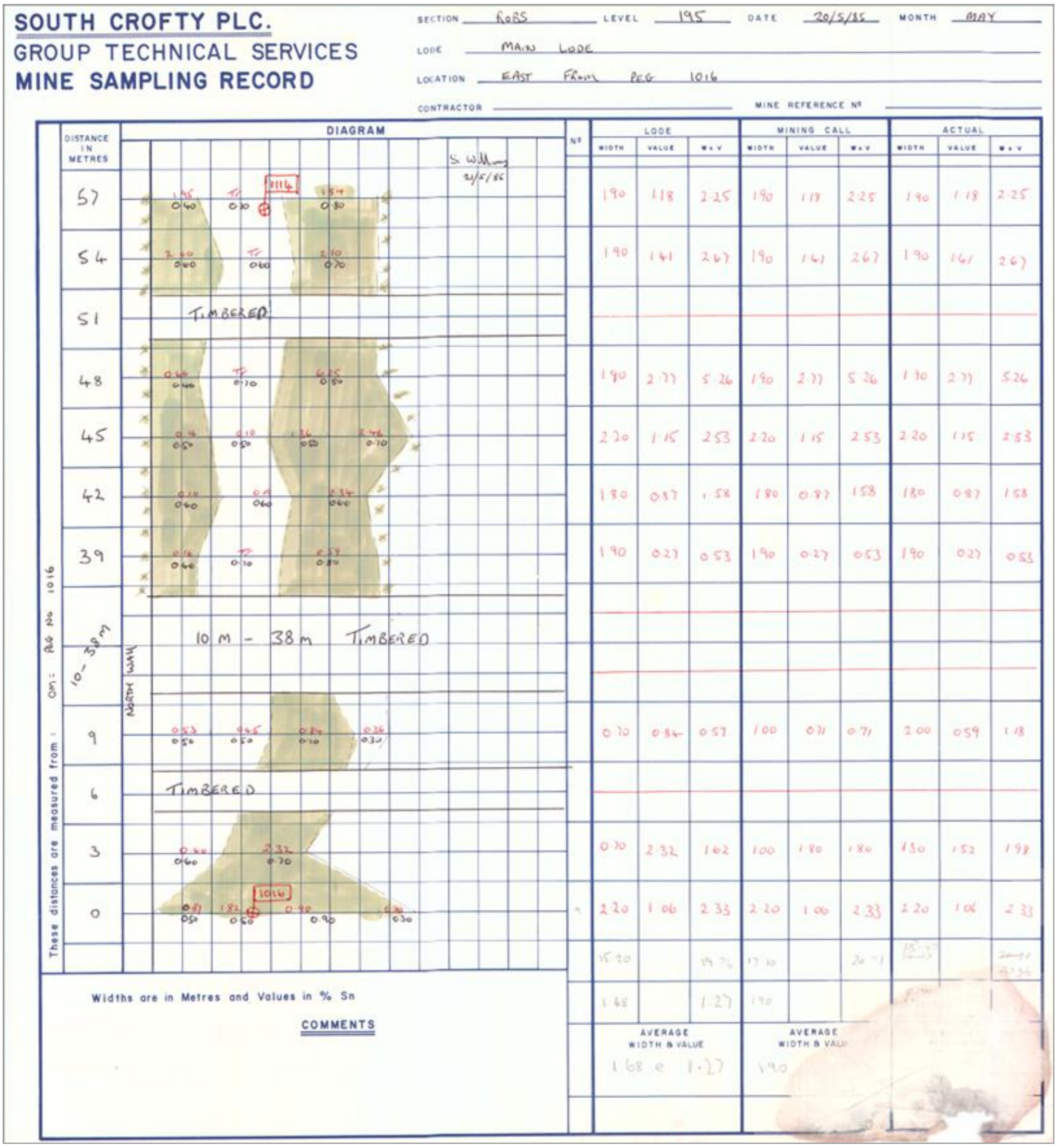
These distances are measured from: X cut wall

Widths are in Metres and Values in % Tin

COMMENTS

Source: South Crofty Ltd., 1978.

Figure 12.3 Example channel sample ledger for XRF assays, Main lode, Level 195



Source: South Crofty Plc, 1985.

During the ledgers review the QP identified that in some areas a number of channels samples have not been incorporated into the sample database. In discussion, with Cornish Metals, the QP has been advised that this is due to the extensive number of historical channel samples, with Cornish Metals choosing to focus on digitising the principal structures making up the lodes. The omitted channel samples do not appear to show bias, with no preferential treatment of high- or low-grade samples.

Given some of the small-scale complexity of the lodes, including splays in the mineralised structures, the QP recommends further work be undertaken to incorporate more of the channel samples into the Mineral Resource database.

Overall, the QP is of the opinion that the discrepancies noted above would not have a material impact on the Mineral Resource estimate. The sample database is a fair representation of the original assay certificates and ledgers and is suitable for use in the Mineral Resource.

Table 12.1 Lower Mine assay ledger review summary

Lode area	Lode	Total samples	# Samples selected for verification	Assays confirmed[1]	Errors noted[2]	Ledger error[3]	% Samples verified
No. 1 & 2	No. 1	1,485	95	95	0	0	6
	No. 2	1,812	67	67	0	0	4
	No. 2e	378	15	14	1	0	4
	WET	722	76	75	0	1	11
No. 3	No. 3	2,603	98	98	1	1	4
Main, Intermediate, North, and Great	Main	1,284	19	17	2	0	2
	Intermediate	333	15	15	0	0	9

Notes:
[1] Assay results match certificate ignoring minor rounding and truncation discrepancies.
[2] Assay value does not match ledger.
[3] Ledger reference illegible or number in the database incorrect.

12.5 Database checks

12.5.1 Cornish Metals database checks

The South Crofty pre-closure database has been subject to audit and data validation between the digital database and the original sample logs by Cornish Metals personnel. Locations have been checked for the conversion from mine grid to national grid and sample azimuths and dips checked against original logs and the mine plans. Geological logs were verified to ensure that the geological log and location of the sample corresponded with the interpretation of the geology in that area.

No direct verification of assays can be carried out as all original sample material has been destroyed or lost through the previous operations. Support for the veracity of the sample data, and the estimates on which they are based is provided by the mine production records and monthly reports.

The QP has reviewed the process of data compilation and checking undertaken by Cornish Metals and is of the opinion that the work has been undertaken in a diligent manner.

12.5.2 Mine grid

During operation, the mine operated on a mine grid system. This grid was centered on the collar of Robinsons shaft at the point 166676.611E. 41444.630N. All elevations in the mine are based on mine datum. This is 2,000 m below Ordnance Datum Liverpool.

Since the 1980s all surveys were converted from the mine grid system to the OS National Grid. Cornish Metals has digitised the level plans, sections, and sample locations in the OS National Grid and mine datum elevations, which have been referenced using the original survey peg locations.

Extensive survey records have been maintained throughout the Mine’s history, including the original surveyors' calculation books, and a digital survey database which was generated in the 1980s-1990s. To ensure the integrity of the surveys at the time, computations were reviewed and verified by another member of the survey team.

Under the UK Mines and Quarries Act 1954 and the Mines Regulations 2014, the mine operator must ensure that there are accurate plans of the workings in the mine (whether abandoned or not), and accurate sections of the veins. The Mines and Quarries Act provides strict guidance regarding the accuracy of the survey information and the safe storage and retention of information.

The QP has visited the Cornish Metals archive and notes the secure storage of the survey, assays, and associated information as part of the statutory requirements under the UK Mines and Quarries Act 1954 and the Mines Regulations 2014.

Due to the current flooding of mine workings, access to conduct additional surveys is not possible. To provide support to the veracity of the surveys, Cornish Metals has undertaken its own review of the computation books and surveys.

Further support is provided from the parent hole and two daughter holes drilled by Cornish Metals in 2020, and the more recent 2022-2023 metallurgical drilling. To prevent the holes collapsing or drill rods getting stuck it was imperative that the planned holes did not intercept any of the extensive historical workings. Based on the digitised surveys, Cornish Metals planned the holes to trace between workings to intercept lodes at depth. The holes successfully avoided key mine workings and intercepted lodes where expected. The success of this drilling was heavily reliant on the accuracy and validity of the mine surveys and provides indirect support to the accuracy of surveys.

The QP is of the opinion that whilst access to independently check the mine surveys is not currently possible, the extensive mine survey records provide a clear audit trail. The checks undertaken by Cornish Metals on the computation books and the digitisation of data is reasonable and robust and is suitable for use in a Mineral Resource estimate.

12.6 Conclusions

In the QP’s opinion the data is adequate for the purposes used in this Technical Report.

13 Mineral processing and metallurgical testing

13.1 Introduction

The metallurgical flowsheet development for this project has primarily been based on the well-known and recorded decades of mine production and processing history. As part of the project development diamond core samples from the mineralised structures have been sampled and used to verify the historic operational production records, operating data, and flowsheet.

A large scale 10,312 m diamond drilling programme was completed in 2023 collecting 1,162 kg of samples from five 'lode' areas: No. 4, No. 8, Roskear, NPZ, and Dolcoath.

WAI was commissioned by Cornish Metals Ltd to provide metallurgical testing services, with the testwork programme separated into two phases; Phase 1: Sample Characterisation, which leads on to Phase 2: Flowsheet development and Verification testing. Data and results presented cover testing conducted as part of Phase 1 as the metallurgical testing is ongoing at the time of preparing this Technical Report (Phase 1 – Sample Characterisation Testwork Report, November 2023, Report Number R001).

13.2 Historic processing

South Crofty has had an extensive operation history prior to its closure in 1998, historical mill records support that the mineralisation is recoverable through the adoption of a suitable milling and processing route.

Processing of mineralisation from South Crofty prior to 1988 was undertaken at the South Crofty mill located on the mine site. From 1988 until the mine closure in 1998, ore was transported and processed at the Wheal Jane process plant, at Baldhu near Truro.

Processing of ore at the South Crofty mill produced two gravity concentrates from an initial head grade of 0.84% Sn:

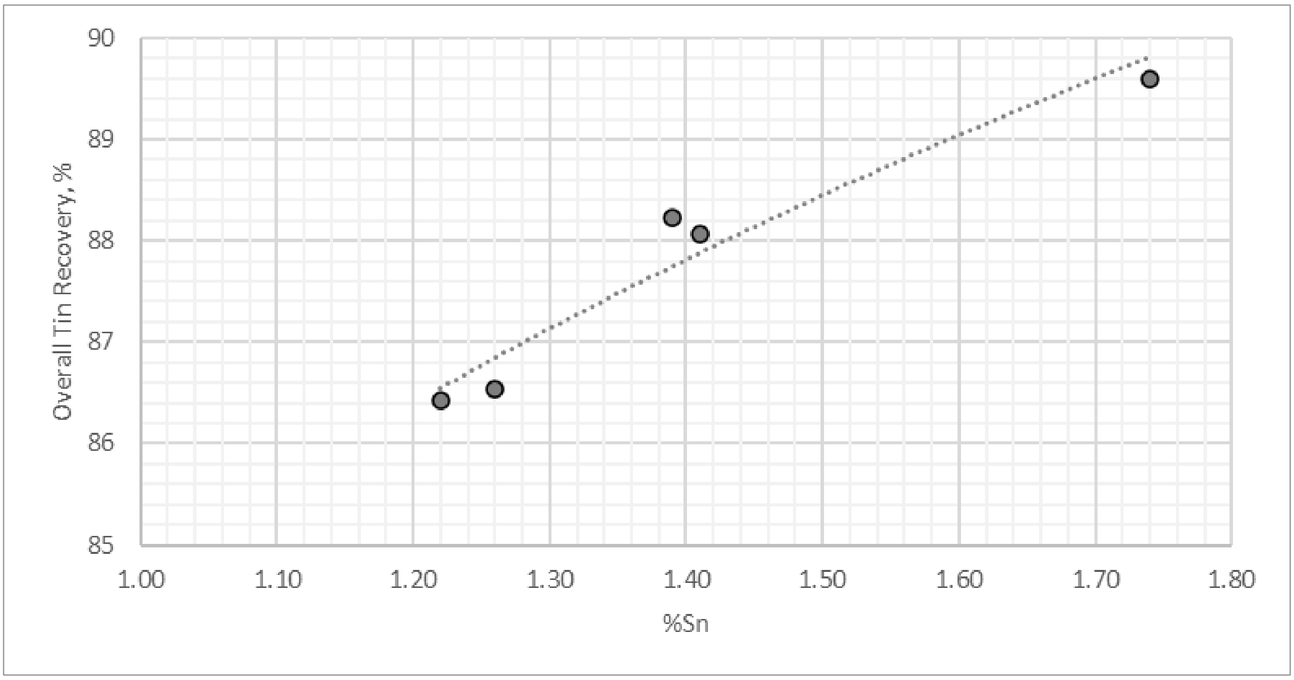
- Low-grade concentrate grading 26% Sn.
- High-grade concentrate grading 47% Sn.

Overall tin recovery for the South Crofty mill was reported at 73%.

Improved recoveries have been reported for ore processed at the Wheal Jane mill where both gravity and tin flotation processes permitted recovery of fine Sn particles that would have been lost to tailings in a gravity-only circuit as employed at the South Crofty Mill. For production in 1997 an average recovery of 88.5% was reported from a head grade of 1.40% Sn. Gravity and flotation concentrates were produced with a combined recovered grade averaging 58% Sn.

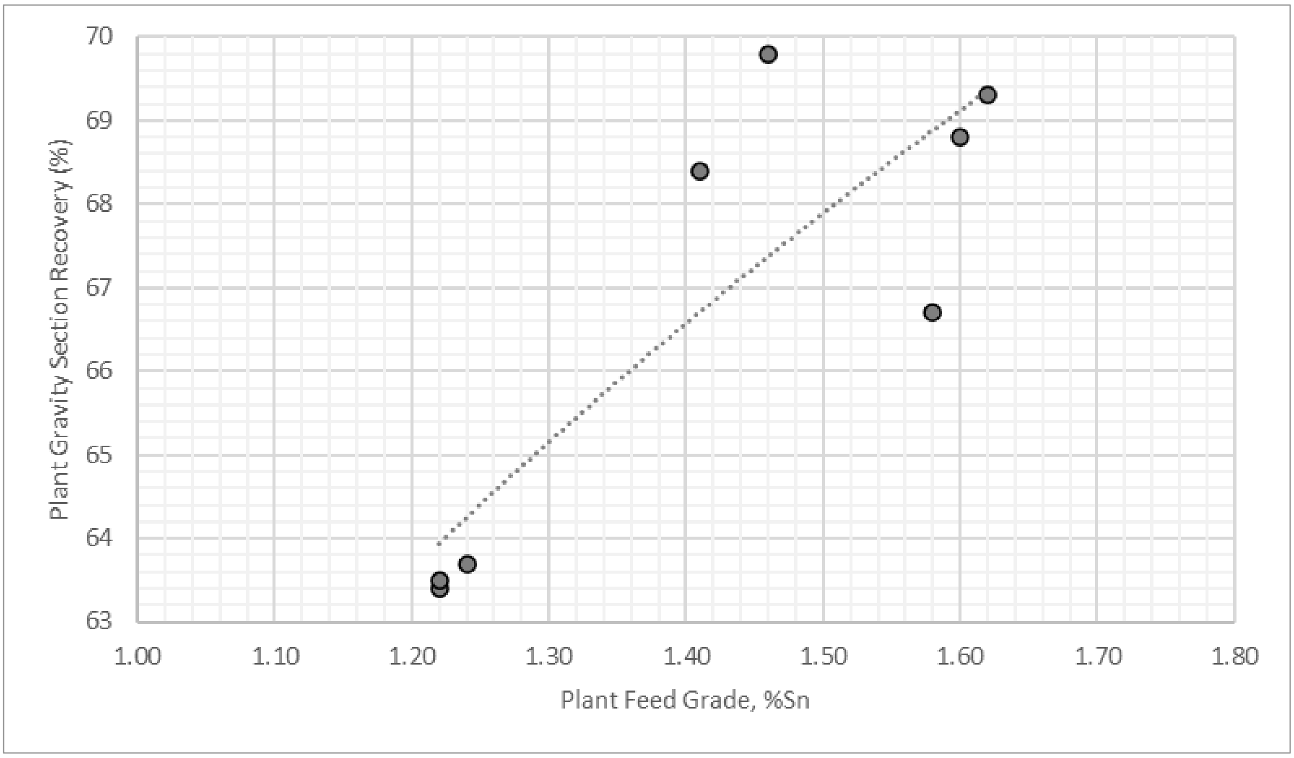
Figure 13.1 and Figure 13.2 below show trends between Wheal Jane Process plant feed grades and overall recovery and combined primary and secondary gravity recovery. The tin recovery is strongly dependent upon feed grade.

Figure 13.1 Plant feed grade vs overall plant recovery



Source: Post, 1994.

Figure 13.2 Plant feed grade vs plant gravity section recovery



Source: Post, 1994.

Production data includes records for ore mined and processed from the Lower Mine, supporting the proposition that this material can be processed, and the minerals economically recovered. No deleterious elements of significance and / or mineralisation significant adverse metallurgical response have been observed in any of the historic metallurgical testwork or production records.

13.3 Wheal Jane Mill Plant

The mill was recommissioned by RioTinto Zinc in 1980, with a differential copper-zinc float circuit addition to the flowsheet used by Consolidated Goldfields from first operation in 1969.

At Wheal Jane Concentrator in the late 1990's, primary crushed run-of-mine (ROM) ore (-150 mm) was crushed in a conventional two stage crushing circuit to -12 mm and stored on a fine ore stockpile. The -150 µm crusher fines reported to a spiral classifier overflow and was pumped to the mill. -12 mm fine ore was milled initially to 80% passing 180 µm using an open circuit 170 kW rod mill followed by a 260 kW variable speed ball mill in closed circuit with DSM screens. Downstream Classification prior to tabling was carried out using hydrocyclones and Stokes "MEP" Hydrosizers.

Classified feed reported to Holman shaking tables where ~60% of the cassiterite was recovered to a bulk concentrate assaying 58% combined tin plus sulphur. This bulk concentrate was ground and arsenopyrite and pyrite subsequently removed by froth flotation. The cleaned cassiterite concentrate was dewatered on an EIMCO horizontal vacuum belt filter to a moisture content of 4-5%, typically assaying 60% Sn.

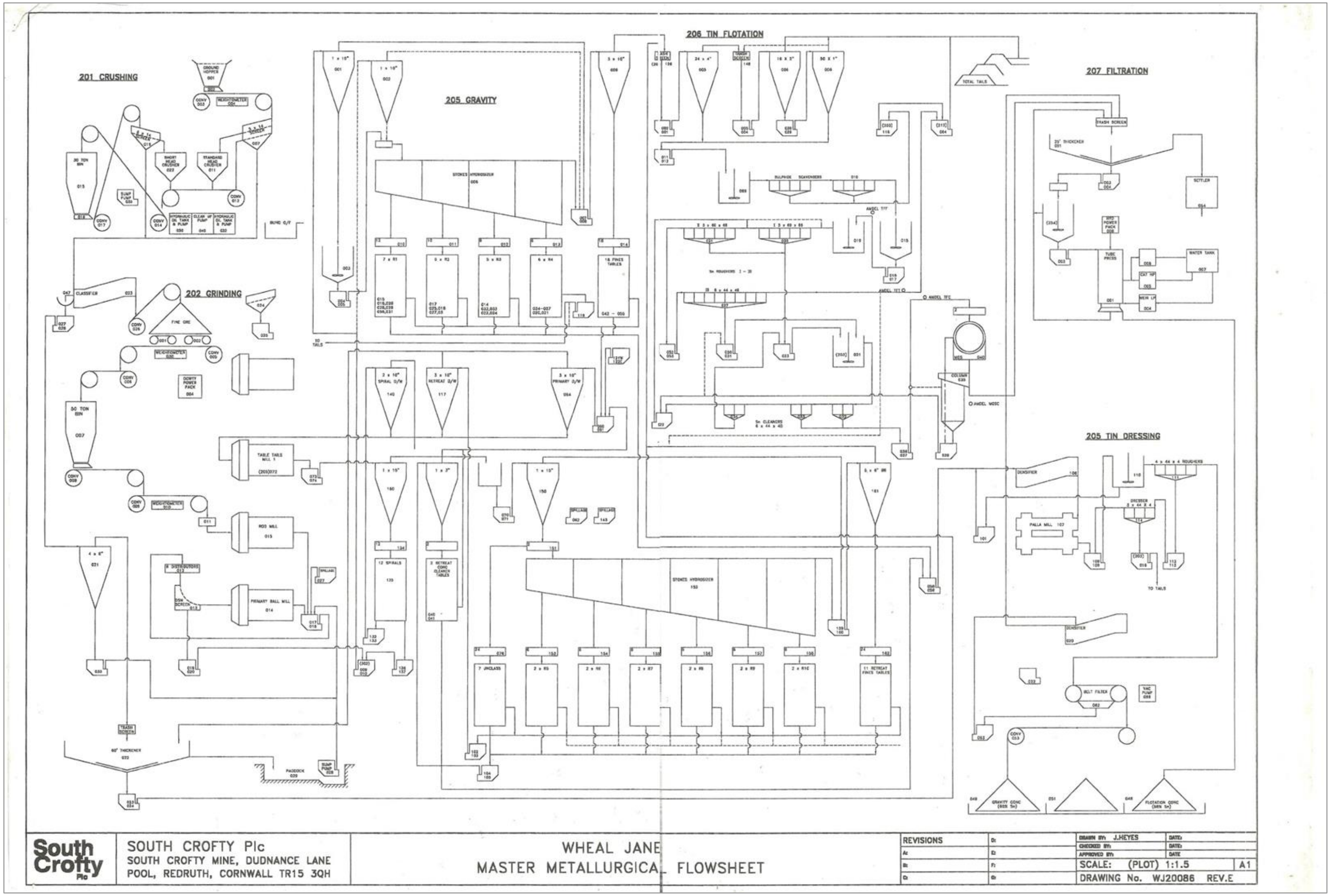
Primary shaking table middlings and tailings were combined, dewatered in hydrocyclones and reground in a 260 kW variable speed regrind ball mill to 80% passing 125 µm in closed circuit with hydrocyclones and more Holman shaking tables. A further ~5% of the cassiterite in feed was recovered to the same bulk concentrate grade of 60%. Finer material (-25 µm) is difficult to recover on shaking tables and this finer cassiterite reported to the tin flotation circuit.

Tin flotation circuit feed was initially deslimed using 4", 2", and 1" hydrocyclones in order to reduce the tin flotation feed -6 µm content to around 10% by weight. The deslimed feed was initially passed through a bank of sulphide scavenger froth flotation cells where sulphides were removed using sodium ethyl xanthate (SEX) as collector, methyl isobutyl carbinol (MIBC) as frother, and sulphuric acid as pH modifier. The small amount of sulphides removed reported to tails and the sulphide scavenger tailings report to the tin flotation circuit. The success of the tin flotation circuit depended largely on the desliming of the tin flotation feed as mentioned above, but also on the employment of a sodium silicate:aluminium sulphate hydrosol reagent which helped disperse the finer particles and depress the silicious gangue minerals.

In 1993 a Mozley Multi Gravity Separator (MGS) was installed, replacing a column flotation cell for second and final stage flotation cleaning. The MGS provided significantly improved recovery in the finer size fractions, particularly (-45 +12 µm). In addition, a stokes (MEP today) six spigot hydrosizer was installed in the secondary table circuit vastly improving secondary table feed preparation using the refurbished six spigot stokes hydrosizer from the then redundant South Crofty Mill. These two changes made significant enhancements to recovery and concentrate grade.

A 1993 flowsheet is shown in Figure 13.3.

Figure 13.3 Wheal Jane Flowsheet



Source: South Crofty Plc, 1993.

Based upon practical experience operating the historical flowsheet at South Crofty and Wheal Jane, the following unit processes are seen as worthy of investigation and inclusion into the new flowsheet to enhance the proposed flowsheet further:

- Pre-concentration using a mixture of XRT Ore Sorting and Dense Media Separation (DMS).
- Spiral concentration of the rod mill discharge product to remove coarse liberated cassiterite prior to ball milling to minimise slime cassiterite production.
- Introduction of surge tank capacity to permit the finer fractions nominally -0.85 mm that are too fine for Dense Media concentration to be stored and introduced into the downstream concentration plant at a fixed rate over 24 hours. This was historically a source of daily operational challenges causing metallurgical deficiencies when the crushers started up and shut down due to plant instability.
- Replacement of finer particle size shaking tables with MGS units to simplify the circuit and increase metallurgical efficiency. This is applicable in both primary and secondary shaking table circuits particularly since the capacity and efficiency of shaking tables is lower at finer sizes below ~106 µms.
- The deslime, tin sulphide scavenger and tin flotation circuits were complex, expensive, and difficult to operate requiring on stream analysis. The tin flotation performance was extremely sensitive to the level of slimes in the flotation feed, reagent dosing, pulp temperature in summer months (Nb. CaF_2 tends to float in summer months contaminating the tin concentrate), water chemistry (flocculant is unable to be used in the crusher fines thickener and / or lime) and so a more simple Falcon Continuous roughing stage followed by a MGS cleaning stage is lower cost to install and operate and would remove all the circuit sensitivities to pulp temperature and water chemistry and also importantly, less technically challenging to operate.

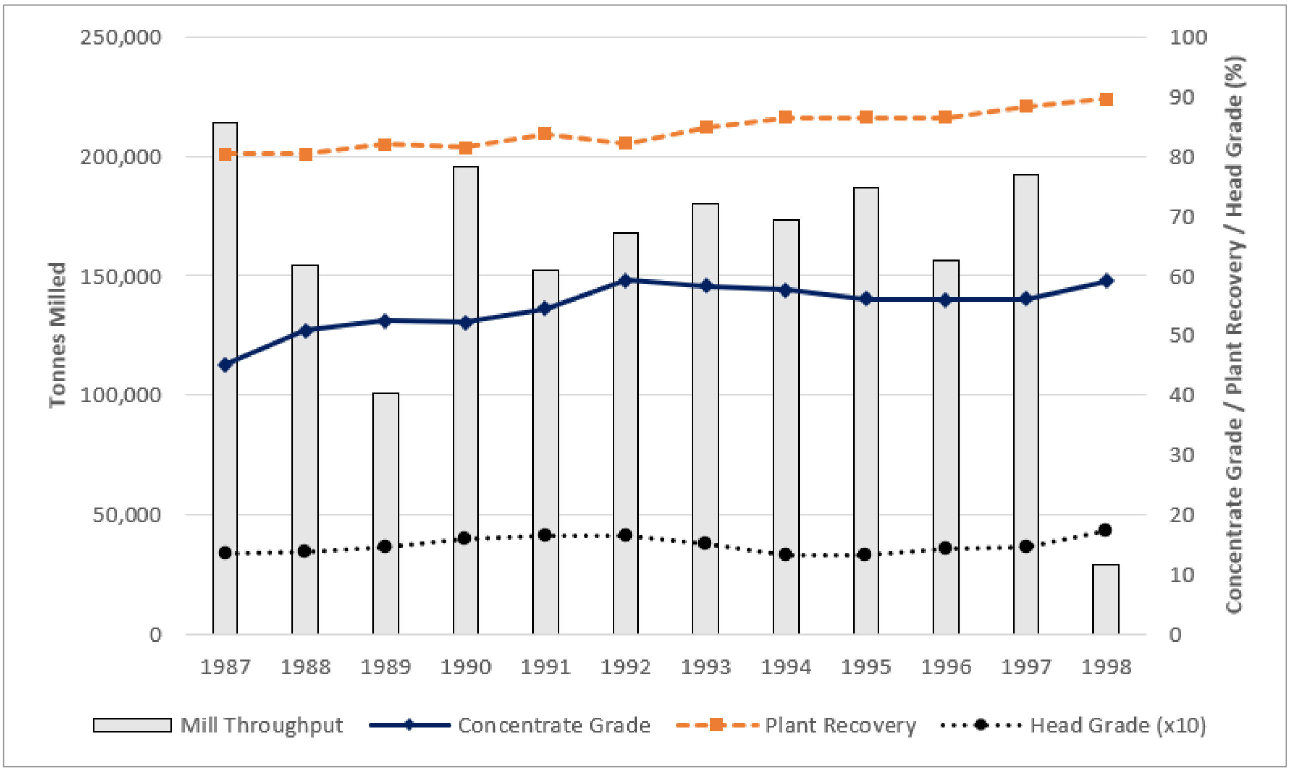
13.3.1 Historic production

Tin production from South Crofty was primarily dictated by mining rates from the underground operation, during 1988-1991, South Crofty and Wheal Jane ores were both batch treated through the Wheal Jane mill.

Ore processed typically averaged 180,000 tpa, however the mill was designed to treat up to 375,000 tpa and as a consequence, the mill ran for ≈10 days and then shut down for four days during which maintenance was carried out. Over the last five years of production, subsequent to the MGS and Hydrosizer improvements to the flowsheet in 1993, the Tin concentrate grade averaged 57% at 88% recovery (at an average feed grade of 1.5% Sn)

The graph in Figure 13.4 shows the key historic processing metrics during treatment of South Crofty Ore at Wheal Jane processing plant. The plant recovery can be seen above 88% in the final years, achieving a consistent concentrate grade >57% Sn.

Figure 13.4 Historic Wheal Jane Plant Production



Source: Cornish Metals, 2024

13.4 Cornish Metals (2022-2024) test programme results

The primary focus of the testwork programme was to confirm the historic flowsheet, design criteria, previous operating data and the existing plant design is valid, but also test the latest technology improvements, as outlined in Section 13.3 above, as well as known limitations in the historic plant design.

In 2022, Cornish Metals engaged WAI, an independent consultancy, to test samples and provide data in support of the South Crofty Project. This testwork is currently ongoing.

13.4.1 Sample selection

Testing was conducted on five 'lode' samples, namely No. 4, No. 8, Roskear, NPZ, and Dolcoath. The mass received for the five lode samples totalled 1,163 kg comprised of cut diamond-drill core was sent to WAI. Samples of 'waste' from each lode was also submitted. Figure 13.5 shows an example of No. 4 lode mineralisation. Upon receipt, each sample was weighed, photographed, and logged into the WAI laboratory sample tracking system.

Figure 13.5 No. 4 Lode Sample (mineralised), Sample No. 523621

Source: WAI, 2023 (WAI Testwork Report).

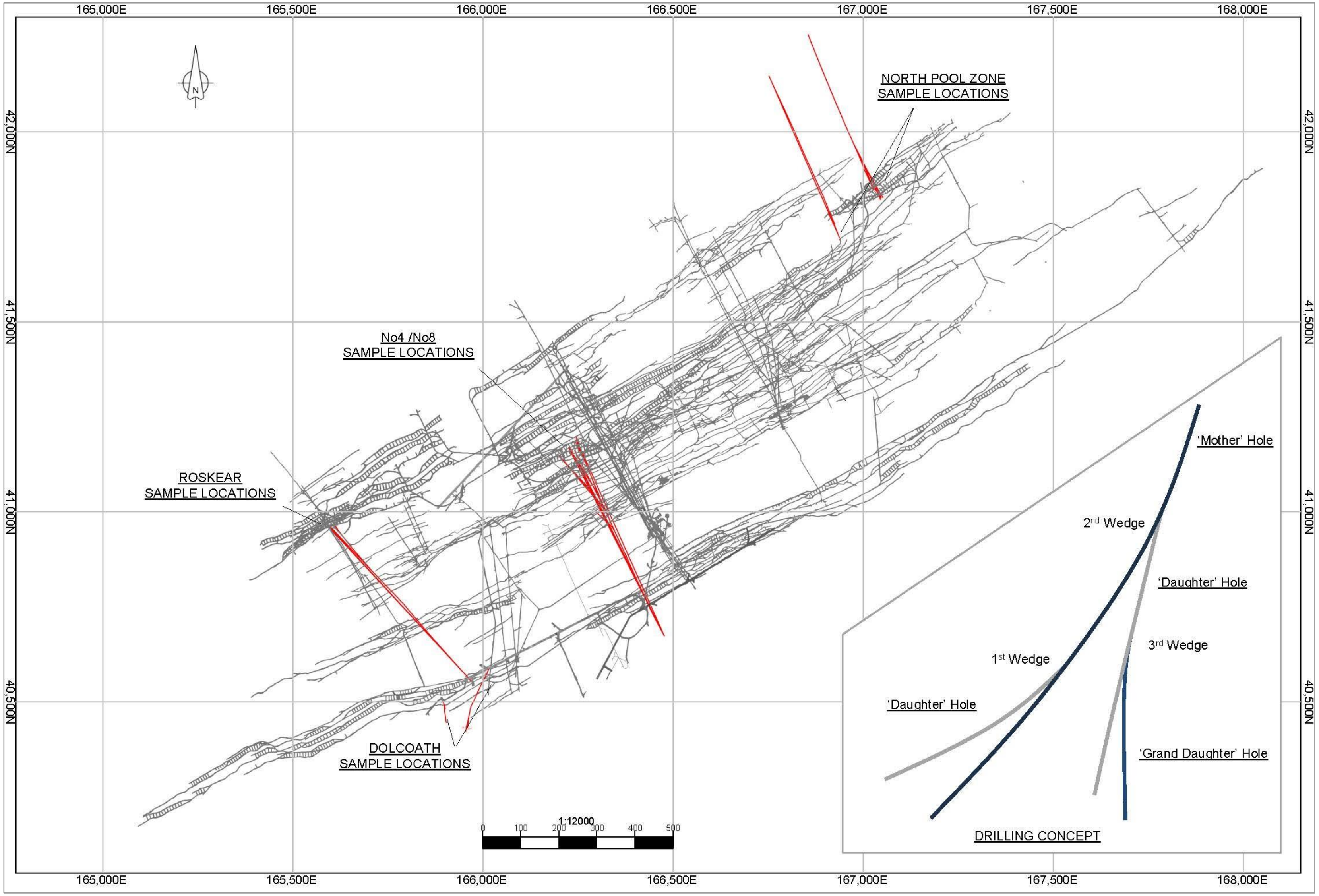
13.4.2 Sample representivity

Each lode was intersected in several places by use of wedges to allow multiple interceptions from one drillhole to increase sample weight (kgs) as well as increasing representivity.

In order to provide a sample that represents expected production, material samples were selected in four categories (Lode, Hangingwall, Footwall, & Waste).

These categories were further divided into mineralised or waste material. Samples were selected based around the lode structure with hangingwall and footwall material selected in the sample if it was mineralised or to give representation of the expected dilution in a mining scenario. Sample intersection lengths were selected based on the expected minimum mining width, the overall mineralised or lode interval and an amount of expected dilution. An overview location map and concept of drilling is shown in Figure 13.6.

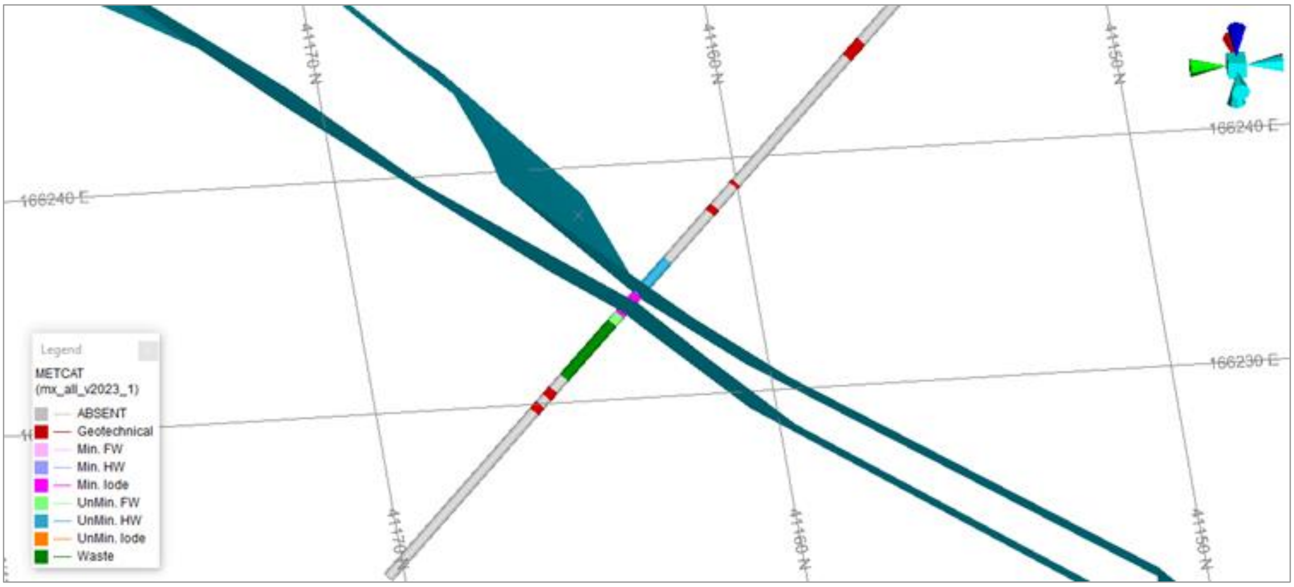
Figure 13.6 Overview of metallurgical drilling sample locations and drilling concept



Source: Cornish Metals, 2024.

Selected sample intersections from No. 8 Lodes are shown in Figure 13.7.

Figure 13.7 Oblique view of metallurgical sampling intersections from SDD20_001E1 in No. 8 Lode



Source: Cornish Metals, 2024.

All samples collected were of NQ size core and holes were surveyed with EZ-TRAC™ single shot surveys every shift, with a multi-shot survey carried out at hole completion. The drilling contractor was Priority Drilling Ltd of Killimor, Ireland.

The testwork reported herein focuses on the results emanating from mineralisation characterisation and variability testwork conducted on the diamond drill core samples extracted from the five lodes mentioned above. It also reports the XRT and heavy liquid (used for DMS prediction) pre-concentration results conducted on the combined composites of all mineralisation samples. A composite of No. 8, No. 4, and Roskear was tested initially and separately from a composite of NPZ and Dolcoath lodes for expedience of project timing. The pre-concentration results of both composite samples and the weighted average results are reported.

Further testwork is currently underway to produce a rationalised flowsheet dataset based upon, a justification for inclusion of the aforementioned flowsheet improvements would be demonstrated. This concentrator rationalisation metallurgical data will be reported separately by WAI as part of the feasibility study.

13.4.3 Head assay

The key two assay results of the head assay analysis conducted on representative subsamples of each lode tested at the WAI assay laboratory are presented in Table 13.1.

Table 13.1 Head assay summary

Lode	Assay, %	
	Sn	S_{TOT}
No. 4	1.15	0.038
No. 8	1.19	0.010
Roskear	1.43	0.500
NPZ	1.16	0.039
Dolcoath	0.59	0.510

Source: WAI, 2023 (WAI Testwork Report).

All five lodes contain relatively low levels of sulphides, Roskear and Dolcoath have elevated levels but do not constitute any issue with respect to sulphide removal in the proposed flowsheet.

A separate representative subsample of pulverised material from each lode was submitted for a multi-element ICP scan. Selected elements are shown in Table 13.2.

Tungsten and Fluorspar (%Ca historically used as the proxy for CaF_2) are both elevated in NPZ. This has been taken into account in mine planning.

Table 13.2 Head assay ICP summary

Lode	Ag	Ca	Cu	Fe	Hg	In	Pb	W	Zn
	ppm	%	ppm	%	ppm	ppm	ppm	ppm	ppm
No. 4	0.06	0.48	18.4	2.01	0.048	0.295	37.7	57.5	108
No. 8	0.06	0.83	31.8	3.17	0.028	0.746	20.5	30.4	127
Roskear	0.10	1.60	24.1	2.17	0.056	0.626	17.1	134	53
NPZ	0.10	4.13	18.0	2.89	0.073	0.557	13.7	1380	59
Dolcoath	0.24	0.96	109.5	4.50	<0.005	0.709	15.1	30.5	162

Source: WAI, 2023 (WAI Testwork Report).

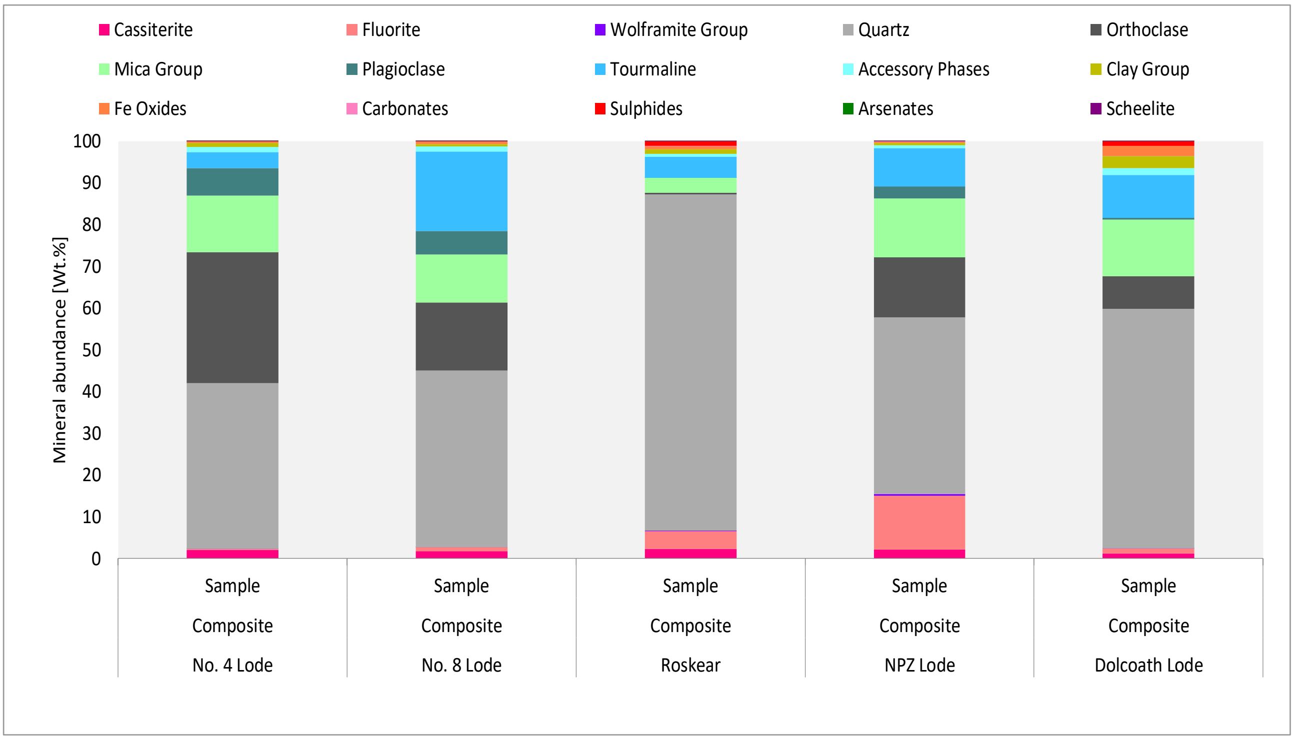
13.4.4 Mineralogy

A representative subsample of feed material for each lode was submitted for quantitative mineralogical analysis to Petrolab using the Zeiss Mineralogic system in order to establish a number of key parameters including bulk mineralogy, deportment, liberation, mineral associations and average grain sizes. A summary of the findings is given below from the Petrolab mineralogical report (Report No. AM6471c).

Bulk mineralogy indicated that the samples were typically dominated by quartz, feldspars, and micas. Tin-bearing phases were found to be exclusively cassiterite. No. 8 Lode was seen to contain higher quantities of tourmaline than other samples, and, as a result, lower quantities of mica and orthoclase. The Roskear lode sample was observed to contain a much higher proportion of quartz with only trace amounts of feldspars. Elevated levels of sulphide minerals (pyrite intergrown with marcasite) were also observed in this sample. The Dolcoath lode sample contained the highest amounts of iron oxides and clay minerals, with only trace amounts of plagioclase feldspar.

The bulk mineralogy of the samples is shown in Figure 13.8. The mineralogical analysis was completed on six size fractions (+500 µm, 500 µm +250 µm, -250 µm +125 µm, -125 µm +53 µm, -53 µm +10 µm, and -10 µm) to investigate mineral liberation characteristics for each lode.

Figure 13.8 Mineral deportment by lode



Source: Petrolab, 2023.

Cassiterite showed moderate to good liberation across all the size fractions, improving towards the finer size fractions, as well as typical coarse grain size across all lodes. Figure 13.9 shows grain size by lode and Figure 13.10 shows liberation by size group by lode.

No. 4 Lode showed 79% free particles in the +10 µm size fraction, the proportion of locked particles was highest within the 125-250 µm size fractions, reaching 42%.

Lode No. 8 showed a similar trend to Lode No. 4, with the finest fraction showing excellent liberation, the proportion of locked particles is the highest at 54% in the coarsest size fraction.

The Roskear sample showed better liberation overall, with the proportion of free particles increasing from 17% in the +500 µm size fraction to 78% in the +10 µm size fraction. The proportion of locked particles is the highest within 250-500 µm size fraction, reaching 43%.

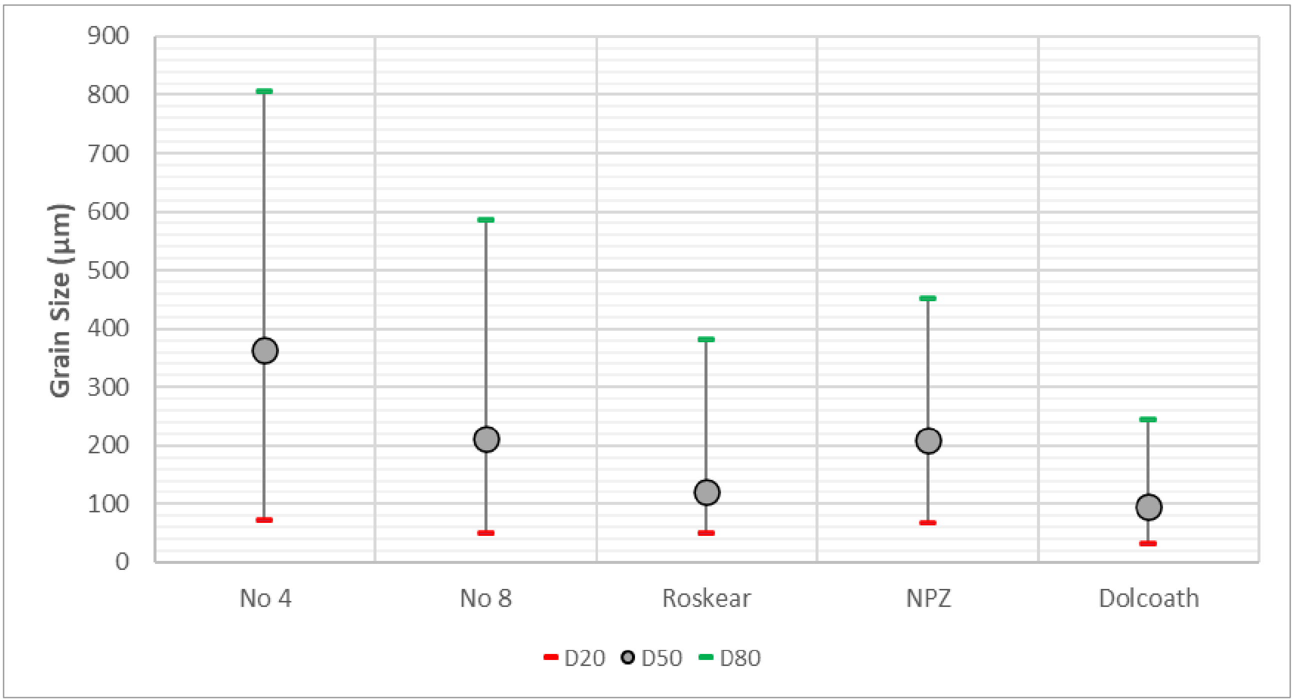
Cassiterite in the NPZ sample showed overall good liberation, however showed almost no liberated particles in the coarsest size fraction, but with a significant improvement in liberation in the finer size fractions. The proportion of free particles in the +10 µm size fraction total 84%. The proportion of locked particles was again highest within +500 µm size fraction, reaching 65%.

The Dolcoath sample showed overall moderate liberation of cassiterite, the proportion of free particles in the +10 µm size fraction of 66%, with the proportion of locked particles in the +500 µm size fraction at 86%.

Cassiterite showed major associations with tourmaline, micas, quartz, iron oxides and accessory phases across all five samples. No. 4, No. 8, and NPZ samples showed additional associations with feldspars, and No. 4, Roskear, NPZ, and Dolcoath samples with sulphides.

Figure 13.9 below shows the median and 20th and 80th percentile cassiterite grain size for the five lodes tested. All Lodes contain relatively coarse grained cassiterite and No. 4 Lode contains the coarsest cassiterite grain sizes whilst Dolcoath contains the finest grain sizes.

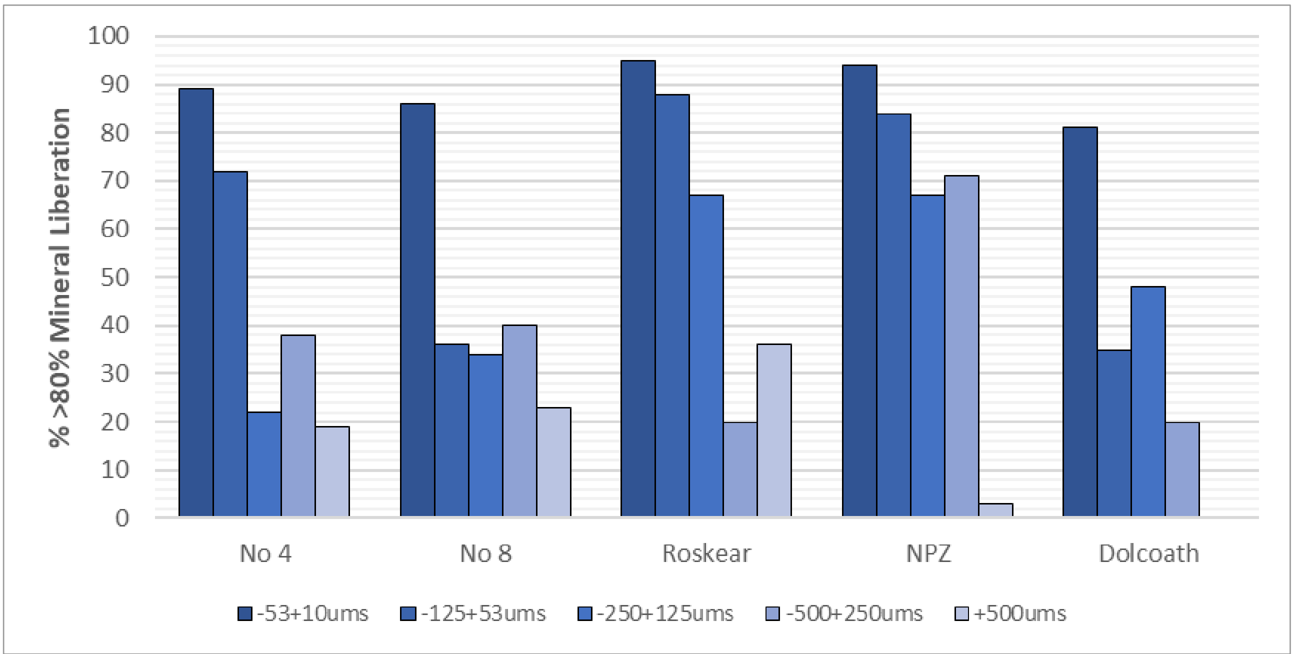
Figure 13.9 Cassiterite grain size by lode



Source: Cornish Metals, 2024.

Figure 13.10 below shows the quantity of cassiterite that is >80% liberated for each of the Lodes tested. Note how No. 8 Lode has much lower liberation characteristics in the -250+125 µm and -125+53 µm size fractions and compared with No. 4, Roskear and NPZ Lodes. Dolcoath has the lowest liberation due in part to the finer grain size of the cassiterite in this lode as mentioned above.

Figure 13.10 Cassiterite liberation by size group by lode



Source: Cornish Metals, 2024.

13.4.5 Comminution testing

Comminution testwork was undertaken on samples of appropriate particle sizes on all five lode samples and also on five corresponding waste samples. Results are summarised as follows:

Bond Low Energy Impact (BLEI): All samples returned Crusher Work Index values greater than 14 kWh/t and less than 18 kWh/t classifying them as 'difficult' with the exception of Dolcoath Waste which was classified as 'medium' (CWi of 13.4 kWh/t). BLEI testing was not conducted on samples from No. 4 Lode or No. 8 Lode.

Bond Abrasion Index Testing: Results indicated that 'lode' samples were slightly more abrasive than their 'waste' sample counterparts. Lode samples generally classified as 'moderately abrasive' to 'very abrasive'.

Bond Rod Work Index: All samples were classified as either being 'hard' or 'medium', with lode samples generally harder than waste samples.

Bond Ball Work Index: Work indices for all ten samples tested fell in the range 14.0 to 20.0 kWh/t, classifying all material as 'hard'.

Crushability testing was undertaken by Metso-Outotec at their Rock Test laboratory in Tampere, Finland. Testing was conducted on 5 kg representative subsamples of -50.0 mm+15.0 mm material from each lode.

Two values were reported – 'crushability' and 'abrasiveness'. Results from both can be classified in the same was as Bond test results, the 'crushability' classification resulted in 'easy' to 'medium' (7-12 kWh/t) and an abrasive classification of 'moderately abrasive' to 'abrasive'.

13.4.6 Grind size vs. tin deportment

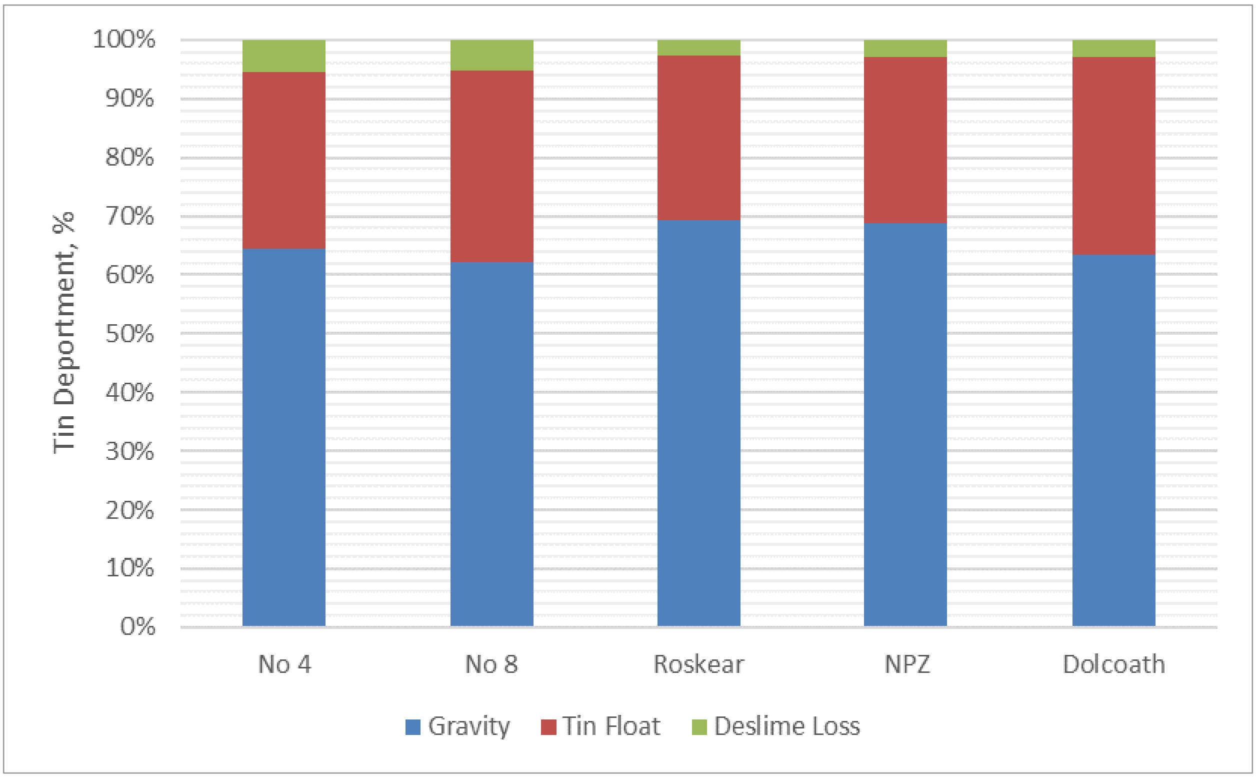
To assess the effect of grind size on tin deportment to size fractions, and also the propensity of the tin to sliming, three grinds were performed at increasing fineness before being sized and assayed.

Three grind sizes were selected: 80% passing 500 µm, 180 µm, and 75 µm. The resultant milled products were then screened to produce the following six size fractions; +500 µm, -500 µm+250 µm, -250 µm+125 µm, -125 µm+53 µm, -53 µm+10 µm, and -10 µm. The data gained can also be used to give estimates of mass and tin reporting to future separation methods.

Once masses had been recorded from each fraction, subsamples were taken, pulverised, and submitted for assay for Sn. The results showed No. 4, No. 8, and Roskear lodes all behaved relatively consistently in terms of mass and tin deportment, and that the deportment to gravity, flotation and slimes are similar and are as expected based on historical data. Roskear, despite being softer, produced fewer tin slimes than No. 4 and No. 8. Roskear and Dolcoath tended to slime the least overall of the five lode samples, even at the finest grind size of 75 µm. Figure 13.11 shows the tin deportment at the 180 µm grind size, the results of which support historic production data.

All lodes tested had a low propensity to produce -6 µm unrecoverable cassiterite which provides assurances on the control of slime tin losses.

Figure 13.11 180 µm grind, tin deportment by lode

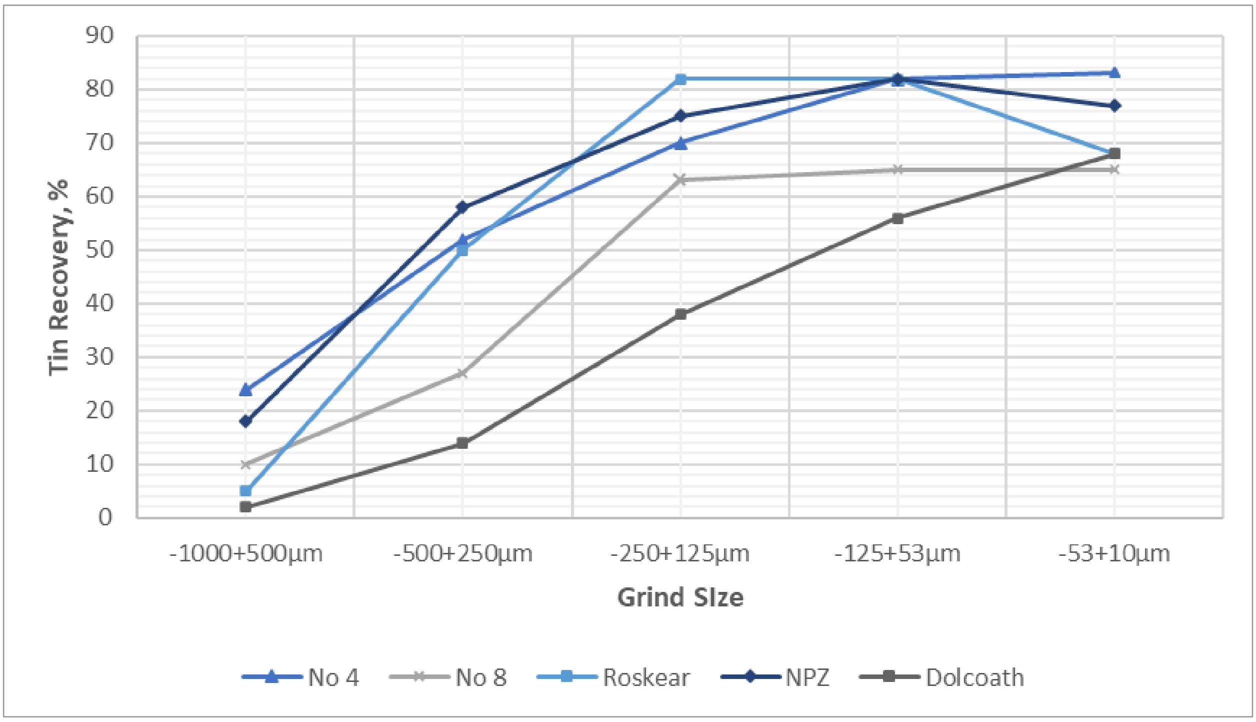


Source: Cornish Metals, 2024.

13.4.7 Gravity release analysis

Gravity release analysis (GRA) was conducted on each lode samples at five discreet size fractions. Figure 13.12 below shows the gravity recovery versus size fraction for a set concentrate grade.

Figure 13.12 Tin recovery (30% concentrate grade) by grind size by lode



Source: Cornish Metals, 2024.

No. 4, Roskear, and NPZ all gave very similar gravity stage recoveries whilst No. 8 did not respond as well, this being due to its inherent lower liberation as in the mineralogical section above. Note that on all of these four lodes, the tin recovery peaked below 250 µm and especially below 125 µm.

Dolcoath Lode was the worst performer and gravity recovery continued to increase at finer sizes, this being due to the inherently finer cassiterite grain size and lower liberation when compared to its peers and its lower feed grade.

Tailings grades in Roskear were observed to be slightly higher, potentially owing to the higher feed grades in the finer fractions. It was also observed that Roskear fractions took notably longer to separate on the table decks.

The ability to produce a throwaway tailing across all samples increased with reducing particle size and this typically occurred below 125 µm. This is supported by the mineralogy and follows the liberation trend.

13.4.8 XRT testwork

Ore sorter testwork (XRT) was conducted on -50 mm+15.0 mm material in two batches - Batch 1 included material from No. 4, No. 8, and Roskear whilst Batch 2 included material from NPZ and Dolcoath. Both tests produced a total of six products plus one waste, once received back at WAI, each product was individually weighed before being stage crushed to 100% passing 3.35 mm in order for representative subsamples to be taken for assay.

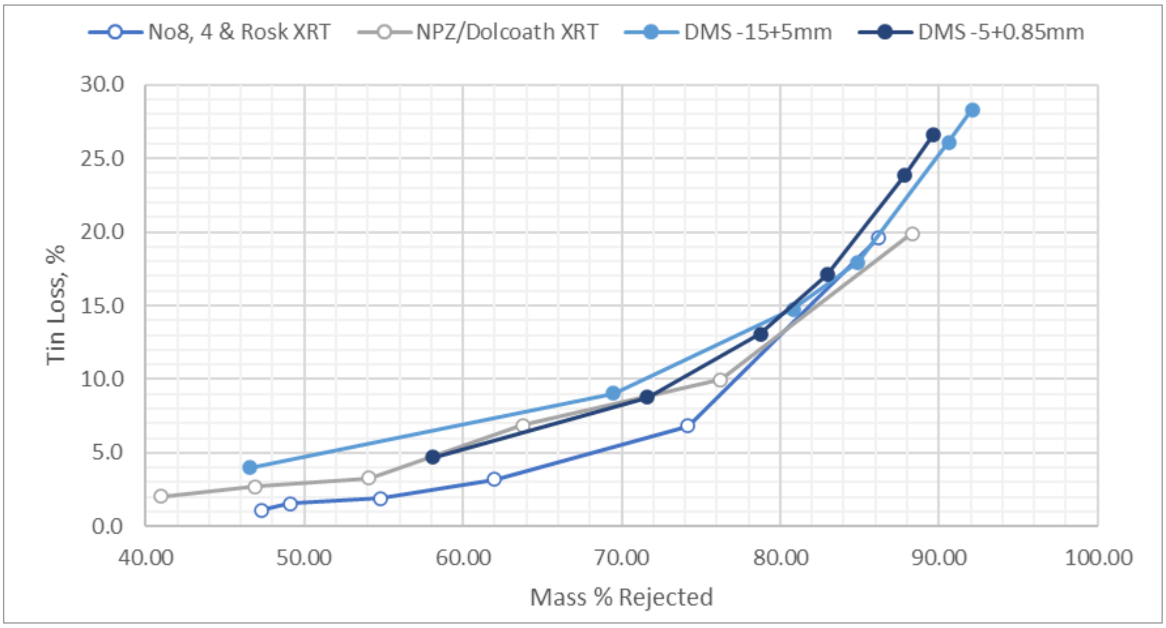
Results were excellent, with Batch 1 showing that 98.9% of the tin at a grade of 2.9% Sn reported to the products to a mass pull of 52.7%. Results from Batch 2 showed that 99.1% of the tin at a grade of 2.3% Sn reported to the products to a mass pull of 59.0%.

13.4.9 Heavy liquid separation

Heavy liquid separation (HLS) testwork was conducted on the -15.0+0.85 mm material in two size fractions (-15.0 mm+5.0 mm and -5.0 mm+0.85 mm). After conducting a separation profile at six separation densities, a density of 2.65 g/cm^3 was selected as optimal. This testwork produced six floats and one sink per size fraction, all of which were crushed, pulverised, and assayed for Sn and S.

Results showed that differences between the two size fractions tested for HLS were minimal, with the finer fraction giving a higher mass reject at 5% loss of tin to reject (60% vs 50%). The tin loss during processing of the coarser heavy liquid fraction (-15.0 mm+5.0 mm) appeared slightly higher than those seen from the XRT testwork, indicating XRT is working well considering the coarser size range (-50.0 mm+15.0 mm), see Figure 13.13 below.

Figure 13.13 Mass rejection vs tin losses, XRT, and HLS



Source: Cornish Metals, 2024.

13.4.10 Pre-concentrate blend

Following all characterisation testwork, streams were designated either as 'Product' (progressing to plant feed) or 'Waste' (exiting the circuit). From all above testwork results and data, the following streams were selected for the blend to create the plant 'Total Plant Feed':

- XRT Products (high grade – low grade, & non-eject -10 mm)
- DMS Sinks (2.65 g/cm^3, -15.0 mm+5.0 mm & -5.0 mm+0.85 mm)
- Master Composite (-0.85 mm+0.15 mm and -0.15 mm material)

A 'Total Plant Feed' grading 2.6% Sn can be formed, comprising 97.6% of the available tin to a mass pull of 51.2%. In turn, streams classified as 'waste' made up 48.8% of the overall starting mass and graded 0.07% Sn (2.4% of the available tin), see Table 13.3.

Table 13.3 Overall product and waste mass balance

	Size fraction	Product	Mass	Assay, %	Distribution, %
			%	Sn	Sn
Product	-50 mm+15 mm	XRT (No. 4, No. 8, Roskear)	15.65	3.29	37.24
		XRT (Dolcoath, NPZ)	14.47	2.82	29.47
		Total Ore Sorter	**30.1**	**3.06**	**66.7**
	-15 mm+5.0 mm	DMS 2.65 g/cm^3 Sinks	9.01	2.52	16.39
	-5.0 mm+0.85 mm	DMS 2.65 g/cm^3 Sinks	4.13	2.42	7.22
	-0.85 mm+0.15 mm	Master Composite	3.11	1.11	2.5
	Total Rod Mill Feed		**46.4**	**2.77**	**92.8**
	-0.15 mm	Master Composite	4.8	1.37	4.76
	Total Plant Feed		**51.2**	**2.64**	**97.6**
Waste	-50 mm+15 mm	XRT (No. 4, No. 8, Roskear)	18.63	0.06	0.76
		XRT (Dolcoath, NPZ)	16.62	0.05	0.64
	-15 mm+5.0 mm	2.65 Floats	7.84	0.12	0.68
	-5.0 mm+0.85 mm	2.65 Floats	5.73	0.09	0.36
	Total Pre-concentrator Plant Waste		**48.8**	**0.07**	**2.44**
Total			**100.0**	**1.38**	**100.0**

Source: WAI, 2023 (WAI Testwork Report)

14 Mineral Resource estimates

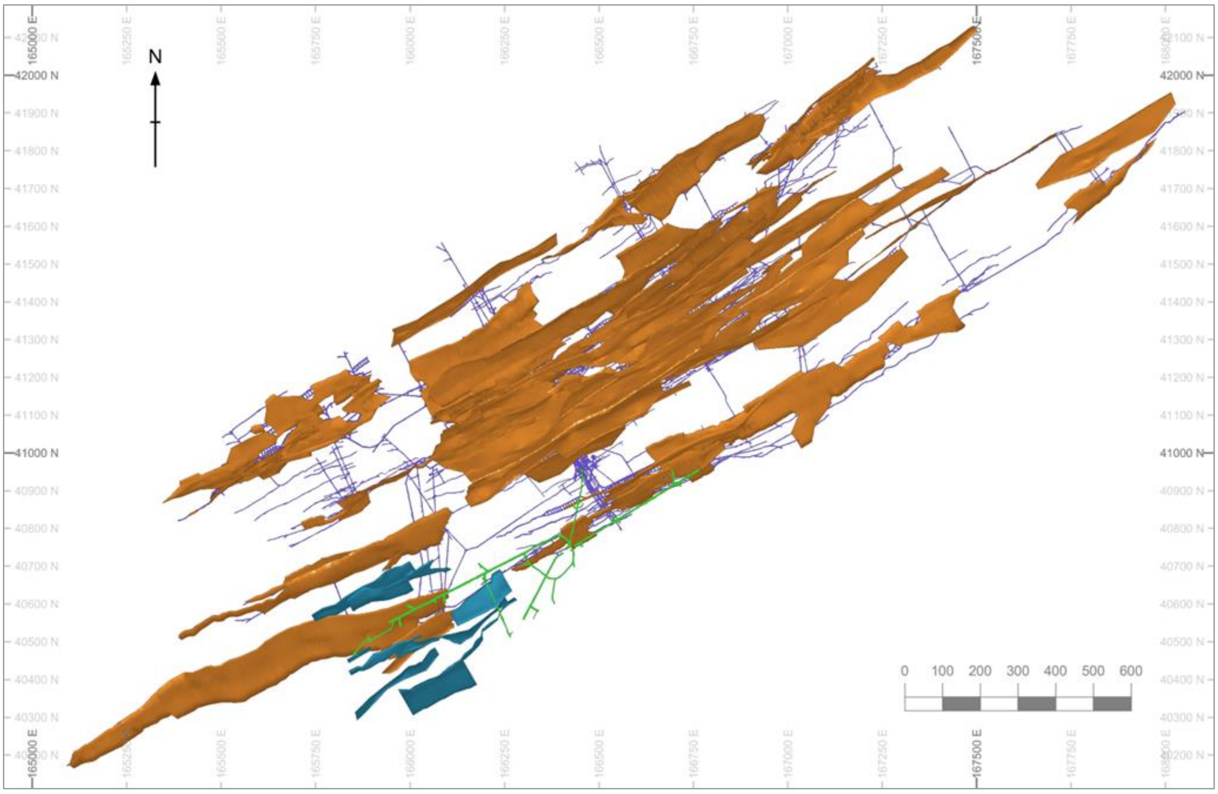
14.1 Introduction

This Technical Report encompasses the updated Mineral Resources for the South Crofty deposit. The deposit can be split into the Upper Mine area and the Lower Mine area with the split based on host lithology along with vein continuity and mineralogy. The use of the term mine area reflects the previous history of mining within the deposit, and does not denote any current mining activity. The Upper Mine area (Upper Mine) consists of polymetallic Cu-Sn-Zn veins hosted in metasediments including one vein, Dolcoath Middle, which extends from the metasediments down into the granite. The Lower Mine area (Lower Mine) consists of tin-only mineralised veins hosted in granite.

Figure 14.1 and Figure 14.2 illustrate the split between the Upper Mine and Lower Mine areas.

The Upper Mine was originally estimated by P&E on 26 February 2016 (Puritch et al., 2016). No material changes have occurred in the Upper Mine since that date. The QP has subsequently reviewed the P&E Mineral Resource estimate and takes responsibility for the Upper Mine Mineral Resources declared within this Technical Report. The Mineral Resources have been restated using a recalculated tin equivalent grade utilising more recent metal prices.

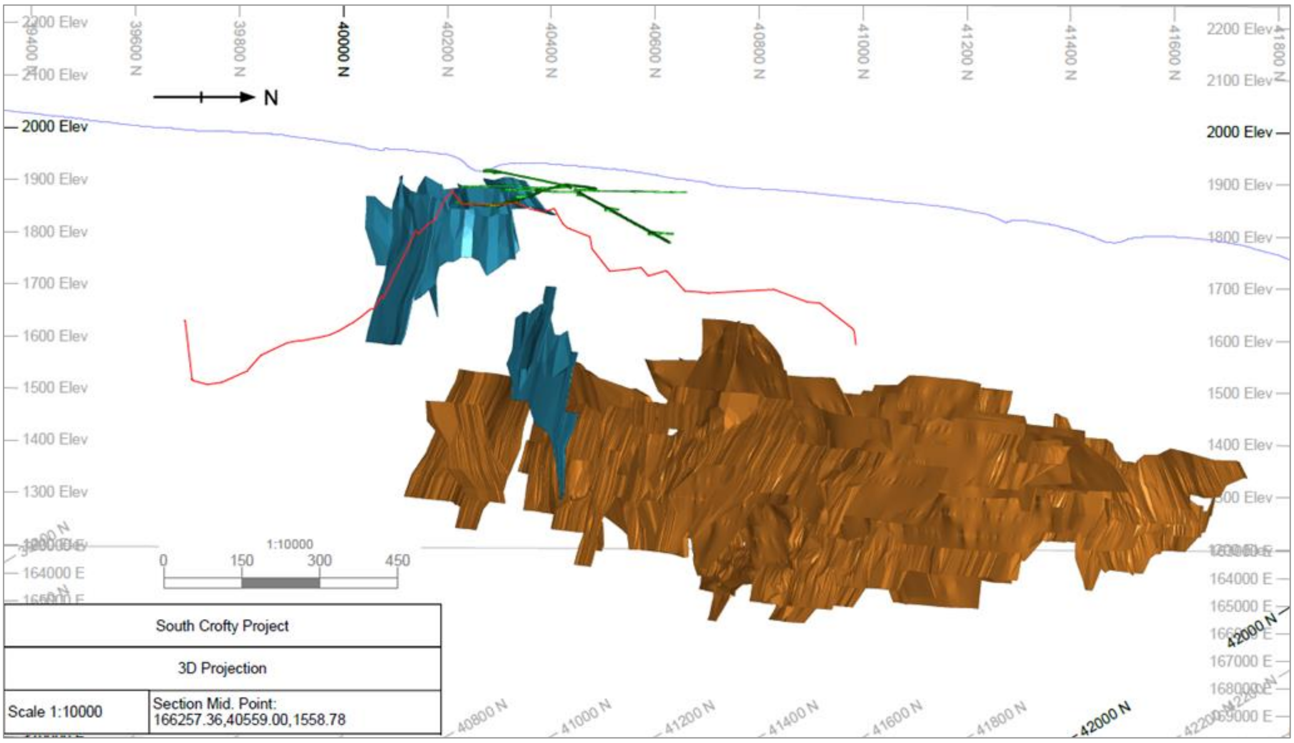
Figure 14.1 Plan view of the estimated South Crofty Project lodes



Notes: Lower Mine lodes (orange), Upper Mine lodes (turquoise), mine development (purple), and the surface decline (green).
Source: Cornish Metals, 2023.

Cornish Metals undertook a Mineral Resource estimate on many of the main tin lodes in the Lower Mine at South Crofty in 2021. Since then, it has undertaken to build on that estimate by modelling and estimating the remaining principal lodes in the Lower Mine. This model has been reviewed by the QP who takes responsibility for the estimate. The significant new additions include No. 1 zone, parts of No. 2 zone, No. 3 zone and the Main, Intermediate, North, and Great lode areas which are highlighted in Figure 14.3. The recent work has included updating and validating the database in these areas and creating new 3D wireframes which have been created in line with the original mine geologists' interpretations.

Figure 14.2 3D view of the South Crofty Project lodes looking north-east

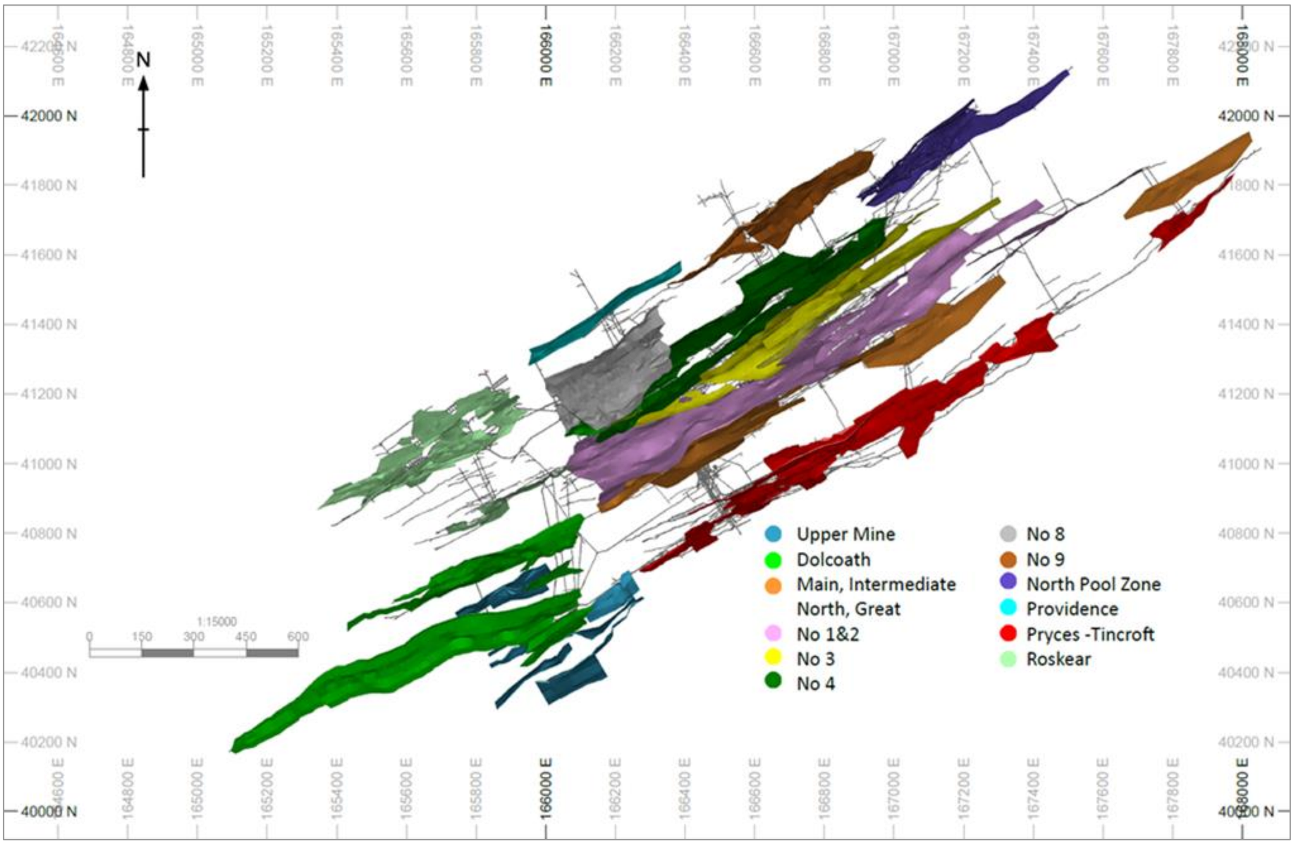


Notes: Lower Mine lodes (orange), Upper Mine lodes (turquoise), surface decline (green), intersection of the granite contact (red), and intersection of topography (purple).
Source: AMC, 2023.

The present Lower Mine lode model now comprises the majority of the lodes that were estimated in the 1998 closure resource for South Crofty, consequently only minor or insignificant lodes remain to be modelled.

Estimation techniques vary between the Upper Mine and Lower Mine and therefore the estimation methodology and findings for both areas are presented in separate sections.

Figure 14.3 Location of modelled Mineral Resource lodes



Note: Development (grey).
Source: AMC, 2023.

14.2 Upper Mine Mineral Resource estimate

14.2.1 Source of data

Drillhole and channel sampling data was provided to P&E in digital format (Access™ and Excel™) by WUM personnel in 2014. The sample data supplied to P&E comprised two databases. The first database contained the 2008-2013 drilling, historical exploration diamond drillholes, and some channel samples. The second database comprised historical channel samples with some historical drilling data.

During the review of the databases, P&E noted some duplication of sample data, comprising resampled channels which included wall sampling in contrast to the earlier sample data which was for the lode only. P&E subsequently cleaned up the databases, retaining the most appropriate data.

14.2.2 Data validation

P&E used GEMS for modelling. Sample data was imported into GEMS and validated to check for:

- Intervals exceeding the hole length (from-to problem).
- Negative or zero length intervals (from-to problem).
- Inconsistent downhole survey records or lack of zero depth entry at collar as needed by GEMS.
- Duplicate samples or out of sequence and overlapping intervals (from-to problem; additional sampling / check sampling included in the database).
- No interval defined within analysed sequences (not sampled or implicit missing samples / results).

P&E validation included checks for:

- Inconsistent naming conventions and analytical units.
- Transposed assay table columns.
- Erroneous drillhole collar locations.
- Erroneous drillhole traces on screen in 3D.
- Drillhole deviation checks by software or Excel™ graphs.

The P&E validation checks noted 53 discrepancies between laboratory certificates and the assay database. Most of these were found to be incorrectly entered QAQC results. P&E subsequently rectified the discrepancies in the sample database.

Historical channel samples had been digitised from the mine plans by WUM and supplied to P&E. The channel coordinates were georeferenced digitally from the scanned mine plans with elevation of these channels taken as being a standard 1.5 m above the drive floor. For channels lacking survey plans or those that were partially sampled wall to wall, the starting points have been taken from the log's distances from survey plugs or identifiable workings features, such as crosscuts, and the origin was set at the drive south wall.

Face samples are included in the database with P&E noting that the majority are in fact back-channels. This results in a minor spatial displacement of the channels with respect to their actual locations. The impact of this spatial deviation is negligible and does not materially impact the Mineral Resource estimate.

During the work undertaken by P&E in 2016 some data inconsistencies relating to the digitised channel samples were noted, including:

- Coordinate errors.
- Excessive sample lengths.
- Duplicate records from resampling.
- Duplicate records from geology grid versus mine grid errors.
- Erroneous orientations with regards to the development walls.

Where errors were identified, P&E worked with WUM to rectify the issues.

The final sample database used by P&E comprised data that was acquired between 1917 to 2013.

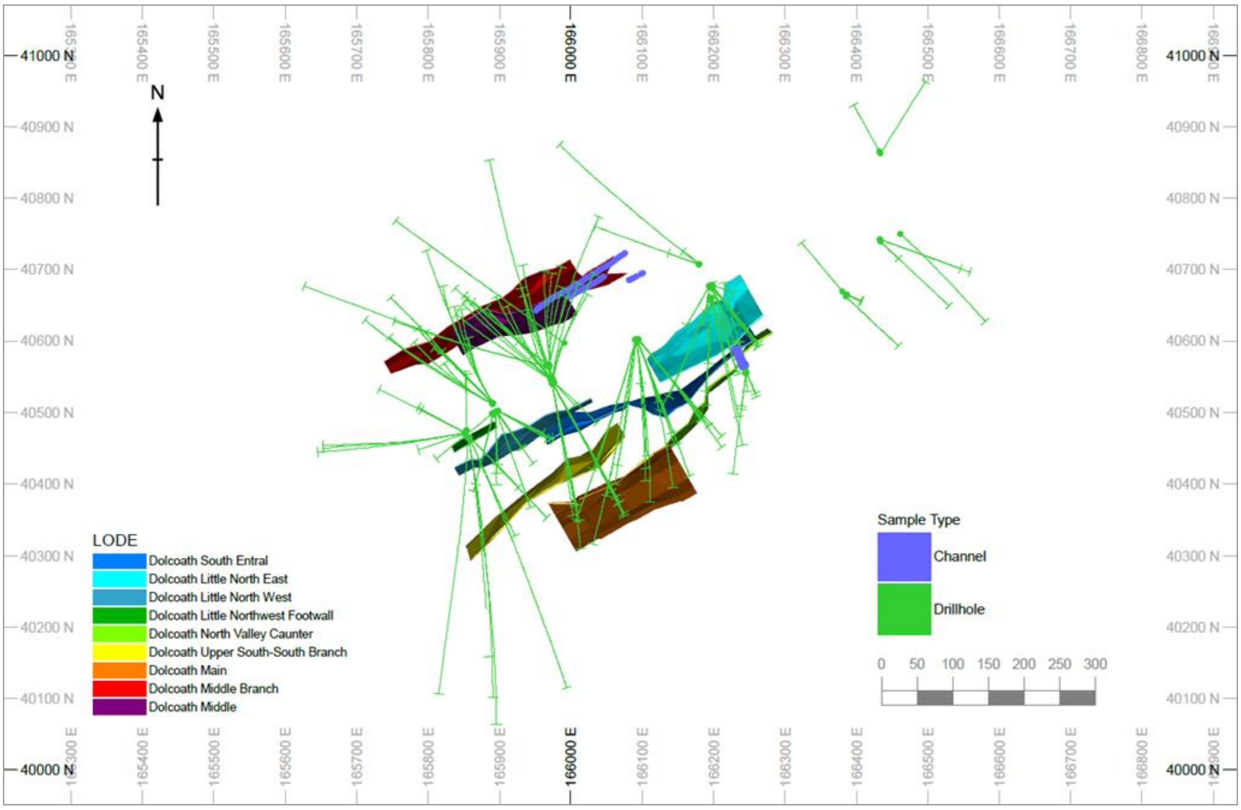
The drilling and channel sampling in the Upper Mine included in the current Mineral Resource estimate spans approximately 500 m along the 60° strike of the mineralised lodes and extends to a depth up to 600 m. Other than bazooka wall drilling, drillholes are fanned or irregularly spaced with variable hole density. The databases are summarised in Table 14.1.

Table 14.1 Summary of diamond drillholes and channels databases

	Count	Length (m)	Minimum (m)	Maximum (m)	Average (m)
Drillholes	157	30,931.82	4.21	450.65	197.02
Channels	132	225.03	1.00	3.90	1.70
Drillholes in resource estimate	96	21,508.90	39.20	450.65	224.05
Channels in resource estimate	64	142.01	1.30	3.90	2.21

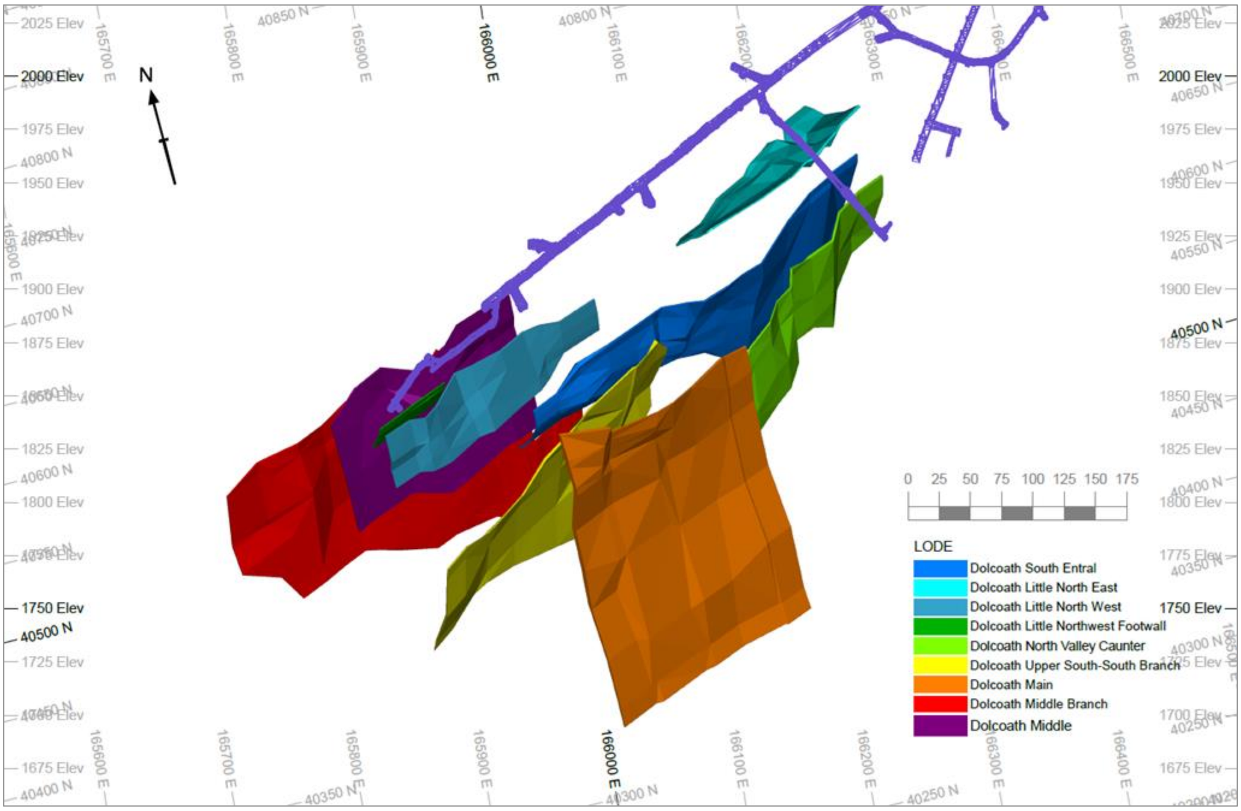
A plan of drillhole locations for the Upper Mine area is shown in Figure 14.4 and a 3D perspective view of the Upper Mine lodes is shown in Figure 14.5.

Figure 14.4 Upper Mine drillhole and channel sample location plan



Notes: Lode wireframes do not show depletion. Not all lode wireframes shown in the legend are visible.
Source: Cornish Metals, 2021.

Figure 14.5 3D isometric view of lode wireframes looking NNE



Notes: Lode wireframes do not show depletion. Not all lode wireframes shown in the legend are visible.
Source: Cornish Metals, 2021.

14.2.3 Assay / analytical database

The sample databases supplied to P&E contained 28,030 samples covering 38,386.42 m of drill core, and 35,556 channel samples covering 29,144.82 m of chip sampling covering both the Upper Mine and Lower Mine areas. Table 14.2 and Table 14.3 summarise basic statistics for the channel sample and drill core databases and the various Mineral Resource areas in the Upper Mine lodes that P&E modelled for its Mineral Resource estimate.

A total of 26 holes out of the 157 drilled in 2008-2013 lack assay data and were therefore excluded from the Mineral Resource estimate. Where uncertainty surrounds other sampling data such as potentially erroneous surveys or assays then the samples were excluded from the Mineral Resource estimate.

Table 14.2 Summary statistics for the Upper Mine channel assays database

Domain	Name	Count	Length (m)	Min Sn%	Max Sn%	Average Sn%	Weighted Sn%	Std. Dev.	Coef. Var.
62	Middle	184	94.71	0.00	9.24	0.85	0.75	1.68	1.96
Totals		**184**	**94.71**						

Table 14.3 Summary statistics for the Upper Mine drill core assays database

Domain	Name	Count	Length (m)	Min Sn%	Max Sn%	Average grade Sn%	Weighted grade Sn%	Std. Dev.	Coef. Var.
62	Middle	86	77.54	0.00	6.45	0.56	0.51	0.99	1.78
66	Upper SSB	39	34.34	0.01	2.11	0.41	0.35	0.46	1.14
70	Upper Main	124	94.24	0.00	3.48	0.41	0.43	0.59	1.45
71	S. Entral	129	94.28	0.00	6.20	0.52	0.54	0.84	1.62
72	NVC	52	45.02	0.00	5.27	0.55	0.39	1.09	1.98
73	Middle Branch	37	30.12	0.01	3.99	0.67	0.57	0.96	1.43
74	Little NE	57	36.88	0.00	14.00	1.06	1.22	2.59	2.45
75	Little NW	41	34.74	0.02	2.37	0.28	0.31	0.48	1.70
76	Little NW FW	10	9.69	0.01	6.61	1.05	0.91	2.04	1.95
Totals		**575**	**456.85**						

14.2.4 Cut-off grades and wireframes

For the purpose of modelling the mineralisation in the Upper Mine P&E used a SnEq cut-off grade. An initial assessment of the breakeven SnEq cut-off grade was calculated using the parameters detailed in Table 14.4. The tin concentrate recovery of 85.5% corresponds with the average tin recoveries reported in the pre-1998 geological monthly reports for ore processed at the Wheal Jane mill.

Table 14.4 P&E Upper Mine Mineral Resource cut-off grade parameters

Metal Price: Sn US$/lb	8.50
Concentrate Recovery Sn	85.5%
Smelter Payable Sn	95%
Mining Cost US$/t	55
Process Cost US$/t	27
G&A Cost US$/t	9
Smelting, Refining, Freight Cost US$/t	600
Total Operating Cost US$/t	**91**
Mine Cut-off SnEq%	**0.6%**

P&E opted to use a 0.5% SnEq threshold for wireframing, slightly below the 0.6% SnEq breakeven cut-off grade.

Wireframes were constructed by P&E in GEMS using polylines on vertical cross-sections and snapping to sample intercepts corresponding to the 0.5% SnEq threshold.

To demonstrate reasonable prospects for eventual economic extraction the modelled wireframes were expanded, where required, to a minimum mining width of 1.2 m. If expanded areas lacked sample data, then the additional width was treated as a zero grade.

P&E exercised its professional judgment with regards to maintaining geological continuity.

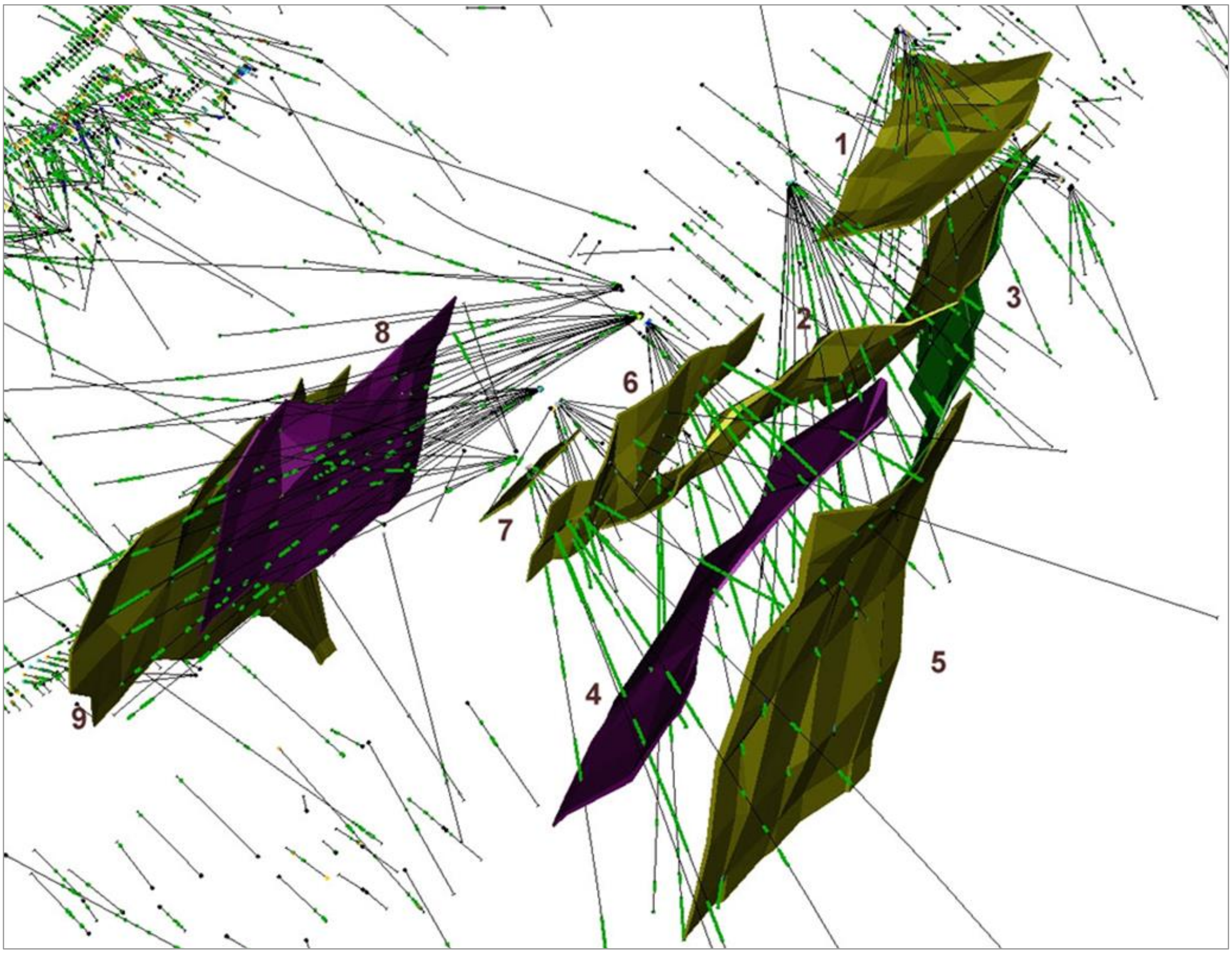
A summary of the P&E modelled Upper Mine wireframes is detailed in Table 14.5.

Table 14.5 Summary of Upper Mine lode wireframes at South Crofty

Lode Name (Wireframes)	Dip / dip direction	Strike length (m)	Dip extent (m)	Average thickness (m)	Volume (m^3)
Dolcoath Little North East	43/330	175	80	2.00	28,358
Dolcoath South Entral	83/330	320	135	2.64	71,606
Dolcoath North Valley Caunter (NVC)	85/125	240	100	2.57	56,149
Dolcoath Upper South-South Branch	85/350	275	175	2.72	73,387
Dolcoath Main	80/150	180	285	3.32	189,223
Dolcoath Little North West	67/150	210	65	1.60	19,380
Dolcoath Little Northwest Footwall	75/330	70	35	1.41	3,668
Dolcoath Middle	75/140	170	135	1.65	90,755
Dolcoath Middle Branch	75/130	300	175	1.36	30,233

An isometric view in Figure 14.6 shows the relative locations of the Upper Mine lodes.

Figure 14.6 Isometric view and relative locations of Upper Mine lodes (looking NNE)



Notes:
1 - Dolcoath Little North East
2 - Dolcoath South Entral
3 - Dolcoath North Valley Caunter (NVC)
4 - Dolcoath Upper South-South Branch
5 - Dolcoath Main
6 - Dolcoath Little North West
7 - Dolcoath Little Northwest Footwall
8 - Dolcoath Middle
9 - Dolcoath Middle Branch
Source: Puritch et al., 2016.

14.2.5 Assay grade distributions and grade capping

A statistical analysis was carried out for the Upper Mine for Sn, Cu, and Zn assays. Based on the statistical review, P&E noted that the Sn assays show a positive skew and some bimodality (Figure 14.7). A subsequent review of the sample grade by P&E did not identify any significant high-grade populations that could be modelled separately.

To prevent undue bias by high-grade outliers, P&E applied grade caps to the sample data, with grade capping applied globally to the Upper Mine rather than on a domain basis. Grade caps were selected based on reviewing lognormal probability cumulative frequency plots, as previously documented in the 2021 South Crofty Tin Project Mineral Resource Update, Technical Report (AMC, 2021). A summary of the selected sample statistics for the Upper Mine before and after grade capping is shown in Table 14.6.

Table 14.6 Grade capping statistics

Grade fields	Count	Max. value	Raw average	Raw CV	Cap	No. values capped	% capped	Capped average	Capped CV
UM Sn%	466	10.56	0.55	1.92	6	4	0.7%	0.53	0.89
UM Cu%	459	11.17	0.77	1.78	4	12	2.5%	0.69	1.41
UM Zn%	459	32.40	0.97	3.24	20	4	0.8%	0.92	2.97

Notes: CV=coefficient variations, Max=maximum.

14.2.6 Compositing

To provide the samples with equal support, drillhole samples were composited to 1.5 m. Channel samples were assigned a composite length of 1.2 m corresponding to the minimum mining width and dynamically adjusted so that all channel samples had the same length.

14.2.7 Bulk density

For granite-hosted Mineral Resources a bulk density of 2.77 t/m^3 has been used corresponding to the historical mining bulk density (Owen et al., 1998). Bulk density testwork was undertaken using the water immersion method on 119 core samples.

In 2010 and 2011, 24 NQ half-core samples were taken for density testwork, and a further 95 samples taken from holes drilled in 2011 and 2012. Samples were taken representing the following lodes:

- Dolcoath South-South branch
- Dolcoath Flat
- Dolcoath Middle
- Dolcoath Main
- Dolcoath South
- Dolcoath South Entral

Bulk density results ranged from 2.60 t/m^3 to 4.57 t/m^3, averaging 3.09 t/m^3. Based on these results a density of 3.0 t/m^3 was used for the killas-hosted Sn-Cu-Zn bearing Upper Mine lodes. The granite-killas contact was modelled from the 2008-2013 drilling and used to build the bulk density block model.

Drilling works completed in 2020 and 2023 by Cornish Metals included taking density measurements for the Lower Mine of which 354 core samples were mineralised. With the exception of one outlier density measurement (1.01 t/m^3), the density measurements showed results between 2.50 t/m^3 and 3.68 t/m^3, averaging 2.79 t/m^3 and with a median value of 2.76 t/m^3. The recent density measurements provide support and credence to the granite density values used in the Upper Mine Mineral Resource estimate.

14.2.8 Variography

To ascertain the principal directions and ranges of grade continuity, P&E generated variance normalised semi-variograms based on the grade capped and composited sample data. Downhole variograms were used to establish the nugget effect.

The variograms generated for the Upper Mine lodes by P&E show high nugget values, contributing to more than two thirds of the overall variance, and relatively short ranges (20 m-30 m along-strike). In most cases the experimental variograms also display poor variogram structures, precluding the development of a reliable variogram model.

Based on the variogram results, P&E opted to estimate grades using Inverse distance weighting cubed (IDW^3) as the principal estimation method.

Whilst the variograms were not used for ordinary kriging (OK) they were used as a guide to the search ellipse parameters.

14.2.9 Block model

A block model prototype was generated for the Upper Mine area in GEMS using the parameters detailed in Table 14.7. The block model is rotated 60° about the Z-axis to align with the overall strike of the lodes.

Table 14.7 Block model parameters

	Dolcoath model
Eastings Origin	165,225
Northings Origin	39,744
RL Origin	2,100
Rotation (degrees)	60 (about Z-axis)
X Cell Size (m)	5
Y Cell Size (m)	15
Z Cell Size (m)	5
X No. Blocks	272
Y No. Blocks	440
Z No. Blocks	170

14.2.10 Search strategy and grade interpolation

Grade estimation has been carried out using IDW^3 as the principal estimation method. Estimates were carried out in a three-pass estimation plan with the second and third passes using progressively larger search radii to enable the estimation of blocks not estimated on the previous pass. Each lode was estimated separately.

The search ellipses were orientated to correspond with the strike and dip of each lode.

Grade estimates for the Upper Mine comprised estimates for Sn, Cu, and Zn.

IDW^3 was utilised for all wireframes except for the Upper Mine Dolcoath lodes of Middle Branch, Little North East, and South Entral, where Inverse distance weighting to the power four (IDW^4) was used to control over-smoothing due to irregular or tight drill intercept spacing.

Table 14.8 summarises the grade estimation parameters.

Table 14.8 Grade interpolation search criteria

Search axis	Pass 1	Pass 2	Pass 3
Upper Mine			
X (m)	55	110	156
Y (m)	65	130	195
Z (m)	10	20	30
Minimum number of samples	2	2	1
Maximum number of samples	12	12	12

Source: After Puritch et al., 2016.

14.2.11 Model validation

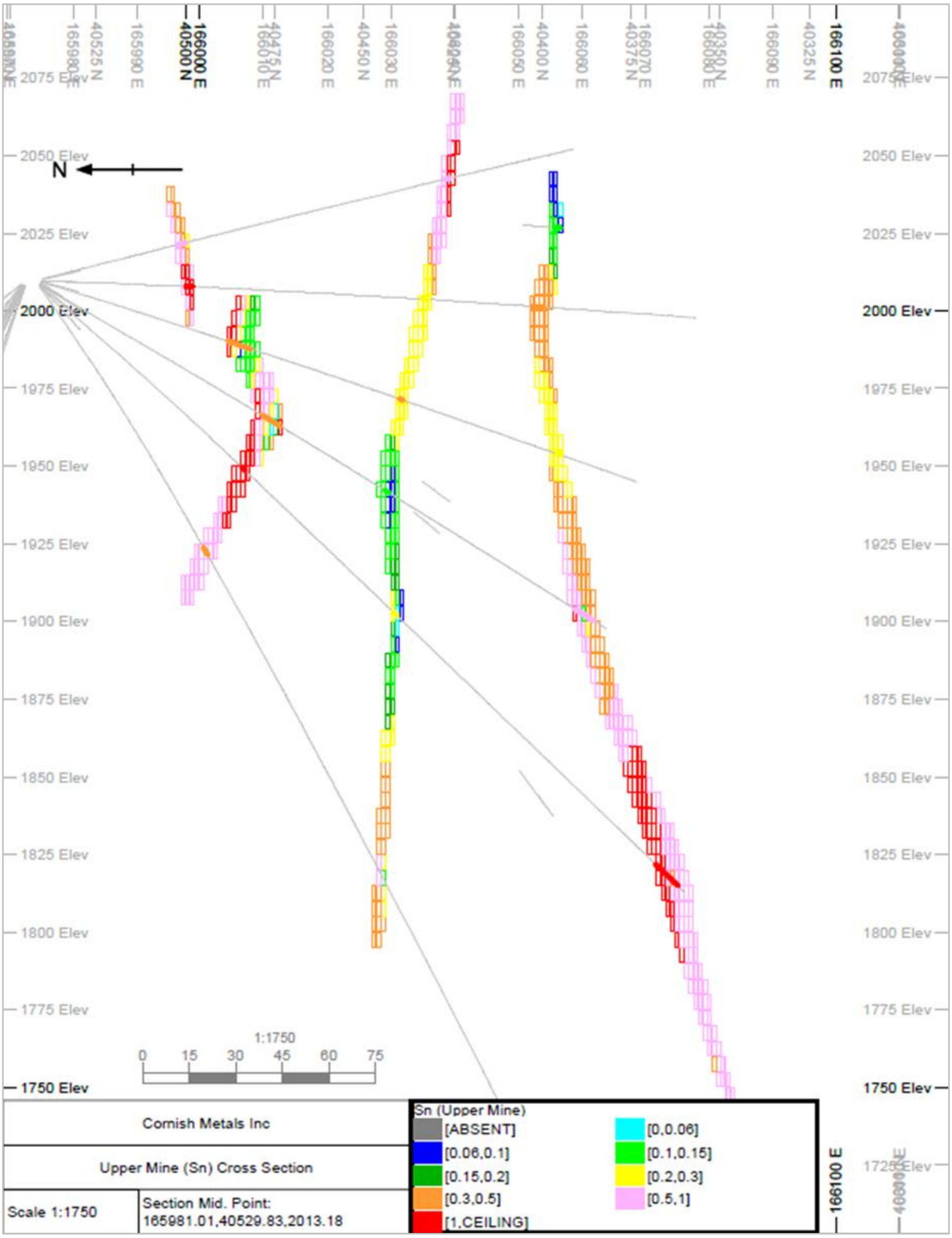
As part of the QP review of the block model, visual and statistical validation checks have been carried out. Validation methods employed includes:

- Visual assessment
- Global statistical grade validation
- Grade profile analysis

14.2.11.1 Visual validation

Visual checks of the grade estimates were carried out in plan, cross-section, and longitudinal section, correlating the sample composite grades against the block model estimated grades. An example Upper Mine cross-section for Sn is shown in Figure 14.7.

Figure 14.7 Upper Mine cross-section block model versus composite grades (Sn)



Source: AMC, 2023.

Some grade smoothing was noted by the QP; however, overall, the QP is of the opinion that the grade estimates are a fair representation of the sample composite data on which they are based.

14.2.11.2 Statistical grade comparison

A grade comparison (Table 14.9) was carried out on a domain-by-domain basis, comparing the block model estimated grades against the sample composite data. A statistical grade comparison provides a check on the reproduction of the mean grade of the composite data against the model on a domain or global basis. Typically, the mean grade of the block model should not be significantly greater than that of the samples from which it has been derived, subject to the sample clustering and spacing.

The statistical grade comparison results are tabulated in Table 14.9.

Table 14.9 Upper Mine statistical grade comparison of composite and block model grades

Lode ID	Sn (%)		Cu (%)		Zn (%)	
	Mean composite grade	Mean block model grade	Mean composite grade	Mean block model grade	Mean composite grade	Mean block model grade
62	0.64	0.50	0.87	0.42	0.19	0.12
66	0.34	0.32	0.52	0.53	0.59	0.97
70	0.43	0.44	0.58	0.56	0.30	0.34
71	0.53	0.44	0.87	0.68	1.09	0.74
72	0.39	0.29	0.85	0.69	0.17	0.16
73	0.57	0.55	0.41	0.26	0.02	0.02
74	1.20	0.73	0.83	0.38	1.94	1.10
75	0.31	0.30	0.23	0.12	1.06	0.83
76	0.91	0.38	0.03	0.02	0.17	0.14
All	**0.57**	**0.50**	**0.87**	**0.50**	**0.65**	**0.48**

The results in Table 14.9 show a number of lodes with deviations between the average composite grade and the average block model grade. Reviewing the Upper Mine model visually provides context for these average global grade deviations, with the QP noting the following contributing factors:

- Sample data clustering, typically in relation to higher grades.
- Extrapolation of lower grade areas at the peripheral areas of lodes based on limited numbers of low-grade sample intercepts.
- Limited grade smoothing.
- Where isolated high-grade samples are present their influence on the grade estimates has been restricted to prevent undue influence.

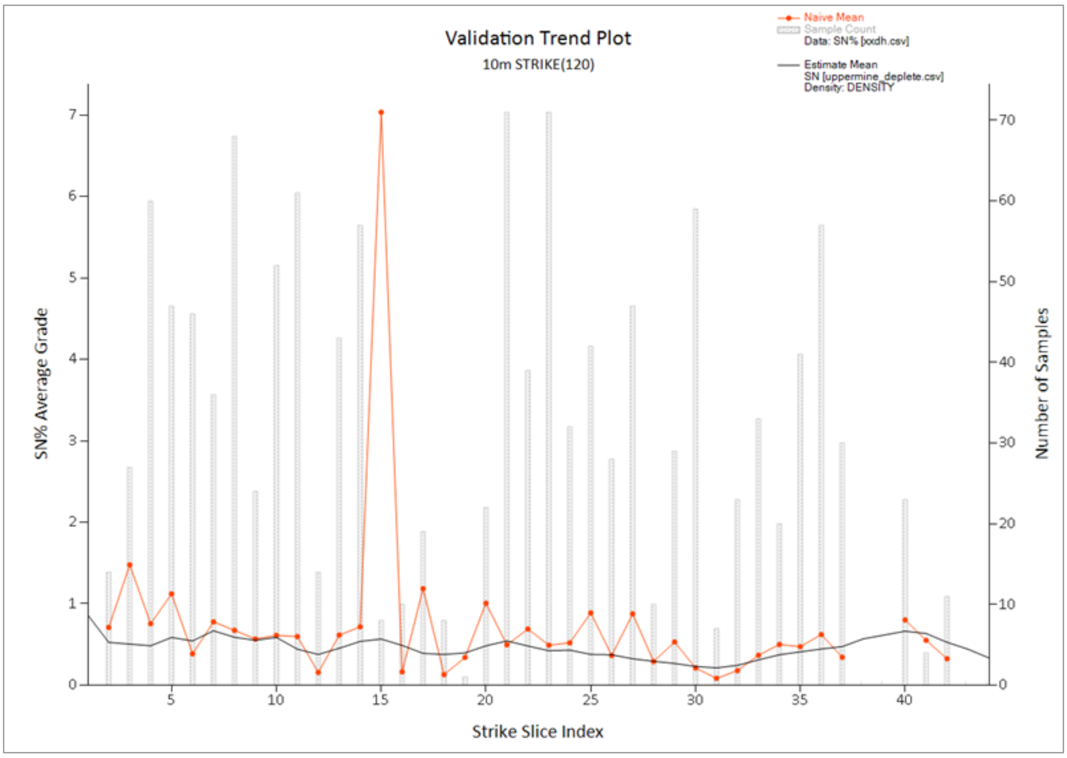
14.2.11.3 Grade profile analysis

To provide a greater resolution of detail than the statistical grade comparison, the QP has carried out a series of local grade profile comparisons, also known as swath plots. A grade profile plot is a graphical representation of the grade distribution through the deposit derived from a series of swaths or bands, orientated along eastings, northings, or vertically as well as along-strike and across-strike. For each swath, the average grade of the composite data and the block model are correlated.

Example grade profile results covering all lodes in the Upper Mine for Sn are provided in Figure 14.8 to Figure 14.10.

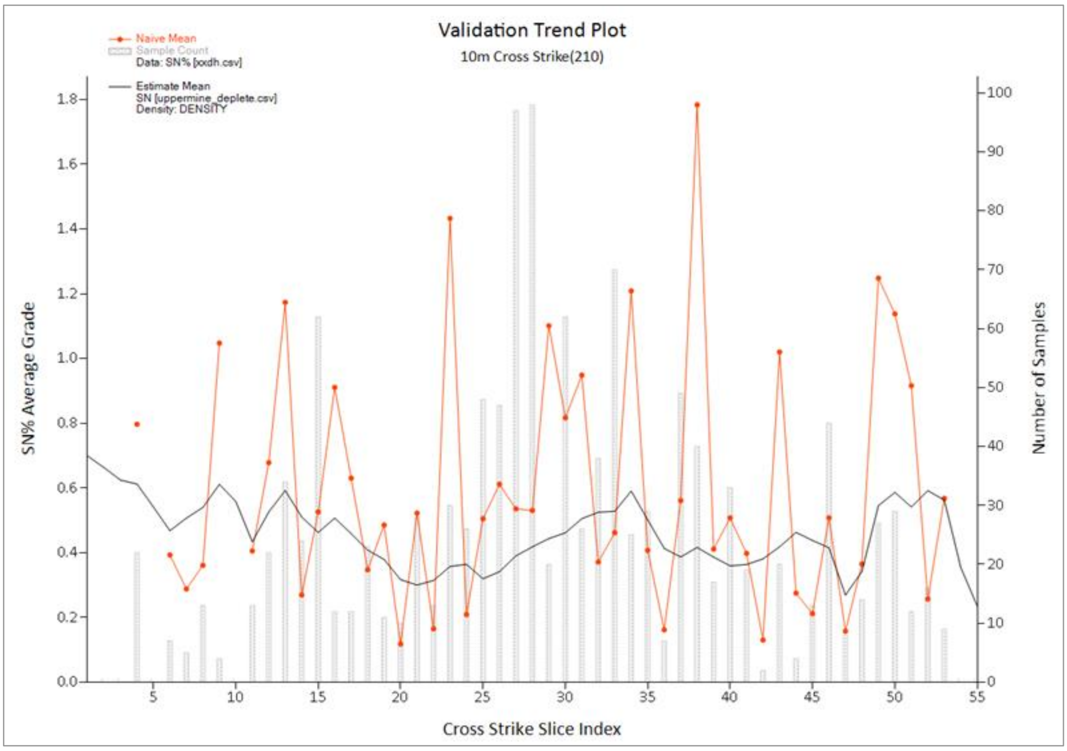
Overall, the grade profile results show a reasonable correlation between the block model estimates and composites. Whilst there is some isolated clustering of high-grade samples as shown by the peaks in the grade profile plots, these high-grade clusters have not biased the estimates.

Figure 14.8 Grade profile plot along-strike for complete Upper Mine – Sn



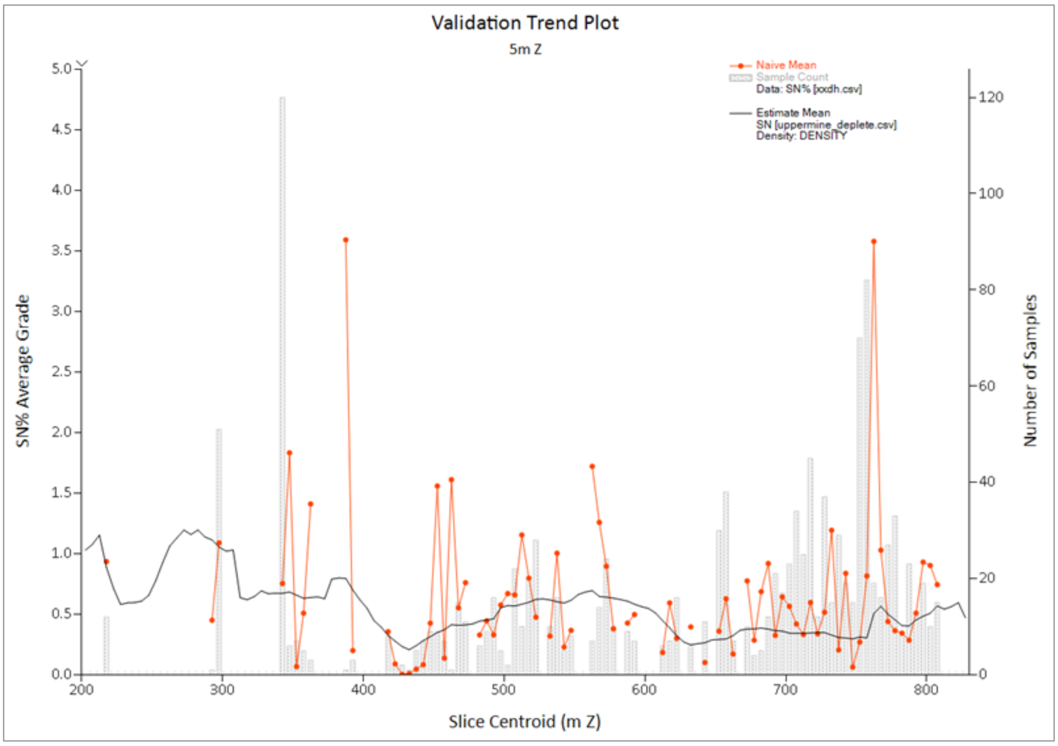
Source: AMC, 2021.

Figure 14.9 Grade profile plot across-strike for complete Upper Mine – Sn



Source: AMC, 2021.

Figure 14.10 Grade profile plot vertical for complete Upper Mine – Sn



Source: AMC, 2021.

14.2.11.4 Validation conclusions

Having visually and statistically reviewed the Upper Mine grade estimates the QP is of the opinion that the estimated grades are representative of the sample composite data on which they are based.

14.2.12 Reasonable prospects for eventual economic extraction

The Upper Mine Mineral Resources meet the requirement of reasonable prospects for eventual economic extraction having been modelled to a minimum mining width of 1.2 m to account for mining selectivity. During the wireframe modelling a minimum thickness for the wireframes was set at 1.2 m with appropriate grade dilution applied.

Mineral Resources are reported at a cut-off grade of 0.6% SnEq. A SnEq grade has been estimated for each block in the Upper Mine block model using the formula:

$$SnEq\% = Sn\% + (Cu\% \times 0.314) + (Zn\% \times 0.087)$$

The SnEq formula is based on the following parameters:

- Sn price: US$24,500/t
- Cu price: US$8,000/t
- Zn price: US$2,700/t
- Sn recovery: 88.5%
- Cu recovery: 85%
- Zn recovery: 70%

The prices used in the SnEq formula are based on World Bank commodity price forecasts as of 27 April 2023[1]. The QP has reviewed the prices against long-term metal forecasts, as of August 2023. The prices used for Sn, Cu, and Zn fall within the lower and upper price forecast ranges.

The processing recovery for Sn corresponds with the upper end of recoveries recorded in the monthly geological reports for Lower Mine ore processed at the Wheal Jane mill, pre-1998. In the absence of specific metallurgical testwork and documented recoveries for the Upper Mine, the QP has opted to adopt the same Sn recovery of 88.5% for the Upper Mine SnEq estimates.

Recoveries for Cu and Zn are based on the values previously used in the 2016 P&E resource estimate (Puritch et al., 2016). The Cu and Zn recovery values are not based on metallurgical testwork but reflect an opinion of the QP as to the potential recoveries should a differential flotation circuit be adopted.

14.2.13 Mineral Resource classification

Mineral Resources for the Upper Mine are classified in accordance with the JORC Code (2012). The confidence categories assigned under the JORC Code were reconciled to the confidence categories in the CIM Definition Standards – for Mineral Resources and Mineral Reserves May 2014 (the CIM Definition Standards). Mineral Resource classifications of “Indicated” and “Inferred” have been used in this Technical Report.

The South Crofty data has been reviewed and verified in relation to CIM best operating practices for reporting and for scope and content of JORC and NI 43-101 reporting through a due diligence conducted by the QP.

The classification of Mineral Resources is based on the QP’s opinion in relation to the quality of data, geological and grade continuity, and the quality of the grade estimates.

The Upper Mine Mineral Resources were classified as follows:

- Indicated Mineral Resources: Resources based on a regular sample spacing of 30 m to 40 m.
- Inferred Mineral Resources: Resources sampled on spacings >40 m and intersected by at least three holes.

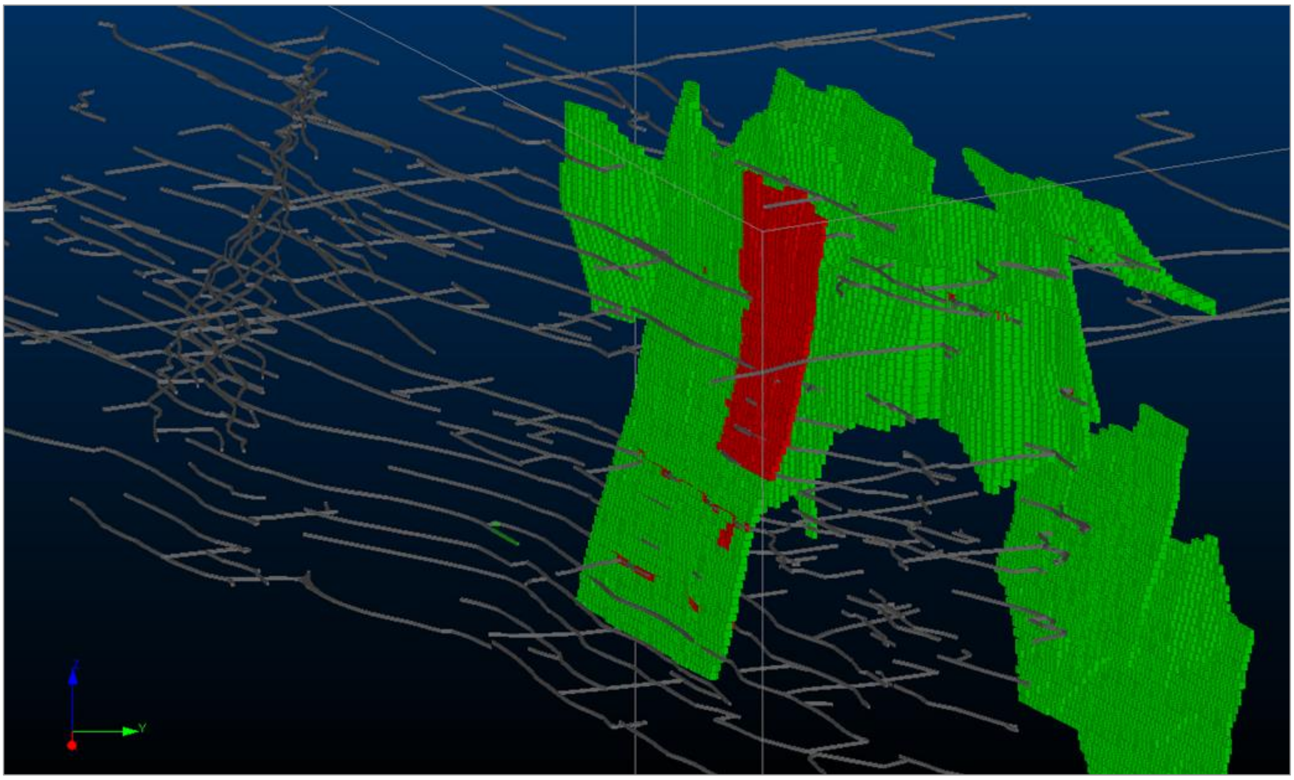
14.2.14 Depletion

To account for historical mining activities in the Upper Mine, development and stope wireframes have been digitised from plans and longitudinal sections. Using the digitised mine workings wireframes, depletion coding was assigned to the block model (Figure 14.11). Areas defined as being mined have been excluded from the Mineral Resource.

As part of the review by the QP it was noted that part of the Upper Mine Dolcoath Upper Main lode had been projected along-strike into an area unsupported by sample data. This area of extrapolation has subsequently been excluded from the Mineral Resource.

[1] https://www.worldbank.org/en/research/commodity-markets.

Figure 14.11 Oblique view looking south of Upper Mine showing depleted blocks in red



Notes: Underground development (grey), mined-out areas (red) depleted from the block model, block model (green).
Source: AMC, 2021.

14.2.15 Mineral Resource reporting

Table 14.10 summarises the South Crofty Upper Mine Mineral Resources reported in accordance with the JORC Code. Mineral Resources are limited to those parts of the mineralisation at a cut-off grade of 0.6% SnEq and a minimum mining width of 1.2 m.

The estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues. The Property is a previously operating mine situated in a mining friendly jurisdiction. The United Kingdom is a politically stable jurisdiction and socio-political factors are unlikely to affect the Mineral Resource. Cornish Metals has underground permissions which include five Mineral Rights, which are registered with the Land Registry, as well as areas of Mineral Rights that are leased or unregistered. Conditional planning permissions for the surface development and underground workings were granted by Cornwall Council, the LPA, in 2011 and 2013 respectively. On 23 October 2017, Cornish Metals announced that it had received Permit EPR/PP3936YU from the United Kingdom EA allowing the discharge of up to 25,000 m^3 of treated water per day from the South Crofty Mine. In January 2020, abstraction licence SW/049/0026/005 was awarded to the Company by the EA. Cornish Metals has the necessary title arrangements and permits, and has addressed environmental considerations relevant to the reporting of Mineral Resources. The QP is not aware of any factors which would materially affect the Mineral Resource disclosed herein.

Table 14.10 Upper Mine Mineral Resource estimate at 0.6% SnEq cut-off as of 6 Sep 2023[1-12]

Lode / zone	Mass (kt)	Grade				Contained tin equivalent (t)
		% Sn	% Cu	% Zn	% SnEq.	
Dolcoath Middle	90	0.72	0.88	0.16	1.01	904
Dolcoath Middle Branch	37	0.89	0.34	0.02	1.00	367
Dolcoath Upper Main	-	-	-	-	-	-
Dolcoath Upper South South Branch	-	-	-	-	-	-
Dolcoath NVC	-	-	-	-	-	-
Dolcoath Little NW	12	0.69	0.16	0.87	0.81	99
Dolcoath Little NW FW	-	-	-	-	-	-
Dolcoath Little NE	-	-	-	-	-	-
Dolcoath South Entral	122	0.62	0.91	1.05	1.00	1,213
Total Indicated	**260**	**0.69**	**0.78**	**0.59**	**0.99**	**2,583**
Dolcoath Middle	22	0.75	0.05	0.01	0.77	171
Dolcoath Middle Branch	-	-	-	-	-	-
Dolcoath Upper Main	271	0.61	0.60	0.22	0.82	2,210
Dolcoath Upper South South Branch	88	0.50	0.73	1.83	0.88	778
Dolcoath NVC	36	0.75	1.09	0.15	1.10	395
Dolcoath Little NW	-	-	-	-	-	-
Dolcoath Little NW FW	1	0.81	0.03	0.25	0.84	8
Dolcoath Little NE	47	1.15	0.55	1.43	1.45	677
Dolcoath South Entral	-	-	-	-	-	-
Total Inferred	**465**	**0.66**	**0.63**	**0.63**	**0.91**	**4,239**

Notes:
1 The Mineral Resource estimate is reported in accordance with the requirements of the Joint Ore Reserves Committee of the Australian Institute of Mining and Metallurgy, the JORC Code (2012).
2 The QP for this Mineral Resource estimate is Mr Nicholas Szebor, MCSM, MSc, BSc, CGeol, EurGeol, FGS, of AMC.
3 Mineral Resources for the Upper Mine are estimated by conventional 3D block modelling based on wireframing at 0.5% SnEq cut-off grade and a minimum width of 1.2 m and estimated by inverse distance to the power of 3 (ID^3) grade interpolation.
4 SnEq is calculated using the formula: SnEq% = Sn% + (Cu% x 0.314) + (Zn% x 0.087). Cornish Metals has used metal prices of US$24,500/tonne Sn, US$8,000/tonne Cu, and US$2,700/tonne Zn. Assumptions for process recovery are 88.5% for Sn, 85% for Cu, and 70% for Zn.
5 For the purpose of this Mineral Resource estimate, assays were capped by lode for the Upper Mine at 6% for Sn, 4% for Cu, and 20% for Zn.
6 Bulk densities of 2.77 t/m^3 and 3.00 t/m^3 have been applied for mineralisation volume to tonnes conversion for the granite-hosted and killas-hosted Mineral Resources, respectively.
7 Mineral Resources are estimated from near-surface to a depth of approximately 350 m.
8 Mineral Resources are classified as Indicated and Inferred based on drillhole and channel sample distribution and density, interpreted geological continuity, and quality of data.
9 The Mineral Resources have been depleted for past mining; however, they contain portions that may not be recoverable pending further engineering studies.
10 Mineral Resources which are not Mineral Reserves do not have demonstrated economic viability. The estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.
11 Effective date 6 September 2023.
12 Totals presented in the table are reported from the resource model are subject to rounding and may not sum exactly.

14.3 Lower Mine Mineral Resource estimate

14.3.1 Source of data

A major audit and verification programme of the Lower Mine database has been undertaken by Cornish Metals since mid-2017 to get more data into a usable secure format for future use. This has involved going back to the original sample ledgers to verify grades, sample widths, collar positions, and orientation of channels and drillholes. Prior to this date the existing data was held in numerous Excel™ spreadsheets and this has all been transferred to a central Access™

database with built-in controls on duplication, deletion, and data entry. Data found to be missing from digital records have been entered into Access™ directly.

The programme of checking individual samples against historical sample sheets is still ongoing; however, this work has been completed for those samples used in the Mineral Resource estimates reported herein. The closure date for data to be included within the Mineral Resource estimates was 29 August 2023.

The database currently comprises more than 30,000 separate sample collars although some sample data is yet to be incorporated into the database. These data are in areas which are yet to be included in the Mineral Resource estimate. Table 14.11 shows the database summary for the Lower Mine samples which have been reviewed and included in this Lower Mine Mineral Resource estimate.

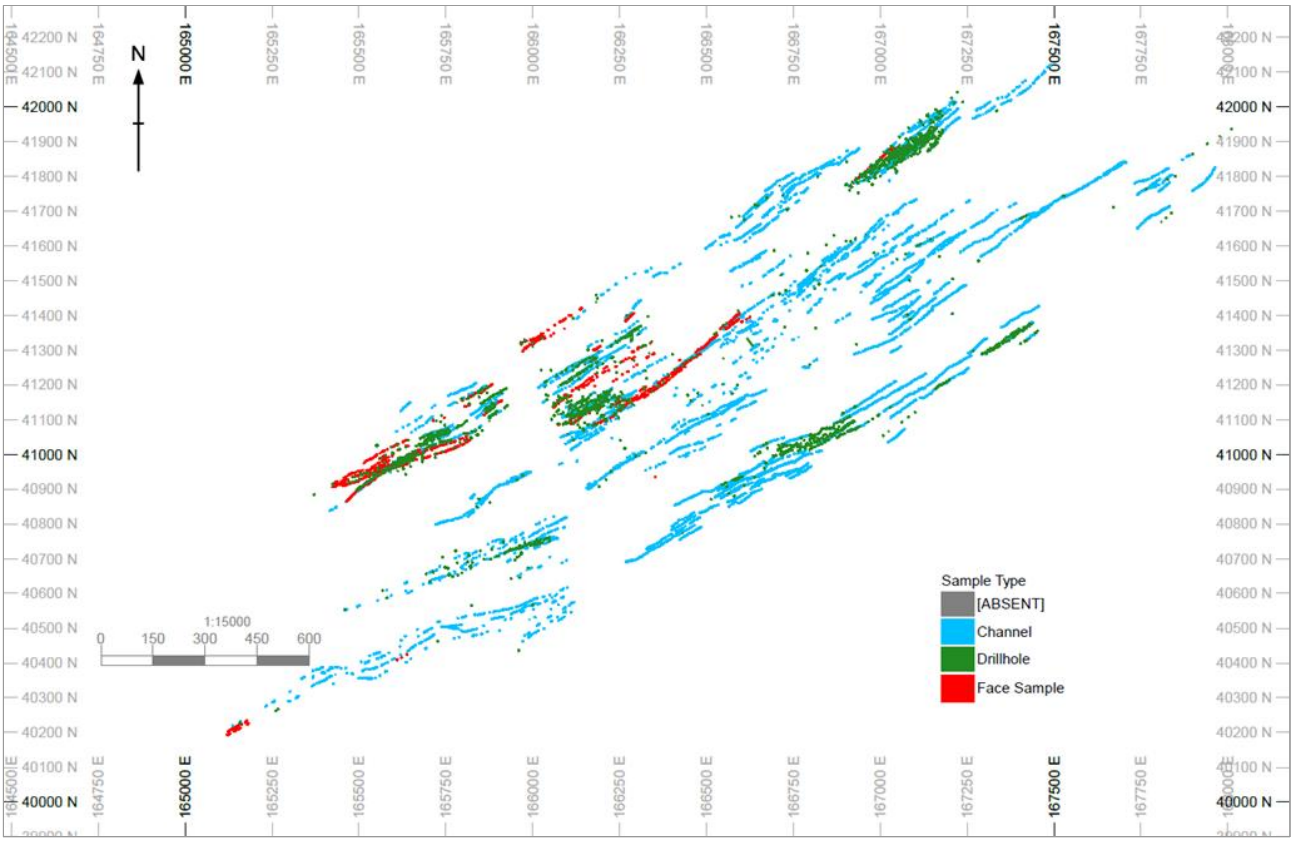
Table 14.11 Lower Mine database summary

Sample type	Count	Average length (m)	Total samples
Channel	35,938	1.69	83,553
Drillhole	3,925	33.72	32,447
Face Sample	1,705	2.74	5,421

Source: Cornish Metals, 2023.

Compared to the database available to P&E for the Mineral Resource estimate published in 2016, some key data have been digitised and added to the database having an impact on the interpretation of mineralised structures. Most notable of these are drillholes drilled below the Roskear B structure, which prove continuity of the structure at depth. A plan view of sample intercepts by sample type in the South Crofty Lower Mine database can be seen in Figure 14.12.

Figure 14.12 Plan view of South Crofty Lower Mine drillhole, channel, and face sample intercepts



Source: AMC, 2023.

14.3.2 Data validation

As the digital mine database used during the final years of operation was lost following the closure of South Crofty, the Lower Mine database has been compiled into an Access™ database. The original data is in the form of log sheets and sample ledgers through to more modern digital computer printouts of sample data and working face sheet records. All records have been stored securely in the mine archive and are in good condition. The mine archive was visited by the QP as part of the July 2023 site visit.

Validation of the data by Cornish Metals comprised visual checks of both assay and survey data in spreadsheet format to check for obvious transcription errors. Sample data was then imported into Access™. The Access™ database was constructed with conditions to avoid duplicate collar entries, and sample / survey entries with no collar information. This served as a further validation exercise. Within Access™, queries were then run to check for absent data for each sample location entry.

The Access™ database was then imported into Datamine Studio RM™ software, during this process further validation checks were made for:

- Intervals exceeding the hole length (from-to problem).
- Negative or zero length intervals (from-to problem).
- Inconsistent downhole survey.
- Duplicate samples or out of sequence and overlapping intervals.
- Additional sampling / check sampling included in the database.
- No interval defined within analysed sequences (not sampled or implicit missing samples / results).

The QP has checked the validation processes, data import, and final data files and is of the opinion that the work completed is robust.

Following import into Datamine Studio RM™ visual checks were carried out by the QP for sample locations and drillhole collar locations. Drillhole locations were cross-checked between the locations recorded in the logs and the locations recorded on the 1:500 geological mine plans. Any errors were corrected.

The majority of the historical drillhole data has limited or no downhole surveys as most holes are short bazooka holes into drift walls. Historical exploration holes testing lower mined lodes are primarily on the fringes of the deposits where Inferred Resources are outlined.

14.3.3 Wireframes

In the previous estimate, the mineralised envelopes were defined using horizontal strings digitised on mine levels using channel sample and drillhole data. Interim strings were digitised where drillhole data was available and / or where intermediate strings were necessary to construct the wireframe envelopes. Interpretation of the structures was based on the sample data, mine plans, and sections produced during the mine's operation.

Definition of wireframe volumes was based on a 0.4% Sn threshold which is broadly consistent with the natural cut-off distinguishing mineralised lodes from barren host rock. Using the 0.4% Sn threshold and considering the structural interpretation, continuity of structure was extrapolated through areas where low-grade was present. Structures were defined across-strike based on structural width, where precedent was given to mineralised structure rather than a set minimum mining width. Wireframe envelopes have been modelled based on available data and structural continuity, and structures have been modelled through the contact between the granite and the overlying metasediments.

Additional lodes have been added to this 2023 Mineral Resource estimate compared to the 2021 estimates. These lodes have been modelled in Leapfrog Geo™ using implicit vein surface modelling which allows for more efficient updates and allows easier definition of cross-cutting relationships. Most notable of these additional lodes is the No. 1, No. 2, and No. 3 zones which consists of a pegmatite body intersected by multiple steeply dipping lodes. The pegmatite zone has formed a locus for the mineralisation filled fractures. Whilst localized mining has taken place within the additional lodes, sufficient mineralisation remains to add to the Mineral Resource. Some of the No. 2 lodes had previously been modelled but the 2023 interpretation has extended these lodes eastwards and better defined the vein system relationships. The pegmatite body itself was known to have tin and tungsten mineralisation but this has not been modelled due to lack of data and inaccurate stope shapes; it is also thought to be largely mined out. Where the pegmatite zone intersects mineralised lodes, these lode areas have been excluded from the Mineral Resource. The Main, Intermediate, North, and Great lodes are also newly modelled and occur between the No. 1 zone and the Pryces-Tincroft zone. These were generally mined pre-1980 and generally occur in the upper levels of the Lower Mine.

The Providence Lode has been re-modelled using Leapfrog Geo™ to further define the lode extents and improve the estimate based on recent reconciliation work.

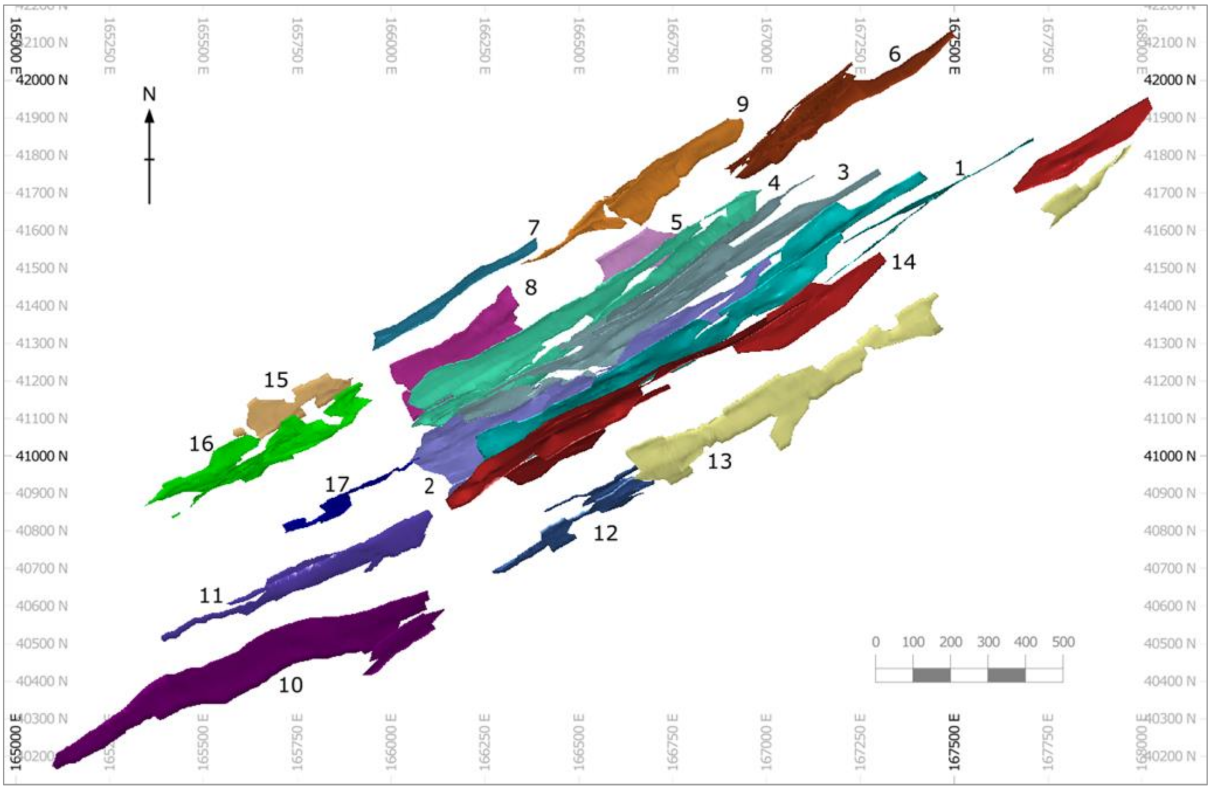
A summary of the Lower Mine lodes modelled as part of the current Mineral Resource are detailed in Table 14.12. A plan of the distribution of modelled lodes is shown in Figure 14.13 with the reference numbers corresponding to Table 14.12.

Table 14.12 Summary of Lower Mine lodes

No. key[1]	Lode name (wireframes)	Dip / dip direction	Strike length (m)	Dip extent (m)	Average thickness (m)	Volume (m^3)
1	No. 1 (1, 1SB, 2A, WET)	65/145	1,430	350	0.77	266,493
	Other Lodes (NN, LM, 2E)	87/140	850	165	0.87	122,561
2	No. 2 (2, 2NB, 2SB)	65/325	820	435	1.16	307,962
	No. 2 2nd South Dipper	75/160	200	270	1.03	41,170
3	No. 3 (3, 3SB, 3A, 3B, 3B Peg)[c]	70/145	1,285	260	0.47	181,202
4	No. 4	70/145	1,050	400	1.68	592,815
5	No. 5	65/145	210	275	0.85	40,580
6	North Pool Zone No.6	64/322	420	100	1.22	55,968
	North Pool Zone No. 6 North Branch (3)	64/144	360	145	1.16	65,386
	North Pool Zone Pegmatite Lodes (2)	85/160	140	75	1.18	17,507
	North Pool Zone Other Lodes (7)	65/319	400	130	1.82	178,193
7	Providence	80/325	520	27	0.81	208,336
8	No. 8 (2)	55/148	315	275	1.74	197,715
9	No. 9 (3)	70/138	620	195	1.41	151,128
10	Dolcoath South	71/150	1,000	275	0.75	186,012
	Dolcoath South South Branch	73/335	225	185	0.64	27,825
11	Dolcoath North (4)	75/158	770	200	0.96	175,525
12	Tincroft (3)	75/145	700	300	2.35	234,656
13	Pryces (4)	60/150	1,500	320	1.93	323,970
14	Main, Intermediate, North, Great[2]	75/325	2,130	280	0.97	359,545
15	Roskear A	60/140	260	195	1.53	64,980
16	Roskear B (3)	65/152	500	270	2.43	349,787
17	Roskear South	80/140	400	175	1.23	57,487

Notes:
[1] No. Key = number key for Figure 14.13.
[2] Some minor lodes dip south.
Source: Cornish Metals, 2023.

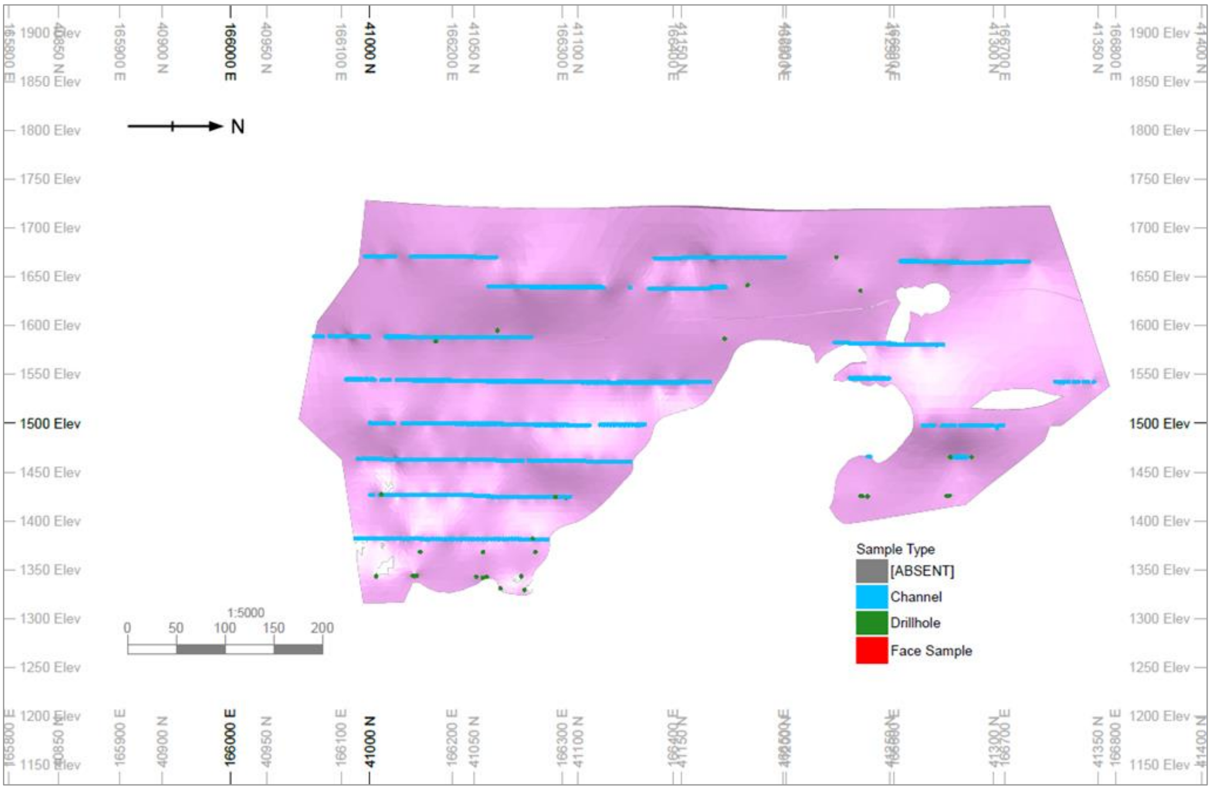
Figure 14.13 Plan showing relative locations of Lower Mine lodes



Note: Correlation of lode wireframe numbers and names is shown in Table 14.12.
Source: Cornish Metals, 2021.

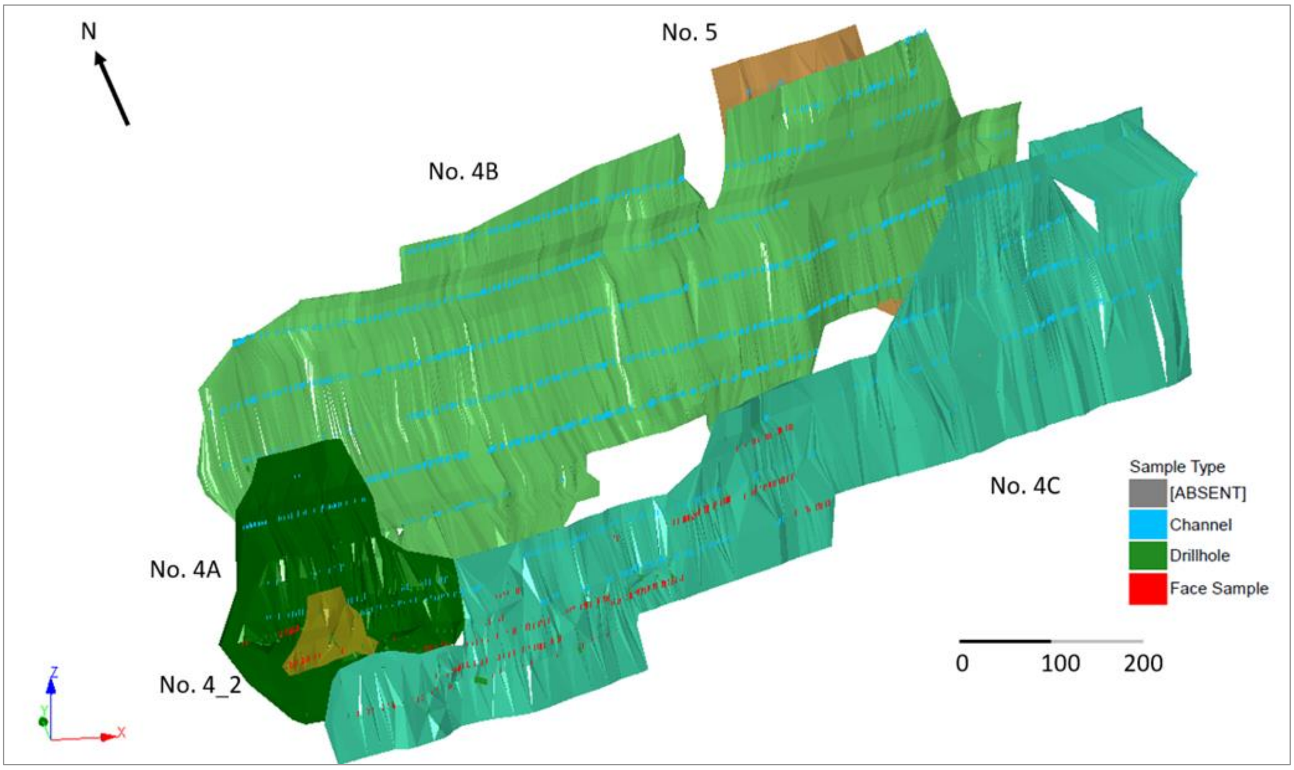
Examples of the modelled lodes are shown in Figure 14.14 to Figure 14.17.

Figure 14.14 Longitudinal section looking north-west of No 2 lode and sample distribution



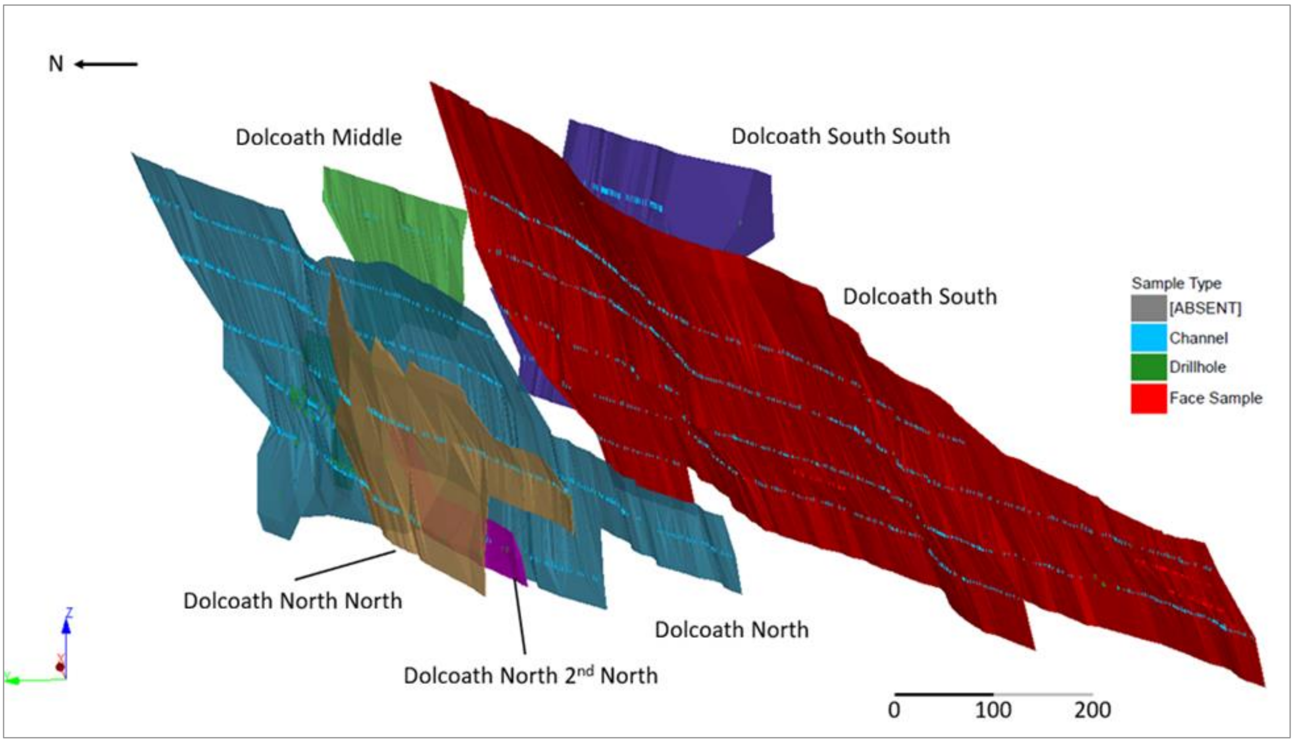
Source: AMC, 2023.

Figure 14.15 View looking north-east of the No 4 lodes



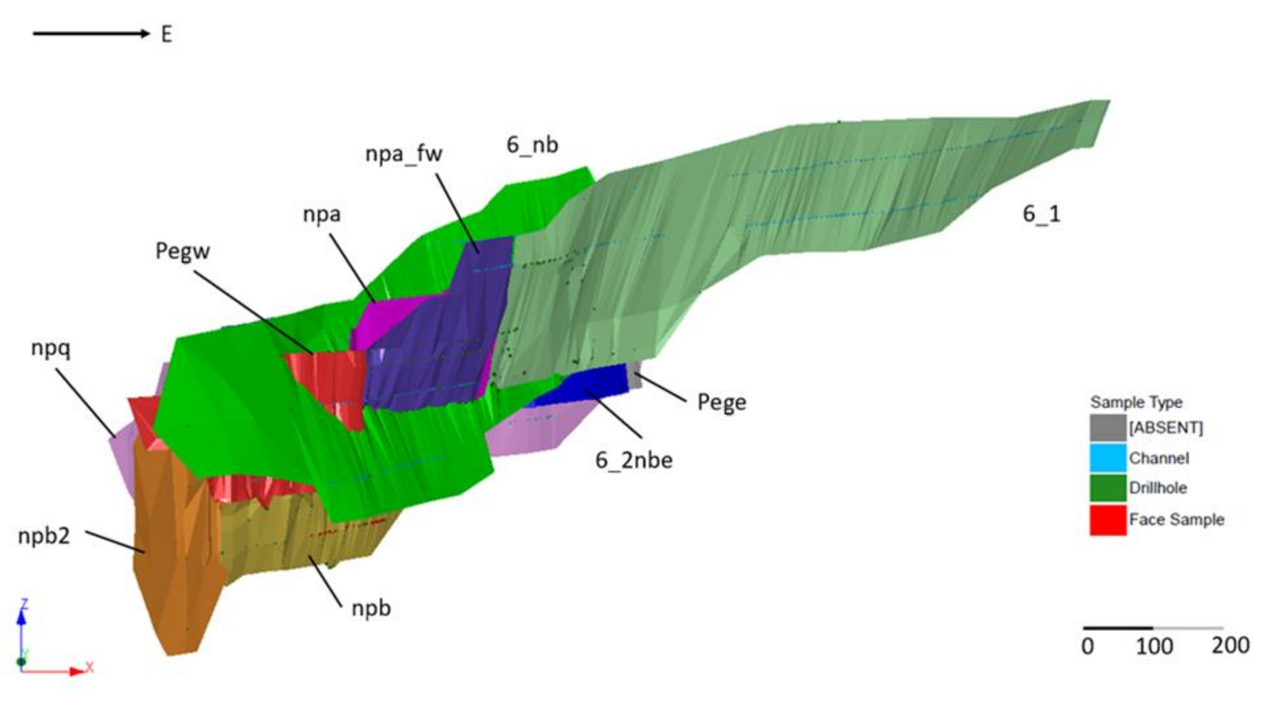
Source: AMC, 2023.

Figure 14.16 3D view looking south-east showing new Dolcoath lode wireframes



Note: Dolcoath North South lode is situated behind Dolcoath North lode and not shown.
Source: AMC, 2023.

Figure 14.17 3D View looking north showing the North Pool Zone lodes



Source: AMC, 2023.

The granite contact is generally thought to limit mineralisation upwards, although this may be biased as much of the historical mining and sampling was stopped at the contact. The contact was constructed using intercept points in drives, underground drilling, and surface drilling. The surface has been used to code the block model but in areas of sparse data on the contacts position, this surface has not been used to truncate or assign differing bulk density values.

Any lodes that cut through each other were truncated or trimmed after the correct relationship had been established.

14.3.4 Statistics

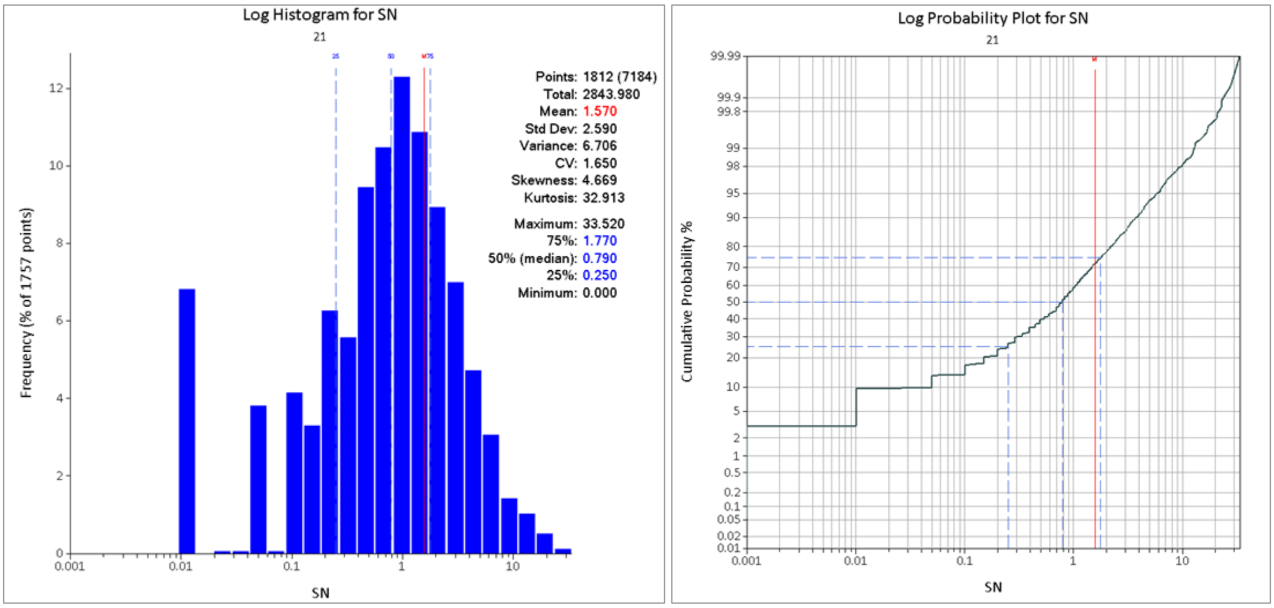
Samples within the wireframe envelopes were selected for further processing prior to grade estimation. Samples were coded according to the lode with both a unique alphanumerical code and a numerical code purely for estimation use. A basic statistical analysis was carried out for each lode and an example of these statistics can be seen in Table 14.13. Sn grade distributions for all lodes display a positive skew with quite different variance and kurtosis values. Example log histogram and probability plots for No. 2 and No. 8A lodes are shown in Figure 14.18 and Figure 14.19 respectively, reflecting some of the more significant lodes in the Lower Mine.

Table 14.13 Summary of raw sample statistics of selected lodes

Mineralised structure	No. of samples	Maximum	Mean	Variance	Standard deviation	Skewness	Kurtosis
No 4A	2,897	27.92	1.36	4.08	2.02	4.30	29.19
No 8A	2,287	47.00	2.66	15.79	3.97	3.51	19.47
Dolcoath South	1,858	38.04	2.25	9.91	3.15	3.22	16.98
Roskear B FW	2,264	32.00	2.07	10.89	3.30	3.43	16.85
No. 1	1,485	73.76	1.20	11.81	3.44	10.87	171.19

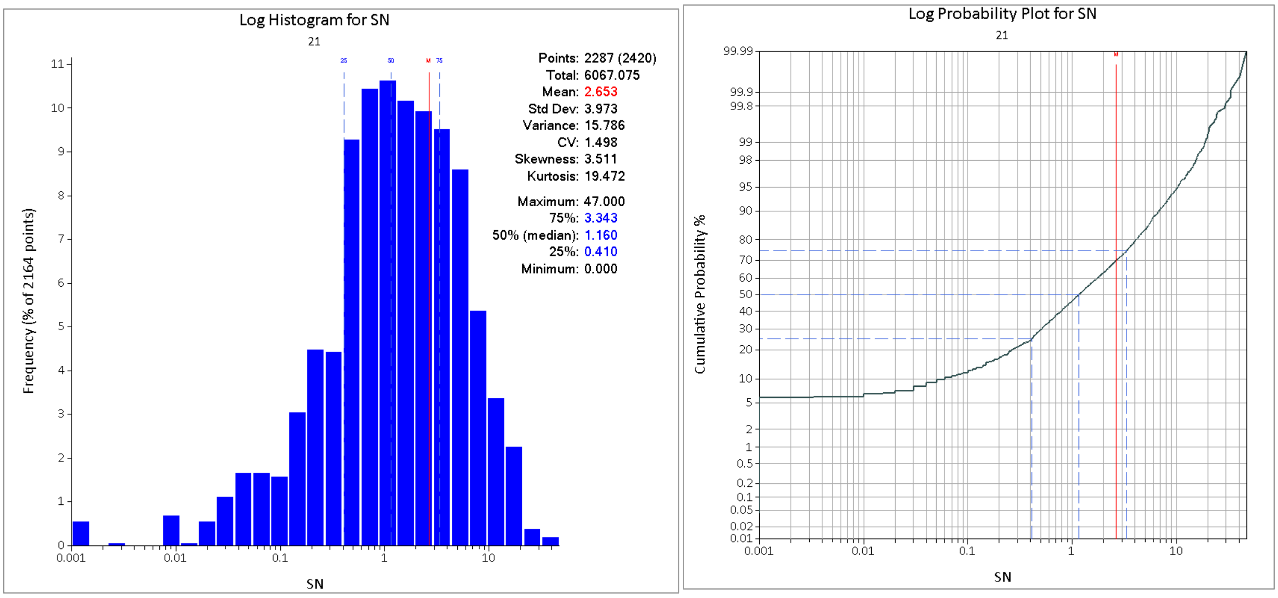
Source: AMC, 2023.

Figure 14.18 Log histogram (left) and log probability plot (right) for No. 2 lode



Source: AMC, 2023.

Figure 14.19 Log histogram (left) and log probability plot (right) for No. 8A lode



Source: AMC, 2023.

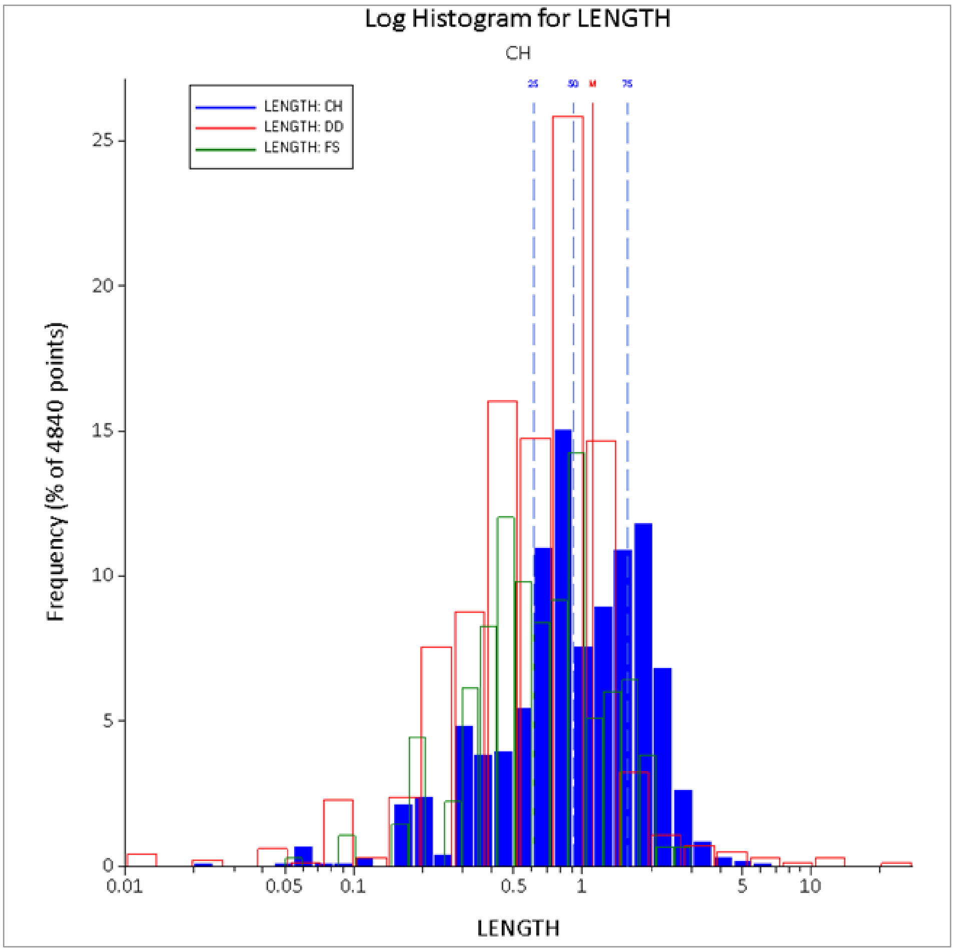
Samples were analysed by type as shown in Table 14.14. Sample length for the combined No. 4 lode is shown in Figure 14.20, with channel sample mean length of 1.12 m, drilling sample mean length of 0.84 m and face sample mean length of 0.80 m.

Table 14.14 Raw Sn sample statistics by sample type for selected lodes

Mineralised structure	Sample type	No. of samples	Maximum	Mean	Variance	Standard deviation	Skewness	Kurtosis
No. 4A	DD	79	10.36	0.99	2.91	1.71	2.95	10.67
	CH	2,818	27.92	1.37	4.11	2.03	4.32	29.38
	FS	0	-	-	-	-	-	-
No. 8A	DD	840	47.00	2.14	12.41	3.52	4.60	38.09
	CH	1,035	40.59	2.85	17.96	4.24	3.45	16.92
	FS	412	21.40	3.19	16.29	4.04	2.09	4.48
Dolcoath South	DD	26	4.36	0.92	0.91	0.96	2.14	4.63
	CH	1,704	38.04	2.19	9.18	3.03	3.32	19.17
	FS	128	24.57	3.32	19.90	4.46	2.10	4.51
Roskear B FW	DD	1,039	32.00	1.97	11.57	3.40	3.81	20.37
	CH	885	18.93	1.94	7.53	2.74	2.76	9.37
	FS	340	31.07	2.72	17.03	4.13	2.83	10.70
No. 2	DD	56	27.63	2.15	20.52	4.53	3.90	16.89
	CH	1,756	33.52	1.55	6.25	2.50	4.56	32.19
	FS	0	-	-	-	-	-	-

Source: AMC, 2023.

Figure 14.20 Log histogram showing sample length by sample type for No. 4 Zone

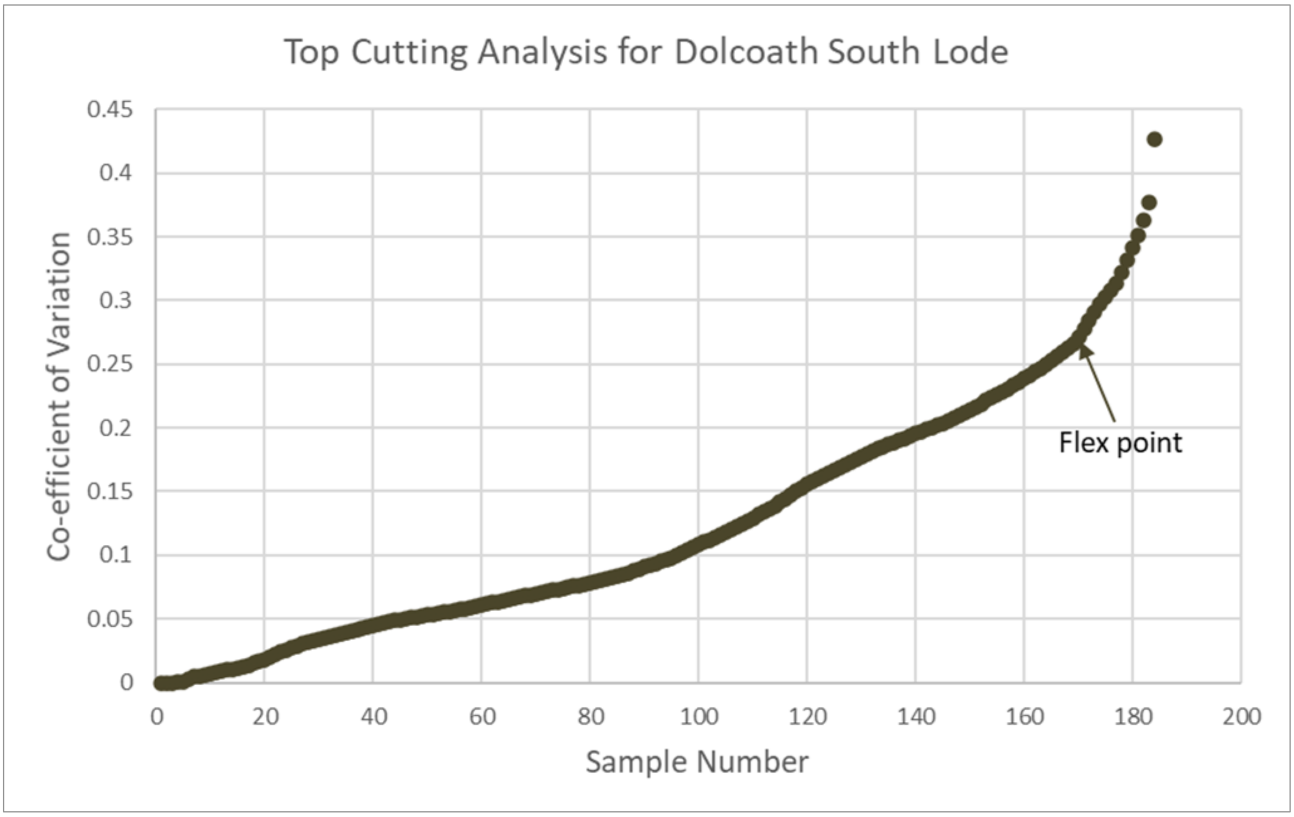


Source: AMC, 2023.

14.3.5 Grade capping

The sample statistics for each individual wireframe were reviewed and grade caps applied where required. This was done to minimise the influence of high-grade outlier samples during estimation. The Sn population for each lode were analysed for appropriate top cutting levels by assessing the cumulative coefficient of variation (CV) as seen in Figure 14.21. Significant changes in gradient of the CV line can indicate a change in population type and has been used to guide grade capping.

Figure 14.21 Cumulative coefficient of variation plot for Dolcoath South sample population



Note: Plot shows the cumulative coefficient of variation in the sorted upper 2 centiles of Dolcoath South sample population. The flex point indicates a possible change in population type equating to 15% Sn.
Source: Cornish Metals, 2021.

An example summary of the grade caps applied is shown in Table 14.15 with sample statistics pre- and post-grade capping. This shows a small proportion of samples have been capped on an individual basis.

Table 14.15 Summary of top-cuts applied to selected lodes

Mineralised structure	Grade cap (Sn %)	No. of samples cut	Pre grade cap mean (Sn%)	Post grade cap mean (Sn%)
No. 4b	15	7	1.39	1.35
No. 6_1	10	28	1.67	1.43
No. 8A	21	12	2.65	2.61
Dolcoath South	15	15	2.25	2.20
Roskear B FW	23	6	1.80	1.79
No. 1	16	10	1.20	1.08

Source: AMC, 2023.

14.3.6 Compositing

Following grade capping, samples were composited to the width of the structure where it is below the minimum mining width of 1.2 m. In areas wider than the minimum mining width the composite length was set at 1.2 m. Narrower zones have the block grade and tonnage diluted to equivalent 1.2 m width after the estimation has taken place. The compositing process required all samples to be included in one of the composites by adjusting the composite length to as closely match the 1.2 m composite length. A summary of the sample statistics following grade capping is shown in Table 14.16.

Table 14.16 Summary of composited sample statistics for selected lodes

Mineralised structure	No. of samples	Maximum (Sn%)	Mean (Sn%)	Variance	Standard deviation	Skewness	Kurtosis
No. 4b	3,597	15.0	1.37	3.55	1.88	3.56	16.88
No. 6_1	449	10	1.09	2.95	1.72	2.70	8.43
No. 8A	1,540	21	2.44	9.29	3.05	2.46	7.55
Dolcoath South	1,414	15	2.08	6.64	2.58	2.25	6.12
Roskear B FW	1,913	23	1.80	5.38	2.32	3.25	16.84
No. 1	1,455	16	1.07	4.21	2.05	4.65	26.21

Source: AMC, 2023.

14.3.7 Drillhole exclusions

Reviewing the sample data, the QP identified that in some areas drillholes intercepted the lodes at shallow angles relative to the dip of the lode. These shallow intercepts resulted in some holes displaying long mineralised intercepts disproportionate to the true widths of the lodes. In other areas the intercept traced the lode / host rock contact and displayed long intervals lacking assay data.

A review was undertaken of the shallow intercept drillholes, and where a potential grade bias (long high-grade or long low-grade intervals) that may impact on the grade estimates were identified, these drillholes were excluded.

Drillhole exclusions were limited to the North Pool Zone with the following drillhole exclusions applied:

- North Pool Zone No 6 (6_1); one drillhole excluded.
- North Pool Zone No 6 North Branch; four drillholes excluded.
- North Pool Zone A (NPA); four drillholes excluded.
- North Pool Zone A Footwall (NPA_FW); two drillholes excluded.
- North Pool Zone 2 East (NPB2_E); two drillholes excluded.
- North Pool Zone B (NPB); five drillholes excluded.
- North Pool Zone C (NPC); six drillholes excluded.
- North Pool Zone Q (NPQ); two drillholes excluded.

14.3.8 Bulk density

The density value used for mineralised areas within the granite is 2.77 t/m^3 in line with the density used by the previous operating mine and supported by production reconciliation.

The drilling programs carried out by Cornish Metals in 2020 and 2023 involved taking 3,255 SG measurements. Of these measurements, 354 were taken on core recognised as mineralised material, either through being designated as mineralised lode material for the metallurgical testing programme or assaying over 0.40% Sn. A summary of the statistics for the specific density of these measurements is shown in Table 14.17. The bulk density value of 2.77 t/m^3 used in the Mineral Resource estimate sits within the range of density measurements made by Cornish Metals in 2020 and 2023.

Table 14.17 Summary of statistics for SG measurements on mineralised granite samples from the 2020 and 2023 Cornish Metals drilling programmes

No. of measurements	Minimum SG	Maximum SG	Mean SG	Standard deviation
353[1]	2.50	3.68	2.79	0.16

Note: [1]Excludes one outlier measurement.
Source: AMC, 2023.

14.3.9 Variography

Generating anisotropic variograms was difficult owing to the narrow geometry of the lodes. On some lodes the majority of samples are channels, and the clustering effect of channels has had a marked influence on the variogram ranges in the down-dip direction.

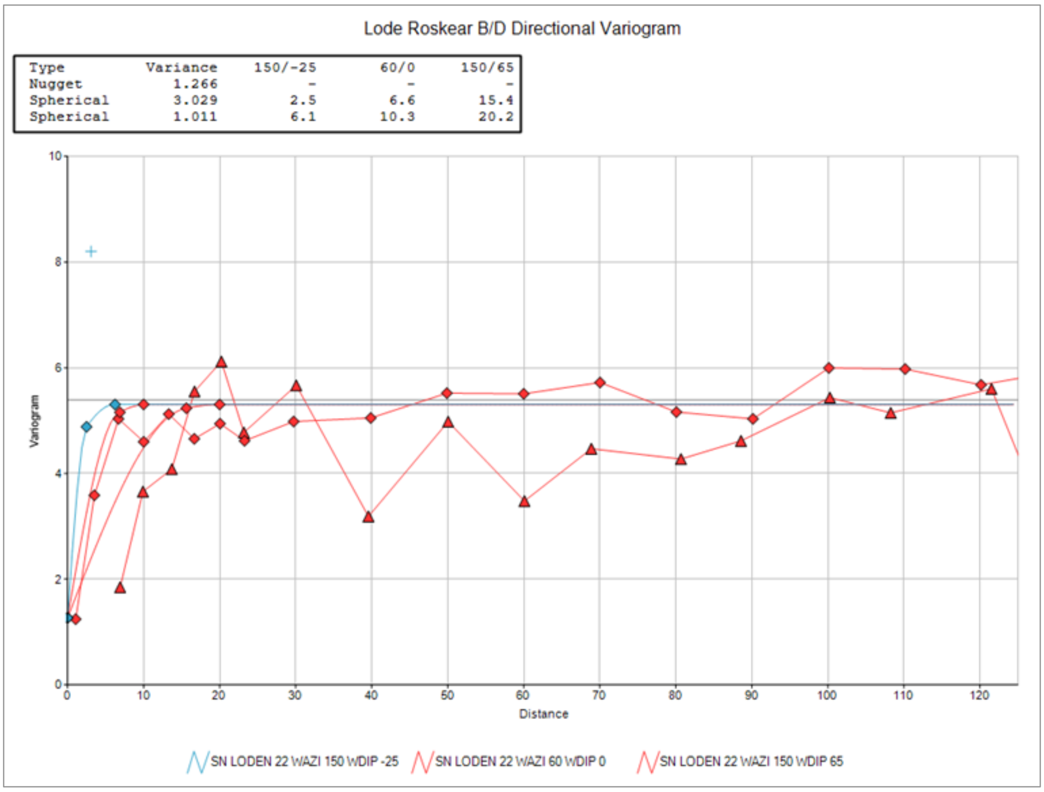
Directional variograms were generally obtainable in lodes where areas of inter-level drilling or sublevel channel sampling had taken place as shown in Table 14.18. An example of the variograms for Roskear B FW and No. 8A lodes are shown in Figure 14.26 and Figure 14.27, respectively. Where these were not possible global isotropic variograms were generated and modelled to give an indication of nugget values and ranges as shown in Table 14.19, Figure 14.24, and Figure 14.25. These were heavily influenced by the sample density along the lode drives.

Table 14.18 Directional variography for selected lodes

Domain	Direction orientation (dip>dip direction)		Nugget	Structure 1		Structure 2	
				Sill	Range (m)	Sill	Range (m)
			C0	C1	A1	C2	A2
Roskear B FW	1	00>060	1.27	3.03	6.6	1.01	10.3
	2	65>150			15.4		20.2
	3	-45>150			2.5		6.1
4 B	1	00>060	1.65	1.00	10.8	0.81	117.8
	2	75>150			22.5		37.3
	3	-35>150			2.5		5.5
No. 8A	1	00>030	4.168	0.221	11.5	3.551	21.3
	2	-60>120			4.7		15.0
	3	-30>300			3.9		7.1
Dolcoath North	1	-45>245	0.391	0.348	40.4	3.174	60.6
	2	-45>065			46.9		58.3
	3	(not enough data)			-		-

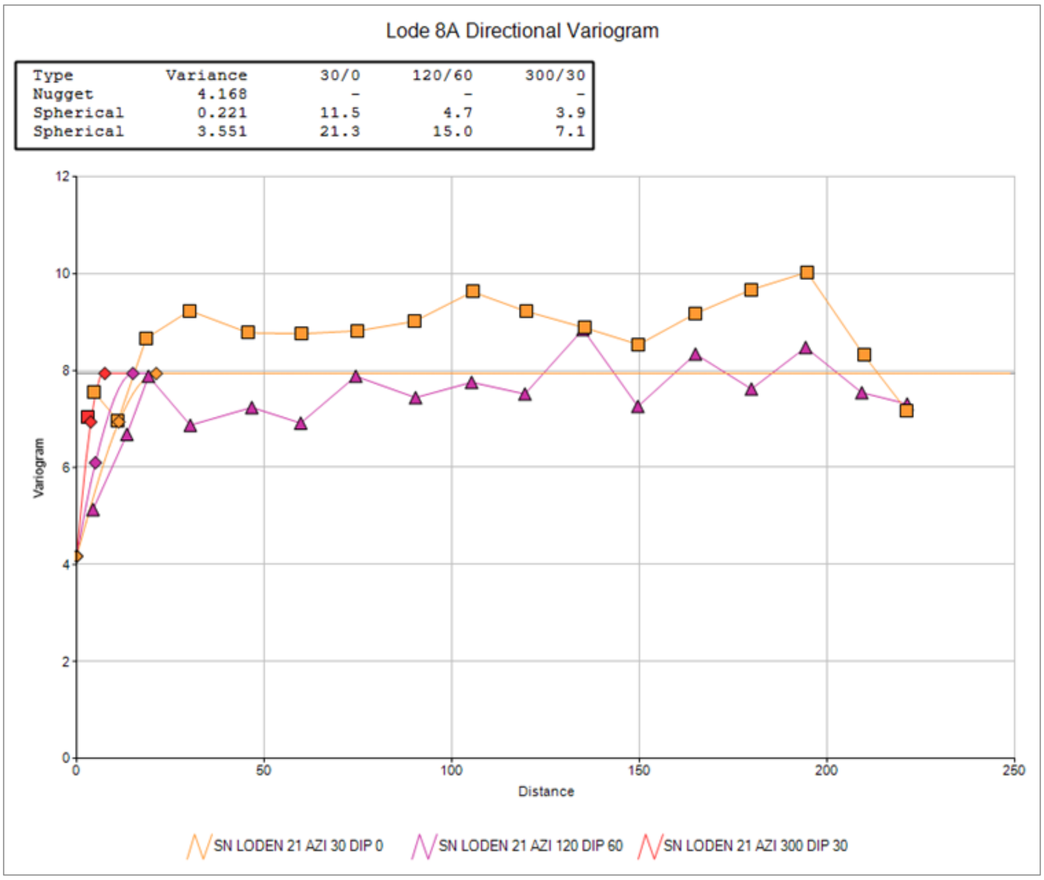
Source: Cornish Metals, 2023.

Figure 14.22 Directional variograms for Roskear B FW lode



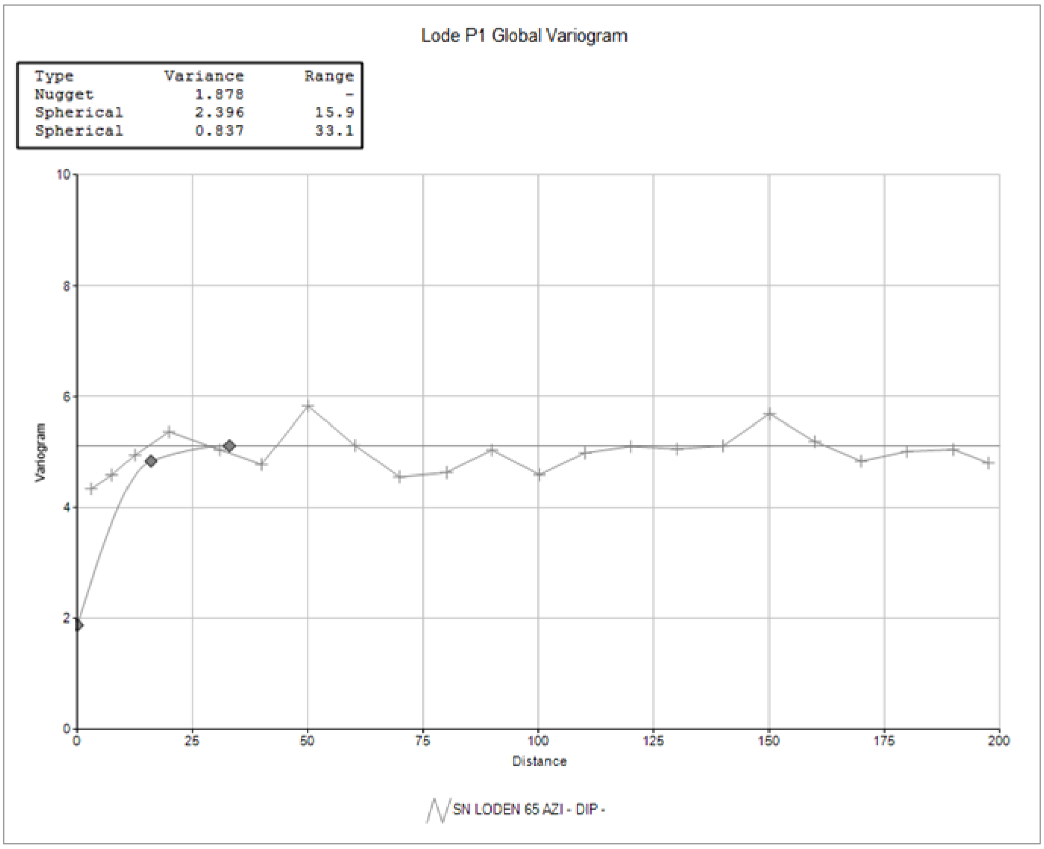
Source: Cornish Metals, 2023.

Figure 14.23 Directional variograms for No. 8A lode



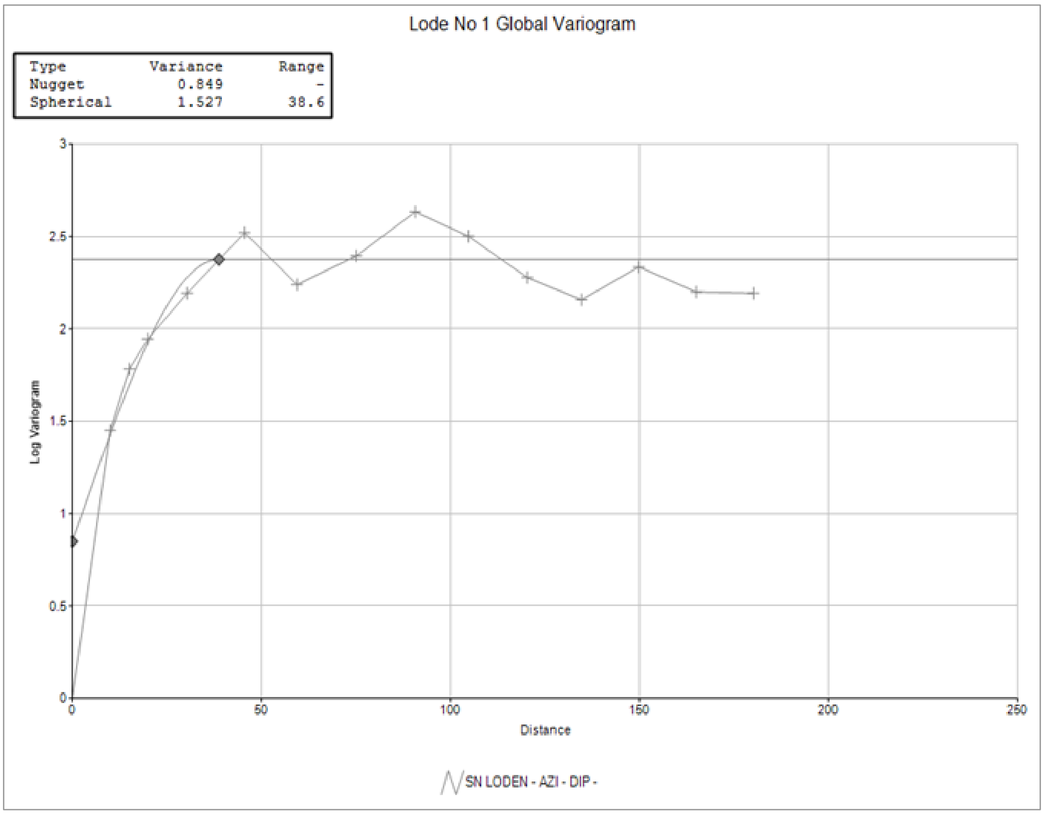
Source: Cornish Metals, 2023.

Figure 14.24 Isotropic variogram for No. Pryces 1 lode



Source: Cornish Metals, 2023.

Figure 14.25 Isotropic variogram for No. 1 lode



Source: Cornish Metals, 2023.

Table 14.19 Isotropic variography for selected lodes

Domain	Nugget	Structure 1		Structure 2	
		Sill	Range (m)	Sill	Range (m)
	C0	C1	A1	C2	A2
Pryces 1	1.878	2.396	15.9	0.837	33.1
No. 1	0.849	1.527	38.6	-	-

Source: Cornish Metals, 2023.

14.3.10 Block model

Individual rotated block models were constructed for each lode based on the lode orientation. As most lodes are narrow the decision was made to construct columnar block models ensuring the best fit of blocks. This entailed rotating the block model prototype so that Z becomes the cross-strike direction, X is along-strike, and Y is down-dip. This ensures that within the Z direction, the lode is only ever one block wide and the width is adjusted to fit the wireframe (lode thickness) exactly. Parent block size for the columnar model is 6 m along-strike, 10 m down-dip, and variable to honour the lode thickness across the strike for all lodes. Model parameters for selected lodes are summarised in Table 14.20.

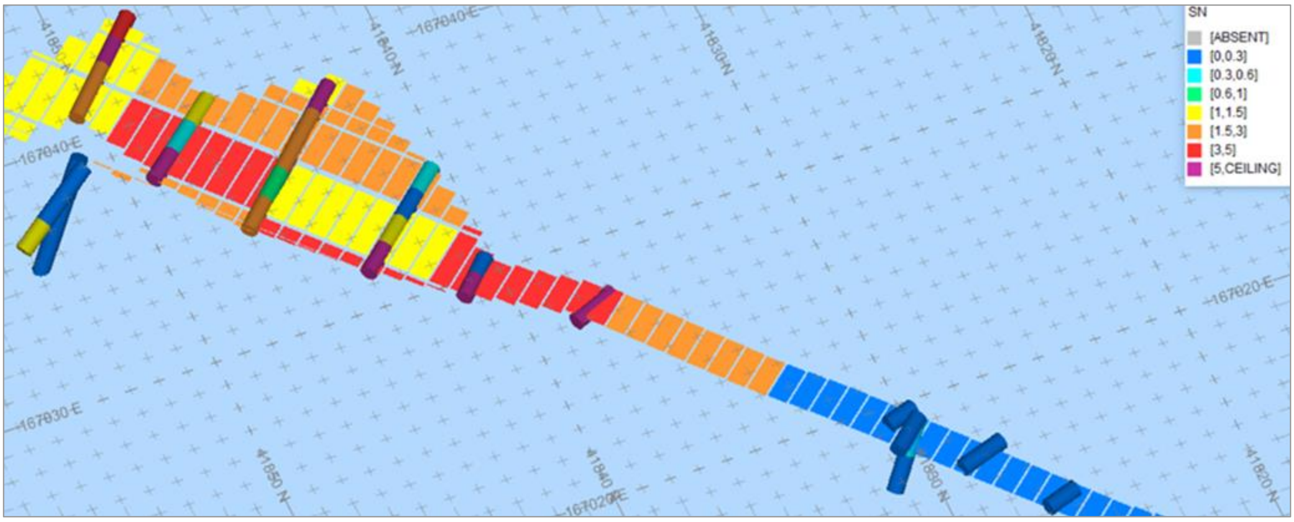
Sub-celling was utilised to ensure that the pinch and swell nature of the lode was honoured, with increased sub-celling taking place in areas of greater undulation of the lode. Minimum sub-cell size along-strike is 0.75 m and 1.25 m down-dip. Many of the lodes have areas that swell in width where the columnar model is not appropriate. Many lodes within the North Pool Zone fall into this category. Firstly, any blocks in the columnar model under the minimum mining width of 1.2 m were coded THIN=1 to aid in the dilution process later on. Then any blocks over 2.4 m in width were coded with NARROW=0, whilst the remainder were coded NARROW=1. The oversize blocks were extracted and sliced on a new block model prototype with cell dimensions of 2.4 m in the Z direction. These sub-celled blocks were then recombined with the narrow blocks to create the complete volumetric model (Figure 14.26). The blocks were also coded ROCK=1 where they occurred beneath the granite-killas contact surface. However, due to uncertainties in the extremities of the project area of the exact granite boundary position, and only minor portions of the lode wireframes extending above the granite surface, all blocks in the Lower Mine resource have been assigned the granite bulk density of 2.77 t/m^3.

Table 14.20 Block model orientation and sizes for selected lodes

Mineralised structure	Axis orientation		Origin (x/y/z)	Number of parent blocks
	Dip direction	Dip		
No. 4b	150°	75°	166000/41100/1770	170/46/1
NPB	317°	66°	166880/41700/1335	81/30/1
No. 8A	150°	55°	165950/41200/1600	85/45/1
Dolcoath South	156°	65°	165050/40150/1800	200/55/1
Roskear B/D	112°	68°	165200/40900/2000	250/210/1
No. 2	332°	67°	166850/41350/1805	155/55/1

Source: Cornish Metals, 2023.

Figure 14.26 3D view of section through North Pool B lode



Notes: This figure shows the difference between the columnar style block modelling on the right and the hybrid sub-celling in the thicker zone on the left. Sn grade is show in %.
Source: Cornish Metals, 2021. Search strategy and grade interpolation.

Estimation for each lode has been carried out separately with only corresponding lode samples being used for estimating blocks within that lode. Nearest Neighbour, IDW^3, and OK estimation techniques have been carried out on all lodes. IDW^3 was used as the preferred estimation method owing to the limitations with the variography, with the exceptions of Roskear B FW and Roskear B HW where OK is the preferred method. During the validation checks the OK estimates were determined to yield improved correlations with the composite data for these two lodes. Nearest Neighbour, and OK estimates (except for Roskear B FW and Roskear B HW) were used as check estimates as part of the validation procedures. The same lode-specific search ellipsoid was used for each estimation technique, but other estimation parameters were adjusted to suit the orientation and sample distribution of each lode. These parameters are detailed in Table 14.21 below. No octants were used.

To better reflect the small changes in strike and dip, orientations of the mineralisation dynamic anisotropy has been used to alter the search ellipse orientation on a block-by-block basis. Strings and wireframes representing the structural trends of the mineralisation were generated and from these wireframes a series of points were produced correlating to each triangle in the wireframe using the ANISOANG function in Datamine Studio RM™. For each point produced, a dip and dip direction orientation was calculated. These dip and dip directions were subsequently estimated into the block model prototypes.

The dip and dip direction have been interpolated into each block and these directions used to adjust the search ellipse orientation to account for changes in lode orientation. Parent cell estimation was used throughout with cell discretization set at 2 by 2 by 2 for all estimates. The parameter Maxkey was set to 2 which allows two samples per drillhole / channel to be used for any estimation.

Estimates were carried out in a three-pass estimation plan with the second and third passes using progressively larger search radii to enable the estimation of blocks not estimated on the previous pass. It is intended that the majority of blocks should be estimated on the first or second passes, with the third search only being utilised to ensure the block model is estimated fully.

Table 14.21 Summary of South Crofty Lower Mine estimation parameters

Lode	Estimation method	Search ellipse ranges			Search ellipse orientation			First pass		Second pass			Third pass			Max. N°. of comps from any drillhole
		Major axis (down dip) (m)	Semi-major axis (along strike) (m)	Minor axis (across strike) (m)	Major axis (°)	Semi-major axis (°)	Minor axis (°)	Min. N°. of comps used	Max. N°. of comps used	Search volume factor	Min. N°. of comps used	Max. N°. of comps used	Search volume factor	Min. N°. of comps used	Max. N°. of comps used	
1, 1SB, 2A, WET, NN, LM, 2E, 2, 2NB, 2SB, No. 2 2nd South Dipper	IDW^3	35	35	15				5	40	2	3	30	15	1	30	2
3, 3SB, 3A, 3B, 3B Peg	IDW^3	35	35	15				10	40	2	5	30	15	2	30	2
No. 4 (4_2, 4_A, 4_B, 4_C, 5)	IDW^3	40	20	10				5	40	2	3	30	10	1	30	2
North Pool Zone No.6, North Pool Zone No. 6 North Branch, North Pool Zone Pegmatite Lodes, North Pool Zone other lodes	IDW^3	20	30	5				5	40	2	3	30	10	1	30	2
Providence	IDW^3	35	10	10				5	30	2	3	40	5	1	40	2
No. 8	IDW^3	24	19	10	Dynamic Anisotropy			5	40	2	3	30	10	1	30	2
No. 9	IDW^3	35	20	10				5	40	2	3	30	10	1	30	2
Dolcoath South, Dolcoath South-South Branch, Dolcoath North	IDW^3	40	40	10				5	40	2	3	30	10	1	30	2
Tincroft, Pryces	IDW^3	30	20	15				5	30	2	3	30	5	1	30	2
Main, Intermediate, North, Great	IDW^3	35	25	15				10	40	2	3	30	15	2	30	2
Roskear A, Roskear South	IDW^3	22.5	20	2.4				5	40	2	3	30	10	1	30	2
Roskear B	OK	22.5	20	2.4				5	40	2	3	30	10	1	30	2

Source: AMC, 2023.

14.3.11 Dilution

The lode wireframes used in the Lower Mine Mineral Resource honour the lode widths giving the best representation of the lode's geometry, variation in thickness, and kinks caused by faulting. Therefore, the wireframe and associated composite samples can be less than the minimum mining width of 1.2 m. To compensate for this, a process was run once the estimation was complete to dilute the grade and increase the tonnage so that the block represents a 1.2 m wide block. This was carried out before reporting at the cut-off grade; meaning narrow blocks previously just above the cut-off grade might be excluded from the Mineral Resource. Where a hybrid model was utilised, only the columnar blocks under the 1.2 m minimum mining width (coded THIN=1) were diluted. A zero Sn grade has been used for the dilution.

14.3.12 Lode width analysis

A lode width analysis was carried out to determine mean and maximum lode widths for each individual lode. This has been possible due to using rotated block models to give an indication of the true lode width. Lode width statistics were carried out on both unfiltered block models and the diluted block models filtered by unmined areas over 0.4% Sn. Example lode width statistics for selected lodes are shown below in Table 14.22.

Table 14.22 Lode width statistics for selected lodes

Zone	Unfiltered			0.4% Sn cut-off, diluted to 1.2 m, unmined	
	Minimum (m)	Maximum (m)	Mean (m)	Maximum (m)	Mean (m)
No. 2	0.01	6.98	1.05	6.80	1.39
No. 4A	0.01	10.96	2.83	10.39	2.19
No. 8A	0.02	14.20	1.77	9.07	1.72
North Pool A	0.01	7.39	2.88	7.02	2.23
Dolcoath South	0.01	5.20	1.25	5.20	1.25
Roskear South	0.07	4.30	1.26	3.08	1.42

Notes: The diluted mean may be less than the unfiltered mean due to application of a cut-off grade.
Source: AMC, 2023.

14.3.13 Depletion models

Block models have been depleted using a combination of surveyed development shapes, including sublevels where possible, and mining shapes. These have been constructed using the closure resource longitudinal sections and have been applied to the lodes "cookie cutter" style so no fragments remain on the footwall or hangingwall. Since the 2021 Mineral Resource estimate (AMC, 2021), checks have been carried out to ensure the depletion shapes match the historical information. This has resulted in additional minor depletion in Dolcoath North South Branch and No. 2 Lode.

Where major infrastructure is in close proximity to the Mineral Resource envelopes, such as the 380 fathom (ftm) - 470 ftm level declines, a 10 m exclusion zone has been depleted from the Mineral Resource around these areas of development.

14.3.14 Block model validation

As part of the QP review of the Mineral Resource block model, visual and statistical validation checks have been carried out by the QP. Validation methods employed includes:

- Reconciliation against historical production data
- Visual assessment
- Statistical grade validation
- Grade profile analysis

14.3.14.1 Reconciliation of model to historical data

Historically, no mine reconciliations were carried out from resource to production data. The operational efficiency of the mine was governed by the Mine Call Factor (MCF) where hoisted tonnages and grade were reconciled against milled tonnages. This data is summarised in Table 14.23. The reconciliation of mine hoisted material with milled material is good, giving confidence to the reliability of both sets of data.

Table 14.23 Mine-to-mill production reconciliation

Year (12 months unless stated)		Mine hoist		Mill	
		Tonnage (t)	Sn (%)	Tonnage (t)	Sn (%)
1987		212,211	1.36	213,610	1.26
1988	11 months	152,438	1.38	153,990	1.33
1989	6 months	101,646	1.46	101,102	1.42
1990		197,003	1.58	195,604	1.55
1991		150,228	1.64	152,193	1.63
1992		166,308	1.64	168,069	1.48
1993		176,734	1.52	179,815	1.45
1994		181,099	1.31	173,082	1.26
1995		186,851	1.33	186,936	1.22
1996	11 months	154,190	1.42	156,605	1.39
1997		190,388	1.45	192,544	1.41
1998	To closure	28,298	1.72	29,179	1.74
Total		**1,897,394**	**1.46**	**1,902,729**	**1.40**

Source: Cornish Metals, 2021.

Cornish Metals has compiled past mine production data from monthly reports from 1989 to 1998. Production from stopes and development was recorded as "trammed" tonnage, this being material, which was hauled from drawpoints and development drives, to the primary crusher. These were estimated from the number of wagons trammed to the crusher, with grab samples being taken from the wagons to estimate production grade. In areas of more geographically isolated lode structures with single crosscut access and areas for where records exist for the life of production from that structure only, trammed tonnages can be extracted with greater confidence. This has been carried out for No. 8 lode for all material below 400 ftm level and the Roskear A, and Providence lodes.

The current Lower Mine Mineral Resource block model has been reconciled against these historical production figures by extracting blocks within the model lying within mined stope and development outlines. Metal content, grade, and tonnage has been compared, and likely dilution estimated by calculating the tonnage difference between trammed and block model tonnages. A summary of reconciled numbers is given in Table 14.24.

Table 14.24 Reconciliation of historical production data to current block model estimate

Structure		Ore (t)	Sn %	Sn metal (t)
Roskear A	Block Model	97,729	2.40	2,452
	Block Model Dilute @ 40%	136,820	1.71	2,452
	Trammed Tonnage	140,850	1.80	2,530
	% Difference Diluted BM to Trammed	-3	-5	-8
No. 8 (below 400 ftm Level)	Block Model	137,427	2.65	3,636
	Block Model Dilute @ 60%	219,883	1.65	3,636
	Trammed Tonnage	230,186	1.69	3,887
	% Difference Diluted BM to Trammed	-4	-2	-7
Providence	Block Model	33,071	1.67	554
	Block Model Dilute @ 20%	39,786	1.39	554
	Trammed Tonnage	37,695	1.33	501
	% Difference Diluted BM to Trammed	5	5	10

Source: Cornish Metals, 2023.

Metal contents between block model and trammed tonnages reconcile well for the larger structures of Roskear A and No. 8. The metal tonnage for Providence lode appear to be slightly overestimated in the resource model. This is likely due to a number of factors, firstly Providence lode is a relatively small structure and thus the error margins are likely to be amplified on both the Mineral Resource and the trammed tonnages leading to potential discrepancies. The mineralisation in Providence is also narrow and so the Mineral Resource may likely represent a “diluted” resource due to wireframe envelopes being closer to the minimum mining width of 1.2 m.

Estimated dilution in Roskear and No. 8 is high, with Roskear A being approximately 40% and No. 8 being approximately 60%. Whilst these seem high rates of dilution, the mining method in these areas was largely long-hole stoping and as such the potential for dilution on such narrow structures could be significant, particularly when considering the type of equipment used at the time.

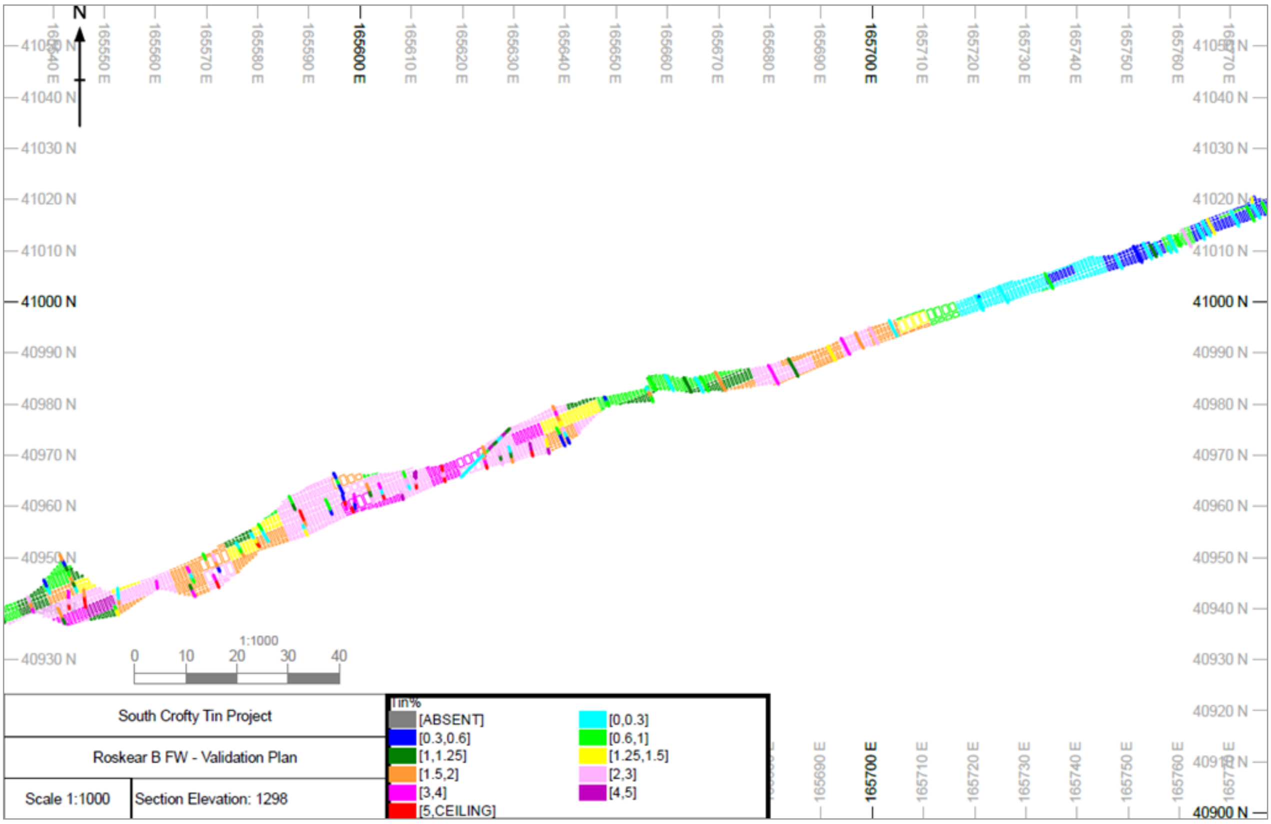
A report commissioned by South Crofty, carried out by Bharti Engineering Inc. (Bharti, 1996) comments on the lack of reconciliation procedures between geological resource, blasted tonnages, and trammed tonnages. This report highlights a brief study of 1995 production, identifying a 38% dilution between blasted and trammed tonnage, the report also discusses that the overall dilution will be higher, as this does not account for the long-hole stope design, including dilution (planned dilution), which was in the order of 20% of the geological resource (Bharti, 1996).

Overall, the QP considers that the reconciliation between historical production data and Mineral Resource block models is reasonable, given the reports on dilution, and adds confidence to the Mineral Resource estimate.

14.3.14.2 Visual validation

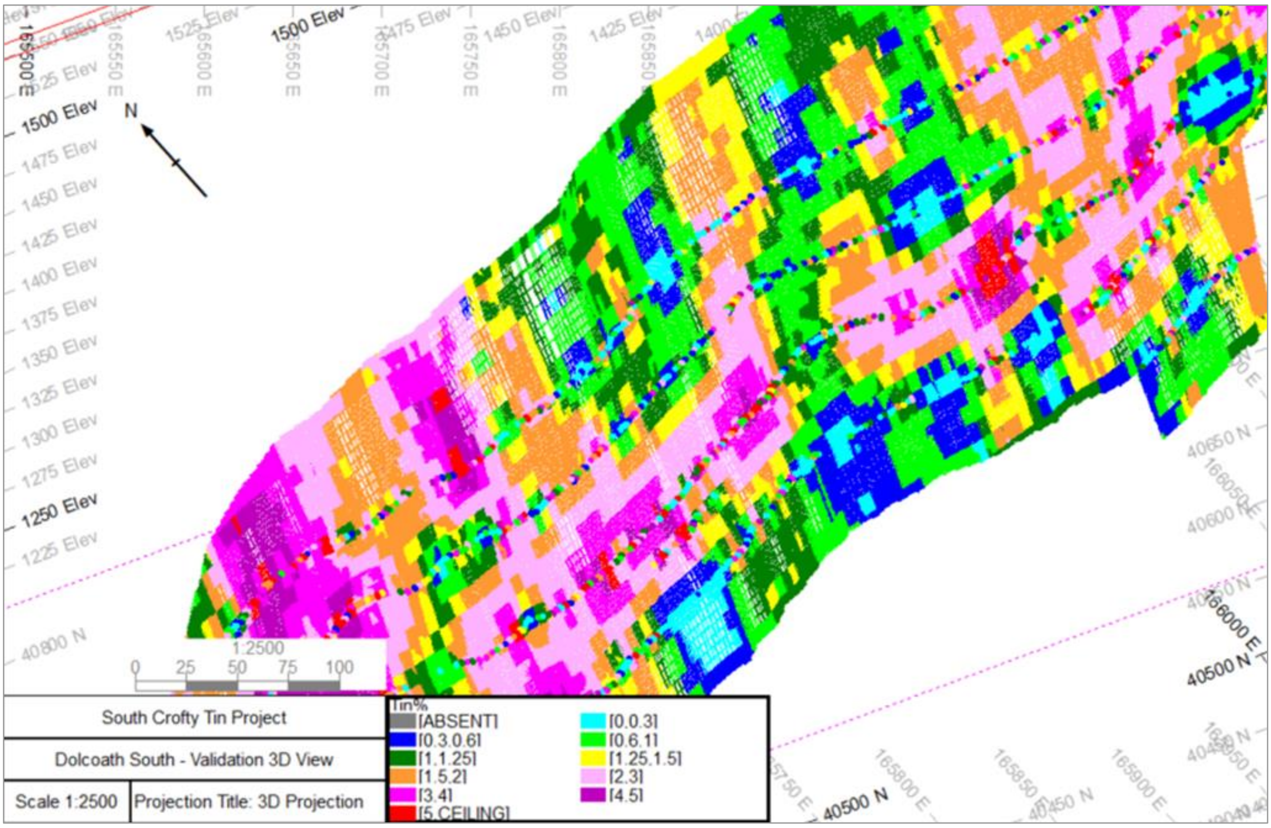
The models were assessed on sections to determine whether the block estimations show a reasonable correlation to the sample composites on which they are based. Examples are shown in Figure 14.27 and Figure 14.28.

Figure 14.27 Plan view lode Roskear B FW showing sample and block IDW Sn grades



Source: AMC, 2023.

Figure 14.28 3D view of lode Dolcoath South showing sample and block IDW Sn grades



Note: 3D view of Dolcoath South lode showing comparison between sample and block IDW Sn grades.
Source: AMC, 2023.

The visual review shows the block model estimates show a reasonable correlation to the sample composites on which they are based.

14.3.14.3 Statistical grade comparison

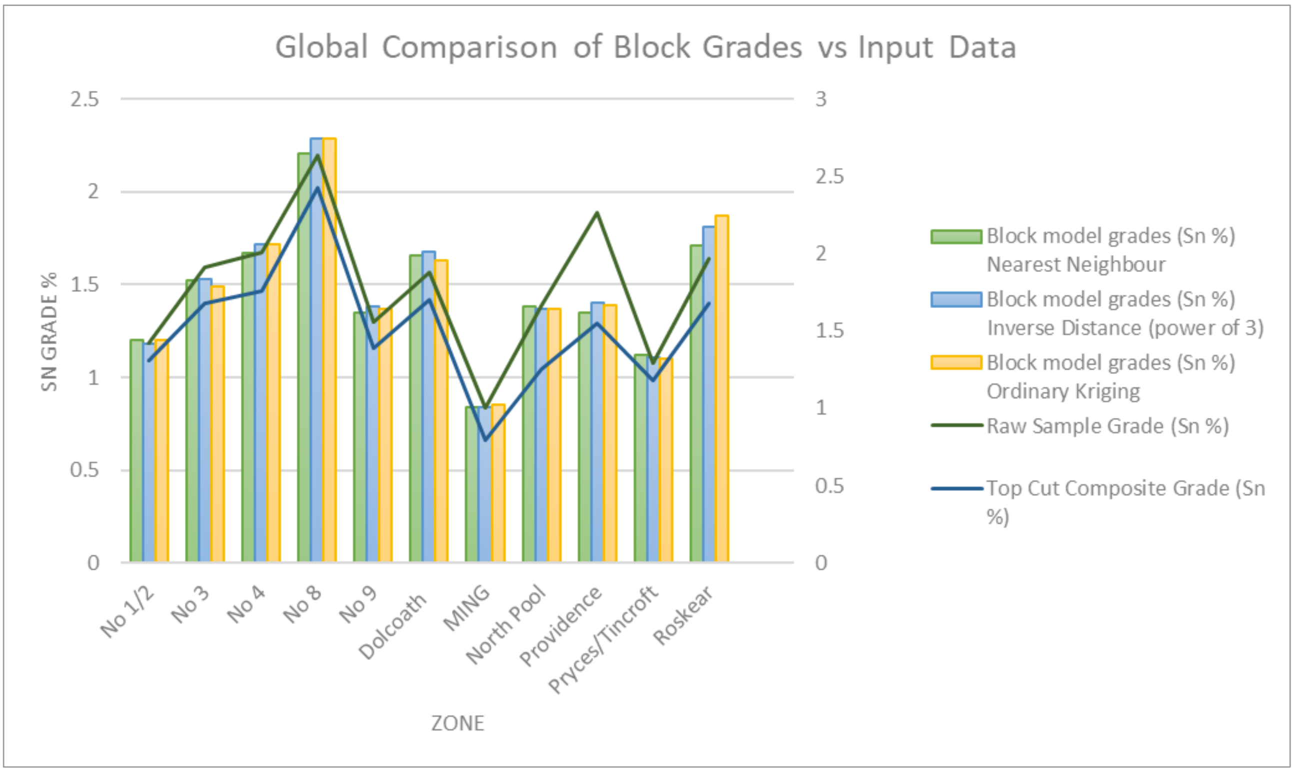
The statistical grades of the blocks within each zone were also compared to the original sample data. Table 14.25 and Figure 14.29 show examples of the statistical grade comparison for different lodes. A global grade comparison provides a check on the reproduction of the mean grade of the composite data against the model over the global domain. Typically, the mean grade of the block model should not be significantly greater than that of the samples from which it has been derived, subject to the sample clustering and spacing at a 0 g/t cut-off grade.

Table 14.25 Statistical comparison of block grades versus composites for selected lodes

Lode	Top cut composite grade (Sn %)	Block model grades (Sn %)		Final Resource estimation technique
		ID^3	OK	
No. 1	1.07	0.99	0.99	IDW
No. 3a	1.72	1.65	1.63	IDW
No. 4b	1.37	1.40	1.40	IDW
No. 8a	2.44	2.32	2.32	IDW
No. 9N	1.26	1.24	1.19	IDW
Dolcoath South	2.08	1.90	1.89	IDW
Main	0.68	0.74	0.78	IDW
North Pool Zone No. 6 North Branch	1.36	1.40	1.41	IDW
Providence	1.74	1.64	1.64	IDW
Pryces (P1)	1.29	1.24	1.23	IDW
Roskear B FW	1.80	1.89	1.99	OK

Source: AMC, 2023.

Figure 14.29 Chart showing global comparison of global block grades versus input data by area



Source: Cornish Metals, 2023.

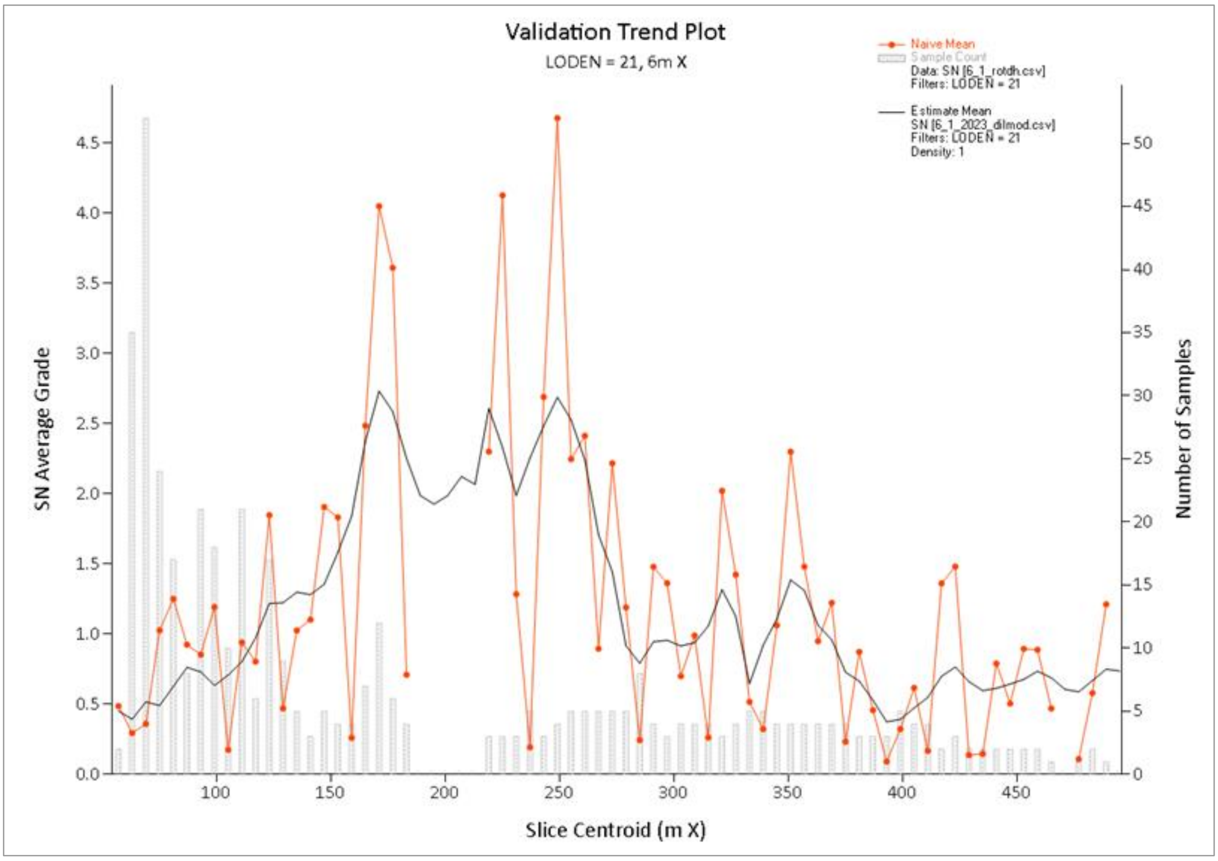
Overall, the block estimate grades show a reasonable correlation to the composite grades on which they are based.

14.3.14.4 Grade profile analysis

To provide a greater resolution of detail than the global grade comparison, a series of local grade profile comparisons, also known as swath plots, were undertaken. A grade profile plot is a graphical representation of the grade distribution through the deposit derived from a series of swaths or bands, orientated along eastings, northings, or vertically. For each swath the average grade of the composite data and the block model are correlated.

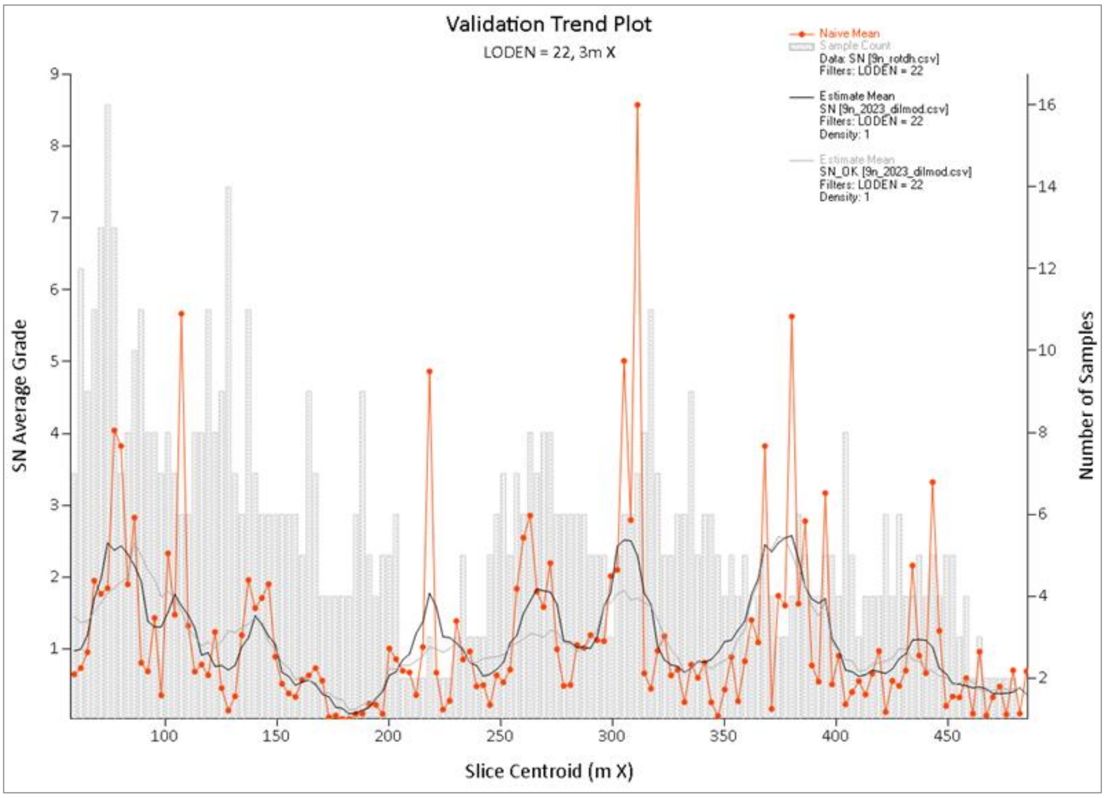
Swath plots were carried out for each major lode along the X direction (along-strike). Figure 14.30 to Figure 14.32 below show swath plots for several of the larger lodes. Overall, the chosen estimation techniques seem to honour the grade data well throughout the lodes.

Figure 14.30 Swath plot for North Pool Zone No. 6 along-strike



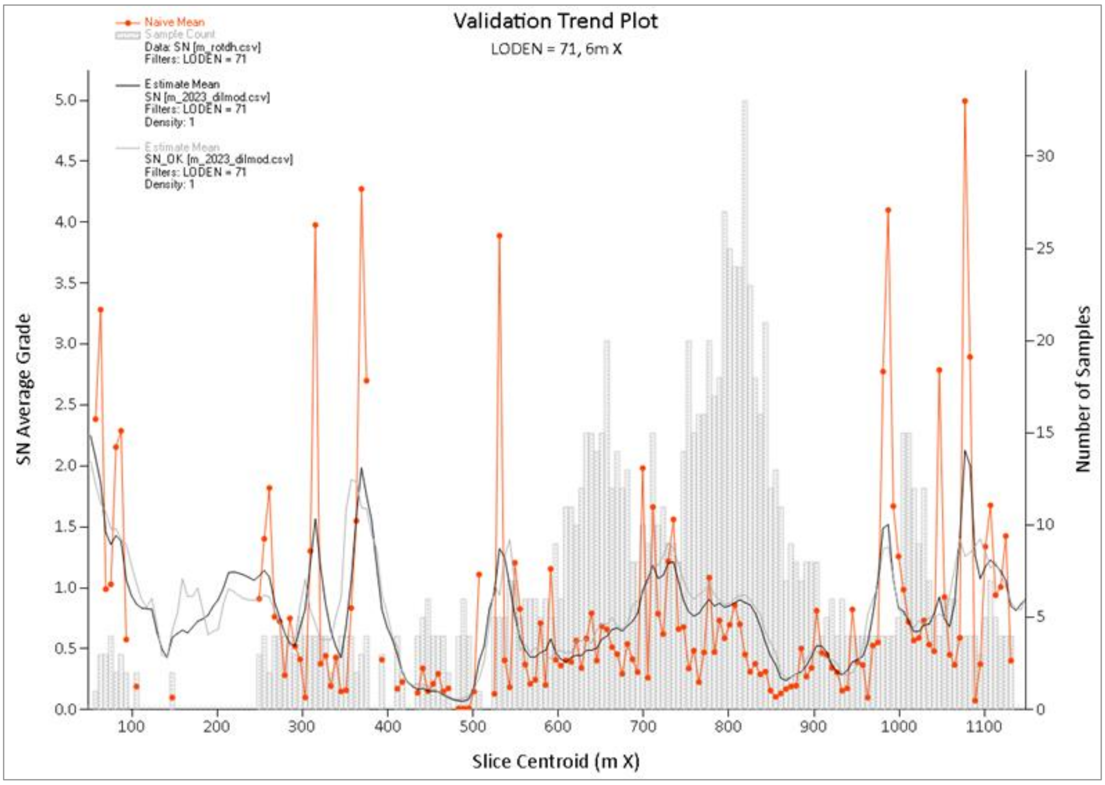
Source: AMC, 2023.

Figure 14.31 Swath plot for No. 9N along-strike



Source: AMC, 2023.

Figure 14.32 Swath plot for Main lode along-strike



Source: AMC, 2023.

Overall, the correlation between the sample composite grades and the estimated block grades are acceptable, without showing any significant over- or underestimation of the block grade.

14.3.15 Reasonable prospects for eventual economic extraction

The Lower Mine Mineral Resources meet the requirement of reasonable prospects for eventual economic extraction, having been modelled to a minimum mining width of 1.2 m to account for mining selectivity. Areas of lodes modelled with widths <1.2 m have been diluted to meet the 1.2 m minimum mining width.

In some older areas the shrink stope mining method has left small pillars and hanging remnants in stopes. Whilst it is unlikely that these will be mined on any large-scale there is the possibility that they may be collected "campaign style" as tertiary retreat pillars, and so these have not been removed from the overall Mineral Resource.

Mineral Resource for the Lower Mine are reported at a cut-off grade of 0.6% Sn based on the cut-off grade parameters detailed in Table 14.4.

14.3.16 Mineral Resource classification

Mineral Resources for the Lower Mine are classified in accordance with the JORC Code (2012). The confidence categories assigned under the JORC Code were reconciled to the confidence categories in the CIM Definition Standards – for Mineral Resources and Mineral Reserves May 2014 (the CIM Definition Standards). Mineral Resource classifications of "Indicated" and "Inferred" have been used in this Technical Report.

The South Crofty data has been reviewed and verified in relation to CIM best operating practices for reporting and for scope and content of Joint Ore Reserves Committee (JORC) and NI 43-101 reporting through a due diligence conducted by the QP.

The classification of Mineral Resources is based on the QP opinion in relation to the quality of data, geological and grade continuity, and the quality of the grade estimates.

The Lower Mine Mineral Resources were classified as follows:

- Indicated Mineral Resources: Resources defined based on level spacing of no more than 40 m vertically, with full channel sampling on those levels. Areas of approximately 20 m diamond drilling where the lode has good continuity between intercepts have also been classified as Indicated.
- Inferred Mineral Resources: Resources estimated but not meeting the requirements to be classified as Indicated have been assigned an Inferred classification.

14.3.17 Mineral Resource reporting

Table 14.26 summarises the South Crofty Lower Mine Mineral Resources reported in accordance with the JORC Code. Mineral Resources are limited to those parts of the mineralisation at a cut-off grade of 0.6% Sn and a minimum mining width of 1.2 m.

A cut-off grade of 0.6% Sn was selected based on a metal price of US$24,000/tonne, a metal recovery of 88.5%, a mining cost of US$64/tonne, processing cost of US$34/tonne, refining / sales cost US$600/tonne, general and administration (G&A) cost of US$10/tonne.

The estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues. The Property is a previously operating mine situated in a mining friendly jurisdiction. The United Kingdom is a politically stable jurisdiction and socio-political factors are unlikely to affect the Mineral Resource. Cornish Metals has underground permissions which include five Mineral Rights, which are registered with the Land Registry, as well as areas of Mineral Rights that are leased or unregistered. Conditional planning permissions for the surface development and underground workings were granted by Cornwall Council, the LPA, in 2011 and 2013 respectively. On 23 October 2017, Cornish Metals announced that it had received Permit EPR/PP3936YU from the United Kingdom EA allowing the discharge of up to 25,000 m^3 of treated water per day from the

South Crofty Mine. In January 2020, abstraction licence SW/049/0026/005 was awarded to the Company by the EA. Cornish Metals has the necessary title arrangements and permits, and has addressed environmental considerations relevant to the reporting of Mineral Resources. The QP is not aware of any factors which would materially affect the Mineral Resource disclosed herein.

Table 14.26 South Crofty Lower Mine Mineral Resource estimate at 0.6% Sn cut-off as of 6 September 2023 (inclusive of remnants)[1-14]

Lode / zone	Classification	Mass (kt)	Grade % Sn	Contained Tin (t)
No. 1/2	Indicated	479	1.31	6,281
No. 3	Indicated	164	1.26	2,070
No. 4	Indicated	488	1.76	8,595
No. 8	Indicated	113	2.00	2,264
No. 9	Indicated	98	1.47	1,442
Dolcoath	Indicated	466	1.39	6,464
Main / Intermediate / North / Great	Indicated	61	1.09	662
North Pool Zone	Indicated	283	1.35	3,814
Providence	Indicated	-	-	-
Pryces / Tincroft	Indicated	347	1.18	4,092
Roskear	Indicated	397	1.99	7,889
Total Indicated		**2,896**	**1.50**	**43,573**
No. 1/2	Inferred	580	1.21	7,029
No. 3	Inferred	183	1.13	2,079
No. 4	Inferred	293	1.53	4,467
No. 8	Inferred	149	2.08	3,103
No. 9	Inferred	103	1.55	1,597
Dolcoath	Inferred	304	1.31	3,993
Main / Intermediate / North / Great	Inferred	276	1.16	3,214
North Pool Zone	Inferred	185	1.30	2,391
Providence	Inferred	98	1.55	1,520
Pryces / Tincroft	Inferred	177	1.34	2,375
Roskear	Inferred	278	2.01	5,596
Total Inferred		**2,626**	**1.42**	**37,364**

Notes:
1 The Mineral Resource estimate is reported in accordance with the requirements of the Joint Ore Reserves Committee of the Australian Institute of Mining and Metallurgy, the JORC Code (2012).
2 The QP for this Mineral Resource estimate is Mr Nicholas Szebor, MCSM, MSc, BSc, CGeol, EurGeol, FGS, of AMC.
3 Mineral Resources for the Lower Mine are estimated by conventional block modelling based on wireframing at 0.4% Sn threshold whilst honouring lode continuity and by OK or ID^3 grade interpolation.
4 Assumptions for process recovery are 88.5% for Sn.
5 Cornish Metals has used a metal price of US$24,500/tonne Sn.
6 For the purpose of this Mineral Resource estimate, assays were capped by lode for the "Lower Mine" between 1.5% Sn and 23% Sn.
7 Bulk densities of 2.77 t/m^3 have been applied for volume to tonnes conversion for the Lower Mine.
8 Mineral Resources for the Lower Mine have had a minimum mining width of 1.2 m applied using 0.0% Sn dilution.
9 Mineral Resources are estimated from a depth of approximately 350 m to a depth of approximately 870 m.
10 Mineral Resources are classified as Indicated and Inferred based on drillhole and channel sample distribution and density, interpreted geological continuity, and quality of data.
11 The Mineral Resources have been depleted for past mining; however, they contain portions that may not be recoverable pending further engineering studies.
12 Mineral Resources which are not Mineral Reserves do not have demonstrated economic viability. The estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.
13 Effective date 6 September 2023.
14 Totals presented in the table are reported from the resource model are subject to rounding and may not sum exactly.

14.4 Comparison to previous estimate

Table 14.27 provides a comparison between the previous 2021 Mineral Resource estimates for the Lower Mine, and the current 2023 Mineral Resource update.

The results show that there has been a 31.6% increase in contained tin for the Indicated classified material, and a 15.5% for Inferred.

The main sources of increase in the Mineral Resources relates to the modelling of No. 1, No. 3, and Main, Intermediate, North, and Great lodes. Assay data for these lodes had not been collated and verified by Cornish Metals at the time of the 2021 Mineral Resource estimates, and therefore these lodes were not modelled.

Assessing the Mineral Resource classification scheme, the QP was of the opinion that some of the mineralisation previously classified as Inferred at Roskear met the requirements to be classified as Indicated. A proportion of the Inferred material at Roskear was therefore converted to Indicated for the Mineral Resource update.

For all other lodes, refinements to the lode interpretations and estimation parameters have had a minor impact on the overall Mineral Resource numbers.

Table 14.27 Comparison of 2023 and 2021 Lower Mine Mineral Resource results

Classification	2021 MRE results			2023 MRE results			Difference in contained tin	
	Mass (kt)	Grade % Sn	Contained Sn (t)	Mass (kt)	Grade % Sn	Contained Sn (t)	Mass (t)	% Difference
Indicated	2,084	1.59	33,098	2,896	1.50	43,573	10,475	31.6
Inferred	1,937	1.67	32,396	2,626	1.42	37,364	4,968	15.3

15 Mineral Reserve estimates

This section is not applicable to this Technical Report.

16 Mining methods

16.1 Mine geotechnical

16.1.1 Introduction

The geotechnical data and analysis to support the mine design has been based on historic databases and technical reports, which have been verified and supplemented by geotechnical investigation and assessment as part of the programme of works. The rock mass and geotechnical conditions have been the subject of numerous technical papers, both internal and academic, when the mine was previously in operation and is generally well known.

Geotechnical characterisation including geotechnical core logging, underground mapping, and laboratory testing along with detailed analysis results, including open span analysis and in-situ stress modelling have been used to inform mine design criteria.

As part of the geotechnical programme, MiningOne undertook a review of the available geotechnical information and completed global and local geotechnical numerical modelling in FLAC3D based on the available data and mine design that was available in March 2023 (MiningOne – U0053_99017_G – SCL Modelling_V2.0).

16.1.2 Geotechnical database

Geotechnical data has been collected to build a database of information for the underground design. The recent investigation work has been used to support and complement the historical information. The data includes:

- Basic lithological historical logging from 3,325 drillholes totalling 132,368 m.
- Geological and geotechnical logging of 75 drillholes, totalling 10,312 m.
- Structural database consisting of 1,998 orientated discontinuity readings generated from downhole televiewing of five drillholes (2,119 m of downhole survey).

The following point is highlighted from the drilling / structural database.

- The televiewer logging was designed to intersect five major areas based on the preliminary mining schedule to select areas near-term in the mining schedule. Intersections through the mineralised lode and surrounding rock mass was achieved in areas No. 4, No. 8, Roskear, NPZ, and Dolcoath.

16.1.2.1 Laboratory testing

The rock strength properties used for this study are based on samples intended to verify previous technical studies that summarised laboratory testing for each lithology. The database is based on:

- 31 Uniaxial compressive strength (UCS) tests, including deformation properties.
- 16 Tensile strength tests.
- 7 Triaxial strength test results.

The samples were taken throughout multiple lithologies in the major five areas of the mine highlighted from the preliminary mining schedule.

16.1.3 Discontinuity sets

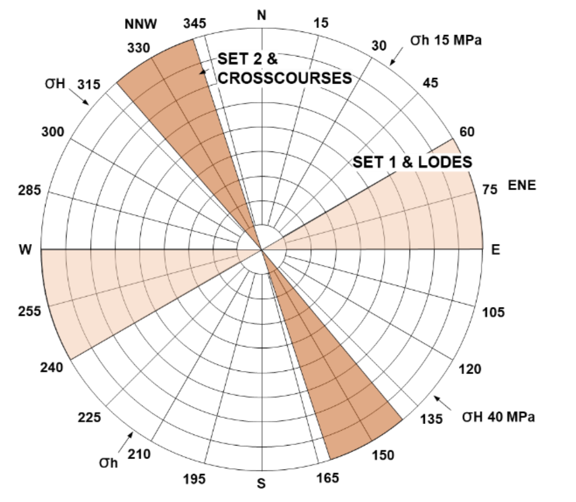
The rock mass structure at South Crofty is well known and has been the subject of multiple academic papers and technical analysis. Known joint set information has been gathered from detailed underground scanline mapping with mean joint orientations shown in Table 16.1 and a plan view of joint, lode and in situ stress orientations with detailed descriptions in Table 16.2.

Table 16.1 Summary details of historic jointing at South Crofty Mine

Joint set	Dip (°)	Dip direction (°)	Spacing (m)	Orientation with respect to lode
1*a*	70	330	2.4	Parallel
1*b*	70	150	1.4	Parallel
2	70	250	2.5	Parallel
3	15	150	2.0	Sub-horizontal

Source: Cornish Metals, 2024.

Table 16.2 Detailed descriptions of jointing at South Crofty Mine



Joint set	Description (after Tyler et al., 1991)
1*a*, 1*b*	These are in general un-weathered, tourmaline filled, with an aperture of 0.5-2 mm. They are dry, planar, and smooth.
2	These are variable, weathered, and sheared granite, often with a kaolinite infill. The aperture is approximately 0.5 mm. The adjacent granite is often kaolinised. Plans are moist, planar, and rough or smooth.
3	These have an aperture of 0.01-0.5 m, they are infilled with quartz and are well healed, dry, planar, and rough. They are mechanically equivalent of the granite host rock.

Source: Cornish Metals, 2024.

16.1.3.1 Geotechnical domains and rock mass properties

The Carnmenellis granite which hosts the mineralisation at South Crofty has undergone extensive historical testing. A rock testing programme was undertaken to verify existing information as well as provide additional information for specific geotechnical domains and test spatial distribution.

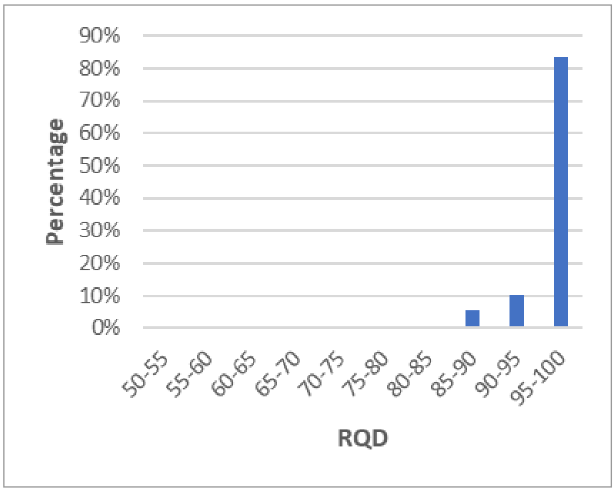
Domains were identified from the televiewer surveys and selected for testing across the project, based on the available rock mass data. Structural characterisation has been conducted based on the following rationale:

- Mineralised lodes have been used to define geotechnical domains (orebody, hangingwall and footwall). The hangingwall and footwall domains have been based on a 20 m zone from the stope. No. 4 Hangingwall is included as a separate domain.
- The defined geotechnical domains have been used to select televiewer drilling data for each domain for consistency.

The RQD distribution for the domains is presented in Figure 16.1.

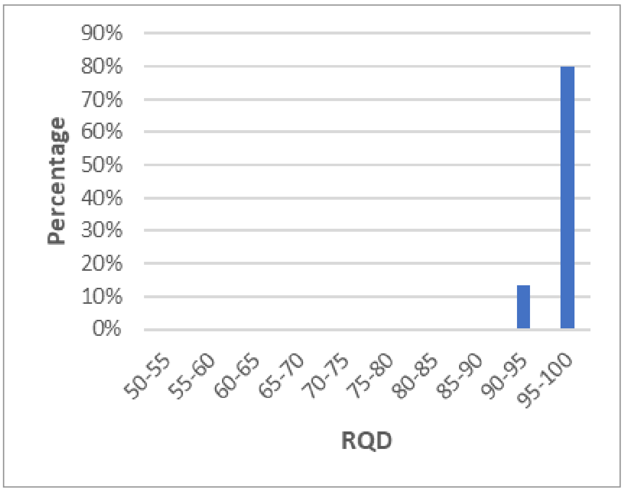
Figure 16.1 Histograms of RQD percentage for geotechnical domains

Domain: All Hangingwall



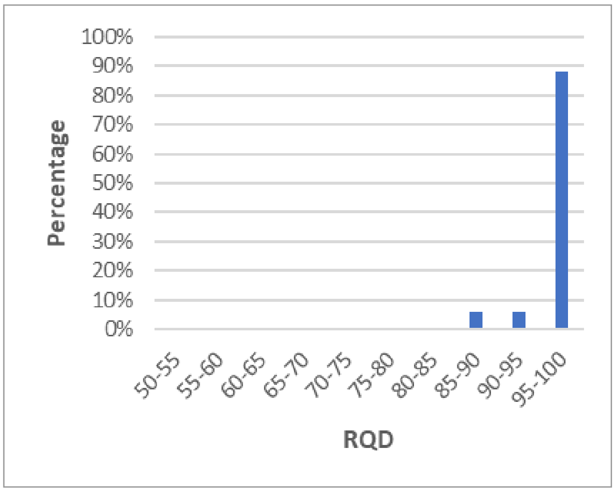
Mean: 98.5%, SD 4.5, Min: 58%, Max: 100%

Domian: No. 4 Hangingwall



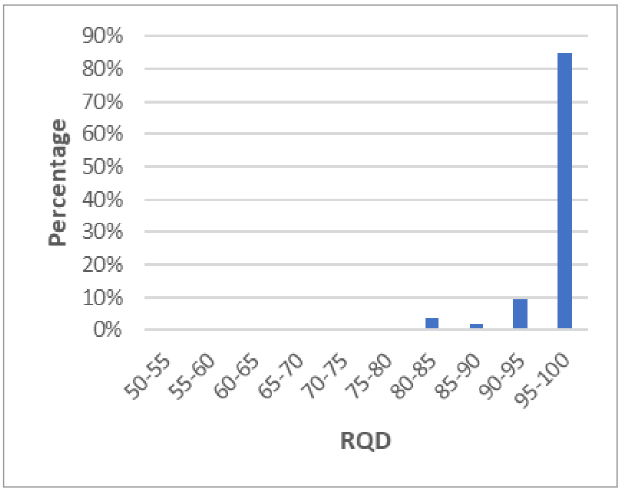
Mean: 92.4%, SD 24.8, Min: 0%, Max: 100%

Domain: All Lode



Mean: 98.7%, SD 3.2, Mi: 89%, Max: 100%

Domian: All Footwall



Mean: 98.9%, SD 4.0, Min: 83%, Max: 100%

Source: Cornish Metals, 2024.

The assessment of the RQD indicates that distribution is centred towards 95 - 100% in all domains apart from No. 4 Hangingwall, indicating little variation in the RQD. No. 4 Hangingwall RQD's mean is slightly reduced, but still above 90%, however the standard deviation is much increased.

Based on domains identified from the televiewer surveys, a number of geotechnical domains were selected for testing across the project. Comparison of the historical and recent test results shows that the values are very similar. Table 16.3 shows a summary of the mean rock UCS and tensile test results.

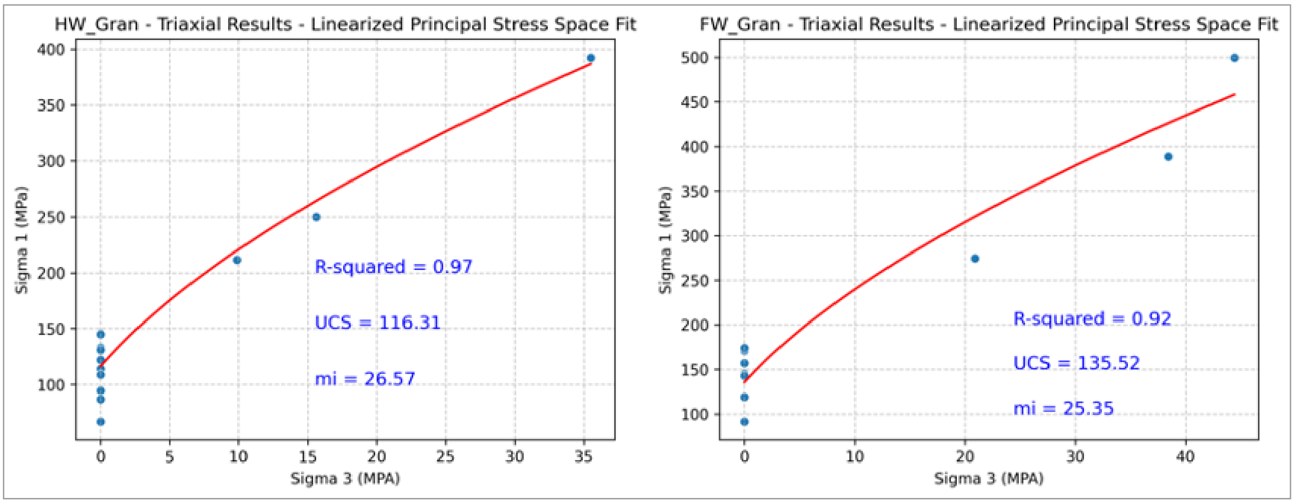
Table 16.3 Summary of mean UCS and tensile testing

Parameter		Domain						
		Altered Granite	Footwall Granite	Hangingwall Granite	Hangingwall Hematized Granite	Footwall Hematized Granite	Intrusion	Lode
Density (t/m^3)	ρ	2.69	2.64	2.64	2.64	2.63	2.56	2.67
Poisson's Ratio	ν	0.23	0.27	0.26	0.23	0.23	0.27	0.25
Intact Tensile Strength (MPa)	σt	16.7	11.1	11.3	12.1	-	17.6	24.8
UCS (MPa)	σc	95.5	140	116	120	146	263	201
Young's Modulus (GPa)	*E*	72	62	60	67	62	71	50

Source: Cornish Metals, 2024.

Triaxial test work has been undertaken on a range of samples to establish intact rock mass behaviour under confinement, and derivation of Hoek-Brown Properties. The triaxial data has been combined with the UCS results to establish a Hoek-Brown failure envelope using a linear-regression line fitting methodology, shown in Figure 16.2.

Figure 16.2 Hoek Brown line fitting to laboratory test data - Linearized Principal Stress Space Fit



Source: MiningOne, 2023.

Both Barton's Q (after Barton et al., 1974) and Bieniawski's RMR$_{89}$ (Bieniawski, 1989) rock mass classification systems have been used for South Crofty using a combination of televiewing data, historical data, and technical reports in the estimation process.

Table 16.4 and Table 16.5 show the respective results for the Q' and RMR' assessments.

Table 16.4 Q' analysis

Parameter	Range of values	Range of ratings
RQD	Mean: 98	90 - 100
Number of Joint Sets	Three Joint Sets	9
Joint Roughness	Mean: Rough Undulating Worse Case: Smooth Planar / No Rock Wall Contact	3 1
Joint Alteration	Mean: Tightly healed Worse: Clay mineral infilling	0.75 6
Q'		**1.6 - 44**

Source: Cornish Metals, 2024.

Table 16.5 RMR analysis

Parameter	Range of values	Range of ratings
UCS	100 - 265 MPa	12 - 15
RQD	90 - 95	20
Joint Spacing	0.5 0.6 – 2.0 m	10 15
Joint Condition	Continuous, minor separation, rough, none to soft infilling, un-weathered to slight.	15 - 23
Groundwater	Completely Dry	15
Sub-total		75 - 88
Joint orientation adjustment		-5 to -12
Total		**63 - 83**

Source: Cornish Metals, 2024.

16.1.4 Stress regime and numerical modelling

South Crofty previously had over-coring tests conducted in 1982 using CSIRO (Pine et al., 1983) hollow inclusion strain cells. A total of 11 tests were completed with the following mean stress tensors reported (Table 16.6).

Table 16.6 Historic average principal stress directions

Stress	Magnitude (MPa)	Azimuth (°)	Dip (°)
σ_1 (σ_H)	37.7	129.8	5.0
σ_2 (σ_v)	18.5	-13.1	84.4
σ_3 (σ_h)	11.3	40.5	-3.2

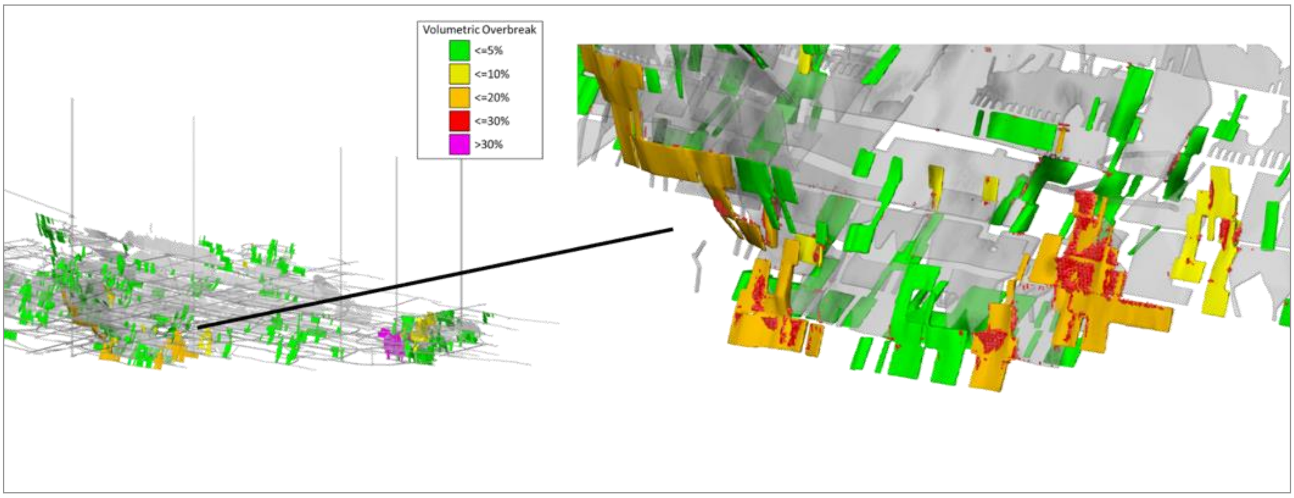
Notes: Dip positive below horizontal. Testing was undertaken at 790 m depth.
Source: MiningOne, 2023.

Conceptual numerical modelling study has been undertaken during 2023 to validate historical geotechnical data interpretations against recorded production. The analysis included a number of conceptual stope models to evaluate stable stope spans, in addition to a mine scale model of historical excavations and initial mineable shape optimiser stopes for the resource.

Analysis of generic stope shapes under virgin stress conditions correlate with the outputs of the calibrated stability graph method. Modelling of weaker conditions assumed in the No. 4 Hangingwall demonstrated a greater sensitivity to stope height than stope length, indicating that under weaker conditions, stability may be improved more effectively by a reduction in stope height than by a reduction in stope strike length.

The conceptual stope shapes designed to Indicated resources at the time of the study did not exceed a hydraulic radius (HR) of 10 m, and the larger stope spans designed to include the Inferred resources did not exceed 16 m. Stope spans tend to be limited by the presence of low-grade zones, forming pillars in the design. It is therefore likely that any stope scale instability will result from interaction between voids or unfavourable stope geometries creating stress concentrations or excessive tensile zones as shown in the mine scale model (Figure 16.3).

Figure 16.3 Modelled Overbreak Conceptual Indicated LOM Model (Isometric view NE)



Source: MiningOne, 2023.

16.1.5 Stope design

South Crofty has an extensive past-production database, with excavated stopes generally very extensive on strike (more than 100 m) and downdip (up to about 100 m) and are usually less than 3 m wide. Most stopes have access via a lode drive-footwall drive combination linked with crosscuts at approximately 8 - 10 m intervals. The orientation of the mined lodes is such that the maximum horizontal stress, σ_H, is almost perpendicular to the stope long axes, which has been the cause of stability problems where they occurred previously.

Previous stoping created hangingwall hydraulic radii of 25 - 26 m without problems, with some areas exceeding HRs of 35.

To provide an indication of an appropriate stope size, an empirical analysis has been completed using the Mathews / Potvin Stability Graph Method as summarised by Villaescusa (2014). The inputs for this are based on Q’, which is modified using the modifying factors (A, B, and C) indicated in Table 16.7.

Table 16.7 Summary of modifying factors for stability graph assessment

(800 m depth, hangingwall dip 50°)			
Modifying factor	**Stope surface**	**Value**	**Comments**
A (Stress factor)	Hangingwall	1.0	800 m Depth Hangingwall Dip of 50° Numerical models have been used to estimate σ1.
	Footwall	1.0	
	Back	0.1	
	Sidewall	0.1	
B (Joint orientation factor)	Hangingwall	0.2	Set 1b influences the hangingwall and footwall surfaces most strongly. Set 3 affects the back surface. Sets 1b & 2 affect the sidewalls.
	Footwall	0.2	
	Back	0.22	
	Sidewall	0.2	
C (Gravity factor)	Hangingwall	4.0	Hangingwall Dip of 50° has been modelled in this table, however a range of dips has been considered.
	Footwall	4.0	
	Back	2.0	
	Sidewall	4.0	

Source: Cornish Metals, 2024.

The analysis has split the stopes into separate surfaces for comparison. A range of rock mass conditions and stope orientation / depths have been included in the analysis. Table 16.8 shows the estimated stope stability number.

Table 16.8 Analysis of N' (800 m depth, Hangingwall dip 50°)

Parameter	N' parameters				Comments
	Hangingwall	Footwall	Back	End wall	
Q'	44	44	44	44	Based on statistical analysis of RQD, Jn, Jr, and Ja
UCS (MPa) Sigma C	140	140	140	140	Summary testing.
Sigma 1 (MPa)	1	1	120	145	Based on 3D stress model.
Stress:strength ratio	140	140	1.1	0.95	
Factor A	1	1	0.1	0.1	
Angle between Stope face and Critical Joint	30	30	33	20	Set 2 is critical for all surfaces, Set 3 for backs.
Factor B	0.2	0.2	0.22	0.2	
Potential Failure Mode	Slabbing	Sliding	Gravity	Sliding	
Dip of Stope Face	50°	50°	0°	90°	
Dip of Critical Joint		70°		70°	
Factor C	4	4	2	8	Vertical walls are assigned a C factor of 8 (Potvin, 2014)
N' = Q' x A x B x C	35	35	1.9	7.0	

Source: Cornish Metals, 2024.

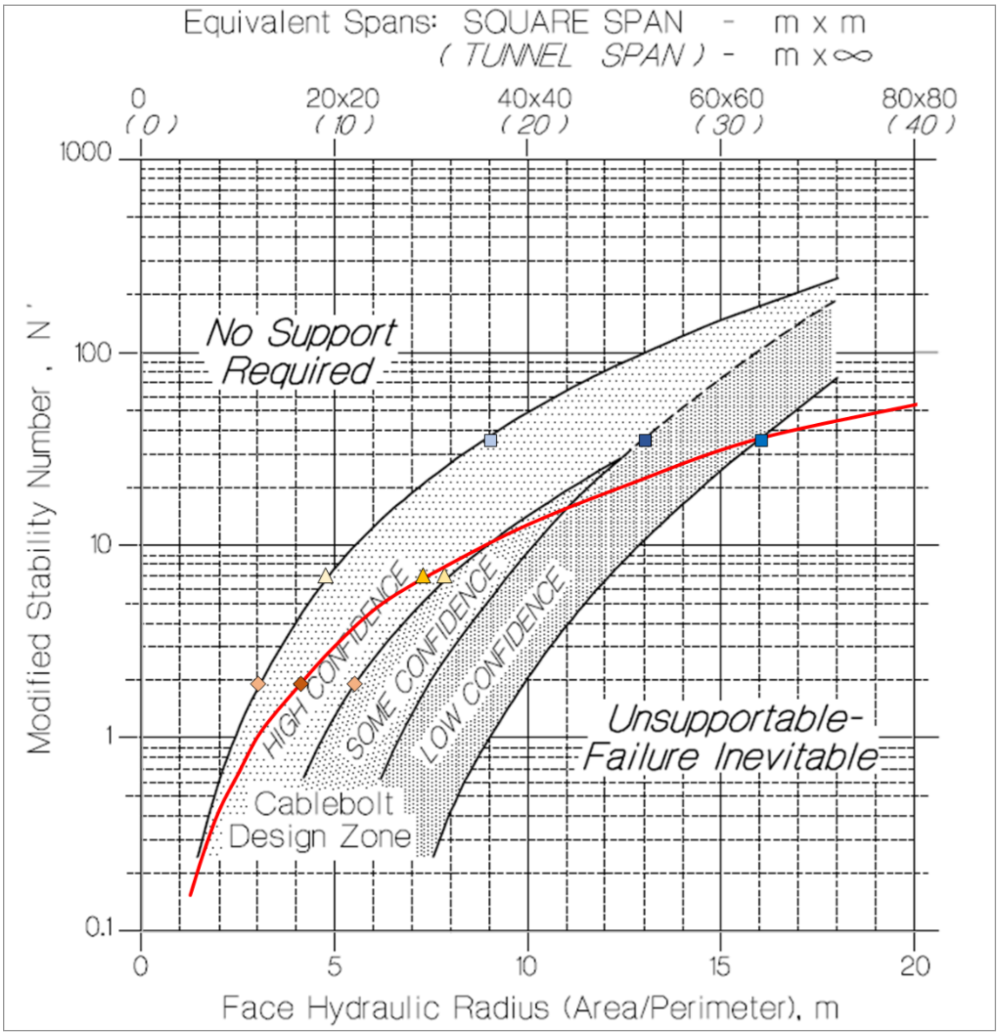
The values reported in Table 16.8 are plotted onto the stability graphs. Stability graphs were generated for each stope surface (hangingwall, sidewalls, footwall, and back), and for stress conditions and stope hangingwall dips from the deeper levels of the mine and from higher levels in the proposed workings.

The stability graph method was evaluated for use at South Crofty and was subsequently used for empirical hangingwall design. The evolution of the stability graph combined the historical opening span data from South Crofty with the original Potvin database; this allowed a for a relatively large dataset and also accounted for the generally larger hydraulic radii with the South Crofty mine. The combined dataset allowed site calibration of the design charts. As has been highlighted, the larger values of HR at South Crofty are more stable than indicated by the original Potvin database.

A new discriminate stable / caved line for South Crofty was generated and has been used to update the stope dimensions analysis. The evaluation and calibration of the stability chart is shown in Table 16.9.

Table 16.9 Stope stability assessment, calibrated (800 m depth, hangingwall dip 50°)

Surface	N′	Max unsupported			Max supported			Calibrated stable		
		W	H/L	HR	W	H/L	HR	W	H/L	HR
Hangingwall	35	33	**40**	9.0	75	**40**	13	160	**40**	16
Back	1.9	7.3	**33**	3.0	12.9	**75**	5.5	8.6	**160**	4.1
Sidewall	7.0	12.5	**40**	4.75	26	**40**	7.8	22.7	**40**	7.25



Source: Cornish Metals, 2024.

The calibrated stability chart reflects the historical opening spans and also confirmation of the results of the 3D numerical back analysis. Dimension analysis was updated as shown in Table 16.10.

Table 16.10 Stope dimension analysis calibrated (800 m depth, hangingwall dip 50°)

Stope	Length (m)						
Height (m)	80	100	120	140	160	180	200
30	10.9	11.5	12.0	12.4	12.6	12.9	13.0
40	13.3	14.3	15.0	15.6	16.0	16.4	16.7
50	15.4	16.7	17.6	18.4	19.0	19.6	20.0
60	17.1	18.8	20.0	21.0	21.8	22.5	23.1
70	18.7	20.6	22.1	23.3	24.3	25.2	25.9
80	20.0	22.2	24.0	25.5	26.7	27.7	28.6

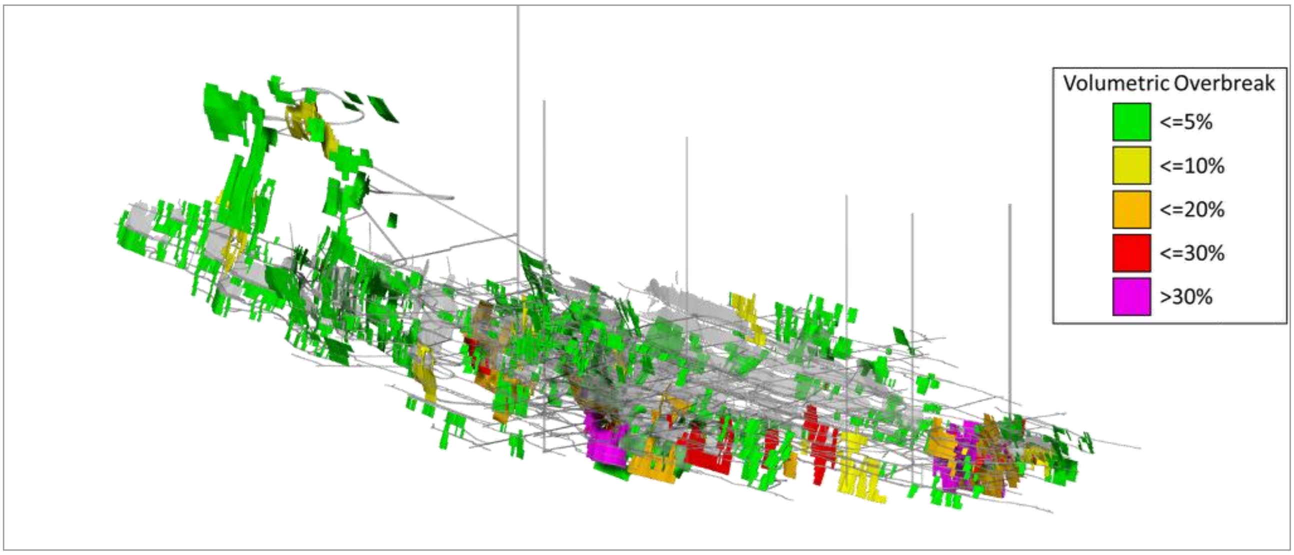
Hangingwall surface		
Key	N′ = 35.2	HR
	Stable	16
	Unsupported Transitional	20
	Stable with Support	23
	Supported Transitional	26
	Unstable	28

Source: Cornish Metals, 2024.

16.1.6 Dilution

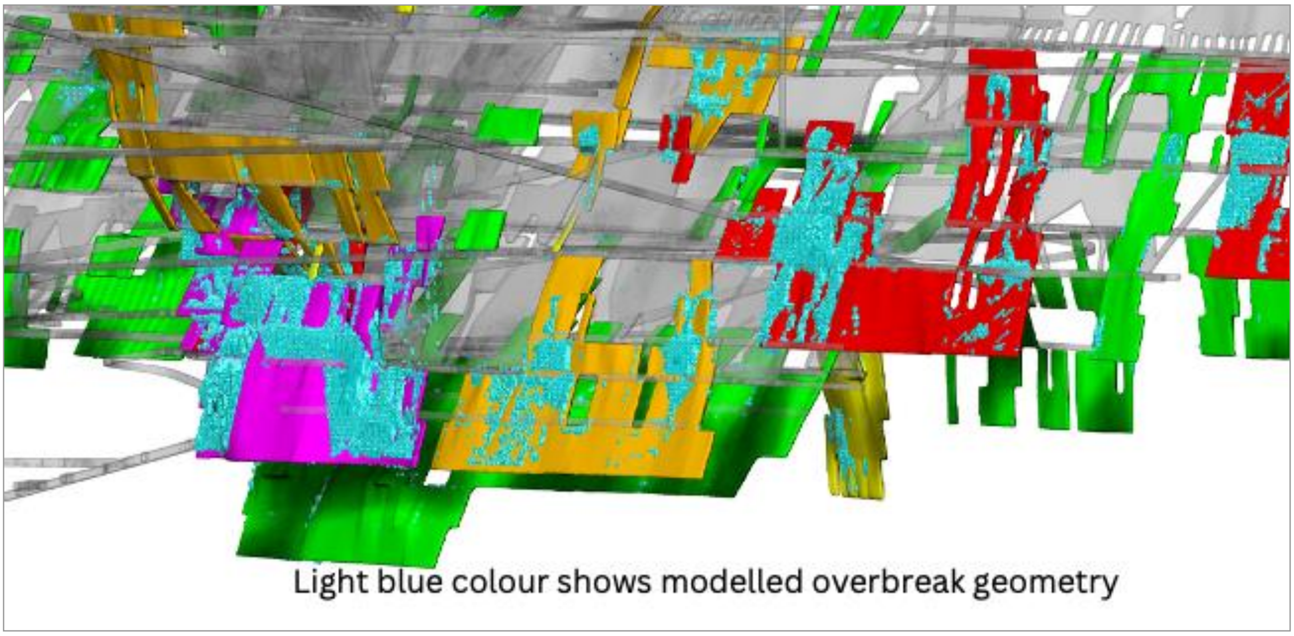
As part of the numerical modelling, the conceptual mine design based on Indicated and Inferred material was assessed for final opening spans and overbreak. Model results are presented, coloured by modelled overbreak, in Figure 16.4 and Figure 16.5.

Figure 16.4 Indicated and Inferred conceptual stopes coloured by modelled overbreak amount (Isometric view NE)



Source: MiningOne, 2023.

Figure 16.5 Modelled overbreak in No.4 'deep' stopes, highlighting sensitivity to span height (Isometric view NE)



Source: MiningOne, 2023.

For the Indicated and Inferred stoping design, a small number of stope shapes are overlapping or are abutting other stopes. This results in a few areas of modelled high overbreak that should be recognised as being an artifact of the conceptual design. The occurrence of these artifacts will be avoided by minor manual amendments to the design during the next phase of studies. Modelling indicates average dilution for Indicated and Inferred stoping design is 5.3%.

16.1.7 Ground support

Designs for proposed development drives and declines, which covers principal development and sizing, were reviewed using empirical methods. The assessment has considered the rock mass Q values to calculate the ground support requirements in rock mass conditions equivalent to mean, poor, and faulted conditions.

To calculate the Q value, a stress reduction factor (SRF) of 2.0 has been used for mean conditions and 2.5 has been used for poor ground and fault zones. A Jw value of 1.0 was chosen to represent the groundwater conditions. The SRF and Jw values have been used to calculate the Q value based on the Q' values selected in Section 4.3. The Q system support chart has been used represent the granite domain.

Table 16.11 shows the recommendations for ground support for typical ore drive and decline development in mean ground conditions, Table 16.12 in poor conditions, and Table 16.13 in fault conditions.

Table 16.11 Summary recommended ground support for development (mean conditions)

Design domain	Ground support category	Ground support
3.0 m x 3.0 m Level Drive (Scenario 1, mean conditions)	Unsupported (Spot Bolt as required)	1.5m, 46mm Friction Stabiliser (Split set)
5.0 m x 5.0 m Decline (Scenario 1, mean conditions)	Unsupported (Spot Bolt as required)	2.1 m Resin Encapsulated Solid Bar Option: 50 mm Shotcrete in Jointed / Kaolinised areas

Table 16.12 Summary recommended ground support for development (poor conditions)

Design domain	Ground support category	Ground support
3.0 m x 3.0 m Level Drive (Scenario 2, poor conditions)	Unsupported (Spot Bolt as required)	1.5 m, 46 mm Friction Stabiliser (Split set). Option: Mesh Support in Jointed / Kaolinised areas
5.0 m x 5.0 m Decline (Scenario 2, poor conditions)	Systematic Bolting Unreinforced Shotcrete	2.1 m Resin Encapsulated Solid Bar 50 mm Shotcrete or Mesh in Jointed / Kaolinised areas

Table 16.13 Summary recommended ground support for development (fault conditions)

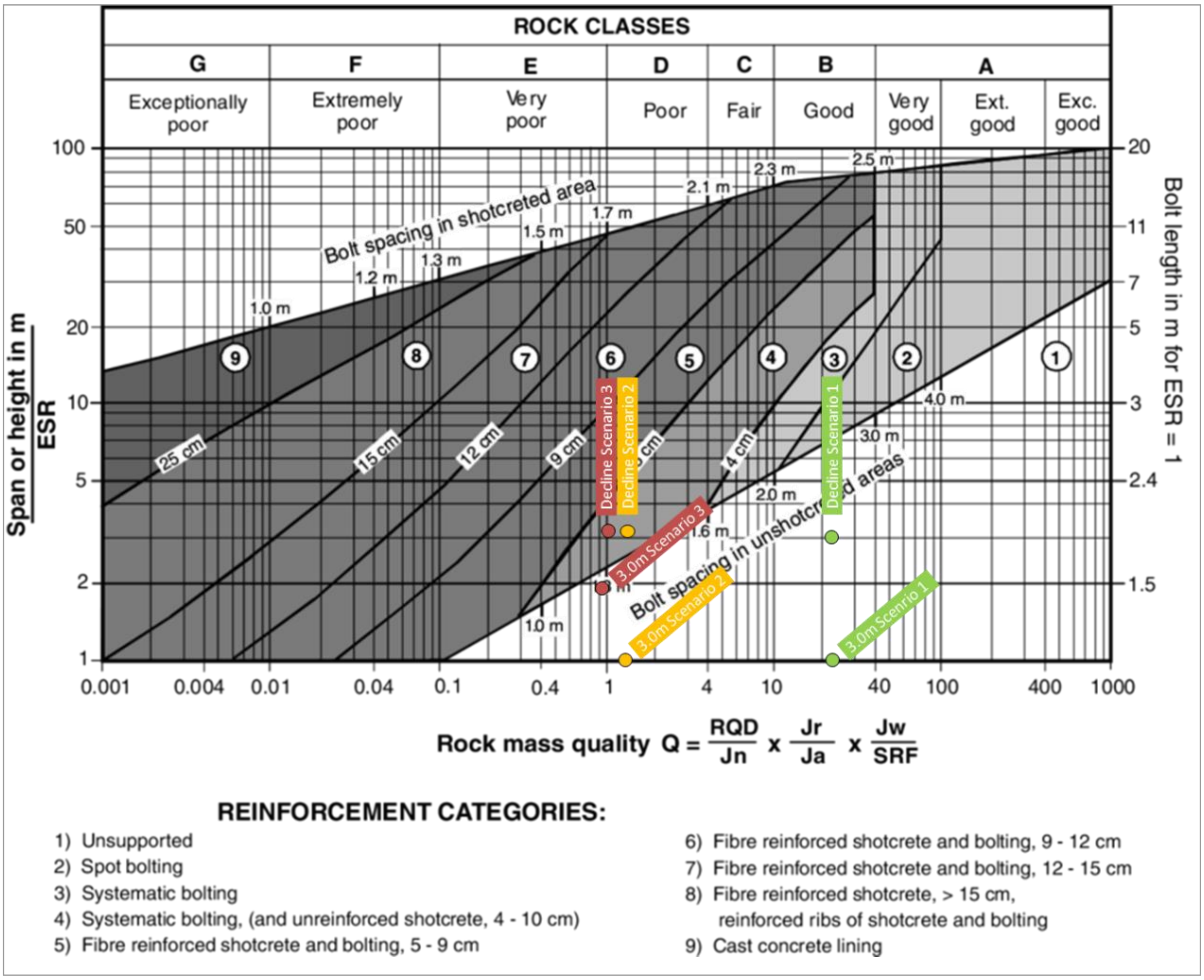
Design domain	Ground support category	Ground support
3.0 m x 3.0 m Level Drive (Scenario 3, fault conditions)	Systematic Bolting Unreinforced Shotcrete	1.5 m, 46 mm Friction Stabiliser (Split set) and 50 mm Shotcrete or Steel Arches at 1.0 m Centres
5.0 m x 5.0 m Decline (Scenario 3, fault conditions)	Systematic Bolting Unreinforced Shotcrete	2.1 m Resin Encapsulated Solid Bar and 50 mm Shotcrete or Steel Arches at 1.0 m Centres

Source: Cornish Metals, 2024.

The Q system support chart (see Figure 16.6) has been used represent the mean, poor, and fault condition Q values for the granite domains in which development will be excavated.

The support charts indicate that the rock mass quality varies from good to poor and the support requirements vary from group 1 to group 4.

Figure 16.6 Ground support chart



Source: Cornish Metals, 2024.

Ground support elements are summarised in Table 16.14. The support requirements are summarised in Table 16.15 for expected ground condition and Table 16.16 for poor or fault conditions. The rock bolt lengths and spacing in these tables are based on using shotcrete where indicated.

Table 16.14 Summary of recommended ground support elements

Ground support element	Description	Length (m)	Assumed capacity
Temporary Bolt	46 mmØ Galvanised Friction Stabiliser (Split Set) 150 mm x 150 mm x 4 mm Domed Plate	1.5	4 t/m
Permanent Bolt	22 mm Resin Encapsulated Threaded Bar 150 mm x 150 mm Domed Plate and Hemispherical Nut	1.8	15 t/m
Steel Arches	TH Arch System Arched Profile (Nominally TH-25 Section)		

Source: Cornish Metals, 2024.

Table 16.15 Spacing of ground support for development (mean conditions)

Design domain	Span (m)	Support category	Reinforcement category	Bolt	# per ring	Ring spacing	Surface support
Access / Level Drive	3.0	Permanent	Unsupported Spot Bolt as required	1.5 m, 46 mmØ Friction Stabiliser (Split Set)	-	-	-
Ore Drive	3.5	Temporary	Unsupported Spot Bolt as required	1.5 m, 46 mmØ Friction Stabiliser (Split Set)	-	-	-
Main Drive	3.5	Permanent	Unsupported Spot Bolt as required	1.8 m Resin Encapsulated Solid Bar	-	-	-
Access Ramps	4.0	Temporary	Unsupported Spot Bolt as required	1.5 m, 46 mmØ Friction Stabiliser (Split Set)	-	-	-
Main Decline	5.0	Capital Infrastructure	Systematic Bolting	1.8 m Resin Encapsulated Solid Bar	6	1.5	-
Pump Chamber / Shaft Station	6.5	Capital Infrastructure	Systematic Bolting	1.8 m Resin Encapsulated Solid Bar	-	1.5 x 1.5	-

Source: Cornish Metals, 2024.

Table 16.16 Spacing of ground support for development (poor conditions)

Design domain	Span (m)	Support category	Reinforcement category	Bolt	# per ring	Ring spacing	Surface support
Access / Level Drive	3.0	Permanent	Systematic Bolting	1.5 m, 46 mmØ Friction Stabiliser (Split Set	4	1.5	Mesh / 50 mm Shotcrete for localised poor conditions
Ore Drive	3.5	Temporary	Unsupported Spot Bolt as required	1.5 m, 46 mmØ Friction Stabiliser (Split Set)	-	-	Mesh / 50 mm Shotcrete for localised poor conditions
Main Drive	3.5	Permanent	Systematic Bolting	1.8 m Resin Encapsulated Solid Bar	5	1.5	Mesh / 50 mm Shotcrete
Access Ramps	4.0	Temporary	Unsupported Spot Bolt as required	1.5 m, 46 mmØ Friction Stabiliser (Split Set)	-	-	Mesh / 50 mm Shotcrete for localised poor conditions
Main Decline	5.0	Capital Infrastructure	Systematic Bolting	1.8 m Resin Encapsulated Solid Bar	6	1.5	Mesh / 50 mm Shotcrete
Fault Zone	-	Permanent	Systematic Bolting / Steel Arches	1.8 m Resin Encapsulated Solid Bar		1.0	Shotcrete / Steel Arch Support

Source: Cornish Metals, 2024.

16.2 Hydrogeology

The hydrogeology of the South Crofty mine can be easily understood because of: (i) the available data and previous experience gained from mining observations and pumping records, and (ii) the relatively low permeability of the granite host rock and the isolated nature of the deeper workings below the level of the New Dolcoath Deep adit. There is adequate hydrogeological data available to support the planned future mining operation and to assess potential future hydrogeological impacts.

Groundwater movement in the Carnmenellis granite and Killas formation occurs by fracture flow. The main preferential flow pathways are controlled by the primary geological structures. In the granite, clean open jointing is reasonably pervasive, so some groundwater flow also tends to occur throughout the rock mass. However, as is normal for granite, the permeability of the formation tends to reduce with depth.

The existing decant point for the South Crofty workings is from the Roskear shaft into the New Dolcoath Deep adit at 51 masl, which is about 6 m above the discharge portal of the adit, some 4 km to the northwest. Recent mining at South Crofty occurred up to 1998, with all water pumped from the NCK Shaft.

The average pumping rate during previous operations was about 6,700 m^3/day. As would be expected, the reported pumping rate was higher in late winter and early spring and declined during the summer months. Maximum seasonal flows were typically between about 8,000 and 9,000 m^3/day. Highest flows (about 9,800 m^3/day) were reported in early 1990. Seasonal baseflows were typically between about 5,800 and 6,000 m^3/day. The water is derived mostly from upstream inflow from abandoned flooded mine workings, with minor infiltration of direct precipitation and minor groundwater inflow from the granite.

All indications are that the future dewatering rate from the South Crofty mine will be similar to the previous pumping rate. Flows will be highest during wetter climatic cycles, but the flows are not expected to respond to individual high precipitation events. Any structures that have already been intersected will be in hydraulic connection with the mine workings and are expected to drain down at the same rate as the workings. All previous pumping records include water from the Great Crosscourse and other penetrated structures.

The future pumped water quality will also be similar to the previous operational water quality. The use of paste tailings is not expected to cause significant changes to the pumped water quality provided that the paste is managed according to the current plan. It is currently planned that all water pumped from South Crofty will be routed to the water treatment plant.

The aerial extent of the drawdown that results from the planned future mining operation will be similar to the drawdown during the previous period of mining. The previous extent of drawdown was small because of:

(i) The general low permeability of the deep granite, and

(ii) The recharge boundaries provided by the surrounding flooded mines (many of which maintain water levels at a similar elevation of the New Dolcoath Deep adit).

The post-mining groundwater recovery can be predicted from the previously observed recovery in 1998, when flooding of the mine workings and recovery to 51 masl was complete within about two and a half years. Slight differences may relate to the future additional volume or void space and the number of stopes that are filled with paste. Recovery may be quicker if it occurs during a wet climatic cycle, or slower during a dry climatic cycle.

During operations, dewatering holes will be drilled outward from the workings, as required, to make sure that adjacent structures are draining down at a similar rate to the workings. Any water strikes or positive pressures measured in any of the holes will be evaluated and additional drainage holes may be installed, as necessary. This forms part of the procedure to minimise the potential for water inrush events.

16.3 Mine design parameters

16.3.1 Cut-off grade criteria

Mine design values were calculated from the resource block model using a tin COG to determine the mineable portions of the lode structures. Mineable stopes were defined based on COG values greater than 0.45% Sn.

The parameters used in the COG calculation are shown in Table 16.17.

Table 16.17 Cut-off grade criteria

Parameter	Unit	Value
Tin price	US$/t	31,000
Payable metal	% Sn	95
Refining / transport	US$/t	600
Process recovery	%	88.5
Total operating costs	US$/t milled	95

Note: Assumptions stated in table were used to establish mining cut-off grade only.
Source: Cornish Metals, 2024.

16.3.2 Dilution

Two types of dilution are included in the stope and development designs:

- Design (planned) and / or internal dilution – Material below COG that is within the planned stope or development design shape.
- External (unplanned) dilution – Additional material (overbreak) that is mined outside of the planned mining shape. All external dilution was assumed as zero grade.

The total estimated external and internal dilution is approximately 39% of the total mine design projected production.

16.3.2.1 Design and internal dilution

Dilution for stoping primarily comes the from the minimum design mining width of 1.5 m, the average orebody width is 0.45 m. Over the life-of-mine (LOM), average in-stope dilution is estimated at 34%.

Any material outside of the Resource modelling but within the mining stope and development shapes has been treated as un-mineralised and has been assigned zero metal grades.

16.3.2.2 External dilution

Unplanned dilution for the adopted longhole stoping mining methods will primarily come in the form of overbreak and block fallout from the hangingwall and footwall. Hangingwall and footwall dilution for longhole stopes was estimated both through numerical modelling, assessing depth of volumetric strain in stope shapes, and historical production records. Average external dilution for longhole stopes is estimated at 5%. For all development a dilution factor of 10% was applied.

16.3.2.3 Mining recovery

Mining or extraction recovery is a function of mineralised material left behind due to operational constraints typical in the mining process.

The longhole mining method is largely dependent on the accuracy of longhole drilling and explosive detonation to properly fracture the mineralised rock. Where holes deviate inside the defined mineralisation limits, some material will remain hung up and may never report to the stope floor for recovery.

Further minor factors considered to affect recoveries of longhole stoping in extraction include irregular mucking floors and opening geometry constraints, limited visibility for remote mucking, and operator error.

A mining recovery of 92% based on industry norms as well as operational experience in stopes and drifts of similar size and dip has been applied to all mining methods.

16.4 Mine planning criteria

Mine planning criteria for the South Crofty project are detailed below:

- The pre-production mine development period will be approximately 18 months. Any mineralised development material that meets COG criteria mined will be stockpiled on surface during this period with no stopes scheduled to start mining until the mill is commissioned and the primary ventilation circuit is established.
- Owner operator development and production mining has been assumed for the duration of the mine life.
- A combination of diesel and battery powered haulage fleet will be utilised.
- Existing voids will be filled with paste backfill or un-mineralised development rock.

Other key mine planning criteria are summarised in Table 16.18.

Table 16.18 Mine planning criteria

Parameter	Unit	Value
Operating days per year	Days	365
Shifts per day	Shifts	2
Hours per shift	Hour	10
Work roster	Days on-off	4x4
Nominal mineralised material mining average rate	t/d	1,370
Annual mineralised material mining average rate	tpa	≈500,000
Rock SG (Granite)	t/m^3	2.77
Rock SG (Killas)	t/m^3	3.00
Swell factor	%	40

Source: Cornish Metals, 2024.

16.5 Mining methods

Longhole stoping mining methods have been designed, primarily dependant on access and stoping extents. Sub-level longhole stoping will be the predominate mining method at South Crofty and is well suited given the excellent ground conditions, average stope dip of 70°, vein geometry consistency along strike for 30 m or greater and vertically for at least 20 m. The method allows for some limited selectivity. Double-lift longhole stoping that will allow an increased production rate will be utilised where larger panels of stoping are available.

The mine design generally consists of blocks of stopes separated by regions of lower grade material and / or historical workings. Mining direction is generally in a top-down sequence, retreating along access. Local variations in mining extraction, dependant on access and historical workings, will require bottom-up working in some cases.

A total of 83% of stoping is attributed to sub-level longhole mining and 17% to double lift longhole mining. Mining method by location is shown in Figure 16.7.

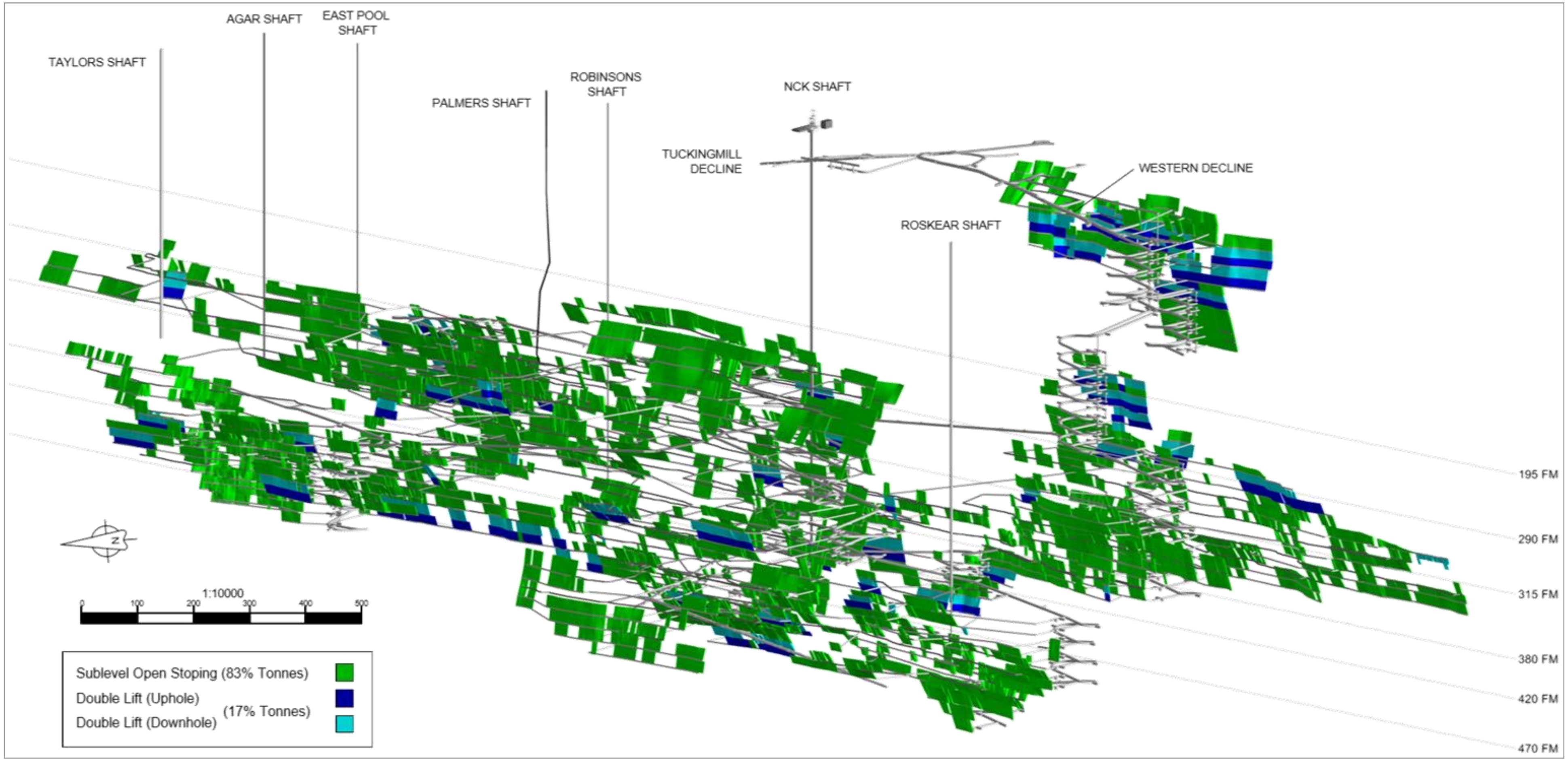
16.5.1 Sub-level longhole mining

Sub-level longhole open stoping (SLOS) is the predominate method planned and is well suited to the ground conditions, rock quality and vein geometry. SLOS offers a good productivity rate for the mine production phase.

SLOS is limited in selectivity compared to other mining methods when applied over long vertical distances due to potential drillhole deviation and vein geometry variations. To mitigate these effects, level spacing is limited to 22.5 m (floor to floor) with ore drives at 2.4 mW by 2.4 mH, giving a maximum hole length of 21.4 m. A minimum stope mining width of 1.5 m was used for design and planning purposes. Where the mineralised vein is less than the minimum stoping width, internal planned dilution is included to increase the width to the minimum 1.5 m (true width).

Unconsolidated un-mineralised development rock may be used for backfill in isolated areas. Where required, rib pillars can be left between stopes. Rib pillar stability assessment at 800 m depth indicates that a 7 m pillar width is required to give a safety factor of 1.5 while limiting interaction between stopes.

Figure 16.7 Mining method by location - Isometric long section looking west



Source: Cornish Metals, 2024.

During top and bottom ore drive development, mine geologists will inspect and map headings to identify structural controls and collect channel samples as part of the mine grade control protocol. Infill drilling will occur along the ore drives using 'bazooka' drills. Information from sampling and mapping in the top and bottom drives will be used, in conjunction with exploration and definition drilling results, to identify the economic limits and complete final stope designs.

Mining engineers will use all collected grade control information to prepare drillhole designs and blasting sequences to minimise extraction dilution and maximise mineralised material recovery. Mine surveyors will then locate and mark drillhole locations and provide drillhole lengths and orientations for drilling. Blast holes will typically be drilled from the lower drift and drilled to break-through into the upper drift where possible to verify drilling accuracy. If the hole deviates significantly from the design, a new hole will be drilled. An allowance has been included in the cost model for re-drilling.

The SLOS mining cycle will begin with blasting the slot raise to provide a free face for the first stope round as well as adequate void for swollen muck. Production blasting will begin at the stope ends and retreat to the access. Blasted material will report to the bottom of the stope where load haul dump (LHD) machines will muck the material via remote control when the brow is open. For remote operation, LHD operators will be stationed in safety cut-outs in order to maintain a safe line of site with the LHD. Specific safety protocols will be required, and all aspects of remote operator location will be assessed for each stope prior to mucking.

Lower drives will be used for loading and blasting of the stope above, as well as providing access for LHDs for mucking. Once the stope is completed, the drive will then be effectively the top access for the stope below. In the event development is unavailable, the upper extraction drive may be used to drill downholes. An example layout is shown in Figure 16.8.

16.5.2 Double lift open stoping

Double lift open stoping (DLOS) was selected for areas that have larger stope panels between main levels and which do not require sub-level development for mucking. This method is the highest productivity method; however, it is limited to areas which have continuous stoping blocks and limited to a top-down mining sequence.

The same selectivity limitations compared to SLOS are present due to potential drillhole deviation and vein geometry variations. To mitigate where possible, drillholes are limited to a maximum vertical hole length of 21.4 m, with both up and downholes. A minimum stope mining width of 1.5 m was used for design and planning purposes. Where the mineralised vein is less than the minimum stoping width, internal planned dilution is included to increase the width to the minimum 1.5 m (true width).

Figure 16.8 Typical sub-level open stoping layout and double lift open stoping layout

Source: Cornish Metals, 2024.

The DLOS mining cycle will begin with blasting a slot raise to provide a free face for the first stope round as well as adequate void for swollen muck. Production blasting will begin at the stope ends, on both upper and lower ore drives and retreat to the access. Blasted material will report to the bottom of the stope where LHD machines will muck the mineralised rock via remote control.

Both drives will be used for drilling, loading, and blasting of the stope above, with the lower drive providing access for LHDs for mucking. Sequencing and access management is an important planning requirement, as both up and downholes from an ore drive will need to be blasted at the same time. An example layout is shown in Figure 16.8.

16.6 Mine design

16.6.1 Existing workings

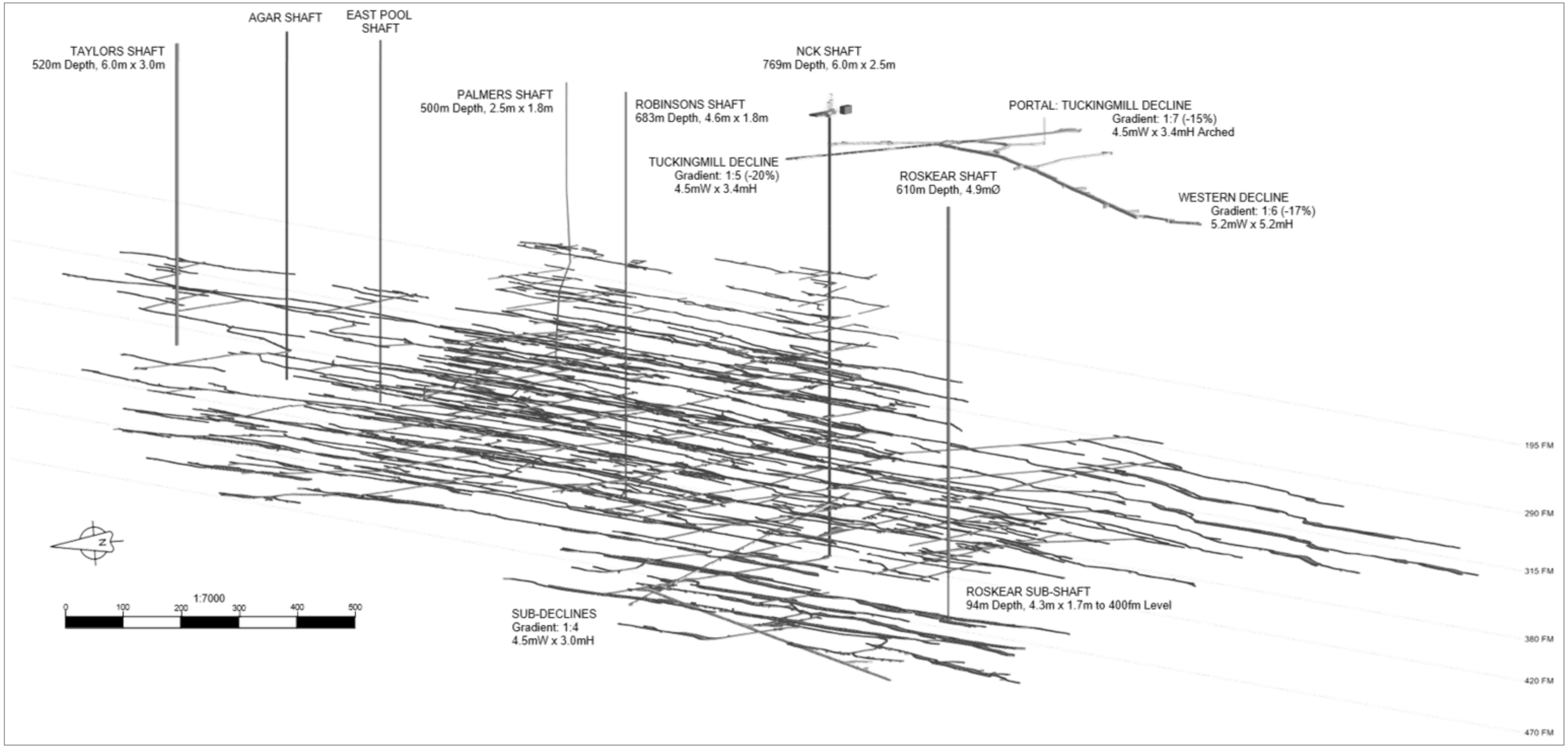
The South Crofty deposit currently has 15 main levels that were developed from NCK Shaft. It was the primary shaft for production and services and is 769 m deep and 6.0 m by 2.5 m in size. In addition, the mine has two internal declines developed from NCK Shaft and giving access to two further levels.

South Crofty also has further shafts Robinsons, Taylors and Roskear for ventilation and alternate access. Robinsons Shaft is 683 m deep and 4.6 m by 1.8 m in size. Taylors Shaft is located to the eastern extremity of the mine and is 520 m deep and 6.0 m by 3.0 m in size. Roskear Shaft is located to the west of the mine. It is 610 m deep, brick-lined, 4.9 m diameter, Roskear Shaft also has a sub-shaft (4.3 m by 1.7 m), which extends down 94 m from shaft bottom. Roskear provided alternate emergency access and is fitted with steel shaft furniture.

The mine also has a surface decline with two ramps, which have been driven at 15% and 18% gradients (1 in 6.5 and 1 in 5.5 respectively) with a curvature radius of 25 m. The western decline is planned to be continued at 15% gradient with 20 m curve radius to the lower developed part of the mine.

The mine plan will use where possible existing development to access new stopes. Existing development is on average 2.4 mW by 2.4 mH, with level spacing generally at about 40 m intervals (20 ftm). Where mobile haulage equipment require access, levels will be stripped out to 3.5 mW by 3.5 mH. Only sections of the levels that are required will be either rehabbed (ventilation) or slashed out (equipment access). Figure 16.9 shows a 3D view of the existing mine development.

Figure 16.9 Perspective view of South Crofty existing mine development (elevations are shown from NCK Shaft)



Source: Cornish Metals, 2024.

16.6.2 Stope optimisation

Mine planning for the South Crofty project was completed using Deswik software.

Deswik stope optimisation (SO) module was utilised to identify mineable stope blocks and generate optimised stope shapes within the resource block models. Table 16.19 shows the optimisation parameters used for the mineable shape optimisation (MSO) analysis.

Table 16.19 Stope optimisation parameters

Parameter	Unit	Value (Lower Mine)	Value (Upper Mine)
Block model		Various	Various
Cut-off variable		SN	SNEQ_23
Stope optimisation plane		XZ (Vertical)	XZ (Vertical)
Framework bearing		Various, by model	Various, by model
Step U	m	5	5
Step V	m	Variable, by model	Variable, by model
Cut-off	% Sn	0.4	0.4
Minimum stope width	m	1.5 (true width)	1.5 (true width)
Stope side area max ratio	#	2.25	2.25
Max strike deviation	°	-45 to +45 w/ max change 20°	-45 to +45 w/ max change 20°
Stope surface orientation		Stope Control Surface	Stope Control Surface
Max dip change between stope	°	20	20

Source: Cornish Metals, 2024.

Optimisations were run separately for each block model. The resulting stope optimizer shapes were reviewed and grouped into likely economic stope blocks and assessed by mining method. MSO was run at a lower cut-off grade than calculated to review continuity. The final mine design has only used stope shapes which are equal to or exceed the reported cut-off grade (0.45% Sn).

16.6.3 Production rate

The following factors were considered in the estimation of the underground mine production rate:

- Mining inventory tonnage and grade.
- Geometry of the mineralised zones.
- Amount of required development.
- Stope productivities.
- Sequence of mining and stope availability.
- Mine layout and location of stopes.

Tonnes per vertical metre for the mine design are approximately 7,550.

An underground mine production rate of 1,400 t/d was selected for the PEA and is considered appropriate in consideration of the productivities of the selected stoping methods and available working faces and / or stopes. The selected mine rate of 1,400 t/d requires that the equivalent of approximately 65 vertical metres are mined annually, or approximately two mine levels.

16.6.4 Mine design criteria

Development profiles and gradients are shown in Table 16.20. They were selected based on the equipment specifications, ventilation requirements, and stope sizes.

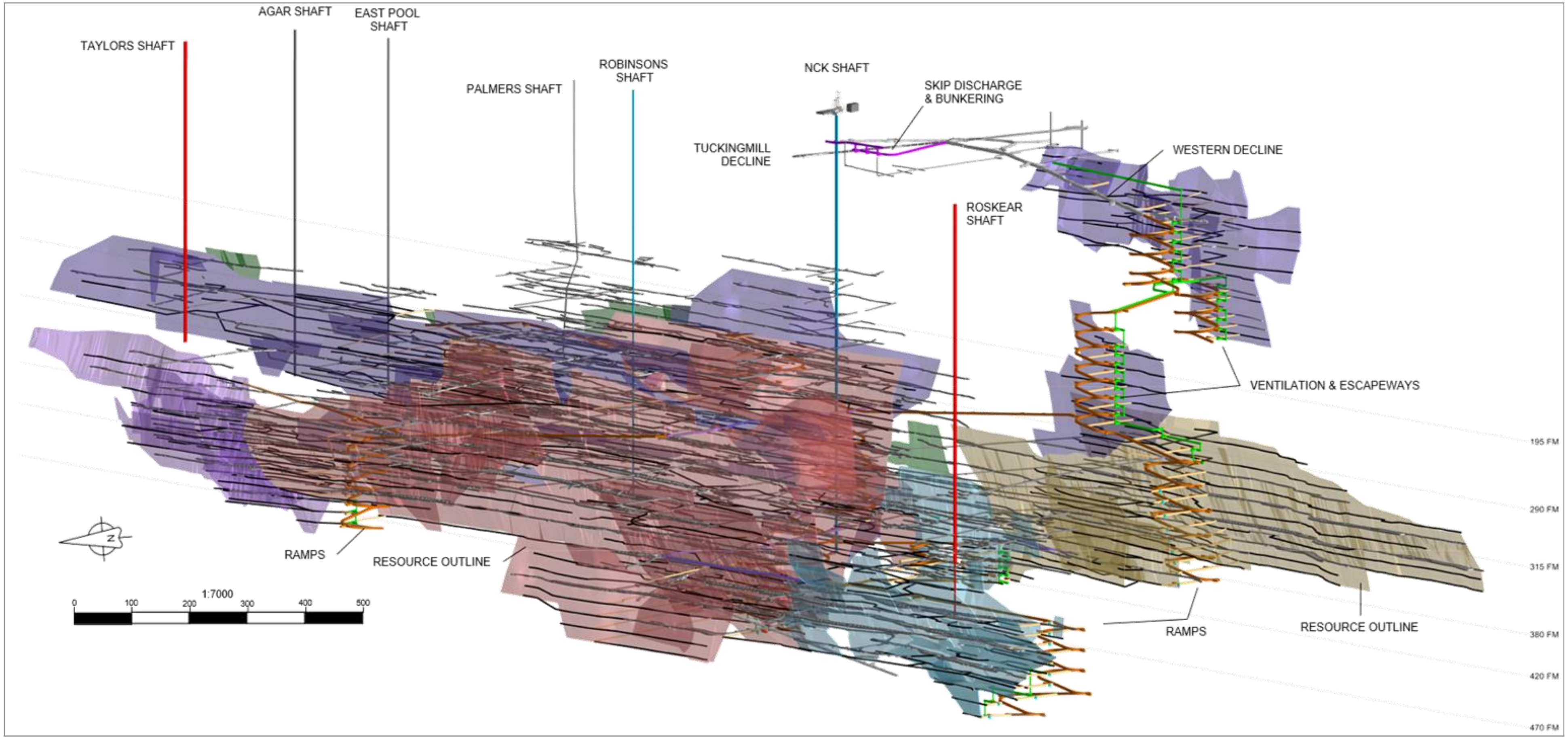
Table 16.20 Mine design criteria, development dimensions

Development heading parameter	Width (m)	Height (m)	Maximum gradient (%)
Ramps	4.0	4.0	15
Infrastructure (Shaft Station, Pump Station)	4.0	4.0	1
Level Access, Remucks	3.5	3.5	1
Vent Drives & Escapeway Access	3.5	3.5	1
Production Access & Ore Drives	2.4	2.4	1
Ventilation (small) and Escapeway Raises	Ø 2.4		90°
Ore Pass Raise	3.0	3.0	90°

Source: Cornish Metals, 2024.

Figure 16.10 shows the main ramps, portal location, and vent raises relative to the Mineral Resources and existing workings.

Figure 16.10 Existing & planned development & ventilation (elevations are shown from NCK Shaft)



Source: Cornish Metals, 2024.

16.6.5 Development types

NCK Shaft will provide initial access to each of the existing mine levels and new stoping areas. New ramps will be developed providing access to other levels. The ramps are driven at -15% grade and 4.0 mW by 4.0 mH, with a minimum curvature radius of 20 m. Ramp development has typically been designed with a minimum offset of 50 m from stopes to limit potential blast damage; the non-ramp development offset is 20 m.

Levels where large equipment access is required will be slashed out to 4.0 mW by 4.0 mH. This will allow for truck access, ventilation, and services. Sections of levels only to be used for services distribution and ventilation will only require rehab. Lateral access drives to stopes and stope access development will be mined from slashed levels, haulage ramps and access ramps at 3.5 mW by 3.5 mH. There are 48,730 m of existing development in the mine plan. Areas that are being utilised for ventilation, services or limited access will be rehabilitated. A total of 2,265 m of rehabilitation development will be stripped out to accommodate larger equipment.

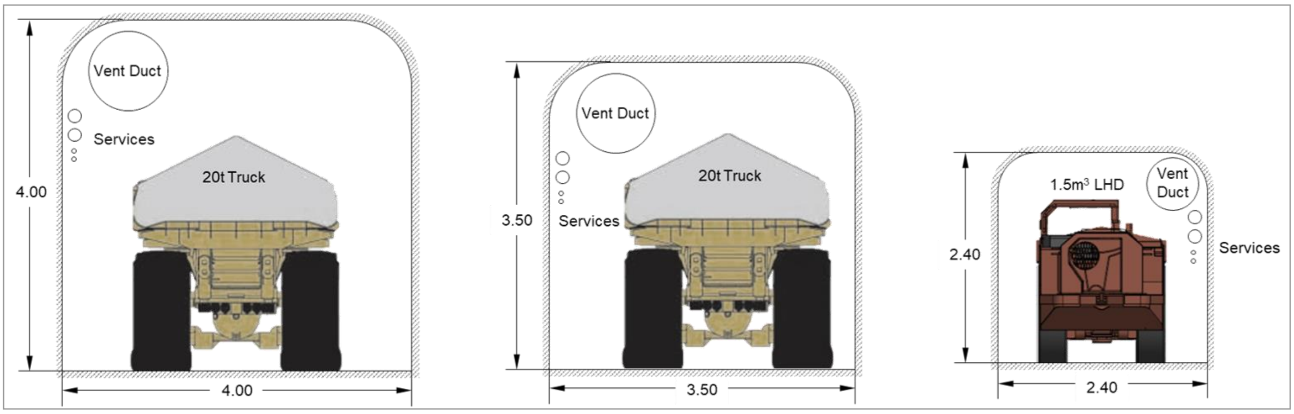
LH stope sub-level development will be mined at 2.4 mW by 2.4 mH to allow for LH production drills and scoop access.

Remucks are excavated on the main ramps to help speed up the development mucking cycle. They are designed at either a halfway point on curved ramps or have an interval of 125 m distance. The remucks are sized at 4.0 mW by 4.0 m H by 12.5 mL. Where a level access or lateral access drift has been designed off the ramp, these can also be utilised as temporary remucks.

Existing development on the levels will be utilised as water collection sumps, refuge station locations, and electrical bays. Fresh air raises and escapeways will be 2.4 m diameter.

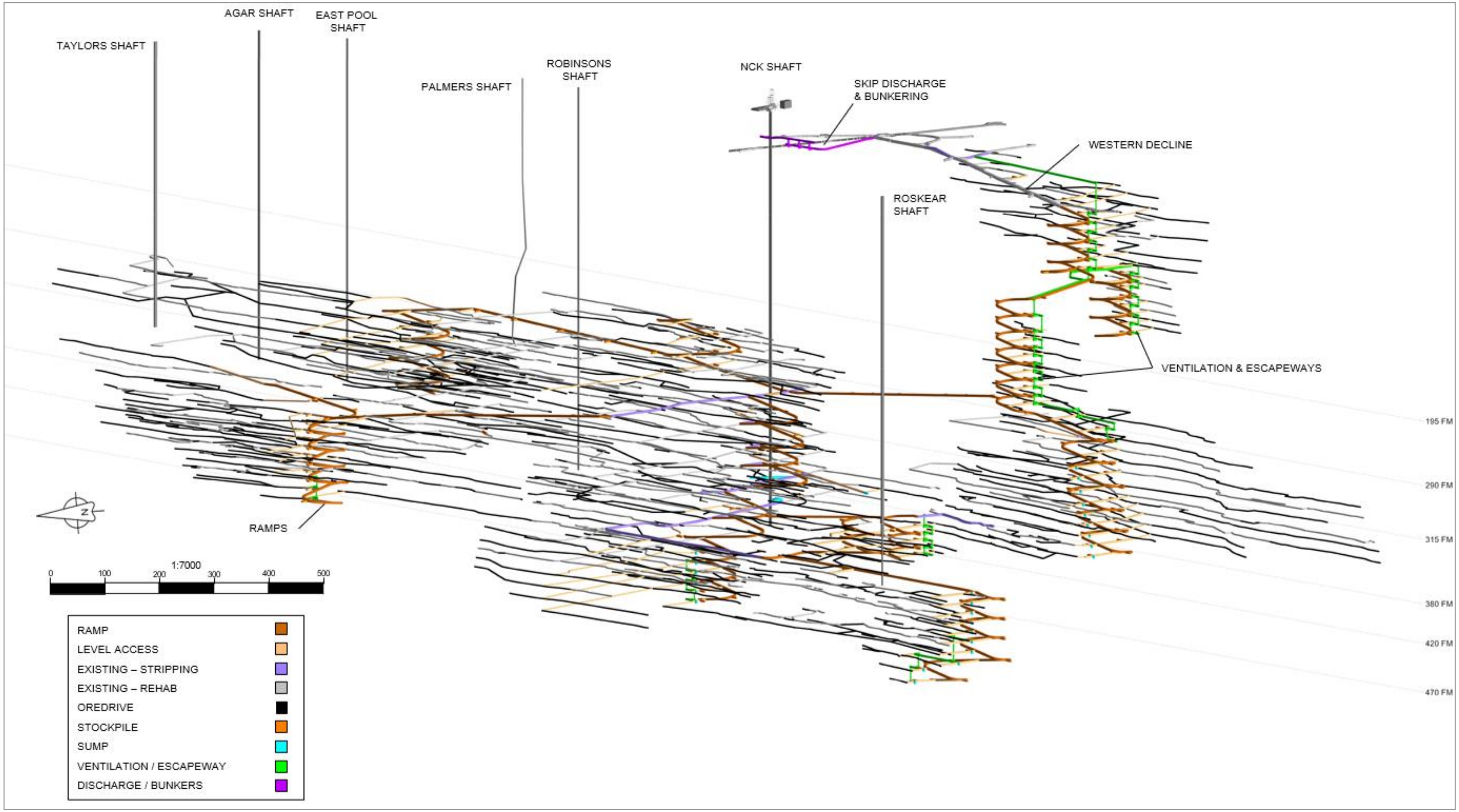
Design development profiles and the 3D mine design are shown in Figure 16.11 and Figure 16.12, respectively.

Figure 16.11 Development profiles



Source: Cornish Metals, 2024.

Figure 16.12 Development design at South Crofty (elevations are shown from NCK Shaft)



Source: Cornish Metals, 2024.

16.7 Mine backfill

16.7.1 Tailings characterisation

The South Crofty tailings material is typical of a gravity / flotation processing product and compares similarly to other nearby mine / process tailings. The tailings material is generally fine with a P80 of about 120 µm, a P50 of 60 µm, and a P20 of 15 µm. The proportion of fines and material size range means that the whole tailings stream is suitable for paste backfill.

Tailings mineralogy was completed by Petrolabs (report AM7370, 19/05/23); the analysis has shown the predominate (80%) constituents are quartz, k-felspar, and tourmaline. There are minor sulphides present (0.3%) indicating similarly to previous testwork that the tailings are net neutralising.

Pilot scale paste testing was conducted on a range of water / cement ratios which showed that samples achieve strength with a typically expected solids density. Thickening and filtration testwork has also been completed which has shown sufficiently high solids can be achieved from thickening (>60% m) and from filtration processes (84% m).

16.7.2 Backfill strength

The following backfill strength targets have been considered:

- A minimum requirement that paste fill exceeds liquidation limits; the UCS should exceed 250 kPa.
- For the existing filling of previous longhole stopes, the UCS should exceed 800 kPa, based on full height exposures.

The backfill system has been primarily designed on filling existing void space from previous mining, prior to filling new mining voids after mining is completed. In-cycle backfill is not required, and there is no currently planned requirement to undercut paste backfill.

Preliminary uniaxial compression testing performed by Paterson & Cooke (UK) Ltd (P&C) shows that sufficient strengths can be achieved with 6% Ordinary Portland Cement (OPC) binder.

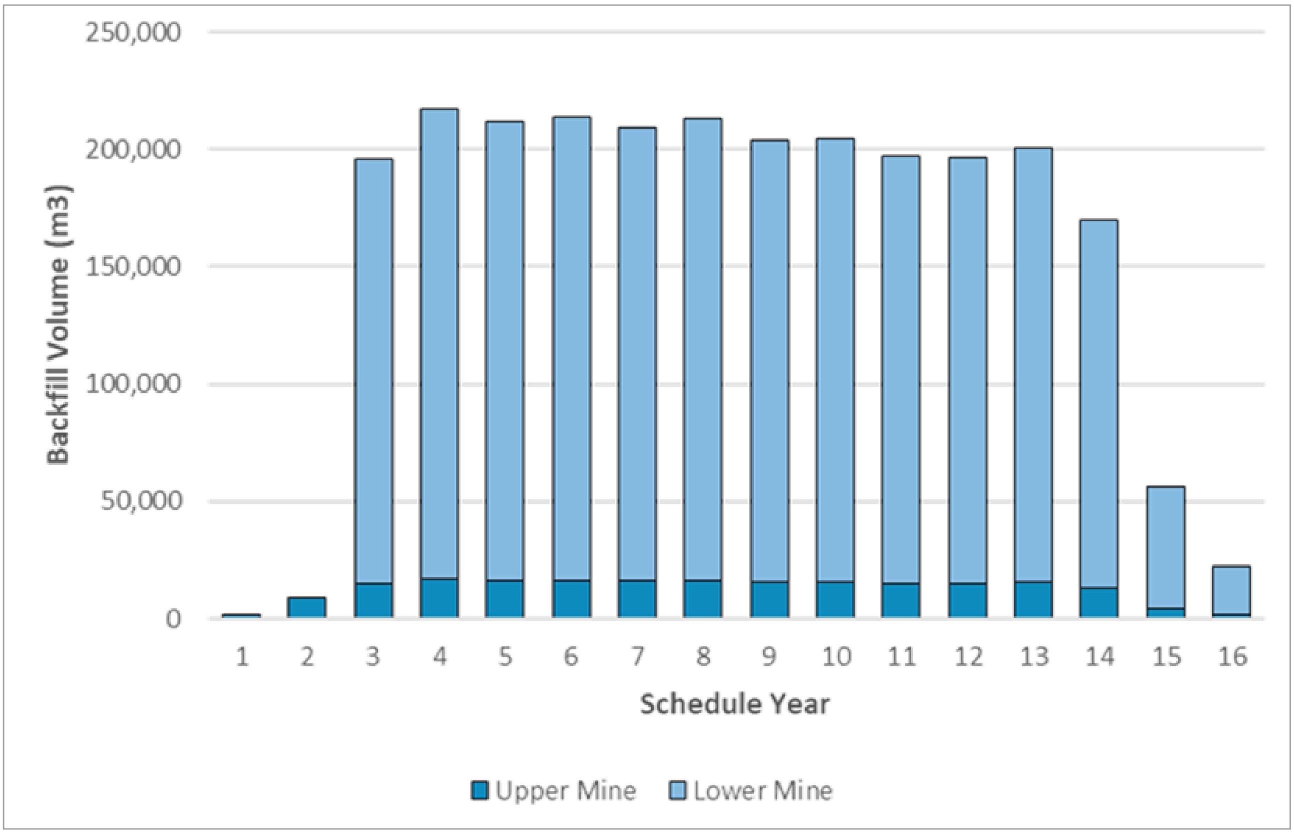
16.7.3 Backfill demand

The backfill plant has been designed and sized to meet storage and placement requirements for backfill in the mine. Due to the need for full underground placement of all the South Crofty tailings material, the backfill plant must be able to continuously produce filter cake independently of backfilling. The plant will then operate in a batch mode, processing stockpiled tailings filter cake and concurrent process tailings.

The plant throughput is based on practical minimums for pipe sizing, filling rates in the stopes and preparation of backfill areas.

The mine production will produce approximately 2.3 Mm^3 of paste backfill placed over the life of the mine. The projected backfill schedule over the life of the mine is shown in Figure 16.13.

Figure 16.13 LOM paste fill production



Source: Cornish Metals, 2024.

The paste backfill is planned to be backfilled into existing voids initially, and then into newly mined areas once completed. The existing areas are shown in Figure 16.14.

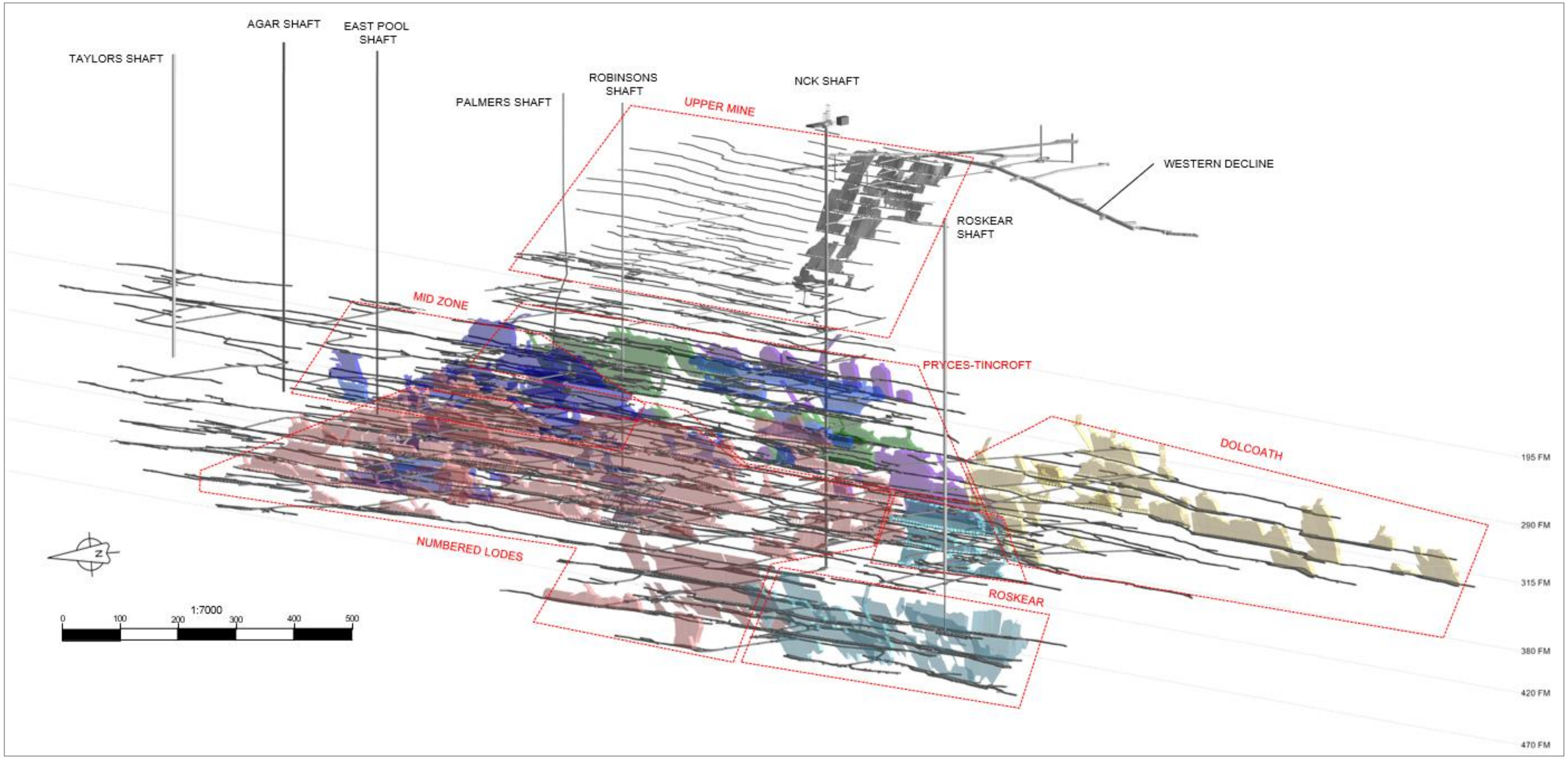
Void volumes from existing mined voids are shown in Table 16.21. The backfill void areas are estimated based on the closure surveys and estimates on the mined tonnage. The selected areas represent large void areas to optimise backfill efficiency, while minor voids have been excluded from the estimate. Two primary areas have been delineated, namely: shallow existing workings and deep level existing workings.

Table 16.21 Estimated existing backfill volume by area

Area	**Volume (Mm^3)**
Upper Mine (NCK & North Tincroft)	0.20
Dolcoath	0.13
Roskear	0.25
Numbered Lodes	0.88
Pryces-Tincroft	0.24
Mid Zone	0.50
North Pool Zone	0.12
Total	**2.33**

Source: Cornish Metals, 2024.

Figure 16.14 Existing backfill areas (elevations are shown from NCK Shaft)



Source: Cornish Metals, 2024.

The shallow workings are accessible from the surface decline and are intended to act as a secondary placement area using mobile fleet, separate from the backfill reticulation system. The primary placement areas are the deep level workings adjacent to NCK Shaft of Pryces-Tincroft and the Central mining area.

In addition, the planned 1,400 t/d mining rate will create roughly 180,500 m^3 of void space per year from stoping, if additional placement areas are required.

The proposed operating capacity of the backfill plant is 60 m^3/hr, which equates to 65% plant utilisation per annum. The operating philosophy of the backfill plant is to operate for fewer hours than the processing plant (accounting for downtime, shift change and maintenance), but at a mass throughput to process the normal tailings production at the same time as working through the buffer capacity available within the thickener and feed tanks (two off). During periods when backfilling is not possible, normal tailings production can be retained within the feed tanks and within the filter cake stockpile area, thereby preventing the need to suspend the process plant operation.

16.7.4 Backfill plant design

Tailings report to a thickener outside the processing plant and will be thickened to ≈60-65% m and then pumped to holding tanks ahead of the filtration plant, which will dewater the tailings to ≈85% m. The filter cake will then either report to the backfill mixing plant or to a stockpile area for storage. During backfill production, both stockpiled and fresh filter cake will report to the backfill mixer, where cement and trim water will be added to produce the target paste backfill for transport underground.

The backfill plant will be located immediately adjacent to the mine water treatment plant (MWTP) and the concentrator building in order to share services and to simplify operations (Figure 16.15). The plant consists of four main sections: an external thickened tailings receiving tank; filtration equipment; the cement handling system; and the mixing system, see Figure 16.16.

The tailings filtration building will consist of a single floor, to limit building height, housing the two pressure filters, ancillary equipment, and laydown area. The mixing system, cement storage and filter cake re-loading system are adjacent to this building.

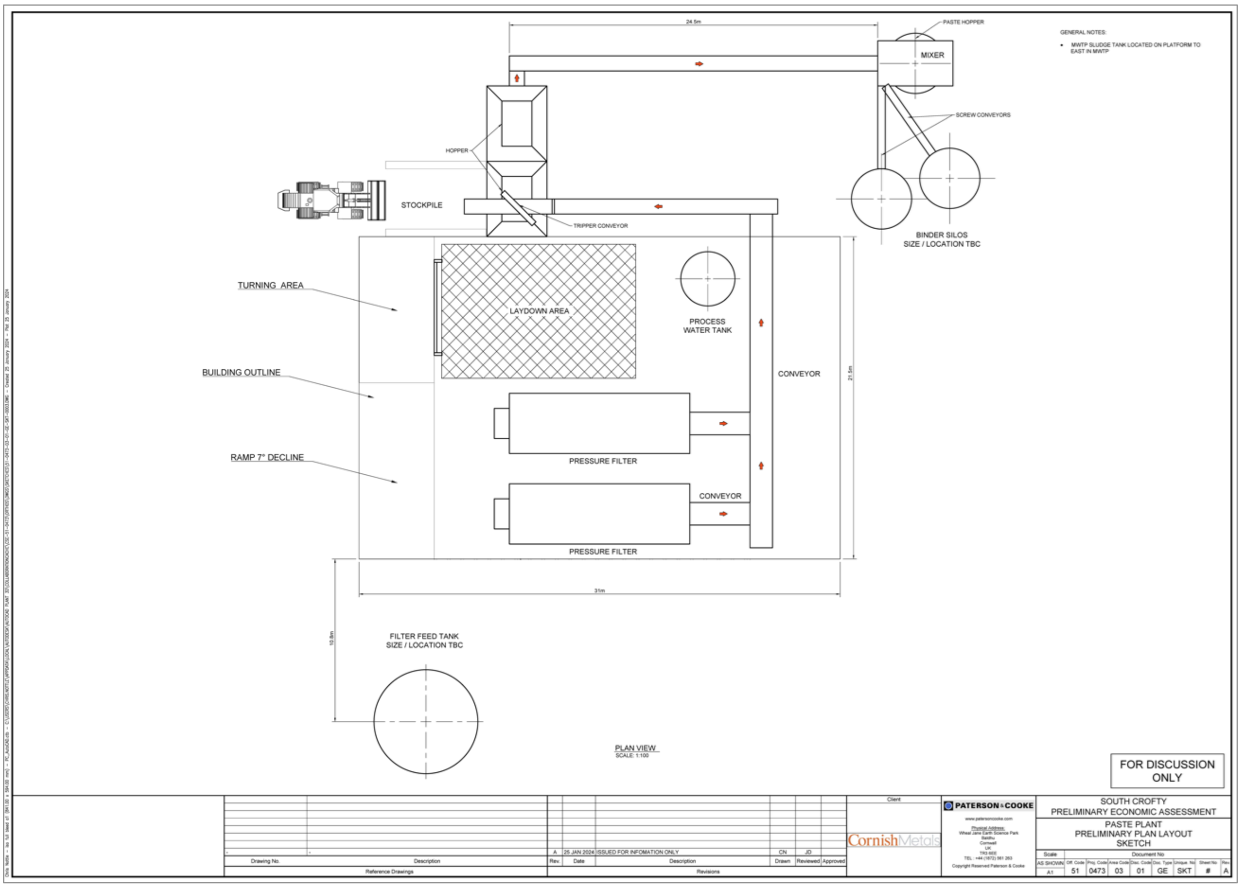
A key operating constraint to the backfill system is storage capacity of both filter cake and tailings slurry. When not backfilling, the filter cake will bypass the mixer to be collected by front-end loader for stockpiling; this will be reclaimed during backfilling.

Buffer / storage capacity is planned by means of a thickener underflow tank and a holding tank ahead of the filtration plant, giving a total of 16 hours capacity at 1,400 t/d mining rate. There is also a filter cake storage area, which gives a further eight days of capacity.

Figure 16.15 Backfill plant location (rendered image)

Source: Atkins, 2024.

Figure 16.16 Backfill plant plan view



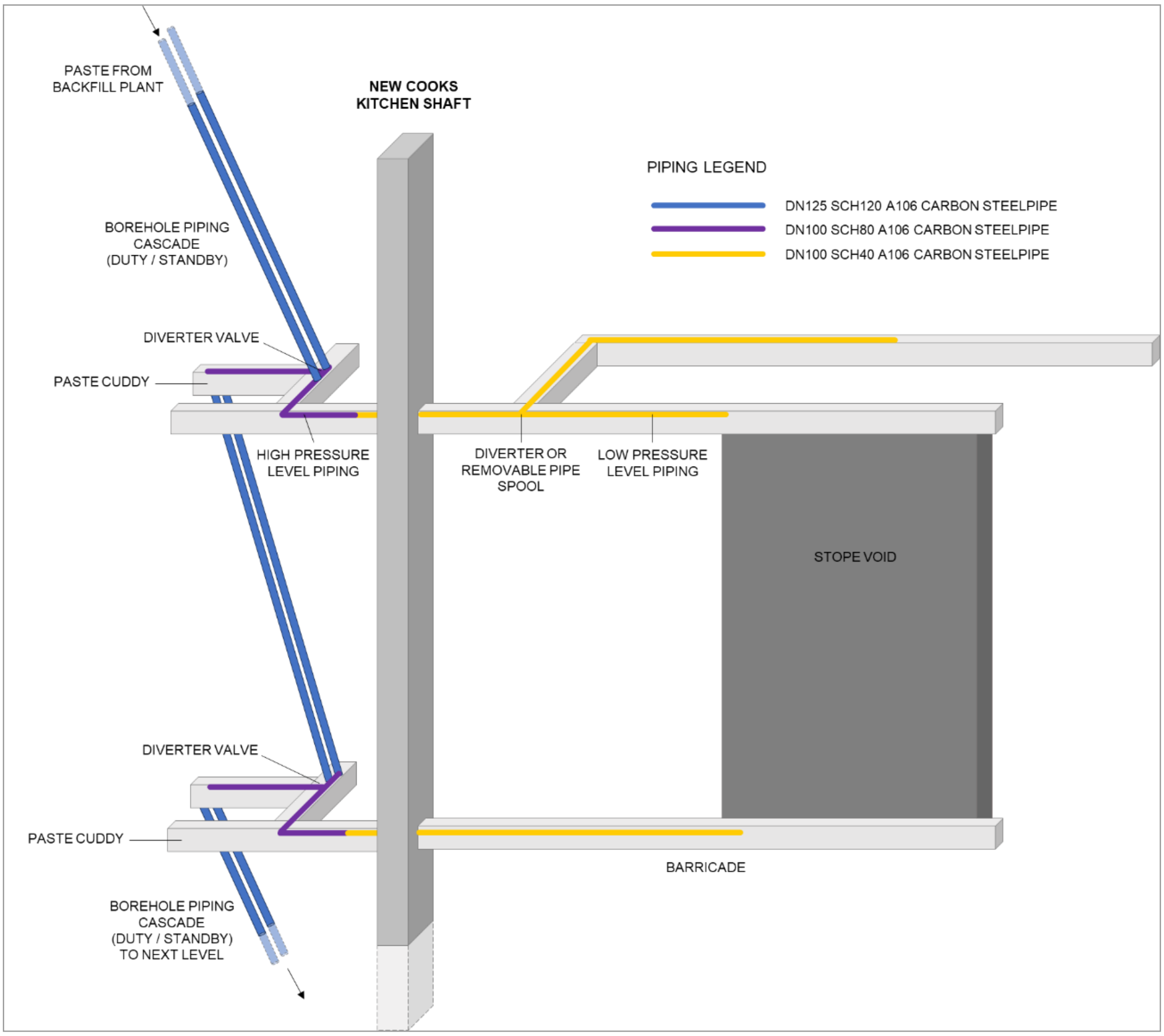
Source: P&C, 2024.

Subject to further testing, the MWTP sludge generated from treating mine water is planned to be included into the mine backfill. This will act as a minor component to the backfill, currently estimated at approximately 0.35%, and will be dosed directly into the backfill mixer from the MWTP.

16.7.5 Backfill delivery

The underground reticulation design is largely based on the use of gravity to deliver the paste back fill to stopes. The system will make use of a new borehole from the backfill plant and a pipe cascade adjacent to NCK Shaft for delivery of slurry to the mining levels. The borehole, pipe cascade, high-pressure and low-pressure level piping runs will be carbon steel. A system schematic is shown in Figure 16.17.

Figure 16.17 Backfill distribution system - simplified view



Source: Cornish Metals, 2024.

16.7.6 Backfill operations

As noted above, backfill operations are planned to fill existing stope voids in two principal areas of the existing mine workings: primary fill areas are deep (m) stope voids adjacent to NCK Shaft, and a secondary area is existing mine workings near surface, accessible from the surface decline.

The intended backfill operation is planned to be operated over a five-day filling cycle, with filter cake being stockpiled, then a paste backfill pour executed in one or multiple areas. The five days of stockpiling gives sufficient time for underground paste crews to inspect, survey, barricade, and run reticulation prior to backfilling. In the event underground areas are not able to be filled, the remaining storage capacity can be used or the alternative near surface backfill areas can be utilised.

The typical existing stope volumes are estimated to be in the order of 3,000 m^3. Most of these stopes are narrow vein with mining widths in the order of 2 to 3 m, with variable strike lengths.

The most common choice for barricades in paste fill operations is a sprayed concrete barrier; an alternative is a block wall or mass filled concrete plug. A sprayed concrete barrier is simple to construct with a small crew and in small headings with dry mix sprayed concrete. However, in some instances, alternative barricades may be better suited. Barricades will be located at the stope entrance in competent ground with favourable jointing. Barricades will be pinned to the rock walls of the stope with rebar or grouted bolts. Once metal framing is in place, mesh is pinned to the framing and the barrier is sprayed with multiple layers of shotcrete.

Depending on the geometry of a filling area, barricades may need breather pipes to prevent over-pressurisation. The filling is stopped when slurry or water appears in the breather tube. The barricades are not intended to withstand large pressures, as the backfill pours will be planned with a 'plug' pour, a higher-strength initial pour just above barricade height which is allowed to cure ahead of a lower strength 'body' pour wherever possible.

16.8 Mine services

16.8.1 Mine ventilation

16.8.1.1 Design considerations

The ventilation network and fresh air supply quantities have been designed to comply with UK Mines Regulation (2014) ventilation standards. Key design criteria include velocity requirements, airflow allocation criteria for working areas (vehicle emissions), k-factors for different airways and climate modelling criteria (heat control).

The following airflow requirements for mobile equipment have been used. There is no specific criteria based on equipment under UK Mines Regulations. Typical worldwide regulatory standards based on diesel engine power require a minimum ventilation requirement of 0.06 $m^3/s/kW$, however an enhanced factor of 0.10 $m^3/s/kW$ has been used for planning.

Airflow requirements have assumed an engine utilisation of 30%, with additional factors for emissions (DPM, CO, NO2) also applied, giving an effective increase of (160-450%) to the engine power factor.

16.8.1.2 General arrangement

The proposed overall ventilation system consists of a negative pressure system whereby main fan(s) are mounted on the surface at Roskear and Taylors ventilation shafts, at the extremities (west and east respectively). These fans will exhaust air from the mine, drawing in fresh air from NCK and Robinsons Shafts in the centre of the mine. The decline will also act as a fresh air intake, although this has not been included in the ventilation design. Locally for working areas, booster fans will be installed in conjunction with brattices to provide positive pressure ventilation.

Fresh air raises will extend down from surface as a series of raise-bored excavations and will be equipped with ladder ways to provide secondary egress. Figure 16.18 illustrates the proposed ventilation network at South Crofty.

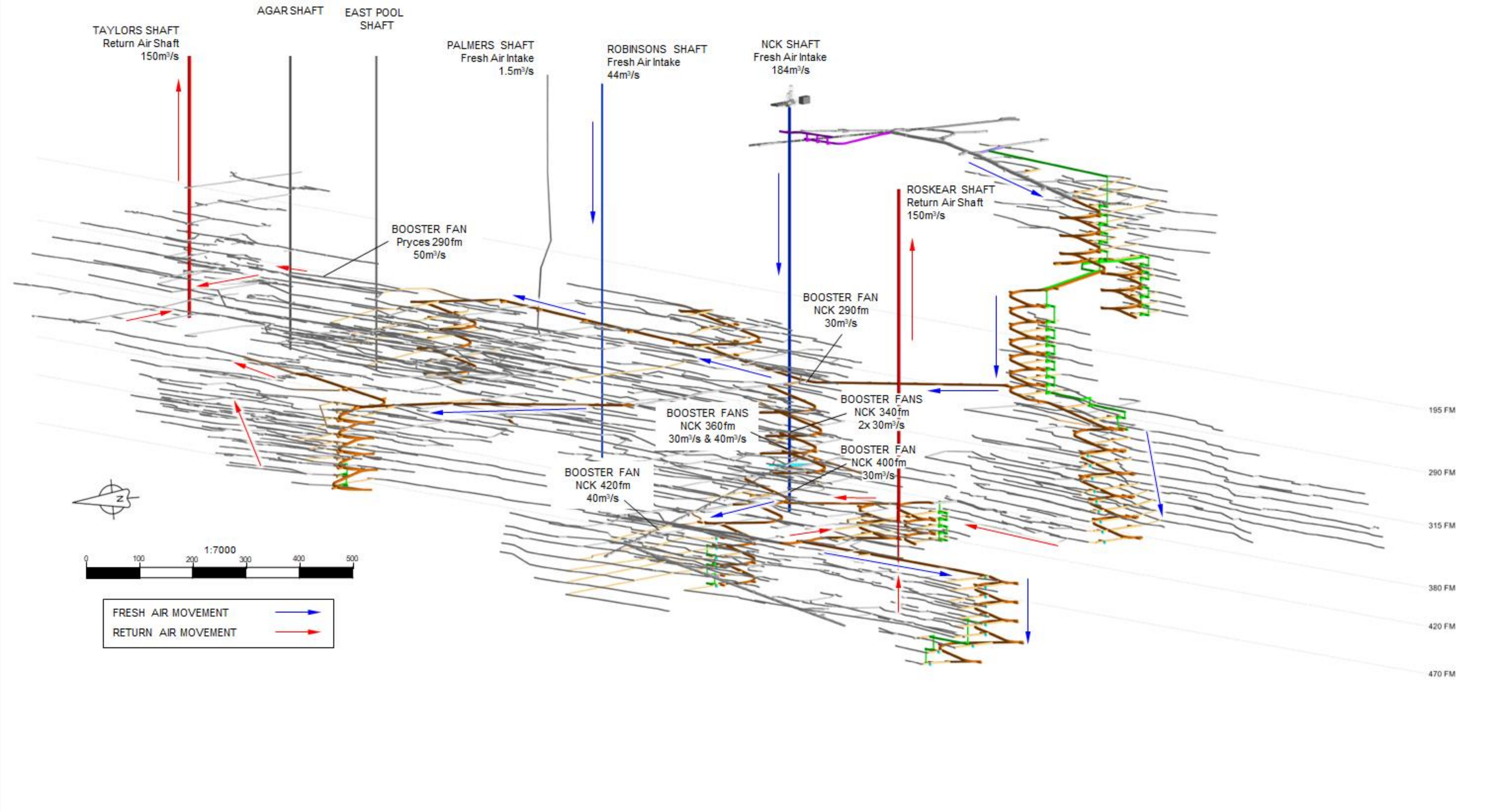
The ventilation controls including regulators and brattices that are required on each level and that will be installed, typically in both working areas and exhaust shaft connections, to control the airflow drawn from intake shafts and for moving around the mine.

Owing to the amount of existing workings and mined out void connections, the previous ventilation records and surveys indicated a high amount of leakage was present in the previous ventilation network. The ventilation design has been modelled in Ventsim®, a 3D simulation software package to simulate the ventilation system. The modelled mass airflow balance indicates total leakage of approximately 50%. The volume of leakage combined with the amount of existing workings and open stopes / raises necessitates the additional booster fans proposed.

A wet-bulb temperature distribution was also modelled in the main workings areas of the mine. With the planned booster fans and additional airflow (in comparison to previous operations) initial modelling indicates wet-bulb temperatures less than 25°C.

Air pressure distribution was also modelled. The proposed system of negative pressure in the primary airflow network with local positive pressure means that naturally occurring radon is kept away from working areas, rather than being drawn in from old workings. The ventilation design is also planned to keep both Roskear and Taylors fans balanced in terms of airflow so that air is not being drawn across the mine.

Figure 16.18 LOM ventilation flow diagram (elevations are shown from NCK Shaft)



Source: Cornish Metals, 2024.

16.8.1.3 Airflow and fan selection

The calculation of LOM ventilation requirements for the mine was based on:

- Mobile equipment fleet ventilation requirements.
- Estimated leakage factors from existing workings.
- Workplace temperature control and active working area airflow requirements.

The peak ventilation demand modelled is 220 m^3/s based on the equipment fleet, and 80 m^3/s based on workplace activity.

The main fan duty points respective to ventilation requirements were determined using Ventsim™ modelling software. The mine requires exhaust fans on surface, and eight underground booster fans at LOM peak ventilation demand. In addition to the estimated losses used in the Ventsim™ model, a 20% leakage factor for airflow was applied in the equipment fleet assessment. To allow for different flow requirements at the different ventilation phases, the main exhaust fans will be installed with Variable Frequency Drives (VFDs) and variable pitch fan blades. Table 16.22 lists preliminary fan duties.

Secondary fans for ramp development, level production and fixed facility ventilation were estimated over the LOM.

Table 16.22 Preliminary fan design data

Location	Airflow (Q) (m^3/s)	Fan total pressure (Pa)	Fan power (kW)
Primary fans			
Roskear	150	640	120
Taylors	150	1250	235
Total primary fan power			**355**
Booster fans			
NCK 290 ftm	30	2320	90
NCK 340 ftm North	30	2720	100
NCK 340 ftm South	30	2775	105
NCK 360 ftm North	30	2768	105
NCK 360 ftm South	40	2700	135
NCK 400 ftm	30	2840	105
NCK 420 ftm	40	3050	150
Pryces-Tincroft 290 ftm	50	400	25
Total booster fan power			**815**
Total installed fan power			**1170**

Source: Howdens, 2024.

16.8.1.4 Ventilation phases

Based on the development and production sequence, the following ventilation phases are identified in the PEA LOM plan; however, the maximum extents have only been reviewed in Ventsim™ for the study.

- Pre-Production Phase (Year -1)
- Early Production Phase (Year 1-3)
- Maximum Mining Extents Phase

Pre-production phase

During the pre-production phase (Year -1), development crews will be refurbishing NCK Shaft and ventilation will be provided by a two-stage 90 kW fan providing forced ventilation into the shaft. Completion to the 290 ftm level is a major milestone, as that is the first level providing access to Roskear Shaft for through-ventilation. Further level connections to Roskear Shaft are on the 310 ftm, 340 ftm, and 360 ftm levels, and the 400 ftm level via the sub-shaft, providing the ventilation circuits during refurbishment as dewatering progresses. Initially, only Roskear Shaft will be equipped with primary exhaust fans.

Early production phase

During early production, mining is targeted around the 290 ftm mid-zone areas and development of deeper levels of the mine of No. 4, No. 8, and Roskear. The primary ventilation network will be established, including primary ventilation fans at Taylors Shaft.

Maximum mining extents phase

Mining areas are grouped through the LOM mining scheduling to limited areas to prevent excessive vehicle movements across the mine and to also limit ventilation set-ups. Depending on the production sequence, multiple levels may be concurrently in production. The total airflow requirement for the mine at this stage is modelled at 300 m^3/s.

16.8.2 Water supply

The active underground workings are currently supplied from municipal water services. Service water during pre-production will continue until the 195 ftm pump station is developed and water from storage dams in the pump station can be used for activities. LOM equipment requirements were reviewed in projecting peak service water requirements of 900 LPM. Water will be distributed via the mine ramp in 152 mm lines, which will feed the main distribution lines on the levels.

16.8.3 Dewatering

The mine is currently dewatered to 255 m below the shaft collar (approximately at 140 ftm and 100 m above the 195 ftm pump station). Estimated LOM underground water volumes and inflow rates are based on the historical operating conditions, which averaged 6,500-7,000 m^3/d, though with seasonal flows up to 10,000 m^3/d being expected.

The dewatering system has been designed to be capable of pumping 25,000 m^3/day for the pre-production period; then as the existing flooded water is removed, the maximum installed dewatering rate is projected at 16,800 m^3/day.

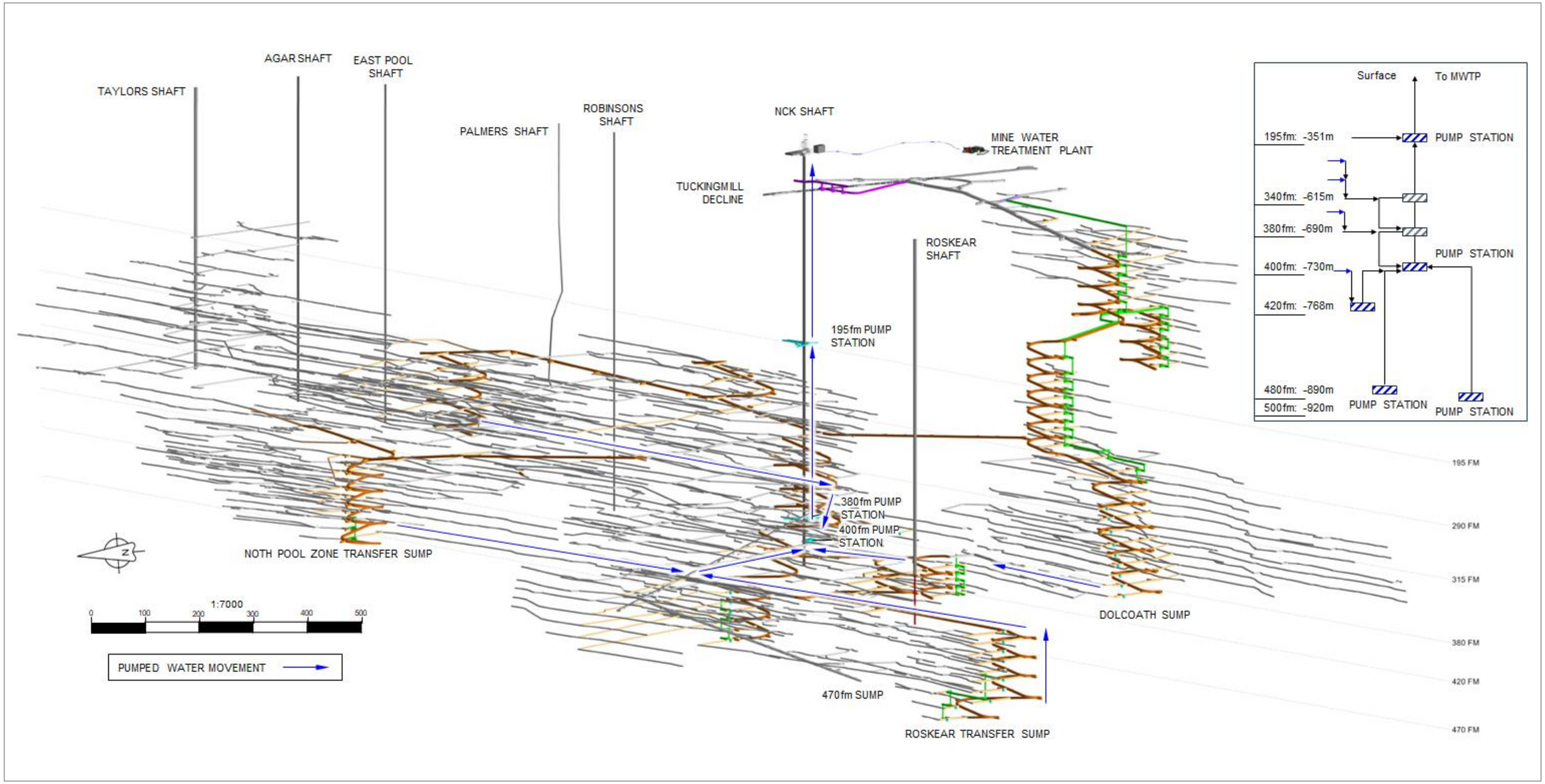
Dewatering is underway through NCK Shaft utilising two KSB BSX 463/5 950 kW high-head submersible pumps. As dewatering progresses, permanent pump stations will be setup on the 195 ftm and 400 ftm levels. Permanent pump stations will utilise VFD equipped KSB Multitec D 125/5-10.2 multi-stage centrifugal pumps fitted with 560 kW electric motors. Initially, four will be installed at the 195 ftm, 3x operating, 1x standby; then two pumps will be moved down to the 400 ftm once the pump station has been established, pumping in stages to the 195 ftm, then to the water treatment plant.

Existing levels and ramps will be dewatered with skid-mounted pumping stations as they are accessed. On the levels, water will drain back to sumps where it will be collected and pumped or gravity fed to a central sump. Pumps on the level will typically be electric 5-20 kW pumps. Gravity fed water will flow via a drain hole to the nearest permanent pump station.

In decline development, water will initially be pumped by small face pumps connected to the drilling rigs and fed to a skid-mounted mobile pumping station, which will feed back to either a level sump or main pump station.

The dewatering single line diagram is shown in Figure 16.19.

Figure 16.19 LOM dewatering schematic & single line diagram (elevations are shown from NCK Shaft)



Source: Cornish Metals, 2024.

16.8.4 Electrical distribution

Power feeding the Tuckingmill and Western Declines is supplied at two voltages from the 11 kV incoming supply. One feeder supplies underground at 400 V and two feeders provide supply at 3.3 kV.

The 400 V feed is a 50 mm^2 SWA cable routed down NCK Shaft to an MCB board at No1 level, which feeds 2 x 1,250 mm diameter fans. The two 3.3 kV feeds are 70 mm^2 SWA cable and are routed down NCK Shaft, through to the Western Decline.

One 3.3 kV supply feeds two sub-stations (No. 3, via No1), the second 3.3 kV feed goes to a further substation (No. 2). Both are connected to 500 kVA 3.3 kV to 400 V step-down transformers. No. 1 sub-station supplies the Tuckingmill Decline, No. 2 sub-station supplies the ventilation fans (56 kW & 30 kW) for the Western Decline, and No. 3 Substation supplies pumps for the Western Decline sump and supplies the underground diamond drilling rigs.

16.8.4.1 Underground (dewatering stages)

Stage 1 (195 ftm): Once dewatering reaches 350 m, works will begin to refurbish and refit the 195 ftm Pump Station to allow the second phase of dewatering. Two 95 mm^2 cables will be lowered to the 195 ftm Pump Station to supply the 3.3 kV VSD feeds to the dewatering pumps. Two further 95 mm^2 cables will be lowered to feed four dewatering pumps from an existing 3.3 kV 350 MVA transformer. All cables will meet UK underground mine specification (BS 6708).

Stage 2 (400 ftm): Once the 400 ftm Pump Station is reached (730 m), two 35 mm^2 cables will be lowered from the 195 ftm Pump Station to the 400 ftm Pump Station with two pumps relocated from the 195 ftm, the pump starters will remain on the 195 ftm level, see Figure 16.20.

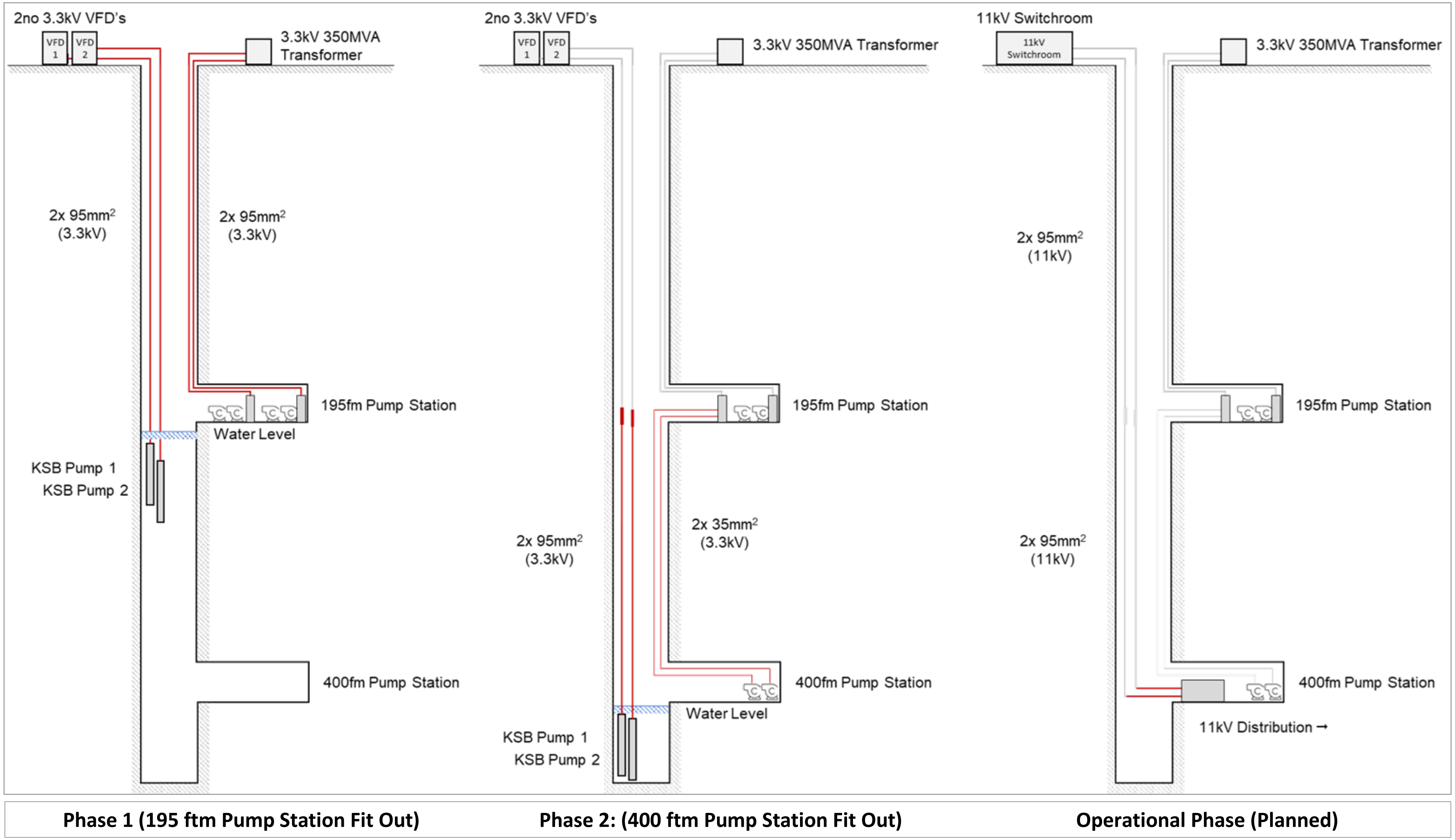
The two 95 mm^2 submersible pump cables will then supply a new substation at the 400 ftm level with voltage uprated to 11 kV to form a 10 MW ring main for the underground HV distribution.

16.8.4.2 Production

The 11 kV switchboard will feed a 5 MVA isolating transformer (earthed via a Neutral Earthing Resistor), to the 95 mm^2 submersible cables in NCK Shaft to the 400 ftm level, where they will supply a new 11 kV switchboard for distribution around the mine to working areas. Each working area we will have an 11 kV – 690 V transformer; these will be skid-mounted for ease of relocation. Permanent sub-stations will be installed for main infrastructure.

Figure 16.20 is a schematic of the electrical distribution for the dewatering stages.

Figure 16.20 Underground electrical phase schematic



Source: Cornish Metals, 2024.

16.8.5 Mine communications

Underground fibreoptic network access points will be installed on main shaft stations with leaky feeder communications installed throughout main lateral development. Mobile equipment operators, light vehicles, and supervisors will be equipped with hand-held radios to communicate with personnel on surface. Communication protocols will be used to ensure safe travel on the ramps and levels.

16.8.6 Compressed air

Newer mobile mining equipment often has built-in air compressors and does not need to be connected to the mine compressed air system. However, compressed air will be required by certain mining equipment, including jackleg drills and longhole drills, slushers, air winches, ammonium nitrate fuel oil (ANFO) loaders, and shotcrete sprayers.

Compressed air will be distributed via 152 mm lines to the working levels where it will be carried in 64 mm lines; this will typically be achieved by local compressor plants.

16.8.7 Explosives storage

Blasting products will be stored in surface explosive storage magazines with bulk explosive and detonators having their own magazines, as per regulations. The blasting crews will pick up the estimated quantities of explosives required for each shift using explosives transport vehicles and deliver those explosives to working faces and explosives-loading equipment underground. Excess explosives and accessories will be returned to the secure surface magazine every shift. All explosives and detonators in and out of the magazines will be documented as per explosives regulations. Temporary underground storage may be used for up to 24 hours only.

16.8.8 Equipment maintenance

Major maintenance will be performed in underground maintenance bays.

Small mobile equipment will refuel as required in an appropriately equipped and bunded underground fuel bay. A mobile fuel and service truck will be servicing all mobile equipment underground.

16.8.9 Mine safety

Self-contained portable refuge stations will be provided in the main underground work areas. The refuge chambers are designed to be equipped with dedicated fresh air, potable water, and first aid equipment. They will also be supplied with a fixed telephone line and emergency lighting. The refuge chambers doors are sealed to prevent the entry of gases. The portable refuge chambers will be moved to new locations as the working areas advance.

Primary mine access will be through NCK Shaft. Secondary emergency egress will be through the fresh air raises on each level and Roskear Shaft. Eventually, the surface decline will also provide alternative access. The raises will be equipped with all the necessary equipment to provide safe secondary egress.

A fully equipped mine rescue team is available 24 hours a day, 365 days per year to respond to emergencies. Currently this coverage is provided by a small South Crofty team supported through a mutual aid agreement with other mines in Southwest England.

16.9 Unit operations

16.9.1 Drilling

There are four principal drilling machines selected for South Crofty. Each has their own primary use:

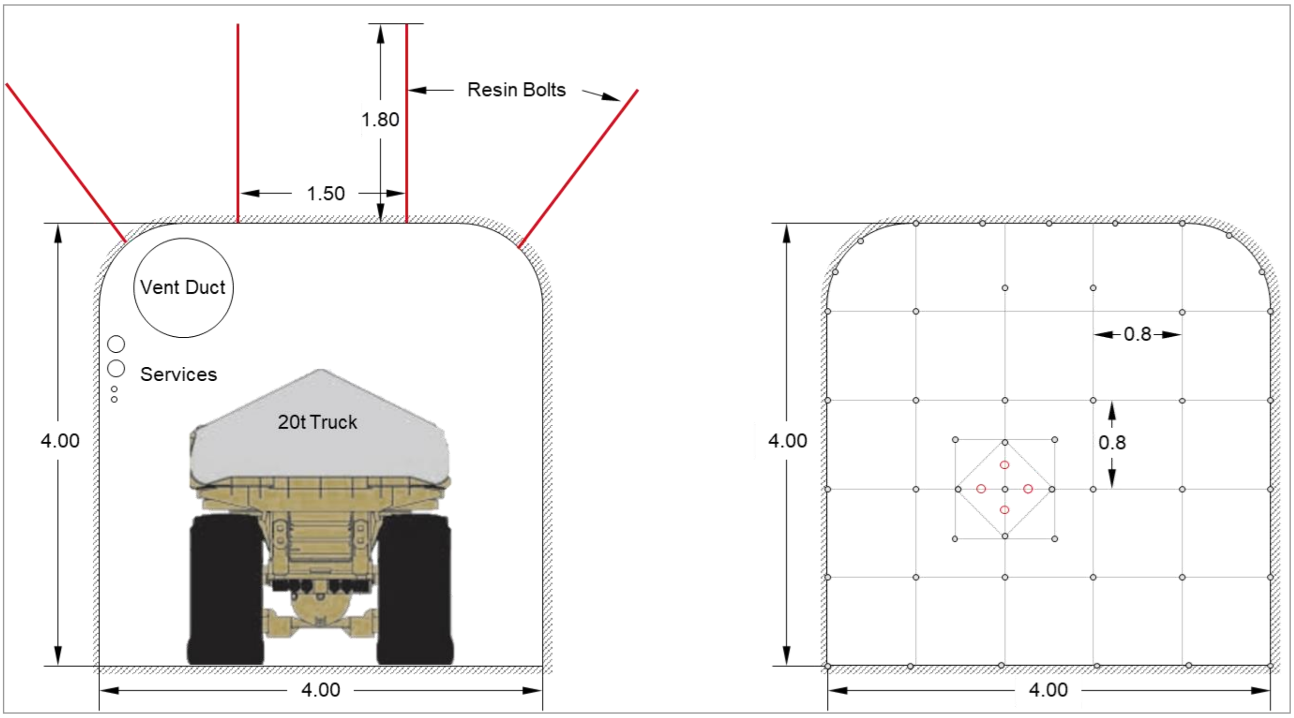
- Single-boom electric-hydraulic jumbos for level slashing, production headings, and ground support.
- Hydraulic-pneumatic longhole drills for production.
- Jackleg and stoper drills for bolting in smaller headings and raises, drilling safety bays, service drilling, ground support installation.
- Bazooka drilling for infill or definition drilling.

Estimated drilling productivities (metres drilled / percussion hour) were built up from first principles and industry standards. Jumbo drilling rates average 30 m/hr in small headings (1-boom) and longhole drill machines average 100 m/d. Drilling productivities include penetration rates, reaming rates, repositioning, set-up / mark-up.

Development headings and level slashing will be conducted by single-boom electric jumbo drills. The single-boom jumbos will be equipped with 3.7 m (12 ft) drill steel and are projected to advance at an average rate of 6 m/d per machine.

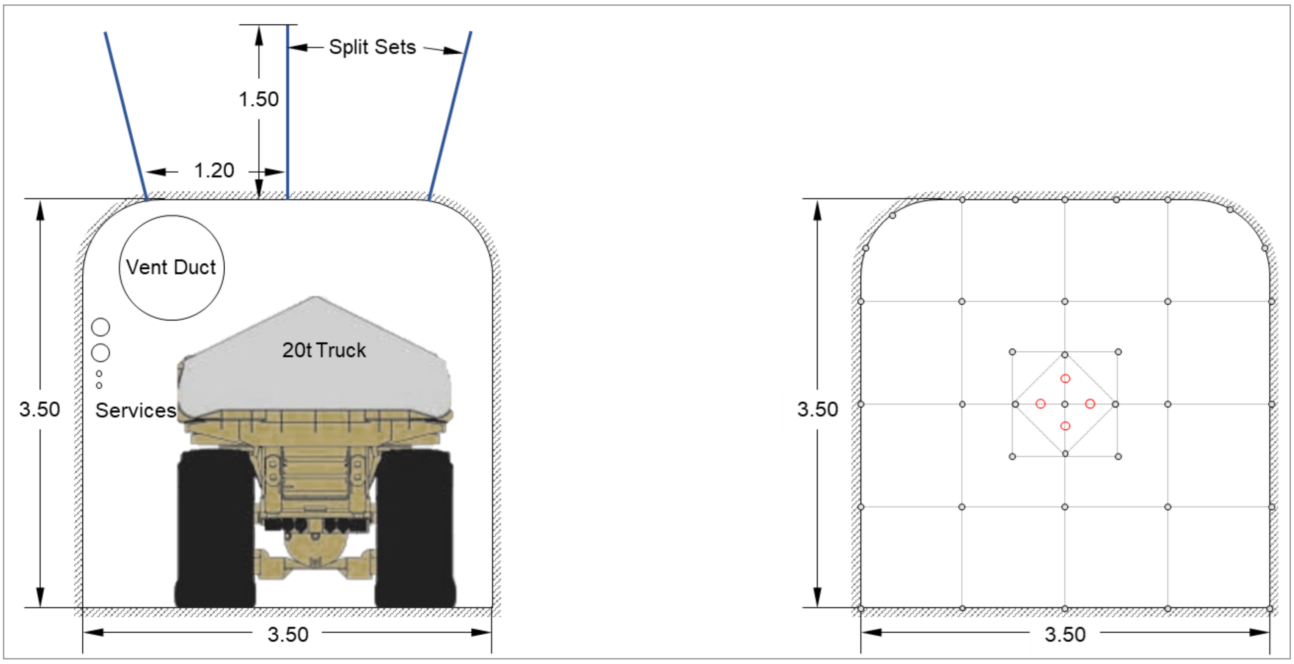
Typical heading profiles and face drilling patterns for development are shown in Figure 16.21 to Figure 16.24.

Figure 16.21 4.0 mW by 4.0 mH development



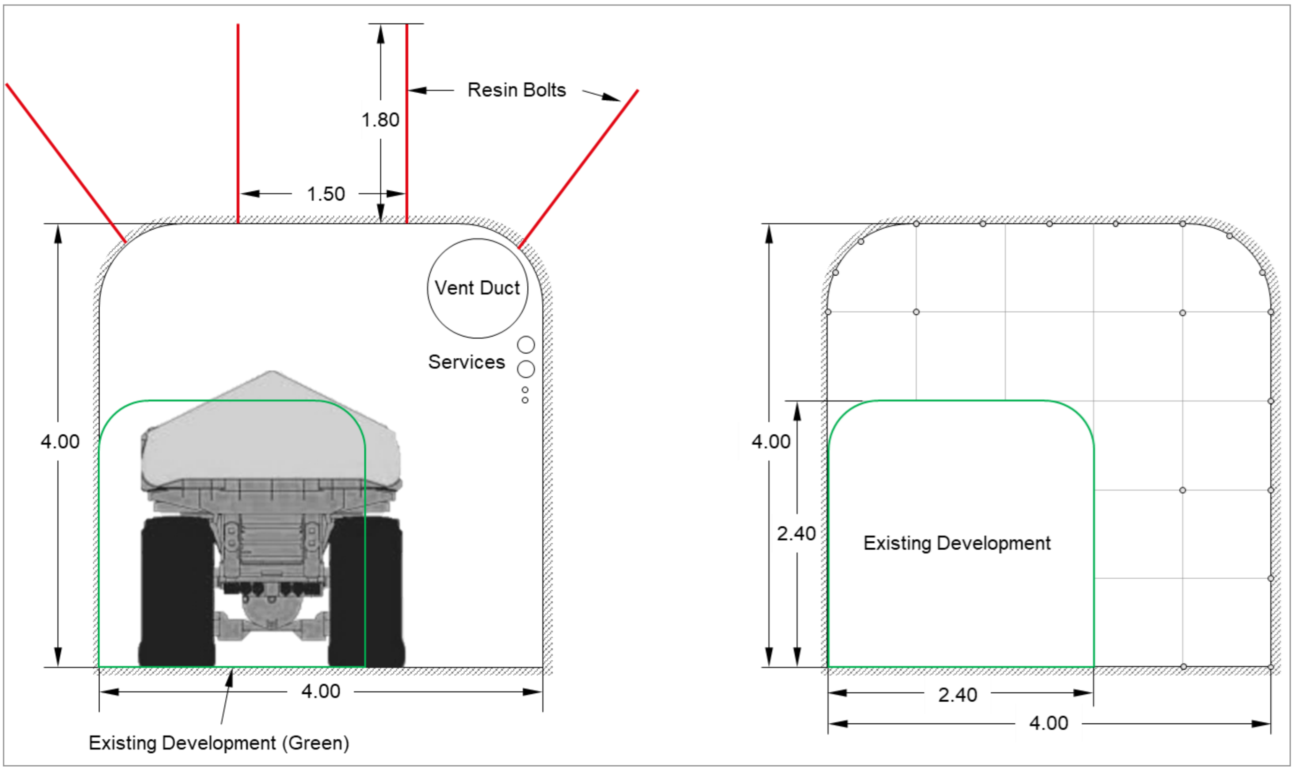
Source: Cornish Metals, 2024.

Figure 16.22 3.5 mW by 3.5 mH development



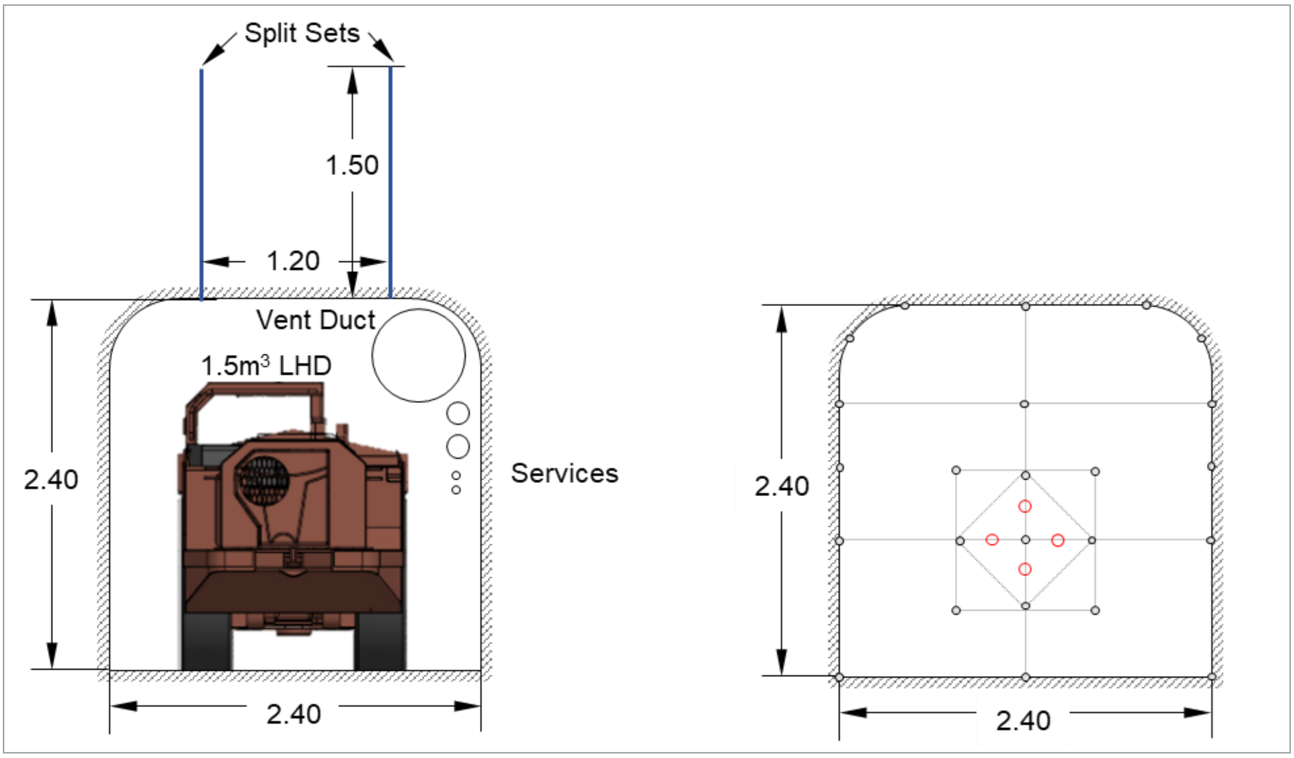
Source: Cornish Metals, 2024.

Figure 16.23 4.0 mW by 4.0 mH stripping



Source: Cornish Metals, 2024.

Figure 16.24 2.4 mW by 2.4 mH development



Source: Cornish Metals, 2024.

16.9.2 Blasting

Blasting crews will be trained and certified for explosives use. Bulk ANFO explosives will be used where possible. Boosters, primers, detonators, detonation cord, and other ancillary blasting supplies will also be utilised. Smooth blasting techniques may be used as required in headings, with the use of packaged products for loading the perimeter holes.

All blasting will be done at shift change. During the production period, a central blast system will be used to initiate blasts for all loaded development headings and production stopes.

Blasts will be initiated with Nonel LP detonators and paired with boosters for lateral development rounds and Nonel MS detonators with packaged products for stopes.

16.9.3 Ground support

Ground support will be installed in line with specifications based on the geotechnical analysis provided in Section 16.1.7 for the various rock qualities expected. Electric-hydraulic bolters, longhole drills and jackleg drills will be used.

Ground support will be installed post-mucking of the blasted drift. No additional development will be commenced in the heading prior to the installation of ground support. At no time will mine workers be under unsupported ground.

Different ground support criteria have been recommended for various types of ground conditions. Ultimate decisions will be made by responsible site personnel, e.g. the development lead with support from the geotechnical engineer, as to which ground support is required.

Regular pull tests will be conducted on-site to ensure adequate installation of rock bolts. Shotcrete, when required, will also be sampled by use of splatter boards and in situ coring to be tested for strength and adequacy.

Rock bolts and screens will be installed with a jumbo machine. In smaller cut and fill drifts, jackleg drills will be used to install the required ground support.

Cable bolts will be installed in 3- and 4-way intersections and along development when required. Cable bolts may be installed shortly after the development round bolting and behind the development crew so as to maintain the advance rate of the drift. Where intersections are located in poor ground conditions, mesh and cable bolts will be installed prior to development of the intersection. Cable bolts will be drilled with a longhole drill and installed from a scissor deck manually.

Shotcrete application is not expected to require quantities to justify an on-site shotcrete batch plant, and pre-mixed bags of shotcrete have been budgeted for the project. Mobile shotcrete machines will apply shotcrete to the underground workings as needed.

16.9.4 Mucking

One LHD size is proposed for the South Crofty project. The LHDs have a nominal 1.5 m^3 (3.5 t) bucket capacity and will be used for ramp development, development headings, stope mucking, loading trucks from re-mucks, and tramming material from the ore pass to the hoisting system.

LHDs will typically muck a blasted round to a nearby re-muck bay in order to clear the working face prior to ground support installation. Rock temporarily stored in the re-muck is then loaded into a haul truck. When available, LHDs will direct-load trucks from the face. Where un-mineralised development headings are proximal to stope voids, the LHD may tram the material to the stope void. LHDs will tram material on average 250 m (maximum of 450 m) to either a re-muck, directly into a haul truck or a stope void.

In stopes, an LHD equipped with remote control will be utilised to keep personnel away from unsupported ground. LHDs will tram the material to a nearby re-muck bay.

16.9.5 Hauling

Rock will be hauled using 20 t capacity underground haul trucks. In most cases, trucks will be restricted to loading at re-muck stations due to the increased back height requirements for LHDs to load over the side of the truck box. Trucks will haul either to a skip loading pocket (or surface if from upper mining production area). Muck transported from the underground storage bunkers to surface will be re-handled by 30 t trucks for transport to the processing plant or rock storage.

16.9.6 Backfill

Backfill strategies consist of paste fill, primarily for tailings storage in both existing stope voids and newly developed voids if required. The purpose of the use of non-structural paste fill is to fill stope voids with tailings for underground storage.

16.10 Shafts and hoisting

The existing NCK Shaft, headframe and hoisting system last operated in a production capacity in 1998. Some components will be replaced, and some components updated with modern technologies. The hoisting of mineralised and un-mineralised rock from depth to surface will be done using skips filled at the loading pocket at 380/400 ftm. An estimated combined average 1,575 t/d of mineralised and un-mineralised rock has been used for project estimation.

16.10.1 Winders

A new south winder has been recently installed at the NCK Shaft, a Siemag Tecburg 2.3 m single drum 132 kW Primary Winder for pre-production access and shaft refurbishment. A new south winder is planned for production personnel and service duties, with the current winder moving to Roskear shaft. Refurbishment of the existing rock hoisting (north) winder, based on further inspection and testing, has been planned.

The new south winder is a 3.4 m diameter single drum unit has been planned to allow hoisting with a single larger (≈4.2 m^2) cage to maximise shaft dimensions for personnel and equipment.

The existing rock hoisting (north) winder is a Markham 3.8 m double drum, double clutched 920 kW ex-sinking winder. This hoist is able to handle the hoisting demands required for the proposed production and development rates.

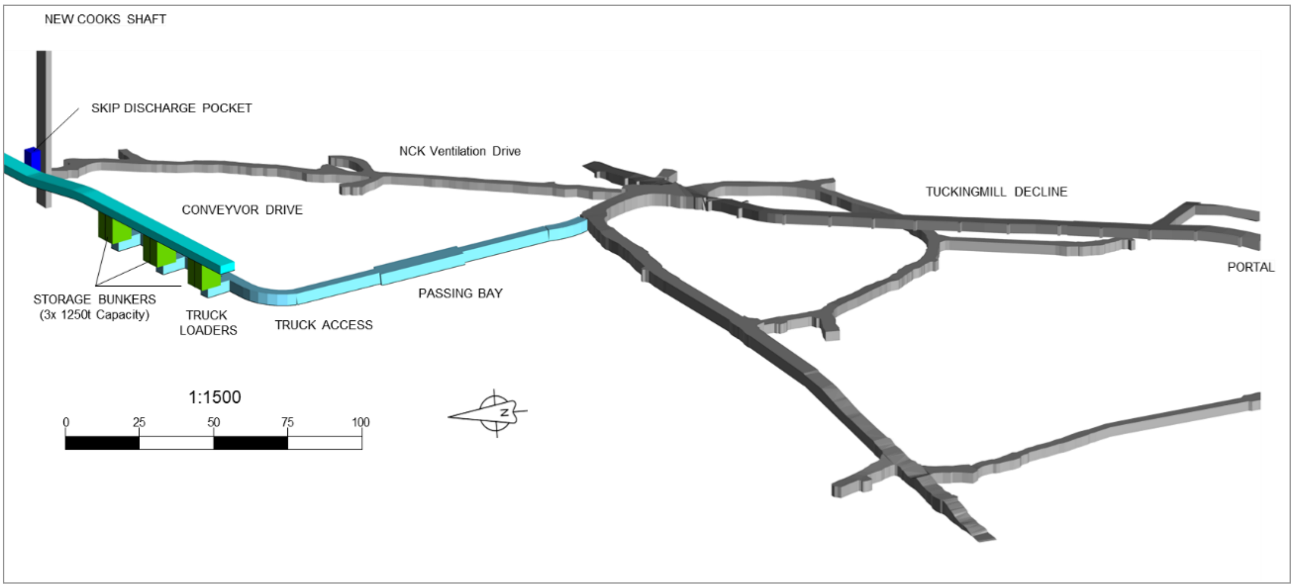
A temporary Emergency Winder, a 90 kW 1.0 m single drum Zitron unit has been installed to provide two means of access into NCK Shaft during refurbishment.

16.10.2 Headframe & material handling

With some minor modifications, the current headframe has been deemed structurally adequate to support hoisting and mining activities. A new head sheave has been installed at the top of the headframe for the south winder. A re-design of the dumping arrangement is planned to allow for sub-surface discharge of hoisted material.

A new unloading station on the 25 ftm, as part of the existing shaft connection, will be developed for operations. The skip discharge section will connect into an underground storage system with automated truck loading for haulage to either the processing plant or secondary aggregate area. The material handling system is shown in Figure 16.25.

Figure 16.25 25 ftm material handling



Source: Cornish Metals, 2024.

16.10.3 Shafts

NCK Shaft currently consists of four separate compartments – two skip compartments and two personnel compartments. The shaft is approximately 5.9 m by 2.2 m in dimension. The shaft was refitted between 1985 and 1988, deepening the shaft to the current depth of 770 m, deepening the skip loading station to the 380-400 ftm, revising the loading arrangement, and refurbishing / replacing the shaft and skip side furniture to steel guides and buntons.

The proposed set-up for the shaft will maintain the two skip compartments, with the two separated personnel compartments revised into a single larger compartment to allow a large cage to be used to ease equipment handling and access. This will be accomplished by stripping and replacing the remaining wood shaft furniture and replacing with a single steel bunton and guides. The current, dewatering, and proposed shaft configurations are shown in Figure 16.26.

16.10.4 Shaft refurbishment

As the mine dewatering progresses, shaft rehabilitation will proceed with the following tasks performed:

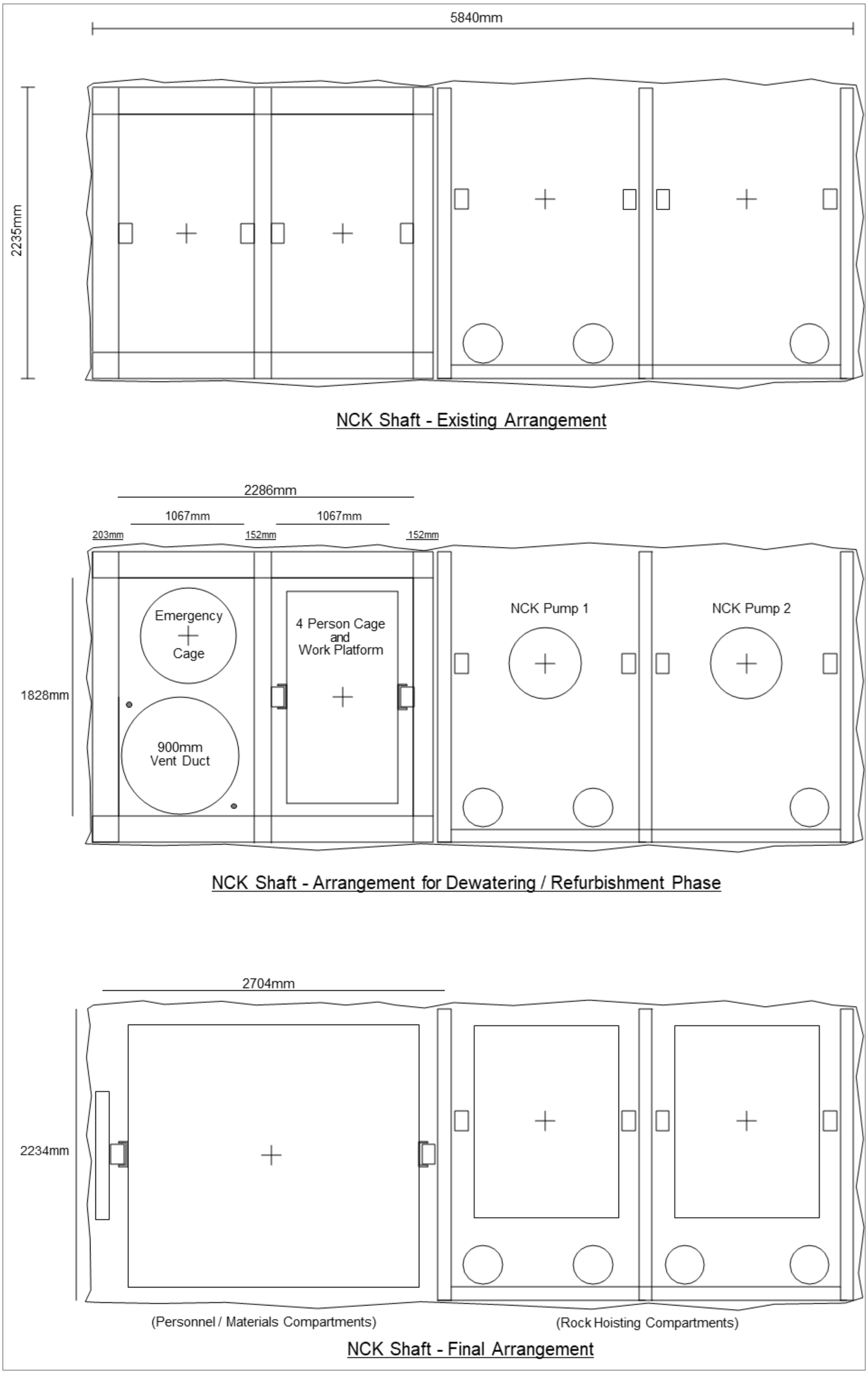
- Check ground and shaft conditions and remediate as required.
- Remove wooden shaft sets & guides, replace with steel bunton and guides. Inspect existing steel sets and guides and replace as necessary.
- Install temporary compressed air and water line.
- Install temporary ventilation ducting.
- Install new electrical cable.

Both the temporary winders (the 2.3 m Primary and 1.0 m Emergency Winder), shaft communication, and safety equipment have been commissioned and passed compliance testing (April 2024) to allow shaft work to proceed.

The shaft refurbishment will utilise a working stage to allow shaft access and a safe working platform during refurbishment. The working stage is designed to remain in its working position in the shaft, with the main conveyance (from the Primary Winder) providing personnel and materials access. The Emergency Winder is designated as such in the event of an emergency it is able to access the working platform or main cage independently.

The working stage has been designed to fit within the existing timber compartments on its lower deck, providing a working area for timber set and guide removal and to allow any remediation on the shaft walls. The working stage has upper decks to allow the installation of services (air and water lines) and ventilation, as well the new steel buntons on the shaft west wall and new steel guides. The working stage is able to travel independently, as required, in the shaft.

Figure 16.26 NCK Shaft configuration



Source: Cornish Metals, 2024.

16.11 Mine equipment

All projected underground mine equipment required to meet the LOM plan is summarised in Table 16.23. Battery powered load and haul equipment was sourced in the first instance, however current mining legislation around battery equipment underground has meant alternative duty diesel has been included with ventilation to suit. 30 t trucks will be used at the 25 ftm material bunkers from the hoisting system for transferring material either to the processing plant or secondary aggregates areas. These trucks would be targeted first for battery / electric operation owing to the ramp haulage and ease of surface charging.

Table 16.23 LOM underground equipment fleet

Equipment	Max	P-2/	P-1	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14
Jumbo –1 boom	5	2	5	5	5	5	5	5	5	5	4	3	2	1	-	-	-
Longhole Drill	7	-	-	7	7	7	7	7	7	7	7	7	7	7	6	2	1
LHD (1.5 m^3)	9	1	2	9	9	9	9	9	9	8	9	9	8	7	5	2	1
Truck (20 t)	5	1	1	3	4	3	4	4	4	5	5	5	5	4	4	1	1
Truck (30 t)	2	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1
Charge-up	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Service Truck	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Utility Lift	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4 x 4	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Face Fans	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Compressors	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Main Pumps	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Face Pumps	15	5	10	15	15	15	15	15	15	15	15	15	15	15	15	15	15

Source: Cornish Metals, 2024.

16.12 Mine personnel

Operations personnel (four crews) are scheduled to work 10-hour shifts on a 4-days-on 4-days-off roster (4 & 4). Other staff will work 8-hour shifts, 5 days a week. Table 16.24 to Table 16.28 show personnel estimated. Quantities represent total personnel across all crews on and off site.

Table 16.24 LOM mine management

Position	Rotation	Peak	Average	Pre-production
General Manager	5 x 2	1	1	1
Projects Manager	5 x 2	1	1	1
Environmental & Permitting Manager	5 x 2	1	1	1
Health, Safety & Training Manager	5 x 2	1	1	1
Finance Manager	5 x 2	1	1	1
HR Manager	5 x 2	1	1	1
Sustainability Manager	5 x 2	1	1	1
Procurement Officer	5 x 2	1	1	1
Environmental Officer	5 x 2	1	1	1
IT Manager	5 x 2	1	1	0
Training Officer	5 x 2	2	2	1
H&S Officer	5 x 2	2	2	1
Skilled Admin Staff	5 x 2	7	7	2
Admin Staff	5 x 2	7	7	4
Security / Warehouse Staff	4 x 4	12	12	2

Source: Cornish Metals, 2024.

Table 16.25 LOM mine operations

Position	Rotation	Peak	Average	Pre-production
Mine Manager	5 x 2	1	1	1
Foreman	4 x 4	4	4	4
Shift Boss	4 x 4	4	4	4
Production Drill Operator	4 x 4	28	25	-
Jumbo Operator	4 x 4	20	13	20
LHD Operator	4 x 4	36	29	8
Truck Operator	4 x 4	28	22	8
Blast Team Supervisor	4 x 4	4	4	4
Blaster	4 x 4	4	4	4
Service Crew Supervisor	4 x 4	4	4	4
Service Crew	4 x 4	16	16	16
Explosives Truck Driver / Operator	4 x 4	4	4	4

Source: Cornish Metals, 2024.

Table 16.26 LOM mine hoisting

Position	Rotation	Peak	Average	Pre-production
Hoisting Foreman	4 x 4	2	2	2
Winder Driver	4 x 4	4	4	4
Onsetter	4 x 4	4	4	4
Cage Attendant	4 x 4	4	4	4

Source: Cornish Metals, 2024.

Table 16.27 LOM mine maintenance

Position	Rotation	Peak	Average	Pre-production
Maintenance Planner	5 x 2	1	1	1
Equipment Fitters	4 x 4	26	22	11
Labourers	4 x 4	26	23	11
Electrician	4 x 4	16	16	16
Technician	4 x 4	2	2	2

Source: Cornish Metals, 2024.

Table 16.28 LOM technical services

Position	Rotation	Peak	Average	Pre-production
Technical Services Manager	5 x 2	1	1	1
Chief Mining Engineer	5 x 2	1	1	1
Senior Mining Engineer	5 x 2	1	1	1
Scheduling / Production Engineer	5 x 2	1	1	1
Drill & Blast Engineer	5 x 2	1	1	1
Geotechnical Engineer	5 x 2	1	1	1
Ventilation Engineer	5 x 2	1	1	1
Chief Geologist	5 x 2	1	1	1
Senior Geologist	5 x 2	1	1	1
Geologist	5 x 2	2	2	2
Geologists Assistant	4 x 4	4	4	4
Senior Surveyor	5 x 2	1	1	1
Surveyor	5 x 2	1	1	1
Surveyors Assistant	4 x 4	2	2	2
*Backfill Personnel included in Backfill Operating Cost				

Source: Cornish Metals, 2024.

16.13 Mine development plan

The mine development plan is divided into three periods: mine dewatering, pre-production development (prior to commercial production), and production operations (commercial production). The objective of the mine dewatering is to access and refurbish NCK Shafts and two pump stations; pre-production development is to provide equipment access to high grade areas and prepare enough stoping areas to support the mine production rate once commercial production commences.

Pre-production development is scheduled to:

- Establish and develop the 400 ftm level as the starting point for mine development and establish and develop the 290 ftm level for development and ventilation (Roskear).
- Develop internal ramps from 290 ftm and 400 ftm to adjacent levels, slashing existing development where needed for large equipment.
- Develop access and establish initial stoping areas over an 18-month period.

During the pre-production period, some mineralised rock will be mined through the development of ore drives. This material will be stockpiled on surface and will feed into the process plant during production. The mineralised rock stockpile is projected to peak at 26,700 t at the end of the pre-production period. Where possible, blasted un-mineralised development rock will be hauled directly to a stope for backfilling; otherwise, it will be hoisted to surface to the secondary aggregates area.

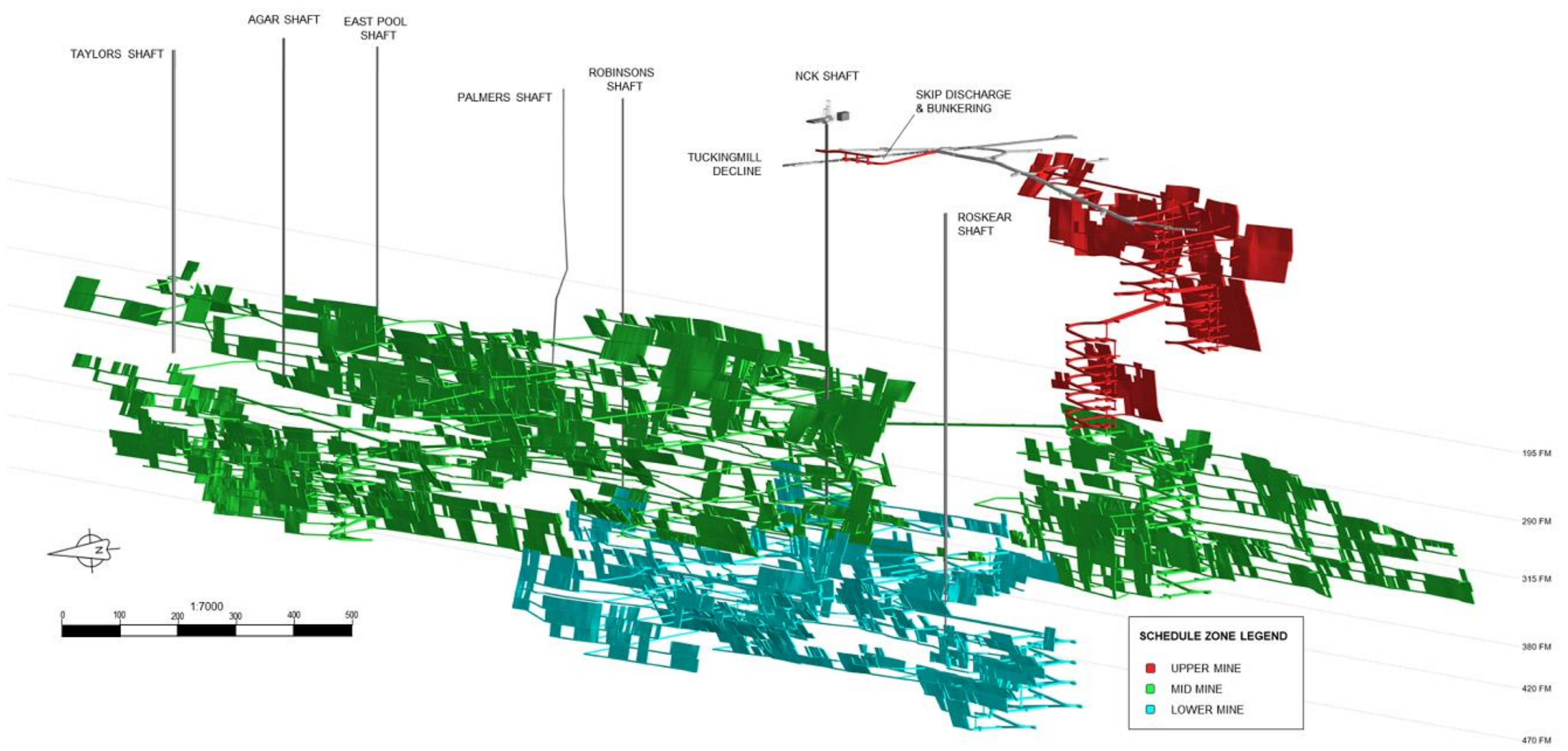
Once production begins, capital and access development remains a priority, in order to access lower levels and prepare adjacent mining areas as early in the mine life as possible.

The hoisting system is planned to be commissioned for the start of pre-production activities in the mine plan. The north winder and 380-400 ftm loading pocket will be refurbished and the 25 ftm discharge point developed and installed.

The mine has been planned and scheduled as three main zones to control material and separate equipment movements, preventing large equipment tramming times. All activity below 360 ftm level is in the lower zone, with all material reporting to the 380 ftm crusher station. All activity from the 360 ftm level to the 245 ftm level will utilise the existing NCK ore and waste pass system on the 290 ftm level to the 380 ftm. All material above the 245 ftm is considered as upper mine and operations will use an extension from the western decline for material movement. Figure 16.27 shows the scheduled control areas.

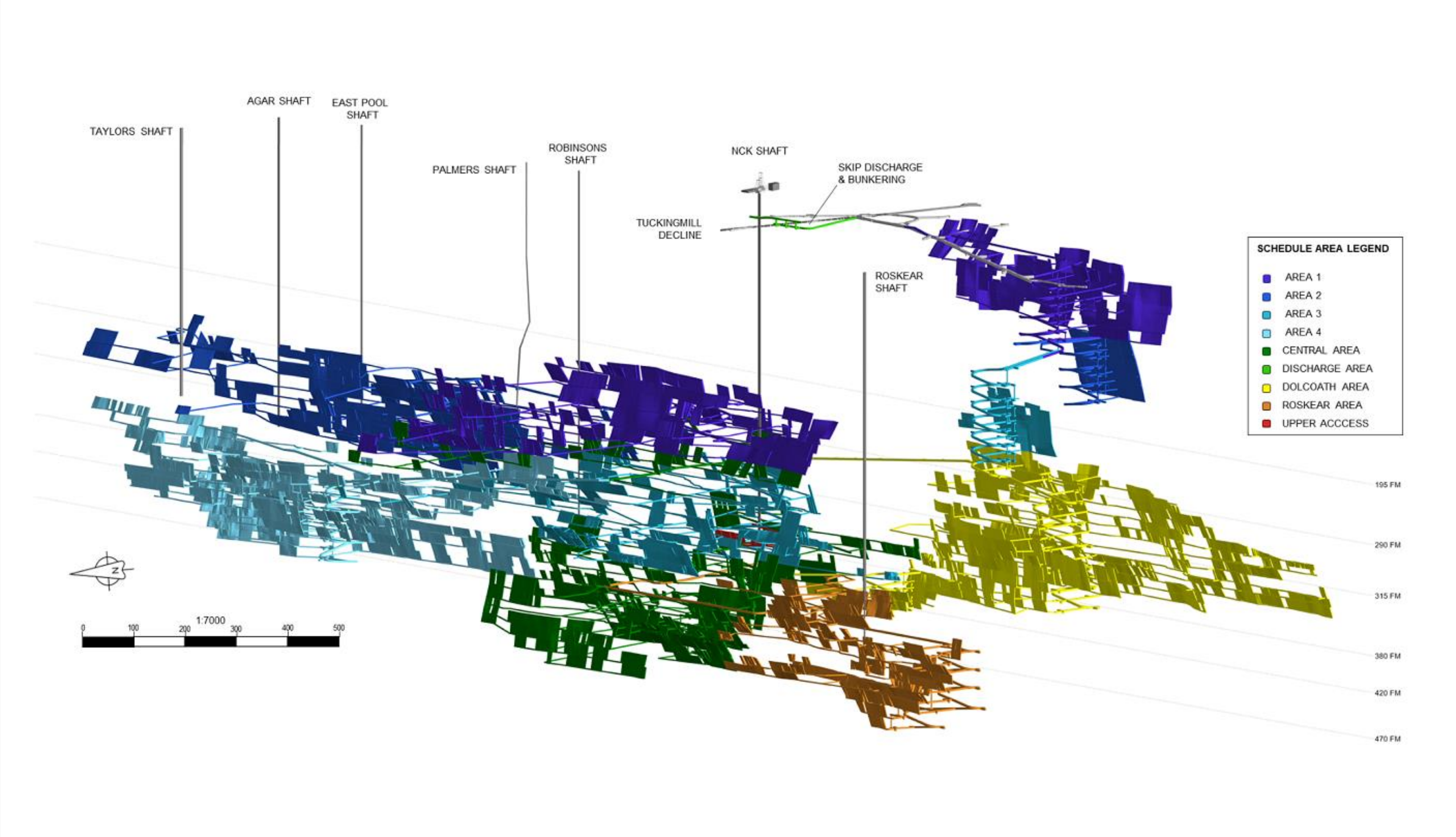
In addition to the main scheduling zones, priority control has been applied to areas within the scheduling zones to prevent isolated or dispersed mining activity and help control fleet movement and ventilation requirements, see Figure 16.28.

Figure 16.27 Mine scheduling zones (elevations are shown from NCK Shaft)



Source: Cornish Metals, 2024.

Figure 16.28 Mine scheduling areas (elevations are shown from NCK Shaft)



Source: Cornish Metals, 2024.

16.14 Mine production schedule

The criteria used for scheduling underground mine production were as follows:

- An average annual mill feed production rate of 500 kt/year (1,400 t/d).
- Provision of enough production faces to support a daily mine production rate of an average of 1,400 t/d.
- Target mining blocks with higher profitability in the early stages of mine life to improve project economics, including prioritising access to No. 4, No. 8, and Roskear.
- Minimise mobile equipment requirements by smoothing mineralised material production and development by area.

Deswik scheduling software was used to optimise the mine production schedule by maximising value (NPV), subject to constraints including maximum lateral development rates, maximum production rates, and extraction sequence. Scheduling constraints utilised in the software are listed below:

- Schedule is constrained by the number of applied resources.
- Maximum concurrent resources of two development drills per level.
- Maximum resources of two development drills in some areas.

Other scheduling rates and productivities are listed in Table 16.29 and Table 16.30.

Table 16.29 Mine schedule criteria, development productivity rates

Development type	Unit	Task rate	Equipment rate
Development - Capital	m/d	1.75 – 3.5	7
Development - Operating	m/d	1.5 – 3.0	6
Drive Stripping & Support	m/d	3.0	12
Drive Support Only	m/d	50	50

Source: Cornish Metals, 2024.

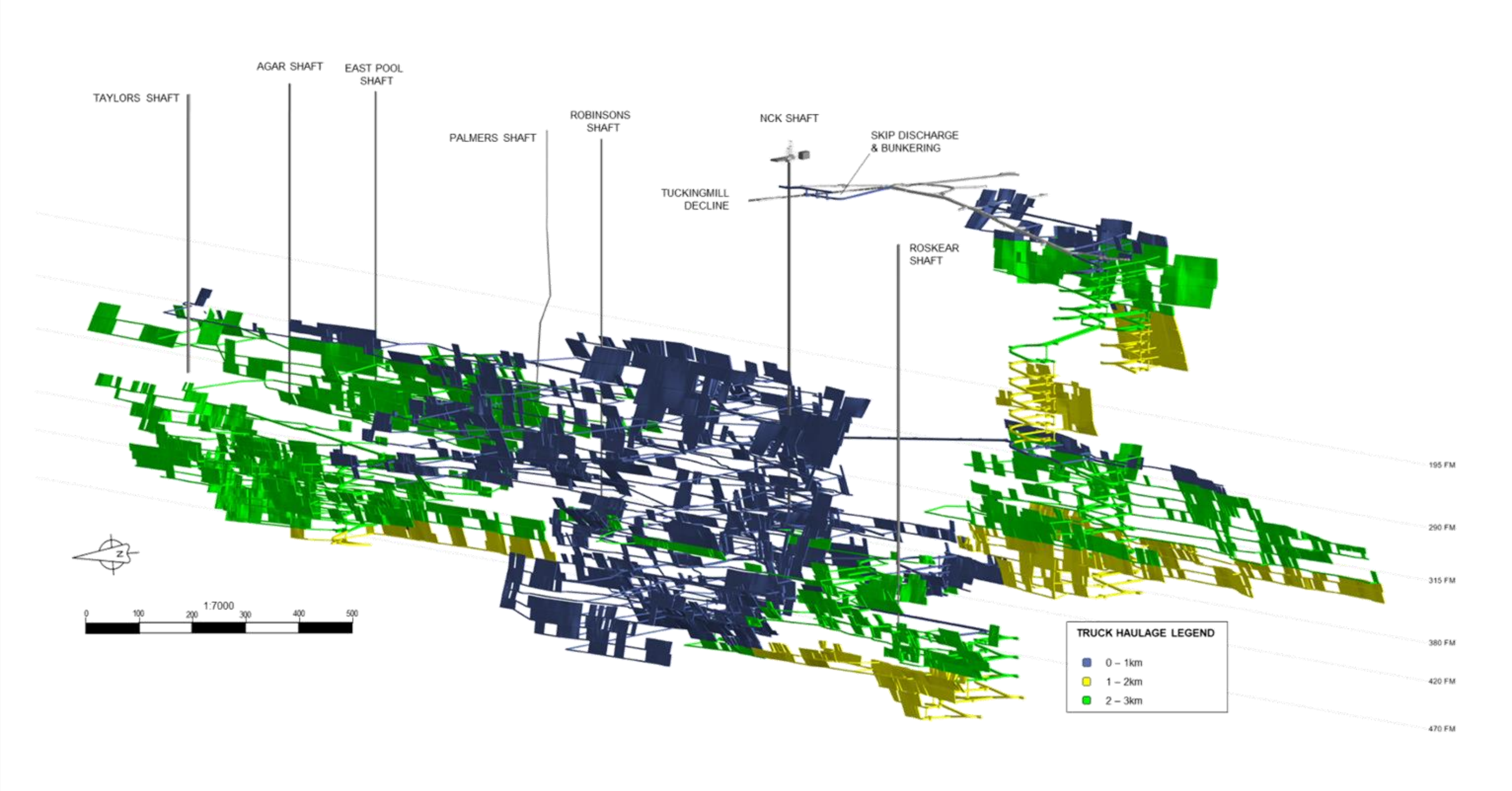
Table 16.30 Mine schedule criteria, stoping productivity rates

Mining method	Unit	Task rate	Equipment rate
Stope Excavation (100 m Tram)	t/d	170	340
Stope Excavation (1,000 m Tram)	t/d	37	75

Source: Cornish Metals, 2024.

Final results of the scheduling exercise were organised such that physical metres, tonnes and metal were broken down into different categories for direct use in the cost model. The mine design and scheduling utilised development and also production and haulage data from the design to schedule drilling requirements and tonnes x kilometres (TKM) data for haulage. Figure 16.29 shows ranges of haulage distance by area.

Figure 16.29 Scheduled truck haulage distance ranges (elevations are shown from NCK Shaft)



Source: Cornish Metals, 2024.

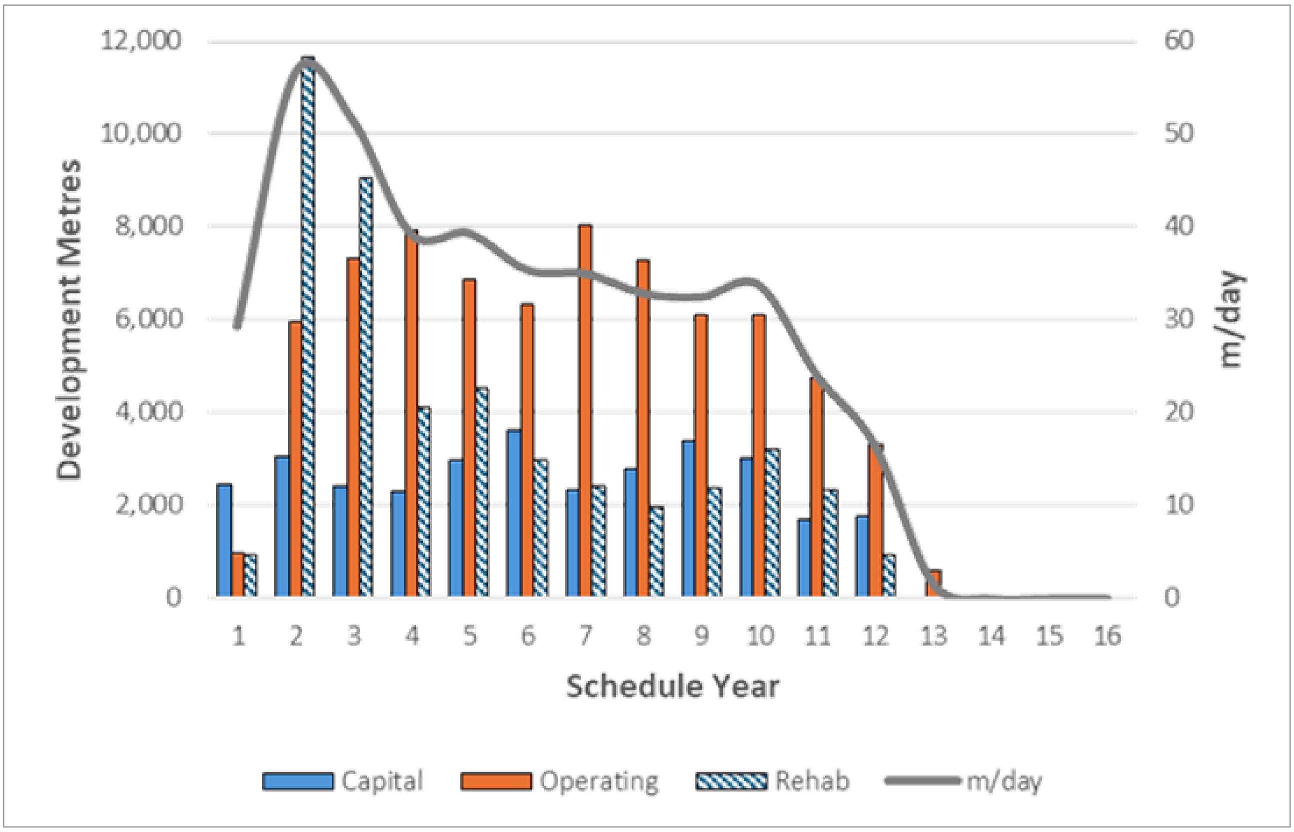
From the final schedule, cost model inputs, including items such as personnel, consumables, ventilation, pumping, and power, were determined and used to develop costs from first principles.

Detailed mine planning and scheduling was completed on a monthly basis for the LOM and is summarised on an annual basis in this report.

16.14.1 Mine development

Projected total underground capital and operating lateral development metres, including rehabilitation, are 32,774 m and 118,322 m, respectively. Underground capital development averages 2,929 m/year or 10 m/d over the first 10 years, when the majority of the underground capital development is completed. Operating development averages 9,102 m/year or 24.9 m/d over the LOM and is shown in Figure 16.30.

Figure 16.30 LOM lateral development schedule

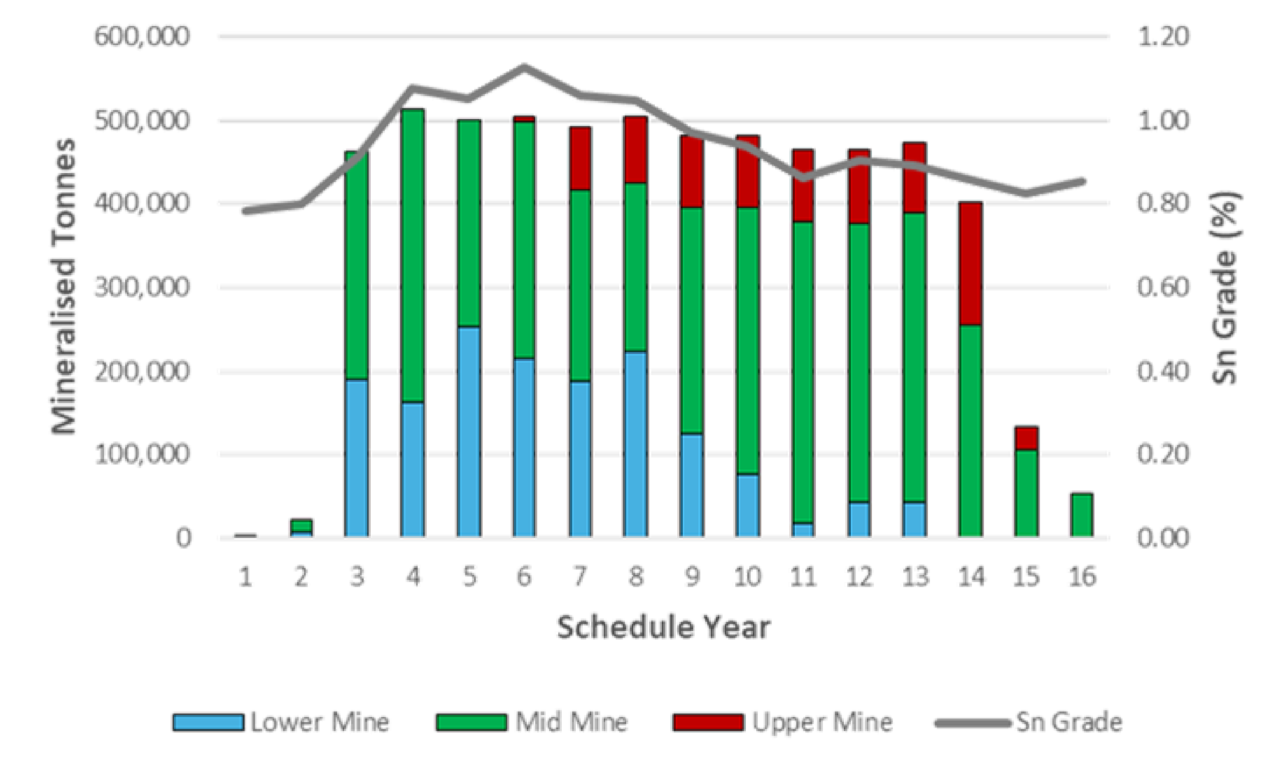


Source: Cornish Metals, 2024.

16.14.2 Mine production

Mine production of 1,400 t/d will be largely achieved by stoping, with a small amount (306 kt over the LOM, ~ 70 t/d) of mineralised tonnes also coming from mineralised development. The 15.5-year mine life tin grade averages close to 1.0%, with production of approximately 8,000 t of concentrate. Annual mine production by zone is shown in Figure 16.31.

Figure 16.31 LOM annual mine production by zone



Source: Cornish Metals, 2024.

16.14.3 Schedule summary

Key outputs from the annual mine production schedule are provided in Table 16.31 to Table 16.33. Mineralised and un-mineralised rock tonnages have been rounded to the nearest thousand.

Table 16.31 LOM annual production schedule

Production	Unit	Total	P-2	P-1	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14
Lower Mine Mined Tonnes	kt	5,189	4.15	22.6	462	513	500	498	416	425	396	395	379	377	389	254	106	53.2
Lower Mine Sn Grade	%	1.00	0.78	0.80	0.91	1.07	1.05	1.10	0.91	0.92	0.83	0.82	0.72	0.76	0.75	0.58	0.67	0.85
Upper Mine Mined Tonnes	kt	766	-	-	-	-	-	7.41	76.7	78.6	85.5	87.7	85.3	86.9	83.5	146	27.7	-
Upper Mine Sn Grade	%	0.54	-	-	-	-	-	1.67	0.75	0.62	0.43	0.31	0.44	0.48	0.65	0.60	0.48	-
Upper Mine Cu Grade	%	0.62	-	-	-	-	-	0.60	0.42	0.44	0.76	0.79	0.80	0.81	0.47	0.45	0.90	-
Upper Mine Zn Grade	%	0.55	-	-	-	-	-	1.26	0.87	0.74	1.23	1.05	0.69	0.17	0.04	0.10	0.04	-
Total Mined Tonnes	kt	5,955	4	23	462	513	500	505	493	503	482	482	465	464	473	401	133	53
Total Mined Sn Metal	Sn t	56,133	32.5	181	4,223	5,512	5,260	5,663	5,067	5,111	4,377	4,232	3,733	3,959	4,092	3,217	1,020	454
Total Mined Cu Metal	Cu t	4,748	-	-	-	3.14	-	44.2	324	347	651	693	683	704	396	654	249	-
Total Mined Zn Metal	Zn t	4,232	-	-	-	0.09	-	93.6	665	580	1,054	924	585	144	36	140	10.4	-
Mined Waste	kt	2,199	120	198	213	194	195	211	203	197	208	202	133	118	6.80	-	-	-
Paste Backfill	km^3	2,330	1.62	8.83	181	201	196	198	193	197	188	189	182	182	185	157	52.1	20.8

Source: Cornish Metals, 2024.

Table 16.32 LOM annual production by type

Mining Method	Unit	Total	P-2	P-1	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14
Longhole Stoping	kt	4,667	-	-	394	429	441	418	422	371	358	343	357	328	352	300	100	53
Double Lift Stoping	kt	983	-	-	42	43	28	52	38	95	99	118	92	125	118	100	33	-
Development	kt	306	4	23	26	41	30	35	33	37	25	21	16	11	3	-	-	-

Source: Cornish Metals, 2024.

Table 16.33 LOM annual development type

Development	Unit	Total	P-2	P-1	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14
Lateral Capital Development	m	31,677	2,456	3,038	2,404	2,289	2,963	3,599	2,333	2,765	3,379	2,988	1,687	1,756	19	-	-	-
Lateral Operating Development	m	71,546	978	5,970	7,316	7,918	6,869	6,342	8,018	7,275	6,123	6,122	4,742	3,303	570	-	-	-
Lateral Rehabilitation	m	46,464	931	11,666	9,055	4,114	4,512	2,969	2,420	1,965	2,356	3,202	2,329	944	-	-	-	-
Lateral Stripping	m	2,264	909	798	-	8	-	326	-	219	-	-	-	5	-	-	-	-
Vertical Development	m	855	42.7	-	-	145	18.0	112	51.0	68.7	105	126	79.0	102	5.45	-	-	-

Source: Cornish Metals, 2024.

17 Recovery methods

17.1 Process description / recovery methods

Cornish Metals engaged px Fairport (pxFA) to carry out a technical study to assess the process plant design for their South Crofty project, specifically to examine the suitability of the proposed flowsheet within the permitted process building dimensions and to produce budget cost estimates.

The Wheal Jane Concentrator, incorporating key metallurgical improvements made in 1993, was utilised as the basis for the flowsheet development with the incorporation of a pre concentration plant. This pre-concentration plant consists of XRT ore sorting of the 50 mm+15 mm size fraction and Dynamic DMS of the 15 mm+0.85 mm fraction leaving the -0.85 mm fraction only to report downstream without pre-concentration. This reduces the size of the downstream concentrator considerably and draws on the strengths of both pre-concentration technologies, XRT being more effective on coarser size fractions and DMS on the finer size fractions.

The 2023 metallurgical test programme has been primarily aimed to test the suitability of XRT pre-concentration and DMS whilst verifying the historic production records, operating data and flowsheet from the Wheal Jane plant and develop the process design criteria and equipment. The process plant will include:

- Underground primary single stage crushing.
- Two stage secondary crushing and XRT / DMS separation.
- Tertiary crushing of XRT products to produce nominal -15 mm material for grinding.
- Open circuit rod mill followed by closed circuit ball mill in closed circuit with screens.
- (Option): Polymetallic flotation.
- Classification and primary gravity concentration using a combination of shaking tables and MGS.
- Regrinding of primary gravity tailings followed by secondary gravity concentration using a combination of shaking tables and MGS.
- Tertiary ultrafine gravity separation using a combination of Falcon "Continuous" Concentrators and MGS.
- Tin Dressing to remove sulphides from gravity concentrates and filter the final product for shipment for smelting.

The underground primary crushing plant has a throughput of 1,400 t/d, the circuit will operate for 12.5 h/d with an availability of 85%, resulting in a throughput of 130 t/h. The majority of the pre-concentrator section (secondary crushing, XRT and tertiary crushing) will operate 12.5 h/d with an availability of 70%, resulting in a throughput of 160 t/h with an average LOM head grade of 0.94% Sn. The DMS and concentrator section (milling, polymetallic Cu-Zn option, primary secondary and tertiary ultra-fine gravity) will operate 24 h/d, 357 days per year at an availability of 90%. The tin dressing circuit will operate for 12 h/d, expecting to produce ≈150 tonnes of high grade (56-58% Sn) mineral concentrate per week.

The primary crusher is protected by a static grizzly mounted over the crusher and operates in open circuit and located underground and will reduce the material down to a product size of 100% passing (P100) 175 mm that is hoisted to surface. Primary crushed mineralisation will be reclaimed from underground bunkers and secondary crushed / screened to produce -50 mm+15 mm ready for XRT ore sorting and -15 mm material to be sent to DMS pre-concentration. The DMS prep-screen then removes -0.85 mm fines which thereby bypass pre-concentration and the DMS plant itself treats only the -15 mm +0.85 mm fraction. Tertiary crushing / screening then reduces the ore sorter accept material to -15 mm and screens out the -0.85 mm fraction. The -15 mm + 0.85 mm ore sorter accept is then combined with the DMS accept which is the same size and sent to the rod mill feed bin. The -0.85 mm DMS prep-screen fines and the -0.85 mm ore sorter accept from tertiary crushing are also combined and sent to the fines screen which separates out the -150 µm fraction to the fines thickener, whereas the -0.85 mm +0.15 mm fraction is sent to a buffer storage tank as it will not require rod milling.

The -15 mm+0.85 mm pre-concentrated ore sorter accepts and DMS sinks material is bunkered before passing to rod milling to nominally d80 = 850 µm. It is envisaged that primary gravity spirals will be installed after the rod mill circuit (subject to positive Phase Two Metallurgical Testwork results) to recover any coarse tin in the combined rod mill discharge and the -0.85 mm+0.15 mm material. The primary spiral concentrate will pass over shaking tables for clean-up with the spiral concentrate table tails recombined with the spiral tails for further processing. The spiral tails are then ball milled to nominally d80 = 150 µm and combined with the -150 µm underflow from the crusher fines thickener. There will be an option for this combined -150 µm material to pass into sulphide flotation, to recover polymetallics, in which case the bulk sulphide flotation tailings will pass on to the gravity sections. Otherwise, the gravity section will receive the entirety of the -150 microns material. With the gravity section material will be hydraulically classified into discrete size fractions and pass into the primary and secondary gravity circuits. Combined primary and secondary gravity concentrates along with the spiral table concentrate will report to tin dressing for final sulphide flotation to remove sulphides, with a further option for wet high-intensity magnetic separators (WHIMS) to remove tungsten prior to producing concentrate with the final tailings processed for paste backfill.

Both primary and secondary fines hydrocyclone overflows (nominally -25 µm cassiterite) will pass into the tertiary ultrafine gravity concentration section where they will first be sent to Falcon "continuous" concentrators with the Falcon concentrate reporting to MGS for clean-up. The tertiary ultrafine MGS concentrate will be combined with the tin dressing concentrate and dewatered via filter press.

17.2 Introduction

The proposed flowsheet consists of the following unit operations:

Primary Crushing: ROM material will pass through a static grizzly and 510 mm by 800 mm (20" by 30") underground jaw crusher in open circuit producing a product of 175 mm (7"), prior to hoisting.

Crushed Material Bunkers and Reclaim: Three 500 m^3 live capacity underground bunkers will receive hoisted material for storage. The bunkers will be equipped with automated truck feeders and chutes.

Secondary Crushing and XRT Sorting: Feed will pass to a dry double deck screen, +50 mm will report to a vibrating feeder and 90 kW cone crusher in closed circuit, -50 mm+15 mm will pass to 20 t hoppers ahead of XRT ore sorting.

Dense Media Separation (DMS): The -15 mm from dry secondary screening will be conveyed to a 430 t storage bin ahead of DMS which uses ferrosilicon media and DMS cyclone. A DMS prep screen will remove -0.85 mm material ahead of the main DMS separation which will then be pumped to the Fines Screening Area. DMS product will report to a 430 t rod mill storage bin.

Tertiary Crushing: XRT products will be screened, +15 mm will report to a vibrating feeder and closed circuit 132 kW tertiary cone crusher. -15 mm+0.85 mm will pass to the 430 t rod mill feed storage bin and -0.85 mm will be pumped to the Fines Screening Area.

Fines Screening: -0.85 mm fines from the DMS prep screen and tertiary screen will be separated at 0.15 mm via a combination of hydrocyclones and screen. 0.85 mm+0.15 mm will be pumped to a 150 m^3 buffer tank prior to joining the rod mill discharge. The -0.15 mm fraction will be pumped to the crusher fines thickener. The crusher fines thickener underflow will be pumped to a buffer tank from where it will be reclaimed to by-pass the grinding circuit and be fed either to the polymetallic flotation section or the primary gravity section.

"Secondary crushing / screening, XRT sorting and tertiary crushing are planned to operate 10 h/d, whereas downstream areas will be operating 24 h/d. 430 t storage bunkers ahead of DMS and rod mill provide storage / buffer capacity between the DMS and concentrator feed which de-couples DMS operation from concentrator operation and avoids DMS and Concentrator plant instability created by any operational downtime in the crushing circuits. The buffer tanks for -0.85 mm +0.15 mm and -0.15 mm crusher fines complete this decoupling and enable refeed of the various size fractions to the most appropriate section of the concentrator plant."

Grinding: A 2.4 m diameter rod mill grinds material to nominally d80 = 850 µm and pumps to a primary spiral circuit, spiral concentrate is cleaned using shaking tables with the table tailings returned and combined with the spiral tailings to report to screen ahead of the ball mill circuit. -850 +212 µm screen oversize reports to a 2.4 m diameter ball mill which pumps back to the screen in closed circuit, whereas the -212 µm screen undersize is combined with the crusher fines thickener underflow and pumped either to the Cu-Zn Flotation or Primary Gravity sections (see below).

Cu-Zn Flotation (Option): Option for polymetallic (Sn-Cu-Zn) from the Upper Mine comprises sulphide float with a 1.5 m diameter regrind ball mill treating bulk sulphide cleaner concentrates operating in closed circuit with hydrocyclones. Cu and Zn flotation sections will then produce additional concentrates from the bulk polymetallic sulphide float. The sulphide flotation pulp is returned to the classification and primary gravity section.

Classification and Primary Gravity: Ball mill product and crusher fines (both nominally d80 = 150 µm) are combined and pumped via hydrocyclones to two 17 m^3 gravity buffer tanks from where the classified feed is deslimed and fed at a controlled rate into a primary multispigot hydrosizer (MSH) ahead of a combination of shaking tables and MGS.

Regrind and Secondary gravity: Primary Gravity tailings will be re-ground using a ball mill operating in closed circuit with hydrocyclones. Cyclone overflow will be deslimed, then separated into size fractions by the secondary MSH and fed to a combination of shaking tables and MGS.

Tertiary Ultrafine Gravity: Slimes from the primary and secondary gravity circuits will be processed using Falcon concentrators with the Falcon concentrate subject to final clean up via MGS. The Falcon tailings will provide the main output from the concentrator to the tailings thickener.

Tin Dressing: Spiral plus primary and secondary gravity bulk concentrates (Combined Sn + S = 52-54%) will be passed through a small sulphide flotation section so as to remove Sulphide minerals and reduce smelter penalties. This tin dressing concentrate will be combined with the tertiary ultrafine MGS concentrate, filtered and then bagged and / or containerised.

Tailings Disposal: Tailings will be dewatered via tailings thickener to 60% - 65% w/w solids and be processed for cemented backfill underground.

Water Reticulation: Crusher fines thickener and tailing thickener overflows will be recycled. Due to the predicted mass balance, under certain circumstances the overall plant may have either a net positive or negative water balance. The process water tank will be linked to the site MWTP to allow bleed / top-up as required.

17.3 Plant design criteria

Key process design criteria from Section 13 are summarised in Table 17.1. The processing plant has been designed with a start-up production rate of 500,000 tpa, however the plant design has incorporated the ability for expansion up to 800,000 tpa. This will be achieved by extending the operating hours of the crushing and XRT Ore Sorter circuits as well as the tin dressing flotation, plus the expansion of the DMS and concentrator equipment, which has been designed for ease of installation in the layout so as to minimise existing circuit disruption.

Table 17.1 Mass and metal balance input summary

Stage	Units	Plant design
Pre-Concentrator Plant Feed	t/h	160
Pre-Concentrator ROM Grade	% (Sn)	0.94
Pre-Concentrator Tin Stage Recovery	%	97.3[1]
Pre-Concentrator Operating Hours	h/d	12.5
Pre-Concentrator Plant Availability	%	70
Concentrator Plant Feed	t/h	26
Concentrator Plant Grade	% (Sn)	1.83
Concentrator Tin Stage Recovery	%	90.3[2]
Concentrator Operating Hours	h/d	24
Final Concentrate Grade	% (Sn)	56-58
Concentrator Plant Availability	%	90
Plant Annual Throughput	tpa	500,000 / 800,000
Overall Tin Recovery	%	87.8[3]

Notes:
[1] Pre-concentrator recovery based on metallurgical testwork and BRUNO modelling mass splits.
[2] Concentrator recovery is based on the historic WJ mill recovery/head grade relationship: (Section 13.2).
[3] Overall Plant Recovery is 97.3% x 90.3% = 87.8%.

17.3.1 Testwork correlation to flowsheet

The flowsheet has been developed based on historic plant performance from the Wheal Jane plant from 1994-1998 post 1993 installation of secondary hydrosizer and MGS which had a dramatic effect on metallurgical recovery rates and supporting testwork completed in 2023/2024 by WAI's Metallurgical Laboratory. Key input data for the flowsheet is listed below:

- XRT Ore Sorter Feed Size: -50 mm+15 mm
- XRT Ore Sorter Rejection: 54%
- XRT Ore Sorter Metal Losses: 2.5%
- DMS Feed Size: -15 mm +0.85 mm
- DMS Rejection: 43%
- DMS Metal Losses: 4.1%
- Primary Grind Product particle size D_{80} of 150 µm
- Secondary Grind Product particle size D_{80} of 125 µm
- Regrind Product particle size D_{80} of 100 µm
- Gravity Deslime particle size D_{80} of 25 µm
- Bond crusher work index: 16.9 kWh/t
- Bond ball mill work index: 17.8 kWh/t
- Bond rod mill work index: 18.3 kWh/t
- Abrasion index: 0.97

The crushing and pre-concentration circuit mass splits have been modelled using BRUNO Process Simulation by Metso whilst all concentration plant weight splits were modelled using metallurgical test work and historical Wheal Jane data. Estimated plant stage and overall recovery is shown in Table 17.2.

Table 17.2 Plant recovery

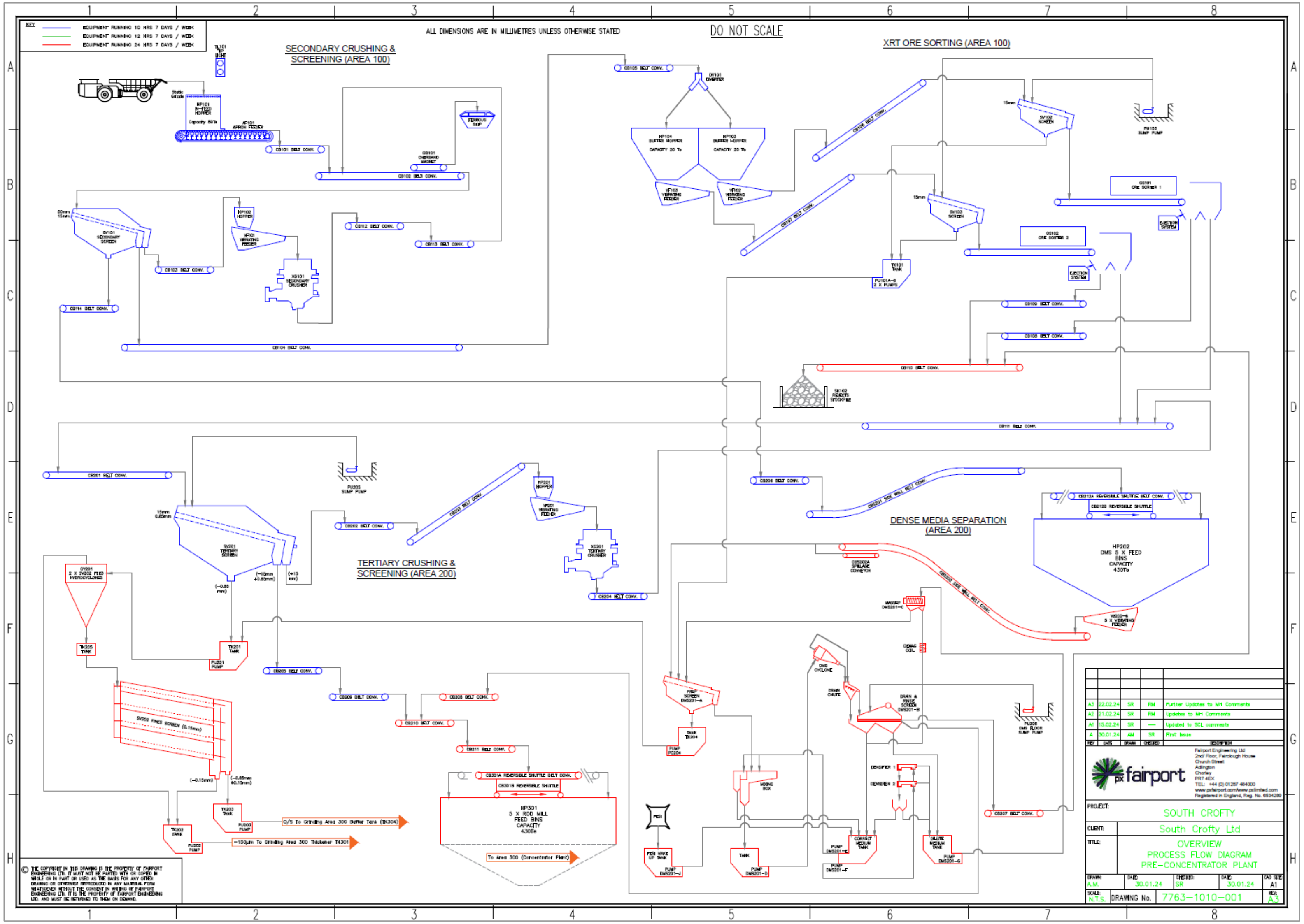
Stage	Units	Plant design
XRT Ore Sorter Stage Recovery	%	97.15
DMS Stage Recovery	%	95.9
Pre-Concentrator Overall Recovery	%	97.3[1]
Concentrator Overall Recovery	%	90.3[2]
Total plant recovery	**%**	**87.8[3]**

Notes:
[1] Pre-concentrator recovery based on metallurgical testwork and BRUNO modelling mass splits.
[2] Concentrator recovery is based on the historic WJ mill recovery/head grade relationship: (Section 13.2).
[3] Overall Plant Recovery is 97.3% x 90.3% = 87.8%.

17.3.2 Plant design

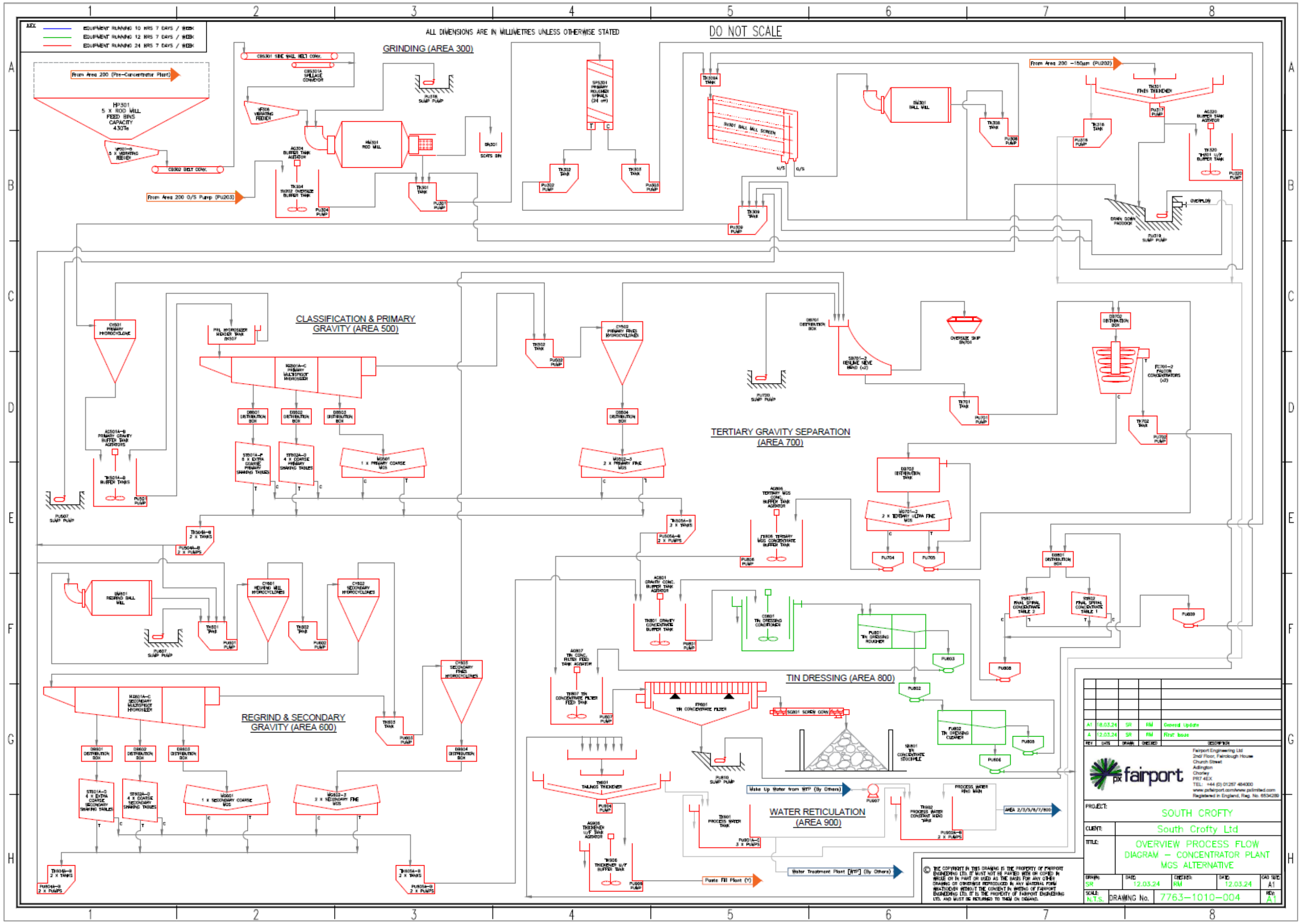
Concept flowsheets and layouts are shown in Figure 17.1, Figure 17.2, Figure 17.3, and Figure 17.4.

Figure 17.1 Overview process flow diagram of pre-concentrator plant



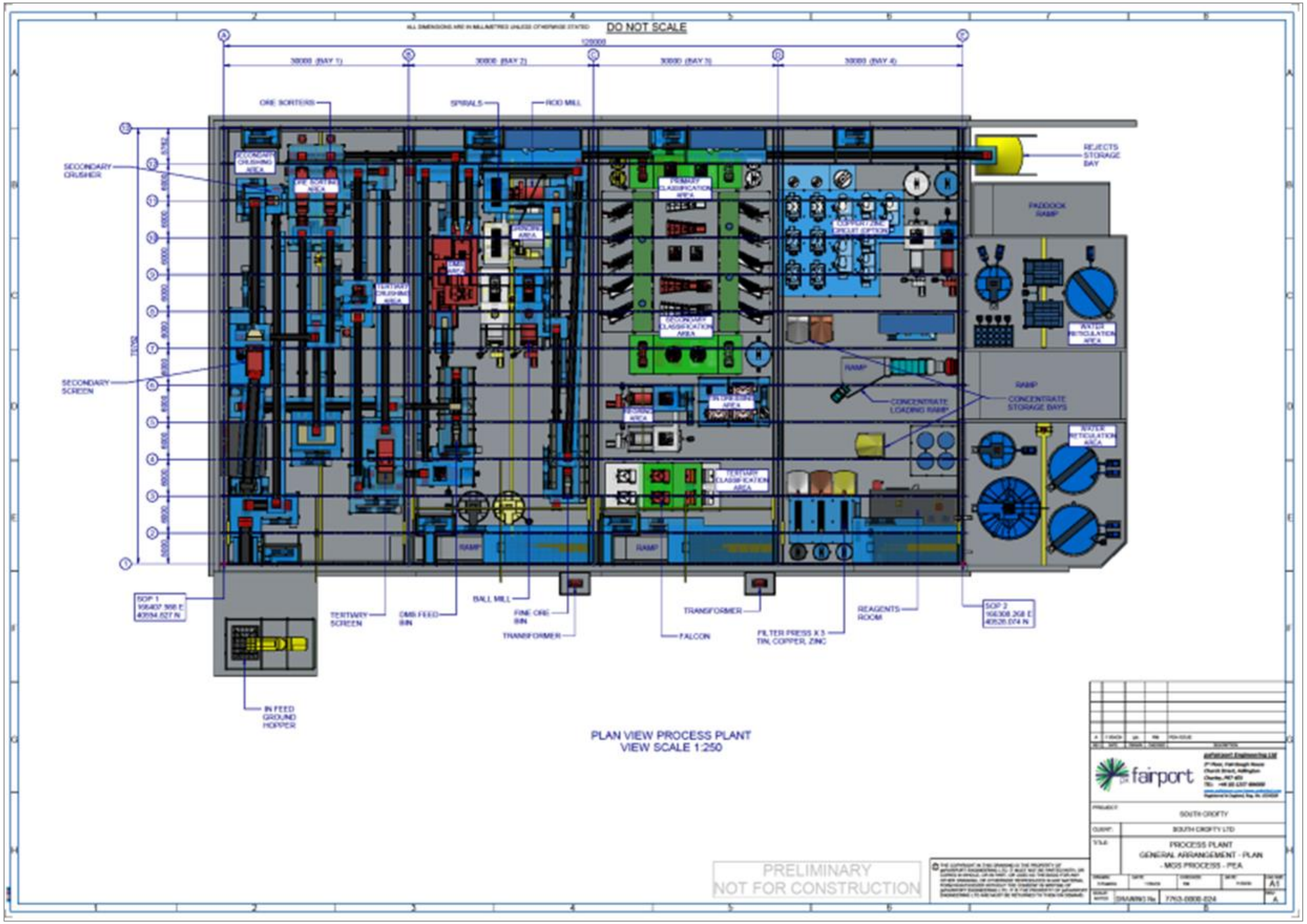
Source: Fairport, 2024.

Figure 17.2 Overview process flow diagram of concentrator plant



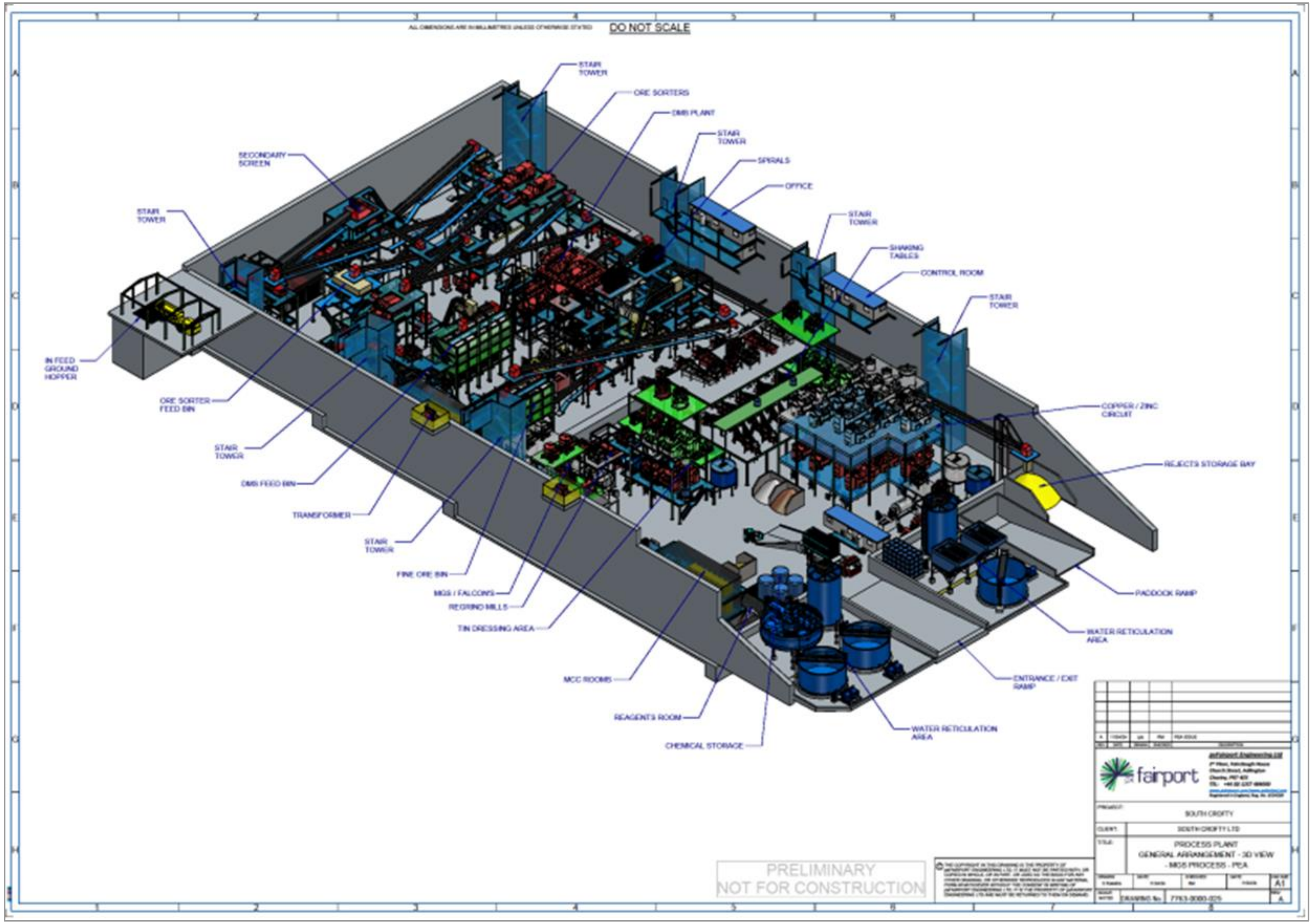
Source: Fairport, 2024.

Figure 17.3 Surface processing plant general arrangement – plan view



Source: Fairport, 2024.

Figure 17.4 Process plant general arrangement – isometric view



Source: Fairport, 2024.

17.3.3 Process plant description

17.3.3.1 Primary crushing

ROM material will be primary crushed underground using a jaw crusher to -175 mm, prior to hoisting in 6.5 t skips for underground bunkering. ROM material will be withdrawn from the underground bunkers, via automated truck loaders, and discharged into the surface feed bin at a rate of approximately 115 t/h, 12.5 h/d.

17.3.3.2 Secondary crushing

The feed to the surface process plant building, by rear ejector trucks, will deliver to a drive over dump hopper. Discharge from the dump hopper will be controlled via apron feeder which will feed onto a series of belt conveyors, with an overband magnet, to the secondary screen which will be a double deck dry screen cutting at 50 mm and 15 mm. The +50 mm oversize from the top deck of the secondary screen will be conveyed to the secondary gyratory cone crusher via a feed hopper and vibratory feeder to control the crusher feed and keep it choke fed. The secondary crusher product will be returned to the secondary screen via conveyor, thus operating in closed circuit and controlling the top size of feed material to the ore sorters.

The -15 mm undersize which is too fine to be processed on the ore sorters will pass through the bottom deck of the secondary screen and will be conveyed to the DMS plant.

The -50 mm +15 mm midsize from the secondary screen will be conveyed to the ore sorter feed bin. Immediately prior to each ore sorter there will be a single deck rinsing screen fitted with spray bars to wash off any residual -15 mm material, which will be pumped to the DMS plant. The ore sorters will analyse the feed material and separate it into high-density product (accepts) and low-density rejects by use of XRT detector technology and high-pressure compressed air jets which will blow the ore sorter accepts over onto the product conveyor. The ore sorter rejects will fall onto the reject conveyor to be conveyed to the edge of the process building for collection by trucks for disposal, whereas the ore sorter product will be conveyed to the tertiary screen for further processing.

17.3.3.3 Tertiary crushing and DMS

The tertiary screen is fed by a conveyor carrying the -50 mm +15 mm ore sorter product and is a double deck wet screen fitted with spray bars cutting at 15 mm and 0.85 mm. The +15 mm oversize from the top deck of the tertiary screen is conveyed to the tertiary cone crusher, the product will be returned to the tertiary screen feed conveyor thus operating in closed circuit.

The -0.85 mm undersize slurry which passes through the bottom deck of the tertiary screen will be collected in a pump box and pumped to the fines screen feed hydrocyclones.

The -15 mm +0.85 mm midsize from the tertiary screen is conveyed to the rod mill feed bin.

It should be noted that the DMS will operate on a 24-hour basis whereas the crushing and screening plant will operate for reduced hours, so a substantial DMS feed bin and reclaim system has been provided to provide the required buffer capacity.

The package DMS plant will be fed with the -15 mm secondary screen undersize plus the -15 mm slurry from the ore sorter rinsing screens. Subject to detailed design, it will use ferrosilicon media and either a DMS cyclone or a proprietary vendor alternative to divide the feed material into dense DMS product 'sinks' and light DMS reject 'floats'. It will also contain a pre-screen to remove any residual -0.85 mm fines in the feed, product and reject dewatering screens and a ferrosilicon media recovery circuit, amongst other design features.

The DMS reject will be conveyed onto the ore sorter reject conveyor, thus being removed from the process for disposal, whereas the DMS product will be conveyed to the rod mill feed bin for further processing, where it will be combined with the -15 mm +0.85 mm midsize from the tertiary screen which comprises the main part of the tertiary crushed XRT accepts.

The -0.85 mm fines from the DMS pre-screen will be pumped to the pump box beneath the tertiary screen, thus combining with the -0.85mm tertiary screen undersize in being pumped to the fines screen feed hydrocyclones. The underflow from these hydrocyclones will be passed over the multi-deck fines screen which will cut at 150 µm, thereby producing a -850 µm +150 µm oversize product and a -150 µm undersize. The hydrocyclone overflow will be combined with the screen undersize and pumped to the crusher fines thickeners, whereas the -850µm +150 µm screen oversize will be pumped to a buffer tank.

17.3.3.4 Grinding (and spiral concentration)

The rod mill feed bin will thereby receive a -15 mm +0.85 mm feed which has been preconcentrated by either XRT ore sorting or DMS. It will therefore be considerably enriched and a lower tonnage than the main feed into the plant from the underground crushing. The rod mill feed bin will act as a buffer between the pre-concentrator and the concentrator. Depending on the plant operation, each section will be operated for different hours, with the rod mill feed bin providing the required buffer capacity.

The crusher fines thickeners will receive -150 µm material from the fines screen and associated hydrocyclones. Compared to the rod mill feed these fines will be partially enriched due to the portion of them that were generated from tertiary crushing of the ore sorter product. The fines thickeners will operate without flocculation to preserve the chemistry required in the flotation sections and produce a clear supernatant overflow which will be returned to the process water tank, thereby reusing the majority of water used in the crushing and screening area. The crusher fines thickener underflow will be pumped to a storage tank to provide the second buffer between pre-concentrator and concentrator.

The third and final buffer between pre-concentrator and concentrator will be the -850 µm +150 µm fines screen oversize storage tank. Like the crusher fines thickener feed, compared to the rod mill feed this material will be partially enriched due to the portion of it that was generated by tertiary crushing the ore sorter product.

The rod mill, which operates in open circuit, will reduce the -15 mm +0.85 mm feed material to d80 = 0.85 mm. The rod mill product will be slurried and recombined with -850 µm+150 µm material reclaimed from the fines screen oversize storage tank which does not require rod milling. It is envisaged that the combined material will be pumped to the primary spiral circuit which will provide the first stage of gravity separation and comprise rougher spiral concentrators only specifically designed and incorporated to recover coarse liberated cassiterite as early in the flowsheet as possible. The spiral concentrate will be pumped to tin dressing for further cleaning on shaking tables whilst the spiral tailings will be pumped to the ball mill screen for further processing.

The ball mill screen will operate at a cut point providing a product size that is d80 ≈ 150 µm with the oversize fed into the ball mill. The ball mill product will be pumped back onto the ball mill screen thus operating in closed circuit, with a predicted recirculating load of around 250%. The ball mill screen undersize will be collected in a tank, to which the -150 µm high solids underflow from the crusher fines thickeners will also be pumped, thereby refeeding this fine material from the crushing areas back into the process. Depending on whether the option for polymetallic Cu-Zn Flotation is taken up, this combined -150 µm will either be pumped to that section or direct to the Primary Gravity section.

17.3.3.5 Cu-Zn flotation

The Cu-Zn flotation area is currently under consideration as an option subject to the mine plan. A buffer tank will be provided to collect the -150 µm feed from the grinding section. The first stage of Cu-Zn flotation will be a bulk sulphide float comprising conditioner, rougher, cleaner 1, and cleaner 2 cells with the rougher tailings pumped to the primary gravity area for further tin recovery. There will be a regrind ball mill between cleaner 1 and cleaner 2 which will operate in closed circuit with a set of hydrocyclones, the regrind size is to be determined but may be in the range ≈45 µm depending on test work and historic data. The cleaner 2 concentrate will be pumped to the copper flotation section. Additional pumps will circulate material between the rougher, cleaner 1, and cleaner 2 sulphide flotation cells.

The copper flotation section will contain an additional set of conditioner, rougher, cleaner 1, and cleaner 2 cells albeit with no further regrind. The copper rougher tailings will be pumped on to the zinc flotation section whereas the cleaner 2 concentrate will be pumped to a small holding tank and then on to the copper concentrate filter. Additional pumps will circulate material between the rougher, cleaner 1, and cleaner 2 copper flotation cells. The copper concentrate filter cake will be conveyed to a stockpile by a screw conveyor for collection and transport offsite as the 'first' saleable product from the process.

Similar to the copper flotation, the zinc flotation section will contain an additional set of conditioner, rougher, cleaner 1, and cleaner 2 cells and no further regrind. The zinc rougher tailings will be pumped to the tailings thickener for disposal whereas the cleaner 2 concentrate will be pumped to a small holding tank and then on to the zinc concentrate filter. Additional pumps will circulate material between the rougher, cleaner 1, and cleaner 2 zinc flotation cells. The zinc concentrate filter cake will be conveyed to a stockpile by a screw conveyor for collection and transport offsite as the 'second' saleable product from the process.

17.3.3.6 Classification and primary gravity

Either the -150 µm sulphide flotation tailings from the Cu-Zn section or the -150 µm product from the grinding section will be pumped to the primary gravity buffer tank via the primary hydrocyclones, the underflow will be fed to the tank whereas the dilute overflow will be fed to a set of primary fines hydrocyclones for additional solids recovery in the underflow. The primary fines hydrocyclones overflow will pass to the tertiary gravity section for final recovery of ultrafine material.

The primary gravity buffer tank will thereby receive the majority of solids entering this section of the plant, and discharge via pump to the primary MSH. Via hindered settling the primary MSH will classify the solids into a number of size fractions, each controlled by its own spigot. The current design is for three spigots with the overflow being combined with the feed to the primary fines hydrocyclones to recover fine solids. The three spigots from the primary MSH plus the underflow from the primary fines hydrocyclones will thereby divide the primary gravity section feed into four size fractions for the primary gravity separation. The feed from spigots 1 and 2 of the primary MSH will be fed to shaking tables, whereas spigot 3 and the underflow from the primary fines hydrocyclones will feed MGS units.

The total number and split of shaking tables between the two coarser size fractions is currently intended to be 6 and 4 for spigots 1 and 2 respectively; a total of 10 primary shaking tables. Similarly, the split of MGS on the finer fractions is currently intended to provide a single production size MGS on the primary MSH spigot 3 underflow and two on the primary fines hydrocyclones underflow for a total of 3 primary MGS. Each set of tables and MGS will require a feed distribution box and subject to detailed plant design, may be provided with individual or shared set(s) of tailings, and concentrate pumps. The concentrate pump(s) will send the tin-rich primary gravity concentrate (%Sn + %S = 52-54%) to the tin dressing section, whereas the tailings pump(s) will send the primary gravity tailings to the secondary gravity area for additional tin recovery. A divert facility will be provided on the primary gravity tailings to the drain down paddock in the crusher fines thickener area, for shutdown and emergency use.

17.3.3.7 Regrind & secondary gravity

The primary gravity tailings will be pumped to the secondary gravity area which will also contain a regrind ball mill that will operate in closed circuit with a set of hydrocyclones to control the regrind product sizing which will be nominally d80 = 125 µm quartz basis. The recirculating load is predicted to be around 250%. The regrind mill hydrocyclone overflow will be pumped to the secondary hydrocyclones which will recover the majority of solids in the underflow and feed them to the secondary MSH. Similar to the primary MSH, the secondary MSH will classify the solids into size fractions by hindered settling. For the secondary MSH there will again be three spigots and therefore three underflow fractions, plus the overflow which together with the secondary hydrocyclones overflow will be pumped to the secondary fines hydrocyclones for additional solids recovery, the secondary fines hydrocyclones underflow thereby comprising a fourth size fraction. The secondary fines hydrocyclones overflow will pass to the tertiary gravity section for final recovery of ultrafine material.

The three spigots from the hydrosizer plus the underflow from the secondary fines hydrocyclones thereby divide the secondary gravity section feed into four size fractions for the secondary gravity separation. The feed from spigots 1 and 2 of the secondary MSH will be fed to shaking tables, whereas spigot 3 and the underflow from the secondary fines hydrocyclones will feed MGS. The total number and split of shaking tables between the two coarser size fractions is currently intended to be 4 and 4 for spigots 1 and 2 respectively; a total of 8 secondary shaking tables. Similarly, the split of MGS on the finer fractions is currently intended to provide a single production size MGS on the secondary MSH spigot 3 underflow and two on the secondary fines hydrocyclones underflow for a total of 3 secondary MGS. Each set of tables and MGS will require a distribution box and, subject to plant design, may be provided with individual or shared set(s) of tailings and concentrate pumps. The concentrate pump(s) will send the tin-rich secondary gravity concentrate (%Sn + %S = 52-54%) to the tin dressing section, whereas the tailings pump(s) will send the secondary gravity tailings back to the regrind mill for reprocessing. A divert facility will be provided on the secondary gravity tailings to the drain down paddock in the crusher fines thickener area, for shutdown and emergency use.

17.3.3.8 Tertiary ultrafine gravity

The tertiary gravity section will be fed by the primary and secondary fines hydrocyclone overflows. These materials will be combined and passed over a pair of sieve bends to remove any coarse trash material, before being pumped to two Falcon C2000 concentrators. The Falcon concentrator tailings will be collected and pumped to the tailings thickener, whereas the Falcon concentrate will be collected and pumped to the tertiary ultra fine MGS feed buffer tank. From the buffer tank, duty and standby pumps will transfer the material to a distribution box in the tertiary ultra fine MGS area where two C902 production MGS will be required, with each being a twin-drum machine, requiring a total of four gravity feeds from the distribution box. The tertiary ultra fine MGS concentrate will then be collected from each drum, diluted as required, and pumped to the tertiary ultra fine MGS concentrate tank, whereas the more dilute tertiary ultra fine MGS tailings will be pumped back to the Falcon concentrator feed tank for re-processing.

17.3.3.9 Tin dressing

The tin dressing area will provide final upgrades for the tin-rich spiral and primary and secondary gravity concentrates. The primary spiral concentrate will first be put over a final pair of shaking tables, with the tailings returned to the ball mill screen for regrind and reprocessing. The final spiral table bulk concentrate (%Sn + %S = 52-54%) will be pumped to a buffer tank which will also receive the primary and secondary gravity concentrates. The gravity concentrate buffer tank will pump to the tin dressing flotation conditioner and then to the tin dressing rougher cells. Please note that this is a 'reverse float' in that the gangue sulphides are floated and the pulp is rich in tin. The tin dressing rougher pulp will be pumped to the tin concentrate filter feed tank, and the tin dressing rougher float will be pumped to the tin dressing cleaner cells. The tin dressing cleaner float will be pumped to the tailings thickener whereas the tin dressing cleaner pulp will be recirculated back to the tin dressing rougher. The flotation air for the tin dressing flotation cells and the polymetallic section flotation cells if required will be provided by a single pair of duty-standby blowers due to the proximity of these two sections of the plant.

The final tin-rich material to join the tin dressing section will be the tertiary ultrafine MGS concentrate which will be provided with a small buffer tank, from where it will be pumped into the tin concentrate filter feed tank along with the tin dressing concentrate. This will allow blending of the two materials if required. The tin concentrate filter will deposit the tin concentrate filter cake onto a short screw conveyor which feeds a product bay from where the tin concentrate can be taken away.

17.3.3.10 Tailings disposal

Tailings from both the gravity and flotation sections will report to the tailings thickener to produce an underflow between 60-65% solids, which will then be pumped on to a filtration plant to produce a cake with less than 16-18% moisture content. Filtered tailings will then be available to rehandle either for cemented backfill underground or be temporarily stored prior to underground disposal.

17.3.3.11 Water reticulation, services, and general

The water reticulation area will collect, recycle, store, and distribute water to where it is needed in the other areas of the process plant. The first major component of the water reticulation system will be a large tailings thickener which will receive a number of individual tailings streams from around the plant, e.g.:

- Cu-Zn polymetallic flotation section tailings (if option taken up).
- Falcon concentrator tailings.
- Tin dressing section tailings.

A flocculant dosing system will be provided for the tailings thickener to prepare flocculant solution of the correct strength from the powder supplied. The solids-rich tailings thickener underflow will be pumped to the mine paste fill operation for disposal, whereas the clarified overflow will pass into the adjacent process water tank where it will be combined with the crusher fines thickener overflow for reuse in the process. The mine paste fill operation will also return a tailings filtrate to the process water tank, and finally the process water tank will also receive the overflow from the drain-down paddock. Duty and standby pumps will transfer from the process water tank into the process water constant head tank which will also have a pumped connection from the site water treatment plant for top-up. The process water constant head tank will be connected to a pair of process water circulation pumps (duty and standby) which will supply process water to the pre-concentrator and concentrator plant.

A 'bleed' facility from the water reticulation network will be required to maintain the process water quality, this will be provided by a third pump from the process water tank to the site MWTP. In the case of a net water surplus from the plant, as is predicted in some operating scenarios, this bleed facility will be in constant operation to balance the levels in the process water tanks.

In addition to the drain-down paddock for the crusher fines thickeners, the process plant floor will contain a number of bunded sumps and sump pumps to collect spillage and return it to the process at appropriate points. The first such sump will be in the ore sorter area and will return solids to the ore sorter rinse screens. A sump provided in the tertiary screening area will return solids to the tertiary screen itself. DMS plant spillage will be contained locally and returned to the DMS prep screen because of the ferrosilicon dense media. Grinding area spillage will be returned to the rod mill. Primary gravity area spillage will be returned to the Primary Hydrocyclones feed tank with secondary gravity area spillage returned to the Regrind Mill Hydrocyclones feed tank. Tertiary gravity area spillage will be returned to the trash screening sieve bends and finally tin dressing area spillage will be returned to the spiral concentrate tables.

The general philosophy is to send material back only as far as necessary to moderate material accumulation with the fresh feed to the system.

Reagent storage, mixing, transfer, and dosing systems will also be required for the tin dressing flotation section. This will require an enclosed and access-controlled storage and mixing area which will contain various containers of as-delivered reagents, including liquid drums, IBCs, and sacks of solid powder. Some of the liquid reagents will require dilution tanks and the solid reagents will all require mixing tanks. Transfer pumps will be provided to transfer the correct strength liquids / solutions to the day tank area above the flotation sections. The storing and mixing area will also be bunded with individual bunds and trays for the various containers, mixing tanks, etc. Safety showers will be provided in both areas. MIBC liquid will be delivered in 200 litre drums and pumped neat to the day tank area. SEX dry powder will be delivered in 25 kg sacks and mixed to a 20% solution before pumping to the day tank area. Sulphuric acid will be delivered as a 10% solution in IBC's and pumped directly to the day tank area. In the day tank area there will be a set of smaller bunded day tanks fitted with the requisite reagent dosing pumps.

Should the option for the polymetallic Cu-Zn flotation be taken up, additional reagent storage, mixing, transfer and dosing systems will be required as well as a second day tank area adjacent to the Cu-Zn flotation cells. Due to the quantities required, sulphuric acid and limewater will be delivered by tanker which will require the provision of two 50,000 litre double-walled storage tanks for the tankers to transfer into directly. In the case of sulphuric acid this will replace the IBC's whereas for the limewater it is an entirely new requirement.

MIBC and SEX mixing and transfer systems are already provided, additional transfer pumps will be provided to the Cu-Zn day tank area. Sulphuric acid will be delivered as a 10% solution and pumped directly from the 50,000 litre storage tank to the two day tank areas. Limewater will also be delivered as the correct-strength solution and pumped directly from the 50,000 litre storage tank to the Cu-Zn Day tank area. Copper sulphate, zinc sulphate and sodium cyanide will each be delivered in 25 kg sacks and mixed to the correct strength solutions before pumping to the Cu-Zn Day tank area.

A high pressure compressed air system will be required, in particular to supply the compressed air jets required by the XRT ore sorters which consume a significant amount of compressed air and will require a consistently high pressure to eject the -50 mm +15 mm lumps of ore, and instrument quality air to keep the nozzles clear. This will require a dedicated pair of duty / standby compressors located in Bay 1 for the ore sorters plus any immediately adjacent equipment. Subject to confirmation the Falcon concentrators may similarly require dedicated duty / standby compressors located in Bay 4 to provide the high pressure required to operate the internal control valves. The remainder of the general plant compressed air will be provided by a final pair of duty / standby compressors. As well as the compressors themselves, plus driers, filters etc. to achieve the required air quality, a number of substantial air receivers will be required. Dependent on the moisture content requirement of the final concentrates the concentrate filters may require a significant volume of compressed air for the 'cake blow' function and there will be a number of other less significant compressed air consumers around the plant like automatic valves.

A foam dust suppression system will be provided in the crushing and screening area, primarily around the dump hopper, secondary screen and crusher, the DMS feed bin, and the ore sorter feed bin. Subsequently the material will generally be damp, as the ore sorter rinse screens, DMS prep screen and tertiary screen are all wet screens, so dust suppression will not be required.

17.3.4 Electrical and controls description

17.3.4.1 Control summary

The concentrator building will contain a large number of plant items spread over a significant area and several floors, so the plant will have high level instrument and automation to allow smooth monitoring and control. The central point of automation will be the main control room where the Scada computer and screens will be located.

The Scada system will interface with the Programmable Logic Controller (PLC) for sequencing and control loops to link together and control the equipment and instrumentation to improve process safety as well as to assist the operator when starting up and stopping the plant and maintaining some of the basic parameters of the plant operation. The control system will include:

- Common PLC mounted in the Control Room. The PLC will be suitably sized for the I/O count and process complexity and will have at least a 50% 'spare' capacity with respect to Processing Power, Memory, and Communications capabilities.
- A detailed I/O Schedule will be prepared as part of the detailed design. However, in summary will consist of the following:
  1. All drives will have a Local Control Station (LCS) with the following facilities.
     - Local / Remote Switch (To Activate the LCS in Local).
     - Emergency Stop Button.
     - Local Isolator (Lockable).
     - Start Button (Active when Local selected).
     - Stop Button (Always active).
  2. All conveyors will have the following field signals.
     - Belt Slip monitoring.
     - Belt Alignment.
     - Blocked Chute.
     - Pull Key Monitoring.

     And where relevant – Belt Weighers.
     - Tonnage Totaliser.
     - Tonnes per Hour.
  3. All belt-driven horizontal centrifugal pumps will have.
     - A variable speed motor.
     - Proof of running (Rotation).
     - An analogue level sensor fitted to the Pump Tank.

     All belt-driven vertical centrifugal pumps will have.
     - A variable speed motor.
     - Proof of running (Rotation).
     - Two digital level sensors, high and low, in the tank to provide speed control for the pump.
  4. Miscellaneous Drives.
     - All drives will have proof of running field signals.
  5. Thickeners will have the following field signals.
     - Proof of rotation for the rake drive.
     - Rake Height sensor.
     - Sludge Level sensor.
     - Thickener Cone Pressure sensor.

- Field Operator Stations based around suitable human machine interfaces (HMIs) will be provided, on plant, in suitable 'control' nodes where operators may not only monitor and control operations through the HMI but may also adjust plant operations beyond the remit of the PLC based control system. This may be for example in the shaking table area where adjustments to the table operations and the distribution of spray and dilution water are necessary and the provision of an 'on-plant' control point would be advantageous.

17.3.5 Process control

17.3.5.1 Control rounds

It is envisaged that all concentration plant process stage inputs and outputs will be sampled once every 2.5 hours and the samples filtered, dried, and assayed using a fast turnaround XRF using pressed pellets.

18 Project infrastructure

18.1 General

Project infrastructure is designed to support mining operations up to 500,000 tpa and processing of up to 800,000 tpa, operating 24-hours per day, 7-days per week. It is designed for the local conditions and topography.

The main infrastructure items include:

- MWTP.
- Mineral processing concentrator plant.
- Assay laboratory.
- Backfill plant for mixing underground paste backfill.
- High voltage electrical substation, site electrical power distribution, and emergency power generators.
- On-site access roads development and improvements.
- Temporary tailings storage.
- Secondary aggregates processing area.
- Offices, administration.
- Workshops, changerooms, warehouses, maintenance facilities.
- Drill core logging and processing facilities.
- Explosives storage facilities and support facilities.
- Mine headframes, winder houses (including winders).
- Underground primary crusher, discharge conveyor, and crushed ore bunkers.
- Surface decline (Tuckingmill Decline) and primary mine shafts.

18.2 General site layout

The site layout has been designed to minimise environmental, community, and visual impacts, reduce construction costs and optimise operational efficiency and sustainability. The existing infrastructure will be utilised to the maximum extent possible. New facilities have been located to allow easy access for construction and existing development footprint to minimise earthworks requirement.

The current project site overall layout is shown in Figure 18.1 with image render of the permitted surface facilities shown in Figure 18.2.

Figure 18.1 Overall site layout – current

Source: Cornish Metals, 2024.

Figure 18.2 Image render of Permitted Surface Facilities

Source: Cornish Metals / Atkins, 2024.

18.2.1 Mine site power

National Grid electricity will provide the power to the project over the life of the mine. The site offers very good connectivity to the National Grid Network, with two 33 kV lines and one 11 kV line crossing the site, with other 11 kV circuits in close proximity. National Grid power is also available at 132 kV within 1 km of the site.

Site power is planned to be upgraded for the new operation, South Crofty has a 12.8 MVA total capacity agreement, in place, which will be supplied via the existing 33 kV overhead line which crosses the site. A new transformer station will be constructed on the mine site, transforming to 11 kV and distribution system upgraded.

An electrical load list was developed for the planned operations, based on the process design and mechanical equipment list (including copper / zinc section), they are summarised in Table 18.1. Mine winders and surface ventilation fans are included under site infrastructure loads.

Table 18.1 Summarised electrical load list (LOM)

Infrastructure area	Connected load (kW)	Demand load (kW)
Process Plant	5,578	2,743
Site Infrastructure	3,554	1,454
Underground Mine	3,875	2,339
Total	**13,007**	**6,536**

Source: Cornish Metals / Fairport, 2024.

18.2.2 Power system – mine main feed

The site currently benefits from three incoming electricity supplies:

- One 11 kV incoming supply from National Grid with a current agreed supply capacity of 5 MVA. The incoming supply is from Carn Brea 33 / 11 kV feeder, where the 11 kV feeder breaker only feeds South Crofty. This supply is located adjacent to the new 11 kV switchroom to the north-east of the site.
- One LV supply supplying the Cooks Kitchen Office on Forth Kegyn. This is a standard 60A / 3 Phase commercial supply.
- One 850 kVA supply feeding the MWTP at 415 V, this is supplied at 11 kV from the overhead lines on the west of the site fed from Lanner substation, transformed on site by a National Grid owned sole use transformer and metered at low voltage.

There is also an obsolete 11 kV connection which fed 3.3 kV and 415 V to the Mine Dry and underground.

A new dedicated electrical supply and substation will be installed from the overhead 33 kV which pass across the site. South Crofty has a 7 MVA supply agreement on this new 33 kV supply, the intention with National Grid is that the existing separate site capacities (5 MVA and 850 kVA) will be combined to the new 33 kV for a total of 12.85 MVA supply capacity, the incoming supply will be transformed on-site to 11 kV and distributed across site on existing networks with minor upgrades to the newly built 11 kV switchroom for local distribution. A single line diagram is shown in Figure 18.3.

18.2.3 Surface distribution

The site has its own private 11 kV and 3.3 kV networks fed from the 11 kV supply. The 11 kV network on site comprises of the new eight-panel 11 kV Brush Eclipse Switchboard, fed from the National Grid 11 kV supply, with room for future expansion should this be required. Power Factor Correction is available on this board via an installed capacitor bank, the board is also fitted with Neutral Earth Resistance monitoring to enable 11 kV to be taken underground in the future. All circuits off this board are currently radial circuits as shown.

18.2.3.1 Phase 1 – Re-access / refurbishment (current)

- 3.3 kV Distribution (3.5 MVA transformer providing supplies underground)
- Power factor correction
- Dewatering pump VSD 1 (11 kV)
- Dewatering pump VSD 2 (11 kV)
- 415 V (LV) distribution (1 MVA transformer auxiliary supplies)
- 195 ftm pump station (11 kV)
- South winder (11 kV)

18.2.3.2 Phase 2 – (expansion)

- Second incoming supply (for redundancy) with bus-connector between supplies.
- 11 kV supply to North Winder.

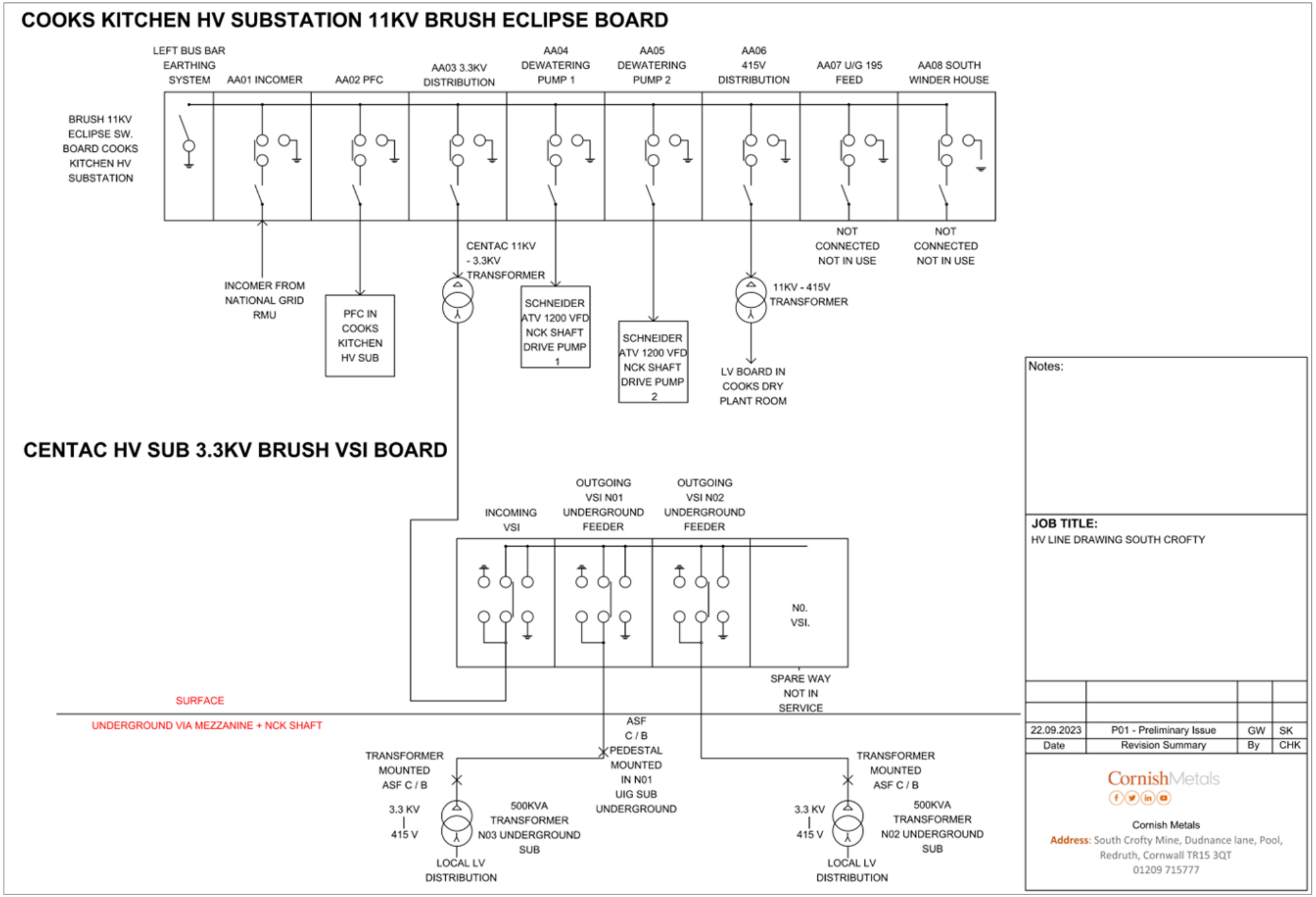
The 3.3 kV network is currently used for underground supplies and will be used for the 195 ftm pump station during the dewatering stage, the 11 kV board feeds the primary side of the 3.3 kV transformer, with the secondary feeding a Brush VSI switchboard, currently supplying two substations located in the Tuckingmill Decline.

South Crofty also has installed a back-up generator to provide emergency power to the mine winders. The generator is a diesel-powered 550 kVA at 415 V which feeds into the LV supply board which supplies the Siemag 2.6 m single-drum winder for re-access into NCK Shaft. In Phase 2 operations the 11 kV switchboard will maintain the second incoming supply for redundancy, as is required by UK Mine Regulations.

18.2.4 Power system – process plant

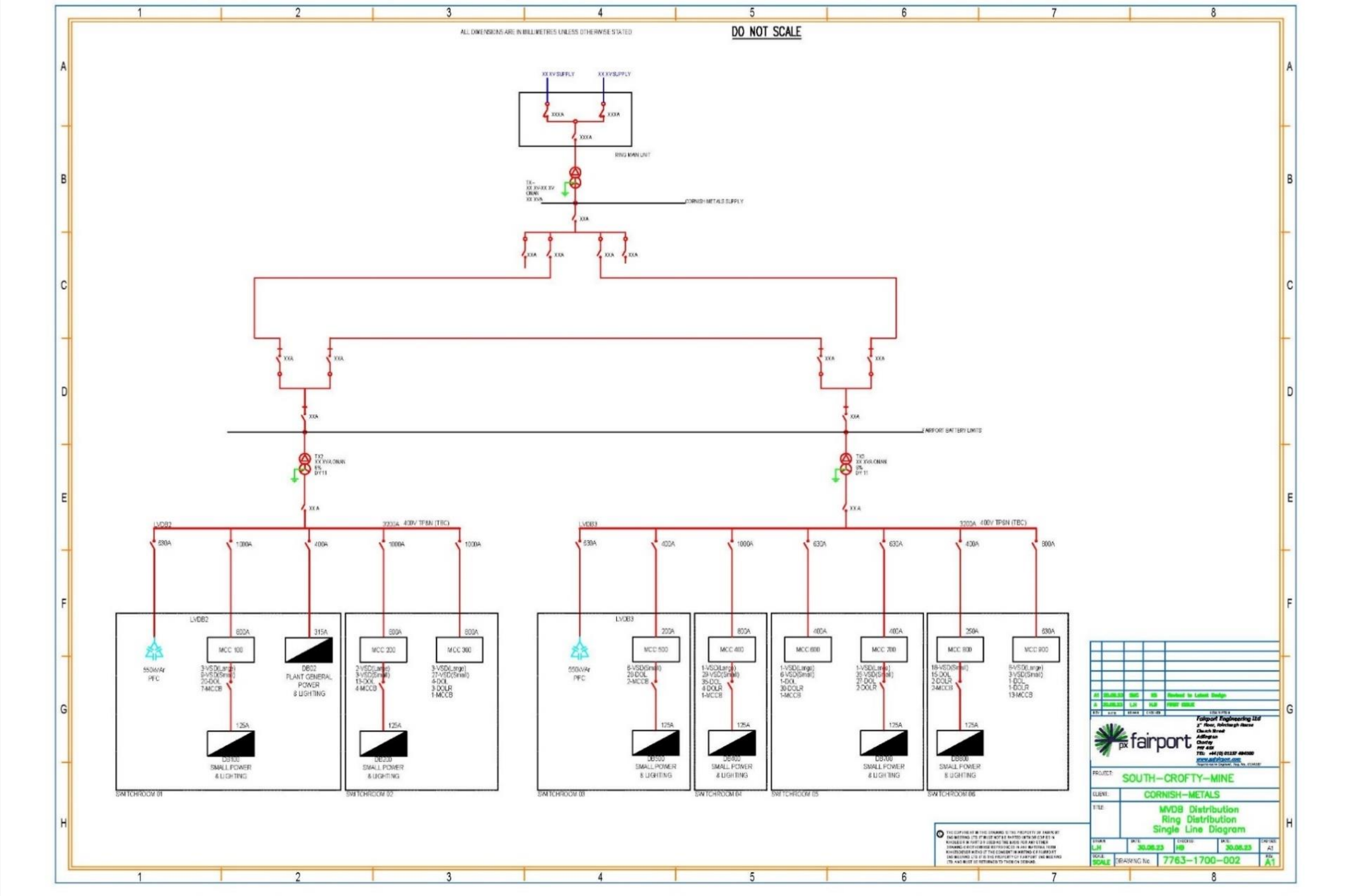
The processing plant will be supplied with 11 kV, with the electrical distribution system capacity at 2.5–3 MVA. Multiple 11 kV-415 V step-down transformers are to be utilised across the plant to supply 415 V distribution panels and Motor Control Panels (form 4 type 2). These panels shall be installed to supply plant equipment, general lighting, and small power and an overall 24VDC control system. Figure 18.4 shows a distribution overview of the plant.

Figure 18.3 Mine electrical single line diagram



Source: Cornish Metals, 2023.

Figure 18.4 Processing plant electrical single line diagram



Source: Fairport, 2023.

18.2.5 Communications

South Crofty site benefits from high-speed broadband internet, with site fibreoptic data links, landline phones, and excellent mobile communication (4G) coverage. A new mine-site-wide radio system will be installed.

South Crofty has also installed fibreoptic cables underground to provide wireless network access into the surface decline, all major access ways and work areas have access points which allows telemetry for ventilation monitors, communications, closed-circuit television (CCTV), and future radio systems. The underground workings also have a ten-pair cable hardline installed for phone communication, 32 phone points are installed within the workings.

The future mine will have fibreoptic cables installed with the new power cables in NCK Shaft, the fibre system be shared multi-channel PON ring network. The main shaft stations will have a switch and UPS installed, the design intention is to have data communication, VOIP, and leaky feeder at shaft stations and main access ways, with leaky feeder in further development.

The underground fibre system, as well as providing communication will allow for data systems to monitor and control pump stations, ventilation and atmosphere (temperature and gases), asset and personnel detection, material handling, blast control, and other data such as CCTV.

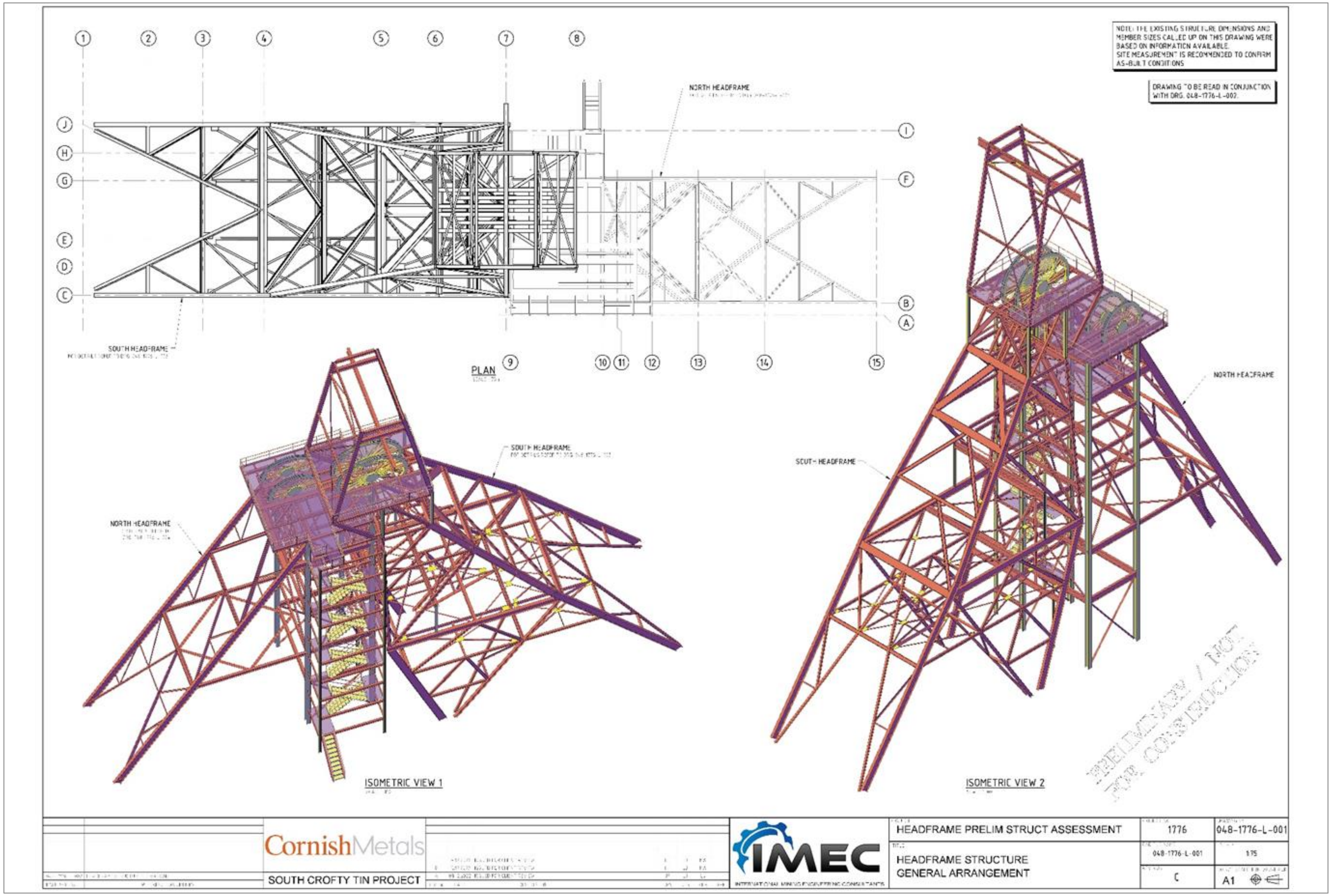
18.2.6 Headframe and hoisting

NCK Shaft is the main operating shaft for South Crofty mine, the shaft has two winding systems, one operating cages for personnel and materials and the second for hoisting rock. Roskear Shaft is located 875 m West of NCK and acted as a secondary egress and materials shaft.

NCK has two separate headframes for the winding systems, the south headframe was originally for rock hoisting, but from 1988 primarily for personnel. It is 130 ft tall (40 m), 100 ft (30.5 m) from bank level to the centre of the sheave wheel. The structure is steel framed “A” type, comprising mainly of standard steel sections with bolted joints. The structure has inclined main legs at the base then inclined raker legs. The north tower was built in 1987 and stands 25.5 m tall, it comprises of steel-framed tower design with supporting raker legs.

The NCK headframes serviced a 770 m deep, four compartment shaft with ground-mounted winders, NCK Shaft will be a primary ventilation intake for the mine, although was temporarily an exhaust raise for the decline development. The south headframe will be reequipped to access the mine during the dewatering phase with a temporary winder which will move to Roskear Shaft in production. A temporary emergency winder and sheave arrangement has been installed on the north headframe for use in the dewatering phase, this winder will also move to Roskear Shaft in production. Figure 18.5 shows the NCK headframe arrangement.

Figure 18.5 NCK Shaft headframes



Source: IMEC, 2022.

A new rock discharge station will be developed 50 m below surface at the existing connection into NCK from the decline access. The new discharge point will include conveyor handling to allow storage of hoisted material into three underground storage bunkers for truck hauling of mineralised material to the processing plant.

The headframe at Roskear Shaft is planned to be rebuilt as per previous design, with a sheave deck at 11.5 m high above the shaft collar. The headframe is a small steel-framed tower design with inclined raker legs and is able to support two separate winders.

18.2.7 Processing plant

The processing plant will be a new construction, partially buried into the hillside close to the Tuckingmill Decline Portal. The plant layout is approximately 120 m L by 70 m W and contains four main bays in a terraced arrangement. The process consists of a two-stage crushing and grinding circuit, pre-concentration, gravity, and tin dressing.

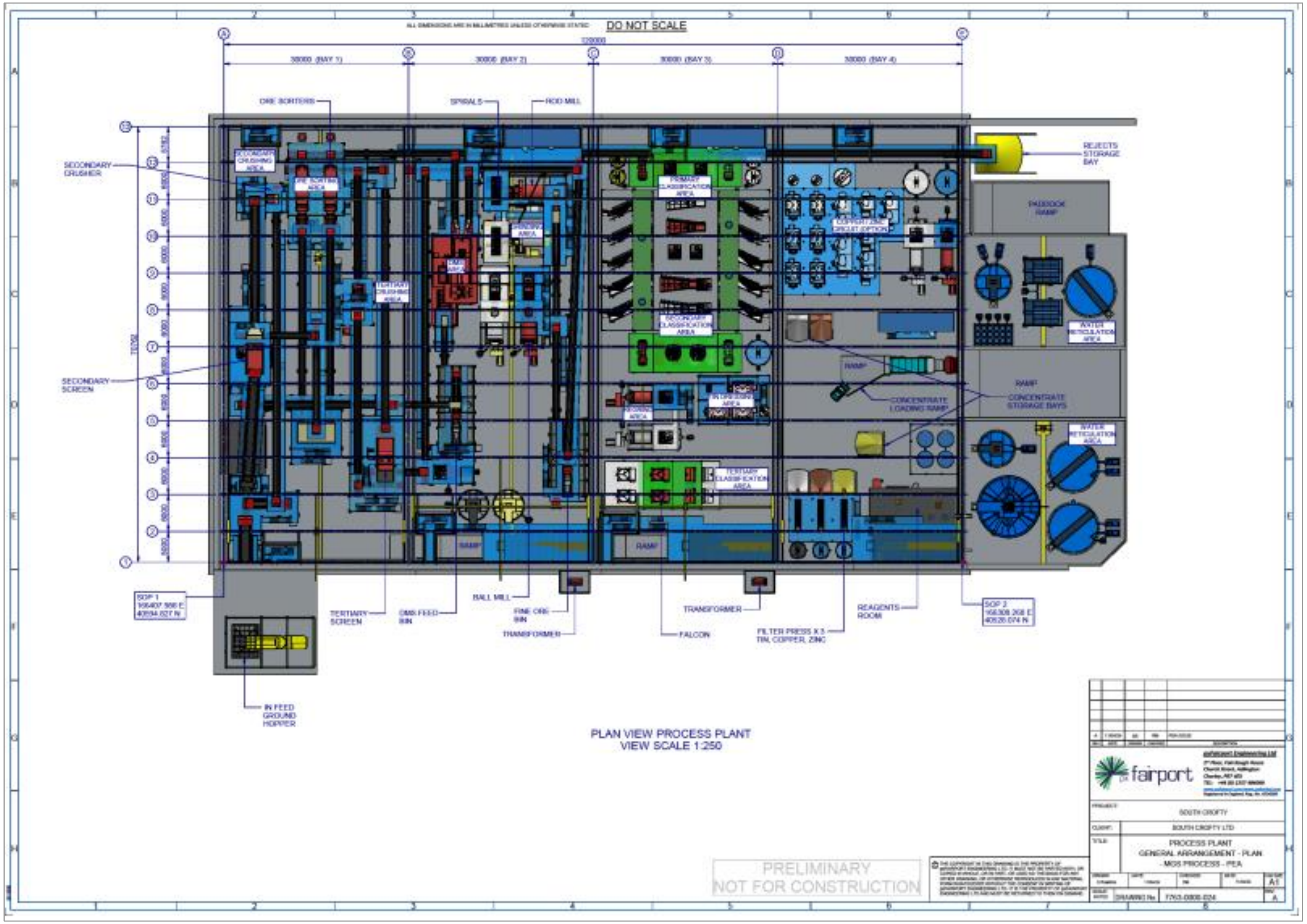
The process plant is based on the flowsheet from Wheal Jane mine, which processed South Crofty ore until closure, updated to reflect modern operating practices. The most significant update is the addition of XRT ore sorting as a pre-concentration stage. Major equipment within the design is listed as follows:

- A secondary cone crusher station, crushed ore storage bins, and transfer conveyors.
- Two XRT ore sorters, compressor plant, tertiary cone crusher, and transfer conveyors.
- DMS plant, ore storage, spirals, ball mill, and rod mill.
- Primary, secondary and tertiary gravity recovery and tin dressing circuits.
- Inclusions for Cu-Zn flotation circuits.

The processing plant has been designed to run as two separate units, pre- and post-concentration, a key feature of the plant is that throughput expansion has included at this design stage, the plant has expanded throughput design of 800,000 tpa. The processing plant is permitted for 24-hour / 7-day week operation.

The pre-concentration plant (secondary / tertiary crushing and screening, and XRT sorting) will operate for a single shift, additional throughput achieved by extending the operating hours. The post-concentration plant (DMS, shaking tables, tertiary gravity, and tin dressing) will operate for 24-hours per day. Expanded throughput capacity will be managed through additional pieces of equipment such as mills, screens, and double-decking shaking tables, which have allocated space in the current design. See Figure 18.6 for the plant layout.

Figure 18.6 Process plant general arrangement - plan view



Source: Fairport, 2023.

18.2.8 Mine water treatment plant (MWTP)

18.2.8.1 General

The MWTP has been designed, built, and commissioned in November 2023 to treat up to 25,000 m^3/day of mine water. The MWTP comprises three parallel treatment streams of identical process. The MWTP design includes flow monitoring which adjusts the submersible pump speed to control the flow of mine water into the MWTP based on river level at the discharge point(s). The MWTP also has active instrumentation and monitoring within the process streams to treat mine water accordingly to meet the discharge consent conditions.

18.2.8.2 Process overview

The MWTP is based on a high-density sludge (HDS) system comprising of three distinct treatment phases as shown below.

Table 18.2 MWTP phases

Phase	Plant stage
1 – Oxidation and Removal of Iron and Arsenic	I – Reaction Tank
	II – Clarifier / Thickener
2 – Manganese Removal	III – Reaction Tank
	IV – Clarifier / Thickener
3 – pH Correction	V – pH Correction Tank

Treated water from the three streams will be combined in a manifold before the treated water will pass through a common water monitoring tank prior to final discharge to either the Red River or the Tuckingmill stream (or a combination of both).

Excess sludge from the plant will be thickened and then stored in an on-site sludge storage tank. This sludge is then to be transported to Wheal Jane for disposal as a slurry.

Hydrogen peroxide will be used to oxidize the arsenic and iron, calcium hydroxide will be used to raise the pH and precipitate the manganese. An anionic polymer will be added as a settlement aid. Carbon dioxide (CO_2) vapour will be used for final pH correction.

18.2.9 Support infrastructure

18.2.9.1 Existing facilities

There are a number of existing facilities on the Project site that will continue to be used during the construction and operations period. These are described in the following sections. The site is serviced with municipal water, electricity, gas, and sewer services for the operation's needs. The site and main infrastructure facilities arrangements planned are presented in Figure 18.7.

Ancillary offices: The existing Cooks Kitchen office will be retained and will have an updated floor plan and extension. The building is a single-storey 16 m by 35 m area and will be updated to include a two-storey 15 m by 17 m extension. The new office will include mine planning, safety, technical services, training, and meeting rooms. The existing building will be converted to include expanded core handling and processing area and laboratory / assay facilities. A modular office building exists on site supporting the current site activities, approximately 5 m by 6 m in size. This office will be repurposed once the mine is in operation.

Mine office / dry facility: The existing mine dry (miners change room) at NCK Shaft will be maintained for continued use. The building is single-storey 19 m by 46 m and currently houses a workshop, maintenance facilities, and stores with limited change-room facilities.

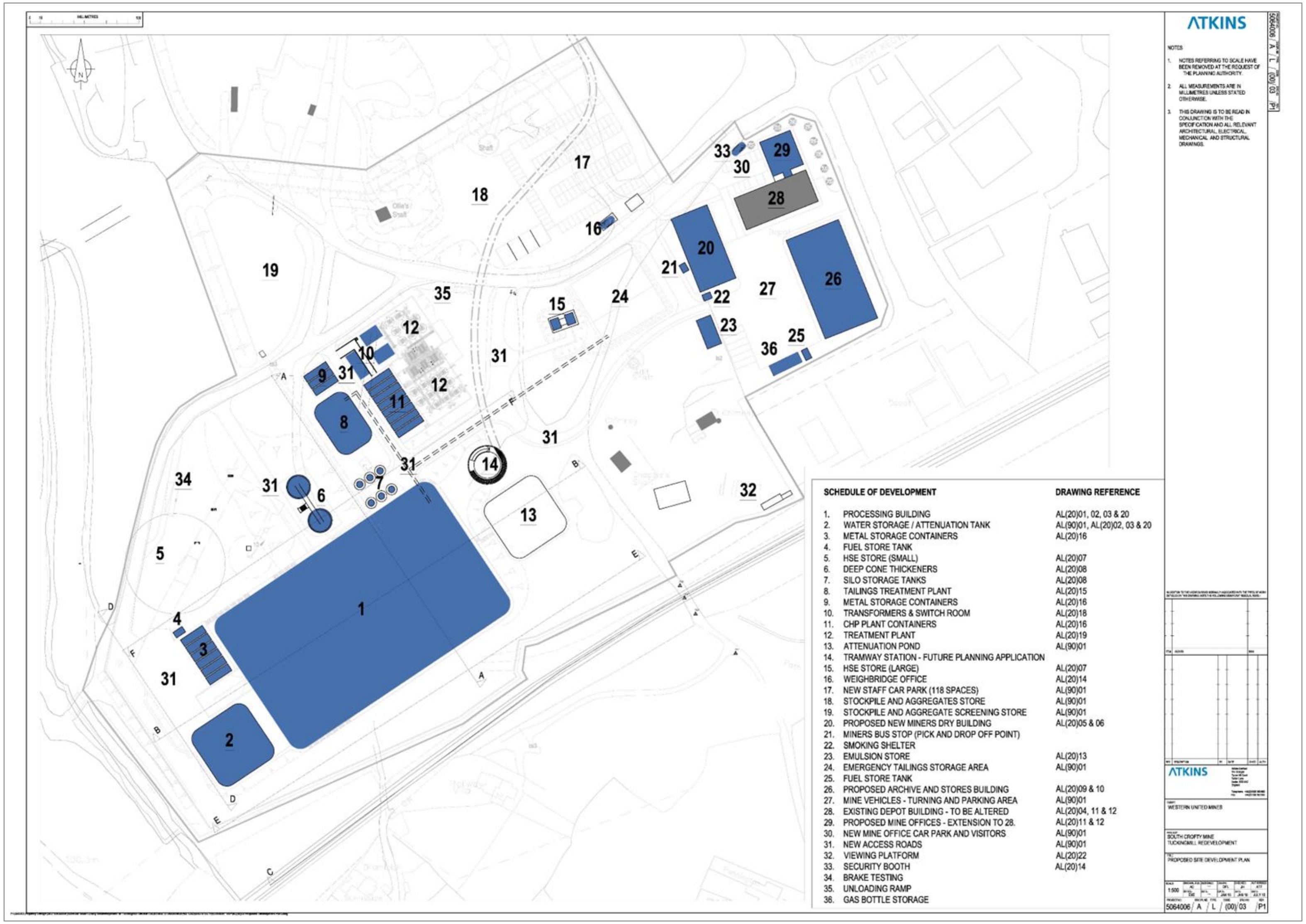
18.2.9.2 New facilities

Processing building: The processing building is sited immediately to the south-east of the existing Tuckingmill Decline portal, aligned adjacent to the decline and sited as to avoid any potential impacts on the railway line embankment. The building is partially buried to minimise impacts on engine houses at Chappell's Shaft to the north-east of the proposed plant location. The plant's location adjacent to the existing decline for ease of materials handling.

Tailing treatment and emergency tailings: The backfill plant and associated equipment will be located to the north of the processing building. The treatment process will remove excess water from the tailings and enable recycling of that water for reuse in the processing plant. The backfill plant has been designed at 30 m^3/h capacity, set on a concrete-base below existing ground levels to reduce the visual impact. Six 3 mØ silos, will be sited adjacent to the plant to be used in the treatment process. Any runoff will be contained in the backfill compound.

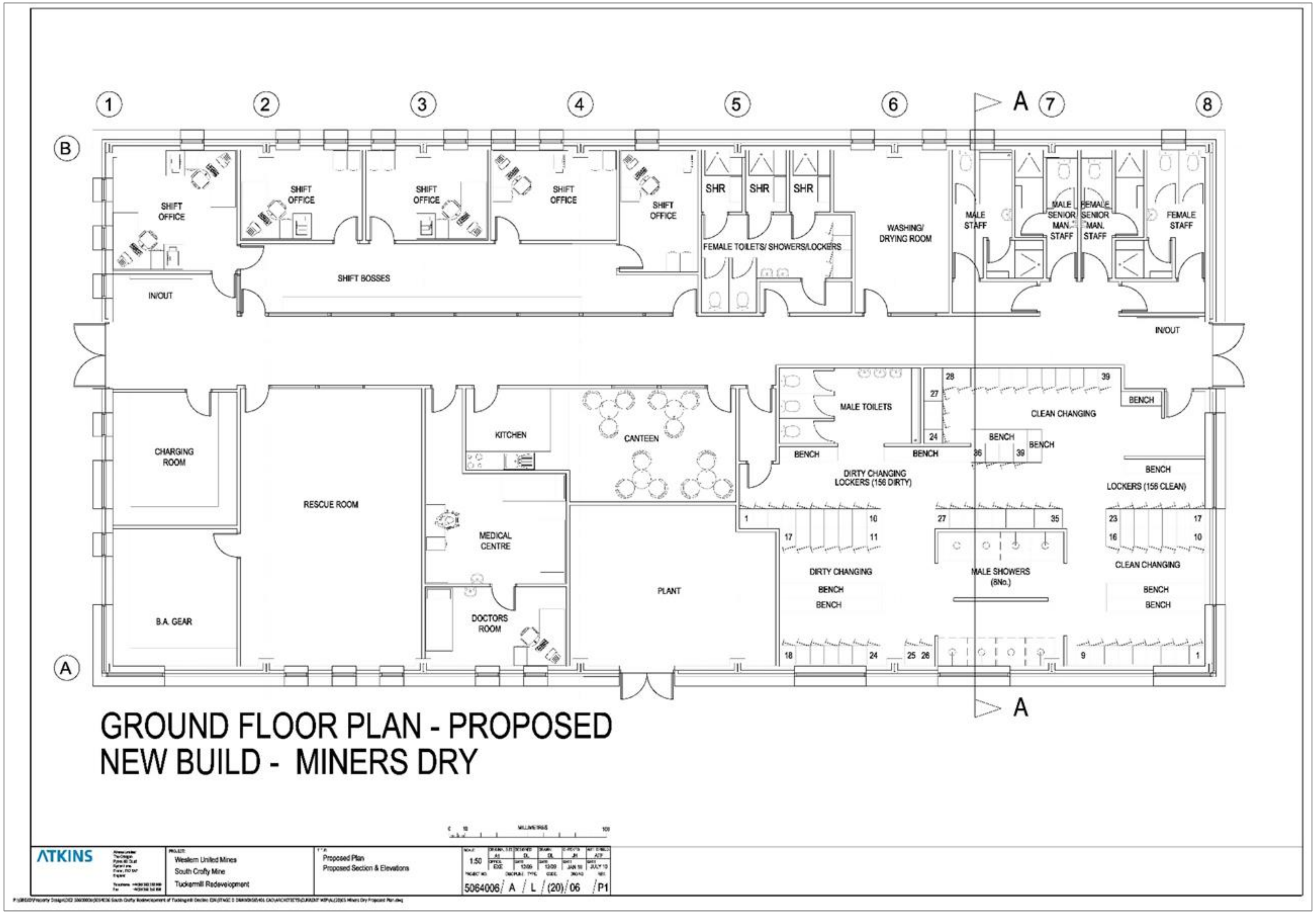
When the backfill plant and infrastructure requires maintenance or modification, an emergency storage facility will be used to enable the processing plant to continue operating for up to one week. This emergency storage area is situated to the east of the plant due to the topography of the ground. The emergency tailings store is 2,500 m^3 capacity and includes a 1 m bund around its perimeter.

Figure 18.7 Main plant and infrastructure (planned)



Source: Atkins, 2010A.

Figure 18.8 Miners dry floor plan



Source: Atkins, 2010.

Miners dry: A new single-storey building will serve as the mine dry, the design will consist of an 18 m by 36 m floor plan with personnel lockers and shower facilities, shift supervisor offices, mine rescue room, and medical facilities. A floor plan for each level is provided in Figure 18.8. The mine dry will service a 39-person shift, with lockers and storage for two shifts at a time. A separate women's area will accommodate up to 12 people.

Health and Safety Executive (HSE) stores: The store will be built to UK HSE standards. The stores are located outside the legal minimum distances to other structures and public footpaths. The site will be bunded and landscaped around security fencing.

Electricity substation: The mine and associated plant will have an estimated 7 MVA demand load, a new substation will be constructed adjacent to the 33 kV lines which cross the site and near to the processing plant and underground mine accesses, the largest power consumers.

Fuel storage: Two fully bunded and alarmed fuel stores will be provided, one adjacent to the mine access and one at the ancillary buildings.

Secondary aggregates plant: An aggregates screening and reclaim area is planned to the north of the processing plant, this site will manage the pre-concentrator rejects as well as any waste material which is hoisted to surface. The screening operations are planning in accordance with the planning permission operating times of 08:00 to 18:00 Monday to Friday. The area is 2,100 m^2 and will have mobile equipment to screening secondary aggregate material.

Security and site access: All public access will be through a single 24-hour controlled security entrance. A prefabricated building will serve as the site security entrance control facility and will be equipped with site monitoring systems. Existing security gates and fencing will be used, and new gates installed as required at road accesses.

The main haul-road serving the processing plant will be surfaced to reduce road noise and dust. A weighbridge and wheel wash will be located near the main entrance to prevent vehicles leaving the site spreading mud or dust.

A secondary entrance for emergencies will be maintained adjacent to the existing entrance and allow HGV access for deliveries to the water and tailings treatment plants, explosives store, and processing plant directly off Forth Kegyn Road.

Site roads: Existing site roads will be upgraded for either mine or maintenance access. The mine roads will be for two-way traffic, with 6 m useable width and safety berms, maintenance access roads will be 3 m wide.

Screening bunds: Screening bunds will be developed to prevent visual impact and also to deflect nuisance noise from operations. The main bunded area will be to the north of the mine site from the secondary aggregate processing area. Additional vegetation and tree planting is planned to further screen the operations.

18.2.10 Mobile equipment

A list of mobile equipment has been estimated for the site services is shown in Table 18.3. Surface equipment and operations to handle the hoisted rock from the underground mine to the processing plant and XRT rejects from the processing plant to the secondary aggregates area will be managed by the owner-operated equipment.

Table 18.3 Site mobile equipment

Equipment	Operating description	Number
Light Vehicles	4x4 Vehicles	4
Telehandler	Site Services	1
12T Wheel Loader	Backfill Plant / Site Services / Aggregate Area	1
30T Excavator	Secondary Aggregates Area	1
Tracked Screening Plant	Secondary Aggregates Area	1
Portable Diesel Generator Light Plant	Safety Lights for night works and maintenance	2

Source: Cornish Metals, 2024.

18.2.11 Water management

The South Crofty site drains to the west and directly into the Red River. The Red River is designated as a problem drainage area by the EA and as such requires any surface water runoff to be restricted to greenfield run off rates to a maximum of the 1:10 year event, with any surplus water stored on site for up to the 1:100-year storm event plus an allowance for climate change.

An attenuation pond will provide 1,500 m^3 of on-site storage at the eastern end of the main processing plant building, supplemented, if necessary, by underground attenuation tanks serving the new buildings to the north-east (main store, office and miners dry) and a holding tank.

Runoff will be restricted by maximising the amount of permeable surface treatment at the site. However, the main internal access route will be paved to minimise the potential for dust generation. In addition, at the western end of the site where there is access to the mine and the processing plant, the area will be protected by a bund which will prevent potential accidental contamination of the river from spills or from the number of vehicle turning movements in this area. This lower area will be drained to Water Engine shaft and will be pumped back up to the attenuation pond via an oil water interceptor.

18.2.12 Waste management

Local registered landfill will be used for inert solid waste disposal for construction and operations. The current practice of using local disposal will continue to be used for non-hazardous construction waste, with disposal bins located near the main site.

Anticipated hazardous wastes consist primarily of oils, process reagents, and laboratory chemicals. Waste oils will be recycled by trade waste suppliers. Most reagents and chemicals will be consumed during the processing, and the remainder will be recycled with the supplier.

All reagent containers will be washed using fresh water in contained areas at the re-agent storage area or mix-up location. Containers will be disposed of or recycled with the supplier in accordance with local regulations.

Clean up of spills of hazardous materials on site will be given the highest operating priority and will generally involve the excavation of contaminated soils, neutralisation of the affected site, and disposal and / or neutralisation of the affected soils on site or at a licensed facility off-site. The site surface equipment will be made available for use in such circumstances.

19 Market studies and contracts

Market studies to support this PEA were completed by Project Blue. The QP has reviewed the Project Blue analysis and is of the opinion that the results presented therein are reasonable and suitable for inclusion in the PEA.

There are no current agreements or forward sales tin contracts in place. The project is open to the spot price market for tin, copper, and zinc.

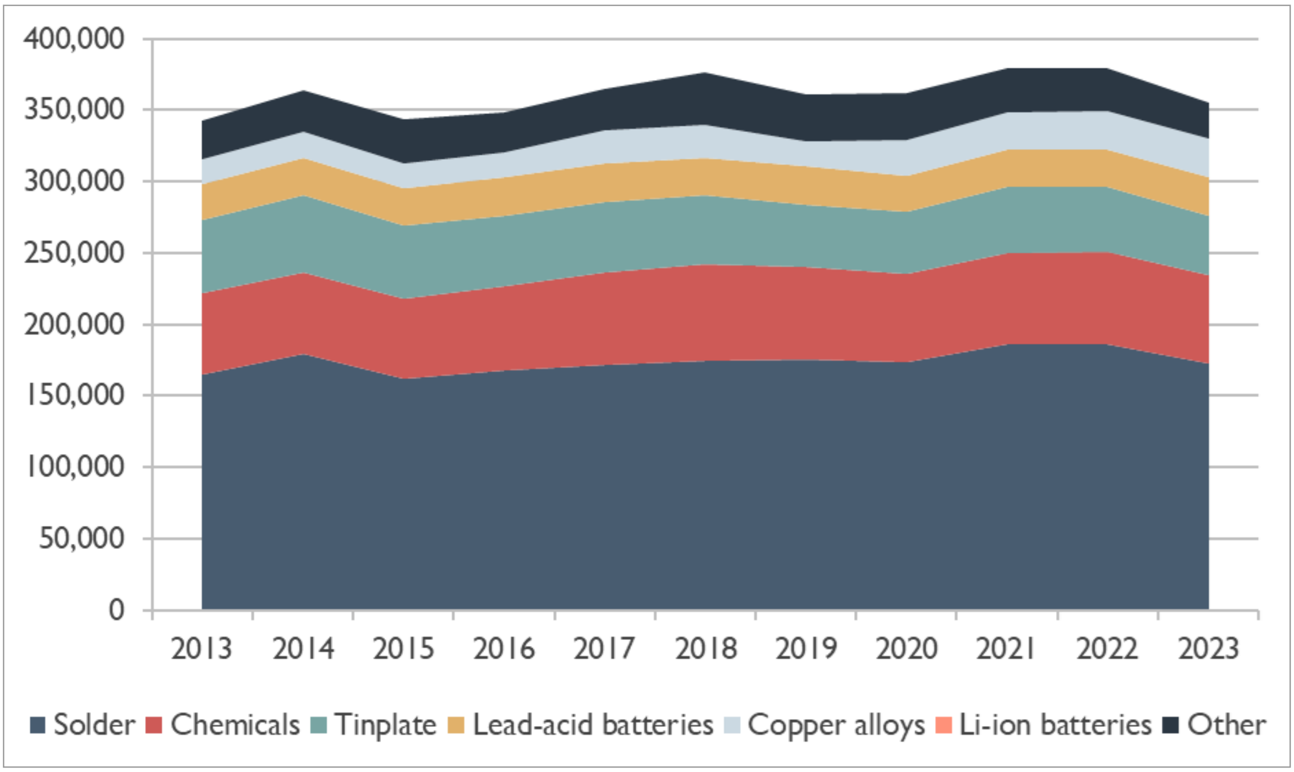
The Project's primary production metal is tin; therefore, Cornish Metals commissioned a market study analysis, which was undertaken by Project Blue. The analysis short-term to medium-term price projection (2024-2026) suggests an average LME tin cash price of US$26,000/t and a long-term price (2027-2040) averaging approximately US$31,000/t. The projected long-term price of US$31,000/t has been used in the South Crofty economic assessment, along with a copper price of US$8,000/t and a zinc price of US$2,500/t. The copper and zinc price projections have been based on World Bank approximate two-year trailing averages at January 2024.

19.1 Consumption and uses

Annual tin demand has averaged approximately 360 ktpa over the last decade. Over the period, the general trend has been an increase in demand (on average 1.2% per year), with annual variations underpinned by dynamics of various end-use sectors.

Tin consumption is diversified across several primary markets, including solders, chemicals, tinplate, lead–acid batteries, and copper alloys. Soldering represents the foremost use, constituting approximately 50% of refined tin consumption. Widely employed in bonding metals, solder finds extensive applications across multiple industries in electronics, electrical engineering, plumbing, automotive manufacturing, jewellery crafting, and renewable energy infrastructure. Figure 19.1 shows world annual consumption of tin from 2013 to 2023.

Figure 19.1 Tin consumption by use (t Sn)



Source: Project Blue, 2024.

Following soldering, chemical compounds constitute the second-largest utilisation of tin, predominantly in stabilising polyvinyl chloride (PVC). Tinplating is the third major first-use category for tin. Tinplate, a type of steel coated with a thin tin layer, primarily serves for preserving perishable foods.

Lead–acid batteries and tin alloys such as bronze or pewter account for a relatively small portion of initial tin product consumption. Tin is also used in numerous niche applications, including low-temperature casting alloys, bearing alloys, tin-infused cast iron, collapsible tubes, dental fillings, superconducting magnets, and aerospace industry alloys.

19.2 Tin ore and concentrate production and producers

Tin is mined from two types of deposits: primary deposits (hard rock) and secondary deposits (placer).

Asia stands as the global leader in both tin reserves and production capacity. In 2023, Indonesia, China, and Myanmar (despite the tin mining and processing suspension in the Wa State), were the top three tin-producing nations, collectively contributing almost 60% to global output. Additionally, Malaysia, Vietnam, and Thailand, notable contributors in this region, collectively accounted for 3% of primary tin supply. Placer deposits are predominantly mined in this region, although scattered hard-rock mining operations also exist.

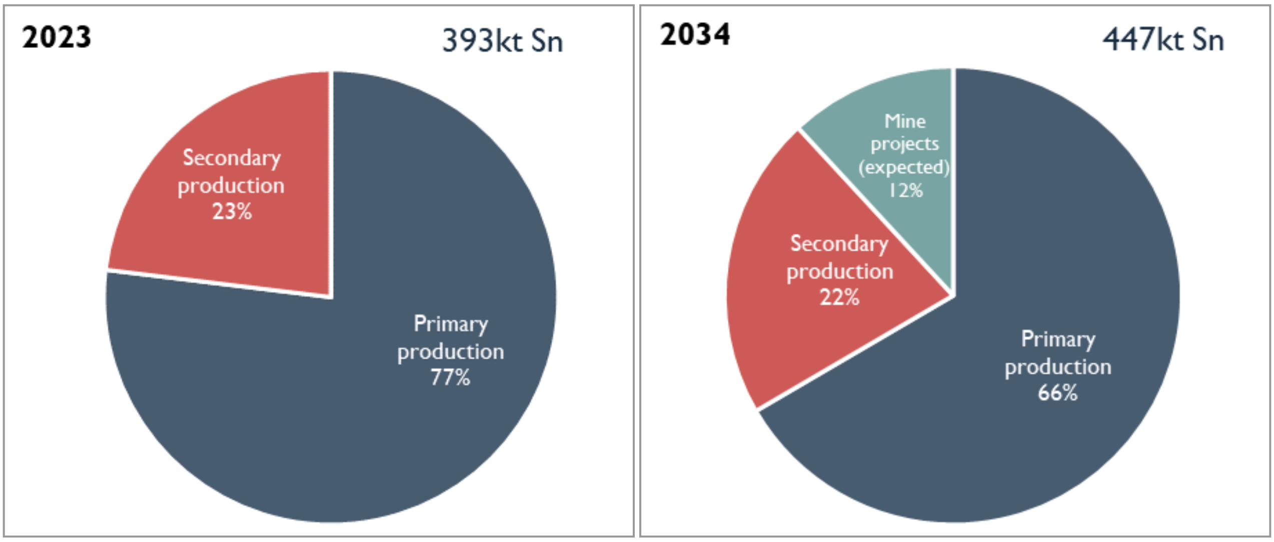
In 2023, South America ranked as the world's second-largest tin-producing region, contributing 23% to global production. Brazil led South American production, followed by Peru and Bolivia. Operations in Peru focus on extracting and refining complex ores into tin concentrate. Operations in Brazil engage in mining hard-rock deposits and also tap into significant placer deposits. Bolivia also contributes significantly to the region's output.

Recently, the Democratic Republic of Congo (DRC) has become a significant presence in tin production. Ranking as Africa's largest producer and the sixth largest globally, the DRC contributed 6% to global primary tin output in 2023. Other notable African countries involved in tin production include Burundi, Namibia, Nigeria, Rwanda, and Uganda.

Australia boasts substantial reserves and has maintained a notable presence as a tin producer. In 2023, Australia contributed approximately 3% to global primary tin supply. Within Europe, Russia, Spain, and Portugal also participate in tin mining, albeit at relatively small scales. The UK generated some concentrate in 2023 and is home to several projects that hope to enter production over the coming years, including Cornish Metals' South Crofty Project.

Project Blue is tracking more than 20 primary tin mining projects globally at various stages of development that have the potential to come online. By the end of the decade, up to 12% of total feedstock is expected to become available for refined tin production (Figure 19.2).

Figure 19.2 Tin feedstock supply in 2023 and outlook for 2034



Source: Project Blue, 2024.

Tin can be obtained from recycling as another route for refined supply. This process occurs predominantly in Belgium, Poland, China, the UAE, the USA, and Japan. Tin concentrate and metal are typically reclaimed from various sources, including tin dross / slag, tinplate trimmings, bearing metals, tinplate cans, scrap obtained from bronze items, soldered ware such as automobile radiators, lead–acid batteries, and electronic waste (e-waste).

19.3 Refined tin production and producers

Tin concentrate is refined into tin metal in Southeast Asia, South America, and, to a lesser extent, in Europe and Africa. Significant producers of refined tin from secondary sources, including recycled metal, that contribute to global refined tin output are located in Europe and China. In 2023, China, Indonesia, and Peru were the top three refined tin-producing nations, collectively contributing almost 78% to global refined tin output. Other notable players include Malaysia, Bolivia, Thailand, and Brazil, which together accounted for more than 16% of global refined tin output.

In 2023, Southeast Asia ranked as the world's largest refined tin-producing region, contributing approximately 80% to global refined tin output. China led production in the region, followed by Indonesia, Malaysia, Thailand, and Vietnam. While these smelting operations have access to material derived from the Southeast Asian Tin Belt, they are known to rely on significant tin concentrate imports to supplement supply from domestic operations.

South America ranked as the world's second-largest tin-producing region in 2023, accounting for approximately 15% of global refined tin output. Peru led production, followed by Bolivia and Brazil. Peru maintained high production levels even though operations were impacted negatively by unrest during the first quarter of 2023.

Elsewhere, smelting operations in Russia and Rwanda produced refined tin, albeit on a relatively small scale. Notably, significant producers of secondary tin in Belgium and Poland also contributed to global refined tin output in 2023.

19.4 Marketing and distribution

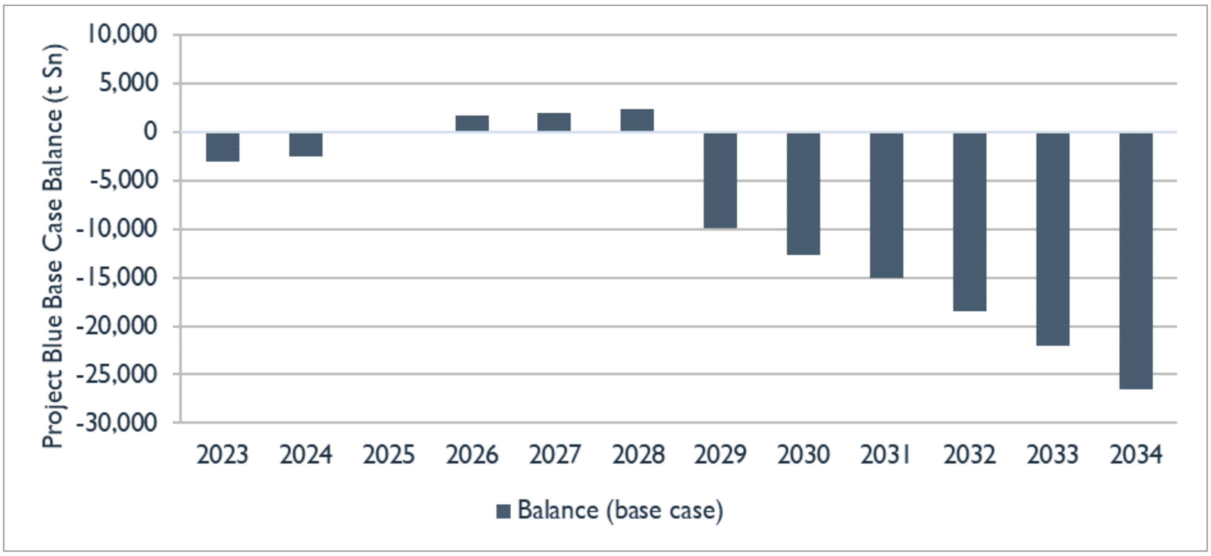
In 2023, Project Blue estimated that global tin-in-concentrate production reached 390 kt, with 77% (300 kt) sourced from primary mining. Cornish Metals' South Crofty Project is projected to yield between 4.5–5.0 kt of tin-in-concentrate at full capacity. Considering South Crofty's impact on the tin market, the project's projected output would contribute an estimated 1.7% of global primary tin supply in 2034, establishing it as Europe's largest primary producer. Additionally, the supply sourced from South Crofty is from a conflict-free country and would be an attractive source for smelters overseas.

19.5 Market outlook and tin prices

Project Blue's base case scenario factors in projected tin demand, refined tin production from existing mines, anticipated capacities of upcoming mining projects within the next decade, and the supply from recycling. Over the past decade, tin demand has fluctuated but maintained a modest growth rate of 1.2% annually. This growth has been propelled primarily by tin solder applications across the telecommunications and portable electronics sectors. Project Blue anticipates these sectors to continue as key drivers of tin demand, while also identifying potential opportunities in emerging applications, such as lithium-ion battery technologies, capable of further elevating tin demand. Project Blue forecasts a modest growth in tin demand over the next decade, projecting global demand to grow by 2.7%py to exceed 463 kt by 2034.

Refined tin production is projected to increase at a similar rate per year over most of the forecast period. Despite this growth, the Project Blue base case analysis indicates an anticipated near-term deficit in the market. As project capacities reach full potential, a brief period of oversupply is expected to occur from 2026 to 2028. In 2028, key tin concentrate-producing operations such as Minsur's San Rafael and B2 Plant are expected to deplete their known reserves, potentially creating a supply shortfall. In addition, a gradual decline in production from existing domestic operations in China and Indonesia is expected to put pressure on available supply. Project Blue anticipates that these supply shortfalls will drive the market into a deficit that will extend over the forecast period (Figure 19.3).

Figure 19.3 Tin market balance outlook (Project Blue base-case)



Source: Project Blue, 2024.

19.6 Tin prices

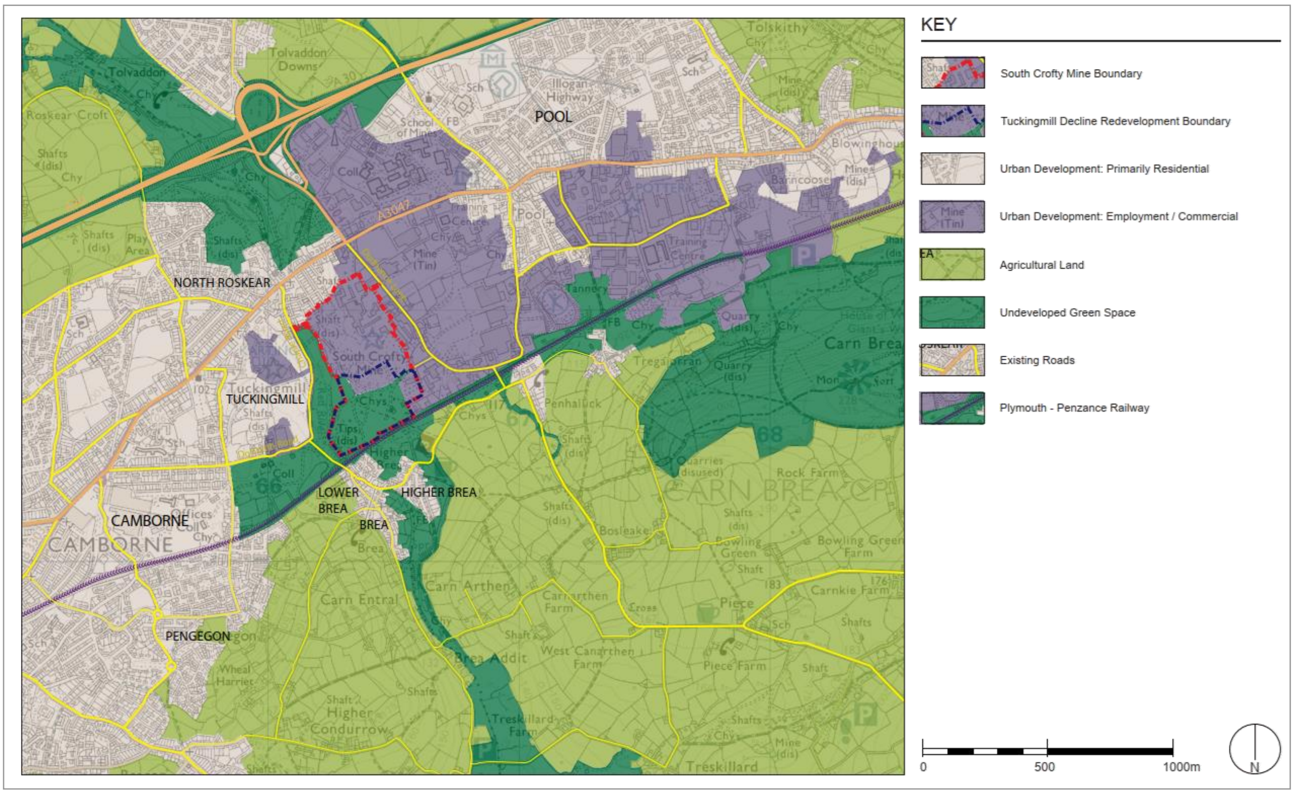
LME tin prices fluctuated substantially over the past decade, notably distinguished by two periods - one (pre-onset of the COVID-19 pandemic) and another (pandemic onwards). Pre-pandemic LME cash tin prices maintained an average of US$20,000/t. Subsequently, prices soared to record highs in 2021 and 2022, averaging US$32,000/t, before receding to an average of US$26,000/t in 2023. These price swings were attributed primarily to supply and demand dynamics linked to production disruptions at major producers, and inflation and consumer sentiment related to portable electronics. Project Blue's tin forecast anticipates similar dynamics of deficits and oversupply to impact future prices. Project Blue's short- to medium-term price projection (2024-2026) suggests an average LME tin cash price of US$26,000/t (US$ 2024 Real) and a long-term price (2027-2040) averaging approximately US$31,000/t (US$ 2024 Real), reflecting these anticipated market dynamics.

20 Environmental studies, permitting and social or community impact

Information on environmental studies, permitting, and social / community impact relating to the development at South Crofty, and where relevant, any known environmental and / or social issues that could materially impact the ability to extract mineral is presented in this section.

Figure 20.1 presents the indicative land use for the area in the vicinity of the proposed development.

Figure 20.1 Indicative land use in the vicinity of South Crofty Mine



Source: SLR, 2024.

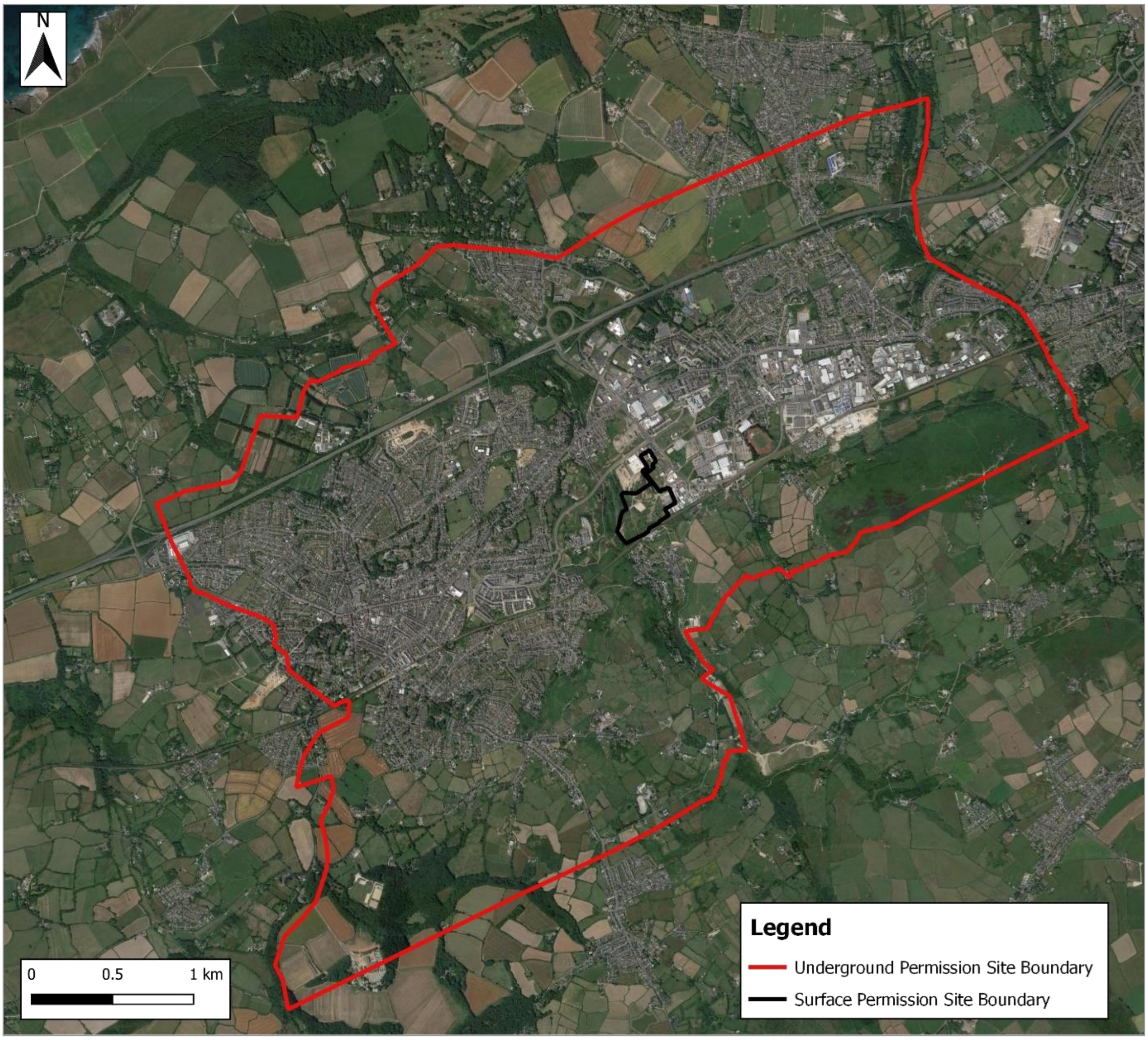
The two main planning permissions relevant to this development are the surface and the underground consents for the site, see Figure 20.2. The Planning history for the surface consent is set out below.

20.1 Surface planning consent

Planning permission **PA10/04564** was granted by Cornwall Council on 3 November 2011 for:

"The proposed modernisation of South Crofty Mine to allow continuation of winning and working of minerals by relocation to land surrounding the Tuckingmill Decline and by erection of buildings, plant and works for ore processing, ancillary processes, associated operations and deliveries, comprising:- Main Processing Plant Building also containing associated engineering works for additional accesses to underground mine, HSE Stores, Aggregate Store, Electricity Substation, Fuel Storage, Tailings Treatment, Emergency Tailings Store, Ancillary Buildings (high density thickeners, security, pumped minewater storage, loading ramp, chemical silo's, bottled gas compound, offices, changing rooms, stores, archive, vehicle and plant maintenance, storage containers), Earth Works, Mine shaft ventilation caps, Surface water management, Water Treatment Plant, Access Roads, Car park areas, weighbridge and wheel washes, aggregate screening and stockpiling area".

Figure 20.2 Plan showing extent of surface and underground permissions



Source: SLR, 2024.

20.1.1 Environmental Impact Assessment - Surface consent

The 2010 planning application was considered under the Environmental Impact Assessment (EIA) procedures and considered to be EIA development as confirmed by Cornwall County Council (as the LPA) in their Screening Opinion dated 23 March 2007, along with subsequent Scoping Opinion dated 2 May 2007 which set out and agreed the scope of topics required for an ES to accompany the planning application.

The aim of an EIA is to enable decision makers to understand the likely environmental impacts that a project may have on the environment and, where applicable, identify mitigation measures that can be put in place to avoid, reduce, remedy, or compensate for the identified adverse environmental impacts, or indeed to create or enhance environmental benefits. Mitigation measures may include the following:

- Changes to the scheme design during the design process.
- Physical measures applied on site.
- Measures to control operational or construction procedures.
- The provision of like-for-like replacement or compensation.

20.1.2 Environmental studies

Technical studies were commissioned on the topics requiring inclusion in an EIA. The main text of the ES details the project description and EIA approach, and provides a summary of the assessment of effects for the following topics:

- Flood Risk and Surface Water Drainage (Atkins, January 2020)
- Landscape and Visual (Atkins, January 2010)
- Land Quality (Atkins, January 2010)
- Ecology (Leppitt Associates, January 2010)
- Traffic and Transport (Atkins, January 2010)
- Air Quality (Atkins, January 2010)
- Noise and Vibration (Atkins, January 2010)
- Socio-Economics (Atkins, January 2010)
- Cultural Heritage (Basererult Holdings Ltd, February 2003)

Each of the technical sections contained within the ES was structured as follows:

- Introduction
- Approach and Methodology
- Existing Situation
- Potential Impacts
- Mitigation Measures
- Residual Impacts
- Summary of Effects and Conclusions

The final section considers the Overall Significance and Cumulative Effects.

All of the above documents are publicly available to view in full, on the Planning Authority's website.

20.2 Underground consent

Planning permission **PA10/05145** was granted by Cornwall Council on 7 January 2013 for the:

"Proposed consolidation and extension of planning permissions for underground winning and working of minerals".

Condition 2 of the planning permission requires that winning and working of minerals to cease by 30 June 2071, unless a further permission has been granted.

20.2.1 Environmental Impact Assessment - Underground consent

On 2 May 2007, under the Town and County Planning (EIA) (England and Wales) Regulations 1999, Regulation 10, the MPA provided its Scoping Opinion as a detailed but not exhaustive list of issues for reference when carrying out the EIA and preparing the ES. Given the underground nature of the development, and the absence of a surface footprint, it became apparent that several of the topics were of limited relevance to the proposals, most notably landscape and visual effects, ecology and effects on protected species, archaeology / cultural heritage, and effects on recreation / public footpaths.

20.2.2 Environmental studies

The following studies in support of the EIA were carried out:

- Hydrology / hydrogeology
- Noise
- Blast vibration
- Air quality

20.3 Social / community requirements

Planning Permission conditions require the operators to be responsible for convening regular Local Liaison Group meetings in accordance with details to be agreed in writing by the MPA. These details include the constitution of the Group, along with the frequency of meeting.

Regular liaison meetings are held with attendees including representatives from Cornish Metals, Illogan and Portreath County Council, Camborne Town Council, Red River Rescuers, Redruth Town Council, Cornwall Council, Carn Brea Parish Council, National Trust the Community Link Officer, EA, and Drillserve, along with County Councillors.

Meeting minutes capture a range of topics relevant to the site and include a wide range of topics. Minutes are circulated and kept on record.

20.3.1 Economic and social impacts

Economic and social impacts of the proposed modernisation of the mine and its significance can be summarised as follows.

Production and employment:

- Production of a wide range of polymetallic concentrates including copper, zinc, tin, and other minerals, contributing to the balance of trade.
- The retention of 66 jobs and the creation of 156 further principally skilled jobs at South Crofty mine; with a further 222 jobs created indirectly.
- Economic activity during the 15-month construction phase.
- The enabling of a further 750 full-time jobs through the associated mixed-use development through the Dudnance Lane and South Crofty framework.

Wider regeneration:

- Release of land for the East West link road, which is a fundamental requirement underpinning the regeneration aspirations of the CPR area, bringing forward valuable mixed-use development.

Heritage and recreation:

- Enhancement of the South Crofty visitor experience, formalising footpath routes with links to wider heritage trails and consolidating listed structures.
- A revival of the area’s primary employment base will refresh its cultural and social heritage.
- Cultural links to Robinson’s Shaft visitor centre.

It is considered that there is a positive psychological effect of the boost to local confidence, evidenced by the wide public and press interest in the proposals for the reopening of the mine.

The development is acknowledged at national, regional, and local level as an important component of the wider regeneration scheme.

The assessment is that the production, employment, and regeneration impacts have significant and highly important benefits.

The impacts on Heritage and Recreation are of medium importance and moderate beneficial significance. The positive psychological effect on public confidence is of local importance and significance.

Finally, it is worth noting the status of tin as a 'critical metal' as recognised by the UK Government. Tin is a mineral that plays a pivotal role in the production of many common items, such as consumer electronics, packaging materials, and alloys for the aviation and automotive industries. Tin's resistance to corrosion and its malleability makes it an ideal material for the production of solder, used to join electronic components on printed circuit boards.

From a demand perspective, tin remains vital in the production of an array of products and is increasingly found in green technologies such as electric vehicle batteries. Along with increased demand for commodities such as lithium, cobalt, nickel and graphite, tin's demand in the EV sector (as solder) has seen it move to the highest proportion of demand.

Tin is also recognised by the EU as a 'conflict metal', under the 'Conflict Minerals Regulation' 2021. The regulation requires EU companies in the supply chain to ensure they import 'conflict metals' from responsible and conflict-free sources only.

20.4 Environmental permitting

20.4.1 Permitting legislation, agencies, and permitting process

20.4.1.1 Permitting legislation

The legislation that implements the requirements for Environmental Permits (EPs) in England is the Environmental Permitting (England and Wales) Regulations 2016 (as amended) (hereafter referred to as the EPR).

The EPR requires operators to obtain EPs for certain activities, for example activities that could pollute air, land, or water, increase risk of flooding, or adversely affect land drainage. Such activities are known as 'regulated facilities'.

The principal offences under the EPR are operating a regulated facility without a permit and failing to comply with a permit condition or statutory notice.

The abstraction of water is regulated under a separate piece of legislation. Water abstraction licences are issued under the provisions of The Water Resources (Abstraction and Impounding) Regulations 2006 (Water Resources Regulations).

20.4.1.2 Permitting agencies

The nature and class of regulated facility determines the agency responsible for its regulation.

The EA regulates a range of different facilities including large and more complex installations (known as Part A(1) installations), waste operations, mining waste operations, water discharge activities, groundwater activities and flood risk activities.

Water abstraction is also regulated by the EA.

The relevant Local Authority (in this case Cornwall Council) regulates the smaller and less complex installations (known as Part A(2) and Part B installations).

20.4.2 Activities requiring permits

Having regard to the activities proposed at the South Crofty mine and the specific provision of the EPR and Water Resources Regulations, there are a number of activities that are defined as 'regulated facilities' and a number of EPs and a water abstraction licence will therefore be required. There are also some activities that may require a permit depending upon specific circumstances.

The activities requiring EPs and a water abstraction licence are as follows:

- Mineral processing.
- Water treatment.
- Treatment of waste process water from mineral processing.
- Disposal of sludge from water treatment process.
- Manufacture of secondary aggregate.
- Mining waste operations.
- Water discharge.
- Flood risk activities.
- Water abstraction.

20.4.3 Existing permits

Cornish Metals have already secured a water abstraction licence and EP for a number of the 'regulated facilities' proposed at South Crofty.

20.4.3.1 Water abstraction

A licence to abstract water was issued by the EA on 20 January 2020 to WUM (now known as Cornish Metals Ltd) under Licence Serial No: SW/049/0026/005.

This licence authorises the abstraction of water from underground strata comprising Granite at NCK Shaft, South Crofty Tin Mine, Pool, Redruth, at National Grid Reference SW 66447 40969.

The water is to be abstracted for the purpose of dewatering for mineral extraction via a series of pumps from a mine shaft not exceeding 859.5 m deep. The abstraction can take place all year round.

All abstracted water must be returned via the Dolcoath Adit to the Red River at SW 64828 41885 and SW 66236 40516.

It is noted that the licence is time limited with a current date of expiry of 31 March 2027 to reflect the timing of a future review by the EA of the catchment resources available.

Renewal of a licence is typically straightforward for existing licences where there is a clear continued need, however in order to secure an extension of time it will be necessary to demonstrate that there is no damage to the environment, the need for the abstraction can be justified and that the water is being used efficiently.

20.4.3.2 Water treatment, water discharge, and flood risk

On 19 October 2017, the EA issued an EP under permit reference EPR/PP3936YU. The permit authorises the treatment and discharge of up to 25,000 m^3 per day of mine water from South Crofty mine into the Red River. The permit also authorises the following:

- The flood risk activities associated with the discharge into the Red River.
- Temporary storage of the hazardous sludge generated from the effluent (water) treatment plant pending off-site removal.
- Handling and storage of chemicals for use in the effluent treatment plant.

The objective of the treatment process is to improve the water quality prior to discharge into the Red River by reduction of heavy metal concentrations.

The permit includes a number of 'pre-operational' and 'improvement' conditions which impose requirements on the operator to submit additional details for EA approval prior to commencement and shortly following commencement of operations. These are listed below.

Pre-operational measures

- PO1: EA prior approval required for commencement of construction of flood risk management measures.
- PO2: EA prior approval required of commissioning plan for effluent (water) treatment plant.

Subject to final approval of a minor addendum to PO1, both these conditions have been discharged and approved by the EA.

Improvement programme requirements

- Review of the effect of the treated effluent on the Red River at downstream monitoring locations 6 and 12, after completion of commissioning.
- Mitigation proposals and review of limits if review indicates deterioration in Red River water quality.

The permit also includes a programme of monitoring of the discharge from the effluent (water) treatment plant and emission limits for pH, arsenic and copper.

20.4.4 Requirement for additional permits

The regulated activities which are currently not permitted and require EPs are as follows:

- Mineral processing.
- Treatment of waste process water from mineral processing.
- Manufacture of secondary aggregate.
- Mining waste operations.

In addition, depending upon specific circumstances the following activities may require permitting:

- Groundwater activity
- Radioactive substances

Apart from the possible requirements for Radioactive Substances permitting, the permitting requirements for these activities have been discussed with the EA as part of a formal pre-application consultation process.

20.4.4.1 Mineral processing

The proposed mineral processing facility at South Crofty involves primarily physical treatment of the mineralised material by sorting, crushing, grinding, DMS, and flotation. There are no thermal processes such as melting or burning. The tin concentrate generated at the facility will undergo further processing / smelting at off-site locations.

The permitting requirements for this activity have been discussed during pre-application consultations with the EA, and the relevant permit application will be made to authorise this activity.

20.4.4.2 Treatment of waste process water from mineral processing

The existing permit EPR/PP3936YU currently only authorises the treatment of water from mine dewatering, so it is considered that either a permit variation or a new permit will be required to authorise the treatment of waste process water from mineral processing.

20.4.4.3 Manufacture of secondary aggregate

Extracted mineralisation that is not processed in the mineral processing facility to generate tin concentrate will be used to manufacture secondary aggregate.

An NMA submitted to the local authority under planning permission PA10/04564 has been granted for the processing and storage of secondary aggregate. However, the crushing equipment used to crush the mineralised material will require a Part B EP issued by the local authority.

The feedstock for the process is a by-product of mineral processing, and therefore it is considered that a waste operation permit will not be required.

20.4.4.4 Mining waste operations

Waste generated from the mineral processing facility will comprise a tailings stream which will be dewatered and mixed with pozzolanic material prior to disposal within the excavation void for the purposes of rehabilitation. There will be no above ground mining waste disposal activities at the site.

There will therefore be no mining waste facility at South Crofty and the disposal of the mining waste will need to be authorised as a *'mining waste operation'* and not a *'mining waste facility'.*

This has been agreed by the EA in an email dated 28 June 2023 from Simon Harry EA officer, and also as part of formal pre-application discussions.

The treatment of the tailings will also need to be regulated under an EP.

20.4.4.5 Groundwater activity

At South Crofty, groundwater will be pumped from the mine to enable extraction of the mineralised material in dry conditions. Pumping of the groundwater will cease following mine closure and at that stage the groundwater will rebound and potentially come into contact with the deposited tailings. The deposit of any material containing hazardous substances in an area where it is likely to be below the groundwater table would be considered a groundwater activity under the EP Regulations and also subject to permitting.

Consequently, depending upon the chemical composition of the tailings there is a possibility that there will be a requirement for a groundwater activity permit.

20.4.4.6 Radioactive substances

Under Schedule 23 of the EP Regulations, permits may be required for keeping or using radioactive materials (including naturally occurring radioactive materials (NORM)), accumulating or disposing of radioactive waste and keeping or using mobile radioactive apparatus. Permits, however, are not required if the radioactive substances are 'out of scope' or the activity is 'exempt'.

Cornish Metals propose to undertake a radiological assessment to determine whether they have any permitting obligations under Schedule 23 and will apply for a permit if necessary.

With regard to radioactive minerals present in the concentrate, analysis (carried out by Petrolabs) has shown that there are very few radioactive minerals present, typically 0.1 - 0.2% by weight, indicating that such minerals in the ore are extremely unlikely to rise above background levels.

20.4.5 Performance and reclamation bonds

There are no performance or reclamation bonds associated with the existing EPs.

As the mining waste activity is not defined as a *'mining waste facility'* (and specifically not a Category A (high risk) or hazardous waste Mining Waste Facility) there will be no performance or reclamation bonds associated with the mining waste EP.

20.4.6 Summary

South Crofty have made significant progress in securing the necessary EPs and licences for the proposed operations at the South Crofty mine.

South Crofty have already secured a permit authorising water abstraction, treatment, and discharge. Potential flood risk activities associated with discharge of treated dewatering water into the Red River have also been authorised as part of this permit.

A Water Resources licence has been granted to authorise the abstraction of water from the mine workings. This licence is currently time limited and will expire on 31 March 2027. Renewal of a licence is typically straightforward for existing licences where there is a clear continued need, however in order to secure an extension of time it will be necessary to demonstrate that there is no damage to the environment, the need for the abstraction can be justified and that the water is being used efficiently.

South Crofty have been pro-active in their discussions with the EA over the permitting requirements for the South Crofty site. They have consulted both the local EA officers and also had formal pre-application consultations with the EA National Permitting Team to ensure that the permitting requirements are agreed with the Regulator.

A number of the proposed activities still require permitting, notably the Mineral Processing Facility and the Mining Waste Operation.

The EA has agreed that the Mining Waste activity will be defined as an 'operation' and not a 'facility', as the waste will be deposited within the mine void for rehabilitation purposes and there will be no above ground deposits. This means there will be no requirement for financial bonds under the EP.

Treatment of the tailings with pozzolanic material will also need to be regulated under an EP.

Treatment of the waste process water from the mineral processing facility will require a variation of the existing water treatment plant permit or a new permit depending upon the circumstances.

The manufacture of secondary aggregate will require the crushers to hold Part B permits issued by the relevant local authority.

If necessary, authorisation for a groundwater permit will be secured via the mining waste operation permit.

South Crofty are proposing to undertake a Radiological Assessment to determine whether they have any permitting obligations in respect of radioactivity.

Regular liaison meetings are held with interested stakeholders through the Local Liaison Group as set out in Condition 5 of both the Surface and Underground Planning Permissions.

It is concluded that South Crofty have a good understanding of their obligations under the EP regime and have already made significant progress in securing permits for the operations proposed at the site. Future permitting requirements are being discussed with the EA and plans for future permit applications are being progressed with a view to ensuring all necessary permits are in place well in advance of individual operations commencing.

20.5 Mine closure plan

This section of the South Crofty PEA relates to the mine closure aspects of the Project.

In recent decades, the mining industry has recognised the risk and long-term impact that closing mines irresponsibly can have on the environment. The risk and potential for impact can be managed and prevented by proper planning and the provision of adequate funding in advance of the closure date, while also considering and managing the risk of an unexpected early closure.

Cornish Metals has retained SLR Consulting (SLR) to review the project with respect to mine closure, and to prepare a draft mine closure plan. SLR has in-house and retained expertise in mine closure and experience with recent successful mine closure implementation. A summary of the plan and the methodology used to draft the plan is included in this section.

There is no national legislation that imposes specific requirements on UK mines with respect to mine closure planning and preparation. However, the planning permissions issued by Cornwall Council (PA10/04564 & PA10/05145) do have specific conditions with respect to mine closure requirements that must be complied with. All of these requirements have been considered and included in the draft closure plan for the South Crofty Mine. There are various guidance documents issued by different organisations and governments to assist with mine closure planning. SLR has used The International Council on Mining and Metals' (ICMM) Integrated Mine Closure: Good practice guide (2nd edition), 2019 to inform the closure plan for the South Crofty Mine.

20.5.1 South Crofty mine closure process complexity

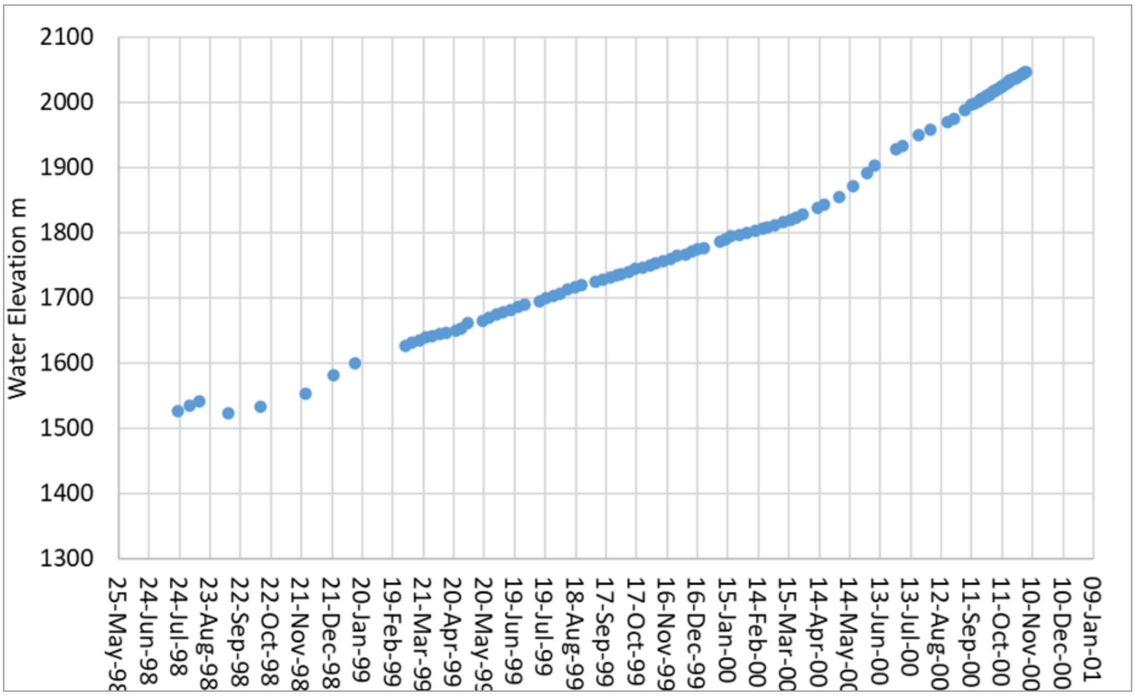
The mine closure process for the South Crofty Mine is considered to be relatively straightforward for a number of important reasons and they are:

- Rewatering - The mine has previously been operated and closed and as such the typically unknown spectre of what will happen when a mine rewaters is well understood for South Crofty (for both hydraulic and chemical recovery).
- There are no Tailings Storage Facilities (TSF) to be capped and managed as part of the closure process.

20.5.2 Rewatering

The mine was allowed to rewater when it last closed in 1998, and as such the rate of recovery of the water level can be known with a high level of certainty. While there will be some variation due to changes in climate as well as year on year annual weather variation, the hydrological setting has not changed in any material way since the mine was last closed and allowed to rewater. Therefore, the length of time it took the water level to recover previously is a very good indicator for how long it would take to recover when South Crofty closes again following cessation of mining. The figure (Figure 20.3) below is taken from the 2022 Piteau report and shows that it took some two and a half years for the water level to recover to the surface discharge adit spill point at about 2,051 m above mine datum (AMD).

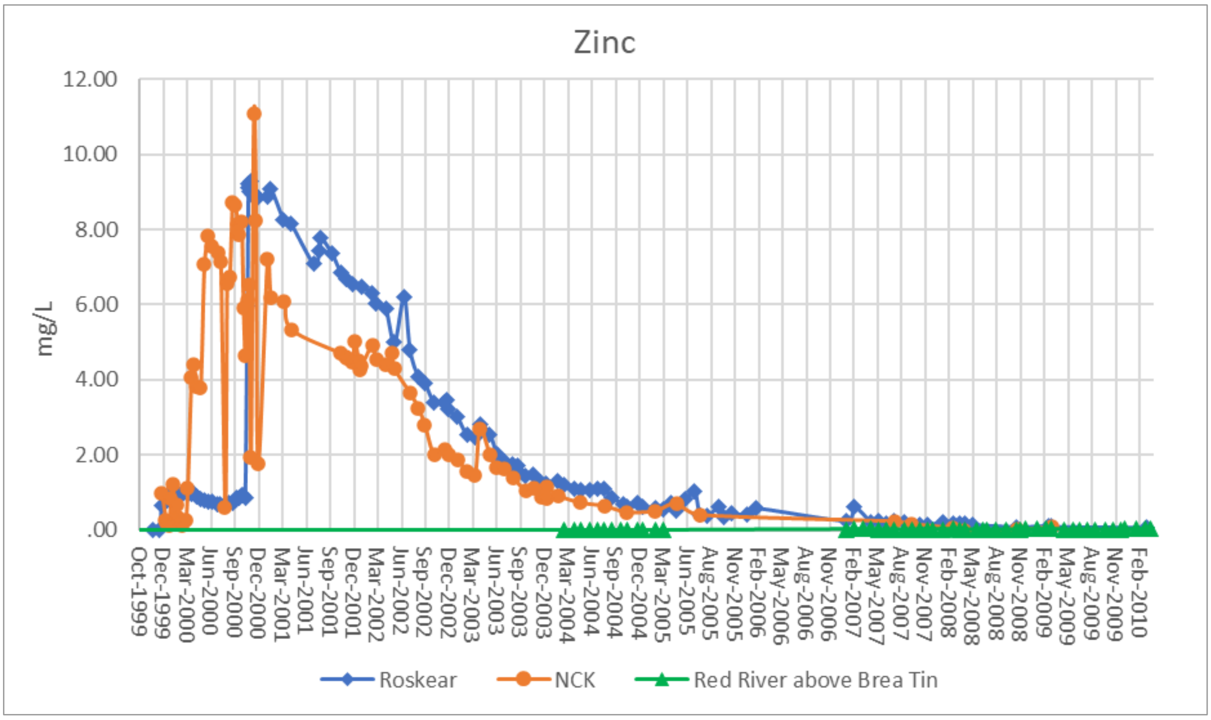
Figure 20.3 Graph of water level recovery in mine workings



Source: Cornish Metals, 2024.

Monitoring data acquired after South Crofty Mine was previously rewatered demonstrates that the metal concentration in groundwater dropped in the years after the mine was rewatered as conditions became anoxic allowing metals to precipitate out of solution and settle within the workings. It is understood that a chemocline became established, whereby the denser mineralised water resides within the working's elevation, with a less dense good quality layer of water residing and flowing above. An example of zinc metal concentrations in groundwater dropping after mine closure is provided in Figure 20.4 below.

Figure 20.4 Graph of zinc concentration in mine water after mine closure



Source: Piteau Associates, 2024.

An important consideration with respect to the risk associated with the rewatering of the South Crofty Mine is Cornish Metals' plan to continue to pump and treat groundwater from the mine as part of a geothermal post closure project. Doing so will maintain an inward gradient of groundwater towards the mine (thus further minimising the risk of movement of potentially contaminated groundwater). Underground bulkheads can be a useful tool for a mine to deploy to manage the rewatering process. Bulkheads can be used to control the movement of water around different parts of the mine, which will result in a more controlled rewatering of the workings. Cornish Metals will work with Piteau to assess whether or not this is something that may be of use; if deemed useful / necessary a budget will be included to construct bulkheads as recommended. Cornish Metals plans to continue to treat the abstracted water for as long as the raw water chemistry dictates, and this will protect surface water quality.

The geothermal project is a key part of the post closure vision for South Crofty Mine. A significant heat resource has been identified and proven for the groundwater around the mine, particularly around the NCK Shaft, but there is also potential around the other shafts. An initial study has demonstrated that the heat resource is sustainable and has the potential to produce in the order of 33 GWh/year. A significant selling point for the geothermal project is the new housing developments that are planned for the area and the potential for the geothermal energy from South Crofty to power a district heating scheme. Preliminary projected capital and operating costs look favourable. This geothermal aspect of the project will be subject to further work before a final decision is made to proceed.

If the proposed geothermal project is not developed, this is a risk that Cornish Metals will consider in future closure planning. In particular, consideration will be given to the retention of the MWTP to treat mine water if deemed necessary after rewatering has commenced. It would only be necessary to treat water if the upper most fraction of the water is not of a quality that is suitable for discharge, this is deemed unlikely due to the chemocline mechanism as described earlier. However, as a precaution, if the geothermal project is not developed, it is Cornish Metals' intention to ensure that the treatment plant it is not demolished at the start of the active closure period and to retain the plant for a suitable period of time. If the geothermal project does not get developed and the water table has recovered to a sufficient elevation and is of good quality, a decision can be made to demolish the plant.

It is Cornish Metals' view that if the geothermal project is developed it is reasonable to assume it will be a long-term project, as the homes and businesses it will serve will always require heat to be provided in an economical way. The treatment plant would be maintained as part of the running cost of the geothermal project. At some point in the future, when the water chemistry of the raw water is compliant it will be possible to decommission the plant, money accrued from the geothermal project will provide sufficient funding to pay for this work.

20.5.3 Mine tailings

Cornish Metals plans to use all of its tailings to produce backfill that will be placed underground. Therefore, there will be no tailings facility to be closed and managed post cessation of operations. Not only does the closure and rehabilitation of TSF require significant budget; they are the facilities that traditionally result in the majority of post closure legacy issues for closed mines around the world. So not having one of these facilities, not only reduces the mine closure cost estimate quantum, but also eliminates the risk associated with retaining such facilities on a closed mine site.

20.5.4 Geotechnical / subsidence risk

The post closure risk of subsidence is a significant aspect of closure that must be assessed by all underground mines. The risk for South Crofty is considered to be low based on the competent nature of the ground to be mined and the mining methods to be used, which includes the placement of adequate quantities of quality controlled backfill support to mitigate against the risk of subsidence. Cornish Metals will continuously assess ground conditions within the mine during operations. A surface subsidence monitoring programme will be in place once operations commence, and this programme will continue into the closure and aftercare period to provide assurance that there is no surface subsidence impact.

20.5.5 Social aspects of closure

While the physical works associated with the closure of the site is a major part of the closure plan, Cornish Metals has also put a priority on the social aspects of closure. Cornish Metals recognises that the community is a key stakeholder in the project, the team has had active engagement with this group throughout the initial phases of the project and this approach will continue throughout the operational phase and into the closure phase. It is vitally important that Cornish Metals listens to the communities wishes and understands their expectations with respect to how the mine is closed, and in particular what the plans will be for the site after the closure plan has been implemented. The feedback from the community will be an important mechanism for developing success criteria for the social aspect of closure.

The social aspect of closure includes more than just the community, the employees themselves are key stakeholders in the mine and Cornish Metals will ensure they are involved fully in preparation for closure. Mine closure will mean loss of employment for all employees. Some employees will lose their jobs as soon as the mine and processing plant close, others will be retained for a period of time to assist with implementation of the closure plan.

All employees need to be provided with adequate notice of closure (and loss of their employment), so they can prepare for when closure does inevitably happen. Ideally Cornish Metals will agree to a minimum notice period for all employees.

Cornish Metals will put in place a programme to assist employees with the loss of their employment. The scope of this programme will be agreed with employee representatives in the years preceding closure – with the objective being that 2 years prior to the planned closure date there is an agreed programme, including details on any training / severance to be provided. The cost of this programme will be paid for out of operational costs (i.e. it is not included in the mine closure cost estimate).

Finally, Cornish Metals will ensure that it engages actively with other stakeholders such as suppliers and customers to ensure that they have the most advanced notice possible of what the mine's plans are with respect to closure dates, to allow these stakeholders make plans for their own businesses.

20.5.6 Surface infrastructure

One of the objectives of the mine closure plan is to facilitate the redevelopment of the site in a sustainable manner for the benefit of the local community. It is for this reason that certain items of infrastructure will be left remaining on the site. The surface planning permission lists certain items that must be removed and Cornish Metals will comply with this. These are listed below, with reference numbers referencing a site plan provided in Figure 20.5.

Structure that are planned to be removed:

- Contents of the processing building (1)
- Metal Storage Containers (3) & (9)
- Fuel store Tank (4)
- HSE store (5) & (15)
- Deep Cone Thickeners (6)
- Silo Storage Tanks (7)
- Tailings Treatment Plant (8)
- CHP plant Containers (11)

- Water Treatment Plant (12)[2]
- Weighbridge Office (16)
- New Staff Car Park (17)
- Stockpile and Aggregates Store (18) & (19)
- Emulsion Store (23)
- Emergency Tailings Storage (24)
- Fuel Store (25)
- Viewing Platform (32)
- Security Booth (33)
- Brake Testing (34)
- Unloading Ramp (35)
- Gas Bottle Storage (36)

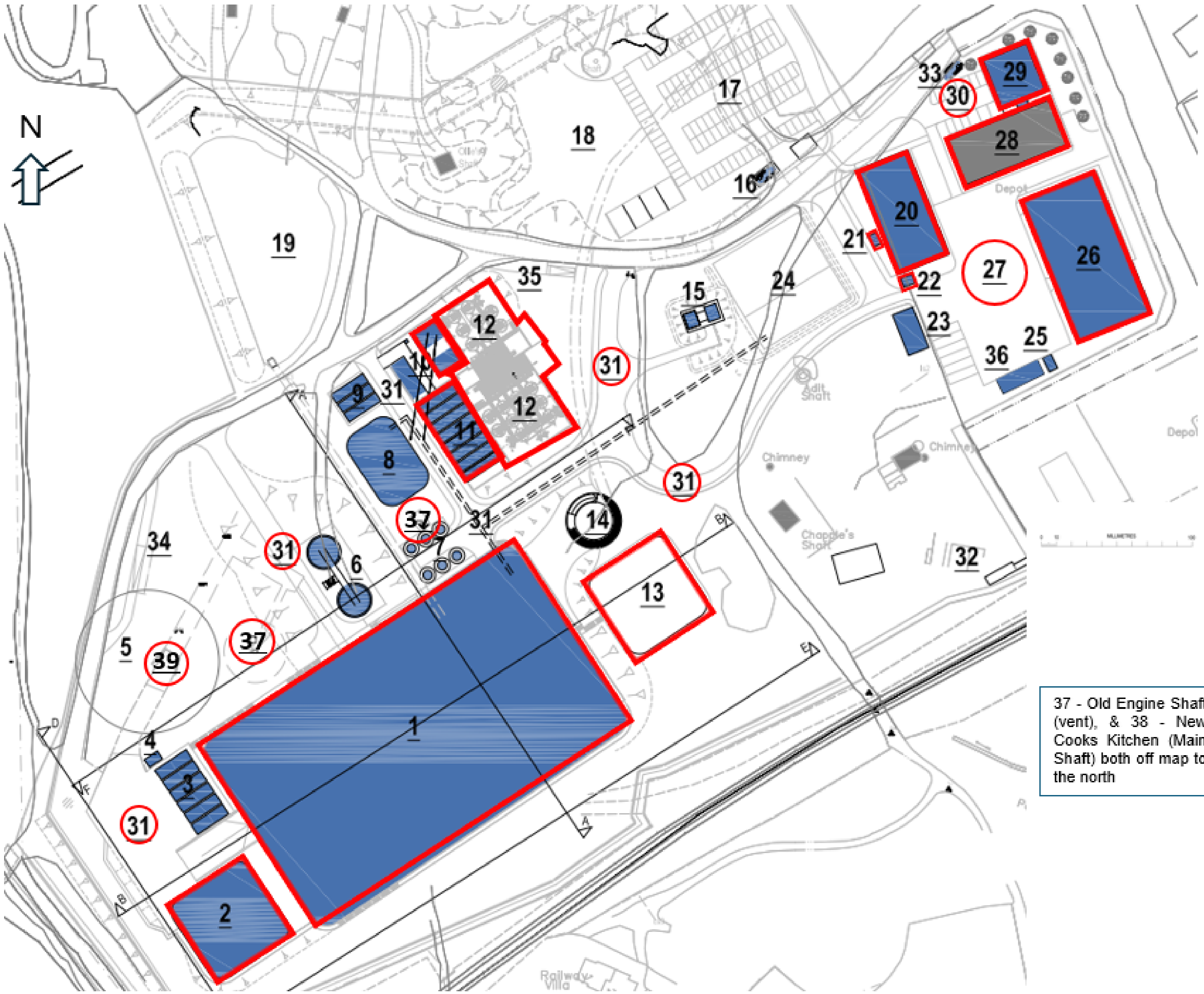
Any structures to be retained will be cleaned to an acceptable level to ensure there is no risk posed by any residues that may have accumulated during the operational life of the mine, this is particularly relevant for the processing plant.

Structure that may be retained:

- Processing Building (1)
- Water Storage and Attenuation tank (2)
- Transformer and Switchroom (10)
- Attenuation Pond (13)
- Miners Dry (20)
- Miners Bus Stop (21)
- Smoking Shelter (22)
- Proposed Archive and Stores Building (26)
- Mine vehicles turning and parking area (27)
- Existing Depot Building (28) & (29)
- Mine offices car park (30)
- Access Roads (31)
- Mine & Ventilation Shafts (37)[3]
- Decline (39)[2]

[2] Water Treatment Plant to be retained post cessation of mining pending planning permission.
[3] Shafts and decline to be made safe following cessation of mining.

Figure 20.5 Plan showing structures to be retained (in red) following cessation of mining



No.	Structures
1	Process Building
2	Water Storage / Attenuation Tank
3	Metal Storage Containers
4	Fuel Store Tank
5	HSE Store (small)
6	Deep Cone Thickeners
7	Silo Storage Tanks
8	Tailings Treatment Plant
9	Metal Storage Containers
10	Transformers & Switch Room
11	CHP Plant Containers
12	Water Treatment Plant
13	Attenuation Pond
14	Tramway Station (Future Planning Application)
15	HSE Store (large)
16	Weighbridge Office
17	New Staff Carpark (118 spaces)
18	Stockpile & Aggregate Store
19	Stockpile & Aggregate Screening Store
20	Proposed New Miners Dry Building
21	Miners Bus Stop
22	Smoking Shelter
23	Emulsion Store
24	Emergency Tailings Storage Area
25	Fuel Store Tank
26	Proposed Archive & Stores Building
27	Mine Vehicles - Turning & Parking Area
28	Existing Depot Building (to be altered)
29	Proposed Mine Offices - Extension to 28
30	New Mine Office Car Park & Visitors
31	New Access Roads
32	Viewing Platform
33	Security Booth
34	Brake Testing
35	Unloading Ramp
36	Gas Bottle Storage
37	Ventilation Shafts
38	Main Shaft
39	Decline
40	Landscaping

37 - Old Engine Shaft (vent), & 38 - New Cooks Kitchen (Main Shaft) both off map to the north

Structures highlighted in Red to be retained following cessation of mining

Source: SLR, 2024.

21 Capital and operating costs

21.1 Capital costs

The LOM capital costs for the South Crofty project total £185M, consisting of the following phases:

- Pre-production capital costs – Includes all costs to develop South Crofty to a commercial operating status (1,400 t/d production rate at steady state). These initial capital costs total £142M (US$177M) and are projected to be expended over an 18-month period on engineering, construction, commissioning, and initial production activities.
- Sustaining capital costs – Includes all costs related to the acquisition, replacement, or major overhaul of assets required to sustain operations during the mine life. Sustaining capital costs total £43.5M and are projected to be expended in operating Years 1 through 14.

The capital cost estimate was compiled using a combination of supplier quotations, database costs, and factors; the overall cost estimate was benchmarked against similar operations. Table 21.1 presents the estimate summary for initial and sustaining capital costs in Q2 2024 Pounds Sterling with no escalation.

21.1.1 Capital cost summary

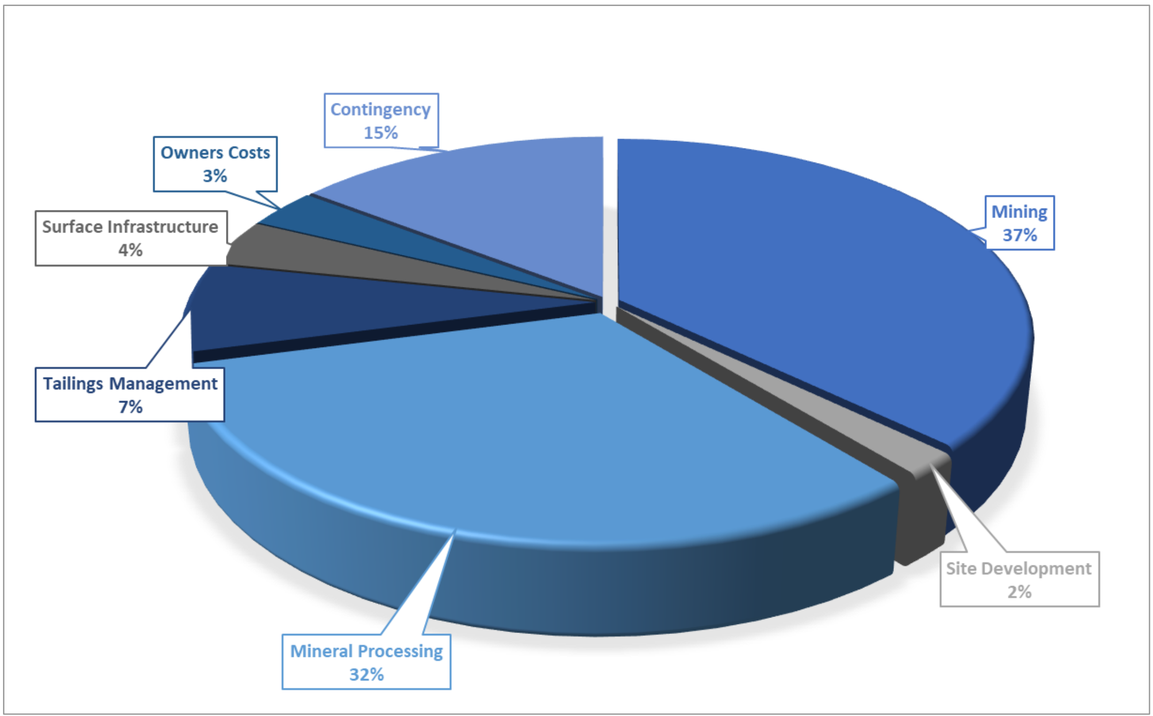
Table 21.1 Capital cost summary

WBS area	Description	Pre-production cost (£M)	Sustaining cost (£M)	Project total cost (£M)
1000	**Mining**	**52.7**	**35.1**	**87.8**
1200	Mine capitalised development & equipment	7.4		7.4
1300	Capitalised operating costs	32.4	35.1	67.5
1400	Shaft refurbishment costs	3.9		3.9
1500	Underground infrastructure	5.9		5.9
1600	Winders	3.1		3.1
2000	**Site development**	**2.7**	**0.0**	**2.7**
2100	Process & backfill plant groundworks	2.7		2.7
3000	**Mineral processing**	**45.1**	**0.0***	**45.1**
3100	Mechanical equipment	16.6		16.6
3200	Electrical	1.8		1.8
3300	Control & instrumentation	1.0		1.0
3400	Pipework & valves	3.0		3.0
3500	Internal structural steel	1.7		1.7
3600	Buildings	5.1		5.1
3700	Civil works	10.1		10.1
3800	Installation & commissioning	5.9		5.9
4000	**Mineral processing upgrade**	**0.0**	**7.0***	**7.0**
4100	Flotation upgrade to treat polymetallic material	0.0	7.0	7.0
5000	**Tailings management**	**10.5**	**0.0***	**10.5**
5100	Paste backfill plant	10.5		10.5
6000	**Surface infrastructure**	**5.5**	**0.0**	**5.5**
6100	33 kV-11 kV sub-station	1.5		1.5
6200	Office, mine dry, workshop & stores buildings	2.7		2.7
6300	Ventilation shaft surface fans	1.3		1.3
7000	**Owner's costs**	**4.6**	**0.0**	**4.6**
7100	Pre-production Staff and G&A Costs	4.6		4.6
8000	**Contingency**	**20.6**	**1.4**	**22.0**
8100	Contingency	20.6	1.4	22.0
	Total CAPEX	**141.8**	**43.5**	**185.2**

Note: *Processing Plant & Backfill Plant Sustaining Capital Costs applied in Operating Cost.
Source: Cornish Metals, 2024.

Figure 21.1 and Figure 21.2 present the capital cost distribution for the pre-production phase and the LOM, respectively. As typical with underground operations, the majority of sustaining capital costs relate to underground lateral and vertical development.

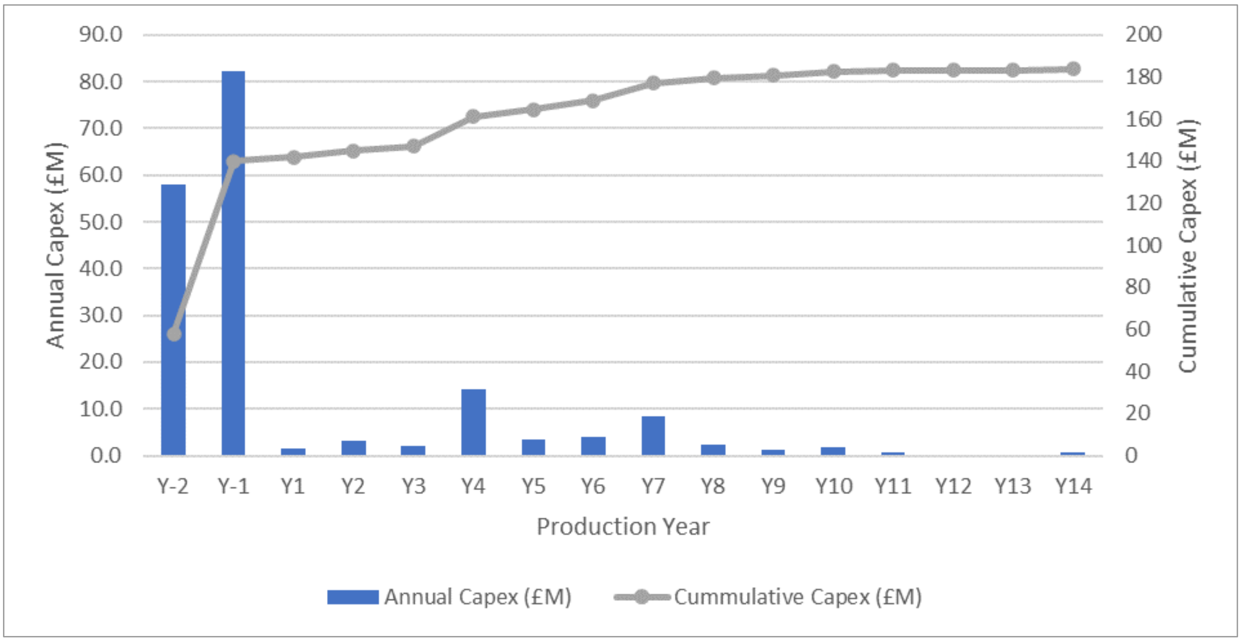
Figure 21.1 Distribution of pre-production capital costs



Source: Cornish Metals, 2024.

All capital costs for the Project have been distributed as per the development and production schedule to support the economic cash flow model. Figure 21.2 presents the annual LOM capital cost profile from pre-production development through to the end of mining and processing operations in Year 14.

Figure 21.2 Capital cost profile



Source: Cornish Metals, 2024.

21.1.2 Basis of estimate

The Project capital estimates include all costs to develop and sustain the project at a commercially operable status. The capital costs do not include project costs or commitments prior to a construction decision, which are considered sunk costs. Sunk costs, corporate costs, and owner's reserve accounts are not considered in the PEA estimates or projected economic cash flows.

The following key assumptions were made during development of the capital estimate:

- The capital estimate is based on the contracting strategy, execution strategy, and key dates planned for the project development.
- Underground mine development activities will be performed by the owner's team.
- All surface construction (including earthworks) will be managed by the owner's team but performed by qualified, local sub-contractors.

The following key parameters apply to the capital estimates:

- Estimate base date: The base date of the capital estimate is Q2 2024. No escalation has been applied to the capital estimate for costs occurring after that date. Proposals and quotations supporting the PEA estimate were received in Q4 of 2023 and Q1 of 2024.
- Units of measure: The International System of Units (SI) is used throughout the capital estimate.
- Currency: All capital costs are expressed in UK Pounds Sterling (£). All major equipment and consumables quotations provided by vendors were received in Sterling. Where costs were obtained in other currencies, the following exchange rates in Table 21.2 were applied.

Table 21.2 Exchange rates

Sterling exchange rate	Currency	Exchange rate
1 £ =	US$	1.25
1 £ =	Euros	1.15

Source: Cornish Metals, 2024.

21.1.3 Mine capital cost estimate

The South Crofty Mine capital cost estimates are based on a combination of budgetary quotes from equipment suppliers, in-house cost databases, and similar mines in Europe and North America. Table 21.3 summarises the underground mine capital cost estimate.

Table 21.3 Mine capital costs

Mine capital cost	Pre-production (£M)	Sustaining (£M)
Mine development, equipment & pre-production	7.4	
Mine capitalised operating costs	32.4	35.1
Shaft refurbishment	3.9	
Underground infrastructure	5.9	
Phase 2 winders purchase & installation	3.1	
Total	**52.7**	**35.1**

Source: Cornish Metals, 2024.

21.1.3.1 Mine development, equipment, & pre-production costs

Underground mining equipment quantities and costs were determined through scheduling of development and production using a detailed mine plan built using the Deswik suite of mine design, planning and scheduling tools. Appropriate performance and utilisation rates were applied to each piece of equipment to determine equipment requirements over the LOM. Budgetary quotes for equipment purchases were received from original equipment manufacturers (OEMs) and applied to the required quantities. The major mobile equipment, trucks, LHDs, and drills are planned to be lease-purchased from the various equipment suppliers. The majority of secondary mining support equipment will be purchased outright.

21.1.3.2 Mine pumping & treatment costs

Mine pumping and treatment costs during the pre-production period have been estimated from the actual performance of the existing dewatering pumps in the mine and the on-site water treatment plant, that have been operating since November 2023. During the development stage of the project, these costs are considered as capital costs, but following commencement of the production period, maintenance dewatering and treatment costs are considered operating costs.

21.1.3.3 Mine capitalised operating costs

During the pre-production period, all operating expenses incurred in the mine for operating development, capitalised development, maintenance, and general mine costs are considered to be capital costs. These expenses include labour, fuel, equipment, power, and consumables costs for lateral and vertical development required for underground access to stopes and underground infrastructure.

- Lateral and vertical development fuel, equipment usage, power and consumables requirements have been developed based on the mine plan and schedule. Appropriate equipment usage rates have been applied to determine the required operating hours.
- Lateral and vertical development labour requirements have been determined for the required equipment fleet in operation. Supervision and support services have been determined for the amount of development activity taking place, the numbers of personnel and equipment employed in the mining operations, statutory requirements, and the expected amount of training and support required during the early years of operation.

21.1.3.4 Shaft refurbishment & underground infrastructure costs

Underground infrastructure requirements have been determined from the mine design, and calculations for ventilation, dewatering, and material handling. Budgetary quotations have been used for major infrastructure components, including underground crushers, ventilation fans, cables, pipes, electrical infrastructure, conveyors, and rock handling equipment in the shaft. Miscellaneous items, such as personal protective equipment (PPE), communications, and other general consumables, have been estimated or factored from experience at other operations. Acquisition and installation of underground infrastructure is timed to support the mine development schedule. Shaft refurbishment costs have been estimated based on the projected man hours required for the various refurbishment activities, budget quotes for shaft furniture, and rates of pay, including productivity bonuses for the mining crews.

21.1.3.5 Phase 2 winders purchase & installation costs

The first phase winder installation at South Crofty has already been completed. Phase 2 winder installation will involve the installation of a new service winder and the refurbishment of the existing production winder at NCK shaft. The Phase 1 winders will be re-located to Roskear shaft and used as egress winders during the later stages of mine development and throughout the LOM. The Phase 2 winder costs are estimated from budget quotations received from OEMs.

21.1.4 Process plant & surface infrastructure capital cost estimate

The South Crofty process plant and surface infrastructure capital cost estimates are based on a combination of a detailed design and costing of mechanical equipment for the process plant, budgetary quotes from equipment vendors, estimates from contractors, and factoring based on similar projects located in Europe and North America. Table 21.4 summarises the process plant and surface infrastructure capital cost estimate.

Table 21.4 Process plant and surface infrastructure capital costs

Process plant & surface infrastructure capital cost	Pre-production (£M)	Sustaining (£M)
Process plant including civils & groundworks	47.8	
Process plant upgrade for polymetallic material (in 2030)	0.0	7.0
Other surface infrastructure	5.5	
Paste backfill plant	10.5	
Total	**63.9**	**7.0**

Note: Processing Plant & Backfill Plant Sustaining Capital Costs applied in Operating Cost.
Source: Cornish Metals, 2024.

21.1.4.1 Process plant including civils & groundworks

The process plant capital costs have been estimated based on a detailed mass balance and process flow sheet design derived from the results of an extensive metallurgical testwork programme conducted during the second half of 2023 and first quarter of 2024. The flow sheet was used to develop a preliminary P&ID which, in turn, enabled all process equipment to be specified and multiple vendor quotes to be subsequently obtained. Other equipment such as piping, valves, electrical, control & automation, internal structural steelwork, installation costs, and commissioning were factored based on the direct cost of the mechanical equipment using industry norms. The groundworks, civils, and buildings cost have been estimated based on quotations received from potential contractors.

21.1.4.2 Process plant upgrade for polymetallic mineralisation

In Year 4 of production, the process plant will be upgraded to enable polymetallic mineralised material from the Upper Mine to be processed in addition to the tin-only mineralised material from the Lower Mine. The basis for the upgrade estimation is the same as for the main processing plant but it is considered as a sustaining capital cost rather than a pre-production capital cost.

21.1.4.3 Other surface infrastructure

Other surface infrastructure includes a new office building, new staff changing facilities, warehouse, and maintenance shops for various trades. Also required is a connection to the existing 33 kV powerlines that cross the site. South Crofty has an existing private 11 kV circuit that distributes power to the mine and water treatment plant. The cost to connect the 11 kV circuit to the 33 kV circuit and build a new 33-11 kV substation has been estimated using a combination of vendor budget quotes for the major equipment and factoring for the installation costs. Buildings costs have been estimated using UK construction industry standards based on the building end use and surface area.

21.1.4.4 Paste backfill plant

The paste backfill plant capital cost estimate is based on a quotation received from a company specialising in the design, installation and commissioning of paste backfill plants. The cost estimate is an all-in cost, based on the specialist company acting as an engineering, procurement, and construction management (EPCM) contractor for the construction of the plant. The design of the plant is supported by preliminary testwork on tailings resulting from the metallurgical testwork programme, combined with benchmarking against other similar projects in Europe and North America conducted by the specialist company in recent years.

21.1.5 Mine closure

The objective of the mine closure plan is to facilitate the redevelopment of the site in a sustainable manner for the benefit of the local community. It is for this reason that certain items of infrastructure will be left remaining on the site. The surface planning permission lists certain items that must be removed and Cornish Metals has included these buildings in the estimate.

Closure costs have been estimated from first principles, taking into account the requirements of the local authority and current building / demolition costs. Activities include:

- Remediation of any contaminated land, as necessary.
- Reinstatement of the site and access roads by clearing plant, buildings and machinery, hard standings, concrete, and brickwork.
- The planting and maintenance of trees, shrubs, and hedgerows as appropriate, including location, species, size, number, and spacing.
- Scheduling of those buildings and structures to remain and those to be removed.
- Ongoing treatment of mine water until final closure.
- Removal of ventilation fans and safe reinstatement of shafts.

Table 21.5 Mine closure cost estimate

Item	Duration (years)	Estimated cost (£M)
Demolition / removal / rehabilitation cost estimate	1	0.3
Management & administrative costs	3	1.9
Aftercare cost estimate	5	0.3
Total		**2.5**
20% contingency		**3.0**

Source: SLR, 2024.

21.1.6 Construction strategy

In order to successfully bring the mine back into production within the estimated timeframe, several parallel workstreams need to be completed simultaneously. These workstreams comprise:

- Underground mine development.
- Underground mine infrastructure installation.
- Process plant early works.
- Process plant civil construction.
- Process plant equipment installation & commissioning.
- General surface site infrastructure & buildings.

The construction strategy for each workstream is planned with the owner's team managing the overall project with the assistance of qualified and experienced engineering support, consultants, and contractors to complete the detailed design, construction, and project delivery. Each workstream will be managed by a dedicated project manager, with the project director overseeing the project as a whole.

Cornish Metals successfully employed this strategy during the construction and commissioning of the MWTP, completed in November 2023, and is currently using the same strategy to simultaneously dewater the mine and refurbish NCK shaft. The core of the project management team is already in place on site and will be expanded as necessary to deliver the larger project.

This approach to project delivery is favoured over an EPC or EPCM approach as it offers greater flexibility and control of the project as a whole, makes use of the considerable expertise and local contacts that exist within the current owner's team, utilises the extensive supply chain that the company has developed, and enables local contractors to be engaged directly. This provides greater employment and financial benefits to the economy of the local area, opportunity to shorten the project development timeline, and the further opportunity to reduce development and construction costs by contracting directly and not fully pricing-in up-front project risk.

The main disadvantage of this approach to project delivery is that the company takes on the full risk of project overruns in terms of both cost and time. However, by employing experienced project managers, working with experienced engineering firms and suppliers, and making use of the many experienced, qualified contractors that are present in the area, the risk of cost and time overruns is reduced and should outweigh the added cost and time factors that any EPC or EPCM contractor would need to build into the project in order to protect itself commercially.

Additionally, by taking on a greater responsibility for the construction and delivery of the project, the company and its employees will have a greater knowledge and understanding of the equipment and infrastructure installed, which should help to reduce commissioning times and smooth the ramp-up from first mineralised material to full production.

21.1.7 Owner cost estimate

The majority of the owner costs incurred during the project development phase are the cost of employing the project management team and the G&A costs for the site that are capitalised in the initial capital costs during the construction phase.

21.1.8 Contingency

A contingency of 15% has been applied to all capital expenditure (CAPEX) items except the process plant construction that has a 20% contingency applied to reflect the current status of the cost estimates and the greater complexity of this workstream.

21.1.9 Capital cost exclusions

The capital costs do not include project costs or commitments prior to a construction decision, which are considered sunk costs. Sunk costs, corporate costs and owner's reserve accounts are not considered in the PEA estimates or projected economic cash flows.

21.2 Operating cost estimate

21.2.1 Operating cost summary

The operating cost estimate in this study includes the costs to mine, pump and treat mine water, and process the mineralised material to produce metal concentrates, along with G&A expenses, including mine closure. These items total the Project operating costs and are summarised in Table 21.6.

The operating cost estimate is broken into four major sections:

- Underground mining.
- Pumping and water treatment.
- Processing.
- G&A, including closure fund.

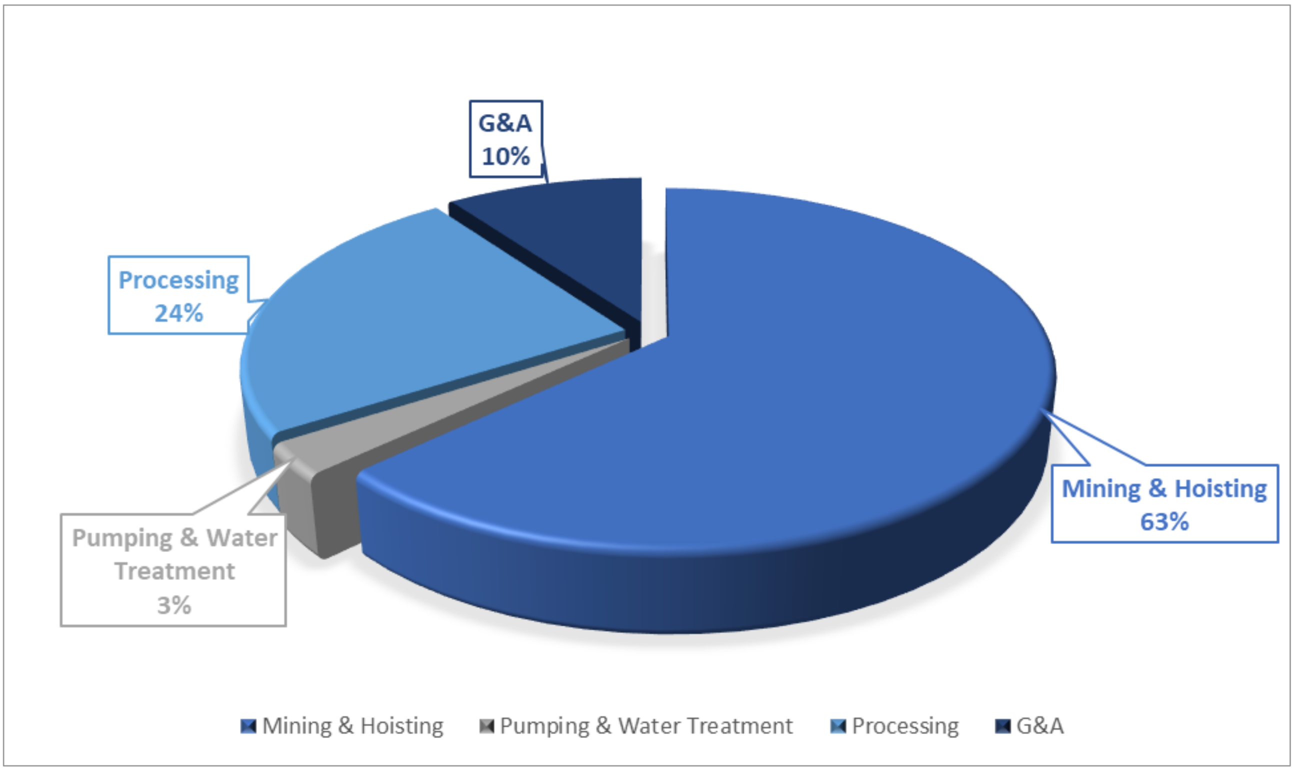
The total operating unit cost is estimated to be £82/t processed. Average annual, total LOM, and unit operating cost estimates are summarised in Table 21.6. The unit rates in this table do not include material mined during the pre-production period. Figure 21.3 illustrates the operating cost distribution. No allowance for inflation has been applied.

Table 21.6 Operating cost breakdown

Operating costs	Avg. annual (£M)	£/t Mined	LOM (£M)
Mining & hoisting	22.0	51.7	308.1
Pumping & water treatment	1.0	2.4	14.0
Processing	8.5	19.9	118.3
G&A, including closure fund	3.5	8.2	48.5
Total	**34.9**	**82.1**	**489.0**

Source: Cornish Metals, 2024.

Figure 21.3 Distribution of operating costs



Source: Cornish Metals, 2024.

The main operating cost component assumptions are shown in Table 21.7.

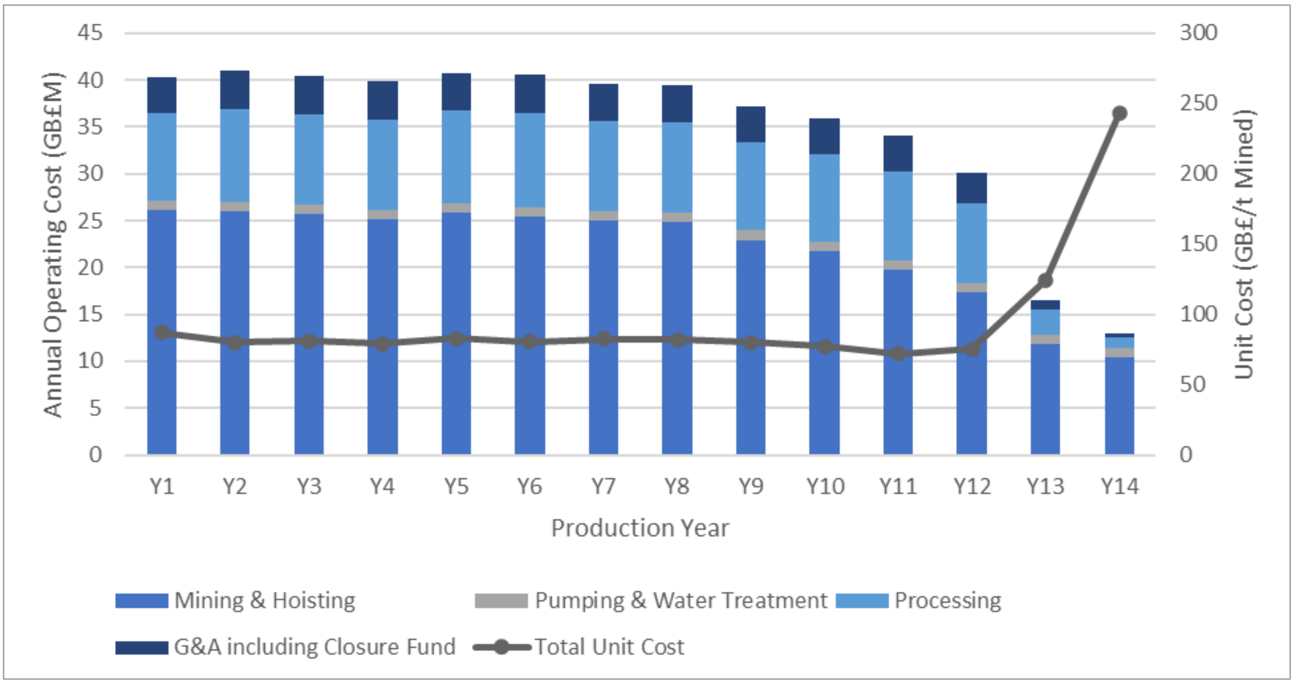
Table 21.7 Main operating cost component assumptions

Item	Unit	Value
Electrical power cost	£/kWh	0.20
Average power demand	kW	6,536
Fuel cost (delivered) HVO diesel	£/litre	1.37
LOM average workforce	Employees	291

Source: Cornish Metals, 2024.

All operating costs for the project have been estimated as per the development and production schedule to support the economic cash flow model. Figure 21.4 presents the annual LOM operating cost profile.

Figure 21.4 LOM operating cost profile



Source: Cornish Metals, 2024.

21.2.2 Basis of estimate

Operational labour rates have been estimated by applying statutory and discretionary additions including productivity bonuses for the mining crews against base labour rates. Wage scales were defined and applied to the various operational positions based on skill level and expected salary.

The owner team estimate averages 291 positions during operations. Levels will fluctuate depending on the amount of yearly underground development.

Table 21.8 lists the total labour positions by area for the construction and operation phases.

Table 21.8 Total labour table pre-production and operations

Position	Pre-production	Peak operations	LOM average
Mining operations	63	139	116
Processing operations	26	45	45
Technical services	18	18	18
Maintenance	49	79	72
Management, G&A	19	40	40
Totals	**175**	**321**	**291**

Source: Cornish Metals, 2024.

21.2.3 Mine operating cost estimate

21.2.3.1 Underground mining operating costs

Mine operating unit costs are summarised below and include:

- Development – Costs related to face drilling, blasting, and mucking, including services and ground support.
- Longhole Stoping – Costs related to the drilling, blasting, and mucking of longhole stopes.
- Backfill – Costs related to paste backfill operations and backfill plant.
- Rock transport – Costs relating to truck haulage and hoisting.

- Mine Maintenance – Maintenance labour costs that support all other sectors.
- Mine General – Costs related to mine support activities, such as technical services, shared infrastructure, support equipment, and definition drilling and mine maintenance - maintenance labour costs that support all other sectors.

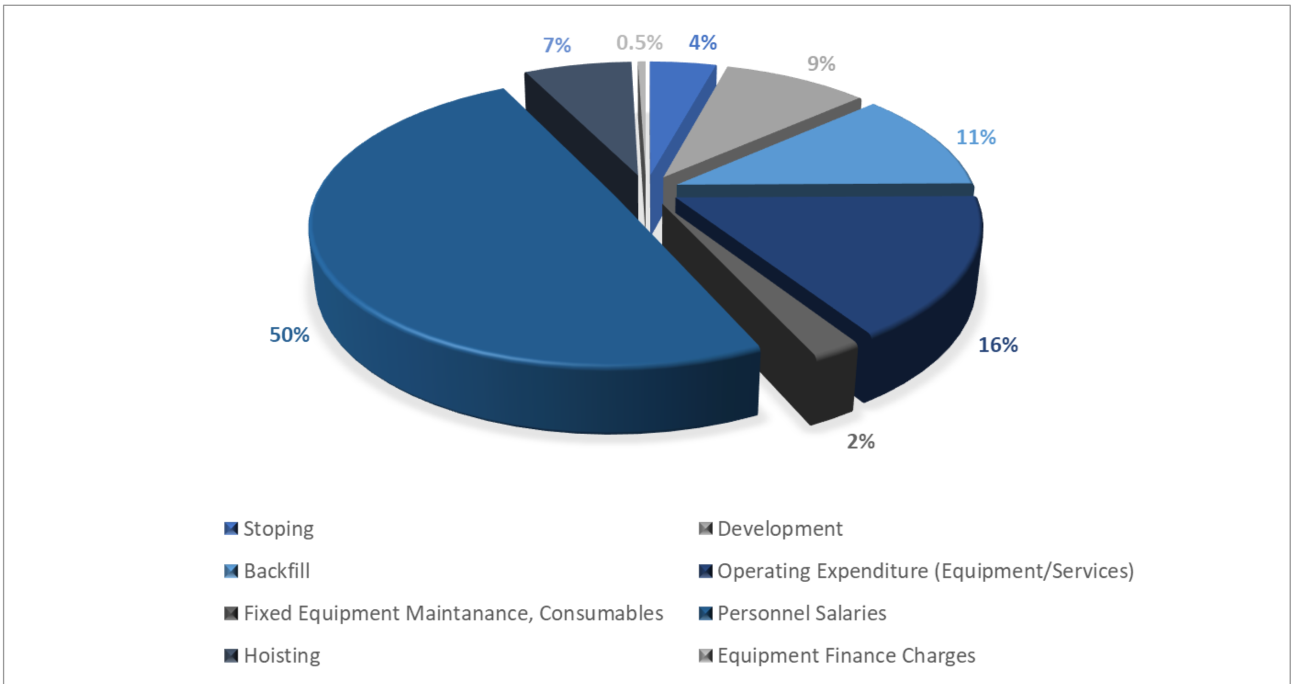
Table 21.9 and Figure 21.5 illustrate the mining operating cost broken down by major component.

Table 21.9 Underground mine operating costs by component

Mine operating cost by category	Unit cost (£/t ore)	LOM cost (£M)
Stoping	2.19	13.0
Development	4.78	28.5
Backfill	5.88	35.0
Operating expenditure (equipment / services)	8.29	49.4
Fixed equipment maintenance, consumables	1.16	6.89
Personnel salaries	25.63	152.7
Hoisting	3.55	21.1
Equipment finance charges	0.25	1.52
Total mine operating costs	**51.73**	**308.1**

Source: Cornish Metals, 2024.

Figure 21.5 Underground operations costs by cost component



Source: Cornish Metals, 2024.

Operating costs shown in Table 21.9 and Figure 21.5 exclude the capitalized 18-month pre-production period.

Personnel

Underground mining staffing levels related to production activities are built up from first principles based on the productivities (work-hours) required for mining activities occurring within a given time period. As such, the projected mining workforce fluctuates somewhat throughout the mine life. Labour costs for operations have provision for leave and absenteeism applied at 15% uplift.

Mine labour (including supervision and support roles) related to development is distributed between capital development (sustaining capital costs) and operating development (operating costs), based on the activities being performed within a given time period. As such, portions of the mine staffing are allocated within the mining operating costs.

Equipment operations

Underground mining equipment usage costs are based on the equipment operating hours required to meet the LOM plan. Equipment usage costs include unit costs (£/hr) for the following elements:

- Overheads
- Maintenance parts
- Tires
- Fuel
- Lubricants
- Wear parts (truck tubs, buckets, and ground engaging tools)

Unit costs for the elements above have been obtained from equipment manufacturer databases or reference equipment cost databases. Equipment replacements and major (mid-life) overhauls are included in the sustaining capital costs.

Power

Electrical power consumption has been based on the equipment connected loads, discounted for operating time and the anticipated operating load level. Surface power includes the power consumption of the hoist. Electricity unit cost is based on a budgetary rate of £0.20/kWh.

Cement

Consumption has been based on the estimated tailings storage paste fill requirements of the mine. Tailings storage paste fill is estimated to require an average of 6% cement. Cement unit cost is based on a budgetary rate of £150/t.

Consumables and services

Mining consumable usage rates are built from first principles based on the mine plan quantities for development and production activities. Unit costs are typically based on budgetary quotations. Minor item costs are based on catalogue or database values. Pricing has included delivery to site or suitable estimates have been included where not available.

Mobile equipment lease

Select major equipment is planned to be leased. Leasing terms include a 15% down payment, with 36 monthly payments at an interest rate of 8.50%.

21.2.4 Processing operating cost estimate

Processing operating costs were estimated to include all tin, copper, and zinc recovery activities to produce metal concentrates on-site. The crushing and process plants are designed for a throughput of 1,400 t/d. The estimated process operating costs are summarised in Table 21.10.

Table 21.10 Processing operating costs

Processing cost category	Unit cost (£/t mineralised material)	LOM cost (£M)
Plant labour	5.30	31.6
Power	7.18	42.8
Utilities	0.21	1.25
Mobile plant & vehicles	0.46	2.77
Maintenance spares	2.81	16.8
Plant consumables	3.19	19.0
Total processing operating costs	**19.16**	**114**

Source: Cornish Metals, 2024.

Processing personnel

Processing operations and maintenance staffing levels have been built up based on experience at similar operations. Labour costs are based on full staffing rates with statutory burdens.

Power

Electrical power consumption has been based on the equipment connected loads, discounted for operating time and the anticipated operating load level. Surface power includes the power consumption of the hoist. Electricity unit cost is based on a budgetary rate of £0.20/kWh.

The total estimated annual process plant energy consumption is estimated to be approximately 20.3M kWh/year. At an estimated power cost of £0.20/kWh, the LOM power cost is £42.8M (£7.18/t processed).

Consumables and services

Liners for the grinding mills and primary crusher have been estimated based on vendor quotes on ore hardness and abrasion resistance. Grinding media consumptions for the grinding mills have been estimated on a kilogram/tonne basis, recognizing projected mill power draw and abrasion index. Budgetary quotations for liners and grinding media were received from equipment vendors and local suppliers.

Annual maintenance parts costs have been factored at a rate of 7.5% of the direct capital costs of the equipment within the crushing and process areas.

Reagent costs

Reagent cost estimates were based on recent quotes including freight to site. Table 21.11 summarises the projected reagent and chemical requirements. The annual costs are based on 1,400 t/d, 357 days per year.

Table 21.11 Processing reagent requirements and costs

Reagents	Consumption (tpa)	Unit cost (£/t)	Annual cost (£k)
75 mm rods	132.3	1,170	155
40 mm balls	205.7	1,340	276
30 mm balls	144.1	1,340	193
DMS - Ferrosilicon Media	40.9	1,500	61.4
MIBC / DP-OMC-1564	2.9	5,000	14.5
SEX	3.4	5,000	17.1
Sulphuric Acid	11.7	210	2.46
Flocculant	4.3	3,100	13.4
Total			**732**

Source: Cornish Metals, 2024.

21.2.5 General and administration operating cost estimate

Table 21.12 presents a summary of G&A operating costs.

Table 21.12 General and administration operating cost

G&A cost area	Average (£M/year)	LOM cost (£M)	Unit cost (£/t mineralised material)
General management	*0.31*	*3.7*	*0.63*
Finance	*0.50*	*5.9*	*1.00*
Environmental	*0.26*	*3.2*	*0.53*
Health & Safety	*0.37*	*4.4*	*0.74*
Security	*0.46*	*5.5*	*0.93*
Human Resources	*0.07*	*0.8*	*0.13*
Purchasing & logistics	*0.38*	*4.6*	*0.77*
Surface & infrastructure	*0.06*	*0.7*	*0.12*
G&A labour subtotal	**2.42**	**28.8**	**4.83**
Office, buildings, & warehouse consumables	0.31	4.0	0.67
Site fencing, security, & roads	0.05	0.7	0.12
Site administration costs & fees	0.83	10.8	1.81
Closure fund accruals	0.34	4.4	0.75
Total G&A operating costs	**3.95**	**48.7**	**8.19**

Source: Cornish Metals, 2024.

G&A labour

G&A staffing levels have been prepared by Cornish Metals management and referencing experience at other, similar operations. Labour costs are based on fully burdened staffing wages.

G&A services and expenses

G&A services and expenses have been estimated by Cornish Metals management, and with consideration for other similar operations. Major items are based on current budgeted and anticipated operating expenses. Insurance premiums for the project are included in costs. Minor items are factored, based on estimate parameters such as numbers of staff, or are general allowances based on experience with other projects.

21.2.6 Contingency

No contingency provision has been included in the operating cost estimate.

22 Economic analysis

An economic model was developed by Cornish Metals to estimate annual cash flows of the Project on a pre-tax and post-tax basis. The QP has reviewed the economic model and finds its inputs and results to be acceptable and takes responsibility for the same.

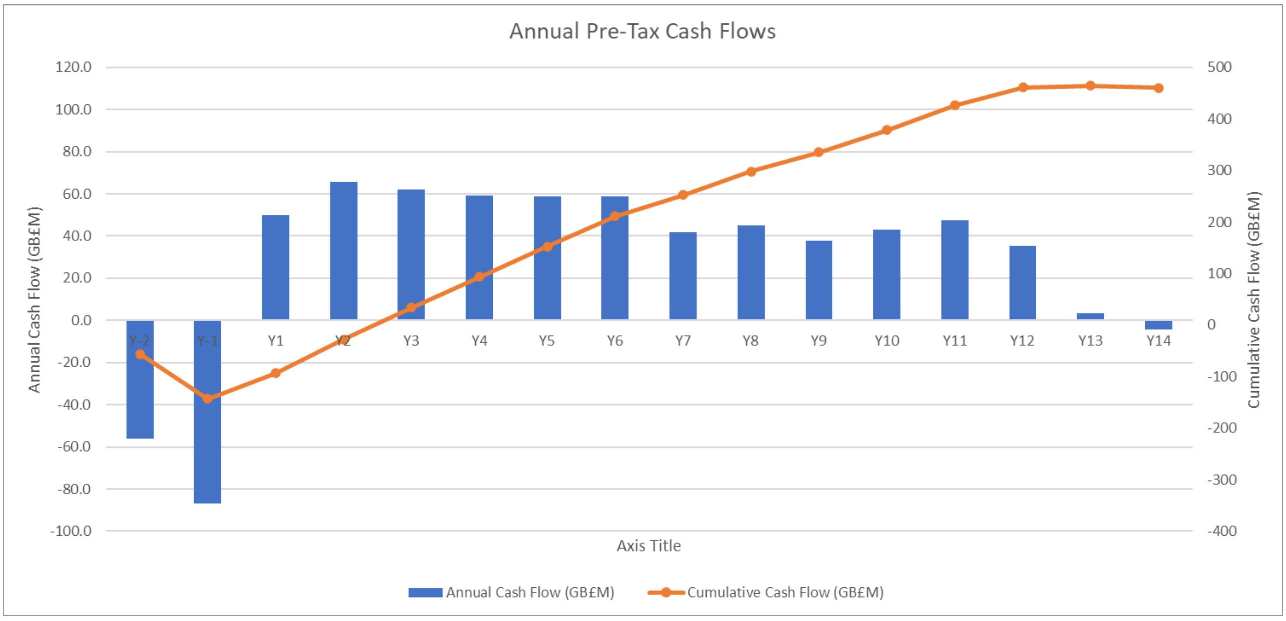
Sensitivity analyses were performed for variations in metal prices, head grades, operating costs, capital costs, and processing recovery to determine their relative importance as Project value drivers.

The estimates of capital and operating costs estimated for the Project are summarised in Section 21 of this report (presented in 2024 GBP). The economic analysis has been run with no inflation ('real' or constant value basis).

22.1 Results

The South Crofty Project economic evaluation indicates positive free cashflow, resulting in a base case post-tax internal rate of return (IRR) of 30% and a net present value (NPV) using an 8% discount rate ($NPV_{8\%}$) of £161M (US$201M) at metal prices shown in Table 22.3. Figure 22.1 shows the projected post-tax cash flows, and Table 22.1 summarises the economic results of the Project.

Figure 22.1 Annual post-tax cashflow



Source: Cornish Metals, 2024.

Table 22.1 Summary of results

Summary of results	Unit	Value
All-in sustaining cost (AISC)	£ /t Sn (US$ /t Sn)	10,930 (13,660)
Capital & revenue		
Pre-production capital	£M	142
Development & sustaining capital	£M	43
Total capital investment prior to payback	£M	149
Gross revenue	£M	1,250
Royalties	£M	27
Treatment & refining costs	£M	89
Net revenue	£M	1,134
Total operating costs	£M	489
Pre-tax cash flow	£M	459
Taxes	£M	102
Post-tax cashflow	£M	358
Economic results		
Pre-tax $NPV_{8\%}$	£M	211
Pre-tax IRR	%	33
Pre-tax payback	Years	2.9
Post-tax $NPV_{8\%}$	£M	161
Post-tax IRR	%	30
Post-tax payback	Years	3.0

Source: Cornish Metals, 2024.

The LOM all-in sustaining cost (AISC) is US$13,660/t Sn. The AISC is calculated using the following formula:

- (Total Operating Costs (C1) + Development & Sustaining Capital Costs (Less Processing Plant Upgrade) – Copper & Zinc Net Revenue) / Tonnes of Payable Tin

The post-tax break-even tin price is approximately US$18,600/t, based on the LOM plan presented herein. This is the tin price at which the post-tax Project NPV @ 0% discount rate is zero.

The inclusion of Inferred material means that mineralised inventories reported in this section do not constitute Mineral Reserves in accordance with NI 43-101.

22.2 Summary of inputs

The summary of the mine plan and payable metals produced is outlined in Table 22.2.

Table 22.2 LOM summary

Parameter	Unit	Value
Mine life	Years	14
Mined total	kt	5,955
Mined grade	% SnEq	0.97
Nominal processing rate	t/d	1,400
Metal recovered & sold	t Sn	49,300
	t Cu	3,840
	t Zn	3,230

Source: Cornish Metals, 2024.

Other economic factors include the following:

- Base discount rate of 8%.
- Nominal 2024 GBP.
- Working capital calculated as one month of operating costs (mining, processing, site services, and G&A).
- Results include royalties, which vary by mining area and ownership; the average royalty is 1.19% Sn based on tin price of $31,000/t over the LOM.
- No management fees or financing costs (equity fund-raising was assumed).
- The model excludes all pre-development and sunk costs up to a construction decision.

22.3 Metal prices and exchange rate

Table 22.3 outlines the metal prices and exchange rate assumptions used in the economic analysis. The tin price was based on long-term price projection (2027 to 2040) averaging approximately US$31,000/t provided by the market analysis study conducted by Project Blue and accepted as reasonable by the QP.

Table 22.3 Metal prices and exchange rates

Parameter	Unit	Value
Tin price	US$/t	31,000
Copper price	US$/t	8,500
Zinc price	US$/t	2,500
US Dollar to Sterling exchange rate	US$/£	1.25

Source: Cornish Metals, 2024.

22.4 Off-site charges

Mine revenue is derived from the sale of metal concentrate into the international marketplace. No contractual arrangements for refining currently exist. Table 22.4 indicates the parameters that were used in the economic analysis. The factors have been derived from recent received indicative smelter terms compiled by Cornish Metals.

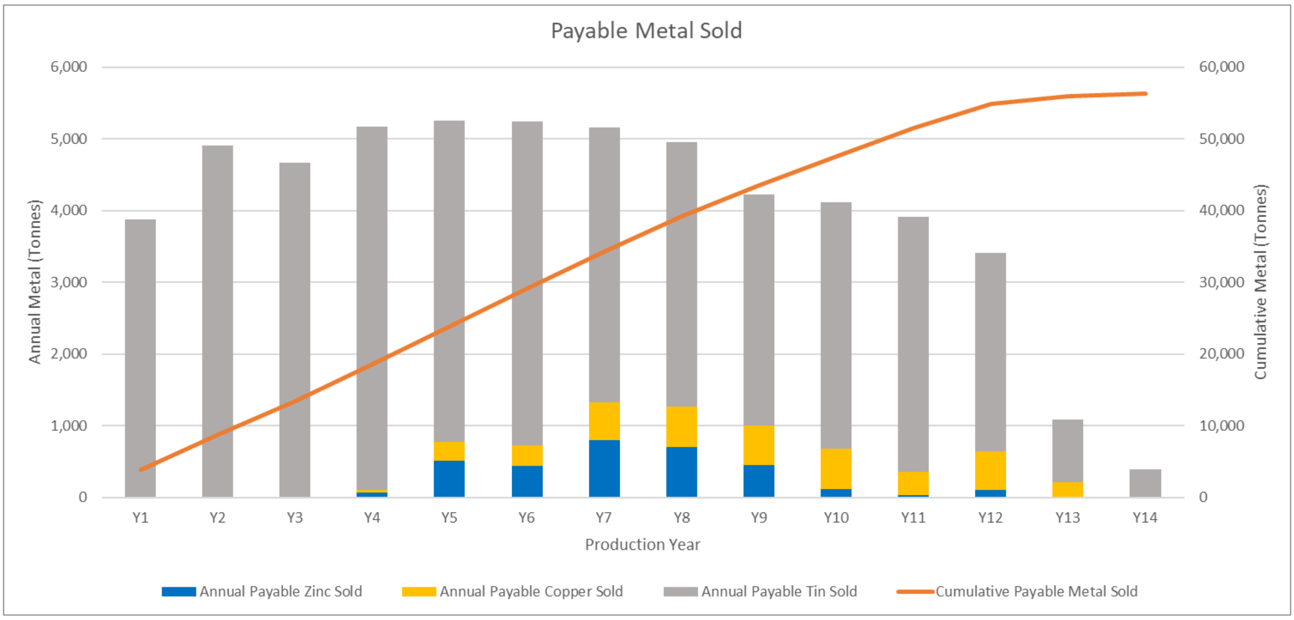
Table 22.4 Tin smelter payability factors

Parameter	Unit	Value
Transport charges	% Sn price	0.49%
Treatment charges	% Sn price	1.37%
Concentrate grade unit deduction	% Sn price	3.39%
Impurity charges	% Sn price	1.70%
Total tin payability	% Sn price	93.05%

Source: Cornish Metals, 2024.

Figure 22.2 shows the amount of metal (tin, copper, and zinc) recovered during the mine life. A total of 49,300 t of tin, 3,840 t of copper, and 3,230 t of zinc is projected to be produced over the LOM.

Figure 22.2 LOM payable metals



Source: Cornish Metals, 2024.

22.5 Taxes

The Project has been evaluated on a post-tax basis to provide an indicative value of the potential Project economics. A tax model reviewed and accepted as reasonable by the QP was prepared by Cornish Metals personnel with input from the company's tax advisors. Current tax rates were used in the analysis. The tax model contains the following assumptions:

- UK Corporation Tax rate: 25%
- UK VAT: 20%

Total taxes for the Project are projected to be £102M.

Tax estimates involve complex variables that can only be accurately calculated during operations as per the regulations at the time of reporting and, as such, the post-tax results are approximations based on currently available information.

22.6 Royalties

Royalty varies by zone and Sn price. For Sn prices over US$25,000/t, the royalty payable is 3.0% NSR. The average royalty to mineral right holders is 0.88% over the LOM. There is an additional NSR royalty payable to Osisko Gold on all metals and minerals produced at South Crofty at 1.5%. The total average royalty paid over the LOM is 1.79%.

22.7 Sensitivities

A univariate sensitivity analysis was performed to examine which factors most affect the Project economics when acting independently of all other cost and revenue factors. Each variable evaluated was tested using the same percentage range of variation, from -30% to +30%.

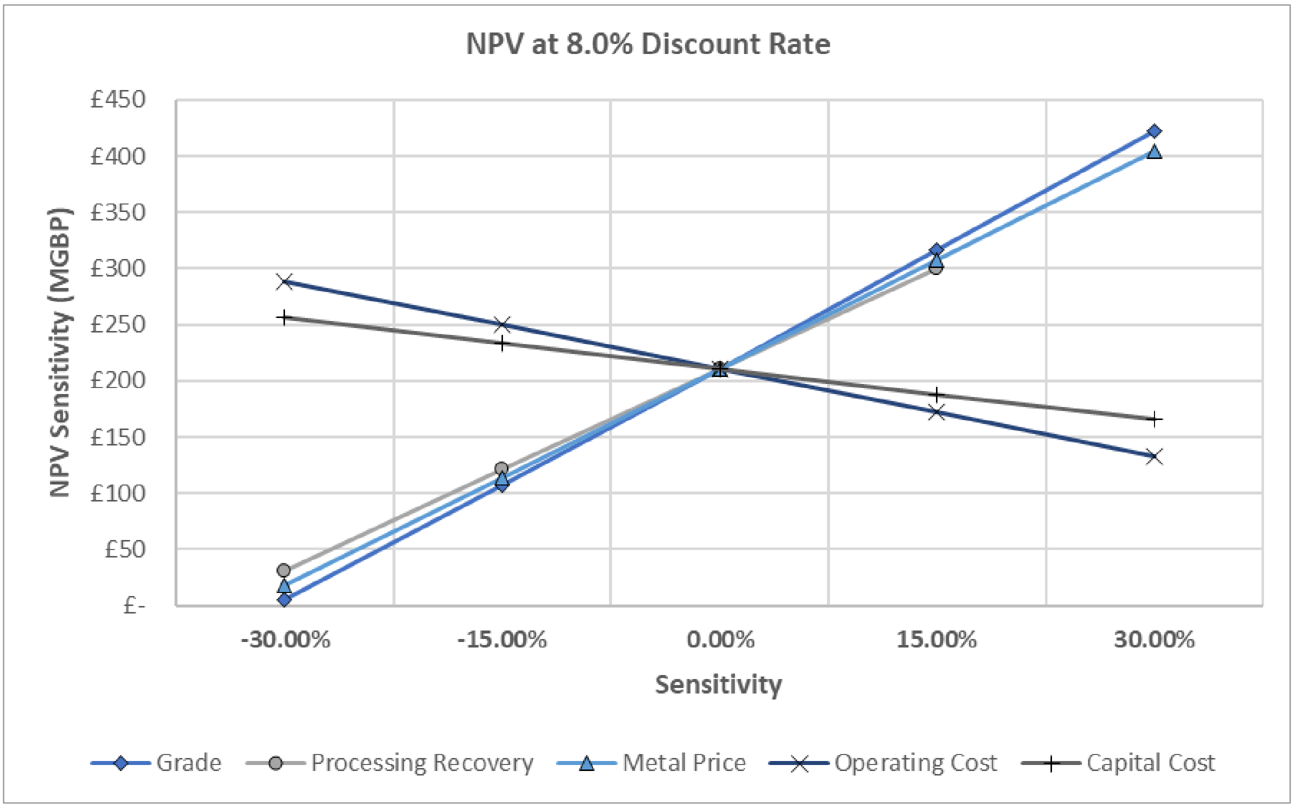
The Project is most sensitive to metal prices and head grade. The Project showed the least sensitivity to capital costs. Table 22.5 and Figure 22.3 show the results of the sensitivity tests, while Table 22.6 shows the NPV at various discount rates.

Table 22.5 Sensitivity results at $NPV_{8\%}$

Variable	Pre-tax $NPV_{8\%}$ (£M)		
	-30% variance	**0% variance**	**+30% variance**
Tin Metal price	18	211	405
Tin Head grade	5	211	422
Processing recovery	31	211	-
OPEX	289	211	133
CAPEX	256	211	166

Source: Cornish Metals, 2024.

Figure 22.3 Pre-tax $NPV_{8\%}$ sensitivity



Source: Cornish Metals, 2024.

Table 22.6 Project NPV at various discount rates

Discount rate (%)	Pre-tax NPV (£M)	Post-tax NPV (£M)
0	459	358
5	282	217
6	256	197
8	211	161
10	174	131
15	105	76

Source: Cornish Metals, 2024.

23 Adjacent properties

Whilst extensive mining activities have taken place in the region historically, there are no other mines operating or in development in the immediate vicinity of the South Crofty Project.

Other companies exploring and developing tin projects in Cornwall and the south-west of England include:

- Cornwall Resources Ltd, developing the Redmoor tin project, situated between the village of Kelly Bray and the town of Callington in south-east Cornwall, 75 km north-east of South Crofty.
- Cornish Tin Ltd, exploring for tin near the village of Breage, 14 km south-west from South Crofty, and for lithium at the nearby Godolphin granite.

24 Other relevant data and information

The QP is not aware of any additional information or explanation that is necessary to make the Technical Report understandable and not misleading.

25 Interpretation and conclusions

At the time of preparing this report, the project is underway with the dewatering phase, with existing mine workings being dewatered via installed pumps in NCK shaft. All pumped water is being treated at the recently constructed MWTP. New winders have been installed and commissioned, and the headframe has been inspected and refurbished, all as part of the dewatering phase of works.

It is concluded that the South Crofty works completed to date, including exploration and study work leading to the current Mineral Resource estimate, and the PEA summarised within this Technical Report, supports the ongoing advancement of the Project.

The PEA is preliminary in nature, it includes Inferred Mineral Resources that are considered too speculative geologically to have economic considerations applied to them that would enable them to be categorised as Mineral Reserves, and there is no certainty that the PEA will be realised.

25.1 Permitting

Permitting for the Project is well advanced, with Surface and Underground Planning Permissions active (underground mining permitted until 2071). South Crofty has made significant progress in securing the necessary environmental permits and licences for the proposed operations at the South Crofty mine.

Permits for abstraction, treatment, and discharge for the dewatering have all been granted. Permits are required for operation of Mineral Processing, Mine Backfill, and Secondary Aggregate manufacturing. South Crofty has a good understanding of its obligations under the EP regime and has already made significant progress in securing permits for the operations proposed at the site. Future permitting requirements are being discussed with the EA and plans for future permit applications are being progressed with a view to ensuring all necessary permits are in place well in advance of individual operations commencing.

25.2 Mineral Resources

The Mineral Resource estimates for both the Upper and Lower Mine areas of the South Crofty Property have extensive sampling undertaken prior to the mine closure in 1998 as a base. Limited additional drilling in 2008-2013 in the Upper Mine has added to the data available for the Upper Mine Mineral Resource estimate. Drilling completed by Cornish Metals in 2020 and 2022-2023 has provided additional assay information for the Lower Mine Mineral Resource estimates.

The Cornish Metals drillholes were planned to avoid the historical mine workings. The successful completion of the drillholes, given the extensive quantity of underground workings, helps to provide support for the veracity of the mine surveys. Under the Mines and Quarries Act of 1954 and subsequent versions, including the Mines Regulations 2014, a mine operator must ensure that there are accurate plans of all the workings within a mine (abandoned or not). Under this statutory requirement, Cornish Metals possesses an extensive set of mine surveys, including the original surveyors’ calculation books, which are safely stored in the mine archive.

Cornish Metals has undertaken an extensive programme of data collation, digitisation, and validation to incorporate sample and survey data into a robust form suitable for inclusion in the Mineral Resource estimates. Overall, the QP is of the opinion that the approach taken by Cornish Metals is suitable and has been performed in a diligent manner. For assay results obtained using the vanning method, ledgers record the assay results in SnO_2 lbs/ton, and the channel length in feet. The QP has verified the conversions of SnO_2 lbs/ton to Sn%, as well as conversion of sample length from feet to metres. The QP review indicates no significant data transcription errors that would materially impact the Mineral Resource estimates.

The QP has undertaken a programme of data review, which has included a comparison of assay methods (vanning versus XRF), pseudo-twinning analysis, assay certificate reviews, and a review of the QAQC data for the 2008-2013, 2020, and 2022-2023 drilling.

The QP is of the opinion that both vanning and XRF assay methods correlate, showing comparable grade populations, and are suitable for inclusion in the Mineral Resource estimates.

Reviewing the QAQC data shows no significant issues associated with sample contamination. CRM submissions for the 2008-2013 drilling and the Cornish Metals 2020 and 2022-2023 drilling show good levels of analytical accuracy. Reviewing the duplicate QAQC data shows that field duplicates exhibit a poor level of precision that is markedly improved following the crushing and pulverisation stages of sample preparation. The results indicate that mineralisation is inherently nuggety and homogenization of the samples is only achieved following the crushing stage.

Based on the pseudo-twinning analysis, and the review of duplicate assay results, the QP is of the opinion that grade variability is likely a function of the inherent compositional and distributional heterogeneity of mineralisation rather than a sampling issue.

Whilst the review work performed by the QP is sufficient to allow the reporting of Inferred and Indicated Mineral Resources, further QAQC activities are required to give additional confidence to the sample data before assigning any Measured classification. Subject to future access to the mine workings, Cornish Metals should consider a programme of twin sampling, which would include submission of QAQC samples.

Reconciliation work carried out correlating the Mineral Resource estimates with historical production data provides support to the veracity of the grade estimates. The reconciliation data is limited to those lodes where production reports can be linked to specific lode areas and other lode areas may not have the same degree of correlation.

The digitised survey data has been used to deplete the Mineral Resource estimates, and to flag areas as remnants where there is a potential to recover pillars or remaining mineralisation through a campaign-style recovery method. Whilst there is the potential to recover these remnant areas, subsequent mining studies might preclude them from being incorporated into a mine plan and economics values being allocated to them. Remnants comprise approximately 21% of the Lower Mine Indicated Mineral Resource and 4% of the Lower Mine Inferred Mineral Resource.

The Mineral Resource estimates for the South Crofty Property have been completed for the Upper Mine and Lower Mine areas. The Upper and Lower Mine estimates have been reviewed by independent QP Mr Nick Szebor, CGeol, EurGeol, of AMC. Mr Szebor has reviewed and takes responsibility for the estimates. AMC acknowledges Cornish Metals initiative in undertaking the Mineral Resource estimation internally.

Grade estimates were completed for Sn only in the Lower Mine, and for Sn, Cu, and Zn in the Upper Mine. A minimum mining width of 1.2 m has been applied to the Mineral Resources, and Mineral Resources are reported at a 0.6% SnEq cut-off grade accounting for the 1.2 m dilution.

For the Upper Mine a SnEq grade has been estimated for each block in the block model based on the following long-term metal price forecasts: Sn US$24,500/t, Cu US$ 8,000/t, and Zn US$2,700/t. For the Lower Mine area, the 0.6% SnEq cut-off grade is based on the Sn grade only.

Indicated Resources for the Upper Mine total 260 kt averaging 0.69% Sn, 0.78% Cu, and 0.59% Zn, while Inferred Resources total 465 kt averaging 0.66% Sn, 0.63% Cu, and 0.63% Zn.

Indicated Resources for the Lower Mine total 2,896 kt averaging 1.50% Sn, while Inferred Resources total 2,626 kt averaging 1.42% Sn.

The Mineral Resource update shows that there has been a 31.6% increase in contained tin for the Indicated classified material, and a 15.5% increase in contained tin for the Inferred classified material compared to the 2021 estimates.

25.3 Metallurgical testwork

Significant metallurgical testwork and analysis has been undertaken to confirm the process design and substantiate historical plant performance and projected recoveries. Cornish Metals has validated historical data from the Wheal Jane processing plant and completed additional confirmatory testwork, included pre-concentration and optimisation of the historic flowsheet. The QP is confident that the pre-concentration stage will add significant value to the project and the close correlation between historical production data and the latest testwork results provides confidence that the proposed flowsheet is fit for purpose. No deleterious elements of significance have been observed in any of the past metallurgical testwork or production records.

The 2022-2024 flowsheet development draws on the robust Wheal Jane flowsheet as a base case. Excellent metallurgical recoveries and concentrate grades were historically reported and key historical unit processes were present at the South Crofty Concentrator, such as ore pre-concentration prior to grinding and concentration, and use of spiral concentration.

Phase one work has been completed by WAI to provide characterisation and variability testing on each of the predominant five lode areas prior to compositing for flowsheet development.

The amenability of the most predominant lodes tested to pre-concentration, using a mixture of XRT Ore Sorting for the -50+15 mm and DMS for the -15+0.85 mm fractions, is excellent. As a consequence, the new flowsheet includes a pre-concentration step ahead of the already well proven Wheal Jane historical flowsheet. The characterisation testing on all five predominant lodes can be summarised as follows:

- All lodes ranked as 'difficult' to crush are 'moderate to very abrasive', have 'moderate to hard' Rod Mill Work Index and 'hard' Ball Mill Work Index. Generally, the waste rocks that will be rejected in the pre-concentration stage were less abrasive and marginally softer than the pre-concentrated mineralised material.
- The average grain size of all lodes is relatively coarse, which permits traditional gravity concentration techniques (spirals and tables) to be utilised for the bulk of the tin recovery. This supports the historical metallurgical flowsheet developments at South Crofty and Wheal Jane. Dolcoath had the finest grain size and poorer liberation characteristics in comparison of the five lodes tested.
- Liberation characteristics support a three-stage grinding approach; rod milling to d80 at 800-900 µm, primary grinding to d80 at 180-150 µm, and secondary grinding to d80 at 125 µm, where the bulk of the mineralisation is liberated.
- NPZ was identified as containing higher levels of fluorspar, which is a potential diluent in tin flotation concentrates, and also tungsten mineralisation. NPZ is the only lode that contains potentially recoverable tungsten, as a coarser grained liberated wolframite series group. All other lodes tend to be predominantly very fine grained and complexly locked scheelite, making any tungsten recovery extremely challenging.
- All five lodes consistently showed extremely low propensity to produce -6 µm slime cassiterite and gave consistent tin deportment by size.
- All lode samples are amenable to recovery using traditional gravity techniques to recover the majority of the cassiterite present. Due to the finer grain size and lower liberation characteristics, Dolcoath mineralisation was the worst performer of the five to traditional gravity separation recovery.

An allowance has been made for processing of the Upper Mine polymetallic (Cu, Zn, Sn) mineralised material using a bulk sulphide flotation followed by differential Cu-Zn flotation circuit, as employed successfully at Wheal Jane treating Wheal Jane ore. At this time, no metallurgical testing has been conducted.

25.4 Mining

The South Crofty project has been designed to continue previous underground mining. The project includes dewatering and pre-production phases prior to commencing production. Mine dewatering is currently underway, and the mine plan detailed in this study consists of an 18-month pre-production period prior to a 14-year mine life.

Mine designs have been completed based on Indicated and Inferred material from the Mineral Resource block models, with a 1.5 m minimum mining width and a cut-off grade above 0.45% Sn. The design has included approximately 40% total dilution, with diluted material carrying no metal value, and has an overall mining recovery estimated at 92%. The mine design projected production totals 5.95 Mt at an average Sn grade of 0.97%.

The pre-production period includes 12,450 m of new development and 14,300 m of rehabilitation / stripping of existing development. During this time 26,730 t of mineralised material will be mined and stockpiled prior to operations. Planned mine production is 500,000 tpa operating over 14 years.

Underground mining by SLOS is confirmed as the most appropriate underground mining method for the Project and was historically used with excellent results. Standard stoping dimensions of 22.5 m height with an average width of 2.2 m have been designed, with larger open spans possible, as determined through the current geotechnical analysis. In-cycle cemented paste fill is not required in active mining areas for ground stabilisation and tailings will be processed for underground disposal into existing mine voids.

Mine production will utilise the NCK shaft for material handling, using the existing underground crusher and ore-pass system for hoisting into a newly developed discharge station. Material will then be transferred from the discharge station to the processing facility by truck.

The mine design includes production from Upper Mine polymetallic areas. These areas have been delayed in the mine production schedules owing to higher Sn grades at depth and a requirement for additional processing equipment in the concentrator plant. Upper Mine polymetallic areas include 0.77 Mt of mineralised material containing Sn, Cu, and Zn.

25.5 Mineral processing

Previous processing recoveries for tin from the Lower Mine are well documented in the historical monthly geological reports. Recoveries for the Upper Mine might differ from those documented for the Lower Mine owing to the lower average Sn grade of 0.65% compared to 1.4% Sn in the Lower Mine. Metallurgical testwork is currently ongoing and may yield results that differ from the historical recoveries.

South Crofty will produce a tin concentrate that is expected to be marketable to a large number of downstream smelters, traders, and sales agents, with which whom the project has been in discussions. The mine will also produce copper and zinc concentrates when processing Upper Mine polymetallic mineralisation.

The metallurgical testwork conducted so far does not flag any significant issues and supports the historical database.

The flowsheet draws on the historical flowsheet that evolved over several years at Wheal Jane in the 1990s and adds a pre-concentration stage using established low risk technologies with proven metallurgical results. Future metallurgical testing with spiral concentrators and Multi Gravity Separation provides further upward potential to enhance recovery and simplify and rationalise capital / operating costs.

The introduction of adequate buffer capacity, specifically between the pre-concentrator and the concentrator, will make the downstream concentrator less susceptible to surges as and when crushing starts and stops. This will make the plant easier to operate and control. Waste products from the planned process include XRT and DMS rejects as well as wet ground tailings. XRT and DMS rejects will be taken off-site as secondary aggregate processing and wet tailings will be processed for paste backfill. The cemented paste backfill will be used to store tailings in existing mined voids.

25.6 Paste backfill

Scoping testwork benchmarking against other projects and assumptions have been used in the study. Paste strength requirements used are considered to be conservative for the narrow widths. The distribution system is based on gravity flow; however, this will be reviewed with further testwork and updates to the mine plan if further lateral delivery extents are required.

25.7 Infrastructure

The project has recently constructed a MWTP to treat pumped mine water, from two installed large dewatering pumps in NCK Shaft. Other infrastructure includes refurbishment of the South Winder House, Winder, and Headframe. A new emergency Winder House and Winder has also been installed.

Project works have included installation of a new 11 kV 5 MVA power supply and switchroom. The site has 33 kV overhead lines passing, with an additional 7 MVA agreed capacity.

The site surface facilities have planning permission and have been designed to support the mining operations with construction of the processing facility, backfill plant, HSE store, fuel stores, and ancillary buildings (including offices, miners dry, archive, workshops).

25.8 Capital and operating costs and financial modelling

Direct cost estimates were developed from a combination of budget quotes, material take-offs, existing contracts, project specific references, and historical benchmarks or reference costs. Indirect and owner's costs were estimated using a combination of existing commitments, calculated project requirements, and historical benchmarks. Contingency was applied to each capital cost item in the estimate based on the level of engineering and reliability of its unit rates.

The capital cost estimate does not include sunk costs. Total capital cost is estimated to be £142M (US$177M) and total operating cost over the projected LOM is estimated to be £489M (US$611M). Project cashflow assessment indicates an IRR of 30% on a post-tax basis at a project long-term tin price of $31,000/t. The post-tax NPV for the project is estimated to be £161M (US$201M) using a discount rate of 8%, with a payback of the capital expenditure achieved in 3.0 years from the start of commercial production.

25.9 Environmental

The environmental studies completed conclude that, during construction and operations, there are site specific impacts; however, the impacts will be managed through best-practices and international standards through to mine closure. The project assessment is that the production, employment, and regeneration impacts have significant and highly important benefits, through the retention and creation of skilled and well-paid jobs available to the local community, the enhancement and revival of the cultural and social heritage of Cornish Mining, and public confidence of local importance and significance.

Tin is recognised as a 'critical metal' by the UK Government and, at a global level, has a pivotal role in the production of many common items, such as consumer electronics, packaging materials, and alloys for the aviation and automotive industries.

Tin is also recognised by the EU as a 'conflict metal', under the 'Conflict Minerals Regulation' 2021. The regulation requires EU companies in the supply chain to ensure they import 'conflict metals' from responsible and conflict-free sources only.

25.10 Closure

Cornish Metals is confident that it has a closure plan in place that is accurate and fit for purpose. Financial assurance will be put in place once the plan has final agreement, while recognising that the plan will be then further developed and revised as the years progress. The mine closure plan is aided by knowledge that has been gained from the previous mine closure and the fact that there will be no TSF to address and manage post closure. The closure plan contains a section on mine closure risk, which describes how Cornish Metals has identified and addressed risks that are associated with mine closure. The plan will be reviewed on an annual basis to ensure that the assumptions remain correct, that there have been no changes in legislation, that there have been no advancements in the industry that impact on the plan, and that the costings remain up to date and accurate.

25.11 Risks

Table 25.1 Project risk matrix

#	Risk name	Risk description	Cause(s) description	Consequence(s) description	Primary consequence type	Secondary consequence type	Existing controls	Probability	Consequence	Rating	Qualitative result	Phase affected	Mitigation(s)	Post mitigation risk estimate			
														Probability	Consequence	Rating	Qualitative result
Geology	Mineralisation and grade variability	Actual production grades differ from those in the Mineral Resource block model.	Mineralisation displays variable "nuggety" grade distributions at the local scale.	Change in production forecast.	Schedule	Quality and Technical Integrity	Mineral Resource estimate	B	3	B3	Significant	OPS	Implement infill resource definition drilling and grade control works to support short term planning.	D	2	D2	Low
Geology	Resource definition drilling access	Limited areas of Inferred Mineral Resources currently available.	Insufficient areas to enable drilling to convert areas of Inferred Mineral Resources to Indicated or Measured.	Prevents conversion of Inferred Mineral Resources to Indicated and Measured, therefore precluding the potential inclusion within Ore Reserves and the mine plan.	Quality and Technical Integrity	Schedule	Limited surface drilling areas	A	4	A4	High	FS	Ongoing dewatering and development of underground drilling cubbies to facilitate drilling.	D	3	D3	Medium
Geology / Mining	Minimum mining width	Increases to the minimum mining width may reduce the Mineral Resource and mineable inventory.	Change in mining method, inappropriate equipment, adverse ground conditions.	Increases to the minimum mining width beyond 1.2 m will increase dilution and may reduce the Mineral Resource above cut-off grade. An increase in mining width above 1.5 m would potentially reduce the mineable inventory.	Schedule	Quality and Technical Integrity	Equipment sized appropriately for historic and proposed mining methods. Minimum mining width of 1.5 m used in mine plan.	C	4	C4	Significant	FS	Further mining studies including geotechnical conditions, mining equipment selection and robust controls on mining selectivity.	D	3	D3	Medium
Metallurgy	Limited Metallurgical Testwork	Insufficient metallurgical data may affect the forecast metallurgical performance.	Metallurgical Variability and Effect of Lower Grade Ore. Process unable to respond effectively to variability in ore feed grade. Some process elements have limited testwork.	Tin Recovery and / or weight rejected vary from Testwork. Concentrator Tin Recovery is lower than forecast.	Quality and Technical Integrity	Quality and Technical Integrity	Existing engineering studies	B	4	B4	High	FS	Conduct Variability Testwork which incorporate effect of feed grade.	D	2	D2	Low
Metallurgy	Limited Process Testwork	Falcon testwork currently based upon -25 µm size fraction only. Falcon - MGS circuit not Locked cycle tested due to constraints on sample kgs. Overall Secondary Gravity Recovery with circulating load.	Higher overall tailing and / or weight pull to concentrate. Falcon testwork currently based upon -25 µm size fraction only. Uncertainty of where the MGS cleaner tailing tin content will deport.	Concentrator Tin Recovery is lower than forecast. Incorrect Equipment Selection with / or Incorrect weight & metal splits to unit processes.	Quality and Technical Integrity	Quality and Technical Integrity	Existing engineering studies	B	4	B4	High	FS	Undertake further process testwork. Undertake trade-off Studies. Experienced Engineering Group to review and re-design where necessary.	D	3	D3	Medium
Mining	Historical Mine Workings	Encountering historical mine workings not encapsulated in current mine surveys.	Not all mine workings have been surveyed, or incorporated into the survey database prior to the previous mine closure.	Additional depletion and sterilization of Mineral Resources.	Quality and Technical Integrity	Schedule	Accurate survey plans required under 1954 Quarries Act. Historic data and diamond drilling.	C	4	C4	Significant	OPS	As areas become accessible and made safe following dewatering, confirmatory survey works should be completed and Resource infill drilling completed.	D	3	D3	Medium

#	Risk name	Risk description	Cause(s) description	Consequence(s) description	Primary consequence type	Secondary consequence type	Existing controls	Probability	Consequence	Rating	Qualitative result	Phase affected	Mitigation(s)	Post mitigation risk estimate			
														Probability	Consequence	Rating	Qualitative result
Mining	Mineable Inventory	Insufficient Resources converted into Measured and Indicated to support Reserves in feasibility study.	No additional drilling completed.	Less material available for Reserves and lower project economics.	Cost	Schedule	Diamond Drilling, historic resources. Preliminary indicated only mine plan.	A	4	A4	High	FS	Additional definition drilling for conversion of Inferred material to Measured and Indicated category. Mine planning to ensure maximum conversion to Reserve status.	D	3	D3	Medium
Mining	Mining Schedule	Unable to reach 500 ktpa mill feed.	Mining in multiple areas, different production rates, ground conditions, rehabilitation progress.	Reduced mill feed	Schedule	Quality and Technical Integrity	PEA Level mine planning	A	4	A4	High	OPS	Detailed mine plan, allowances for unquantified delays.	C	3	C3	Significant
Mining	Development Advance	Development schedule not achieved.	Not achieving planned advance rates for rehabilitation and stripping.	Reduced development rate and delayed access to production areas.	Schedule	Cost	PEA Level mine planning, reduced advance rates.	B	3	B3	Significant	OPS	Detailed mine plan, allowances for unquantified delays.	C	3	C3	Significant
Mining (Backfill)	Backfill strength	Backfill does not achieve the desired strength.	Inadequate cement additional, excessive water addition or geochemical interference.	Backfill may not achieve the desired strength to prevent liquefaction and thus presents an ongoing inundation risk to the underground environment.	Safety / Health	Cost	Extensive test work has been performed to confirm the performance of cement at various addition rates.	D	5	D5	High	OPS	Further testing if additional or alternative tailings become available prior to the start of operations. Once in operations, operator training to ensure the backfill system operates as intended and consistent QAQC so that if low strength material is produced, it is identified and post placement mitigations (such as area isolation) can be put in place.	E	4	E4	Medium
Mining (Backfill)	Backfill Reticulation system leak	A failure occurs in the integrity of the backfill reticulation system leading to leakage of backfill in unintended locations.	Poor initial installation and / or poor routine maintenance and wear monitoring.	Backfill will be released into unintended areas which may result in the interruption of other processes in the mine (e.g. haulage). The leak will also take time and cost to repair and will interrupt the backfilling schedule.	Cost	Schedule	The initial design has been developed in accordance with industry standards.	C	2	C2	Medium	OPS	Installation by experienced contractor and proper supervision and sign off. Staff training and development of SOPs to improve routine maintenance and wear monitoring.	D	2	D2	Low
Mining (Backfill)	Excessive Backfill System Down Time	The backfill system does not operate for the number of hours per year anticipated in the design.	Inadequate stope availability underground.	The buffer capacity (tanks and filtercake stockpile) is exhausted in the surface plant and the process plant operation needs to be suspended.	Cost	Schedule	Additional throughput capacity in the backfill system to allow for high run rates to "catch up".	C	3	C3	Significant	OPS	Comprehensive mapping of underground stope voids to allow for proper scheduling. Proactive pipe work installation to minimise downtime between filling areas.	D	3	D3	Medium
Mining / Recovery Methods	Availability of skilled labour	Increase in labour rates and UK shortage of professional engineers.	Lack of skilled engineers and a competitive market.	Inability to achieve mine production schedule and operation of process facilities.	Schedule	Cost	Search for talented engineers underway. Supporting scholarship program at local university "Camborne School of Mines"	C	2	C2	Medium	OPS	1) Begin training of operators at nearest opportunity. 2) Provide career progression. 3) Continue to support the local mining school to attract graduates. 4) Continued networking through HR.	C	1	C1	Low
Recovery Methods	Plant throughput	Current engineering studies aligned at 400,000 tpa throughput.	Design needs adjusting to suit 500,000 tpa from 400,000 tpa.	The mass-water balance and PDC needs upgrading to suit 500,000 tpa capacity.	Quality and Technical Integrity	Quality and Technical Integrity	Current engineering study	A	5	A5	High	FS	Engineering Group with appropriate knowledge and experience re-engineer the Process design where necessary.	D	2	D2	Low

#	Risk name	Risk description	Cause(s) description	Consequence(s) description	Primary consequence type	Secondary consequence type	Existing controls	Probability	Consequence	Rating	Qualitative result	Phase affected	Mitigation(s)	Post mitigation risk estimate			
														Probability	Consequence	Rating	Qualitative result
Recovery Methods	Incorrect process equipment selection	Incorrect equipment selected for process.	Process Design Criteria too simplistic.	Incorrect equipment selections.	Quality and Technical Integrity	Quality and Technical Integrity	Current engineering study	B	4	B4	High	FS	Engineering Group with appropriate knowledge and experience re-engineer the Process design where necessary.	D	2	D2	Low
Recovery Methods	Increase in process plant construction costs	Increase in plant building cost associated with its placement into the relatively confined area.	Detailed engineering not at a stage to enable local contractors to provide budgetary cost estimates. Possible cost rise as elaborate lifting equipment / systems may be required.	Additional capital cost expenditure.	Cost	Schedule	Detailed engineering is scheduled	C	2	C2	Medium	EXEC	Completion of detailed engineering will enable contractors to provide more accurate cost estimates.	D	1	D1	Low
Recovery Methods	Increase in process plant operating costs	Change in process operating costs (materials, consumables, energy, and labour).	Market fluctuations	Additional operating costs.	Cost	Schedule	Detailed engineering is scheduled	C	2	C2	Medium	OPS	1) Once an appropriate level of engineering has been completed the procurement of materials, equipment and contractors should be undertaken at nearest opportunity. 2) Exploring alternative suppliers and methodologies will serve to provide alternative solutions. 3) Manage and control costs tightly.	D	2	D2	Low
Environmental and Social (Closure)	Groundwater & Surface water Chemistry / Quality	Risk of long term impact on groundwater quality post closure.	Contamination from chemicals or materials used during the mining process.	The concentration for one or more chemical parameter may be beyond guidance or legal requirements and may have an impact on humans or flora / fauna.	Environment	Legal & Regulatory		D	4	D4	Significant	OPS	Good housekeeping for mine life to avoid spill (bunding, etc.). MWTP. Maintain operation of MWTP post closure for geothermal project, which will further mitigate against the risk.	E	4	E4	Medium
Environmental and Social (Closure)	Geotechnical / Subsidence Risk	Risk of subsidence and related damage above the workings post closure.	Void space created by mining results in collapse / surface subsidence.	Damage to surface infrastructure including third party property.	Safety/Health	Reputation / Social / Community	Competent host rock	D	4	D4	Significant	OPS	Mine plan, designate a maximum span, placement of engineered backfill.	E	4	E4	Medium
Environmental and Social (Closure)	Contaminated / Impacted Land Risk	Risk of contaminated land remaining post closure.	Spillage of material during LOM and failure to remediate.	The concentration for one or more chemical parameter may be beyond guidance or legal requirements and may have an impact on humans or flora / fauna.	Environment	Legal & Regulatory		B	3	B3	Significant	OPS	Good housekeeping for mine life to avoid spill (bunding, etc.). Monitoring.	E	3	E3	Medium
Environmental and Social (Closure)	Risk of post closure impact on ecology / biodiversity	Risk that the closure plan will result in the impact on sensitive species on and around the mine site.	A decline in the number and diversity of species on and around the mine site.	Mine closure is a complex activity and has the potential to impact on habitat if not correctly implemented and in particular failure to manage surface water, groundwater, and land / soil contamination risks - has the potential for direct impact on species.	Environment	Legal & Regulatory		B	3	B3	Significant	OPS	Controls as described in 001 and 003. Use of independent ecologists to monitor biodiversity during operations, during closure and post closure.	E	3	E3	Medium

#	Risk name	Risk description	Cause(s) description	Consequence(s) description	Primary consequence type	Secondary consequence type	Existing controls	Probability	Consequence	Rating	Qualitative result	Phase affected	Mitigation(s)	Post mitigation risk estimate			
														Probability	Consequence	Rating	Qualitative result
Environmental and Social (Closure)	Technical Knowledge	Risk that South Crofty will not have the required technical knowledge to develop and implement the closure plan.	The closure plan is only as good as the people who develop and implement the plan. The risk is particularly acute as mine closure approaches and people can tend to leave a project for new operations.	Inexperienced incompetent people will not properly maintain or implement the closure plan and thus increase the likelihood of impact from the risks described in this table (e.g. groundwater, etc.).	Environment	Legal & Regulatory		B	3	B3	Significant	OPS	Manage terms and conditions of staff and contractors. Offer completion bonus / severance if deemed necessary.	E	3	E3	Medium
Environmental and Social (Closure)	Financial Assurance / Security of Funds	Risk that closure funds will be unavailable when required.	Company did not provide for closure or did not adequately secure funds.	No funds or reduced funds when the time arrives to implement the closure plan.	Cost	Legal & Regulatory		D	3	D3	Medium	OPS	Adequately provide for and secure closure funds.	E	3	E3	Medium
Environmental and Social (Closure)	Early / Delayed Closure	A need for early or delayed closure brought about by events beyond the control of the project.	Unforeseen change to closure timeline.	Early or delayed closure can have implications on the availability of resources to implement the closure plan.	Cost	Environment		D	3	D3	Medium	OPS	Review the closure plan on an annual basis, including a review of resources and funding to ensure that there is an implementable plan available at all times.	D	1	D1	Low
Environmental and Social (Closure)	Change to Legislation	Changes to environmental or other legislation that impacts on success criteria for closure plan.	Although the project has a short mine life it is possible that changes to legislation may occurring during the life of the project.	Changes in legislation can directly impact on the success criteria of the closure plan - for example a lower concentration for specific chemical parameters may be required in surface or groundwater.	Legal & Regulatory	Cost	Short mine life	C	3	C3	Significant	OPS	Maintain legal register, monitor proposed changes in legislation being proposed by government (lobby if necessary via industry representatives). Annual review of closure plan and success criteria.	C	2	C2	Medium
Environmental and Social (Closure)	Stakeholder Expectation	Risk that the project team underestimates the expectation of any of the stakeholders with respect to any aspect of closure (e.g. local government or community).	New stakeholders may require changes to success criteria (including changes in personnel within stakeholder - e.g. local authorities).	Stakeholders may require success criteria that are harder to achieve.	Reputation / Social / Community	Cost		B	2	B2	Medium	OPS	Continuous engagement with stakeholders to explain how operations are being managed and how the closure implementation process is being managed and how it is not having a negative impact.	E	2	E2	Low
Permitting	Delay in permitting process	Permitting delayed	Delay from 3rd Party objections. Request for additional information for Authorities.	Fail to secure funding for project.	Schedule	Cost	Mature project. Historical mining site. Number of permits in place.	D	3	D3	Medium	FS	Engage with Authorities to progress any remaining permits.	E	3	E3	Medium
Permitting	Refusal of permit(s)	Operating permits refused	Issue with project (environmental and / or social issues), or no issue with project, however, weak EIA does not provide adequate explanation.	Fail to secure funding for project.	Schedule	Cost	Mature project. Historical mining site. Number of permits in place.	D	3	D3	Medium	FS	Engage with Authorities to progress any remaining permits.	E	3	E3	Medium
Permitting	Onerous Conditions	Permits contain conditions that require additional costs and resources to achieve.	Conditions difficult to meet technically.	Increase CAPEX & OPEX over life of project.	Cost	Schedule	Mature project. Historical mining site. Number of permits in place.	D	3	D3	Medium	FS	Engage with Authorities to ensure achievable & appropriate conditions are issued.	E	3	E3	Medium

Source: AMC, 2024.

26 Recommendations

Technical study work and site development / construction completed to date provide a strong technical and economic basis for continuing the development of the South Crofty project. It is recommended to continue with the project development while progressing the technical studies that are already underway. The planned activities include optimisation and confirmatory work, which are not expected to affect the development schedule but that will reduce and de-risk the project execution schedule. The work is being led by South Crofty personnel.

26.1 Mineral Resource estimation

Since the previous 2021 Mineral Resource estimate, Cornish Metals has undertaken further work to collate, digitise, and validate some of the historical sample data into the Mineral Resource database. As a result of this work, additional lodes have been modelled as part of the current Mineral Resource estimates. The QP recommends that additional work be undertaken to collate the outstanding historical sample data into the database to further inform the Mineral Resource estimates. The collation of historical sample data can be accommodated by the current Cornish Metals geological team and under existing operating budgets.

To supplement and to provide additional support to the historical data, Cornish Metals should carry out further confirmation sampling works. The QP is of the opinion that sampling from underground, following dewatering, would provide the best access for drilling and sampling. Dewatering commenced in November 2023 and key areas for drilling access have been identified and will be accessed when made available. The cost of dewatering is included in current operating budgets.

As part of any sampling works a rigorous QAQC scheme should be implemented. The QP recommends continued use of CRMs, blanks, and duplicates for any additional sampling.

26.2 Metallurgical testwork

Metallurgical testwork is currently ongoing and includes optimisation of gravity separation and tin dressing of primary and secondary bulk gravity concentrates. Upon completion of this testwork programme, the results should be reviewed to inform trade off studies for optimisation of the flowsheet alternatives.

Samples for the metallurgical programme have been limited to those obtained from surface drilling of the down-dip extents of known lodes. As the mine dewatering progresses further, the QP recommends that metallurgical sampling and variability testwork should be completed on the Upper Mine if included in subsequent phases of the project. Further larger scale testwork on a single bulk composite sample to verify the proposed alternative multi-gravity separation technologies is required, as well as testwork on different grade samples to better understand the effect of head grade on the pre-concentration metallurgy. Estimated costs would range between US$100,000 - US$500,000.

26.3 Mining

Following dewatering, a programme of checking the mine surveys is planned to be undertaken to provide additional support to the historical digitised mine survey data. The additional survey checks could be undertaken by Cornish Metals under its existing operating costs.

Further geotechnical data will be collected from future diamond drillholes to confirm the rock mass characterisation. This will include continued geotechnical logging, additional televiewer surveys and geotechnical testwork. The cost of this work is covered in planned operating costs.

As the Project progresses towards a Feasibility Study, additional mine design works will be required on Measured and Indicated Resources only, supported by further studies including geotechnical and mine ventilation. The cost of this work is included under engineering studies as part of the PEA pre-production work estimates.

26.4 Mineral processing

The plant design process should continue to draw on robust historical designs, but look for enhanced recovery and / or rationalisation of capital / operating costs using new design and technologies. This will be part of Cornish Metals staff duties under the Project's standard operating costs.

Trade-off studies are recommended to support flowsheet development logic to ensure the new unit processes employed are fully justified. Trade-off work is planned under engineering studies that are part of the PEA pre-production work estimates.

26.5 Paste backfill

Feasibility of paste backfill design and testing is continuing. The testing programme underway includes leachate and environmental testwork to support the upcoming operational permit applications. This will include the incorporation of the MWTP sludge into the paste backfill. The cost of this work is covered by planned ongoing testwork.

26.6 Environmental

Ongoing testing and associated works, including discussions with the environment agency and local regulators, is recommended to be continued to complete permitting on remaining operating activities and to support review of any further permitting obligations. The cost of the work is covered by planned operational budgets.

26.7 Mine closure

The closure plan will be reviewed on an annual basis to ensure that the assumptions remain correct, that there have been no changes in legislation, that there have been no advancements in the industry that impact on the plan, and that the costings remain up to date and accurate. The cost of this work is covered by planned operational budgets.

27 References

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28 QP Certificates

QUALIFIED PERSON CERTIFICATE

I, Nicholas Szebor, CGeol (London), EurGeol, FGS, of Maidenhead, United Kingdom, do hereby certify that:

1 I am currently employed as the Regional Manager (UK) / Principal Geologist with AMC Consultants (UK) Limited, with an office at Building 3, 1st Floor, Concorde Park, Concorde Road, Maidenhead, Berkshire, SL6 4BY, United Kingdom.

2 This certificate applies to the technical report titled "South Crofty PEA" with an effective date of 8 April 2024 (the "Technical Report") prepared for Cornish Metals Inc. ("the Issuer").

3 I am a graduate of Camborne School of Mines in Penryn, Cornwall, UK (Master of Science in Mining in 2006), and the University of Wales in Bangor, UK (Bachelor of Science in Ocean Science in 2004). I am a member in good standing of the European Federation of Geologists (License #1174), Geological Society of London (License #1015279), and a fellow of the Geological Society of London (License #1015279). I have 17 years of experience within the mineral industry working in roles including consultancy and production. My experience covers a range of commodities, geological settings, exploration, and production environments, including underground and open pit operations. This experience has been obtained across the mining lifecycle from early-stage exploration to production and mine closure. I have carried out Mineral Resource estimates to international reporting codes including JORC, CIM (NI 43-101), and SAMREC. I am familiar with the tin deposits of Cornwall, having studied the geology of the region and worked on other projects in the region. I am familiar with narrow vein "nuggety" styles of mineralization both in terms of exploration methods, sampling, and Mineral Resource estimation.

I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

4 I have visited the Project site on 4 February 2020, for 1 day, and 14 July 2023, for 1 day.

5 I am responsible for Sections 2-12, 14, 23, 24, 27, and parts of Sections 1, 25, and 26 of the Technical Report.

6 I am independent of the Issuer and related companies applying all of the tests in Section 1.5 of NI 43-101.

7 I have had prior involvement with the property that is the subject of the Technical Report, as a qualified person for previous AMC Technical Report on the South Crofty property in 2021 (effective date 7 June 2021) and 2023 (effective date 14 September 2023).

8 I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

9 As of the effective date of the Technical Report and the date of this certificate, to the best of my knowledge, information and belief, this Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Effective Date: 8 April 2024
Signing Date: 24 May 2024

Original signed by

____

Nicholas Szebor, CGeol (London), EurGeol, FGS
Regional Manager (UK) / Principal Geologist
AMC Consultants (UK) Limited

QUALIFIED PERSON CERTIFICATE

I, Dominic Claridge, FAusIMM, of Maidenhead, United Kingdom, do hereby certify that:

1 I am currently employed as a Principal Mining Engineer with AMC Consultants (UK) Limited, with an office at Building 3, 1st Floor, Concorde Park, Concorde Road, Maidenhead SL6 4BY, United Kingdom.

2 This certificate applies to the technical report titled "South Crofty PEA" with an effective date of 8 April 2024 (the "Technical Report") prepared for Cornish Metals Inc. ("the Issuer").

3 I am a graduate of the University of Sydney in Sydney, Australia (Bachelor of Engineering in Mining in 1988). I am a Fellow in good standing of the Australasian Institute of Mining and Metallurgy (Fellow #101409). I have more than 30 years of experience within the mineral industry working in roles including experience in mining operations, senior and corporate mine management, project planning and execution, technical due diligence, and Mineral Reserve estimation. I have experience in gold operations with both shaft and decline access. My experience extends to reopening historic mines in Australia and Africa.

I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

4 I have visited the Project site from 29-31 August 2023, for 3 days.

5 I am responsible for Sections 15, 16, 19, 22, and parts of Sections 1, 18, 21, 25, and 26 of the Technical Report.

6 I am independent of the Issuer and related companies applying all of the tests in Section 1.5 of NI 43-101.

7 I have not had prior involvement with the property that is the subject of the Technical Report.

8 I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

9 As of the effective date of the Technical Report and the date of this certificate, to the best of my knowledge, information and belief, this Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Effective Date: 8 April 2024
Signing Date: 24 May 2024

Original signed by

____

Dominic Claridge, FAusIMM
Principal Mining Engineer
AMC Consultants (UK) Limited

QUALIFIED PERSON CERTIFICATE

I, Barry Balding, P.Geo., EurGeol, of Kilkenny, Ireland, do hereby certify that:

1 I am currently employed as a Technical Director with SLR Environmental Consulting (Ireland) Ltd, with an office at 35 Friary Street, Kilkenny, R95 FP62, Ireland.

2 This certificate applies to the technical report titled "South Crofty PEA" with an effective date of 8 April 2024 (the "Technical Report") prepared for Cornish Metals Inc. ("the Issuer").

3 I am a graduate of Trinity College, Dublin, Ireland (BA Mod. Earth Science, 1986), and University College, Galway, Ireland (MSc. Applied Geophysics, 1987). I am a member in good standing of the Institute of Geologists of Ireland (IGI) (No. 51), and a Professional Member of the European Federation of Geologists EurGeol (#379). I have over 30 years' experience in technical and management experience in the mining and aggregate industries, with both open pit and underground experience. I have been responsible for the management of multi-disciplinary projects, including feasibility studies, site assessments (resource evaluation), and project due diligence for a variety of commodities and aggregate types. I have extensive project management experience in producing ESIAs and planning / permit applications for the extractive industry, as well as mine closure and stakeholder engagement. My experience also covers the management, planning, and execution of exploration programmes for aggregates, base metals, and gold, including the use of geophysics.

I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

4 I have visited the Project site on 30 November 2023, for 1 day.

5 I am responsible for Section 20, and parts of Sections 1, 21, 25, and 26 of the Technical Report.

6 I am independent of the Issuer and related companies applying all of the tests in Section 1.5 of NI 43-101.

7 I have not had prior involvement with the property that is the subject of the Technical Report.

8 I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

9 As of the effective date of the Technical Report and the date of this certificate, to the best of my knowledge, information and belief, this Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Effective Date: 8 April 2024
Signing Date: 24 May 2024

Original signed by

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Barry Balding, P.Geo., EurGeol
Technical Director
SLR Environmental Consulting (Ireland) Ltd

QUALIFIED PERSON CERTIFICATE

I, Stephen Wilson, B.Eng., ACSM, C.Eng., FIMMM, of Cornwall, United Kingdom, do hereby certify that:

1 I am currently employed as a Managing Director with Paterson & Cooke (UK) Ltd, with an office at Wheal Jane Earth Science Park, Truro, United Kingdom.

2 This certificate applies to the technical report titled "South Crofty PEA" with an effective date of 8 April 2024 (the "Technical Report") prepared for Cornish Metals Inc. ("the Issuer").

3 I am a graduate of Camborne School of Mines (University of Exeter) in Camborne, United Kingdom (Bachelor of Mining Engineering in 2002). I am a member in good standing of the Engineering Council (Chartership #587140), and a Fellow of the Institute of Materials, Minerals and Mining (Fellowship #0454826). I have experience in a wide variety of international tailings, backfill, and mining related projects, and my experience with cemented rock fill, paste, and thickened tailings technology has been applied to a range of mining applications, both for surface disposal and underground backfill, as well as applications outside the mining industry. I have been actively involved in all study levels and engineering work, from conceptual through to detailed design and construction, where I have been involved both technically and in a project management role.

I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

4 I visit the Project site on an ongoing basis, the last visit was 7 May 2024.

5 I am responsible for parts of Sections 16, 21, and 25 of the Technical Report.

6 I am independent of the Issuer and related companies applying all of the tests in Section 1.5 of NI 43-101.

7 I have had prior involvement with the property that is the subject of the Technical Report, namely a conceptual study performed by Golder Paste Technology (Europe) Ltd title Conceptual Engineering Study for a Paste Backfill Plant at the South Crofty Mine, 08-1901-0029/B.1, dated 31 October 2008.

8 I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

9 As of the effective date of the Technical Report and the date of this certificate, to the best of my knowledge, information and belief, this Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Effective Date: 8 April 2024
Signing Date: 24 May 2024

Original signed by

____

Stephen Wilson, B.Eng., ACSM, C.Eng., FIMMM
Managing Director
Paterson & Cooke (UK) Ltd

QUALIFIED PERSON CERTIFICATE

I, Michael Peter Hallewell, B.Sc., FIMMM, FSAIMM, FMES, C.Eng., of Cornwall, United Kingdom, do hereby certify that:

1 I am currently employed as a Consultant with MPH Minerals Consultancy Ltd, with an office at 8 The Gluyas, Falmouth, Cornwall, TR11 4SE, United Kingdom.

2 This certificate applies to the technical report titled "South Crofty PEA" with an effective date of 8 April 2024 (the "Technical Report") prepared for Cornish Metals Inc. ("the Issuer").

3 I am a practicing Metallurgical Consultant and a Fellow of the South African Institute of Mining & Metallurgy (RSA), a Fellow of the Institute of Materials, Minerals and Mining (London, UK), and a Chartered Engineer. I am a graduate with a B.Sc. (Engineering) degree in Minerals Engineering from the University of Birmingham, UK. I have 44 years practical experience in Minerals Processing as Plant Manager, Consulting or Senior Metallurgist in precious metals, base metals, and ferrous metals industry.

I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

4 I visit the Project site on an ongoing basis, the last visit was 20 March 2024.

5 I am responsible for Section 13, and parts of Sections 1, 17, 18, 21, 25, and 26 of the Technical Report.

6 I am independent of the Issuer and related companies applying all of the tests in Section 1.5 of NI 43-101.

7 I have had prior involvement with the property that is the subject of the Technical Report.

   a. Plant Metallurgist South Crofty 1984-1988

   b. Senior Metallurgist Wheal Jane Mill treating both Wheal Jane Ore and South Crofty Ore 1988-1991

   c. Plant Manager 1991-1998 during which time I was responsible for the 1993 processing improvements.

8 I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

9 As of the effective date of the Technical Report and the date of this certificate, to the best of my knowledge, information and belief, this Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Effective Date: 8 April 2024
Signing Date: 24 May 2024

Original signed by

____

Michael Peter Hallewell, B.Sc., FIMMM, FSAIMM, FMES, C.Eng.
Consultant
MPH Minerals Consultancy Ltd

QUALIFIED PERSON CERTIFICATE

I, Barrie O'Connell, PhD, C.Eng., B.Eng., ACSM, FIMMM, of Cornwall, United Kingdom, do hereby certify that:

1 I am currently employed as a Consultant with Tech Mill Services Ltd., with an office at 40 Weeth Road, Camborne, Cornwall, United Kingdom.

2 This certificate applies to the technical report titled "South Crofty PEA" with an effective date of 8 April 2024 (the "Technical Report") prepared for Cornish Metals Inc. ("the Issuer").

3 I am a graduate of the Camborne School of Mines, Penryn, United Kingdom (Bachelors / Masters of B.Eng. (Hons) and PhD in 1998 and 2002 respectively). I am a member in good standing of the Association of Institute of Materials, Minerals and Mining (License #0441115). I have experience in mineral processing ranging from managing laboratory / pilot plant test work programmes to hands on experience in operating milling and flotation plants. In addition, I have undertaken numerous process feasibility design studies where I have reviewed / managed metallurgical test work programmes to acquire necessary data for design and equipment selection and cost estimations. As well as designing polymetallic and gold plants, I have undertaken final engineering design for a backfill plant and a dry stacking tailings plant where I selected and procured the necessary process equipment and materials in preparation of their construction. I have participated in projects throughout the CIS, Turkey, Africa, and Europe involving base metals, precious metals, and industrial minerals, and completed Competent Person's Reports under NI 43-101 and JORC (2012).

I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

4 I have visited the Project site from 11-24 April 2024, for 2.5 days.

5 I am responsible for parts of Sections 17 and 21 pertaining to the process plant capital and operating costs (excluding associated infrastructure and the Backfill Plant) of the Technical Report.

6 I am independent of the Issuer and related companies applying all of the tests in Section 1.5 of NI 43-101.

7 I have not had prior involvement with the property that is the subject of the Technical Report.

8 I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

9 As of the effective date of the Technical Report and the date of this certificate, to the best of my knowledge, information and belief, this Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Effective Date: 8 April 2024
Signing Date: 24 May 2024

Original signed by

Barrie O'Connell, PhD, C.Eng., B.Eng., ACSM, FIMMM

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