AMC Consultants Pty Ltd
ABN 58 008 129 164

Level 1, 1100 Hay Street
West Perth WA 6005
Australia

T +61 8 6330 1100
E perth@amcconsultants.com
W amcconsultants.com

AMC consultants
mine smarter

Report

Gediktepe Competent Person's Report

Polimetal Madencilik Sanayi Ticaret A.Ş.

Effective date: 31 March 2024

AMC Project 0224006
Report date: 20 August 2024

Contents

1 Summary ... 9
1.1 Background and purpose of the Competent Person's Report (CPR) ... 9
1.2 Project description ... 9
1.3 Mineral Resource and Ore Reserve ... 10
1.4 Mining and mine planning ... 12
1.5 Metallurgical testwork and recovery methods ... 14
1.6 Infrastructure and services ... 17
1.7 Market studies and contracts ... 18
1.8 Environmental studies, permitting and social impact ... 18
1.9 Capital and operating costs ... 20
1.10 Economic assessment ... 21
1.11 Other relevant data ... 23
1.12 Interpretations and conclusions ... 24
1.13 Recommendations ... 28

2 Introduction ... 30
2.1 Purpose of the CPR ... 30
2.2 AMC's independence ... 30
2.3 Qualifications on the CPR contents ... 31
2.4 Reporting standard and compliance ... 31
2.5 Qualifications of consultants ... 32
2.6 Site inspections ... 33
2.7 Sources of information ... 34
2.8 Conventions and abbreviations ... 35

3 Reliance on other experts ... 39
3.1 Reliance on other experts ... 39

4 Project description and location ... 40
4.1 Project location ... 40
4.2 Project description ... 40
4.3 Land tenure ... 43

5 Accessibility, climate, local resources, infrastructure and physiography ... 45
5.1 Accessibility ... 45
5.2 Climate ... 45
5.3 Local resources ... 46
5.4 Physiography ... 47
5.5 Other considerations ... 47
5.6 Forestry status ... 47

6 History ... 49
6.1 Project history ... 49
6.2 Historical production ... 50

7 Geological setting ... 51
7.1 Regional geology ... 51
7.2 Project geology ... 51
7.3 Mineralization ... 53
7.3.1 Gossan (oxide mineralization) ... 53
7.3.2 Massive pyrite (MPy) ... 54
7.3.3 Massive pyrite magnetite (MPyMag) ... 54
7.3.4 Enrichment zone (Enrch) ... 55
7.3.5 Disseminated sulphide mineralization (Tr-Sulp) ... 55
7.4 Conclusions ... 55

8 Deposit type ... 56

9 Exploration ... 57

9.1 Geochemistry 57
9.2 Geophysics 57
9.3 Conclusions....57

10 Drilling 58
10.1 Drilling summary 58
10.2 Conclusions....60

11 Sample preparation, analyses, and security 61
11.1 On-site sample preparation 61
11.1.1 Diamond core 61
11.1.2 Reverse circulation (RC) 61
11.2 Laboratory sample preparation and analysis....61
11.2.1 SGS procedures 61
11.2.2 ALS procedures 62
11.3 Quality assurance and quality control (QA/QC) 62
11.3.1 Certified reference materials (CRMs) 62
11.3.2 Blanks 63
11.3.3 Duplicates 63
11.4 Bulk density 63
11.5 Conclusions....64

12 Data verification 65
12.1 AMC Verification 65

13 Mineral processing and metallurgical testwork 66
13.1 Sulphide Project mineralogy 66
13.2 Sulphide Project metallurgical test work programme 67
13.3 Sampling 68
13.4 Sulphide Project Comminution Test Work....71
13.5 Sulphide Project Enriched Material Treatment....75
13.6 Variability tests 76
13.7 Concentrate quality....77
13.8 Operating metallurgical parameters 81
13.9 Mineral processing and metallurgical test work conclusion....81

14 Mineral Resource estimates....82
14.1 Introduction 82
14.2 Drilling and sampling data 82
14.3 Geological interpretation....83
14.3.1 Lithology....83
14.3.2 Weathering 84
14.3.3 Mineralization 84
14.3.4 Faults 86
14.4 Exploratory data analysis (EDA) 86
14.4.1 Domaining 86
14.4.2 Compositing 86
14.4.3 Variography 86
14.4.4 Grade capping 89
14.5 Volumetric block model 89
14.6 Bulk density 90
14.7 Grade estimates 90
14.8 Model validation 92
14.8.1 Visual assessment....92
14.8.2 Global statistical grade validation 92
14.8.3 Grade profile analysis 93
14.8.4 Validation summary 94
14.9 Classification 94
14.10 Mineral Resource summary 97

14.11 Comparison of 2019 and 2024 Mineral Resource estimates 98
14.12 Conclusions 99

15 Ore Reserve estimate 101
15.1 Introduction 101
15.2 Ore loss and dilution analysis 101
15.3 Pit slopes 101
15.4 Concentrate grades and metal recoveries 102
15.5 Operating costs 104
15.6 Metal pricing and offsite costs 105
15.7 Cut-off to define ore 106
15.8 Pit optimization 106
15.9 Pit design 107
15.10 Pit inventory 109
15.11 Mine scheduling 110
15.11.1 Mine scheduling parameters 110
15.11.2 Mine schedule results 110
15.12 Ore Reserve 114
15.13 Comparison of 2019 and 2024 Ore Reserve estimates 114
15.14 Conclusion 115

16 Mining methods 116
16.1 Open pit mining methodology 116
16.2 Mining equipment 118
16.3 Geotechnical design 118
16.3.1 Background to geotechnical design 118
16.3.2 Oxide Project geotechnical design 118
16.3.3 Geotechnical conditions 120
16.3.4 Open pit stability assessment 121
16.3.5 Sulphide Project geotechnical design 122
16.3.6 Data gaps 124
16.3.7 AMC review 124
16.4 Waste dump design 125
16.4.1 Geochemical assessment 125
16.4.2 Waste dump design 126
16.5 Pit dewatering, hydrogeology and hydrology 127
16.5.1 Oxide Project pit dewatering 127
16.5.2 Hydrogeology assessment 128
16.5.3 Hydrology assessment 129
16.6 Conclusion 130

17 Recovery methods 131
17.1 Introduction 131
17.2 Oxide Project ore processing 131
Plant description 132
Historical performance 133
17.3 Sulphide Project Processing Plant Description 135
17.4 Conclusion 139

18 Infrastructure and services 140
18.1 Roads and Site Access 140
18.2 Process Plant 141
18.3 Project buildings 142
18.3.1 Processing Plant Buildings 142
18.3.2 Administration and General Buildings 142
18.4 Tailings storage facility 143
18.4.1 Background 143
18.4.2 Geotechnical investigations 143
18.4.3 Hazard Rating 144

18.4.4 Design Criteria 144
18.4.5 Tailings Characteristics 145
18.4.6 Design Concept 145
18.4.7 TSF Storage Characteristics 148
18.4.8 Liners and Drainage 149
18.4.9 Instrumentation 150
18.4.10 Surface Water Diversion 150
18.4.11 Construction Methods 150
18.4.12 Operational aspects 151
18.5 TSF closure 152
18.6 Clean Water Pond 153
18.7 Power Supply and electrical distribution 154
18.8 Water Management 155
18.9 Waste Disposal 155

19 Market studies and contracts 156
19.1 Introduction 156
19.2 Smelters and refining options 157
19.3 TCRCs and payability of copper and zinc concentrates 158
19.4 Smelter payment terms for copper and zinc concentrates 159
19.5 Shipping 159
19.6 Market Outlook 160
19.7 Copper Demand 162
19.8 Zinc Demand 163

20 Environmental studies, permitting and social impact 164
20.1 Permitting 164
20.2 Environmental Impacts 167
20.2.1 Construction Phase 167
20.2.2 Operations Phase 167
20.2.3 Closure Phase 170
20.3 Social studies 172
20.3.1 Previous Studies 172
20.3.2 Stakeholders 173
20.3.3 History of Engagement 174

21 Capital and operating costs 176
21.1 Sources of Information 176
21.2 Scheduled physicals 176
21.3 Operating costs 176
21.4 Capital cost 177

22 Economic assessment 179
22.1 Sources of Information 179
22.2 Revenue assumptions costs 179
22.3 Economic evaluation 180
22.4 Economic sensitivity 181

23 Adjacent properties 184

24 Other relevant data and information 185
24.1 Project Execution Strategy 185
24.1.1 Engineering, procurement and construction management 185
24.1.2 Schedule Overview 186
24.2 Project organization 187

25 Interpretation and conclusions 188
25.1 Geology and Mineral Resources 188
25.2 Exploration 188
25.3 Ore Reserve Estimates 188

25.4 Mine Plan ... 189
25.5 Mineral Processing ... 189
25.6 Infrastructure ... 189
25.7 Markets and Contracts ... 190
25.8 Environment, approvals and social ... 190
25.9 Capital Cost Estimates ... 191
25.10 Operating Cost Estimates ... 191
25.11 Economic Analysis ... 191
25.12 Risks and Opportunities ... 191

26 Recommendations ... 193

27 References ... 194

Tables

Table 1.1 Gediktepe Mineral Resource Estimate Summary – 31 March 2024 ... 11
Table 1.2 Gediktepe Ore Reserve Estimate Summary – 31 March 2024 ... 11
Table 1.3 Pit slope assumptions ... 12
Table 1.4 LOM mining and processing production ... 14
Table 1.5 Metal prices, royalties and treatment costs ... 18
Table 1.6 Gediktepe LOM operating cost summary ... 20
Table 1.7 Gediktepe LOM capital cost summary ... 20
Table 1.8 Gediktepe LOM revenue summary ... 21
Table 1.9 Gediktepe LOM pre-tax cash flow summary ... 22
Table 2.1 Key contributors to this CPR ... 33
Table 2.2 Abbreviations ... 35
Table 3.1 Reliance on other experts ... 39
Table 4.1 Project mining licence details ... 43
Table 6.1 Gediktepe historical production ... 50
Table 7.1 Mineralization type names and codes ... 53
Table 10.1 Summary of drilling programmes ... 58
Table 11.1 CRM summary ... 62
Table 11.2 Bulk density values for Gediktepe lithologies ... 64
Table 13.1 Summary of mineral composition for Sulphide Project composite samples ... 67
Table 13.2 Sulphide Project – composite sample make-up and assay ... 69
Table 13.3 Summary of comminution testwork results ... 72
Table 13.4 LCT results – master composite samples ... 75
Table 13.5 LCT results – Massive Pyrite and Disseminated Sulphide composite samples ... 75
Table 13.6 Effect of Enriched mineralization on flotation performance ... 76
Table 13.7 Variability testing results ... 77
Table 13.8 Average concentrate grades and recoveries. ... 78
Table 13.9 Copper concentrate analysis ... 79
Table 13.10 Zinc concentrate analysis ... 80
Table 14.1 Drillhole data files ... 82
Table 14.2 Drilling phase summary statistics: Number of hole types ... 82
Table 14.3 Drilling phase summary statistics: Metres by hole type ... 83
Table 14.4 Lithology codes ... 83
Table 14.5 Mineralization codes ... 86
Table 14.6 Variogram parameters ... 88

Table 14.7 High grade caps by MINZONE and subzones: Major elements 89
Table 14.8 Volumetric model summary 89
Table 14.9 Bulk density statistics by mineralization, weathering and lithology 90
Table 14.10 Estimation domains 90
Table 14.11 Default values for unsampled intervals 91
Table 14.12 Estimation subzones 91
Table 14.13 Estimation search parameters 96
Table 14.14 Summary of NSR metal prices and metallurgical recoveries 97
Table 14.15 Gediktepe Mineral Resource Estimate Summary – 31 March 2024 98
Table 14.16 Comparison between 2019 and 2024 Mineral Resource estimates 99
Table 15.1 Dilution and ore loss tonnage and grade results 101
Table 15.2 Pit slope assumptions 102
Table 15.3 Metal recovery (oxide) 102
Table 15.4 Metal recoveries to concentrate 102
Table 15.5 Operating costs 104
Table 15.6 Oxide Project process operating costs (Q2 2022) 104
Table 15.7 Sulphide process operating costs (Q2 2022) 105
Table 15.8 Metal prices, royalties and treatment costs 105
Table 15.9 Pit inventories 109
Table 15.10 Gediktepe annual mine schedule summary 113
Table 15.11 Gediktepe open-pit Ore Reserve estimate at 31 March 2024 114
Table 15.12 Gediktepe open-pit Ore Reserve estimate at 5 March 2019 114
Table 15.12 Comparison between 2019 and 2024 Ore Reserve estimates 115
Table 16.1 Gediktepe mining equipment summary 118
Table 16.2 Oxide Project pit design parameters 119
Table 16.3 RMR_{76} rating of geotechnical core holes drilled in 2017 (Golder 2020) 120
Table 16.4 Geotechnical domains and descriptions (Golder 2020) 121
Table 16.5 Pit design acceptance criteria (Golder 2020) 122
Table 16.6 Sulphide Project pit design parameters 123
Table 16.7 Golder pit slope design recommendations (Golder 2020) 123
Table 17.1 Oxide Project historical production 133
Table 17.2 Sulphide circuit design parameters 137
Table 18.1 TSF storage capacity summary 148
Table 18.2 Diversion drain details 150
Table 18.3 TSF cover design 153
Table 19.1 Annual concentrate production 156
Table 19.2 Average concentrate quality 157
Table 19.3 Payability and TCRCs assumptions for Gediktepe copper concentrate 158
Table 19.4 Payability and TCRCs for Gediktepe zinc concentrate 158
Table 19.5 Penalty limits for copper concentrates 158
Table 19.6 Penalty limits for zinc concentrate 159
Table 19.7 Shipment costs 160
Table 19.8 Long-term metal price forecast (2023-2031) 161
Table 19.9 Spot Market 3 Years Backward/Forecast Metal Prices (S&P Capital IQ) 161
Table 19.10 Spot Market 3 Years Forecast TCRCs for Cu/Zn Conc. 162
Table 20.1 Current permits and project approvals 165

Table 20.2 Vulnerable people in the study area as identified in 2017 ... 174
Table 21.1 Gediktepe operating cost assumptions ... 177
Table 21.2 Annual Gediktepe operating costs ... 178
Table 21.3 Annual Gediktepe capital costs (Q2, 2022) ... 178
Table 22.1 State area royalty ... 179
Table 1.5 Metal prices, royalties and treatment costs ... 179
Table 22.2 Annual Gediktepe revenues ... 182
Table 22.3 Annual Gediktepe cash flows ... 183

Figures

Figure 1.1 Gediktepe pit design ... 13
Figure 1.2 Gediktepe annual material movement ... 13
Figure 1.3 Gediktepe sulphide ore processing flowsheet ... 15
Figure 1.4 Gediktepe annual concentrate production (dry) ... 16
Figure 1.5 Gediktepe annual copper and zinc metal production ... 17
Figure 1.6 Gediktepe annual gold and silver metal production ... 17
Figure 1.7 Cumulative undiscounted and discounted cash flow ... 23
Figure 1.8 Economic sensitivity of cash flow ... 23
Figure 4.1 Project location (Google Earth) ... 40
Figure 4.2 Gediktepe site layout (January 2024) ... 41
Figure 4.3 Project mining licence location ... 43
Figure 5.1 Project access roads from Balikesir (Google Earth) ... 45
Figure 5.2 Average high and low temperatures in Dursunbey ... 46
Figure 5.3 Project topography ... 47
Figure 7.1 Geological map of the Project area (1:1000 scale) ... 51
Figure 7.2 Chlorite-sericite schist in outcrop ... 52
Figure 7.3 Typical weathering profile ... 54
Figure 8.1 Vertical section of an idealized convex MS deposit ... 56
Figure 10.1 Drillhole location plan ... 59
Figure 10.2 DD vs RC gold grade population comparison ... 60
Figure 13.1 Metallurgical Drill Hole Locations ... 70
Figure 13.2 Locked cycle test circuit ... 74
Figure 14.1 Oblique view of lithologies ... 83
Figure 14.2 Oblique view of mineralization shell interpretations ... 85
Figure 14.3 Variogram charts: Gossan Au ... 87
Figure 14.4 Cu global grade comparison ... 93
Figure 14.5 Along strike Cu grade profile analysis results for MISZ domain ... 93
Figure 14.6 Oblique view of part of the classified block model ... 95
Figure 15.1 Pit shell by pit shell discounted cash flow and pit inventory ... 106
Figure 15.2 Final pit design ... 107
Figure 15.3 Stage 1 (oxide) pit design ... 108
Figure 15.4 Pit stage layout ... 108
Figure 15.5 West to east section through pit stages ... 109
Figure 15.6 Gediktepe annual material movement ... 111
Figure 15.7 Gediktepe annual concentrate production (dry) ... 111
Figure 15.8 Gediktepe annual copper and zinc metal production ... 112

Figure 15.9 Gediktepe annual gold and silver metal production....112
Figure 16.1 Oxide Project mining operations....116
Figure 16.2 Typical grade control model and pattern....117
Figure 16.3 Gediktepe pit wall monitoring with Robotic Total Station....119
Figure 16.4 Pit slope recommendations by sector (Golder 2020)....124
Figure 16.5 Gediktepe waste dump design....127
Figure 16.6 Diversion channels and horizontal and vertical dewatering bores....128
Figure 16.7 Gediktepe stormwater diversion channels....129
Figure 17.1 Oxide Project ore processing operations....131
Figure 17.2 Oxide Project ore processing layout....132
Figure 17.3 Crushing circuit....134
Figure 17.4 Gediktepe sulphide ore processing flowsheet....136
Figure 18.1 Sulphide plant road access schematic....140
Figure 18.2 Aerial view of the plant site....141
Figure 18.3 Longitudinal Geological Section of Embankment and Ground Water Level....144
Figure 18.4 Typical TSF embankment profile....146
Figure 18.5 TSF layout....147
Figure 18.6 Storage capacity curve for the TSF....149
Figure 18.7 Typical cross section of CWP embankment....154
Figure 19.1 Commodity price outlook, FY16-FY31 (Indexed FY22 = 100%)....161
Figure 19.2 Refined copper consumption by end use (Mt)....162
Figure 19.3 Annual historical and forecast zinc consumption (Mt)....163
Figure 20.1 Position of pit lake, spillover point and TSF perimeter embankment....171
Figure 22.1 Undiscounted and discounted cash flows....180
Figure 22.2 Cumulative undiscounted and discounted cash flows....181
Figure 22.3 Economic sensitivity of discounted cash flows....183
Figure 24.1 Gediktepe organization chart....187

Distribution list

1 e-copy to Polimetal Madencilik Sanayi Ticaret A.Ş.
1 e-copy to AMC Perth office

OFFICE USE ONLY Version control (date and time) 20 August 2024 1700

1 Summary

1.1 Background and purpose of the Competent Person's Report (CPR)

Polimetal Madencilik Sanayi Ticaret A.Ş.(Polimetal) owns and operates the Gediktepe open pit gold and silver mine and 0.864 Mtpa heap leach and Merrill-Crowe oxide ore processing plant (the Oxide Project) located in the Balıkesir Province of Western Türkiye. The process plant currently treats gold and silver ore contained in the Gediktepe oxidized zone and, as a stand-alone project, the Oxide Project, has a remaining life until 2025.

Polimetal undertook a feasibility study during 2022-2023 (2022 FS) compiled by AMC Consultants Pty Ltd (AMC) from the work of AMC and others, dated June 2022, on development of the sulphide mineralization underlying the oxide cap currently being mined by the Oxide Project (Sulphide Project). Polimetal is considering raising finance for development of the Sulphide Project, which may involve a listing on the London Stock Exchange (LSE). This CPR is based on the work undertaken for the 2022 FS and was prepared by AMC in support of Polimetal's listing on the LSE.

AMC was engaged by Polimetal to undertake geology and mine planning work for the 2022 FS and compile the 2022 FS report from the contributions of AMC, Polimetal, and third-party technical specialists engaged directly by Polimetal. Polimetal was responsible for project organization, environmental and social assessment, and government licensing and approvals. The work for which AMC and third-party technical specialists were engaged was:

- AMC for the sulphide Mineral Resource, mine planning and sulphide Ore Reserve, pre-tax economic evaluation with input from others, and compilation of this 2022 FS Report.
- Golder Associates (Turkey) Ltd (Golder) for open pit and waste rock storage geotechnical assessment.
- SRK Consulting (SRK) for hydrogeology, hydrology, waste rock management, and mine closure.
- Hacettepe Mineral Technologies (HMT) for metallurgical testwork and process metallurgy.
- GR Engineering Services Ltd (GRES) for metallurgy and ore processing and the project implementation schedule.
- EN-SU Engineering (EN-SU) for tailings storage facility (TSF) and clean water pond (CWP) design and tailings management.
- CMW Geosciences Pty Ltd (CMW) for review of the TSF design.
- Link Investment and Consulting UK (Link) for product marketing, metal prices, metal payability, concentrate treatment costs and penalties, metal refining costs, and concentrate land and ocean transport costs.

AMC confirms that it is independent of Polimetal and has no interest in the assets of Polimetal or the LSE listing, should it proceed. The persons nominated as Competent Persons in this proposal are Members or Fellows of the Australasian Institute of Mining and Metallurgy or Chartered Geologists with the Geological Society of London and are bound by the codes of ethics of those industry professional institutes whose charters include the upholding of standards and developing and promoting professional best practice in the mining industry.

1.2 Project description

Gediktepe is approximately 90 km by road south-east of Balıkesir, the provincial capital, and is well serviced by local infrastructure and communities. The Sulphide Project, as set out in the 2022 FS, comprises an expanded and deeper open pit mine, a sulphide ore processing plant and supporting infrastructure to treat copper, zinc, gold, and silver minerals to produce copper and zinc concentrates with gold and silver credits, an expanded clean water pond (CWP), larger waste dump to store mine waste rock, and a tailings storage facility (TSF) to store processing plant waste material.

Oxide ore will continue to be mined and processed through 2024-2025 while the sulphide plant is constructed and commissioned, and in 2026 when the sulphide plant is operating. The sulphide plant will be commissioned in Q4 of 2025 and will start processing sulphide ore. In 2026, oxide and sulphide mining and processing will continue concurrently. When the current Oxide Project pit is depleted in Q3 of 2025, the heap leach pregnant solution will continue to be processed in the Merrill-Crowe plant in 2026.

Gediktepe has an operations licence (Licence number: 85535) obtained from the General Directorate of Mining and Petroleum Affairs (MAPEG). This licence was merged with the operations licence 20054077 (Access number: 2060132) and an exploration licence (Licence number: 201400291, Access no: 3316107).

All costs are expressed in real Quarter 2 (Q2) 2022 US dollars ($ or US$) and a discount rate of 10% per annum was used to estimate discounted cash flows. Year 1 was assumed to be 2024.

1.3 Mineral Resource and Ore Reserve

Mineralization currently defined at Gediktepe displays complex interplays of lithologies, mineralogy, metal grade distributions and structural effects.

The Gediktepe Mineral Resource estimate at 31 March 2024 was prepared by AMC and is presented by classification in accordance with the guidelines of the JORC Code[1] in Table 1.1. Mineral Resources are estimated at a net smelter return (NSR) cut-off, as stated in the notes below the table.

The Gediktepe open pit Ore Reserve estimate at 31 March 2024 was prepared by AMC and is presented by classification and in accordance with the guidelines of the JORC Code, in Table 1.2.

[1] Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, The JORC Code 2012 Edition. Effective 20 December 2012 and mandatory from 1 December 2013. Prepared by the Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australasian Institute of Geoscientists and Minerals Council of Australia (JORC).

Table 1.1 Gediktepe Mineral Resource Estimate Summary – 31 March 2024

Resource Classification	Tonnes (Mt)	Grade					Contained Metal			
		Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	Pb (%)	Au (koz)	Ag (Moz)	Cu (kt)	Zn (kt)
Measured Oxide	-	-	-	-	-	-	-	-	-	-
Indicated Oxide	1.3	2.79	67	0.11	0.1	0.44	113.0	2.7	1.4	1.1
Measured + Indicated (Oxide)	**1.3**	**2.79**	**67**	**0.11**	**0.1**	**0.44**	**113.0**	**2.7**	**1.4**	**1.1**
Inferred Oxide	0.01	0.90	23	0.08	0.1	0.17	0.4	0.01	0.01	0.01
Measured Sulphide	3.8	0.68	26	0.99	1.9	0.35	83	3.2	38	73
Indicated Sulphide	21.0	0.76	28	0.79	1.7	0.35	511	19.0	166	367
Measured + Indicated (Sulphide)	**24.8**	**0.74**	**28**	**0.82**	**1.8**	**0.35**	**594**	**22.2**	**204**	**440**
Inferred Sulphide	3.1	0.53	21	0.77	1.2	0.28	54	2.1	24	37
Total Measured (Oxide + Sulphide)	3.8	0.68	26	0.99	1.9	0.35	83	3.2	38	73
Total Indicated (Oxide + Sulphide)	22.3	0.87	30	0.75	1.7	0.36	624	21.7	167	368
Measured+Indicated (Oxide+Sulphide)	26.1	0.84	30	0.79	1.7	0.36	707	24.9	205	441
Total Inferred (Oxide + Sulphide)	3.1	0.53	21	0.77	1.2	0.28	54	2.1	24	37

Notes:
- JORC definitions were followed for Mineral Resources.
- Mineral Resources are inclusive of Ore Reserves.
- Effective Date of Mineral Resource is 31 March 2024
- Mineral Resources are estimated at NSR cut-offs of US$19.00/t for oxide and US$23.90/t for sulphide.
- Mineral Resources constrained using optimized shell to reflect reasonable prospects of economic extraction.
- Mineral Resources that are not Ore Reserves do not have demonstrated economic viability.
- Totals may not match due to rounding.

Table 1.2 Gediktepe Ore Reserve Estimate Summary – 31 March 2024

Ore Reserve classification	Ore tonnes (Mt)	Copper grade (%)	Zinc grade (%)	Gold grade (g/t)	Silver grade (g/t)	Contained metal			
						Copper (Mlb)	Zinc (Mlb)	Gold (koz)	Silver (Moz)
Proved Oxide	-	-	-	-	-	-	-	-	-
Probable Oxide	1.4	-	-	2.0	48	-	-	93	2.2
Total Oxide	1.4	-	-	2.0	48	-	-	93	2.2
Proved Sulphide	3.4	0.92	1.9	0.67	25	70	140	70	3
Probable Sulphide	13.7	0.72	1.9	0.85	32	220	590	380	14
Total Sulphide	17.1	0.76	1.9	0.82	30	290	730	450	17

Notes:
- Totals may not equal the sum of the component parts due to rounding adjustments.
- Ore tonnes are rounded to 0.1 Mt and grade and contained metal to two significant figures.
- Probable ore includes buffer material from boundary with enriched material.
- Estimates are based on forecast metal prices of US$3.63/lb Cu, US$1.27/lb Zn, US$1,500/oz Au and US$20/oz Ag and an expected value calculation to report tonnes above a zero US$/t net expected value.

Sulphide ore mined before the sulphide processing plant is commissioned is treated as waste and removed from the Ore Reserve. Enriched mineralization can't be processed and plant feed can't contain more than 10% buffer material on the boundary with enriched mineralization at any time. Buffer material and enriched mineralization that is not included in the processing schedule is classified as waste. Approximately 141 Mt of associated fresh waste material will be mined including mineralized waste, resulting in a waste material to sulphide Ore Reserve ratio of 7.6 to 1.0 (t:t).

1.4 Mining and mine planning

Mining at the Oxide Project is undertaken by a local mining contractor and uses conventional open pit methods and an equipment fleet typical of the region. Polimetal will use a similar approach for the Sulphide Project, although larger equipment may be required to meet Sulphide Project targets. AMC considers this is appropriate.

Geotechnical engineering on the project was undertaken and documented by Golder, who provided recommendations for the geotechnical parameters for mine planning. Pit slope performance monitoring at the site identified that pit slopes in the south-east sector should be reduced, resulting in the final pit slope parameters used for mine planning shown in Table 1.3. AMC has reviewed the geotechnical assessment and recommendations and considers that a range of rock strength should have been used in geotechnical assessment rather than average values, so that there is a risk that some pit slopes may be too steep.

Table 1.3 Pit slope assumptions

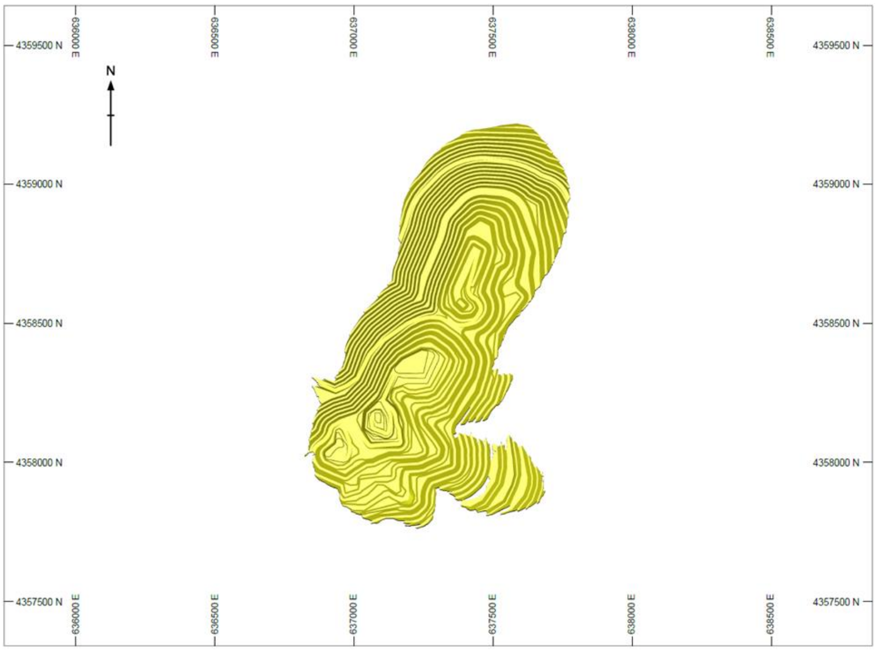
Sector	Zone	Batter Angle (°)	Batter Height (m)	Berm Width (m)	Overall Slope (°)	No of Benches
North-west	0	45	15	6.5	39	12
Weathered	1	45	15	5.7	39	12
Fresh	2	63.5	15	6.5	39	12
South-east wall	3	35	10	5.0	20	12
Below 1130 mRL	4	63	15	6.5	39	12

Note: Geotechnical berm 30 m wide at 1,280 mRL and 1,300 mRL

The hydrogeological assessment, hydrogeology model, pit dewatering and pit water management recommendations were undertaken by Golder in conjunction with their geotechnical assessment. Phreatic surfaces from this assessment were used by Golder in developing their geotechnical model.

Final pit limits were defined by AMC using Whittle Four-X pit optimization software and inputs provided by Polimetal, HMT, GRES, and Link. AMC developed seven pit stages to smooth material movements during scheduling, the first of which is the final oxide pit design. The Gediktepe final pit design, based on the revenue factor 0.74 pit optimization shell is shown in Figure 1.1.

Figure 1.1 Gediktepe pit design

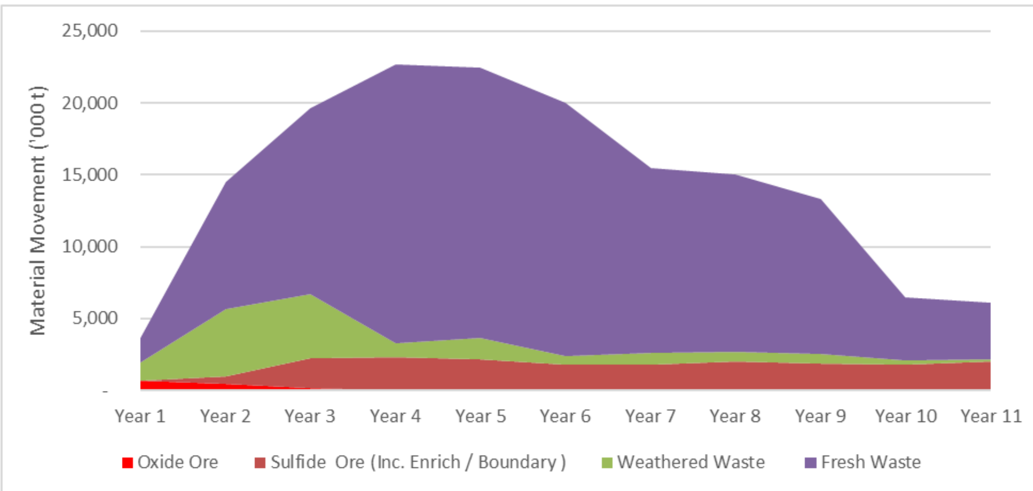


SRK was contracted to provide multi-disciplinary support for the Sulphide Project concerning geochemistry, hydrogeology and hydrology. A regional groundwater model was constructed to provide pit inflow estimates and evaluate groundwater resource impacts. Pit water inflows were used to support the Owners costs and site water balance.

AMC developed a mining and processing production schedule using Minemax schedule optimization software. Scheduling identified a viable life-of-mine (LOM) operating schedule for 12 years of mining and 10 years of sulphide ore processing. Sulphide mineralization was subdivided into buffer material (up to 10% of annual total process feed), enriched mineralization (not processed), and sulphide mineralization (massive pyrite and disseminated, all process feed).

Annual material movements from the mining schedule are shown in Figure 1.2.

Figure 1.2 Gediktepe annual material movement



Total scheduled mining ore tonnes, grade and waste tonnes; processing plant tonnes, grade, and contained metal; and concentrate tonnes and metal production is shown in Table 1.4. Sulphide ore includes enriched and buffer ore.

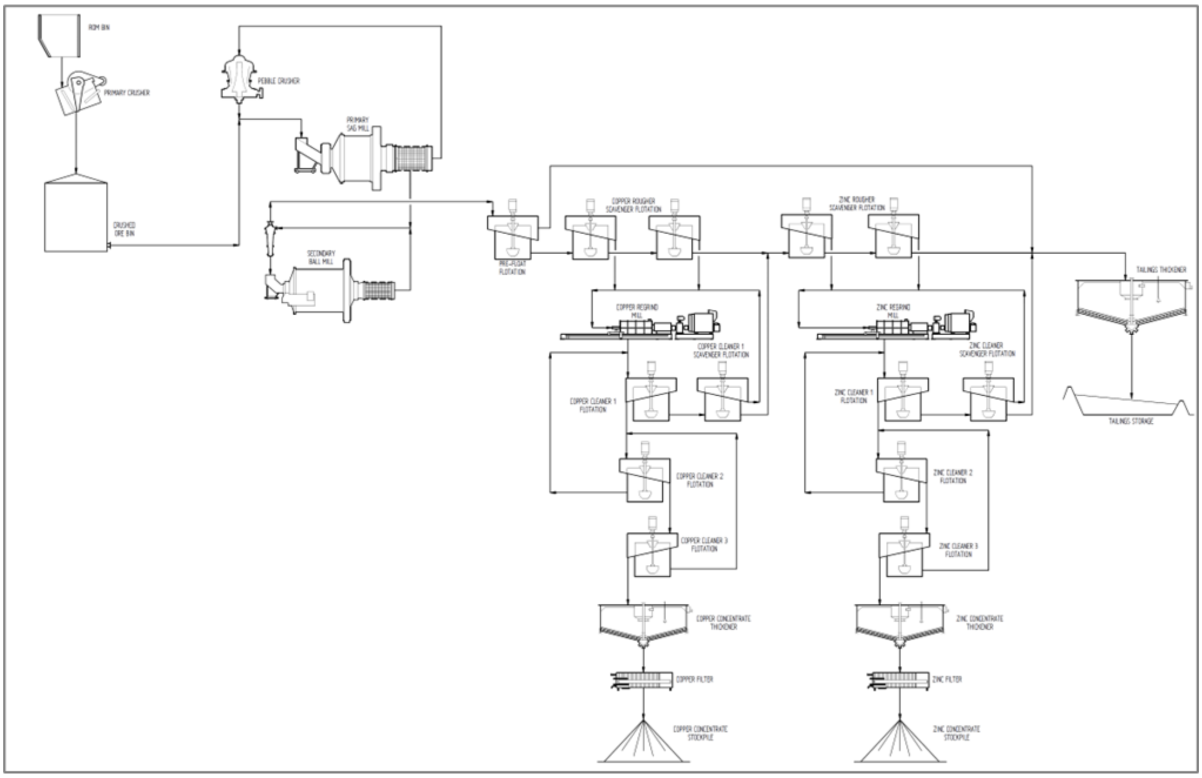
Table 1.4 LOM mining and processing production

Description	Units	Value
Mine Production		
Oxide Ore	Mt	1.4
Oxide Grade Au	g/t	2.08
Oxide Grade Ag	g/t	50
Sulphide Ore	Mt	18.4
Sulphide Grade Cu	%	0.89
Sulphide Grade Zn	%	1.96
Sulphide Grade Au	g/t	0.83
Sulphide Grade Ag	g/t	31
Weathered Waste	Mt	16
Fresh Waste	Mt	124
Total Material	**Mt**	159
Process Plant Production		
Metal recovered to Doré	**-**	**-**
Gold in doré	koz	73
Silver in doré	koz	760
Sulphide Ore Processed	Mt	17.3
Sulphide Grade Cu	%	0.77
Sulphide Grade Zn	%	1.94
Sulphide Grade Au	g/t	0.81
Sulphide Grade Ag	g/t	30
Contained Metal		
Copper	Mlb	294
Zinc	Mlb	743
Gold	koz	544
Silver	Moz	19
Concentrate Production		
Copper Concentrate Tonnes	kt	375
Copper	Mlb	209
Gold	koz	178
Silver	Moz	3.6
Zinc Concentrate Tonnes	kt	491
Zinc	Mlb	572
Gold	koz	29
Silver	Moz	3.1

1.5 Metallurgical testwork and recovery methods

The processing facility has been designed to treat 1.82 Mt per annum of copper and zinc-bearing sulphide ore. The sulphide flowsheet shown in Figure 1.3 includes primary crushing, two stage grinding, sequential flotation (pre-float of talc/silicate minerals, and production of separate copper and zinc concentrates), regrind (copper and zinc), concentrate thickening, concentrate filtration, and tailings disposal (thickening).

Figure 1.3 Gediktepe sulphide ore processing flowsheet



Four main lithologies have been used to describe the sulphide mineralization which occurs as thin veins or lenses hosted in a chlorite-sericite schist:

- Massive pyrite.
- Magnetite rich massive pyrite.
- Disseminated or transitional pyrite.
- Enriched massive pyrite.

Test work used master composites that reflected the proportion of ore types determined by the resource model at the time of each phase of the Project. The test conditions established for the master composite were then applied to variability samples in each phase of work. A total of 78 samples from 40 drillholes were tested in the 2021 – 2022 variability programme. The test work identified variable performance due to mineralogical and head grade variations, material type blends, surface oxidation (aging effects) and pulp chemistry conditions.

Gediktepe sulphides requires a fine primary grind 80% passing size (P_{80}) of 38 µm and a fine regrind of the copper rougher concentrate to a P_{80} of 15 µm and of the zinc rougher concentrate to a P_{80} of 20 µm to achieve acceptable liberation of the fine-grained mineral assemblage. Selectivity between copper and zinc minerals is affected by pre-activation of zinc minerals, due to the presence of secondary copper minerals in situ and/or due to galvanic effects between galena (lead mineral) and pyrite.

A depressant reagent regime of sodium sulphide, zinc sulphate and metabisulphite is needed to effect selectivity between the copper minerals and the zinc and iron sulphide minerals. Depending on the ore feed, some non-sulphide gangue (NSG) is removed in a pre-flotation stage prior to copper rougher flotation. Circulated water (tailing from zinc rougher and cleaner flotation) containing residual organics, such as xanthate ions and other reagent breakdown products, causes flotation of sulphide minerals in the pre-flotation stage and loss of copper, zinc and precious metal with the rejected pre-flotation concentrate. Treatment of the process water using activated carbon to remove the residual organics has been included in the flowsheet and plant design.

A 40 kg/h pilot plant operation was conducted treating a total of 1.8 tonnes of material to generate rougher concentrates for regrind signature plot tests, final concentrates for thickening, filtration and transport tests, and final tailing (zinc rougher tail and zinc cleaner scavenger tail) for thickening tests.

Concentrates will be dewatered using thickeners and pressure filters prior to road transport to a port for bulk shipment to smelters.

Copper concentrate grades above 23% Cu (23% to 32% Cu) with greater than 68% copper recovery, and zinc concentrate grading over 49% Zn (49% to 53% Zn) with greater than 76% recovery being targeted. Both concentrates will contain credits for gold and silver. The copper concentrate may have variable penalties for arsenic, lead, zinc, bismuth and fluorine at times. Similarly, the zinc concentrate may have iron and cadmium penalty levels at times.

Results of ore processing schedules are summarized in Figure 1.4 (concentrate production), Figure 1.5 (copper and zinc metal production) and Figure 1.6 (gold and silver metal production).

Figure 1.4 Gediktepe annual concentrate production (dry)

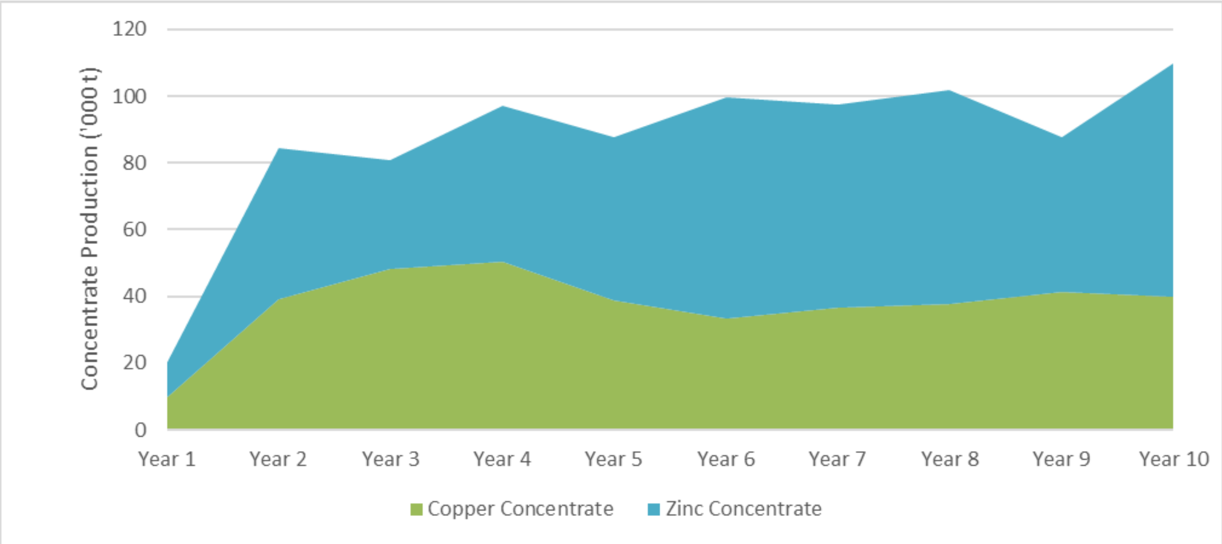


Figure 1.5 Gediktepe annual copper and zinc metal production

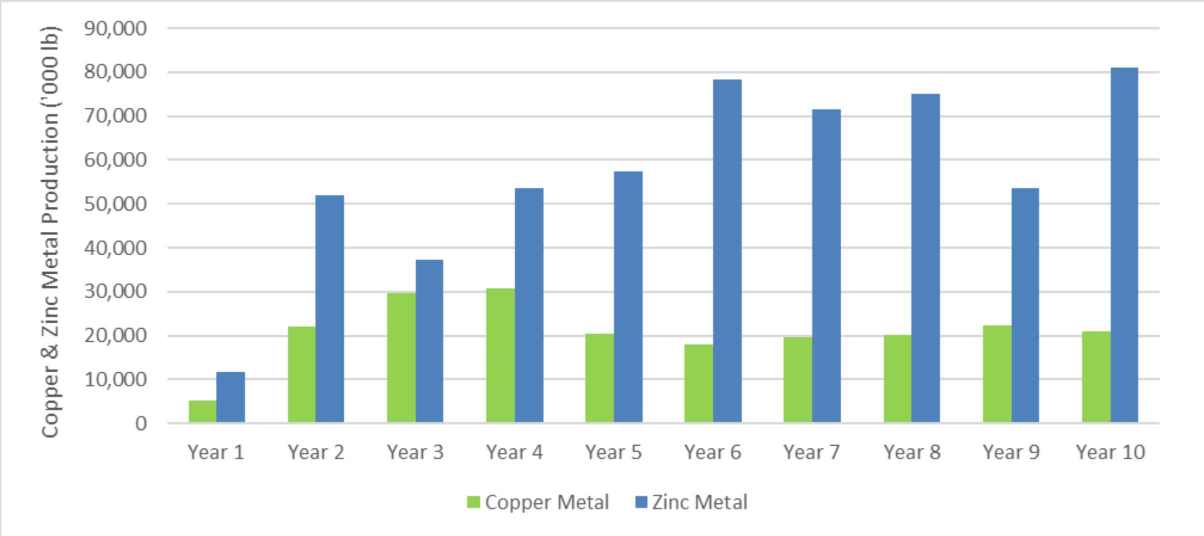
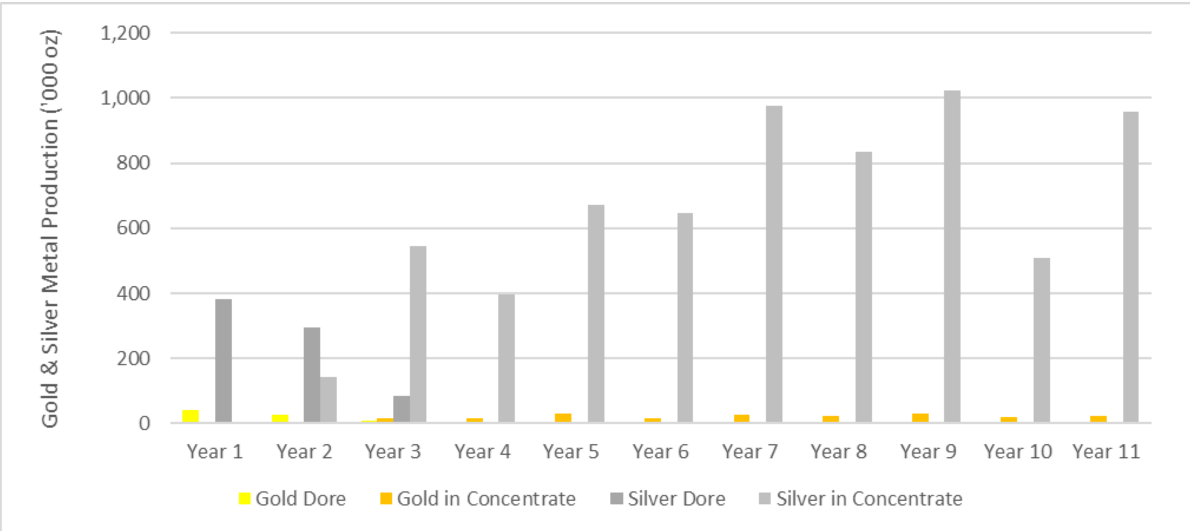


Figure 1.6 Gediktepe annual gold and silver metal production



1.6 Infrastructure and services

Access to site and transport and logistics to supply the Oxide Project are well established. The Oxide Project has access to the open pit, heap leach area, and other facilities all year round. For the Sulphide Project, a new 6.4 km access road will be constructed by the mining contractor using cut and fill and sealed with cold asphalt or concrete. Access to the Sulphide Project plant will be from haul roads leading to the ROM pad.

The Sulphide Project will use the Oxide Project infrastructure and the following:

- The expanded TSF.
- The CWP, which will provide water to the project.
- The expanded non-acid generating (NAG) waste dump located at the west of the mining licence. The current design has 76 Mm^3 of capacity, but can be increased to 122 Mm^3.
- Additional power transmission line.
- Mine buildings, such as offices, warehouse, workshops, changing room, and canteen.

Tailings from the flotation circuits will be combined and thickened to 65% solids prior to being pumped to the TSF. The TSF and CWP will be located in a steep-sided valley. Geotechnical investigations were conducted which included boreholes, test pits and sampling, and laboratory testing of both borrow and foundation materials. Seismic assessments were also carried out. The TSF will cover 60 ha with a storage volume of 11 Mm^3, for tailings storage of 17.4 Mt. The TSF embankment will be constructed using waste rock from the mine. A liner system comprising a 0.5 m thick clay material with a textured 2 mm thick HDPE geomembrane. An over drainage system (above the lining system) will be constructed to capture leachate from the tailings profile and to reduce the phreatic surface within the TSF. An underdrain system will be installed under the TSF lining system to recover water from springs within the TSF valley and to act as a leak detection system.

A clean water pond, located downstream of the TSF, will accept runoff diverted around the mining operations and from the underdrain system of the TSF. The closest settlements to the facilities are the Asıdere and Meyvali neighbourhoods, which are 300 m downstream, and Hacıomerderesi neighbourhood, which is 600 m downstream.

1.7 Market studies and contracts

Polimetal requested Link to assess the value and the marketability of the copper and zinc concentrates to be produced from the Sulphide Project, including payability, deductions, forecasts of smelting charges and metal prices.

Link noted that continued urbanization and industrialization and the growth in demand for electrical vehicles will continue to be the major drivers of copper demand and pricing, and that construction and transportation, ongoing urbanization and industrialization of the developing world will continue to be the major drivers of zinc demand and pricing.

Metal prices, royalties and concentrate treatment and refining costs for the copper and zinc concentrates are shown in Table 1.5.

Table 1.5 Metal prices, royalties and treatment costs

Metal	Metal Price	Payability Lesser of		Royalty (% Metal Price)	Treatment and Refining Cost
Copper concentrate					US$90/dmt
Copper	US$3.63/lb	96.5%	Cu -1%	5.5	US$0.09/lb Cu
Gold	US$1,500/oz	90%	Au – 1 g/t	4.8	US$10.00/oz Au
Silver	US$20.00/oz	90%	Ag – 30 g/t	3.6	US$1.00/oz Ag
Zinc concentrate					US$200/dmt
Zinc	US$1.27/lb	85%	Zn – 8%	4.5	-
Gold	US$1,500/oz	70%	Au – 1 g/t	4.8	US$10.00/oz Au
Silver	US$20.00/oz	70%	Ag – 108.862 g/t	3.6	US$1.00/oz Ag

Source: Link and Polimetal.

1.8 Environmental studies, permitting and social impact

Environmental impact assessment (EIA) studies for the Oxide Project were carried out by SRK. The EIA was given an "EIA Positive" decision by the Ministry of Environment and Urbanization in 2016. The environmental impacts of the Oxide Project and Sulphide Project were previously evaluated within the scope of that EIA. Because the Oxide Project is already constructed and operating, site-specific conditions are well-defined. Dust, noise, and vibration measurements are all controlled and reported to the Regional Environmental and Urbanization Department. Assays of surface and underground water monitoring wells are shared with legal authorities. All permits are in place for the Oxide Project and local authorities visit to confirm that adequate controls are in place. Periodic reporting to regulatory authorities for the Oxide Project is in place.

Diversion channels are planned to prevent contamination of water coming from natural drainage entering the site. Diversion channels built around the open pit, waste dumps, heap leach facility, and TSFs have been sized for an average recurrence interval of 1 in 1000 extreme peak flow rates. The operational water needs will be met from the CWP and surface water. Water from the CWP will be distributed after treatment at the water treatment plant.

The level of environmental noise to be generated by equipment during open pit mining was evaluated, with an estimated cumulative sound level of 56 dBA in Meyvalı, 51 dBA in Hacıömerderesi and 52 dBA in Aşıdere, against statutory limits of 65 dBA in the day, 60 dBA in the evening, and 55 dBA at night. In the worst-case scenario where all equipment operates simultaneously, noise will be below the daytime and evening legislated limits.

Geochemical studies were carried out to determine the acid mine drainage (AMD) and metal leaching potential of waste rock. Geochemical characterization of the waste showed potential net acid production in lithologies from the sulphide zone. Kinetic analysis samples showed long delay times in some sulphide rocks, associated with the sulphur oxidation reaction rates and the neutralization potential content. Therefore, it will be possible to prevent or minimize the risk of net acidic drainage during operations with appropriate waste management.

Potentially acid-generating (PAG) waste with high sulphur content will be stored within the existing PAG waste dumps and PAG waste with lower sulphur contents will be blended with NAG waste and stored in a NAG WRD. Blending PAG waste with lower sulphur content with NAG waste will minimize acid formation during both operations and closure phases.

Closure and rehabilitation works will be carried out upon completion of operations. The pit base will be 1,155 m above mean sea level (AMSL) in the north and 1,120 m AMSL in the south. Hydrogeological studies identified that a lake will be formed in the open pit on closure after dewatering ceases, with the north pit lake expected to reach a final level of 1,175 m AMSL 5-6 years after closure and then spill into the south pit lake. The south pit will reach 1,145 m AMSL within 6.5-7 years from the end of dewatering and begin to overflow into natural drainage within 2-7 years, depending on upstream diversions.

Water quality and quantity evaluation of the pit lake after closure is still in progress, and will determine treatment requirements, with both passive and active treatment options. The TSF is located 160 m downstream of the spill-over point, with its perimeter embankment at 1,160 m AMSL. Water management of mine closure will focus on transferring spill-over water downstream without allowing ponding behind the TSF.

At closure, the TSF will be covered with rock and levelled. The minimum total top-surface cover thickness will be 2 m. While the overall cover thickness of 2 m is appropriate, it is recommended that alternative cover designs be considered.

Polimetal reports significant local support since the start of exploration and into operation of the Oxide Project. Local residents were recruited during construction activities of the Oxide Project, and currently 60% of the workforce is from the nearby villages, of Bigadiç or Balıkesir, strengthening the relationship between Polimetal and local residents. The community relations department of Polimetal has communicated with local authorities, local villagers, and other stakeholders about the development progress of the Sulphide Project. The same employment approach will be used for sourcing labour for the Sulphide Project, with Polimetal receiving positive feedback on providing long term employment. Unionization of the workforce gives security of personal rights and built trust between local residents, the workforce and Polimetal.

1.9 Capital and operating costs

Operating costs were developed for Gediktepe from the following sources:

- Operating costs for the Oxide Project were provided by Polimetal.
- Mining costs for the Sulphide Project derived from contract unit rates, owner costs derived from Oxide Project costs, and forestry costs were provided by Polimetal.
- Sulphide ore processing and general and administration (G&A) fixed costs, variable operating costs, and sustaining capital costs were provided by GRES.

Both operating and capital costs have a base date of Q2 2022 and are expressed in US$. The operating cost life of mine total and average unit costs are shown in Table 1.6.

Table 1.6 Gediktepe LOM operating cost summary

Operating Cost Elements	Units	Unit Cost (US$/t)	Total Cost (US$'000)
Mine			
Owner's personnel	US$/t rock	0.20	22,981
Mining contractor's cost	US$/t rock	1.67	195,499
Total mining cost	US$/t rock	1.86	218,480
Processing			
Oxide direct cost	US$/t feed	19.94	27,170
Sulphide direct cost	US$/t feed	22.58	391,497
Total processing cost	US$/t feed	22.39	418,667
Owner's cost			
Sitewide general and administration	US$/t feed	1.01	18,816
Land usage and forestry fee	US$/t feed	1.64	30,652
Licence and compliance fees	US$/t feed	0.11	2,116
Total Owner's cost	US$/t feed	2.76	51,585
Total operating cost	**US$/t feed**	**36.83**	**688,732**

Capital costs were developed for the Project from the following sources:

- Sulphide ore processing plant construction costs were provided by GRES.
- TSF and CWP capital construction and closure costs were provided by EN-SU.
- Mine closure, environmental monitoring, and Owner's costs were provided by Polimetal.

Gediktepe capital costs, inclusive of US$14.28M of contingency, are summarized in Table 1.7.

Table 1.7 Gediktepe LOM capital cost summary

Description	Units	Initial Capital	Other Capital	Total Capital
Sulphide ore process plant	US$'000	95,964	832	96,796
TSF and CWP	US$'000	28,366	39,014	67,380
Mining	US$'000	992		992
Mine closure	US$'000	-	11,421	11,421
Contingency	US$'000	8,029	6,248	14,276
Total Capital	**US$'000**	**133,350**	**57,514**	**190,864**

Contingency allowances were estimated for each component, ranging from 6% for the capital cost of the sulphide ore processing plant estimated by GRES, to 8% for the TSF and CWP developed by EN-SU, and 25% for mine closure estimates developed by Polimetal.

1.10 Economic assessment

Project revenues were developed from the mining and processing schedule developed by AMC, metal prices, government and third-party royalties, concentrate treatment and refining costs, and penalties for copper and zinc concentrates provided by Link. Key revenue inputs are shown in Table 1.5 and total Project revenues in Table 1.8.

Table 1.8 Gediktepe LOM revenue summary

Revenue Elements	Total (US$'000)
Revenue	
Gold in doré	108,456
Silver in doré	14,889
Copper concentrate	730,695
Zinc concentrate	619,615
Au in Cu concentrate	240,025
Ag in Cu concentrate	64,080
Au in Zn concentrate	14,481
Ag in Zn concentrate	19,964
Subtotal	**1,812,205**
Sales cost	
Doré Sales Cost	1,564
Cu Concentrate Transport Cost	41,496
Zn Concentrate Transport Cost	54,318
Copper Conc. Treatment	33,790
Zinc Conc. Treatment	98,291
Copper Conc. Cu Refining Charge	18,123
Copper Conc. Au Refining Charge	1,697
Copper Conc. Ag Refining Charge	4,202
Copper Conc. Insurance	1,942
Zinc Conc. Insurance	1,111
Subtotal	**256,534**
Penalties	
Lead in Copper Conc	5,996
Zinc in Copper Conc	271
Arsenic in Copper Conc	781
Lead in Zinc Conc	32
Copper in Zinc Conc	-
Arsenic in Zinc Conc	-
Subtotal	**7,080**
Total Revenue	**1,548,591**
Government Royalty on Ore	55,488
EMX Royalty	45,248
Subtotal	100,736
Revenue less royalties	**1,447,855**

AMC developed a high-level Microsoft Excel-based pre-tax cash flow economic assessment model for Gediktepe using the cost and revenue information described above. Polimetal provided taxation calculations to be applied to the economic assessment to develop post-tax cash flows and financial indicators such as internal rate of return (IRR), net present value (NPV), and payback periods. Undiscounted cash flow, net present value discounted at 10% (NPV 10%), internal rate of return, and payback period (discounted) are shown in Table 1.9.

Table 1.9 Gediktepe LOM pre-tax cash flow summary

Cash Flow Elements	Total (US$'000)
Total operating cost	688,732
Total revenue	1,548,591
Total royalty	100,736
Operating cash flow	759,123
Capital cost	190,864
Cash (operating and capital) flow	568,536
NPV (10%)	264,530
Internal rate of return	60%
Payback period (years)	3.4

The Project returns a positive undiscounted cash flow and NPV at a 10% discount rate. The payback period for discounted cash flows is 3.4 years. The cumulative undiscounted and discounted (NPV) cash flows are shown in Figure 1.7.

Sensitivity of the NPV to the key drivers of operating cost, capital cost and revenue for a range of +/-15% is shown in Figure 1.8. This shows NPV changes by 47% for a 15% change in revenue related items (such as metal price, recovery or grade), 23% for a 15% change in operating cost and 9% for a 15% change in capital cost.

Figure 1.7 Cumulative undiscounted and discounted cash flow

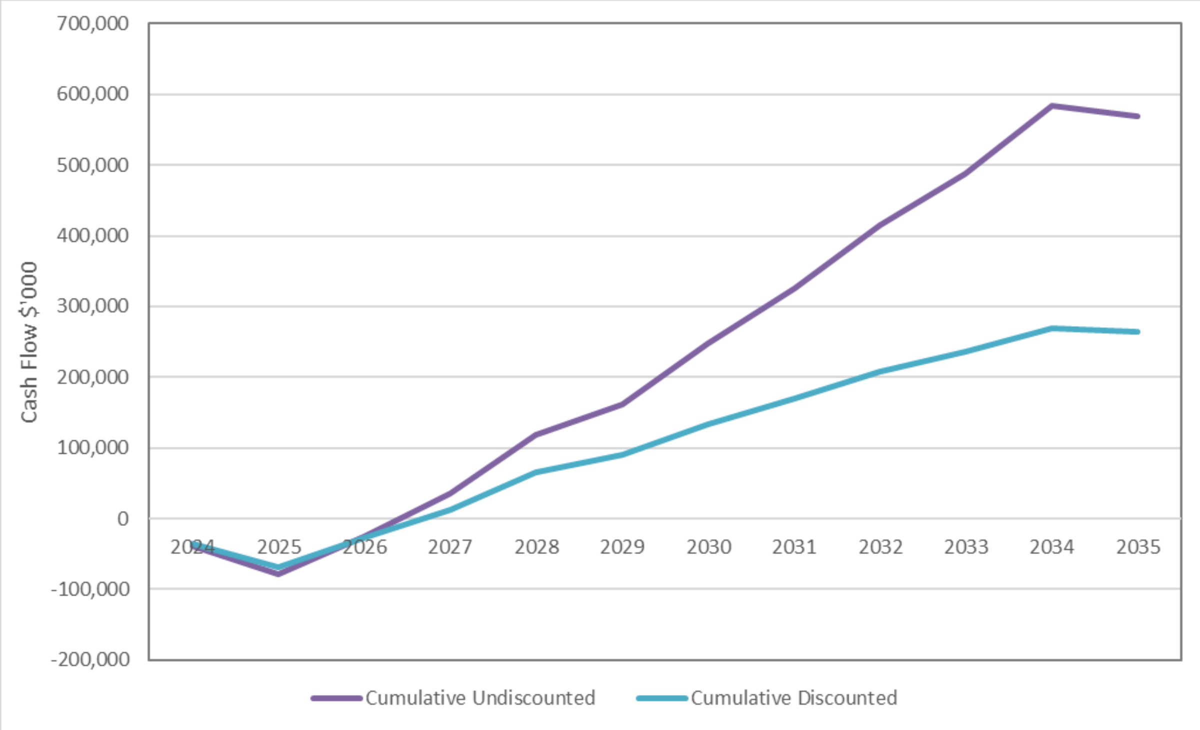
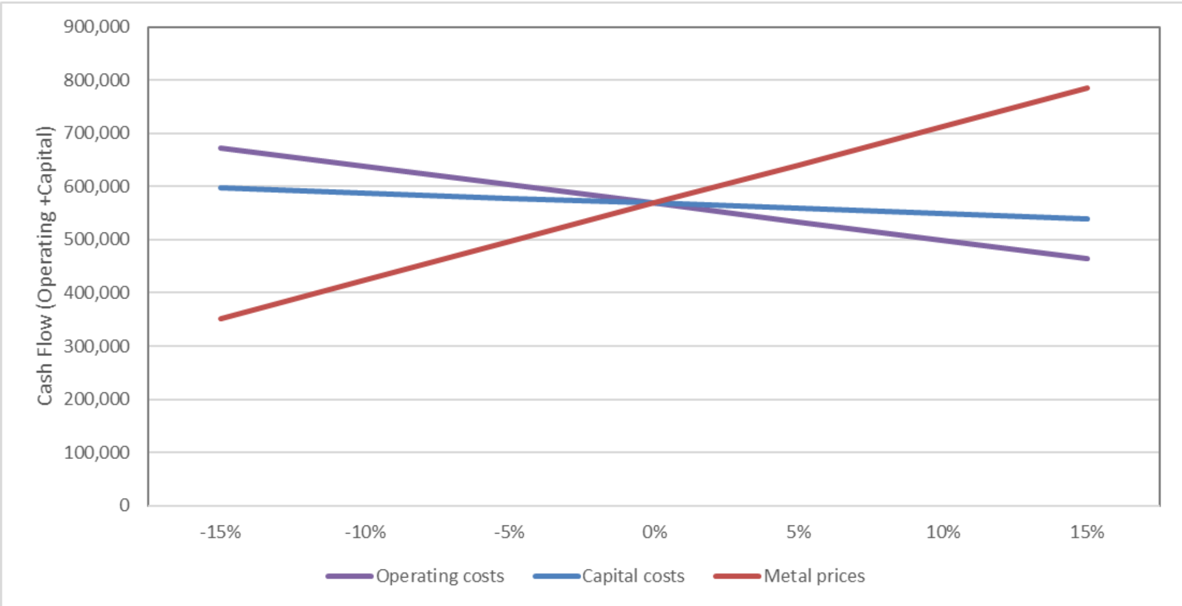


Figure 1.8 Economic sensitivity of cash flow



1.11 Other relevant data

Project implementation

Polimetal will use an engineering, procurement, and construction management (EPCM) approach for project delivery and appoint a Managing Engineer to arrange suitable installers to carry out design, procurement, fabrication and construction works to deliver the completed project. The Owner will pay for all direct costs of plant, equipment, materials, supply, fabrication and erection orders, as approved by the Managing Engineer. The works will be divided into packages and construction is estimated to take 116 weeks up to the time of commissioning from approval of finance. Project implementation strategy is driven by relying on Turkish construction companies and fabricators where practical and/or competitive.

Project organization

Gediktepe has a conventional mining organization structure with a predominantly unionized workforce. The Oxide Project has the functional areas of mining, process, maintenance, health, safety and the environment, administration, purchasing, warehouse, public relations, information technology and communications, finance and accounting, and human resources departments. The same departmental structure will be used for managing the Sulphide Project. A marketing department will be included in the organization.

The mining team is currently managing all open pit and waste rock mine planning and operations and will manage all open pit and waste rock mining during the sulphide operation. The current Oxide Project process team will be strengthened with flotation-experienced engineers and operators. Türkiye has a significant amount of flotation plants and has enough experienced engineers and operators with flotation experience and training. The marketing department will manage off take agreements, selling concentrates and organizing ports.

Where possible, Polimetal proposes that the increase in the size of the workforce during sulphide construction and operation be sourced from local villages, Bigadiç and Balıkesir, the Simav district, the Sındırgı district and the Kütahya province.

1.12 Interpretations and conclusions

Mineral Resource estimate

The regional and Gediktepe geology is well understood and reflected in the geological model used in the Mineral Resource estimate. Gediktepe has been extensively drilled through a combination of reverse circulation (RC) and diamond drillholes (DD) enabling a robust interpretation of the geology and mineralization. AMC is of the opinion that the Mineral Resource is a fair representation of the sample and geological data. AMC has carried out a series of visual and statistical validation checks on the Mineral Resource block model, and the validation checks show that the Au, Ag, Cu, Zn and Pb grade estimates correlate with the sample data.

Mineral Resource classifications are suitable and consider data quality, geological continuity, grade variability, and performance of the grade estimates. Areas classified as Measured are limited to the massive pyrite domain (MSPY), where there is good coverage by drilling data and a good understanding of geological and grade continuity. Areas classified as Indicated are well supported by drilling data. Mineral Resources are reported on an NSR basis. Metal prices for Ag, Cu and Zn appear reasonable. The Au price of US$1,725/oz appears conservative and may present some upside potential.

Exploration

Geochemical and geophysical exploration surveys have identified anomalies which correspond to known mineralization occurrences, supporting the use of these methods for exploration purposes. Additional exploration targets have been identified through the exploration methods beyond the current Mineral Resource. Polimetal have outlined four near mine target areas with oxide potential. These are situated around the existing open pit and comprise:

- Area 1: situated immediately SW of the open pit.
- Area 2: situated on the NW flank of the open pit.
- Area 3: situated NE of the open pit.
- Area 4: located approximately 1.3 km west of the open pit.

AMC has compared the four near mine oxide target areas with the geochemistry and geophysical data. The target areas correspond to areas exhibiting soil and rock geochemistry results with anomalous elevated gold grades, indicating potential oxide hosted gold mineralization.

Ore Reserve estimate

AMC completed an assessment at feasibility level to determine appropriate Modifying Factors to convert Measured and Indicated Mineral Resource to Ore Reserve. The Ore Reserve takes account of diluting materials and allowances for losses that may occur when the material is mined and processed. Economic assessment, using reasonable financial assumptions, shows that extraction of the Ore Reserve can reasonably be justified. Inferred Mineral Resources are considered as waste rock in the mine plan and economic assessment of the Ore Reserve. Enriched mineralization and buffer material that are not included in the processing schedule are not included in the Ore Reserve.

AMC considers that Modifying Factors are at an appropriate level of confidence for an Ore Reserve estimate and that the Ore Reserve and classification are reasonable. However, confidence in geotechnical Modifying Factors are not as high as other factors and additional work on pit stability assessment is recommended.

Mining and mine plan

The drill and blast, load and haul mining methods currently being used at the Oxide Project with an experienced mining contractor are considered appropriate for the operation, as is the scaling up the current methods and equipment fleet to account for larger movements required for the Sulphide Project.

The mine plan developed by AMC is reasonable and robust. The Oxide Project is well understood through extensive experience over four years. The Sulphide Project is less well understood, with enriched mineralization and buffer material complications making mine planning and mine scheduling more complex.

Additional work on geotechnical assessment of pit slopes using the full range of rock strengths identified in geotechnical testing is recommended prior to implementation to confirm that pit slopes are stable.

Mineral Processing

The Oxide Project heap leach and Merrill-Crowe ore processing infrastructure and processes are well understood and will continue until the Sulphide Project is in production.

The sulphide processing facility has been designed to treat 1.82 Mt per annum of copper and zinc bearing sulphide ore. The sulphide flowsheet includes primary crushing, two stage grinding, sequential flotation (pre-float of talc/silicate minerals, and production of separate copper and zinc concentrates), regrind (copper and zinc), concentrate thickening, concentrate filtration, and tailings disposal (thickening). This is all well tested technology, and multiple similar operations are in production around the world. Metallurgical testwork and flowsheet development was undertaken using extensive testwork and analysis by well-respected metallurgical consultants, GRES in partnership with HMT.

The process plant design has been based on the key parameters, with the metallurgical balance and flotation circuit equipment selection based on median values achieved in the locked cycled flotation testing. The maximum concentrate production rate and grade from locked cycle tests has been used as a check on the capacity of the equipment to handle higher concentrate rates and the expected short term maximum head grades from the mine.

Infrastructure

Existing Oxide Project infrastructure will be used as much as possible for the Sulphide Project, with the addition of an expanded TSF, a CWP, additional power transmission lines, and additional office, warehouse, workshop, changing room, and canteen buildings. Operational water needs will be met from the CWP and surface water. Water from the CWP will be distributed after treatment at the water treatment plant.

The TSF was designed with a storage volume of 11.1 Mm^3, sufficient for the LOM. To provide this volume with the lowest cost, the Acisu Stream valley adjacent to the pit and processing facilities was selected. The TSF and CWP pond are located in a steep sided valley, with the closest settlements to the facilities being the Asıdere and Meyvali neighbourhoods 300 m downstream and Hacıomerderesi neighbourhood 600 m downstream. The TSF has a 'Very High' consequence classification (refer Global Industry Standard on Tailings Management (GISTM), 2020), assigned from a 'potential population at risk' of at least 100.

The design criteria adopted by EN-SU were based on Turkish standards and were considered compatible with ANCOLD 2019 hazard rating. TSF design and all construction drawings and reports were approved by Ministry of Environment & Urbanization. International guidelines were subsequently changed since the original TSF design was compiled.

Markets and Contracts

The Project will produce a copper concentrate and a zinc concentrate between years 1 and 11 to generate revenue. Formal discussions have commenced, and smelters have confirmed their interest in both concentrates under long-term agreements and have indicated willingness to sign Letters of Intent when final qualities and quantities are known.

The copper concentrates are expected to be attractive for western copper smelters, however, attention should be given to the contents of Pb to maintain the level below 2.5% and as low as possible to reduce penalty charges. The zinc concentrates are clean, without any deleterious elements and with payable precious metal contents, generating additional income in the concentrates.

Based on the expectation that growth in copper smelting capacity will be greater than the growth in concentrate supply, it is expected that global smelting capacity for copper remains sufficient to absorb the new production. The rising demand for zinc metal will come from higher utilization of existing smelters, new smelters or expansions at existing smelters.

Environment, approvals and social

All permits are in place for the Oxide Project, local authorities visit to confirm that adequate controls are in place, and periodic reporting to regulatory authorities is in place. Because the Oxide Project is operating, site-specific conditions are well-defined. Dust, noise, and vibration measurements are all controlled and reported, along with assays of surface and underground water monitoring wells. Diversion channels have been built around the open pit, waste dumps, heap leach facility, and TSFs, with further channels planned to prevent contamination of water from natural drainage entering the site during the Sulphide Project.

Geochemical studies were carried out to determine the acid mine drainage and metal leaching potential of waste rock. Geochemical characterization of the waste showed potential net acid production in lithologies from the sulphide zone. Kinetic analysis samples showed long delay times in some sulphide rocks, so that it will be possible to prevent or minimize the risk of net acidic drainage during operations with appropriate waste management. High sulphur potentially acid-generating (PAG) waste will be stored within the existing PAG waste dump and PAG waste with lower sulphur contents will be blended with non-acid-generating (NAG) waste and stored in a NAG WRD.

Closure and rehabilitation works will be carried out on completion of operations. A pit lake will be formed after dewatering ceases and is expected to overflow into natural drainage. The TSF will be covered with rock, levelled, and with a minimum top-surface cover thickness of 2 m.

Polimetal reports significant local support since the start of exploration and into operation of the Oxide Project, with 60% of the workforce from nearby villages. The community relations department of Polimetal has communicated with local authorities, local villagers, and other stakeholders about the development progress of the Sulphide Project. The same employment approach will be used for sourcing labour for the Sulphide Project.

Capital Cost Estimates

Capital cost estimates were prepared using international engineering standards by appropriately qualified and experienced engineering consultants using a combination of first principles estimates and supplier quotes and budget estimates. Initial capital costs for construction are estimated at US$133M, with a further US$58M in capital throughout the mine life for an overall capital cost of US$191M, inclusive of approximately US$14M in contingency.

Contingency allowances were estimated for each component, ranging from 6% for the capital cost of the sulphide ore processing plant, to 8% for the TSF and CWP, and 25% for mine closure estimates. Capital costs are considered reasonable and reflective of the proposed operation.

Operating Cost Estimates

Operating cost estimates were prepared using international engineering standards by appropriately qualified and experienced engineering consultants using a combination of first principles estimates and experience with operating the Oxide Project. Mining operating costs averaged US$1.86/t rock mined, oxide processing costs averaged US$19.94/t processed, sulphide processing costs US$22.58/t processed, and overall operating costs averaged US$36.83/t processed.

Operating costs are considered reasonable and reflective of the current Oxide Project and the proposed Sulphide Project.

Economic Analysis

Economic analysis of the Project returns a positive undiscounted cash flow and NPV 0f US$264M at a 10% discount rate and an IRR of 60%. The payback period for discounted cash flows is 3.4 years.

Sensitivity of the NPV to the key drivers of operating cost, capital cost and revenue for a range of +/-15% shows NPV changes by 47% for a 15% change in revenue related items (such as metal price, recovery or grade), 23% for a 15% change in operating cost and 9% for a 15% change in capital cost.

Risks and opportunities

The Project risks identified as high are:

- Penalties will be applied by smelters for off-specification concentrates and there is a risk that penalties may be higher than planned. Lead reporting to copper concentrate from disseminated ore can result in penalties from Chinese smelters. Therefore, European or Japanese smelters should be targeted for sales of copper concentrate.

- The natural variability of this type of deposit will return variable, and at times, material levels, of uncertainty (lower confidence). These uncertainties are not evenly distributed throughout the deposit.
- Unidentified faults not included in the geological fault model could form large plane shears and wedges and affect bench stability.
- Pit slopes may be too high in some areas and require additional waste stripping to form stable slopes.
- Groundwater trapped behind faults and foliation could result in localized high pore pressures that impact slope stability.
- The pit lake could overflow from the south portion of the pit at the level of 1,145 m above mean sea level during the closure period.
- Mine planning, if not properly undertaken, could result in incorrect areas of the pit being scheduled for mining and result in mining of sulphide ore prior to the sulphide plant commissioning and result in wastage of sulphide ore.
- Stockpiling of sulphide ore for extended periods is not possible due to alteration in the characteristics of the ore which results in low recoveries. A risk exists that the current allowance for stockpiling, in covered areas, is insufficient to meet the mine schedule. This must be critically reviewed in the next stage of mine planning.
- The rate of rise during the initial years of operation, considering unexpected heavy rain and a narrow settling area for tailings, may be quicker than planned. Phase 3 of TSF construction may, therefore, start sooner than planned.
- Geotechnical analysis of the process plant area is required prior to beginning construction and may result in site infrastructure changes and increased costs.
- There is the risk that prices continue to increase at a significant rate and that the capital cost increases substantially prior to implementation of the Sulphide Project.

The major project opportunities are:

- Off-take agreements with smelters for concentrates from Gediktepe will ease financing.
- Sulphide ore is open and dipping at the north and north-west sides. The open part of the sulphide deposit is around 60 m thick. With resource drilling from inside the open pit, more Mineral Resource may be identified and converted to Ore Reserve.
- Additional exploration activities have identified other areas of potential oxide mineralization in the near mine area. Subject to further successful exploration works including drilling, there is the potential to increase the oxide Mineral Resources and extend the duration of oxide operations.
- Alternative markets may be identified to allow mining and transport of enriched mineralization as a directly saleable ore product.
- Mining may be more selective than assumed and result in less tonnes classified as buffer material around enriched mineralization, resulting in more sulphide ore suitable for plant feed.
- Calık Holding, a Holding company of Polimetal, has a construction company within its corporate group, which may assist with the procurement and construction of the Project.
- Processing enriched mineralization may add significant economy to the Project.

1.13 Recommendations

The following studies are recommended prior to project implementation:

- Update the resource model with new drilling data (drilling underway on site) and learnings from the reconciliation between resource and reserve models and mine production from Oxide Project mining and processing operation.
- Review the classification criteria for low confidence blocks.

- Update mine plans with the new resource model and results of other work.
- More detailed geotechnical study should be undertaken during the Oxide Project to confirm fault characteristics and locations, increase the confidence level of the geotechnical model, and adjust the in-pit geometry of production faces accordingly.
- A geophysical study should be undertaken over the areas for which there is little or no drill core data to identify potentially problematic ground conditions.
- Revise the open pit slope stability study based on production phases and possibly for each production year with the information obtained during the Oxide Project.
- Update the groundwater model with test data from new dewatering drillholes.
- Revise the method for identifying PAG waste rock and updating the NCV model when additional data is available from the waste characterization programme.
- Provide additional detail on waste characterization modelling and the scheduling of potentially acid-generating (PAG) and non-acid-generating (NAG) waste rock dumping.
- Update detailed short-term quality scheduling for sulphide process plant feed to ensure any areas of high impurity grades are blended to achieve a saleable product quality.
- Final plant layout to be confirmed.
- Power supply and voltage to be confirmed and final design to be confirmed.
- Start off-take agreement discussions with potential customers.
- Review hedging strategies to assess value of hedging a proportion of planned production.
- List any permit updates required for the Project investment and commissioning and schedule the required permit applications and deadlines based on the construction and commissioning schedule.
- Review closure plans every two years and update the closure cost.
- Put aside closure funds to cover closure costs and any future requirements.
- Seek EPCM contractor expressions of interest, then proceed to evaluation, contractual arrangements, and appointment.

2 Introduction

2.1 Purpose of the CPR

This CPR was prepared for Polimetal Madencilik Sanayi Ticaret A.Ş. (Polimetal) by AMC Consultants Pty Ltd.

Polimetal owns mineral assets located in the Balıkesir Province of Western Türkiye (Mineral Assets). The Mineral Assets consist of:

- Gediktepe open pit gold and silver mine and 0.864 Mtpa heap leach and Merrill-Crowe oxide ore processing plant (Oxide Project). The process plant currently treats gold and silver ore contained in the oxidized zone and, as a stand-alone project, the Oxide Project, has a remaining life to 2025.
- Gediktepe sulphide development project (Sulphide Project), which will mine and process the sulphide ore underlying the oxidized cap currently being mined and processed. This sulphide zone contains copper, zinc, gold, and silver minerals and Polimetal will produce copper and zinc concentrates with gold and silver credits. The Sulphide Project comprises an expanded and deeper open pit mine, a sulphide ore processing plant and supporting infrastructure, and expanded clean water pond (CWP), waste dump, and tailings storage facility (TSF).
- Exploration properties.

Mineral Resource and Ore Reserve estimates, classified and reported under the guidelines of the JORC Code, have been prepared for the Sulphide Project (AMC 2022) and separately for the Oxide Project.

Polimetal has requested AMC Consultants Pty Ltd (AMC) to prepare a Competent Person's report (CPR) on the Mineral Assets to support a potential listing on the London Stock Exchange (Proposed Transactions).

The CPR conforms with the Financial Conduct Authority's Technical Note 619.1 and is for inclusion in offering documents, including but not limited to the offering circular, and the prospectus or marketing materials in relation to the Proposed Transactions.

2.2 AMC's independence

AMC confirms that it is independent of Polimetal and has no interest in the Mineral Assets or the LSE listing, should it proceed. The key AMC employees are Members or Fellows of the Australasian Institute of Mining and Metallurgy or the Institute of Mining and Metallurgy, UK, or the Australian Institute of Geoscientists, or Chartered Geologists with the Geological Society of London and are bound by the codes of ethics of those industry professional institutes whose charters include the upholding of standards and developing and promoting professional best practice in the mining industry.

Notwithstanding the below declaration of independence, it should be noted that AMC has, in recent years, undertaken other technical consulting assignments for Polimetal on the Gediktepe Sulphide Project. An AMC consultant has signed off as Competent Person for the Gediktepe Sulphide Mineral Resources and Ore Reserve estimates in accordance with the JORC Code, even though the statements of those estimates were not publicly released. Therefore, this CPR will include descriptions of those estimates, plus coverage of the other technical aspects of the Mineral Assets.

AMC has no interest in the Mineral Assets or the Proposed Transactions.

Neither AMC nor the contributors to this CPR will receive benefits other than the fees paid to AMC and the contributors in connection with preparation of this CPR. The fee paid to AMC is not dependent on the findings of this CPR. AMC does not, nor do its directors or employees, have any business relationship with Polimetal or its shareholders other than the carrying out of individual consulting assignments as engaged. Based on the above, AMC concludes that it is independent for the purposes of preparing this CPR.

2.3 Qualifications on the CPR contents

For the purposes of preparing the CPR, AMC has reviewed material technical reports and management information. AMC has not audited the information provided to it but has aimed to satisfy itself that all the information was prepared in accordance with proper industry standards and is based on data that AMC considers to be of acceptable quality and reliability.

In preparing the CPR, AMC relied on information provided by Polimetal and specialist third party providers engaged to undertake work on the 2022 FS, and AMC has no reason to believe that information is materially misleading or incomplete or contains any material errors.

By way of Polimetal's acceptance of AMC's proposal to prepare the CPR, Polimetal has agreed to release and indemnify AMC for any loss or damage howsoever arising from AMC's reliance on any information provided by Polimetal in connection with the CPR that is materially inaccurate or incomplete.

Polimetal was provided with drafts of the CPR to enable correction of any factual errors and notation of any material omissions. The views, statements, opinions, and conclusions expressed by AMC are based on the assumption that all data provided to it by Polimetal are complete, factual and correct to the best of its knowledge. The CPR and the conclusions in it are effective at 31 March 2024. Those conclusions may change in the future with changes in relevant metal prices, exploration and other technical developments regarding the Mineral Assets and the market for mineral properties.

All currency values in this report are United States dollars (US$ or $) unless otherwise stated.

2.4 Reporting standard and compliance

The JORC Code is the mineral reporting standard adopted by Polimetal and used in this CPR for reporting and classifying Mineral Resources and Ore Reserves, and reporting exploration results and exploration targets. The JORC Code is a reporting code aligned to the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) reporting template. Accordingly, AMC considers the JORC Code to be an internationally recognized reporting standard which is recognized world-wide for market-related reporting and financial investment.

This CPR was prepared under the direction of a Competent Person who, according to the May 2022 Primary Market Technical Note on disclosure requirements under the Prospectus Regulation, should:

- Be professionally qualified and a member in good standing of an appropriate recognised professional association, institution or body relevant to the activity being undertaken, and who is subject to the enforceable rules of conduct.
- Have at least five years relevant professional experience in the estimation, assessment and evaluation of the type of mineral or fluid deposit being or to be exploited by the company and to the activity which that person is undertaking.
- Be independent of the company, its directors, senior management and its other advisors and have no economic or beneficial interest (present or contingent) in the company or in the mineral assets being evaluated and is not remunerated by way of a fee that is linked to the admission or value of the issuer.

Each Competent Person is independent of Polimetal, its directors, senior management and its other advisers, and has no economic or beneficial interest (present or contingent) in Polimetal or in any of the Mineral Assets being assessed and is not remunerated by way of a fee that is linked to the admission or value of Polimetal.

The Competent Person assumes overall professional responsibility for this CPR. This CPR is, however, published by AMC, the commissioned entity and, accordingly, AMC assumes responsibility for the views expressed herein. Consequently, where relevant, all references to AMC shall include the Competent Person and vice-versa.

Those who have prepared and accept responsibility for this CPR satisfy the above requirements.

2.5 Qualifications of consultants

This CPR has been prepared by AMC.

AMC is a firm of independent geological, mining geotechnical, mine engineering and mine management consultants offering expertise and professional advice to the exploration, mining and mining finance industries from its offices in Australia (Melbourne, Perth, Brisbane, and Adelaide), United Kingdom (Maidenhead), Canada (Vancouver), and South Africa (Capetown). AMC's activities include the preparation of due diligence reports on, and reviews of, mining and exploration projects for equity and debt funding, and for public reports.

AMC's project manager and the Competent Person for preparation of this CPR is Mr Glen Williamson. Glen is AMC's Operations Consulting Manager and Principal Mining Engineer and has managed a team of AMC consultants that contributed to this CPR. Mr Williamson is a Fellow and Chartered Professional (CP Mining) of The Australasian Institute of Mining and Metallurgy (AusIMM). He has over 40 years of experience in the mining industry, with broad experience in copper and gold and other open pit operations in both mine planning and management roles. In these roles, he has been responsible for public reporting of Ore Reserves in accordance with the JORC Code, Canadian Institute of Mining, Metallurgy and Petroleum (CIM, Canadian National Instrument 43-101, NI 43-101), and United States Securities and Exchange Commission Regulation S-K 1300, and has managed feasibility studies in Australia, Türkiye, and other countries for copper, gold and other natural resources, and has conducted operational reviews and provided information for valuations of mineral assets.

The Competent Person for Mineral Resources is Mr Nick Szebor, MCSM, MSc, Cgeol, EurGeol, who is a full-time employee and Regional Manager, Maidenhead (UK)/Principal Geologist (Resource Geology) at AMC. Nick has 17 years of experience within the mineral industry, working in roles, including consultancy and production. His experience covers a range of commodities, geological settings, and exploration and production environments. This experience has been obtained across the mining life cycle from early-stage to production and mine closure. Nick is a member in good standing of the European Federation of Geologists (License #1174) and a Chartered Geologist and Fellow of the Geological Society of London (License #1015279). Nick is a Competent Person and Qualified Person and has carried out Mineral Resource estimates to international reporting codes, including CIM (NI 43-101), JORC Code and SAMREC Code.

The Competent Person for mine planning is Mr Koray Gundem, BEng (Mining), MAusIMM, who is a full-time employee and Open Pit Manager, Perth and Principal Mining Engineer at AMC. Koray has more than 30 years' experience in the mining industry. He has extensive mine technical and managerial experience across a number of commodities including gold, iron ore, copper, diamonds, uranium and rare earths. He has worked on projects based in Australia, South Africa, Turkiye, USA, Russia, Philippines, South America and Kazakhstan.

He is experienced in executive, operations management as well as project management and consulting. Koray has managed many feasibility studies for AMC over the last 27 years.

The Competent Person for metallurgy and ore processing is Mr Peter Allen, BEng (Met), MAusIMM (CP-Metallurgy), who is a full-time employee and Manager – Technical Services at GR Engineering Services Ltd (GRES). Peter has more than 40 years' experience in the mining industry. He has worked with a team of GRES engineers and technical personnel contributing to this CPR. Mr Allen has experience in mineral processing operations, plant design, commissioning and feasibility studies for commodities including base metals, precious metals, industrial minerals and iron ore. Other duties with GRES have included operational and project reviews, consultation and contribution to due diligence investigations both within Australia and overseas.

Mr Chris Hogg, BE (Civil), GradCertBus (Mineral Economics), MIEAust, CPEng, is an associate of AMC and a full-time employee and Principal Tailings Engineer for CMW Geosciences, an independent specialist in civil and geotechnical engineering and tailings management. Chris has over 35 years of industry experience across civil engineering, geotechnical engineering, and tailings storage design with a number of well credentialed civil engineering companies and reviewed the Gediktepe tailings storage facility.

Mr Bruce Gregory has peer reviewed this CPR in accordance with AMC's internal peer review policy. Mr Gregory is an AMC Principal Mining Engineer and is AMC's Perth office General Manager. He is a Fellow and Chartered Professional of the AusIMM. He has over 40 years of experience in the mining industry and has been the peer reviewer to numerous public independent technical reports.

All of the persons noted as Competent Persons meet the requirements of the JORC Code for Competent Persons. The qualifications and experience of the Competent Persons and contributing specialists for this CPR and their area of contribution are listed in Table 2.1.

Table 2.1 Key contributors to this CPR

Name	Qualifications	Affiliations	Review Area
Glen Williamson	BEng. (Mining Hons)	FAusIMM (CP Mining)	Competent Person for open pit mining, Ore Reserves and the CPR
Nicholas Szebor	MSc (MCSM) Mining Geology, BSc Ocean Science	CGeol, EurGeol, FGS	Competent Person for geology, Mineral Resources, and exploration
Koray Gundem	BEng. (Mining)	MAusIMM	Competent Person for mine planning
Peter Allen	BEng (Metallurgy)	MAusIMM (CP Metallurgy)	Competent Person for metallurgy and ore processing
Chris Hogg	BE (Civil), GradCertBus (Mineral Economics)	MIEAust, CPEng,	Independent specialist for Tailings Storage Facility
Bruce Gregory	BEng (Mining)	FAusIMM (CP Mining)	Peer review

2.6 Site inspections

AMC personnel visited the Gediktepe site during 2023 and did not consider re-visiting the site was necessary for the purposes of preparing this CPR.

AMC Principal Geologist, Chris Arnold, visited the Gediktepe mine on two occasions in 2018 and 2019 for five days each visit. In addition to inspecting the project site and reviewing a suite of representative drill core, the visits facilitated regular interactions with site professionals. No field or sampling operations were being conducted at the time of the site visits, and AMC did not inspect the ALS laboratory in Izmir.

The Competent Persons for mine planning and Ore Reserves, Glen Williamson and Koray Gundem visited the Gediktepe mine for two days in July 2023, where they undertook an inspection of the open pit and ore processing operations to evaluate site conditions, the performance of the mining operation, the condition of the open pit walls, the hardness of ore and waste materials, the equipment employed on site, and the general layout of the operation. AMC's mine planning engineer has also visited the site on multiple occasions to undertake briefings with mine planning personnel and develop mine plans.

The Competent Person for metallurgy and ore processing, Peter Allen, visited the Gediktepe mine for four days in September 2017, where he undertook an inspection of the ore processing operations, the equipment employed in the plant, the general layout of the operation, the proposed plant and infrastructure locations, and inspected drill core to observe the hardness of ore. He also had briefings from Polimetal project, mining, geology, and exploration personnel, visited potential equipment vendors, participated in technical meetings with Polimetal and Alacer personnel in Ankara from 4 to 6 July 2018, and observed some of the test work completed by ALS for the variability programme in 2021-2.

The independent specialist for tailings management, Chris Hogg visited the Gediktepe mine in December 2017, where he undertook discussions with ENSU designers, a site reconnaissance of the mine area including CWP, TSF areas and communities immediately downstream, viewed core from geotechnical investigations and provide recommendations including additional investigations and testing requirements.

AMC has also relied on information and feedback provided by other AMC consultants who have visited the site together with AMC's familiarity with Gediktepe from previous consulting assignments.

2.7 Sources of information

The information in this CPR was derived primarily from the 2022 FS. Contributions to the 2022 FS and therefore for this CPR from Polimetal and third-party technical specialists engaged directly by Polimetal are included in this CPR. The work for which AMC and third-party technical specialists were engaged during the 2022 FS comprises:

- AMC for geology and sulphide Mineral Resources, mine planning and Sulphide Ore Reserves, pre-tax economic evaluation with input from others, and compilation of this FS Report.
- Golder Associates (Turkey) Ltd. ŞTI (Golder) for open pit and waste rock storage geotechnical assessment.
- SRK Consulting (SRK) for hydrogeology, hydrology, waste rock management, and mine closure.
- Hacettepe Mineral Technologies (HMT) for metallurgical testwork and process metallurgy.
- GR Engineering Services Ltd (GRES) for metallurgy and ore processing and the Project implementation schedule.
- CMW Geosciences Pty Ltd (CMW) and EN-SU Engineering (EN-SU) for tailings storage facility (TSF) and clean water pond (CWP) design and tailings management.
- Link Investment and Consulting UK (Link) for product marketing, metal prices, metal payability, concentrate treatment costs and penalties, metal refining costs, and concentrate land and ocean transport costs.

AMC did not direct or oversee the work of Polimetal or third-party technical specialists and has not reviewed their work, except as required by AMC to estimate Mineral Resources and undertake the mine planning and estimate the Ore Reserve, and the conclusions and recommendations of third-party specialists remain their own.

2.8 Conventions and abbreviations

Costs are expressed in Q2 2022 United States dollars (US$ or $), unless otherwise specified. All references to pounds (lb) of copper (Cu), zinc (Zn), or lead (Pb) are imperial pounds
(454 g) and references to ounces (oz) of gold (Au) and silver (Ag) are troy ounces (31.1035 g).

Commonly used abbreviations and definitions are shown in Table 2.2.

Table 2.2 Abbreviations

Unit	Description	Unit	Description
$ or US$	United States dollar	LECO	LECO Corporation
US$/oz	United States dollars per troy ounce	Link	Link Investment and Consulting UK
US$M	million United States dollars	LME	London Metals Exchange
%	per 100	LOM	life-of-mine
/t	per tonne	LP	low pressure
<	less than	LV	low voltage
>	greater than	m	metre
≤	less than or equal to	M	mega (million)
≥	greater than or equal t	m AMSL	metres above mean sea level
°C	degrees Celsius	mµ	micron
2019 PFS	pre-feasibility study undertaken by Polimetal in 2018-2019	m2	square meter
2D	two dimensional	m3	cubic meter
3D	three dimensional	MAE	mean absolute error
AACE	Association for the Advancement of Cost Engineering	MAP	moisture active passive
ABA	acid base accounting	MBS	metabisulphides
AC	air core	MC	Merrill-Crowe
Ag	silver	MCC	motor control centre
AGI	stream flow measurement station	MCS	master composite sample
Ai	Abrasion Index	MDE	maximum design earthquake
Alacer	Alacer Gold Corp	MEL	mechanical equipment list
ALS	ALS Metallurgy Pty Ltd	mg/L	milligram per litre
AMC	AMC Consultants Pty Ltd	MGM	General Directorate of Meteorology
AMD	acid mine drainage	mi	Hoek-Brown intact rock parameter
AMSL	above mean se level	mm	millimetre
ANC	acid neutralizing capacity	MoC	materials of construction
ANCOLD	Australian National Committee on Large Dams	MoEU	Ministry of Environment and Urbanization
ANFO	ammonium nitrate and fuel oil	Moz	million ounces
AoI	area of influence	mRL	metres reduced level
AP	acid potential	Mt	million tonnes
ARD	acid rock drainage	Mtpa	million tonnes per annum
ARI	average recurrence interval	MTTF	mean time to failure
As	arsenic	MTTR	mean time to repair
ASTM	American Society for Testing and Materials	MW	megawatt
Au	gold	MWh	megawatt-hour
AUD	Australian dollar	NAG	net acid generating

Unit	Description	Unit	Description
AVR	acidification, volatilization and recovery	NaHS	sodium hydrosulphide
bcm	bank cubic meter	NAPP	net acid producing potential
BFI	base flow index	NCV	net carbonate value
BOCO	base of complete oxidation	NI 43-101	Canadian Nation Instrument 43-101
BQR	budget quotation request	NP	neutralization potential
BV	Bed Volume	NPR	neutralization potential ratio
BWi	Bond Ball Mill Work Index	NPV	net present value
C	celsius	NQ	47.6 mm diameter core
CIF	cost, insurance and freight	NRMSE	normalised root mean squared error
CIP	Carbon in Pulp	NSG	non-sulphide gangue
CLC	Cobre las Cruces operation	NSR	net smelter return
cm	centimetre	OCS	open circuit cleaner test
cm2	square centimetre	OK	ordinary kriging
CMC	carboxymethylcellulose	OD Pond	over-drain pond
CMW	CMW Geosciences Pty Ltd	oz	Troy ounce (31.1035 g)
Competent Person	person defined in JORC to supervise Mineral Resource or Ore Reserve estimates	P&ID	Piping and Instrumentation Diagram
COS	coarse ore stockpile	P80	size at which 80% passes
CRMs	certified reference materials	PAG	potentially acid-generating
CSTR	continuously stirred reactors	PAP	potentially affected person
Cu	copper	PAR	population at risk
CuEq	copper equivalent	Pb	lead
CWP	clean water pond	PDC	Process Design Criteria
DBOCS	discounted best case operating cash surplus	PEA	Preliminary Economic Assessment
DETA	diethylenetriamine	PFD	process flow diagram
DGPS	Differential Global Positioning System	PFS	Prefeasibility Study
dmt	dry metric tonne	POF	probability of failure
DSI	General Directorate of State Hydraulic Works	Polimetal	Polimetal Madencilik Sanayi Ticaret A.Ş.
DSO	directly saleable ore	PPAR	potential population at risk
DTM	digital terrain model	PPE	personal protective equipment
Dwi	drop weight index	ppm	parts per million
DWOCS	discounted worst case operating cash surplus	PQ	85 mm core
EIA	Environmental Impact Assessment	Project	Gediktepe Copper and Zinc Project
EN_SU	EN-SU Engineering	PSD	particle size distribution
EPCM	engineering, procurement and construction management	PTL	power transmission line
ESIA	Environmental and Social Impact Assessment	PVC	polyvinyl chloride
EUR	Euro	QA/QC	quality assurance and quality control
F80	feed size at which 80% passes the required size test	RC	reverse circulation
FA	face angle	Rdi	Resource Development Inc
FEED	front end engineering design	RF	revenue factor
FEL	front end loader	RL	reduced level

Unit	Description	Unit	Description
FGD	focus group discussions	RMR76	average rock mass rating
FOS	factor of safety	RMS	root mean squared
FS	Gediktepe Sulphide Project Feasibility Study	RMSE	root mean squared error
g	gram	ROM	run-of-mine
G	giga (billion)	RQD	rock quality designation
G&A	general and administration	S	sulphur
g/t	gram per tonne	S&P IQ Capital	S&P Global Commodity Insights Capital IQ
GDMA	General Directorate of Mining Affairs	SABC	SAG mill, ball mill, and pebble crusher
Gediktepe	Gediktepe Project	SAG	semi-autogenous grinding
Gediktepe AWOS	Gediktepe Automatic Meteorology Observation Station	SART	sulphidisation, acidification, recycle and thickening
GIS	geographic information system	SCSE	standard circuit specific energy
GISTM	Global Industry Standard on Tailings Management 2020	SEP	Stakeholder Engagement Plan
Golder	Golder Associates (Turkey) Ltd	SG	specific gravity
GPM	global precipitation measurement	SI	selectivity index
GPS	global positioning system	SIA	Social Impact Assessment
GRES	GR Engineering Services Ltd	SIPX	sodium isopropyl xanthate
GSL	Grinding Solutions Ltd	SMAP	NASA-USDA soil moisture active passive
GSM	Workplace Opening and Working Permit	SMD	stirred media detritor
h/a	hours per annum	SMU	selective mining unit
ha	hectare	SRK	SRK Consulting Pty Ltd
HMT	Hacettepe Mineral Technologies	t/h	tonnes per hour
HDPE	high density polyethylene	TCRC	treatment costs and refining costs
HG	high-grade	TDS	total dissolved solids
HMT	Hacettepe Mineral Technologies	TL	Turkish lire
HQ	63.5 mm diameter core	TML	transportable moisture limit
HV	high voltage	TOF	top of fresh
I/O	inputs and outputs	tpd	tonnes per day
ICA	International Copper Association	TSF	tailings storage facility
ID2	inverse distance squared	UCS	unconfined compressive strength
IFCPS	International Finance Corporation Performance Standards	UOCS	undiscounted operating cash surplus
IRA	inter-ramp angle	V	volt
IRR	internal rate of return	VAC	volts alternating current
ISO	International Organization for Standardization	VDC	volts direct current
IT	Information Technology	VDU	visual display units
JK	Julius Krutschnitt Mineral Research Centre	VVVF	Variable Voltage Variable Frequency
JORC Code	Australasian Joint Ore Reserves Committee (JORC), Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code), 2012 edn, effective December 2012	VWP	vibrating wire piezometer
K	hydraulic conductivity value	w/w	weight percent

Unit	Description	Unit	Description
kg	kilogram	W4X	Whittle Four-X pit optimization software
km	kilometre	WAI	Wardell Armstrong International
km2	square kilometre	Whittle	Whittle Programming Pty Ltd
koz	thousands of ounces	wmt	wet metric tonne
kt	kilotonnes	WPCR	Water Pollution Control Regulation
kV	thousand volts	WRS	waste rock storage
kW	kilowatt	WTP	water treatment plant
L	litre	YAMAS	Yeni Anadolu Mineral Madencilik San. Tic. Ltd. Sti
L/s	litres per second	ZAR	South African rand
LAP	Land Acquisition Plan	Zn	zinc
LCT	locked cycle tests		

3 Reliance on other experts

3.1 Reliance on other experts

The qualifications and experience of other key contributors to this CPR and their area of contribution are listed in Table 3.1.

Table 3.1 Reliance on other experts

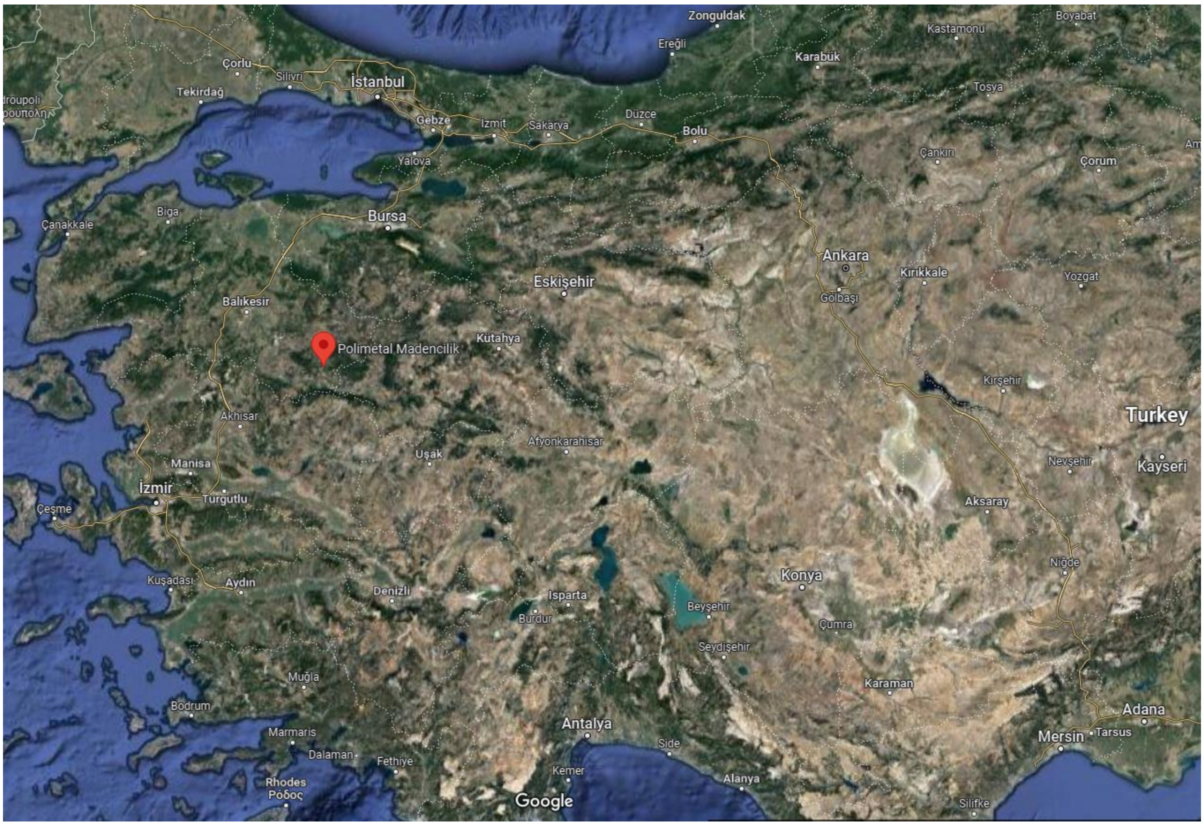
Name	Qualifications	Affiliations	Contribution Area
Rob Chesher	BEng (Minerals Process)	MAusIMM CP (Metallurgy)	Review of metallurgy, ore processing and infrastructure
Asoka Herath	BSc (Geology – Hons) MSc (Engineering Geology)	MAusIMM	Review of open pit geotechnical engineering

4 Project description and location

4.1 Project location

Gediktepe is located in the Balıkesir Province of Western Türkiye, approximately 90 km by road south-east of Balıkesir, the provincial capital, 510 km by road west of Ankara, and 38 km by road east–south-east of the nearest town of Bigadiç (see Figure 4.1 from Google Earth).

Figure 4.1 Project location (Google Earth)



4.2 Project description

Gediktepe is a massive sulphide deposit hosted in metamorphic schist units. The upper portions of the deposit are weathered, leached, and oxidised by naturally occurring acidic surface water and ground water. The oxide zone is nearly devoid of base metals, but gold and silver remain relatively intact. The sulphide zone is polymetallic, with potentially economic values of zinc, copper, gold, and silver. The major economic minerals are sphalerite and chalcopyrite. Pyrite is ubiquitous.

The current Oxide Project at Gediktepe comprises an open pit mining operation, a 0.864 Mtpa heap leach and Merrill-Crowe oxide ore processing plant, run-of-mine (ROM) ore pad, workshops and offices, mining contractor’s area, various borrow pits and camp accommodation close to the site. The Gediktepe site layout is shown in Figure 4.2.

Figure 4.2 Gediktepe site layout (January 2024)

Oxide Project facilities comprise:

- Three open pit areas (South pit, Middle pit, North pit).
- Two borrow pits (Aggregate pit and Clay pit).
- Two waste rock dumps (NAG (non-acid-generating) waste dump and PAG (potentially acid-generating) waste dump).
- NAF waste dump deviation channel.
- Mining contractor's facilities.
- ROM pad.
- Heap leach pads.
- Processing facilities comprising a Merrill-Crowe facility, agglomerator, crusher control room, screen room, transfer tower, laboratory, and chemical warehouse.
- Clear water tank, two stormwater ponds, a process pond, PLS pond, and industrial wastewater treatment pond and plant.
- Cyanide destruction unit.
- Concrete plant.
- Two temporary hazardous waste storage areas.
- Three dressing rooms.
- Three offices.
- Garages for ambulance and emergency vehicles.
- Truck weigh-scale.
- Electrical transformers.

The 2022 FS evaluated mining and processing the sulphide mineralization underlying the oxide cap and comprised an expanded and deeper open pit mine, a sulphide ore process plant and supporting infrastructure, and expanded clean water pond, waste dump and TSF facilities. Facilities planned to be constructed as part of the Sulphide Project includes:

- Expanded waste dumps, ROM stockpile area, and topsoil stockpile areas.
- TSF for sulphide ore tailings disposal.
- CWP and water diversion structures.
- Power transmission line.
- Fixed plant workshops, warehouse, control room, and change rooms.
- Security gate house.
- Mine administration building.
- Services, such as a kitchen and dry mess, laboratory, and fuel storage.

Proposed off-site infrastructure includes the operations personnel camp and facilities and concentrate storage and blending bays at the selected export facility.

4.3 Land tenure

The Project operates under two operational licences and an exploration licence (see Figure 4.3 for location and Table 4.1 for licence details).

Figure 4.3 Project mining licence location

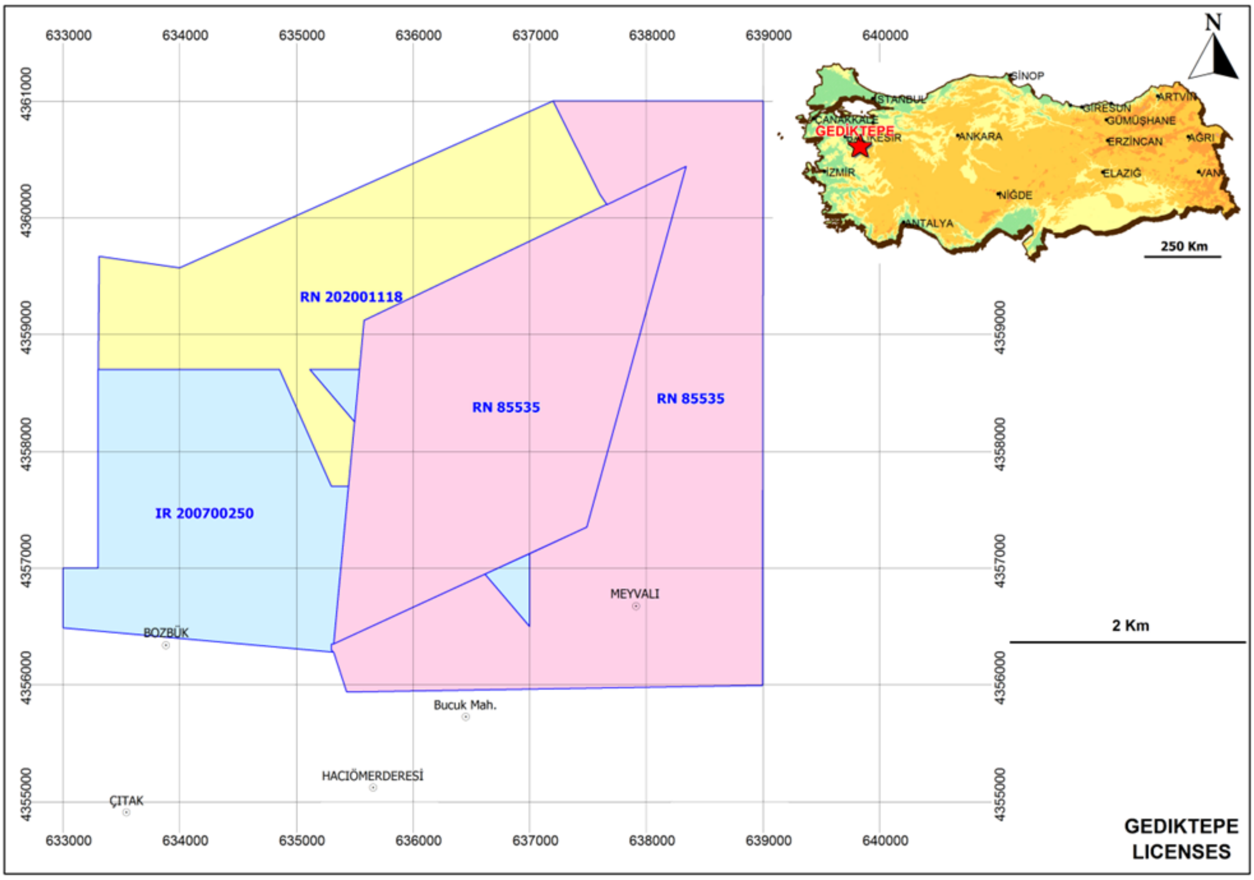


Table 4.1 Project mining licence details

Licence Type	Licence Number (IR)	Area (ha)
Operating	85535	1,486.99
Operating	200700250	492.16
Exploration	202001118	496.73

Operating Licence – 85535

The Gediktepe exploration license (EL 20054077) covering the central area (diamond shape) of the Project was acquired from the General Directorate of Mining Affairs (GDMA) by tender in July 2005 on behalf of Yeni Anadolu Mineral Madencilik San. Tic. Ltd. Sti. (YAMAS). The EL covers an area of 657.87 ha.

The EL was changed to an operation license (OL 20054077) in June 2011 and was valid for ten years. The OL was transferred to Polimetal from YAMAS in July 2011.

An Environmental Impact Assessment (EIA) permit application was submitted, and the EIA Permit was granted in March 2012. A Forest Permit was granted in October 2013 and a Workplace Opening and Working Permit (GSM) was granted in October 2013.

After obtaining all of the necessary permits, the Operation Permit was granted on in January 2014 for OL 20054077.

EL 201400291 on the east side of EL 20054077 was acquired by Polimetal from GDMA in September 2014 by auction tender. EL 201400291 covers an area of 829.12 ha.

OL 20054077 was subsequently merged with EL 201400291 in July 2016.

GDMA approved the merging of OL 20054077 and EL 201400291 in July 2016. (OL- 85535) Currently, the merged OL is valid until 23 June 2036 and covers an area of 1,486.99 ha, of which approximately 76% is forest area.

GDMA approved Polimetal's application for a production permit for clay and aggregate for three locations within RN 85535 operating license in February 2018

Operating Licence – 200700250

Polimetal purchased the OL from Hakki Musa Nogay in June 2014. Transfer of the OL to Polimetal was completed in November 2015. The OL covers an area of 492.16 ha.

Exploration Licence – 202001118

EL 202001118 was acquired by Polimetal from GDMA in September 2020 by auction tender. The EL covers an area of 496.73 ha.

5 Accessibility, climate, local resources, infrastructure and physiography

5.1 Accessibility

The Project site is centrally located with access by road to the following ports, with approximate road distances via Balıkesir:

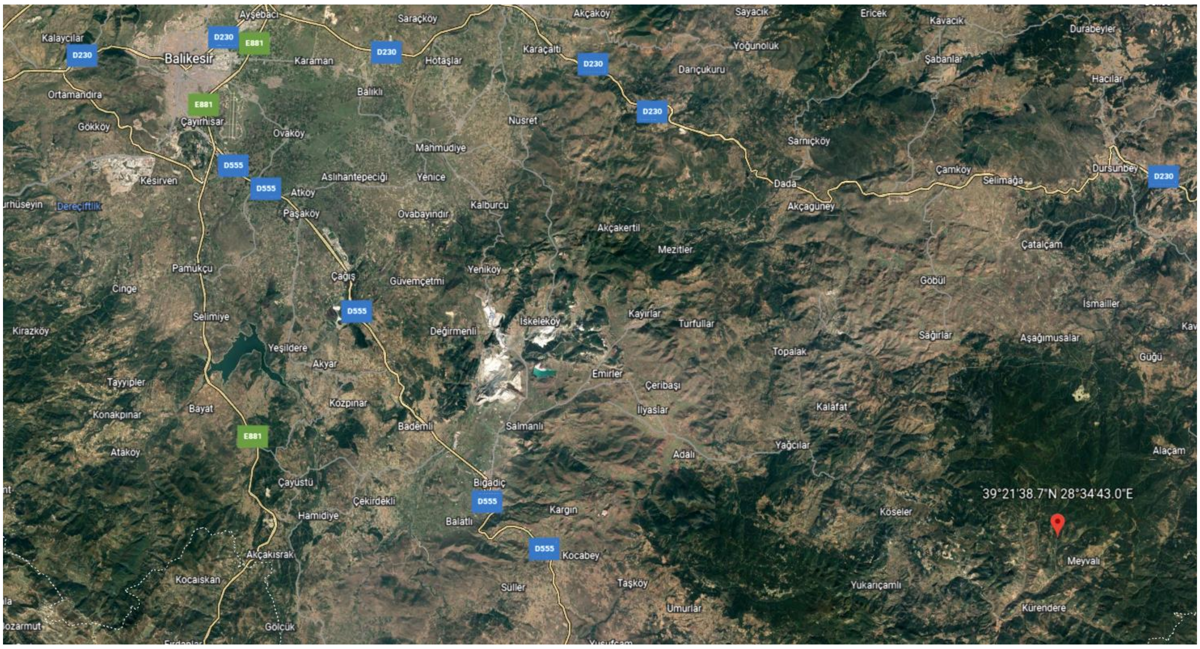
- Bandırma port is 194 km to the north.
- Dikili port is 207 km to the west.
- Aliağa port is 224 km to the west.
- Izmir port is 225 km to the south-west.

The closest settlements to the Project site are:

- Hacıömerderesi neighbourhood.
- Aşıderesi neighbourhood, affiliated to Hacıömerderesi neighbourhood.
- Meyvalı neighbourhood.

Gediktepe is accessed via 102 km of paved road from the regional centre of Balıkesir on Highway D555 through the town of Bigadiç (see Figure 5.1 from Google Earth).

Figure 5.1 Project access roads from Balikesir (Google Earth)



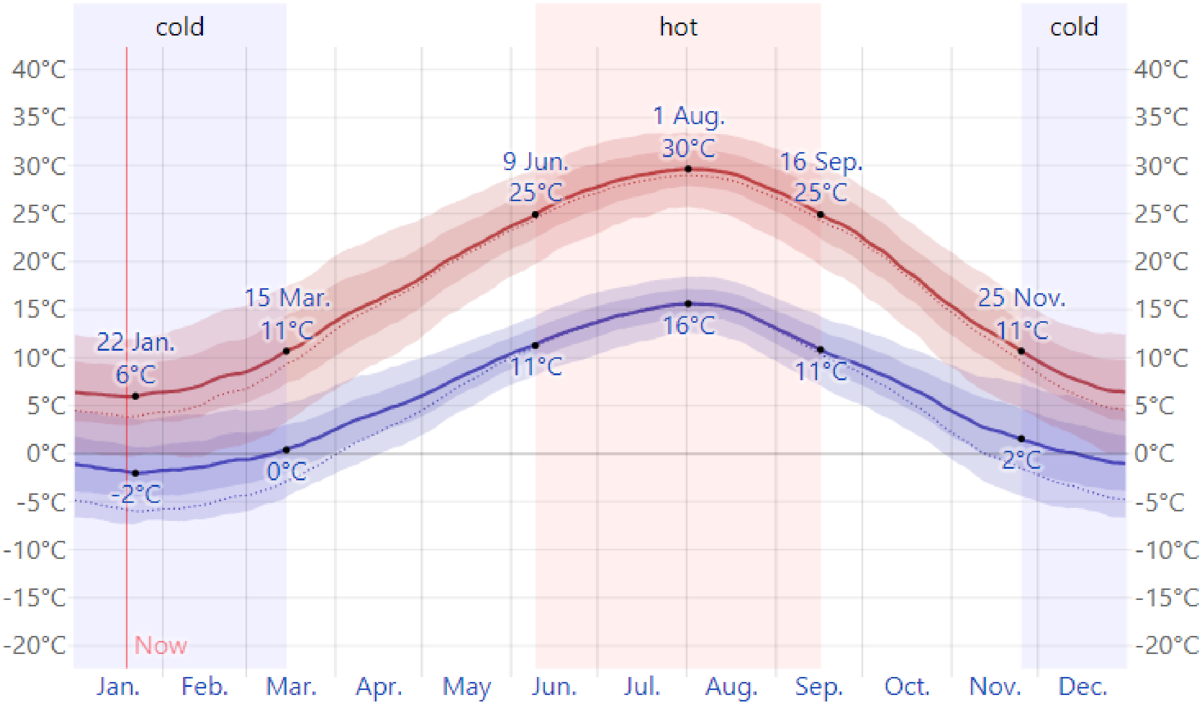
The nearest airport, Balıkesir Koca Seyit Airport serving Balıkesir and Edremit, is approximately 185 km by road from site. There are also air services to the city of Izmir, approximately 290 km by road from the site. The nearest railway stations are in Dursunbey to the north and Balıkesir to the north-west. The closest hospital is the Bigadiç State Hospital, and there is a university hospital in Balıkesir Province.

5.2 Climate

Three climates are dominant in Balıkesir Province. The Mediterranean climate is predominant on the Aegean coast, the Marmara climate in the north, and a Continental climate in the inner regions. The temperature difference between summer and winter is small on the coastline. In the interior of the province, this difference is larger. In the mountainous eastern region, winters are harsh, and summers are cool.

The local climate is hot and arid during the summer and warm during autumn. There is snow from December through February but not significant accumulation. Spring is often the rainy period. Over the course of the year, the temperature typically varies from -2°C to 30°C (see Figure 5.2).

Figure 5.2 Average high and low temperatures in Dursunbey



The daily average high (red line) and low (blue line) temperature, with 25th to 75th and 10th to 90th percentile bands. The thin dotted lines are the corresponding average perceived temperatures.

Source: https://weatherspark.com/y/95394/Average-Weather-in-Dursunbey-Turkey-Year-Round, accessed 19/01/2024

According to data from Dursunbey Meteorological Station for the years 1965–2014, the annual average temperature is 12.2°C. The highest measured temperature was recorded as 40.3°C in 2007 and the lowest temperature was recorded as −16°C in 1985.

The wind is generally from the north or north-east.

Average evaporation from the Dursunbey Meteorological Station data is 943 mm per year with the highest average monthly evaporation of 190 mm experienced during July.

A meteorological station was installed at site at the end of 2014 as part of the environmental base line data collection.

5.3 Local resources

There is an open pit borax mine in Bidagiç, operated by the State Enterprise, and an open pit gold mine in Sındırgı, operated by a private company. Regionally, gold, silver, lead, copper, zinc, molybdenum, and chromite mines have operated for many years. The other main economic income sources in the area are forestry, agriculture, and animal husbandry.

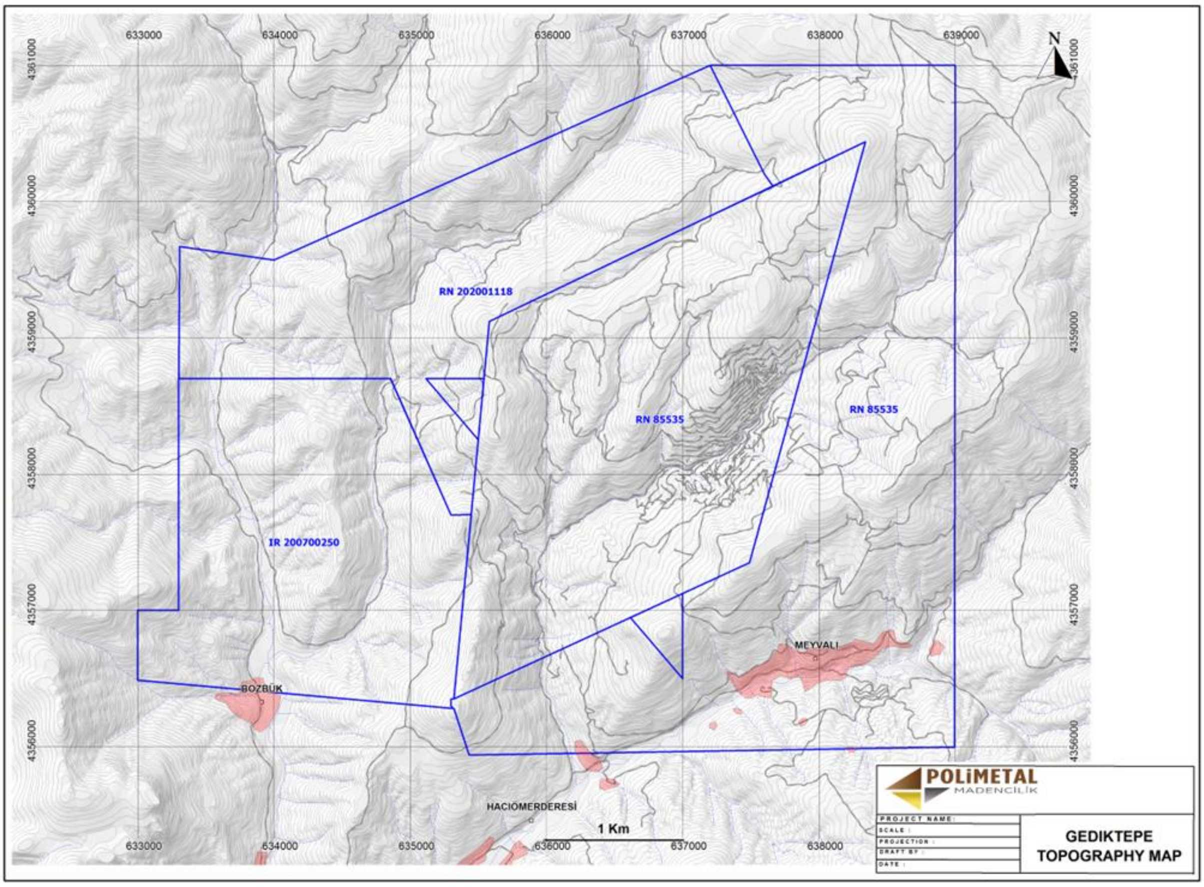
A 39.6 km-long 34.5 kV power transmission line was constructed by Polimetal between Dursunbey substation and Kürendere to provide power to the Project.

5.4 Physiography

The terrain at Gediktepe is mountainous with steep erosional valleys. Elevations in the Project area range from 974–1,482 m above mean sea level (AMSL). Coniferous trees cover most of the Project site, with occasional open meadows in areas of less-steep terrain.

Figure 5.3 shows the topography of the area. The contour interval is 10 m, illustrating the steep nature of the terrain.

Figure 5.3 Project topography



5.5 Other considerations

The region covering the Project area is classified as "1st Degree Earthquake Zone" according to the Seismic Zone Map of Türkiye.

5.6 Forestry status

A forestry permit is required for any forest land that will be used in the Project. To obtain a forestry permit, an application must be prepared by the forest engineer and should be submitted to the Regional Management of Forestry Department. Permit applications are assessed and approved by the Operation Chief of Forestry Department, Regional Management of Forestry Department, General Management of Forestry Department and Presidency, respectively.

The cost of obtaining a forestry permit depends on the location of the project, type of project (such as an operating a mine, infrastructure or power line), type of forest and the quantum of trees.

After obtaining approval, an agreement needs to be signed, and the forestry land permit fee must be paid every year until the end of the permit period, as well as a re-forestation fee and a deposit. After reclamation of the used area, the deposit will be reimbursed.

For the current Oxide Project, a 167 ha forest land permit was granted in 2020. An additional 47 ha permit was granted for the Oxide project in 2022. A 230.89 ha forest land permit application was made to the Regional Forestry Department for the Project and the permitting process is on-going.

6 History

6.1 Project history

Alacer Gold Corp (Alacer) was granted OL RN 85535 for Gediktepe in 2005 and completed geochemical stream sampling. Permit applications were submitted at various times for greenfields exploration, drilling, and installation of a meteorological station, and other site activities necessary to support technical investigations for the Project.

Project development activity related to Gediktepe is summarized below:

- A Phase 1 drilling EIA permit was obtained in August 2012 for 21 drill locations and a forestry permit granted for 11 drill locations in March 2013. An EIA permit for drilling at 234 drill locations was obtained in March 2012 and June 2013 and a forestry permit in October 2013.
- Polimetal commissioned a Preliminary Economic Assessment (PEA) of the project under the Canadian National Instrument 43-101 (NI 43-101) mineral reporting code in mid-2014 to determine economic potential. The PEA identified a combined oxide and sulphide Indicated Mineral Resource of approximately 10 Mt. Oxide processing was proposed by heap leaching and the subsequent sulphide processing through a concentrator. The PEA did not estimate a Mineral Reserve.
- A Phase 2 drilling EIA permit was obtained in December 2013 and February 2014 and a forestry permit in September 2014 for 139 drill locations.
- A Phase 3 drilling EIA permit was obtained in April 2014 and a forestry permit in September 2014 for 264 drill locations.
- A Phase 4 drilling EIA permit for 344 drill locations was obtained in June 2014, 175 of which received subsequent forestry approval.
- The meteorological station EIA permit was obtained in February 2014 and a forestry permit in September 2014.
- Based on the positive PEA findings, a revised project operation was submitted to the GDMA in September 2014 to enlarge the operation permit area and to change the annual production and processing capacity up to 2.375 Mt of ROM ore.
- A Phase 5 drilling EIA Permit was obtained in June 2014 for 242 drill and trench locations and a forestry permit for 17 drill and trench locations was obtained in November 2015. Forestry permit approval of another 61 drill and trench locations planned for Stage 2 geotechnical investigations followed.

An EIA application for oxide and sulphide mining and processing was submitted in July 2015 and a public participation meeting was held in August 2015. The EIA report was submitted to the Ministry of Environment and Urbanization in December 2015.

Polimetal commissioned a pre-feasibility study on the Project during 2015. Using drilling to August 2015, the results of that pre-feasibility study were published in June 2016 and estimated a significant increase in combined oxide and sulphide Measured and Indicated Resource of 36 Mt and a combined oxide and sulphide Mineral Reserve of 25 Mt, reported under NI 43-101, and a potential mining and processing operation with a 12-year mine life.

Polimetal commissioned another pre-feasibility study under NI 43-101 during 2019 (2019 PFS) using drilling to January 2018, at which point 616 drillholes had been completed totaling 68,822 m of drilling. The 2019 PFS estimated a combined oxide and sulphide Measured and Indicated Resource of 30 Mt and a combined oxide and sulphide Mineral Reserve of 19 Mt, reported under NI 43-101, and a potential mining and processing operation with a 11-year mine life.

Polimetal commissioned the current Oxide Project in 2021 and started to produce gold and silver doré as of 6 November 2021. Polimetal confirms that all of the legal and other necessary permits are in place for the operation.

6.2 Historical production

Historical production from the Gediktepe gold and silver mine over the period 2021 to Q1 2024 is shown in Table 6.1.

Table 6.1 Gediktepe historical production

Description	Units	Q1 2024	2023	2022	2021
Ore mined	'000 t	8	772	709	170
Waste mined	'000 t	1,962	5,601	5,224	1,008
Total mined	**'000 t**	**1,969**	**6,372**	**5,933**	**1,178**
Strip ratio	t:t	NA	7.26	7.37	5.91
Ore Processed	t	49,196	678,559	741,461	136,024
Gold grade processed	g/t Au	2.53	2.28	1.82	0.93
Silver grade processed	g/t Ag	47.3	57.74	51.64	21.35
Gold produced	oz	14	34,019	29,711	576
Silver produced	oz	156	360,510	308,691	3,062

7 Geological setting

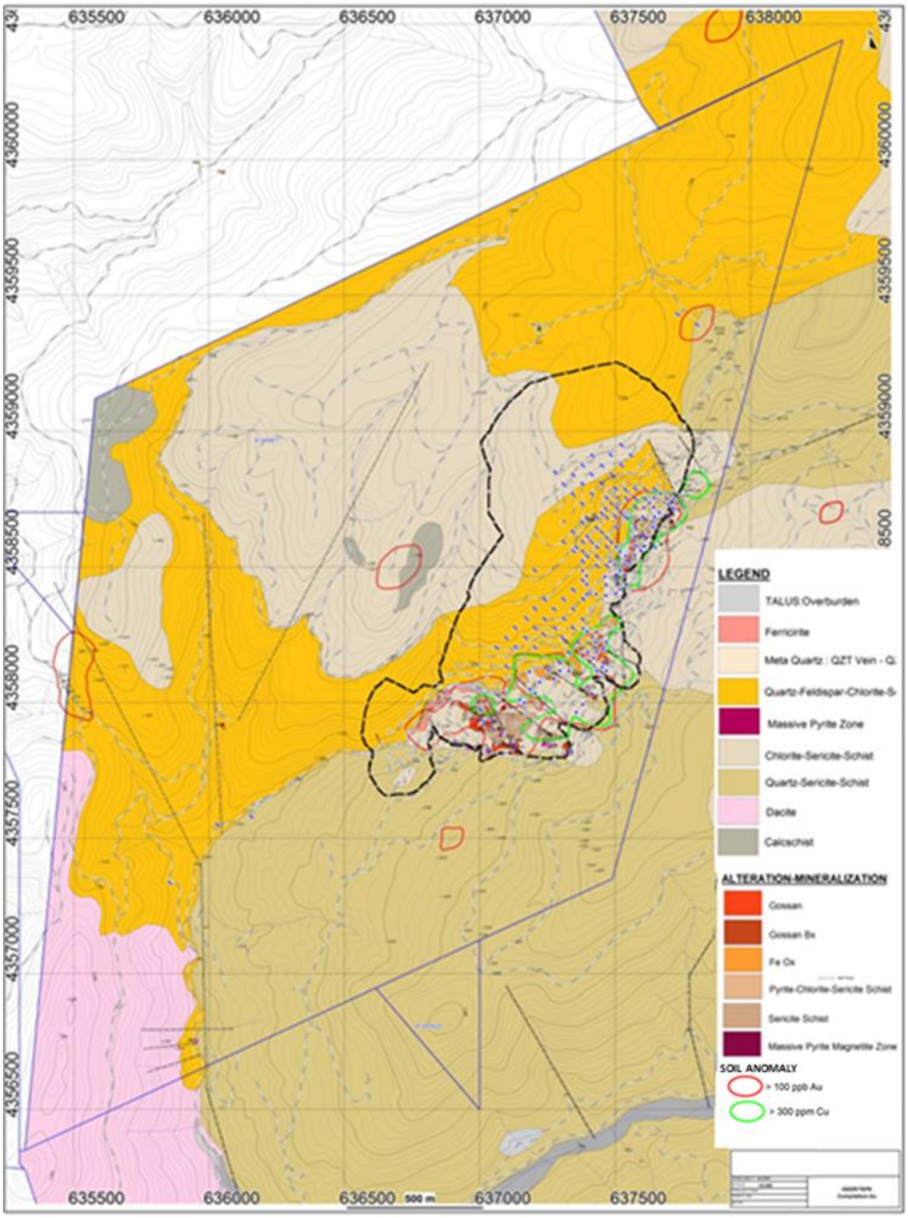
7.1 Regional geology

Gediktepe is located within the Ören-Afyon Zone, one of the main tectonic units of Türkiye. The Ören-Afyon Zone is a belt trending NW-SE, consisting of generally low-grade weathered metamorphic rocks, and is located between Menderes Massive to the west, and the Tavşanli Zone to the north and east. The Gediktepe regional geology comprises Upper Palaeozoic metamorphics and Lower-Middle Miocene intrusives and volcanics.

7.2 Project geology

Geological and structural mapping has been completed across the project at 1:1000 scale (Figure 7.1), along with more general mapping at 1:5000 scale to delineate possible structures and alteration features.

Figure 7.1 Geological map of the Project area (1:1000 scale)



Source: Polimetal 2018

Upper Palaeozoic metamorphics are the most common units at Gediktepe, with a stratigraphic sequence, from top to bottom being:

- Dacite and pyroclastic.
- Calcschist.
- Feldspar-quartz schist.
- Chlorite-sericite schist.
- Quartz schist.

The second most common rocks are the Lower-Middle Miocene volcanics, observable around Karadikmen hill, southwest of Gediktepe, comprising altered dacites-rhyodacites, characterized by lava flows and pyroclastics.

The youngest units on the project are mineralized gossan and ferricrete, along with talus, colluvium and alluvium, being weathering products of the host rock.

Chlorite-sericite schist is the main host rock at Gediktepe, marked by gold and silver in the oxide zone, and copper-zinc-lead, with associated gold-silver, in the sulphide zone. The unit is observed at Fındıkalanı Ridge, Çamdamı Ridge, Karaismailöldüğü, and northwest of Göğne Hill in the license area (Figure 7.2).

Figure 7.2 Chlorite-sericite schist in outcrop

Source: Polimetal 2018

When disseminated pyrite in the chlorite-sericite schists exceeds 10% to 45% by volume, the unit is logged by Polimetal as transition zone (TR-Sulp) or disseminated sulphide. Disseminated pyrite minerals are aligned parallel to schistosity and appear as pyrite bands.

Petrographic analysis indicates that the rock has been intensely chloritized, epidote-altered, silicified, carbonatized, and mineralized. Fractures and spaces between individual crystals of cataclastic, structured epidote are filled with quartz, calcite and chlorite.

The feldspar-quartz schist is beige-light green in colour and is observable over a wide area at Gediktepe. It forms the primary unmineralized capping over the deposit, and generally contains virtually no sulphides.

The calc schist observed at Gediktepe in outcrop at Küçük Yellice hill and Fındıkalanı Ridge is beige-light grey coloured, with low hardness and schistosity, and is reactive to HCl acid.

The dacites and pyroclastics, of the Lower-Middle Miocene volcanics, are the second largest geological unit at the Gediktepe project. The volcanics, located at southwest of Karadikmen Hill and Gaşakdoğrusu Hill, contain altered dacite to rhyodacite lava and pyroclastics.

7.3 Mineralization

The mineralization at Gediktepe is associated with greenschist facies schist units. The mineralization is thought to be deposited syn-genetically in sedimentary units, as an elongated NE-SW structure zone, and metamorphosed to schist. Greenschist minerals are generally actinolite + chlorite + albite + epidote (Alizade, 2013 – 2015, Çiftehan, 2015).

Massive sulphide-type mineralization occurs as lens shapes trending NW-SE and dipping approximately 20° to 40° to the north-west. Minerals include pyrite, sphalerite, tetrahedrite, tennantite, chalcopyrite, galena and magnetite, and the units are cut by later NW-SE trending post-mineralization structures. Within the oxidized zone, the sulphide mineralization has been completely leached out, leaving gold and silver relatively intact.

Potentially economic Au-Ag-Cu-Zn-Pb metals are present to varying degrees in the sulphide zone.

The mineralization at Gediktepe has been divided by Polimetal into five main types, as summarized in Table 7.1.

Table 7.1 Mineralization type names and codes

Horizon	Name	Code
Oxide	Gossan	Gos
Sulphide	Massive pyrite	MPy
	Massive pyrite magnetite	MPyMag
	Enrichment zone	Enrch
	Disseminated sulphide	Tr-Sulp

Reviews of interpretations revealed that, in the northern part of the deposit and in the vicinity of the enrichment zone, part of the sulphide zone shows high Au and Ag and low base-metal content (<0.1 % Cu and Zn).

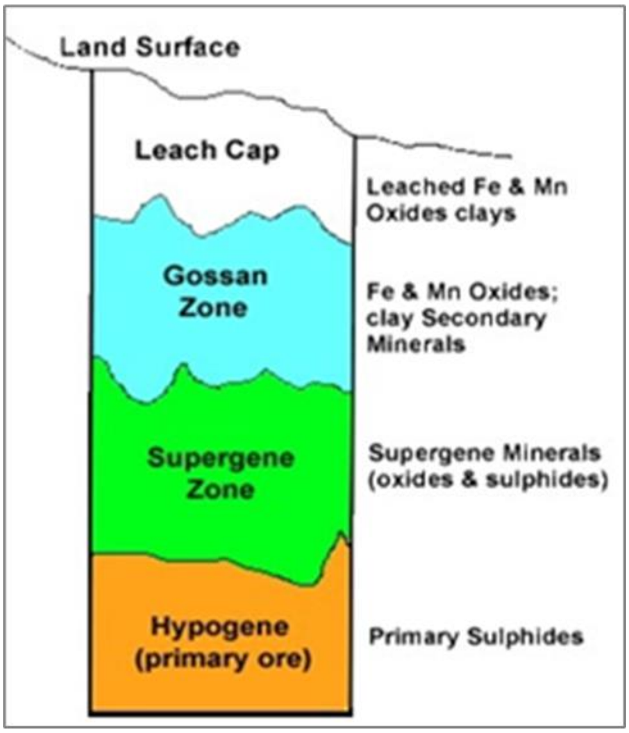
7.3.1 Gossan (oxide mineralization)

The upper portions of the Gediktepe deposit have been weathered, leached, and oxidized by naturally-occurring acidic surface water and ground water. The natural acidity is due to the presence of sulphides, particularly pyrite, within the oxide zone, and the sulphide mineralization has been completely leached out, leaving gold and silver relatively intact. Relic “lenses” of high-gold mineralization remain in the oxide zone. There is some evidence that gold mineralization has been transported downwards, chemically or mechanically, as there is often an increase in gold grade just above the oxide – sulphide contact.

The base of oxidation is generally abrupt, with rapid changes of metal grade in assay intervals across the boundary. Copper and zinc grades are typically less than 0.10% within the oxide zone, but increase to values typically around 1.4% Zn and 0.80% Cu immediately below the oxide horizon. Gold and silver follow the reverse trend, with Gold in the range of 3.0 g/t Au in the oxide zone and often less than 0.7 g/t Au immediately below in the sulphide zone.

Figure 7.3 shows the typical weathering profile at Gediktepe, showing the change from the gossan oxide to the primary sulphides.

Figure 7.3 Typical weathering profile



Source: Polimetal 2018 from (Okay and Tüysüz, 1999)

7.3.2 Massive pyrite (MPy)

The massive pyrite zone consists of fine to medium-grained pyrite, with massive to banded, vuggy textures, and locally sandy textures near structural zones. The sphalerite-chalcopyrite-galena-and weak covellite are observed as vug-fracture fill, and replacement mineralization within a pyrite matrix. Locally, magnetite fragments are observed within massive pyrite. The massive pyrite zone (Figure 1.20) hosts high Au and Cu mineralization (Çiftehan, H, 2015).

7.3.3 Massive pyrite magnetite (MPyMag)

Massive pyrite magnetite (MPyMag) has been distinguished based on magnetite contamination. It shows the same textures of the massive pyrite zone, and qtz-magnetite fragments can be seen conformable with the schistocity, or primary bedding structures within the massive pyrite. The MPyMag zone characteristically shows lower Au-Ag-Cu-Zn-Pb than the massive pyrite zone.

7.3.4 Enrichment zone (Enrch)

The enrichment zone consists of mainly chalcocite-covellite within fine to medium grained size pyritic mass. Due to occurring near or along the structure zone, most of the enrichment zone is intensely fractured, broken and fragmental. This zone contains higher grade Au-Ag-Cu-Zn mineralization than other sulphide mineralization.

7.3.5 Disseminated sulphide mineralization (Tr-Sulp)

A lower-grade sulphide mineralization (Au-Ag-Cu-Zn-Pb) is present within the rich disseminated (pyrite>10%) chlorite sericite schist. The total sulphide content in this zone exceeds 8.5%. Thick bands (1 cm to 50 cm) appear parallel to bedding, in host rock below and above the sulphide mineralization.

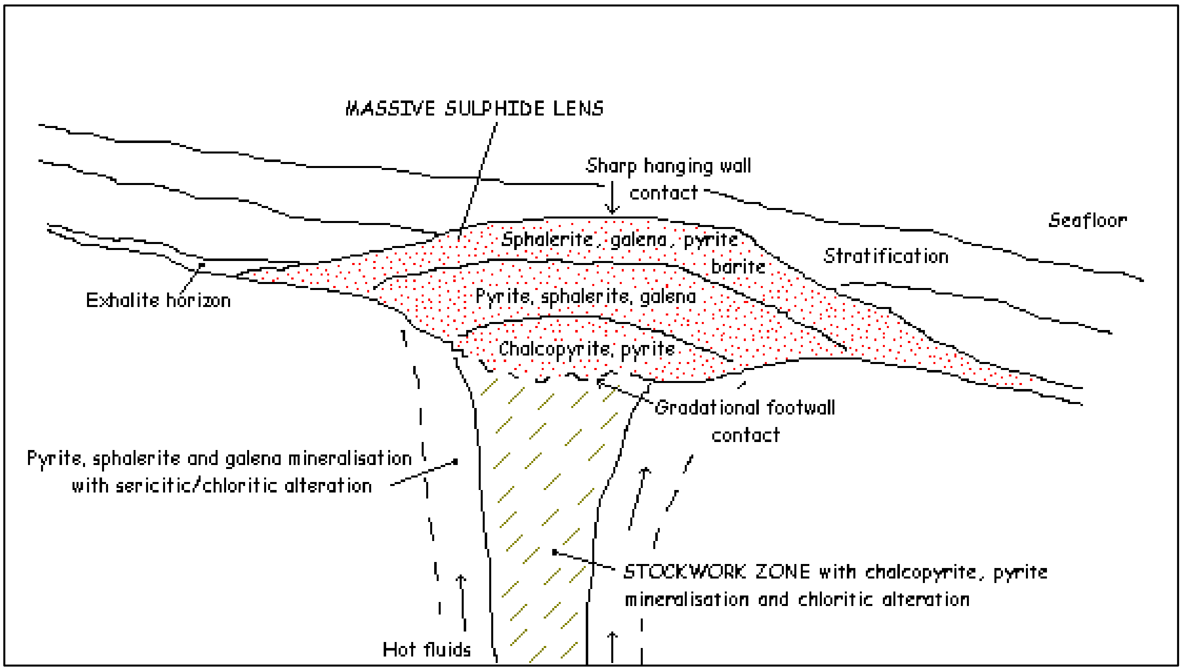
7.4 Conclusions

The regional and Project geology is well understood and reflected in the geological model used in the Mineral Resource estimate.

8 Deposit type

The characteristics of the Gediktepe mineralization have been interpreted as a convex massive sulphide type deposit, illustrated in Figure 8.1, which implies a syngenetic style of sulphide mineralization. Subsequent weathering and oxidation have been responsible for the development of oxide and gossan horizons.

Figure 8.1 Vertical section of an idealized convex MS deposit



Source: Polimetal 2018

9 Exploration

Exploration activities at Gediktepe have included geochemical and geophysical surveys (magnetic and induced polarization (IP)). Mineralogical studies comprising thin and polished sections have also been completed.

9.1 Geochemistry

Several surface geochemical sampling programmes were completed at Gediktepe from 2005 to 2014, with early work conducted by Anatolia Minerals prior to the establishment of Polimetal Madencilik. Soil geochemistry sampling works cover the entire licence area (20054077), representing 6.57km^2. Rock geochemistry sampling has also been undertaken, primarily focusing on the immediate open pit area. Limited rock geochemistry has been carried out across the rest of the licence area.

The results of the surface geochemical sampling supported the presence of the Au-Ag-Cu-Zn-Pb mineralization, along an elongated NE-SW structural zone. Further gold anomalies (>20 ppb Au) NW and NE of the known mineralized zone remain untested and require further detailed work to define possible additional mineralization.

9.2 Geophysics

A magnetic survey was completed at Gediktepe during August of 2013. A total of 112.2 km of survey were conducted over 32 lines, at 100 m line spacing. The lines were oriented north-south and cover the entire area of the initial Gediktepe License 20054077.

The magnetic anomalies generated by the survey, indicate that medium and high magnetic values correspond to the high magnetite or massive sulphide mineralization. The high magnetic anomaly observed over the strong geochemical anomaly, supported by drilling results, indicates that high magnetic anomalies may be a good indicator of other hidden sulphide zones containing magnetite. This observation provides support for further detailed evaluation of the strong magnetic and low gold anomaly, observed about 500 m NW of the Gediktepe deposit, and south of known mineralization external to the license.

The IP survey was completed in parallel with the magnetic survey, and consisted of 22 IP section lines oriented NW to SE, for a total of 41.6 km of line, at 50 m, 100 m and 200 m spacing. Higher chargeability results were obtained where disseminated pyrite mineralization occurs within chlorite sericite schist zone.

9.3 Conclusions

The geochemical and geophysical surveys have identified anomalies which correspond to the known mineralization occurrences, supporting the use of these methods for exploration purposes. Additional, exploration targets have been identified through the exploration methods beyond the current Mineral Resource.

Polimetal have outlined four near mine target areas with oxide potential. These are situated around the existing open pit and comprise:

- Area 1: situated immediately SW of the open pit.
- Area 2: situated on the NW flank of the open pit.
- Area 3: situated NE of the open pit.
- Area 4: located approximately 1.3 km west of the open pit.

AMC has compared the four near mine oxide target areas with the geochemistry and geophysical data. The target areas correspond to areas exhibiting soil and rock geochemistry results with anomalous elevated gold grades, indicating potential oxide hosted gold mineralization.

10Drilling

10.1 Drilling summary

The majority of drilling at Gediktepe has focused on outlining and then defining the main deposit over a strike length of 1.6 km, and delineating down-dip extents of up to 600 m. The work has been conducted through five distinct phases (campaigns) which are summarized in Table 10.1. Drilling layouts are dominantly arranged along a set of 45° azimuth grid lines, with line spacing down to 25 m intervals, referencing the UTM European Zone 35 coordinate system. Magnetic declination for the area is +4.78°.

Table 10.1 Summary of drilling programmes

Drilling Phase	Period	DD		RC	
		Holes	Metres	Holes	Metres
1	2013	11	1,528.5	–	–
2	2013/2014	143	17,114.1	81	6790
3	2015	152	26,527.7	103	6026
4	2017	93	5,189.2	–	–
5	2017/2018	33	5,646.5	–	–
Total		432	56,006	184	12,816

Drilling has been completed by a combination of diamond core (DD) and reverse circulation (RC) by local contractor companies (Asyatek, Spektra, IDC, Ortadoğu). Diamond core holes were typically started using PQ diameter core, and rarely with a few HQ holes. Most deeper holes, however, switched to HQ at depth. RC drilling, was restricted to Phases 2 and 3, and was used on the margins of the deposit to define extensions or set limits, and for infill in some parts of the deposit.

As of January 2018, a total of 616 drillholes had been completed at Gediktepe totalling 68,822 m of drilling. Figure 10.1 illustrates the drillhole locations and the drillhole types.

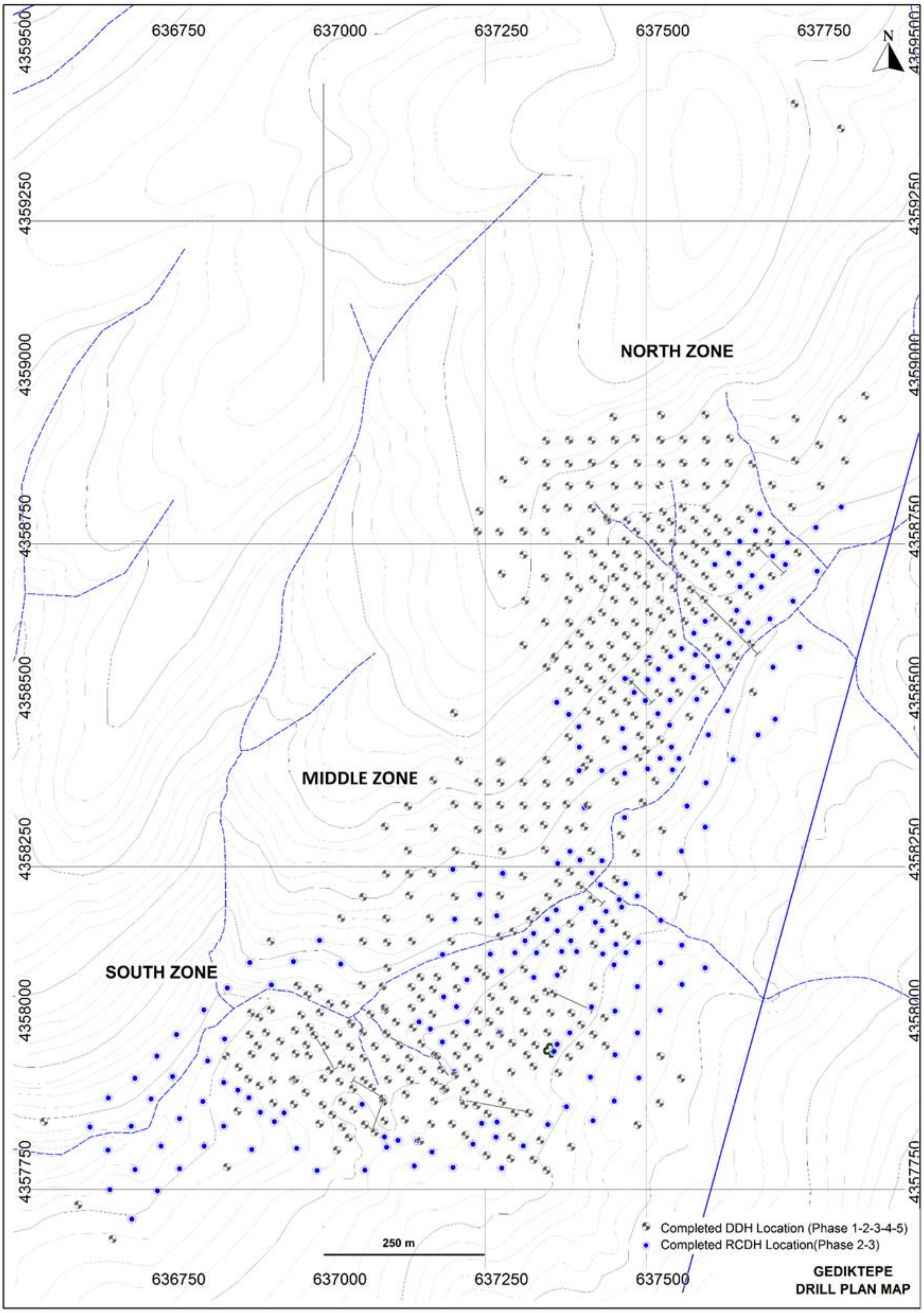
The majority of drillholes have been drilled vertically, to intersect the low-angle zones of mineralization. Eight of the initial 11 Phase 1 holes were inclined, with the remainder of holes vertical or sub-vertical. The average deviation of the surveyed holes is less than 1° per 100 m.

At the end of each phase of drilling, drillhole collars were surveyed by a local surveying firm. Downhole survey data is available for 384 of the 432 diamond drillholes. Downhole surveys were performed, generally at 40 m intervals, with a Devico reflex device. RC drill holes were not surveyed downhole.

Core samples are boxed at the drill rig and transported by company vehicle to the core logging facilities nearby. Core is washed and logged for geotechnical and geological parameters, including lithology, alteration, mineralization and structures.

RC samples are collected using a rotary splitter at the drill rig. Chip samples are collected for rock type and geological logging, including lithology, alteration, mineralization and structures. Approximately 55% of the RC samples were taken at 2 m long intervals. The other 45% of samples are shorter, with the shortest and most common being 1 m in length. Weights of RC samples are recorded, and are typically about 3 kg.

Figure 10.1 Drillhole location plan



Source: Polimetal 2018

10.2 Conclusions

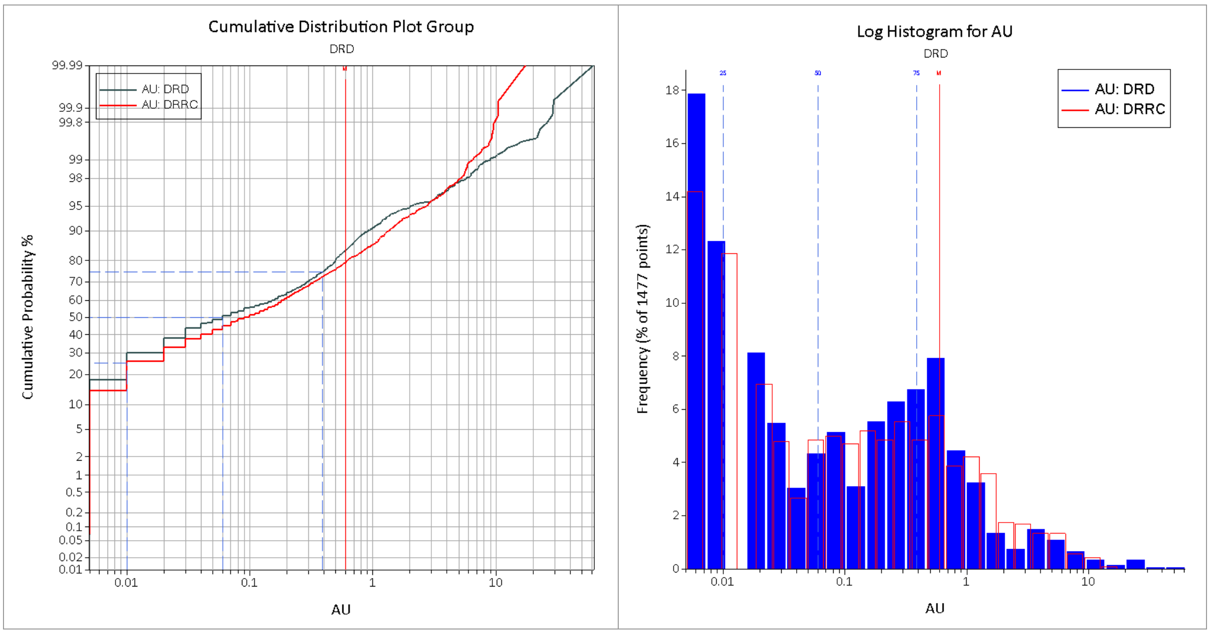
The Gediktepe deposit has been extensively drilled through a combination of RC and DD enabling a robust interpretation of the geology and mineralization.

Twin hole comparisons have been completed for 7 pairs or RC and DD holes. Visual comparisons of the holes show broadly comparable intercept locations and interval lengths.

AMC has statistically reviewed each of the pairs of twin holes graphically. The results do show variability between the DD and RC drillholes, however, this is potentially related to small scale compositional and distributional heterogeneity within the deposit. To assess the variability at a larger scale that would have more bearing on the Mineral Resource estimate, AMC has selected two areas within the deposit, where the distribution of RC and DD drillholes is broadly comparable.

Statistical comparisons of the DD and RC drillholes within the two selected areas show comparable sample grade populations for the mineralized intervals, prior to compositing. Figure 10.2 shows log probability and log histogram plots comparing the DD and RC drillholes for the selected areas. Correlation between DD and RC drillholes was also shown for Ag, Cu, Pb and Zn.

Figure 10.2 DD vs RC gold grade population comparison



Overall, the statistics and graphical comparisons indicate that there is no significant bias due to the different drilling methods. Differences at the smaller scale between drillholes is likely due to the compositional and distributional heterogeneity of mineralization. AMC notes that RC drillhole DRRC-062 shows evidence of downhole contamination relative to the twin DRD-142. This feature is not replicated in the other RC drillholes and is therefore considered to not be reflective of a consistent matter of concern. AMC therefore has no basis for questioning the RC data referenced against the diamond core data.

AMC has reviewed core recovery data and notes that core recoveries range from 4% to 100%, averaging 84%. Comparing assay grades versus core recovery there is no indication of grade bias associated with recovery. Notwithstanding, the lower recoveries do highlight a potential risk associated with sample representivity.

11Sample preparation, analyses, and security

11.1 On-site sample preparation

11.1.1 Diamond core

Sampling for assay is nominally at 1.0 m to 2.0 m intervals, selected on a geological basis, but may be reduced to as little as 0.40 m in the mineralized zones.

Drill core samples of were cut by diamond blade rock saw, with half of the sawn core placed in individual bags in preparation for dispatch to for assaying, and the remainder returned to the original core box for historic reference. The retained core is stored in a core-shed at the field camp area.

Polimetal inserts standards, field duplicates, and blanks into the sample shipments. Duplicates are additional splits of the core.

11.1.2 Reverse circulation (RC)

The RC sample splits for assaying are approximately 3 kg. The remaining 3 kg of sample residues after splitting at the rig are retained in a storehouse at the field camp.

Similar to core sampling standards, blanks, and field duplicates are submitted with RC samples. RC duplicates are second splits from the drill rig.

11.2 Laboratory sample preparation and analysis

Following standard procedures, samples were assigned unique sample tag numbers and weighed. Samples from each drillhole were prepared as a single batch, along with the associated blanks, duplicate, and certified reference material (CRM) samples.

Transportation from Gediktepe to the respective laboratories was the responsibility of Polimetal. The dispatched samples were accompanied by a sample shipment form (GSS form) which includes the project code, coordinate information, sample type, analytical methods, QA/QC procedures, and sender details. GSS forms are completed by field staff and approved by the database team prior to shipment.

Once samples are delivered to the laboratory, laboratory staff log the samples into their system and confirm transfer and possession of the sample to Polimetal.

During Phase 1 drilling, all assays were submitted to the SGS Turkiye (SGS) laboratory in Ankara. From Phase 2 (2013), all samples were submitted to the ALS Metallurgy Ltd (ALS) Chemex laboratory in Izmir. Both the SGS laboratory in Ankara and the ALS laboratory in Izmir are ISO-9001:2008 certified. The same set of CRMs were submitted throughout the phases.

Gold was assayed using the Fire Assay Fusion technique with a nominal 30 g sample weight (ALS Code Au-AA25) with additional 33 element analysis by ICP-AES with Aqua Regia Digestion (ALS code ME-ICP61a).

11.2.1 SGS procedures

The SGS procedures applied to the Phase 1 core during 2013 were as follows:

- The samples were logged in and weighed on arrival.
- The samples were dried and crushed by SGS protocol CRU24.
- Pulps were prepared. The laboratory certificates from SGS did not list the pulp protocol, but the nominal pulp criteria for the AA and ICP analysis at SGS is 75 µm.
- Gold was assayed by protocol FAA303, a fire assay with AA finish on a 30 g aliquot.
- Copper and silver were assayed by protocol AAS42S, which is an AA finish.

- All other metals were assayed by protocol ICP40B which is a four-acid digestion and multi-element ICP procedure.

11.2.2 ALS procedures

The ALS sample preparation and assay procedures were applied to the Phase 2, 3, 4 and 5 drilling for both core and RC samples.

- The samples were logged in and weighed on arrival.
- The core samples were dried and crushed by ALS protocol CRU-31 with 70% passing (P_{70}) less than 2 mm. RC samples are not crushed but are dried before splitting.
- Samples are split with a riffle splitter before pulping.
- Pulps were prepared with ALS protocol PUL-32, with 1 kg reduced to P85 of 75 µm.
- Gold was assayed by protocol Au-AA25, a fire assay with AA finish on a 30 g aliquot.
- All other metals were assayed by protocol ME-ICP61a which is a four-acid digestion to report 33 elements by ICP methods. After a three-month period of storage at the ALS laboratory, pulps are transferred to the Polimetal field camp storage facility.

The ALS laboratory also inserted internal standards into every assay batch with results reported to Polimetal.

11.3 Quality assurance and quality control (QA/QC)

11.3.1 Certified reference materials (CRMs)

Certified reference materials (CRMs) were used to test the accuracy of the assays and to monitor the consistency of the laboratory results. CRMs are inserted on a 1 in 20 basis.

Four CRMs were used for the project; two of the CRMs are for gold, providing confirmation at 0.63 g/t and 3.84 g/t Au respectively. The third and fourth CRMs are base metal CRMs. These CRMs were selected randomly from the available set and inserted into the sample sequences every 20 samples. A total of 1,920 CRMs out of 37,772 samples were inserted and analyzed during the 2013 to 2018 drill program.

Table 11.1 summarizes the CRMs used.

Table 11.1 CRM summary

Name	Source	Element	Unit	Value
G907-4	Geostats Pty Ltd	Au	g/t	3.84
G910-8	Geostats Pty Ltd	Au	g/t	0.63
GBM398-1	ROCKLABS	Cu	%	1.482
		Zn	%	2.030
		Pb	%	2.667
		Ag	g/t	5.10
GBM914-10	Geostats Pty Ltd	Au	g/t	0.137
		Cu	%	1.864
		Zn	%	9.697
		Pb	%	4.671
		Ag	g/t	9.40

AMC has received a document (Polimetal Madencilik, 2018) which reports the results of CRM analyses for Phases 1 to 5. An independent analysis of the Gediktepe CRM results was undertaken by AMC for Au, Ag, Cu, Pb, and Zn. Overall, the results show reasonable levels of accuracy and precision with >98% of results for Au and Ag falling within ± 3 standard deviations. Reasonable levels of accuracy and precision was also shown for Cu, Zn and Pb with >95% of results falling within ± 2 standard deviations. Some cyclicity was exhibited in the Phase 5 Ag CRM GBM914-10 results, however, with the exception of 1 result (3.4% of data) all results fall within ± 3 standard deviations.

11.3.2 Blanks

Blanks are generally used to check the cleanliness of the laboratory. Blanks are inserted on a 1 in 20 basis and are typically inserted as the first and last sample of a drillhole to assure no carryover of values. In total 1,737 blanks out of 37,772 samples were inserted into the sample batches, which equates to an average insertion rate of 1 in 25 samples.

Five blank samples, AuBlank_S50, AuBlank62, AuBlank65, AuBlank66 and BlankST154 were used. The blank samples, purchased from ROCKLABS, consist of a mixture of finely pulverized feldspars and basalt.

All blank Au results from drilling Phases 1 to 5 show assay results within ten times the detection limit, indicating there is no material sample contamination. Blank assay results are reported by Polimetal for Cu, Zn, Pb or Ag.

11.3.3 Duplicates

Polimetal inserts field duplicates comprising additional splits of the core, and duplicate splits from the drill rig of RC cuttings into the sample batches.

Duplicate pulp samples were re-submitted to ALS Chemex, Izmir, to ascertain the repeatability and precision of assays. During the period of 2013 to 2018, pulp duplicate samples were inserted on a 1 in 40 basis and after 2017 duplicate samples were inserted at a rate of 1 in 20.

11.4 Bulk density

Density measurements are routinely undertaken by Polimetal geology staff on samples of the whole core at the logging facility. Core samples of 10 cm in length were selected every 5 m within mineralized zones, and every 10 m outside of mineralization. Samples were dried in an oven at 105° C for 24 hours, before being waxed. The sample is first weighed in air, and then while immersed in water. The difference in the two weights is the weight in the water displaced by the volume of the core sample.

After measurements had been completed, core samples were labelled and returned to relevant positions within the core boxes.

Calculations, as specific gravity (SG) are conducted according to the following formula:

$$SG = \frac{Mdry}{Mwax - Mwater - \left(\frac{Mwax - Mwater}{0{,}86}\right)}$$

The SG values for each primary logged unit at Gediktepe are given in Table 11.2.

Table 11.2 Bulk density values for Gediktepe lithologies

TOTAL SAMPLE		
Lithology	**Sample Number**	**SG**
Ovb	33	2.56
Qzt	44	2.86
Dac	2	2.53
QFClSch	767	2.68
Gos	491	2.56
ClayLikeGos	29	2.50
ClSerSch	1755	2.71
Tr-Sulp	907	3.27
MPy	827	4.33
MPyMag	676	4.39
Enrch Zone	121	4.20
QSch	608	2.68

Source: Polimetal 2018

11.5 Conclusions

The laboratories used for sample preparation and assaying are reputable and independent of Polimetal. The sample preparation and assay methods used are considered suitable by AMC and in line with standard industry practices.

AMC has reviewed the raw CRM results for Au, Ag, Cu, Zn and Pb. Overall, the results show reasonable levels of accuracy and precision with >98% of results for Au and Ag falling within ± 3 standard deviations, and >95% of results falling within ± 2 standard deviations for Cu, Zn and Pb.

Blank assay results indicate no significant sample contamination.

AMC has been supplied with copies of the duplicate assay results. The data provided does not detail the duplicate assay type (Field, Coarse, Pulp, laboratory duplicates) which precludes AMC commenting on how sample representivity and precision changes through the sample preparation process.

Overall, the duplicate assays indicate reasonable precision for Au, Ag, Cu, Zn and Pb, with the Au and Ag assays showing a slight possible increase in variability. In reviewing the assay results, AMC notes that some of the outliers might reflect a mislabeling of results, and further care is required when entering results into the database.

The bulk density measurement method employed by Polimetal is standard industry practice. The average density values reported in Table 11.2 are in the opinion of AMC reasonable and in line with the expected densities for these rock types.

12 Data verification

12.1 AMC Verification

AMC Principal Geologist, Chris Arnold visited the Gediktepe project on two occasions in 2018 and 2019. In addition to inspecting the project site and reviewing a suite of representative drill core, the visits facilitated regular interactions with site professionals. No field or sampling operations were being conducted at the time of the site visits, and AMC did not inspect the ALS laboratory in Izmir.

AMC has been provided with a full set of drill core photographs, collated into easy-accessible PDF documents. During the resource modelling and associated geological interpretations and statistical analyses, these photo documents allowed AMC to cross-check observations relating to assays and geology against the core photos. This process represents a spot-check confirmation of relationships between geology and assays, and in this way provided additional assurance concerning the validity of data.

AMC conducted a number of data verification activities, including the independent analyses of QA/QC data. AMC also ran a set of routine tests of database validity, as part of the data preparation phase of the resource estimation work. These include both specific and general tests, and no matters of concern were identified.

13 Mineral processing and metallurgical testwork

13.1 Sulphide Project mineralogy

The deposit is classified as a massive sulphide skarn where weathering, leaching by the acidic (pH 5.5) groundwater, and oxidation of the sulphides in the upper regions depleted them of the sulphur and base metals leaving an oxide zone defined by two lithologies, a gossan and a disseminated oxide. Four main lithologies have been used to describe the sulphide mineralization which occurs as thin veins or lenses:

Massive Pyrite - Typical pyrite content is over 80%. Copper is present mainly as chalcopyrite ($CuFeS_2$) and zinc as sphalerite (Zn,Fe)S. The massive pyrite (FeS_2) ore type comprises more than half the deposit.

Massive Pyrite – Magnetite - The massive pyrite – magnetite (Fe_3O_4) material has a similar texture to that of massive pyrite and includes magnetite within the bedding planes. Pyrite content is about 80% with the iron oxides replacing pyrite (4% of the mineral content on average). Talc and dolomite/calcite contents tends to be higher than for the massive pyrite – an average 1.8% talc compared to 0.7% talc for massive pyrite, and 3.5% carbonate compared to 1% for massive pyrite.

Disseminated Pyrite - Typical pyrite content is about 30% as is the chlorite content (30%). Quartz (20%) and other silicates (10%) make up most of the remaining mineral content. Where ¾ of the arsenic is present as tennantite ($Cu_6[Cu_4(Fe,Zn)_2]As_4S_{13}$ in the massive pyrite ore types, the arsenic is evenly distributed between arsenopyrite (FeAsS) and tennantite in the disseminated ore.

Enriched - The enriched mineralization is characterized by:

- A high cyanide soluble copper (CNsolCu) content >1% due to the presence of secondary copper minerals within the massive pyrite.
- Low copper recovery.
- Poor Cu/Zn selectivity.
- Fractured and broken rock.

The lithologies occur in layers hosted in a chlorite-sericite schist.

Table 13.1 shows a summary of the mineral composition of the composite samples used in the Sulphide Project testwork. The mineralogy of the sulphide zones of the Gediktepe deposit has the following impact on metallurgical performance:

- Fine grain sizes and intergrowths will require fine grinding to liberate valuable minerals.
- High pyrite content (median content of 76% in samples analyzed) in all samples.
- Variable chalcopyrite, sphalerite and galena (PbS) contents and ratios present.
- Secondary minerals (notable secondary copper minerals) are present.
- Presence of naturally floating silicates (non-sulphide gangues such as talc and chlorite).
- In-situ activation of minerals such as sphalerite has occurred.

Table 13.1 Summary of mineral composition for Sulphide Project composite samples

Mineral Group	Mineral Abundance (%)									
	MP/MAG		MP/MAG/DIS		DISSEM		DIS/MP/MAG		Enriched	
	Av.	Median	Av.	Median	Av.	Median	Av.	Median	Av.	Median
Pyrite	81.31	82.75	62.81	61.95	34.42	30.20	58.22	60.81	79.7	78.0
Sphalerite	4.68	3.68	5.35	4.55	0.63	0.41	6.10	6.40	6.25	6.85
Galena	0.70	0.36	1.09	0.74	0.04	0.00	0.78	0.71	0.89	0.48
Arsenopyrite	0.03	0.01	0.03	0.03	0.02	0.00	0.02	0.01	0.03	0.02
Chalcopyrite and Cu-sulphide intergrowths	2.48	2.40	2.06	1.64	1.55	1.51	2.21	1.97	4.76	4.09
Covellite/chalcocite	0.10	0.03	0.31	0.17	0.03	0.02	0.28	0.12	1.66	1.15
Tennantite-tetrahedrite	0.24	0.17	0.43	0.13	0.07	0.00	0.31	0.15	0.39	0.39
Quartz	1.80	1.27	7.24	7.54	19.74	17.75	8.50	8.66	1.83	1.07
Micas	0.46	0.17	3.85	3.69	9.52	7.89	5.29	5.50	0.36	0.18
Albite	0.04	0.01	0.48	0.23	0.04	0.02	0.54	0.38	0.16	0.03
Chlorite	1.34	0.94	8.06	5.37	28.02	30.31	10.76	9.52	0.19	0.11
Talc and similar	1.13	0.98	0.42	0.11	0.90	0.31	0.70	0.35	0.53	0.06
Kaolinite and similar	0.05	0.01	0.15	0.12	0.15	0.10	0.17	0.12	0.01	0.01
All other silicates	0.02	0.02	0.04	0.03	0.06	0.06	0.06	0.04	0.23	0.01
Rutile/ilmenite	0.02	0.01	0.13	0.06	0.83	0.66	0.26	0.22	0.05	0.02
Hematite/magnetite	0.99	0.47	1.48	0.35	1.39	0.61	1.39	0.57	0.08	0.04
Fe-(Ti)-oxides/oxyhydroxides/ carbonates/goethite/siderite	1.34	0.37	1.07	0.87	1.32	0.38	0.90	0.36	0.06	0.04
Ankerite-dolomite/calcite	2.04	1.68	2.15	0.06	0.65	0.31	1.75	0.92	0.21	0.02
Barite	0.94	0.20	2.49	1.35	0.07	0.06	1.39	0.41	2.37	1.56
Apatite	0.02	0.01	0.05	0.03	0.18	0.18	0.07	0.07	0.01	0.00
Other minerals	0.06	0.06	0.06	0.06	0.07	0.06	0.07	0.06	0.04	0.04
Steel	0.22	0.22	0.24	0.23	0.31	0.30	0.26	0.27	0.18	0.18
Cu-(Fe)-sulphates	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01

Mineral liberation data shows the average grain sizes of all minerals is less than 50 µm with a valuable mineral grain size P_{50} of 30 µm, indicating the need for fine primary grind and regrind sizes to achieve liberation for mineral separation and to produce high grade concentrates.

The degree of liberation of all minerals is variable with the main minerals ranging in liberation from 20% to 75% emphasizing the need for a fine grind and regrind.

Pyrite is the dominant mineral and can contain inclusions of magnetite, chalcopyrite, galena and sphalerite in the coarser grains. SGS (Sample Selection Report in 2015) described some pyrite having a vuggy texture with deposition of other sulphide minerals in the cracks, fractures and openings. Most pyrite is euhedral with little porosity.

13.2 Sulphide Project metallurgical test work programme

Test work was undertaken by a number of groups from 2014 to 2015 for a PFS in 2016. Further test work was performed from 2016 to 2022 for the 2019 PFS and the 2022 FS. The main variability test work (2021 and 2022) was completed at HMT and ALS (Perth, Australia) following a delay due to the COVID-19 pandemic and completion of additional drilling.

The Sulphide Project metallurgical test work completed on samples from the sulphide zones of the deposit used sequential flotation to recover separate copper and zinc concentrates. The test work identified variable performance due to mineralogical and head grade variations, material type blends, surface oxidation (aging effects) and pulp chemistry conditions. The test work focused on understanding the complexity of the mineralogy and development of methodologies to control the metallurgical performance.

Test work used master composites that reflected the proportion of ore types determined by the resource model at the time of each phase of the Project. The test conditions established for the master composite were then applied to variability samples in each phase of work. A total of 78 samples from 40 drillholes were tested in the 2021 – 2022 variability programme. The test work identified variable performance due to mineralogical and head grade variations, material type blends, surface oxidation (aging effects) and pulp chemistry conditions.

Pyrite is the main gangue mineral. Grinding in mild steel media to provide reducing pulp conditions (-400 mV (Ag/AgCl)) has been applied to assist depression of sphalerite in copper flotation. A pre-float stage has been included to increase the pulp potential and remove natural floating talc prior to copper flotation. Treatment of recycled process water to remove residual organic reagents, was found to reduce the loss of copper, zinc and gold into the talc concentrate which is discarded to tailing.

To assess metallurgical performance of the sulphide flotation flowsheet, results of locked cycle tests were used to supplement data from batch roughing and cleaning tests. The data from the locked cycle tests was balanced using the standard method as described in the SME handbook and the concentrate production balance method where the tailing is calculated by difference between the feed and concentrates. LCT balances have been completed by the testing laboratories and independently by GRES and used for prediction of the concentrate grades and recoveries. Simulation of open circuit cleaner tests by HMT using JKSimFloat has been used to extend the variability data available for the assessment of performance.

13.3 Sampling

The location of the samples used in the test work are shown in Figure 13.1. The southern and northern mining areas can be seen to be separated by a middle 'ridge' region. Test work used master composites that reflected the proportion of ore types determined by the resource model at the time of each phase of the Project and therefore the distribution of ore types changed as understanding of the deposit developed. The test conditions established for the master composite were then applied to variability samples in each phase of work.

RDi (2014) prepared composites from drill core reject samples that represented the three main sulphide ore types identified at that time – Massive Pyrite, Massive Pyrite/Magnetite and Disseminated Sulphide. A master sulphide composite (MCS-RDi) was then prepared from these in the proportions outlined in Table 13.2, and flotation test work was conducted on the master composite.

A master composite sample (MCS-HMT) comprising the same blend as RDi was used by HMT to develop a sequential copper and zinc flotation flowsheet (January 2015).

The subsequent optimization test work used a different MCS (MCS-HMT2) that represented an updated model of the mine and included 1% of "Enriched" material. An analysis of the mine geology and elemental distributions by SGS Canada (report "Sample Selection Report for Gediktepe Deposit, Turkey", undated) identified nine variability samples –

disseminated, enriched, massive pyrite, massive pyrite-magnetite, Hi-Zn, Lo-Zn, Hi-Au, Hi Pb, and Hi-Au-Ag – for variability testing in 2016.

Samples for the 2021 - 2022 variability test programme were determined from a geometallurgical assessment completed in 2018 and 2021. Selection was based on lithology, ore type, location (north, middle, south), section through the deposit, copper grade (>2.5% Cu, 1.5% - 2.5% Cu, <1.5% Cu), lead grade (for disseminated > or <0.3% Pb, or > and < 0.15% Pb for other ore types), and mining schedule (as understood at the time). The cyanide soluble copper content was used to indicate enriched material (>1% CNsolCu).

A total of 78 samples from 40 drillholes were tested in the 2021 – 2022 variability programme. Comminution tests were conducted on eight samples. A master composite (47% MPY, 32% MPY-Mag and 21% DISS) and composites of each of the four ore types were prepared to conduct preliminary tests to confirm conditions prior to testing of the 78 variability samples. 38 samples were deemed to represent 'pure' lithologies (33 massive pyrite, 13 massive pyrite – magnetite, 14 disseminated and 18 enriched) while 40 were blends of adjacent lithologies in the core sections. 34 samples came from the north, 15 from the middle and 29 from the south mining areas. Mineralogy (QemScan), rougher tests and open-circuit cleaner tests were completed on all samples. Locked cycle tests were done on 12 samples. A 40 kg/h pilot plant operation was conducted treating a total of 1.8 t of material to generate rougher concentrates for regrind signature plot tests, final concentrates for thickening, filtration and transport tests, and final tailing (zinc rougher tail and zinc cleaner scavenger tail) for thickening tests.

Table 13.2 Sulphide Project – composite sample make-up and assay

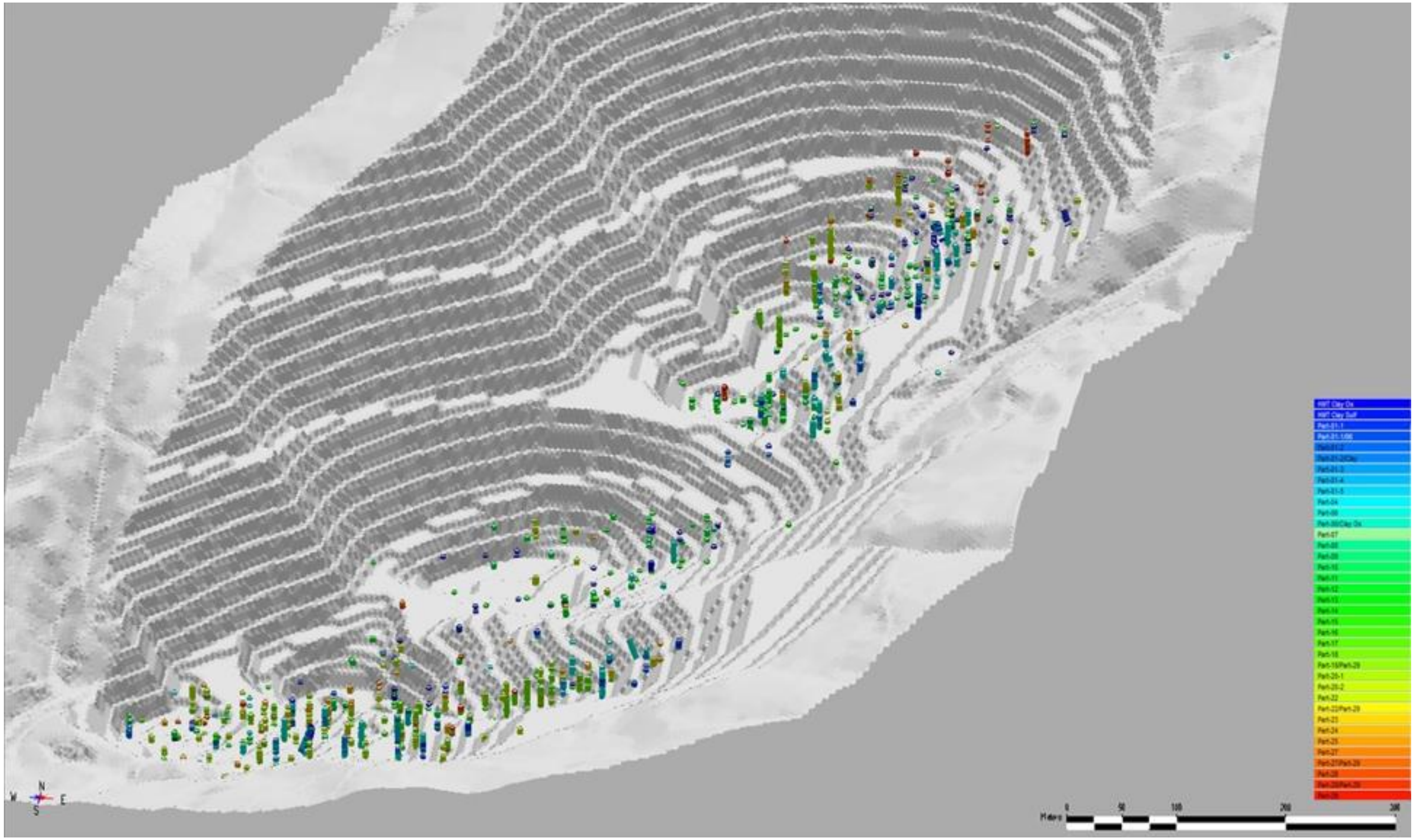
	RDi (2014)	**HMT (Aug 2015)**	**SGS (2016)**	**HMT (Mar 2016)**	**WAI (Aug 2018)**	**HMT Met Drill (2018)**	**ALS (2021)**
Ore Type	MCS	MCS	MCS	MCS	MCS	MCS	MCS
- MPy	30%	30%	34%	34%	48%	48%	47
- MPyMag	30%	30%	26%	26%	36%	36%	32
- Dissem	38%	38%	39%	39%	15%	15%	21
- Enr	2%	2%	1%	1%	1%	1%	0
Assay							
- %Cu	0.85	0.82	0.81	0.75	0.74	0.70	0.87
- %Pb	0.18	0.27	0.29	0.23	0.3	0.16	0.35
- %Zn	1.36	1.56	1.76	1.90	2.01	1.64	1.99
- %Fe	28.3	25.5	18.5	28.9	37.8	35.6	36.9
- %S	26.5		30.3		40.1		36.8
- %As	0.055					0.046	0.056
- g/t Au	0.57		0.62	0.69			1.05
- g/t Ag	24		28.8	23.8		23	30
- %CNsolCu						0.34	0.58

Notes:

(1) RDi 2014 and HMT 2015 master composite lithologies were re-defined and updated 28 November 2017. Previously the sample was classified as 33% MPy, 10% MPyMag, 57% Dissem with 0% Enriched.

(2) Split from WAI sample Aug 2018 was also tested at HMT.

Figure 13.1 Metallurgical Drill Hole Locations



13.4 Sulphide Project Comminution Test Work

Comminution testing was conducted by internationally recognized testing laboratories and the following comminution design parameters were determined by testing using composite samples:

- Ave SG average specific gravity.
- Ai Bond Abrasion Index.
- CWi Bond Crushing Work Index.
- RWi Bond Rod Mill Work Index.
- BWi Bond Ball Mill Work Index.
- SMC Test parameters – for design of AG (autogenous grinding) and SAG (semi-autogenous grinding) circuits - A*b, t_a, SCSE, Dwi, Mia, Mih, and Mic.

A summary of all comminution testwork undertaken is shown in Table 13.3.

General conclusions to be drawn from the testwork regarding comminution character of the Gediktepe ore are as follows:

- Ai:
  - All ore types are characterized as "soft" with low abrasivity.
- CWi, RWi:
  - Parameters associated with crushing.
  - Disseminated ore characterized as "medium".
  - All other types are characterized as "soft".
  - Blend (78% Massive/22% Disseminated) characterized as "soft".
- BWi:
  - Parameter associated with ball mill grinding.
  - All types and the Blend characterized as "soft-medium".
- SMC – AG/SAG related parameters.
- A*b:
  - Impact breakage parameter.
  - Disseminated characterized as "medium".
  - All other types are characterized as "soft".
- Blend characterized as "soft".
- t_a – JK abrasion parameter:
  - All types are characterized as "soft".
- SCSE – energy requirement parameter:
  - Characterized as lower than the average energy requirement.
  - Disseminated ore showed the highest energy requirement.
- Mia, Mih, Mic – energy requirement parameters:
  - Characterized as "low", in the lowest 10% of an industry-wide database.

Table 13.3 Summary of comminution testwork results

Composite	Test Program	Ave SG	Ai	CWi (kWh/t)	RWi (kWh/t)	BWi (kWh/t)	SMC Parameters						
							A*b	t_a	SCSE (kWh/t)	DWi (kWh/m^3)	Mia (kWh/t)	Mih (kWh/t)	Mic (kWh/t)
Massive Pyrite	SGS Jul 2016	–	–	–	–	6.7	–	–	–	–	–	–	–
Massive Pyrite	–	–	–	–	–	6.9	–	–	–	–	–	–	–
Massive Pyrite	–	–	–	–	–	6.2	–	–	–	–	–	–	–
Massive Pyrite	–	–	–	–	–	7.9	–	–	–	–	–	–	–
Massive Pyrite	–	–	–	–	–	6.9	–	–	–	–	–	–	–
Massive Pyrite	RDi - Apr 2014	4.35		3.2		6.3	164	0.98		2.65	5.8	3.5	1.8
Massive Pyrite	WAI - 13 Sept 2017	4.56	0.1852		7.59	10.66	86	0.5	6.86	5.14	9.6	6.8	3.5
VAR-028 Massive Pyrite	ALS –May 21	4.55	0.07			12.6	146	0.83	8.01	3.11	6.2	4	2
Massive Pyrite Magnetite	SGS - Jul 2016	–	–	–	–	7.9	–	–	–	–	–	–	–
Massive Pyrite Magnetite		–	–	–	–	7.4	–	–	–	–	–	–	–
Massive Pyrite Magnetite		–	–	–	–	7	–	–	–	–	–	–	–
Massive Pyrite Magnetite		–	–	–	–	7.7	–	–	–	–	–	–	–
Massive Pyrite Magnetite		–	–	–	–	6.8	–	–	–	–	–	–	–
Massive Pyrite Magnetite		–	–	–	–	9.9	–	–	–	–	–	–	–
Massive Pyrite Magnetite	RDi - Apr 2014	4.69				5.66	126	0.69		3.73	7	4.6	2.4
Massive Pyrite Magnetite	WAI - 13 Sept 2017	4.53	0.2207		7.82	11.22	72	0.43	7.4	6.08	11.1	8.1	4.2
VAR-010 Magnetite	ALS –May 21	4.51	0.0975			10.6	59	0.34	8.01	7.65	13	9.8	5.1
VAR-048 Magnetite	ALS –May 21	4.49	0.0145			12	84	0.48	6.89	5.34	9.8	6.9	3.6
VAR-065 Massive Pyrite Mag	ALS –May 21	4.68	0.039			9.5	72	0.4	7.27	6.49	10.9	8	4.2
Disseminated Sulphide	SGS –Jul 2016					8.5							
Disseminated Sulphide	"					9							
Disseminated Sulphide	"					9							
Disseminated Sulphide	"					10.3							
Disseminated Sulphide	"					10.8							
Disseminated Sulphide	"					10.3							
Disseminated Sulphide	"					11.1							

Composite	Test Program	Ave SG	Ai	CWi (kWh/t)	RWi (kWh/t)	BWi (kWh/t)	SMC Parameters						
							A*b	t_a	SCSE (kWh/t)	DWi (kWh/m^3)	Mia (kWh/t)	Mih (kWh/t)	Mic (kWh/t)
Disseminated Sulphide	"					10.8							
Disseminated Sulphide	RDi – Apr 2014	3.31		18.8		9.81	103	0.81		3.2	8.8	5.6	2.9
Disseminated Sulphide	WAI - 13 Sept 2017	3.5	0.2237		10.28	11.88	65	0.49	8.6	5.3	12.6	8.9	4.6
VAR-021 Disseminated (D2)	ALS - May 21	3.15	0.1401			15.9	50	0.41	9.73	6.33	15.9	11.6	6
VAR-049 Disseminated (D3)	ALS - May 21	3.34	0.0831			14.7	52	0.4	9.61	6.41	15.2	11.1	5.8
VAR-041 Massive Pyrite-Enriched	ALS - May 21	4.05	0.1018			11.9	98	0.63	6.73	4.12	8.8	5.9	3.1
VAR-069 Enriched	ALS - May 21	4.64	0.0229			8.9	88	0.49	6.71	5.25	9.3	6.6	3.4
Enriched Sulphide	SGS - Jul 2016					9.7							
Enriched Sulphide	"					8.9							
Enriched Sulphide	"					7.8							
Enriched Sulphide	WAI - 13 Sept 2017	4.96	0.1274		5.41	9.88	132	0.78	5.86	3.3	6.8	4.4	2.3
Overall - average		4.22	0.110		7.78	9.4	93	0.58	7.6	4.9	10.1	7.1	3.7
- 80th Percentile		4.65	0.176		8.80	11.0	64	0.79	8.5	6.3	12.7	9.1	4.7
Disseminated Sulphide - average		3.33	0.149		10.28	11.01	67	0.53	9.31	5.3	13.1	9.3	4.8
- 80th percentile		3.40	0.190		10.28	11.72	51	0.62	9.68	6.4	15.5	11.3	5.9
Massive Pyrite - average		4.49	0.128		7.59	8.02	132	0.77	7.44	3.6	7.2	4.8	2.4
- 80th percentile		4.56	0.162		7.59	9.56	110	0.92	7.78	4.3	8.2	5.7	2.9
Massive Pyrite/Magnetite - average		4.58	0.093		7.82	8.70	82	0.47	7.39	5.9	10.4	7.5	3.9
- 80th percentile		4.68	0.147		7.82	10.60	69	0.52	7.64	6.7	11.5	8.4	4.4
Enriched Sulphide - average		4.55	0.084		5.41	9.51	106	0.63	6.43	4.2	8.3	5.6	2.9
- 80th percentile		4.83	0.117		5.41	9.88	92	0.72	6.72	4.8	9.1	6.3	3.3
Blend 78% Massive / 22% Dissem.		4.27	0.119		8.272	8.942	97	0.60	7.83	4.9	9.7	6.8	3.5

The objective of the test work was to develop a flowsheet which could produce separate, marketable copper and zinc concentrates, providing the highest NSR. Extensive and detailed testing was performed to establish an acceptable circuit configuration and to optimize flotation parameters. Options tested included the following:

- Primary and regrinding sizes required for mineral liberation.
- Removal/depression of naturally floating talc and silicates.
- Effect of recycled water quality on flotation performance.
- Collector and depressant selection.
- Aging effects on flotation performance.

The main challenge for the Gediktepe sulphide ore is in the copper circuit. A fine primary grind (P_{80} of 38 µm) and a fine regrind of the copper rougher concentrate (P_{80} of 15 µm) is required to achieve acceptable, although still incomplete, liberation of the fine-grained mineral assemblage. Selectivity between copper and zinc minerals is affected by pre-activation of zinc minerals, due to the presence of secondary copper minerals in situ and/or due to galvanic effects between galena (lead mineral) and pyrite.

Learnings from the initial testing were used to configure the circuit used for locked cycle testing (LCT) to simulate steady-state plant operation. Six to eight cycles were used to achieve a reasonable steady-state condition. The circuit included a pre-float to remove talc and silicates and regrinding of copper and zinc concentrates.

SGS completed three LCTs for the prefeasibility study. Thirty-three additional LCTs have been done during the feasibility study period 2017 to 2022 – four by WAI, eleven by HMT and eighteen by ALS. The LCTs have been supported by JKSimMet simulations of open circuit cleaner test (OPCs) to assess performance.

Figure 13.2 Locked cycle test circuit

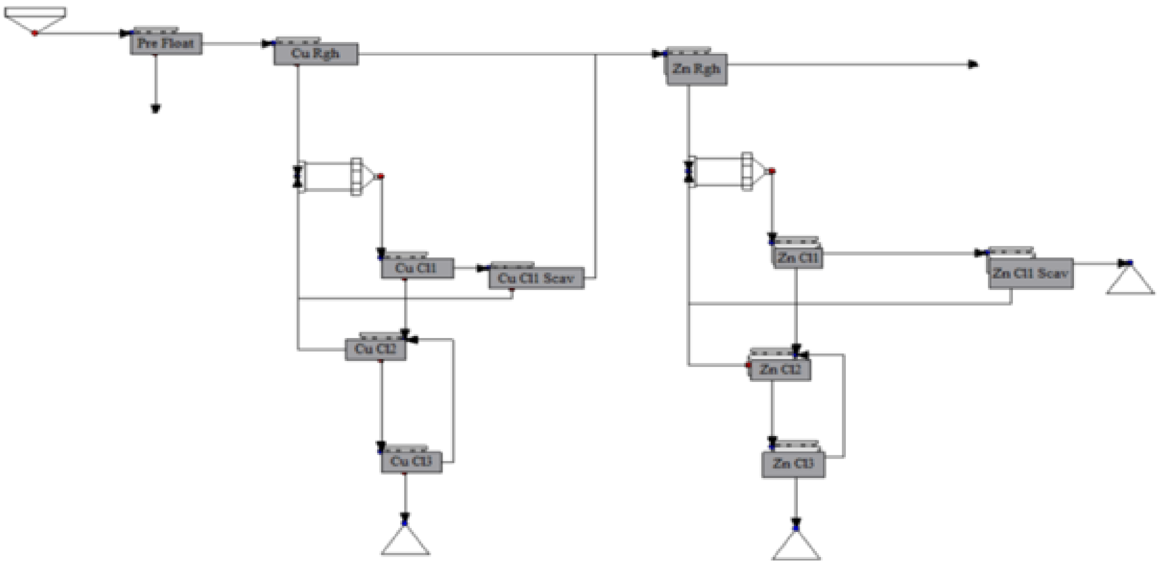


Table 13.4 and Table 13.5 show summaries of the results of the LCT testing. Typical copper concentrates containing >20% Cu, <6% Zn, and <4% Pb while zinc concentrates containing >50% Zn, <2% Pb and <2% Cu were produced in locked cycle tests (LCTs) from samples classified as massive pyrite, massive pyrite-magnetite, disseminated pyrite and various proportions of these ore types. The presence of more than 5% of enriched material in a sample resulted in generation of a copper concentrate high in zinc which exceeds smelter limits and reduces the zinc available for recovery into the zinc concentrate. The enriched material has been excluded from the feed to the concentrator in the mine plan.

Production of saleable zinc concentrates, grading in excess of 50% Zn at recoveries of around 75% has been consistently achieved in the test work.

Table 13.4 LCT results – master composite samples

				Feed			Copper concentrate						Zinc Concentrate					
				Assay			Assay			Distribution			Assay			Distribution		
Date	Lab	Comp.	Test No	Cu%	Pb%	Zn%	Cu%	Pb%	Zn%	Cu	Pb	Zn	Cu%	Pb%	Zn%	Cu	Pb	Zn
Aug 2015	HMT	MCS	LCT8	0.63	0.24	1.38	23.8	1.16	1.87	66.06		1.96			53.38			84.75
Aug 2015	SGS	MCS	LCT1	0.80	0.28	1.75	30.95	1.30	2.49	75.51	8.96	2.77	0.80	0.28	1.75	8.79	24.62	80.14
Dec2017	HMT	MCS Met Drill	100%	0.67	0.15	1.51	28.74	2.21	4.57	75.51	8.96	2.77	1.98	0.35	52.87	6.87	5.34	81.53
Dec 2017	HMT	MCS Met Drill	90:10	0.87	0.18	1.87	29.88	2.63	11.49	68.14	29.57	12.20	2.64	0.48	50.18	8.47	7.59	75.01
May 2108	WAI	MCS Blend 7	LCT3	0.71	0.29	1.89	28.00	2.17	6.67	44.50	8.46	3.99	4.64	2.65	46.07	22.18	31.04	82.83
Jun 2018	WAI	MCS Blend 8	LCT4	0.69	0.39	1.70	29.72	6.51	3.68	47.49	18.72	2.41	3.69	3.56	45.26	16.10	27.92	80.68

Table 13.5 LCT results – Massive Pyrite and Disseminated Sulphide composite samples

				Feed			Copper concentrate						Zinc Concentrate					
				Assay			Assay			Distribution %			Assay			Distribution %		
Date	Lab	Comp.	Test No	Cu%	Pb%	Zn%	Cu%	Pb%	Zn%	Cu	Pb	Zn	Cu%	Pb%	Zn%	Cu	Pb	Zn
Aug 2015	HMT	Disseminated		0.67	0.15	1.50	31.10	6.90	5.10	73.80	48.50	6.60	3.70	1.90	50.70	9.90	14.80	74.20
Aug 2018	HMT	Hi Pb Diss		0.25	0.40	0.96	24.02	14.24	6.09	67.70	24.90	4.50	2.29	5.20	50.23	12.60	17.70	71.80
Aug 2018	HMT	Med Pb Diss.		0.42	0.22	0.91	21.70	6.31	9.08	72.20	40.20	14.00	2.96	2.26	48.51	9.20	13.50	70.00
Aug 2018	HMT	Low Pb Diss		0.48	0.10	0.81	28.09	1.61	9.36	58.00	16.80	11.50	6.48	1.53	36.89	21.30	25.40	72.10
Aug 2018	HMT	HI Pb MPY		0.98	0.69	4.67	31.27	1.28	5.16	71.20	4.12	2.46	1.75	2.72	54.28	12.20	26.80	79.10
Aug 2018	HMT	Med Pb MPY		0.67	0.25	2.58	30.87	1.95	2.68	65.55	11.11	1.48	1.60	1.08	60.00	0.46	14.40	77.60
Aug 2018	HMT	Low Pb MPY		0.87	0.18	1.12	30.58	1.76	6.40	72.10	20.30	11.70	3.96	0.59	44.51	7.80	5.70	68.00

WAI conducted a 40 kg/h pilot plant operation treating a total of 1.8 tonnes of MCS Blend 8 material over seven days to generate rougher concentrates for regrind signature plot tests, final concentrates for thickening, filtration and transport tests, and final tailing (zinc rougher tail and zinc cleaner scavenger tail) for thickening tests.

13.5 Sulphide Project Enriched Material Treatment

The resource contains 0.97 Mt of material classified as Enriched material with an average grade of 3.24% Cu, 2.09% Zn, 1.17 g/t Au and 46 g/t Ag. Test work in 2018 compared different proportions of enriched material relative to the MCS blend. Results of the testing are shown in Table 13.6. Results indicated that blends containing less than 10% enriched could achieve a satisfactory separation of copper and zinc however metal recoveries suffered and the zinc assay of the copper concentrate exceeded 6%.

Enriched material and its flotation response is characterized by:

- A cyanide soluble copper (CNSolCu) content of > 1% due to the presence of secondary copper minerals (covellite, chalcocite) as shown in Table 13.1.
- Low copper recovery when the CNSolCu content is >1%.
- High EDTA extractable copper values (>10%).
- Low selectivity between sulphide minerals specifically sphalerite and copper sulphides (Gaudin Cu/Zn selectivity indices < 1).
- Higher flotation kinetics for sphalerite relative to the copper minerals which has not been reversed in cleaning.
- Copper concentrate assaying >6% Zn.

Table 13.6 Effect of Enriched mineralization on flotation performance

Enriched Ratio	Feed %Cu	Feed %Zn	Copper Concentrate					Zinc Concentrate				
			Mass Pull %	Cu (%)	Cu Rec (%)	Zn (%)	Zn Rec (%)	Mass Pull %	Cu (%)	Cu Rec (%)	Zn (%)	Zn Rec (%)
1% LCT	0.80	1.75	1.9	30.4	70.0	2.8	2.6	2.6	2.8	9.0	51.5	86.0
5%	-	-	2.1	27.3	71.4	7.9	9.2	2.8	2.1	7.3	50.0	78.1
10%	1.06	2.18	1.9	33.3	60.4	6.1	5.4	3.2	2.3	6.8	50.9	74.6
10% LCT	0.87	1.90	2.0	29.9	68.1	11.5	12.2	2.6	2.6	8.5	50.2	73.9
20%	1.25	2.40	2.3	32.2	58.4	10.1	9.6	3.0	4.4	10.8	49.5	62.7
30%	1.47	2.82	1.8	28.9	35.7	17.2	11.1	4.4	8.3	25.1	42.8	67.2
40%	1.70	2.73	2.6	21.7	32.6	31.1	29.0	3.6	11.7	24.6	36.8	48.3
50%	1.79	2.73	2.2	20.0	25.0	30.1	24.7	4.2	14.4	34.1	39.7	61.6
100%	**3.47**	**3.82**	**20.8**	**9.5**	**56.8**	**5.6**	**30.3**	**5.8**	**12.5**	**20.9**	**41.3**	**62.6**

The blending of 5% Enriched material into plant feed was not considered practical as the Enriched material mined from pods which occur mostly in the southern end of the pit, would have to be stockpiled over an extended period during which time, aging effects would further impact on selectivity in flotation.

Various leaching and leach/flotation combinations have been proposed and some were tested at scoping-study level. Results obtained were not sufficiently positive and further development was not pursued.

13.6 Variability tests

Variability samples tested by SGS (2016) were selected by SGS Geostat. The results from the nine samples showed that flotation behaviour of disseminated sulphide and enriched samples was different from massive pyrite and massive pyrite magnetite samples.

The 2021/2 ALS variability test work was done on samples prepared from continuous sections of core from 40 individual drill holes. The details are outlined in the HMT report (2022). The samples were selected to represent head grade variations within each lithology, the different lithologies and spatial distribution in the deposit. Due to the nature of the geology (series of thin lenses), of the 78 samples, there were 40 samples that contained blends of the different metallurgical domains.

All samples were analyzed to provide:

- Detailed head assays including CNSolCu.
- Mineralogy – mineral abundance, elemental deportment (copper, sulfur and arsenic), mineral grain size, liberation and locking.
- EDTA extraction to gauge the extent of surface oxidation (Cu, Fe, Pb, Zn) and presence of secondary copper minerals.
- All samples were subjected to sequential Cu-Zn rougher flotation at standard conditions and open circuit cleaner testing.
- Eighteen samples were chosen for locked cycle testing.
- Flotation results were variable depending on head grade and mineralogical differences.

Table 13.7 Variability testing results

		Sample	Ore Type	Feed			Copper concentrate						Zinc Concentrate					
				Assay			Grade			Distribution			Grade			Distribution		
Date	Lab	Comp.	Test No	Cu%	Pb%	Zn%	Cu%	Pb%	Zn%	Cu	Pb	Zn	Cu%	Pb%	Zn%	Cu	Pb	Zn
2022	ALS	VAR008	MP	0.87	0.63	2.62	26.4	4.3	4.2	65.8	14.8	3.5	0.8	2.2	47.6	3.2	12.1	63.0
2022	ALS	VAR011	MP	0.68	0.48	1.86	22.5	9.9	3.7	64.6	40.0	3.8	1.2	1.1	52.7	3.6	4.7	57.6
2022	ALS	VAR039	MP	0.64	0.48	2.99	20.4	6.6	6.3	62.8	27.0	4.2	1.2	1.4	54.5	7.4	11.7	74.2
2022	ALS	VAR059	MP	0.65	0.21	1.48	25.7	3.9	3.0	71.5	33.7	3.7	1.7	1.0	49.9	6.3	11.5	82.1
2022	ALS	VAR004	MAG	0.85	0.35	1.70	28.1	1.1	1.5	73.1	7.3	2.0	2.4	4.2	49.3	7.2	31.5	75.6
2022	ALS	VAR005	MAG	0.70	0.51	1.37	21.6	2.2	1.8	46.4	6.5	2.0	2.2	7.4	45.8	7.3	33.6	76.9
2022	ALS	VAR046	MAG	1.20	0.62	2.79	29.3	2.0	1.6	66.4	8.7	1.5	2.2	6.6	52.0	7.2	41.6	73.2
2022	ALS	VAR048	MAG	0.93	0.90	3.80	22.9	3.2	2.1	58.7	8.5	1.3	1.5	4.8	55.8	4.3	14.2	39.4
2022	ALS	VAR002	MP/MAG	0.85	0.19	2.37	21.0	1.0	3.6	76.8	17.3	4.8	1.6	0.5	44.1	8.2	11.3	83.7
2022	ALS	VAR047	MP/MAG	0.73	0.35	2.56	20.9	3.7	4.6	72.8	26.2	4.5	1.2	1.4	56.8	5.3	12.7	72.1
2022	ALS	VAR042	MP/DIS	0.67	1.20	4.46	24.1	19.4	5.3	61.4	27.8	2.0	0.8	5.4	53.9	7.9	31.0	83.2
2022	ALS	VAR051	MP/DIS	0.89	0.38	2.19	24.3	6.4	16.6	67.8	42.1	18.9	1.2	1.1	52.8	4.0	8.4	69.6
2022	ALS	VAR072	MP/DIS	0.46	0.52	2.08	17.6	11.9	12.6	75.3	45.0	12.1	0.9	2.6	47.6	6.2	16.2	75.5
2022	ALS	VAR077	MP/DIS	0.51	0.86	3.99	19.0	9.9	8.6	72.2	22.5	4.2	0.7	5.4	56.3	7.9	35.3	78.6
2022	ALS	VAR060	MAG/DIS(D2)	0.75	0.08	0.79	26.1	0.5	1.6	81.2	13.0	4.7	2.3	0.8	53.4	2.9	8.9	65.5
2022	ALS	VAR006	MAG/DIS (D3)	0.77	0.95	4.05	27.1	6.5	4.9	66.4	12.7	2.3	1.8	6.8	51.5	6.7	20.7	36.7
2022	ALS	VAR055	DIS(D4)/MP/EN	0.77	0.25	3.02	22.0	3.3	14.9	65.1	29.7	11.2	1.1	0.7	51.9	5.8	10.9	70.1
2022	ALS	VAR035	DIS (D3)	0.48	0.07	0.33	15.4	1.6	1.3	76.2	50.8	9.2	3.4	0.6	36.9	4.6	5.5	71.7

The variability test work indicated the following:

- Copper head grade – copper recovery to copper rougher concentrate tended to be in the range 70% to 90% for MPY, MPY-MAG and DIS ore types with head grades <1.5% Cu. There was a general increase in recovery as head grade increased up to 1.5% Cu.
- Copper head grade for Enriched material or samples containing enriched material – these samples had higher feed grades (up to 5% Cu). There was an exponential decrease in copper recovery as copper feed grade increased reflecting the difficulty in achieving selectivity with high proportions of secondary copper minerals.
- Lead head grade – both lead assay and recovery into copper rougher concentrate increased as the lead feed assay increased for all ore types.
- Zinc head grade – there was no apparent relationship with zinc recovery into copper rougher concentrate however the zinc assay of the copper rougher concentrate tended to increase with increasing zinc feed grade for all ore types. The lower zinc head grades were associated with the disseminated ore samples.
- Zinc head grade – stage recovery of zinc into zinc rougher concentrate was above 80% for most samples. Lower recoveries occurred when head grade was less than 1% Zn. This is consistent with the earlier test work by WAI, HMT and SGS.
- Zinc head grade – head grade below 0.3% Zn failed to produce final concentrate grades above 48% Zn.

13.7 Concentrate quality

Determination of metallurgical performance was based on estimates of concentrate grades and recoveries from the Massive Pyrite/Massive Pyrite/Magnetite and Disseminated ore types. Of the 78 variability samples, 16 had a component of enriched material and another 11 were classified as Enriched. The Enriched mineralization has not been included in recovery projections although based on test work, up to 5% 'dilution' of feed has been allowed in mine blocks surrounding enriched mineralization pods. The individual components from the mine production schedule are then summed to produce the expected quantity and quality of copper and zinc concentrate by period or quarter. Blending of concentrate will be necessary at times to maintain products within the smelter specifications.

Nominal copper and zinc concentrates to be produced are as follows:

- Standard copper concentrate: containing >20% Cu, <6% Zn, < 4% Pb.
- Zinc concentrate: >49% Zn, <2.5% Cu and <3% Pb.

The average concentrate grades and recoveries for the sulphide resource for each feed type are shown in Table 13.8. The estimates are based on the following analysis:

- Head grade effects (e.g. copper recovery is related to copper in feed)
- Fixed copper concentrate grade for the disseminated ore
- Mass balances to calculate grades or recoveries of metals other than copper for copper concentrates and other than zinc for zinc concentrates

Table 13.8 Average concentrate grades and recoveries.

	Cu (%)	Zn (%)	Pb (%)	Au (g/t)	Ag (g/t)	As (%)
Copper Concentrate						
Grades						
Massive Pyrite	24.71	3.25	3.55	15.56	250.22	0.23
Disseminated	27.80	2.44	7.12	9.41	624.56	0.51
Recovery						
Massive Pyrite	70.86	3.64	20.29	42.01	18.27	9.41
Disseminated	73.54	2.66	34.44	20.00	34.92	14.25
Zinc Concentrate						
Grades						
Massive Pyrite	1.62	53.27	2.34	1.92	208.02	0.05
Disseminated	0.91	51.33	3.75	1.59	140.92	0.06
Recovery						
Massive Pyrite	6.08	78.03	17.52	6.78	19.86	2.80
Disseminated	3.15	73.15	23.74	4.42	10.30	2.34

Source: AMC June 2022

Table 13.9 and Table 13.10 show complete assays for copper and zinc concentrate generated from master composite and variability testing. Both concentrates will receive precious metals credits based on the average concentrate grades.

The zinc concentrate can be considered relatively 'clean' however will have minor penalties incurred for iron (average 8.5% being > typical penalty level of 8%) and cadmium (average 0.17% >0.1%). At times the combined copper and lead content may incur a penalty when the zinc grade is also low.

The copper concentrate has average penalty levels exceeded for lead, zinc, arsenic, bismuth and combined fluorine and chlorine. Often excursions in penalty assays may be able to be 'blended out' using the concentrate stocks which will happen with the occasional exceedances for antimony, cadmium, silica and mercury. Some contracts may be agreed where these elements do not exceed the nominated level that incurs penalties. Most of the penalties are considered minor.

Table 13.9 Copper concentrate analysis

Analyte	Method	Sample	SGS LCT1	WAI LCT1	VAR002	VAR004	VAR005	VAR006	VAR008	VAR011	VAR035	VAR039	VAR042	VAR046	VAR047	VAR048	VAR051	VAR055	VAR059	VAR060	VAR072	VAR077	Average	Median
			MCS Blend	MCS Blend	MP/MAG	MAG	MAG	MAG/DIS (D3)	MP	MP	DIS (D3)	MP	MP/DIS (D2)	MAG	MP/MAG	MAG	MP/DIS (D3)	DIS (D4)/MP/EN	MP	MAG/DIS (D2)	MP/DIS (D4)	MP/DIS (D3)		
		Unit	Cycle 8 Cu Clnr 4 Conc	Cu Conc 2018	Cycle 7 Cu Clnr 1 Conc	Cycle 7 Cu Clnr 3 Conc	Cycle 7 Cu Clnr 3 Conc	Cycle 5-7 Cu Clnr 3 Conc	Cycle 5-7 Cu Clnr 3 Conc	Cycle 5-7 Cu Clnr 3 Conc	Cycle 6 Cu Clnr 3 Conc	Cycle 5-7 Cu Clnr 3 Conc	Cycle 5-7 Cu Clnr 3 Conc	Cycle 7 Cu Clnr 3 Conc	Cycle 5-7 Cu Clnr 3 Conc	Cycle 5-7 Cu Clnr 3 Conc	Cycle 5-7 Cu Clnr 3 Conc	Cycle 7 Cu Clnr 3 Conc	Cycle 7 Cu Clnr 3 Conc	Cycle 5-7 Cu Clnr 3 Conc	Cycle 5-7 Cu Clnr 3 Conc	Cycle 5-7 Cu Clnr 3 Conc		
Au	Fire Assay	g/t	4.53	6.92	3.30	18.2	7.86	21.9	24.5	15.2	3.01	12.1	63.80	58.5	10.2	30.6	9.70	7.07	1.36	1.28	23.10	14.50	*17*	*11*
Ag	D3/ICP	g/t	112	323	158	128	120	356	258	590	204	360	1334	294	232	192	492	316	190	68	869	493	*354*	*276*
Al	D4Z/ICP	ppm	2276	159	520	<400	600	<400	140	120	2000	220	<400	1000	300	340	400	900	140	<0.04	400	400	*620*	*400*
As	XRF-BM	%	0.037	0.282	0.14	0.04	0.22	0.16	0.36	1.17	1.47	0.19	2.04	0.09	0.20	0.24	1.28	0.10	0.10	0.04	0.20	0.26	*0.43*	*0.20*
Ba	D3/ICP	ppm	-	-	70.0	10.0	25.0	45	90	75	35.0	20	600	50.0	110	70.0	500	45.0	60.0	20	600	300	*151*	*65*
Bi	D3/ICP	ppm	132	742	430	430	570	560	430	1390	990	850	890	490	580	400	470	630	760	260	1220	810	*652*	*575*
Ca	D3/ICP	ppm	-	-	2350	200	1100	300	250	200	<50	650	300	100	700	400	100	100	100	0.07	400	200	*438*	*250*
Cd	D3/ICP	ppm	50	194.5	95.0	30.0	50.0	170	180	160	5.00	205	155	60.0	150	85.0	710	615.0	105.0	40	555	315	*196*	*153*
Ce	D4Z/ICP	ppm	-	-	8.00	2.00	2.00	2	15	38	6.00	19	1.00	2.00	<1	<1	11.0	4.00	2.00	<1	2.00	10.0	*8.3*	*4.0*
Cl	XRF/BMF	%	100	60	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*<0.01*	*<0.01*
Co	D3/ICP	ppm	<10	5	15.0	<5	20.0	15	<5	10	20.0	<5	<5	<5	<5	<5	<5	<5	10.0	45	<5	<5	*19*	*15*
Cu	XRF-BM	%	30.39	30.47	20.7	29.7	21.6	26.8	26.1	23.4	15.3	20	24.1	30.2	20.9	22.9	24.3	21.7	25.3	25.8	17.6	19.0	*23.8*	*23.8*
AsolCu	5% H2SO4	ppm	-	-	1848	2552	4570	424	710	542	734	1146	8.00	2256	1252	1586	9912	12490	1484	2206	6450	1012	*2843*	*1535*
CNsolCu	5% NaCN	%	-	-	1.50	1.58	4.11	0.86	1.3	1.2	0.91	1.42	4.14	1.21	0.79	0.87	8.41	8.63	2.51	1.67	5.23	2.91	*2.7*	*1.5*
F	ISE	ppm	100	160	450	400	1200	50	<50	<50	50.0	400	<50	350	600	850	<50	<50	250	200	150	600	*427*	*400*
Fe	XRF-BM	%	23.78	23	26.2	27.0	24.2	25.5	27.1	25.5	33.8	23.2	18.5	27.3	23.1	21.7	18.0	20.5	26.6	29.1	20.4	20.4	*24.2*	*24.0*
Hg	D1/ICP	ppm	1	4.51	1.50	1.00	1.90	0.3	4.3	5.9	2.30	3.9	12.2	1.30	2.20	1.60	12.4	6.70	1.70	0.4	4.90	3.20	*3.7*	*2.3*
Mg	D4Z/ICP	%	1.05	0.35	2.72	1.64	3.54	0.12	0.014	0.01	0.088	1.7	0.04	1.20	2.85	3.78	<0.04	0.078	1.36	1.16	0.56	2.04	*1.3*	*1.2*
Mn	D3/ICP	ppm	<100	70	145	45.0	140	65	<100	<100	50.0	200	55.0	35.0	200	100	65.0	65.0	110	200	100	200	*111*	*100*
Mo	D3/ICP	ppm	<10	10.3	10.0	<5	5.00	<5	<5	5	<5	5	10.0	<5	5.00	<5	35.0	35	<5	<5	30.0	15.0	*16*	*10*
Na	D3/ICP	ppm	-	-	380	200	380	200	260	280	160	300	340	240	320	340	360	160	200	240	360	340	*281*	*290*
Ni	D3/ICP	ppm	10	22	140	20.0	25.0	15	20	35	210	40	25.0	25.0	25.0	20.0	100	55.0	105	30	110	15.0	*52*	*25*
P	D3/ICP	ppm	-	-	1500	<100	<100	<100	1000	900	<100	900	1200	<100	800	800	1800	<100	1500	<100	1500	1300	*1200*	*1200*
Pb	XRF-BMF	%	1.23	2.29	1.01	0.88	1.41	6.88	4.36	9.96	1.54	6.45	19.4	1.62	3.65	3.20	6.39	3.58	3.96	0.49	11.9	9.90	*5.0*	*3.6*
S Total	XRF-BM	%	31.75	33.2	30.3	31.0	27.7	32.4	34.1	33.7	41.6	30.1	28.9	31.3	27.8	24.9	32.1	34.6	32.1	32.9	31.9	28.1	*32*	*32*
Sb	D1/ICP	ppm	105	985	291	94.1	274	37.7	1204	-	4512	606	0.53	358	378	550	0.54	542	302	41.9	0.21	0.10	*541*	*291*
Se	D1/ICP	ppm	59	400	110	75.0	55.0	75	125	330	80.0	60	135	75.0	100	80.0	155	70.0	90.0	90	140	145	*122*	*90*
SiO2	D4Z/ICP	%	4.05	1.5	10.6	6.20	14.2	0.4	<0.2	<0.2	0.60	7.2	0.20	INS	11.4	15.2	0.40	0.60	5.40	4.6	2.60	7.80	*5.5*	*4.6*
Te	D1/ICP	ppm	<1	4.1	2.40	3.40	2.20	2.4	3	31.8	6.20	6	5.60	2.20	1.60	1.80	2.60	2.40	1.80	2.6	3.80	2.40	*4.7*	*2.5*
Th	D4Z/ICP	%	-	-	<2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	2.00	<2	<2	<2	<2	<2	*<2*	*<2*
U	D4Z/ICP	ppm	-	-	<2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	2.00	<2	<2	<2	<2	2.00	*<2*	*<2*
Zn	XRF-BM	%	2.78	5.2	3.54	0.89	1.84	4.89	4.24	3.65	1.30	6.17	5.27	1.69	4.56	2.11	16.6	16.8	2.91	1.58	12.6	8.63	*5.4*	*3.9*
SG	He Pyc	kg/m^3	-	-	3988	3997	INS	4370	4504	4529	4684	4257	4723	4318	3954	3891	4487	4500	4287	4129	4485	4192	*4311*	*4318*

Table 13.10 Zinc concentrate analysis

Analyte	Method	Sample	SGS LCT1	WAI LCT1	VAR002	VAR004	VAR005	VAR006	VAR008	VAR011	VAR035	VAR039	VAR042	VAR046	VAR047	VAR048	VAR051	VAR055	VAR059	VAR060	VAR072	VAR077	Average	Median
					MP/MAG	MAG	MAG	MAG/DIS (D3)	MP	MP	DIS (D3)	MP	MP/DIS (D2)	MAG	MP/MAG	MAG	MP/DIS (D3)	DIS (D4)/MP/EN	MP	MAG/DIS (D2)	MP/DIS (D4)	MP/DIS (D3)		
		Unit	Cycle 8 Zn Clnr 4 Conc	Zn Conc 2018	Cycle 7 Zn Clnr 1 Conc	Cycle 7 Zn Clnr 3 Conc	Cycle 7 Zn Clnr 3 Conc	Cycle 5-7 Zn Clnr 3 Conc	Cycle 5-7 Zn Clnr 3 Conc	Cycle 5-7 Zn Clnr 3 Conc	Cycle 6 Zn Clnr 3 Conc	Cycle 5-7 Zn Clnr 3 Conc	Cycle 5-7 Zn Clnr 3 Conc	Cycle 7 Zn Clnr 3 Conc	Cycle 5-7 Zn Clnr 3 Conc	Cycle 5-7 Zn Clnr 3 Conc	Cycle 5-7 Zn Clnr 3 Conc	Cycle 7 Zn Clnr 3 Conc	Cycle 7 Zn Clnr 3 Conc	Cycle 7 Zn Clnr 3 Conc	Cycle 5-7 Zn Clnr 3 Conc	Cycle 5-7 Zn Clnr 3 Conc		
Au	Fire Assay	g/t	3.77	1.37	1.27	1.5	2.49	2.26	2.72	2.42	2.58	1.68	2.27	2.05	1.36	1.69	1.79	2.65	0.85	0.8	1.89	1.16	1.85	1.84
Ag	D3/ICP	g/t	147	91.3	104	152	142	242	112	104	128	120	200	536	112	186	75.0	72.0	84.0	114	151	216	*158*	*124*
Al	D4Z/ICP	ppm	<400	<400	680	<400	680	<400	360	300	2340	300	<400	200	260	560	<400	700	140	<0.04	400	<400	*577*	*380*
As	XRF-BM	%	0.132	0.19	0.02	0.03	0.09	0.02	0.07	0.04	0.31	0.02	0.16	0.03	0.03	0.03	0.08	0.04	0.04	0.06	0.06	0.04	*0.07*	*0.04*
Ba	D3/ICP	ppm	-	-	65.0	20.0	35.0	55	245	245	55.0	20	2400	80.0	115	220	700	40.0	60.0	25	1100	500	*332*	*73*
Bi	D3/ICP	ppm	259	198	190	470	510	440	220	320	410	300	200	1170	250	510	50.0	150	440	370	180	350	*363*	*335*
Ca	D3/ICP	ppm	640		3750	1800	4350	1900	2250	2600	7250	3500	3550	2700	2850	2900	2350	2000	3200	0.39	4050	1850	*2936*	*2775*
Cd	D3/ICP	ppm	973	1750	1220	1940	1345	1830	1770	1925	1375	1675	1735	2000	1760	2125	1980	1475	1570	1550	1835	1895	*1723*	*1765*
Ce	D4Z/ICP	ppm	-	-	3.00	1.00	<1	1	<1	7	9.00	<1	3.00	14.0	<1	5.00	2.00	12.00	1.00	<1	3.00	2.00	*4.85*	*3.00*
Cl	XRF/BMF	%	0.21	0.016	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	*<0.01*	*<0.01*
Cr	D3/ICP	ppm	<100	70	70.0	30.0	30.0	40	70	70	470	20	70.0	40.0	50.0	20.0	90.0	50.0	60.0	40	130	50.0	*78*	*50*
Cu	XRF-BM	%	2.84	1.98	1.57	4.63	2.56	1.79	0.78	1.2	3.12	1.15	0.77	2.10	1.19	1.50	1.24	1.12	1.83	2.29	0.87	0.73	*1.69*	*1.37*
AsolCu	5% H2SO4	ppm	-	-	692	16.0	660	224	106	252	2160	440	<2	456	532	410	4.0	1408.0	964	702	<2	<2	*602*	*456*
CNsolCu	5% NaCN	%	-	-	1.03	1.34	0.46	0.25	0.32	0.84	1.26	0.78	0.68	0.49	0.78	0.31	0.96	0.69	1.21	1.08	0.75	0.65	*0.77*	*0.76*
F	ISE	ppm	100	<20	<50	<50	<50	<50	<50	50	<50	<50	<50	<50	50.0	50.0	<50	<50	<50	<50	<50	<50	*<50*	*<50*
Fe	XRF-BM	%	6.13	8.01	15.2	5.58	10.9	5.43	11.6	8.4	18.7	6.6	4.58	4.73	5.08	3.58	8.12	10.3	12.0	6.99	11.0	4.76	*8.53*	*7.56*
Hg	D1/ICP	ppm	17	23.1	16.1	34.6	9.50	34	37	39.2	12.5	29.3	49.6	35.1	23.9	30.1	31.1	18.9	22.4	12.8	17.5	17.7	*26.2*	*26.6*
Mg	D4Z/ICP	%	<0.02	0.06	0.08	0.04	0.17	0.08	0.054	0.05	1220	0.09	0.12	0.04	0.06	0.07	<0.04	0.078	0.04	0.16	0.08	0.04	*72*	*0*
Mn	D3/ICP	ppm	<100	150	100	90.0	150	135	200	300	165	200	200	85.0	100	100	75.0	145.0	175	200	200	200	*157*	*158*
Mo	D3/ICP	ppm	<10	3.8	55.0	70.0	75.0	75	60	65	45.0	65	85.0	70.0	60.0	65.0	80.0	85.0	70.0	<5	70.0	80.0	*69*	*70*
Na	D3/ICP	ppm		-	200	160	260	240	300	280	540	300	340	200	220	280	340	120	160	180	360	340	*268*	*270*
Ni	D3/ICP	ppm	10	11	25.0	<5	10.0	10	5	15	135	10	10.0	5.00	5.00	10.0	10.0	15	25.0	<5	15.0	<5	*20*	*10*
P	D3/ICP	ppm	-	-	1900	<100	<100	<100	2600	2600	2500	2600	1800	100	2500	2500	1900	300	2100	200	1900	1800	*1820*	*1900*
Pb	XRF-BMF	%	2.77	0.354	0.46	2.00	7.48	6.85	2.2	1.1	0.57	1.39	5.40	7.39	1.38	4.77	1.10	0.67	1.01	0.76	2.57	5.43	*2.9*	*1.7*
S Total	XRF-BM	%	34.35	35.9	37.6	32.7	34.0	31.5	35.7	33.7	36.5	32.6	31.5	31.2	32.9	31.4	34.1	36.0	35.6	33.1	34.9	31.6	*33.7*	*33.4*
Sb	D1/ICP	ppm	204	388	34.0	78.5	180	85.1	80.2	184	873	28.6	288	83.8	28.9	35.3	123	53.1	62.2	66.2	219	41.1	*141*	*79*
Se	D1/ICP	ppm	45	80	105	80.0	65.0	125	120	105	80.0	50	65.0	275	105	120	60.0	50.0	80.0	135	60.0	135	*101*	*93*
SiO2	D4Z/ICP	%	2.04	0.2	0.40	0.40	0.32	0.2	0.4	0.4	1.60	0.4	0.80	0.40	0.40	0.40	0.20	0.40	<0.2	0.4	0.80	0.40	*0.49*	*0.40*
Te	D1/ICP	ppm	<1	0.6	1.00	2.60	2.40	3.4	1.6	3.8	4.00	1.4	1.60	7.20	0.60	1.40	0.60	0.40	0.80	1.8	0.80	1.20	*2.03*	*1.50*
Th	D4Z/ICP	%	-	-	<2	-	<2	<2	<2	<2	<2	<2	2.00	<2	<2	<2	4.00	<2	<2	<2	2.00	4.00	*<2*	*<2*
U	D4Z/ICP	ppm	-	-	<2	-	<2	<2	<2	<2	<2	<2	2.00	<2	<2	<2	4.00	<2	<2	<2	2.00	<2	*<2*	*<2*
Zn	XRF-BM	%	51.52	51.64	42.8	54.9	42.8	51.7	47.3	52.1	34.1	54.3	53.9	51.8	56.8	55.8	52.8	49.7	46.6	53.1	47.6	56.3	*50*	*52*
SG	He Pyc	kg/m^3	-	-	4281	4239	INS	4247	4235	4202	4431	4238	4203	4343	4065	4259	4171	4310	4348	INS	4229	4257	*4254*	*4243*

13.8 Operating metallurgical parameters

Testing using the domain composite samples was used to establish design and operating parameters for the Sulphide Project as follows:

- Concentrate settling characteristics.
- Concentrate filtration parameters.
- Tailings settling characteristics and response to flocculation.

13.9 Mineral processing and metallurgical test work conclusion

AMC considers that there was sufficient and representative metallurgical sampling and test work undertaken for Gediktepe to identify metallurgical domaining within the deposit, identify the best methods for mineral processing, and an appropriate processing flowsheet to achieve copper and zinc concentrates with saleable metal grades and to achieve the design throughput, metallurgical recoveries, and process operating costs assumed for the Ore Reserve estimate.

14 Mineral Resource estimates

14.1 Introduction

A Mineral Resource estimate for Gediktepe, was initially completed by AMC in 2018, with an update to the model in 2022, comprising mining depletion and updated NSR cut-off grade calculations. Whilst both oxide and sulphide mineralization were estimated, only the sulphide Mineral Resources were reported as part of the Gediktepe Sulphide Feasibility Study, the starting surface of which was assumed to be completion of the Oxide Project. The 2022 Mineral Resource figures formed part of the 2022 FS based on the sulphide mineralization only (AMC, 2023).

The following sections summarize the Mineral Resource estimation methodology for both the oxide and sulphide mineralization. The current Mineral Resources comprises the 2022 Mineral Resource block model and accounts for depletion as of 31 March 2024.

The major grades of economic interest to the project, Au, Ag, Cu and Zn, were estimated into both identified mineralization zones and background material portions of the block model. Minor grades, As, C, Pb, S, Fe, and Hg, along with bulk densities, were similarly estimated into both mineralization and background zones.

The Mineral Resources are reported with an effective date of 31 March 2024.

14.2 Drilling and sampling data

The final suite of drilling database files supplied by Polimetal were received on 21 March 2018. Table 14.1 summarizes the individual files. AMC undertook a series of basic and standard checks of database validity and did not detect any matters of concern.

Table 14.1 Drillhole data files

Database File	Records	Description
Gediktepe_Collar_20180321.xls	730	Drillhole collars
Gediktepe_Survey_201800321.xlsx	2,160	Drillhole downhole surveys
Gediktepe_Lithology_20180321.xlsx	43,926	Geological logs
Gediktepe_All_Assay_MasterData_20180321.xls	38,003	Sample assays
Gediktepe_Specific_Gravity_20180321.xls	6,262	Bulk density measurements

Following validation checks both DD and RC drillholes were deemed suitable by AMC for inclusion in the Mineral Resource estimates. Assays with below detection limits were set to half the detection limit. Drillholes completed for water boreholes, geotechnical, metallurgical and tailings storage sterilization drilling purposes, and which lack assays were excluded from the Mineral Resource estimates.

The summary statistics of accepted drillholes by phase, are shown in Table 14.2 (number of holes) and Table 14.3 (drilled metres).

Table 14.2 Drilling phase summary statistics: Number of hole types

Phase	DRD	DRRC	GEO	J	OPJT	Total
1	11	-	-	-	-	11
2	144	84	-	-	-	228
3	153	107	-	-	-	260
4	93	-	1	-	-	94
5	32	-	-	2	2	36
Total	**433**	**191**	**1**	**2**	**2**	**629**
Percent (%)	69	30	0	0	0	100

Table 14.3 Drilling phase summary statistics: Metres by hole type

Phase	DRD	DRRC	GEO	J	OPJT	Total
1	1,529	-	-	-	-	1,529
2	17,158	6,920	-	-	-	24,078
3	26,544	6,309	-	-	-	32,853
4	5,189	-	63	-	-	5,252
5	5,319	-	615	-	480	6,414
Total	**55,739**	**13,229**	**678**		**480**	**70,127**
Percent (%)	79	19	1	0	1	100

14.3 Geological interpretation

14.3.1 Lithology

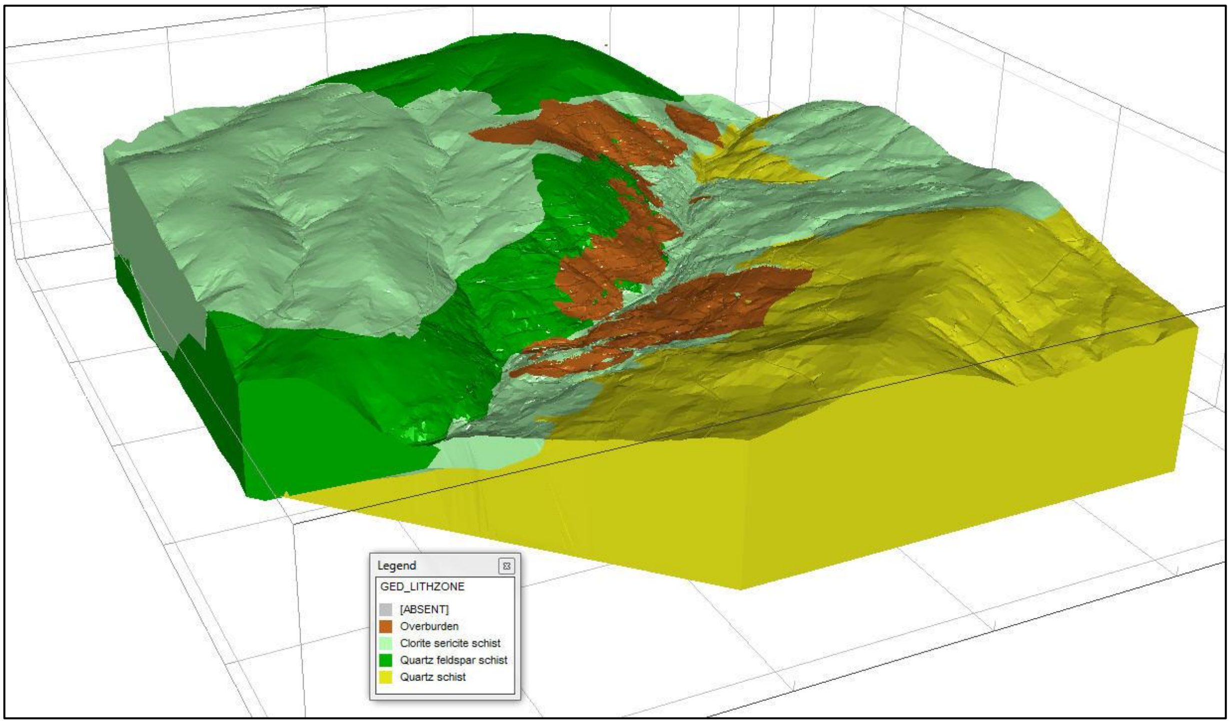
Polimetal provided AMC with a set of solid wireframes representing interpretations of the three main schist lithologies, plus overburden, based on core and reverse circulation drilling logs. AMC consolidated the wireframes and assigned corresponding codes to a lithology field (LTHZONE), as shown in Table 14.4.

Table 14.4 Lithology codes

LTHZONE	Description
OVBN	Overburden
SHQF	Quartz feldspar schist
SHCS	Chlorite sericite schist
SHQZ	Quartz schist

Figure 14.1 is an oblique view which illustrates the relationships between the lithologies.

Figure 14.1 Oblique view of lithologies



Note: Elevated view towards NNE

14.3.2 Weathering

Based on core and reverse circulation drilling logs of oxidation, Polimetal prepared and provided to AMC a surface wireframe representing the interpreted base-of-oxidation (top-of-sulphide) horizon. Beyond the immediate areas of drillhole intersections, the surface was extended laterally to follow topography, but offset vertically down. This reasonably reflects the tendency for the base-of-oxidation to follow the water table, which in turn tends to track a profile offset below the topography. The extrapolation has been projected to the edges of the model.

14.3.3 Mineralization

Polimetal prepared four sets of mineralization interpretations, based strictly on drillhole logging codes. All were provided to AMC in the form of wireframe solids.

Two sets, gossan and clay-like-gossan are confined to the oxide zone, and the other two, massive pyrite and enriched, relate to the sulphide zone. Previous studies distinguished between massive pyrite and massive pyrite magnetite. However, evaluations by Hacettepe Mineral Technologies, Polimetal and others had indicated that there is no value, from either Mineral Resource estimation or mineral processing perspectives, to partition the massive pyrite, therefore the two previous subsets have been combined.

The wireframe solids collectively capture the majority of Au, Ag, Cu, and Zn mineralization, and the wireframe boundaries commonly coincide with sharp changes in grades. However, a significant number of mineralized intersections can be observed outside of these solids, usually as lower grades, or where some grades remain elevated (e.g. Zn) but others are not.

AMC and Polimetal have observed that this lower-grade mineralization often follows the boundaries of the massive sulphide or gossan zones in a parallel fashion, or extends laterally up or down dip, or along strike, away from the interpreted mineralization zones. Often these trends are not well defined by grade but are revealed in logs of disseminated sulphide and higher sulphur grades. In many cases this evidence of mineralization, either as grades or logs, form shells of variable thickness around the massive pyrite or gossan interpretations.

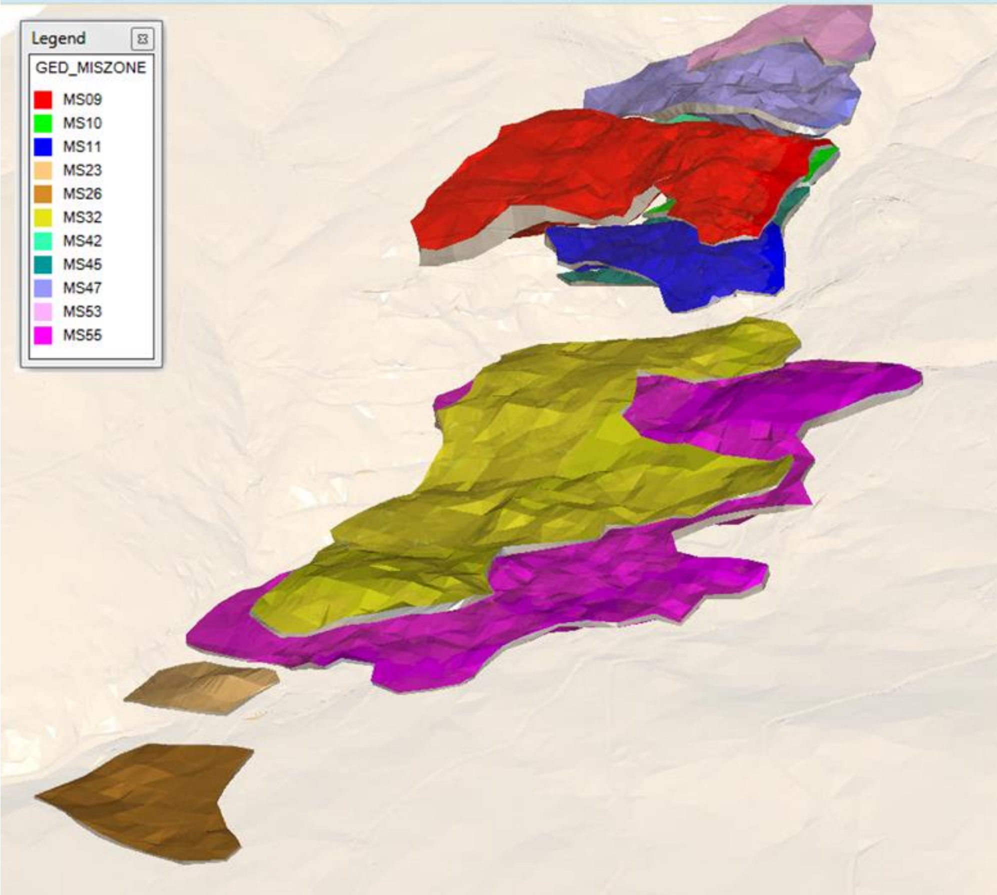
AMC modelled a series of mineralized shells to capture this peripheral mineralization outside of the solid models. In many cases the boundaries and extents of the shell mineralization are relatively well defined, however there are instances where establishing continuity proved to be challenging. In addition to the logging and grade information, AMC used both the existing solid wireframes, and the mineralization strings supplied by Polimetal, to guide the interpretation process.

There is strong evidence that the gossan and massive pyrite zones once formed continuous bodies of mineralization across what is now the base-of-oxidation. The mineralized shell interpretations have therefore been constructed extending across this boundary, since any subsequent need for partitioning between oxide and sulphide can be achieved using the base-of-oxidation surface.

The outcome was a set of 10 defined mineralization shells, mostly encapsulating the mineralization solid wireframes, but deviating locally to facilitate continuity. These deviations are not considered to be material, given that the primary objective of the mineralization shells was to manage the grade estimation process. A secondary benefit would be to use the names assigned to the shells to partition the sulphide or gossan mineralization, which otherwise are difficult to separate spatially.

Figure 14.2 shows an oblique view of the mineralized shell interpretations.

Figure 14.2 Oblique view of mineralization shell interpretations



Note: Elevated view towards NNE

While reviewing the spatial distributions of grades across the deposit, AMC detected a range of patterns that were often specific to individual metals or showed consistency between two or more elements. Two particularly marked distributions showed potential for compromising the grade estimation process.

The first sub-zone relates to copper within the massive pyrite which displays higher copper grades situated mostly in the up-dip areas of the massive pyrite domain. The distinctive grade characteristics required separate domaining of the higher and lower-grade areas for further evaluation.

AMC also noted that the high copper grades show a clear spatial association with interpreted solids of enriched mineralization.

The second sub-zone was observed in cross section, initially in relation to zinc grades. While the copper grade are strongly elevated across the full intersections of the massive pyrite, zinc remains depleted from the hangingwall through to some point within the intersection, after which the zinc grades increase sharply through to the footwall. The trend is consistent over a number of adjacent drillholes.

To ensure that this clearly defined subzone could be partitioned during both analysis and grade estimation, a wireframe surface linking the intersection points where zinc grades change sharply was created for use as a sub-zoning boundary. Further inspection of trend in other grades show that Au, Ag and Hg in particular closely mirror the Zn trends, and even assays not included in the estimates, such as Cd, Co (reversed), and Mn are conformable. These give further weight to recognizing the zone as geochemically distinctive.

14.3.4 Faults

The presence of faulting at the Gediktepe deposit is evident from a three-dimensional view of filtered grade values. In some cases, the dislocations are clearly defined, while in others the faults are more subtle.

Polimetal has identified, and modelled faults as wireframe surfaces which have been used in defining the limits to. and offsets of. the interpretations of mineralization.

14.4 Exploratory data analysis (EDA)

14.4.1 Domaining

Samples were selected using the mineralization, weathering and lithology interpretation wireframes, and assigned unique domain codes to define the zones in which the samples are located.

A total of five different mineralization codes have been applied to the sample data, as summarized in Table 14.5.

Table 14.5 Mineralization codes

MINZONE	Description
GOSS	Gossan
GSCL	Clay-like gossan
MSPY	Massive pyrite
MSEN	Enriched zone
MISZ	Mineralized shell
BKGR	Background

14.4.2 Compositing

The sampling practice at Gediktepe applied default sampling intervals at 1 m within mineralized zones and 2 m outside of these zones, with options for shorter sample lengths according to geological features.

AMC elected to conduct statistical analyses on mineralized zones, excluding the mineralized shell material, using 1.0 m sample composites, and all other material using 2.0 m composites.

14.4.3 Variography

Variographic analysis was focused on the major grade fields for those mineralized zones that demonstrate suitable continuity. The selected zones were combined gossan (GOSS) and clay-like gossan (GSCL), and massive pyrite (MSPY). The enriched pods (MSEN) were considered to be too discrete and discontinuous, and the mineralized shell (MISZ) grades are not considered to represent sufficiently defined populations to be meaningful for variography.

Experimental variograms were generated on untransformed 1 m composites.

Directions of preferred continuity were tested within the primary planes of orientation for each zone, and structures were determined for each of the strike (045°/00°), down dip (315°/20°), and across-plane (using down hole variograms as a proxy) orientations.

The downhole variograms typically displayed low nugget variances, around 10% to 20% of the total, particularly for base metals in the massive pyrite. This is consistent with the generally low variability of Cu and Zn observed visually in profiles down mineralized intersections. Similarly, the downhole grade trends noted in some of the thicker massive pyrite intersections, are reflected in some downhole variograms not settling on to a horizontal sill.

Another feature is that many variograms in the plane of the mineralization (along strike and down dip) are not well formed, suggesting that the drill spacings are at or near the ranges in these directions.

The modelled sills for the three directions are commonly quite different (e.g. Figure 14.3), and this zonal anisotropy is to be expected from observations of internal grade zonation within the plane of the mineralization, particularly wider portions of massive pyrite.

In some cases, very long ranges were invoked for the final structures to ensure that, where zonal anisotropy is evident, variogram models for all directions reach a common sill. These ranges are well beyond the search neighbourhood during estimation and therefore have no influence on the interpolation.

A summary of the variogram model parameters is provided in Table 14.6.

Figure 14.3 Variogram charts: Gossan Au

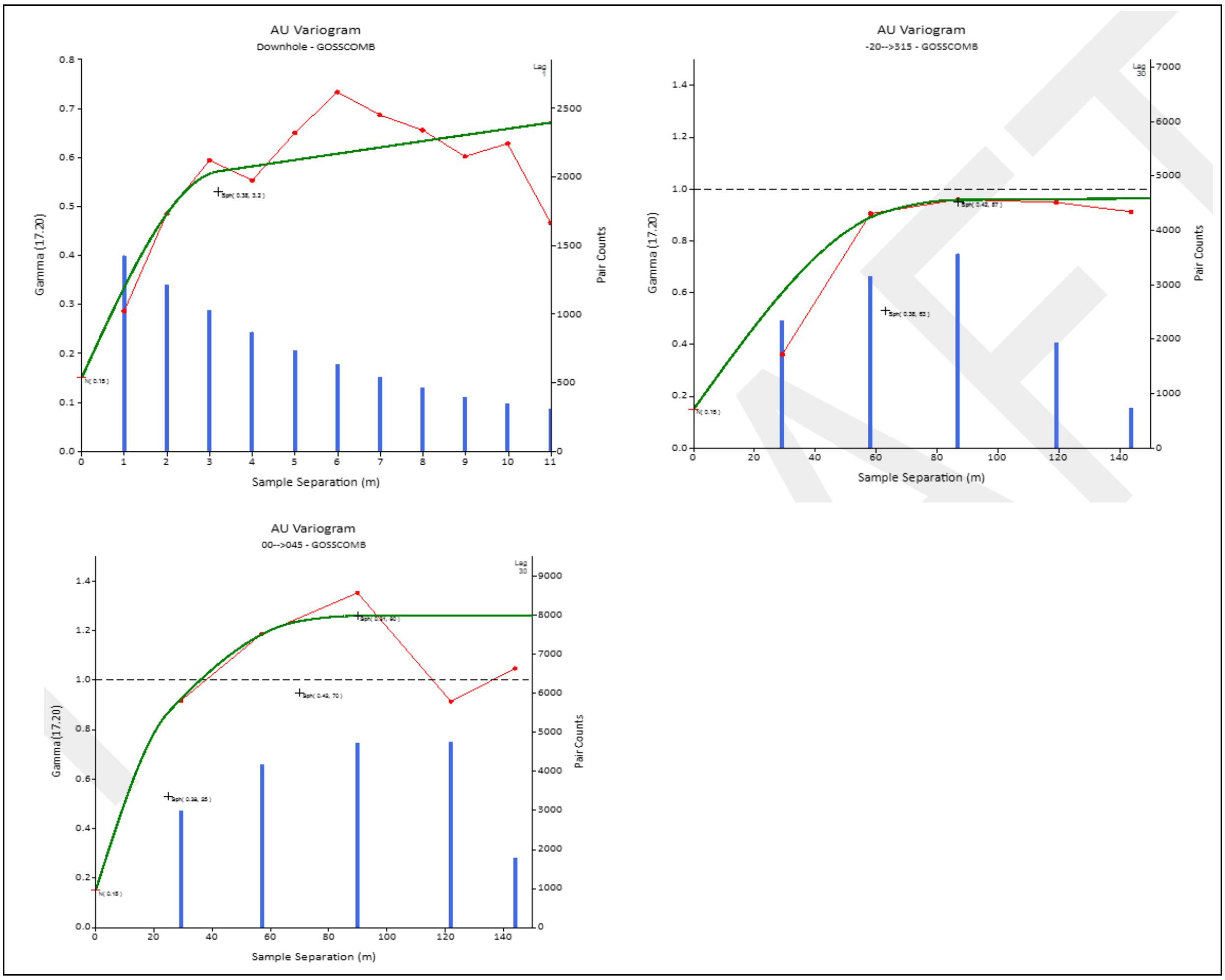


Table 14.6 Variogram parameters

MINZONE	Field	Sub-Zone	Dip Dir.	Dip	Nugget	Structure 1				Structure 2				Structure 3			
						Var.	Strike	Dip	X-str	Var.	Strike	Dip	X-str	Var.	Strike	Dip	X-str
GOSS	AU		315	20	0.15	0.38	25	63	3	0.42	70	87	50	0.31	90	5,000	1,000
	AG		315	20	0.15	0.23	20	36	5	0.45	35	79	7	0.22	60	89	200
	CU		315	20	0.1	0.5	50	60	5	0.37	95	80	1,000	-	-	-	-
	ZN		315	20	0.1	0.65	25	37	7	0.33	75	1,000	100	-	-	-	-
	S		315	20	0.3	0.1	10	10	6	0.5	40	20	8	-	-	-	-
	AS		315	20	0.1	0.45	10	10	4	0.3	25	25	8	0.38	500	40	16
	HG		315	20	0.35	0.2	10	10	4	0.38	40	25	7	0.57	65	60	500
	PB		315	20	0.05	0.5	10	10	3	0.3	25	25	5	0.35	40	40	50
	FE		315	20	0.08	0.17	10	10	4	0.5	45	25	11	0.28	90	250	25
MSPY	AU		315	20	0.18	0.26	76	10	5	0.48	170	200	150	0.15	180	2,000	1,000
	AG		315	20	0.04	0.22	11	60	5	0.5	70	105	45	0.09	200	140	60
	CU	1	315	10	0.02	0.18	15	6	8	0.45	50	25	15	1	120	350	60
		2	315	20	0.1	0.36	25	22	3	0.33	120	125	13	0.41	230	1,000	1,000
	ZN		315	20	0.15	0.25	15	20	5	0.4	40	60	20	0.27	300	500	1000
	S		315	20	0.1	0.2	8	8	3	0.14	25	25	9	0.6	100	250	250
	AS		315	20	0.2	0.2	20	20	4	0.44	70	100	13	0.55	1000	1,000	25
	HG		315	20	0.1	0.18	10	45	3	0.2	30	120	15	0.48	160	500	60
	PB		315	20	0.05	0.35	8	8	4	0.08	20	25	5	0.45	45	50	27
	FE		315	20	0.1	0.2	10	20	4	0.14	20	95	8	0.4	30	250	150

14.4.4 Grade capping

To reduce the impact of high-grade assays on the grade estimates, grade capping has been applied on a mineralization and weathering domain basis.

AMC undertook a detailed review of grade characteristics for the major grade fields, in each of the mineralization and weathering zones, as a basis for determining suitable values for high (or low) grade capping.

Table 14.7 summarizes the grade capping limits applied to the major elements of interest. Grade capping limits were also applied to the minor elements of Pb, As, S, Fe and Hg.

Table 14.7 High grade caps by MINZONE and subzones: Major elements

Assay	Comp. (m)	Zones		Capping grade (g/t, %)	Nº Comps. Affected
		MINZONE	Subzone		
AU	1	GOSS	-	25.0	3
	1	MSPY	-	6.0	5
	1	MSEN	-	6.0	1
	2	MISZ	WEATH	2.5	5
	2	MISZ	FRSH	5.0	8
AG	1	GOSS	-	350	27
	1	MSPY	-	150	15
	1	MSEN	-	150	2
	2	MISZ	WEATH	100	5
	2	MISZ	FRSH	100	18
CU	1	GOSS	-	0.7	4
	1	MSPY	1	12.0	1
	1	MSPY	2	2.0	8
	1	MSEN	-	10.0	3
	2	MISZ	WEATH	0.6	7
	2	MISZ	FRSH	2.0	12
ZN	1	GOSS	-	0.5	4
	1	MSPY	-	12.0	11
	1	MSEN	-	10.0	2
	2	MISZ	WEATH	0.8	6
	2	MISZ	FRSH	5.0	15

14.5 Volumetric block model

A volumetric block model was constructed in Datamine Studio RM and assigned the respective key domain codes for the mineralization, lithology and weathering. A summary of the block model parameters is provided in Table 14.8.

Table 14.8 Volumetric model summary

Description	X	Y	Z
Model Origin	636000	4357000	1000
Model Rotation	Unrotated		
Parent Cell Size (m)	20	20	10
Nº Parent Cells	100	120	55
Minimum Sub Cell Size (m)	5	5	2

14.6 Bulk density

Evaluation of bulk density data was initiated by coding all sample data points by lithology (LTHZONE), mineralization (MINOZNE), and weathering (WEAZONE) field codes. A total of 6,202 coded samples were available for analysis.

Statistics of minimum, maximum and mean were computed for densities in each of the mineralization zones (and weathered and fresh for mineralized shells), and for background material in each of the lithology zones. Some outlier values were identified, with lower and upper truncations applied to prevent the analysis being skewed. Table 14.9 summarizes the bulk density statistics following truncation of outliers.

Table 14.9 Bulk density statistics by mineralization, weathering and lithology

Filters	Samples	Minimum	Maximum	Mean
GOSS	439	2.00	3.84	2.60
GSCL	34	2.00	2.88	2.45
MSEN	121	3.44	4.92	4.23
MSPY	1389	3.25	4.92	4.37
MISZ – WEAT	45	2.17	3.23	2.54
MISZ – FRSH	709	2.52	4.84	3.41
BKGR – OVBN	32	2.41	2.69	2.57
BKGR – SHQF	741	2.43	2.79	2.67
BKGR – SHCS	1905	2.30	3.80	2.78
BKGR – SHQZ	570	2.45	2.78	2.66

The number, frequency, and broad spatial distribution of density values were considered by AMC to be a sufficient basis for estimating density values into model blocks. Statistical demonstrated that the values within the different mineralization and weathering zones show distinct and characteristic density population. Consequently, in preparation for estimation, density values were assigned an ESTDOM domain field derived using MINZONE and WEAZONE field codes (Table 14.10).

Table 14.10 Estimation domains

ESTDOM	Equivalent To	
	MINZONE	WEAZONE
GOSS	GOSS	
	GSCL	
MSPY	MSPY	
MSEN	MSEN	
MISW	MISZ	WEAT
MISF	MISZ	FRSH

Densities were estimated for each ESTDOM domain using inverse distance weighting squared. Search orientations were aligned with the same orientations used for grade estimations, but with larger search ellipse dimensions to account for the lower frequency of values. Any blocks that did not receive a density estimate, typically because of insufficient data in the neighbourhood, were assigned default values, derived from statistical analysis, according to mineralization and weathering zone.

14.7 Grade estimates

Grade estimates were completed for Au, Ag, Zn, Cu, As, Hg, Pb, Fe, S and C. The grades were estimated using either ordinary kriging (OK) or inverse distance weighting (IDW) squared as interpolators, and either 1 m or 2 m composite lengths, depending on the zones being estimated. 1 m composites were applied to estimates of the gossan, massive pyrite and enriched zones, while 2 m composites were used to estimate material within the mineralized shells.

The volumetric block model was adjusted onto a new model prototype for the purpose of the grade estimates, reducing the parent cell size to 10 m by 10 m by 2.5 m (X/Y/Z). Grades were estimated into parent cells. The resultant grade estimate model was subsequently converted back to the 20 m by 20 m by 5 m (X/Y/Z) parent cell prototype. Sub-cells received the same grade estimate as the parent cell.

Absent grade intervals within the selected composite data were assigned trace grade values as summarized in Table 14.11. This approach to unsampled intervals may result in more conservative grade estimates local to the unsampled intervals. Further work would be required to assess whether these intervals are non-mineralized and warrant the low default values, or if they are potentially mineralized and should be left as absent.

Table 14.11 Default values for unsampled intervals

Grade	Units	Subzone	Value
AU	g/t	All	0.005
AG	g/t		0.05
ZN	%		0.01
CU	%		0.01
AS	ppm		50
HG	ppm		0.001
PB	%		0.01
FE	%		20
C	%		0.01
S	%	Weathered	0.001
S	%	Fresh	10

Grade interpolation was conducted into parent blocks under hard-bounded zonal control, referencing the ESTDOM field (Table 14.10). Additional sub domaining (Table 14.12) was completed with respect to the identified copper and zinc grade distribution subzones previously described in Section 14.3.3.

Table 14.12 Estimation subzones

ZONE	CODE	Description
SUBZONCU	1	Higher grade Cu massive sulphides (around enriched sulphides)
	2	Remaining Cu massive pyrite
SUBZONZN	1	Zinc-depleted massive sulphide
	2	Remaining massive pyrite

Given the relatively regular distributions of drillhole intersections, and the similarity of the geometries for each mineralized zone across the deposit, a limited set of search ellipsoid configurations was applied (Table 14.13). These dimensions were chosen with consideration of capturing sufficient samples for estimation within the search neighbourhood, the observed continuities of grades, and evidence of zonal anisotropies in variograms. 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.

At a deposit scale, the Gediktepe mineralization shows a relatively consistent strike, dip direction, and dip, corresponding to a 315° dip direction and 15° to 20° dip. Locally the dip orientations can be considerably more varied, particularly in long-section, often as a consequence of faulting. Dynamic anisotropy was applied to account for a limited number of variations from the default 315°/20° (dip direction/dip) orientation.

Block discretization during grade estimation was applied using a 4 by 4 by 2 (X/Y/Z) matrix.

Following grade estimation, any mineralization blocks that failed to receive an estimated grade were assigned default values using the same values as used for unsampled sample intervals (Table 14.11).

Background material, outside of the defined mineralization zones, is not considered for inclusion in the Mineral Resource estimates. However, Polimetal requested that available data be used to generate grade and density estimates in background model blocks. Since background material is located outside of the mineralization, grades and densities were partitioned according to lithologies (LTHZONE) and weathering (WEAZONE). Grades and densities were estimated using inverse distance squared weighting.

14.8 Model validation

A statistical and visual validation assessment of the block-model grade estimates was carried out by AMC to check that grade estimates conform to the sample composite data and that the estimates perform as expected.

Validation methods employed by AMC includes:

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

14.8.1 Visual assessment

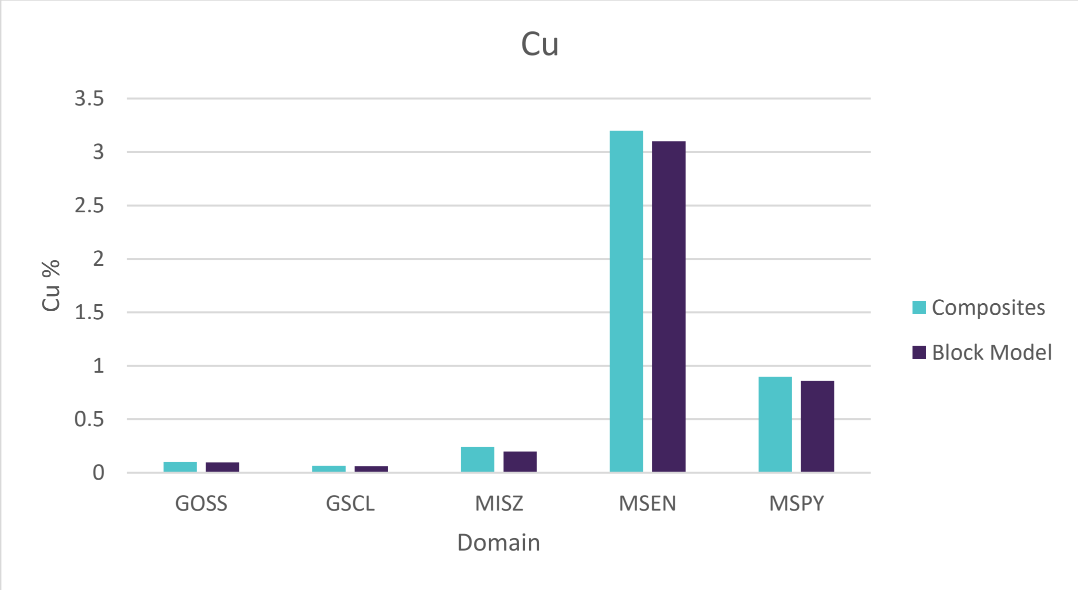
Visual checks of the grade estimates were carried out in plan, cross-section, and longitudinal section, correlating the sample composite grades against the block model estimated grades.

Overall, AMC considers the block model estimated grades to correlate with the sample composite data on which the estimates are based.

14.8.2 Global statistical grade validation

A global grade comparison (e.g. Figure 14.4) was carried out on a domain-by-domain basis, comparing the block model estimated grades against the sample composite data. 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.

Figure 14.4 Cu global grade comparison

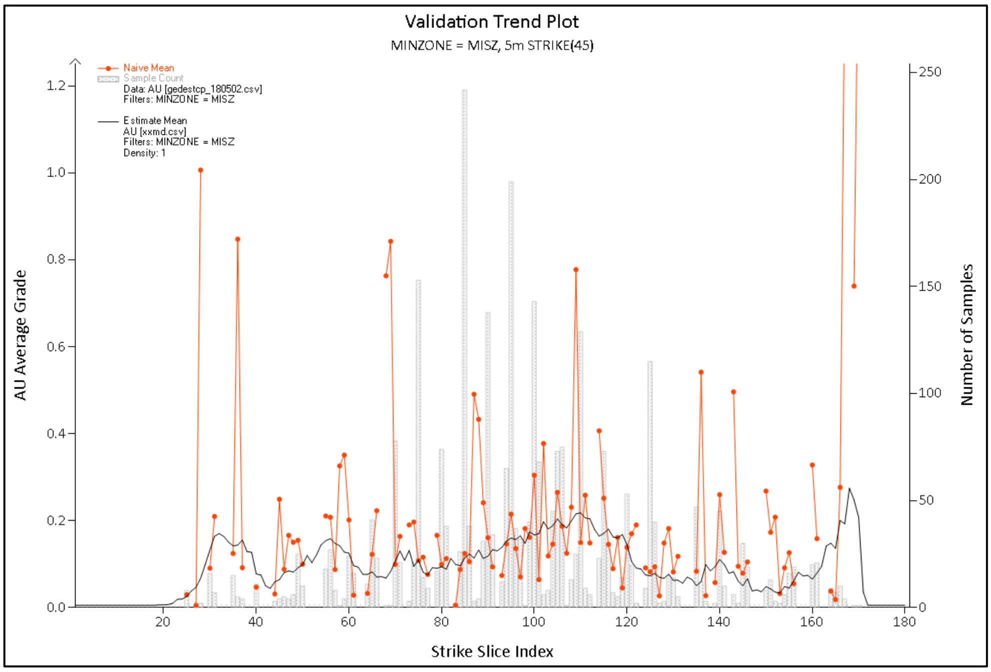


14.8.3 Grade profile analysis

To provide a greater resolution of detail than the global grade comparison, AMC 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.

Figure 14.5 is an example of the along strike swath plot for Cu grades in the MISZ domain.

Figure 14.5 Along strike Cu grade profile analysis results for MISZ domain



Overall, swath results show average estimated grades within each swath tracking with the mean composite grade, showing a good correlation between the estimates and the composite data.

14.8.4 Validation summary

Based on the visual and statistical validation checks carried out by AMC, no significant indications of overestimation or underestimation were identified. AMC considers the estimated block model grades to be a fair representation of the contributing sample composite data.

14.9 Classification

Procedures for classifying the reported resources were undertaken within the context of the JORC Code.

Estimated resources have been classified with consideration of the following general criteria:

- Confidence in the geological interpretation.
- Knowledge of grade continuities gained from observations and geostatistical analyses.
- Number, spacing and orientation of intercepts through mineralized zones.
- Quality and reliability of raw data (sampling, assaying, surveying).
- The likelihood of material meeting economic mining constraints over a range of reasonable future scenarios, and expectations of relatively high selectivity of mining.

Knowledge of geological and grade continuities, along with drilling densities, was used to identify the most likely areas for higher resource classification potential.

Geological considerations affecting confidence:

- Mineralization boundaries:
  - Sharpness within individual drill intersections.
  - Lateral continuities of between adjacent intersections (are boundaries easily correlated?).
- Continuities (or variabilities) of grades:
  - Within individual intersection profiles.
  - Lateral continuities (or variabilities) between adjacent intersections (are intersection profiles consistent?).
- Structural effects – faulting, folding.

Other indicators of confidence:

- Observations from statistical and variographic work – low/high CoV, quality of variogram structures, ranges, nuggets etc.
- Data quality and how it varies across the deposit.
- Output from the estimation process – e.g. number of samples, search ellipse pass.

All the above were considered with respect to the individual characteristics of each estimated grade and each defined zone (domain).

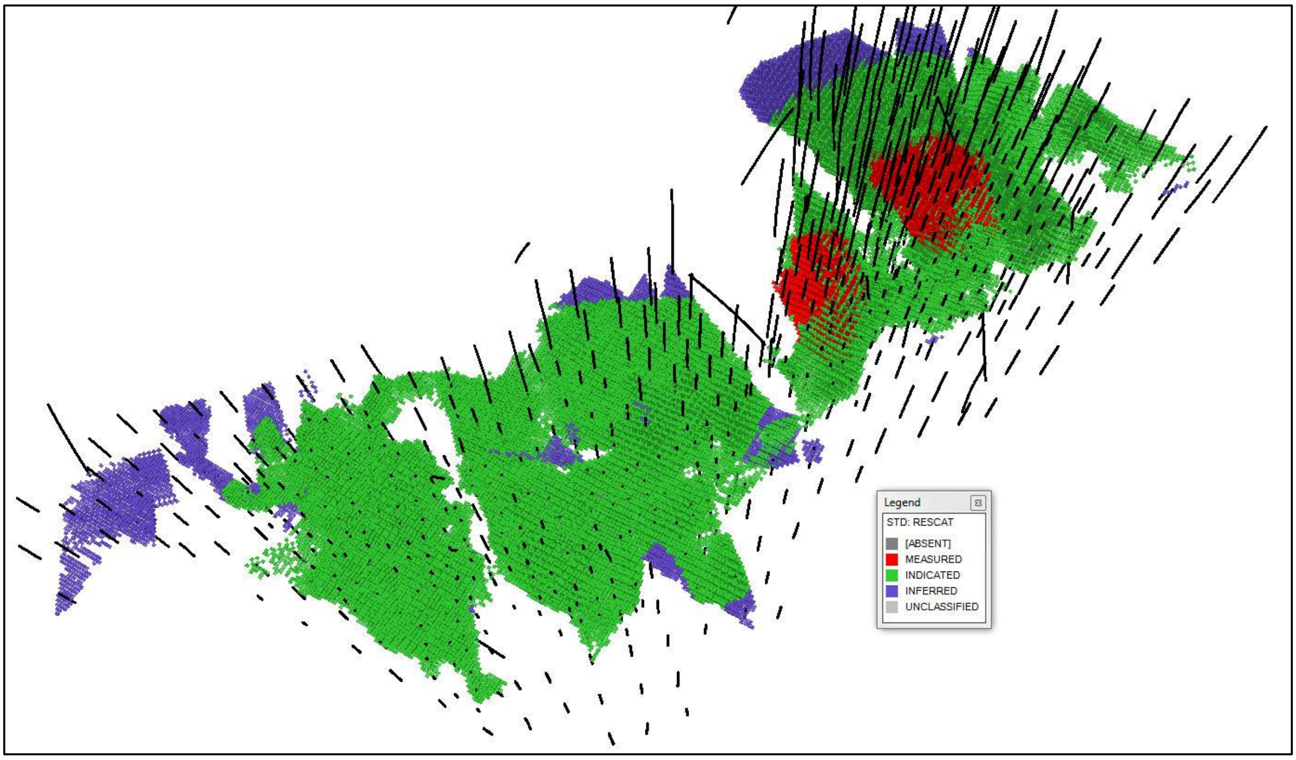
The enriched zone mineralization (MSEN) is unsuitable for processing in the proposed Sulphide Project processing plant and has a deleterious effect on recovery of metals from other sulphide minerals (massive and disseminated) processed with it. On this basis the MSEN domain mineralization has been excluded from the reported Mineral Resources.

The following classification criteria has been assigned to the Gediktepe resource model:

- Measured Mineral Resources: Limited to the massive pyrite (MSPY) domain in the northern part of the deposit, and where drillhole spacing is approximately 25 m.
- Indicated Mineral Resources: Assigned to all other mineralization domains estimated from sample composites with a sample spacing of up to approximately 45 m.
- Inferred Mineral Resources: Assigned to those parts of the modelled mineralization which have been estimated but do not meet the classification criteria for Measured or Indicated Mineral Resources. Typically corresponding to peripheral areas of mineralization.

An oblique view of the classifications applied to the block model is shown below in Figure 14.6.

Figure 14.6 Oblique view of part of the classified block model



Notes:

- View from above looking approximately north.
- Mineralized shell mineralization excluded.
- Some blocks obscured by overlying blocks.

Table 14.13 Estimation search parameters

ESTDOM	WEAZONE	Search distance (m)			Dip	Dip	Octant			Search 1		Search 2			Search 3			Max in
		Strike	Dip	X-str	Direct.		Min oct.	Min / oct	Max / oct	Min. comp	Max. comp	Expand	Min. comp	Max. comp	Expand	Min. comp	Max. comp	
GOSS		40	50	5	315	20	2	2	4	5	24	1.5	3	24	3	2	20	5
MSPY		40	50	5	315	20	2	2	4	5	24	1.5	3	24	3	2	20	5
MSEN		40	50	5	315	20	-	-	-	4	24	1.5	3	24	3	1	20	5
MISZ	WEAT	20	25	5	315	20	-	-	-	2	15	1.5	2	24	-	-	-	5
MISZ	FRSH	20	25	5	315	20	-	-	-	2	15	1.5	2	24	-	-	-	5
BKGR		50	50	10	315	20	-	-	-	2	15	1.5	2	24	3	1	20	-

14.10 Mineral Resource summary

Mr Nicholas Szebor is employed by AMC as UK General Manager and Principal Geologist and is the Competent Person for geology, exploration and Mineral Resources for Gediktepe.

Mineral Resources are reported based on a Net Smelter Return (NSR) basis. Separate NSR cut-offs are applied to each of the oxide and sulphide zones. A summary of the metal prices and metallurgical recoveries applied in the NSR calculation are summarized in Table 14.14 below.

In addition to the parameters in Table 14.14 the NSR calculation accounted for royalties, G&A costs, copper and zinc concentrate specifications, mining costs, processing costs, transportation costs, moisture content and NSR payment terms.

Table 14.14 Summary of NSR metal prices and metallurgical recoveries

Parameter		Unit	Value
Cu Price		US$/lb	4.17
Au Price		US$/oz	1,725
Ag Price		US$/oz	23
Zn Price		US$/lb	1.46
Oxide	Au Metallurgical Recovery (Oxide)	%	80
	Ag Metallurgical Recovery (Oxide)	%	45
Copper Concentrate Metallurgical Recoveries	Au, Ag, Cu, Zn, Pb, As (MSPY domain)		Regression formulas applied on a domain basis.
	Au, Ag, Cu, Zn, As (MISZ domain)		Regression formulas applied on a domain basis.
	Pb (MISZ domain)	%	40
Zinc Concentrate Metallurgical Recoveries	Au, Ag, Cu, Zn, Pb, As (MSPY domain)		Regression formulas applied on a domain basis.
	Cu, Zn, As (MISZ domain)		Regression formulas applied on a domain basis.
	Au (MISZ domain)	%	10
	Ag (MISZ domain)	%	20
	Pb (MISZ domain)	%	18.1

In order to report a Mineral Resource in accordance with the JORC Code (2012) there needs to be a reasonable prospect for eventual economic extraction (RPEEE). To meet this requirement, AMC has constrained the classified Gediktepe resources to those falling within an optimized pit shell, in which the metal price parameters used for the determination of Ore Reserves have been inflated by 14%, and where all categories of material have been included in the optimization.

Table 14.15 summarizes the Gediktepe Mineral Resources as of 31 March 2024.

Table 14.15 Gediktepe Mineral Resource Estimate Summary – 31 March 2024

Resource Classification	Tonnes (Mt)	Grade					Contained Metal			
		Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	Pb (%)	Au (koz)	Ag (Moz)	Cu (kt)	Zn (kt)
Measured Oxide	-	-	-	-	-	-	-	-	-	-
Indicated Oxide	1.3	2.79	67	0.11	0.1	0.44	113.0	2.7	1.4	1.1
Measured + Indicated (Oxide)	1.3	2.79	67	0.11	0.1	0.44	113.0	2.7	1.4	1.1
Inferred Oxide	0.01	0.90	23	0.08	0.1	0.17	0.4	0.01	0.01	0.01
Measured Sulphide	3.8	0.68	26	0.99	1.9	0.35	83	3.2	38	73
Indicated Sulphide	21.0	0.76	28	0.79	1.7	0.35	511	19.0	166	367
Measured + Indicated (Sulphide)	24.8	0.74	28	0.82	1.8	0.35	594	22.2	204	440
Inferred Sulphide	3.1	0.53	21	0.77	1.2	0.28	54	2.1	24	37
Total Measured (Oxide + Sulphide)	3.8	0.68	26	0.99	1.9	0.35	83	3.2	38	73
Total Indicated (Oxide + Sulphide)	22.3	0.87	30	0.75	1.7	0.36	624	21.7	167	368
Measured+Indicated (Oxide+Sulphide)	26.1	0.84	30	0.79	1.7	0.36	707	24.9	205	441
Total Inferred (Oxide + Sulphide)	3.1	0.53	21	0.77	1.2	0.28	54	2.1	24	37

Notes:
- JORC Code definitions were followed for Mineral Resources.
- Mineral Resources are inclusive of Mineral Reserves.
- Effective Date of Mineral Resource is 31 March 2024
- Mineral Resources are estimated at NSR cut-offs of US$19.00/t for oxide and US$23.90/t for sulphide.
- Mineral Resources constrained using optimized pit shell to reflect reasonable prospects of economic extraction.
- Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
- Totals may not match due to rounding.

14.11 Comparison of 2019 and 2024 Mineral Resource estimates

Table 14.16 provides a comparison between the updated 2024 Mineral Resource estimate, reported as of 31 March 2024, and the 2019 Mineral Resource estimate reported as of 5 March 2019.

The Mineral Resource block model used in both the 2019 and 2024 estimates is the same, with no updated sample data or revised grade estimates. Differences between the final reported Mineral Resource numbers reflects changes to the NSR calculations and cut-off grades, subsequent pit optimization constraints, and mining depletion since 5 March 2019.

The biggest change relates to the oxide mineralization which exhibits a 53% reduction in ore tonnages for Indicated material, and 43% for Inferred. The main driver for the change is the ongoing extraction and processing of oxide ore which has been depleting the oxide Mineral Resource since the previous 2019 Mineral Resource estimate.

Sulphide Mineral Resources show ore tonnage differences within ±7%. No significant mining has taken place within the sulphide Mineral Resources. Differences between the 2019 and 2024 Mineral Resource numbers reflects the differing input parameters for the NSR calculations, NSR cut-off grades and the pit optimization constraints.

Table 14.16 Comparison between 2019 and 2024 Mineral Resource estimates

Weathering Zone	Resource Version	Cut-Off (NSR$/t)	Classification	Tonnes (kt)	Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)
Oxide	2019	20.72	Measured	-	-	-	-	-
			Indicated	2,674	2.71	66	0.10	0.1
			Inferred	23	0.95	22	0.23	0.1
	2024	19.00	Measured	-	-	-	-	-
			Indicated	1,261	2.79	67	0.11	0.1
			Inferred	13	0.90	23	0.08	0.1
Sulphide(excl Enriched)	2019	17.79	Measured	3,999	0.67	25	1.01	1.8
			Indicated	22,637	0.72	27	0.76	1.7
			Inferred	2,958	0.53	20	0.76	1.2
	2024	23.90	Measured	3,838	0.68	26	0.99	1.9
			Indicated	20,991	0.76	28	0.79	1.7
			Inferred	3,135	0.53	21	0.77	1.2
Total 2019		**Measured+Indicated***		**30,217**	**0.91**	**31**	**0.80**	**1.6**
Total 2024		**Measured+Indicated***		**26,090**	**0.84**	**30**	**0.79**	**1.7**

Note: * Totals do not include Inferred

14.12 Conclusions

AMC is of the opinion that the Mineral Resource is a fair representation of the sample and geological data. AMC has carried out a series of visual and statistical validation checks on the Mineral Resource block model, comparing grade estimates against the sample data on which they are based. The validation checks show that the Au, Ag, Cu, Zn and Pb grade estimates correlate with the sample data.

The enriched mineralization presents a key risk to the project owing to its deleterious effect on processing recovery, and the potential to yield concentrates outside of saleable specifications. Whilst the enriched mineralization has been reasonably modelled and accounted for in the Mineral Resource estimate, suitable grade control procedures will be key to mitigating its impact during the mine operation. Grade control procedures will necessitate sufficient resources and time allocation to sample and define the enriched mineralization ahead of mining. Suitable blasting, ore demarcation (including enriched domains), and digging practices will be required to minimize the risk of enriched mineralization entering the plant feed, and to limit losses associated with the buffer mineralization around the enriched domain.

The mineralization shells (MISZ) modelled to capture the peripheral mineralization is less well defined than the other mineralization domains. Grade distributions within the MISZ domain is variable, with nuggety high grades encountered. A lack of defined grade populations precluded robust variogram models being established. AMC is of the opinion that the MISZ Mineral Resource estimates are reasonable, however, grade control sampling is warranted to better define grade variability at the short-range scale.

Where absent grades were present within the selected composite data, they were assigned default trace grade values. Less than 1% of the selected sample data informing the Mineral Resource grade estimates has absent grade data for Au, Ag, Cu, Pb, and Zn. The impact of replacing absent values with trace grades has no material effect on the overall reported Mineral Resources. At a local scale the impact of replacing absent intervals with trace grades may provide a more conservative estimate, however, this will be localized and the impact negligible.

Extensive density measurements have been completed enabling density to be estimated into the Mineral Resource block model. The density measurements are in line with the expected results for these types of geological units. Reviewing the density estimates AMC notes that the estimated values for the GOSS, MISZ, MSEN and MSPY domains fall within the density measurement ranges. Density estimates for the GSCL domain shows a limited number of blocks with density values exceeding (up to 3.25 t/m^3) the maximum density measurement of 2.88 t/m^3 for the domain. The over estimation of density values is likely due to the weighting received during the estimation process. If the blocks are capped at the maximum density value of 2.88 t/m^3 then the overall tonnage difference equates to 878 t. AMC is of the opinion that the impact on the Mineral Resources is negligible.

The Mineral Resource classifications are suitable and consider data quality, geological continuity, grade variability, and performance of the grade estimates. Areas classified as Measured are limited to the massive pyrite domain (MSPY), where there is good coverage by drilling data and a good understanding of geological and grade continuity. Areas classified as Indicated are well supported by drilling data, however, they exhibit greater grade and geological variability than the areas classified as Measured.

Mineral Resources have been reported on an NSR basis. Any changes to metal prices, costs, or recoveries will lead to revised reported Mineral Resource numbers. Metal prices for Ag, Cu and Zn appear reasonable. The Au price of US$1,725/oz appears conservative and may present some upside potential.

15 Ore Reserve estimate

15.1 Introduction

Polimetal engaged AMC for the 2022 FS to undertake mine planning and an Ore Reserve estimate for the Sulphide Project as a stand-alone operation. The mine plan was subsequently updated by AMC in late 2023 to include the Oxide Project production. The combined Oxide Project and Sulphide Project mine plan is documented in this section.

15.2 Ore loss and dilution analysis

Because of the variable geometry of the different ore zones comprising the sulphide mineralization, dilution and ore loss was modelled as a two-step process. A dilution skin was applied to enriched mineralization, a model regularization process was applied to account for loss and dilution in the remainder of the model.

Enriched mineralization is unsuitable for processing in the proposed Sulphide Project processing plant and has a deleterious effect on recovery of metals from other sulphide minerals (massive and disseminated) processed with it. The mine planning strategy for dealing with this material is to isolate a dilution skin of one metre around enriched mineralization to ensure that this material does not end up in the feed to the process plant. Blocks generated from the dilution skin that are above the cut-off value are referred to as buffer material. Mining will, therefore, accept loss of other sulphide mineralization as a preferred alternative to dilution with enriched mineralization.

The results of the dilution analysis show an overall average dilution of the deposit in tonnes of 14.4% and an ore loss of 8.8% (see Table 15.1) The resulting effect on contained metal shows that the diluted model contains from 94%-96% of the original undiluted resource model. AMC considers this to be a reasonable result and reflective of the expected mining recoveries.

Table 15.1 Dilution and ore loss tonnage and grade results

Description	Quantity[1] (Mt)	Resource Mt (%)	Grade			
			Cu (%)	Zn (%)	Au (g/t)	Ag (g/t)
Resource	34.4	–	0.72	1.48	0.83	28.4
Dilution	4.9	14.3	0.07	0.08	0.04	1.8
Ore Loss	3.0	8.8	0.63	0.85	0.49	17.9
Diluted ore	36.4	105.6	0.64	1.34	0.75	25.6

Note: [1] Not limited by a constraining pit shell

15.3 Pit slopes

Polimetal engaged Golder in 2018 to undertake geotechnical and hydrogeological engineering for the open pit and waste dump for the Oxide Project and the Sulphide Project, and provide recommendations for batter, berm and overall pit slope design. Golder developed geotechnical and groundwater models for the Gediktepe deposit, which were used to provide recommendations for pit slopes to be used for pit optimization and mine design. Golder identified five design sectors that affected geotechnical properties. Design parameters were provided for batter/berm configurations and maximum stack height in benches.

Open pit walls have been exposed for a period of up to four years, allowing performance monitoring and observation of the current open pit slopes, which has resulted in a revision to the pit slope recommendations for final and staged pit slope angles. The updated mine plan used the revised pit slope parameters developed by Polimetal shown in Table 15.2.

Table 15.2 Pit slope assumptions

Sector	Zone	Batter Angle (degrees)	Batter Height (m)	Berm Width (m)	Overall Slope (degrees)	No of Benches (no)
North-west	0	45	–	6.5	39	12
Weathered	1	45	–	5.7	39	12
Fresh	2	63.5	–	6.5	39	12
South-east wall	3	40	–	9	25	12
Below 1130 mRL	4	63	–	6.5	39	12

The pit will be mined in multiple stages affording the opportunity to expose walls and refine the designs as the pit develops.

15.4 Concentrate grades and metal recoveries

There are three metal products planned for production from Gediktepe:

- Oxide project – gold and silver bullion.
- Sulphide operation – copper concentrate.
- Sulphide operation – zinc concentrate.

Recoveries of gold and silver from the current Oxide Project from mining and processing oxide ore in the weathered zone are shown in Table 15.3.

Table 15.3 Metal recovery (oxide)

Metal	Units	Value
Gold	%	80
Silver	%	45

Source: Polimetal

Recoveries of copper, gold, and silver metal to copper concentrate by lithology were supplied by GRES and HMT from their analysis of recent and historical metallurgical testwork completed on Gediktepe ore and the proposed sulphide ore process plant flowsheet.

The detailed formulae used for the massive pyrite and disseminated sulphides ores were derived from HMT 2023 and are shown in Table 15.4.

For massive pyrite, the following applied:

- A correction was applied to convert MgO to Mg as the database uses Mg assays.
- Copper concentrate maximum copper recovery = 80%.
- Zinc concentrate, maximum Zn recovery = 82%.

For disseminated, the following applied:

- Copper concentrate maximum copper recovery = 80% and maximum lead assay of 14%.
- Zinc concentrate, maximum Zn recovery = 82% and minimum copper assay of 0.6%.

Table 15.4 Metal recoveries to concentrate

Copper Concentrate	Massive pyrite
Concentrate tonnes	TCu=Cu x RCu/GCu
Copper recovery	RCu= (2.84 x Cu + 3.908 x Cu/Zn + 5.779 x Mg + 55.982)/100
Copper grade	GCu=(8.913 x ln(Cu) + 25.964)/100
Lead grade	GPb=7.1596 x Cu/Pb^-1.237
Lead recovery	RPb=TCu*GPb/(T x Pb)
Zinc grade	GZn= 1.5085 x Zn

Copper Concentrate	**Massive pyrite**
Zinc recovery	RZn=TCu x GZn/(T x Zn)
Arsenic grade	GAs=2.738 x FAs + 0.07 x GZn-0.188 for FAs<0.5% and minimum GAs=0.037% GAs=8.3501 x FAs-0.2103 for FAs>0.5%
Gold grade	GAu= 10.287 x Au^2 + 4.4823 x Au - 0.1523
Gold recovery	RAu=TCu x GAu/(T x Au)
Silver grade	GAg= 0.969 x RPb
Silver recovery	RAg=TCu x GAg/(T x Ag)
Zinc Concentrate	-
Concentrate tonnes	TZn=Zn x RZn/GZn
Zinc recovery	RZn= (1.908 x Zn + 5.2537 x Mg - 13.805 x Cu/Zn - 90.069 x As + 77.44)/100
Zinc grade	GZn= (50.724 + 1.059 x Zn – 2.057 x Cu + 1.465 x Cu/Zn + 4.351 x Zn/S)/100
Copper grade	GCu= (2.984 x Cu – 0.456 x Zn + 0.504)/100
Copper recovery	RCu=TZn x GCu/(T x Cu)
Lead grade	GPb= 3.583 x Pb^0.9496
Lead recovery	RPb=TZn x GPb/(T x Pb)
Arsenic grade	GAs= 0.7595 x As
Arsenic recovery	RAs=TZn x GAs/(T x As)
Gold grade	GAu= 0.6452LN(Au) + 1.9281
Gold recovery	RAu=TZn x GAu/(T x Au)
Silver grade	GAg= 4.6702 x Ag
Silver recovery	RAg=TZn x GAg/(T x Ag)
Copper Concentrate	**Disseminated**
Concentrate tonnes	TCu=Cu x RCu/GCu
Copper recovery	RCu= (24.992LN(Cu) + 91.639)/100 for Rcu<80% Rcu= 80% for (24.992LN(Cu) + 91.639)/100)>80%
Copper grade	GCu= 27.8% Cu
Lead grade	GPb= 34.44 x Pb – 0.5516
Lead recovery	RPb=TCu*GPb/(T x Pb)
Zinc grade	GZn= 1.1401LN(Zn) + 2.487
Zinc recovery	RZn=TCu x GZn/(T x Zn)
Arsenic grade	GAs=0.0153 EXP(36.708 x FAs) for FAs<0.06%
	GAs=1.0572 ln FAs+4.0843 for FAs>=0.06%
Gold grade	GAu= 10.287 x xAu^2 + 4.4823 x Au – 0.1523
Gold recovery	Rau=Tcu x Gau/(T x Au)
Silver recovery	Rag= 0.969 x RPb
Zinc Concentrate	-
Concentrate tonnes	TZn=Zn x RZn/GZn
Zinc recovery	RZn= (78.513 + 0.294 x Zn + 0.249 x Cu/Pb – 15.298 x Cu/Zn)/100
Zinc grade	GZn= (63.169 + 1.014 x Zn + 0.375 x Cu/Pb – 11.233 x Cu/Zn – 5.187 x Mg)/100
Copper recovery	RCu= (0.972 – 30.934 x Pb + 11.006 x Cu +2.283 x Zn – 0.096 x Cu/Pb)/100
Lead grade	GPb= 9.0447 x Pb
Lead recovery	RPb=TZn x GPb/(T x Pb)
Arsenic grade	GAs= 1.0957 x As
Arsenic recovery	RAs=TZn x GAs/(T x As)
Gold grade	GAu= 0.6452Ln(Au)+1.9281
Gold recovery	RAu=TZn x GAu/(T x Au)
Silver grade	GAg= 4.6702 x Ag
Silver recovery	RAg=TZn x GAg/(T x Ag)

15.5 Operating costs

Operating costs for pit optimization are summarized into mining, ore processing, G&A, and sustaining capital (TSF) costs in Table 15.5.

Table 15.5 Operating costs

Parameter	Units	Value	Source
Mining contractor cost	US$/t mined	1.20	Polimetal
Oxide ore processing costs	US$/t feed	10.32	GRES
Sulphide ore processing cost	US$/t feed	19.24	GRES
G&A costs	US$/t feed	6.84	GRES
Sustaining capital costs	US$/t feed	0.07	GRES

Mining contractor costs were provided by Polimetal based on the current mining contract at Gediktepe for the Oxide Project mining and processing operation and are expressed as a flat unit cost per tonne mined (US$/t mined). Owner mining costs (technical, administration and supervisory) were not included in pit optimization.

Oxide and sulphide ore processing, G&A, and sustaining capital costs were estimated by GRES from fixed and variable cost inputs and are expressed as a variable unit cost per tonne of ore processing feed (US$/t feed).

Oxide Project fixed and variable ore processing costs developed by GRES that were used for pit optimization are shown in Table 15.6, converted to a variable unit cost assuming an annual process plant throughput of 1.095 Mtpa. Annual operating costs will vary with processing throughput.

Sulphide ore processing costs developed by GRES that were used for pit optimization are shown in Table 15.7, converted to a variable unit cost assuming an annual process plant throughput of 1.85 Mtpa. Operating costs were estimated in Q2 2022. Annual operating costs will vary with processing throughput.

AMC reviewed the operating costs provided and considers that they are a suitable basis for pit optimization.

Table 15.6 Oxide Project process operating costs (Q2 2022)

Cost Category	Total Cost (US$'000 pa)	Total Cost (US$/t feed)	Fixed Cost (US$'000)	Variable Cost (US$/t feed)	% of Operating Cost
Processing					
Salaries/Labour	4,372	3.99	4,372		16
Power	2,424	2.21	1,875	0.50	9
Reagents & Consumables	13,035	11.90	2,286	9.82	46
Maintenance	1,994	1.82	1,994		7
General	2,505	2.29	2,505		9
Sub-Total Processing	24,331	22.22	13,032	10.32	87
Administration					
Salaries/Labour	3,004	2.74	3,004		11
Maintenance	161	0.15	161		1
General	579	0.53	579		2
Total	**28,075**	**25.64**	**16,776**	**10.32**	**100**
Sustaining Capital	**131**	**0.01**	**-**		

Table 15.7 Sulphide process operating costs (Q2 2022)

Cost Category	Total Cost (US$'000 pa)	Total Cost (US$/t feed)	Fixed Cost (US$'000)	Variable Cost (US$/t feed)	of Operating Cost
Processing					
Salaries/Labour	3,590	1.97	3,590		8
Power	10,129	5.55	8,937	0.65	24
Reagents & Consumables	20,772	11.38	1,343	10.65	48
Maintenance	3,559	1.95	3,559		8
General	1,963	1.08	1,963		5
Sub-Total Processing	40,012	21.92	19,392	11.30	93
Freight (Conc to Izmir)	294	0.16		0.16	1
Administration					
Salaries/Labour	2,382	1.30	2,382		6
Maintenance	23	0.01	23		0
General	281	0.15	281		1
Total	**42,992**	**23.56**	**22,077**	**11.46**	**100**

Concentrate related cost assumptions are discussed in section 19.

15.6 Metal pricing and offsite costs

Metal prices and revenue factors used for pit optimization and economic evaluation, such as metal payability, royalty, and treatment and refining costs were supplied by Polimetal and Link based on experience of current contracts. Revenue factors are summarized in the marketing section and Table 15.8.

Table 15.8 Metal prices, royalties and treatment costs

Metal	Metal Price	Payability Lesser of		Royalty (% Metal Price)	Treatment and Refining Cost
Copper concentrate					US$90/dmt
Copper	US$3.63/lb	96.5%	Cu -1%	6.0	US$0.09/lb Cu
Gold	US$1,500/oz	90%	Au – 1 g/t	4.8	US$10.00/oz Au
Silver	US$20.00/oz	90%	Ag – 30 g/t	3.6	US$1.00/oz Ag
Zinc concentrate					US$200/dmt
Zinc	US$1.27/lb	85%	Zn – 8%	4.5	-
Gold	US$1,500/oz	70%	Au – 1 g/t	4.8	US$10.00/oz Au
Silver	US$20.00/oz	70%	Ag – 108.862 g/t	3.6	US$1.00/oz Ag

Source: Link and Polimetal.

Off-site concentrate costs (treatment costs) are typically expressed as a cost per dry metric tonne (US$/dmt) and on-site concentrate costs as a cost per wet metric tonne (US$/wmt). Concentrate moisture is assumed as 9.0%.

Royalties are based on a sliding scale based on the sale price. A State Area royalty is also applicable, discounted by 40% for gold and silver and 50% for copper and zinc to account for the value added to ROM ore by processing.

AMC has reviewed the revenue factors, concentrate assumptions, and concentrate costs (see section 19) and considers that they are a reasonable basis for the FS. A discount rate of 10% per annum was used to estimate discounted cash flows.

15.7 Cut-off to define ore

The net smelter return (NSR) cut-off value used in the mine plan to distinguish between ore and waste rock is the non-mining, break-even value, taking into account metallurgical recovery, site operating costs including processing and G&A, treatment and refining, royalties, and revenues from sales of concentrate. The cut-off grade varies by ore type (oxide, massive pyrite, disseminated, and enriched), but equates to approximately 0.6% Cu at the average copper recovery of 68% for the deposit, without counting revenue contribution from zinc concentrate or gold and silver credits.

The breakeven cut-off value was calculated using the following formulae:

Cut-off value = Cost of ore/Value of ore

Cost of ore = Processing cost + G&A cost + Sustaining capital

Value of ore = Sales price x Recovery x Payability x (1-Royalty) – Treatment cost - Penalties

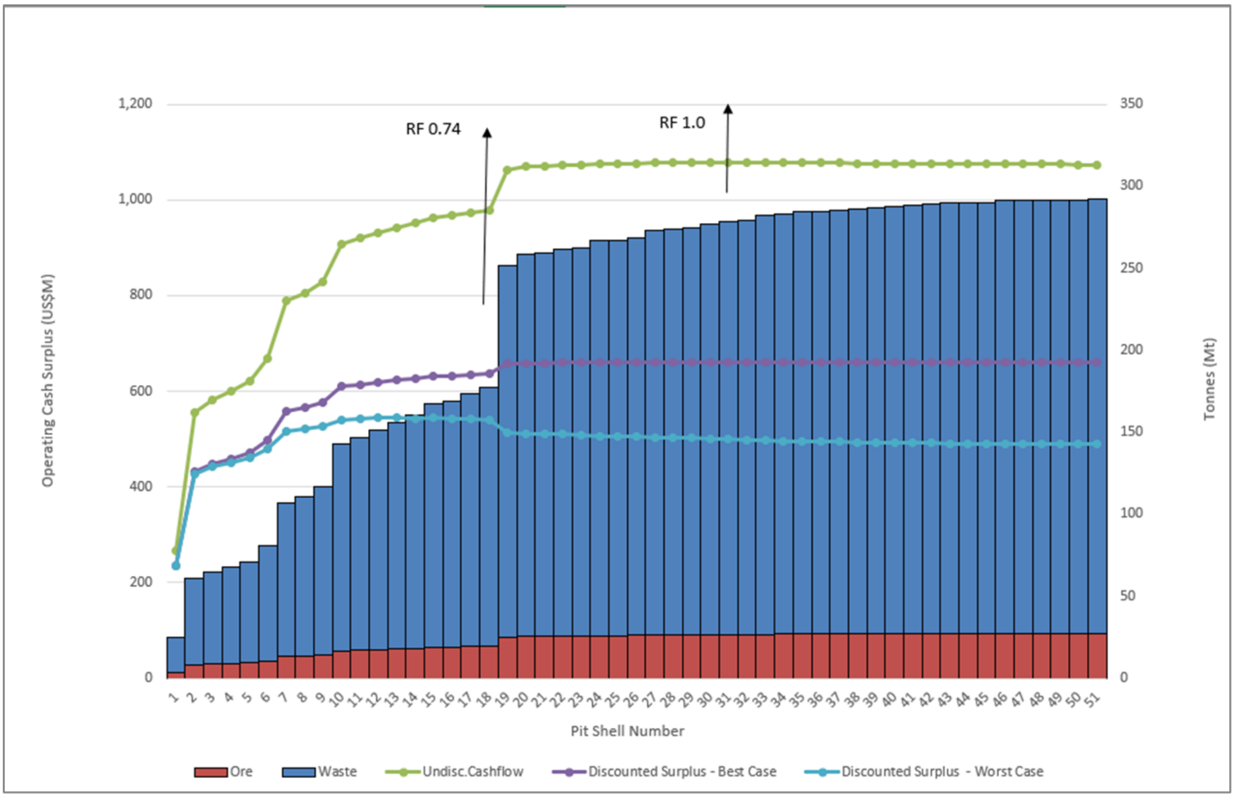
15.8 Pit optimization

Economic limits for the Gediktepe deposit were generated from Whittle Four-X (W4X) pit optimization software, using Measured and Indicated Mineral Resource only, with Inferred, enriched and boundary ore treated as waste.

Polimetal selected the 74% revenue factor (RF 0.74) pit optimization shell to guide the Gediktepe final sulphide pit design. Included within this pit is 2.1 Mt of oxide ore at 2.2 g/t Au and 1.7 g/t Ag that will primarily be mined by the current Oxide Project mining and processing operation. At the planned throughput rate of 1.85 Mtpa, this gives an ore processing life of nearly 10 years. The RF 0.74 pit shell is a more conservative pit than the RF 1.0 pit shell and contains 96% of the best case discounted value of the RF 1.0 pit shell.

Full pit shell by pit shell optimization results are shown in Figure 15.1.

Figure 15.1 Pit shell by pit shell discounted cash flow and pit inventory



15.9 Pit design

The final pit design, based on the RF 0.74 pit shell, is approximately 1,500 m long, 950 m wide, 135 m deep from the pit exit at 1,220 mRL, and 394 m deep from the highest point on the north wall. There are multiple pit exits, with pit exits designed to exit on the south-west corner of the pit and located adjacent to both the ROM pad and the waste dump. A 25 m minimum mining width was generally used for pit development.

The pit is accessed by a two lane (15 m wide and 10% gradient) dual ramp system for the first 390 m from the pit exit (10 mRL) and a single ramp to the ultimate pit base.

The final pit design is shown in Figure 15.2.

Five pit stages were designed for scheduling purposes to smooth out material movement requirements, guided by pit optimization results. The first stage of the pit design is the oxide pit (see Figure 15.3), to be completed before sulphide mining can begin, although waste pre-strip of the initial sulphide pit stage will be required during Oxide Project operations. This pit was subdivided into three sub-pits for scheduling purposes to minimise the amount of sulphide ore mined prior to commencement of the sulphide processing plant. The plan layout of pit stages is shown in Figure 15.4 and in a W-E section in Figure 15.5, colour coded by pit stage.

Figure 15.2 Final pit design

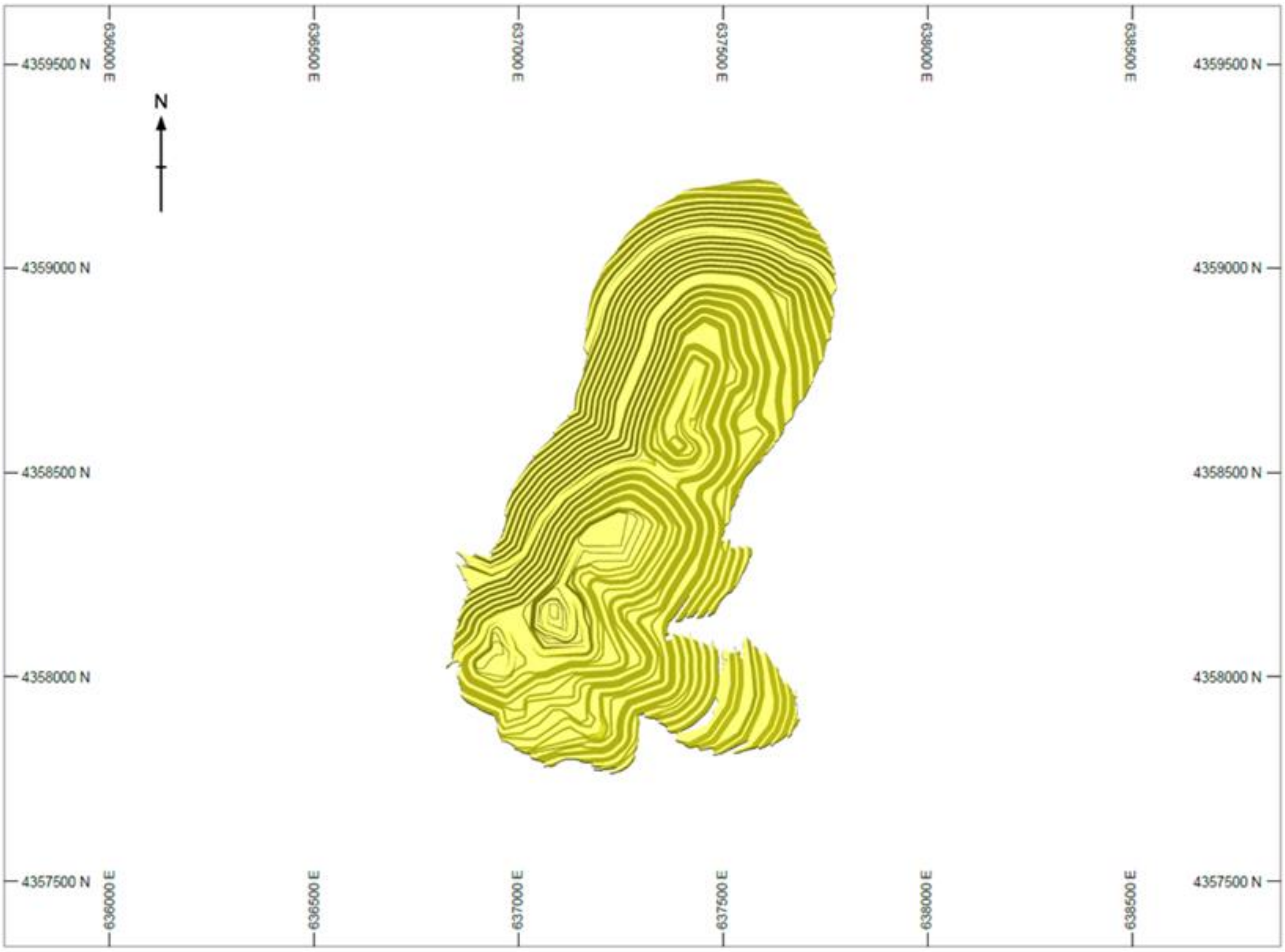


Figure 15.3 Stage 1 (oxide) pit design

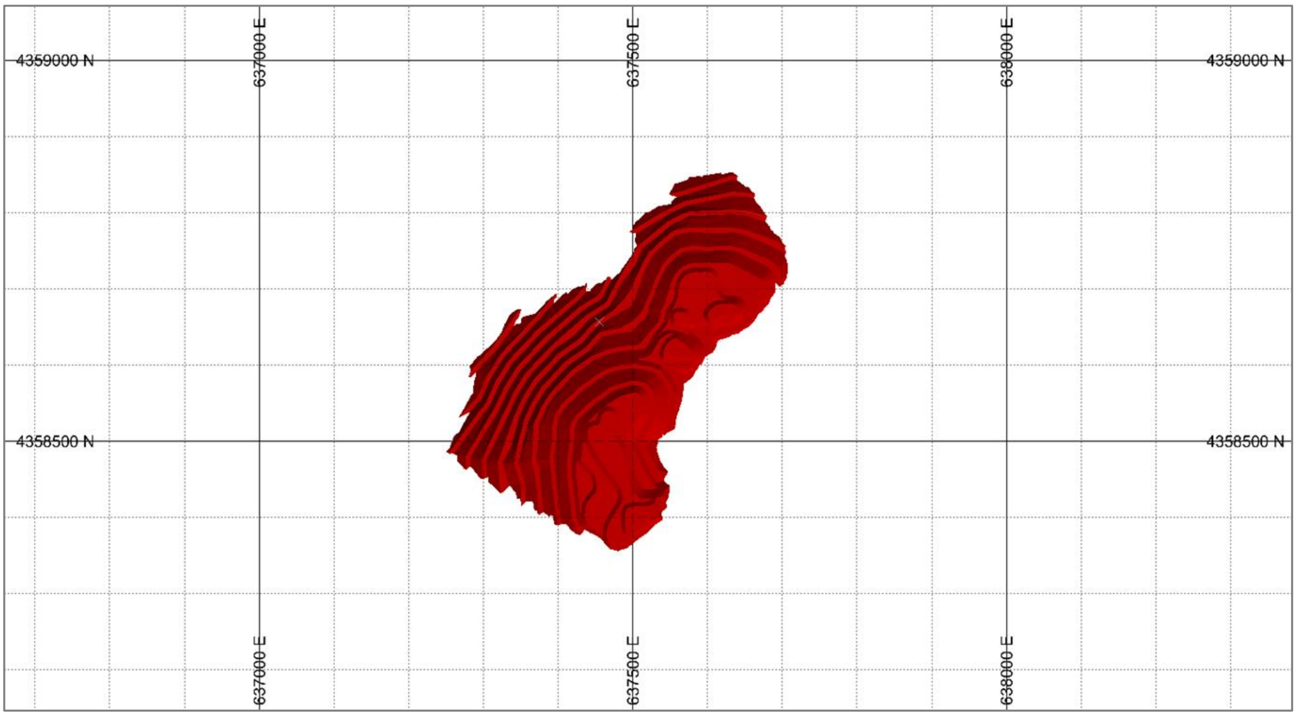


Figure 15.4 Pit stage layout

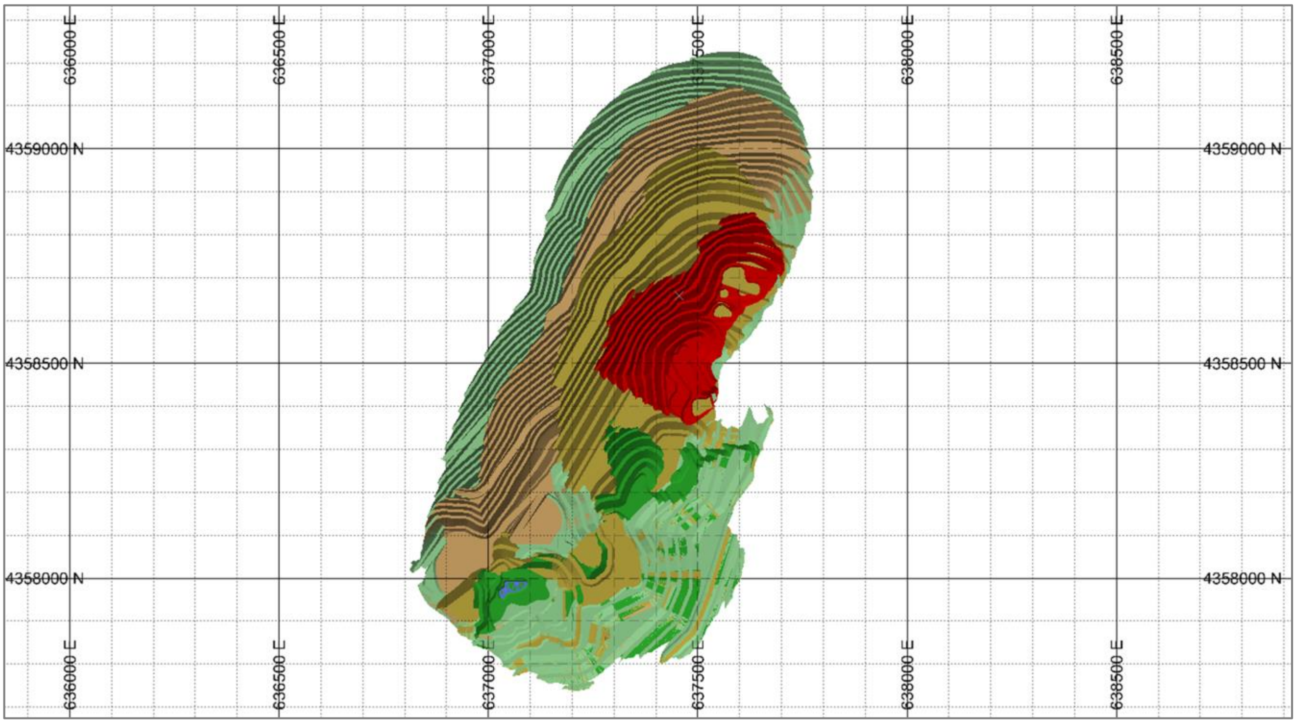
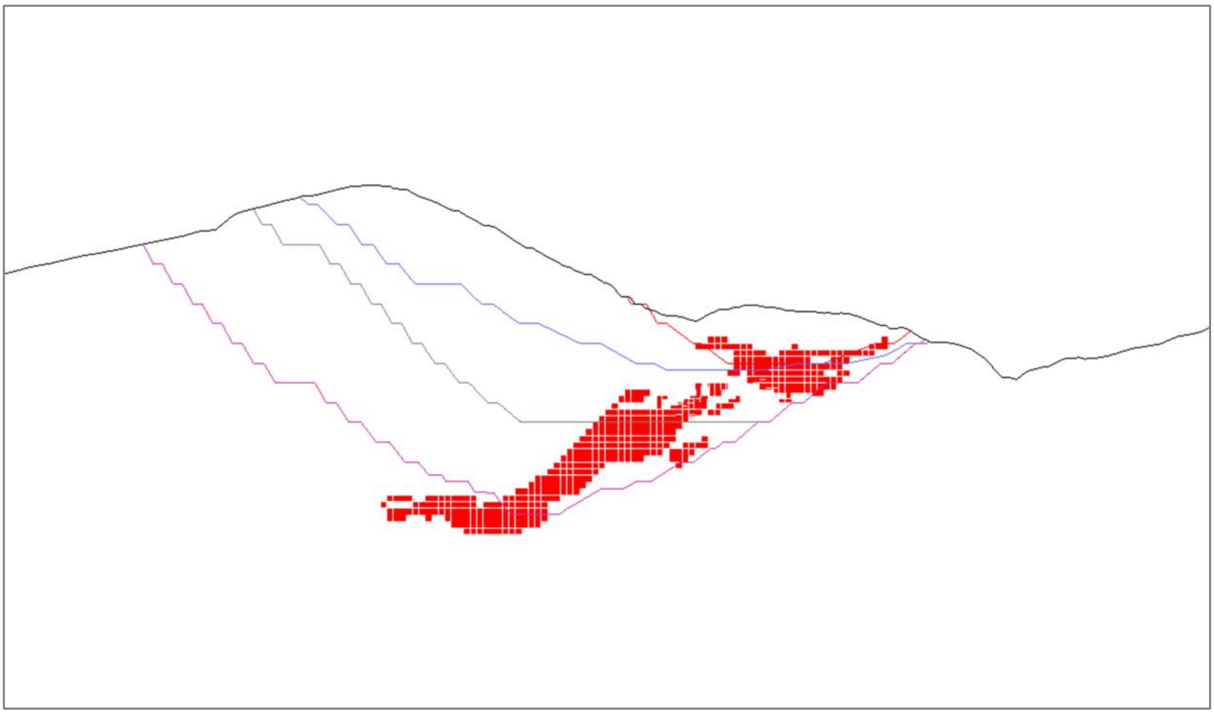


Figure 15.5 West to east section through pit stages



15.10 Pit inventory

The inventory of the pit designs by pit stage and by weathering zone is shown in Table 15.9. Ore mined prior to the process plant commissioning was considered as waste and excluded from the ore inventory. Buffer material and enriched mineralization is included in waste, although buffer material is subsequently included opportunistically in processing schedules.

Table 15.9 Pit inventories

Description	Units	Pit 1	Pit 2	Pit 3	Pit 4	Pit 5	Pit 6	Pit 7	Total
Oxide									
Ore Tonnes	kt	388	769	119	73	47	24	0	1,420
Gold Grade	g/t	2.02	2.20	1.63	1.88	0.85	0.39	0.32	2.01
Contained Gold	koz	25.2	54.5	6.3	4.4	1.3	0.3	0.0	91.9
Silver Grade	g/t	52.80	50.43	36.93	40.81	25.06	28.04	14.17	48.24
Contained Silver	koz	659.4	1,246.1	141.7	95.4	37.6	21.3	0.1	2,201.6
Waste Tonnes	kt	434	748	970	4,728	3,026	3,007	2,797	15,710
Strip Ratio	W(t):O(t)	1.1	1.0	8.1	65.0	64.8	127	18,182	11.1
Total Tonnes	kt	823	1,517	1,089	4,801	3,073	3,031	2,797	17,130
Sulphide									
Ore Tonnes	kt	211	376	1,469	958	2,030	7,886	4,192	17,122
Copper Grade	%	0.75%	0.96%	0.71%	0.81%	1.06%	0.70%	0.71%	0.76%
Contained Copper	kt	1.6	3.6	10.5	7.7	21.6	55.3	29.8	130.1
Gold Grade	g/t	1.17	0.81	0.63	0.87	0.68	0.89	0.77	0.82
Contained Gold	koz	8.0	9.8	29.6	26.7	44.3	226.8	104.1	449.3
Silver Grade	g/t	40.05	27.68	26.11	33.60	23.90	33.46	28.48	30.44
Contained Silver	koz	271.8	334.3	1,233.1	1,035.2	1,559.9	8,484.0	3,839.1	16,757.6
Zinc Grade	%	1.20%	0.65%	1.39%	2.52%	1.24%	2.18%	1.99%	1.93%
Contained Zinc	kt	2.5	2.4	20.4	24.1	25.2	172.1	83.4	330.1
Arsenic Grade	%	0.06%	0.06%	0.05%	0.07%	0.06%	0.06%	0.05%	0.06%
Lead Grade	%	0.26%	0.16%	0.21%	0.44%	0.23%	0.45%	0.40%	0.38%
Waste Tonnes	kt	493	1,392	2,214	9,776	24,289	45,126	41,761	125,051
Strip Ratio	W(t):O(t)	2.3	3.7	1.5	10.2	12.0	5.7	10.0	7.3
Total Tonnes	kt	704	1,768	3,683	10,734	26,319	53,012	45,953	142,173

15.11 Mine scheduling

15.11.1 Mine scheduling parameters

Mine scheduling was undertaken for Gediktepe assuming that the current Oxide Project mining and processing operation would be undertaken first and the sulphide mining and processing operation would follow. Quarterly mine and ore processing production schedules were completed for Gediktepe in Minemax software. These were converted to monthly schedules for the first five years followed by quarterly schedules for the LOM.

The following scheduling parameters were used.

Ore processing

- The schedule starts in March 2024.
- Oxide Project ore processing rate of 216 kt per quarter.
- Sulphide Project ore processing rate of 450 kt per quarter.
- Seven quarters of oxide mining and processing while the sulphide ore process plant is constructed and waste pre-stripping for the sulphide operation is undertaken.
- Enriched sulphide is treated as waste.
- Boundary ore (one metre skin of enriched mineralization) can be up to 10% of the feed.
- Sulphide processing starts in October 2024.

Mining

- Annual mine production limit of 25 Mt of total rock.
- Because of the high reactivity of the ore, no ore stockpiling is assumed. Any ore mined before the sulphide ore process plant is ready is assumed as waste.
- Target mining ramp up:
  - Maximum (2027-2028) - 23 Mt.
- Vertical rate of advance 25 m per quarter.

15.11.2 Mine schedule results

Mine scheduling was able to identify a viable mine production schedule for 11 years of mining and sulphide ore processing that achieved the following:

- Mill feed schedule of 1.8 Mtpa met with no interruptions to ore supply.
- Process plant annual feed Cu grade from 0.65% to 1.37%, zinc from 1.4% to 2.5%, gold from 0.64 g/t to 1.0649 g/t, and silver from 22 g/t to 39 g/t.
- Total material movement mining ramp up to 23 Mtpa by year 2.
- Vertical rate of advance limit maintained.

Sulphide mineralization was subdivided into buffer mineralization (up to 10% of process feed), enriched mineralization (not processed), and sulphide mineralization (massive pyrite and disseminated, all process feed).

Concentrate production was subdivided into standard concentrate (generated from sulphide ore) and enriched/buffer concentrate (generated from buffer, up to 10% and enriched, 0%).

Results of schedules are summarized in Figure 15.6 to Figure 15.8 and Table 15.10.

Figure 15.6 Gediktepe annual material movement

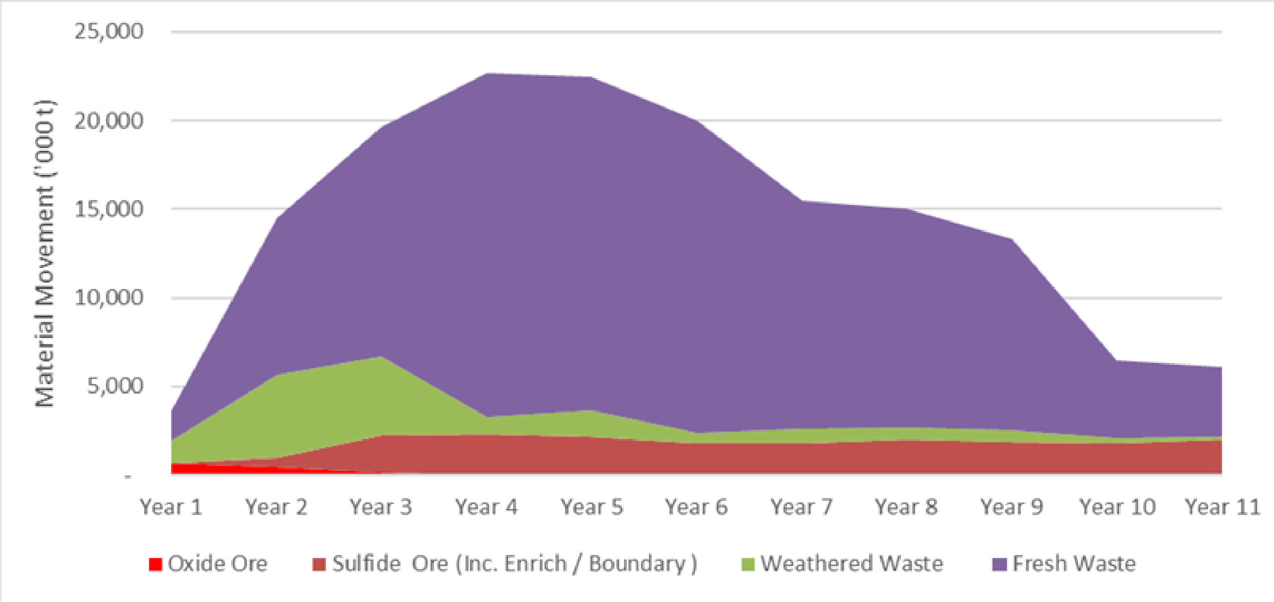


Figure 15.7 Gediktepe annual concentrate production (dry)

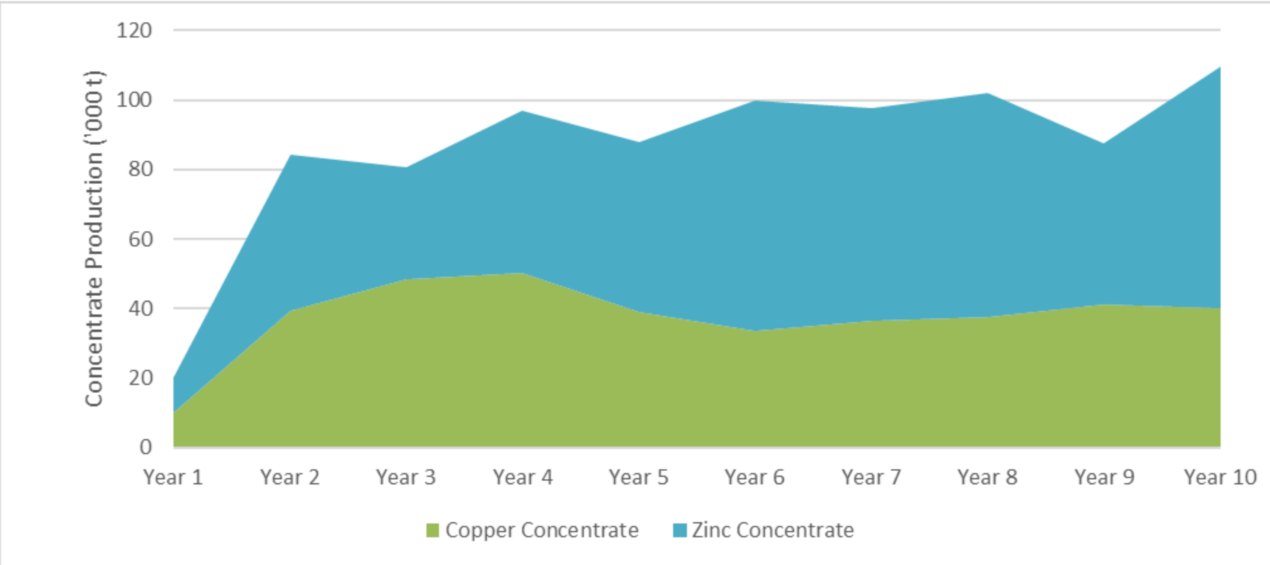


Figure 15.8 Gediktepe annual copper and zinc metal production

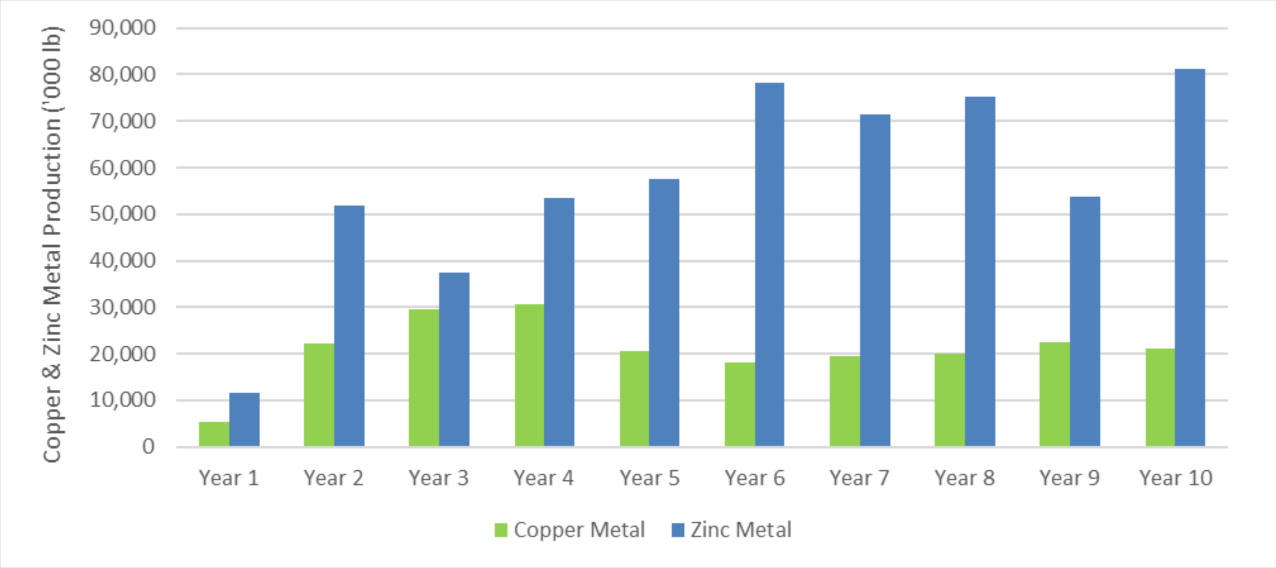


Figure 15.9 Gediktepe annual gold and silver metal production

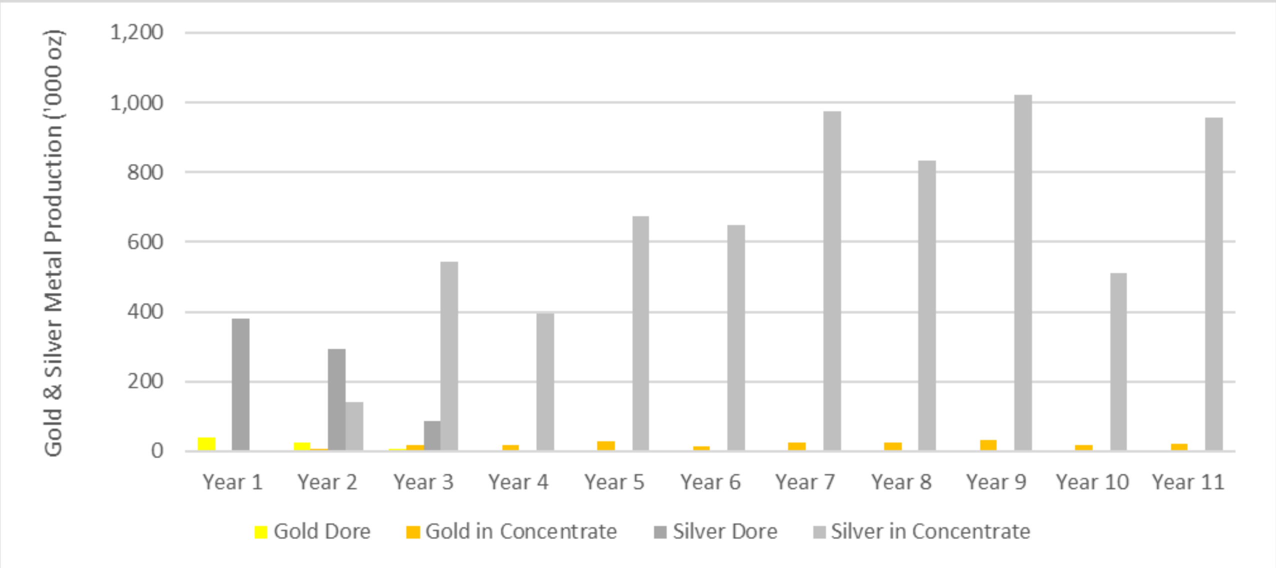


Table 15.10 Gediktepe annual mine schedule summary

Description	Units	Totals $'000	2024 Year 1	2025 Year 2	2026 Year 3	2027 Year 4	2028 Year 5	2029 Year 6	2030 Year 7	2031 Year 8	2032 Year 9	2033 Year 10	2034 Year 11
Mine Production													
Oxide Ore	kt	1,363	700	485	177	-	-	-	-	-	-	-	-
Oxide Grade Au	g/t	2.08	2.21	1.99	1.83	-	-	-	-	-	-	-	-
Oxide Grade Ag	g/t	50	48.38	53.68	42.75	-	-	-	-	-	-	-	-
Sulfide Ore (Inc. Enrich / Bounda	kt	18,436	-	515	2,062	2,318	2,166	1,821	1,837	2,032	1,853	1,800	2,031
Sulfide Grade Cu	%	0.89	0.00	0.80	0.90	1.37	1.26	0.72	0.66	0.82	0.73	0.77	0.65
Sulfide Grade Zn	%	1.96	0.00	1.54	1.73	1.43	1.83	1.84	2.50	2.24	2.35	1.73	2.26
Sulfide Grade Au	g/t	0.83	0.00	0.85	0.71	0.71	0.95	0.64	0.98	0.91	1.06	0.69	0.81
Sulfide Grade Ag	g/t	31	0.00	34	30	24	33	25	38	35	39	22	33
Weathered Waste	kt	15,710	1,100	4,668	4,461	950	1,467	584	749	634	702	288	107
Fresh Waste	kt	123,794	1,851	8,832	12,915	19,442	18,810	17,595	12,914	12,333	10,759	4,377	3,967
Total Material	kt	159,302	3,651	14,500	19,615	22,710	22,443	20,000	15,500	15,000	13,314	6,465	6,104
Process Plant Production													
Oxide Ore	kt	1,363	700	485	177	-	-	-	-	-	-	-	-
Oxide Grade Au	g/t	2.08	2.21	1.99	1.83	-	-	-	-	-	-	-	-
Oxide Grade Ag	g/t	49.53	48.38	53.68	42.75	-	-	-	-	-	-	-	-
Sulfide Mill Ore	kt	17,340	0	494	1,876	1,880	1,882	1,817	1,828	1,905	1,828	1,800	2,031
Sulfide Grade Cu	%	0.77	0.00	0.71	0.78	0.98	1.02	0.72	0.65	0.67	0.71	0.77	0.65
Sulfide Grade Zn	%	1.94	0.00	1.46	1.70	1.30	1.75	1.84	2.50	2.17	2.36	1.73	2.26
Sulfide Grade Au	g/t	0.81	0.00	0.82	0.70	0.66	0.90	0.64	0.98	0.87	1.06	0.69	0.81
Sulfide Grade Ag	g/t	30.45	0.00	32.70	28.81	21.44	31.30	25.47	38.08	33.11	39.08	22.43	33.44
Ore contained Metal													
Copper	klb	294,163	0	7,728	32,169	40,526	42,140	28,727	26,395	28,088	28,655	30,460	29,274
Zinc	klb	743,312	0	15,928	70,330	53,957	72,521	73,745	100,902	91,130	95,035	68,591	101,172
Gold	koz	544	50	44	53	40	54	38	58	53	62	40	53
Silver	koz	19,148	1,089	1,357	1,982	1,295	1,893	1,488	2,238	2,028	2,296	1,298	2,183
Metal Recovered to Dore													
Gold	koz	73	40	25	8	0	0	0	0	0	0	0	0
Silver	koz	760	381	293	85	0	0	0	0	0	0	0	0
Sulfide concentrate Recovered Metal													
kTonnes Copper Conc.		375	0	10	39	48	50	39	33	36	38	41	40
Copper	klb	209,279	0	5,310	22,110	29,564	30,643	20,511	18,084	19,571	20,111	22,362	21,013
Gold	koz	178	0	5	15	15	27	12	21	21	28	15	18
Silver	koz	3,615	0	93	329	231	366	315	508	454	537	270	511
kTonnes Zinc Conc.		491	0	10	45	32	47	49	66	61	64	46	70
Zinc	klb	571,574	0	11,739	51,831	37,334	53,518	57,480	78,220	71,451	75,170	53,709	81,123
Gold	koz	29	0	1	2	2	3	3	4	4	4	3	4
Silver	koz	3,084	0	48	215	165	306	333	467	379	485	239	446

15.12 Ore Reserve

Table 15.11 shows the Gediktepe 31 March 2024 open pit Ore Reserve estimate, classified and reported in accordance with the JORC Code.

Table 15.11 Gediktepe open-pit Ore Reserve estimate at 31 March 2024

Ore Reserve Classification	Ore Tonnes (Mt)	Copper Grade (%)	Zinc Grade (%)	Gold Grade (g/t)	Silver grade (g/t)	Contained Metal			
						Copper (Mlb)	Zinc (Mlb)	Gold (Moz)	Silver (Moz)
Oxide									
Proved	-	-	-	-	-	-	-	-	-
Probable	1.4	-	-	2.0	48	-	-	93	2.2
Total	1.4	-	-	2.0	48	-	-	93	2.2
Sulphide									
Proved	3.4	0.92	1.9	0.67	25	70	140	70	2.7
Probable	13.7	0.72	1.9	0.85	32	220	590	380	14
Total	17.1	0.76	1.9	0.82	30	290	730	450	17

Notes:
- Totals may not equal the sum of the component parts due to rounding adjustments.
- Ore tonnes are rounded to 0.1 Mt and grade and contained metal to two significant figures.
- Estimates use forecast metal prices of US$3.63/lb Cu, US$1.27/lb Zn, US$1,500/oz Au and US$20/oz Ag.
- Estimates based on an expected value calculation to report tonnages above a zero US$/t net expected value.

Approximately 141 Mt of associated waste material will be mined including mineralized waste, resulting in a waste material to Ore Reserve ratio of 7.6 to 1.0 (t:t). Sulphide ore mined before the sulphide processing plant is commissioned is treated as waste and removed from the Ore Reserve. Enriched mineralization and buffer material is included in the fresh waste.

15.13 Comparison of 2019 and 2024 Ore Reserve estimates

The previous Gediktepe open pit Ore Reserve (Mineral Reserve estimate reported using CIM definitions under NI 43-101) was on 5 March 2019 as part of the Gediktepe 2019 Prefeasibility Study[2] (see Table 15.12, AMC has used JORC Code terms and the same units and rounding as above for ease of comparison.

Table 15.12 Gediktepe open-pit Ore Reserve estimate at 5 March 2019

Ore Reserve Classification	Ore Tonnes (Mt)	Copper Grade (%)	Zinc Grade (%)	Gold Grade (g/t)	Silver grade (g/t)	Contained Metal			
						Copper (Mlb)	Zinc (Mlb)	Gold (Moz)	Silver (Moz)
Oxide									
Proved	-	-	-	-	-	-	-	-	-
Probable	2.8	-	-	2.3	57	-	-	207	5.0
Total	2.8	-	-	2.3	57	-	-	207	5.0
Sulphide									
Proved	3.6	1.03	1.9	0.68	27	70	140	70	2.7
Probable	15.0	0.89	1.9	0.89	33	220	590	380	14
Total	18.6	0.92	1.9	0.85	32	290	730	450	17

[2] OreWin Pty Ltd, March 2019, Gediktepe Prefeasibility Study for Alacer Gold Corp.

The main change since the 2019 estimate is due to mining and processing depletion of the Oxide and an updated resource model resulting in a change to the final pit design. A comparison of the two estimates is shown in Table 15.13.

Table 15.13 Comparison between 2019 and 2024 Ore Reserve estimates

Ore Reserve Classification	Ore Tonnes (Mt)	Copper Grade (%)	Zinc Grade (%)	Gold Grade (g/t)	Silver grade (g/t)	Contained Metal			
						Copper (Mlb)	Zinc (Mlb)	Gold (Moz)	Silver (Moz)
Oxide									
Proved	-	-	-	-	-	-	-	-	-
Probable	-1.4	-	-	-0.3	-9	-	-	-114	-2.8
Total	-1.4	-	-	-0.3	-9	-	-	-114	-2.8
Sulphide									
Proved	-0.2	-0.11	0.0	-0.01	-2	-12	-14	-9	-0.4
Probable	-1.3	-0.17	0.0	-0.04	-1	-73	-67	-49	-1.9
Total	-1.5	-0.16	0.0	-0.03	-2	-85	-81	-59	-2.0

15.14 Conclusion

AMC completed an assessment at feasibility level to determine appropriate Modifying Factors to convert Measured and Indicated Mineral Resources to Ore Reserve and develop a mine plan to underpin the Ore Reserve estimate. AMC considers that the Ore Reserve takes sufficient account of diluting materials and allowances for losses that may occur when the material is mined and processed. Economic assessment, using reasonable financial assumptions, shows that extraction of the Ore Reserve can reasonably be economically justified. Inferred Mineral Resources are considered as waste rock in the mine plan and economic assessment of the Ore Reserve.

Confidence in the geotechnical Modifying Factors is not as high as other Modifying Factors. Additional work on geotechnical assessment of pit slopes using the full range of rock strengths identified in geotechnical testing is recommended prior to the Sulphide Project implementation to confirm that pit slopes are stable.

The work to estimate Ore Reserves was supervised by persons who have sufficient relevant experience in the style of mineralization or type of deposit under consideration and the activity being undertaken to qualify as a Competent Person as defined by the JORC Code. AMC considers that Modifying Factors are at an appropriate level of confidence for an Ore Reserve estimate and that the Ore Reserve estimate and classification is reasonable.

16Mining methods

16.1 Open pit mining methodology

Polimetal has been mining oxide gold and silver ore from the Gediktepe open pit for feed to the 0.864 Mtpa heap leach and Merrill-Crowe oxide ore processing plant at the Oxide Project since 2019. Mine development has been through a series of incremental cutbacks.

Mining for the Oxide Project is being undertaken by a local Turkish mining contractor, Uluova İnşaat ve Mak. San. Ltd. Şti. (Uluova), using conventional open pit mining methods and mining equipment. The mining methodology proposed by Uluova for the Sulphide Project is the same using additional similar sized equipment, although AMC considers that larger mobile equipment (in waste rock) may be more appropriate to mine the additional volumes required to meet the Sulphide Project production targets.

The Oxide Project mining operations are shown in Figure 16.1.

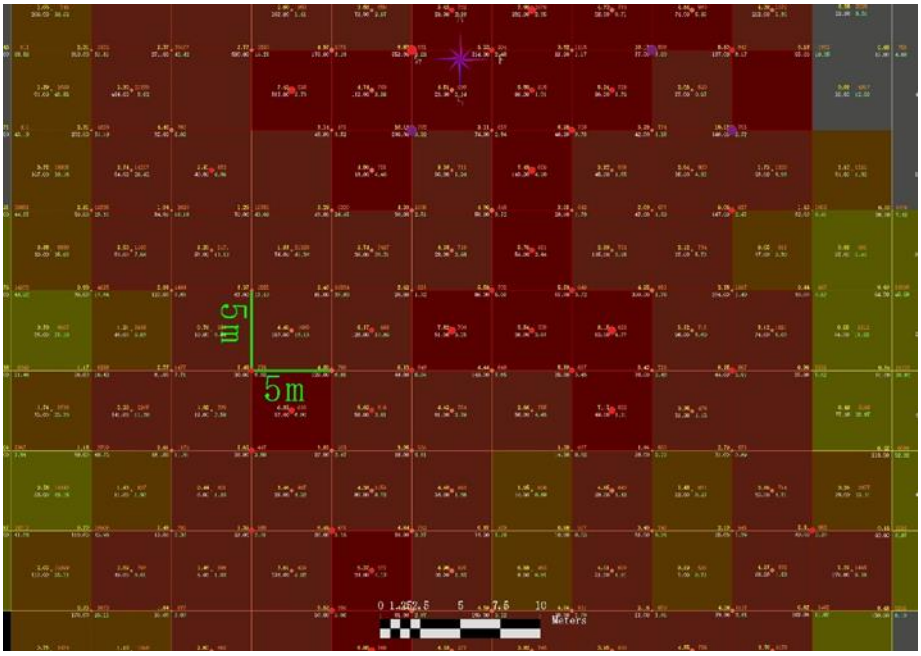
Figure 16.1 Oxide Project mining operations

All mining and support equipment is provided by the mining contractor, with explosives and blast services sub-contracted to a specialist local supplier, Kapeks.

Mining is undertaken using drill-and-blast on 5 m benches with 89 mm holes drilled to a staggered 3.0 m by 3.0 m to 4.0 m by 4.0 m pattern, depending on rock properties. Small excavators (3-4 m^3 bucket capacity) operating on 2.5 m benches are used for mining to achieve the selectivity required, loading into small rear-dump haul trucks (16-17 m^3 capacity).

Grade control drilling to determine material types and ore boundaries is done on a regular grid that, in some benches, is also used for blasting. Grade control sampling and assaying is conducted under the direction of the mine geologists. The grade control model is constructed using block dimensions of 5 m (E) by 5 m (N) by 2.5 m (RL). Sampling lengths vary by domain; if a lack of continuity of the geological unit is expected, sampling is done every 2.5 m, with samples every 5 m otherwise. A plan view of a typical grade control model and grade control holes is shown in Figure 16.2.

Figure 16.2 Typical grade control model and pattern



Process plant feed is hauled to a ROM pad adjacent to the processing plant for direct tip into a primary crusher located at the ROM pad or tipping onto stockpiles. Feed to the process plants is a combination of direct tipping and reclaim by front-end-loader feed from ROM stockpiles to ensure an optimal blended feed to the crushing plant.

Waste rock is hauled to the waste dump located to the west of the open pit. Potentially acid-generating (PAG) waste rock with high sulphur values will be stored within the approved PAG waste dump to a design undertaken by specialist consultants, and PAG with lower sulphur ratios will be blended with non-acid generating (NAG) waste. Grade control drilling will be undertaken using sampling of blast holes, which will define ore blocks on their combination of copper, zinc, gold, and silver grades from an on-site laboratory and PAG waste rock based on net carbonate value (NCV). Support equipment will comprise graders, dozers, water carts, front end loaders, service trucks, an ANFO truck and lighting plants.

The life-of-mine (LOM) mine plan was developed by AMC using industry standard resource planning software, W4X pit optimization, and Minemax strategic scheduler, and an industry standard approach to cut-off grade determination, pit optimization, pit design, production scheduling and economic assessment.

16.2 Mining equipment

A summary of major mining equipment on site is shown in Table 16.1

Table 16.1 Gediktepe mining equipment summary

Category	Brand	Model	Year	Number
Excavator	Hitachi	ZX490	2020-2021	8
Excavator	Hidromek	230LC	2020	1
Haul truck	MAN	TGS 41.430	2021	26
Haul truck	Ford	41.42	2021	1
Water truck	Ford	Cargo	2019	2
Drill rig	Epiroc	ROC T40	2023	1
Drill rig	Atlas Copco	TROC T35	2017-2021	2
Front-end-loader	Komatsu	WA380-6	2021	1
Front-end-loader	Komatsu	WA470-6	2020	1
Front-end-loader	Volvo	L150H	2021	1
Dozer	Komatsu	D85	2020	2
Dozer	Caterpillar	D6R	2006	1
Grader	Caterpillar	150/140M	2014-2022	2
Mobile crusher/screen	Kleeman	MR122/MS16	2015	1/1
Compactor	HAMM/Bomag	3516/213 d-4	2012-2023	3
Concrete mixer	MAN	TGS 8 x 4	2021	1
Snow plough	MAN	33.400	2016	1
Fuel truck	Ford	41.42	2021	1
Maintenance truck	Ford	Cargo CDL1	2023	1
Low-bed trailer	MAN	TGS 6 x 4	2014	1

16.3 Geotechnical design

16.3.1 Background to geotechnical design

Geotechnical assessment for Gediktepe has been undertaken by Golder and the results presented in their report "Open Pit Slope Design and Dewatering & Depressurizing Evaluation (Final)", dated January 21, 2020 (Golder 2020). The geotechnical engineering undertaken by Golder is documented in the 2022 FS and has been reviewed by AMC for this CPR and is summarized in this section, along with AMC's observations.

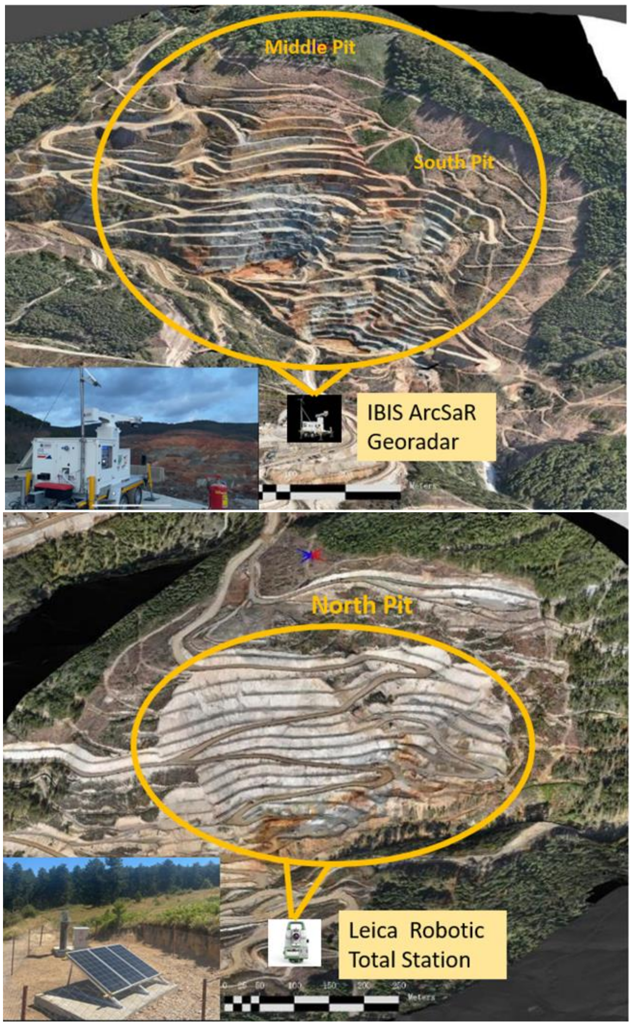
Golder's field data collection programme for this study was performed in 2017, including six oriented geotechnical core holes. Golder engineers also performed point load tests and selected samples of rock core for laboratory testing. Window mapping was performed on natural rock outcrops and at the road cuts at the Project site to collect rock fracture orientations and characteristics. The geotechnical data collected by Polimetal was used to calculate RMR_{76} properties for major rock units in the Gediktepe pit.

The study identified gaps in the data which is a risk to slope performance. This includes, wide spacing between geotechnical core holes and lack of oriented subsurface structures. The assumptions used in the designs are conservative in the east wall due to lack of data. There is an opportunity to optimize or adjust the design to achieve acceptable pit slope performance with systematic structural mapping and model updates. (Golder 2020).

16.3.2 Oxide Project geotechnical design

The Gediktepe open pit has been in operation supplying ore feed to the Oxide Project since 2019. Polimetal engaged Golder in 2018 to undertake geotechnical engineering for the open pit and waste dump for the Oxide Project and the Sulphide Project, and provide recommendations for batter, berm and overall pit slope design. Open pit walls have therefore been exposed for a period of up to four years, allowing performance monitoring and observation of the Oxide Project open pit interim pit slope recommendations. Monitoring of the pit walls is being carried out by a Georadar and automated total stations to measure movements on slopes (see Figure 16.3).

Figure 16.3 Gediktepe pit wall monitoring with Robotic Total Station



The monitoring and observation of the Oxide Project pit walls subsequently resulted in a revision to the pit slope recommendations for both the Oxide Project and Sulphide Project pit slope angles. Oxide pit walls have been designed using a combination of Golder recommendations and experience from monitoring pit wall performance since 2019. Pit slope parameters used for the Oxide Project pit are shown in Table 16.2.

Table 16.2 Oxide Project pit design parameters

Pit Sector	Batter slope (°)	Bench Height (m)	Berm Width (m)	Inter-ramp Slope (°)
South	30	10	5	22-30
Middle	33-40	10	5	26-30
North	40-63.5	15	6-9	35-47

16.3.3 Geotechnical conditions

Rockmass classification

Core logging data from the geotechnical core holes logged by Golder were used to calculate the average rock mass rating (RMR_{76}) weighted by core footage. Weighted RMR_{76} values and ratings are listed in Table 16.3.

The Quartz Feldspar, Chlorite Sericite Schist, and the Quartz Schist are typically composed of weak to moderately strong rock, however, the rock mass is highly fractured. The stability analyses for the pit slopes indicate acceptable factors of safety for shear through the rock mass.

Table 16.3 RMR_{76} rating of geotechnical core holes drilled in 2017 (Golder 2020)

Geotechnical Unit	Metres Drilled	RMR76 Rating values						RMR76
		Parameter	UCS	RQD	Fracture Spacing (m)	Joint Condition Rating	Ground Water	
Quartz-Feldspar Schist	631.4	Average[1]	R3	26	0.17	14	Dry	47
		Rating	4	7	12	14	10	Fair
Chlorite-Sericite Schist	662.0	Average[1]	R3	26	0.24	14	Dry	48
		Rating	4	6	14	14	10	Fair
Quartz Schist	69.4	Average[1]	R3	49	0.15	13	Dry	49
		Rating	4	10	12	13	10	Fair
Massive Pyrite Magnetite Zone	16.9	Average[1]	R4	73	0.88	19	Dry	48
		Rating	7	15	21	19	10	Fair

Structural analysis

The structural characterization included an assessment of the major and minor structures. The major structures were evaluated using 10 fault models provided by Polimetal. The minor structures were analyzed from surface mapping by Fugro/Sial (2015), Golder (2017) and Polimetal personnel (Golder 2020). Known faults are not expected to control overall slope stability, and the effects of faults on inter-ramp and bench slopes are expected to be local. Foliation dips generally to the southwest to northwest and could form plane shear failures on the east side of the pit and bench faces may form parallel to the foliation where these structures are persistent and closely spaced. Bench faces on the east of the pit should be designed conservatively to account for this.

On the north and west sides of the pit, the general orientation of foliation dips into the pit slope towards the west, an orientation favorable for bench face stability. Joints in the rock units are steep and not anticipated to form widescale bench scale wedges on the north and west side. The rock mass is too fractured to develop an effective pre-split, and the steepness of bench faces will be limited by blasting and excavating practices. Trim blasting can be implemented to create 60° to 65° bench faces on the west and north sides of the pit.

Geotechnical domains

There were five geotechnical units defined in Golder 2020, these geotechnical units are summarized in Table 16.4.

Table 16.4 Geotechnical domains and descriptions (Golder 2020)

Geotechnical Unit	Description
Quartz-Schist	moderately fractured, weak to medium strong rock. It does not host mineralization and occurs stratigraphically lower than the Chlorite-Sericite Schist. This unit will generally occur in the footwall of the deposit, although it will form some slopes on the east side of the pit.
Chlorite-Sericite Schist	highly fractured, weak to medium strong rock. This rock unit is distinguished from the other schists by its well-developed schistosity (also referred to in this report as foliation). This rock unit hosts the ore at Gediktepe and can contain disseminated pyrite forming up to more than 15 to 25 percent of the rock by volume. It forms slopes on the east, west, and north sides of the pit.
Quartz-Feldspar Schist	highly fractured, weak to medium strong rock. The Quartz-Feldspar schist can be differentiated from other metamorphic rocks by its weak schistosity_ The Quartz-Feldspar schist contains almost no sulphides and forms slope on the east, west, and north sides of the pit.
Mineralized Rock	mineralized rock is largely mined out in the pit; however, small zones consisting of Massive Pyrite and Massive Magnetite/Pyrite will be left in the pit walls. These units have a high unit weight relative to surrounding geotechnical units and consists of medium strong to strong rock. It is less fractured than the surrounding geotechnical units.
Residual soils	transported soils including the "landslide" or "slide debris" and clay-like Gossan in mostly the southern pit area. The geotechnical characteristics of these soils are variable. Overall, the altered soils are a variable mix of silt-clay or sand with some gravel. For example, the slope debris encountered in PBH-09 (east side of the creek) was described as yellowish brown, cobble to boulder sized, angular to subangular, metamorphic rock fragments with clay infilling.

Material properties

Material properties were determined from laboratory testing by Golder in 2017 of unconfined compressive strength (UCS) tests, splitting disk tensile (Brazilian) tests, triaxial compression strength tests and direct shear tests. Rock mass strength parameters based on Hoek and Brown[3] criterion, which is based on laboratory tests and empirical correlations which utilizes the RMR_{76} classification system developed by Bieniawski (1976).

Seismicity

Gediktepe is in an area of high seismicity. However, there are few documented cases of seismic forces resulting in large-scale pit slopes failures, even in highly seismically active areas. Recent research indicates pseudo-static stability analyses of pit slopes for seismic forces is largely unnecessary. There are no permanent facilities planned at the pit crest and the open pit has a short operating life. The most likely impact of seismic forces on pit slope stability in the event of an earthquake is falls of rock from bench faces. Benches are left in pit slopes to provide catchment of rockfall, including rockfall resulting from earthquakes.

16.3.4 Open pit stability assessment

Kinematic analysis

The kinematic analysis included using all available structural data to assess slope stability. Overall slope stability was analyzed using fault structural data and bench scale stability were assessed using minor structural data. Kinematic analysis was performed to identify the formation of wedge, planar shear, toppling failures and the impact on bench design.

Inter-ramp and overall slopes

No faults were identified that form large structurally controlled plane shear failures based on the review of Polimetal's major structure (fault) and lithology model, and no contacts between rock units appear to dip out of the slope and into the pit. On the west and north

[3] Hoek and Brown 1980, Underground Excavations in Rock, Institute of Mining and Metallurgy, September 1980.

sides of the pit, the contacts between the Chlorite Sericite Schist and Quartz Feldspar Schist dip to the west and north respectively, orientations favorable for slope stability. On the east side of the pit, the contact between the Chlorite Sericite Schist and Quartz Schist dips steeper than the pit slope and therefore does not daylight in the pit wall.

Several faults form non-daylighting wedges in pit slopes with shallow plunging intersections that pass under the bottom of the pit. As such, these wedges are not kinematically admissible. However, in some cases wedges are close to daylighting, with a small rock bridge at the toe. These wedges can become unstable if resistance of the rock mass in the bottom of the pit is insufficient to resist the driving forces caused by the weight of the rock in the wedge. The risk of instability is greater if adverse pore pressure conditions develop.

The risk of instability increases if the geometry of the faults is not consistent with the current interpretation (the wedge daylights near the toe) or if high groundwater pressures develop. Groundwater pressures could be reduced by installation of horizontal drains that intersect the wedge forming faults and reduce groundwater pressures in the faults (Golder 2020).

Limiting equilibrium analysis

The potential for instability of pit slopes due to shear through the rock mass was evaluated using 2D limit-equilibrium analysis. Slopes on the west of the pit are composed primarily of Chlorite Sericite Schist and Quartz Feldspar Schist and on the east Chlorite Sericite Schist and Quartz Schist. Golder performed limit equilibrium slope stability analyses on six sections through the final pit slopes.

The slope stability assessment by Golder used the widely accepted Read and Stacey (2009) criterion for static loading and dynamic (pseudo-static) conditions. The pit design acceptance criteria used in the analysis is shown in Table 16.5.

Table 16.5 Pit design acceptance criteria (Golder 2020)

Slope	Factor of Safety (static)	Factor Of Safety (Dynamic)
Inter-ramp	>1.2	>1.0
Overall slope	>1.3	>1.05

Ground water considerations for the pit slope analysis were completed assuming both saturated and dry conditions to evaluate the effect of groundwater on the slope stability. For saturated conditions, the approximate water table elevations derived from the groundwater flow model were used to determine groundwater conditions in the pit slopes.

In addition to water table elevations from the groundwater model, pit slope stability analyses made allowances for a zone of enhanced permeability close to the pit walls due to blast damage. This zone may range from 5 m in small pits to over 40 m in large pits. Based on the proposed pit design the groundwater table was located about 10 m behind the bench faces in the stability analyses.

16.3.5 Sulphide Project geotechnical design

Pit slope parameters used for the final pit were a combination of Golder recommendations and experience with pit wall monitoring from the Oxide Project and are shown in Table 16.6. The mine plan was subsequently updated by AMC in late 2023 using the revised pit slope parameters. Geotechnical recommendations provided by Golder are shown in Table 16.7.

Table 16.6 Sulphide Project pit design parameters

Sector	Zone	Batter Angle (degrees)	Batter Height (m)	Berm Width (m)	Overall Slope (degrees)	No of Benches (no)
North-west	0	45	–	6.5	39	12
Weathered	1	45	–	5.7	39	12
Fresh	2	63.5	–	6.5	39	12
South-east wall	3	40	–	9	25	12
Below 1130 mRL	4	63	–	6.5	39	12

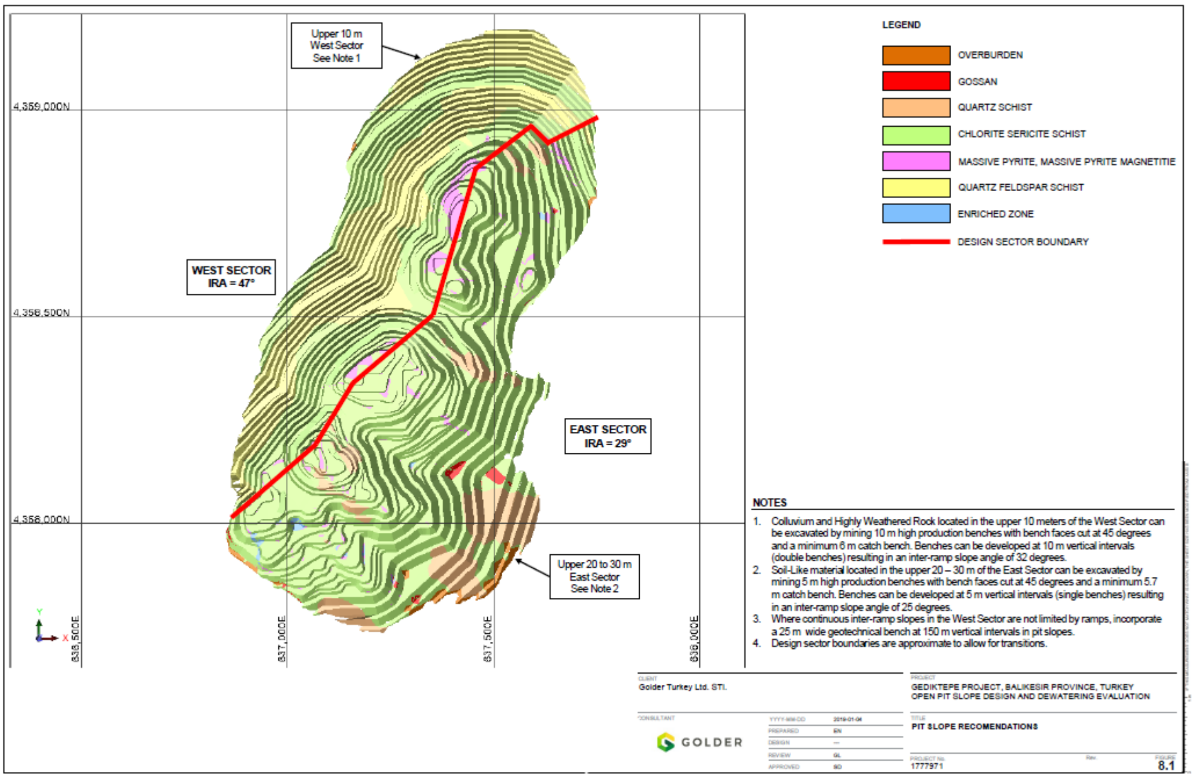
Table 16.7 Golder pit slope design recommendations (Golder 2020)

Geotechnical Unit	Dip Azimuth of Pit Sector (°)	Operating Practices	Bench Configuration and Height (m)	Catch Bench Width (m)	Bench Face Angle (°)	Design Inter-Ramp Slope Angle (°)
Colluvium and Highly Weathered Rock (uppermost bench)						
Colluvium/Highly Weathered Rock	0 to 220 (Upper 10 meters of pit slope)	Dozer Trim and Trackhoe Scaling	Single Bench 10 m (Waste)	6-meter bench on top of Bedrock	45	32
"Soil-Like" material including Slide Debris	220-360 (Upper 20 to 30 meters of pit slope)	Trackhoe Excavation with Dozer Trim	Single Bench 5 m (Waste)	5.7	45	25
Bedrock with favorably oriented foliation						
All Rock Types - Waste (Final Slopes)	0 to 220	Cushion Blasting with Trim and Excellent Scaling	Double Bench 2 x 7.5 m or Triple Bench 3 x 5 m	6.5	63.5	47
Bedrock with unfavorably oriented foliation (assume plane shear failure mode on all benches)						
All Rock Types	220 to 360	Blast and Scale to Foliation as required	Double Bench 2 x 7.5 m or Triple Bench 3 x 5 m	9.1	40 (average)	29

Note:
1. Range of dip azimuth of pit sectors measured clockwise from True North.
2. Definition of inter-ramp, bench face angle, and catch bench width shown in Figure 6.1

Recommendations for the final pit design (showing a previous version of the final design than discussed in Section 15) are shown in Figure 16.4. Bedrock conditions in the phase and annual pits are expected to be similar to those encountered in the final pit slopes. The pit slope design criteria summarized in Table 16.7 can also be used to develop phase and annual pit plans.

Figure 16.4 Pit slope recommendations by sector (Golder 2020)



16.3.6 Data gaps

There is a risk to pit slope performance from data gaps due to wide spacing between core holes and the lack of subsurface structural orientation data. While the stability analyses indicate acceptable factors of safety, zones of weaker than typical rock mass, unidentified faults, or variations in structural fabric could result in localized slope instability.

Additional intermediate scale faults should be anticipated to be encountered during mining. If these faults are in orientations unfavorable for pit slope stability, they could result in unstable slopes and benches that may require adjustments to the pit design. Systematic pit wall mapping should be undertaken and used to update the structural model.

There are no reliable subsurface structure orientation measurements, and it is assumed based on review of the geologic model that the orientation of structures observed at the surface will be similar to structure orientations at depth. Golder selected bench face angles using conservative assumptions to account for data gaps on the east side of the pit. The impact of these data gaps is that the pit slope designs may need to be adjusted during mining to achieve acceptable pit slope performance to account for locally unfavorable conditions.

Golder recommends that continuous inter-ramp slopes should not exceed approximately 150 m without a 25 m geotechnical bench. As Indicated in Figure 4.1, haul roads are included at vertical intervals of less than 150 m in the pit slope so geotechnical benches are not required.

16.3.7 AMC review

Asoka Herath, Principal Geotechnical Engineer, is employed by AMC and undertook a high level geotechnical review of Golders geotechnical assessment and design recommendations for Gediktepe.

Golder 2020 states that hydrothermal alteration is not significant at the site and appears not to significantly affect the properties of rock materials of geotechnical interest for slope stability. AMC does not agree with this evaluation, and considers that pit wall rocks were subject to varying degrees of alteration affecting integrity of the rock mass, as per:

- In general weathering varies form 5 m to about 30 m, which is not a major design issue.
- Wall rocks are altered. AMC infers the degree of alteration can range from 10% to 50% (visual estimation from core photos).
- As a result of alteration, wall rocks appear to be in a poor condition, and strength is inferred to be poor.
- It is difficult to ascertain how far away the rock mass alteration extends from the mineralization, as all geotechnical drillholes are located within the footprint of the pit.

Core photos show significant alteration through the drilled depth (about 300 m vertical. Such alteration is commonly observed in most drill core presented in Golder 2020. AMC considers that alteration related poor rock mass conditions and strength loss are the most significant geotechnical characteristics that can adversely influence wall stability and slope design.

A range of laboratory testing was carried out consisting of UCS, UTS, PLT, DS rock and soil triaxial tests. Golders have collated all test data which are presented in Golder 2020. Golder has used the average intact strengths obtained from UCS tests in slope stability analysis. Although AMC considers that sufficient laboratory testing was conducted, given the poor conditions observed in lithological units due to alteration, the laboratory average strength values should not be used in the analysis as UCS samples are generally selected from good core hence generally overestimate the intact strength in weathered and altered rock. AMC notes that the average UCS values are significantly higher than logged strength values and considers that the field strength estimates from geotechnical logging are more appropriate to be used in pit wall stability evaluations, instead of average values obtained from UCS tests.

Golder has used RMR method for rock mass classification and the Generalised Hoek and Brown method for the stability assessment. AMC have no issues with the methodologies they have used as they are industry accepted practices. However, RMR_{76} values appear to be on the high side and not a true representation of rock mass conditions. AMC considers that the average values (UCS and RMR) adopted for stability analyses are not representative of actual conditions and are on the high range and therefore may have resulted in wall design parameters that might be too steep.

AMC considers that Golder should have defined ranges for UCS using laboratory and field strength estimates from logging and RMR_{76} (lower bound and average) and conducted probability of failure approach for the slope design.

AMC has undertaken check pit optimization with 5 degrees shallower walls and notes that ore tonnes are not sensitive to pit slope, but waste tonnes are, and an additional 30 mt of waste would be required at the shallower slopes.t

16.4 Waste dump design

16.4.1 Geochemical assessment

The Gediktepe deposit contains waste rock with sulphide mineralization that has the potential to generate acid and may leach metals to the environment. These acid rock drainage (ARD) issues were recognized by Polimetal and a waste rock characterization study was undertaken by SRK to identify the rock types that have ARD potential and the design parameters required to manage any adverse effects.

A total of 332 core and rock chip samples were taken from exploration drilling to characterize the ARD and metal leaching potential (ARD-ML) of the main rock types of the final pit shell. Static and kinetic testing methods included modified acid-base accounting (ABA), net acid generation (NAG) tests, and major and trace elements analysis by XRF and ICP-MS analysis of aqua regia (AR) extracts. Test results were then used to assign the ARD potential by rock type. Approximately 35% of waste rock was classified as PAG.

A PAG waste rock dump has already been approved as part of the Oxide Project, which has a liner underneath to collect any contact water that may be produced during the operation, closure, and post-closure stages. The capacity of the PAG waste dump is insufficient to host all the PAG waste rock, and therefore, part of the PAG waste need alternative management:

- The PAG waste dump should be preserved for the most problematic material (PAG sulphate-sulphide) above a 2.2% S cutoff.
- Remaining PAG waste rock should be emplaced in the centre of the NAG waste dump to be encapsulated with NAG waste rock in the NAG waste dump.
- Waste dump design will account for encapsulation, presentation of PAG and NAG waste in the mining schedule the oxygen transport mechanism that typically occurs and the development of preferential channels within the WRD that may conduct water-moisture.

16.4.2 Waste dump design

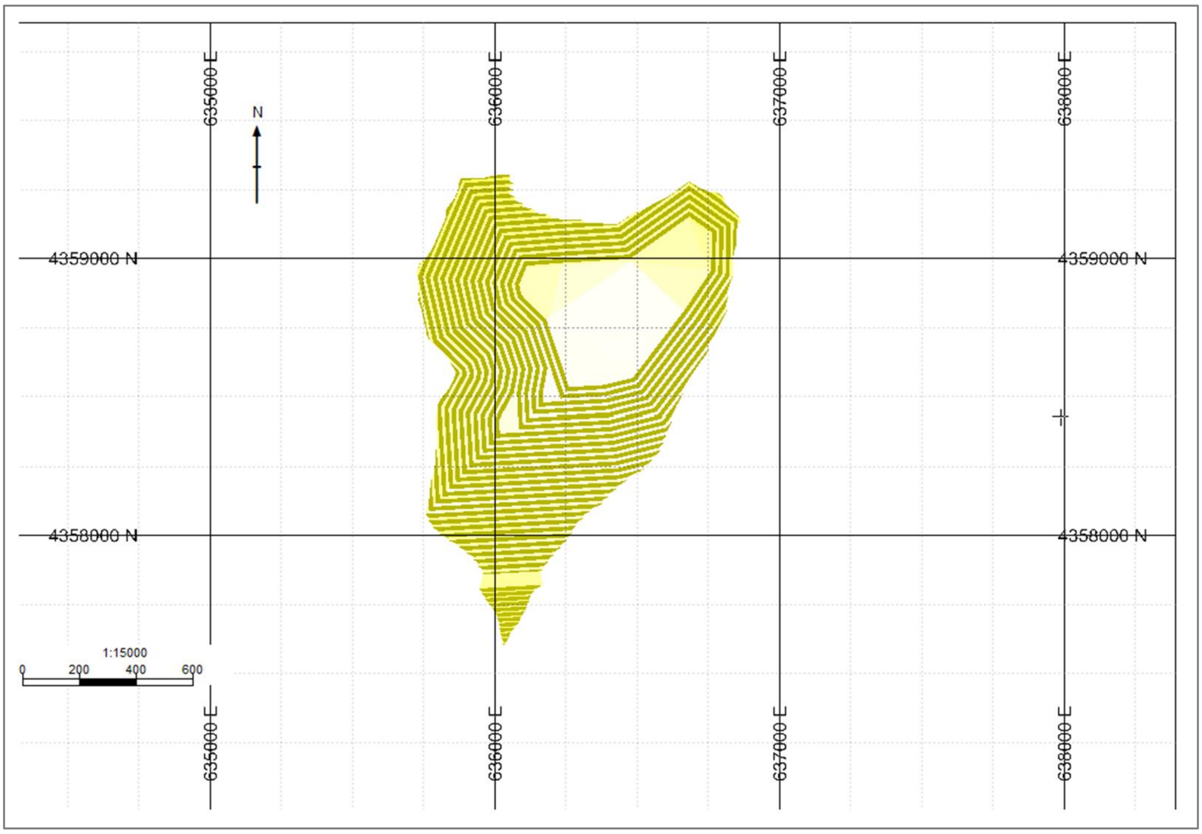
The waste dump for Gediktepe was designed by INR and is located adjacent to the pit exit to the south-west of the pit. The waste dump is designed to hold the material from the current Oxide Project mining operation as well as the for the sulphide mining operation.

The PAG waste dump area will be used for the waste rock having high S values. Waste rock with moderate or lower S values will be blended with NAG waste rock or encapsulated within NAG waste. The PAG waste rock dump is located at the south of the heap leach, between the mining contractor’s facilities and the NAG waste dump. It was constructed for the Oxide Project and has 7 Mm^3 of capacity. The base of this dump area is covered with clay. The design was approved by the Turkish Government Ministry of Environment and Urbanization.

The NAG waste rock dump is located to the west of the mining licence and upstream of the TSF. It is currently used for the Oxide Project, with 76 Mm^3 of capacity, however, it can be increased to 122 Mm^3. The surrounding topography is suitable for extensions.

The Gediktepe waste dump designed by INR is shown in Figure 16.5.

Figure 16.5 Gediktepe waste dump design



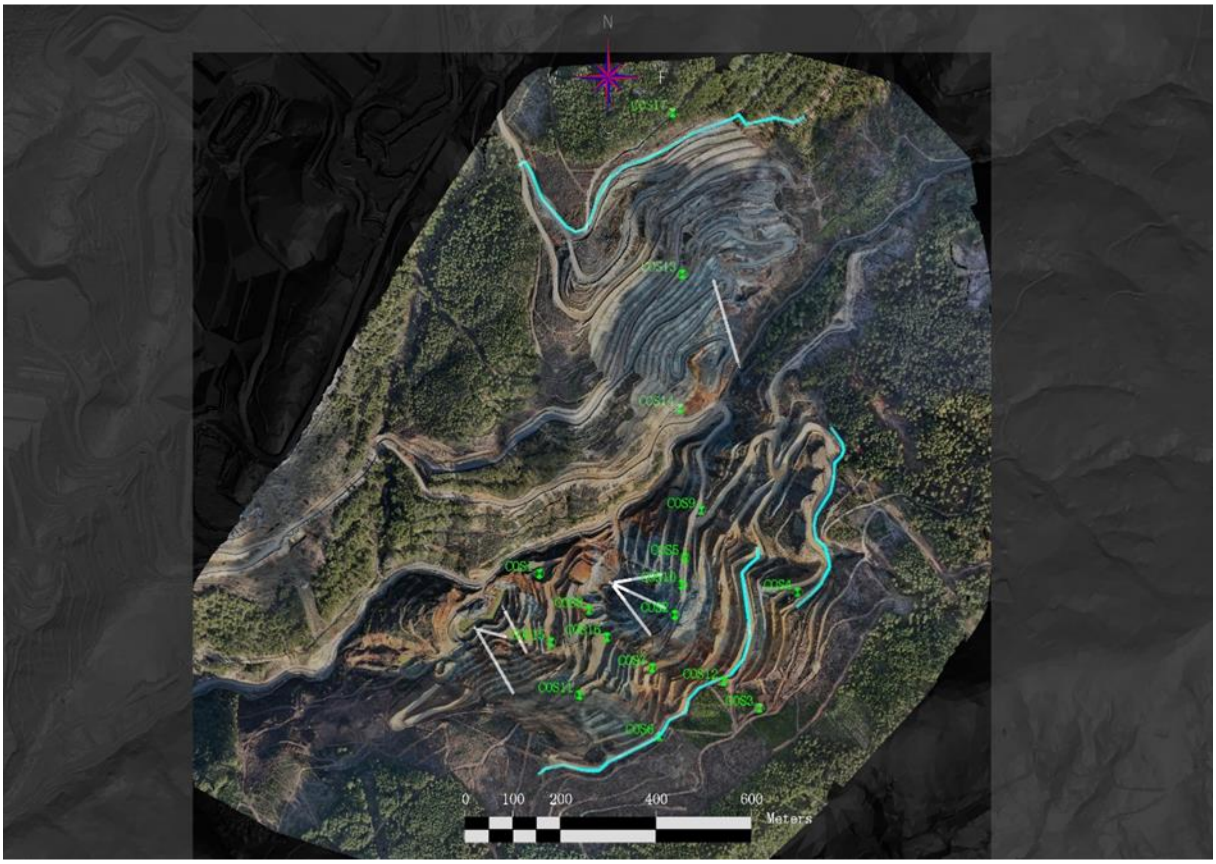
16.5 Pit dewatering, hydrogeology and hydrology

16.5.1 Oxide Project pit dewatering

Open pit dewatering is carried out by vertical pit dewatering bores, horizontal drains, and in-pit and ex-pit diversion channels. To date, 17 vertical pit dewatering bores (total 1,750 m) and 7 long-range horizontal drainage holes (total 835 m) have been drilled. Short-range horizontal dewatering/depressurization holes (10-15 m each) are also drilled on each bench face at 2-3 m spacing. Berms are designed with 3% grade and lined water diversion channels are constructed on benches as required to control runoff water.

Figure 16.6 shows the Oxide Project vertical pit dewatering bores, long-range horizontal drainage holes and diversion channels.

Figure 16.6 Diversion channels and horizontal and vertical dewatering bores



16.5.2 Hydrogeology assessment

The hydrogeology and hydrology assessment for the 2022 FS was undertaken by SRK Consulting (U.S.) Inc. (SRK) from work undertaken by SRK and others. Field work undertaken from 2015-2022 included:

- Continuous monitoring of surface water flow at 2 stream flow measurement stations.
- Comprehensive hydrocensus survey that identified 181 water points.
- Periodical water quality sampling at 22 locations.
- Drilling of 19 large diameter monitoring wells.
- Installation of 6 vibrating wire piezometers (VWP).
- Packer test profiling at 39 locations.
- Conducting aquifer tests at 10 locations.
- Monitoring water levels at 102 wells.

Key outcomes of hydraulic conductivity tests are:

- The most permeable units are alluvium and quartz feldspar schist (present in the mine).
- There is a two to three orders of magnitude variability of hydraulic conductivity values.
- There is a general trend of decreasing hydraulic conductivity of bedrock with depth.

A regional 3-D groundwater flow model was developed over a 120 km^2 area. After calibration, the model simulated that the open pit intersects the regional groundwater table at approximately 10 m to 20 m below the ground surface, and the numerical model indicates a maximum drawdown of 140 m within the central part of the pit. Based on the proposed mine plan, the estimated groundwater inflow will increase from 2 L/s to 14 L/s within 2 years and inflows from Years 3-10 are predicted to increase to 15 L/s. SRK concluded that groundwater inflows can be managed by in-pit sumps located at the base of the pit and will be moved periodically through the life of the mine as pit development progresses. As a result, no additional studies on dewatering and depressurization of the pit were completed.

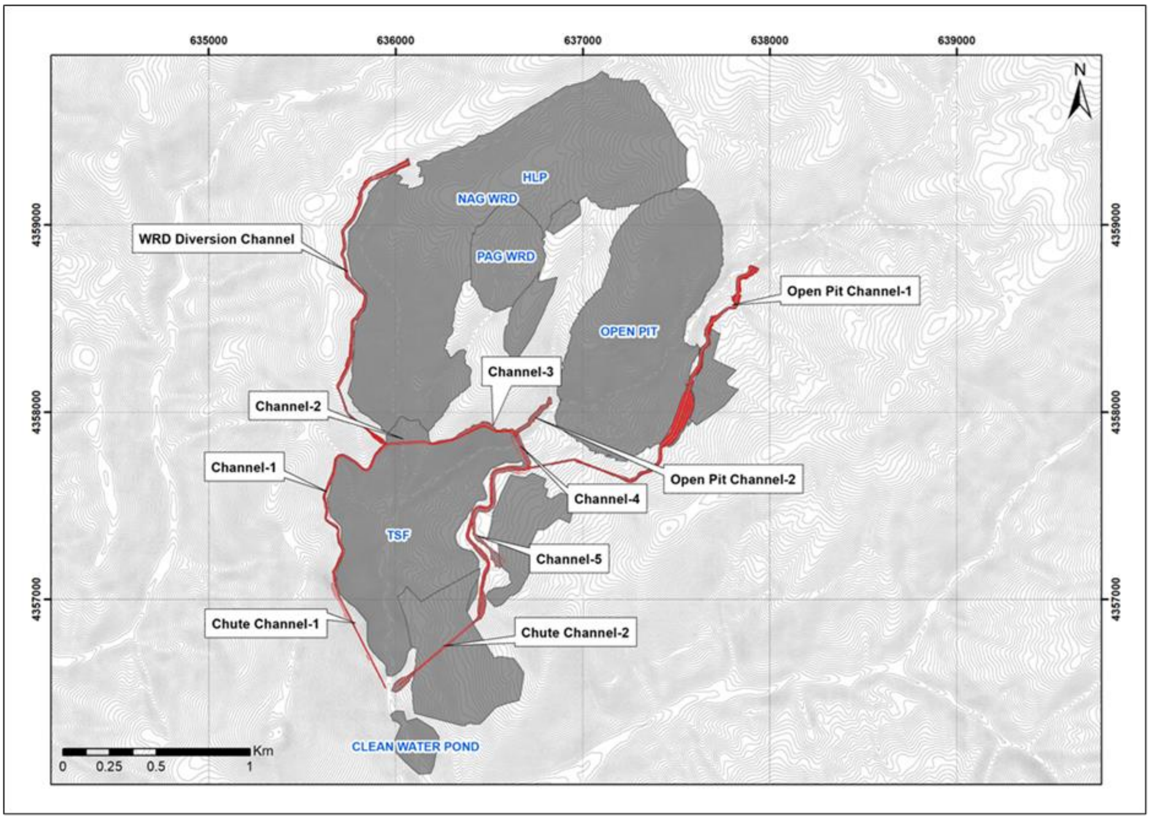
16.5.3 Hydrology assessment

Hydrological studies completed from 2015-2022 included:

- Two weirs were constructed on the Acısu Stream for continuous streamflow monitoring.
- Site climatic conditions were evaluated using an on-site meteorological station, regional stations, and climatic gridded models.
- A rainfall-runoff-snow melting model was established and calibrated with site data.
- Hydrograph analysis and baseflow separation were used to characterize streamflow.
- A catchment-wide water budget study was done to evaluate recharge to groundwater.

The Project facilities are associated with one main catchment that includes three sub-catchments. Diversion channels were designed surrounding the open pit, waste rock dump, TSF, and heap leach pad (Figure 16.7) to prevent surface flow from precipitation impacting operations and to segregate fresh and contact water. Runoff water from upstream catchments drained by Acısu, Kaynarsu, and Peynirkurusu creeks is directed to the CWP.

Figure 16.7 Gediktepe stormwater diversion channels



A site-wide water balance was done to evaluate production, consumption, movement, and storage of water through the operation, closure, and post-closure, considering the fresh and contact water, mine water demand, supply sources and makeup water requirements. Fresh water will be harvested where possible and contact water minimized. Based on nominal mass balance calculations, the sulphide plant requires 119 m^3/hr of water, of which 34 m^3/hr can be supplied as process makeup water from TSF reclaim, while the remaining 82 m^3/hr will be supplied as raw water makeup. When water availability is constrained, the CWP can be used as a makeup source if the reclaim and treated water are insufficient. According to the site-wide water balance model, water supply sources will be adequate to meet plant requirements.

16.6 Conclusion

AMC considers that the drill and blast, load and haul mining methods currently being used at the Oxide Project with an experienced mining contract are appropriate for the operation. AMC considers it likely that larger equipment (in waste rock) rather than scaling up the current methods and equipment fleet to account for the larger movements required for the Sulphide Project may be more appropriate.

Additional work on geotechnical assessment of pit slopes using the full range of rock strengths identified in geotechnical testing is recommended prior to implementation to confirm that pit slopes are stable.

17Recovery methods

17.1 Introduction

Polimetal has been operating the Oxide Project at Gediktepe since 2019, mining and processing gold and silver ore from the existing Gediktepe open pit and processing the ore through the 0.864 Mtpa heap leach and Merrill-Crowe oxide ore processing plant at the site. The Oxide Project is scheduled to continue operations until 2025, after which Polimetal plan to mine and process the sulphide mineralization underlying the oxide cap currently being mined and processed.

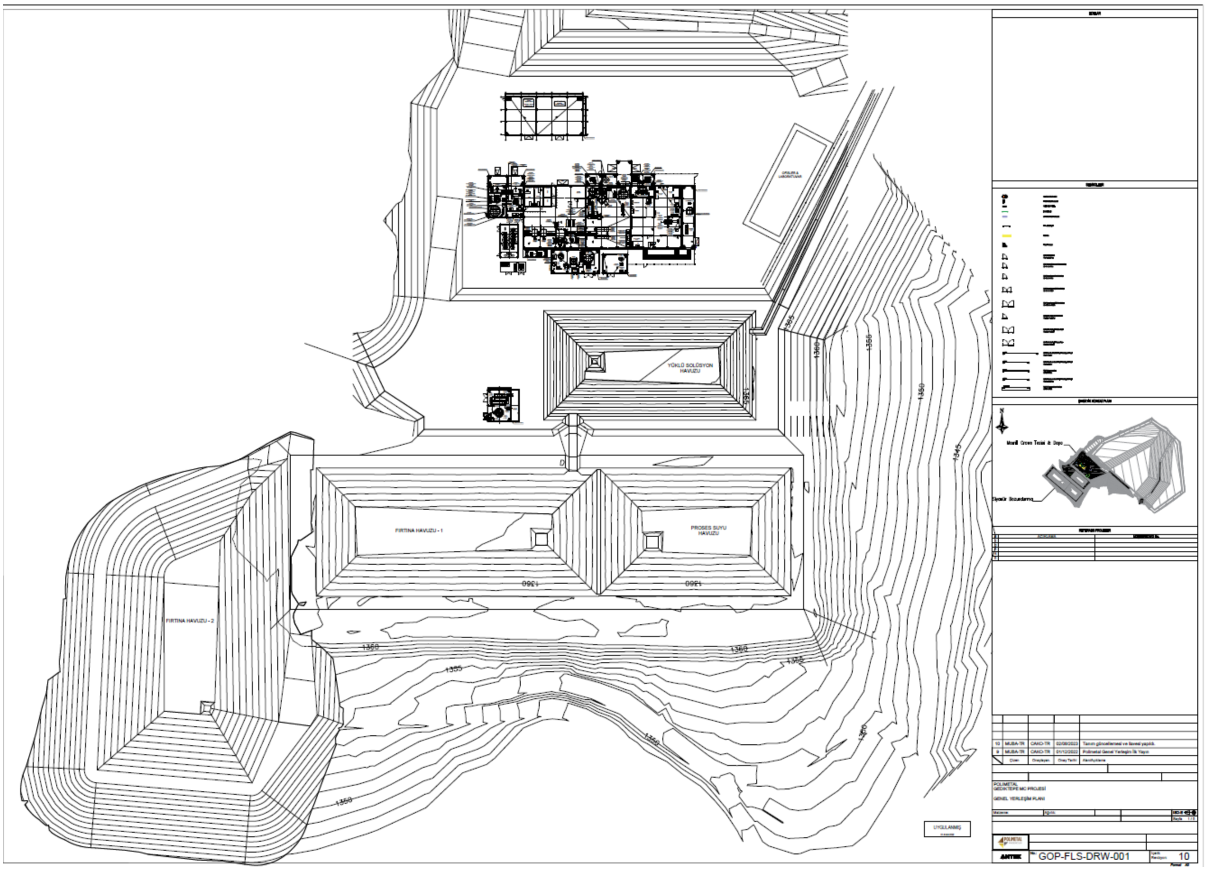
Sulphide Project metallurgy and ore processing assessment and engineering design for the 2022 FS was undertaken by GR Engineering Services Limited (GRES), with input from Hacettepe Mineral Technologies (HMT).

17.2 Oxide Project ore processing

The Oxide Project commenced operation in 2019. The ore processing facilities and heap leach pads are shown in Figure 17.1 and the layout of the processing facilities and the design of the heap leach pads is shown in Figure 17.2.

Figure 17.1 Oxide Project ore processing operations

Figure 17.2 Oxide Project ore processing layout



Plant description

The Oxide Project processing plant consists of the following basic circuits:

Crushing

- Nominal throughput of 3,000 tpd achieved using 220 tph feed rate, 60% plant utilization and 95% availability.
- Run-of-mine (ROM) ore at 100% passing 600 mm (F_{100}) is crushed to a P_{100} size of 19 mm (P_{80} of 12.6 mm) using a two-stage plant as shown in Figure 17.3.
- Crushing circuit consists of the following:
  - ROM ore bin.
  - Variable speed feeder.
  - Vibrating grizzly screen.
  - Primary jaw crusher.
  - Product screen.
  - Secondary cone crusher.
  - Crushed ore bin.
- Agglomeration and stacking:
  - Agglomerating drum – using cement, lime and NaCN.
  - Stacking conveyor system.
- Heap leaching:
  - Heaps consist of 6 lifts of 6 m.
  - 90-day leaching cycle.
  - Irrigation rate 10 L/h/m^2.
  - Pregnant leach solution (PLS) flowrate between 175 m^3/hr and 238 m^3/hr.

- Merrill-Crowe metal recovery:
  - Solution clarification and deaeration.
  - Zinc addition and precipitation.
  - Precipitate leaching to remove base metals and filtration.
  - Solution make-up and recycle.
  - Refining and doré production.
- Cyanide (CN) destruction:
  - Reduce free CN to <10 ppm.

Historical performance

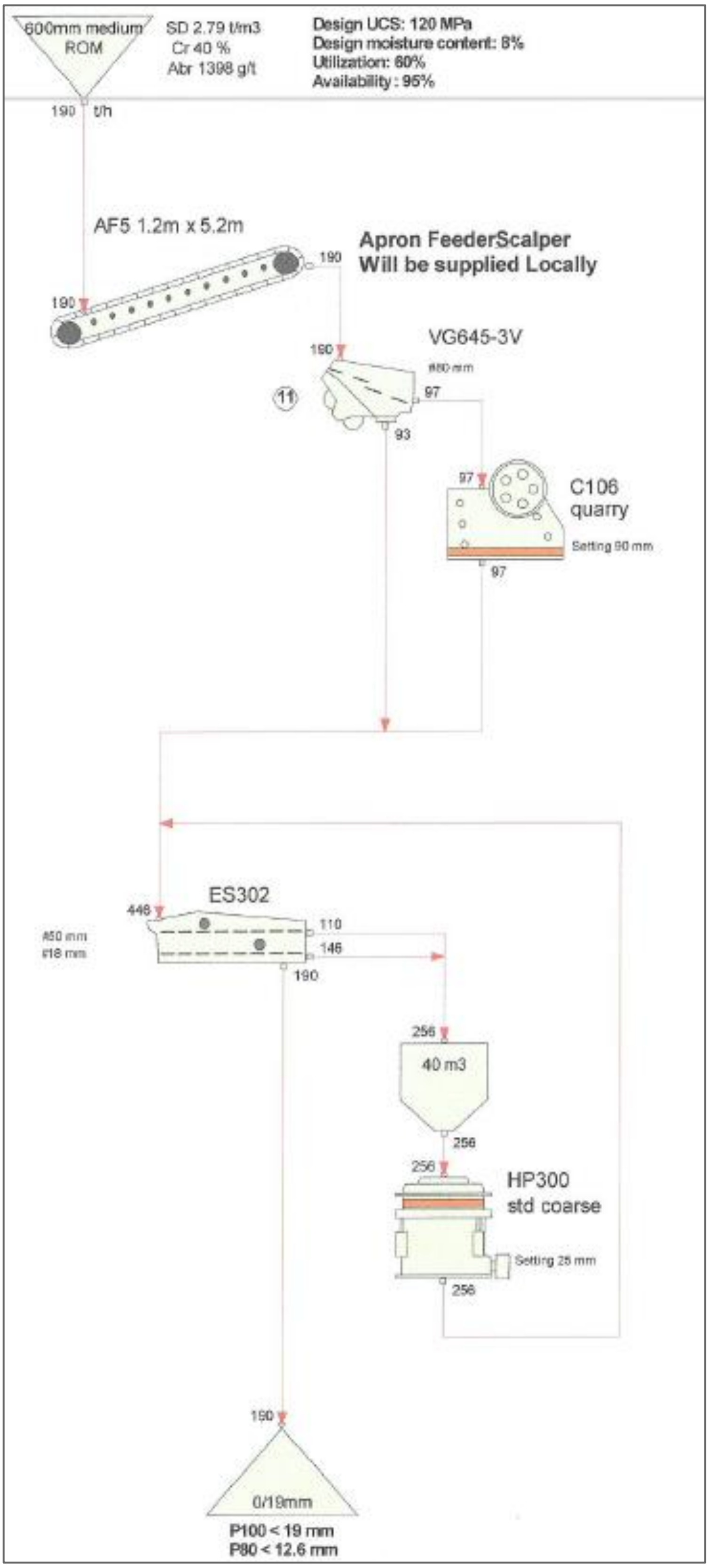
Table 17.1 shows historical production for the Oxide Project. In 2023, 678,558 tonnes were processed with average grades of 2.28 g/t Au and 57.74 g/t Ag. Gold production was 34,018 oz while silver production was 360,509 oz.

Table 17.1 Oxide Project historical production

Description	units	Q1 2024	2023	2022	2021
Ore processed	t	49,196	678,558	741,461	136,024
Gold grade processed	g/t Au	2.53	2.28	1.82	0.93
Silver grade processed	g/t Ag	47.3	57.74	51.64	21.35
Gold produced	oz	14	34,018	29,710	575
Silver produced	oz	156	360,509	308,690	3,062

Placement of oxide ore on the heaps is planned to be completed in Q3 of 2025. In Q4 of 2025 and 2026, leach solution will continue to be applied to the heaps and PLS will continue to be processed in the Merrill-Crowe plant. PLS grades can be expected to decrease during this winding-down period.

Figure 17.3 Crushing circuit



17.3 Sulphide Project Processing Plant Description

The processing facility has been designed to treat 1.82 Mt per annum (1.82 Mtpa) of copper and zinc-bearing sulphide ore. The design parameters used for the design of the comminution circuit are as follows:

- Treatment of ore at a rate of 5,000 t/d.
- Reduction to a flotation feed P_{80} size of 38 µm.
- Consideration was given to capital and operating costs, and flexibility of operation.

A concentrator utilization of 92% (8,059 h/a) has been applied to determine the design treatment rate:

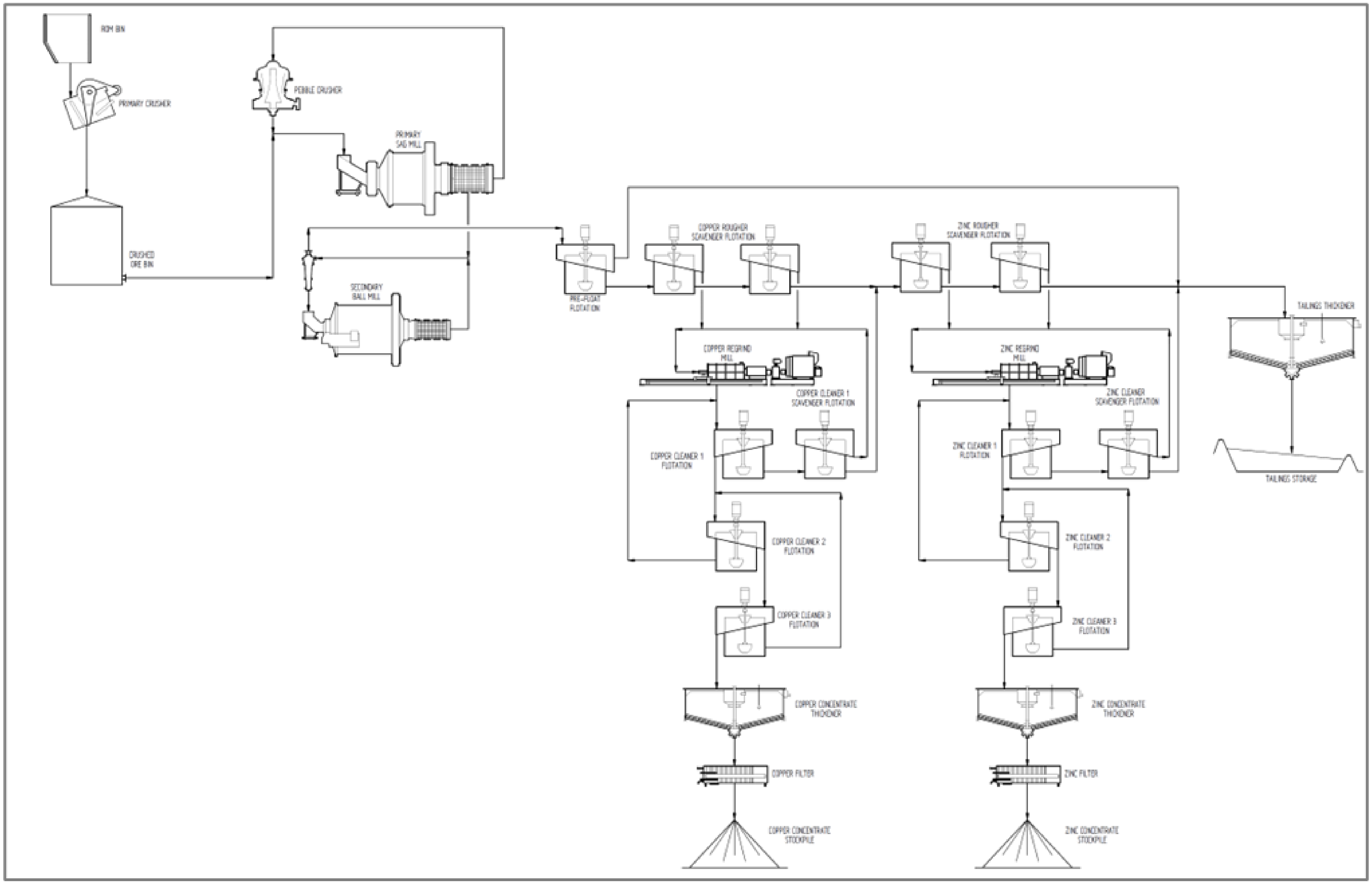
1,825,000 / 8,059 = 227 t/h.

The circuit includes a sizing screen between the semi-autogenous grinding (SAG) SAG mill and ball mill to control the top size reporting to the ball mill in order to optimize the ball size for the fine product size targeted. The screen will also limit the top size of particle and hence the breadth of the size distribution in the cyclone feed which will promote improved classification efficiency for the fine size separation in the cyclones.

In general, the ore is soft with only disseminated ore and chlorite-sericite schist dilution material providing competent media for the SAG mill. Therefore, it is expected that the SAG mill will operate with a ball charge of up to 15% to compensate. The screen will provide flexibility to optimize the circulating load and the power drawn by the SAG mill. A bi-modal distribution of specific gravity exists with a low 3.3 for the disseminated ore relative to a specific gravity of 4.5 for the massive sulphide ore components. The higher ball charge will assist minimizing the accumulation of a heavy sand fraction in the SAG mill. Pebble ports will be installed to ensure small balls are removed from the charge to prevent ‘overgrinding’ of the softer high specific gravity particles and to control any build-up of competent disseminated ore pebbles.

The sulphide flowsheet shown in Figure 17.4 includes primary crushing, two stage grinding, sequential flotation (pre-float of talc/silicate minerals, and production of separate copper and zinc concentrates), regrind (copper and zinc), concentrate thickening, concentrate filtration, and tailings disposal (thickening).

Figure 17.4 Gediktepe sulphide ore processing flowsheet



Features of the flowsheet developed in the 2022 FS are:

- A single crushing stage with a SAG mill followed by a secondary grinding ball mill to generate a flotation feed P_{80} size of 38 µm. The grinding circuit will include a pebble crusher to handle slow grinding, coarse material from the SAG mill and a sizing screen to control the transfer size to the ball mill, both operating in closed circuit with the SAG mill.
- A crushed ore storage bin has been included to minimize long-term storage of plant feed in 'dead' stockpile to minimize oxidation and aging effects in flotation.
- A pre-float stage has been included to remove naturally floating gangue and provide aeration for pulp chemistry control in the upper rougher flotation stage.
- Stirred bead mills (IsaMills) are utilized in the regrind duties to achieve a product P_{80} size of 15 µm for the copper circuit, and for the zinc regrind a P_{80} size of 20 µm.
- Both copper and zinc flotation circuits feature a cleaner and cleaner scavenger arrangement with the cleaner scavenger tailing open circuited to zinc flotation feed for the copper, and final tail for the zinc cleaner scavenger tail.
- Treatment of process water using activated carbon has been included to reduce the residual reagent content of the recycled water and thereby prevent inadvertent recovery of copper and zinc into the pre-float circuit concentrate.

The process plant design has been based on the key parameters as outlined in Table 17.2. The metallurgical balance and flotation circuit equipment selection has been based on median values achieved in the LCT flotation testing. The maximum concentrate production rate and grade from the LCTs has been used as a check on the capacity of the equipment to handle higher concentrate rates and the expected short term maximum head grades from the mine.

Table 17.2 Sulphide circuit design parameters

Description	Units	Design Value	Comments
Plant Throughput	Mt/a	1.825	–
Annual Operating Hours – Concentrator	h	8059	
Daily Throughput (nominal)	t/d	5000	Project requirement
Milling Rate	t/h	227	–
Grind Product Size D_{80}	µm	38	Test work assessment
Copper Regrind Size D_{80}	µm	15	Test work assessment
Zinc Regrind Size D_{80}	µm	20	Test work assessment
Feed Assay			
- Copper	% Cu	0.77	AMC 15 July 2022
- Zinc	% Zn	1.96	AMC 15 July 2022
Copper Concentrate			
- Copper Grade	% Cu	25.7	Calculated - Correlations
- Copper Recovery	%	69.4	Calculated - Correlations
- Transportable Moisture Limit	% moisture	13.3	Test work Bureau Veritas
Zinc Concentrate			
- Zinc Grade	% Zn	52.1	Calculated - Correlations
- Zinc Recovery	%	76.0	Calculated - Correlations
- Transportable Moisture Limit	% moisture	13.2	Test work Bureau Veritas

The aspects identified in test work that impact on the performance and design of the processing plant have been addressed in the following manner:

- Feed Preparation - Fine grinding to a particle size P_{80} of 38 µm was required to provide adequate liberation of the minerals for their separation in a sequential flotation circuit.
- Feed Preparation – The different flotation behaviour of the three main lithologies requires control of the feed blend to limit the zinc-to-copper ratio in the enriched material to less than 1:1.
- Feed Preparation – Due to the propensity of the feed to oxidize (age) with a detrimental impact on flotation performance a maximum two-to-four-week feed supply on the ROM pad has been targeted in the operating schedule. Blending fingers will be used to minimize fluctuating head grades and ore types.
- Pre-float – A pre-float circuit will remove a portion of sheet silicate minerals, which are naturally and fast floating to minimize silica levels in the copper (and zinc) concentrates.
- Pulp chemistry - To minimize loss of base metals into the pre-float concentrate due to inadvertent flotation from residual reagents in the recycled process water, the process water will be treated using activated carbon to remove these chemicals (and some metallic ions). Any effect of metal ions in tailing dam return water will be addressed by returning this water stream to the tailing thickener to use the residual high pH from the zinc circuit to raise the pH and precipitate metallic ions.
- Pulp chemistry – An antiscalant will be dosed into the process water to prevent gypsum precipitation onto mineral particle surfaces, equipment surfaces and inside pipes. The sulphate levels in the site water have been measured at 2,000 ppm.
- Pulp chemistry – Mild steel grinding media will be used in the milling circuit to create a reducing pulp redox potential in the flotation feed which has been shown in test work as necessary to effect the copper – zinc and chalcopyrite – pyrite separation.
- Regrind size reduction – Fine grinding technology will be used in regrind applications to increase liberation with reduction in particle size to a P_{80} of 15 µm for the copper circuit and a P_{80} of 20 µm for the zinc circuit.
- Copper - zinc selectivity – In addition to the pulp redox potential, zinc sulfate will be dosed into the feed and copper cleaner circuit to depress sphalerite in the copper flotation stage.
- Copper – lead selectivity – The main contributor to lead reporting into copper concentrate is inclusions of fine galena within chalcopyrite (and pyrite) grains. In addition to the blending strategy, sodium cyanide has been shown to help limit galena recovery and addition into the copper regrind and cleaning circuit has been included in the design.
- Pyrite selectivity – Additions of SMBS and sodium sulphide will be used for depression of pyrite in the copper circuit. Lime will be used to adjust and maintain pH in the slurry at levels sufficient to depress the pyrite in the zinc circuit. Starvation levels of collector will also be used in the copper and zinc circuits to minimize inadvertent collection of the iron sulphides (and sphalerite in the copper circuit).
- Pyrite selectivity – cleaner circuits are designed for open circuit operation to avoid build-up of circulating loads of pyrite. Cleaner scavenger cells have been included to limit loss of the respective copper and zinc metal to cleaner tail.

The Gediktepe sulphide requires a fine primary grind (P_{80} of 38 µm) and a fine regrind of the copper rougher concentrate (P_{80} of 15 µm) and of the zinc rougher concentrate (P_{80} of 20 µm) to achieve acceptable liberation of the fine-grained mineral assemblage. Selectivity between copper and zinc minerals is affected by pre-activation of zinc minerals, due to the presence of secondary copper minerals in situ and/or due to galvanic effects between galena (lead mineral) and pyrite.

A depressant reagent regime of sodium sulphide, zinc sulfate and metabisulfite is needed to effect selectivity between the copper minerals and the zinc and iron sulphide minerals. Depending on the ore feed, some non-sulphide gangue (NSG) is removed in a pre-flotation stage prior to copper rougher flotation. Circulated water (tailing from zinc rougher and cleaner flotation) containing residual organics, such as xanthate ions and other reagent breakdown products, causes flotation of sulphide minerals in the pre-flotation stage and loss of copper, zinc and precious metal with the rejected pre-flotation concentrate. Treatment of the process water using activated carbon to remove the residual organics has been included in the flowsheet and plant design.

Concentrates will be dewatered using thickeners and pressure filters prior to road transport to a port for bulk shipment to smelters.

Copper concentrate grades above 23% Cu (23% to 32% Cu) with greater than 68% copper recovery, and zinc concentrate grading over 49% Zn (49% to 53% Zn) with greater than 76% recovery will be targeted. Both concentrates will contain credits for gold and silver. The copper concentrate may have variable penalties for arsenic, lead, zinc, bismuth and [fluorine+chlorine] at times. Similarly, the zinc concentrate may have iron and cadmium penalty levels at times.

Annual scheduled concentrate production is shown in Figure 15.7.

Annual scheduled metal production is shown in Figure 15.8 (copper and zinc) and Figure 15.9 (gold and silver).

17.4 Conclusion

The Oxide Project heap leach and Merrill-Crowe ore processing infrastructure and processes is well understood and will continue until the sulphide process is in production. The Sulphide Project ore processing technology is well-tested and multiple similar operations are in production around the world and metallurgical testwork and analysis has been undertaken by well-respected metallurgical consultants, GRES.

Metallurgical testwork and flowsheet development was undertaken by GRES in partnership with HMT. Extensive testwork was undertaken and analysis used to develop the current Sulphide Plant processing circuit.

The processing facility has been designed to treat 1.82 Mt per annum of copper and zinc bearing sulphide ore. The sulphide flowsheet includes primary crushing, two stage grinding, sequential flotation (pre-float of talc/silicate minerals, and production of separate copper and zinc concentrates), regrind (copper and zinc), concentrate thickening, concentrate filtration, and tailings disposal (thickening).

The process plant design has been based on the key parameters, with the metallurgical balance and flotation circuit equipment selection based on median values achieved in the locked cycled flotation testing. The maximum concentrate production rate and grade from locked cycle tests has been used as a check on the capacity of the equipment to handle higher concentrate rates and the expected short term maximum head grades from the mine.

18 Infrastructure and services

The infrastructure and services section for the 2022 FS was prepared by Polimetal, with input from GRES (process plant) and INR (roads and site infrastructure). Existing infrastructure will be used as much as possible. However, the Sulphide Project will need some new infrastructure, with the major infrastructure items being the TSF and CWP, additional power transmission lines (PTL) to supplement the current PTL and mine buildings, such as offices, warehouse, workshops, changing room, and canteen.

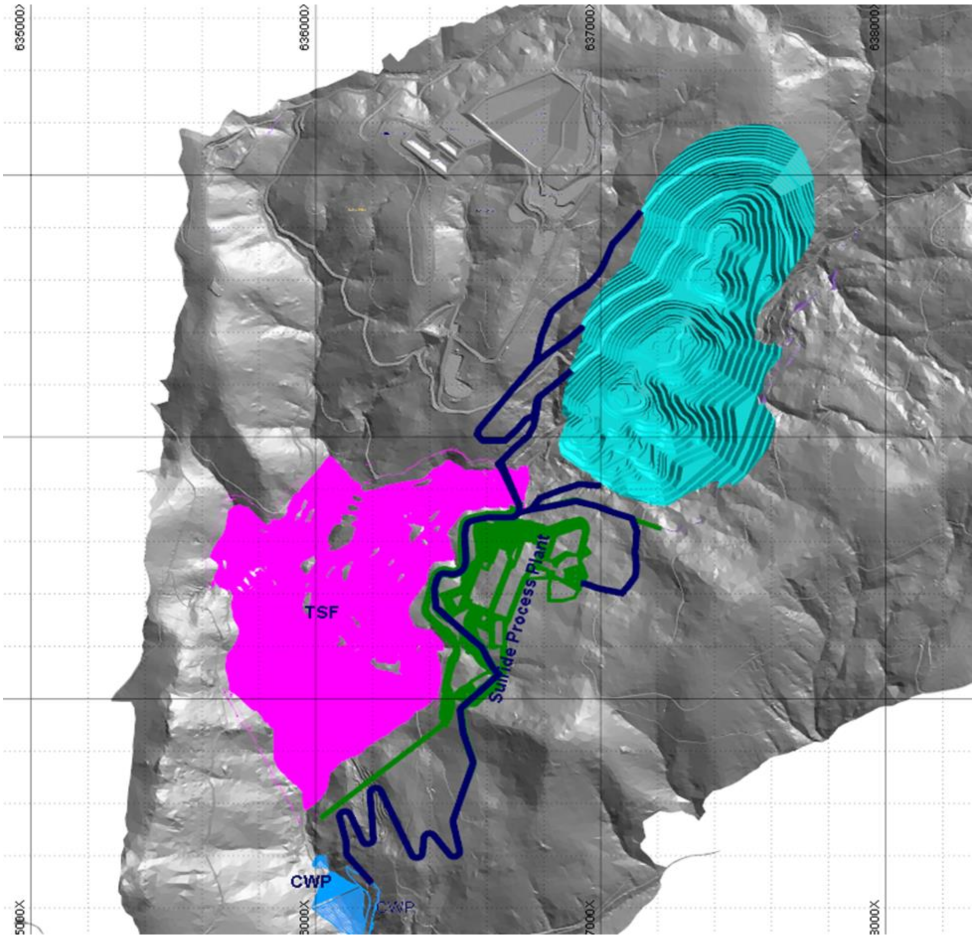
The current Oxide Project team has been using Turkcell GSM mobile phone operator for mobile communication and has internet infrastructure. The site transfers required data via radio link to Ankara and İstanbul.

18.1 Roads and Site Access

Access to the Gediktepe mine and logistics to supply operations are well established, with all year access to the open pit, heap leach, and other facilities. For the Sulphide Project, a new access road will be constructed passing over the top of the CWP to the sulphide plant. Approximately 6.4 km of new road will be constructed using cut and fill and is planned for sealing with cold asphalt or concrete. The road will be constructed by the mining contractor.

Access to facilities will be as shown in Figure 18.1, with haul roads leading to the ROM pad and plant access on the eastern side.

Figure 18.1 Sulphide plant road access schematic



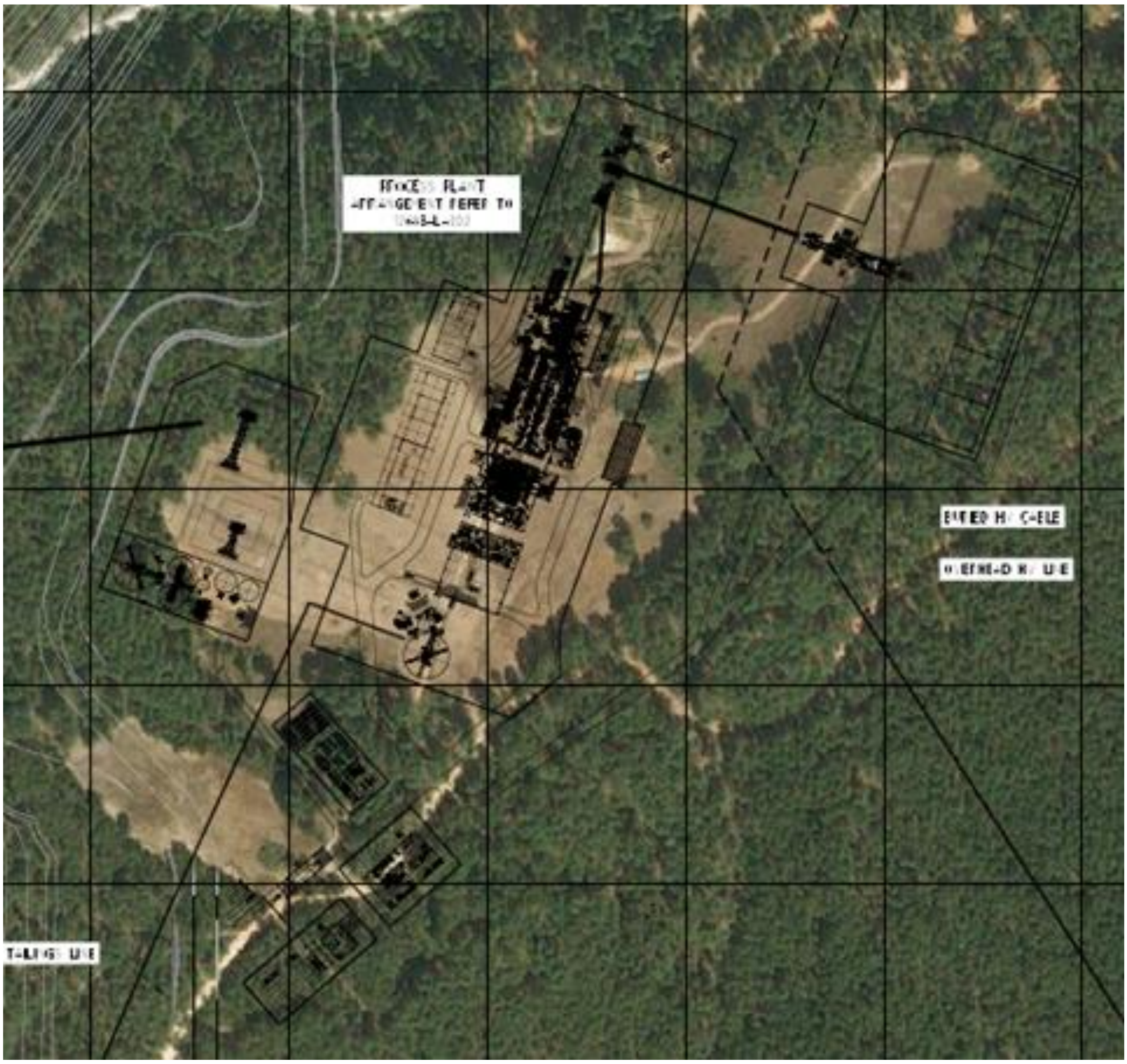
18.2 Process Plant

The licence area is currently occupied by the forestry department. The mine and process plant border the woodlands. The plant site is relatively steep towards the western flank and levels out towards the eastern flank, bordering the proposed TSF location. The open cut mine is located to the northeast, setting the alignment for the ROM pad and ROM crushing pocket.

Crushed ore is conveyed to the coarse ore bin, located on moderately sloped terrain to the east of the crusher pocket, which utilizes the natural fall in slope to minimize fill requirements. The remainder of the processing circuit extends to the southwest, aligning the plant with the TSF on the east. The circuit follows a moderate slope, dipping downward in this direction. The process and contact water ponds are located in the lower southwest corner, taking advantage of the slope to gravity flow surface run off water to the site contact pond. The process water pond borders the TSF embankment to allow gravity flows.

An aerial view of the plant site is shown in Figure 18.2.

Figure 18.2 Aerial view of the plant site



The remaining infrastructure, administration, canteen, change rooms and emergency services are located in the southwest corner on the main entry road to the process plant.

The security gatehouse is at the main entry perimeter fence. Workshops, the laboratory and the main control room are located on the process plant pad to allow for direct access.

18.3 Project buildings

18.3.1 Processing Plant Buildings

The plant workshop will be contained within a single pre-engineered 36 m by 12 m clad, steel framed building, located adjacent to the process plant with 4 m front awnings. The workshop will incorporate electrical, mechanical and welding bays, have high bay lighting with skylight roof sheeting, roof and wall vents, concrete floors and 6 m wide concrete aprons.

The plant warehouse will be contained within a single pre-engineered 36 m by 12 m clad, steel framed building with an eaves roof, 4 m overhang awnings, two offices, kitchen, toilet, store racking, and tool store. The warehouse incorporates a tool store with heavy-duty shelving, an open area for non-waterproof and non-sunproof large equipment, pallet racking, office area under a mezzanine floor, concrete floors and a 6 m concrete apron. A 72 m by 12 m fenced compound will be installed at the rear of the warehouse and workshop to enable secure storage of large bulk items and unloading of semi-trailers.

The laboratory will be a pre-engineered building located next to the workshop and divided into wet and dry areas, with a concrete floor and floor drain for the wet area, and a roller door to accommodate the sample and equipment transportation. The dry area will consist of a balance room, TGA room, fusion room, SRF room, office with small kitchenette and toilet. A breezeway will be between the dry and wet area with all the double doors for internal and external access.

The main control room will be the centralized control hub from crushing circuit to both oxide and sulphide circuits. It will be a 12 m by 12 m prefabricated building located to the north of the grinding building. There will be eight main control stations to cover each part of the processing plants and four smaller control stations on the side. The main control building consists of a 6 m by 3 m server room to store critical communication equipment.

Allowance has been made for one light vehicle diesel storage tank to supply fuel to the plant light vehicles. The facility will include a truck unloading bay, complete with an unloading pump.

18.3.2 Administration and General Buildings

A two-storey prefabricated office complex building will be located on the main LV access road to the process plant. The administration building will be approximately 800 m^2 each storey and will accommodate 100 management personnel, including administration, human resources, health safety and environment, payroll, procurement, and processing. There will be a small kitchenette, large meeting room, toilets on each level and single offices for management and joint offices and open plan areas for the general employees.

The security gatehouse will be located at the perimeter fence on the main access road. There will be an automatic gate for vehicles and trucks, with a swipe card system for vehicles and personnel and continuous monitoring by a security guard. The building will have a gatehouse turnstile, security office, community office, induction room and ablution blocks. A trade certified weighbridge to record freight in-bound and concentrate loads outbound will also be located there. A car park for private vehicles will be located outside the main gatehouse perimeter fencing. Security for the camp area and for the current operation was contracted to local security providers, SitePlus. The number of security personnel will be increased as per the needs of the construction camp and sulphide plant.

A 21 m by 14 m prefabricated clad, steel framed change room will have male and female change rooms separated by a 3 m wide covered breezeway, lockers, shower and ablution cubicles for 180 personnel to allow for local employees who drive-in and drive-out each day. A pedestrian footpath alongside the LV access road connects to the front gatehouse.

A prefabricated prayer room and ablution building will be located between the kitchen and the emergency response team (ERT) building, consisting of a 12 m by 6 m prayer room with two entry and exit points, to allow for separate male and female entry and exit. A screen will be installed in the prayer room to separate males and females. A 1.5 m long awning will be hung over the ablution block.

A prefabricated ERT building and induction room will be located next to the prayer room, with sufficient space for the ambulance and emergency response vehicle. The building will have a treatment room, medical storeroom, data room, disabled toilet and shower unit, emergency response team office, safety and medical area, and induction room. The emergency response team will utilize the safety and medical area for rescue equipment. The induction room will be used for the employee induction, training or assembly.

Canteen facilities will be prefabricated and located opposite the administration building, and consist of a kitchen and dining area, with a truck parking bay and double door at the back of the kitchen to accommodate bulk food delivery. The cooking facilities will be required to produce meals on a two-shift basis, seven days per week.

18.4 Tailings storage facility

18.4.1 Background

The TSF and CWP included in the 2022 FS was designed by EN-SU consultants and the designs were reviewed by CMW.

The TSF will occupy an area of approximately 60 ha and will have a storage volume of approximately 11.1 Mm^3 to 1,142 mRL to accommodate the 17.6 Mt of sulphide ore processed over the LOM. The CWP is located immediately downstream of the TSF and will accept runoff diverted around the Gediktepe mining operations.

The TSF and CWP pond are located in a steep sided valley in a tributary to the Kocagecemek D. valley. The closest settlements to the facilities are the Asıdere and Meyvali neighbourhoods 300 m downstream, and Hacıomerderesi neighbourhood 600 m downstream.

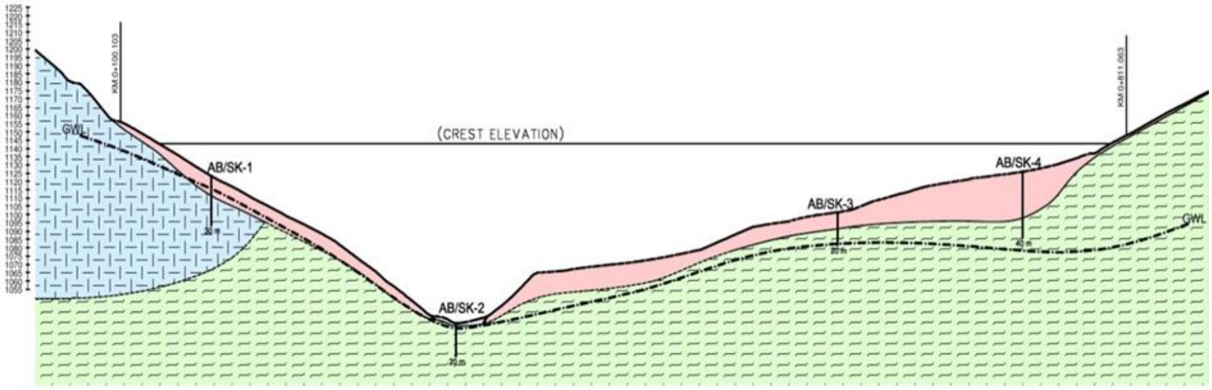
18.4.2 Geotechnical investigations

Geotechnical investigations conducted for the design of the TSF and CWP included boreholes, test pits and sampling and laboratory testing of both borrow and foundation materials. Seismic assessments were also carried out including a detailed site seismic assessment. Twelve cored boreholes with a total depth of 312 m were drilled to investigate the embankment area and field tests were performed in the bores. 27 permeability (leakage) tests were carried out at 2 m intervals in boreholes within the alluvial soils to determine the permeability of bedrock/soil material. 28 Lugeon Tests at 2 m intervals and 42 pressure-meter tests were carried out in 3 additional bores at 2 m intervals to assess elastic moduli. UCS and point load tests were done on drill core samples and samples of proposed mine waste borrow materials were also tested, including with direct shear (box) tests.

The ground conditions at the TSF site comprise a thin alluvium, colluvium and talus (land slide debris) over mainly quartz schists. On one (right-hand) abutment, a more competent dacite volcanic rock was encountered. Slope debris was encountered on the slopes of the TSF site and alluvium over bedrock was encountered in the creek bed at the base of the valley. The bedrock under the TSF has been altered, and in places disintegrated partly by the effect of faulting. This altered material does not exhibit soil properties, as there is not extensive weathering at the site. Based on in situ testing, the upper levels of the bedrock are generally more permeable, whereas the lower levels are less permeable to impermeable.

A geological cross section is present in Figure 18.3.

Figure 18.3 Longitudinal Geological Section of Embankment and Ground Water Level



Based on the investigation, the alluvium in the creek bed varies in thickness between 1.5 - 4.8 m. The slope debris (talus) as intersected by the boreholes extends to 12.0 m depth to 28.0 m and to thicknesses varying between 10 m to 31 m in other bores. The depth of slope debris is generally greater in bores drilled in the left bank crest.

Geophysical borehole studies were performed on the right and left bank slopes, in addition to the borehole studies. This study indicated, slope debris with a thickness varying between 9 m to 15.5 m on the right bank, and between 5 m-30 m on the left bank. This data was used in the estimation of stripping excavation volumes for the TSF construction.

The slope has a thick talus deposit believed to be a paleo-landslide area. It will be necessary to remove it from the base of the embankment during foundation excavations to prevent a potential landslide being triggered due to the embankment stripping excavations. Stripping excavation should include excavation 1 m into the bedrock to remove fractured-cracked, disintegrated zones that may remain under the embankment footprint. To provide a low permeability facility, the embankment and storage area will be provided with geosynthetic clay and geomembrane cover.

18.4.3 Hazard Rating

The Gediktepe TSF has a 'Very High' consequence classification (refer Global Industry Standard on Tailings Management (GISTM), 2020). This rating has been assessed based on a 'potential population at risk' (PPAR) of at least 100.

The Gediktepe TSF and CWP have a High-A consequence rating (refer Australian National Committee on Large Dams (ANCOLD) 2019). This rating has been assessed based on a population at risk (PAR) of at least 100 and a Major damage classification (i.e. losses >US$100M, a crippling effect on the business and significant effects downstream).

18.4.4 Design Criteria

The design criteria adopted in the design by EN-SU were based on Turkish standards and were considered compatible with ANCOLD 2019 hazard rating at the time of the design. TSF design and all the construction drawings and reports were approved by Ministry of Environment & Urbanization and the design is in line with related Turkish regulations. International guidelines were subsequently changed since the original TSF design was compiled.

The following summarizes the criteria adopted in the design:

- Provide LOM tailings storage for 17.4 Mt of tailings.
- Maximum Design Earthquake (MDE) used in deformation assessments of the embankment approx. 1:2,500 yr. Annual Exceedance Probability (AEP).
- Design criteria for diversion design during operations, 1:1000-year AEP.
- Assessed against the criteria from the GISTM for 'Very High' consequence facilities.
  - Seismic criteria: Operations 1:5,000 yr. AEP and Closure 1:10,000 yr. AEP.
  - Flood criteria: Operations 1:5,000 yr. AEP and Closure 1:10,000 yr. AEP.

The TSF and CWP are located in a relatively high seismic area. The most important tectonics in the region is the Çay-Simav segment belonging to the Simav Fault.

Gediktepe is located in the 1st Degree Earthquake Zone according to the Turkish Earthquake Zone Map prepared by the Earthquake Research Department of the General Directorate of Disaster Affairs, Ministry of Public Works and Settlement in 1996.

A Seismic Hazard Study of Gediktepe was performed to provide inputs for geotechnical design. The peak ground acceleration at the TSF/CWP site is summarized as follows:

- 1:2,500 yr. AEP, 0.55g.
- 1:5,000 yr. AEP, 0.749g.
- 1:10,000 yr. AEP, 0.892g.

18.4.5 Tailings Characteristics

Tailings geotechnical properties are based on test work on representative samples. Settling tests were conducted on a slurry sample at a slurry density of 65% solids, to a methodology supplied by CMW. The key tailings characteristics were:

- Particle size distribution P_{80} of 39 µm, approximately P_{20} of 7 µm.
- Undrained settled density, 1.67 t/m^3 (dry).
- Drained settled density, 1.74 t/m^3 (dry).
- Air Drying test, final density, 1.85 t/m^3 (dry).
- C_v, 4 to 223 m^2/yr.

Sulphide tailings have good settling characteristics. The relatively high dry densities obtained in the testing are a result of the high solids SG of the tailings. The tailings solids SG is 4.1 – 4.2 based on metallurgical testing.

For the purposes of operational design, the following tailings parameters were assumed:

- Tailings in situ dry density, 1.85 t/m^3 (dry).
- Beach slope, nominally 1.5%.

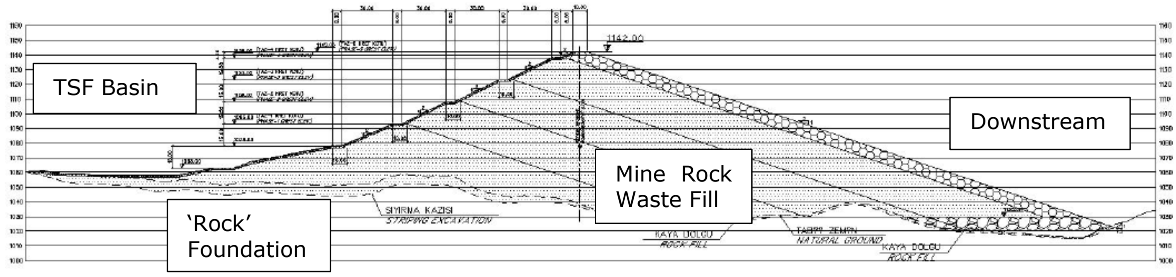
The tailings are PAF and the solids have elevated levels of metals.

18.4.6 Design Concept

The TSF was designed with a storage volume of 11.1 Mm^3 (crest 1,142 mRL). To provide this volume with the lowest cost, the Acisu Stream valley located adjacent to the proposed pit and processing facilities was selected. The embankment axis is proposed in an appropriate section of the valley to reduce embankment volumes whilst providing capacity to enable LOM storage and potential for additional storage.

The TSF embankment will be constructed using waste rock from the mine pit operations. The embankment will be constructed with an upstream slope of 1V:2H with benches at 15m in vertical height and a downstream slope of 1V:3H. The TSF basin area slopes have been designed with a bench height of 15 m with 1:2 (v:h) slopes and 6 m bench width in order to allow for liner construction. Figure 18.4 shows the TSF embankment profile.

Figure 18.4 Typical TSF embankment profile



Earthworks (excavation and fill) will be provided in the TSF reservoir area to re-profile the valley sides in order to provide a surface for installation of a lining system. A liner system is required to ensure the floor and side surfaces of the facility have low permeability and reduce the impact of seepage to the surrounding and downstream environment.

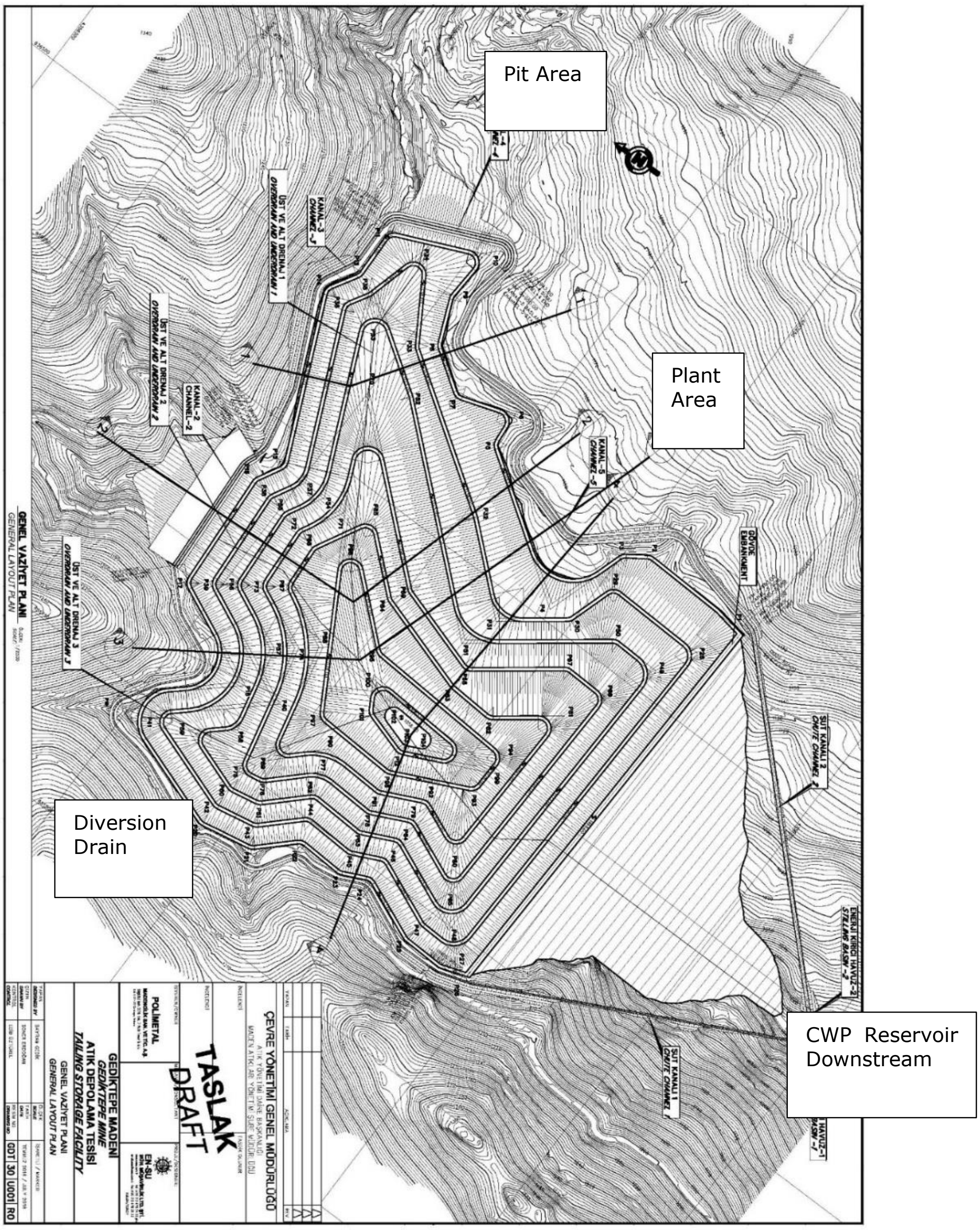
The lining system will comprise natural clay material, 0.50 m thick in the bottom of the valley and geosynthetic clay material on the valley sides. A textured 2 mm thick HDPE geomembrane will be laid over the clay sub-layers. This lining system will have adequate strength and be resistant to environmental and atmospheric effects and leachate from the PAF tailings.

An over drainage system (above the lining system) will be constructed to capture leachate for the tailings profile and reduce the phreatic surface within the TSF. Reducing the phreatic surface over the liner will reduce the leakage rate through any defects in the lining. An underdrain system will be installed under the TSF lining system to recover water from springs within the TSF valley and act as a leak detection system. The underdrain system will discharge to the CWP reservoir downstream of the TSF.

The TSF area will be surrounded by the diversion channels. Runoff from upslope of the TSF will be diverted through concrete lined channels above the TSF. The concrete diversion channels will discharge into concrete chutes aligned down the abutments of the TSF, with the concrete chutes discharging into the CWP.

The site layout for the TSF is provided Figure 18.5.

Figure 18.5 TSF layout



Stability and deformation analyses were performed for an embankment with a crest at 1,153 mRL rather than the approved crest 1,142 mRL. Embankment stability analyses indicated FoS greater than 1.5 for normal loading conditions and 1.1 for pseudo-static earthquake cases. The stability and deformation under earthquake loading (1:2,500 yr. AEP) for the TSF embankment was checked by performing dynamic analysis using Plaxis. This was similar to deformation estimated by CMW using the Swaisgood Method, an empirical method as a check.

The TSF embankment was analyzed for the 1:5,000 year AEP earthquake (PGA 0.749 g) and the 1:10,000 year AEP earthquake (PGA 0.892 g). The results of the stability analyses indicated adequate FoS for the 1:5,000 yr. earthquake and FoS around 1 for the 1:10,000 yr. earthquake. A FoS around 1 indicates some damage to the embankment can be expected.

Deformation analyses were done using Plaxis for the 1:5,000 yr. AEP and the 1:10,000 yr. AEP earthquakes. These analyses indicated some local damage under a 1:5,000 year earthquake and a 1:10,000 year earthquake. However, it was noted maximum deformations were approximately 1.3% of embankment height or around 1.5 m. This deformation is less than the freeboard allowance of 2 m and hence the maximum deformation is assessed as acceptable.

It is considered that the embankment complies with GISTM requirements for seismic design.

18.4.7 TSF Storage Characteristics

A storage capacity curve for the TSF was compiled by CMW utilizing the latest EN-SU design. This storage capacity and storage life for the TSF was estimated based on a tailings in-situ dry density of 1.85 t/m^3, a beach slope of 1.5% and a tailings production rate of 1.83 Mtpa. The tailings beach slopes modelled assumed tailings deposition as per the CMW Operations Manual, that is from the main embankment and along the western boundary of the TSF with the decant to be raised up a ramp towards the north east.

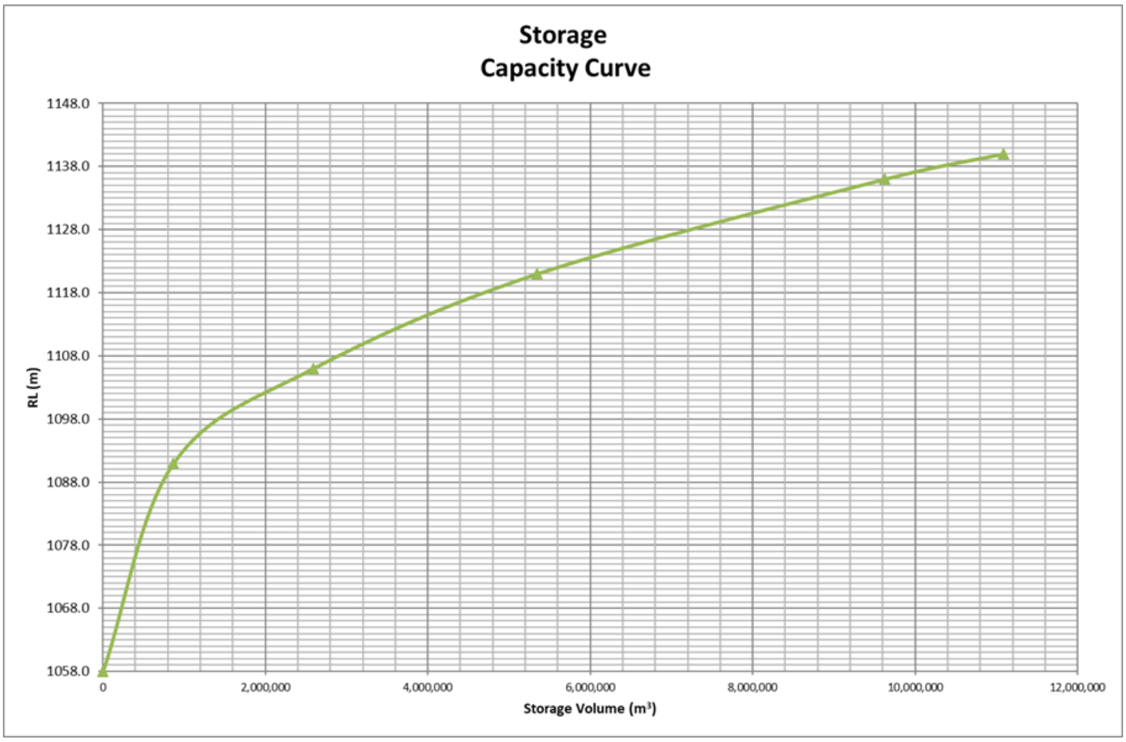
Table 18.1 shows the TSF storage capacity and a storage capacity curve is shown in Figure 18.6.

Table 18.1 TSF storage capacity summary

RL (m)	Cumulative Volume (m^3)	Cumulative Capacity (t)[1]	Cumulative Storage Life (years)	Comments
1140	11,082,656	20,502,914	11.2	Stage 5 tailings level*
1136	9,622,447	17,801,527	9.7	Stage 4 crest level
1121	5,344,206	9,886,781	5.4	Stage 3 crest level
1106	2,587,201	4,786,322	2.6	Stage 2 crest level
1091	868,412	1,606,562	0.9	Stage 1 crest level
1058	-	-	-	Bottom of TSF

Note: *Stage 5 crest level, 1142.0 m, i.e. an allowance of 2 m freeboard above the tailings level – as per the drawing used for modelling.

Figure 18.6 Storage capacity curve for the TSF



To store 17.4 Mt, the TSF will need to be raised to 1138 mRL. It should be noted that government approvals for the TSF are for a final crest elevation of 1142 mRL and hence the approved TSF design can accommodate more than the current LOM.

18.4.8 Liners and Drainage

On the base of the tailing storage area there will be barrier layer comprising 0.5 m of natural clay, underlying a geomembrane, 2 mm thick HDPE liner. On side slopes, a textured 2 mm thick HDPE geomembrane will be used, overlying a geosynthetic clay layer. Textured HDPE liner has greater friction angle to reduce movement on the 1:2 (v:h) batter slopes. Above the HDPE geomembrane there will be a protective geotextile where over-drainage is placed.

To reduce the phreatic surface over the lining system and hence reduce the rate of leakage a leachate collection and drainage system will be constructed. This will reduce the potential risks of leachate contaminating the underlying groundwater and the environment downstream.

The over-drainage system will comprise a protective geotextile under an over-drainage aggregate layer with a minimum 0.5 m thickness. This over-drainage layer will be installed across the base of the TSF, over the lining system. The over-drainage system will also comprise a network of slotted drainage pipes running up the valley. The over-drainage pipework system will grade to an internal sump. An inclined bore will run down the side of the TSF into the internal sump. A bore pump deployed down the inclined bore will recover leachate and pump the leachate water back into the facility for reuse.

An underdrainage system will be installed under the lining system (and over-drains). This system will act as a leak detection system and also intersect water from springs within the TSF valley. The underdrain system will deliver water under gravity to a collection pond, downstream of the TSF embankment via an HDPE outfall pipe. Water will be recovered from the underdrainage system in the downstream collection pond. The water quality within the collection pond will be monitored and only water of an acceptable quality allowed in the CWP.

18.4.9 Instrumentation

Instrumentation is included in the TSF design and includes observation wells downstream of the main embankment as well as vibrating wire piezometers, accelerometers and movement monitoring in the TSF and CWP embankments. The instrumentation system should be monitored in real time with trigger levels set (by the designers) and alarms to alert when action by the mine is required. The data from instruments should be collected using data loggers and transmitted via telemetry to a mine-based computer (usually web-based). If data indicates a trigger is exceeded, an alarm can be sent to site management.

18.4.10 Surface Water Diversion

TSF area will be surrounded by the diversion channels. Runoff water from upstream will be diverted through these channels. The diverted runoff water from the upstream catchments will be diverted to the reservoir of the Clean Water Pond downstream of TSF.

The table below summarizes the flows for various catchments reporting to the diversion drains. The channel types are provided on the drawings. Peak flow estimates were calculated using two methods. For the catchment areas below 1 km^2, the "Rational Method" was used and for the catchment areas above 1 km^2, "Mockus Method" was used.

A design check using Manning's formula (Manning's number 0.015, utilized) indicates that the existing channel design generally has sufficient capacity to cater for a 1:5,000 yr. AEP event. EN-SU has advised that the number 3 and 5 channels, have flood levels slightly above the freeboard and hence these channels walls must be designed slightly higher (i.e. by 3 cm and 11 cm higher than the current design, respectively). The drainage design is considered to comply with the GISTM requirements for water management design. Table 18.2 summarizes the catchment area, design flow and channel details.

Table 18.2 Diversion drain details

Name	Channel 1 *	Channel 2	Channel 3	Channel 4	Channel 5 **
Catchment Area	0.296 km^2	2.406 km^2	3.103 km^2	3.103 km^2	9.716 km^2
Capacity (Q1000)	5.2 m^3/s	17.2 m^3/s	25.2 m^3/s	25.2 m^3/s	78.4 m^3/s
Channel Width	2.0 m	1.5 m	3.5 m	1.5 m	5.0 m
Channel Slope	0.003 m/m	0.002 m/m	0.0025 m/m	0.002 m/m	0.0025 m/m
Nominal Flow Depth#	1.0 m / 1.2 m	1.6 m / 1.9 m	1.9 m / 2.5 m	1.9 m / 2.3 m	3.1 m / 3.9 m
Capacity (Q5000)	7.4 m^3/s	25.6 m^3/s	37.9 m^3/s	37.9 m^3/s	113.6 m^3/s
Channel Length	1090 m	228 m	455 m	260 m	947 m

Notes:

- * Channel 1 will join chute channel 1 on the right-hand abutment of the TSF embankment
- ** Channel 5 will join chute channel 1 on the left-hand abutment of the TSF embankment
- #. Q1000 flow depth / Q5000 flow depth

18.4.11 Construction Methods

The construction of the TSF and CWP will utilize both resources from the mining operations and a civil contractor. The bulk fill from embankment construction will be sourced from the pit operations as well as stripping from within the TSF and CWP. The bulk fill sourced from the mine will be delivered to the TSF and CWP site using the mine truck fleet. The civil contractor will be responsible for fill spreading, working and compaction, at the embankments.

The civil contractor will perform the following activities as part of the TSF and CWP construction:

- Clearing and topsoil stripping.
- Embankment stripping and excavation. Suitable material for embankment construction (i.e. rock-fill) would be hauled to the embankments by the civil contractor.
- Unsuitable materials from the TSF/embankment stripping (i.e. clays, sands etc.) will be hauled by the civil contractor to the waste dump area.
- Spreading, working and compaction of the fill on the embankments using dozers, graders and roller compactors.
- Diversion channel construction. Mostly excavation using excavators and a trucking operation to take materials to the embankment or to the waste dump area.
- Foundation preparation for the embankments
- Foundation preparation for the liner system
- Installation of the under-drainage system (below the liner)
- Installation of the liner system
- Installation of the over drainage system (above the liner)

A competent and experienced liner contractor will be engaged to install the liner system.

18.4.12 Operational aspects

The operational design of the facilities has the following objectives:

- Provide optimum removal and return of water to the plant for re-use in processing.
- Optimize tailings storage capacity by maximizing tailings density (i.e. undertaking cyclic tailings deposition between groups of spigots).
- Reduce environmental impact (i.e. due to seepage) by incorporation of a liner system and over-drainage and under-drainage systems in the design.
- The following operational considerations have been incorporated into the design:
- Tailings in the form of slurry will be discharged sub-aerially into the facility in thin discrete layers, not exceeding 0.3m thickness, in order to allow optimum density and strength gain by subjecting each layer to a drying cycle. The number of deposition location will need to be trialled but is likely to be 1 to 3 points dependent on through-put.
  - At start-up, deposition will take place via multiple spigots located on the upstream main embankment crest.
  - Additional discharge locations (open end discharge points) are located on the western boundary of the TSF in order to beach the tailings to the north-east as the tailings level rises (i.e. during Stage 1).
- Tailings deposition or spigotting is to be carried out such that the supernatant pond is maintained at and around the decant pump, which will be deployed from a ramp running down the north-east arm of the TSF valley. The pond is to be maintained well away from the main embankment at all times.
- Water will be removed from the facility and pumped back to the process plant via a decant pump deployed from the access ramp.
- The tailings storage area is in the form of a truncated prism with a depressed cone on the top surface and will have capacity to store a considerable volume of water during a large to extreme storm event. Minimum operation freeboard is 0.5 m at the main embankment.
- Frequent inspections should be made of the tailings line, water return line, discharge point, water recovery system and the position of the supernatant pond in relation to

the water recovery system, the liner system, and over-drainage and underdrainage systems.

- Only by regular inspection and appropriate remedial action can the performance of the water return system, and over-drainage and underdrainage systems be optimized, and operational problems be avoided.
- Operations, safety and environmental aspects will be periodically reviewed by a suitably experienced and qualified engineer. This inspection should be done at least every year.
- On decommissioning, the TSF will remain as a permanent feature and drain to form an increasingly stable mass. The top surface will be stabilized and rehabilitated.

18.5 TSF closure

The TSF will be closed to comply with Turkish Mining Waste Regulations. These regulations require that after the tailing storage process is finished, the area is dried / dehydrated before the top layer is formed over the storage area.

The downstream slope of the main embankment will have a slope of 1:3 (v:h) and will not require major rehabilitation works.

At completion of the processing at Gediktepe, preparations will be made for closure of the TSF. Upon decommissioning, the slurry pipework will be removed. The decant pump and pipework will be left in place over the closure period to remove water from the storage as required to lined water ponds at the plant. The over-drainage system will remain operating post decommissioning and prior to closure until little water can be recovered from the inclined bore. The underdrainage system will remain operational post closure with water from this system flowing to the CWP. The CWP will remain operational and will be taken over by the 'state' at closure.

The tailings will take several years to consolidate (at least 2 years and less than 5 years) and gain strength following completion of deposition of tailings. When a sufficient 'crust' has developed over the tailings and the tailings are suitable for trafficking by equipment, the top surface of the TSF should be covered.

The objectives of the cover design should be to reduce the ingress of water and oxygen into the tailings profile. A mixed type of cover has been selected as the most suitable for the climate at Gediktepe (Mediterranean climate of hot dry summers and wet winters with snow). This cover system includes a store and release system to remove rainfall ingress into the cover by evapo-transpiration and a barrier layer to reduce the potential for water to seep into the tailings profile.

The minimum total thickness of the cover on the top-surface of the TSF will be 2 m. While the overall cover thickness of 2 m is appropriate, it is recommended that the alternative cover design provided below, be considered. In the alternative, the drainage layer could be allowed to act as a capillary break when placed above the tailings. A compacted clay layer (target permeability k, 10-9m/s) will be placed over the capillary break layer and roller compacted. A buffer layer located at the top of the profile will act as a store and release layer, protecting the compacted clay from drying out.

Materials characterization, borrow investigations and laboratory testing will also be required in order to advance the cover design. Geosynthetic clay layers could also be considered to provide low permeability instead of natural clay if no appropriate clay sources can be found.

The TSF cover design options comprise in Table 18.3.

Table 18.3 TSF cover design

Proposed Cover Design – Alternative Design	Cover Design in EN-SU Report
Topsoil, over	Topsoil, over
1m, Store and Release (Buffer) layer, over	0.2m, Drainage layer, over
0.5m, Compacted clay, over	0.5m, Compacted clay, over
*0.2m, Drainage layer / capillary break layer, over	1m, Buffer layer, over
Tailings	Tailings

Note: * May need to be thicker for constructability

The cover will be constructed by progressively pushing waste out over the tailings. The cover system will be pushed out over the tailings in layers using small dozers. Small dump trucks will be required to traverse the cover, along haul roads to deliver materials to the work front.

It is recommended that towards the end of the life of the facility, the closure design be reviewed and a formal closure plan for the TSF compiled. Trials should be conducted in order to review the design and assess the required cover thickness. These trials should comprise plots instrumented in order to assess the ingress of water and oxygen into the tailings profile.

A spillway will be required for closure in order to ensure water does not accumulate on top of the TSF. The closure spillway will comprise a concrete spillway graded across the TSF rehabilitated surface, discharging into the concrete chute on the left-hand abutment. The closure spillway has been designed for a 1:1,000 yr. AEP flood event. The capacity of the closure spillway will be 2.83 m^3/s. It was noted that this capacity assumes a functional diversion system at closure diverting runoff from upslope around the TSF, this aspect should be reviewed as part of the development of the TSF closure plan. In order to comply with the GISTM the diversions and ultimate spillway should be designed for a 1:10,000 yr. AEP event.

When construction of the cover system has been completed, the top-surface should be lightly tyned and the area seeded and fertilized. Preference should be giving to cultivating grasses and low vegetation over deep rooted plants. Deep rooted plants could penetrate the cover and lead to greater ingress of water and oxygen into the tailings profile.

Post closure monitoring should be considered in the TSF closure plan. The post closure monitoring would need to take place over a minimum five-year period and include regular monitoring of instrumentation and repair and maintenance of TSF infrastructure e.g. channels, batters etc.

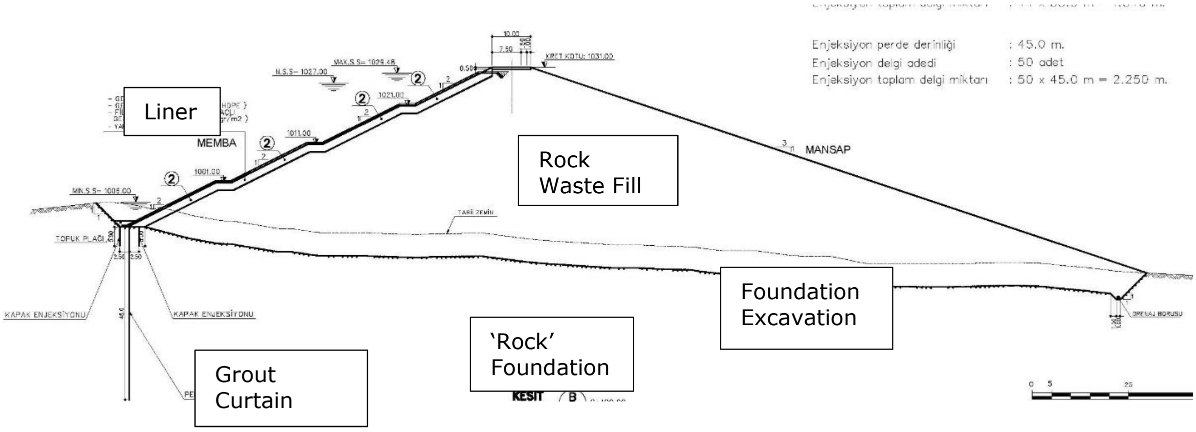
18.6 Clean Water Pond

The CWP area is located downstream of the TSF and receives diverted clean water. The location of the embankment was largely determined by the location of the EIA boundary downstream. This boundary was determined by the proximity of nearby villages.

CWP active capacity was determined at 680 000 m^3, which is the required storage capacity to meet the annual water balance requirements for the mine. This capacity allows for a dead volume of approximately 57 000 m^3 or 20years of sediment accumulation (based on 250 m^3 / year / km^2 value which is the Turkish average).

The CWP embankment will comprise compacted rock waste with a liner on the upstream face and a grout curtain to reduce seepage losses. The rock waste will be sourced from the open pit area (the same source as the TSF). The CWP impoundment area is not lined. The section below (Figure 18.7) provides a typical cross section of the CWP embankment.

Figure 18.7 Typical cross section of CWP embankment



Embankment stability analyses indicated safety factors greater than 1.5 for normal loading conditions and 1.1 for pseudo-static earthquake cases.

To facilitate construction of the CWP embankment a pipe diversion was designed with a capacity of 23.5 m^3/s, which should be able to cater for a 1:25 year AEP flood from upstream of the CWP. The design incorporates a concrete spillway on the left-hand abutment. The spillway has been sized for a probable maximum flood (or catastrophic flood discharge) of 138 m^3/s, which is understood to be in accordance with the general instruction of General Directorate of State Hydraulic Works (DSİ).

18.7 Power Supply and electrical distribution

Power will be supplied to the plant via an overhead power line and substation to step down the voltage to 6.6 kV. Power will be distributed around the site at a voltage of 6.6 kV, with a switchboard established in a substation adjacent to the plant to distribute power to substations. Power will generally be distributed via buried cables. A substation will also be established at the TSF and fed via an overhead power line. Transformers will be installed in fenced, bunded compounds located adjacent to the low voltage switchboards or MCC that they supply. Electric motor voltages for drives other than the mill (SAG, ball and regrind) motors will be 400 V.

Prefabricated transportable switch rooms will be constructed from non-combustible materials and fitted with smoke detection and handheld fire extinguishers. Switch rooms will be elevated above the ground on either concrete or steel plinths to allow for the installation of cables beneath the building floors. These switch rooms will house the 400 V MCCs, variable speed drives, instrument marshalling and PLC cubicles for the various areas of the plant. A dedicated high voltage switch room will house the 6.6 kV switchgear and SAG Mill variable speed drive.

All 400 V MCCs will be arranged for cable entry from the beneath the boards. PLC equipment associated with the motor control modules will be built into one or more tiers of the MCC and the PLC inputs and outputs (I/O) will be hard wired between drive modules and the PLC racks. Communications between the MCCs and control system HMI will be via Ethernet and by fibre or copper as appropriate. Low voltage variable speed drives will be VVVF six-pulse and either wall or floor mounted depending on size and weight.

All drives will have local control stations with start and stop buttons adjacent to the for local control for maintenance. Selected drives will be remotely operable from the control room. The operating status of drives will be displayed on the operator interface pages. Any drive fault will be reported by the control system, and an alarm will be initiated and logged. The control voltage for all drives will be 24 VDC. Hot-dip galvanized cable ladders will be installed through the plant to support electrical cables. Low voltage power cables in processing areas will be insulated. Screened cable will be used for all variable speed drive applications.

LED lighting will be used for general plant lighting. Battery back-up lighting will be installed in all switch-rooms and access ways to ensure safe evacuation is possible in the event of a blackout. Small power circuits feeding socket outlets and lighting circuits will be protected by residual current devices.

18.8 Water Management

The CWP will provide water for the Project. It will be treated as needed for industrial use and for personal use. Acısu Creek and Kaynarsu Creek pass through the open pit and NAG waste dump areas and have been diverted with deviation channels. The Kaynarsu Creek deviation channel is connected to the deviation channels around the TSF. The TSF and Acısu Creek deviation channels direct water to the reservoir of the CWP.

Surface rain and snow non-contact water will be directed to the non-contact water pond for the use of the plant and facilities. Contact surface water will be directed to the contact water pond for treatment and used in the process plant. Non-contact water will be directed to the CWP's reservoir and any water after treatment, as per the regulation standards can be discharged to the environment. Drains will be constructed by the side of all roads and the plant areas to divert surface water to the dedicated locations.

Water gathered in the site perimeter diversion flumes will be collected in the Non-Contact Water Pond and pumped to the process plant via a sand filter for use as raw water. Filtered Raw Water will be stored in the Potable Water Tank and pumped to the control room, offices, ablution areas, laboratory and lunchroom via an ultraviolet sterilizer.

Tailings thickener overflow will be pumped to the water treatment plant, where remaining flotation reagents will be stripped and then to the process water pond. Decant water will be pumped to the process water pond and reticulated through the plant. Excess process water will be treated in the water treatment plant to a level compliant with regulations.

18.9 Waste Disposal

In the plant area, separate and dedicated area will be constructed for waste separation, such as for timber, steel, oil, and plastic. These waste streams will be collected by recycling companies and any dangerous waste, such as oil will be sent to certified disposal facilities.

Non separated waste will be collected by the Municipality. Polimetal has donated a garbage truck to the Municipality, and they collect waste twice a week.

Biological treatment units will be installed for sewage treatment.

19 Market studies and contracts

19.1 Introduction

This marketing section was prepared by Polimetal from information supplied by Link and input from AMC and GRES on concentrate quantities and qualities.

Polimetal requested Link to assess the value and the marketability of the concentrates to be produced from the Sulphide Project, including payables, deductions, forecasts of smelting charges and metal prices. The forecast terms were used in financial modelling and sensitivity analyses in Section 15. Link noted that major European and Asian smelters showed interest in both copper and zinc concentrates from the Project.

The Project will produce a copper concentrate and a zinc concentrate between years 2 and 11 to generate revenue for the Project. The estimation of the annual and LOM production in thousands of wmt (‘000 wmt) forecast of each concentrate is as per Table 19.1.

Separate copper and zinc concentrates will be produced and shipped to major smelters. Formal discussions have commenced, and smelters have confirmed their interest in both concentrates under long-term agreements and have indicated willingness to sign Letters of Intent (LOI) as soon as final qualities and quantities are known.

Table 19.1 Annual concentrate production

Year	Annual concentrate production (‘000 wmt)	
	Copper	**Zinc**
Year 1	-	-
Year 2	11	11
Year 3	43	49
Year 4	53	35
Year 5	55	51
Year 6	42	53
Year 7	36	72
Year 8	40	67
Year 9	41	70
Year 10	45	51
Year 11	43	76
Total	**409**	**536**

The typical quality of products (copper concentrate and zinc concentrate) to be generated from the Project are shown in Table 19.2, which are based upon the results of metallurgical test work undertaken by ALS Metallurgy Pty Ltd (ALS)[4] and metallurgical analysis carried out by HMT[5] during the PFS. Values given for the main commercial elements of gold, silver, copper, zinc, lead, and arsenic were calculated according to a weighted average based on ore type tonnages. The remaining element values are estimated from the locked cycle tests that were completed rather than calculated according to a weighted average based on ore type tonnages and do not necessarily represent the specifications for the Project. However, these are considered to be representative for the Project, although feed and product grades will vary over time.

[4] Quantitative Automated Mineralogical Analysis on Sulphiode Samples from the Gediktepe Sulphide Project for Polimetals Madencilik, A21847, various reports (8), April 2021-July 2021, ALS. See Appendix 8.2.

[5] Gediktepe Project Ore Variability Testwork and Derivation of Grade vs Recovery Equations, March 2023, Hacettepe Mineral Technologies. See Appendix 8.1.

Table 19.2 Average concentrate quality

Average concentrate quality			
		Cu Conc.	Zn Conc.
Au	ppm	14.39	1.84
Ag	ppm	294.14	194.60
Cu	%	25.39	1.47
Zn	%	2.99	51.63
Pb	%	3.96	2.53
Al_2O_3	%	0.06	<0.04
As	ppm	2,806	630
Bi	ppm	742	198
Cd	ppm	194.5	1750
Cl	ppm	60	160
Co	ppm	5	3
Cr	ppm	110	70
Hg	ppm	4.51	23.1
S	%	33.2	35.9
F	ppm	160	<20
Fe	%	23	8.01
MgO	%	0.56	0.1
Mn	ppm	70	150
Mo	ppm	10.3	3.8
Ni	ppm	22	11
Sb	ppm	985	388
Se	ppm	400	80
SiO_2	%	1.5	-
Te	ppm	4.1	-

The copper concentrates are expected to be attractive for western copper smelters, however, attention should be given to the contents of Pb to maintain the level below 2.5% and as low as possible to reduce penalty charges.

The zinc concentrates are clean, without any deleterious elements and with payable precious metal contents, generating additional income in the concentrates.

19.2 Smelters and refining options

Based on the expectation that growth in copper smelting capacity will be greater than the growth in concentrate supply, it is expected that global smelting capacity for copper remains sufficient to absorb the new production. In China, new smelter projects are already in construction or committed to the market and will start operation within 3 years. The permitting issues in China levelled the rate of growth in smelters. On the other side, China converted its smelters to use more environmentally friendly technologies and it is forecast that the copper smelting capacity will increase to over 40 Mtpa. There is only one copper smelter in Türkiye, which is located in Samsun. The smelter processes 210 ktpa of concentrate containing 20% copper and produces 40 ktpa of blister copper.

The rising demand for zinc metal will reach 2.0 Mtpa from 2024, with the higher smelter production expected to come from higher utilization, new smelters or expansions at existing smelters. There is no operational zinc smelter in Türkiye. However, the neighbouring country of Bulgaria has production capability of 72 ktpa of zinc ingot in the city of Plovdiv.

The Project is a polymetallic mine and an early engagement with smelters with off-take agreements could be an additional tool to secure project financing. Prominent smelters such as Boliden in Sweden, Aurubis in Germany and KCM in Bulgaria, which are potential smelters to buy the concentrates, expressed interest during various meetings, as well as during Boliden's site visit in December 2021. Europe will be the most convenient market for Gediktepe concentrates in terms of location, although Asian smelters remain active alternatives, depending on freight rates to the main Asian ports.

19.3 TCRCs and payability of copper and zinc concentrates

The treatment costs and refining costs (TCRCs) forecast is sensitive to concentrate availability and smelter production capacity. Typically, significant surplus in this market results in a rise in spot TCRCs and in annual benchmark terms. A rising deficit is forecast over the next two years as primary smelting capacity in the custom traded sector continues to increase, while growth in mine production capability destined for this market is forecast to slow. Link's base case long-term forecast assumes copper TCRC of US$90/dmt of concentrate treatment cost and US$0.09/lb of copper refining cost (see Table 19.3).

Table 19.3 Payability and TCRCs assumptions for Gediktepe copper concentrate

Item	Term
Payable Copper	Pay lesser 96.5% or Cu content less 1%
Treatment Charge	US$90/dmt
Refining Charge	US$0.09/lb
Payable Gold	Pay lesser of 90% or Au content less 1 g/t
Payable Silver	Pay lesser of 90% or Ag content less 30 g/t
Gold Refining Charge	US$10/oz
Silver Refining Charge	US$1/oz

For zinc, the ramp-up of concentrate production from new mines is forecast to move the concentrate market towards a significant surplus, thus the market needs more smelter capacity, and smelters will take advantage when negotiating terms. Link's base case long-term forecast assumes zinc TC of US$200/dmt of concentrate (see Table 19.4).

Penalties for deleterious elements in copper concentrates are shown in Table 19.5 and for zinc concentrates in Table 19.6. Penalties are based on dry metric tonnes of concentrates.

Table 19.4 Payability and TCRCs for Gediktepe zinc concentrate

Item	Term
Payable Zinc	Pay 85% or zinc content less 8%
Treatment Charges	US$200/dmt
Payable Gold	70% after 1 g/t deduct from Au content
Payable Silver	70% after 108.862 g/t deduct from Ag content

Table 19.5 Penalty limits for copper concentrates

Elements	Copper Concentrate LOI* Limits (%)	Copper Concentrate Reject Limits (%)	Penalty Charges
Pb	2.5	6.0	US$4.50 for each 1% above 0.5%
Zn	7.0	10.0	US$1.50 for each 1% above 1.5%
As	0.5	0.5	US$2.50 for each 0.1% above 0.2%

Note: *LOI – Letter of Intent

Table 19.6 Penalty limits for zinc concentrate

Elements	Zinc Concentrate Limits (%)	LOI Limits (%)	Rejection Limits (%)	Penalty Charges
Cu	-	5.0	-	No penalty
Pb	3.0	5.0	-	US$1.50 for each 1% above 3%
As	0.2	0.6	0.6	US$1.50 for each 0.1% above 0.2%

19.4 Smelter payment terms for copper and zinc concentrates

Payment terms for copper and zinc concentrates by the smelters are as per below:

- 90% first provisional payment, calculation based on provisional assay results and London Metal Exchange (LME) spot prices at the time of shipment, to be paid by smelter within one week following the arrival of the vessel at the port of discharge.
- 10% second provisional payment 60-90 days following the arrival of the vessel at port of discharge.
- Final settlement when final metal prices, weights, moisture, and final assays are known.

19.5 Shipping

Shipment of the Gediktepe concentrates is planned from Marmara Sea ports (Gemlik or Bandirma) or Aegean Sea ports (Aliaga), where various shipping options are being examined to minimize cost and maximize control of concentrates. Consumers of zinc concentrate and copper concentrate generally prefer to receive cargoes in bulk shipments of 2,500 wmt to 7,500 wmt. Subject to the locations and the proximity of customers for various concentrates, one bulk carrier may be used to carry two different qualities of concentrates with separations between cargoes of differing quality. Minimizing inventories at the mine site and at the loading port can be managed, which will provide a steady cash flow for the Project as well as a yearly average pricing mechanism, with approximately 5,000 wmt to 7,500 wmt of concentrate shipped per month.

There will not be a stockpiling area for concentrate at the mine site, so all the concentrate will be transported to a storage facility at the port. Based on port visits, there is no shed option at any of these ports, but Gemport (Gemlik Port) has a shed for lead concentrate only to avoid contamination with other concentrates. This shed option will be investigated to store copper and zinc concentrates during the operation. Shipment costs have been calculated on the basis of cost, insurance and freight (CIF) and the breakdown is shown in Table 19.7.

Table 19.7 Shipment costs

Item	Cost
Inland Transport	US$16.80/wmt
Open Warehousing (after 30 days)	US$1.25/wmt monthly basis
Material Handling (splitting, drying, and tumbling)	US$4.00/wmt
Port charges (weighing, transfer, ship loading, and ISPS)	US$18.00/wmt
Sea Freight (CIF)*	US$57.00/wmt
Insurance**	US$0.06/wmt
Custom Clearance	US$1.00/wmt
Inspection***	US$3.29/wmt
Marine Insurance (0.2% CIF)	US$0.11/wmt
TOTAL	US$101.51/wmt

Notes:

- * Average of potential destinations
- ** 0.15% over CIF amount
- *** covers sampling, sizing, moisture determination, sample preparation, pre-shipment moisture sampling, flow moisture point and transportable moisture limit sampling and analysis, weighing by draught survey and supervision, sample dispatch to laboratory, assay performed (Cu, Zn, Pb, As, Au, Ag) and environmental fee.

Inland transport costs were quoted from a local transport cooperative from Bigadic that can transport minerals such as boron from Bigadiç to Bandırma port. Other than boron minerals, the same cooperative also transports concentrate to Aliağa port from small local mines.

Sea freight cost were calculated based on CIF Europe port rates.

In addition, international supervisory companies such as Alex Stewart UK, SGS Geneva and Alfred H. Knight UK have quoted for inspection facilities. The above inspection cost covers sampling during loading, sizing determination, moisture control, flow moisture point (FMP), transportable moisture limit (TML) testing, assays and environmental fees.

Overall, the total logistics and transport cost for Gediktepe concentrates from the mine site to the discharge port are estimated at US$101.51/wmt. According to moisture tests, the moisture will be around 9% for both concentrates, so the total logistics and transport cost for Gediktepe concentrates will be US$93/dmt.

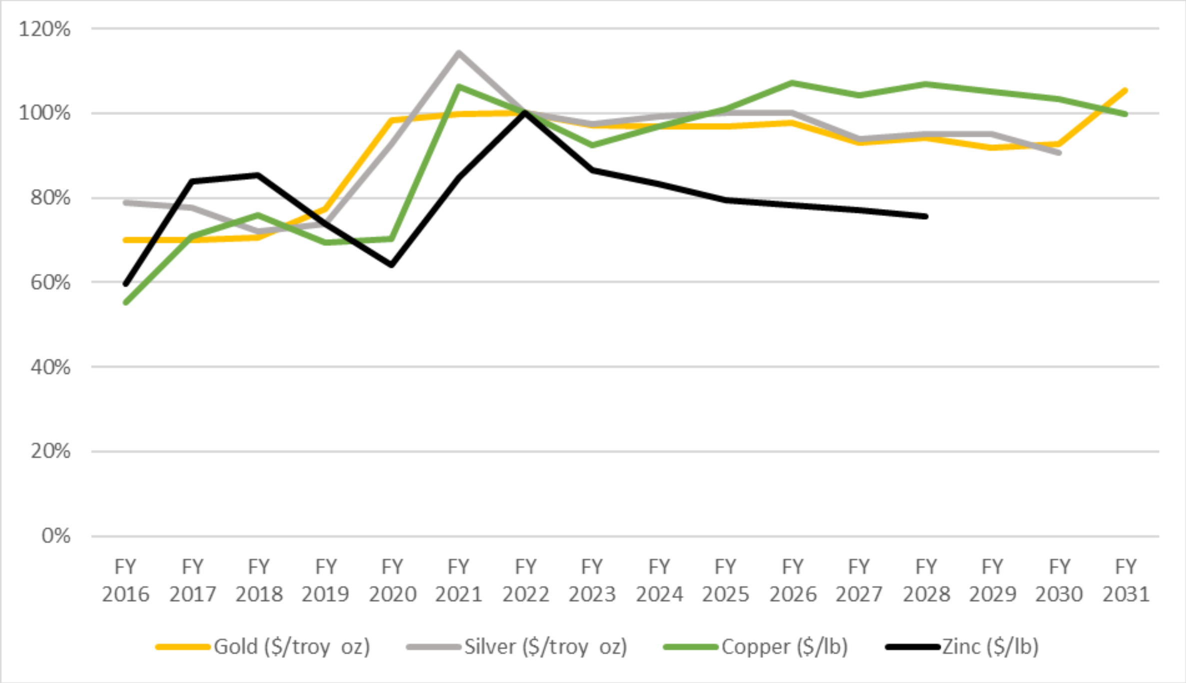
19.6 Market Outlook

Project financials are sensitive to metal prices, like most of the mining projects around the world. In addition to this, smelting, refining charges and other related costs also play a role in determining revenue. Metal demands within manufacturing industries, as well as the capital and operating cost of production all influence long-term metal prices.

Incentivizing new production capacities in most base metals requires that higher metal prices will be required than current levels over the long term. The inability of supply to match demand is pertinent in the copper market for medium to long term. Higher prices in the zinc concentrate market are also required to incentivize the development of new projects. However, for the long-term, both copper and zinc metal prices are expected to remain close to the historical real term average prices.

The commodity price outlook from S&P Global Commodity Insights Capital IQ Commodities Estimates Overview dated December 2022 (S&P IQ Capital) is shown in Figure 19.1 and the long-term metal price forecast in Table 19.8.

Figure 19.1 Commodity price outlook, FY16-FY31 (Indexed FY22 = 100%)



Source: S&P Global Commodity Insights Capital IQ Commodities Estimates Overview dated December 2022.

Table 19.8 Long-term metal price forecast (2023-2031)

S&P Capital IQ Long Term Prices (Median-High)		
Gold	US$/oz	1,708.5-1,948.4
Silver	US$/oz	21.23-22.88
Copper	US$/lb	3.94-4.93
Zinc	US$/lb	1.22-1.42

Table 19.9 and Table 19.10 show the three-year backward realized and three-year forward forecast prices for copper, zinc, gold and silver and the TCRCs for copper and zinc concentrates respectively. The realized numbers are based on moving average of spot market prices and the forecast numbers are taken from the (S&P Capital IQ).

Table 19.9 Spot Market 3 Years Backward/Forecast Metal Prices (S&P Capital IQ)

Metal Prices	2019R	2020R	2021R	2022YTD	2023F	2024F	2025F
Gold (US$/oz)	1,394	1,775	1,801	1,805	1,753	1,748	1,750
Silver (US$/oz)	16.28	20.47	25.22	22.10	21.50	21.94	22.09
Copper (US$/lb)	2.73	2.76	4.18	3.93	3.63	3.81	3.97
Zinc (US$/lb)	1.15	1.00	1.32	1.56	1.35	1.30	1.24

Note: December 2022

Table 19.10 Spot Market 3 Years Forecast TCRCs for Cu/Zn Conc.

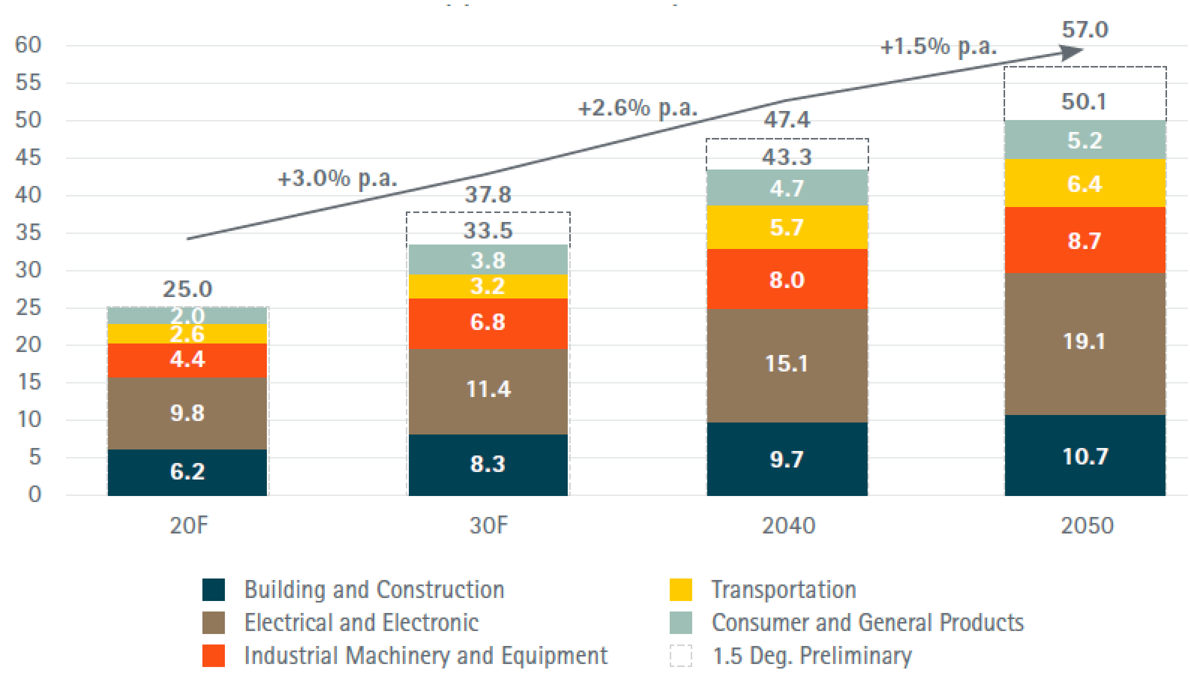
	2023F	2024F	2025F	2026F	2027F	2028F	2029F
Copper							
TC (US$/dmt)	90.00	90.00	90.00	90.00	90.00	90.00	90.00
RC (USc/lb)	9.00	9.00	9.00	9.00	9.00	9.00	9.00
RC of Au (US$/payable oz Au)	10.00	10.00	10.00	10.00	10.00	10.00	10.00
RC of Ag (US$/payable oz Ag)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Zinc							
TC (US$/dmt)	200	200	200	200	200	200	200

19.7 Copper Demand

Copper is one of the highest electric conductive metals. With this unique feature, it is commonly used in electrical applications, accounting for almost 70% of total consumption[6]. Most countries are in growth mode at different stages of their economic cycles. On this basis, the economic growth for copper looks bright for the near to medium term. Urbanization, industrialization, and electrical vehicles are the major drivers of copper demand.

Refined copper demand is forecast to grow by an average annual rate of 2.8% from 2020 to 2050 (ICA 2023, see Figure 19.2). The inability of supply to match demand in the medium to long-term will be one of the biggest risk factors for the copper market. Refined copper consumption forecast from 2020 to 2050 in 10-year periods is shown in Figure 19.2.

Figure 19.2 Refined copper consumption by end use (Mt)



Source: ICA 2023

[6] International Copper Association, March 2023, Copper - The Pathway to Net Zero, ICA 2023.

19.8 Zinc Demand

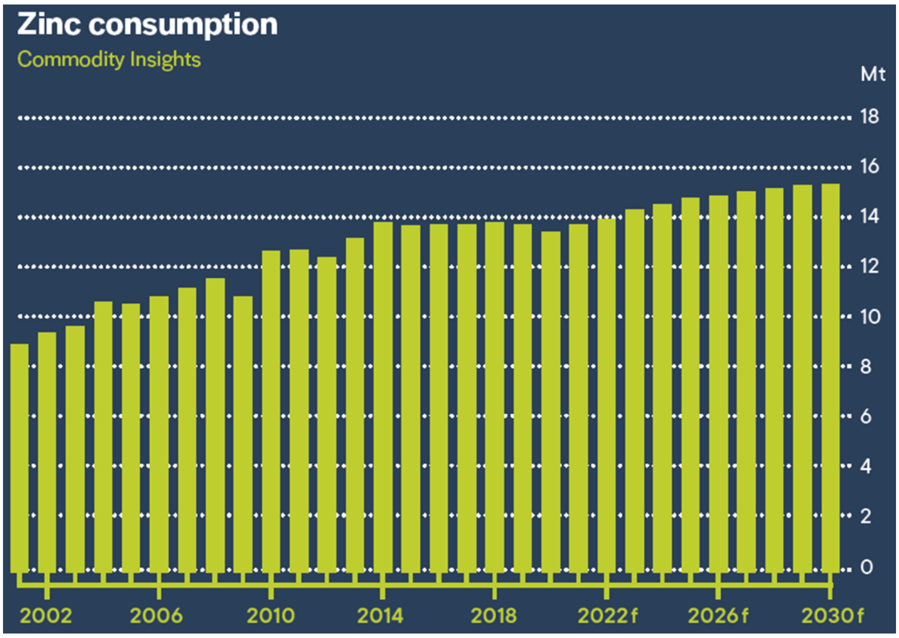
Zinc has wide range of use in industry due to its physical, electrochemical and chemical properties. The largest end-use sector for zinc is in zinc galvanizing for its anti-corrosive properties, accounting for approximately 50% of global end-use zinc consumption (US Geological Service Fact Sheet 2011-3016). The second most important end-use sector is in alloying with other metals (such as copper to form brass), used in automobiles, electrical components, and household fixtures. A third significant use is in the production of zinc oxide, which is used in rubber manufacturing and as a protective skin ointment.

As a result of zinc's use in construction and transportation, ongoing urbanization and industrialization of the developing world has been and will continue to be the primary driver of global zinc consumption. Rising populations will require higher numbers of larger apartment buildings that will require higher steel intensity, with the resulting increased construction of transport infrastructure and the requirement for zinc to manage corrosion risks likely to be a dominant trend.

With China in the midst of restructuring from investment and export-led growth to one driven by domestic consumption and services, the pace of Chinese zinc demand growth is slowing and Chinese economic growth in the longer-term will inevitably be less zinc intensive than it has been in the past. Similarly, lower use of zinc in the automobile industry as internal combustion engines are replaced by lower zinc intensity electric vehicles will reduce zinc requirements.

However, the outlook for global zinc consumption over the near to medium term is moderately positive, with growth of 1.0% p.a. forecast until 2030[7]. Annual historical and forecast zinc consumption from 2002 to 2030 from the Minerals Council of Australia and Commodity Insights, 2023 is shown in Figure 19.3.

Figure 19.3 Annual historical and forecast zinc consumption (Mt)



[7] Minerals Council of Australia and Commodity Insights, Commodity Demand Outlook 2030, MCA 2023.

20 Environmental studies, permitting and social impact

The environmental studies, permitting and social impact section was prepared by SRK.

20.1 Permitting

The Gediktepe Site has an operation licence (Licence number: 85535) obtained from the General Directorate of Mining and Petroleum Affairs (MAPEG). This licence was merged with the operation licence 20054077 (Access number: 2060132) and an exploration licence (Licence number: 201400291, Access number: 3316107). The necessary applications regarding uniting the mentioned licences will be made to the General Directorate of Mineral Research and Exploration. An "EIA is not required" decision was granted for the site with Licence No: 20054077 by the Balıkesir Provincial Directorate of Environment and Urbanisation on March 14, 2012.

EIA permitting is the first step in the Turkish environmental permitting system. EIA studies for the Oxide Project were carried out by SRK Danışmanlık ve Mühendislik A.Ş. The prepared EIA Report was given an "EIA Positive" decision by the Ministry of Environment and Urbanization (MoEU) on July 1, 2016. The geophysical and geotechnical studies carried out at the former WRD area of the Oxide Project demonstrated that the ground condition was not suitable, hence the location of the Project facilities was changed. The waste area, WRD, heap leaching and Merrill-Crowe facility area, explosive storage area, vegetable soil storage areas and subcontractor settlement areas have been relocated, on the assumption that the EIA boundaries remain the same. The MoEU approved the relocation of the Project units on November 6, 2019.

Following the completion of the EIA process, property permits, environmental permits and licences, and business licence must be obtained in order to start construction and operation. Gediktepe is composed of 1,052.38 ha (90.78%) of forest land, 82.04 ha (7.08%) of agricultural land, and the remaining land belongs to treasury, and municipality. The necessary permitting process for Gediktepe has been completed and operational activities have started in 2022. Table 20.1 lists the permissions obtained within the scope of the Project.

Table 20.1 Current permits and project approvals

Type	Permit	Corresponding Government Authority	Date
Licence	85535 operating licence	MAPEG	June 23, 2011 – June 23, 2036
	Clay production permit	MAPEG	July 19, 2016 (validation number: 808320)
EIA Permit	Gediktepe Project "EIA positive" decision	MoEU	July 1, 2016
	Relocation of project units	MoEU	November 6, 2019
	"EIA is not required" decision for Licence No: 20054077	Balıkesir Provincial Directorate of Environment and Urbanisation	March 14, 2012
Ownership	Forest permit (open pit, road, water, yard, waste rock storage area, topsoil storage area, enrichment plant 1,661,547.09 m^2)	General Directorate of Forestry (OGM)	June 23, 2030
	Non-agricultural use permit (1,024,663.24 m^2)	Balıkesir Governorship, Provincial Directorate of Food, Agriculture and Livestock	May 24, 2016
	Decision of expropriation of 58 parcels (170,805.75 m^2)	MAPEG	November 7, 2017
	Decision of expropriation of 6 parcels (7,95.09 m^2)	MAPEG	November 11, 2019
Business and Working Licence	Business licence, 1st Class 3.7. open pit (92.31 ha)	Balıkesir Governorship	January 2, 2018
Environmental Permit and Licence	Temporary licence (including air emission, wastewater discharge, mine waste disposal-category A)	MoEU	October 4, 2021 - October 4, 2022
Other permission	Permission to purchase and use explosives	Balıkesir Governorate, Provincial Police Department	December 29, 2016 – December 31, 2017
	Groundwater use permit for two wells (371.00 t/day or 135,415.00 t/year) and (1,000.00 t/day or 365,000.00 t/year)	Ministry of Forestry and Water Management, General Directorate of State Water Works 25th Regional Directorate	October 4, 2017
	Construction permit	Bigadiç Municipality	October 7, 2015
	Private Security Permit	Balıkesir Governorship	August 31, 2021
	Road Access Permit	Balıkesir Municipality	November 09, 2021
	Industry registration certificate	Ministry of Industry & Technology	November 09, 2021
Project approval	Wastewater treatment plan	Balıkesir Provincial Directorate of EU	October 22, 2016
	PAG Waste Dump Application Project	MoEU	April 30, 2021
	Clean Water Pond Geotechnical Report	Regional Directorate of State Water Works	August 23, 2021

Type	Permit	Corresponding Government Authority	Date
	EIA Exemption Letter for the industrial wastewater treatment plant project	Balıkesir Provincial Directorate of EU	August 20, 2021
	Approval of the water supply transmission line project in Meyvalı, Hacıömerderesi, Aşıdere Village	Balıkesir Metropolitan Municipality BASKİ General Directorate	February 24, 2016
	Approval of the Gediktepe mine diversion channel project	Ministry of Forestry and Water Management, General Directorate of State Water Works 25. Regional Directorate	February 12, 2020
	Approval of the mine waste management plan	MoEU, General Directorate of Environmental Management	August 1, 2018
	Approval of the heap leach facility project	MoEU, General Directorate of Environmental Management	October 23, 2020
	Approval of Industrial Waste Management Plan	Balıkesir Provincial Directorate of EU	February 14, 2022
	Approval of the PAG waste store area application project	MoEU General Directorate of Environmental Management	April 30, 2021
	Approval of measures taken for fire protection purposes	Balıkesir Metropolitan Municipality	March 3, 2022

20.2 Environmental Impacts

The environmental impacts of the Oxide Project and the sulphide mining and processing operation were previously evaluated within the scope of the EIA Report approved in 2016. The project units were relocated in the project area due to geotechnical reasons, and this update was exempted from EIA by the MoEU.

20.2.1 Construction Phase

Land preparation and construction activities will include clearing vegetation and topsoil within affected areas, constructing haul roads and auxiliary buildings, preparing open pits and waste rock storage areas, and constructing the CWP, the TSF, surface water diversion channels, and other infrastructure.

Stripping and excavation activities will result in topsoil loss. In order to reduce this impact, the topsoil will be stripped and stored in a separate zone within the Project area. Erosion losses will be prevented by planting the upper part of the soil piles, limiting the height of the vegetative soil pile, and constructing diversion channels around it.

Activities such as cutting the existing trees, removing vegetation, and stripping the vegetative soil in the area will result in habitat loss. In order to reduce this impact, transferable fauna species was moved out of the area during the Oxide Project, construction activities will be carried out gradually during the breeding season, seeds of endemic flora species was collected and delivered to the gene bank to be transported to suitable habitats outside the Project area. Personnel were trained as necessary regarding the existing ecological characteristics.

Dust emissions will result from construction activities being carried out in the Project area, such as excavation, loading, unloading and transportation. Dust formation will be minimized through the application of regular watering of operation areas and roads.

To control environmental noise, vehicles will be required to comply with speed limits and undergo regular maintenance, and working hours will be regulated.

20.2.2 Operations Phase

During the operations phase of the Project, ore is planned to be extracted by using open pit mining and processed using flotation. The wastes to be generated as a result of the process will be stored in the TSF. The waste rock from the open pit will be stored in the WRDs.

Blasting will be performed in the open pit to allow removal of ore and waste. Blasting impacts can be listed as stone throwing, vibration, and air shock. Blasting works will be delayed by milliseconds, all operations will be stopped during blasting and personnel will be removed from the area. Vibration measurements will be performed in the nearest public building. The working areas and roads will be regularly irrigated to keep dust emissions under control. Dust emissions and noise levels will be regularly measured at environmental monitoring points. Stable slope angles obtained from geotechnical survey data will be studied to ensure open pit slope stability.

Modelling studies were carried out to determine the effects of possible dust emissions on air quality during the mining activities planned within the scope of the Project. The PM10 concentrations in the nearest settlements are measured below the limit values set by the Regulation on the Control of Industrial Air Pollution during the Oxide Project. In addition, air pollution control measures have been proposed for the preparation of the land, the construction and operation periods, filling and unloading without tossing, irrigation of the roads and working areas, and compliance with speed limits on the field. It was determined that the estimated emissions will not affect human health provided that these control measures are applied. Compliance with the limit values set by the Regulation will be ensured with monitoring studies to be carried out at two pre-determined points in the field.

The TSF is planned to store sulphide ore process wastes. The grounds and side surfaces of the TSF will be covered with impermeable layers to ensure impermeability. Impermeability of the TSF ground will be provided with a 50 cm thick natural clay layer and a 2 mm thick HDPE geomembrane. Impermeability of the side surfaces will be ensured with a geocomposite clay layer and a 2 mm HDPE geomembrane layer. The drainage system to be installed on the impermeable layer formation will collect the water filtered through the waste at the lowest elevation at the bottom of the TSF to be pumped to the surface. The TSF drainage system will consist of drainage pipes to be placed in a 900 mm thick drainage material.

Diversion channels are planned to be constructed at Gediktepe to prevent contamination of water coming from natural drainage upon entering the site. The diversion channels to be built around the open pit, waste storage areas, HLF, and TSFs have been sized considering Q1000 extreme peak flow rates. The diversion channels will be directed to the clean water pond and the water to be collected in the clean water pond will be used within the scope of the Project.

The need for process water in the first years of the operation will be higher, as in the following years, water will be recycled in the system, with supplemental water required for water losses. Water needs will be met from the CWP and surface water, provided that the necessary permits are obtained. Water from the CWP will be distributed to the relevant units after being treated at the WTP. A water collection pond with an approximate water collection capacity of 690,000 m^3 is planned on Acısu Creek, prior to the operations phase. A water collection pond will be built in the south of the Project area to supply water to the. After the water collection pond, a minimum of 4 L/s of water will be continuously released from the pond to the stream bed. In addition, in cases where a road crossing is required over the surface water resources passing through Gediktepe, Project boundaries, or its vicinity, the necessary art structures will be constructed in the appropriate section, and transition will be provided.

The majority of water needs for the process plant will be met by return water from the TSF. For this purpose, the return water from the TSF will be treated at the WTP prior to reuse. Open pit dewatering water and WRD seepage water will be diverted from the mine to the TSF for reuse. Open pit operations will be conducted below the groundwater level. At this stage, the dewatering water that will come to the open pit and the precipitation water that will fall onto the open pit area will be collected in the collection pond (sump), which will be built at the lowest elevation of the open pit, and then pumped to the TSF.

Runoff from catchments will be diverted from the open pit and WRD with diversion channels to be constructed around these areas. Precipitation that falls onto the waste area will be released as leachate by seeping through the waste. Drainage gravel will be installed on the waste areas to collect the leachate, and seepage will be collected and monitored in collection pools downstream of the waste. During operations, seepage water from the WRD will be transferred to the TSF and later used as process water, together with return water.

Wastewater to be generated within the Project will consist of domestic wastewater, vehicle maintenance and washing unit wastewater, tire washing unit wastewater, ready mixed concrete plant wastewater, filter backwash water of the clean water preparation plant, precipitation water contaminated by falling onto the mine site, seepage water from the WRD, and open pit dewatering water. A package wastewater treatment plant will be constructed to treat domestic wastewater, and the plant effluent will be discharged to the receiving environment within the scope of environmental and licence permits to be obtained in accordance with the discharge standards of the Water Pollution Control Regulation (WPCR). Other wastewater will be collected, transferred to the TSF, and then treated in an industrial wastewater treatment plant to be used for process water purposes. The wastewater of the industrial wastewater treatment plant will be used for process purposes, and if its discharge is needed, the wastewater will be disposed of in accordance with the WPCR sector tables. In order to reuse industrial wastewater in the process, necessary works and procedures will be carried out within the scope of the Wastewater Treatment / Deep Sea Discharge Facility Project Approval Circular numbered 2014/7.

Waste generated by the Project will consist of excavation waste, municipal waste, packaging waste, treatment sludge, waste oil, waste vegetable oil, hazardous waste, medical waste, waste batteries and accumulators, and waste tires. All waste will be managed within the framework of the waste management plans to be prepared in line with regulations published within the Turkish Environmental Legislation. Process waste will be stored in the TSF in accordance with the Mining Waste Regulation. TSFs to be constructed for this purpose will be covered with a sealed layer to prevent groundwater pollution. Groundwater quality will be monitored with observation wells at the upstream and downstream of the TSF. Water inflow into the TSF from the basin where it is located will be prevented by constructing diversion channels around the site. Possible flood risk due to direct precipitation onto the field will be prevented thanks to the air margin to be left. Consolidation of the waste will be ensured by collecting the water with the floating pump system from the pond that will be formed as a result of the precipitation of the waste in the TSF over time. The impermeability of the base will increase thanks to the wastes consolidating over time.

The level of environmental noise to be generated by construction equipment to be used during open pit mining activities has been evaluated in the Acoustic Report. Calculations in the report estimated that the final cumulative sound level would be 56.2 dBA in Meyvalı, 50.5 dBA in Hacıömerderesi and 51.9 dBA in the Aşıdere neighbourhood. The noise limit, as given in Table 4 of the Regulation on the Evaluation and Management of Environmental Noise, for "areas where commercial buildings and noise sensitive uses are located together and where residential areas are densely located", is 65 dBA during the day, 60 dBA in the evening, and 55 dBA at night. In the worst-case scenario where all equipment operates simultaneously, noise to be generated due to the activities at Gediktepe will be below the limit values in the legislation during the daytime and evening periods. The value calculated for the Meyvalı neighborhood for the night period was 1 dBA over the limit. As all equipment will not work at the same time and the noise that will be caused by a large part of activities will be shielded by topographic obstacles and existing vegetation, it is predicted that limit values will be met for all periods of the day in Meyvalı, actual sound levels will be lower than calculated values in nearby settlements, and there will not be any issues in terms of noise in settlements located in close proximity.

Geochemical studies were carried out to determine the acid mine drainage and metal leaching potentials of the waste that is planned to be stored in the waste storage areas. According to the studies, the geochemical characterization of the waste showed mined rocks have the following ARD characteristics:

- Samples having a paste pH less than 5.5 (immediately acid generating rocks) were classified as potentially acid generators due to the occurrence of soluble Fe- and Al- oxy-hydroxy-sulphates. Among these, two groups were distinguished: samples with an occurrence of sulphide above and below 0.1%. As such, samples can be classified as PAG sulphate, PAG sulphide and PAG sulphide – sulphate depending on the main acid generator mechanism (dissolution of Fe- and Al- oxy-hydroxy-sulphate, sulphide oxidation, or both, respectively).
- Samples having a paste pH>5.5 are classified with an uncertain acid generator potential if they have sulphide above 0.1% and an NP/AP ratio between 1 and 3.
- Samples having a paste pH>5.5 are classified as not acid generator (NAG) if they have NP/AP greater than 3, independently of the sulphide contents.

The kinetic analysis confirms the immediate acidic conditions that can be produced by the PAG sulphide-sulphate and PAG sulphate, and that can be sustained for several water pore volumes, and it also shows that some PAG sulphide rocks have long delay times to reach acidic conditions associated with sulphur oxidation.

Considering these geochemical characteristics, and the limited capacity of the already approved PAG waste rock dump (16 Mt), the waste rock management plan must consider the following aspects:

- To minimize the impact on the surrounding water systems, PAG material to be dumped in the PAG WRD should correspond to that with the capacity of generating immediate acidic conditions in the presence of water due to the dissolution of Fe- and Al oxy-hydroxy-sulphate (PAG sulphate-sulphide waste rocks).
- Since the mass of the PAG sulphate-sulphide waste rocks is close to 18.6 Mt, the material to be dumped in the PAG WRD should correspond to that with higher sulphur contents. A 2.2% cut-off of S was calculated to match the PAG waste rock capacity.
- PAG rocks classified as PAG sulphate (2,671 t), PAG sulphide (36.1 Mt), uncertain (0.34 Mt), undefined (5.48 Mt) as well as PAG sulphate-sulphide with total S contents lower than 2.2 wt.% (2.72 Mt) will be hauled within the NAG WRD.
- Since the main ARD mechanism of the PAG rocks to be deposited into the NAG waste rock dump is oxidation of sulphides (mainly pyrite), these PAG rocks need to be placed in the centre of the WRD, encapsulated by NAG waste rocks.
- The encapsulation objective is to prevent PAG waste rocks from entering in contact with water and oxygen, and if they do, enough neutralization potential exists along the water flow path to neutralize any acidic leachates that could be generated by sulphide oxidation.

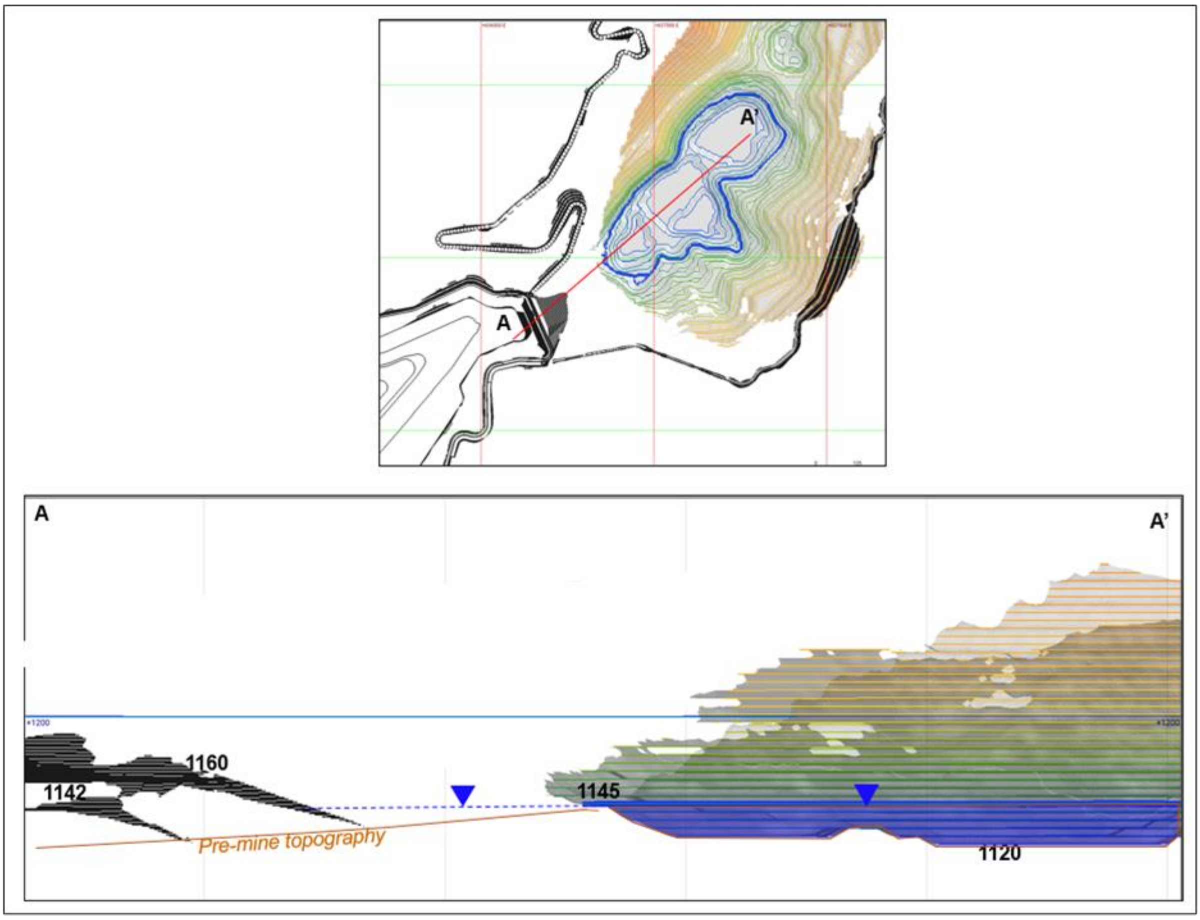
20.2.3 Closure Phase

Closure and rehabilitation works will be carried out upon completion of operational activities at Gediktepe. The 11-year production plan of the open pit operation at Gediktepe will end at the bottom level of 1,155 m AMSL and 1,120 m AMSL respectively, in the northern and southern parts. According to the findings obtained from the hydrogeological studies, a lake will be formed in the open pit during the closure phase, where the dewatering works will be terminated. According to the final pit hydrology, the northern pit lake is expected to reach its final level and feed the south pit lake in the later stages of the lake formation process. The water accumulated in the north pit during the closing period will spill over to the southern open pit at 1175 m AMSL elevation 5 to 6 years after closure, depending on the closure conditions. The southern pit, on the other hand, will reach topographic elevations at 1145 m AMSL within 6.5-7 years from the end of dewatering and will begin to overflow after this stage. The south pit lake level will eventually be 1145 m AMSL. According to a recent water balance model for the pit lake, it is predicted that the southern pit will spill over into natural drainage within 2 to 7 years, depending on upstream diversion conditions.

The closure phase of water management will focus on transferring spilled-over water downstream, without allowing any ponding behind the TSF. To establish such transfer, a NAG embankment has been planned (Figure 20.1). With this embankment, the storage capacity of the southern pit lake capacity increases from an elevation of 1145 m AMSL to 1160 m AMSL, and according to the water balance model for the pit lake (SRK, 2023), with the NAG embankment, water will spill over the southern pit will into natural drainages within 19 to 20 years under an active diversion channel scenario, and within 5 to 6 years under a deactivated upstream diversion channel scenario.

Under both scenarios, water quality estimates indicate that elements like Cd, Cu, Pb and Zn need to be actively treated if the water is to be discharged into the surrounding water system. Given the hydrochemical characteristics of the pit lake water modelled, an in-pit lime treatment can be implemented on an annual basis once the pit lake is developed. This treatment consists of dosing with lime to a pH around 9.5, where metals are removed as metal-hydroxides. Once metals precipitate, and the pH values decrease to 8 (due to the absorption of atmospheric CO_2) water can be pumped out of the pit.

Figure 20.1 Position of pit lake, spillover point and TSF perimeter embankment



A total of 9.5 Mt of NAG waste rock from the open pit will be used for the TSF and CWP construction. The remaining waste will be stored in the NAG WRD and PAG WRD. NAG rock will need to be stockpiled and made available for construction of the NAG embankment between the TSF and the pit.

With the closure studies to be carried out in parallel to operations, a closure cover will be installed over the parts of the waste storage areas where the storage process is completed to prevent air and water from entering into the waste. Thus, the amount of leachate formation will be reduced and the reactivity of the sulphide zone rocks will be prevented or minimized by preventing oxygen contact.

At closure, the TSF will be covered with rock and levelled. The minimum total thickness of the cover on the top-surface of the TSF will be 2 m. While the overall cover thickness of 2 m is appropriate, an alternative cover design is being considered where the drainage layer is allowed to act as a capillary break when placed above the tailings. A compacted clay layer (target permeability k, 10^{-9} m/s) can then be placed over the capillary break layer and roller compacted. A buffer layer located at the top of the profile can act as a store and release layer, protecting the compacted clay from drying out.

Topsoil, which has been previously stripped and stored, will be spread over the area and a natural appearance will be achieved with plants without deep roots.

20.3 Social studies

20.3.1 Previous Studies

In 2018, SRK developed a draft Environmental and Social Impact Assessment (ESIA) study for Polimetal to align the Turkish EIA studies with international best practice standards, and International Finance Corporation Performance Standards (IFCPS) on Environmental and Social Sustainability (2012). Within the scope of this ESIA study, a draft Social Impact Assessment (SIA) report, a draft Stakeholder Engagement Plan (SEP) and a draft Land Acquisition Plan (LAP) including a Livelihood Restoration Framework were also produced.

Social Impact Assessment (SIA)

The SIA included a Social Baseline Study that provides the socio-economic details regarding the Project Area of Influence (AoI) through desktop studies (literature review, secondary data collection), household surveys, focus group discussions, key informant interviews, and field observations. The AoI for Gediktepe includes environments and communities that may experience negative or positive changes to baseline conditions as a direct or indirect result of the Project. Four distinct neighborhoods were identified within the AoI, which are Haciomerderesi and Meyvali Neighborhoods as the primary AoI at the closest distance to the Project area, and Bozbuk and Citak Neighborhoods as the secondary AoI. The SIA also identified the social impacts associated with the Project activities and presented a Social Management Framework Plan that included the company’s commitments to manage the social impacts identified by the impact assessment process.

The SIA findings revealed that the main impacts of the Project will be land acquisition and changes in local livelihoods. Accordingly, the Project site and infrastructure would create economic displacement due to loss of agricultural and forestry land for inhabitants of both the neighborhoods of Hacıömerderesi, Meyvalı and to a lesser extent of Bozbük. SRK addressed these impacts with a Land Acquisition and Livelihood Restoration Plan as well as a Stakeholder Engagement Plan. The complete list of potential negative and positive socio-economic impacts identified during SIA are listed below:

- Economic Development: Employment generation by the Project resulting in increased income, increased economic activity leading to inflation and impact on standard of living, employee training leading to skills development in the local community, contribution to the Turkish national economy, and opportunities for local suppliers and contractors leading to local economic growth.
- Loss of Land and Natural Resources: Impoverishment through loss of land and agricultural produce, loss of traditional livelihoods and threat to long term sustainable livelihoods, increased water availability improving rural livelihoods, and post-closure decreased water availability affecting rural livelihoods.
- Sense of Place: Change in rural landscape impacting people’s well-being.
- Social and Cultural Practices: Increase in social and lifestyle problems due to changed livelihoods and influx, and real or perceived lack of or unequal distribution of Project benefits leading to social tension.
- Human Health: Increased pollution (noise, air, water, soil) affecting human health and wellbeing, and increase in road accidents as a result of increased traffic.
- Social Services: Additional pressure on social services.
- Closure: Loss of income for people and businesses directly or indirectly associated with the Project leading to an economic downturn and decrease in the standard of living.

Stakeholder Engagement Plan (SEP)

The scope of the draft SEP prepared by SRK was to plan appropriate stakeholder engagement during the ESIA for Gediktepe Project in line with all relevant legal and regulatory requirements (including EIA public hearing) and aligned with international good practice. The draft SEP: i) identified stakeholders and mechanisms through which they will be included in the engagement process for the ESIA (with particular attention paid to inclusion of vulnerable groups), ii) outlined the consultation, disclosure and engagement activities to be implemented during the ESIA, and iii) served as a record of the engagement process followed for the EIA and ESIA.

Land Acquisition Plan (LAP)

It was established during the impact assessment that the neighbourhoods of Hacıömerderesi and Meyvalı would incur loss of agricultural land, crops, and forestry land; and to a lesser extent Bozbük would lose their forestry land because of the Project. This triggered the IFCPS 5 on Land Acquisition and Involuntary Resettlement and required the development and execution of a LAP. The LAP was compiled to guide the land acquisition process for the Gediktepe Project in such a manner that it complies with IFCPS 5 and the Turkish legislation. The LAP provided an outline of the IFC policy and Turkish legal framework for land acquisition; identified and described the Project Affected People (PAP) and their loss of assets; defined criteria for eligibility for compensation and the nature of compensation entitlements for PAPs as well as options for livelihoods restoration. It also outlined organizational arrangements for the land acquisition process, provided mechanisms for stakeholder participation, and outlined monitoring mechanisms.

20.3.2 Stakeholders

Stakeholder identification should be an ongoing process through the mine life, and the list should be continuously updated. The stakeholder identification and analysis undertaken during the ESIA process listed the stakeholder groups as follows:

- National government agencies/departments.
- Regional government agencies/departments.
- Local government agencies.
- International and national NGOs/civil organizations.
- Political parties.
- Local unions.
- Communities (from Haciomerderesi, Meyvali, Citak, Bozbuk, Kurenderesi, Yagcilar, And Bigadic).
- Special interest groups.
- Businesses and universities.
- Media.

Vulnerable Groups

Vulnerable stakeholder groups include those who, by virtue of their sex, ethnicity, age, physical or mental disability, economic disadvantage, or social status, may be more disproportionately impacted or further disadvantaged by a project compared to other groups, and who may be limited in their ability to take advantage of a project’s development benefits. IFC Guidelines state that vulnerable stakeholders require special attention in terms of their effective participation in the process. As defined by the IFCPS, vulnerable people may include, but are not limited to households headed by women or children, people with disabilities, the very poor, the elderly, persons without social security, illiterate people, and people without secure land tenure.

Vulnerable groups in the study area were identified by SRK as part of the ESIA studies in 2017 as shown in Table 20.2.

Table 20.2 Vulnerable people in the study area as identified in 2017

Category	Bozbük	Çıtak	Hacıömerderesi	Meyvalı
Mentally disabled	3	3	2	2
Physically disabled	2	1	2	-
Sick Abed	-	-	2	2
Elder	5	2	-	10
Illiterate	25-30	10	10-15	50-60
Women-headed household	10+	5-6	15	30
Households supported by the Government	5	8	40	47
Households supported by the neighbours/relatives	5	number unknown	-	-
Receiving widow's pension	-	-	-	number unknown
Receiving old-age pension	-	-	-	number unknown

Source: SRK Social Baseline Study: Muhtar Interviews & FGDs – June 2017 and August 2017.

Project Affected People (PAP)

Project affected parties refer to people/person/household who will lose assets or the right to use assets as a result of the Project. PAP might be affected by loss of (co)ownership of private land; loss of rented land; loss of crops; loss of trees; or loss of land improvements (such as irrigation ponds, fences, irrigation pumps). PAPs may be affected by one or several of these losses and would be compensated for these. Gediktepe Project required land, affecting Hacıömerderesi and Meyvalı neighbourhoods. The reported number of PAP by loss of their private land was 197, and 4 who were renting the treasury lands for agricultural purposes.

20.3.3 History of Engagement

Engagement between stakeholders and Polimetal commenced during the exploration and early scoping phases, when Polimetal established a Community Relations Department and employed a Community Relations Chief. Between 2014 and 2017, Polimetal conducted stakeholder engagement activities by distributing project leaflets/background information documents and conducting meetings to inform local communities and government authorities about the progress of project activities, land acquisition, and potential social and environmental impacts, as well as to receive and respond to comments, requests, grievances or suggestions about the Project.

The main stakeholder engagement activity followed as part of the EIA was the EIA Public Participation Meeting in 2015, with 110 participants, to communicate a summary of the data provided in the EIA Application Document, the activities carried out to date, those to be carried out, and to receive comments and suggestions of the potentially PAP.

As part of ESIA, secondary and primary data collection were performed along with field studies in June and August 2017. Prior to the field study, secondary data was gathered through desktop research to compile information regarding Balikesir province, Bigadic district, Bozbuk, Citak, Hacıomerderesi and Meyvali neighbourhoods for developing the questionnaires/interview guidelines to be used during the field survey. Primary data collection studies are listed and summarized as follows:

- Initial scoping visit was conducted by SRK in 2017, during which the project area was visited, and interviews conducted with the muhtars of Haciomerderesi and Meyvali neighborhoods to collect data about the demographic and socio-economic structure, infrastructure capacities, health and educational services of the neighborhoods, and the perception and attitudes towards Gediktepe Project. The collected information informed the development of household survey questionnaires.
- Household survey of 47 households from Haciomerderesi and 85 households from Meyvali based on random selection in 2017.

- Focus Group Discussion (FGD) with 8 FGDs to inform participants about the scope and purpose of field studies and EIA and ESIA studies. Data was collected from female and male populations residing in Bozbük, Çıtak, Hacıömerderesi and Meyvalı neighbourhoods about their economic income resources, daily practices, access to health and educational services and their suggestions, grievances, and perceptions about Gediktepe.
- Key Informant Meetings, with 7 meetings in 2017, including Bigadic Mayor, District Directors and Sub-Governros, to receive information about Bigadiç district and their service areas in Hacıömerderesi, Meyvalı, Bozbük and Çıtak neighbourhoods.
- Oral History with 5 interviews with the elder or notable people from Hacıömerderesi, Meyvalı, Bozbük, Çıtak Neighbourhoods were conducted to gather information about the history of the settlements, traditions, economic income resources from past to present, changes on life standards, and population movements.
- Informal (Unstructured) Interviews were held with local men and women between 2017 and 2018 to discuss a broad range of topics on local livelihoods and life in the villages.

The core principle of the land acquisition for the Project is that nobody defined as a PAP should be worse off after their land has been acquired. As part of this principle, Polimetal has adopted a "genuine consultation and participation" principle, which required all affected people to be informed and consulted about the land acquisition and have a voice in the land acquisition process, including the determination of compensation rates. The draft LAP outlines the entitlements, including compensation methods and rates, and mitigation measures, for different PAPs identified for the Project. The document also identifies the parties involved in the preparation and execution of the land acquisition process, together with their roles and responsibilities. The stakeholders identified specifically for the land acquisition process were the proponent (Polimetal), land valuation team, law firm, ESIA team, PAPs, Muhtars, Fiscal Director of Bigadic District, District Directorate of Food, Agriculture and Livestock, and other relevant government departments and agencies.

Current status

Polimetal reports that they have received significant local support since the commencement of exploration and into the Oxide Project. Local residents were recruited during construction activities of the Oxide Project, and currently 60% of the workforce is from the nearby villages, of Bigadiç or Balıkesir, strengthening the relationship between Polimetal and local residents. The community relations department of Polimetal has communicated with local authorities, local villagers, and other stakeholders about the development progress of Gediktepe.

The same employment approach will be used for sourcing labour for the Sulphide Project, with Polimetal receiving feedback that with the oxide ore scheduled for depletion by the end of 2025, local residents have been waiting for approval of the Sulphide Project to provide long term employment. Unionization of the workforce also gives security of personal rights and has also built trust between local residents, the workforce and Polimetal.

Polimetal will continue to make donations to local community organizations throughout the life of the Project, such as scholarships, road repairs, renovations of village houses and mosques, and school construction.

Currently, training has been organized for all operators at the site to have certification. Local labour will continue to be employed during the sulphide operation. Polimetal encourages local business opportunities in areas such as cooperatives for personnel transportation, and continues to allocate funds to the Regional Forestry Department for reafforestation activities, the Law Enforcement Foundation, the Bigadiç Municipality (for rubbish truck purchases), the Bigadiç Municipality for construction of a vocational high school, local villages for mosque refurbishment, cooperative offices, village health units and for improving conditions of local roads, water diversion channels, and bridges. Polimetal also donates books to libraries, provides scholarship to students and supplies weaving looms to local organizations.

21 Capital and operating costs

21.1 Sources of Information

AMC collated capital and operating costs from the input of others and used the following sources of information:

- The Minemax mining schedule developed by AMC.
- Updated mining costs provided by Polimetal, based on the contract unit rates for the current Oxide Project mining operation and in consideration of the sulphide mine plan and haulage distance.
- Mining owner costs (salaries and personnel levels) for technical, administration, and supervisory personnel provided by Polimetal.
- Updated oxide and sulphide ore processing operating costs, inclusive of G&A and sustaining capital costs, and initial construction capital costs provided by GRES.
- Owner's operating and capital costs provided by Polimetal.
- TSF and CWP capital costs provided by EN-SU Engineering[8].
- Forestry costs provided by Polimetal.
- Mine closure and environmental monitoring costs provided by Polimetal.

All costs are expressed in Q2 2022 US dollars (US$).

21.2 Scheduled physicals

AMC developed the mining and processing production schedule using Minemax schedule optimization software. The mining ore tonnes, grade and waste tonnes; processing plant tonnes, grade, and contained metal; and concentrate tonnes and metal production are shown in Table 15.10.

21.3 Operating costs

Mining contractor costs were provided by Polimetal expressed as a flat unit cost per bcm mined (US$/bcm mined) for oxide and sulphide ore and waste, plus a haulage cost.

Mining Owner costs were provided by Polimetal and they comprise the fixed costs of Polimetal supervisory and technical mining personnel, which increase as production ramps up. Costs are estimated from personnel numbers, annual salaries, US$6.60/day messing and accommodation allowance and US$4.17/trip travel allowance.

Haul road construction costs of US$1,146M were provided by Polimetal based on a design undertaken on site.

Ore processing costs, inclusive of G&A and sustaining capital costs were provided by Polimetal, expressed as a variable unit cost per tonne of ore processing feed (US$/t feed).

Owner's personnel costs for site wide G&A were developed by GRES and Polimetal in the 2022 FS, based on first principles cost estimation and experience with Polimetal's Oxide Project, which identified 45 roles across the site.

Other Owners costs provided by GRES in the 2022 FS include:

- Insurance.
- Outsourced security.
- Travel and accommodation.
- Health and safety equipment.

---

[8] TSF Design Report Rev02, TSF report submitted to Ministry of Environment & Urbanisation, dated March 2019

- Holding charges.
- Licence fees.
- IT support.
- Intercompany charges
- Owner's sustaining capital costs.
- Forestry costs.

Operating costs for economic evaluation are summarized in Table 21.1.

Table 21.1 Gediktepe operating cost assumptions

Parameter	Units	Value	Source
Mining contractor cost			
Oxide ore- Variable	US$/bcm mined	2.65	Polimetal
Oxide and sulphide waste- Variable	US$/bcm mined	2.65	Polimetal
Sulphide ore- Variable	US$/bcm mined	3.75	Polimetal
Haulage- Variable	US$/bcm mined	1.44	Polimetal
Mining Owner cost - Fixed	US$M/year	3.559	Polimetal
Processing costs			
Oxide processing cost – Fixed/Variable	US$/t feed	19.94	Polimetal
Sulphide processing cost – Fixed/Variable	US$/t feed	22.58	Polimetal
General and administration (G&A)	US$M/year	-	Included above
Owner's costs	US$M	18.82	Polimetal
Forestry costs	US$M/year	2.65	Polimetal
License and compliance costs	US$M	0.20	Polimetal

A summary of annual operating costs is provided in Table 21.2.

21.4 Capital cost

Capital costs were provided by GRES and Polimetal for the sulphide ore process plant, TSF and CWP capital costs, Owner's capital costs, Owner's sustaining capital costs, and mine closure costs. Capital costs were estimated in Q2 2022.

A summary of annual capital costs is provided in Table 21.3.

Table 21.2 Annual Gediktepe operating costs

Description	Unit Cost	Units	Totals $'000	2024 Year 1	2025 Year 2	2026 Year 3	2027 Year 4	2028 Year 5	2029 Year 6	2030 Year 7	2031 Year 8	2032 Year 9	2033 Year 10	2034 Year 11	2035 Year 12
Operating Costs															
Mine															
Owner Staff	0.20	$/t total	22,981	203	1,216	2,376	2,378	2,379	2,347	2,353	2,390	2,352	2,339	2,452	197
Mining Cost	1.67	$/t total	195,499	3,185	7,399	26,302	24,115	33,095	23,796	18,745	21,955	19,527	9,039	8,341	0
Sub-total	1.86	$/t total	218,480	3,389	8,615	28,678	26,493	35,474	26,143	21,097	24,345	21,879	11,378	10,793	197
Process															
Oxide Direct Cost	19.94	$/t feed	27,170	13,893	8,442	4,835	0	0	0	0	0	0	0	0	0
Sulfide Mill Direct Cost	22.58	$/t feed	391,497	466	18,086	41,415	41,446	41,465	40,868	40,973	41,679	40,966	40,713	42,838	583
Sub-total	22.39	$/t feed	418,667	14,359	26,528	46,249	41,446	41,465	40,868	40,973	41,679	40,966	40,713	42,838	583
Owners Costs															
Sitewide G&A	1.01	$/t feed	18,816	1,145	2,196	1,724	1,714	1,854	1,814	1,724	1,714	1,694	1,609	1,609	20
Land Usage/Forestry Fee	1.64	$/t feed	30,652	1,786	2,477	2,477	2,747	2,646	2,646	2,646	2,646	2,646	2,646	2,646	2,646
License and Compliance Fees	0.11	$/t feed	2,116	19	196	196	196	196	196	196	196	196	196	16	319
Sub-total	2.76	$/t feed	51,585	2,950	4,869	4,397	4,657	4,696	4,655	4,565	4,555	4,535	4,451	4,271	2,984
Total Operating Cost	36.83	$/t feed	688,732	20,698	40,012	79,324	72,595	81,635	71,667	66,636	70,579	67,380	56,541	57,902	3,764

Table 21.3 Annual Gediktepe capital costs (Q2, 2022)

Description	Totals $'000	2024 Year 1	2025 Year 2	2026 Year 3	2027 Year 4	2028 Year 5	2029 Year 6	2030 Year 7	2031 Year 8	2032 Year 9	2033 Year 10	2034 Year 11	2035 Year 12	2036 Year 13
Initial Capital Costs														
Plant	95,964	33,669	61,054	1,241	0	0	0	0	0	0	0	0	0	0
Infrastructure	28,366	9,491	15,282	3,593	0	0	0	0	0	0	0	0	0	0
Mining	992	743	249	0	0	0	0	0	0	0	0	0	0	0
Contingency	8,029	2,780	4,887	362	0	0	0	0	0	0	0	0	0	0
Subtotal	133,350	46,683	81,472	5,195	0	0	0	0	0	0	0	0	0	0
Sustaining Capital Costs														
Plant	832	130	249	144	25	93	87	41	41	19	3	0	0	0
Infrastructure	39,014	0	5,397	6,755	4,797	7,614	7,740	1,850	0	3,645	1,215	0	0	0
Mine closure	11,421	0	0	2,217	1,420	65	65	65	65	65	229	1,296	2,974	2,962
Contingency	6,248	0	469	1,142	772	678	689	177	16	333	163	324	743	741
Subtotal	57,514	130	6,116	10,258	7,014	8,450	8,581	2,133	122	4,061	1,609	1,620	3,717	3,703
Total	190,864	46,813	87,588	15,453	7,014	8,450	8,581	2,133	122	4,061	1,609	1,620	3,717	3,703

22 Economic assessment

22.1 Sources of Information

AMC developed a high-level Microsoft Excel based pre-tax cash flow economic assessment model for the Project using the following sources of information:

- The Minemax mining schedule developed by AMC.
- Operating and capital costs.
- Metal recoveries and concentrate grades provided by GRES and HMT.
- Metal prices, metal payability, concentrate land and ocean transport costs, concentrate treatment costs and penalties, and metal refining costs.
- Government and third-party royalties and on-site and off-site costs provided by Polimetal.

Polimetal provided taxation calculations in the economic assessment model to develop post-tax cash flows and financial indicators, such as internal rate of return (IRR), net present value (NPV) and payback periods.

All costs are expressed in Q2 2022 US dollars (US$) and a discount rate of 10% per annum was used to estimate discounted cash flows.

22.2 Revenue assumptions costs

Royalties are based on a sliding scale based on the sale price. A State Area royalty is also applicable, discounted by 40% for gold and silver and 50% for copper and zinc to account for the value added to ROM ore by processing. At the metal price used for the Project, the royalty is calculated as per Table 22.1.

Table 22.1 State area royalty

Table 22.2 Metal prices, royalties and treatment costs

Metal	Metal Price	Payability Lesser of		Royalty (% Metal Price)	Treatment and Refining Cost
Copper concentrate					US$90/dmt
Copper	US$3.63/lb	96.5%	Cu -1%	5.5	US$0.09/lb Cu
Gold	US$1,500/oz	90%	Au – 1 g/t	4.8	US$10.00/oz Au
Silver	US$20.00/oz	90%	Ag – 30 g/t	3.6	US$1.00/oz Ag
Zinc concentrate					US$200/dmt
Zinc	US$1.27/lb	85%	Zn – 8%	4.5	-
Gold	US$1,500/oz	70%	Au – 1 g/t	4.8	US$10.00/oz Au
Silver	US$20.00/oz	70%	Ag – 108.862 g/t	3.6	US$1.00/oz Ag

Source: Link and Polimetal.

Additional to pit optimization costs, a royalty is also payable to EMX Royalty Corporation (EMX) resulting from the purchase of the Project, as 10% of the net smelter return (NSR) for oxide production, 2% for sulphide production and a US$10M payment over three tranches (US$4M of which was triggered in 2022 and no longer current) triggered by reaching production milestones.

Metal prices and revenue factors used for economic evaluation, such as metal payability, and treatment and refining costs were generally as per the pit optimization and were supplied by Link based on experience of current mining contracts. Royalties as per legislation were provided by Polimetal.

Bullion sales from oxide production are assumed as 99% payability for gold and 98% for silver. A gold refining cost of US$5.133/oz was applied, and silver refining cost of US$1.602/oz. Off-site concentrate costs (treatment costs) are expressed as a US$/dmt and on-site concentrate costs as a US$/wmt. Concentrate moisture is assumed as 9.0%.

Metal prices, royalties, payabilities, treatment and refining costs, additional on-site and off-site concentrate related costs, and penalty elements and penalty charges that were used in pit optimization were applied in economic evaluation are discussed in section 19.

Annual Gediktepe revenues from copper and zinc concentrates are shown in Table 22.3.

22.3 Economic evaluation

The Project returns a positive undiscounted cash flow of US$569M, on revenue of US$1,549M, operating costs of US$689M, total royalties of US$101M, and capital cost of US$191M. Cash flows discounted at 10% provide a net present value (NPV) of US$264M, and the internal rate of return (IRR) is 60%. The payback period for discounted cash flows is 3.4 years.

The annual cash flow summary for Gediktepe is summarized in Table 22.4.

The undiscounted and discounted cash flows are shown in Figure 22.1 and the cumulative undiscounted and discounted cash flows are shown in Figure 22.2.

Figure 22.1 Undiscounted and discounted cash flows

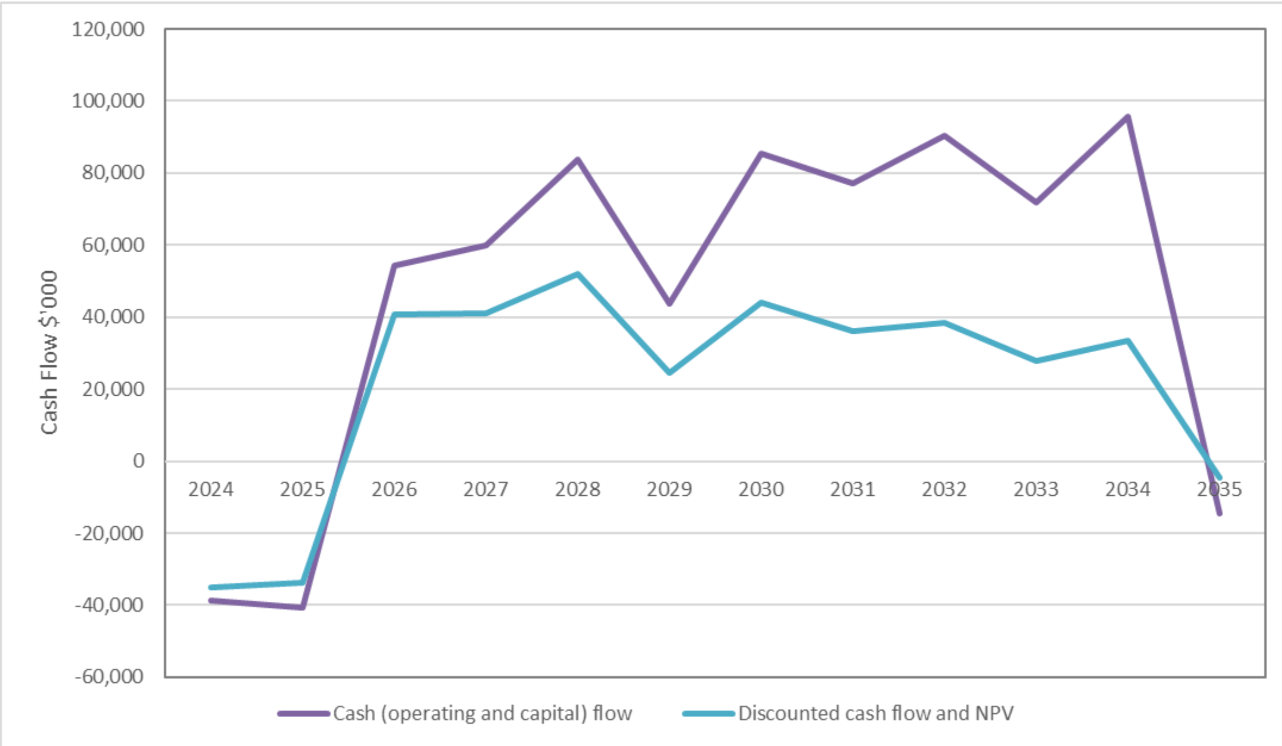
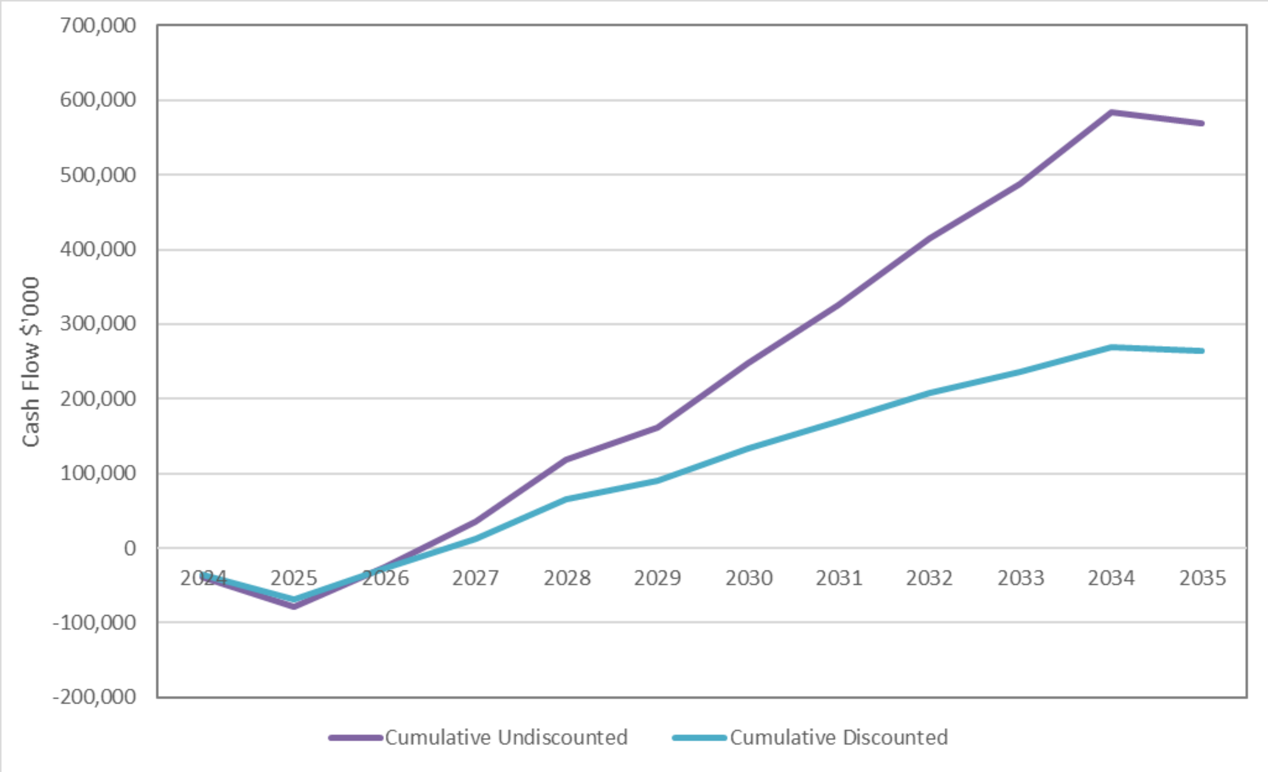


Figure 22.2 Cumulative undiscounted and discounted cash flows



22.4 Economic sensitivity

Sensitivity of NPV to changes in a range of +/-15% in the key economic drivers of operating cost, capital cost and revenue is shown in Figure 22.3, both as an absolute change in NPV (left hand graph) and a percentage change in NPV (right hand graph).

The Project is most sensitive to inputs that directly affect revenue (such as metal price, recovery, or grade), with a 15% change in metal prices resulting in a 47% change in NPV.

The Project is least sensitive to capital cost, with a 15% change in capital cost resulting in a 9% change in NPV. This is as a result of the relatively moderate capital cost estimate for the Project, with capital cost representing just 19% of the combined total of operating, royalty and capital cost.

The Project is moderately sensitive to operating cost, with a 15% change in operating cost resulting in a 23% change in NPV. Operating cost is estimated as 69% of the combined total of operating, royalty and capital costs for the Project.

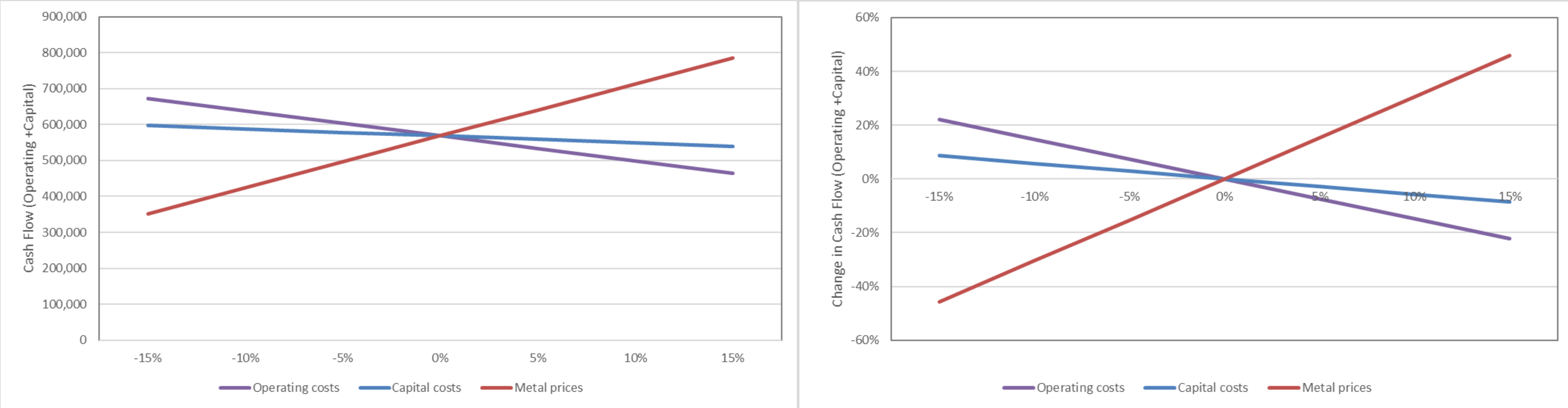
Table 22.3 Annual Gediktepe revenues

Description	Totals $'000	2024 Year 1	2025 Year 2	2026 Year 3	2027 Year 4	2028 Year 5	2029 Year 6	2030 Year 7	2031 Year 8	2032 Year 9	2033 Year 10	2034 Year 11	2035 Year 12
Oxide													
Au	108,456	59,077	36,952	12,427	0	0	0	0	0	0	0	0	0
Ag	14,889	7,469	5,747	1,673	0	0	0	0	0	0	0	0	0
Subtotal	123,345	66,546	42,699	14,100	0	0	0	0	0	0	0	0	0
Sulfides													
Cu	730,695	0	18,539	77,379	103,847	107,420	71,357	62,991	68,253	70,008	77,842	73,059	0
Zn	619,615	0	12,858	56,598	40,686	58,325	62,184	84,649	77,528	81,227	57,982	87,577	0
Au in Cu Conc	240,025	0	6,753	20,236	19,554	37,018	16,754	28,776	28,515	37,187	20,596	24,637	0
Ag in Cu Conc	64,080	0	1,690	5,834	3,780	6,404	5,542	9,161	8,193	9,672	4,602	9,202	0
Au in Zn Conc	14,481	0	259	1,059	935	1,513	1,352	2,129	1,831	2,237	1,168	1,999	0
Ag in Zn Conc	19,964	0	222	1,007	849	2,199	2,321	3,362	2,433	3,672	1,078	2,821	0
Subtotal	1,688,861	0	40,320	162,113	169,651	212,879	159,510	191,069	186,753	204,004	163,267	199,295	0
Sa Oxide Sales Cost	1,564	800	587	177	0	0	0	0	0	0	0	0	0
Dore Au	371	105	165	87	15	-	-	-	-	-	-	-	-
Dore Ag	1,193	346	531	276	39	-	-	-	-	-	-	-	-
Cu Concentrate Transport Cost	41,496	0	1,099	4,343	5,340	5,558	4,301	3,698	4,027	4,158	4,565	4,409	0
Zn Concentrate Transport Cost	54,318	0	1,145	4,980	3,582	5,177	5,398	7,327	6,766	7,102	5,129	7,713	0
Copper Conc. Treatment	33,790	0	895	3,537	4,349	4,525	3,502	3,011	3,279	3,386	3,717	3,590	0
Zinc Conc. Treatment	98,291	0	2,072	9,011	6,482	9,367	9,768	13,258	12,244	12,851	9,282	13,957	0
Copper Conc. Cu Refining Charg	18,123	0	460	1,919	2,576	2,664	1,770	1,562	1,693	1,736	1,931	1,812	0
Copper Conc. Au Refining Charg	1,697	0	47	142	137	257	121	206	202	263	145	178	0
Copper Conc. Ag Refining Charg	4,202	0	96	342	231	430	393	626	531	667	284	601	0
Copper Conc. Insurance	1,942	0	51	194	239	285	174	189	197	220	193	200	0
Zinc Conc. Insurance	1,111	0	23	99	72	105	112	154	139	149	102	157	0
Subtotal	256,534	800	6,473	24,744	23,007	28,369	25,538	30,030	29,078	30,532	25,347	32,615	0
Penalties													
Lead in Copper Conc	5,996	0.0	87	413	312	514	677	837	804	939	434	977	0
Zinc in Copper Conc	271	0	0	20	14	21	23	58	36	51	0	47	0
Arsenic in Copper Conc	781	0	0	77	75	97	54	197	107	106	10	59	0
Lead in Zinc Conc	32	0	0	0	0	0	31	1	0	0	0	0	0
Copper in Zinc Conc	-	0	0	0	0	0	0	0	0	0	0	0	0
Arsenic in Zinc Conc	-	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal	7,080	0	87	511	400	633	785	1,093	948	1,096	444	1,084	0
Total Revenue	1,548,591	65,745	76,459	150,958	146,244	183,877	133,188	159,945	156,727	172,376	137,476	165,596	0

Table 22.4 Annual Gediktepe cash flows

Description	Totals $'000	2024 Year 1	2025 Year 2	2026 Year 3	2027 Year 4	2028 Year 5	2029 Year 6	2030 Year 7	2031 Year 8	2032 Year 9	2033 Year 10	2034 Year 11	2035 Year 12
Total Operating Cost	688,732	20,698	40,012	79,324	72,595	81,635	71,667	66,636	70,579	67,380	56,541	57,902	3,764
Total Revenue	1,548,591	65,745	76,459	150,958	146,244	183,877	133,188	159,945	156,727	172,376	137,476	165,596	0
Government Royalty on Ore	55,488	0	2,424	2,609	5,158	5,352	7,115	4,526	5,690	5,563	6,320	4,807	5,924
EMX Royalty	45,248	9,332	7,721	3,996	2,818	3,534	2,572	3,082	3,024	3,321	2,653	3,193	0
Operating cash flow	759,123	35,715	26,302	65,029	65,673	93,356	51,833	85,702	77,434	96,111	71,961	99,694	-9,688
Capital cost	190,587	74,364	66,978	10,716	5,693	9,721	8,201	111	126	5,577	82	4,009	5,011
Cash (operating and capital) flow	568,536	-38,648	-40,676	54,314	59,980	83,635	43,632	85,591	77,308	90,534	71,879	95,685	-14,699
Cumulative cash flow		-38,648	-79,325	-25,011	34,969	118,604	162,237	247,828	325,136	415,670	487,549	583,234	568,536
Discounted cash flow and NPV	264,530	(35,135)	(33,617)	40,807	40,967	51,931	24,629	43,922	36,065	38,395	27,712	33,537	(4,683)
IRR	60%												

Figure 22.3 Economic sensitivity of discounted cash flows



23 Adjacent properties

There are no adjacent properties to Gediktepe with significant mineral assets.

24 Other relevant data and information

24.1 Project Execution Strategy

24.1.1 Engineering, procurement and construction management

Polimetal will use the engineering, procurement and construction management (EPCM) approach and appoint a managing Engineer to arrange suitable installers to carry out design, procurement and fabrication and construction works, to deliver the completed Sulphide Project. Polimetal will pay for direct costs of plant, equipment, materials, supply, fabrication and erection orders as approved by the Engineer and apply for all permits and licences to operate. Once these are granted and the Sulphide Project approved by the Board and adequate funding is available, Polimetal will award an EPCM agreement to carry out all necessary design, engineering, procurement, construction and commissioning works for the processing plant and infrastructure.

The EPCM Engineer will coordinate project activities to ensure the Project is delivered on time and budget. The EPCM Engineer will provide the following services:

- Project management including management of safety, cost, time, quality, changes, communications, design, procurement, manufacturing/fabrication and inspection, expediting and logistics, construction and commissioning.
- Cost control including maintaining a cost control system which includes budgets, commitments, estimates to complete, cost projections and change management.
- Planning and scheduling including a detailed base line schedule, actual dates, times to complete, projected end dates and planned versus actual S-curves.
- Quality assurance / quality control covering the design, procurement, manufacturing / fabrication, construction and commissioning phases of the Project.
- Engineering design, design reviews, hazard studies, drafting, equipment and works specification and work scope preparation.
- Procurement services for purchase orders including tender preparation based on Client agreed terms and conditions, tender evaluation and recommendation, order preparation and award, order administration and close out as appropriate.
- Manufacturing / fabrication and inspection including associated quality control and testing and any required systems integration and pre-assembly.
- Expediting and logistics including transportation, storage and inventory control as required.
- Construction management including safety management, installer supervision and works inspection and testing.
- Commissioning including construction verification, pre commissioning, dry commissioning and wet commissioning.
- Project handover including close out of all purchase orders, close out report, and ‘as built’ engineer’s drawings.

Other specialist consultants will be engaged via the Engineer (as part of the direct costs), as required, to provide geotechnical assessments., an access road upgrade, tailings dam design and construction management, transport and logistics management, and surveying services.

Polimetal will liaise with the Government and manage community relations and environmental regulation.

Construction management will be undertaken from an on-site Project office. The strategy for implementation of the Project is driven by relying on Turkish construction companies and fabricators where practical and/or competitive that will compete for defined work packages.

All buildings installed on site will be temporary prefabricated buildings including the laboratory, administration and training facility. Larger facilities such as the mining workshop and warehouse will be light steel structured buildings over an enclosed space with concrete floors as required. The containers will be used as stores and offices. The mining workshop installed by the mining contractor for the Oxide Project will continue as the mining workshop for the expanded mining operations. Specialized buildings such as the plant control rooms and titration laboratory will be prefabricated in shipping containers and brought to site fully assembled. Switch rooms (housing the various MCCs) will likewise be prefabricated and pre-wired inside shipping containers, with the wiring tested in the factory before dispatch, to minimize site work.

24.1.2 Schedule Overview

The project schedule is governed by the requirement to pre-strip mine waste to access the deeper sulphide ore, to be undertaken as part of the Oxide Project mining operation. The reactivity of the sulphide ore is such that stockpiled sulphide is unsuitable for processing, and therefore any sulphide ore mined prior to the sulphide processing plant commissioning will be considered as waste. The mine schedule allows for waste pre-strip up to September 2024, and a further 3 months of production ramp-up.

Prior to this, the mining fleet must be procured, shipped to site, assembled and commissioned. In order to mobilize the mining fleet to site, the access road must be upgraded.

The process plant and remaining infrastructure will be constructed during the mine pre-stripping operations.

The overall Project is estimated to take 116 weeks to commissioning from approval of finance and the start of basic engineering.

The following summarizes the implementation schedule:

- Project approvals period following submission of BFS – 2 months.
- CM agreement completed month 1.
- Complete detailed design month 11.
- Mills delivered months 18 - 20.
- Pre-commissioning months 22 to 23.
- Commissioning months 23 to 24.
- Practical Completion month 25.

Once Gediktepe is approved, the critical path for the project schedule is as follows:

- Mine pre-stripping operations and ramp-up of production to sustainable crushing rates.
- Commissioning.

The schedule is based on the following:

- Offsite – nominal forty (40) hour week, no work on public holidays.
- Client approval period – five (5) working days unless otherwise noted herein.
- Onsite, Engineer and construction companies – thirteen (13) days per fortnight, ten (10) hours / day; no site activities during holiday seasons.
- No work on gazetted Turkish public holidays.

The Engineer will follow a commissioning plan to bring the Project into production. A key aspect of the commissioning will be on the job training for the processing and maintenance staff. As part of their familiarization with the process and equipment and problem-solving skills development, they will assist with commissioning, working under the direction of the Engineer’s commissioning team to check the construction integrity and no-load operation of drives, the introduction of water to the process and finally slurry and process chemicals. The Owner’s team will then take over operation of the plant.

24.2 Project organization

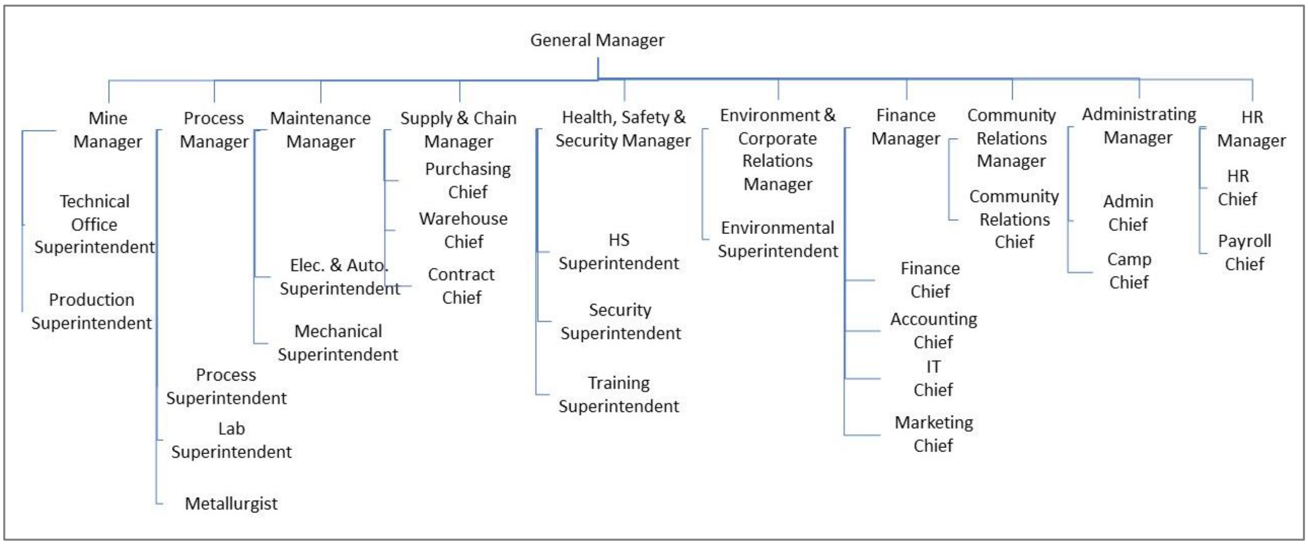
Gediktepe will have a conventional mining organization structure, with the workforce predominantly unionized. A General Manager will be in charge of sulphide operations. Each functional department will have managers, superintendents, chiefs, engineers and other specialized personnel.

The current Oxide Project has the functional areas of mining, process, maintenance, health, safety and the environment, administration, purchasing, warehouse, public relations, information technology and communications, finance and accounting, and human resources departments. The same departmental structure will be used for managing the sulphide operation. Additional to the current departments, a marketing department will be included in the organization.

The mining team has been managing all open pit and waste rock mining planning and operations to date and they will be in charge of all open pit and waste rock mining during the sulphide operation. The current Oxide Project process team will be strengthened with flotation experienced engineers and operators. Turkiye has a significant amount of flotation plants and has enough experienced engineers and operators with flotation experience and training.

Other departments will continue to manage the sulphide operation by recruiting additional personnel. The marketing department will be in charge of off take agreements, selling concentrates and organizing ports. The Gediktepe organization will be as shown in Figure 24.1.

Figure 24.1 Gediktepe organization chart



Where possible, Polimetal proposes that the increase in the size of the workforce during sulphide construction and operation be from local villages, Bigadiç and Balıkesir, the Simav district, the Sındırgı district and the Kütahya province.

25Interpretation and conclusions

25.1 Geology and Mineral Resources

The regional and Gediktepe geology is well understood and reflected in the geological model used in the Mineral Resource estimate. Gediktepe has been extensively drilled through a combination of RC and DD enabling a robust interpretation of the geology and mineralization. Twin hole comparisons have been completed for 7 pairs or RC and DD holes. Visual comparisons of the holes show broadly comparable intercept locations and interval lengths.

AMC is of the opinion that the Mineral Resource is a fair representation of the sample and geological data. AMC has carried out a series of visual and statistical validation checks on the Mineral Resource block model, comparing grade estimates against the sample data on which they are based. The validation checks show that the Au, Ag, Cu, Zn and Pb grade estimates correlate with the sample data.

The Mineral Resource classifications are suitable and consider data quality, geological continuity, grade variability, and performance of the grade estimates. Areas classified as Measured are limited to the massive pyrite domain (MSPY), where there is good coverage by drilling data and a good understanding of geological and grade continuity. Areas classified as Indicated are well supported by drilling data, however, they exhibit greater grade and geological variability than the areas classified as Measured.

Mineral Resources have been reported on an NSR basis. Any changes to metal prices, costs, or recoveries will lead to revised reported Mineral Resource numbers. Metal prices for Ag, Cu and Zn appear reasonable. The Au price of US$1,725/oz appears conservative and may present some upside potential.

25.2 Exploration

The geochemical and geophysical exploration surveys have identified anomalies which correspond to the known mineralization occurrences, supporting the use of these methods for exploration purposes. Additional, exploration targets have been identified through the exploration methods beyond the current Mineral Resource.

Polimetal have outlined four near mine target areas with oxide potential. These are situated around the existing open pit and comprise:

- Area 1: situated immediately SW of the open pit.
- Area 2: situated on the NW flank of the open pit.
- Area 3: situated NE of the open pit.
- Area 4: located approximately 1.3 km west of the open pit.

AMC has compared the four near mine oxide target areas with the geochemistry and geophysical data. The target areas correspond to areas exhibiting soil and rock geochemistry results with anomalous elevated gold grades, indicating potential oxide hosted gold mineralization.

25.3 Ore Reserve Estimates

The drill and blast, load and haul mining methods currently being used at the Oxide Project with an experienced mining contractor are considered appropriate for the operation, as is the scaling up the current methods and equipment fleet to account for the larger movements required for the Sulphide Project.

AMC completed an assessment at feasibility level to determine appropriate Modifying Factors to convert Measured and Indicated Mineral Resources to Ore Reserve. The Ore Reserve takes account of diluting materials and allowances for losses that may occur when the material is mined and processed. Economic assessment, using reasonable financial assumptions, shows that extraction of the Ore Reserve can reasonably be economically justified. Inferred Mineral

Resources are considered as waste rock in the mine plan and economic assessment of the Ore Reserve. Confidence in the geotechnical Modifying Factors is not as high as other Modifying Factors. Additional work on geotechnical assessment of pit slopes using the full range of rock strengths identified in geotechnical testing is recommended prior to implementation to confirm that pit slopes are stable.

The work to estimate Ore Reserves was supervised by persons who have sufficient relevant experience in the style of mineralization or type of deposit under consideration and the activity being undertaken to qualify as a Competent Person as defined by the JORC Code. AMC considers that Modifying Factors are an appropriate level of confidence for an Ore Reserve estimate and that the Ore Reserve estimate and classification is reasonable.

25.4 Mine Plan

The mine plan developed by AMC is reasonable and robust. The Oxide Project is well understood through extensive experience over four years. The Sulphide Project is less well understood, with enriched mineralization and buffer material complications making mine planning and mine scheduling more complex.

Additional work on geotechnical assessment of pit slopes using the full range of rock strengths identified in geotechnical testing is recommended prior to implementation to confirm that pit slopes will be stable.

25.5 Mineral Processing

The Oxide Project heap leach and Merrill-Crowe ore processing infrastructure and processes are installed, operating and well understood and will continue until the sulphide process is in production. The Sulphide Project ore processing technology is well tested and multiple similar operations are in production around the world and metallurgical testwork and analysis has been undertaken by well-respected metallurgical consultants, GRES.

Metallurgical test work and flowsheet development for the Sulphide Project were undertaken by GRES in partnership with HMT. Extensive test work was undertaken and analysis used to develop the current Sulphide Plant processing circuit.

The processing facility has been designed to treat 1.82 Mt per annum of copper and zinc bearing sulphide ore. The sulphide flowsheet includes primary crushing, two stage grinding, sequential flotation (pre-float of talc/silicate minerals, and production of separate copper and zinc concentrates), regrind (copper and zinc), concentrate thickening, concentrate filtration, and tailings disposal (thickening).

The process plant design has been based on the key parameters, with the metallurgical balance and flotation circuit equipment selection based on median values achieved in the locked cycled flotation testing. The maximum concentrate production rate and grade from locked cycle tests has been used as a check on the capacity of the equipment to handle higher concentrate rates and the expected short term maximum head grades from the mine.

25.6 Infrastructure

The infrastructure and services was prepared by Polimetal, with input from GRES (process plant) and INR (TSF, CWP, roads and site infrastructure). Existing infrastructure will be used as much as possible. However, the Sulphide Project will need some new infrastructure, with the major infrastructure items being the TSF and CWP, additional power transmission lines, such as offices, warehouse, workshops, changing room, and canteen.

The Gediktepe TSF has a 'Very High' consequence classification (refer Global Industry Standard on Tailings Management (GISTM), 2020). This rating has been assessed based on a 'potential population at risk' (PPAR) of at least 100. The TSF and CWP pond are located in a steep sided valley, with the closest settlements to the facilities being the Asıdere and Meyvali neighbourhoods 300 m downstream and Hacıomerderesi neighbourhood 600 m downstream. It was designed to store the Gediktepe LOM production.

The design criteria adopted in the design by EN-SU were based on Turkish standards and were considered compatible with ANCOLD 2019 hazard rating. TSF design and all the construction drawings and reports were approved by Ministry of Environment & Urbanization and the design is in line with related Turkish regulations. International guidelines were subsequently changed since the original TSF design was compiled.

The TSF was designed with a storage volume of 11.1 Mm^3. To provide this volume with the lowest cost, the Acisu Stream valley located adjacent to the proposed pit and processing facilities was selected. The embankment axis is proposed in an appropriate section of the valley to reduce embankment volumes whilst providing capacity to enable LOM storage and potential for additional storage.

25.7 Markets and Contracts

The Project will produce a copper concentrate and a zinc concentrate between years 1 and 11 to generate revenue for the Project. Formal discussions have commenced, and smelters have confirmed their interest in both concentrates under long-term agreements and have indicated willingness to sign Letters of Intent (LOI) as soon as final qualities and quantities are known.

The copper concentrates are expected to be attractive for western copper smelters, however, attention should be given to the contents of Pb to maintain the level below 2.5% and as low as possible to reduce penalty charges. The zinc concentrates are clean, without any deleterious elements and with payable precious metal contents, generating additional income in the concentrates.

Based on the expectation that growth in copper smelting capacity will be greater than the growth in concentrate supply, it is expected that global smelting capacity for copper remains sufficient to absorb the new production.

The rising demand for zinc metal will reach 2.0 Mtpa from 2024, with the higher smelter production expected to come from higher utilization, new smelters or expansions at existing smelters. There is no operational zinc smelter in Türkiye. However, the neighbouring country of Bulgaria has production capability of 72 ktpa of zinc ingot in the city of Plovdiv.

25.8 Environment, approvals and social

All permits are in place for the Oxide Project, local authorities visit to confirm that adequate controls are in place, and periodic reporting to regulatory authorities is in place. Because the Oxide Project is operating, site-specific conditions are well-defined. Dust, noise, and vibration measurements are all controlled and reported, along with assays of surface and underground water monitoring wells. Diversion channels have been built around the open pit, waste dumps, heap leach facility, and TSFs, with further channels planned to prevent contamination of water from natural drainage entering the site during the Sulphide Project.

Geochemical studies were carried out to determine the acid mine drainage and metal leaching potential of waste rock. Geochemical characterization of the waste showed potential net acid production in lithologies from the sulphide zone. Kinetic analysis samples showed long delay times in some sulphide rocks, so that it will be possible to prevent or minimize the risk of net acidic drainage during operations with appropriate waste management. High sulphur potentially acid-generating (PAG) waste will be stored within the existing PAG waste dump and PAG waste with lower sulphur contents will be blended with non-acid-generating (NAG) waste and stored in a NAG WRD.

Closure and rehabilitation works will be carried out on completion of operations. A pit lake will be formed after dewatering ceases and is expected to overflow into natural drainage. The TSF will be covered with rock, levelled, and with a minimum top-surface cover thickness of 2 m.

Polimetal reports significant local support since the start of exploration and into operation of the Oxide Project, with 60% of the workforce from nearby villages. The community relations department of Polimetal has communicated with local authorities, local villagers, and other stakeholders about the development progress of the Sulphide Project. The same employment approach will be used for sourcing labour for the Sulphide Project.

25.9 Capital Cost Estimates

Capital cost estimates were prepared using international engineering standards by appropriately qualified and experienced engineering consultants using a combination of first principles estimates and supplier quotes and budget estimates. Initial capital costs for construction are estimated at US$119M, with a further US$43M in capital throughout the mine life for an overall capital cost of US$162M, inclusive of approximately US$11M in contingency.

Contingency allowances were estimated for each component, ranging from 6% for the capital cost of the sulphide ore processing plant, to 8% for the TSF and CWP, and 25% for mine closure estimates. Capital costs are considered reasonable and reflective of the proposed Sulphide Project operation.

25.10 Operating Cost Estimates

Operating cost estimates were prepared using international engineering standards by appropriately qualified and experienced engineering consultants using a combination of first principles estimates and experience with operating the Oxide Project. Mining operating costs averaged US$1.86/t rock mined, oxide processing costs averaged US$20/t processed, sulphide processing costs US$23/t processed, and overall operating costs averaged US$37/t processed.

Operating costs are considered reasonable and reflective of the current Oxide Project and the proposed Sulphide Project operation.

25.11 Economic Analysis

Economic analysis of the Project returns a positive undiscounted cash flow and NPV 0f US$264M at a 10% discount rate and an IRR of 60%. The payback period for discounted cash flows is 3.4 years.

Sensitivity of the NPV to the key drivers of operating cost, capital cost and revenue for a range of +/-15% shows NPV changes by 47% for a 15% change in revenue related items (such as metal price, recovery or grade), 23% for a 15% change in operating cost and 9% for a 15% change in capital cost.

25.12 Risks and Opportunities

The Project risks identified as high are:

- Penalties may be applied by smelters for off-specification concentrates and there is a risk that penalties may be higher than planned. Lead reporting to copper concentrate from disseminated ore can result in penalties from Chinese smelters. Therefore, European or Japanese smelters should be targeted for sales of copper concentrate.
- The natural variability of this type of deposit will return variable, and at times, material levels, of uncertainty (lower confidence) in grade and tonnes. These uncertainties are not evenly distributed throughout the deposit.
- Unidentified faults not included in the fault model could form large plane shears and wedges and affect bench stability.

- Pit slopes may be too high in some areas and require additional waste stripping to form stable slopes.
- Groundwater trapped behind faults and foliation could result in localized high pore pressures that impact slope stability.
- The pit lake could overflow from the south portion of the pit at the level of 1,145 m above mean sea level during the closure period.
- Mine planning, if not properly undertaken, could result in incorrect areas of the pit being scheduled for mining and result in mining of sulphide ore prior to the sulphide plant commissioning and result in wastage of sulphide ore.
- Stockpiling of sulphide ore for extended periods is not possible due to alternation in the characteristics of the ore which results in lower recoveries. A risk exists that the current allowance for stockpiling, in covered areas, is insufficient to meet the mine schedule. This must be critically reviewed in the next stage of mine planning.
- Although the TSF was designed with a downstream construction approach, the embankment downstream slope selected was considered safe at 1:3 (v:h), no geotechnical risk was identified, and the embankment complies with the Global Industry Standard on Tailings Management (2020) requirements for seismic design, potential financiers and investors may require additional assessments to be undertaken.
- The rate of rise during the initial years of operation, considering unexpected heavy rain and a narrow settling area for tailings, may be quicker than planned. Phase 3 of TSF construction may, therefore, start sooner than planned.
- Geotechnical analysis of the process plant area is required prior to beginning construction and may result in site infrastructure changes and increased costs.
- There is the risk that raw material prices continue to increase at a significant rate and that the capital cost increases substantially prior to implementation of the Project.

The major project opportunities are:

- Off-take agreements with smelters for concentrates from Gediktepe will ease financing.
- Sulphide ore is open and dipping at the north and north-west sides. The open part of the sulphide deposit is around 25 m thick. With resource drilling from inside the open pit, more Mineral Resource may be identified and converted to Ore Reserve.
- Additional exploration activities have identified other areas of potential oxide mineralization near the mine. Subject to further successful exploration works including drilling, there is the potential to increase the oxide Mineral Resources and extend the duration of oxide operations.
- Alternative markets may be identified to allow mining and transport of enriched mineralization as a directly saleable ore product.
- Mining may be more selective than assumed and result in less tonnes classified as buffer material around enriched mineralization, resulting in more sulphide ore suitable for plant feed.
- Calık Holding, a Holding company of Polimetal, has a construction company within its corporate group, which may assist with the procurement and construction of the Project.
- Processing enriched mineralization may add significant economy to the Project.

26Recommendations

The recommended work programme for Polimetal prior to implementation of the Sulphide Project is listed by functional area, compiled from contributors to the 2022 FS.

Mineral Resource estimates:

- Update the Mineral Resource with new drilling data (drilling underway on site) and learnings from the reconciliation between resource and reserve models and mine production from the Oxide Project mining and processing operation.
- Review the classification criteria for low confidence blocks.
- Revise the method for identifying PAG waste rock and updating the net carbonate value (NCV) model when additional data is available from the waste characterization programme.

Ore Reserve estimates:

- Update the Ore Reserve estimate with the updated Mineral Resource and results of other work.

Mining methods:

- A more detailed geotechnical study should be undertaken during the Oxide Project to confirm fault characteristics and locations, increase the confidence level of the geotechnical model, and adjust the in-pit geometry of production faces accordingly.
- A geophysical study should be undertaken over the areas for which there is little or no drill core data to identify potentially problematic ground conditions.
- Revise open pit slope geotechnical study based on production phases and possibly for each production year with the information obtained during oxide ore production.
- Update the groundwater model with test data from new dewatering drillholes.
- Provide additional detail on waste characterization modelling and the scheduling of PAG and NAG waste rock dumping.

Recovery methods:

- Update detailed short-term quality scheduling for sulphide process plant feed to ensure any areas of high impurity grades are blended to achieve a saleable product quality.

Infrastructure and services:

- Final plant layout to be confirmed.
- Power supply and voltage to be confirmed and final design to be confirmed.

Market studies and contracts:

- Start off-take agreement discussions with potential customers during the engineering phase.
- Review hedging strategies to assess value of hedging a proportion of planned production.

Environmental studies, permitting and social impacts:

- List any permit updates required for the Project investment and commissioning and schedule the required permit applications and deadlines based on the construction and commissioning schedule.
- Review closure plans every two years and update the closure cost.
- Put aside closure funds to cover closure costs and any future requirements.

Other relevant information:

- Seek EPCM contractor expressions of interest, and then evaluation, contractual arrangements, and appointment of contractors.

27References

Geology and Mineral Resources:

- AMC, 2023. Gediktepe Phase II Sulphide Feasibility Study. Prepared for Polimetal Madencilik Sanayi Ticaret A.Ş. Effective date 31 July 2022. Report date, 24 May 2023.
- Alizade, F, 2013 - 2015, Polimetal Weekly / Monthly Reports Dursunbey (Gediktepe (sections).
- Çiftehan, H, 2015, Gediktepe Project – Weekly/Monthly Report.
- Okay, A.I, ve Tüysüz, O. 1999. Tethyan stures of northern Turkey. In "The Mediterranean Basins: Tertiary extension within the Alpin Orogenes" (eds. B.Durand, L.Jolivet, F. Hortvath and M. Seranne) Geological Society of London, Special Publication 156 p.155-178, Özgür, O, 2014

Mining methods:

- Bieniawski 1976, Rock mass classification in rock engineering, in Proceedings Symposium on Exploration for Rock Engineering, Z.T. Bieniawski (ed), 1–5 November 1976.
- Golder 2020, Open Pit Slope Design and Dewatering & Depressurizing Evaluation (Final)", Golder Associates (Turkey) Ltd, dated January 21 2020.
- Hoek and Brown 1980, Underground Excavations in Rock, Institute of Mining and Metallurgy, September 1980.
- Mockus, V. (1957). Use of storm and watershed characteristics in synthetic hydrograph analysis and application. In Southwest Region Meeting of the American Geophysical Union. Sacramento, California.
- SRK Danışmanlık ve Mühendislik A.Ş. (2016). Gediktepe Polymetallic (Cu, Zn, Pb, FeS2, Ag, Au) Mine Open Pit Capacity Increase, Heap Leaching and Merill Crowe Facility, Flotation Facility and Tailings Storage Facility EIA Report

Mineral processing and metallurgical testwork:

- GR Engineering Services. (2022). Polimetal Madencilik Gediktepe Sulphide Project, Process Design Criteria and Mass Balance, REV A.
- HMT 2022, Gediktepe Project Ore Variability Testwork and Derivation of Grade Vs Recovery Equations, 3 July 2022.
- HMT 2023, Gediktepe Project Ore Variability Testwork and Derivation of Grade vs Recovery Equations, March 2023, Hacettepe Mineral Technologies. See Appendix 8.1
- RDi 2015, Metallurgical Testing of Sulphide Samples From Gediktepe Prospect, Turkey, 2 June 2015.
- SGS 2015, Sample Selection Report for Gediktepe Deposit – Turkey, 29 April 2015.
- SGS 2016, Metallurgical Analysis of the Gediktepe Sulphide Ore Deposit – Interim Report, 10866-577/100866-609, February 2016.

Infrastructure and services:

- Australian National Committee on Large Dams (ANCOLD)
- 2019 Global Industry Standard on Tailings Management (GISTM), 2020

Marketing studies and contracts:

- ICA 2023, International Copper Association, March 2023, Copper - The Pathway to Net Zero, ICA 2023.
- MCA 2023, Minerals Council of Australia and Commodity Insights, Commodity Demand Outlook 2030.
- S&P IQ Capital 2022, S&P Global Commodity Insights Capital IQ Commodities Estimates Overview dated December 2022.

Environmental studies, permitting and social impact:

- SRK Danışmanlık ve Mühendislik A.Ş. (2016). Gediktepe Polymetallic (Cu, Zn, Pb, FeS2, Ag, Au) Mine Open Pit Capacity Increase, Heap Leaching and Merill Crowe Facility, Flotation Facility and Tailings Storage Facility EIA Report
- SRK Danismanlik ve Muhendislik A.S. (2018). Gediktepe Polymetallic Mine Project, Turkey, Social Impact Assessment Report. (DRAFT).
- SRK Danismanlik ve Muhendislik A.S. (2018). Environmental and Social Impact Assessment Stakeholder Engagement Plan, Gediktepe Polymetallic Mine Project, Turkey. (DRAFT).
- SRK Danismanlik ve Muhendislik A.S. (2018). Gediktepe Polymetallic Mine Project Land Acquisition Plan (DRAFT).

Our offices

Australia

Adelaide
Level 1, 12 Pirie Street
Adelaide SA 5000 Australia

T +61 8 8201 1800
E adelaide@amcconsultants.com

Brisbane
Level 15, 100 Creek Street
Brisbane Qld 4000 Australia

T +61 7 3230 9000
E brisbane@amcconsultants.com

Melbourne
Level 12, 477 Collins Street
Melbourne Vic 3000 Australia

T +61 3 8601 3300
E melbourne@amcconsultants.com

Perth
Level 1, 1100 Hay Street
West Perth WA 6005 Australia

T +61 8 6330 1100
E perth@amcconsultants.com

Canada

Toronto
140 Yonge Street, Suite 200
Toronto ON M5C 1X6 Canada

T +1 647 953 9730
E toronto@amcconsultants.com

Vancouver
200 Granville Street, Suite 202
Vancouver BC V6C 1S4 Canada

T +1 604 669 0044
E vancouver@amcconsultants.com

South Africa

Cape Town
First Floor, Willowbridge Centre
Carl Cronje Drive
Cape Town 7530 South Africa

T +27 720 833 231
E capetown@amcconsultants.com

United Kingdom

Maidenhead
Registered in England and Wales
Company No. 3688365

Building 3, 1st Floor
Concorde Park, Concorde Road
Maidenhead SL6 4BY United Kingdom

T +44 1628 778 256
E maidenhead@amcconsultants.com

Registered Office:
The Kinetic Centre
Theobald Street
Elstree
Hertfordshire WD6 4PG United Kingdom