List of Figures

EXECUTIVE S	UMMARY	VOLUME 1
	FRONT MATTE	ER PAGE
Figure 1-1:	Project Location and Communities	2
Figure 1-2:	Project Overview	3
PROJECT OVI	ERVIEW	VOLUME 2
	CHAPTER	R1 PAGE
Figure 1.1 1:	Project Location and Communities	8
Figure 1.1 2:	Red Mountain Mineral Tenure Map	13
Figure 1.1 3:	Project Overview	17
Figure 1.1 4:	Project Footprint - Mine Site	18
Figure 1.1 5:	Project Footprint - Bromley Humps	19
Figure 1.1 6:	Project Timeline	21
Figure 1.2 1:	Regional Geology	25
Figure 1.2 2:	Mine Site Geology	28
Figure 1.2 3	Schematic Cross-Section of the Red Mountain Property	29
Figure 1.2 4:	Surficial Geology and Bedrock Mapping	31
Figure 1.2 5:	Pictorial Conceptual Site Model: Red Mountain Underground Gold Project	54
Figure 1.2 6:	Box-and-Line Conceptual Site Model: Red Mountain Underground Gold Proje	ect55
Figure 1.6 1:	Water Management – Mine Site	97
Figure 1.6 2:	Water Management – Bromley Humps	98
Figure 1.6 3:	Water Management – Quarries and Borrows along the Access Road	99
Figure 1.6 4:	Tailings Management Facility General Arrangement	114
Figure 1.7 1:	C&F Stoping (Section View)	126
Figure 1.7 2:	Shanty Back Profile & Wall Slash	128
Figure 1.7 3:	Level Plan	129
Figure 1.7 4:	4.5 m x 4.5 m Ramp Profile	130
Figure 1.7 5:	4 m x 4 m Waste Drift Profile	131

Figure 1.7 6:	4 m x 4 m Shanty Profile	132
Figure 1.7 7:	Annual Production Sequencing	134
Figure 1.7 8:	Typical Stope Sequencing	135
Figure 1.7 9:	Mine Access	136
Figure 1.7 10:	Red Mountain Underground Gold Project Simplified Process Flow	sheet151
Figure 1.7 11:	Filling Schedule	161
Figure 1.7 12:	Water Balance Schematic – Mine Site (Year -2 to Year 1)	169
Figure 1.7 13:	Water Balance Schematic – Mine Site (Year 2 to Year 6)	170
Figure 1.7 14:	Water Balance Schematic – Bromley Humps	171
Figure 1.7 15:	Water Balance Schematic – Borrows and Quarries	172
Figure 1.7 16:	Water Treatment System - Process Flow Diagram	178
Figure 1.7 17:	Schematic of MBBR Configuration	182
Figure 1.7 18:	Example of Plastic Biofilm Carrier for MBBR	182
ASSESSMENT	PROCESS	VOLUME 2 CHAPTER 2 PAGE
Figure 2.3-1:	Provincial Environmental Assessment Process Chart (EAO 2015)	•
Figure 2.5-1:	Nisga'a Nation Treaty Territory	
5		
ALTERNATIVE	MEANS OF UNDERTAKING THE PROJECT	VOLUME 2
		CHAPTER 4 PAGE
Figure 4.3-1:	Mine Access Portal: Alternative Locations	10
Figure 4.3-2:	Tailings Management Facility and Process Plant – Alternative Loca	ations21
Figure 4.4-1:	Project Overview with Borrow and Quarry Site Locations	39
CLOSURE ANI	O RECLAMATION	VOLUME 2
		CHAPTER 5 PAGE
Figure 5.1-1:	Project Overview	
Figure 5.1-2:	Project Footprint – Bromley Humps	4

2 | LIST OF FIGURES SEPTEMBER 2017

Figure 5.1-3:	Project Footprint – Mine Site	5
Figure 5.6-1:	Post-Closure TMF Layout	27
FFFFCTS ASSE	SSMENT METHODOLOGY	VOLUME 3
211201371332	SSIVIEW METHODOLOGI	CHAPTER 6 PAGE
Figure 6.1 1:	Overview of Key Steps in Effects Assessment	•
Figure 6.2 1:	VC Selection Process	
Figure 6.3 1:	Project Footprint including Temporary and Permanent Pl	
Figure 6.12 1:	Past, Present, and Reasonably Future Projects with Poter	
Figure 6.12 2:	Past, Present, and Reasonably Future Activities with Pote	
Figure 6.12 3:	Bitter Creek Hydro Project Footprint Compared to the Pr	
		-,
AIR QUALITY	EFFECTS ASSESSMENT	VOLUME 3
		CHAPTER 7 PAGE
Figure 7.1 1:	Project Overview	2
Figure 7.1 2:	Project Footprint – Bromley Humps	3
Figure 7.1 3:	Project Footprint – Mine Site	4
Figure 7.3 1:	Air Quality Spatial Boundaries	11
NOISE EFFECT	TS ASSESSMENT	VOLUME 3
		CHAPTER 8 PAGE
Figure 8.1 1:	Project Overview	
Figure 8.1 2:	Project Footprint – Bromley Humps	
Figure 8.1 3:	Project Footprint – Mine Site	
Figure 8.3 1:	LSA for Noise Effects Assessment	
Figure 8.5 1:	Noise Contour Map (Construction)	
Figure 8.5 2:	Noise Contour Map (Operation)	
Figure 8.5 3:	Noise Contour Map (Blasting)	20

LANDFORMS AND NATURAL LANDSCAPES

VOLUME 3

	CI	HAPTER 9	PAGE
Figure 9.1-1:	Project Overview		3
Figure 9.1-2:	Project Footprint – Bromley Humps		4
Figure 9.1-3:	Project Footprint – Mine Site		5
Figure 9.3-1:	Red Mountain Project Regional, Local and Project Footprint Study Are	eas	17
Figure 9.3-2:	Administrative and Technical Boundaries		18
Figure 9.4-1:	Terrain Mapping within the Local Study Area		30
Figure 9.4-2:	Terrain Stability Mapping (1:20,000) in the Local Study Area		32
Figure 9.4-3:	Terrain Stability Mapping (1:5,000) in the Project Footprint Study Are	a	33
Figure 9.4-4:	Soil Map Units in the PFSA		49
Figure 9.4-5:	Soil Erosion Potential in the PFSA		55
Figure 9.5-1:	Loss and Alteration by Soil Management Unit		77
Figure 9.5-2:	Fugitive Dust Accumulation		90
Figure 9.5-3:	Rates of NO2 Deposition interaction with Acid Sensitive Soils		95
Figure 9.5-4:	Geohazard Type and Project Infrastructure		96
Figure 9.5-5:	Slope Stability and Project Infrastructure		101
Figure 9.8-1:	Projects and Activities Included in the Cumulative Effects Assessment		139
HYDROGEOLO	OGY EFFECTS ASSESSMENT	VO	LUME 3
	CHA	APTER 10	PAGE
Figure 10.1-1:	Project Overview		2
Figure 10.1-2:	Project Footprint – Bromley Humps		3
Figure 10.1-3:	Project Footprint – Mine Site		4
Figure 10.3-1:	Spatial Boundaries for Hydrogeology		12
Figure 10.4-1:	Groundwater Monitoring Locations in the Mine Site TSA		18
Figure 10.4-2:	Groundwater Monitoring Locations in the Bromley Humps TSA		19
Figure 10.4-3:	Hydraulic Conductivity (K) in the Mine Site TSA versus Depth		23
Figure 10.4-4:	Conceptual Hydrogeological Model for the Mine Site TSA		27
Figure 10.4-5:	Hydraulic Conductivity (K) in the Bromley Humps TSA versus Depth (1996 Site	28

4-6: Hydraulic Conductivity (K) in the Bromley Humps TSA versus Depth (2016 Site Investigation)	Figure 10.4-6:
4-7: Conceptual Baseline Piezometric Contours and Flow Direction for the Bromley Humps TSA (Plan View)	Figure 10.4-7:
4-8: Conceptual Groundwater Flow for the Bromley Humps TSA (Cross Section) 33	Figure 10.4-8:
7-1: Predicted Drawdown at the Underground Mine	Figure 10.7-1:
7-2: Particle Paths from the Mine to the Surface Water Receptors	Figure 10.7-2:
7-3: Predicted Groundwater Mean Life Time Expectancy (LTE) in the Mine Site TSA49	Figure 10.7-3:
8-1: Bitter Creek Hydro Project Footprint Compared with the Project52	Figure 10.8-1:
WATER QUALITY EFFECTS ASSESSMENT VOLUME 3	GROUNDWAT
CHAPTER 11 PAGE	
1-1: Project Overview	Figure 11.1-1:
1-2: Project Footprint - Bromley Humps	Figure 11.1-2:
1-3: Project Footprint - Mine Site	Figure 11.1-3:
3-1: Spatial Boundaries for Groundwater Quality11	Figure 11.3-1:
4-1: Groundwater Monitoring Locations	Figure 11.4-1:
8-1: Bitter Creek Hydro Project Footprint Compared with the Project40	Figure 11.8-1:
OGY EFFECTS ASSESSMENT VOLUME 3	HYDROLOGY E
CHAPTER 12 PAGE	
1-1: Project Overview2	Figure 12.1-1:
1-2: Project Footprint – Bromley Humps	Figure 12.1-2:
1-3: Project Footprint – Mine Site	Figure 12.1-3:
3-1 Spatial Boundaries for Hydrology9	Figure 12.3-1
8-1: Bitter Creek Hydro Project Footprint Compared with the Project	Figure 12.8-1:

SURFACE WA	TER QUALITY EFFECTS ASSESSMENT	VOLUME 3
		CHAPTER 13 PAGE
Figure 13.3-1:	Local and Regional Study Areas for Surface Water Quality	10
Figure 13.4-1:	Project Components - Overview	14
Figure 13.4-2:	Project Components – Mine Site	15
Figure 13.4-3:	Project Components – Bromley Humps	16
Figure 13.4-4:	Water Quality Sampling Sites	27
SEDIMENT QU	JALITY EFFECTS ASSESSMENT	VOLUME 3
		CHAPTER 14 PAGE
Figure 14.3-1:	Local and Regional Study Areas for Sediment Quality	9
Figure 14.4-1:	Project Components – Overview	13
Figure 14.4-2:	Project Components – Mine Site	14
Figure 14.4-3:	Project Components – Bromley Humps	15
Figure 14.4-4:	Sediment Quality Sampling Sites	20
VEGETATION	AND ECOSYSTEMS EFFECTS ASSESSMENT	VOLUME 3
		CHAPTER 15 PAGE
Figure 15.1 1:	Project Overview	3
Figure 15.1 2:	Project Footprint – Mine Site	4
Figure 15.1 3:	Project Footprint – Bromley Humps	5
Figure 15.3 1:	Vegetation and Ecosystems Study Areas	17
Figure 15.3 2:	Administrative and Technical Boundaries	18
Figure 15.4 1:	Plot Locations in the LSA and RSA for Ecosystems, Vegetation,	and Soil27
Figure 15.4 2:	Ecologically Valuable Soils within the PFSA	37
Figure 15.4 3:	Predictive Ecosystem Mapping within the RSA	44
Figure 15.4 4:	Terrestrial Ecosystem Mapping within the LSA	45
Figure 15.4 5:	Terrestrial Ecosystem Mapping within the PFSA	46
Figure 15.4 6:	Occurrences of Rare Vascular Plants within the LSA	63
Figure 15.4 7:	Occurrences of Rare Lichen within the LSA	64
Figure 15.4 8:	Occurrences of Rare Moss and Liverwort within the LSA	65

Figure 15.5 1:	Loss and Alteration of Ecologically Valuable Soil
Figure 15.5 2:	Loss and Alteration of Alpine Ecosystems
Figure 15.5 3:	Loss and Alteration of Parkland Ecosystems
Figure 15.5 4:	Loss and Alteration of Old Growth and Mature Forested Ecosystems94
Figure 15.5 5:	Loss and Alteration of Floodplains
Figure 15.5 6:	Loss and Alteration of Wetlands
Figure 15.5 7:	Loss and Alteration of Rare Plants and Lichen
Figure 15.5 8:	Annual Dust Deposition on Rare Plants and Lichens
Figure 15.8 1:	Projects and Activities Included in the Cumulative Effects Assessment147
WILDLIFE AND	WILDLIFE HABITAT EFFECTS ASSESSMENT VOLUME 3
Fig., wa 10 1 1.	CHAPTER 16 PAGE
Figure 16.1 1:	Project Overview
Figure 16.1 2:	Project Footprint – Bromley numps
Figure 16.1 3:	
Figure 16.3 1:	Regional and Local Study Areas for Wildlife Valued Components
Figure 16.4 1:	Habitat Suitability Map for Mountain Goat — Summer Living
Figure 16.4 2:	Habitat Suitability Map for Mountain Goat — Winter Living
Figure 16.4 3:	Habitat Suitability Map for Grizzly Bear — Late Spring Feeding
Figure 16.4 4:	Habitat Suitability Map for Grizzly Bear — Summer Feeding
Figure 16.4 5:	Habitat Suitability Map for Grizzly Bear — Fall Feeding
Figure 16.4 6:	Habitat Suitability Map for Marten — Winter Living
Figure 16.4 7:	Habitat Suitability Ratings for Wolverine — Summer Living
Figure 16.4 8:	Habitat Suitability Map for Bats — Usable
Figure 16.4 9:	Habitat Suitability Map for MacGillivray's Warbler — Nesting
Figure 16.4 10:	Habitat Suitability Map for Olive-sided Flycatcher — Nesting
Figure 16.4 11:	Habitat Suitability Map for Sooty Grouse — Nesting
Figure 16.4 12:	Habitat Suitability Map for Sooty Grouse — Winter Living
Figure 16.4 13:	Habitat Suitability Map for White-tailed Ptarmigan — Winter Living 83
Figure 16.7 1:	Overlap of the Project with Mountain Goat Effective Habitat — Summer Living 127
Figure 16.7 2:	Overlap of the Project with Mountain Goat Effective Habitat — Winter Living
Figure 16.7 3:	Mountain Goat Trails Mapped within the RSA

Figure 16.7 4:	Overlap of the Project with Grizzly Bear Effective Habitat — Early Spring Feeding 1	37
Figure 16.7 5:	Overlap of the Project with Grizzly Bear Effective Habitat $-$ Late Spring Feeding 1	38
Figure 16.7 6:	Overlap of the Project with Grizzly Bear Effective Habitat $-$ Summer Feeding 1	39
Figure 16.7 7:	Overlap of the Project with Grizzly Bear Effective Habitat — Fall Feeding1	40
Figure 16.7 8:	Overlap of the Project with Grizzly Bear Effective Habitat — Winter Denning1	41
Figure 16.7 9:	Overlap of the Project with Moose Effective Habitat — Summer Living1	46
Figure 16.7 10:	Overlap of the Project with Moose Effective Habitat — Winter Living1	47
Figure 16.7 11:	Overlap of the Project with Marten Effective Habitat — Winter Living1	51
Figure 16.7 12:	Overlap of the Project with Wolverine Effective Habitat — Growing Living1	54
Figure 16.7 13:	Overlap of the Project with Wolverine Effective Habitat — Winter Denning1	55
Figure 16.7 14:	Overlap of the Project with Hoary Marmot Effective Habitat — Summer Living1	61
Figure 16.7 15:	Overlap of the Project with Bat Effective Habitat — Growing Living1	66
Figure 16.7 16:	Overlap of the Project with Migratory Breeding Bird Effective Habitat — Alpine 1	70
Figure 16.7 17:	Overlap of the Project with Migratory Breeding Bird Effective Habitat — Old/Mature Forest	71
Figure 16.7 18:	Overlap of the Project with Migratory Breeding Bird Effective Habitat — Riparian 1	72
Figure 16.7 19:	Overlap of the Project with Migratory Breeding Bird Effective Habitat — Shrub/Early Successional	73
Figure 16.7 20:	Overlap of the Project with MacGillivray's Warbler Effective Habitat — Nesting 1	76
Figure 16.7 21:	Overlap of the Project with Black Swift Effective Habitat – Nesting 1	80
Figure 16.7 22:	Overlap of the Project with Common Nighthawk Effective Habitat — Nesting1	83
Figure 16.7 23:	Overlap of the Project with Marbled Murrelet Effective Habitat – Nesting 1	91
Figure 16.7 24:	Overlap of the Project with Olive-sided Flycatcher Effective Habitat $-$ Nesting 1	97
Figure 16.7 25:	Overlap of the Project with Northern Goshawk Effective Habitat — Nesting 2	02
Figure 16.7 26:	Overlap of the Project with Northern Goshawk Effective Habitat — Foraging2	03
Figure 16.7 27:	Overlap of the Project with Western Screech-owl Effective Habitat — Nesting 2	06
Figure 16.7 28:	Overlap of the Project with Sooty Grouse Effective Habitat — Summer Living 2	10
Figure 16.7 29:	Overlap of the Project with Sooty Grouse Effective Habitat — Winter Living 2	11
Figure 16.7 30:	Overlap of the Project with White-tailed Ptarmigan Effective Habitat — Winter Living	16
Figure 16.7 31:	Overlap of the Project with Western Toad Effective Habitat — Breeding 2	21
Figure 16.8 1:	Location of Projects and Activities Included in the Cumulative Effects Assessment 2	34

8 | LIST OF FIGURES SEPTEMBER 2017

AQUATIC RES	OURCES EFFECTS ASSESSMENT	VOLUME 3
		CHAPTER 17 PAGE
Figure 17.3 1	Local and Regional Study Areas for Aquatic Resources	10
Figure 17.4 1:	Project Overview	14
Figure 17.4 2:	Project Footprint – Mine Site	15
Figure 17.4 3:	Project Footprint – Bromley Humps	16
Figure 17.4 4:	Aquatic Resources Sampling Sites, 1993, and 2014-2016	22
Figure 17.5 1:	Location of the TMF Relative to Unnamed Tributaries to Bitter Cr	reek43
FISH AND FISH	HABITAT EFFECTS ASSESSMENT	VOLUME 3
		CHAPTER 18 PAGE
Figure 18.3-1:	Local and Regional Study Areas for Fish and Fish Habitat	12
Figure 18.4-1:	Project Components – Overview	15
Figure 18.4-2:	Project Components – Mine Site	16
Figure 18.4-3:	Project Components – Bromley Humps	17
Figure 18.4-4:	Fisheries Sampling Sites, 1993-1994, and 2014-2016	26
Figure 18.4-5:	Photographs of Bitter Creek Reaches	32
Figure 18.4-6:	Fish Bearing Status of Bitter Creek Mainstem	36
Figure 18.4-7:	Photographs of Bitter Creek Tributaries	37
Figure 18.4-8:	Overview of Fish Habitat Utilization	40
ECONOMIC EF	FECTS ASSESSMENT	VOLUME 3
		CHAPTER 19 PAGE
Figure 19.1-1:	Project Overview	3
Figure 19.1-2:	Project Footprint – Bromley Humps	4
Figure 19.1-3:	Project Footprint – Mine Site	5
Figure 19.3-1:	Project Employment and Revenue to Local Economy LSA and RSA	۱5 ما
Figure 19.3-2:	CRA Fisheries and Contemporary Land and Resource Use LSA and	d RSA16
Figure 19.4-1:	Contemporary Land and Resource Use (selected)	22

SOCIAL EFFECT	TS ASSESSMENT	VOLUME 3
	СН	APTER 20 PAGE
Figure 20.1 1:	Project Overview	3
Figure 20.1 2:	Project Footprint – Bromley Humps	4
Figure 20.1 3:	Project Footprint – Mine Site	5
Figure 20.3 1:	RSA and LSA for Social Effects of the Project, except Social and Health	n Services15
Figure 20.3 2:	RSA and LSA for Social and Health Services	16
Figure 20.10 1:	CULRTP Local and Regional Study Areas	76
Figure 20.10 2:	Past, Present, and Future Project with Potential for Cumulative Effect	ts148
Figure 20.10 3:	Past, Present, and Future Activities with Potential for Cumulative Effe	ects149
HERITAGE FEE	ECTS ASSESSMENT	VOLUME 3
TIENTIAGE ETT		APTER 21 PAGE
Figure 21 2 1:	Project Overview	•
Figure 21.2-1:	•	
Figure 21.2-2.		
· ·	RDKS Heritage Registry Sites	
	Cultural and Heritage Resources Local Study Area	
rigule 21.5-1.	Cultural and Heritage Resources Local Study Area	10
HEALTH EFFEC	CTS ASSESSMENT	VOLUME 3
	CH	APTER 22 PAGE
Figure 22.1-1:	Project Overview	4
Figure 22.1-2:	Project Footprint – Bromley Humps	5
Figure 22.1-3:	Project Footprint – Mine Site	6
Figure 22.3-1:	Local and Regional Study Areas – Human Health	34
Figure 22.3-2:	Air Quality Spatial Boundaries	35
Figure 22.3-3:	Surface Water Quality Spatial Boundaries	36
Figure 22.3-4:	Fish and Fish Habitat Spatial Boundaries	37
Figure 22.3-5:	Wildlife and Wildlife Habitat Spatial Boundaries	38
Figure 22.5-1:	Conceptual Site Exposure Model – Human Health	68
Figure 22.5-2:	Conceptual Site Exposure Model – Human Health	69

TSETSAUT SKI	I KM LAX HA	VOLUME 4
		CHAPTER 25 PAGE
Figure 25.2 1:	TSKLH Territory (Map 1 of 2)	8
Figure 25.2 2:	TSKLH Traditional Territory (Map 2 of 2)	9
Figure 25.2 3:	Registered Traplines held by TSKLH Members	12
MÉTIS NATION	N BC	VOLUME 4
		CHAPTER 26 PAGE
Figure 26.2-1:	MNBC Communities in Northwest BC	5
Figure 26.2-2:	MNBC Map of Occupancy and Use Sites near the Project	9
NIS <u>G</u> A'A NATI	ON	VOLUME 4
		CHAPTER 27 PAGE
Figure 27.2-1:	Nisga'a Nation Treaty Territory	6
Figure 27.2-2:	Structure of Nisga'a Lisims Government	27
PUBLIC CONSI	JLTATION	VOLUME 4
		CHAPTER 28 PAGE
Figure 28.2-1:	Regional Location of the Project	6
Figure 28.3-1:	Overlapping Tenures	10
MANAGEMEN	IT PLANS	VOLUME 5
		CHAPTER 29 PAGE
Figure 29.1-1:	Hierarchy of Environmental Management Documentation	16
Figure 29.2-1:	Adaptive Management Response Framework	21
Figure 29.5-1:	Project Location and Mine Components	39
Figure 29.5-2:	AEMP Sampling Locations	46
Figure 29 15-1:	Location of Aggregate Sources	106

Figure 29.15-2:	Project Footprint – Bromley Humps	109
Figure 29.15-3:	Project Footprint – Mine Site	110
Figure 29.17-1:	Hierarchy of Controls (WorkSafeBC 2017b)	127
Figure 29.18-1:	Mine Site Water Management Structures	133
Figure 29.18-2:	Bromley Humps Water Management Structures	134
Figure 29.18-3:	Borrow and Quarry Water Management Structures	135
Figure 29.18-4:	SCS Type 1A 24-Hour Unit Hydrograph (HydroCAD, 2015)	139
Figure 29.18-5:	Mine Site Water Monitoring Locations	145
Figure 29.18-6:	Bromley Humps Water Monitoring Locations	146
Figure 29.18-7:	Borrow and Quarry Water Monitoring Locations	147
Figure 29.20-1:	Summary of Community Feedback System Procedure	168
Figure 29.22-1:	Project Overview	177
Figure 29.22-2:	TMF General Arrangement (Final – Stage 4)	181
Figure 29.22-3:	TMF Filling Schedule	182
Figure 29.22-4:	Embankment Cross-section	185
Figure 29.22-5:	Foundation Drains Plan	186
Figure 29.22-6:	Foundation Drains Cross-section	187
Figure 29.22-7:	Basin Underdrain Plan	188
Figure 29.22-8:	Basin Underdrain Cross-section	189
Figure 29.22-9:	TMF Water Balance Results – Base Case	191
Figure 29.22-10	: TMF Water Balance – Adjusted Case	191
Figure 29.25 1:-	Example of Waste Organization	225