

Supplementary Material 2. Database of ore deposits evaluated for their suitability for Narrow Reef Mining Equipment (NRE), based on key morphological parameters, including orebody dip and thickness. Individual scores for dip and thickness were used to assign NRE suitability classes at the ore body and deposit scale. Deposits for which one or more key parameters could not be reliably constrained were retained in the database but classified as not assessable (NA) and excluded from quantitative comparisons of suitability classes. Supplementary Material compiled after [1–112].

Ore deposit	Mine	Dip	Thickn ess	Score _dip	Score_t hickne ss	NRE efficiency (%)	NRE suitability class	General NRE suitability general/ scale	Genetic type of deposit	Referenc es
Abitibi	Dumont Project	60 to 70°	NA	1	NA	<10%	Unsuitable ore body	Unsuitable/ ore deposit	Magmatic	[1]
Abitibi (general)		NA	NA	NA	NA	NA	NA			
African Cu Belt	Kamoa&Kaku la	0°-20°	3 m	3	2	70–100%	Highly suitable ore body	Conditional /ore body	Sediment hosted	[2-7]
	Konkola Copper	15-70°	NA	2	NA	NA	NA			
	Lumwana	5°-25°	15-200 m	2	1	10–30%	Low-suitability ore body			
	Mufulira mine	45°	NA	1	NA	<10%	Unsuitable ore body			
	Nchanga	25°	10-40 m	2	1	10–30%	Low-suitability ore body			
African Cu Belt - Chambishi- Nkana Basin (general)		15-20°	1-3 m	3	2	70–100%	Highly suitable ore body			
Bushveld	Amandebult Complex (Tumela mine)	18-27°	1.3-1.4 m	2	3	30–70%	Conditionally suitable ore body	High/ore body	Magmatic	[8-34]
	Amandebult Complex (open pit Dishaba mine)	18°-27°	1.3-1.4 m	2	3	30–70%	Conditionally suitable ore body			
	Bafokeng Rasimone Platinum (BRPM)	5°-12°	1.2-1.5 m	3	3	70–100%	Highly suitable ore body			
	Bakubung Platinum	5°	1.4 m	3	3	70–100%	Highly suitable ore body			
	Bathopele Mine	9°	2 m	3	2	70–100%	Highly suitable ore body			
	Bauba Moeijeljik	9-25°	1.02- 1.35 m	2	3	30–70%	Conditionally suitable ore body			
	Bokoni mine	18°-25°	1-1.3 m	2	3	30–70%	Conditionally suitable ore body			
	Booyse dal	10°	110-140 cm	3	3	70–100%	Highly suitable ore body			
	Cons Modder	10°-14°	3 m	3	2	70–100%	Highly suitable ore body			
	Dishaba mine	18 - 27°	NA	2	NA	NA	NA			
	Dwarsrivier Mine	10°	1.86 m	3	2	70–100%	Highly suitable ore body			
	Eastern Chrome	10°	0.6 -1.4 m	3	3	70–100%	Highly suitable ore body			
	Eland Platinum	18°	1.6-3 m	3	2	70–100%	Highly suitable ore body			
	Garatau PGM	20°	1-2 m	3	2	70–100%	Highly suitable ore body			
	Grootvlei	10°	126 cm	3	3	70–100%	Highly suitable ore body			
	Helena	NA	NA	NA	NA	NA	NA			
	Impala	10°- 12°	110-130 cm	3	3	70–100%	Highly suitable ore body			

	Jagdlust Chrome Mine	25°	150 cm	2	3	30–70%	Conditionally suitable ore body			
	Khuseleka mine	9° - 12°	NA	3	NA	NA	NA			
	Magareng	9-16°	1.7 m	3	2	70–100%	Highly suitable ore body			
	Marikana	9°- 20°	124-106 cm	3	3	70–100%	Highly suitable ore body			
	Marula	12°-14°	0.6-1 m	3	3	70–100%	Highly suitable ore body			
	Modikwa	10°	102-157 cm	3	3	70–100%	Highly suitable ore body			
	Modikwa mine	10°	60 cm	3	3	70–100%	Highly suitable ore body			
	Mototolo mine	9°-10°	118 cm	3	3	70–100%	Highly suitable ore body			
	Nigel	10°	300 cm	3	2	70–100%	Highly suitable ore body			
	Northam mine	20°	100 cm	3	3	70–100%	Highly suitable ore body			
	Platreef	40°	average 24.7 m	1	1	<10%	Unsuitable ore body			
	Samancor Chrome Mines	10°	110-140 cm	3	3	70–100%	Highly suitable ore body			
	Siyanda Bakgatla Platinum	21°	30-110 cm	3	3	70–100%	Highly suitable ore body			
	Sky Chrome Mine	10°	186 cm	3	1	10–30%	Low-suitability ore body			
	Smokey hills mine	50°	NA	1	NA	<10%	Unsuitable ore body			
	Styldrift Royal Bafokeng	5°-12°	150 cm	3	3	70–100%	Highly suitable ore body			
	Tharisa (MG)	9°-15°	3-6 m	3	2	70–100%	Highly suitable ore body			
	Thorncliffe	10°-14°	185-250 cm	3	2	70–100%	Highly suitable ore body			
	Twickenham	15°	100-200 cm	3	2	70–100%	Highly suitable ore body			
	Two Rivers	7°-10°	180 cm	3	2	70–100%	Highly suitable ore body			
	Waternval	10° – 14°	0.6 m	3	2	70–100%	Highly suitable ore body			
	Zandfontein mine	15°-25°	135-150 cm	2	3	30–70%	Conditionally suitable ore body			
	Zondereinde	9-10°	150–160 cm	3	3	70–100%	Highly suitable ore body			
	Blue Ridge project	18°	125 cm	3	3	70–100%	Highly suitable ore body			
	Rustenburg	9°	76.2 cm	3	3	70–100%	Highly suitable ore body			
	Kroondal	9-10°	0.4-0.8 m	3	3	70–100%	Highly suitable ore body			
	Mooiooi	9-10°	60-140 m	3	1	10–30%	Low-suitability ore body			
	Waterkloof-Millsell	9-10°	60-140 m	3	1	10–30%	Low-suitability ore body			
	Winkelhaak	NA	NA	NA	NA	NA	NA			
Cape Smith Belt	Expo Ungava Nickel prospect	45-80°	NA	1	NA	<10%	Unsuitable ore body	Unsuitable/ ore deposit	Magmatic	[35-37]
	Nunavik Nickel Project (Expo Sud mine)	30°	NA	1	NA	<10%	Unsuitable ore body			
	Nunavik Nickel Project (Ivakkak UG mine)	30°	NA	1	NA	<10%	Unsuitable ore body			

	Nunavik Nickel Project (Mequillon UG2 mine)	30°	NA	1	NA	<10%	Unsuitable ore body			
	Raglan project	45-80°	NA	1	NA	<10%	Unsuitable ore body			
Córrego do Sítio	Corrego do Sítio	20°-70°	NA	2	NA	NA	NA	Unsuitable/ore deposit	Sediment-hosted	[38-39]
	Cuiaba	30°	NA	1	NA	<10%	Unsuitable ore body			
	Lamego	20°-30°	NA	2	NA	NA	NA			
Diluluth Complex	Duluth Complex - Birch Lake	NA	NA	NA	NA	NA	NA	Unsuitable/ore deposit	Magmatic	[40]
Diluluth Complex (general)		NA	several 10s of meters	NA	1	NA	NA			
Dzhezkazgan deposit (general)		5° to 15°	3 to 5 m	3	2	70–100%	Highly suitable ore body	Low/ore deposit	Sediment. hosted	[41]
Fedorova–Pana Complex	Fedorov Tundra Project	30°	NA	1	NA	<10%	Unsuitable ore body	Conditional /ore body	Magmatic	[42-44]
	Kievei PGE deposit	30°	NA	1	NA	<10%	Unsuitable ore body			
Fedorova–Pana Complex (general)		25-70°	NA	2	NA	NA	NA			
Great Dyke	Ngezi Mine Complex (Mupani mine)	5° and 20°	2-3 m	3	2	70–100%	Highly suitable ore body	High/ore body	Magmatic	[45-52]
	Ngezi Mine Complex (Bimha mine)	5° and 20°	2-3 m	3	2	70–100%	Highly suitable ore body			
	Ngezi Mine Complex (Rukodzi mine)	5° and 20°	2-3 m	3	2	70–100%	Highly suitable ore body			
	Ngezi Mine Complex (Mupfuti mine)	5° and 20°	2-3 m	3	2	70–100%	Highly suitable ore body			
	Ngezi Mine Complex (Ngwarati mine)	5° and 20°	2-3 m	3	2	70–100%	Highly suitable ore body			
	Bokai Platinum Project	9° - 14°	250 cm	3	2	70–100%	Highly suitable ore body			
	Darwendale Platinum Project	5°-20°	<150 cm	3	3	70–100%	Highly suitable ore body			
	Hartley mine	18°	2-8 m (stopping width average 2 m)	3	2	70–100%	Highly suitable ore body			
	Karo Platinum Project	20°-32°	NA	2	NA	NA	NA			
	Mhondoro	<20°	2-8 m (stopping width average 2 m)	3	2	70–100%	Highly suitable ore body			
	Unki Mine	0°-14°	2 m (stopping width)	3	2	70–100%	Highly suitable ore body			
	Mimosa Platinum Mine	14°	2-8 m (stopping width)	3	2	70–100%	Highly suitable ore body			

			average 2 m)							
Iberian Py belt	Panasqueira mine	<20°	0.1-1.0 m	3	3	70–100%	Highly suitable ore body	Unsuitable/ mine scale	Hydrothermal	[53-54 and references therein]
Iberian Py belt (general)		50°-70°	NA	1	NA	<10%	Unsuitable ore body			
Kambalda District	Lake Johnston nickel mine	NA	NA	NA	NA	NA	NA	Unsuitable/ ore deposit	Magmatic	[55]
	Spotted Quoll	NA	3.1-13.4 m	NA	1	NA	NA			
Kambalda District (general)		30° to 80°	NA	1	NA	<10%	Unsuitable ore body			
Koitelainen Intrusion	Kevitsa	gently dipping	up to 300 m	2	1	NA	NA	Unsuitable/ ore deposit	Magmatic	[56-59]
	Hietaharju	75°	NA	1	NA	<10%	Unsuitable ore body			
	Kauniinlampi	50°	NA	1	NA	<10%	Unsuitable ore body			
	Lomalampi	80°	NA	1	NA	<10%	Unsuitable ore body			
Kondyor Intrusion	Anomal'nyi	subvertical	NA	NA	NA	NA	NA	Unsuitable/ ore deposit	Magmatic	[60-61]
	Kondyor platinum mine	NA	NA	NA	NA	NA	NA			
Kuhmo Greenstone Belt	Kuhmo Nickel Project	30-40	3-10 m	1	2	<10%	Unsuitable ore body	Unsuitable/ ore deposit	Magmatic	[62]
Kupferschiefer	Deep Głogów Technical Project	gentle	1 m	NA	3	NA	NA	High/ore body	Sediment-hosted	[63-64]
	Lubin (7 shafts)	gentle	1 m	NA	3	NA	NA			
	Polkowice-Sieroszowice (10 shafts)	gentle	1 m	NA	3	NA	NA			
	Retków mine	gentle	1 m	NA	3	NA	NA			
	Rudna (11 shafts)	gentle	1 m	NA	3	NA	NA			
	Spremberg-Graustein-Schleife	NA	NA	NA	NA	NA	NA			
	The Donaldson Copper Deposit	NA	NA	NA	NA	NA	NA			
Lac des Iles (general)		subvertical	NA	1	NA	<10%	Unsuitable ore body	Unsuitable/ ore deposit	Magmatic	[65]
Montegorsk /Vuruchuaivench	Vuruchuaivench project	15°	0.5 to 10–20 m thick	3	2	70–100%	Highly suitable ore body	High/ore deposit	Magmatic	[66-67]
Vuruchuaivench (general)		15°	1-3 m	3	2	70–100%	Highly suitable ore body			
Munni Munni	Auralia Nickel-Copper-PGE Project	30-60°	NA	1	NA	<10%	Unsuitable ore body	Unsuitable/ ore deposit	Magmatic	[68-69]
	Julimar Nickel-Copper-PGE Project	30-60°	NA	1	NA	<10%	Unsuitable ore body			
	Kings Nickel-Copper-PGE Project	30-60°	NA	1	NA	<10%	Unsuitable ore body			
	Munni Munni Project	30-60°	NA	1	NA	<10%	Unsuitable ore body			
	Narryer Nickel-	30-60°	NA	1	NA	<10%	Unsuitable ore body			

	Copper-PGE Project									
	Northam Resources Joint Venture Nickel-Copper-PGE Project	30-60°	NA	1	NA	<10%	Unsuitable ore body			
	Panton project	30-60°	NA	1	NA	<10%	Unsuitable ore body			
	Yarawindah Brook	30-60°	NA	1	NA	<10%	Unsuitable ore body			
Muskox	Big Lake	NA	NA	NA	NA	NA	NA	High/ore deposit	Magmatic	[70]
	Muskox project	NA	NA	NA	NA	NA	NA			
Muskox (general)		3-5°	10s of cm thick	3	3	70–100%	Highly suitable ore body			
Nebo-Babel	Nebo-Babel	10-15°	average 30 m	3	1	10–30%	Low-suitability ore body	Low/ore body	Magmatic	[71]
Noril'sk–Talnakh field	Chernogorsko ye	NA	up to 200 m	NA	1	NA	NA	Conditional /ore body	Magmatic	[72]
	Kharayelakh	NA	NA	NA	NA	NA	NA			
	Medvezhy Ruchi	NA	NA	NA	NA	NA	NA			
	Norilsk Nickel Polar	NA	NA	NA	NA	NA	NA			
	Oktyabrsky Mine	NA	NA	NA	NA	NA	NA			
	Skalisty Mine	NA	NA	NA	NA	NA	NA			
	Taimyrsky Mine	NA	NA	NA	NA	NA	NA			
	Zapolyarnaya	NA	NA	NA	NA	NA	NA			
	Komsomolsky	NA	NA	NA	NA	NA	NA			
	Mayak	NA	NA	NA	NA	NA	NA			
Noril'sk–Talnakh field (general)		4–6°	cm's-45 m	3	2	70–100%	Conditionally suitable ore body			
North Caribou greenstone belt	Musselwhite	15°	Up to 10 meters	3	1	10–30%	Low-suitability ore body	Low/ore body	Sediment-hosted	[73]
Penikat&	Arctic platinum project Konttijärvi and Ahmavaara	NA	NA	NA	NA	NA	NA	Unsuitable/ore deposit	Magmatic	[74-75]
Portimo	Penikat	45	NA	1	NA	<10%	Unsuitable ore body			
	Suhanko	30	NA	1	NA	<10%	Unsuitable ore body			
Penikat&Portimo (general)		30-70°	NA	1	NA	<10%	Unsuitable ore body			
Skaergaard	Skaergaard project	NA	NA	NA	NA	NA	NA	High/ore deposit	Magmatic	[76-78]
Skaergaard (general)		20°	1-3 m	3	2	70–100%	Highly suitable ore body			
Stella Intrusion	Kalplats project	>70°	NA	1	NA	<10%	Unsuitable ore body	Unsuitable/ore deposit	Magmatic	[79]
Stillwater	Stillwater (East Boulder)	NA	NA	NA	NA	NA	NA	Unsuitable/ore deposit	Hydrothermal	[80]
	Stillwater (West Boulder)	NA	NA	NA	NA	NA	NA			
Stillwater (general)		30-60°	NA	1	NA	<10%	Unsuitable ore body			
Sudbury	Aer-Kidd project	30°	NA	1	NA	<10%	Unsuitable ore body	Unsuitable/ore deposit	Magmatic	[81-83]

	Coldwell Complex - Marathon	5°- 45°	NA	2	NA	NA	NA			
	Coleman	30-70	NA	1	NA	<10%	Unsuitable ore body			
	Copper Cliff Complex	NA	NA	NA	NA	NA	NA			
	Creighton	80	NA	1	NA	<10%	Unsuitable ore body			
	Fraser	30°	NA	1	NA	<10%	Unsuitable ore body			
	Frood and Stobie	NA	NA	NA	NA	NA	NA			
	Janes project	30°	NA	1	NA	<10%	Unsuitable ore body			
	Lockerby East property	45°	NA	1	NA	<10%	Unsuitable ore body			
	McCreedy West	NA	NA	NA	NA	NA	NA			
	Nunavik Nickel	20°-30°	NA	2	NA	NA	NA			
	Podolsky	NA	NA	NA	NA	NA	NA			
	Delta-1 gold project (ex. Shebandowan Mine)	65-90	NA	1	NA	<10%	Unsuitable ore body			
	Thompson (T-1 and T-3)	65-90	NA	1	NA	<10%	Unsuitable ore body			
	Totten	NA	NA	NA	NA	NA	NA			
	Victoria	NA	NA	NA	NA	NA	NA			
Sulitjelma (general)		20°	2m	3	2	70–100%	Highly suitable ore body	High/ore body	Hydrothermal	[84-86]
Suomussalmi Greenstone belt	Peura-aho	NA	3-10 m	NA	2	NA	NA	Unsuitable/ore deposit	Magmatic	[87-89]
	Sakatti	45	NA	1	NA	<10%	Unsuitable ore body			
	Tainiovaara	70	NA	1	NA	<10%	Unsuitable ore body			
Tarkwaian Group (general)		10	1-2 m	3	2	70–100%	Highly suitable ore body	High/ore body	Sediment-hosted	[90-91]
Tati Greenstone Belt	Selkirk mine	30-80	NA	1	NA	<10%	Unsuitable ore body	Unsuitable/ore deposit	Magmatic	[92]
West Yilgarn Ni-Cu-PGM Province	Barrabarra Nickel-Copper-PGE Project, Kings Nickel-Copper-PGE, Northam Resources Joint Venture Nickel-Copper-PGE, Warrego Copper-Gold, Julimar Nickel-Copper-PGE, Narryer Nickel-Copper-PGE, South West Nickel-Copper-PGE exploration projects (Chalice Ltd.)	NA	NA	NA	NA	NA	NA			
	Gonneville PGE-Ni-Cu Project	NA	NA	NA	NA	NA	NA			
White Pine (general)		15°	2.2-3 m	3	2	70–100%	Highly suitable ore body	High/ore deposit	Sediment-hosted	[95-96]

Witwatersrand	Bambanani	25°-45°	NA	2	NA	NA	NA	Conditional /ore body	Sediment- hosted	[96-109]
	Blyvoor	22°	1-2 m	3	2	70–100%	Highly suitable ore body			
	Burnstone	10°	<1 m	3	3	70–100%	Highly suitable ore body			
	Driefontein	21-25°	<2 m	2	2	30–70%	Conditionally suitable ore body			
	Evander Complex (South, Poplar, Egoli project)	<24°	<1 m	2	3	30–70%	Conditionally suitable ore body			
	Fairview	NA	NA	NA	NA	NA	NA			
	Kloof	25-35	2 m	2	2	30–70%	Conditionally suitable ore body			
	Masimong	2-45°	45-200c m	2	2	30–70%	Conditionally suitable ore body			
	Moab Khotsong	NA	NA	NA	NA	NA	NA			
	Modder East	NA	NA	NA	NA	NA	NA			
	Sheba	NA	NA	NA	NA	NA	NA			
	South Deep	NA	1 m	NA	3	NA	NA			
	Virginia	NA	NA	NA	NA	NA	NA			
	Vaal Reefs Mine	30	NA	1	NA	<10%	Unsuitable ore body			
Yoko-Dovyren (general)		>30	NA	1	NA	<10%	Unsuitable ore body	Unsuitable/ ore body	Magmatic	[110-111]
Yushui	Yushui copper	10-25°	3-7 m	2	2	30–70%	Conditionally suitable ore body	Conditional /ore body	Hydrothermal	[112]

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