Relationship between exploration, new mines and equipment sales

Peter GilewiczThe Parker Bay Company



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PART ONE — Chris Hinde, Pick and Pen Ltd

- 1. Recent Mining Trends and Exploration Activity
- 2. Mine Construction (2010-2019)
- 3. Delays and Construction Periods
- 4. New Gold and Copper Mines (2020-24)
- 5. Need for Metals and Mines

- 1. Timing of Key Milestones and Equipment Deliveries
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Source of Data Discussed Throughout Presentation

Parker Bay's Mobile Mining Equipment Database

Active population 80,000+ machines with installed value of ~US\$170 billion











Directly provide historical and ongoing quarterly reports of shipments:

Caterpillar, Komatsu (Joy/P&H), Hitachi, BelAZ, BIS, Liebherr, OMZ/IZ-Kartex, MCC/Elite, CRRC, Sany









Other OEMs H10% of market

Track equipment through other sources:

Epiroc, Sandvik, XEMC, HEC, BEML, Taiyuan, North Hauler & handful small specialty & emerging market OEMs

- Data supplied directly by manufacturers
- □ Fleet updates from mines, OEMs and hundreds of other industry sources, public and proprietary.
- □ Machine records are tracked individually with make, model, ship date, specifications...as well as data on the mines where they operate.
- Attempts to capture all "mining-class" equipment; size parameters included generally coincide with OEM classifications of mining equipment.

The Global Mining Sector

MINERAL	MINED 2018 ('000t)	SURFACE EQUIPMENT SHIPMENTS 2010-2019 (MM US\$)	SURFACE EQUIPMENT POPULATION 12/31/2019 (MM US\$)
Coal (commercial)	6,500,000	29,600	71,703
Iron Ore (62% Fe)	2,187,000	10,710	19,628
Copper	20,800	11,217	21,278
Gold	106 Moz 3.28	7,094	12,505
Zinc	12,620	380	444
Nickel	2,126	398	1,019
Diamonds	147 Mct 0.029	1,220	2,217
Bauxite	300,000	416	1,217
Silver	840 Moz 27	138	275
Potash (K2O)	37,000		
Top Ten Total	9,059,380	61,173	130,286

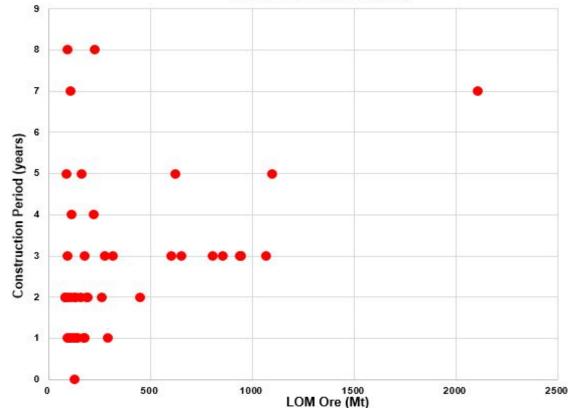
Source: S&P Global Market Intelligence, Parker Bay

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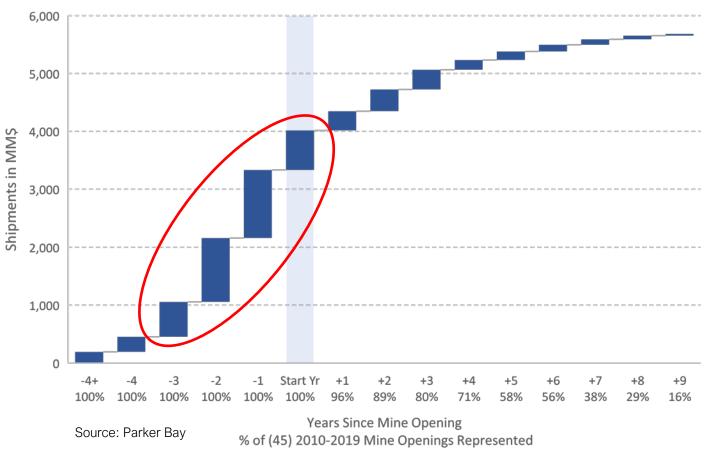
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Construction Period (years) vs Size (LOM Ore; Mt)



- Source: S&P Global Market Intelligence
 - □ Construction Period varies from 1-8 years
 - □ 77% of new mines: 1-3 years

Shipments Relative to Mine Start Date for 45 Mine Openings 2010-2019



- □ A 71% of equipment shipped in 3-4 years preceding startup.
- Lower but substantial shipments in subsequent years
- Many of the 45 mines started in the past few years and as such have no ship data 2,3... years after start date.

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In Part 1 of the presentation, Chris Hinde from Pick & Pen focused on the largest 45 primary metals mines to have opened since 2010

Mine Openings (five metals over past 10 years)

Commodity	Number	Unknown LOM	Total LOM* Ore (Mt)	Average LOM* Ore (Mt)
Gold	174	1	8,295.3	47.9
Copper	23	2	10,455.1	497.9
Nickel	8	0	619.1	77.4
Silver	5	1	21.4	5.4
Zinc	3	2	23.8	23.8
Total	213	6	19,414.7	93.8

^{*} LOM taken as actual and expected production between 2010 and 2040

Source: S&P Global Market Intelligence

The 45 largest mines
(those with 80mt+ LOM ore
production) represent
82.5% of the total LOM ore
production of the 213 mines
opened over the past 10
years

Parker Bay's analysis focuses primarily on these same operations with a few exceptions...

45 Largest Mine Openings 2010-2019 by LOM production

Project Name		Primary	Country	LOM Ore	Discovery	FEA	Construction
•	Year	commodity	•	production (Mt)	Year	Completed	started
Cobre Panama	2019	Copper	Panama	2,103.3	1969	2012	2012
Las Bambas	2015	Copper	Peru	1,095.5	2005	2009	2010
Oyu Tolgoi	2013	Copper	Mongolia	1,065.2	2001	2007	2010
Aktogay	2015	Copper	Kazakhstan	944.0	1935	2011	2012
Caserones	2013	Copper	Chile	942.1	1988	2007	2010
Sentinel	2015	Copper	Zambia	938.1	2007	2012	2012
Salobo	2012	Copper	Brazil	853.9	1975	2003	2009
Penasquito	2010	Gold	Mexico	805.5	1992	2006	2007
Constancia	2015	Copper	Peru	653.2	2004	2007	2012
Bozshakol	2016	Copper	Kazakhstan	623.5	1990	2010	2011
Detour Lake	2013	Gold	Canada	602.8	1998	2009	2010
Copper Mountain	2011	Copper	Canada	449.3	1970	2008	2009
Sukari	2010	Gold	Egypt	314.5	1997	2005	2007
Canadian Malartic	2011	Gold	Canada	288.5	1926	2008	2010
Red Chris	2015	Copper	Canada	277.9	1973	2004	2012
Blagodatnoye	2010	Gold	Russia	262.7	2004	2008	2008
Natalka	2018	Gold	Russia	225.7	1942	2009	2010
Bystrinskoye	2018	Copper	Russia	221.8	1986	2011	2014
Gross	2018	Gold	Russia	189.8	2009	2014	2016
Essakane	2010	Gold	Burkina Faso	187.4	1993	2007	2008
Bissa	2013	Gold	Burkina Faso	174.9	1997	2011	2012
Kevitsa	2012	Nickel	Finland	174.1	1987	2007	2009
Pueblo Viejo	2013	Gold	Dominican Republic	169.7	1960	2010	2012
Ambatovy	2012	Nickel	Madagascar	163.0	1960	2005	2007
Merian	2016	Gold	Suriname	154.9	2005	2013	2014
Noche Buena	2012	Gold	Mexico	141.1	1994	2010	2011
Shahuindo	2016	Gold	Peru	136.3	1995	2010	2015
Rainy River	2017	Gold	Canada	131.3	1995	2015	2015
Tantahuatay	2011	Gold	Peru	128.5	1995	2008	2011
La Arena	2011	Gold	Peru	124.9	1996	2010	2010
Dublin Gulch	2019	Gold	Canada	124.7	1994	2016	2017
Martabe	2012	Gold	Indonesia	110.6	1997	2007	2008
Malomir	2010	Gold	Russia	110.6	1966	2008	2009
Gold Mountain	2014	Gold	China	109.5	2003	2009	2013
Asanko	2016	Gold	Ghana	109.2	1992	2012	2014
Goro	2011	Nickel	New Caledonia	106.1	1983	2003	2004
Kibali	2013	Gold	Dem. Rep. Congo	99.2	1998	2007	2012
Copler	2011	Gold	Turkey	94.4	2002	2006	2008
Akyem	2013	Gold	Ghana	93.6	1993	2002	2005
Albyn	2011	Gold	Russia	93.4	1939	2009	2010
Gruyere JV	2019	Gold	Australia	92.9	2013	2016	2017
New Afton	2012	Gold	Canada	85.7	2000	2006	2007
Edikan	2012	Gold	Ghana	84.0	1900	2007	2010
Carrapateena	2019	Copper	Australia	83.4	2005	2017	2017
Verninskoye	2011	Gold	Russia	81.2	1988	2005	2009

From the list of the 45 largest mine openings by LOM production:

11 were removed from consideration as they utilize smaller equipment, are underground mines, etc.

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11 additional mines were added to arrive to a set of 45 large new openings for consideration

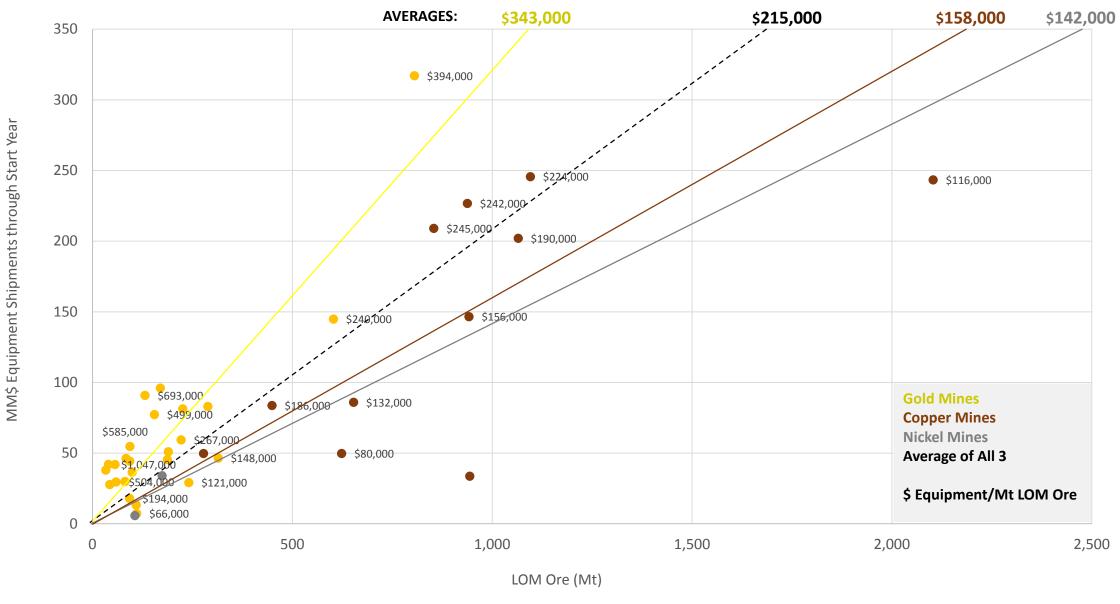
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45 Mine Openings 2010-2019 examined by Parker Bay

Startup Primary Country		Country	LOM Ore		FEA	Construction	
Project Name	Year	commodity	Country	production (Mt)	Year	Completed	started
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Verninskoye	2011	Gold	Russia	81.2	1988	2005	2009
Haile	2017	Gold	USA	58.8	1836	2014	2015
Fekola	2017	Gold	Mali	56.6	1954	2014	2015
Tongon	2010	Gold	Cote d'Ivoire	43.2	1997	2008	2009
El Limon-Guajes	2016	Gold	Mexico	40.2	1998	2012	2013
Hounde	2017	Gold	Burkina Faso	33.0	1990	2013	2016
Meadowbank	2010	Gold	Canada		1987	2005	2008
KOV	2010	Copper	Congo		na	2007	2009
Toromocho	2013	Copper	Peru		1974	2007	2009
Ministro Hales	2014	Copper	Chile		1991	2009	2010
Loulo-Gounkoto	2011	Gold	Mali		1981	1998	2004

Source: S&P Global Market Intelligence, Parker Bay

Mine's LOM Ore vs. Equipment Shipments Through Mine Open



Shipments and "Population of Equipment for (45) 2010-2019 Mine Openings (MM\$)

COMMODITY	Population 12/31/2009	Shipments 2010-2019	Population 12/31/2019	Population Growth	Population Growth %
COPPER (15 MINES)	325	2,843	3,111	2,786	858%
GOLD (27 MINES)	757	1,880	2,590	1,833	242%
NICKEL (3 MINES)	1	159	161	159	nmf
45 MINES COMBINED	1,083	4,882	5,861	4,778	341%

^{*}difference between shipments and population growth due to small number of replacements/removals

Source: Parker Bay

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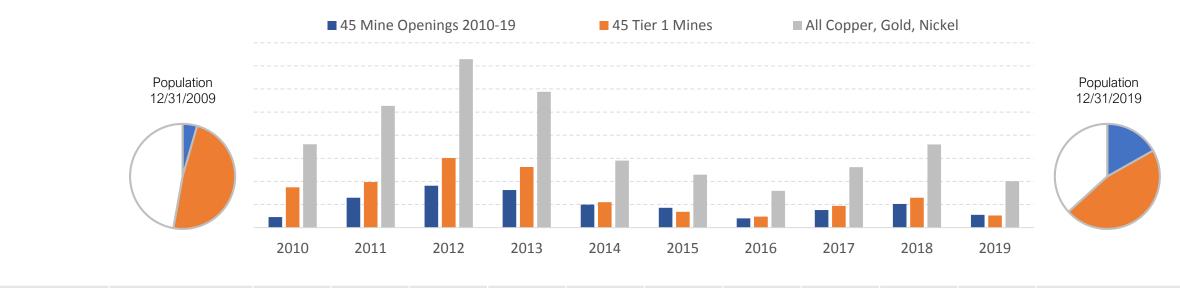
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Aktogay	Kazakhstan	Copper
Caserones	Chile	Copper
entinel	Zambia	Copper
alobo	Brazil	Copper
enasquito	Mexico	Gold
Constancia	Peru	Copper
ozshakol	Kazakhstan	Copper
etour Lake	Canada	Gold
Copper Mountain	Canada	Copper
ukari	Egypt	Gold
Canadian Malartic	Canada	Gold
led Chris	Canada	Copper
latalka	Russia	Gold
ystrinskoye	Russia	Copper
iross	Russia	Gold
ssakane	Burkina Faso	Gold
issa	Burkina Faso	Gold
(evitsa	Finland	Nickel
ueblo Viejo	Dominican Republic	Gold
lmbatovy	Madagascar	Nickel
/lerian	Suriname	Gold
lainy River	Canada	Gold
//alomir	Russia	Gold
sanko	Ghana	Gold
ioro	New Caledonia	Nickel
ibali	Dem. Rep. Congo	Gold
kyem	Ghana	Gold
llbyn	Russia	Gold
Gruyere JV	Australia	Gold
dikan	Ghana	Gold
/erninskoye	Russia	Gold
laile	USA	Gold
ekola	Mali	Gold
ongon	Cote d'Ivoire	Gold
l Limon-Guajes	Mexico	Gold
lounde	Burkina Faso	Gold
/leadowbank	Canada	Gold
OV	Congo	Copper
oromocho	Peru	Copper
Ministro Hales	Chile	Copper
oulo-Gounkoto	Mali	Gold
ierra Gorda	Chile	Copper

Tier 1 Mines

Project Name	COUNTRY	Commodity
Almalyk/Kalmakyr Copper	Uzbekistan	Copper
Amman Mineral/Batu Hijau	Indonesia	Gold
Anglo American Sur/Los Bronces	Chile	Copper
Anglogold-Ashanti/Geita	Tanzania	Gold
Antamina/Antamina	Peru	Copper
Antofagasta/Los Pelambres	Chile	Copper
Antofagasta-Centinela/Esperanza	Chile	Copper
Barrick Gold-Shandong/Veladero	Argentina	Gold
BHP/Escondida	Chile	Copper
BHP/Mount Keith	Australia	Nickel
Centerra/Kumtor	Kyrgyzstan	Gold
CODELCO/Norte	Chile	Copper
Collahuasi/Rosario	Chile	Copper
Freeport/Cerro Verde	Peru	Copper
Freeport/Morenci	U.S.	Copper
Glencore/Tintaya-Antapaccay	Peru	Copper
Gold Fields/Damang	Ghana	Gold
Gold Fields/Tarkwa	Ghana	Gold
Hycroft Mining/Hycroft	U.S.	Gold
lamgold/Rosebel	Suriname	Gold
Jiangxi Copper/Dexing	China	Copper
Kalgoorlie/Fimiston Super Pit	Australia	Gold
Kennecott/Bingham Canyon	U.S.	Copper
Kinross Gold/Bald Mountain	U.S.	Gold
Kinross Gold/Fort Knox & True North	U.S.	Gold
Kinross Gold/Round Mountain	U.S.	Gold
Kinross-Redback/Tasiast	Mauritania	Gold
Leagold/Los Filos-El Bermejal	Mexico	Gold
Minara Resources/Murrin Murrin	Australia	Nickel
Navoi/Murantau	Uzbekistan	Gold
Nevada Gold Mines/Carlin-Eastern NV	U.S.	Gold
Nevada Gold Mines/Cortez-Pipeline & Cortez Hills	U.S.	Gold
Nevada Gold Mines/Goldstrike	U.S.	Gold
Newcrest/Telfer	Australia	Gold
Newmont Goldcorp/Ahafo	Ghana	Gold
Newmont Goldcorp/Boddington	Australia	Gold
Newmont Goldcorp/Cripple Creek	U.S.	Gold
Newmont Goldcorp/Yanacocha	Peru	Gold
Penmont/La Herradura	Mexico	Gold
Polymetal/Kyzyl-Bakyrchik	Kazakhstan	Gold
Polyus-Krasnoyarsk/Olimpiada, Blagodatnoye	Russia	Gold
Southern Copper/Buenavista	Mexico	Copper
Southern Copper/Toquepala	Peru	Copper
SSR Mining/Marigold	U.S.	Gold
Vale/Voisey's Bay	Canada	Nickel

Population & Shipments of Equipment to Cu, Au, Ni Mines 2010-2019 (MM\$)



	Population 12/31/2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Population 12/31/2019
45 Mine Openings 2010-2019	1,083	229	647	905	813	497	427	198	381	511	275	5,861
45 Tier 1 Mines	11,717	873	986	1,505	1,311	549	343	239	469	646	264	16,148
new open% of	9%	26%	66%	60%	62%	91%	124%	83%	81%	79%	104%	36%
All Cu, Au, Ni Mines * 279 active	12,900	1,803	2,633	3,644	2,940	1,450	1,147	795	1,307	1,800	1,002	34,802
new open% of	8%	13%	25%	25%	28%	34%	37%	25%	29%	28%	27%	17%

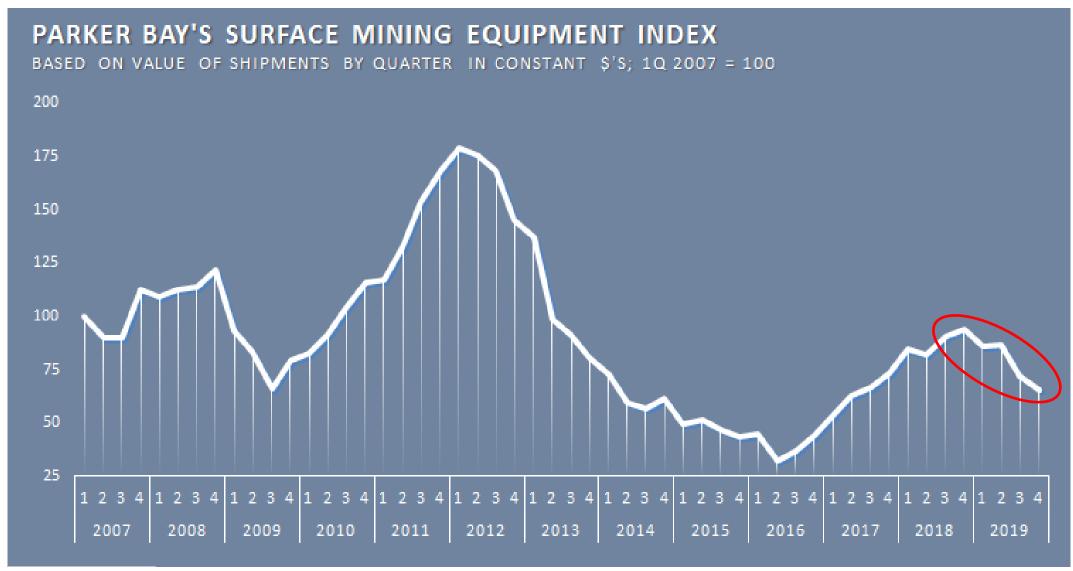
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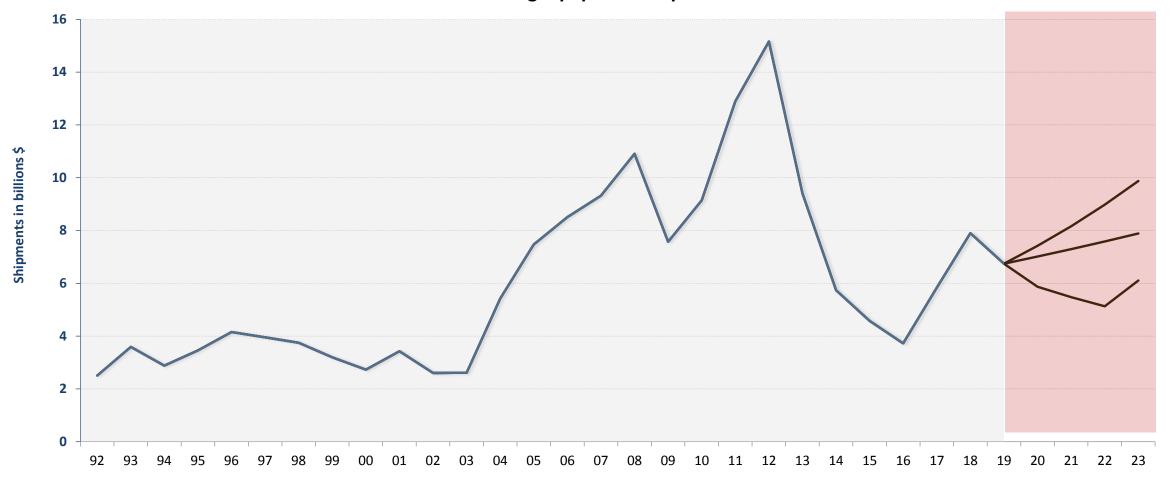
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SURFACE MINING EQUIPMENT INDEX



Source: Parker Bay

Forecast of Mining Equipment Shipments



#1 Resumption of growth through '23 at 10% apr. Market = \$11 billion

- #2 Consolidation at H1 '19 followed by 4% apr. Market = 9 billion.
- #3 Contraction through '22 = 1/3 of last one. Market = \$7 billion

Project Name	Start Date	Commodity	Country	Average Output (mt)
Salares Norte	2023	Gold	Chile	9.1
Mt Todd	2021	Gold	Australia	12.7
Amulsar	2021	Gold	Armenia	7.0
Volta Grande	2021	Gold	Brazil	6.4
McPhillamys	2021	Gold	Australia	5.5
Tocantinzinho	2023	Gold	Brazil	5.0
La Coipa	2021	Gold	Chile	4.2
Certej	2021	Gold	Romania	4.3
Yaoure	2021	Gold	Cote d'Ivoire	4.6
Bombore	2021	Gold	Burkina Faso	3.3
Tulu Kapi	2021	Gold	Ethiopia	3.8
Boto	2022	Gold	Senegal	4.1
Dugbe 1	2022	Gold	Liberia	3.9
Mara Rosa	2022	Gold	Brazil	3.8
Tri-K	2020	Gold	Guinea	3.2
Camino Rojo	2022	Gold	Mexico	2.9
Perama Hill	2022	Gold	Greece	3.4
Ilovitza	2021	Gold	N Macedonia	2.7
Relief Canyon	2020	Gold	USA	2.0
Yandal - Bronzewing	2020	Gold	Australia	2.4
Awak Mas	2022	Gold	Indonesia	2.7
Ixtaca	2022	Gold	Mexico	2.7
Oksut	2020	Gold	Turkey	3.5
Lindero	2020	Gold	Argentina	2.8
Karlawinda	2021	Gold	Australia	2.6
Gediktepe	2023	Gold	Turkey	2.2
Borborema	2022	Gold	Brazil	3.0
Segilola	2021	Gold	Nigeria	2.0
Doup	2024	Gold	Indonesia	3.6
Bau	2024	Gold	Malaysia	2.3

Project Name	Start Date	Mineral	Country	Average Output ('000 mt)
Quellaveco	2022	Copper	Peru	264.8
Frieda River	2023	Copper	PNG	140.8
Casino	2023	Copper	Canada	85.3
Rosemont	2021	Copper	USA	102.7
Tia Maria	2021	Copper	Peru	90.5
Marcona	2021	Copper	Peru	103.1
Santo Domingo	2022	Copper	Chile	60.2
Skouries	2023	Copper	Greece	32.6
El Pilar	2021	Copper	Mexico	31.7
NorthMet	2021	Copper	Peru	29.0
Asmara	2020	Copper	Eritrea	25.6
Rovina Valley	2022	Copper	Romania	12.4

Source: S&P Global Market Intelligence

Forecast based on cumulative average mineral production, value of average equipment required by existing mines

Copper: 12 mines, 1.231 MM mt @

\$1.53 MM/mt =

ship value \$1.89 billion during 2020-2024

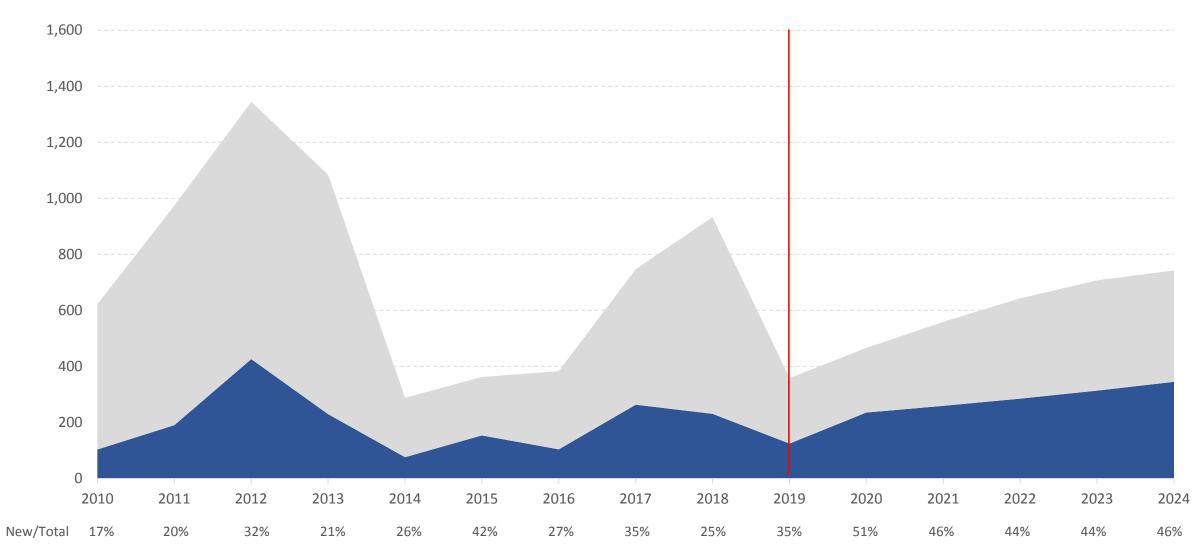
Gold: 30 mines, 139 mt (4.5 MM oz)

\$10.3 MM/tonne =

ship value \$1.44 billion during 2020-24

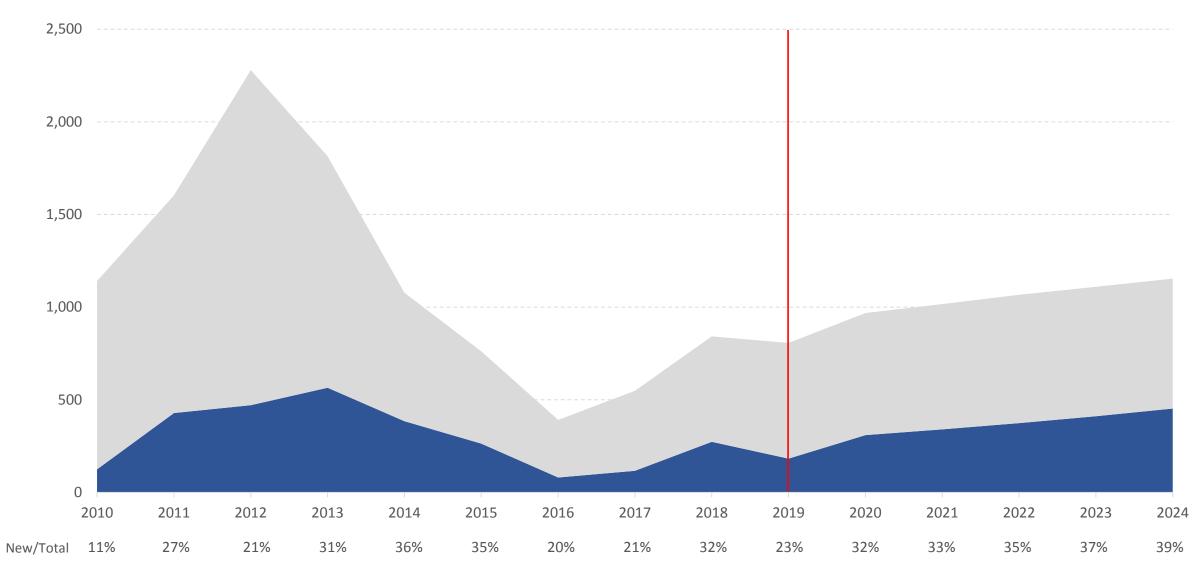












Thank You

Peter Gilewicz Managing Director The Parker Bay Company LLC www.parkerbaymining.com

Tel: +1 (814) 806-2800

Email: pg@parkerbaymining.com

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