INDEX OF THE PHYSICAL VOLUME OF MINING PRODUCTION FOURTH QUARTER 2021

STATS BRIEF

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STATISTICS BOTSWANA

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1.0 Preface

Statistics Botswana is mandated to compile data on industrial production in Botswana, hence the Index of Mining Production is confined to minerals extracted across the country. This is intended to monitor the performance of the mining sector in Botswana.

This statistical release presents quarterly Indices of Mining Production **(IMP)** for the period 2012 to the fourth quarter of 2021. Also carried in the report are the annual **IMP** for the period 2012 to 2021, derived as the average of the four quarters of the year. The base year is 2013. Data used in this publication are sourced from the Department of Mines under the Ministry of Mineral Resources, Green Technology and Energy Security.

The Index of Mining Production stood at 82.0 during the fourth quarter of 2021, showing a year-on-year increase of 28.1 percent from 64.0 recorded during the fourth quarter of 2020. Comparison on a quarter-on-quarter basis shows a decrease of 19.6 percent, from the index of 101.9 realised during the third quarter of 2021.

The release further shows the contribution of each mineral and mineral group to the Year-on-Year Percentage Change in the Volume of Mining Production, and provides the trend in the local mining sector.

For more information, contact the Directorate of Stakeholder Relations on **(+267) 3671300**. All Statistics Botswana outputs/publications are available on the website at www.statsbots.org.bw and at the Statistics Botswana Information Resource Centre.

I sincerely thank all stakeholders involved in the formulation of this brief, for their continued support, as we strive to better serve users of Statistics Botswana products and services.

Dr Burton S. Mguni
Statistician General
April 2022

2.0 Summary of Findings

All figures in this report are not seasonally adjusted.

Table 1 presents a summary of findings for the Index of Mining Production **(IMP)** from the first quarter of 2012 to the fourth quarter of 2021. This table forms the basis for the discussions under Sub-Section 2.1. Reference, however, is made to this table and other tables throughout the report.

The Index of Mining Production for the third quarter of 2021 has been revised to include data for Copper in Concentrates and Silver that was not available at the time of the publication of the report in December 2021. It should be recalled that the companies associated with the commodities have been under liquidation since 2015 and resumed operations under the new management during the course of 2021.

2.1 Index of Mining Production

The Index of Mining Production stood at **82.0** during the fourth quarter of 2021, showing a year-on-year growth of **28.1** percent, from **64.0** registered during the fourth quarter of 2020. The main contributor to the increase in mining production came from Diamonds, which contributed 23.1 percentage points as shown in **Table 2**. Gold and Soda Ash were the only negative contributors to mining production, at negative 0.8 and negative 0.1 of a percentage point respectively.

The quarter-on-quarter analysis shows a decrease of **19.6 percent** from the index of 101.9 during the third quarter of 2021 to 82.0 observed during the period under review.

On annual basis, the total index of mining production stood at 86.0, showing an increase of 37.0 percent in 2021 when compared with 62.8 registered in 2020. The 37.0 percent increase in annual mining production followed a decrease of 28.1 percent in 2020 and a decrease of 3.9 in 2019. The increase in the total mining production was mainly due to the growth realized in diamond production which contributed 33.1 percentage points to the total mining production growth.

Although the total index of mining production increased in some parts of the period 2011 to 2021, it should be noted that it has been decreasing at an average annual rate of 0.7 percent during the last ten (10) years.

Table 1: Key Figures in the Volume of Mining Production

Base Period : 2013=100			
Period	Index of the physical volume of mining production	Year-on-year percentage change	Quarter-on-Quarter percentage change
Q1_2012	90.3	1.6	13.0
Q2_2012	89.1	(7.3)	(1.3)
Q3_2012	70.2	(32.9)	(21.2)
Q4_2012	91.4	14.4	30.2
Q1_2013	82.5	(8.7)	(9.7)
Q2_2013	111.6	25.2	35.3
Q3_2013	97.1	38.4	(12.9)
Q4_2013	108.8	19.1	12.0
Q1_2014	96.2	16.7	(11.5)
Q2_2014	106.6	(4.5)	10.8
Q3_2014	105.7	8.9	(0.8)
Q4_2014	104.5	(4.0)	(1.2)
Q1_2015	95.6	(0.7)	(8.6)
Q2_2015	98.7	(7.4)	3.3
Q3_2015	65.6	(37.9)	(33.5)
Q4_2015	77.9	(25.5)	18.7
Q1_2016	90.1	(5.7)	15.7
Q2_2016	86.0	(12.9)	(4.5)
Q3_2016	73.7	12.3	(14.3)
Q4_2016	82.4	5.8	11.8
Q1_2017	77.1	(14.4)	(6.4)
Q2_2017	87.9	2.1	13.9
Q3_2017	91.0	23.4	3.5
Q4_2017	82.8	0.5	(9.0)
Q1_2018	86.9	12.6	4.9
Q2_2018	94.0	7.0	8.3
Q3_2018	87.1	(4.2)	(7.4)
Q4_2018	95.3	15.1	9.4
Q1_2019	89.6	3.1	(6.0)
Q2_2019	85.9	(8.7)	(4.1)
Q3_2019	85.8	(1.5)	(0.1)
Q4_2019	87.8	(7.9)	2.3
Q1_2020	84.6	(5.5)	(3.6)
Q2_2020	30.0	(65.1)	(64.6)
Q3_2020	72.5	(15.5)	141.9
Q4_2020	64.0	(27.1)	(11.7)
Q1_2021	74.4	(12.1)	16.2
Q2_2021	85.6	185.6	15.0
Q3_2021	101.9	40.6	19.1
Q4_2021	82.0	28.1	(19.6)

Note: ( ) denotes negative numbers

Figure 1: Total Index of Mining Production for the First Quarter of 2012 to the Fourth Quarter of 2021

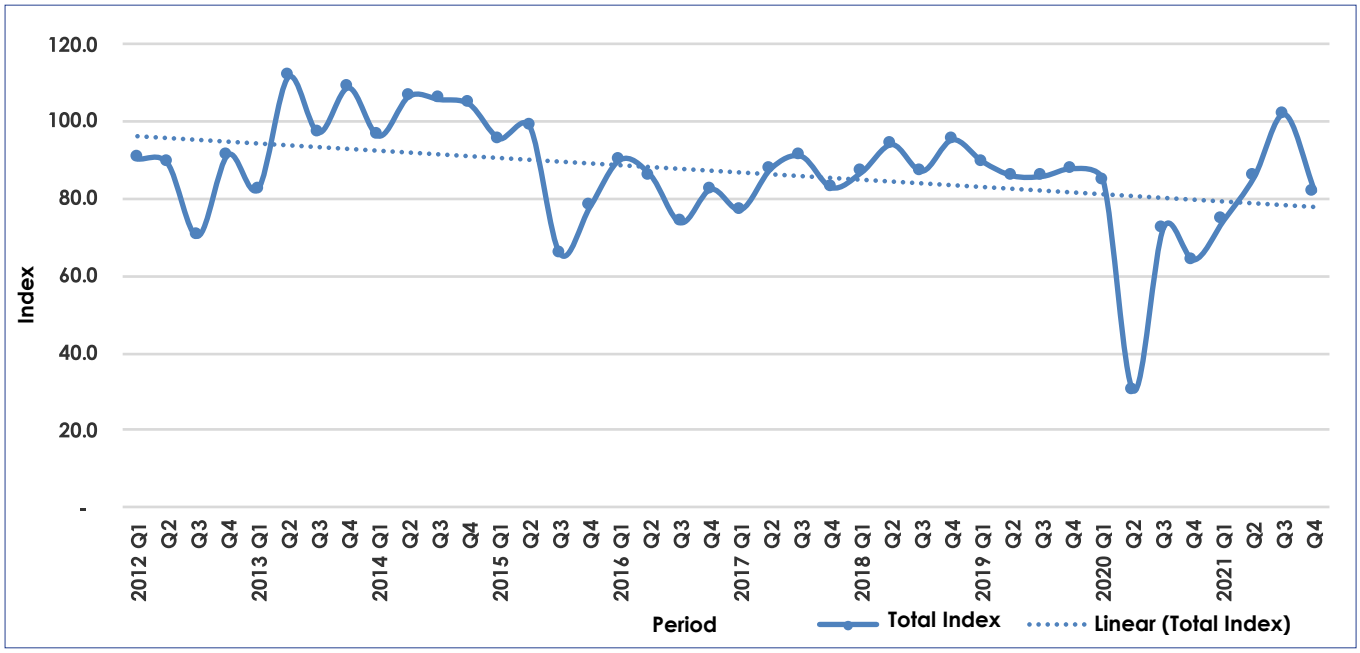

Figure 1 shows the graphical presentation of the Total Index from the first quarter of 2012 to the fourth quarter of 2021. The linear graph shows that, on average, production has been declining gradually, between the years 2012 and 2021.

2.2 Mineral Production

The discussions on mineral production, which compare production during the fourth quarter of 2021 to the same quarter of 2020, are based on **Table 2** and **Table 6**. Table 5 provides analysis of the mineral production for the quarter under review, in comparison to the preceding quarter.

Diamond production increased by 24.2 percent (1, 038 thousand carats) from 4, 290 thousand carats during the fourth quarter of 2020 to 5, 329 thousand carats during the same quarter of 2021. The increase was a result of intensified production strategy aligned with stronger trading conditions. The quarter-on-quarter analysis shows that production registered a decrease of 18.0 percent (1,172 thousand carats) during the fourth quarter of 2021 compared with 6, 500 thousand carats during the third quarter of 2021.

Copper in Concentrates production commenced during the third quarter of 2021 following 6 years of non-production as the associated mine was undergoing liquidation. During the fourth quarter of 2021, an amount of 4, 225 tonnes of Copper in Concentrates was produced. The quarter-on-quarter analysis shows that production decreased by 43.8 percent (3,292 tonnes) during the fourth quarter of 2021 compared with 7, 517 tonnes produced during the third quarter of 2021.

Gold production decreased by 49.1 percent (109 kilograms) during the fourth quarter of 2021, from 222 kilograms during the same quarter of the previous year to 113 kilograms during the period under review. Similarly, the quarter-on-quarter analysis reflects a decrease of 35.9 percent (63 kilograms) from 176 kilograms in the preceding quarter to 113 kilograms during the fourth quarter of 2021. The decrease was a result of the deteriorating lifespan of the mine arising from resource depletion.

Soda Ash production decreased by 4.4 percent (3, 116 tonnes) from 70, 159 tonnes during the fourth quarter of 2020 to 67, 043 tonnes produced during the period under review. On the other hand, quarter-on-quarter analysis shows that production went up by 2.8 percent (1, 848 tonnes) during the period under review, from 65, 195 tonnes during the previous quarter.

Salt production went up by 27.9 percent (31, 385 tonnes) to 143, 751 tonnes during the fourth quarter of 2021, from 112, 366 tonnes during the same quarter of the previous year. On the other hand, quarter-on-quarter analysis shows that salt production registered a decrease of 15.4 percent (26, 075 tonnes) compared with 169, 826 tonnes during the third quarter of 2021.

Silver production commenced during the third quarter of 2021 following 6 years of non-production as the associated mine was undergoing liquidation. During the fourth quarter of 2021, 3, 626 tonnes of silver were produced. The quarter-on-quarter analysis shows that production decreased by 46.3 percent (3,131 tonnes) during the fourth quarter of 2021 compared with 6, 757 kg produced during the third quarter of 2021. Although the production is still at infancy, it is worthy to note that the mine is under new management following liquidation in 2015.

Coal production increased by 9.3 percent (40, 099 tonnes), from 429, 382 tonnes during the fourth quarter of 2020, to 469, 481 tonnes in the current quarter. The increase came as a result of the efforts made to meet increased demand from both domestic and international markets, particularly that new markets have been identified. On the other hand, quarter-on-quarter comparison shows that coal production decreased by 14.5 percent (79, 746 tonnes) compared with 549, 227 tonnes during the third quarter of the current year.

Copper-Nickel-Cobalt Matte, recorded zero production during the period under review. The affected mines are still under liquidation.

Table 2: Index of Mining Production for the Fourth Quarter of 2021 by Mineral Groups and Minerals

Base: 2013=100					
Mineral	Weights (2013)	Oct-Dec 2020	Oct-Dec 2021	Year-on-Year Percentage Change	Contribution (% points) to the Percentage Change in the total Mining Production
Diamonds	**82.5**	74.2	92.1	24.2	23.1
Copper-Nickel-Cobalt Matte	**8.6**	n.a.	n.a.	n.a.	n.a.
Copper in Concentrates	**5.5**	n.a.	60.0	...	5.1
Gold	**1.4**	73.4	37.4	(49.1)	(0.8)
Soda Ash	**0.9**	123.1	117.7	(4.4)	(0.1)
Salt	**0.5**	86.2	110.3	27.9	0.2
Silver	**0.4**	n.a.	64.2	...	0.4
Coal	**0.3**	114.8	125.6	9.3	0.0
Total	**100**	**64.0**	**82.0**	**28.1**	**28.1**

Table 3: Physical Volume of Mineral Production

Mineral		Diamonds	Copper-Nickel-Cobalt Matte				Copper in Concentrates	Gold	Soda Ash	Salt	Sliver	Coal
			Matte	Copper	Nickel	Cobalt						
Unit of measure		('000 carats)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)	Kg	(tonnes)	(tonnes)	Kg	(tonnes)
Year												
2012		20,619	35,757	17,620	17,942	195	8,743	1,377	248,629	367,749	n.a.	1,454,404
2013		23,134	44,396	21,300	22,848	248	28,146	1,207	227,913	521,306	22,597	1,495,653
2014		24,658	29,782	14,628	14,958	196	32,093	958	268,529	515,311	22,288	1,711,555
2015		20,823	30,993	13,888	16,789	316	8,396	753	243,369	404,295	2,801	2,065,778
2016		20,892	30,279	13,120	16,878	281	n.a.	832	280,457	399,837	n.a.	1,870,939
2017		22,941	n.a.	n.a.	n.a.	n.a.	n.a.	921	226,667	369,613	n.a.	2,215,782
2018		24,496	n.a.	n.a.	n.a.	n.a.	n.a.	1,105	297,237	392,244	n.a.	2,482,313
2019		23,687	n.a.	n.a.	n.a.	n.a.	n.a.	943	264,119	383,779	n.a.	2,110,891
2020		16,868	n.a.	n.a.	n.a.	n.a.	n.a.	851	238,476	418,379	n.a.	1,923,992
2021		22,696	n.a.	n.a.	n.a.	n.a.	11,742	649	261,838	484,628	10, 383	2,021,218
2012	Q1	5,352	12,216	6,183	5,970	63	1,676	406	60,354	85,746	n.a.	234,213
	Q2	5,346	11,054	5,462	5,532	60	1,609	361	56,541	101,983	n.a.	224,757
	Q3	4,384	2,843	1,424	1,404	14	2,881	329	73,583	75,854	n.a.	444,360
	Q4	5,537	9,645	4,551	5,036	58	2,577	281	58,151	104,166	n.a.	551,074
2013	Q1	4,658	9,766	4,501	5,203	62	6,612	231	70,049	126,420	5,777	401,939
	Q2	6,462	12,471	6,047	6,358	66	8,127	297	50,710	152,223	6,670	278,947
	Q3	5,541	11,961	5,894	6,000	67	6,555	309	64,311	154,529	6,099	425,630
	Q4	6,473	10,198	4,858	5,287	53	6,852	370	42,843	88,134	4,051	389,137
2014	Q1	5,870	5,193	2,447	2,715	31	6,819	291	62,090	89,417	4,136	355,096
	Q2	6,364	8,148	3,964	4,134	50	8,069	224	65,846	131,405	4,998	463,235
	Q3	6,321	5,732	2,880	2,810	42	9,573	255	66,818	151,481	7,648	488,335
	Q4	6,103	10,709	5,337	5,299	73	7,632	188	73,775	143,008	5,506	404,889
2015	Q1	5,734	9,724	4,423	5,169	132	5,230	156	41,836	80,244	2,801	474,619
	Q2	6,022	11,675	5,127	6,439	109	2,135	150	55,199	79,655	n.a.	505,016
	Q3	4,207	2,204	989	1,194	21	1,031	235	71,562	138,924	n.a.	578,979
	Q4	4,860	7,390	3,349	3,987	54	n.a.	212	74,772	105,472	n.a.	507,164
2016	Q1	5,429	13,208	5,777	7,303	128	n.a.	181	67,204	87,696	n.a.	427,894
	Q2	5,305	10,370	4,464	5,801	105	n.a.	244	47,850	73,695	n.a.	350,987
	Q3	4,601	6,701	2,879	3,774	48	n.a.	194	79,397	113,305	n.a.	549,352
	Q4	5,557	n.a.	n.a.	n.a.	n.a.	n.a.	213	86,006	125,141	n.a.	542,706
2017	Q1	5,280	n.a.	n.a.	n.a.	n.a.	n.a.	141	40,975	59,926	n.a.	490,650
	Q2	5,976	n.a.	n.a.	n.a.	n.a.	689	209	35,780	52,853	n.a.	575,250
	Q3	6,117	n.a.	n.a.	n.a.	n.a.	340	297	71,868	153,283	n.a.	583,719
	Q4	5,568	n.a.	n.a.	n.a.	n.a.	210	274	78,044	103,551	n.a.	566,163
2018	Q1	5,885	n.a.	n.a.	n.a.	n.a.	135	238	64,510	85,987	n.a.	597,298
	Q2	6,360	n.a.	n.a.	n.a.	n.a.	547	314	51,189	58,972	n.a.	664,448
	Q3	5,825	n.a.	n.a.	n.a.	n.a.	625	265	96,136	104,507	n.a.	667,782
	Q4	6,426	n.a.	n.a.	n.a.	n.a.	155	288	85,402	142,778	n.a.	552,785
2019	Q1	6,081	n.a.	n.a.	n.a.	n.a.	n.a.	198	73,940	111,468	n.a.	554,636
	Q2	5,828	n.a.	n.a.	n.a.	n.a.	n.a.	270	51,229	86,686	n.a.	622,620
	Q3	5,804	n.a.	n.a.	n.a.	n.a.	n.a.	262	76,432	86,539	n.a.	476,494
	Q4	5,973	n.a.	n.a.	n.a.	n.a.	n.a.	213	62,518	99,086	n.a.	457,141
2020	Q1	5,737	n.a.	n.a.	n.a.	n.a.	n.a.	212	64,460	114,245	n.a.	581,910
	Q2	1,925	n.a.	n.a.	n.a.	n.a.	n.a.	177	67,974	100,507	n.a.	368,907
	Q3	4,916	n.a.	n.a.	n.a.	n.a.	n.a.	241	35,883	91,261	n.a.	543,792
	Q4	4,290	n.a.	n.a.	n.a.	n.a.	n.a.	222	70,159	112,366	n.a.	429,382
2021	Q1	5,040	n.a.	n.a.	n.a.	n.a.	n.a.	174	71,638	69,275	n.a.	516,868
	Q2	5,827	n.a.	n.a.	n.a.	n.a.	n.a.	186	57,962	101,776	n.a.	485,642
	Q3	6,500	n.a.	n.a.	n.a.	n.a.	7,517	176	65,195	169,826	6,757	549,227
	Q4	5,329	n.a.	n.a.	n.a.	n.a.	4,225	113	67,043	143,751	3,626	469,481

Note: 1. Source: Department of Mines
2. n.a. Signifies data not available/no production during the specified period

Table 4: Index of the Volume of Mining Production by Mineral Group and Mineral

Base 2013 = 100									
	Diamonds	Copper-Nickel-Cobalt Matte	Copper in concentrates	Gold	Soda Ash	Salt	Silver	Coal	Total Index
Weights	**82.5**	**8.6**	**5.5**	**1.4**	**0.9**	**0.5**	**0.4**	**0.3**	**100.0**
2012	89.1	80.5	31.1	114.1	109.1	70.5	n.a.	97.2	**85.3**
2013	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	**100.0**
2014	106.6	67.1	114.0	79.4	117.8	98.9	98.6	114.4	**103.3**
2015	90.0	69.8	29.8	62.4	106.8	77.6	12.4	138.1	**84.5**
2016	90.3	68.2	n.a.	69.0	123.1	76.7	n.a.	125.1	**83.1**
2017	99.2	n.a.	4.4	76.3	99.5	70.9	n.a.	148.1	**84.7**
2018	105.9	n.a.	5.2	91.6	130.4	75.2	n.a.	166.0	**90.8**
2019	102.4	n.a.	n.a.	78.1	115.9	73.6	n.a.	141.1	**87.3**
2020	72.9	n.a.	n.a.	70.5	104.6	80.3	n.a.	128.6	**62.8**
2021	98.1	n.a.	41.7	53.8	114.9	93.0	45.9	135.1	**86.0**
2012 Q1	92.5	110.1	23.8	134.6	105.9	65.8	n.a.	62.6	**90.3**
Q2	92.4	99.6	22.9	119.8	99.2	78.3	n.a.	60.1	**89.1**
Q3	75.8	25.6	41.0	108.9	129.1	58.2	n.a.	118.8	**70.2**
Q4	95.7	86.9	36.6	93.1	102.1	79.9	n.a.	147.4	**91.4**
2013 Q1	80.5	88.0	94.0	76.6	122.9	97	102.3	107.5	**82.5**
Q2	111.7	112.4	115.5	98.5	89.0	116.8	118.1	74.6	**111.6**
Q3	95.8	107.8	93.2	102.4	112.9	118.6	108	113.8	**97.1**
Q4	111.9	91.9	97.4	122.5	75.2	67.6	71.7	104.1	**108.8**
2014 Q1	101.5	46.8	96.9	96.4	109	68.6	73.2	95.0	**96.2**
Q2	110.0	73.4	114.7	74.3	115.6	100.8	88.5	123.9	**106.6**
Q3	109.3	51.6	136	84.5	117.3	116.2	135.4	130.6	**105.7**
Q4	105.5	96.5	108.5	62.3	129.5	109.7	97.5	108.3	**104.5**
2015 Q1	99.1	87.6	74.3	51.7	73.4	61.6	49.6	126.9	**95.6**
Q2	104.1	105.2	30.3	49.7	96.9	61.1	n.a.	135.1	**98.7**
Q3	72.7	19.9	14.7	77.9	125.6	106.6	n.a.	154.8	**65.6**
Q4	84.0	66.6	n.a.	70.3	131.2	80.9	n.a.	135.6	**77.9**
2016 Q1	93.9	119	n.a.	60	117.9	67.3	n.a.	114.4	**90.1**
Q2	91.7	93.4	n.a.	80.9	84	56.5	n.a.	93.9	**86.0**
Q3	79.6	60.4	n.a.	64.3	139.3	86.9	n.a.	146.9	**73.7**
Q4	96.1	n.a.	n.a.	70.6	150.9	96.0	n.a.	145.1	**82.4**
2017 Q1	91.3	n.a.	n.a.	46.7	71.9	46.0	n.a.	131.2	**77.1**
Q2	103.3	n.a.	9.8	69.2	62.8	40.6	n.a.	153.8	**87.9**
Q3	105.8	n.a.	4.8	98.5	126.1	117.6	n.a.	156.1	**91.0**
Q4	96.3	n.a.	3.0	90.8	137	79.5	n.a.	151.4	**82.8**
2018 Q1	101.8	n.a.	1.9	78.9	113.2	66.0	n.a.	159.7	**86.9**
Q2	110.0	n.a.	7.8	104.1	89.8	45.2	n.a.	177.7	**94.0**
Q3	100.7	n.a.	8.9	87.8	168.7	80.2	n.a.	178.6	**87.1**
Q4	111.1	n.a.	2.2	95.5	149.9	109.6	n.a.	147.8	**95.3**
2019 Q1	105.1	n.a.	n.a.	65.6	129.8	85.5	n.a.	148.3	**89.6**
Q2	100.8	n.a.	n.a.	89.5	89.9	66.5	n.a.	166.5	**85.9**
Q3	100.4	n.a.	n.a.	87.0	134.1	66.4	n.a.	127.4	**85.8**
Q4	103.3	n.a.	n.a.	70.5	109.7	76.0	n.a.	122.3	**87.8**
2020 Q1	99.2	n.a.	n.a.	70.3	113.1	87.7	n.a.	155.6	**84.6**
Q2	33.3	n.a.	n.a.	58.7	119.3	77.1	n.a.	98.7	**30.0**
Q3	85.0	n.a.	n.a.	79.8	63.0	70.0	n.a.	145.4	**72.5**
Q4	74.2	n.a.	n.a.	73.4	123.1	86.2	n.a.	114.8	**64.0**
2021Q1	87.1	n.a.	n.a.	57.7	125.7	53.2	n.a.	138.2	**74.4**
Q2	100.8	n.a.	n.a.	61.8	101.7	78.1	n.a.	129.9	**85.6**
Q3	112.4	n.a.	106.8	58.3	114.4	130.3	119.6	146.9	**101.9**
Q4	92.1	n.a.	60.0	37.4	117.7	110.3	64.2	125.6	**82.0**

Note: 1. n.a. Signifies data not available/no production during the specified period.

Table 5: Quarter on Quarter Percentage Change in the Volume of Mining Production by Mineral Group and Mineral

BASE 2013 = 100									
	Diamonds	Copper-Nickel-Cobalt Matte	Copper in Concentrates	Gold	Soda Ash	Salt	Silver	Coal	Total
Year/Weights	**82.5**	**8.6**	**5.5**	**1.4**	**0.9**	**0.5**	**0.4**	**0.3**	**100.0**
2012 Q1	15.2	10.8	3.0	(16.0)	(12.7)	(30.6)	n.a.	142.7	**13.1**
Q2	(0.1)	(9.5)	(4.0)	(11.0)	(6.3)	18.9	n.a.	(4.0)	**(1.4)**
Q3	(18.0)	(74.3)	79.1	(9.1)	30.1	(25.6)	n.a.	97.7	**(21.2)**
Q4	26.3	239.3	(10.6)	(14.5)	(21.0)	37.3	n.a.	24.0	**30.2**
2013 Q1	(15.9)	1.3	156.6	(17.7)	20.5	21.4	...	(27.1)	**(9.7)**
Q2	38.7	27.7	22.9	28.6	(27.6)	20.4	15.5	(30.6)	**35.3**
Q3	(14.3)	(4.1)	(19.3)	4.0	26.8	1.5	(8.6)	52.6	**(12.9)**
Q4	16.8	(14.7)	4.5	19.6	(33.4)	(43.0)	(33.6)	(8.6)	**12.0**
2014 Q1	(9.3)	(49.1)	(0.5)	(21.4)	44.9	1.5	2.1	(8.7)	**(11.5)**
Q2	8.4	56.9	18.3	(22.9)	6.0	47.0	20.8	30.5	**10.8**
Q3	(0.7)	(29.7)	18.6	13.8	1.5	15.3	53.0	5.4	**(0.8)**
Q4	(3.4)	86.8	(20.3)	(26.3)	10.4	(5.6)	(28.0)	(17.1)	**(1.2)**
2015 Q1	(6.0)	(9.2)	(31.5)	(17.0)	(43.3)	(43.9)	(49.1)	17.2	**(8.6)**
Q2	5.0	20.1	(59.2)	(3.8)	31.9	(0.7)	(100.0)	6.4	**3.3**
Q3	(30.1)	(81.1)	(51.7)	56.7	29.6	74.4	n.a.	14.6	**(33.5)**
Q4	15.5	235.3	(100.0)	(9.7)	4.5	(24.1)	n.a.	(12.4)	**18.7**
2016 Q1	11.7	78.7	n.a.	(14.7)	(10.1)	(16.9)	n.a.	(15.6)	**15.7**
Q2	(2.3)	(21.5)	n.a.	34.8	(28.8)	(16.0)	n.a.	(18.0)	**(4.5)**
Q3	(13.3)	(35.4)	n.a.	(20.5)	65.9	53.7	n.a.	56.5	**(14.3)**
Q4	20.8	(100.0)	n.a.	9.8	8.3	10.4	n.a.	(1.2)	**11.8**
2017 Q1	(5.0)	n.a.	n.a.	(33.8)	(52.4)	(52.1)	n.a.	(9.6)	**(6.4)**
Q2	13.2	n.a.	n.a.	48.2	(12.7)	(11.8)	n.a.	17.2	**13.9**
Q3	2.4	n.a.	(50.7)	41.9	100.9	190.0	n.a.	1.5	**3.5**
Q4	(9.0)	n.a.	(38.2)	(7.6)	8.6	(32.4)	n.a.	(3.0)	**(9.0)**
2018 Q1	5.7	n.a.	(35.7)	(13.2)	(17.3)	(17.0)	n.a.	5.5	**4.9**
Q2	8.1	n.a.	305.2	32.0	(20.6)	(31.4)	n.a.	11.2	**8.3**
Q3	(8.4)	n.a.	14.3	(15.6)	87.8	77.2	n.a.	0.5	**(7.4)**
Q4	10.3	n.a.	(75.2)	8.7	(11.2)	36.6	n.a.	(17.2)	**9.4**
2019 Q1	(5.4)	n.a.	(100.0)	(31.3)	(13.4)	(21.9)	n.a.	0.3	**(6.0)**
Q2	(4.2)	n.a.	n.a.	36.6	(30.7)	(22.2)	n.a.	12.3	**(4.1)**
Q3	(0.4)	n.a.	n.a.	(2.9)	49.2	(0.2)	n.a.	(23.5)	**(0.1)**
Q4	2.9	n.a.	n.a.	(18.9)	(18.2)	14.5	n.a.	(4.1)	**2.3**
2020 Q1	(4.0)	n.a.	n.a.	(0.3)	3.1	15.3	n.a.	27.3	**(3.6)**
Q2	(66.4)	n.a.	n.a.	(16.5)	5.5	(12.0)	n.a.	(36.6)	**(64.6)**
Q3	155.4	n.a.	n.a.	36.0	(47.2)	(9.2)	n.a.	47.4	**141.9**
Q4	(12.7)	n.a.	n.a.	(8.0)	95.5	23.1	n.a.	(21.0)	**(11.7)**
2021 Q1	17.5	n.a.	n.a.	(21.4)	2.1	(38.3)	n.a.	20.4	**16.2**
Q2	15.6	n.a.	n.a.	7.0	(19.1)	46.9	n.a.	(6.0)	**15.0**
Q3	11.6	n.a.	...	(5.5)	12.5	66.9	...	13.1	**19.1**
Q4	(18.0)	n.a.	(43.8)	(35.9)	2.8	(15.4)	(46.3)	(14.5)	**(19.6)**

Note: **1.** ( ) Denote negative numbers
2. n.a. Signifies data not available/no production during the specified period

Table 6: Year-on-Year Percentage Change in the Volume of Mining Production by Mineral Group and Mineral

Base 2013 = 100									
	Diamonds	Copper Nickel-Cobalt Matte	Copper in Concentrates	Gold	Soda Ash	Salt	Silver	Coal	Total
Weights	**82.5**	**8.6**	**5.5**	**1.4**	**0.9**	**0.5**	**0.4**	**0.3**	**100.0**
2012	(10.0)	12.0	40.6	(11.8)	(3.6)	(17.6)	n.a.	84.7	**(7.7)**
2013	12.2	24.2	221.9	(12.4)	(8.3)	41.8	...	2.8	**17.3**
2014	6.6	(32.9)	14.0	(20.6)	17.8	(1.1)	(1.4)	14.4	**3.3**
2015	(15.6)	4.1	(71.5)	(21.4)	(9.4)	(21.5)	(87.4)	20.7	**(18.2)**
2016	0.3	(2.3)	(100.0)	10.5	15.2	(1.1)	(100.0)	(9.4)	**(1.6)**
2017	9.8	(100.0)	...	10.7	(19.2)	(7.6)	n.a.	18.4	**2.0**
2018	6.8	n.a.	18.0	20.0	31.1	6.1	n.a.	12.0	**7.3**
2019	(3.3)	n.a.	(100.0)	(14.7)	(11.1)	(2.2)	n.a.	(15.0)	**(3.9)**
2020	(28.8)	n.a.	n.a.	(9.7)	(9.7)	9.0	n.a.	(8.9)	**(28.1)**
2021	34.6	n.a.	...	(23.7)	9.8	15.8	...	5.1	**37.0**
2012 Q1	(0.8)	15.6	51.4	21.1	7.3	(8.4)	n.a.	12.7	**1.6**
Q2	(9.8)	15.9	(3.9)	7.2	(2.3)	12.6	n.a.	(17.0)	**(7.3)**
Q3	(36.7)	255.4	59.1	(18.9)	(1.3)	(45.4)	n.a.	109.0	**(32.9)**
Q4	19.2	(12.5)	58.4	(42.0)	(15.9)	(15.6)	n.a.	471.1	**14.4**
2013 Q1	(13.0)	(20.1)	294.5	(43.1)	16.1	47.4	...	71.6	**(8.7)**
Q2	20.9	12.8	405.1	(17.8)	(10.3)	49.3	...	24.1	**25.2**
Q3	26.4	320.7	127.4	(5.9)	(12.6)	103.7	...	(4.2)	**38.4**
Q4	16.9	5.7	165.9	31.6	(26.3)	(15.4)	...	(29.4)	**19.1**
2014 Q1	26.0	(46.8)	3.1	25.8	(11.4)	(29.3)	(28.4)	(11.7)	**16.7**
Q2	(1.5)	(34.7)	(0.7)	(24.6)	29.8	(13.7)	(25.1)	66.1	**(4.5)**
Q3	14.1	(52.1)	46.0	(17.5)	3.9	(2.0)	25.4	14.7	**8.9**
Q4	(5.7)	5.0	11.4	(49.1)	72.2	62.3	35.9	4.0	**(4.0)**
2015 Q1	(2.3)	87.3	(23.3)	(46.3)	(32.6)	(10.3)	(32.3)	33.7	**(0.7)**
Q2	(5.4)	43.3	(73.5)	(33.0)	(16.2)	(39.4)	(100.0)	9.0	**(7.4)**
Q3	(33.4)	(61.5)	(89.2)	(7.8)	7.1	(8.3)	(100.0)	18.6	**(37.9)**
Q4	(20.4)	(31.0)	(100.0)	12.9	1.4	(26.2)	(100.0)	25.3	**(25.5)**
2016 Q1	(5.3)	35.8	(100.0)	16.0	60.6	9.3	(100.0)	(9.8)	**(5.7)**
Q2	(11.9)	(11.2)	(100.0)	62.7	(13.3)	(7.5)	n.a.	(30.5)	**(12.9)**
Q3	9.4	204.0	(100.0)	(17.4)	10.9	(18.4)	n.a.	(5.1)	**12.3**
Q4	14.3	(100.0)	n.a.	0.4	15.0	18.6	n.a.	7.0	**5.8**
2017 Q1	(2.7)	(100.0)	n.a.	(22.1)	(39.0)	(31.7)	n.a.	14.7	**(14.4)**
Q2	12.6	(100.0)	n.a.	(14.3)	(25.2)	(28.3)	n.a.	63.9	**2.1**
Q3	32.9	(100.0)	n.a.	52.9	(9.5)	35.3	n.a.	6.3	**23.4**
Q4	0.2	n.a	...	28.7	(9.3)	(17.3)	n.a.	4.3	**0.5**
2018 Q1	11.5	n.a	...	68.7	57.4	43.5	n.a.	21.7	**12.6**
Q2	6.4	n.a	(20.6)	50.2	43.1	11.6	n.a.	15.5	**7.0**
Q3	(4.8)	n.a	83.8	(10.6)	33.8	(31.8)	n.a.	14.4	**(4.2)**
Q4	15.4	n.a	(26.2)	5.1	9.4	37.9	n.a.	(2.4)	**15.1**
2019 Q1	3.3	n.a	(100.0)	(16.9)	14.6	29.6	n.a.	(7.1)	**3.1**
Q2	(8.4)	n.a	(100.0)	(14.0)	0.1	47.0	n.a.	(6.3)	**(8.7)**
Q3	(0.4)	n.a	(100.0)	(1.0)	(20.5)	(17.2)	n.a.	(28.6)	**(1.5)**
Q4	(7.1)	n.a	(100.0)	(26.1)	(26.8)	(30.6)	n.a.	(17.3)	**(7.9)**
2020 Q1	(5.7)	n.a	n.a	7.2	(12.8)	2.5	n.a.	4.9	**(5.5)**
Q2	(67.0)	n.a	n.a	(34.5)	32.7	15.9	n.a.	(40.7)	**(65.1)**
Q3	(15.3)	n.a	n.a	(8.3)	(53.1)	5.5	n.a.	14.1	**(15.5)**
Q4	(28.2)	n.a	n.a	4.1	12.2	13.4	n.a.	(6.1)	**(27.1)**
2021 Q1	(12.1)	n.a.	n.a.	(17.9)	11.1	(39.4)	n.a.	(11.2)	**(12.1)**
Q2	202.7	n.a.	n.a.	5.2	(14.7)	1.3	n.a.	31.6	**185.6**
Q3	32.2	n.a.	...	(26.9)	81.7	86.1	...	1.0	**40.6**
Q4	24.2	n.a.	...	(49.1)	(4.4)	27.9	...	9.3	**28.1**

Note: 1. ( ) Denote negative numbers
2. ... Data is not zero, but the figure is not significant enough to be measured
3. "n.a." Signifies data not available/no production during the specified period

Table 7: Contribution of Each Mineral Group and Mineral to the Year-on-Year Percentage Change in the Volume of Mining Production

Base 2013 = 100									
	Diamonds	Copper-Nickel-Cobalt Matte	Copper in Concentrates	Gold	Soda Ash	Salt	Silver	Coal	Total
Weights	**82.5**	**8.6**	**5.5**	**1.4**	**0.9**	**0.5**	**0.4**	**0.3**	**100.0**
2012	(8.8)	0.8	0.5.	(0.2)	(0.0)	(0.1)	0.0	0.1	**(7.7)**
2013	10.5	2.0	4.4	(0.2)	(0.1)	0.2	0.5	0.0	**17.3**
2014	5.4	(2.8)	0.8	(0.3)	0.2	(0.0)	(0.0)	0.0	**3.3**
2015	(13.2)	0.2	(4.5)	(0.2)	(0.1)	(0.1)	(0.4)	0.1	**(18.2)**
2016	0.3	(0.2)	(1.9)	0.1	0.2	(0.0)	(0.1)	(0.0)	**(1.6)**
2017	8.8	(7.0)	0.3	0.1	(0.3)	(0.0)	0.0	0.1	**2.0**
2018	6.5	0.0	0.1	0.3	0.3	0.0	0.0	0.1	**7.3**
2019	(3.2)	0.0	(0.3)	(0.2)	(0.1)	(0.0)	0.0	(0.1)	**(3.9)**
2020	(27.8)	0.0	0.0	(0.1)	(0.1)	0.0	0.0	(0.0)	**(28.1)**
2021	33.1	0.0	3.6	(0.4)	0.1	0.1	0.3	0.0	**37.0**
2012 Q1	(0.7)	1.4	0.5	0.4	0.1	(0.0)	0.0	0.0	**1.6**
Q2	(8.6)	1.2	(0.1)	0.1	(0.0)	0.0	0.0	(0.0)	**(7.3)**
Q3	(34.7)	1.5	0.8	(0.3)	(0.0)	(0.2)	0.0	0.1	**(32.9)**
Q4	15.9	(1.3)	0.9	(1.2)	(0.2)	(0.1)	0.0	0.4	**14.4**
2013 Q1	(11.0)	(2.1)	4.3	(0.9)	0.2	0.2	0.5	0.1	**(8.7)**
Q2	17.9	1.2	5.7	(0.3)	(0.1)	0.2	0.6	0.0	**25.2**
Q3	23.5	10.0	4.1	(0.1)	(0.2)	0.4	0.8	(0.0)	**38.4**
Q4	14.6	0.5	3.6	0.5	(0.3)	(0.1)	0.4	(0.1)	**19.1**
2014 Q1	21.0	(4.3)	0.2	0.3	(0.2)	(0.2)	(0.2)	(0.0)	**16.7**
Q2	(1.3)	(3.0)	0.0	(0.3)	0.2	(0.1)	(0.1)	0.1	**(4.5)**
Q3	11.4	(5.0)	2.4	(0.3)	0.0	(0.0)	0.1	0.0	**8.9**
Q4	(4.8)	0.4	0.6	(0.8)	0.4	0.2	0.1	0.0	**(4.0)**
2015 Q1	(2.0)	3.6	(1.3)	(0.6)	(0.3)	(0.0)	(0.1)	0.1	**(0.7)**
Q2	(4.6)	2.6	(4.3)	(0.3)	(0.2)	(0.2)	(0.4)	0.0	**(7.4)**
Q3	(28.5)	(2.6)	(6.3)	(0.1)	0.1	(0.0)	(0.6)	0.1	**(37.9)**
Q4	(17.0)	(2.5)	(5.7)	0.1	0.0	(0.1)	(0.4)	0.1	**(25.5)**
2016 Q1	(4.6)	2.8	(4.3)	0.1	0.4	0.0	(0.2)	(0.0)	**(5.7)**
Q2	(10. 4)	(1.0)	(1.7)	0.4	(0.1)	(0.0)	0.0	(0.1)	**(12.9)**
Q3	8.6	5.3	(1.2)	(0.3)	0.2	(0.2)	0.0	(0.0)	**12.3**
Q4	12.8	(7.3)	0.0	0.0	0.2	0.1	0.0	0.0	**5.8**
2017 Q1	(2.4)	(11.3)	0.0	(0.2)	(0.5)	(0.1)	0.0	0.0	**(14.4)**
Q2	11.1	(9.3)	0.6	(0.2)	(0.2)	(0.1)	0.0	0.2	**2.1**
Q3	29.3	(7.0)	0.4	0.6	(0.2)	0.2	0.0	0.0	**23.4**
Q4	0.2	0.0	0.2	0.3	(0.2)	(0.1)	0.0	0.0	**0.5**
2018 Q1	11.2	0.0	0.1	0.6	0.5	0.1	0.0	0.1	**12.6**
Q2	6.2	0.0	(0.1)	0.6	0.3	0.0	0.0	0.1	**7.0**
Q3	(4.6)	0.0	0.2	(0.2)	0.4	(0.2)	0.0	0.1	**(4.2)**
Q4	14.8	0.0	(0.1)	0.1	0.1	0.2	0.0	(0.0)	**15.1**
2019 Q1	3.2	0.0	(0.1)	(0.2)	0.2	0.1	0.0	(0.0)	**3.1**
Q2	(8.1)	0.0	(0.5)	(0.2)	0.0	0.1	0.0	(0.0)	**(8.7)**
Q3	(0.3)	0.0	(0.6)	(0.0)	(0.4)	(0.1)	0.0	(0.1)	**(1.5)**
Q4	(6.8)	0.0	(0.1)	(0.4)	(0.4)	(0.2)	0.0	(0.1)	**(7.9)**
2020 Q1	(5.5)	0.0	0.0	0.1	(0.2)	0.0	0.0	0.0	**(5.5)**
Q2	(64.8)	0.0	0.0	(0.5)	0.3	0.1	0.0	(0.2)	**(65.1)**
Q3	(14.8)	0.0	0.0	(0.1)	(0.7)	0.0	0.0	0.1	**(15.5)**
Q4	(27.3)	0.0	0.0	0.0	0.1	0.1	0.0	(0.0)	**(27.1)**
2021 Q1	(11.7)	0.0	0.0	(0.2)	0.1	(0.2)	0.0	(0.1)	**(12.0)**
Q2	185.7	0.0	0.0	0.1	(0.5)	0.0	0.0	0.3	**185.6**
Q3	31.2	0.0	8.1	(0.4)	0.6	0.4	0.7	0.0	**40.6**
Q4	23.1	0.0	5.1	(0.8)	(0.1)	0.2	0.4	0.0	**28.1**

Note: 1. ( ) Denote negative numbers

3.0 Technical Notes

3.1 Background

Mining activity in Botswana started in the 19th century with the production of Gold by Europeans from the Tati Reefs, which is now the modern Francistown area. However, much of this activity could not be accounted for, despite its significant contribution to the economy at that time. Modern mining in Botswana started with the mining of Diamonds at Orapa in 1971 followed by Copper-Nickel production in 1973 at Selebi Phikwe. Since the early 1980s, the mining industry has been the largest contributor to real Gross Domestic Product (GDP), contributing between 20 and 50 percent.

These mineral contributions enabled the Government to undertake investments in both human and physical infrastructure development over time. Even though the mining sector's contribution to GDP has been below 25 percent since the 2009 recession, available data indicates that the sector still leads in terms of value added contribution to GDP, according to the quarterly GDP reports produced by Statistics Botswana. Despite its great contribution to Botswana's GDP, the mining industry is capital intensive and accounts for less than 5 percent of employment in the private sector.

With such a significant contribution to the GDP, and the national economy, the need for a measure of the change in the production of minerals in Botswana cannot be over emphasised. The index of the physical volume of mining production is such a measure that provides a relative change over time in mining production. The IMP can also be used as a deflator to calculate the GDP at constant prices.

3.2 Data collection

A mining production survey is carried out by the Department of Mines at the Ministry of Minerals, Energy and Water Resources, covering all mining establishments operating in the country. After the completion of data collection, the Department of Mines provides the data to Statistics Botswana. Following international standards and guidelines, Statistics Botswana cleans the data, produces statistical tables and produces reports which are then packaged and disseminated to users. The results of the survey are used to calculate the volume of mining production indices on a quarterly basis and subsequently to estimate GDP, also on a quarterly basis.

3.3 Scope of the survey

The survey covers all mining establishments conducting activities relating to the extraction of minerals such as Diamonds, Copper-Nickel-Cobalt Matte, Copper in Concentrates, Gold, Soda Ash, Salt, Silver, Coal, Semi-precious stones and the quarrying of building materials. The activities are classified according to the International Standard of Industrial Classification of all Economic Activities, ISIC Rev 4, and the Central Product Classification (CPC) Version 2.

4.0 Concepts, definitions and methods

4.1 Index of the volume of mining productions

The index of the volume of mining production is a ratio that indicates the increase or decrease of a magnitude. The index form is used not only for intertemporal comparisons, but for comparisons between countries.

The IMP is an important macro-economic indicator which monitors progress and fluctuation of the mineral sector production in the economy. The Index is also known to be an effective tool that measures current production, which indicates relative changes over time in the physical volume of mining production.

4.2 Base Period

The base period, usually a year, is the period against which other periods are compared and whose values provide the weights for an index. The base period used in this brief, is 2013 and it is set at 100.

4.3 Index weighting

The weight of the mineral group is the ratio of the estimated value of production of a mineral group to the total estimated value of production of the mining industry. The weight of a mineral group reflects the importance of the mineral group in the total mining industry. The relative importance of various mineral groups is different and these differentials need to be reflected while measuring the performance of the entire mining sector.

4.4 Seasonal Adjustment

Seasonal adjustment is a means of removing the estimated effects of normal seasonal fluctuations and typical calendar effects from the series so that the effects of other influences on the series can be more clearly recognised. Seasonal adjustment does not aim to remove irregular or non-seasonal influences which may be present in any particular period.

The data produced are not seasonally adjusted. However, there is a further scope of producing and disseminating an additional seasonally adjusted series only when there is a clear statistical evidence and economic interpretation of the seasonal/calendar effects.

4.5 Year-on-Year Percentage Change

Year-on-Year percentage change in a variable for any given period is the rate of change expressed over the same period.

4.6 Quarter-on-Quarter percentage change

Quarter-on-Quarter percentage change in a variable for any given period is the rate of change expressed over the previous quarter.

4.7 Index Contribution (percentage points)

The contribution (percentage points) of a mineral group or mineral to the percentage change in the total mining production for a given period is calculated by multiplying the difference in the index for each mineral group or mineral by the weight of the mineral group or mineral and then dividing by the previous period's total index. It indicates the extent to which each mineral group affects the overall growth of mining production.

4.8 Calculation of the Index of Mining Production

To calculate the evolution of physical volume of mining production on a quarterly basis, a Laspeyres indicator, base year 2013=100, was used. The index is calculated as the weighted arithmetic mean of the production relatives in respect of selected items. The weighted average is done to measure the importance of various mineral groups in the mining sector when calculating the comprehensive growth rate of the sector.

$$I = \frac{\sum R_i * W_i}{\sum W_i}$$

Where; I is the index, R_i is the production relative of item i and W_i is the weight allocated to item i

The production relative (R_i) of the i^{th} item for the quarter has been calculated by using the formula:

$$R_i = \frac{P_{ic}}{P_{i0}} * 100$$

Where P_{ic} is the production of the ith item in the current quarter and P_{i0} is the production of the i^{th} item in the base year.

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