

- **Vale's performance in 2024 was marked by greater operational stability and the start-up of key projects. Iron ore production reached 328 Mt, the highest since 2018, surpassing the original guidance of 310–320 Mt<sup>1</sup>. In Copper, the Salobo complex reached record annual production. In Nickel, a significant milestone was achieved with the VBME project construction completion.**
- Iron ore production totaled 85.3 Mt in Q4, 4.1 Mt (-5%) lower y/y, as per plan after the portfolio optimization decision, which prioritized production of higher-margin products. As a result, Southern System's output decreased, while S11D achieved record production. Pellets production totaled 9.2 Mt, 0.7 Mt (-7%) lower y/y. Iron ore sales were 81.2 Mt, 9.1 Mt (-10%) lower y/y, driven by the decision to reduce high-silica products sales in the quarter, improving all-in premiums.
- Copper production totaled 101.8 kt in Q4, 2.7 kt (+3%) higher y/y, positively impacted by stronger operational performance at Salobo and Sudbury and the ramp-up of the Voisey's Bay underground mines.
- Nickel production totaled 45.5 kt in Q4, 0.6 kt (+1%) higher y/y, even after PTVI deconsolidation, mainly reflecting higher output at Onça Puma after the furnace rebuild and stronger performance in Sudbury and Voisey's Bay.

## Highlights

### Production Summary

000' metric tons	4Q24	4Q23	Δ y/y	3Q24	Δ q/q	2024	2023	Δ y/y	2024 guidance	2025 guidance
Iron ore <sup>1</sup>	85,279	89,397	-4.6%	90,971	-6.3%	327,675	321,154	2.0%	~328 Mt	325–335 Mt
Pellets	9,167	9,851	-6.9%	10,363	-11.5%	36,891	36,455	1.2%	~38 Mt <sup>2</sup>	38–42 Mt <sup>2</sup>
Copper	101.8	99.1	2.7%	85.9	18.5%	348.2	326.6	6.6%	~345 kt	340–370 kt
Nickel	45.5	44.9	1.3%	47.1	-3.4%	159.9	164.9	-3.0%	~160 kt	160–175 kt

<sup>1</sup> Including third-party purchases, run-of-mine and feed for pelletizing plants.  
<sup>2</sup> Iron ore agglomerates guidance, including iron ore pellets and briquettes.

### Sales Summary

000' metric tons	4Q24	4Q23	Δ y/y	3Q24	Δ q/q	2024	2023	Δ y/y
Iron ore	81,196	90,328	-10.1%	81,838	-0.8%	306,652	300,919	1.9%
Fines <sup>1</sup>	69,912	77,885	-10.2%	69,344	0.8%	260,314	256,789	1.4%
Pellets	10,067	10,285	-2.1%	10,143	-0.7%	38,300	35,840	6.9%
ROM	1,216	2,158	-43.7%	2,351	-48.3%	8,038	8,290	-3.0%
Copper	99.0	97.5	1.5%	75.2	31.6%	327.2	307.8	6.3%
Nickel	47.1	47.9	-1.7%	40.7	15.7%	155.2	167.9	-7.6%

<sup>1</sup> Including third-party purchases.

### Price Realization Summary

US\$/t	4Q24	4Q23	Δ y/y	3Q24	Δ q/q	2024	2023	Δ y/y
Iron ore fines (CFR/FOB, wmt)	93.0	118.3	-21.4%	90.6	2.6%	95.3	108.1	-11.8%
Iron ore pellets (CFR/FOB, wmt)	143.0	163.4	-12.5%	148.2	-3.5%	154.6	161.9	-4.5%
Copper <sup>1</sup>	9,187	7,941	15.7%	9,016	1.9%	8,811	7,960	10.7%
Nickel	16,163	18,420	-12.3%	17,012	-5.0%	17,078	21,830	-21.8%

<sup>1</sup> Average realized price for copper operations only (Salobo and Sossego). Average realized copper price for all operations, including copper sales originated from nickel operations, was US\$ 8,947/t in 4Q24.

<sup>1</sup> As announced on December 5<sup>th</sup>, 2023.

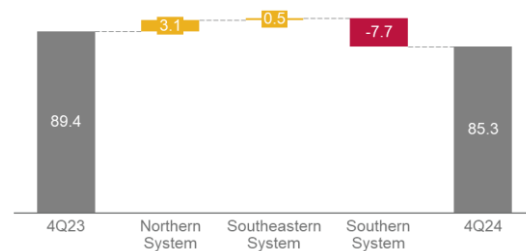
# Iron ore and pellets operations

- **Northern System: production increased by 3.1 Mt y/y**, driven by record production at S11D in Q4. In 2024, S11D achieved a record output of 83.0 Mt, as a result of the optimized maintenance strategy, which enabled greater asset availability and operational stability. Serra Norte's production was in line with the production plan.

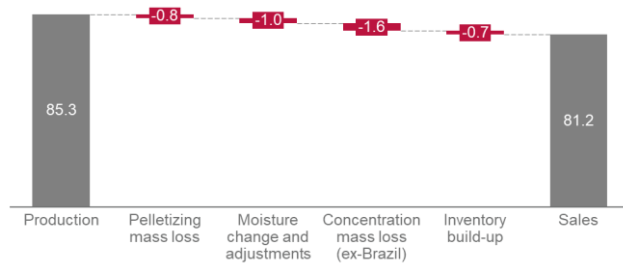
- **Southeastern System: production increased by 0.5 Mt y/y**, driven by Brucutu's fourth processing line commissioning, resulting in the site's highest quarterly production since 2019. This was partially offset by maintenance activities at the Conceição 2 plant, which impacted Itabira's performance. In November, Vale started the Capanema project's commissioning, which aims to add 15 Mtpy of iron ore at the Mariana complex. Capanema will produce sinter feed using the natural moisture process, enhancing Vale's operations and product portfolio flexibility.

- **Southern System: production was 7.7 Mt lower y/y**, driven by the decision to prioritize the production of higher-margin products in response to current market conditions. Consequently, the production of high-silica ores and third-party purchases declined y/y.

Iron ore production, Mt (4Q24 vs. 4Q23)



Iron ore production-to-sales, Mt (4Q24)



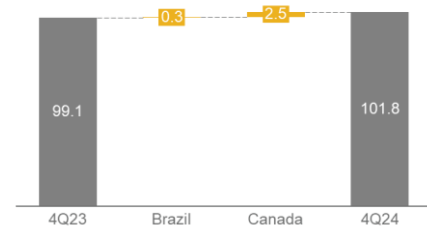
- **Pellets: production was 0.7 Mt lower y/y**, mainly due to the Vargem Grande plant performance, impacted by maintenance activities in November and December.
- **Iron ore sales totaled 81.2 Mt, 9.1 Mt lower y/y**, mainly due to a 7.5 Mt reduction in direct sales of high-silica products. This reduction was driven by portfolio optimization based on current market conditions, resulting in high-silica products being predominantly directed to the formation of blended products (BRBF) and concentration plants in China (PFC1). As a result, **the all-in premium improved by US\$ 2.9/t q/q, totaling US\$ 4.6/t<sup>2</sup>**, with the iron ore fines average premium reaching US\$ 1.0/t in the quarter (vs. US\$ -1.9/t in Q3).
- **The average realized iron ore fines price was US\$ 93.0 /t**, US\$ 2.4/t higher q/q, largely attributed to higher average premiums and higher iron ore prices, which were partially offset by the negative impact of pricing mechanisms related to provisional pricing adjustments. **The average realized iron ore pellet price was US\$ 143.0/t**, US\$ 5.2/t lower q/q, mainly due to the negative impact of lagged prices on pricing mechanisms.

<sup>2</sup> Iron ore fines premium of US\$ 1.0/t and the weighted average contribution of the pellet business of US\$ 3.6/t.

# Copper operations

- **Salobo: copper production increased by 3.6 kt y/y**, as a result of improved performance at Salobo 1&2 and the completion of the Salobo 3 ramp-up. The Salobo complex continues to perform well, with a 10% increase in ore processed y/y.
- **Sossego: copper production decreased by 3.3 kt y/y**, mainly due to lower feed grade to the mill, as per the plan.
- **Canada: copper production increased by 2.5 kt y/y**, mainly reflecting increased mill throughput in Sudbury and the ramp-up of VBME. Quarter-on-quarter, production increased by 5.3 kt as the mines and mill operations have fully resumed after maintenance in Q3.
- **Payable copper sales<sup>3</sup> totaled 99 kt in the quarter, up 1.5 kt y/y**, in line with the strong production figures.
- **The average copper realized price was US\$ 9,187/t**, US\$ 171/t higher q/q, despite lower LME reference prices, due to timing of final pricing and lower TC/RC discounts, reflecting a favorable spot market for copper concentrates.

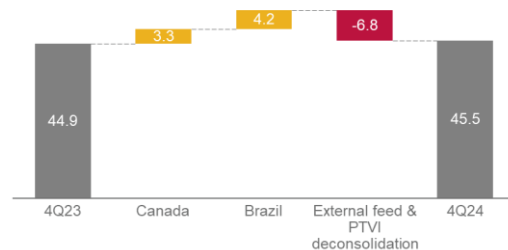
Copper production, kt (4Q24 vs. 4Q23)



# Nickel operations

- **Sudbury-sourced ore: finished nickel production increased by 0.6 kt y/y**, as a result of a 17% increase in mill throughput. Quarter-on-quarter, production decreased by 1.5 kt due to lower nickel inventories availability after Q3 maintenance.
- **Thompson-sourced ore: finished nickel production was largely in line y/y.**
- **Voisey's Bay-sourced ore: finished nickel production increased by 3.0 kt y/y**, as underground mines continued to ramp-up. The Eastern Deeps bulk handling system, a major project milestone, was commissioned in November, which will allow the accelerated ramp-up of the underground project, which is expected to be concluded in 2H26.
- **Onça Puma: nickel production increased by 4.2 kt y/y**, as furnace 1 has been halted for rebuilding in 4Q23. Quarter-on-quarter, the production decreased by 1.4 kt as the plant experienced a power disruption after a severe windstorm in October.
- **Nickel sales totaled 47.1 kt, largely in line y/y.**
- **The average nickel realized price was US\$ 16,163/t**, down US\$ 849/t q/q, mainly due to lower LME reference prices.

Nickel production, kt (4Q24 vs. 4Q23)



<sup>3</sup> Sales volumes are lower than production volumes due to payable copper vs. contained copper: part of the copper contained in the concentrates is lost in the smelting and refining process, hence payable quantities of copper are approximately 3.5% lower than contained volumes.



# Annex 1: Production and sales summary

## Iron ore

'000' metric tons	4Q24	4Q23	Δ y/y	3Q24	Δ q/q	2024	2023	Δ y/y
<b>Northern System</b>	<b>51,942</b>	<b>48,852</b>	<b>6.3%</b>	<b>50,137</b>	<b>3.6%</b>	<b>177,542</b>	<b>172,968</b>	<b>2.6%</b>
Serra Norte and Serra Leste	28,274	28,703	-1.5%	28,044	0.8%	94,547	97,986	-3.5%
S11D	23,667	20,150	17.5%	22,094	7.1%	82,995	74,982	10.7%
<b>Southeastern System</b>	<b>22,097</b>	<b>21,595</b>	<b>2.3%</b>	<b>24,000</b>	<b>-7.9%</b>	<b>86,876</b>	<b>82,344</b>	<b>5.5%</b>
Itabira (Cauê, Conceição and others)	7,722	7,979	-3.2%	9,492	-18.6%	32,816	31,164 <sup>4</sup>	5.3%
Minas Centrais (Brucutu and others)	8,083	6,658	21.4%	7,250	11.5%	27,882	24,730 <sup>4</sup>	12.7%
Mariana (Alegria, Timbopeba and others)	6,292	6,959	-9.6%	7,258	-13.3%	26,178	26,451 <sup>4</sup>	-1.0%
<b>Southern System</b>	<b>11,241</b>	<b>18,949</b>	<b>-40.7%</b>	<b>16,833</b>	<b>-33.2%</b>	<b>63,257</b>	<b>65,841</b>	<b>-3.9%</b>
Paraopeba (Mutuca, Fábrica and others)	4,214	8,758	-51.9%	7,103	-40.7%	25,812	28,740 <sup>4</sup>	-10.2%
Vargem Grande (VGR, Pico and others)	7,027	10,191	-31.0%	9,730	-27.8%	37,445	37,101 <sup>4</sup>	0.9%
<b>Iron Ore Production<sup>1</sup></b>	<b>85,279</b>	<b>89,397</b>	<b>-4.6%</b>	<b>90,971</b>	<b>-6.3%</b>	<b>327,675</b>	<b>321,154</b>	<b>2.0%</b>
Own production	79,609	81,585	-2.4%	84,063	-5.3%	301,967	297,170	1.6%
Third-party purchases	5,671	7,812	-27.4%	6,908	-17.9%	25,707	23,984	7.2%
<b>Iron Ore Sales</b>	<b>81,196</b>	<b>90,328</b>	<b>-10.1%</b>	<b>81,838</b>	<b>-0.8%</b>	<b>306,652</b>	<b>300,919</b>	<b>1.9%</b>
<b>Fine Sales<sup>2</sup></b>	<b>69,912</b>	<b>77,885</b>	<b>-10.2%</b>	<b>69,344</b>	<b>0.8%</b>	<b>260,314</b>	<b>256,789</b>	<b>1.4%</b>
IOCI	9,287	13,074	-29.0%	11,709	-20.7%	43,578	52,673	-17.3%
BRBF	43,890	45,199	-2.9%	34,797	26.1%	135,130	134,333	0.6%
Pellet feed – China (PFC1) <sup>3</sup>	3,585	3,279	9.3%	3,328	7.7%	12,786	13,335	-4.1%
Lump	1,535	1,871	-18.0%	1,971	-22.1%	7,097	7,498	-5.3%
High-silica products	852	7,466	-88.6%	8,050	-89.4%	27,435	25,556 <sup>4</sup>	7.4%
Other fines <sup>5</sup> (60–62% Fe)	10,764	6,996	53.9%	9,489	13.4%	34,288	23,393 <sup>4</sup>	46.6%
<b>Pellet Sales</b>	<b>10,067</b>	<b>10,285</b>	<b>-2.1%</b>	<b>10,143</b>	<b>-0.7%</b>	<b>38,300</b>	<b>35,840</b>	<b>6.9%</b>
<b>Rom Sales</b>	<b>1,216</b>	<b>2,158</b>	<b>-43.7%</b>	<b>2,351</b>	<b>-48.3%</b>	<b>8,038</b>	<b>8,290</b>	<b>-3.0%</b>
<b>Sales from 3<sup>rd</sup> party purchase</b>	<b>5,290</b>	<b>7,807</b>	<b>-32.2%</b>	<b>7,118</b>	<b>-25.7%</b>	<b>25,178</b>	<b>23,570<sup>4</sup></b>	<b>6.8%</b>

<sup>1</sup>Including third party purchases, run-of-mine and feed for pelletizing plants. Vale's product portfolio Fe content reached 62.4%, alumina 1.3% and silica 5.8% in 4Q24.

<sup>2</sup>Including third-party purchases.

<sup>3</sup>Products concentrated in Chinese facilities.

<sup>4</sup>Restated from historical figures.

## Pellets

'000 metric tons	4Q24	4Q23	Δ y/y	3Q24	Δ q/q	2024	2023	Δ y/y
<b>Northern System</b>	<b>521</b>	<b>735</b>	<b>-29.1%</b>	<b>818</b>	<b>-36.3%</b>	<b>2,595</b>	<b>3,221</b>	<b>-19.4%</b>
São Luis	521	735	-29.1%	818	-36.3%	2,595	3,221	-19.4%
<b>Southeastern System</b>	<b>5,328</b>	<b>5,618</b>	<b>-5.2%</b>	<b>5,978</b>	<b>-10.9%</b>	<b>20,947</b>	<b>19,323</b>	<b>8.4%</b>
Itabasco (Tubarão 3)	789	739	6.8%	908	-13.1%	3,016	3,495	-13.7%
Hispanobras (Tubarão 4)	921	892	3.3%	531	73.4%	2,869	1,669	71.9%
Nibrasco (Tubarão 5 and 6)	1,612	1,585	1.7%	1,935	-16.7%	5,962	4,760	25.3%
Kobrasco (Tubarão 7)	896	899	-0.3%	1,071	-16.3%	3,309	3,204	3.3%
Tubarão 8	1,110	1,503	-26.1%	1,532	-27.5%	5,793	6,195	-6.5%
<b>Southern System</b>	<b>638</b>	<b>1,175</b>	<b>-45.7%</b>	<b>1,238</b>	<b>-48.5%</b>	<b>4,154</b>	<b>4,629</b>	<b>-10.3%</b>
Fábrica	-	-	-	-	-	-	-	-
Vargem Grande	638	1,175	-45.7%	1,238	-48.5%	4,154	4,629	-10.3%
<b>Oman</b>	<b>2,680</b>	<b>2,323</b>	<b>15.4%</b>	<b>2,328</b>	<b>15.1%</b>	<b>9,195</b>	<b>9,283</b>	<b>-0.9%</b>
<b>Pellet Production</b>	<b>9,167</b>	<b>9,851</b>	<b>-6.9%</b>	<b>10,363</b>	<b>-11.5%</b>	<b>36,891</b>	<b>36,455</b>	<b>1.2%</b>
<b>Pellet Sales</b>	<b>10,067</b>	<b>10,285</b>	<b>-2.1%</b>	<b>10,143</b>	<b>-0.7%</b>	<b>38,300</b>	<b>35,840</b>	<b>6.9%</b>



## Copper – Finished production by source

'000' metric tons	4Q24	4Q23	Δ y/y	3Q24	Δ q/q	2024	2023	Δ y/y
<b>Brazil</b>	<b>77.0</b>	<b>76.7</b>	<b>0.4%</b>	<b>66.3</b>	<b>16.1%</b>	<b>265.2</b>	<b>247.2</b>	<b>7.3%</b>
Salobo	58.9	55.2	6.7%	46.6	26.4%	199.8	180.4	10.8%
Sossego	18.1	21.4	-15.4%	19.7	-8.1%	65.4	66.8	-2.1%
<b>Canada</b>	<b>24.9</b>	<b>22.4</b>	<b>11.2%</b>	<b>19.6</b>	<b>27.0%</b>	<b>83.0</b>	<b>79.4</b>	<b>4.5%</b>
Sudbury	16.3	15.4	5.8%	11.6	40.5%	58.6	57.9	1.2%
Thompson	3.6	2.9	24.1%	3.2	12.5%	7.2	4.7	53.2%
Voisey's Bay	3.9	2.7	44.4%	3.6	8.3%	12.9	9.6	34.4%
Feed from third parties <sup>1</sup>	1.2	1.4	-14.3%	1.1	9.1%	4.1	7.2	-43.1%
<b>Copper Production</b>	<b>101.8</b>	<b>99.1</b>	<b>2.7%</b>	<b>85.9</b>	<b>18.5%</b>	<b>348.2</b>	<b>326.6</b>	<b>6.6%</b>
<b>Copper Sales</b>	<b>99.0</b>	<b>97.5</b>	<b>1.5%</b>	<b>75.2</b>	<b>31.6%</b>	<b>327.2</b>	<b>307.8</b>	<b>6.3%</b>
Copper Sales Brazil	74.4	76.3	-2.5%	61.3	21.4%	250.3	234.0	7.0%
Copper Sales Canada	24.7	21.2	16.5%	13.9	77.7%	76.9	73.8	4.2%

<sup>1</sup> External feed purchased from third parties and processed into copper in our Canadian operation.

## Nickel

'000' metric tons	4Q24	4Q23	Δ y/y	3Q24	Δ q/q	2024	2023	Δ y/y
<b>Finished Production by Source</b>								
<b>Canada</b>	<b>20.0</b>	<b>16.7</b>	<b>19.8%</b>	<b>21.5</b>	<b>-7.0%</b>	<b>65.8</b>	<b>59.5</b>	<b>10.6%</b>
Sudbury	10.6	10.0	6.0%	12.3	-13.8%	36.6	38.2	-4.2%
Thompson	2.9	3.2	-9.4%	3.1	-6.5%	9.9	7.9	25.3%
Voisey's Bay	6.5	3.5	85.7%	6.1	6.6%	19.2	13.5	42.2%
<b>Brazil</b>	<b>4.8</b>	<b>0.6</b>	<b>700.0%</b>	<b>6.2</b>	<b>-22.6%</b>	<b>14.2</b>	<b>17.0</b>	<b>-16.5%</b>
<b>Indonesia</b>	<b>-</b>	<b>19.8</b>	<b>-100.0%</b>	<b>-</b>	<b>-</b>	<b>34.9</b>	<b>64.1</b>	<b>-45.6%</b>
<b>External feed</b>	<b>20.7</b>	<b>7.7</b>	<b>168.8%</b>	<b>19.3</b>	<b>7.3%</b>	<b>45.4</b>	<b>24.2</b>	<b>87.6%</b>
Feed from third-parties <sup>1</sup>	4.4	7.7	-42.9%	4.1	7.3%	13.8	24.2	-43.0%
PTVI offtake <sup>2</sup>	16.3	-	n.a.	15.2	7.2%	31.5	-	n.a.
<b>Finished Production by Site</b>								
Sudbury	14.8	16.2	-8.6%	17.4	-14.9%	50.5	57.6	-12.3%
Voisey's Bay & Long Harbour	9.2	8.3	10.8%	9.5	-3.2%	30.5	27.7	10.1%
Onça Puma	4.8	0.6	700.0%	6.2	-22.6%	14.0	17.0	-17.6%
Clydach	10.5	10.5	-	8.0	31.3%	34.2	31.3	9.3%
Matsusaka	5.2	3.9	33.3%	5.5	-5.5%	20.4	15.2	34.2%
Others <sup>3</sup>	1.0	5.4	-81.5%	0.5	100.0%	10.3	16.1	-36.0%
<b>Nickel Production</b>	<b>45.5</b>	<b>44.9</b>	<b>1.3%</b>	<b>47.1</b>	<b>-3.4%</b>	<b>159.9</b>	<b>164.9</b>	<b>-3.0%</b>
<b>Nickel Sales</b>	<b>47.1</b>	<b>47.9</b>	<b>-1.7%</b>	<b>40.7</b>	<b>15.7%</b>	<b>155.2</b>	<b>167.9</b>	<b>-7.6%</b>

<sup>1</sup> External feed purchased from third parties and processed into finished nickel in our Canadian operations. It does not include feed purchased from PTVI.

<sup>2</sup> Starting from 3Q24, PTVI sourced production is reported as "External feed" and reflects solely the 80%-offtake attributable to Vale Base Metals processed at downstream facilities. Before, PTVI production was 100% consolidated by Vale.

<sup>3</sup> Includes intermediates produced in Thompson and PTVI, tolling and others.

## Energy Transition Metals by-products – Finished production

	4Q24	4Q23	Δ y/y	3Q24	Δ q/q	2024	2023	Δ y/y
Cobalt (metric tons)	695	549	26.6%	714	-2.7%	2,079	1,959	6.1%
Platinum (000' oz troy)	36	31	16.1%	23	56.5%	107	125	-14.4%
Palladium (000' oz troy)	38	39	-2.6%	20	90.0%	120	149	-19.5%
Gold (000' oz troy) <sup>1</sup>	136	123	10.6%	103	32.0%	445	410	8.5%
<b>Total by-Products (000' metric tons Cu eq.)<sup>2,3</sup></b>	<b>54</b>	<b>45</b>	<b>20.0%</b>	<b>37<sup>4</sup></b>	<b>45.9%</b>	<b>160</b>	<b>156</b>	<b>2.6%</b>

<sup>1</sup> Includes Gold from Copper and Nickel operations.

<sup>2</sup> Includes Iridium, Rhodium, Ruthenium and Silver.

<sup>3</sup> Copper equivalent tons calculated using average market metal prices for each quarter. Market reference prices: for copper and cobalt: LME spot; for Gold, Silver, Platinum, and Palladium: Bloomberg; for other PGMs: Johnson Matthey.

<sup>4</sup> Restated from historical figures.



## Annex 2: Energy Transition Metals: Maintenance scheduled in 2025

	Q1	Q2	Q3	Q4
<b>Copper operations</b>				
<b>Salobo</b>				
Salobo I & II	< 1 week		< 1 week	< 1 week
Salobo III	< 1 week	< 1 week		< 1 week
<b>Sossego</b>				
Sossego	< 1 week	< 1 week	< 1 week	< 1 week
<b>Nickel operations</b>				
<b>Sudbury</b>				
Coleman			4 weeks	
Creighton			5 weeks	
Copper Cliff North			4 weeks	
Copper Cliff South			3 weeks	
Garson			4.5 weeks	
Totten			1.5 weeks	
Clarabelle mill			4 weeks	
Sudbury Smelter				
Sudbury Refinery				
Port Colborne (Ni, Co & PGMs)				
<b>Thompson</b>				
Thompson mine			4.5 weeks	
Thompson mill			4.5 weeks	
<b>Voisey's Bay &amp; Long Harbour</b>				
Voisey's Bay			2 weeks	
Long Harbour Refinery				4.5 weeks
<b>Standalone Refineries</b>				
Clydach				
Matsusaka	4.5 weeks			
<b>Brazil</b>				
Onça Puma		1.5 weeks		< 1 week

Note: The maintenance schedule may be deliberately adjusted if it proves beneficial for operations and the overall business. The number of weeks is rounded to 0.0 or 0.5 and may involve more than one maintenance activity within the quarter.



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