# Boliden - Westmin (Canada) Ltd.



January 2004 Geological Resources and Mining Reserves for Myra Falls Operations





COMPILED BY: ALBERT CHONG, P.Geo FINLEY BAKKER, P.Geo MFO

830740

## 

## BOLIDEN - WESTMIN CANADA LTD Myra Falls Operation January 2004 Ore Reserves

Wherever possible the definitions of reserves have been adhered to as outlined in the document:

Setting New Standards Recommendations for Public Mineral Exploration and Mining Companies Mining Standards Task Force Final Report By the Toronto Stock Exchange and the Ontario Securities Commission January 1999

Minesight/Compass (referred to as Medsystem in previous years) was used to calculate the mineral resource wherever possible. The Battle, Gap, Extension zone, 43-Block, and H-W were recalculated using Compass. The remaining areas were not recalculated by Compass. The Ridge Zone West had changes due to economics and the Lynx changes were due to mining. All other numbers reported in the 2003 Reserve stand.

## **Reporting of Reserves**

Although it is technically incorrect, but because the purpose of this report is for in-house use only, the following terms are often used interchangeably:

Measured = Proven = Highest degree of confidence (0-20% error in contained metal) - a maximum of 15 meters from a given diamond drill hole

Indicated = Probable = Lower degree of confidence (20-70% error in contained metal) - a maximum of 30 meters from a given diamond drill hole

Inferred = Possible = Low confidence (70-100% error in contained metal) - maximum of 50 meters from a given diamond drill hole.

Potential = Target - no limits applied

For purposes of the Boliden Annual Report the following terms are used:

Proven Mining Reserve – Dilution and Extraction applied.
Probable Mining Reserve – Dilution and Extraction applied.
Measured Geological Resource – does not include Mining Reserve.
Indicated Geological Resource – does not include Mining Reserve.
Inferred Geological Resource – grades not to be reported.
NSR - net smelter return - the calculation of which is given in the Appendices.

For purposes of Accounting the following term is used:

#### Geological Inventory = Undiluted Mining Reserve + Geological Resource

This number was historically used for Depletion and Depreciation purposes. Currently Mining Reserve is used for Depletion and Depreciation.

For Mine Planning and Geological purposes a number of other terms are used:

**Incremental Ore**—previously referred to as "resource" or as "economically challenged", this is material that can be modeled geologically but while carrying a certain level of mineralization does not meet the cnrrent definition of ore. As a rule this is material that is less than a \$45 NSR cut off but greater than \$35. This term is discussed in greater detail in the section titled "Incremental Ore".

**Potential** – this material that could meet TSE definitions of "inferred" but does not meet our own in-house definition – that is it falls outside a 50 meter radius from a given drillhole.

**NIMR** = Not in Mining Reserve. This is material that initially falls in either the Measured or Indicated portion of the Resource. Due to a lack of geological understanding of the area, difficult extraction or lack of a concrete mining plan this material is referenced as NIMR. It is then relegated to the Indicated Category of Geological

Confidential

12/08/2004

Resources. Generally an extraction factor of zero (0) is applied against this material for inclusion in Mining Reserves. It is highlighted with an 899 code in Compass.

AU/AU1 AG/AG1 Two values for gold and silver are now shown in the in-house reserve document. Au/Ag assumes that where no assays were taken then the value for that intersection is zero. Au1/Ag1 assumes that missing assays were assigned a "-1" value. The model in this case ignored the intersection (for PM's) and used adjacent diamond drill holes with an assayed grade to assign a value to block model. In the past "default" values were assigned to missing assay intersections. The rationale behind the missing assays is as follows: not all core was assayed for precious metals in an attempt to reduce the workload on the assay lab. This case of "saving money" has occurred more in the recent past and as a result 43 Block and Battle are affected the most. It is expected that the "true" grade of most areas will lie between the two calculated values but only the lower grade i.e. Au/Ag are reported in reserves.

- Au = Gold in gm/tonne
- Ag = Silver in gm/tonne
- Cu = Copper in percent
- Pb = Lead in percent
- Zn = Zinc in percent

Ba = Barium in percent - used in calculation of density

Fe = Iron in percent - used in calculation of density and percent sulpher

Den = Density - calculation based on assumption that all copper is tied up in chalcopyrite, zinc in sphalerite, lead in galena, barium in barite. Density is used to calculate density weighted averages used in calculation of grade and to calculate tonnages based on volumes.

Density formula is:

Density = 795047.4/(294460-1463.8\*Zn - 475.9\*Cu -2912.9\*Fe - 2207.6\*Pb - 2003.0\*Ba) Formula is based on report "Density of Ores and Rocks in the H-W Mine" by Rick Walker 1981



Confidential

12/08/2004

## **Diluted Mining Reserve - Proven and Probable by category**

This is the Proven and Probable portion of Reserves for which there is a concrete mining plan/pre-feasibility study and for which dilution and recovery factors have been applied.

Note: NSR is expressed in Canadian dollars- the calculation is included in Appendices.

			Diluted M	ining R	eserve - P	roven and	Probab	e (Janu	ary 2004)					
FEATURE	EXTRN	TOTAL	DILUTED		DILUTED	TONNES	AND DILUT	ED GRADI						
Mine	FACTOR	DILN	TONNES	NSR	AU g/t	AU1 g/t	AG g/t	AG1 g/t	CU %	PB %	ZN %	BA %	FE %	DEN
43-Block	72%	28%	582,910	\$ E	5 1.51	1.69	29.21	33.54	1.24	0.34	4.21	1.30	10.25	3.12
Battle	69%	33%	2,763,398	\$ 7	9 0.77	1.08	38.34	51.90	1.10	0.64	8.82	1.85	7.71	3.14
Extension	72%	31%	247,391	\$ 5	0.89	0.95	22.06	23.44	1.29	0.27	4.10	2.01	18.10	3.45
Gap	71%	30%	476,867	\$ 11	0 1.84	1.92	99.40	102.64	1.55	0.79	10.83	9.25	11.08	3.53
HW-Mine	71%	25%	1,529,054	<u>\$</u> €	1 1.73	1.87	40.54	43.43	1.32	0.45	4.65	1.92	16.08	3.38
Total Proven	70%	30%	5,599,619	\$ 7	3 1.20	1.42	42.47	50.74	1.22	0.55	7.17	2.45	11.00	3.24
43-Block	53%	33%	106,322	\$ 2	3 0.50	0.68	12.68	17.11	0.52	0.25	1.85	0.65	5.57	2.91
6-Level	0%	0%	-	\$-	-	-	-	-	-	-	-	-	-	2.70
Battle	60%	31%	291,341	\$ 5	0.71	0.97	46.90	61.66	0.69	0.61	5.37	2.07	5.50	3.00
Extension	72%	31%	330,420	\$ <b>∠</b>	6 0.72	0.93	41.56	47.11	1.11	0.34	3.55	0.83	14.11	3.24
Gap	15%	30%	8,202	\$ 8	9 0.69	0.85	133.23	134.31	1.63	0.44	8.14	3.30	6.42	3.11
HW-Mine	43%	22%	831,835	\$ 3	5 1.35	1.66	13.32	17.42	0.99	0.11	1.85	1.03	24.07	3.63
Lynx	5%	115%	27,452	\$ 6	8 1.02	1.02	53.77	53.77	1.28	0.57	6.22	0.76	5.94	3.00
Marshall	0%	0%	-	\$-	-	-	-	-	-	-	-	-	-	2.70
Price	61%	30%	317,859	\$ 7	6 1.46	1.54	44.77	47.92	1.13	0.95	7.54	2.58	7.41	3.13
Ridge-West	43%	31%	233,863	\$ 7	8 1.98	1.98	65.28	65.28	0.90	0.84	7.61	0.77	5.05	3.00
Total Probable	52%	29%	2,147,295	\$ !	0 1.20	1.41	33.48	38.61	0.96	0.43	4.14	1.33	14.26	3.27
Total Prov/Prob	65%	29%	7,746,914	\$ 6	7 1.20	1.42	39.98	47.38	1.15	0.52	6.33	2.14	11.91	3.25



## **Diluted Mining Reserve - Proven and Probable by zone**

The Diluted Mining Reserve is listed below. The Proven and Probable tonnages are combined for clarity.

			<b>Diluted M</b>	iniı	ng Res	erve - Pr	oven and	Probabl	e (Janua	ry 2004)					
FEATURE	EXTRN	TOTAL	DILUTED			DILUTED	TONNES A	ND DILUT	ED GRADE						
Mine	FACTOR	DILN	TONNES		NSR	AU g/t	AU1 g/t	AG g/t	AG1 g/t	CU %	PB %	ZN %	BA %	FE %	DEN
43-Block	69%	29%	689,232	\$	50	1.35	1.54	26.66	31.01	1.13	0.33	3.85	1.20	9.52	3.09
6-Level	0%	0%	-	\$	-	-	-	-	-	-	-	-	-	-	2.70
Battle	69%	32%	3,054,739	\$	77	0.76	1.07	39.16	52.83	1.06	0.64	8.49	1.87	7.50	3.12
Extension	72%	31%	577,811	\$	48	0.79	0. <b>94</b>	33.21	36.98	1.19	0.31	3.78	1.34	15.82	3.33
Gap	70%	30%	485,069	\$	109	1.82	1.90	99.97	103.18	1.55	0.79	10.79	9.15	11.00	3.52
HW-Mine	61%	24%	2,360,889	\$	52	1.59	1.80	30.95	34.26	1.20	0.33	3.66	1.61	18.89	3.46
Lynx	5%	115%	27,452	\$	68	1.02	1.02	53.77	53.77	1.28	0.57	6.22	0.76	5.94	3.00
Marshall	0%	0%	-	\$	-	-	-	-	-	-	-	-	-	-	2.70
Price	61%	30%	317,859	\$	76	1.46	1.54	44.77	47.92	1.13	0.95	7.54	2.58	7.41	3.13
Ridge-West	43%	31%	233,863	\$	78	1.98	1.98	65.28	65.28	0.90	0.84	7.61	0.77	5.05	3.00
Total Prov/Prob	65%	29%	7,746,914	\$	67	1.20	1.42	39.98	47.38	1_15	0.52	6.33	2.14	11.91	3.25



Confidential

12/08/2004

## BOLIDEN - WESTMIN CANADA LTD Myra Falls Operation January 2004 Ore Reserves <u>Geological Resource - Measured and Indicated by category</u>

As stated previously the Geological Resource is undiluted and has no recovery factors included. It does not include the mining reserve but does include that portion of the mining reserve calculation that is felt to be non-recoverable at present (i.e. future losses due to mining method). It also includes all areas that have as yet no mining plan but still fall within the Measured and Indicted portion of calculations.

Note: NSR is expressed in Canadian dollars- the calculation is included in Appendices.

		Ge	ological	Resour	ce - Meas	ured and	I Indicated	l (Janua	iry 2004)				
FEATURE	FUT-LOST					FUTURE !	LOST TONN	ES AND U	NDILUTED	GRADE			
Mine	TONNES		NSR	AU g/t	AU1 g/t	AG g/t	AG1 g/t	CU %	PB %	ZN %	BA %	FE %	DEN
43-Block	177,198	\$	71	1.93	2.17	37.36	42.91	1.59	0.44	5.38	1.67	13.11	3.27
Battle	917,305	\$	103	1.04	1.46	54.01	73.37	1.41	0.86	11.36	2.64	9.93	3.30
Extension	72,533	\$	67	1.16	1.24	28.90	30.70	1.69	0.35	5.37	2.63	23.71	3.77
Gap	148,015	\$	142	2.40	2.50	129.21	133.43	2.02	1.03	14.08	12.02	14.40	3.89
HW-Mine	500,112	\$	73	2.04	2.23	46.97	50.96	1.63	0.50	5.43	2.00	21.18	3.63
Total Measured	1,815,164	\$	93	1.52	1.82	55.57	67.42	1.55	0.72	9.12	3.13	14.26	\$.44
43-Block	70,113	\$	37	0.90	1.23	20.76	28.64	0.86	0.30	2.81	1.17	8.52	3.03
6-Level	113,903	\$	69	1.61	1.61	122.91	122.91	0.38	1.15	6.85	1.00	9.86	3.17
Battle	149,088	\$	72	0.85	1.19	48.11	63.98	0.95	0.65	7.89	2.27	7.54	3.12
Extension	96,877	\$	60	0.94	1.22	54.44	61.72	1.46	0.45	4.64	1.09	18.48	3.46
Gap	34,673	\$	114	1.56	1.84	80.59	87.14	1.13	1.72	12.88	12.58	6.20	3.49
HW-Mine	901,441	\$	52	1.90	2.13	34.02	37.97	1.32	0.33	3.06	1.54	26.03	3.79
Lynx	227,778	\$	129	3.38	3.38	104.36	104.36	2.01	1.21	11.37	1.23	12.14	3.36
Marshall	589,330	\$	65	2.05	2.05	98.81	98.81	0.57	0.76	5.82	7.19	4.22	3.09
Price	154,292	\$	98	2.83	3.10	101.29	110.20	1.19	1.44	8.88	3.56	8.69	3.24
Ridge-West	237,348	\$	78	2.03	2.03	69.72	69.72	0.95	0.80	7.31	0.82	6.24	3.04
Total Indicated	2,574,843	\$	69	1.99	2.13	68.18	71.59	1.09	0.69	5.80	3.00	14.13	3.36
Total M + I	4,390,007	\$	79	1.80	2.00	62.97	69.86	1.28	0.7.0	7.17	3.06	14.18	3.39



12/08/2004

Confidential

## **Geological Resource - Measured and Indicated by zone**

The Measured and Indicated tonnage have been combined for clarity.

		Geo	ological	Resourc	e - Meas	ured and	Indicated	(Janua	ry 2004)				
FEATURE	FUT-LOST					FUTURE L	OST TONN	ES AND UN	DILUTED	GRADE			
Mine	TONNES		NSR	AU g/t	AU1 g/t	AG g/t	AG1 g/t	CU %	PB %	ZN %	BA %	FE %	DEN
43-Block	247,312	\$	61	1.64	1.90	32.65	38.87	1.39	0.40	4.65	1.53	11.81	3.20
6-Level	113,903	\$	69	1.61	1.61	122.91	122.91	0.38	1.15	6.85	1.00	9.86	3.17
Battle	1,066,394	\$	98	1.01	1.43	53.18	72.06	1.35	0.83	10.87	2.59	9.60	3.27
Extension	169,410	\$	63	1.04	1.23	43.51	48.44	1.56	0.41	4.96	1.75	20.72	3.59
Gap	182,688	\$	137	2.24	2.37	119.98	124.65	1.85	1.16	13.85	12.13	12.84	3.80
HW-Mine	1,401,553	\$	59	1.95	2.16	38.64	42.61	1.43	0.39	3.91	1.70	24.30	3.73
Lynx	227,778	\$	129	3.38	3.38	104.36	104.36	2.01	1.21	11.37	1.23	12.14	3.36
Marshall	589,330	\$	65	2.05	2.05	98.81	98.81	0.57	0.76	5.82	7.19	4.22	3.09
Price	154,292	\$	98	2.83	3.10	101.29	110.20	1.19	1.44	8.88	3.56	8.69	3.24
Ridge-West	237,348	\$	78	2.03	2.03	69.72	69.72	0.95	0.80	7.31	0.82	6.24	3.04
Total M + I	4,390,007	\$	79	1.80	2.00	62.97	69.86	1.28	0.70	7.17	3.06	14.18	3.39



12/08/2004



## **Undiluted Mining Reserve - Proven and Probable by category**

The Undiluted Mining Reserve is listed below. It can be added to the Geological Resource to give the Geological Inventory as used in Depletion and Depreciation calculations.

		Insi	itu -Undi	iluted Mi	ining Res	erve - no	t reported	(Janua	ry 2004)				
FEATURE	EXTRN	REC	OVERED	TONNES	AND UNDIL	UTED GR	ADE						
Mine	TONNES		NSR	AU g/t	AU1 g/t	AG g/t	AG1 g/t	CU %	PB %	ZN %	BA %	FE %	DEN
43-Block	455,653	\$	71	1.93	2.17	37.36	42.91	1.59	0.44	5.38	1.67	13.11	3.27
Battle	2,083,304	\$	105	1.02	1.43	50.85	68.85	1.46	0.85	11.70	2.45	10.22	3.31
Extension	188,848	\$	67	1.16	1.24	28.90	30.70	1.69	0.35	5.37	2.63	23.71	3.77
Gap	366,821	\$	142	2.40	2.50	129.21	133.43	2.02	1.03	14.08	12.02	14.40	3.89
HW-Mine	1,226,406	\$	77	2.15	2.34	50.54	54.15	1.64	0.56	5.80	2.40	20.04	3.60
Total Measured	4,321,031	<b>\$</b> 1	95	.1.56	, 1.85	55.04	65.76	1.59 ,	0.72	9.29	3.17	14.26	3.45
43-Block	79,797	\$	31	0.67	0.91	16.90	22.80	0.69	0.34	2.46	0.87	7.42	2.98
6-Level	-	\$	-	-	-	-	-	-	-	-	-	-	2.70
Battle	223,183	\$	68	0.93	1.26	61.23	80.49	0.90	0.79	7.01	2.71	7.18	3.11
Extension	252,229	\$	60	0.94	1.22	54.44	61.72	1.46	0.45	4.64	1.09	18.48	3.46
Gap	6,309	\$	116	0.90	1.10	173.20	174.60	2.12	0.57	10.58	4.29	8.34	3.26
HW-Mine	680,119	\$	42	1.65	2.03	16.29	21.30	1.21	0.13	2.26	1.26	29.44	3.94
Lynx	12,742	\$	146	2.20	2.20	115.84	115.84	2.76	1.22	13.40	1.63	12.79	3.45
Marshall	-	\$	-	-	-	-	-	-	-	-	-	-	2.70
Price	244,507	\$	99	1.90	2.00	58.20	62.30	1.47	1.24	9.80	3.35	9.63	3.29
Ridge-West	178,522	\$	102	2.59	2.59	85.51	85.51	1.18	1.10	9.97	1.01	6.61	3.11
Total Indicated	1,677,408	\$	J 63	1.54	1.81	42.86	49.43	1.23	0.55	5.30	1.70	18.26	3.48
Total Meas/Ind	5,998,438	\$	86	1.55	1.84	51.63	61.19	1.49	0.67	8.17	2.76	15.38	3.46

## **Undiluted Mining Reserve - Proven and Probable by zone**

	····	Ins	itu -Und	liluted M	ining Res	erve - nc	ot reported	(Janua	ry 2004)				<u> </u>
FEATURE	EXTRN	REC	OVERED	TONNES	AND UNDI	UTED GF	RADE			<u> </u>			
Mine	TONNES		NSR	AU g/t	AU1 g/t	AG g/t	AG1 g/t	CU %	PB %	ZN %	BA %	FE %	DEN
43-Block	535,449	\$	65	1.74	1.98	34.31	39.91	1.46	0.42	4.95	1.55	12.26	3.22
Battle	2,306,486	\$	102	1.01	1.41	51.86	69.97	1.41	0.84	11.25	2.47	9.93	3.29
Extension	441,077	\$	63	1.04	1.23	43.51	48.44	1.56	0.41	4.96	1.75	20.72	3.59
Gap	373,130	\$	142	2.37	2.47	129.96	134.13	2.02	1.02	14.02	11.89	14.30	3.87
HW-Mine	1,906,525	\$	64	1.97	2.23	38.33	42.43	1.49	0.41	4.54	1.99	23.39	3.71
Lynx	12,742	\$	146	2.20	2.20	115.84	115.84	2.76	1.22	13.40	1.63	12.79	3.45
Price	244,507	\$	99	1.90	2.00	58.20	62.30	1.47	1.24	9.80	3.35	9.63	3.29
Ridge-West	178,522	\$	102	2.59	2.59	85.51	85.51	1.18	1.10	9.97	1.01	6.61	3.11
Total Meas/Ind	5,998,438	\$	86	1.55	1.84	51.63	61.19	1.49	0.67	8.17	2.76	15.38	3.46

## **Geological Inventory – Measured and Indicated by category**

Note: NSR is expressed in Canadian dollars- the calculation is included in Appendices.

	·	Ge	ological	Invento	ry - Meası	ured and	Indicated	(Janua	ry 2004)				
FEATURE	Γ		· · · · · · · · · · · · · · · · · · ·	<b>INSITU TO</b>	NNES AND	UNDILUT	ED GRADE						
Mine	TONNES		NSR	AU g/t	AU1 g/t	AG g/t	AG1 g/t	CU %	PB %	ZN %	BA %	FE %	DEN
43-Block	632,851	\$	71	1.93	2.17	37.36	42.91	1.59	0.44	5.38	1.67	13.11	3.27
Battle	3,000,609	\$	104	1.03	1.44	51.82	70.23	1.45	0.85	11.60	2.51	10.14	3.31
Extension	261,381	\$	67	1.16	1.24	28.90	30.70	1.69	0.35	5.37	2.63	23.71	3.77
Gap	514,836	\$	142	2.40	2.50	129.21	133.43	2.02	1.03	14.08	12.02	14.40	3.89
HW-Mine	1,726,518	\$	76	2.12	2.30	49,51	53.22	1.64	0.55	5.69	2.28	20.37	3.61
Total Measured	6,136,195	\$	94	1.55	1.84	55.20	66.25	1.58	0.72	9.24	3.16	14.26	3.45
43-Block	149,910	\$	34	0.78	1.06	18.70	25.53	0.77	0.32	2.6 <b>2</b>	1.01	7.93	3.01
6-Level	113,903	\$	69	1.61	1.61	122.91	122.91	0.38	1.15	6.85	1.00	9.86	3.17
Battle	372,271	\$	70	0.90	1.23	55.98	73.88	0.92	0.74	7.36	2.53	7.33	3.12
Extension	349,106	\$	60	0.94	1.22	54.44	61.72	1.46	0.45	4.64	1.09	18.48	3.46
Gap	40,982	\$	114	1.46	1.72	94.85	100.60	1.28	1.55	12.53	11.31	6.53	3.45
HW-Mine	1,581,560	\$	48	1.79	2.09	26.40	30.80	1.27	0.25	2.72	1.42	27.49	3.85
Lynx	240,520	\$	130	3.31	3.31	104.97	104.97	2.05	1.21	11.48	1.25	12.17	3.37
Marshall	589,330	\$	65	2.05	2.05	98.81	98.81	0.57	0.76	5.82	7.19	4.22	3.09
Price	398,799	\$	99	2.26	2.42	74.87	80.83	1.36	1.32	9.44	3.43	9.26	3.27
Ridge-West	415,870	\$	88	2.27	2.27	76.50	76.50	1.05	0.93	-8.45	0.90	6.40	3.07
Total Indicated	4,252,251	\$	67	1.81	2.00	58.19	62.85	1.15	0.64	5.60	2.49	15.76	3.41
Total MEAS/IND	10,388,446	\$	83	1.66	1.91	56.42	64.86	1.40	0.68	7.75	2.89	14.87	3.43

The Geological Inventory is a sum of all Measured, Indicated, Proven and Probable Ore on-site. It includes the **undiluted** portion of the Mining Reserve.



## **Geological Inventory – Measured and Indicated by zone**

		Ge	ological	Invento	ry - Meası	ured and	Indicated	by zone	(Januar	y 2004)			
FEATURE				INSITU TO	DNNES AND	UNDILUT	ED GRADE						
Mine	TONNES		NSR	AU g/t	AU1 g/t	AG g/t	AG1 g/t	CU %	PB %	ZN %	BA %	FE %	DEN
43-Block	782,761	\$	64	1.71	1.95	33.79	39.58	1.43	0.42	4.86	1.54	12.12	3.21
6-Level	113,903	\$	69	1.61	1.61	122.91	122.91	0.38	1.15	6.85	1.00	9.86	3.17
Battle	3,372,880	\$	101	1.01	1.42	52.28	70.63	1.39	0.84	11.13	2.51	9.83	3.29
Extension	610,487	\$	63	1.04	1.23	43.51	48.44	1.56	0.41	4.96	1.75	20.72	3.59
Gap	555,818	\$	140	2.33	2.44	126.68	131.01	1.96	1.07	13.97	11.97	13.82	3.85
HW-Mine	3,308,078	\$	62	1.96	2.20	38.46	42.50	1.46	0.40	4.27	1.87	23.78	3.72
Lynx	240,520	\$	130	3.31	3.31	104.97	104.97	2.05	1.21	11.48	1.25	12.17	3.37
Marshall	589,330	\$	65	2.05	2.05	98.81	98.81	0.57	0.76	5.82	7.19	4.22	3.09
Price	398,799	\$	99	2.26	2.42	74.87	80.83	1.36	1.32	9.44	3.43	9.26	3.27
Ridge-West	415,870	\$	88	2.27	2.27	76.50	76.50	1.05	0.93	8.45	0.90	6.40	3.07
Total MEAS/IND	10,388,446	\$	83	1.66	1.91	56.42	64.86	1.40	0.68	7.75	2.89	14.87	3.43





## **Geological Resource - Inferred by category and zone**

The Inferred Geological Resource is listed below. For In-house purposes, the grades as calculated by Compass are given. For official purposes, the grades are not to be stated. The tonnage is undiluted and recovery factors are NOT included.

		Ge	ological	Invento	y - Inferre	ed -(Jain	uary 2004)	,—,,—,,—, )		يهاكاني المتنبيكا تواك			
FEATURE				INSITU TO	NNES AND	UNDILUT	ED GRADE	· · · · · · · ·					
Mine	TONNES		NSR	AU g/t	AU1 g/t	AG g/t	AG1 g/t	CU %	PB %	ZN %	BA %	FE %	DEN
43-Block	10,664	\$	87	3.35	3.39	69.69	70.40	1.37	2.02	6.72	1.43	15.59	3.44
6-Level	57,327	\$	61	1.76	1.76	102.66	102.66	0.33	0.93	5.92	1.00	9.47	3.13
Battle	33,865	\$	108	1.51	1.52	110.86	111.20	2.18	1.19	9.46	5.59	17.63	3.71
Extension	439,670	\$	56	0.83	1.06	36.18	42.14	1.60	0.35	4.13	0.67	20.77	3.53
HW-Mine	49	\$	49	1.60	1.60	113.90	113.90	0.34	1.56	3.95	2.16	2.14	2.90
Lynx	16,480	\$	83	1.67	1.67	90.15	90.15	0.88	1.26	8.41	1.25	12.50	3.31
Marshall	621,036	\$	49	1.33	1.33	62.81	62.81	0.44	0.51	4.73	5.03	4.83	3.03
Price	554	\$	113	8.94	9.02	129.63	131.99	0.74	1.93	6.10	1.23	9.45	3.17
Ridge-East	326,461	\$	48	0.80	0.80	41.10	41.10	0.70	0.77	4.68	1.33	12.00	3.21
Ridge-West	566,791	\$	62	1.75	1.75	68.37	68.37	0.76	0.66	5.62	0.87	6.38	3.01
Trumpeter	211,440	\$	90	2.44	2.44	57.68	57.68	3.35	.0.29	<u>3.8</u> 5	2.31	16.95	3.42
Total Inferred	2,284,337	\$	59	1.39	1.44	57.45	58.60	1.08	0.57	4.88	2.24	10.84	3.19



# 

## BOLIDEN - WESTMIN CANADA LTD Myra Falls Operation January 2004 Ore Reserves

## **Potential Tonnage**

The Potential Tonnage listed below is what we believe may be available for mining based on current modeling. The grades used are the based on the best available numbers that we have for that area. As a rule these are measured and indicated grades from the areas in question. If these were not available then inferred grades were used. These numbers are NOT to be used in any reports and are for on-site purposes ONLY.

		Pot	ential T	onnage	- Onsite	use only	/ (January	2004)					
FEATURE				INSITU TO	NNES AND	UNDILUT	ED GRADE				ىرىمىي سەرىيە مىيەتلە يىنىڭ رېپىك		,
Mine	TONNES		NSR	AU g/t	AU1 g/t	AG g/t	AG1 g/t	CU %	PB %	ZN %	BA %	FE %	DEN
43-Block	322,254	\$	3	0.10	0.10	10.00	10.00	0.05	0.05	0.10	1.00	11.00	3.06
6-Level	4,613	\$	8	0.10	0.10	14.17	14.17	0.12	0.11	0.66	1.00	11.00	3.07
Battle	118,959	\$	3	0.10	0.10	10.00	10.00	0.05	0.05	0.10	1.00	11.00	3.06
Extension	452,616	\$	3	0.10	0.11	10.09	10.14	0.05	0.05	0.13	1.00	10.96	3.06
Gap	8,667	\$	3	0.10	0.10	10.00	10.00	0.05	0.05	0.10	1.00	11.00	3.06
HW-Mine	5,716	\$	3	0.10	0.10	10.00	10.00	0.05	0.05	0.10	1.00	11.00	3.06
HW-South	268,513	\$	15	0.26	0.26	17.64	17.64	0.45	0.26	0.96	1.00	9.35	3.02
Lynx	760,000	\$	86	2.22	2.22	77.43	77.43	1.26	0.93	7.67	1.00	10.00	3.19
Marshall	4,207,921	\$	18	0.47	0.47	24.94	24.94	0.18	0.19	1.63	2.20	9.02	3.05
Price	1,302	\$	3	0.10	0.10	10.00	10.00	0.05	0.05	0.10	1.00	11.00	3.06
Ridge-East	642,014	\$	45	0.76	0.76	40.20	40.20	0.62	0.69	4.44	1.35	10.38	3.14
Ridge-West	1,132,428	\$	3	0.10	0.10	10.00	10.00	0.05	0.05	0.10	1.00	11.00	3.06
Trumpeter	1,356,867	\$	<i>)</i> 30 (	0.83	0.83	24.03	24.03	1.02	0.13	1.43	1.43	12.78	3.16
Total Potential	9,281,870	\$	, 24 ,	0.60	0.60	26.66	26.66	0.40	0.25	1.93	1.63	10.19	3.08



## BOLIDEN - WESTMIN CANADA LTD Myra Falls Operation January 2004 Ore Reserves Location of Zones: Longitudinal Section



## Location of Zones: Plan View



Confidential

12/08/2004



## **Discussion of Global Reserves (January 2004)**

#### **Geological Inventory**

The Geological Inventory is the sum of all Measured, Indicated, Proven and Probable ore at MFO. It **includes** the undiluted portion of the mining reserve. The Geological Inventory decreased by 1.4 million tonnes to at total of 10.4 million tonnes. The negative change is due to mining, limited diamond drilling, and a more realistic assessment of sterilized ore in the Battle- Gap mining areas. The Extension Zone had the most positive gain in tonnage at 77,500 tonnes. Diamond drill programs and modeling of information by the geology and diamond drill departments are the reasons for the positive change. Similar tonnage was discovered and upgraded in the South Fringe of the H-W deposit, but the gains were readily offset by mining.

Grades for the Geological Inventory remained similar for all elements except for Zn. The average Zn grade has decreased from 8.13% to 7.75% relative to the January 2003 reserve estimate. The decrease is due to mining in the Battle, Gap and H-W mines. The Battle mine saw the largest decrease in grade from 11.72% for the January 2003 estimate to 11.13% for the current estimate.

#### **Inferred Geological Resource**

The Inferred Category lost approximately 194,000 tonnes due mostly to upgrading of resources into the mining reserve for the Extension Zone and the Battle areas. Grades remained the same.

### Ridge Zone East

The Ridge Zone East reserves remain essentially the same as for previous years.

#### Ridge Zone West

Much of the exploration effort in 2001 was centered on the Ridge Zone West. Approximately 6,500 meters of diamond drilling took place. No change to the ore reserve for this past year.



(discussion of Global Reserves continued:)

#### Trumpeter Zone

The reserves for the Trumpeter remain unchanged for 2002. The Price 13 Level drilling which was to test for continuity or extensions of the Trumpeter and 43-Block was halted in the latter part of 2001 because of the temporary suspension in operations at MFO.

#### **Diluted Mining Reserve**

The diluted Mining Reserve currently stands at 7.7 million tonnes at 1.15%Cu and 6.33% Zn. This represents a decrease of 648,000 tonnes compared to the January 2003 diluted mining reserve. During 2003, 1.05 million tonnes were mined. Therefore, an approximate 406,000 tonne differential is attributed to a combination of dilution, an increase in recoveries for the Battle deposit, upgrading of non-recoverable pillars in the H-W, diamond drilling, and adding missing diamond drill holes from a former Price deposit drill program.

Grades for the diluted mining reserve remained similar for all elements except for Zn. The average Zn grade decreased from 6.71% to 6.33% relative to the January 2003 diluted mining reserve estimate due to mining in the Battle, Gap and H-W mines.

The January 2004 diluted mining reserve has an average extraction factor of 65% and an average dilution factor of 29%. There are no significant changes to the average overall extraction and dilution factors relative to the January 2003 mining reserve. Efforts to improve on the external dilution must come from the following issues: ore interpretations, minimizing long hole stopes without overcut development, controlling deviation in longhole production drilling, improving on the quality of the backfill, better tight filling of excavations, and allowing adequate curing times of the backfill before taking out adjacent secondary stopes. The only area of improvement has been the implementation of overcut drifts for long hole stopes in the 43-Block area. The final secondary stopes adjacent to stopes with excessive external dilution from 43-Block is nearing the end. This will help improve dilution issues in 43-Block and other mining areas in the future.

## **Changes in Reserves**

Changes to Geological	Inventory - Mea	asured and Indicated (Jan. 2003 - Jan. 2004)
Area	G.I. Change (tonnes)	Activity during 2003
43-BLOCK Total	(86,934)	Mining-reinterpretation-diamond drilling
6-LEVEL Total	-	N/C
BATTLE Total	(760,434)	Mining; sterilized ore (900 Meds code in model)
EXTENSION Total	77,587	Diamond drilling
GAP Total	(180,987)	Mining; sterilized ore (900 Meds code in model)
HW-MINE Total	(465,458)	Mining-reinterpretation-diamond drilling
LYNX Total	8,000	Eyesworth Zone (Pit-Wall)
LYNX-PIT Total	(40,052)	Mining-Ground Failure (Becherer Zone)
MARSHALL Total	-	N/C
PRICE Total	18,623	Addition of two missing drill holes
RIDGE-WEST Total	-	N/C
Grand Total	(1,429,655)	

Changes to Diluted Mi	ning Reserve - Pi	oven and Pro	bable (Jan. 2003 - Jan. 2004)
Area	M.R. Change (tonnes)	2003 Mining (tonnes)	Comments
43-BLOCK Total	(25,374)	(146,253)	Mining-reinterpretation-diamond drilling
6-LEVEL Total		-	
BATTLE Total	(311,189)	(320,191)	Mining; increase in recoveries for remaining ore
EXTENSION Total	127,337	-	Upgrade due to diamond drilling from 20317Rp
GAP Total	(93,769)	(128,935)	Mining
HW-MINE Total	(301,251)	(452,721)	Mining; S-Zone diamond drilling; pillar recovery upgrades
LYNX Total	(13,604)	•	Eyesworth Zone; 40,000 tonnes downgraded from S-Centre
LYNX-PIT Total	(30,952)	(6,156)	Mining-Ground Failure (Becherer Zone)
MARSHALL Total	- [	-	No Change
PRICE Total	41,429	-	Addition of missing drill holes
RIDGE-WEST Total	(40,785)	-	NSR change
Grand Total	(648,159)	(1,054,256)	



## **Changes in Mining Reserve Dilution**

Mine	Jan-02	Jan-03	Jan-04	Change	Comments
43-Block	14%	35%	29%	-6%	Overcut development and ground support installation
Battle	20%	31%	32%	1%	Basically no change
Extension	17%	33%	31%	-2%	New diamond drill information
Gap	20%	30%	30%	0%	Basically no change
l+w	15%	25%	24%	-1%	Basically no change
Lynx	23%	23%	115%	92%	Inclusion of Eyesworth Zone in the pit
Lynx Pit	84%	30%	0%	-30%	Not included in Jan 2004 report
Price	25%	25%	30%	5%	Realization that 25% dilution is not possible
Ridge West	25%	25%	31%	6%	Realization that 25% dilution is not possible
TOTAL	18%	29%	29%	0%	No change

#### January 2004: Changes to the Mining Reserve - Dilution by Mining Area

The total dilution factor estimate for the January 2004 ore reserve report is 29%. This has no overall change relative to the previous year. The figures used for this report are based on information by area engineers and geologists prior to the global reconciliation exercise. Hence, dilution factors should increase for the Battle, Gap, and HW mining areas for the January 2005 exercise.

The following paragraph is from the January 2003 ore reserve report by F. Bakker:

In the January 2002 Ore Reserve report it was felt that dilution was being controlled better than in the past (and probably was) and as a result the global dilution was decreased to 18%. Mining in 2002 has indicated that the process of controlling dilution slipped as we endeavoured to increase tonnage. As a result dilution numbers were again increased to that of historic levels. That is not to say that we are incapable of decreasing the dilution but rather that we have in fact not done so. As we to continue to improve our methods of ground control it is fully anticipated that dilution numbers will fall to a more acceptable level. Until this is actually done however, it is not felt to be prudent or technically correct to report what we hope to achieve.

(discussion of Global Reserves continued:)

### Trend in Lead Grade

(excerpt from the Myra Falls January 2003 ore reserve report) The undiluted lead grade in the Geological Inventory MUST be addressed. The lead grade of the undiluted Geological Inventory is now 0.68%. Though down from 0.71% Pb for the January 2003 Geological Inventory, the Pb grade has still increased from the January 2001 Geological Inventory grade estimate of 0.59% Pb.

#### Manpower

Manpower reductions in the Geology - Diamond Drill departments and effort towards infrastructure issues have negative impacts on the ability to maintain the Geological Inventory and the Mining Reserves. Up to 5 manmonths for the year was spent on infrastructure issues such as hung ore passes and plugged back fill holes from surface. If the manpower trend is not reversed, it is likely that the mining reserve will be depleted in 5-6 years. This is indicated in attached graph from the January 2003 ore reserve report.





## **Global Reconciliation and Discussion on Dilution**

A year-end global reconciliation compares the computer generated model (Compass) relative to the reported millhead tonnage and grade. The computerized model looked at actual mined out openings as received from survey information (Compass 802 feature code), not conceptual stopes used in the Budget or Plan. The mined out openings within the interpreted ore envelope represent the tonnes of ore sent to the mill as estimated by Compass. This estimated tonnage of ore sent to the mill is compared with the total tonnage of rock sent to the mill. The difference between material reported as ore by the computerized model and the material being sent to the mill is noted as "theoretical dilution" in the following discussion. "Theoretical dilution" is a combination of waste dilution and/or non-modeled ore found during mining. The findings are listed in the table below:

	Jan 2004 Ore Reserves: 2003 MINING - COMPASS MINED OUT (802 Feature code) vs MILL and MUCK DATA											
Compass	calculated or	e mined during 2	003									
MINE	INSITU(802)	TONNES	AU	AG	CU	PB	ZN	FE	COMMENTS			
43-BLK	insitu	119,571	2.16	42.19	1.47	0.45	5.21	12.80	Pb data missingfrom@002			
BATTLE	insitu	215,425	0.99	30.84	1.75	0.42	13.66	14.84				
GAP	insitu	82,912	2.18	134.44	2.36	0.83	14.21	18.13				
[HW	insitu	402,545	2.08	47.22	1.99	0.52	4.60	24.79				
LYNX PIT	insitu	15,000	2.29	124.05	2.14	1.37	11.07	7.63				
		835,453	1.82	52.31	1.89	0.33	8.10	19.54				
Estimato	d recovery to	decian										
MINE	% REC	TONNES	AU	AG	CU -	PB	ZN	FE	COMMENTS			
43-BLK	95%	113,592	2.16	42.19	1.47	0.45	5.21	12.80				
BATTLE	95%	204.654	0.99	30.84	1.75	0.42	13.66	14.84				
GAP	95%	78,766	2.18	134.44	2.36	0.83	14.21	18,13	3			
HW	90%	362.291	2.08	47.22	1.99	0.52	4.60	24.79				
LYNX PIT	20%	3.000	2.29	124.05	2.14	1.37	11.07	7.63	L206B1+Scavenger muck			
	91%	762,303	1.81	51.39	1.89	0.52	8.14	19.57				
-		d anada basad as										
Ineoretic	al dilution an	a grade based on				00	71	Ēć	COMMENTS			
MINE	% DIL	RECON TONNES	AU	AG		PB	<u>2N</u>		COMMENTS			
43-BLK	29%	146,203	1.00	32.77	1.14	0.35	4.00	9.94	Dilution reduced from 2002 due to overcut development and support			
GAR	20%	129 035	1 22	82.13	1.12	0.27	8.68	11 05	Dilution attributed to low grade "incremental" muck and waste-backfill			
UM/	25%	452 721	1.66	37 70	1.50	0.01	3.68	10.83	Dilution due to waste and backfill			
I VNY DIT	105%	6 156	1 12	60.45	1.03	0.67	5 39	3.72	Dilution attributed to poor blasting and caving			
L DAVID	38%	1 054 256	1 31	37 16	1 36	0.37	5.89	14 15	Zn under predicted by 10% attributed to "incremental" muck and waste			
	3070	1,004,200	1.01	01.10	1.00	0.01	0.00		Au and Ag under predicted by 20% relative to the mill			
<u> </u>	L								The are he driver predicted by 20% relative to the mill			
2003 Mill	and Muck Sa	mple Data										
MINE		RECON TONNES	ÂŬ	AG	CU	PB	ŹN	FE	COMMENTS			
43-BLK	muck	146,253	_		1.59	0.41	5.30	13.63	3			
BATTLE	muck	320,191			1.44	0.43	10.92	12.86	5			
GAP	muck	128,935			2.19	0.64	13.62	18.48	3			
нw	muck	452,721			1.60	0.56	4.94	20.97	7			
LYNX PIT	muck	6,156			1.17	0.62	3,58	10.25	5			
TOTAL	Muck (uncut)	1,054,256			1.62	0.51	7.86	17.12	2			
TOTAL	85%	1.054,256			1.38	0.43	6.68	14.55	Historical cut muck grades closely match mill grades			
TOTAL	MILL	1.035.989	1.53	44.12	1.35	0.42	6.50	16.12	2			

(Global reconciliation continued)

#### **Muck vs Mill**

The muck sample program remains consistent with the mill results. Grades cut by a factor of 0.85 closely match the Cu, Pb, and Zn grades reported by the mill. Au and Ag are not analyzed for the muck sample program and hence not discussed.

#### Theoretical diluted Compass Grades vs Mill Grades

As iterated earlier, the "theoretical dilution" is comprised of waste dilution and non-modeled ore found during mining. The theoretical diluted Cu grade of 1.36 % compares favourably with the mill and muck grades of 1.35 % and 1.38 % respectively. The theoretical diluted Compass calculated Pb grade of 0.37 % is within 12 % of the mill grade of 0.42 %.

The theoretical diluted Compass calculated Zn grade of 5.89 % under estimates the mill grade of 6.50 %. This represents a 10% under estimation by the theoretical diluted Compass calculated grade relative to the mill. One likely explanation for the under estimation of Zn is attributed to mining non-modeled ore "found during mining". This material is mined for ore while developing towards stoping areas and is not necessarily designated as ore within the computerized model. However, this explanation does not account for all the "theoretical dilution" comprised of dilution, "ore found by mining", and low grade "incremental" ore.

The diluted Compass calculated Au / Au1 and Ag / Ag1 grades underestimate the realized mill grades by approximately 20%. Because the Au1 and Ag1 grades also underestimate the realized mill grades, missing precious metal assays are only part of the issue towards understanding the shortfall. This is an area of concern that needs to be resolved by more characterization, modeling, and metallurgical work for the precious metals. Anecdotal evidence on limited samples from the QA/QC sampling program alludes to possible nugget effects (see QA/QC section in the appendices).



(Global reconciliation continued)

#### **Theoretical Dilution**

As iterated earlier, the "theoretical dilution" is comprised of waste dilution and non-modeled ore found during mining. The overall estimated theoretical dilution sent to the mill during 2003 is 38%. This is a 5% increase from that reported for the previous year. The following discussion comments on issues for each of the main mining area at Myra Falls.

43 Block theoretical dilution dramatically reduced from 140% for 2002 to an estimate of 29% for 2003. This is due to establishing overcut drill drifts and the installation of proper ground support for the hangingwall flat fault. Excessive waste dilution still occurred within secondary pillars adjacent to stopes with excessive hangingwall cave. The waste dilution created large delays in the mining cycle (eg. K439B2).

The Battle and Gap mining areas had significant increases in theoretical dilution and are now up to an estimated 56% and 64% respectively. This is due to smaller longhole stopes with or without back support and backfill from adjacent stopes. In addition, backfill is a continued concern for drift and fill mining areas as it is often the eulprit for producing poor quality "sticky" muck. Plugged ore passes and possible recovery issues in the mill are concerns resulting from backfill.

As discussed earlier, one component of the dilution is the mining of "incremental" ore within and outside the interpreted orebody. This is done due to convenience. The convenience is based on poor waste handling issues for all areas of the mine as well as mining shortfalls relative to the objectives set out by the scheduled plan and budget. Similar concerns were outlined in the 2002 ore reserve report by F. Bakker.

(Global reconciliation continued)

The majority of the following discussion on "theoretical dilution" and grade prediction is taken directly from the January 2003 ore reserve report by F. Bakker:

It is important that we once again begin to strive for quality rather than quantity of tonnes. The ore bodies (and computerized model) have proven themselves reasonably robust on a yearly/monthly scale to provide the grades when we were able to move them. The surrounding rock has also proven incompetent enough to fail on a grand scale when inadequate ground support is provided and hence easily allow us to meet our "budgeted" dilution.

I would strongly recommend the following:

- 1) Update mapped ore outlines on a more rigorous basis. This includes outlines for non-modeled areas intentionally mined for ore.
- 2) Monthly reconciliation of mined out openings to check grade predictions and more importantly to monitor dilution.
- 3) Try to stick to original design and plan and not to take shortcuts the ground conditions do not allow this to succeed.
- 4) Use Compass to predict grades to the mill and not the Miner's mucks. It should be remembered that the original concept of the muck sample program was to monitor the life of a stope and to flag problem areas. It was never intended to replace grade predictions- either manual or computerized.
- 5) Continue to improve advance knowledge of the ore body through mapping, drilling, detailed interpretations, and thorough metallurgical assessment.

## BOLIDEN - WESTMIN CANADA LTD Myra Falls Operation January 2004 Ore Reserves <u>Incremental Ore</u>

- The nomenclature "challenged" was removed from reserves during the January 2003 ore reserve report and replaced to a large extent with "incremental ore".
- Some of the material in the challenged material was moved into the "incremental ore" category but with a greater rational behind the decision.
- For the most part however these areas are NOT the same BUT the nature of the material remains much the same. In many cases it is pyrite rich material similar to that previously described as "challenged"
- Some of the material is "clastic" as described in 43-Block.
- Incremental Ore was added to the Indicated/Probable portion of Reserves regardless of its original classification.
- Incremental Ore was defined as material >\$35 but <\$45 in the Geological Inventory.
- The cutoff is based on the "incremental" cost of sending material to the mill.

The total incremental mining and milling costs have increased from January 2003 costs by \$6.86 per tonne. Mining costs have increased by \$5.47 per tonne due mostly to increased combined development and stoping costs and an additional expense of equipment leasing. Milling costs increased by \$1.39 per tonne with power consumption and tailings disposal accounting for most of the increase. Overall, the total incremental cost of mining mineralization has increased to the point where approximately half of the resource is questionable. The increases in costs may be offset by the recent increases in metal prices that have not been incorporated for the purposes of this report. The calculation is given below:

## Table of Incremental Mining Costs (January 2004)Mining Costs:

<i>0</i>			
Development:	\$2.98		
Stoping:	\$8.80		
Hoisting and Tramming:	\$0.10		
Truck Haulage:	\$0.22		
U/G Crushing:	\$0.03		
Backfill:	\$2.67		
Shaft Operations:	\$0.27		
Mine Power:	\$1.06		
Mine Mobile Equipment:	\$8.01		
Mine Electrical Equipment:	\$2.75		
Equipment Leasing:	\$1.34		
Total Mine:	\$28.23		
Milling Costs:			
Crushing:	\$0.60		
Grinding:	\$1.52		
Flotation:	\$2.30		
Dewatering:	\$0.47		
Mill Power:	\$1.20		
Tailings Disposal:	\$1.13		
Terminal Trucking:	\$1.68		
Total Mill:	<b>\$8.88</b>		
<b>Total Incremental Cost:</b>	\$37.11		

## **Discussion on the Inclusion of Incremental Ore**

The issue of including "incremental ore" or material previously referred to as "challenged" material in the Mining Reserve is still the subject of much discussion and is referred to in considerable detail in previous reserve statements. None the less it is apparent that the inclusion of this material in a Strategic Plan is not only necessary to maintain production it is also profitable if it is indeed used as incremental ore i.e. supplemental ore and not as the primary source of material for the mill. The majority of the incremental tonnes are found in the HW-Mine and the amount included is listed below.

JANUARY 2004:	Incremental C	Dre	In the G	eologica	I Inventor	у							
Geological Inventory INSITU TONNES AND UNDILUTED GRADE													
Mine	TONNES		NSR	AU g/t	AU1 g/t	AG g/t	AG1 g/t	CU %	PB %	ZN %	BA %	FE %	DEN
43-Block Total	99,300	\$	18	0.40	0.60	10.50	15.90	0.42	0.11	1.37	0.74	5.76	2.90
Battle Total	177,857	\$	40	0.60	0.96	38.17	53.35	0.36	0.49	4.42	1.36	4.22	2.93
EXTENSION Total	40,643	\$	41	0.95	1.17	50.20	65.03	0.51	0.58	3.80	1.34	8.49	3.06
HW-Mine Total	962,511	\$	38	1.61	1.96	12.65	15.62	1.15	0.09	1.77	1.14	30.53	3.98
Grand Total	1,280,311	\$	37	1.36	1.69	17.22	22.45	0.97	0.16	2.17	1.14	24.25	3.65

JANUARY 2004: Incremental Ore in the Diluted Mining Reserve													
Mine	TONNES NSR AU g/t AU 1 g/t AG g/t AG 1 g/t CU % PB % ZN % BA % FE %										DEN		
43-Block Total	78,422	\$	13	0.30	0.44	7.78	11.78	0.31	0.08	1.01	0.55	4.27	2.85
Battle Total	140,376	\$	31	0.48	0.77	31.84	44.50	0.27	0.40	3.40	1.10	3.23	2.87
EXTENSION Total	38,468	\$	31	0.72	0.90	38.32	49.64	0.39	0.44	2.90	1.03	6.48	2.97
HW-Mine Total	727,984	\$	31	1.28	1.57	10.05	12.62	0.93	0.06	1.46	0.97	25.10	3.67
Grand Total	985,249	\$	29	1.06	1.34	14.08	18.54	0.77	0.13	1.76	0.95	19.60	3.42

(Incremental ore continued):

In 2001 approximately 6% of the Geological Inventory tonnes was made up of incremental ore. For the January 2004 ore reserve report, the amount of incremental ore within the Geological Inventory is 1.2 M tonnes (12%) of the overall January 2004 Geological Inventory. This is an increase of 362,000 tonnes (40%) from the January 2003 Geological Inventory. The amount of incremental ore in the January 2004 diluted mining reserve is 985,249 tonnes, or approximately 13%. This represents a 471,000 tonne (91%) increase from the January 2003 diluted mining reserve. The increases are due to changing economic factors as well as the desire to "high grade".

Excerpt from the January 2003 ore reserve report by F. Bakker:

I am quite concerned that if a deliberate planned and scheduled effort is not made to incorporate some of this material in future mining plans, then future economics will dictate that this material must be removed from our Mining Reserve. This would dramatically decrease the life of the HW-Mine. Historically approximately 5% of this material was reported as having been sent to the mill although in many cases this was not deliberate. The incremental material reported however does meet the requirement of "incremental ore" discussed elsewhere.

## Reserves by Area

It is important to note that the Measured- Proven, Indicated-Probable, Inferred-Possible, categories are often used interchangeably.



**Exploration Diamond Drilling:** During 2002 exploration diamond drilling was curtailed. The exploration program was rejuvenated during 2003 with the commissioning of an exploration report. See appendices for "Review of Potential Exploration Targets at MFO" by C. Pearson (2003). This report has 35 exploration targets outlined for assessment. A strategic exploration plan was initiated. R. Sawyer of MFO was named the on-site Exploration Geologist reporting to the Senior Geologist.

Exploration drilling was rejuvenated during 2003 with platforms on Price 13 level. 1,416 feet were drilled from Price 13 Level testing the eastern trend of 43-Block. This program had mechanical issues. The Advance drill had been in storage for more than one year. Maintenance was required to re-commission the drill along with other logistical issues. The drill hole was in progress by year end but the target area had not been achieved.

**Definition Diamond Drilling:** Definition drilling continued during 2003 with 99,927 feet drilled. This compares favourably relative to the 65,731 feet drilled during 2002, but is significantly less than the 167,178 feet drilled during 2001. Approximate equal amounts of core were drilled on the Battle-Gap deposits, the Extension Zone, the H-W and the 43-Block deposits.

**Mine Infrastructure:** 1,695 ft were drilled for hung ore pass and drain hole projects. The 131 and 165 ore passes for the Battle-Gap mining areas. The drilling occurred over a 4 month time frame and required 4 diamond drillers. This work is obviously essential, but also takes away from the main purpose of finding and upgrading ore tonnes to the mining reserve.



## **ORE RESERVES BY AREA: ACTIVE MINING AREAS**

43-Block, Battle-Gap, Extension, H-W

## <u>43-Block</u>

**Diamond drilling:** Definition diamond drilling in 43 Block area used 23-449 ramp as a drill platform and covered the strike length extent as far east as 4500 E. The 23-449 ramp is being extended eastward during 2004 facilitating future definition and exploration diamond drilling east of 4500 E. Drilling from 23-338 ramp was directed towards the gap between K381 and 43 Block west and intersected a zone of semi-massive sulfides associated with mixed volcaniclastic rocks. This assemblage, known as the Track Zone, appears to be plunging to the east, well below the 24 track drift elevation. A follow-up program of diamond drilling from the track drift is planned for 2004.

3,279 feet was cored from 20445XN using the B20 drill. This program targeted the North of 43 Block Trend centered about 4200E / 4070N / 2825m. This program intersected some sulphide bearing mafic breccia and argillite, but did not intersect sulphide mineralization.

Approximately 15,852 ft of definition core was drilled and processed for the 43 Block area. The drill program added approximately 7,700 undiluted new found tonnes to the pre-mining geological inventory. These tonnes are included within the diluted mining reserve. Addition of pending assays upgraded previously discovered tonnes. A total of 1.2 M pre-mining tonnes have been discovered to date for the 43 Block area. Currently the Geological Inventory has approximately 782,700 tonnes of undiluted insitu ore in the measured and indicated categories inventory.

Exploration drilling on the property began during the last quarter of 2003. The drill platform is in Price 13 Level centered about 4675E / 3537N. The program is testing for mineralization and volcanic stratigraphy between the Lynx-Myra-Price horizon and 43-Block. The program is still in progress at time of writing but encountering poor footage output due to inappropriate crewing-scheduling, mechanical issues, and poor ground conditions.

#### 43-block continued:

**Pillar recovery assessment:** A review of previously written-off resources in the 900 feature code category has resulted in an upgrade and increase of approximately 15,000 tonnes into the Not In Mining Reserve resource category (NIMR-899 feature code). The reallocated tonnage is highlighted for future engineering assessment during 2004.

**Mining:** 78,600 tonnes were mined from 43-Block during 2003. The results had a mix of successes for stopes with overcut drifts and ground support, but continued poor results for stopes without overcut access. Dilution for the mining area during 2003 was 29% compared to approximately 140% during 2002. The stopes that did not have tight filling in adjacent stopes and lacked overcut access drifts were K428B1 (20% dilution), K434B1 (59% dilution), and K439B1 (67% dilution). The individual stope dilution is based on unreconciled mucking data. In the case of K439B1, over 15,500 tonnes of waste muck was handled and the stope took approximately 2.5 months to muck. This had a severe impact on the scheduling, manpower allocation, and profitability of the mine production plan. Conversely, K437B1 is a stope with overcut access and appropriate tight fill in the adjacent stopes. This stope was a very successful with 100% recovery to plan and 0% external dilution. This is discussed in further detail in the section "Discussion on Dilution".

**Precious metal grade and recovery:** As discussed during the January 2003 report, concern exists for the precious metal values reported. As part of a cost cutting measure, much of the assaying for gold and silver were either suspended or severely curtailed over the last several years. As stated in the section on global reserves, the area most impacted was 43-Block. It is suspected, but not confirmed, that the positive discrepancy between budget/forecast grade and actual grade may be due in large part to 43-Block. Precious metals were analyzed for only 36% of drill core samples taken prior to 2003. Of those intervals sampled over 1% had gold grades greater than 10 gm / tonne with one sample grading 39 gm / tonne gold!



**Clastic Ore Typical of 43-Block**
**BOLIDEN - WESTMIN CANADA LTD Myra Falls Operation January 2004 Ore Reserves** 4600 200 4200 N --4200 N MFO - 43 Block Deposit Reserve Type Disposition Map **V**r January 2004 – Plan View 4000 N 4000 N THE PARTY OF As Reported by Compass **PROVEN/MEASURED PROBABLE/INDICATED POSSIBLE/INFERRED** POTENTIAL **PROBABLE =Not in Mining Reserve** 3800 N 3800 N GEOLOGICAL INVENTORY AND GEOLOGICAL RESOURCE (January 2004) INSITU TONNES AND UNDILUTED GRADE FEATURE TYPE TONNES AG g/t AG1 g/t PB% ZN % BA% FE% DEN Mine NSR AU g/t AU1 g/t CU % 3.27 MEASURED 632,851 \$ 1.59 0.44 5.38 1.67 13.11 43-Block Total 71 1.93 2.17 37.36 42.91 149,910 \$ 0.78 1.06 18.70 25.53 0.77 0.32 2.62 1.01 7.93 3.01 43-Block Total INDICATED 34 43-Block Total INFERRED 10,664 \$ 87 3.35 3.39 69.69 70.40 1.37 2.02 6.72 1.43 15.59 3.44 43-Block Total 793,425 \$ 1.73 1.97 34.27 40.00 1.43 0.44 4.88 1.54 12.16 3.22 64





43 Block - Track Zone Location Maps: Top – Plan view; Bottom – Longitudinal Section (view north)



Confidential

12/08/2004



# **Battle -Gap**

**Definition Diamond Drilling:** Approximately 29,100 ft was drilled in the Battle-Gap mining area targeting Upper Zone style mineralization. A gain of approximately 121,500 tonnes of sub-economic low grade mineralization was added to the pre-mining geological resource. The drilling generally had poor results except for the M185 and H147 areas. Drilling in the M185 resulted in the development of a longhole stope while in H147 a cut and fill stope has commenced.

At the end of the year there was no core backlog. Definition drilling for 2004 is expected to continue focusing on Upper Zone and Price Formation Contact Zone targets towards the east end of the deposit area.

**Upper Zone grade distribution:** Poor assay results from the drilling has emphasized the complex nature of Upper Zone style mineralization. In order to better understand this mineralization, a geostatistical examination is being carried out by Gunnar Algman of Boliden, Sweden. Results are pending.

**Pillar recovery assessment:** The Battle-Gap mining area is now roughly half-way through its mine-life. Effort towards recovering a portion of currently written-off resources should be considered for assessment.



Confidential





# **Battle-Gap Ore Lens Location Map**



#### Extension Zone (Geology and diagrams submitted by R. Sawyer; MFO Exploration)

**Diamond drilling:** The 2003 drill program was run by the re-established exploration department and focused on the area between 2440 east and 2900 east. Drill platforms were located along the 20-317 ramp and a total of 36,466 ft of core was drilled. Core logged during 2002 and 2003 was modeled during 2003. This work has resulted in 261,000 tonnes upgraded from indicated and inferred resources to the measured and indicated categories. An additional 67,000 tonnes were discovered and added to the pre-mining geological inventory. Sixty thousand tonnes were added to the diluted mining reserve. The 2004 program will fill in the western half of the Extension zone continuing from 2200 east to 2440 east. Follow-up diamond drilling will continue to outline Upper Zone style polymetallic mineralization located in the hangingwall, north of the main mineralization.

**Geology:** The work during 2003 outlined two main zones of mineralization as defined by their position relative to the shallow angle north dipping gouge fault which strikes generally east. The most consistent and higher grade material is located between 2440 east and 2600 east, where the copper rich massive sulfide lenses lie on the hangingwall contact of the flat fault. In addition to the sulfide lenses, one and possibly two, polymetallic zones were intersected. The best polymetallic mineralization defined at this time is situated directly north of the main sulfide ore. It consists of sphalerite – galena – tennantite - chalcopyrite veins and stringers set in rhyolite breccia.

A second set of Upper Zone style polymetallic stringers has been observed near the collars of drill holes located along the west end of 20-317 ramp and out of the sump at 2445 east. Modest zinc values of up to 4% also include significant gold values up to 24 g/t for this mineralized trend.

**Engineering:** A thorough geotechnical/rock mechanics study is strongly recommended based on the poor host rock conditions encountered for the Extension Zone. Planning is required to incorporate new drill drifts for tighter spaced definition drilling, location of main infrastructure, mining method selection, and ground control perspectives.

BOLIDEN - WESTMIN CANADA LTD Myra Falls Operation January 2004 Ore Reserves



Confidential

12/08/2004



Confidential



BOLIDEN - WESTMIN CANADA LTD Myra Falls Operation January 2004 Ore Reserves



**Extension Zone 2485E** 



#### **Extension Zone Section 2580E**



# **H-W Mine**

**Diamond drilling:** The H-W Mine had 5,640 m of diamond drilling on the high grade polymetallic south fringe. The program tested approximately 250 meters of strike length between 3400 E - 3600 E, up-dip towards the Myra deposit. This resulted in the upgrade of 30,000 tonnes from the probable to proven category. An additional 57,000 tonnes of high-grade polymetallic Zn-Pb-Cu-Au-Ag rich lenses have been added to the undiluted geological inventory. This tonnage is currently included within the mining reserve. The ore is narrow with horizontal widths typically between 2.0 to 3.0 meters wide except for an area located immediately south of the 21 Level shop. The ore hody has moderate to steep northerly dip.

**Engineering:** Engineering assessment is pending for the new found south fringe material. Smaller equipment should be considered for this mining area to help minimize dilution. The exception to this would be a stoping area immediately south of the 21 Level mechanical shop where horizontal widths are up to 14 meters wide.

Future diamond drilling in the H-W mine will test the NW and SE corners of the deposit area for both Price Formation Contact Zone and Upper Zone style mineralization.

**Pillar recovery test mining:** Approximately 3,700 tonnes were successfully test-mined from remnant pillars of the old B370 stoping area. Pillar recovery test mining successes in the B370 area during 2003 has resulted in 23,000 tonnes being reallocated back into the mining reserve from previously written-off resources (900 feature code category). A similar approach is being applied to pillars in the BP406 area with minimal tonnes being brought back into the January 2004 reserves. Future resources may be brought back into the mining reserve with the success of test mining during 2004 and the establishment an overall area mine plan for the mining block. Current mining plans are using the naming nomenclature of B406 instead of BP406. This area is still listed as BP406 for consistency in the ore reserve.



#### H-W Mine (continued):

**Pillar recovery assessment:** A review of previously written-off resources in the Compass 900 code category has resulted in an overall increase of approximately 64,000 tonnes into the "Future Lost Tonnes" of the Geological Resource that is NOT included within mining reserve. These tonnes are also known as the "Not-In-Mining-Reserve" resource category (NIMR-Compass 899 code). Approximately 145,000 tonnes of this reallocated NIMR tonnage have been upgraded for the F316-F320 remnant pillars. This reallocated tonnage is highlighted for future engineering assessment based on pillar recovery successes during 2002-2003.

Low grade pyritic ore: Approximately 138,000 tonnes of this material was mined during 2003. Approximately 50,000 incremental low-grade tonnes from the N370 pyrite core of the H-W main lens has been taken out of the mining reserve due to access issues relating to progress from the BP366 pillar retreat. Looking forward, the next low-grade incremental longhole stoping blocks from the pyrite core are N350-N351 with 129,000 tonnes and S335 with approximately 81,000 tonnes. Work is required to properly assess this resource from a mining block NSR perspective otherwise this material could be sterilized as mining progresses. Future in-stope testholes are expected to better refine the BP366-S335 pyrite core pillar retreat.

As iterated in the January 2003 ore reserve report, the greatest concern for the H-W mine is the amount of "incremental ore". There are an estimated 962,500 tonnes of "incremental ore" in the Geological Inventory and approximately 728,000 tonnes in the Mining Reserve for the H-W mine. This represents approximately 30% of the January 2004 mining reserve for the H-W mine. Furthermore, an additional 1.4 million tonnes of economically challenged resource (<\$35 NSR) from the H-W main lens is NOT included within the mining reserve or the geological inventory. More effort must be made to assess the viability of this material into the Life of Mine Plan using stope block specific NSR economic-mining factors as opposed to global factors.

BOLIDEN - WESTMIN CANADA LTD Myra Falls Operation January 2004 Ore Reserves



H-W deposit and North Lens Plan Map: 2003 project areas and 2004 areas for assessment









# ORE RESERVES BY AREA: LYNX-MYRA-PRICE AREAS



# Lynx 5 and 6 Level

There was no drill-related activity in this area last year. The following is from the Myra Falls Operations -January 2003 in-house ore reserve report by F. Bakker. A pre-feasibility study was undertaken by Engineering in 2001 indicating a 1-% rate of return at present metal prices. As such the zone was not upgraded to mineable subject to an increase in metal prices. An access road was started late in 2001 and involved the placement of a bridge. There was considerable interest expressed in mining the Lynx 5-6 with an attempt to create synergies with the clean fill project and a desire to "fill the mill", recognizing the potential impact that any ore not tied to the existing mine infrastructure has on profitability. Mining that occurred in the pit has highlighted the impact of external ore.

# <u>Lynx-Pit</u>

**Stockpiles:** The Lynx area had approximately 6,100 tonnes of ore grade material scavenged from muck berms in the Lynx pit. Pockets of ore grade stockpiles and boulders were located by the tailings dam, on the slope between the Lynx 10 Level north portal and the generator building by the surface crew who referred this information to the Geology department. This material was not within the mining reserve. Therefore, no changes are required to the mining reserve for this work.

**Eyesworth Zone:** Late in 2003 a new potential ore zone was visually identified on one of the lower benches located on the NE wall of the Lynx Pit. Outcroppings of the ore were then sampled and it was determined that there appeared to be sufficient material and grade to be mined economically as supplemental mill feed. While this material did not meet the "indicated" category of reserves in the strictest sense i.e. no diamond drill holes within 30 meters, the visual and sample results along with the decision to mine this material in 2004 resulted in 16,000 tonnes being placed in the Mining Reserve. Results are found in the table below. Plans to mine this zone are pending.

Lynx Pit- Eyesworth Zone Grab samples								
Sample I.D.	Au	Ag	Cu	Pb	Zn	Fe		
	g/t	g/t	%	%	%	%		
19677	1.30	9.80	1.75	0.05	16.5	11.0		
19678	0.80	19.70	2.90	0.30	6.5	15.8		
19679	0.30	5.50	0.35	-	0.4	25.6		
19680	0.50	51.60	3.05	1.70	19.9	17.0		
19681	4.10	105.10	1.75	0.95	14.4	17.1		
19682	8.20	184.00	4.75	0.75	19.3	20.1		
19683	0.30	35.60	5.55	0.05	0.5	25.6		
Average	2.21	58.76	2.87	0.54	11.06	18.89		





#### Lynx Mine

No new work was undertaken in 2003. The following is from the Myra Falls Operations - January 2003 inhouse ore reserve report by F. Bakker. Mipoz Geological Inc. was retained during 2002 to do a study on the proposed surface ramp and the potential for mining and exploration in the Lynx Mine. Portions of the report are incorporated into this reserve. There was some confusion in the terminology used and diluted grades and tonnages were usually reported in the Mipoz Report. Indicated and inferred tonnages were often added. I believe that the confusion arose over the precise purpose of the report. The author of the report in the Mining Potential refers to Indicated and Inferred. Because this is a "Mining Potential", I believe that the Indicated tonnes are in fact Measured. The Inferred tonnage was interpreted to mean that while there is a relatively good geological probability that the ore is there (i.e. drill indicated), there is only a "possibility" that the material can be mined because of engineering constraints. Several areas were also left out of the totals because they were thought to be inaccessible to mining. The pre-feasibility study on the ramp however indicates that these tonnes are in all likelihood recoverable. Therefore these tonnes have also been included. In order to include the tonnes in reserves, it was first necessary to "undilute" them. These are the numbers reported in the Geological Inventory.

In addition to the Mipoz study, approximately 4,000 diamond drill holes previously drilled in the Lynx Mine were entered into Compass during 2002. This allowed a small portion of the Lynx to be modeled and allowed a comparison to the manual numbers used by Mipoz. The results are tabulated below. The contained metal remains the same but the tonnage is higher and the grade is lower when Compass is used. This is in all likelihood due to the "smearing" of data. None the less there is a good correlation. This is particularly true when it is realized that the Lynx traditionally had no recovery factors applied - only dilution. Any additional material mined was usually referred to as "ore found by mining". The net result is that any final "Mining Reserve" numbers would be very close. The Mipoz numbers were used in the Reserves.



Lynx Mine Reserves – M	ipoz 2002 vs Medsystem (	(Compass) comparison
------------------------	--------------------------	----------------------

res-type	I-section	TONNES		NSR	AU	AG	CU	РВ	ZN	BA	FE	DEN
medsystem no.	2150	298	\$	148	2.0	98.8	2.73	0.87	9.46	1.00	11.00	3.27
mipoz-numbers	2150	500	\$	290	3.1	178.3	6.80	1.40	15.70	<u> </u>	•	3.00
medsystem no.	2200	5,478	\$	135	2.5	92.4	2.41	1.02	8.41	1.09	10.07	3.22
mipoz-numbers	2200	3,000	\$	168	3.6	125.7	2.15	1.12	12.03	-	<u> </u>	2.91
medsystem no.	2250	2,850	\$	123	1.6	87.4	1.37	1.08	9.95	1.61	12.21	3.34
mipoz-numbers	2250	1,500	\$	98	0.8	76.8	0.87	1.00	8.55	-	-	2.85
medsystem no.	2300	8,889	\$	98	1.4	68.9	1.01	0.77	8.06	1.53	11.95	3.28
mipoz-numbers	2300	<u>6,5</u> 00	\$	104	1.4	80.1	1.11	0.76	8.43	-	-	2.84
medsystem no.	2350	4,293	\$	134	2.7	116.2	1.32	1.01	10.46	1.00	11.00	3.28
mipoz-numbers	2350	4,300	\$	<u> </u>	3.8	<u> </u>	1.61	1.21	13.76	-	-	2.93
medsystem no.	2400	3,336	\$	161	2.9	132.3	1.69	1.56	12.63	1.00	11.00	3.35
mipoz-numbers	2400	4,000	\$	119	1.3	87.4	<u> </u>	1.33	<u>· 9.20</u>	-	<u> </u>	2.87
medsystem no.	2450	2,107	\$	143	1.7	130.5	1.43	1.49	11.62	1.00	11.00	3.32
mipoz-numbers	2450	2,800	\$	187	1.7	122.4	<u> </u>	1.86	15.83	-	-	2.99
medsystem no.	2500	2,781	\$	109	1.9	90.1	1.31	1.01	8.16	1.00	11.00	3.24
mipoz-numbers	2500	2,000	\$	220	2.4	<u> </u>	2.30	1.60	18.70	•		3.03
medsystem no.	2550	4,031	\$	105	2.5	131.7	1.53	1.26	6.38	1.00	11.00	3.21
mipoz-numbers	2550	1,500	\$	<u>15</u> 6	3.8	141.7	2.63	1.97	9.67		•	2.89
medsystem no.	2600	3,696	\$	96	1.9	86.2	1.46	0.92	6.24	1.00	11.00	3.20
mipoz-numbers	2600	4,500	\$	142	2.4	78.9	2.70	0.73	8.83			2.85
medsystem no.	2650	5,937	\$	133	2.0	88.9	1.80	1.15	9.92	1.00	11.00	3.28
mipoz-numbers	2650	<u> </u>	\$	177	3.6	<u> </u>	2.87	1.10	11.56			2.90
medsystem no.	2700	4,974	\$	103	1.3	74.1	1.29	0.88	8.01	1.00	11.00	3.23
mipoz-numbers	2700	2,500	\$	<u>    18</u> 2	3.7	134.7	2.44	1.44	12.89		•	2.93
medsystem no.	2750	1,424	\$	94	1.2	73.4	1.13	0.85	7.28	1.00	11.00	3.21
mipoz-numbers	27/50	1,500	\$	79	0.8	30.8	0.90	0.60	7.00		-	2.81
total meds-model	<u></u>	50.094		119	2.0	94.1	1.50	1.04	8.80	1.14	11.14	3.26
total minoz number	rs	40,100	ŝ	152	2.5	108.0	2.02	1.15	11.22	•	•	2.90
term import intimos			<del>_</del>							**********		
total metal				NSR	AU	AG	CU	PB	ZN			
meds-model Total			5,	945,482	98,356	4,713,251	75,087	52,077	440,994			
mipoz-numbers To	tal		6.	095,917	98,700	4,329,210	80,850	46,200	449,830			



# **Myra Mine**

The following is from the Myra Falls Operations - January 2003 in-house ore reserve report by F. Bakker. The Myra Mine was officially closed in 1985 and was deemed mined out. In 2000, most of the diamond drill information was computerized. Time constraints did not allow analysis of the data, but did highlight some elevated precious metal grades that existed in the deposit. A site visit of the mine during 2001 indicated that while access is still available in many areas of the mine considerable rehab would be necessary before any meaningful work could be undertaken. It is recommended that more detailed data analysis take place before any thoughts are given to a physical presence underground.

Work by C. Pearson, former Chief Geologist of Myra Falls, during 2003 has indicated positive exploration potential for the Myra deposit area. See the report "Review of Potential Exploration Targets at MFO (Pearson, 2003) in the appendices.



(Price Mine continued): **Price Mine diamond drilling - January 2004** Definition drilling was not undertaken in 2003.

#### Price Deposit - 2003 MFO Ore Reserve Report (Bakker, 2003) excerpt

The description of the Price deposit given below was first presented in the 2002 Reserves. With the exception of the 18,000 tonne increase in the Geological Inventory (and subsequent Mining Reserve and Mineral Resource), the text is still valid.

The Price Deposit is a group of east-west striking polymetallic sulfide lenses located in the eastern part of the Myra Falls property primarily between 4700E and 5300E and centered roughly at 3400N. These deposits are accessed from Thelwood Valley via the 4 and 5 Levels drifts.

(Price Deposit continued):

#### **Price Deposit History**

The Price surface showing, in a creek near the current 4 and 5 Level adits, was one of the first documented massive sulfide showings in what would become the Myra Falls property. A 1930 report by Gunning of the Geological Survey of Canada documents this occurrence. It wasn't until the 1970s that this prospect received serious exploration consideration when Westmin Resources conducted a surface-drilling program over several years. This drilling was successful in outlining steeply dipping, strongly altered volcanic rocks along a strike length of over 500m which hosted numerous high-grade polymetallic massive sulfide intersections. The positive results of the surface drilling program led to the decision in the early 1980s to drive the 4 and 5 Level drifts in an effort to better define the lenses and prepare them for possible future mining. Definition drilling was carried out and a preliminary feasibility study was completed, but no decision was made to mine the deposits at that time.

In 2000 the decision was made to take another look at the Price Deposit as a viable ore source. The 4 Level portal was rehabilitated and an underground drilling program was conducted with the goal of filling in some gaps in the original drilling and to retest some of the previously defined lenses. Some of this new information was incorporated into the 2001 ore reserves. This 4 Level drill program was completed in 2001.

The 2002 inventory represented a lower total tonnage than previous calculations, but the overall grade is higher. This is due to the more detailed and more tightly constrained interpretations of the orebodies that were completed during that year. Although the inventory has been calculated as measured/indicated all of this has been downgraded to indicated for the 2002-2004 reserves.

#### **Price Deposit Geology**

The Price Deposit has been subdivided into three spatially continuous and distinct zones: the Main, North and South Zones. The calculated resources of each of these zones are summarized in the table below. The three zones are roughly parallel, are steeply dipping and tend to have the same approximate elevation to each other in all areas. The Price lenses can, however, be divided into two domains based on elevation: 1) a lower elevation western



domain in which the Main, North and South lenses lie almost completely below 4 Level and 2) a larger, slightly higher elevation eastern domain in which the greater part of the three zones lies mostly above 4 Level. The elevation change is due to a NE-trending, NW-dipping fault, analogous to the Myra Price Fault, that was mapped by Jack Hamilton in the 4 Level drift.

#### **Price Main Zone**

The Main Zone is the thickest and most continuous of the Price Lenses and therefore constitutes the bulk of the geological inventory as indicated in the table above. This zone comprises massive and semi-massive sulfides hosted by strongly quartz-sericite altered and often steeply foliated fine to coarse-grained volcaniclastics. In places such as around section 4980E the mineralization has been cut by fresh, near vertical feldspar porphyry dikes. The western, lower elevation portion of the Main Zone tends to be thicker in cross-section with less dip length, whereas the eastern portions are thinner and elongate down-dip.

#### **Price North Zone**

The North Zone is divided into two sub-zones that are located from 4750E-4860E and from 4940E-5165E. The North Zone mineralization parallels the Main Zone and is geologically similar to it, except that in places it is be in contact with "purple and green" mafic-dacite volcaniclastic rocks to the north.

#### **Price South Zone**

The South Zone is an intriguing area of mineralization that is confined almost entirely to the area from 4735E-4875E. It too parallels the Main Lens to the south. It is a thin, but fairly continuous zone of massive to semi-massive sulfides that locally show remarkably high grades, especially Au, Ag and Pb. It is generally in sharp contact to the south with fresh, "purple and green" mafic-dacite volcaniclastic rocks and with the strongly altered volcaniclastics to the north. It is thought that the South Zone occupies a slightly higher stratigraphic position to the Main and North Zones.







ORE RESERVES BY AREA: MFO West- Marshall, Ridge East and Ridge West Deposits



# Marshall Zone

No exploration drilling has taken place since 2001. Hence the numbers remain unchanged. Development drifting towards the Marshall Zone trend from 24 Level commenced during the last quarter of 2003. The purpose of this drift is to provide an initial exploration diamond drill platform providing access to the untested eastern trend.




# **Ridge Zone East**



No work towards diamond drilling or developing the Ridge Zone East was performed during 2003. Currently, the Ridge Zone East is believed to be the western extension of the Gap and Upper Zones of the Battle deposit area.

# **<u>Ridge Zone West</u>**



Confidential





#### Ridge Zone West - 2003 Reserves - Discussion

#### **RZW Central Block**

The January 2001 reserve included resources from a 100-meter strike length centered about 0+00 East. Continued geological interpretation and computerized modeling during the remainder of 2001 for the *entire* Ridge Zone West area has further increased our confidence level of the geological data to a current 205 meter strike length centered about 0+00 East.

The measured and indicated geological resource within the Central Block between -105 East and +100 East has been included in the January 2002 reserve improving the overall tonnage from 212,482 tonnes to 415,870 tonnes at slightly decreased grades. This is an increase of 203,388 tonnes for this block from January 2001.

#### **RZW Western Block**

Diamond drilling during 2001 from Lynx 10 level extended and improved the potential geological resource of the Ridge Zone West a further 175 metres westward of previous drilling. The new mineralization on -250 East from Lx10-2054 is a polymetallic massive sulfide intersection on the same geological horizon as the known Ridge Zone West. See the table below for the intersection length and grades. This new Inferred Geological Resource however will *not be reported* until more significant intersections verify the continuity that is believed to exist.

Section -250 E	Length	Au	Ag	Cu	Pb	Zn	Fe
	(m)	g/t	g/t	%	%	%	%
Lx10-2054	9.0	2.5	207.7	1.5	1.6	13.0	6.2



#### **RZW Eastern Block**

Diamond drilling on 375 East did not intersect any new massive sulfides but has aided in the overall geological understanding of the Ridge Zone West area. Reassessment of the geological interpretation and computer modeling of the multiple stacked lenses within the area has made for increases in the mineral inventory for this block. All categories have been allocated to the Inferred Geological Resource but will *not be reported* until further diamond drilling can better confirm the continuity and grades of the various lenses outlined.

#### **RZW North Zone Inventory**

Mineralization north of the main Ridge Zone West trend has been outlined for the purpose of future diamond drill targets. The mineralization is typically low grade with occasional spotty higher-grade intervals. All categories from this area will *not be reported* in this reserve.



**ORE RESERVES BY AREA: H-W SOUTH AND TRUMPETER DEPOSITS** 

**BOLIDEN - WESTMIN CANADA LTD Myra Falls Operation January 2004 Ore Reserves Trumpeter Zone** MFO – Trumpeter Zone Reserve Type Disposition Map January 2004 - Plan View As Reported by Compass PROVEN/MEASURED PROBABLE/INDICATED POSSIBLE/INFERRED POTENTIAL 38,00 N PROBABLE =Not in Mining Reserve GEOLOGICAL INVENTORY AND GEOLOGICAL RESOURCE (January 2004) FEATURE TYPE INSITU TONNES AND UNDILUTED GRADE TONNES NSR AU1 a/t AG g/t AG1 g/t CU % PB % **ZN %** BA % FE % DEN Mine AU g/t TRUMPETER Total MEASURED 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 TRUMPETER Total INDICATED 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 TRUMPETER Total INFERRED 16.95 211,440 \$ 90 2.44 2.44 57.68 57.68 3.35 0.29 3.85 2.31 3.42 TRUMPETER Total 2.44 2.44 57.68 57.68 3.35 3.42 211.440 0.29 3.85 2.31 16.95 90

No activity occurred on the Trumpeter Zone during 2003.



Examining old drill records indicates the possibility of an ore lens located up dip and south of the HW Deposit. A potential tonnage was included in reserves. Further work in early 2003 has also highlighted additional drilling that may confirm the possible existence of this lens. See the report "Review of Potential Exploration Targets at MFO (Pearson, 2003) in the appendices.

Confidential

# **Clean Fill**

#### Submitted by S. Campbell - Myra Falls project engineer (January 2004)

As per Section 10(1) of the Mines Act, clean fill (non-acid generating) must be identified at Myra Falls Operation. The use of the clean fill material is for various legislated construction projects currently underway at MFO. The material for the projects (including clean fill) are required for the seismic upgrade of the tailings disposal facility, the new Lynx paste tailings disposal facility and for reclamation purposes. The clean fill source areas identified fall within the mining leases and crown grants at MFO. The details of each area can be found in the report "Application to Develop Clean Fill Borrow Sites at Myra Falls Operations" by Gavin Dirom; March, 2004.

Clean Fill Area Volumes									
Lecetion	Volume (millions m <sup>3</sup> )								
East Borrow	0.9								
Cookhouse North	0.3								
West Borrow	0.1								
Lynx Switchback	0.2								
Mill Area	0.3								
Cookhouse South	0.4								
Total	2.2								

It is to be noted that clean fill has been conditionally identified in Thelwood Valley (estimated volume greater than 8 million m<sup>3</sup>). A prior report commissioned by Myra Falls during October, 2001 entitled "Surficial Clean Fill Resource Evaluation, Myra Valley - Emphasis on the Area Around the Lynx Open Pit" by Mipoz Geological Inc. outlined a total volume of 1.2 M m<sup>3</sup>. Compared to the current clean fill inventory, there has been a volume increase of approximately 1.0 M m<sup>3</sup> towards the clean fill inventory. This increase is based on additional resources from the following areas: the Mill, the Cookhouse North, the Cookhouse South and the Lynx Switchback area.



# Areas of Concern for Ore Reserves at Myra Falls

Issues concerning the ore reserves at Myra Falls include:

- Deciding on, and implementing a proper database for diamond drill data. There are over 10,000 drill holes currently in electronic format. Future drill holes and historical data from the Myra-Lynx mines are pending.
- A profitability model as alluded to by comments Gunnar Agmalm (see comments below).
- The issue of the ever increasing lead in the head grades MUST be addressed by the Mill Department.
- The possibility of producing a gold rich pyrite concentrate would have a very positive impact on reserves.
- Better consistency relative to maintaining and archiving hard copies of diamond drill logs, plans, and sections.
- "Theoretical dilution" comprised of waste and non-modeled ore" appears to have increased this past year to a point whereby over 3 months of equivalent production is comprised of this material. This needs to be better accommodated for in the ore reserve, planning and budgeting processes.
- Even though the mining and milling costs have increased, the amount of incremental ore within the Geological Inventory and the diluted Mining Reserve has also increased. The amount of incremental ore in the diluted mining reserve is up to 0.9 M tonnes. If the incremental mining and milling costs continue to rise, much of this material will have to be written off.

#### The following are *excerpts* from a memo by Gunnar Agmalm, Project Engineer Dept. of Ore Reserves and Project Evaluation, Boliden Mineral AB, dated June 25<sup>th</sup>, 2001 Regarding: Ore reserve issues at Myra Falls.

#### Some of the issues that he highlighted are being addressed; others still need considerable work.

- NSR values and mining costs for different ore bodies and mining methods should be revised.
- Model parameters for grade modeling should be updated.
- Reconciliation data should regularly be assembled and compared with model grades.
- The amount of definition drilling requires very rapid core logging. Selected cross sections, every 45-60 meter, must however be logged more detailed to enable good geological interpretations in these sections. More detailed logging is also required in new ore bodies until the geological conditions are known.

- The ore reserve definitions requires geological and grade continuity. To be able to show geological continuity and also to understand the ores geological interpretations in sections are required. These are currently not regularly made. Geological interpretations should at least be made every 45 60m. Exploration knowledge should be used and perhaps also exploration geologists can be involved in preparing these sections.
- NSR and Costs
- For the ore reserve estimation one NSR value and one cost is used in Myra Falls.
- Mill test should verify the use of one NSR for the different ore types or if necessary give 2-3 different values for different ore types. Before a new ore body can be included in the ore reserve mill tests must be made unless the geology and mineralogy is similar to other ore bodies and the same recoveries can be expected.
- The NSR value of CAD 45 does not reflect the costs for different mining methods and ore types. Three costs should be estimated for each mining method and ore body:
- Marginal cost: Direct mining, milling, transportation and selling cost for each ton. Includes costs for drilling, blasting, depreciation on mining equipment etc. but not overhead and development costs (marginal cut-off cost).
- Direct cost: All marginal costs plus development costs that can be directly related to a single mining stope and mine site overhead costs. Development in infrastructure and depreciation on buildings etc. should not be included (cut-off cost).
- Total cost: All costs expressed as a cost per ton.
- To include an area or ore body in the reserve:
- The model parameters are 10 years old and based mainly on data from HW main ore body. They are not relevant to other geological situations mined today and must be updated.
- Reserve and resource classification
- A lot of reconciliation is made on the mine but the numbers are not put together and compared with the model. Reconciliation for the ore reserve should include:
  - Planned: Outline from mine plan. Grades and tonnes from model.
  - Mined: Grades and tonnes from truck loads and muck samples.
  - Mined from model: Outline from surveying. Grades and tonnage from model. Dilution from surveying compared with model.



# **Proposed Claim/Land Exchange**



During 2002 a discussion on the possibility of a "land swap" with B.C. Parks occurred. Shown above is the proposed exchange of land. Note: This was for discussion purposes ONLY - **no formal** request was made.

# 

## BOLIDEN - WESTMIN CANADA LTD Myra Falls Operation January 2004 Ore Reserves

# Socio-Economic Impact Statement (Historical study)

The Myra Falls Operations has an economic impact spreading far beyond the minesite. A May 1997 study by economic consultants Will McKay and Co. Ltd. estimated that in 1996 Myra Falls Operations generated \$45.7 million in income and created 1,085 jobs within the Comox-Strathcona Regional District (CSRD).

The \$45.7 million in income was made up of \$27.5 million wages, pensions and dividends to our employees, retirees and local shareholders (direct income) and \$12.4 million by the income component of local purchases of our suppliers and employees (induced income). Working this backward it means that every \$1.00 of direct income from the mine generates \$1.68 in total regional income.

Applying provincial and national income multipliers of 2.5 and 3.0 respectively which are appropriate for the mining industry, means that there is an additional \$18 million of income generated elsewhere in the province and an additional \$15.2 million nationally for a total of \$78.9 million of income generated in Canada.

The employment impact works somewhat the same way. At the end of March 1998 there were 434 employees at Myra Falls (direct employment). Employment of our suppliers and contractors in the region is estimated at 165 (indirect employment) and the spending of our employees and suppliers/contractors results in an additional 492 jobs in the region (induced employment). This comes to a total of 1,085 jobs, which means each direct job generates 2.50 total jobs for the region.

The total employment generated by the mine accounts for roughly 3 percent of the jobs in the CSRD. In Campbell River, which is the residence of approximately 80 percent of Myra Falls employees and the source of most of the local purchases, the relative importance of the mine is more than double that for the CRSD. Over seven percent of total employment in Campbell River result from Myra Falls Operations activities. Another local benefit is the annual lease payment to the Campbell River Indian Band, which owns the land where Discovery Terminal stands.

#### Confidential



# **Compass (Medsystem) / Minesight**

Compass/Minesight is a commercial 3-D Block Modeling program available from Mintec Inc. which is based out of Tucson Arizona USA, with branch offices in Canada, Peru, Chile, South Africa and affiliates in Australia. MFO currently has 1 Network License (NET-103) and 2 Key Licenses (EM-336 and EM-337)

Compass has been used in various stages at MFO since 1988 and has been verified by a number of in-house tests as well as through outside consultants such as MRDI, CESL Engineering, Noranda, Wrigglesworth and Assoc., Winters Group, Derry, Michener, Booth and Wahl.

Compass employs a search ellipse of 25 meters N-S, 50 meters E-W and 15 meters vertical. This search ellipse was not varied to accommodate different structural controls of the various ore bodies. Inverse cubed was used as the weighting factor for drill holes. Kriging was not used. Compass honors the geological lens code and does not expand the model beyond those determined by the geologist. It also will not use material from one lens code to calculate grades for another, unless specifically requested to do so.

Compass calculates reserves based on proximity to the nearest diamond drill hole. Measured (Proven) is material within 15 meters, Probable (Indicated) is material between 15 and 30 meters, Possible (Inferred) is material between 30 and 50 meters and Potential is material greater than 50 meters from the nearest drill hole. These results are then tabulated by lens, zone or area. These categories are then often downgraded to more closely reflect the various resource categories as outlined in MFO standards that are based on National Policy 2A and the new TSE standards. These standards are attached. As a rule, areas that do not have access or are not currently being mined are downgraded to Indicated/Probable. Depending on the degree of confidence in the area, Indicated/Probable may then also be downgraded to Inferred and so on.

Compass does not take in account the contained metal content of the lens and all material that is delineated according to the lens outline as determined by the geologist is reported. Areas are then looked at, as a whole and if the entire area (zone, stope etc.) has a contained metal value of less than \$45 NSR, this material is removed from reserve calculations and placed in the old "Resource" category, now referred to as "Incremental or Economically Challenged". Portions of these "Incremental tonnes" may then be added to the Indicated portion of the reserve if they meet the minimum economic requirements of \$35, which is felt to be variable cost of mining. Traditionally this generally applied only to areas in the HW Mine. More recently however as mining and drilling has expanded in the Battle, Gap and Extension, some of these areas have also been removed from the Geological Inventory.



The Block Model is based on a 5x5x4 (vertical) block size. Each block contains the calculated metal value for that block, density, percentage of the block that is ore, percentage that has been mined out and the percentage that has been "removed" from reserves. It also contains the "r-type" i.e. proven probable etc. classification of the ore. In cases where two lenses overlap, it carries the values of the material, which is in majority.

# BOLIDEN - WESTMIN CANADA LTD Myra Falls Operation January 2004 Ore Reserves Budget and Long Term Prices Used

These values were forwarded from the Myra Falls accounting department. For the purposes of this report, the Budget values were used.

Assumptions forecast 2003	and budget 20	04			_
					Comments
METAL PRICES		FC oct-dec 2003	SHORT-TERM Bu 2004	LONGTERM	
Copper	c/lb	82.0	83.0	90.72	<u> </u>
Coppo.	USD/t	1808	1830	2000.00	
Zinc	c/lb	39.0	42.0	49.90	
	USD/t	860	926	1100.00	
Lead	c/lb	23.0	23.0		
	USD/t	507	507		
Gold	USD/oz	370	350	280.00	
Silver	USD/oz	5.00	5.00	5.00	
Palladium	USD/oz	200	225		
Platinum	USD/oz	700	630		
TC/RC					
Cu TC/RC (long term contract)	USD/t : Usc/lb		46 / 4.6	88 / 8.8	Benchmark for year 2004
Cu TC/RC (spot contract)	USD/t : Usc/lb		25 / 2.5		Benchmark for year 2004
Zn TC	USD/t		139 / 926	190 / 1100	
(basis 1 000)	USD/t		150.6 / 1000		
Conc grade			54.5%		
Smelter charge			32.5%		
РЬ ТС	USD/t		133 / 507		
Conc grade			60.0%		
Smelter charge			46.0%		
Freight				37.00	I
EXCHANGE RATES					
USD/SEK		8.18	8.27		
CAD/SEK		5.92	5.71		
EUR/SEK		9.00	9.10		
NOK/SEK			1.10		
USD/CAD		1.38	1.45	1.45	•
EUR/USD		1.10	1.10		
Other cross rates can be derived	l from the above nu	mbers			
OTHER					
Inflation			2%		All countries

# **Calculation of NSR Values**

Oboliden					MYRA FALLS (	OPERATION	IMMARY SHEET						
HEAD	GRADES	COPPE	R CONCENTR	ATE	I	ZINC CONCEN	TRATE		1	KNELSON	CONCENTRATE		
COLUMN DE LE COLUM	Conversion of the second	GRADE	1990代的包括18	RECOVERY	GRAD	ENAN	RECO	VERY	GRA	DE V	RECOV	ERY	
(metal)	(grade)	(melel)	(grede)	(metal)	(metal)	(grade)	(metal)	(%)	(metal)	(grade)	(metal)	(%)	
Copper (Cu %) Zinc (Zn %) Lead (Pb %) Gold (Au %) Silver (Ag %)	1.44% 6.59% 0.51% 1.45 46.82	4% CU (dmt conc./mt ore) 0.0436 O   9% Copper (Cu %) 26.00% 0   1% Zinc (Zn %) 6.65% 6.87%   45 Lead (Pb %) 6.87% 6.87%   82 Arsenic (As %) 0.65% Antimony (Sb %) 0.04%   Gold (Au g/mt) 9.22 Silver (Ag g/mt) 512.61		Copper (Cu %) Zinc (Zn %) Lead (Pb %) Gold (Au %) Silver (Ag %)	r (Cu %) ZN (dmt conc./mt ore) \$ 0,11 ;(Zn %) Zinc (Zn %) \$ 0.55 (Pb %) Iron (Fe %) \$ 0.07 i (Au %) Arsenic (As %) \$ 0.00 (Ag %) Cadmium (Cd %) \$ 0.00 Gold (Au g/m) \$ 2,73 Silver (Ag g/m!) \$ 100.49			Zinc (2n %) 91.05% Copper (2u %) 13.20% Lead (Pb %) 37.87% Gold (Au %) 20.74% Silver (Ag %) 23.63%		10000 2500	(kg conc./mt ore) Gold (Au %) Silver (Ag %)	0.0093 6.44% 0.05%	
	000050	0010	CHITDATE TEE			CONICENTRAT	TEDUC	1.000		CONCENT	TDATE TEDMS		
META	L PRICES	CUNC	ENTRATE TER	MS		Matel Dedu				Metal	Deductions	Verties Provident	
Copper (US\$/lb) Zinc (US\$/lb) Silver (US\$/oz Gold (US\$/oz Cdn\$/JS\$F/	) \$0.91 ) \$0.50 ) \$5.00 ) \$280.00 < \$1.45	Copper Metal Unit Deduc Gold Payable Silver Payable	lion	1.00 96.50% 93.00%	Zinc Metal Unit Deduction Zinc Metal Unit Deduction Gold Payable (less 1.0 gr Silver Payable	( < 53.33% zn ) > 53.33% zn mt.pay 65%)	8.0 8.1 0.4 0.0	0 8 12 0%	Gold Payable <100 Gold Payable >100 Silver Payable >20 Silver Payable <20	000 G/MT 000 G/MT 000 G/MT 000 G/MT	98.5( 99.0) 95.0) 94.0)	)% )% )%	
Cadmium (\$US/LB	\$0.00	Treetma	int, Refining & F	reight		Treatment Relini	ng & Freight	a the second second	e festivas no registantes	Treatment	Refining & Freight	A Statistic Alles	
-		TC US\$/dmt copper conc Rc US\$/db payable copp RC US\$/oz payable gold Rc US\$/oz payable silve FrU S\$/dmt copper conc Cu PP Base Price Cu PP 4/-% participation Pb - 2n Penalty US\$/dmt Pb - 2n Penalty US\$/dmt As + Sb Penalty US\$/dmt	entrate er entrate > 4% > 6% > 0.1375%	\$88.00 \$0.088 \$7.00 \$0.50 \$37.00 \$0.90 10% \$3.00 \$4.00 \$3.00	TC US\$/dmt zinc concent Zn PP Base Price Zn TC Escelator 1 Zn TC De-escelator Zn TC Escelator 2 Frt US\$/dmt zinc concent Fe Penalty US\$/dmt > 8.0 As Penalty US\$/dmt > 0.0	rate 1% 75%	\$19( \$0.4 16 16 537 \$1. \$2.	0.00 990 % % % .00 50	TC US\$/kg Knelso Transportation US Refining Gold U Silver U	n conc. \$/kg conc. S\$/oz JS\$/oz	\$0. \$0 \$6. \$0.	0 3 0 0	
		NET SMELTER RETUR	N & PRODUCT	ION DEDUCTIONS			1		-A.				
Copper Zinc Gold	\$41.76 \$41.76 \$105.12 \$18.93		Cu Concentr Copper Gold P	ate Treatment & Tran ate Treatment Charge Refining Charges efining Charges	\$5.56 \$3.07 \$0.13	CS/mtone		CONT	RIBUTION TO NSP	VALUE			
Silver	\$10.91	\$176.72	Silver F Copper I Cu Concentr	Refining Charges Price Participation ate - Pb+Zn Penalties	\$0.48 \$0.03 \$2.28			Overall	74.40	100.00			
Mill Metallurgi	cal Process Losses		Cu Concentr Zn Concentr	ate - As+Sb Penalties ate Treatment Charge	\$1.05 \$30.33			Copper Conc	26.59	35.74			
Zinc Gold	\$0.00 \$9.41 \$8.54		Zn Concentrate - Fe Penalty Zn Concentrate - As Penalty Ocean Freight & Transportation		\$0.00 \$0.10 \$8.25			Knelson		1.59			
Silver	\$3.12	(\$29.95)	Au Concentre	te Treatment Charges	\$0.03 <b>\$(51.30)</b>		2						
Smelter Metal Deduct	ions		3				1	Model Update	d: January 8, 2004	by G. Locke			
Copper Zinc Gold Silver	\$1.26 \$14.36 \$2.51 \$2.94	(\$21.08)	Net Smelter	Return (C\$/mt ore F	OB Campbell River)	\$ 74.40		Using 2004 Bu	dget Production, I	Prices & Term	S		

# Value of Ore



From January 2003 Ore reserve report (Bakker, 2003)



From January 2003 Ore reserve report (Bakker, 2003)

# **BOLIDEN - WESTMIN CANADA LTD Myra Falls Operation** January 2004 Ore Reserves **Metallurgical Report for 2003**

BOLIDEN WESTMIN LIMITED

Ōb	olide	en		I		A FALLS OPERA	N LIMITE	D						
Boliden We	stmin Lim	ited		December (	Adjusted)	200	3	Year To Date						
Myra Falls Operations					Varia	nce			Varia	nce				
			Actual	Budget	Amount	Percent	Actual	Budget	Amount	Percent				
MILL FEED	Tonnes		mt	65,502	95,207	(29 705)	(31 20)	1,035,989	1,152,002	(116,013)	(10.0			
	Tonnes /	day	mt/d	2,113	3,174	(1.060.60)	(33.42)	2,906	3,165	(258 84)	181			
	Grade	Au	g/mt	1.80	1.29	0.51	39.84	1.53	1.45	0.08	5.2			
3		Ag	g/mt	60.99	34.12	26.87	78.74	44.12	40.85	3.27	8.0			
		Cu	%	1.36	1.26	0.10	7.94	1.35	1.27	0.08	5.9			
		Pb	%	0.30	0.50	(0.20)	(40.00)	0.42	0.48	(0.06)	(12.4			
		Zn	%	6.33	7.08	(0 75)	(10.59)	6.50	7.35	(0.86)	(116			
		Fe	%	16.85	10.25	6.60	64.39	16.12	13.17	2.95	22.3			
Eoliden Weel Myra Falls Of MILL FEED Cu CONC	Tonnes		mt	2,258	3,571	(1,313)	(36 77)	42,954	42,368	586	1.3			
	Grade	Au	g/mt	11.60	8.54	3.06	35.83	9.98	10.28	(0.30)	(2.9			
		Ag	g/mt	812.90	457.53	355.37	77.67	521.54	545.48	(23.95)	(4 3			
		Cu	%	22.94	26.00	(3.06)	(11.77)	24.88	26.00	(1 12)	(4.3			
		Pb	%	4.52	9.40	(4 88)	(51 91)	5.61	8.90	(3 29)	(37 0			
		Zn	%	10.72	6.74	3.98	59.05	7.08	6.81	0.27	3.9			
	Recovery	/ Au	%	22.17	24.83	(2.66)	(10.73)	27.07	26.04	1.03	3.9			
		Aq	%	45.95	50.30	(4 35)	(8 64)	49.01	49,11	(0 10)	(0 ;			
		Cu	%	58,15	77.40	(19.25)	(24.87)	76.66	75,29	1.38	1.8			
		Ph	96	51.94	70.51	(18 58)	(26.34)	55.34	68.21	(12.87)	/18.8			
		Zn	%	5.84	3.57	2.27	63.50	4.52	3.41	1.11	32.6			
Zn CONC	Tonnes mt			6,915	11,564	(4,649)	(40.20)	107,986	144,240	(36,254)	(25)			
	Grade	Au	g/mt	4.60	2.38	2.22	93.28	3.11	2.64	0.46	17.5			
		Aq	a/mt	171.90	80,18	91.72	114.39	106.01	93.43	12.58	13.4			
		Cu	%	2.45	1.40	1.05	75.00	1.68	1.35	0.32	24.0			
		Pb	96	0,76	1.59	(0.83)	(52.20)	1.05	1,46	(0.41)	(28.0			
		Zn	%	50.25	54.50	(4.25)	(7.80)	53.17	54.50	(1 33)	(2.4			
		Fe	%	8.49	7.30	1.19	16.30	6.39	7.30	(0.91)	(12			
	Recovery Au %		26.92	22.41	4.51	20.13	21.20	22.81	(1.60)	(7.0				
		Ag	%	29.76	28.54	1.21	4.25	25.04	28.63	(3 59)	(12 5			
		Cu	%	19.02	13.50	5.52	40.92	13.00	13.34	(0 34)	(2)			
		Pb	%	26.74	38.59	(11.85)	(30.70)	25.99	37.98	(11.98)	(31			
		Zn	%	83.81	93.50	(9 69)	(10.37)	85.32	92.79	(7 47)	18 1			
Kc CONC	Tonnes	l.	mt	0.57	0.90	(0.33)	(36 52)	8.43	10.80	(2.37)	(21)			
Zn CONC	Grade	Au	g/mt	16,565.00	7,000.00	9,565.00	136.64	9,909.44	7,000.00	2,909.44	41.			
		Ag	g/mt	2,879.00	2,500.00	379.00	15.16	2,474.24	2,500.00	(25 76)	(1)			
	Au grams g		9,464.21	6,300.00	3,164.21	50.23	83,572.35	75,600.00	7,972.35	10.				
	Recover	y Au	%	8.01	5.13	2.88	56.14	5.28	4.52	0.76	16.			
		Ag	%	0.04	0.07	(0 03)	(40 55)	0.05	0.06	(0 01)	(20)			
OVERALL	Recover	y Au	%	57.10	52.37	4.73	9.02	53,55	53.36	0.18	0.			
		Ag	%	75.75	78.91	(3.16)	(4 01)	74.09	77.80	(3.70)	(4			

Analog Sector (Constraint) in the Mark Processing, No. Adjustrants ware made to Monthy Feed Transe, Feed Grader, Concernate Organs of Tablings Grader Jacuary Prinauticine Tigue For Copper Care, Pricoaction Revencible to 3 446 MT from 3 200 MT (-150 MT) Jacuary Prinauticine Tigue For Copper Care Friedmann Revenced to 102 XVM from 1 3 475 km (-150 MT)

MMM Reconstruct, No. Adjustments were in adde to Ministry, Feed Torvies, Feed Grades, Consertine Grades of Takings Gra Phoduction Reconstited to 8,527 MT hom 10,027 MT (- 1500 MT) ice Accounted for in the Million Figure for Zinc Concentrate Courses Concentrate

es el Constrato Prolotos. Yes Accoratel Prolotos na Na Maca Pacconnes, to Adjustrates vera made la Monte Field Crades, Field Crades, Constrate Grades o Tatlag, Grades Figurato Tat, Constratos Pocaticanis de Báta Milliona (2014 MI), ESDATI Tratef má Erecta di Adore Difference Seleven Fieland Provider & Saloco Conc Weyts (Acel 2002 to May 2008), and -200 m Difference in Millions versus Dav Productor Togen Convertion

Sevender havenstellen at Generate Privations Al Compositions Contractific in the Million Encodering, No Adjustments even applies Monthly Faed Trainer, Faed Chabes, Concentrate Grades or Tablays Gra Chel Privatsan Egnant L'Opper Concentrate Franktionen Neuroritetto 2,250 MI Table 2,550 MT (2,400 MT), based or Year-Bind Investory Reconduction No Champio Sing Concentration, Mar 2016 Reconstration and and the 2,550 MT table 2,550 MT (2,400 MT), based or Year-Bind Investory Reconduction No Champio Sing Concentration, Mar 2016 Reconstration and and the 2,550 MT (2,400 MT), based or Year-Bind Investory Reconduction

# **Historical Production Data (1966-present)**

	MFO HISTORICAL PRODUCTION																
	Mill Throughout	Conc. Production (tonnes)				Head Gr	rades			Опе	Sources	(%)		Metal Prices			
	(000's tonnes)	Cu	Zn	Total conc.	Au	Ag	Cu	Zn	B-G	HW	Lvnx	Pit	Mvra	Cu	Zn	Au	Ag
1966	0	0	0		0.0	0.0							_				
1967	209	13,218	21,565	34,783	2.4	68.6	1.9	8.2				100.0					
1968	300	0	0		2.4	75.4	1.9	9.3				100.0					- 1
1969	339	0	0		1.4	52.8	1.7	7.2			15.1	84.9		0.66			
1970	351	25,349	32,277	57,627	1.4	48.0	2.0	6.4			39.0	61.0		0.59			
1971	351	23,659	34,476	58,135													
1972	344	22,168	30,508	52,676	1.4	58.3	1.8	6.1			48.9	49.8	1.3	0.49	0.18	58.36	1.69
1973	321	12,084	39,769	51,853	3.1	161.1	1.2	8.0			59.0	20.0	21.0	0.81	0.22	97.22	2.56
1974	270	9,362	33,880	43,242	2.7	140.6	1.1	7.5			41.0	26.6	32.4	0.93	0.37	159.25	4.71
1975	261	8,053	31,222	39,275	2.9	140.6	1.2	7.8			52.0	18.0	40.0				
1976	269	9,012	32,299	41,311	3.1	140.6	1.2	7.9	I		49.0	8.6	42.4	Ì			
1977	269	8,848	31,885	40,732	2.7	126.9	1.1	7.5			49.0	8.0	43.0				
1978	269	10,317	36,298	46,615	3.1	139.9	1.2	8.0			64.0		36.0	0.63	0.33	192.00	5.27
1979	267	10,455	36,566	47,021	3.1	131.0	1.3	8.5			68.0		32.0				
1980	278	10,195	32,468	42,663	2.7	124.1	1.2	7.6			70.0		30.0				
1981	246	8,118	28,139	36,257	2.7	127.2	1.1	7.4			66.0		34.0		0.39		
1982	288	9,077	32,943	42,021	2.7	127.9	1.1	7.3		1.0	72.0		27.0	0.67	0.34		[
1983	248	7,942	29,251	37,193	2.7	121.0	1.1	7.5			77.0		23.0	0.72		425.18	11.44
1984	204	5,937	23,697	29,635	2.4	105.6	1.0	7.4			72.0		28.0	0.62		360.45	8.14
1985	586	33,042	53,979	95,925	2.1	59.4	1.6	6.2		56.0	40.0		4.0	0.65		317.27	6.14
1986	1,067	90,100	100,300	190,400	2.5	49.3	2.3	5.9		78.0	22.0			0.62	0.36	368.00	5.47
1987	1,090	100,200	86,500	186,700	2.2	40.1	2.5	4.9		82.0	18.0			0.80	0.37	447.00	7.01
1988	1,255	118,790	96,640	215,430	2.3	39.2	2.5	4.8		90.5	9.5			1.18	0.56	437.00	6.53
1989	1,229	101,188	79,305	180,493	2.1	33.6	2.1	4.0		91.3	8.7			1.29	0.78	382.00	5.51
1990	1,171	83,577	69,636	153,213	2.2	29.3	1.9	3.7		93.0	7.0			1.21	0.69	384.00	4.83
1991	1,081	65,900	55,222	121,122	2.1	26.2	1.7	3.3		92.6	7.4			1.06	0.51	362.00	4.05
1992	1,172	68,352	58,720	127,072	2.0	27.1	1.7	3.2		91.4	8.6			1.04	0.56	344.00	3.95
1993	433	28,220	18,705	46,925	1.9	21.9	1.9	2.8		90.4	9.6			0.87	0.44	359.80	4.31
1994	252	16,389	9,555	25,944	1.9	27.2	1.9	2.8		100.0				1.05	0.45	384.16	5.29
1995	1,197	84,741	53,230	137,971	1.9	22.5	2.0	2.7	5.0	95.0				1.33	0.47	384.06	5.20
1996	1,268	67,888	87,082	154,970	1.7	21.9	1.6	3.9	24.0	76.0				1.04	0.47		
1997	1,257	63,693	113,912	177,605	1.6	21.0	1.5	5.4	35.0	65.0				1.03	0.60	330.00	4.90
1998	1,047	60,249	95,450	123,942	1.6	23.0	1.7	5.6	28.6	71.4				0.75	0.46	294.00	5.54
1999	740	40,004	69,153	109,157	1.6	20.0	1.6	5.7	34.1	65.9				0.71	0.49	276.00	5.22
2000	1,167	66,922	94,758	161,680	1.6	26.7	1.7	5.0	34.5	59.2		6.3		0.82	0.51	279.29	4.95
2001	979	49,630	105,483	155,113	1.5	25.1	1.6	6.5	43.5	56.3		0.2		0.72	0.40	271.19	4.37
2002	774	27,567	93,054	120,621	1.5	46.6	1.2	7.3	47.2	50.8		0.2		0.71	0.36	317.30	4.59
2003	1,036	42,954	107,986	150,940	1.53	_ 44.12	1.35	6.5	42.6	56.8		0.6		0.77	0.37	300.00	4.75
TOTAL	23,883	1,403,201	1,955,913	3,336,262										* = (	estimate	d head gra	ades



# BOLIDEN - WESTMIN CANADA LTD Myra Falls Operation January 2004 Ore Reserves Mining Reserve vs. Production Statistics (1966-present)



BOLIDEN - WESTMIN CANADA LTD Myra Falls Operation January 2004 Ore Reserves Production Statistics by Area (1966-present)



Confidential

# BOLIDEN - WESTMIN CANADA LTD Myra Falls Operation January 2004 Ore Reserves Historical Production Rates and Concentrate Produced (1966-present)





BOLIDEN - WESTMIN CANADA LTD Myra Falls Operation January 2004 Ore Reserves Historical Metal Recoveries in Concentrate (1966-present)





# H-W Mine: Tonnage and NSR Distribution Statistics – Life of mine relevance

## NSR Distribution in the HW Mine

The total composites used in Compass for block modeling were graphed to see the grade distribution in the HW Mine. The spike at the end of the graph reflects all grades greater than \$195. Data from MFO January 2003 ore reserve report (Bakker, 2003).



Graph showing the cumulative grade distribution in remaining ore in the HW Mine, based on 4x4x5 meter blocks. This is reported as REM2% in Compass. Data from MFO January 2003 ore reserve report (Bakker, 2003).



Graph showing the remaining tonnage (REM2%) in the HW Mine by NSR cutoffs. Data from MFO January 2003 ore reserve report.

