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WE HAVE XEROX 495 TELECOPIER COMPATIBLE WITH GROUP 1, 2 & 3 MACHINES DATE:	SUL	Į GI	
PLEASE DELIVER THE FOLLOWING PAGES TO: FAX NO.: 660-2653 <u>NAME: TOM SCHROETER</u> <u>COMPANY/LOCATION: VA</u> FROM: <u>KEA MCCCONCE</u> TOTAL NUMBER OF PAGES <u>3</u> INCLUDING THIS COVER PAGE. DIRECT TELECOPIER PHONE NUMBER: (604) 685-3041 IF YOU DID NOT RECEIVE ALL THE PAGES, CALL ASAP: (604) 682-0611	WE HAVE XEROX 49	5 TELECOPIER	
NAME:       TOTAL SCHEDETER         COMPANY/LOCATION:       VA         FROM:       KEA       MCLEDNAN         TOTAL NUMBER OF PAGES       B       INCLUDING THIS COVER PAGE.         DIRECT TELECOPIER PHONE NUMBER:       (604)       685-3041         IF YOU DID NOT RECEIVE ALL THE PAGES, CALL ASAP:       (604)       682-0611	DATE: 000.24/88		
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FROM: <u>KEA</u> <u>HCLEWAR</u> TOTAL NUMBER OF PAGES <u>B</u> <u>INCLUDING</u> THIS COVER PAGE. DIRECT TELECOPIER PHONE NUMBER: (604) 685-3041 IF YOU DID NOT RECEIVE ALL THE PAGES, CALL ASAP: (604) 682-0611		NAME: TOM SC	HEDETER
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IF YOU DID NOT RECEIVE ALL THE PAGES, CALL ASAP: (604) 682-0611	TOTAL NUMBER OF PAGES 3 INCLU	DING THIS COVER PAGE	•
IF YOU DID NOT RECEIVE ALL THE PAGES, CALL ASAP: (604) 682-0611	DIRECT TELECOPIER PHONE NUMBER: (604) 6	85-3041	
SAN WALKER AND WALKER	IF YOU DID NOT RECEIVE ALL THE PAGES, CA	LL ASAP: (604) 682-0 LOCAL 2081	511

which carries out environmental and technical research related to lead and zinc market applications. The Product Research Centre had 28 employees at year-end.

### Electronic Materials

Research and development expenditures in the field of electronic materials totalled \$2.9 million in 1987. New process technology is being developed for the purification of arsenic and gallium to special grades optimized for gallium arsenide production. Major efforts continue to be focused on the improvement of technology for the manufacture of compound semiconductors including gallium arsenide, cadmium telluride, and cadmium mercury telluride. As a result of a program to develop epitaxial cadmium mercury telluride as a new product, a Certificate of Merit in the Innovation category of the Canada Awards for Business Excellence was received from the Government of Canada in 1987. Research is continuing on the development of detector-grade germanium single crystal.

Metals

Cominco Electronic Materials successfully completed Canada's first industrial experiment in space in 1987. A rocket launched from the Swedish Space Corporation's Estange facility contained cadmium mercury telluride samples for crystallization experiments under near zero gravity conditions.

Research and development continued on rapid solidification casting and powder metallurgical processing methods.

A new company, Crystar Research Inc., was established in Victoria, B.C.

Thursday Manual Provided The second and 57

to extend capabilities into the field of advanced optical materials which are finding increasing application in high technology products. Crystar is producing the first large synthetic sapphires grown in Canada, with optical quality crystals weighing up to 20 kilograms.

The Electronic Materials operations located in Trail, those of Cominco Electronic Materials Incorporated in Spokane, and Crystar Research Inc. had 42 employees directly engaged in research and development activities at year-end.

### **Production and Sales Statistics**

	and the second second second second	Twelve Months Ended December 31				
			87	19		
Manufal ( ) (1) (1) (1) (1) (1) (1) (1) (1) (1)	an a	Sales	Production	Sales	Production	
Refined Metal						
Zinc						
Trail	10115	218,100	210,300	265,800	266,900	
Tolled Polaris	tons	1296/201	Mergenes	7,400	5,700	
annan an a		218,100	210,300	273,200	272,600	
Lead					-	
Trail	tons	83,200	87,700	123,500	122,300	
Silver'	Qunces	7,596,600	7,615,000	8,709,500	8,810,000	
Gold					and the second	
Highland Valley Copper (55%)	QUINCES	3,700	3,700	800	800	
Con	ounces	Accessed	increase,	88,200	88,300	
Trail	ounces	38.900	38,800	21,400	21,400	
Buckhorn	OURCES	27,800	28,000	28,500	29,300	
	and a second	70,400	70,500	138,900	139,800	
Concentrates <sup>2</sup>	anni <del>an an an</del> Anna ann an Anna an Anna an Anna an			an an all and all the same parameters and all the same in	and the second	
Zinc						
Sullivan	tons	2124-111	144,800	and an end of the second s	176,200	
Polaris	ions	221,800	227.100	181.400	200.700	
Magmont	tons	11,900	12,000	10.800	10,800	
Pine Point	tons	13,200	\$33,000	*A <sup>2</sup> GAAA	457,800	
<ul> <li>DATE A DATA</li> <li>PERMITAN DESCRIPTION DE LOS DE LOS</li></ul>	6627.58	246.900	916,900	192.200	845,500	
<ul> <li>Second second secon second second sec</li></ul>	ning a here men as the same of the states	eneration of the statement of the statem	2503200	174-74W	0.43130	
Lead Sullivan			245 B00		104 101	
Polarîs	tons	-1. 1 10 10 10	115,800	unite A AA A	127,600	
	tons	36,500	37,000	40,000	35,300	
Magnooni	tons	52,800	49,500	56,400	56,800	
Pine Point	K005	164,900	163,300	156,100	163,800	
		254,200	365,600	252,500	383,500	
Copper'						
Highland Valley Copper (55%)	tons	95,000	95,000	43,000	43,000	
Valley	tons	ALTERNA	Represented	23,500	22,500	
Magmont	tons	1,400	1,000	1,000	900	
		96,400	96,000	67,500	66,400	
Molybdenum <sup>3</sup>	and the second se			and a second	A CONTRACTOR OF A CONTRACTOR O	
Highland Valley Copper (55%)	tons	1,700	1,700	1,100	1,200	

Includes silver sold in concentrates and intermediate products.

<sup>2</sup>Sales tonnages exclude concentrates processed at Trail and concentrates tolled through other smelters which are reported as refined metal sales. <sup>3</sup>Tonnages are for metal contained in concentrate. 17

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Metals

	Mining	and	Integrated	d	Metals
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Revenues and Operating Profit (Loss)

Summary.

	Reve	enues	Opera	ting Prof	lit (Loss
2.5 Statistical definition of the statistic statis Statistic statistic statis Statistic statistic statistic Statistic statistic statistic Statistic statistic stati	1987	1986	Record States and a state	1987	1986
-	(a) (b) (b)		(millions)		
Trail Metallurgical Operations	\$330	\$356	(verstarres)	\$ 22	\$(10)
Sullivan Mine	65	63		14	(3)
Pine Point Mines	110	96		35	5
Polaris Mine	89	80		21	16
Magmont Mine	38	25		18	7
Con Mine <sup>1</sup>	Augus Zusiel	44.		dispersion to be	6
Buckhorn Mine	18	16		3	4
Valley Mine <sup>2</sup>	-Pit-Spect	35		add of the second	4
Highland Valley Copper <sup>2</sup>	198	59		79	The second se
Cominco UK	2	2		the second	-resplays.
Metals Operations Overhead				(5)	(7)
Burgersternerstelling under Parte Party and the second state of th	\$850	\$776		\$188	\$ 21
First Quarter	en en sans hur nem egyptiskinens te	and the state of t	eran yayatta bara - rafasa	\$ 27	\$ (6)
Second Quarter				30	(8)
Third Quarter				43	9
Fourth Quarter				88	26
				\$188	\$ 21

The Con Mine was sold in December 1986

<sup>2</sup>Valley Mine operated from January 1, 1986 to June 30, 1986 and Highland Valley Copper partnership from July 1, 1986 to December 31, 1987.

### Gold and Silver

Gold and silver prices advanced strongly in 1987 as the U.S. dollar declined further due to concern about inflation and the U.S. debt. The price of gold peaked at U.S.\$503/oz. in mid-December and averaged U.S.\$446/oz. for the year, up from U.S.\$368/oz. in 1986.

The price of silver showed a rising trend during the year in response to the rising gold price. In April a speculative surge moved the price briefly to levels above U.S.\$10.00/oz. Silver prices averaged U.S.\$7.01/oz. in 1987 compared with U.S.\$5.57/oz. in 1986.

Trail Metallurgical Operations The integrated smelter and refining complex at Trail, B.C. produces a wide range of metals, principally refined zinc, lead, silver and gold. Annual production capacity is 300,000 tons (272,000) of refined zinc and 135,000 tons (122,500) of refined lead. Over half of Cominco's Canadianmined zinc and lead concentrates are refined at Trail, with the balance made up through the purchase of custom concentrates. Electrical power from Cominco's two hydro-electric generating plants serves the operations in Trail and Kimberley and any surplus is offered for sale to West Kootenay Power and Light Company, Limited and to other public utilities.

Construction of the new lead smelter and an air separation plant to supply it with oxygen progressed favorably during 1987 and startup of the smelter is planned for mid-1989.

A \$15 million project to upgrade the Zinc Operations' zinc solution purification capability is continuing. Completion of construction is scheduled for December 1988.

A \$14 million project to build a plant for the production of copper sulphate and copper arsenate is well advanced. Copper sulphate production is expected to begin in the spring of 1988 and copper arsenate production in mid-1989. Copper sulphate is an important reagent in the mineral processing industry and copper arsenate is used in the manufacture of chromated copper arsenate, a wood preservative. The production of copper arsenate will create further environmental improvements in the processing of zinc and lead concentrates. There was a significant turnaround in earnings from metallurgical operations as a result of improved prices for zinc, lead and silver together with improved productivity and reduced unit operating costs for both zinc and lead. While sales were severely affected by a 17-week strike, stand-by costs during that period were covered by sales of excess electric power.

	Production a	f Refined Metals	1
		1987	1986
Zinc	tons	210,300	266,900
	(tonnes)	(190,800)	(242,100)
Lead	tons	37,700	122,300
	(tonnes)	(79,500)	(110,900)
Silver	Ounces	6,418,000	7,939,600
	(kg)	(199,600)	(247,000)
Gold	ounces	38,800	21,400
	(kg)	(1,200)	(666)
No. of emp	Novers		
at year-end		2,629	2,291

### Sullivan Mine

The Sullivan Mine at Kimberley, B.C. has been in operation since 1909. From that date it has been the principal supplier of zinc and lead concentrates to Trail.

Operations were shut down for 17 weeks as the result of a strike, and mill throughput was reduced by 25 per cent compared with 1986.

A project to expand the flotation circuit in the concentrator will be completed in September 1988. This increased capacity will allow the addition of some lower grade material to the regular mill feed on an incremental basis, and thus, some marginal mineralization will be turned into ore over the next few years.

		1987	1986
One Milled	tons	1,393,700	1.859.000
	(lonnes)	(1,264,400)	(1,687,000)
Elmo			
Average ore	grade	6.0%	5.5%
Concentrate	tons	144,800	176,200
	(tonnes)	(131,400)	(159,800)
Average con	contrate		
grade		48.4%	49.3%
Lead			
Average ore	grade	6.3%	5.3%
Concentrate	tons	115,800	127,600
	(lonnes)	(105,100)	(115,700)
Average con	centrate		
grade		61.3%	62.0%
SHVer			
Average ore	grade		
	Qz./ton	1.9	1.4
	(g/tonne)	(59)	(48)
No. of emplo	iyees		
at year-end	3	855	827

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# Metals

Mining	and	Integrated	Metals
Revenues	and	<b>Operating</b> Pro	fit (Loss)

ngt: 3 r

ENALTY CONTRACTOR	Reve	nues	<b>Operating</b> Prof	it (Loss)
	1987	1986	1987	1986
and the state of proceeding to a	anali jama	(1	nillions)	
Trail Metallurgical Operations	\$330	\$356	\$ 22	\$(10)
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Polaris Mine	89	80	21	16
Magmont Mine	38	25	18	7
Con Mine <sup>1</sup>	Security 121	44	ant-mark	6
Buckhorn Mine	18	16	3	4
Valley Mine <sup>2</sup>	Agramore	35	retransmi	2
Highland Valley Copper <sup>2</sup>	198	59	79	-
Cominco UK	2	2	-line	en e
Metals Operations Overhead			(5)	(7)
	\$850	\$776	\$188	\$ 21
First Quarter	ور مرد رود و روه ولو کرد و رو	Contraction of the second s	\$ 27	\$ (6)
Second Quarter			30	(8)
Third Quarter			43	9
Fourth Quarter			88	26
			\$1 <b>R</b> 8	\$ 21

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	(tonnes)	(79,600)	(110,900)
Stiver	ounces	6,418,000	7,939,600
	(48)	(199,600)	(247.000)
Gold	ounces	38,800	21,400
	(kg)	(1,200)	(666)
No. of empl	loyees		
at year-end		2,629	2,291

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		1987	1986
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Average cond	entrate		
grade		48.4%	49.3%
Lead			
Average ore ;	grade	6.3%	5.3%
Concentrate	tons	115,800	127,600
	(ionnes)	(105,100)	(115.700)
Average conc	entrate		
grade		61.3%	62.0%
Silver			
Average ore	grade		
	Öz./ton	1.9	1.4
	(glionne)	(59)	(48)
No. of emplo	yees		
at year-end	1	855	<i>827</i>

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## **Production and Sales Statistics**

A STATEL

Physics of Supervised States and Supervised Supervised and Supervised Su	and the second	10	87	19	86
		Sales	Production	Sales	Production
Refined Metal					
Zinc				and the second de-	
Thail	tons	218,100	210,300	265,800	266,900
Tolled Polaris	tons		A-Repts	7,400	5,700
	All Landson and	218,100	210,300	273,200	272,600
Lead					
Thail	tions	83,200	87,700	123,500	122,300
SHver <sup>1</sup>	QRIAÇES	7,596,600	7,615,000	8,709,500	8,810,000
Gold					
Highland Valley Copper (55%)	QUIGES	3,700	3,700	800	800
Con	ounces	#107	ROAT-AND	88,200	88,300
Filmedia	ounces	38,9990	38,800	21,400	21,400
Buckhorn	ounces	27,890	28,000	28,500	29,300
naan oo dhii bayyaa mii xaanaa dhii baanaa yaa ahaa ka aanaa ahayaan iyo ahaa dhii baanaa ka dhii baanaa dhii b	and the second second second	70,400	70,500	138,900	139,800
Concentrates <sup>2</sup>	and the second se	and a second			
Zinc					
Sullivan	1005	Parmer	144.800	dk	176,200
Polaris	tons	221,800	227,100	181,400	200,700
Magmon	tons	11,900	12,000	10,800	10,800
Pine Point	1005	13,200	533,000	Ben defined of	457,800
E MAS & UNIX	77/19	246.900	916,900	192,200	845,500
Lead	Alternative strategy and a second second	10	na se la constante de la const La constante de la constante de	and the part of the second sec	
Sullivan	tons		115,800		127,600
Polaris	tons	36.500	37.000	40,000	35,300
r Maris Magnoot		52,800	69.500	56,400	56,800
Pine Point	tons	164,900	163,300	155,100	163,800
ring round	fous	254,200	365.600	252.500	383,500
Conner <sup>3</sup>		\$10.7 \$ \$ \$47.0	and a state of the	and a state of the	Part of the state
Highland Valley Copper (55%)	tons	95,000	95,000	43.000	43,000
Valley	tons	Sam A Balan	to al delate	23,500	22,500
Magmont	tons	1.400	1.000	1.000	900
an an an Arabitation and a state of the second state of the	55-212:	96.400	96.000	67,500	66.400
Molvbdenun <sup>3</sup>	10151 Sar	ar tyr y to ter y'	and the state of t	and the first state of the first	and a second sec
Highland Valley Copper (55%)	tons	1,700	1.700	1,100	1,200
and the same state of	(1922) The State of States of States and States	ander interesting proceedings	a ale d'Arran de la presentación de la Cargona de La Cargo		Henry Constant Street and Street and

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