



## INTERNAL CORRESPONDENCE

DATE 84 03 12  
YEAR MONTH DAY

To J. H. McKibbon, R. Buckley, G. Jilson, FROM H. M. Visagie

R. Tolbert

Business Development  
DEPARTMENT OR FIELD OFFICE

COST CENTRE OR AFE No. FILE No. CCM 11

SUBJECT

Re: GRUM DEPOSIT GEOLOGICAL RESERVES

In the tabulation of CAMC's geological reserves, the Grum deposit is listed as having 30,781,000 tonnes of combined lead and zinc grade of 8.0 percent. This reserve calculation was based on a preliminary computer model and calculated using the Mintec Modeling system. The reserve is calculated using a 4% cut-off and is for the section 62W to 86W which excludes the Champ Zone and 1982 drill results for section 60W and 58W.

The following table suggests that there is a discrepancy between the computer models and the sectional reserve calculations done by both CAMC and Kerr Addison (KA) geologists. (Note: KA sold the Grum Deposit to CAMC.)

Geologic Reserves (62W to 86W, 4% Cutoff)

	Tonnes	Lead (%)	Zinc (%)	Combined
- Sectional Calculations				
CAMC	32,611,059	3.5	5.7	9.2 =
Kerr Addison	26,083,000	4.1	6.4	10.5 =
- Computer Calculations				
CAMC	30,781,000	3.1	4.9	8.0 =
Kerr Addison	27,650,000	3.1	4.9	8.0 =

The CAMC sectional calculations includes the reserves of the Gnomes Cap which were drilled in 1982 and consequently differs from the KA in extent. The geological reserves for both sectional models are compared in Exhibit 1. The CAMC model has 6,528,059 tonnes of average combined grade of 3.8% more than the KA model. Given the inclusion of the Gnomes Cap reserves and the differences in sectional interpretations the results appear compatible. also difference in approach

CAMC's computer calculation resulted in a decreased metal content of 18% and 10% for the CAMC and KA section models. The following reasons may address the discrepancy. ● Both the CAMC and the KA computer models are only preliminary and may not accurately reflect the deposit. ● The Grum deposit is extremely complex and will probably require extensive work before an accurate computer model can be developed. ● The Mintec modeling system which calculates the reserves was designed to calculate reserves for large homogenous deposits and may have difficulty calculating reserves for small inhomogenous deposits. ● Different assay compositing parameters may have been used.

*should specify that this is not exactly normal use of the term cut off*

*or a cut off between two essentially different deposits?*

The 4% cut-off grade has been used to determine what is potentially economic. The 4% cut-off appears to have been used on Grum reserves because it was used on Faro reserves. Since Grum has significantly higher precious metal content a case can be made for a lower cut-off grade. If a 3% cut-off grade is used, the reserves between section 62W and 82W would become 35,383,461 tonnes of 8.72% combined grade.

The Champ Zone which lies between 51 to 62W on the Grum grid has 1,700,000 tonnes of 7.8% combined grade at 4% cut-off. This reserve was calculated by KA and because of proximity should be included in Grum reserves.

Recommendations

- o The following reserve calculations be accepted as proven and probable for Grum.

Grum Geological Reserves

Section	M Tonnes	"Cut-off" %	Lead %	Zinc %	Copper %	Silver 9/mt	Gold 9/mt
62-86W	35,400	3%	3.32	5.43	.15	56.0	.84
51-62W	1,700	4%	3.51	4.28	?	46.0	?
	37,100		3.33	5.38	.15	55.5	.84

*write up*

- o The discrepancy between the computer model and the sectional calculation be rationalized as to why the difference in tonnage and grade. *get us a sectional block print out of Grum with rock and grade codes*
- o Once the new geological model for the Grum is complete, the sectional calculation of the reserves be updated.
- o Economics of the Grum ore be done as to rock type and ore grade to determine what is an appropriate cut-off grade. *or characteristic*
- o The reserves found by the 1982 drilling in sections 60 and 58W be included in the reserve. *they are minimal*

*o geotechnical aspects should be considered - impact on pit - impact on UG reserves vs pit / impact on UG reserves.*

HMV/rdp  
Attach.

*o consideration should be given to an experienced underground mining consultant having a look at the underground.*

*o requirements for pit merging, geotechnical drilling and waste dump drilling should be laid out*

## EXHIBIT 1

## GRUM DEPOSIT

A.

GRUM SECTIONAL MODEL  
(Not Including Champ Zone)

Grid (W)	CAMC		KERR ADDISON		CHANGE	
	Tonnes	Grade	Tonnes	Grade	Tonnes	Grade
62	632,340	9.17 <sup>57986</sup>	630,266	9.95 <sup>62707</sup>	2,074	(228) ← (4721)
64	1,028,545	9.59	1,164,762	11.07	(136,217)	(228) ←
66	1,613,702	10.36	1,377,821	11.35	235,881	4.5
68	1,440,349	11.42	1,736,341	10.93	(295,992)	7.9
70	2,425,119	10.68	2,226,492	12.22	198,627	(6.6)
72	2,389,111	9.91	2,223,718	10.56	165,393	(12.3)
74	3,237,299	9.62	2,778,449	10.78	458,850	2.59
76	3,006,734	9.67	2,732,810	10.32	273,924	3.18
78	3,093,642	9.33	2,918,497	10.24	175,145	(5.83)
80	3,783,293	8.47	3,039,373	9.38	743,920	4.75
82	3,618,273	8.11	2,185,447	11.36	1,432,826	3.15
84	2,763,172	7.69	1,375,120	8.39	1,388,002	6.46
86	3,579,480	8.08	1,678,746	9.39	1,900,734	6.92
TOTAL	32,611,059	9.17	26,083,000	10.50	6,528,059	3.80

B. Comparison of Sectional Model with Mintec

	Tonnes	Pb + Zn (%)	Tonnes	Pb + Zn (%)
Sectional	32,611,059	@ 9.17	26,083,000	10.50
Mintec	30,781,000	@ 8.0	30,781,000	@ 8.0
Change	1,830,059	@28.84	(5,648,000)	(2.98)

Notes:

o Kerr Addison model did not include Gnomes Cap tonnage since it was proven up by CAMC.

HMV/rdp  
84-03-12

GRUM RESERVES AT DIFFERENT CUT-OFFS

## Sectional Calculation Summary

AREA OF  
INFLUENCE = 61 METRES

7 % COMBINED Pb - Zn

SECTION	AREA	Pb %	Zn %	Ag	Cu %	Au	Pb+Zn	TONNES
62W	1378	4.30	7.82	85	0.00	0	12.12	330403
64W	2330	5.31	8.14	85	0.00	0	13.45	557842
66W	5113	5.27	7.08	86	0.00	0	12.35	1156755
68W	4553	5.28	8.20	84	0.00	0	13.48	1049067
70W	6103	5.38	8.65	88	0.00	0	14.03	1484466
72W	9683	3.97	6.42	68	0.00	0	10.38	2161058
74W	11195	4.12	6.78	70	0.00	0	10.90	2447724
76W	8568	4.45	7.47	76	0.00	0	11.92	1902970
78W	10468	3.92	7.02	68	0.00	0	10.94	2181775
80W	9263	4.20	6.76	70	0.00	0	10.97	2017002
82W	8095	3.95	6.86	69	0.00	0	10.81	1991631
84W	8439	3.34	5.75	57	0.00	0	9.09	1821637
86W	6790	3.96	6.97	66	0.00	0	10.92	1481202
TOTAL/WTED AVG		4.28	7.04	72	0.00	0	11.31	20583532

4 % COMBINED Pb - Zn

SECTION	AREA	Pb %	Zn %	Ag	Cu %	Au	Pb+Zn	TONNES
62W	2790	3.32	5.66	63	0.00	0	9.17	632340
64W	4638	3.84	5.75	62	0.00	0	9.59	1028545
66W	7315	4.41	5.95	71	0.00	0	10.36	1613702
68W	6338	4.54	6.88	73	0.00	0	11.42	1440349
70W	10768	4.06	6.62	68	0.00	0	10.68	2425119
72W	10815	3.80	6.11	65	0.00	0	9.91	2389111
74W	15328	3.66	5.97	61	0.00	0	9.62	3237299
76W	14540	3.61	6.06	62	0.00	0	9.67	3006734
78W	12995	3.37	5.96	59	0.00	0	9.33	3093642
80W	13378	3.31	5.41	56	0.00	0	8.47	3783293
82W	6874	3.00	5.10	52	0.00	0	8.11	3618273
84W	12727	2.86	4.83	48	0.00	0	7.69	2763172
86W	16345	2.88	5.21	49	0.00	0	8.09	3579480
TOTAL/WTED AVG		3.48	5.72	59	0.00	0	9.17	32611059

3 % COMBINED Pb - Zn

SECTION	AREA	Pb %	Zn %	Ag	Cu %	Au	Pb+Zn	TONNES
62W	2885	3.27	5.57	62	0.00	0	9.02	648740
64W	6715	3.18	4.50	52	0.00	0	7.68	1490805
66W	7315	4.41	5.95	71	0.00	0	10.36	1613702
68W	6338	4.54	6.88	73	0.00	0	11.42	1440349
70W	11415	3.94	6.39	66	0.00	0	10.33	2552185
72W	12815	3.45	5.52	59	0.00	0	8.97	2792473
74W	15978	3.58	5.84	60	0.00	0	9.42	3353809
76W	16698	3.36	5.56	57	0.00	0	8.92	3415783
78W	12445	3.08	5.41	54	0.00	0	8.49	3609917
80W	15860	3.02	4.90	51	0.00	0	7.71	4433403
82W	7128	2.97	5.05	52	0.00	0	8.02	3689643
84W	12727	2.86	4.83	48	0.00	0	7.69	2763172
86W	16345	2.88	5.21	49	0.00	0	8.09	3579480
TOTAL/WTED AVG		3.32	5.43	56	0.00	0	8.72	35383461

Notes:

o Neither gold nor copper grades were tabulated.

o Does not include Champ Zone or 1982 drilling on section 60W and 58W.