



Energy, Mines and
Resources Canada

Canada Centre for
Mineral and Energy
Technology

CANMET

555 Booth Street
Ottawa, Canada
K1A 0G1

Énergie, Mines et
Ressources Canada

Centre canadien de la
technologie des minéraux
et de l'énergie

555 rue Booth
Ottawa, Canada
K1A 0G1

006501

September 27, 1992

Rick Pakkele
Plant Metallurgist
Curragh Resources,
Post Office Box 1000
Faro, Yukon
Y0B 1K0

Dear Mr. Pakkele:

RE: MINERALOGICAL EXAMINATION OF VANGORDA PLANT SAMPLES

This letter reports on my examination of the lead and zinc concentrates to determine the reason for low grades. A polished section of each sample was prepared and examined by means of the optical microscope and image analysis system. Modal analyses and liberation of sphalerite and galena were determined. The output from the image analyzer is appended.

Lead Concentrate

The galena content in the sample is 73%. Assuming a lead content of 86.6% in the galena then the lead grade is calculated to be 63.2%. The sphalerite content in the sample is 14.26% and assuming a zinc content in the sphalerite of 55% is equivalent to a grade of 7.84%. Chalcopyrite is 1.08% which seems high for your lead conc.

The liberation of galena and sphalerite are high. Pyrite has a moderate liberation. Chalcopyrite as observed by means of the ore microscope is estimated to be well liberated.

A significant quantity of covellite and other secondary copper minerals were observed in the sample. The amount of this material is higher than normal and appears to be at the same high level I observed two years ago when the Vangorda ore first came on stream. At that time you were also experiencing grade problems.

Canada

Zinc Concentrate

The sphalerite content in the sample is 83.96% and, assuming a zinc content in the sphalerite of 58%, is equivalent to a grade of 48.7% zinc. The galena content in the sample is 7.39%. Assuming a lead content of 86.6% in the galena this is equivalent to a grade of 6.40% lead.

Liberation of sphalerite is high. Pyrite and galena have a moderate liberation. Chalcopyrite was also observed to be free.

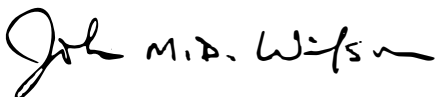
Summary

The data show that poor liberation is not the reason for low grades. In fact, the liberations of galena and sphalerite are very high.

It is my opinion that the low grades in both concentrates are due to poor selectivity caused by the presence of excess secondary copper minerals.

If you have any further questions, please call me. As well, keep us in mind for future mineralogical investigations.

Yours truly,



John M.D. Wilson

vangorda Lead conc

AREA OF GIVEN PHASE IN ALL MEASURED FIELDS

PHASE 1
farea: 2962.03
PHASE 2
farea: 22572.95
PHASE 3
farea: 17612.24
PHASE 4
farea: 1221.28
PHASE 5
farea: 5634.24
PHASE 6
farea: 76061.40
PHASE 7
farea: 575.33
PHASE 8
farea: 13529.17
PHASE 9
farea: 213104.0

VOLUME PERCENT OF MEASURED PHASES

PHASE 1
Vol%: 0.838455
PHASE 2
Vol%: 6.39
PHASE 3
Vol%: 4.99
PHASE 4
Vol%: 0.345704
PHASE 5
Vol%: 1.59
PHASE 6
Vol%: 21.53
PHASE 7
Vol%: 0.162858
PHASE 8
Vol%: 3.83
PHASE 9
Vol%: 60.32

WT PERCENT OF MEASURED MINERALS

Mineral 1	wt%: 0.358835	qtz
Mineral 2	wt%: 4.02	carbonates
Mineral 3	wt%: 4.03	pyrite 66% + 90% <u>free</u>
Mineral 4	wt%: 0.256821	po
Mineral 5	wt%: 1.08	cp free
Mineral 6	wt%: 14.26	lots of sp 80% + 80% <u>free</u>
Mineral 7	wt%: 0.159649	asp
Mineral 8	wt%: 2.77	bari
Mineral 9	wt%: 73.07	galena - 94% + 70% <u>free</u>

file galena.fre - mode 5

variable z :GRAREA
variable x :GRPERC
variable y :PTSIZE

	0.00	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00		
3.34	0.00	0.00	0.01	0.02	0.03	0.05	0.05	0.06	0.06	0.04	0.11	9.12	9.54
4.72	0.00	0.00	0.02	0.03	0.08	0.12	0.12	0.17	0.13	0.14	0.21	8.66	9.67
6.67	0.00	0.01	0.05	0.07	0.11	0.08	0.15	0.30	0.74	0.70	0.63	12.48	15.31
9.43	0.00	0.02	0.07	0.13	0.12	0.16	0.16	0.27	0.61	1.85	2.46	15.04	20.89
13.34	0.00	0.05	0.09	0.21	0.26	0.30	0.29	0.39	0.34	1.52	6.41	15.37	25.22
18.85	0.00	0.07	0.01	0.08	0.47	0.06	0.63	0.28	0.24	1.09	6.68	6.42	16.02
26.65	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.16	0.00	0.00	1.49	0.64	2.43
37.68	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.92
53.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
106.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
212.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
425.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.16	0.26	0.87	1.05	0.89	1.39	1.63	2.12	5.33	18.59	67.73	

94% + 70% galena

file galene.fre - mode 5

variable z :GRAREA

variable x :GRPERC

variable y :GRSIZE

	0.00	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00		
3.34	0.00	0.10	0.16	0.12	0.16	0.17	0.15	0.15	0.12	0.05	0.11	9.12	10.42
4.72	0.00	0.02	0.08	0.11	0.14	0.08	0.12	0.22	0.34	0.21	0.24	8.66	10.22
6.67	0.00	0.03	0.02	0.24	0.17	0.15	0.18	0.36	0.65	0.97	0.71	12.48	15.95
9.43	0.00	0.00	0.00	0.08	0.52	0.35	0.25	0.38	0.63	1.94	2.69	15.04	21.88
13.34	0.00	0.00	0.00	0.11	0.06	0.00	0.69	0.23	0.24	1.30	6.18	15.37	24.19
18.85	0.00	0.00	0.00	0.21	0.00	0.13	0.00	0.28	0.14	0.87	6.57	6.42	14.62
26.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.49	0.64	2.13
37.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.60
53.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
106.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
212.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
425.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.16	0.26	0.87	1.05	0.89	1.39	1.63	2.12	5.33	18.59	67.73	

file pyrite.fre - mode 5

variable z :GRAREA
variable x :GRPERC
variable y :PTSIZE

	0.00	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00		
3.34	0.00	0.26	0.32	0.39	0.25	0.13	0.08	0.00	0.01	0.00	0.04	39.56	41.04
4.72	0.00	0.42	0.31	0.20	0.13	0.05	0.10	0.10	0.20	0.22	0.00	2.39	4.13
6.67	0.00	0.59	0.19	0.19	0.08	0.00	0.14	0.13	0.18	0.62	0.46	4.72	7.31
9.43	0.00	0.85	0.05	0.00	0.25	0.00	0.45	0.76	1.39	1.57	0.84	7.64	13.80
13.34	0.00	1.11	0.18	0.00	0.72	0.00	0.48	0.54	1.59	1.90	3.41	3.29	13.23
18.85	0.00	0.71	0.00	0.40	0.00	0.99	1.90	1.03	3.18	2.94	1.50	2.06	14.70
26.65	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
37.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.70	0.00	0.00	0.00	0.00	5.70
53.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
106.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
212.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
425.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	4.03	1.06	1.19	1.43	1.17	3.16	8.26	6.55	7.26	6.25	59.66	

66^P/₁₀ + 95^P/₁₀
pyrite

file pyrite.fre - mode 5

variable z :GRAREA

variable x :GRPERC

variable y :GRSIZE

	0.00	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00		
3.34	0.00	3.44	0.96	0.79	0.46	0.17	0.08	0.00	0.09	0.00	0.04	39.56	45.59
4.72	0.00	0.34	0.10	0.00	0.00	0.00	0.24	0.23	0.30	0.22	0.00	2.39	3.83
6.67	0.00	0.25	0.00	0.00	0.52	0.00	0.45	0.35	0.89	0.62	0.81	4.72	8.62
9.43	0.00	0.00	0.00	0.40	0.45	0.00	0.48	0.95	0.50	1.57	1.89	7.64	13.89
13.34	0.00	0.00	0.00	0.00	0.00	0.99	1.90	1.03	3.03	3.21	2.01	3.29	15.46
18.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.74	1.63	1.50	2.06	6.92
26.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.70	0.00	0.00	0.00	0.00	5.70
37.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
106.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
212.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
425.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	4.03	1.06	1.19	1.43	1.17	3.16	8.26	6.55	7.26	6.25	59.66	

300X

vangorda zinc conc repeat
AREA OF GIVEN PHASE IN ALL MEASURED FIELDS

PHASE 1
farea: 10176.47
PHASE 2
farea: 8481.40
PHASE 3
farea: 23159.42
PHASE 4
farea: 5246.46
PHASE 5
farea: 13489.31
PHASE 6
farea: 682086.6
PHASE 7
farea: 512.42
PHASE 8
farea: 6397.83
PHASE 9
farea: 32800.87

VOLUME PERCENT OF MEASURED PHASES

PHASE 1
Vol%: 1.30
PHASE 2
Vol%: 1.08
PHASE 3
Vol%: 2.96
PHASE 4
Vol%: 0.670602
PHASE 5
Vol%: 1.72
PHASE 6
Vol%: 87.18
PHASE 7
Vol%: 0.065497
PHASE 8
Vol%: 0.817770
PHASE 9
Vol%: 4.19

WT PERCENT OF MEASURED MINERALS

file galena.fre - mode 5

variable z :GRAREA
variable x :GRPERC
variable y :PTSIZE

	0.00	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00		
3.34	0.00	0.01	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.05	7.37	7.45
4.72	0.00	0.01	0.02	0.00	0.02	0.00	0.10	0.00	0.00	0.00	0.00	5.85	6.00
6.67	0.00	0.01	0.04	0.18	0.05	0.08	0.11	0.00	0.00	0.18	0.00	5.21	5.86
9.43	0.00	0.13	0.17	0.00	0.00	0.30	0.17	0.50	0.00	0.20	0.00	7.23	8.70
13.34	0.00	0.12	0.67	0.45	0.89	0.45	1.40	0.85	0.48	0.00	0.00	6.42	11.73
18.85	0.00	0.43	1.23	0.00	0.42	1.04	0.99	0.00	1.19	0.00	1.50	6.76	13.56
26.65	0.00	1.32	1.41	0.67	1.37	0.00	1.29	3.28	0.00	0.00	0.00	6.13	15.47
37.68	0.00	2.01	1.42	0.00	1.56	3.03	2.97	2.76	0.00	0.00	6.60	0.00	20.35
53.26	0.00	1.52	0.00	2.58	4.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.96
75.29	0.00	1.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.93
106.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
212.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
425.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	7.49	4.97	3.88	9.17	4.91	7.03	7.39	1.67	0.38	8.15	44.98	

file galena.fre - mode 5

variable z :GRAREA

variable x :GRPERC

variable y :GRSIZE

	0.00	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00		
3.34	0.00	0.54	0.24	0.18	0.08	0.00	0.10	0.00	0.00	0.00	0.05	7.37	8.55
4.72	0.00	0.54	0.55	0.00	0.00	0.08	0.11	0.00	0.00	0.00	0.00	5.85	7.14
6.67	0.00	1.31	1.11	0.45	0.00	0.51	0.17	0.20	0.00	0.38	0.00	5.21	9.34
9.43	0.00	2.52	0.65	0.00	1.30	0.25	0.90	1.14	0.00	0.00	0.00	7.23	13.99
13.34	0.00	2.58	2.43	0.67	0.00	1.04	0.49	0.00	0.48	0.00	0.00	6.42	14.10
18.85	0.00	0.00	0.00	0.00	2.93	0.00	2.29	1.33	1.19	0.00	1.50	6.76	15.99
26.65	0.00	0.00	0.00	2.58	0.00	3.03	2.97	4.72	0.00	0.00	0.00	6.13	19.43
37.68	0.00	0.00	0.00	0.00	4.85	0.00	0.00	0.00	0.00	0.00	6.60	0.00	11.45
53.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
106.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
212.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
425.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	7.49	4.97	3.88	9.17	4.91	7.03	7.39	1.67	0.38	8.15	44.98	

file`pyrite.fre - mode 5

variable z :GRAREA

variable x :GRPERC

variable y :PTSIZE

	0.00	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00		
3.34	0.00	0.00	0.00	0.01	0.05	0.02	0.00	0.00	0.00	0.00	0.00	12.69	12.77
4.72	0.00	0.00	0.03	0.02	0.12	0.00	0.00	0.00	0.00	0.00	0.00	1.50	1.67
6.67	0.00	0.00	0.05	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	1.74	1.87
9.43	0.00	0.22	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	5.75	6.38
13.34	0.00	0.29	0.00	0.00	0.00	0.45	0.41	0.00	0.00	0.00	1.43	7.95	10.53
18.85	0.00	0.29	0.23	0.00	0.00	0.62	0.00	0.00	0.00	1.04	0.00	4.38	6.55
26.65	0.00	0.70	0.00	1.52	0.00	1.20	0.00	0.00	0.00	3.06	3.69	8.07	18.24
37.68	0.00	0.53	0.98	0.00	0.00	2.16	0.00	0.00	0.00	5.83	4.47	0.00	13.97
53.26	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.11	0.00	10.19
75.29	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.47	0.00	0.00	17.83
106.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
212.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
425.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	2.48	1.43	1.56	0.16	4.52	0.41	0.00	0.00	27.39	19.97	42.09	

file pyrite.fre - mode 5

variable z :GRAREA
variable x :GRPERC
variable y :GRSIZE

	0.00	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00		
3.34	0.00	1.33	0.22	0.04	0.16	0.02	0.00	0.00	0.00	0.00	0.00	12.69	14.46
4.72	0.00	0.47	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	1.50	2.05
6.67	0.00	0.68	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	1.74	2.91
9.43	0.00	0.00	0.00	0.00	0.00	0.45	0.41	0.00	0.00	0.00	0.49	5.75	7.10
13.34	0.00	0.00	0.98	1.52	0.00	0.62	0.00	0.00	0.00	1.04	0.94	7.95	13.04
18.85	0.00	0.00	0.00	0.00	0.00	1.20	0.00	0.00	0.00	0.00	0.00	4.38	5.57
26.65	0.00	0.00	0.00	0.00	0.00	2.16	0.00	0.00	0.00	3.06	3.69	8.07	16.98
37.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.83	4.47	0.00	10.31
53.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.11	0.00	10.11
75.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.47	0.00	0.00	17.47
106.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
212.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
425.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	2.48	1.43	1.56	0.16	4.52	0.41	0.00	0.00	27.39	19.97	42.09	

file sphale.fre - mode 5

variable z :GRAREA

variable x :GRPERC

variable y :PTSIZE

	0.00	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00		
3.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.02	2.04
4.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.01	2.61	2.65
6.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.04	0.01	4.85	4.98
9.43	0.00	0.00	0.00	0.00	0.01	0.00	0.04	0.01	0.06	0.17	0.18	6.73	7.20
13.34	0.00	0.01	0.00	0.01	0.05	0.06	0.05	0.15	0.15	0.31	0.81	11.42	13.02
18.85	0.00	0.01	0.01	0.06	0.03	0.04	0.07	0.10	0.06	0.67	1.47	12.59	15.11
26.65	0.00	0.01	0.02	0.02	0.09	0.10	0.16	0.00	0.43	0.70	4.12	12.32	17.97
37.68	0.00	0.01	0.05	0.09	0.00	0.33	0.39	0.00	0.00	0.76	7.90	6.99	16.51
53.26	0.00	0.04	0.00	0.09	0.00	0.00	0.00	0.39	0.31	0.48	4.57	5.63	11.51
75.29	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.62	0.00	7.40	0.87	9.01
106.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
212.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
425.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.08	0.20	0.28	0.17	0.54	0.72	0.67	1.69	3.14	26.47	66.04	

file sphale.fre - mode 5

variable z :GRAREA
variable x :GRPERC
variable y :GRSIZE

	0.00	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00		
3.34	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.02	0.00	0.00	0.00	2.02	2.08
4.72	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01	0.01	2.61	2.69
6.67	0.00	0.02	0.01	0.01	0.03	0.01	0.04	0.01	0.04	0.08	0.02	4.85	5.11
9.43	0.00	0.00	0.02	0.06	0.03	0.05	0.05	0.00	0.09	0.19	0.25	6.73	7.47
13.34	0.00	0.04	0.00	0.06	0.06	0.04	0.07	0.25	0.11	0.37	0.77	11.42	13.20
18.85	0.00	0.00	0.05	0.14	0.05	0.10	0.06	0.00	0.06	0.56	1.51	12.59	15.11
26.65	0.00	0.00	0.12	0.00	0.00	0.33	0.31	0.00	0.43	0.70	4.21	12.32	18.42
37.68	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.31	0.76	7.72	6.99	15.96
53.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.62	0.48	5.28	5.63	12.40
75.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.69	0.87	7.56
106.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
212.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
425.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.08	0.20	0.28	0.17	0.54	0.72	0.67	1.69	3.14	26.47	66.04	