PRELIMINARY GEOSTATISTICAL STUDY

OF BTU VARIATIONS

IN THE

HAT CREEK DEPOSIT

Respectfully submitted

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Montreal, May 16, 1978

F O R E W O R D

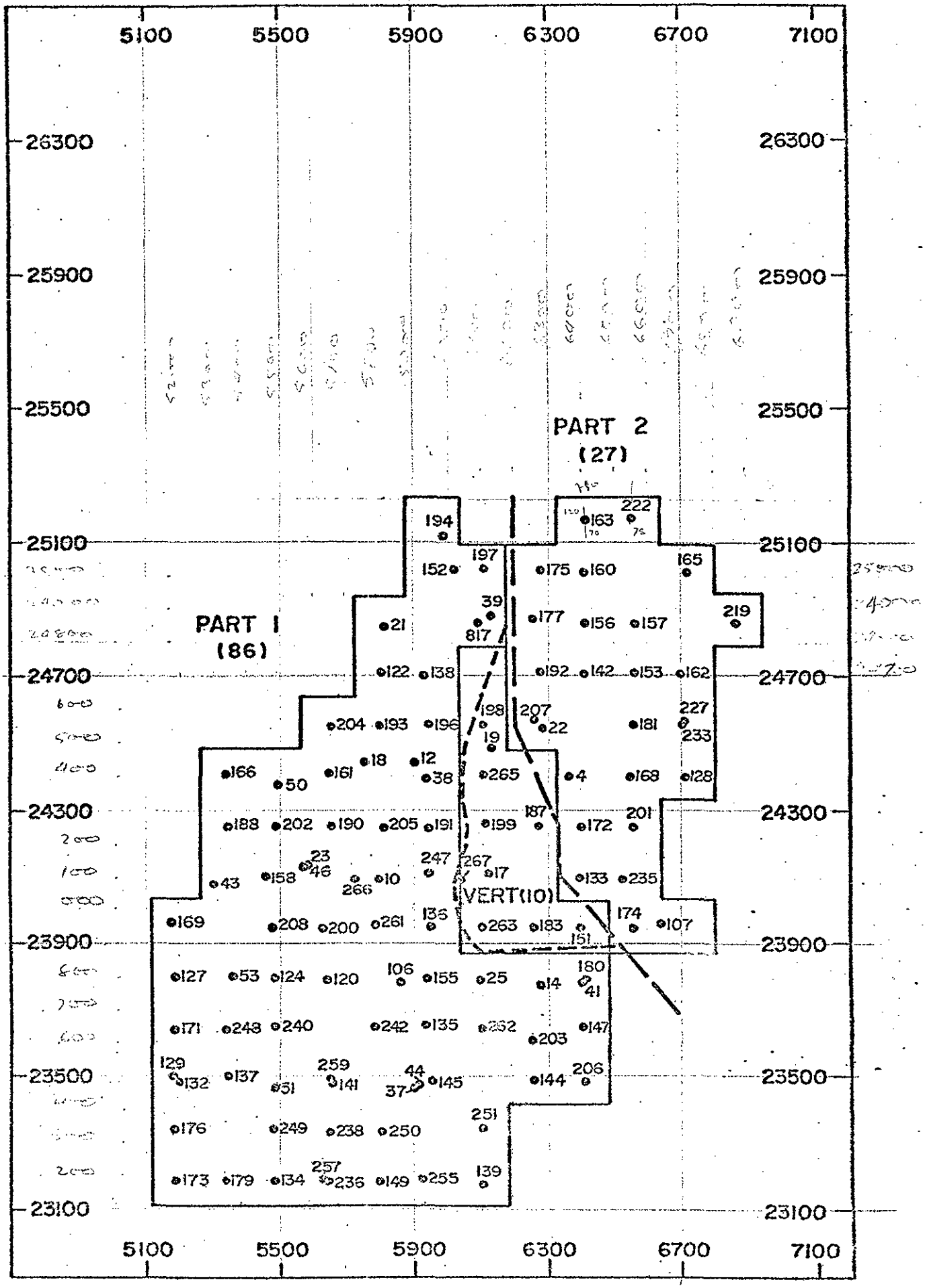
This report describes the work done following the proposal # 1 made to B.C. Hydro on March 13, 1978 by IREM-MERI, concerning the Hat Creek Project. It contains conclusions, variograms and maps obtained by kriging.

CONCLUSIONS

1. The purpose of this first study was to estimate the Hat Creek deposit for BTU content layer by layer, using geostatistics.

2. Each layer has been horizontally projected, but as no vertical thicknesses were available, no tonnage calculations have been made.

3. Due to the existence of the fault and almost vertical attitude of layers in its vicinity, only the western part of the deposit has been considered in a first phase. Figure 1 shows the definition of the zone considered. This zone in fact encompasses most of the tonnage of the deposit.



HAT CREEK PROJECT MAP OF HOLE COLLARS

Scale : 1" = 400'

FIGURE 1 (legend on the following page)

FIGURE 1 : Map of location of drill holes with sampling information codified in the data file supplied by MINTEC. The deposit has been divided in a north-eastern zone (PART2 with 27 holes) and a southwestern zone (PART1 with 86 holes). Both zones are synclines separated by a fault. The study has been restricted to PART1 only. In that zone, the group of 10 holes drilled in the nearly vertical limb of the syncline close to the fault (VERT on the figure) has not been considered too.

LAYER	NUMBER OF INTERCEPTS IN PART 1	MEDIAN BTU	MEAN BTU	MINIMUM BTU	MAXIMUM BTU	STANDARD DEVIATION BTU
A1-1	20	5752.5	5588.7	3208	7132	1042.1
A1-2	27	5569.0	5558.3	3508	7205	742.7
A1-3	30	5404.0	5391.5	2368	7757	1486.2
A1-4	32	5350.5	5061.2	2236	6900	1242.5
A2-1	29	1333.0	1387.9	0	5561	1265.1
B1-1	33	7314.0	6841.5	1508	9874	1863.8
B1-2	33	6101.0	5730.4	1051	7964	1913.4
C1-1	33	666.0	1353.6	0	6597	1773.8
C2-1	33	3284.0	2982.4	0	6385	1926.8
C2-2	41	3841.0	3536.3	164	6963	2010.2
D1-1	41	7654.0	7386.9	2914	9499	1566.7
D1-2	46	8670.5	8541.5	3741	10536	1360.4
D1-3	49	9822.0	9570.1	5875	11017	1084.9
D1-4	52	9590.0	9382.0	6500	10489	814.4

TABLE 1 : (Legend on the following page)

TABLE 1 : Statistics of the distributions of BTU values in each layer and reported from holes in the isoclinal PARTI only (see Figure 1 for the limits of that zone).

The layers of economic importance (A, B and D) are characterized by some negative dissymetry with the median values greater than the means. The relative dispersion in these layers keeps small with coefficients of variation ranging from 8% to 28%. It should be noted that in the richer D horizon, the dispersion is decreasing when the mean value increases. This has to be related to the progressive disappearance of the low values in the distributions (see the variation of the minimum values).

The layers which yield a large proportion of uneconomic values (A2-1 and C) generally show some positive dissymetry and larger relative dispersions (coefficients of variation from 57% to 131%).

4. The data considered is the average BTU content within an intersection (including samples below 4000 BTU, no cut-off made), as read from the tape supplied by Mintec. The list of hole numbers and BTU content for each layer is given in Appendix 1, for the zone considered. Table 1 shows a summary of statistics for the 14 layers.

5. VARIOGRAMS

As the thickness (vertical) is not available, but regular, variograms have been computed on BTU content for different directions in order to check for anisotropies. They are shown in Appendix 2 for the 12 layers and two partings.

6. As expected anisotropies and trends are present in several layers. The models retained are summarized in table 2. One should note that when trends are present, one can in fact handle it as a "geometrical anisotropy" to avoid having to go to universal kriging. One can see from this table that there are several groups of layers.

The upper layers are isotropic on distances less than 600 m. (A1-1, A1-3, A1-4 show good isotropic variograms, A1-2 shows a "bad" variogram but in fact the amplitude of variations is much smaller, and thus there is no particular problem here). Starting with

BTU's

precision estimate

LAYER	NUGGET EFFECT	SLOPE(S)	AVERAGE STANDARD ERROR	
A1-1	0	2,500 isotropic	350	(6%)
A1-2	150,000	844 - min cost 542.86 - max cost ratio of 2	230	(4%)
A1-3	0	2,909	380	(7%)
A1-4	0	2,100	330	(7%)
A2-1 waste	200,000	1,550 688.89	300	(22%)
B1-1	300,000	3,000 1,153.85	330	(5%)
B1-2	400,000	4,000 1,600	400	(7%)
C1-1 waste	750,000	2,300 836.36	550	(41%)
C2-1 waste	0	7,200 3,272.73	400	(13%)
C2-2	500,000	7,777.78 3,181.82	550	(16%)
D1-1	200,000	3,125 1,590.91	380	(5%)
D1-2	150,000	1,295.24 715.79	280	(3%)
D1-3	0	1,181.80 541.70	150	(2%)
D1-4	60,000	350.	220	(2%)

TABLE 2 : (Legend on the following page)

TABLE 2 : Variogram models for the variations of BTU in each layer and corresponding average standard error in the estimation of the average BTU content of 75 x 75 m blocks. In all cases, the variograms are the sum of a nugget effect and an anisotropic or isotropic linear model. When the model is isotropic, a single value for the slope is given. When the model is anisotropic the maximum and the minimum slopes are given. The maximum slope is assigned to the variogram along the direction N-23°-E and the minimum slope is for the variogram in the perpendicular direction. In the models, the distance is always expressed in meters. The average standard error is the mean of the standard errors for all the 75 x 75 m blocks estimated by kriging in the layer. The value between parenthesis is the relative standard error of precision for a 68% confidence level.

layer B, the trend is more and more pronounced, showing higher values on the east north-east side, this giving a maximum slope for the variogram in this direction.

A common characteristic of all variograms is the low variance and ~~absence~~ existance of a small nugget effect; all this corresponding to the expected good continuity of the BTU content.

7. KRIGING:

Using the equations of Table 2 kriging has been performed for each layer. Blocks are 75 m x 75 m and the origin of the blocks is at 5137.5E, 23087.5N .

8. Maps have been produced at a scale of 1" = 300 m. The outline of the layer, taken from isoelevation maps supplied by B.C. Hydro is shown. Within each block BTU content and the precision of the estimation (one standard deviation) is given. These maps should be compared with the map produced by inverse square distance method in the COMINCO-MONENCO model. Difference can be expected, if only due to the fact that the trend is now taken into account. The maps are given in Appendix 3. These maps can be plotted at other scales on request.

9. The estimation of blocks in the "vertical" section should require a more sophisticated model. The estimation of blocks in the small syncline can be done using the same techniques.

10. The precision of the estimation is different in each layer. Table 2 shows for instance the average precision obtained in each layer when the BTU content of a 75 x 75 m is estimated by kriging. The precision in absolute value is fairly constant (less than 500 BTU) which means that in rich layers the relative precision is better and areas of leaner quality are relatively less well known.

APPENDIX 1

File of the sample values used in this study

For each layer, the intercept of an hole with the layer is characterized by:

- the hole number
- the coordinates (in the order: longitude, latitude, elevation) of the top of the intercept
- the coordinates (in the same order) of the bottom of the intercept if they can be derived from the data file supplied by MINTEC (another layer has been encountered below). Otherwise, these values are set to zero.
- the average ash content in the intercept (in percent).
- the average BTU in the intercept.
- the average specific gravity of the rocks in the intercept.
- the true length of the intercept i.e. the length of its projection in the direction of the shortest dimension of the layer (in meters).

25	6120.5	23786.4	920.1	6137.4	23786.4	890.8	54.24	4859.	1.60	33.66
37	6036.2	23469.1	783.7	6059.4	23469.1	743.7	48.71	5543.	1.56	42.75
44	5833.3	23469.1	815.7	5814.6	23469.1	783.4	45.04	6078.	1.54	37.02
106	5867.4	23782.1	852.5	5867.4	23782.1	818.2	37.26	7132.	1.48	32.89
135	5932.1	23658.7	822.8	5930.4	23659.6	786.2	42.60	6249.	1.52	33.58
136	5956.6	23946.3	861.4	5956.0	23946.5	827.9	44.72	6120.	1.53	33.48
139	6106.6	23171.9	691.6	6106.6	23171.9	627.6	46.76	5962.	1.55	60.33
141	5649.5	23491.2	948.3	5648.0	23491.5	915.1	48.34	5456.	1.57	20.29
144	6258.8	23487.9	907.3	6258.8	23488.0	849.4	37.24	7069.	1.47	44.23
145	5951.3	23487.3	793.4	5950.4	23487.4	752.0	43.47	6021.	1.52	41.31
149	5806.4	23187.8	811.4	5808.6	23190.9	738.0	55.97	4238.	1.62	57.10
155	5951.0	23792.7	838.5	5951.8	23793.0	804.8	46.28	6000.	1.55	33.79
203	6258.8	23606.3	914.5	6262.1	23608.3	870.5	38.53	7001.	1.49	40.46
236	5642.2	23184.5	957.1	5639.1	23185.7	876.3	61.78	3208.	1.67	63.88
242	5785.9	23643.3	943.8	5777.4	23639.3	819.9	41.33	6524.	1.51	35.80
247	5948.4	24110.8	901.6	5942.7	24110.3	877.0	48.68	5141.	1.57	23.87
250	5796.1	23346.2	812.4	5793.3	23349.6	760.9	49.77	5246.	1.57	46.03
251	6205.0	23353.7	790.6	6224.1	23355.0	755.3	56.82	4069.	1.62	40.01
255	5913.0	23207.9	733.6	5909.7	23211.4	679.3	52.08	4616.	1.59	51.51
262	6106.3	23639.6	853.0	6106.5	23638.8	812.8	48.30	5242.	1.55	34.56

Layer A1-1

10	5800.3	24092.7	924.5	5800.3	24092.7	885.2	46.43	5818.	1.55	34.03
25	6137.4	23786.4	890.8	6174.7	23786.4	826.2	52.98	4961.	1.60	73.52
37	6059.4	23469.1	743.7	6104.8	23469.1	665.0	48.00	5569.	1.56	86.59
38	5975.8	24393.2	871.2	5990.1	24393.2	846.5	42.22	6141.	1.52	16.81
44	5814.6	23469.1	783.4	5784.1	23469.	730.6	43.41	6220.	1.54	60.87
106	5867.4	23782.1	818.2	5867.4	23782.1	760.4	49.19	5275.	1.57	55.70
135	5930.4	23659.6	786.2	5927.8	23661.1	728.4	43.43	6334.	1.53	57.88
136	5956.0	23946.5	827.9	5955.0	23947.0	771.5	48.25	5726.	1.57	56.13
139	6106.6	23171.9	627.6	6106.6	23171.9	580.7	51.38	5455.	1.59	46.44
141	5648.0	23491.5	915.1	5645.4	23491.9	858.5	51.98	5030.	1.59	34.64
144	6258.8	23488.0	849.4	6258.9	23488.3	766.5	47.19	5686.	1.56	65.39
145	5950.4	23487.4	752.0	5948.9	23487.5	684.1	47.30	5500.	1.55	67.24
149	5808.6	23190.9	738.0	5810.3	23193.4	679.5	52.00	5088.	1.60	44.80
155	5951.8	23793.0	804.8	5953.2	23793.4	749.3	47.03	5898.	1.56	55.46
191	5948.1	24245.5	883.7	5946.5	24242.1	837.6	55.43	4496.	1.63	37.37
203	6262.1	23608.3	870.5	6266.7	23611.0	811.4	44.74	6194.	1.53	49.63
206	6375.5	23490.7	894.9	0.0	0.0	0.0	35.78	7205.	1.46	44.50
236	5639.1	23185.7	876.3	5637.0	23186.4	820.3	50.05	5181.	1.58	45.18
238	5651.2	23330.9	968.2	5645.2	23330.6	831.1	53.16	4574.	1.60	102.83
242	5777.4	23639.3	819.9	5773.0	23637.3	755.5	45.88	5865.	1.55	55.75
247	5942.7	24110.3	877.0	5938.6	24108.9	816.5	40.43	6634.	1.50	59.16
250	5793.3	23349.6	760.9	5790.0	23353.5	701.3	45.20	5978.	1.54	52.51
251	6224.1	23355.0	755.3	6254.7	23357.0	698.9	50.94	5024.	1.59	64.01
255	5909.7	23211.4	679.3	5905.7	23215.5	614.3	46.72	5281.	1.55	61.99
257	5622.1	23195.8	951.1	5603.2	23208.9	874.1	58.65	3508.	1.64	68.21
261	5794.7	23951.2	920.7	5795.9	23953.3	865.8	43.96	6155.	1.53	25.12
262	6106.5	23638.8	812.8	6107.1	23636.7	695.8	48.28	5277.	1.56	107.22

Layer A1-2

10	5800.3	24092.7	885.2	5800.3	24092.7	860.8	35.70	7444.	1.47	20.09
12	5911.3	24443.8	904.3	5911.3	24443.8	866.6	48.19	5468.	1.57	31.97
25	6174.7	23786.4	826.2	6185.9	23786.4	806.8	56.95	4322.	1.63	21.99
37	6104.8	23469.1	665.0	6124.4	23469.1	631.0	46.02	5766.	1.54	38.24
38	5990.1	24393.2	846.5	5999.3	24393.2	830.6	45.84	5905.	1.56	10.56
44	5784.1	23469.1	730.6	5770.0	23469.1	706.2	53.17	4503.	1.61	28.20
106	5867.4	23782.1	760.4	5867.4	23782.1	741.4	37.57	7237.	1.49	18.33
120	5649.1	23788.5	936.1	5652.5	23788.2	872.8	54.74	4313.	1.62	33.99
135	5927.8	23661.1	728.4	5926.7	23661.8	704.1	42.73	6438.	1.53	24.39
136	5955.0	23947.0	771.5	5954.6	23947.2	748.6	35.43	7593.	1.47	22.51
139	6106.6	23171.9	580.7	6106.6	23171.9	552.9	51.81	5110.	1.60	27.68
141	5645.4	23491.9	858.5	5643.8	23492.2	824.6	54.57	4514.	1.62	20.71
144	6258.9	23488.3	766.5	6259.0	23488.4	733.9	55.69	4642.	1.63	25.71
145	5948.9	23487.5	684.1	5948.2	23487.5	656.3	41.04	6634.	1.51	27.44
149	5810.3	23193.4	679.5	5811.3	23194.9	645.2	56.84	4231.	1.64	25.86
155	5953.2	23793.4	749.3	0.0	0.0	0.0	0.0	48.24	5778.	1.57	26.76
191	5946.5	24242.1	837.6	5945.9	24240.8	819.4	32.80	7757.	1.45	14.95
196	5952.8	24562.0	910.8	5952.6	24562.1	902.2	39.84	6837.	1.49	8.05
203	6206.7	23011.0	811.4	6208.4	23012.1	788.8	50.61	5340.	1.58	16.75
205	5812.8	24248.0	912.7	5812.7	24247.7	901.3	70.74	2368.	1.76	8.90
236	5637.0	23186.4	820.3	5635.7	23186.9	786.9	58.53	3814.	1.65	27.74
238	5645.2	23330.6	831.1	5643.7	23330.5	797.6	58.54	3871.	1.65	25.09
242	5773.0	23637.3	755.5	5771.3	23636.4	729.7	43.37	6366.	1.53	22.94
247	5938.6	24108.9	816.5	5937.2	24108.3	794.5	38.55	7038.	1.49	21.15
250	5790.0	23353.5	701.3	5788.4	23355.4	672.1	50.50	5297.	1.58	25.16
251	6254.7	23357.0	698.9	6278.1	23358.6	655.5	63.22	3195.	1.69	49.23
255	5905.7	23215.5	614.3	5903.8	23217.5	583.8	52.52	4811.	1.60	28.84
257	5603.2	23208.9	874.1	5596.0	23213.8	844.9	66.58	2438.	1.72	25.81
261	5795.9	23953.3	865.8	5796.5	23954.4	838.5	36.76	7219.	1.47	12.60
262	6107.1	23636.7	695.8	6107.3	23636.2	667.1	47.94	5497.	1.56	27.69

Layer A1-3

10	5800.3	24092.7	860.8	5800.3	24092.7	824.2	43.06	6420.	1.53	29.32
12	5911.3	24443.8	866.6	5911.3	24443.8	852.6	54.69	4811.	1.63	11.81
14	6280.4	23770.2	905.6	6280.4	23770.2	890.3	39.52	6792.	1.50	6.47
25	6185.9	23786.4	806.8	6203.1	23786.4	777.0	58.85	4067.	1.66	33.03
37	6124.4	23469.1	631.0	6144.1	23469.1	596.9	47.38	5776.	1.57	38.83
38	5899.3	24393.2	830.6	6027.3	24393.2	782.0	54.00	4672.	1.61	37.95
44	5770.0	23469.1	706.2	5751.0	23469.1	673.2	51.42	5025.	1.59	37.85
106	5867.4	23782.1	741.4	5867.4	23782.1	696.7	45.53	6092.	1.55	42.91
120	5652.5	23788.2	872.8	5654.4	23788.0	837.2	50.62	5267.	1.59	19.08
135	5926.7	23661.8	704.1	5924.6	23662.9	658.4	46.75	5912.	1.56	45.68
136	5954.6	23947.2	748.6	5953.8	23947.5	706.0	41.67	6639.	1.51	41.67
139	6106.6	23171.9	552.9	6106.6	23171.9	506.9	52.12	5434.	1.61	45.98
141	5643.8	23492.2	824.6	5641.6	23492.6	777.8	58.37	4183.	1.66	33.71
144	6259.0	23488.4	733.9	6259.1	23488.6	666.9	60.37	3781.	1.68	53.03
145	5948.2	23487.5	656.3	0.0	0.0	0.0	48.72	5448.	1.57	50.84
149	5811.3	23194.9	645.2	5812.8	23197.1	595.8	61.82	3407.	1.68	36.85
191	5945.9	24240.8	819.4	5944.2	24237.3	771.0	48.07	5724.	1.57	41.02
196	5952.6	24562.1	902.2	5951.5	24562.9	855.9	48.03	5579.	1.56	43.32
203	6268.4	23612.1	788.8	6272.0	23614.2	741.8	56.81	4337.	1.63	34.70
205	5812.7	24247.7	901.3	5812.0	24246.6	855.3	45.40	6010.	1.54	36.89
236	5635.7	23186.9	786.9	5634.1	23187.5	743.7	66.98	2381.	1.72	35.66
238	5643.7	23330.5	797.6	5641.9	23330.4	755.7	59.42	3668.	1.66	31.38
242	5771.3	23636.4	729.7	5768.4	23635.1	687.9	48.50	5499.	1.57	37.83
247	5937.2	24108.3	794.5	5934.2	24107.4	751.7	46.50	5938.	1.56	40.58
250	5788.4	23355.4	672.1	5786.0	23358.2	628.8	52.94	4772.	1.60	36.79
251	6278.1	23358.6	655.5	0.0	0.0	0.0	60.84	3483.	1.66	45.04
255	5903.8	23217.5	583.8	0.0	0.0	0.0	58.32	3737.	1.64	43.19
257	5596.0	23213.8	844.9	5587.0	23220.0	808.4	67.76	2236.	1.73	31.90
259	5618.7	23481.1	930.6	5588.5	23482.1	856.5	49.76	5152.	1.56	65.68
261	5796.5	23954.4	838.5	5797.6	23956.5	786.1	42.07	6426.	1.51	25.44
262	6107.3	23636.2	667.1	6107.5	23635.2	615.3	43.83	6392.	1.53	48.73
266	5716.2	24096.6	926.0	5714.7	24096.6	921.8	40.16	6900.	1.51	3.92

Layer A1-4

10	5800.3	24092.7	824.2	0.0	0.0	0.0	80.00	0.	1.84	20.60
12	5911.3	24443.8	852.6	5911.3	24443.8	824.8	77.83	413.	1.82	23.51
14	6280.4	23770.2	890.3	6280.4	23770.2	875.0	48.06	5561.	1.57	6.47
25	6203.1	23786.4	777.0	6216.1	23786.4	754.5	61.07	3419.	1.68	24.01
37	6144.1	23469.1	596.9	6155.1	23469.1	577.9	72.41	1982.	1.77	21.70
38	6027.3	24393.2	782.0	6036.3	24393.2	766.4	71.70	1991.	1.76	15.07
44	5751.0	23469.1	673.2	5729.6	23469.1	636.2	83.94	543.	1.87	41.17
100	5867.4	23782.1	696.7	5867.4	23782.1	676.6	75.73	847.	1.80	19.17
120	5654.4	23788.0	837.2	5656.8	23787.8	793.4	78.09	539.	1.82	24.33
135	5924.6	23662.9	658.4	5923.5	23663.5	634.1	75.07	1444.	1.80	24.39
136	5953.8	23947.5	706.0	5953.5	23947.7	687.7	69.31	2510.	1.75	17.95
139	6106.6	23171.9	506.9	6106.6	23171.9	485.9	75.43	1333.	1.80	21.00
141	5641.6	23492.6	777.8	5639.6	23492.9	735.1	79.84	337.	1.84	35.67
144	6259.1	23488.6	666.0	6259.1	23488.7	636.9	73.94	1308.	1.79	24.66
149	5812.8	23197.1	595.8	0.0	0.0	0.0	80.00	0.	1.84	14.54
191	5944.2	24237.3	771.0	5943.5	24236.0	752.8	73.54	2052.	1.78	16.22
196	5951.5	24562.9	855.9	5951.1	24563.2	841.3	70.71	2623.	1.76	13.66
203	6272.0	23614.2	741.8	6273.5	23615.1	721.8	74.23	1709.	1.79	14.78
205	5812.0	24246.6	855.3	5811.8	24246.2	840.4	67.50	2805.	1.73	12.07
236	5634.1	23187.5	743.7	5631.5	23188.4	675.6	79.81	36.	1.84	55.28
238	5641.9	23330.4	755.7	5639.2	23330.3	694.7	79.56	81.	1.84	46.46
242	5768.4	23635.1	687.9	5766.4	23634.2	658.3	73.60	1277.	1.78	27.15
247	5934.2	24107.4	751.7	5932.7	24106.8	729.0	70.80	2056.	1.76	21.69
250	5786.0	23358.2	628.8	5783.0	23361.8	574.2	80.00	0.	1.84	46.07
257	5587.0	23220.0	808.4	5577.6	23226.5	769.9	80.00	0.	1.84	33.28
259	5588.5	23482.1	856.5	5568.6	23482.7	807.8	79.59	230.	1.84	43.18
261	5797.6	23956.5	786.1	5798.2	23957.6	759.9	70.85	1758.	1.75	15.90
262	6107.5	23635.2	615.3	6107.6	23634.8	594.4	72.51	1534.	1.77	19.45
266	5714.7	24096.6	921.8	5709.3	24096.6	907.0	72.02	1861.	1.77	13.56

Layer A2-1

12	5911.3	24443.8	824.8	5911.3	24443.8	781.2	31.31	8260.	1.48	38.95		
14	6280.4	23770.2	875.0	6280.4	23770.2	792.7	28.44	8425.	1.45	36.72		
16	5759.8	24444.1	926.9	5759.8	24444.1	883.7	35.42	6692.	1.52	34.71		
25	6216.1	23786.4	754.5	6231.3	23786.4	728.1	31.15	8173.	1.48	28.28		
37	6155.1	23469.1	577.9	6185.6	23469.1	525.1	36.57	7201.	1.53	60.61		
38	6036.3	24393.2	766.4	6051.6	24393.2	740.0	31.13	7945.	1.48	27.95		
44	5729.6	23469.1	636.2	5715.9	23469.1	612.5	44.34	6289.	1.60	25.58		
106	5807.4	23782.1	676.6	5867.4	23782.1	630.1	35.13	7427.	1.51	44.10		
120	5656.8	23787.8	793.4	5658.9	23787.5	753.1	73.73	1508.	1.87	24.20		
134	5492.5	23177.9	853.1	5492.5	23177.3	825.4	60.09	3760.	1.75	18.70		
135	5923.5	23663.5	634.1	5921.2	23664.8	585.4	34.85	7676.	1.51	48.35		
136	5953.5	23947.7	687.7	5952.8	23948.0	645.1	31.29	8159.	1.48	41.91		
138	5940.9	24702.1	896.7	5941.8	24700.8	854.7	28.77	8294.	1.46	38.28		
139	6106.6	23171.9	485.9	0.0	0.0	0.0	35.95	7665.	1.52	25.90		
141	5639.6	23492.9	735.1	5637.9	23493.2	698.7	49.51	5666.	1.65	29.94		
144	6259.1	23488.7	636.9	0.0	0.0	0.0	37.78	7267.	1.53	11.03		
147	6412.8	23637.2	893.3	6414.4	23638.9	839.8	26.30	8975.	1.43	42.06		
191	5943.5	24236.0	752.8	5942.3	24233.4	716.4	36.09	7314.	1.52	33.00		
196	5951.1	24563.2	841.3	5950.4	24563.7	810.8	29.99	8309.	1.47	28.54		
200	5635.7	23940.3	980.9	5636.5	23938.5	933.6	52.97	4652.	1.67	22.01		
203	6273.5	23615.1	721.8	0.0	0.0	0.0	36.09	7406.	1.52	34.83		
205	5811.8	24246.2	840.4	5811.3	24245.4	808.2	30.15	8302.	1.47	25.04		
236	5631.5	23188.4	675.6	0.0	0.0	0.0	16.99	9874.	1.35	9.97		
238	5639.2	23330.3	694.7	0.0	0.0	0.0	46.81	6592.	1.62	12.58		
242	5766.4	23634.2	658.3	5764.0	23633.0	622.9	39.36	6908.	1.55	32.75		
247	5932.7	24106.8	729.0	5930.7	24106.1	699.1	33.66	7826.	1.50	28.66		
249	5410.7	23343.6	903.4	5400.4	23344.5	885.3	71.69	2030.	1.86	20.03		
250	5783.0	23361.8	574.2	5781.4	23363.8	544.6	46.79	5823.	1.62	24.97		
257	5577.6	23226.5	769.9	5574.5	23228.7	757.2	48.49	5662.	1.63	10.88		
259	5568.6	23482.7	807.8	5557.5	23483.1	780.6	57.28	4131.	1.72	24.28		
261	5798.2	23957.6	759.9	5799.2	23959.4	714.1	37.39	7130.	1.53	34.33		
262	6107.6	23634.8	594.4	6107.9	23634.0	548.2	35.08	7680.	1.51	43.62		
266	5709.3	24096.6	907.0	5697.5	24096.6	874.5	39.13	6747.	1.55	30.11		

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N	x_c	Y_c	Z_c	x_i	y_i	z_i	Ash	BTU	SG	L
12	5911.3	24443.8	781.2	5911.3	24443.8	765.3	37.81	7274.	1.54	14.14
14	6280.4	23770.2	792.7	6280.4	23770.2	747.0	46.62	6009.	1.62	24.04
18	5759.8	24444.1	883.7	5759.8	24444.1	871.5	58.56	3647.	1.73	10.05
25	6231.3	23786.4	728.1	6243.5	23786.4	707.0	34.06	7713.	1.50	22.70
37	6185.6	23469.1	525.1	6194.7	23469.1	509.2	44.11	6101.	1.60	18.15
38	6051.6	24393.2	740.0	6066.8	24393.2	713.7	33.12	7659.	1.50	28.91
44	5715.9	23469.1	612.5	5706.8	23469.1	596.6	57.17	4393.	1.72	16.91
46	5582.4	24131.4	963.8	5591.8	24131.4	947.4	48.85	5483.	1.65	6.46
106	5867.4	23782.1	630.1	5867.4	23782.1	590.7	41.68	6632.	1.57	37.08
120	5658.9	23787.5	753.1	5661.5	23787.3	704.8	55.45	4598.	1.70	31.69
124	5494.7	23793.3	977.5	5495.1	23793.4	940.7	73.93	⇒1327.	1.88	25.73
134	5492.5	23177.3	825.4	5492.5	23176.3	781.0	64.37	3282.	1.79	28.89
135	5921.2	23664.8	585.4	5919.9	23665.5	556.5	38.40	7164.	1.54	28.32
136	5952.8	23948.0	645.1	5952.2	23948.3	613.1	37.82	7130.	1.53	31.49
138	5941.8	24700.8	854.7	5942.3	24700.2	833.4	32.49	7959.	1.49	19.43
141	5637.9	23493.2	698.7	0.0	0.0	0.0	56.35	4640.	1.72	19.14
147	6414.4	23638.9	839.8	0.0	0.0	0.0	36.43	7427.	1.52	59.09
161	5655.4	24408.2	939.4	5655.4	24408.0	931.1	53.05	4448.	1.69	7.48
190	5655.2	24254.8	954.7	5655.2	24254.8	918.7	37.43	6956.	1.53	26.96
191	5942.3	24233.4	716.4	5941.4	24231.6	692.1	35.25	7481.	1.52	22.27
193	5802.5	24558.2	906.8	5801.6	24558.7	879.4	37.65	7084.	1.53	24.06
196	5950.4	24563.7	810.8	5949.8	24564.1	787.4	32.71	7918.	1.49	21.99
200	5636.5	23938.5	933.6	5637.3	23936.6	882.2	55.29	4399.	1.69	31.38
205	5811.3	24245.4	808.2	5810.8	24244.6	777.7	37.19	7195.	1.53	22.96
246	5490.3	23651.0	918.1	5490.3	23651.0	901.0	77.61	⇒1051.	1.92	12.13
242	5764.0	23633.0	622.9	0.0	0.0	0.0	52.34	5041.	1.67	35.01
247	5956.7	24106.1	899.1	5928.8	24105.5	871.6	33.03	7964.	1.50	25.93
256	5781.4	23363.8	544.6	0.0	0.0	0.0	59.02	4256.	1.74	23.23
257	5574.5	23228.7	757.2	5571.5	23230.7	745.3	68.18	2506.	1.82	10.00
259	5557.5	23483.1	780.6	5551.3	23483.3	765.4	53.95	4899.	1.69	13.90
261	5799.2	23959.4	714.1	0.0	0.0	0.0	41.90	6539.	1.57	38.80
262	6107.9	23634.0	548.2	6108.1	23633.3	513.3	39.02	7202.	1.55	33.73
266	5697.5	24096.6	874.5	5689.8	24096.6	853.4	46.83	5726.	1.62	19.87

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12	5911.3	24443.8	765.3	5911.3	24443.8	754.4	80.00	0.	2.01	9.58
14	6280.4	23770.2	747.0	0.0	0.0	0.0	42.57	6597.	1.59	9.52
15	5759.8	24444.1	871.5	5759.8	24444.1	842.2	73.34	1163.	1.93	24.43
25	6243.5	23786.4	707.0	6249.6	23786.4	696.4	61.78	3704.	1.81	11.39
37	6194.7	23469.1	509.2	6203.9	23469.1	493.4	75.87	870.	1.96	18.12
38	6066.8	24393.2	713.7	6079.0	24393.2	692.6	54.28	4352.	1.72	23.67
44	5706.8	23469.1	596.6	5691.7	23469.1	570.6	81.88	0.	2.03	28.45
46	5591.8	24131.4	947.4	5681.7	24131.4	791.7	74.08	1144.	1.94	62.97
51	5485.4	23461.1	958.3	5485.4	23461.1	844.9	80.00	0.	2.01	21.64
53	5366.0	23797.91006.5		5366.0	23797.9	971.1	80.00	51.	2.01	29.69
106	5867.4	23782.1	590.7	5867.4	23782.1	555.0	80.00	0.	2.01	33.22
120	5661.5	23787.3	704.8	5662.9	23787.2	679.2	81.11	0.	2.03	17.67
124	5495.1	23793.4	940.7	5495.6	23793.6	891.5	80.00	0.	2.01	36.19
134	5492.5	23176.3	781.0	5492.5	23175.2	735.3	80.00	379.	2.01	28.90
135	5919.9	23665.5	556.5	5918.2	23666.5	518.4	79.16	666.	2.00	37.27
136	5952.2	23948.3	613.1	5952.0	23948.4	597.9	75.34	1831.	1.96	15.01
138	5942.3	24700.2	833.4	5942.5	24699.9	821.2	62.30	3711.	1.81	10.98
158	5466.5	24100.0	962.2	5465.9	24098.3	936.7	63.96	3200.	1.83	23.01
181	5655.4	24408.0	931.1	5655.1	24407.0	885.1	80.00	0.	2.01	40.82
190	5655.2	24254.8	918.7	5655.2	24254.8	857.8	79.84	90.	2.01	46.31
191	5941.4	24231.6	692.1	5940.8	24230.4	675.3	67.11	2647.	1.86	15.74
193	5801.6	24558.7	879.4	5800.9	24559.0	860.9	75.53	2016.	1.96	16.71
196	5949.8	24564.1	787.4	5949.3	24564.5	764.6	48.37	5653.	1.64	21.33
200	5637.3	23936.6	882.2	5638.4	23934.1	814.0	78.53	1622.	2.00	49.04
202	5492.4	24254.8	954.0	5491.9	24254.8	940.8	80.00	0.	2.01	11.10
205	5810.8	24244.6	777.7	5810.3	24243.6	739.3	77.69	1001.	1.98	30.57
208	5486.7	23944.3	979.9	5487.0	23942.6	906.5	80.00	0.	2.01	59.95
240	5490.3	23651.0	901.0	5490.3	23651.0	878.8	79.74	183.	2.01	15.14
247	5928.8	24105.5	671.6	5927.5	24105.0	652.2	73.02	2172.	1.93	18.12
257	5571.5	23230.7	745.3	5562.6	23236.8	708.9	79.77	149.	2.01	29.96
259	5551.3	23483.3	765.4	5535.9	23483.8	727.4	80.19	0.	2.02	32.91
262	6108.1	23633.3	513.3	0.0	0.0	0.0	72.00	1469.	1.91	8.65
266	5689.8	24096.6	853.4	5670.7	24096.6	800.8	80.00	0.	2.01	51.55

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12	5911.5	24443.8	754.4	0.0	0.0	0.0	0.0	50.63	2134.	1.98	65.11
18	5759.8	24444.1	842.2	5759.8	24444.1	810.5	51.61	4824.	1.69	27.03
23	5576.6	24131.4	805.1	5576.6	24131.4	851.9	69.07	2757.	1.88	27.76
25	6249.6	23786.4	696.4	6258.7	23786.4	680.7	47.85	5929.	1.65	16.96
37	6203.9	23469.1	493.4	6213.0	23469.1	477.5	52.00	4587.	1.70	18.12
38	6079.0	24393.2	692.6	6084.6	24393.2	682.8	53.46	4545.	1.71	11.22
44	5691.7	23469.1	570.6	5658.9	23469.1	513.8	78.20	1149.	1.99	63.50
46	5681.7	24131.4	791.7	5708.6	24131.4	745.2	61.67	3303.	1.79	20.55
50	5505.3	24376.1	940.0	5505.3	24376.1	917.1	65.31	2934.	1.84	22.90
51	5485.4	23461.1	844.9	5485.4	23461.1	765.3	80.00	0.	2.01	23.27
53	5380.0	23797.9	971.1	5366.0	23797.9	933.6	74.89	1253.	1.95	32.70
106	5867.4	23782.1	555.0	5867.4	23782.1	526.3	59.40	3756.	1.77	26.92
120	5662.9	23787.2	679.2	5664.7	23787.0	645.2	79.67	189.	2.01	24.49
124	5495.0	23793.6	891.5	5496.1	23793.8	855.3	80.98	721.	2.02	27.04
134	5492.5	23175.2	735.3	0.0	0.0	0.0	78.25	434.	1.99	24.89
135	5918.2	23666.5	518.4	5917.0	23667.2	492.6	63.87	3284.	1.82	24.98
136	5952.0	23948.4	597.9	5951.5	23948.6	573.5	52.04	5170.	1.69	24.15
138	5942.5	24699.9	821.2	5943.1	24699.1	796.8	44.27	6385.	1.60	21.87
158	5465.9	24096.3	936.7	5465.4	24096.6	911.2	74.83	976.	1.95	22.76
161	5655.1	24407.0	885.1	5655.0	24406.5	863.8	61.63	3744.	1.80	18.50
179	5339.9	23180.3	982.8	5337.8	23178.9	905.1	75.56	882.	1.96	47.95
190	5655.2	24254.8	857.8	5655.2	24254.8	822.4	58.53	3844.	1.76	27.31
191	5940.8	24230.4	675.3	5940.0	24228.6	651.0	52.29	5069.	1.70	23.33
193	5800.9	24559.0	860.9	5800.3	24559.3	842.6	58.22	4191.	1.76	16.51
196	5949.3	24564.5	764.6	5949.0	24564.8	750.8	50.15	4952.	1.67	12.91
200	5638.4	23934.1	814.0	5638.9	23932.9	779.6	72.84	2092.	1.92	26.54
205	5810.3	24243.6	739.3	5809.7	24242.7	704.8	56.76	4357.	1.74	29.12
208	5487.0	23942.6	906.5	5487.2	23941.7	869.9	75.63	1382.	1.96	31.88
240	5490.3	23651.0	878.8	5490.3	23651.0	854.5	74.22	1312.	1.94	16.57
247	5927.5	24105.0	652.2	5925.8	24104.5	626.9	51.66	5249.	1.69	23.52
257	5502.6	23236.8	708.9	5553.4	23243.2	671.4	78.41	338.	1.99	31.80
259	5535.9	23483.8	727.4	5527.2	23484.0	706.1	77.38	641.	1.98	16.73
266	5670.7	24096.6	800.8	5664.1	24096.6	782.9	63.59	3016.	1.82	18.16

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18	5759.8	24444.1	810.5	5759.8	24444.1	791.6	61.81	3107.	1.80	16.03
23	5576.6	24131.4	851.9	5576.6	24131.4	822.0	66.61	3277.	1.85	24.27
25	6258.7	23786.4	680.7	6267.9	23786.4	664.8	39.76	6963.	1.55	17.08
37	6213.0	23469.1	477.5	6219.1	23469.1	467.0	59.24	3879.	1.78	11.98
38	6084.6	24393.2	682.8	6096.8	24393.2	661.7	45.55	5862.	1.62	24.39
39	6141.0	24877.8	861.5	6153.9	24877.8	839.0	54.94	4043.	1.72	17.99
41	6425.7	23777.5	886.7	6434.2	23777.5	871.9	50.59	5443.	1.68	14.50
43	5313.2	24076.5	976.6	5313.2	24076.5	950.5	74.52	1316.	1.94	23.75
44	5658.9	23469.1	513.8	5645.8	23469.1	491.1	75.78	1435.	1.96	25.58
46	5708.6	24131.4	745.2	5739.0	24131.4	692.4	38.65	6869.	1.54	29.26
50	5505.3	24376.1	917.1	5505.3	24376.1	890.6	57.65	3911.	1.76	26.50
51	5485.4	23461.1	765.3	5485.4	23461.1	694.6	78.34	393.	1.99	30.99
53	5366.0	23797.9	933.6	5366.0	23797.9	884.4	75.95	1226.	1.96	45.36
106	5867.4	23782.1	526.3	5867.4	23782.1	496.8	41.36	6647.	1.57	28.21
120	5664.7	23787.0	645.2	5667.2	23786.7	600.1	73.89	1275.	1.94	33.41
124	5496.1	23793.8	855.3	5496.5	23794.0	818.1	62.85	3483.	1.80	28.21
135	5917.0	23667.2	492.6	5916.3	23667.6	477.4	57.27	4505.	1.74	14.27
136	5951.5	23948.6	573.5	5951.1	23948.8	549.1	51.75	4930.	1.68	24.16
137	5342.6	23495.7	914.8	5341.7	23495.0	887.1	63.47	3478.	1.82	21.16
138	5943.1	24699.1	796.8	5943.6	24698.4	772.5	45.60	5661.	1.62	22.06
158	5465.4	24096.6	911.2	5464.7	24094.4	878.1	70.19	1915.	1.90	29.18
161	5655.0	24406.5	863.8	5654.8	24405.9	837.6	59.41	4104.	1.78	22.59
179	5337.8	23178.9	905.1	5335.8	23177.5	830.7	77.16	603.	1.98	45.60
180	6411.1	23790.3	891.2	6411.1	23790.3	839.7	42.01	6176.	1.57	28.05
188	5344.7	24250.3	961.3	5344.4	24250.0	946.7	70.45	2627.	1.90	13.58
190	5655.2	24254.8	822.4	5655.2	24254.8	783.1	46.38	5567.	1.62	31.59
191	5940.0	24228.6	651.0	5939.1	24226.8	625.2	50.08	5135.	1.67	24.98
193	5800.3	24559.3	842.6	5799.2	24559.9	811.5	50.10	5038.	1.67	28.12
196	5949.0	24564.8	750.8	5948.6	24565.1	733.8	48.11	5528.	1.64	15.91
200	5638.9	23932.9	779.6	5639.5	23931.5	743.0	60.60	3841.	1.77	27.22
202	5491.9	24254.8	940.8	5489.7	24254.7	882.2	65.06	3238.	1.84	51.40
204	5660.2	24554.2	897.1	5661.8	24554.2	859.1	79.90	164.	2.01	36.02
205	5809.7	24242.7	704.8	5809.3	24242.0	678.0	45.64	5905.	1.62	23.34
208	5487.2	23941.7	869.9	5487.2	23941.2	848.6	71.05	2208.	1.90	19.26
240	5490.3	23651.0	854.5	5490.3	23651.0	821.6	72.89	1415.	1.93	21.04
247	5925.8	24104.5	626.9	5924.3	24103.9	604.7	51.84	5109.	1.68	20.99
248	5338.5	23632.1	916.1	5337.6	23631.1	892.5	71.53	1555.	1.91	22.88
249	5400.4	23344.5	885.3	0.0	0.0	0.0	74.01	1134.	1.93	80.11
257	5553.4	23243.2	671.4	5541.5	23251.4	622.9	77.91	445.	1.99	41.78
259	5527.2	23484.0	706.1	5516.5	23484.4	679.9	73.39	1430.	1.93	20.76
266	5564.1	24096.6	782.9	5653.7	24096.6	754.1	57.63	4147.	1.75	28.79

Layer C2-2

18	5759.8	24444.1	791.6	5759.8	24444.1	745.0	30.02	8336.	1.47	39.94
23	5576.6	24131.4	822.0	5576.6	24131.4	791.5	35.05	7648.	1.51	25.06
25	6267.9	23786.4	604.8	6283.1	23786.4	638.4	33.42	7678.	1.49	28.52
37	6219.1	23469.1	467.0	6229.8	23469.1	448.5	28.25	8521.	1.45	21.19
38	6096.8	24393.2	661.7	6112.1	24393.2	635.2	25.28	8999.	1.43	30.41
39	6153.9	24877.8	839.0	6169.1	24877.8	812.7	26.89	8872.	1.44	21.12
41	6434.2	23777.5	871.9	6446.4	23777.5	850.7	38.26	6980.	1.54	21.62
43	5313.2	24076.5	950.5	5313.2	24076.5	926.1	50.42	5191.	1.66	22.11
44	5645.8	23469.1	491.1	5641.2	23469.1	483.1	43.11	6433.	1.59	9.01
46	5739.0	24131.4	692.4	5763.4	24131.4	650.2	30.60	8245.	1.47	27.46
50	5505.3	24376.1	890.6	5505.3	24376.1	872.3	34.39	7416.	1.51	18.30
51	5485.4	23461.1	694.6	5485.4	23461.1	662.6	52.00	5103.	1.67	15.51
53	5366.0	23797.9	884.4	5366.0	23797.9	873.9	32.27	7769.	1.49	9.82
106	5867.4	23782.1	496.8	5867.4	23782.1	472.4	32.24	8039.	1.49	23.54
120	5667.2	23786.7	600.1	5668.5	23786.6	575.1	66.03	2914.	1.80	18.55
124	5496.5	23794.0	818.1	5496.7	23794.1	793.7	37.50	7288.	1.54	18.15
135	5916.3	23667.6	477.4	5915.2	23668.2	453.0	52.43	4896.	1.67	22.79
136	5951.1	23948.8	549.1	5950.7	23949.0	526.2	27.55	8769.	1.45	22.65
137	5341.7	23495.0	887.1	5341.2	23494.6	868.8	46.21	6014.	1.62	14.43
138	5943.6	24698.4	772.5	5944.1	24697.7	748.1	24.02	9141.	1.41	22.15
152	6021.9	25020.5	851.0	6021.9	25020.5	821.7	22.06	9458.	1.40	29.30
158	5464.7	24094.4	878.1	5464.2	24092.9	856.1	41.72	6422.	1.58	19.34
161	5654.8	24405.9	837.6	5654.6	24405.1	801.0	34.01	7654.	1.50	31.71
179	5335.8	23177.5	830.7	5335.3	23177.1	811.8	58.38	4407.	1.73	11.52
180	6411.1	23790.3	839.7	6411.1	23790.3	803.2	20.81	9499.	1.38	19.88
188	5344.4	24250.0	946.7	5343.6	24249.5	919.0	44.97	5732.	1.61	25.85
190	5655.2	24254.8	783.1	5655.2	24254.8	752.6	25.62	8794.	1.43	24.51
191	5939.1	24220.8	625.2	5938.0	24224.6	594.8	29.53	8401.	1.47	29.42
193	5799.2	24559.9	811.5	5798.0	24560.5	774.9	25.71	9032.	1.43	33.73
196	5948.6	24565.1	733.8	5947.8	24565.6	703.3	29.39	8470.	1.46	28.54
200	5639.5	23931.5	743.0	5639.9	23930.6	718.7	38.53	6964.	1.55	17.49
202	5489.7	24254.7	882.2	5488.9	24254.7	862.5	34.32	7616.	1.51	17.99
204	5661.8	24554.2	859.1	5663.4	24554.2	822.2	49.15	5612.	1.64	34.99
205	5809.3	24242.0	678.0	5808.9	24241.2	647.5	27.29	8816.	1.44	27.25
208	5487.2	23941.2	848.6	5487.4	23940.4	816.4	37.46	7285.	1.54	28.58
817	6100.2	24860.8	851.6	6100.2	24860.8	794.3	23.40	9367.	1.41	52.35
240	5490.3	23651.0	821.6	5490.3	23651.0	794.8	37.28	7188.	1.53	17.14
247	5924.3	24103.9	604.7	5922.2	24103.2	574.8	27.63	8804.	1.45	29.02
248	5337.6	23631.1	892.5	5336.9	23630.4	872.7	47.74	5606.	1.63	18.93
259	5516.5	23484.4	679.9	5507.6	23484.6	658.2	47.91	5778.	1.63	17.92
266	5653.7	24096.6	754.1	5647.4	24096.6	736.9	33.48	7705.	1.50	16.88

Layer D1-1

18	5759.8	24444.1	745.0	5759.8	24444.1	718.5	26.26	8622.	1.43	22.77
23	5576.6	24131.4	791.5	5576.6	24131.4	767.1	26.12	9071.	1.43	19.47
25	6283.1	23786.4	638.4	6301.4	23786.4	606.7	22.63	9412.	1.40	34.28
37	6229.8	23469.1	448.5	6243.5	23469.1	424.8	20.77	9811.	1.38	27.13
38	6112.1	24393.2	635.2	6121.2	24393.2	619.4	17.54	10286.	1.35	18.18
39	6169.1	24877.8	812.7	6181.3	24877.8	791.6	20.82	9623.	1.38	17.10
41	6446.4	23777.5	850.7	0.0	0.0	0.0	24.77	9057.	1.42	24.39
43	5313.2	24076.5	926.1	5313.2	24076.5	907.8	35.52	7434.	1.52	16.55
44	5641.2	23469.1	483.1	5632.1	23469.1	467.3	33.63	7785.	1.50	17.89
46	5763.4	24131.4	650.2	5781.7	24131.4	618.5	20.05	9870.	1.38	21.64
50	5505.3	24376.1	872.3	5505.3	24376.1	844.9	29.86	8063.	1.47	27.40
51	5485.4	23461.1	662.6	5485.4	23461.1	635.2	36.07	7570.	1.53	12.97
53	5366.0	23797.9	873.9	5366.0	23797.9	853.4	37.96	7052.	1.54	19.14
106	5867.4	23782.1	472.4	5867.4	23782.1	448.0	20.63	9768.	1.38	23.65
120	5668.5	23786.6	575.1	5670.3	23786.4	542.8	59.84	3741.	1.74	23.59
124	5496.7	23794.1	793.7	5497.0	23794.2	769.3	27.59	8719.	1.45	16.75
127	5192.9	23798.0	948.7	5193.2	23798.9	921.2	41.86	6928.	1.57	24.61
129	5184.3	23501.1	939.1	0.0	0.0	0.0	37.37	7330.	1.53	5.44
132	5199.0	23492.5	937.0	5199.3	23492.8	922.4	30.82	8173.	1.48	14.70
135	5915.2	23668.2	453.0	5913.5	23669.1	416.5	32.13	8214.	1.49	33.23
136	5950.7	23949.0	526.2	5950.2	23949.2	497.3	24.05	9415.	1.41	28.50
137	5341.2	23494.6	868.8	5340.3	23493.9	840.8	33.15	7951.	1.50	23.17
138	5944.1	24697.7	748.1	5944.5	24697.2	729.8	29.75	8348.	1.47	16.51
152	6021.9	25020.5	821.7	6021.9	25020.5	809.5	15.01	10536.	1.33	12.20
158	5464.2	24092.9	856.1	5463.6	24091.3	831.9	30.32	7920.	1.47	21.36
161	5654.6	24405.1	801.0	5654.6	24404.9	788.8	22.56	9370.	1.40	10.70
166	5349.8	24407.8	930.5	5349.8	24407.8	914.1	44.06	6219.	1.60	15.21
169	5186.4	23961.0	950.7	5186.4	23961.0	941.5	33.87	7759.	1.51	7.72
179	5335.3	23177.1	811.8	5334.9	23176.8	795.7	51.88	5066.	1.67	9.92
180	6411.1	23790.3	803.2	6411.1	23790.3	760.5	15.81	10299.	1.34	23.26
188	5343.6	24249.5	919.0	5343.2	24249.2	900.7	30.42	8106.	1.47	17.14
190	5655.2	24254.8	752.6	5655.2	24254.8	734.3	17.25	10002.	1.35	14.32
191	5938.0	24224.6	594.8	5937.3	24223.3	576.5	27.00	8917.	1.44	17.50
193	5798.0	24560.5	774.9	5797.1	24560.9	750.5	16.05	10392.	1.34	22.73
196	5947.8	24565.6	703.3	5947.4	24565.9	685.0	21.61	9599.	1.39	17.12
200	5639.9	23930.6	718.7	5640.5	23929.3	682.1	24.41	9215.	1.42	24.98
202	5488.9	24254.7	862.5	5488.1	24254.6	839.8	31.77	8014.	1.48	20.93
204	5663.4	24554.2	822.2	5664.2	24554.2	803.9	21.55	9448.	1.39	17.30
205	5808.9	24241.2	647.5	5808.6	24240.8	629.2	22.93	9552.	1.40	16.56
208	5487.4	23940.4	816.4	5487.5	23939.7	785.9	25.82	8907.	1.43	27.11
817	6100.2	24860.8	794.3	6100.2	24860.8	769.9	18.33	9979.	1.36	22.29
240	5490.3	23651.0	794.8	5490.3	23651.0	770.8	27.92	8591.	1.45	16.36
247	5922.2	24103.2	574.8	5921.4	24103.0	562.8	30.87	8213.	1.48	11.71
248	5336.9	23630.4	872.7	5335.7	23629.1	839.6	31.67	7997.	1.48	31.65
259	5507.6	23484.6	658.2	5499.1	23484.9	637.2	33.72	7737.	1.50	17.42
260	5647.4	24096.6	736.9	5634.9	24096.6	702.6	26.15	8826.	1.43	33.72

Layer D1-2

18	5759.8	24444.1	718.5	5759.8	24444.1	676.7	19.51	9995.	1.37	35.54
21	5866.6	24867.2	824.3	5893.4	24879.2	794.9	23.10	9373.	1.40	13.16
23	5576.6	24131.4	767.1	5576.6	24131.4	755.0	18.28	9936.	1.36	9.06
25	6301.4	23786.4	606.7	6313.6	23786.4	585.6	16.84	10327.	1.35	23.00
37	6243.5	23469.1	424.8	6248.1	23469.1	416.8	15.53	10895.	1.34	9.11
38	6121.2	24393.2	619.4	6127.3	24393.2	608.9	13.90	11017.	1.32	12.03
39	6181.3	24877.8	791.6	6190.5	24877.8	775.7	16.69	10453.	1.35	12.94
43	5313.2	24076.5	907.8	5313.2	24076.5	880.2	26.71	8794.	1.44	25.26
44	5632.1	23469.1	467.3	5623.0	23469.1	451.5	22.38	9677.	1.40	18.07
46	5781.7	24131.4	618.5	5795.6	24131.4	594.5	17.51	10298.	1.35	17.43
50	5505.3	24376.1	844.9	5505.3	24376.1	826.6	19.10	9695.	1.37	18.30
51	5485.4	23461.1	635.2	5485.4	23461.1	604.7	24.17	9261.	1.41	13.61
53	5366.0	23797.9	853.4	5366.0	23797.9	831.8	29.98	8224.	1.47	20.23
106	5867.4	23782.1	448.0	5867.4	23782.1	435.8	15.45	10606.	1.33	11.84
120	5670.3	23786.4	542.8	5671.2	23786.3	524.6	37.65	7303.	1.54	13.14
124	5497.0	23794.2	769.3	5497.2	23794.3	757.1	22.09	9521.	1.40	8.26
127	5193.2	23798.9	921.2	5193.3	23799.5	903.0	21.64	9750.	1.39	16.32
132	5199.3	23492.8	922.4	5199.6	23493.1	910.2	23.87	9093.	1.41	12.20
135	5913.5	23669.1	416.5	5912.5	23669.7	393.7	19.10	10316.	1.37	20.01
136	5950.2	23949.2	497.3	5949.9	23949.4	477.5	15.40	10687.	1.33	19.50
137	5340.3	23493.9	840.8	5339.8	23493.5	826.2	21.85	9822.	1.39	12.15
138	5944.5	24697.2	729.8	5944.9	24696.6	711.5	16.20	10197.	1.34	16.58
152	6021.9	25020.5	809.5	6021.9	25020.5	791.2	17.00	10188.	1.35	18.30
158	5463.6	24091.3	831.9	5463.4	24090.5	819.7	24.11	9170.	1.42	10.85
161	5654.6	24404.9	788.8	5654.5	24404.6	776.6	19.44	9596.	1.37	10.87
166	5349.8	24407.8	914.1	5349.8	24407.8	899.8	46.30	5875.	1.62	13.26
169	5186.4	23961.0	941.5	5186.4	23961.0	922.3	27.48	8590.	1.45	16.10
171	5186.7	23636.0	931.8	5185.8	23635.5	911.9	24.17	8910.	1.41	16.82
176	5191.1	23339.6	949.3	5191.3	23339.8	943.5	34.29	7438.	1.51	3.69
179	5334.9	23176.8	795.7	5334.4	23176.4	777.4	36.23	7499.	1.53	11.40
180	6411.1	23790.3	760.5	6411.1	23790.3	723.9	23.43	9227.	1.40	19.93
188	5343.2	24249.2	900.7	5342.7	24248.9	882.4	23.35	9070.	1.41	17.14
190	5655.2	24254.8	734.3	5655.2	24254.8	716.0	16.15	10204.	1.34	14.47
191	5937.3	24223.3	576.5	5936.9	24222.4	564.5	15.75	10615.	1.34	11.60
193	5797.1	24560.9	750.5	5796.5	24561.2	732.2	13.79	10836.	1.32	16.96
194	5994.5	25120.8	851.7	5994.5	25120.8	833.1	15.69	10438.	1.34	18.60
196	5947.4	24565.9	685.0	5947.0	24566.3	666.7	15.25	10653.	1.33	17.12
197	6114.2	25020.2	812.3	6114.2	25020.2	804.9	37.66	7076.	1.53	6.81
200	5640.5	23929.3	682.1	5640.8	23928.6	663.9	19.03	9823.	1.37	11.90
202	5488.1	24254.6	839.8	5487.6	24254.6	827.6	21.64	9563.	1.39	11.25
204	5664.2	24554.2	803.9	5665.0	24554.2	785.6	15.65	10430.	1.34	17.02
205	5808.6	24240.8	629.2	5808.4	24240.5	617.1	18.77	10110.	1.36	10.95
208	5487.5	23939.7	785.9	5487.6	23939.2	767.6	19.60	9781.	1.37	16.41
817	6100.2	24860.8	769.9	6100.2	24860.8	751.6	16.70	10276.	1.35	16.72
240	5490.3	23651.0	770.8	5490.3	23651.0	757.8	19.03	9850.	1.37	9.43
247	5921.4	24103.0	562.8	5920.6	24102.7	550.9	17.31	10396.	1.35	11.75
248	5335.7	23629.1	839.6	5335.3	23628.7	827.6	21.41	9004.	1.39	11.34
259	5499.1	23484.9	637.2	5492.7	23485.1	621.7	24.54	9104.	1.42	12.62
266	5634.9	24096.6	702.6	5628.7	24096.6	685.5	17.89	9971.	1.36	16.69

Layer D1-3

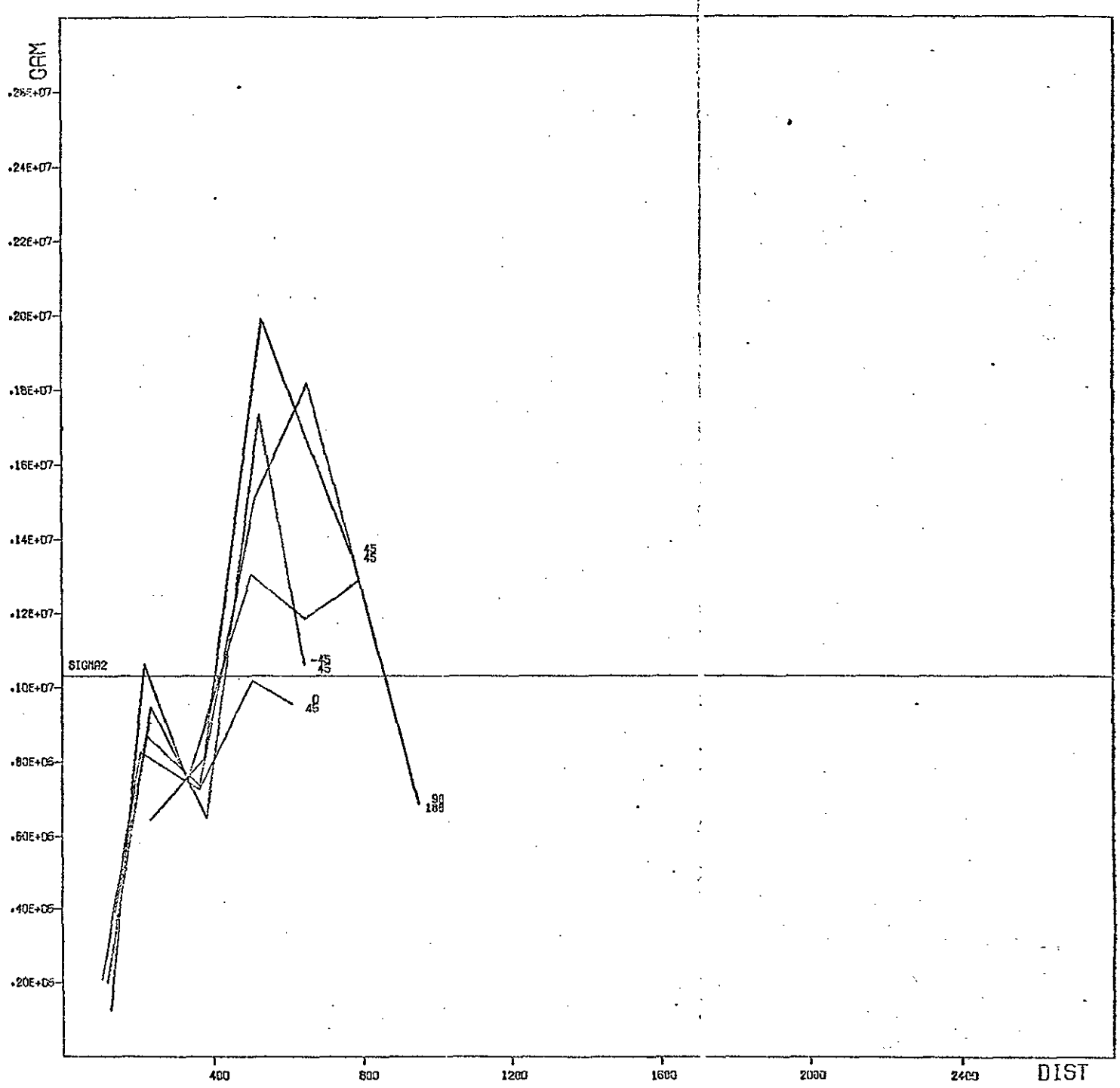
18	5759.8	24444.1	676.7	0.0	0.0	0.0	19.60	9780.	1.37	16.03
21	5893.4	24879.2	794.9	0.0	0.0	0.0	41.38	6500.	1.58	2.69
23	5576.6	24131.4	755.0	0.0	0.0	0.0	24.86	9116.	1.42	16.53
25	6313.6	23786.4	585.6	0.0	0.0	0.0	22.34	9592.	1.40	18.61
37	6248.1	23469.1	416.8	0.0	0.0	0.0	23.55	9790.	1.41	15.05
38	6127.3	24393.2	608.9	0.0	0.0	0.0	18.49	10235.	1.36	26.55
39	6190.5	24877.8	775.7	0.0	0.0	0.0	21.05	9807.	1.39	17.10
43	5313.2	24076.5	880.2	0.0	0.0	0.0	21.18	9588.	1.39	23.88
44	5623.0	23469.1	451.5	0.0	0.0	0.0	22.36	9857.	1.40	16.62
46	5795.6	24131.4	594.5	0.0	0.0	0.0	20.99	9886.	1.38	18.17
50	5505.3	24376.1	826.6	0.0	0.0	0.0	22.00	9411.	1.39	21.00
51	5485.4	23461.1	604.7	0.0	0.0	0.0	22.90	9454.	1.40	3.90
53	5366.0	23797.9	831.8	0.0	0.0	0.0	18.42	9989.	1.36	11.39
106	5867.4	23782.1	435.8	0.0	0.0	0.0	22.35	9625.	1.40	26.00
120	5671.2	23786.3	524.6	0.0	0.0	0.0	25.72	9254.	1.43	13.25
122	5808.2	24711.7	792.2	0.0	0.0	0.0	19.99	10152.	1.38	19.38
124	5497.2	23794.3	757.1	0.0	0.0	0.0	22.91	9489.	1.40	15.49
127	5193.3	23799.5	903.0	0.0	0.0	0.0	29.33	8701.	1.46	9.60
132	5199.6	25493.1	910.2	0.0	0.0	0.0	29.86	8371.	1.47	11.40
135	5912.5	23669.7	393.7	0.0	0.0	0.0	20.77	10099.	1.38	13.55
136	5949.9	23949.4	477.5	0.0	0.0	0.0	18.83	10255.	1.37	16.57
137	5339.8	23493.5	826.2	0.0	0.0	0.0	26.30	9081.	1.43	11.08
138	5944.9	24696.6	711.5	0.0	0.0	0.0	19.91	10057.	1.38	13.68
152	6021.9	25020.5	791.2	0.0	0.0	0.0	19.51	10008.	1.37	19.78
158	5463.4	24090.5	819.7	0.0	0.0	0.0	21.59	9563.	1.39	21.30
161	5654.5	24404.6	776.6	0.0	0.0	0.0	18.90	9952.	1.37	32.55
166	5349.8	24407.8	899.8	0.0	0.0	0.0	19.18	9831.	1.37	28.28
169	5186.4	23961.9	922.3	0.0	0.0	0.0	23.49	9310.	1.41	14.26
171	5185.8	23635.5	911.9	0.0	0.0	0.0	26.92	8558.	1.44	12.63
173	5190.1	23185.3	973.8	0.0	0.0	0.0	29.36	8202.	1.46	15.90
176	5191.3	23339.8	943.5	0.0	0.0	0.0	27.09	8582.	1.44	11.59
179	5334.4	23176.4	777.4	0.0	0.0	0.0	31.71	8105.	1.48	10.87
189	6411.1	23790.3	723.9	0.0	0.0	0.0	33.03	7697.	1.50	15.58
188	5342.7	24248.9	882.4	0.0	0.0	0.0	20.50	9509.	1.38	18.51
190	5655.2	24254.8	716.0	0.0	0.0	0.0	19.05	9913.	1.37	12.72
191	5936.9	24222.4	564.5	0.0	0.0	0.0	24.76	9106.	1.41	26.83
193	5796.5	24561.2	732.2	0.0	0.0	0.0	18.14	10186.	1.36	21.52
194	5994.5	25120.8	833.1	0.0	0.0	0.0	18.98	10092.	1.37	24.40
196	5947.0	24566.3	666.7	0.0	0.0	0.0	23.83	9180.	1.41	15.72
197	6114.2	25020.2	804.9	0.0	0.0	0.0	23.13	9448.	1.40	16.99
200	5640.8	23928.6	663.9	0.0	0.0	0.0	23.91	9325.	1.41	11.65
202	5487.6	24254.6	827.6	0.0	0.0	0.0	19.24	9933.	1.37	26.77
204	5665.0	24554.2	785.6	0.0	0.0	0.0	24.01	9606.	1.41	19.99
205	5808.4	24240.5	617.1	0.0	0.0	0.0	17.17	10489.	1.35	29.75
208	5487.6	23939.2	767.6	0.0	0.0	0.0	21.73	9674.	1.39	11.48
817	6100.2	24860.8	751.6	0.0	0.0	0.0	19.38	9955.	1.37	16.72
240	5490.3	23651.0	757.8	0.0	0.0	0.0	21.95	9552.	1.39	8.70
247	5920.6	24102.7	550.9	0.0	0.0	0.0	20.56	9935.	1.38	19.60
248	5335.3	23628.7	827.6	0.0	0.0	0.0	27.27	8801.	1.44	10.84
257	5541.5	23251.4	622.9	0.0	0.0	0.0	40.37	6887.	1.56	10.82
259	5492.7	23485.1	621.7	0.0	0.0	0.0	28.23	8637.	1.45	10.81
256	5628.7	24096.6	685.5	0.0	0.0	0.0	20.77	9740.	1.38	14.06

Layer D1-4

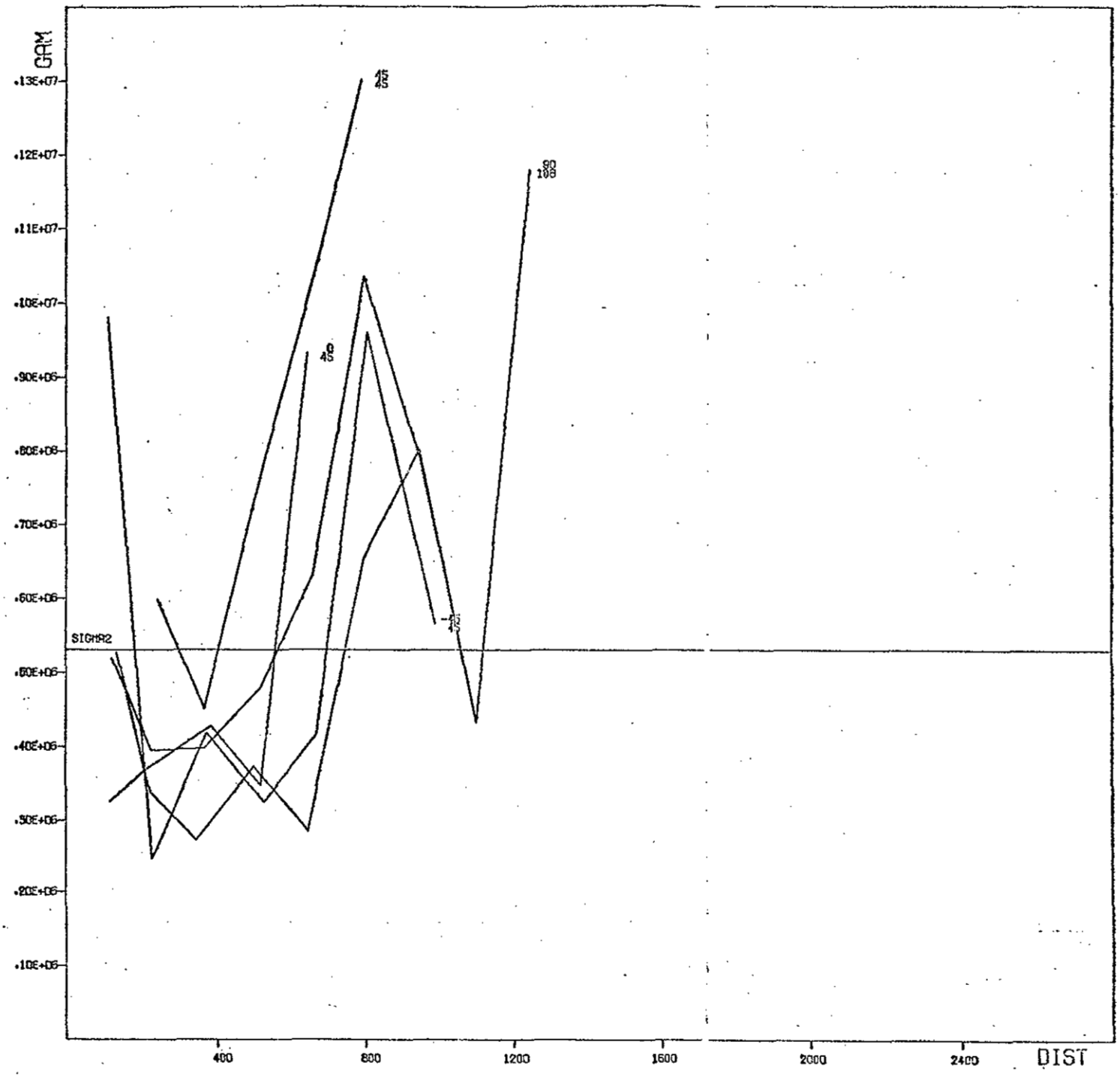
APPENDIX 2

Experimental variograms of BTU in the layers

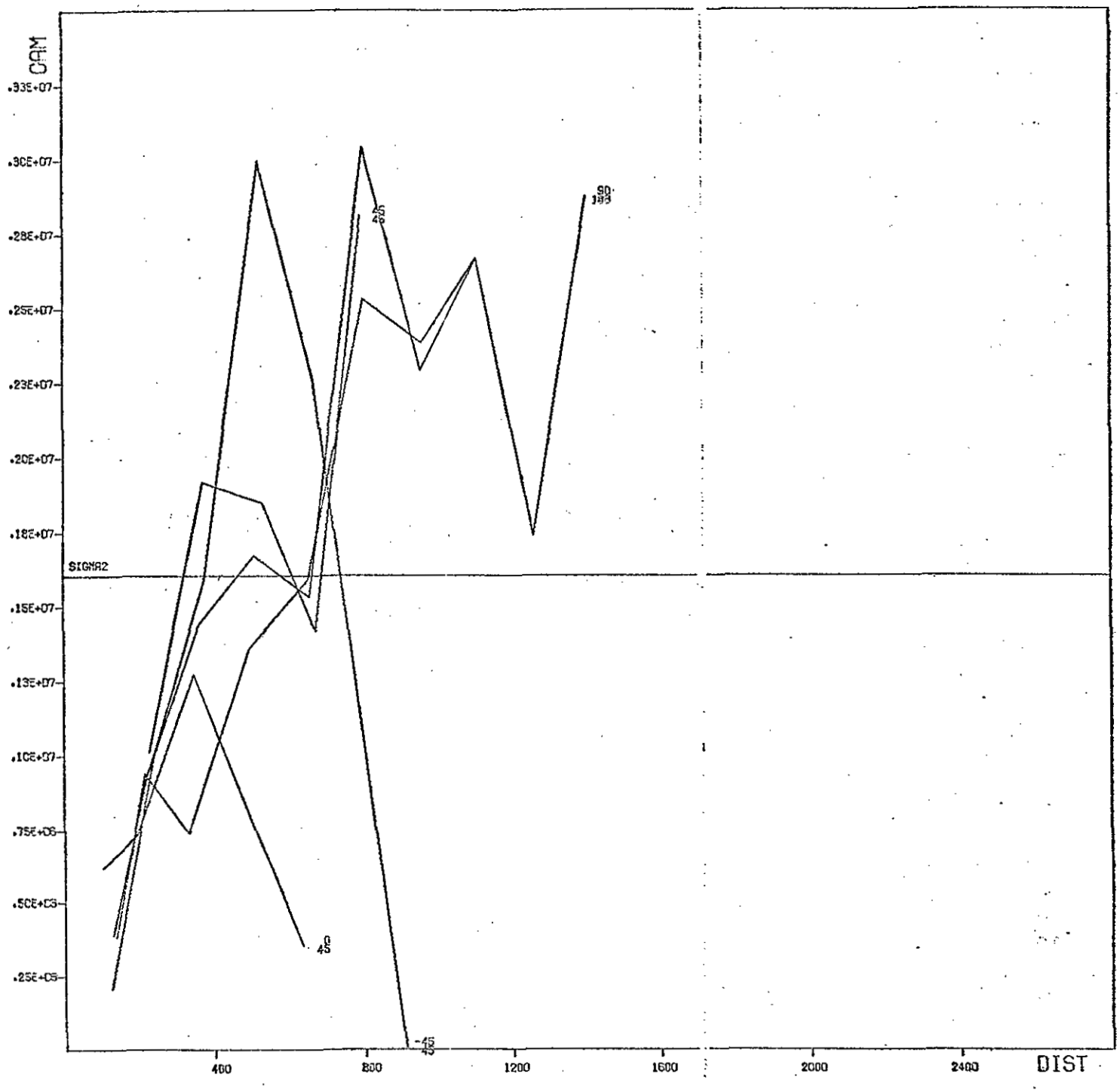
The variograms have been computed along the four principal directions of the horizontal plane : N-S or 90, NE-SW or 45, E-W or 0, NW-SW or -45. The MAREC2 program (See David, p.149) has been used with an angular regularization PSI=45° and an interval for distances STEP=150m. The average variogram (PSI=180°. same STEP) has also been determined (noted 0-180 on the diagrams). In the computation, the intercepts are localized by the three coordinates of their top. Thus the distance is the true distance between the intercepts and not the projected distance in the horizontal plane. On the diagram, the horizontal line with SIGMA2 indicates the amplitude of the experimental variance of the sample values.



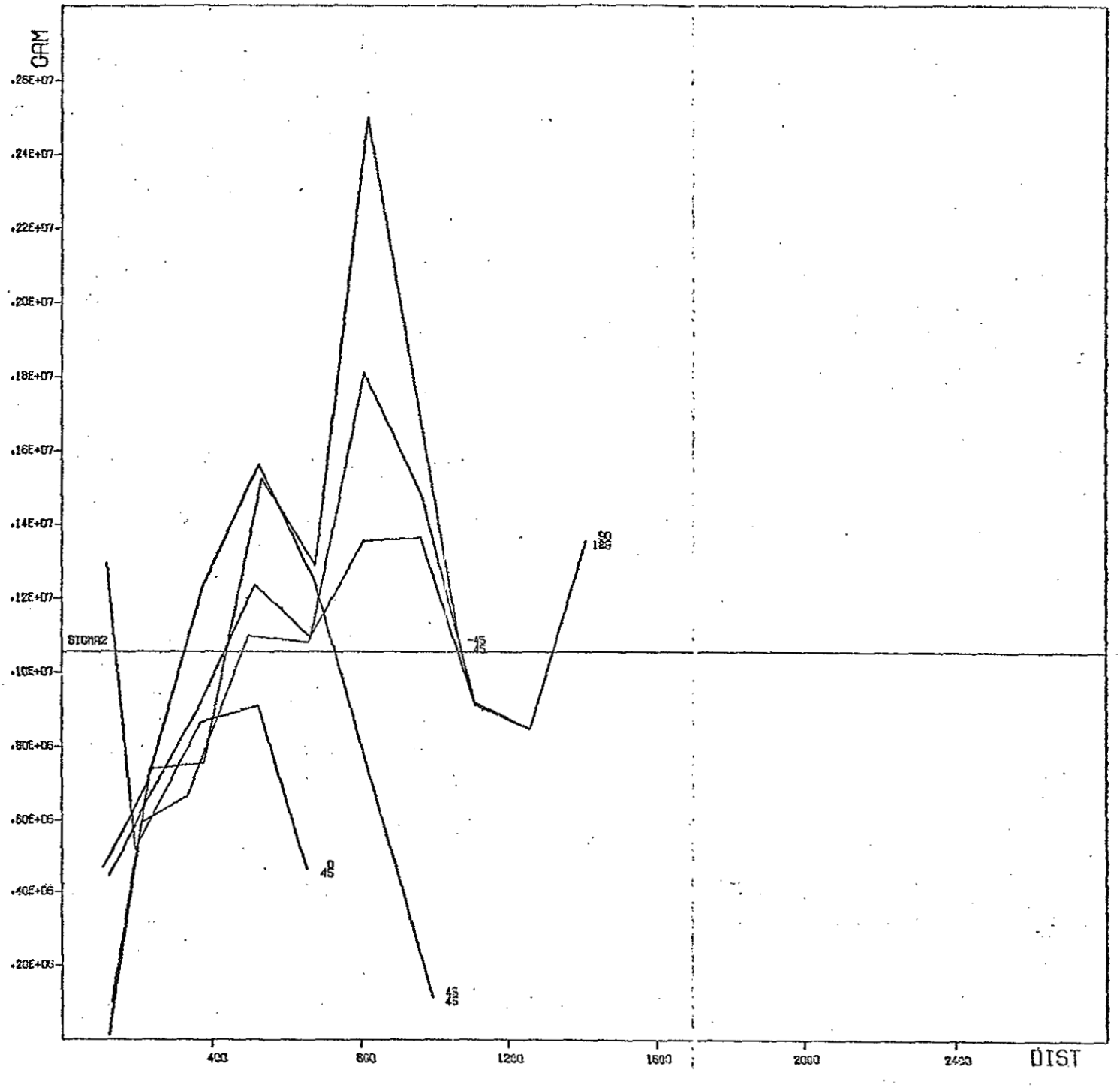
VARIOGRAMS OF BTU IN ZONE 111 (A1-1)



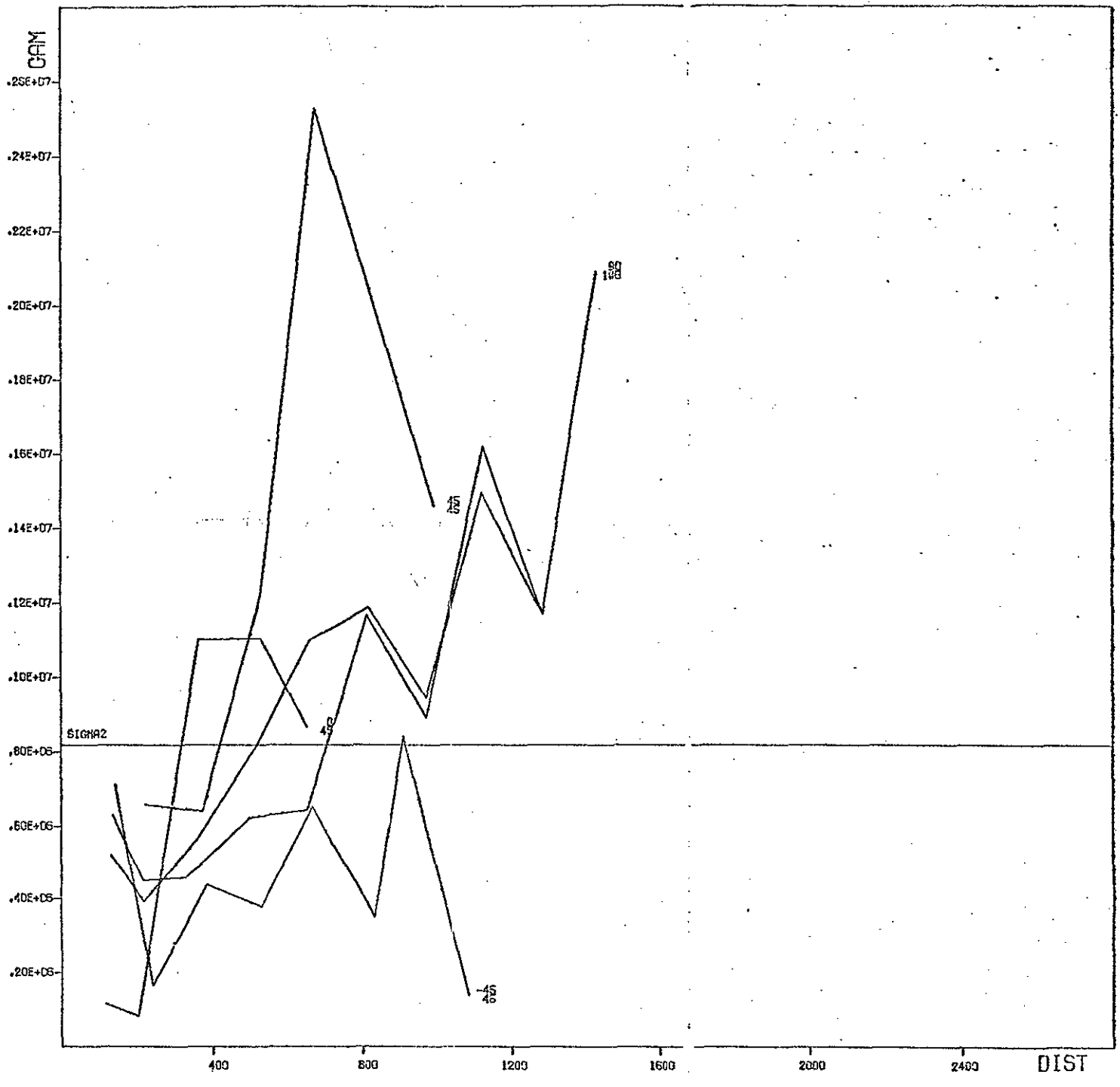
VARIOGRAMS OF BTU IN ZONE 112 (A1-2)



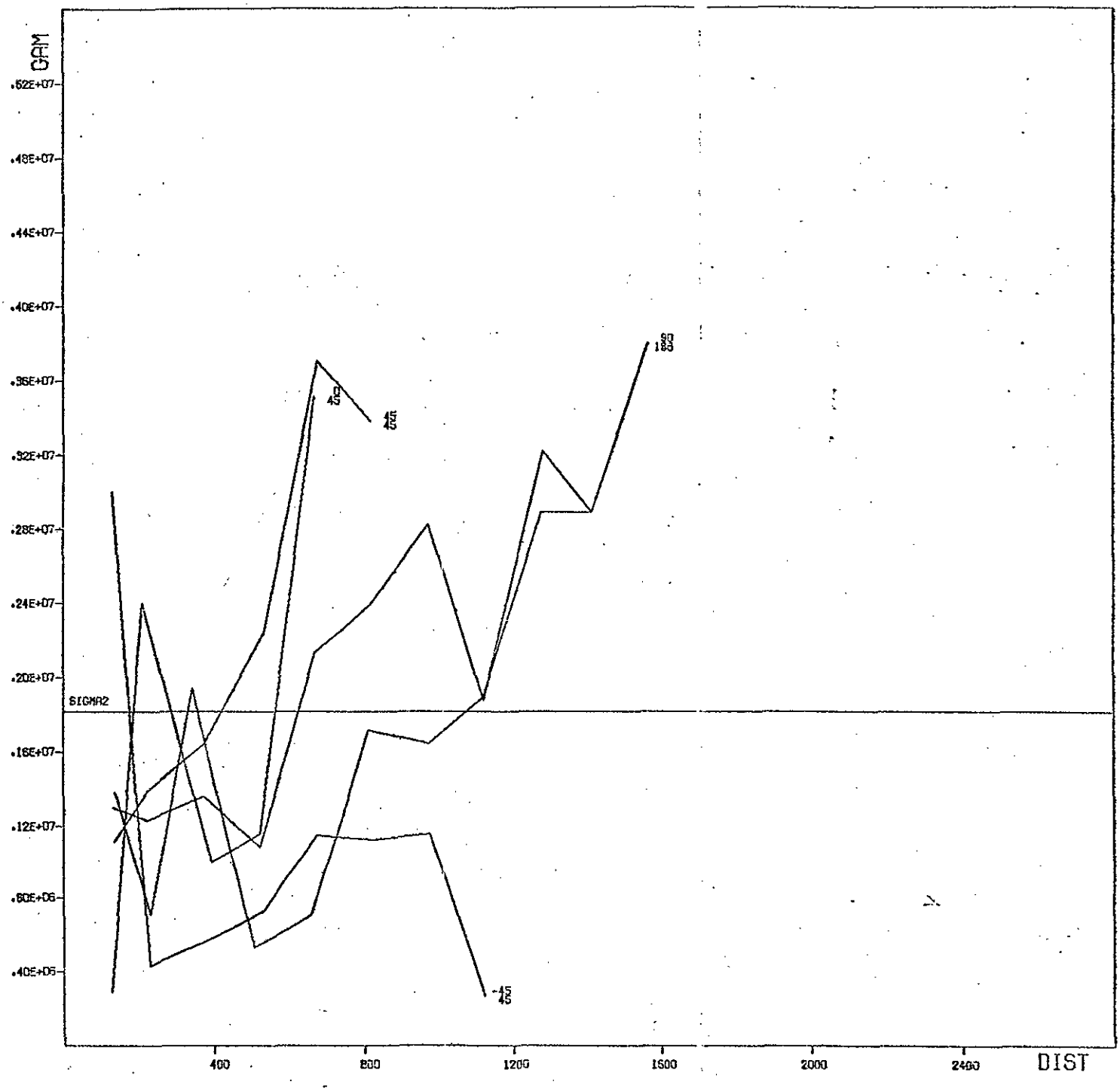
VARIOGRAMS OF BTU IN ZONE 113 (A1-3)



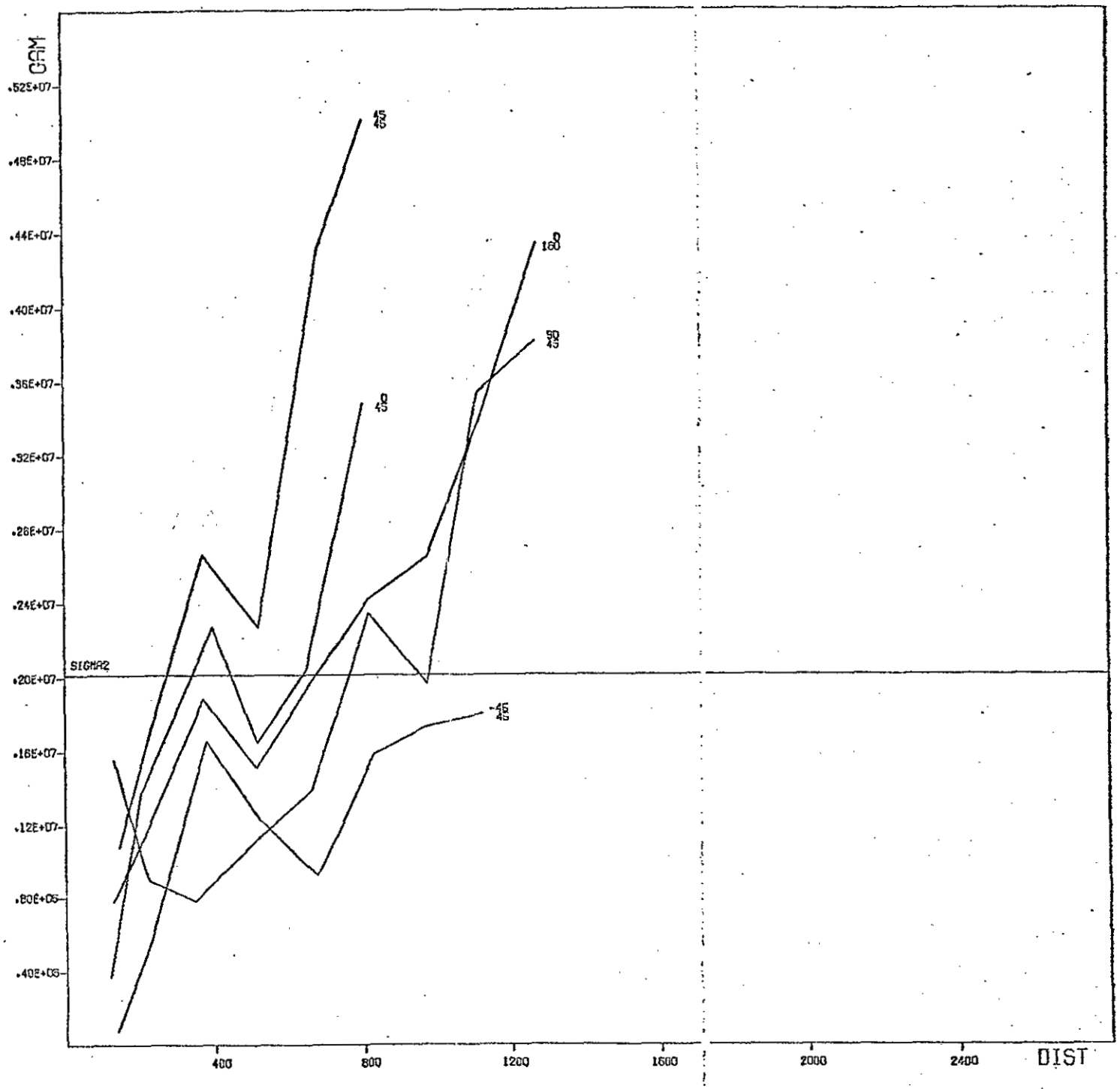
VARIOGRAM S OF BTU IN ZONE 114 (A1-4)



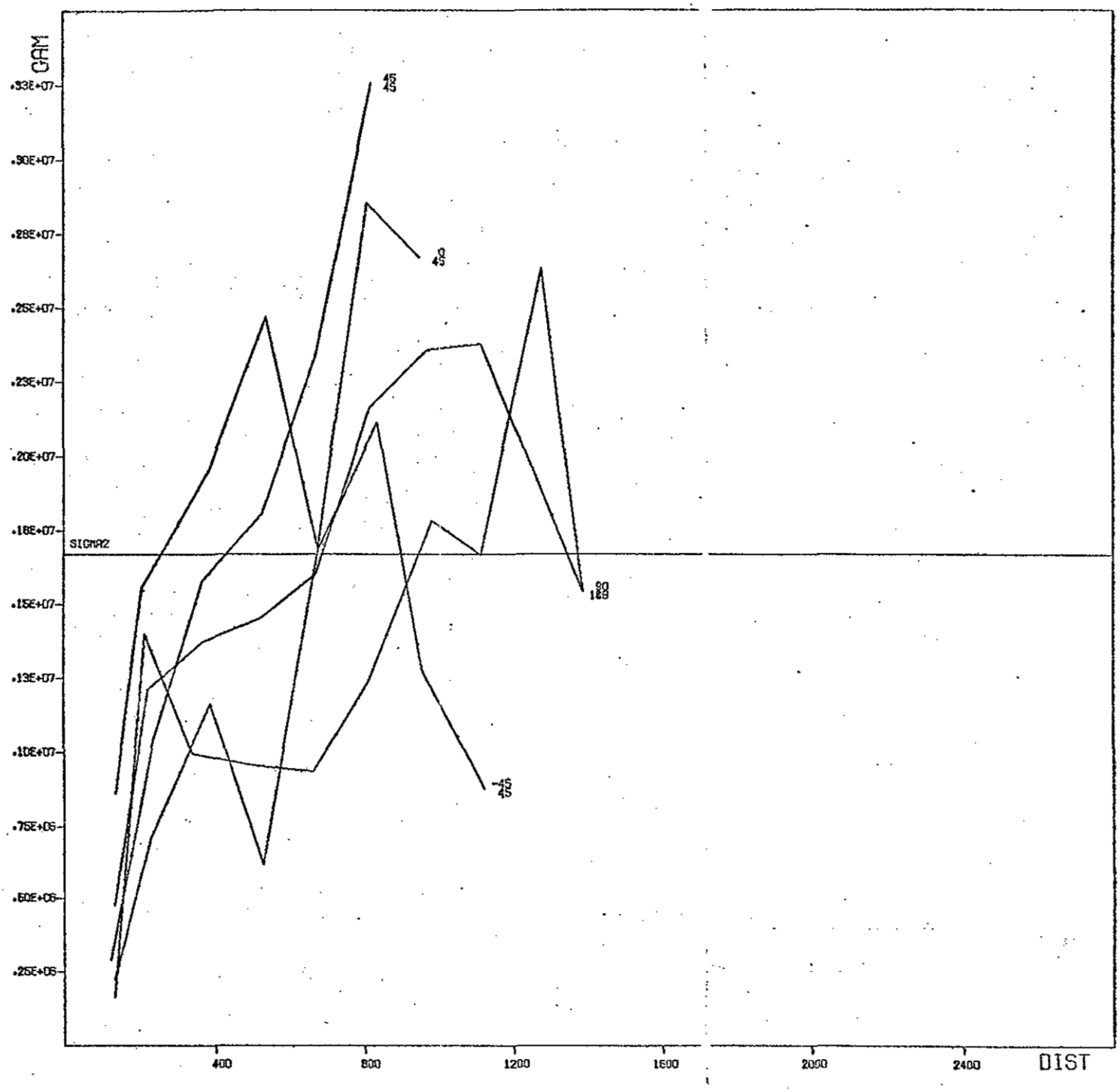
VARIOGRAMS OF BTU IN ZONE 121 (A2-1)



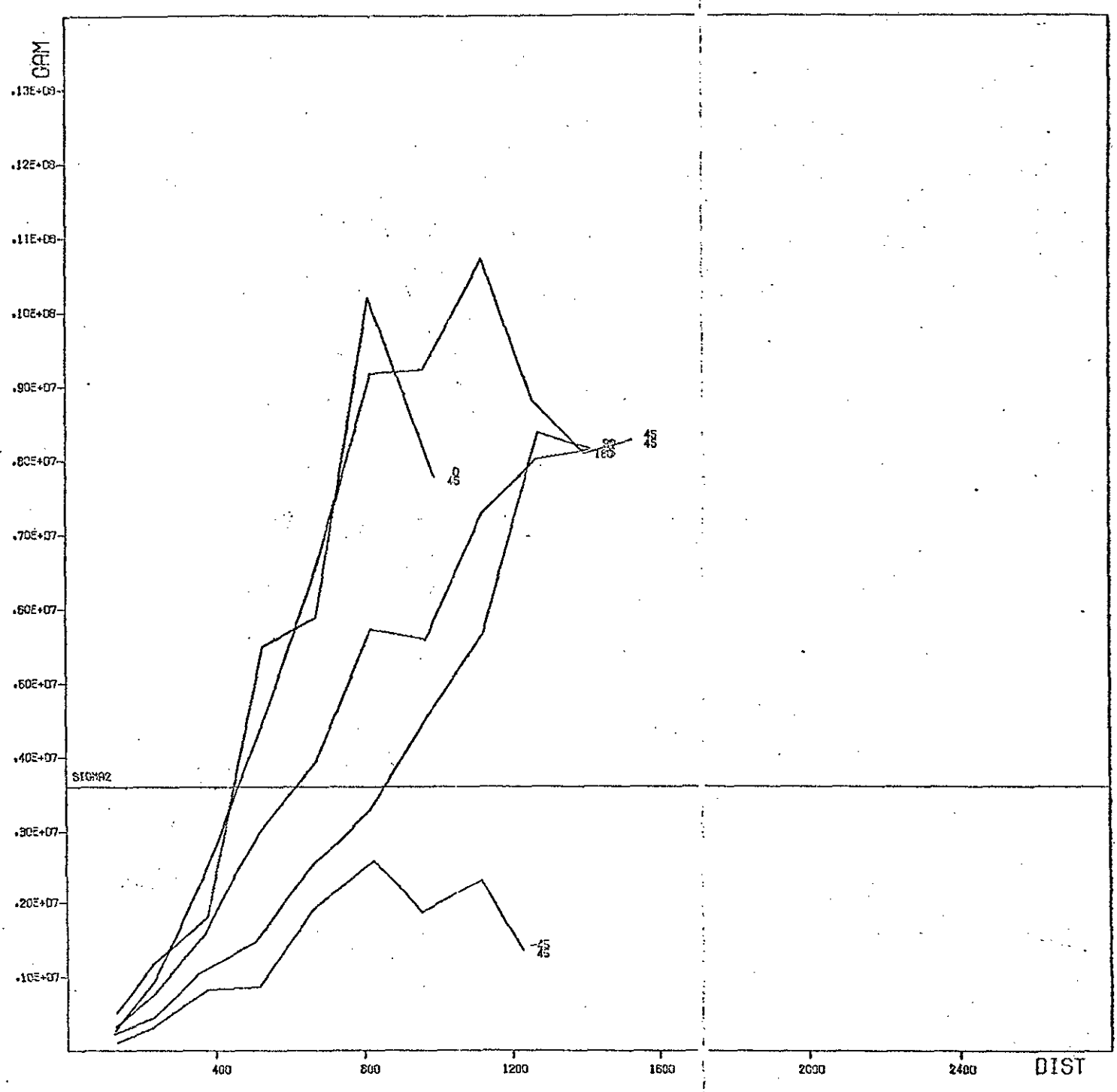
VARIOGRAMS OF BTU IN ZONE 211 (B4-1)



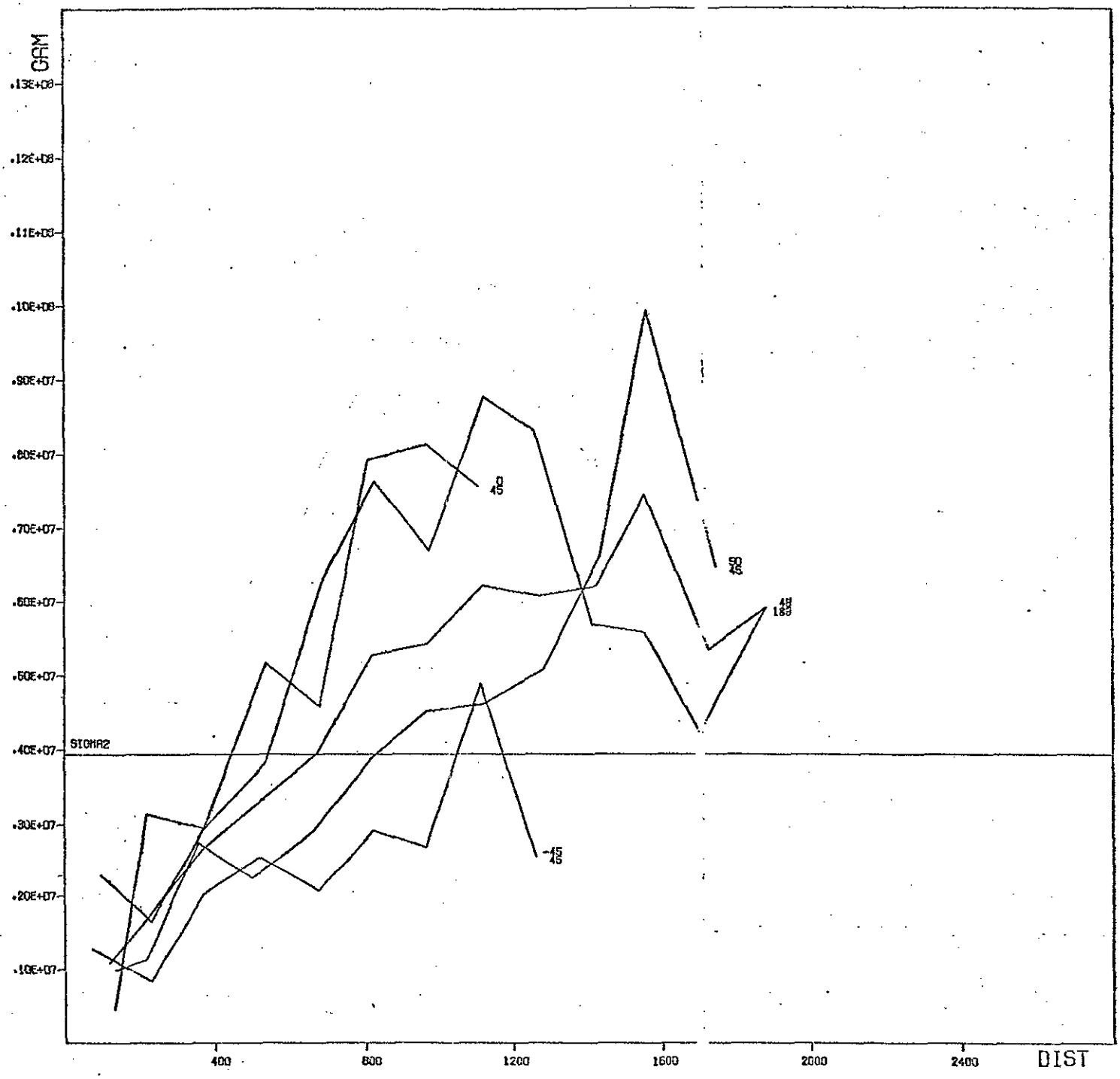
VARIOGRAMS OF BTU IN ZONE 212 (B1-2)



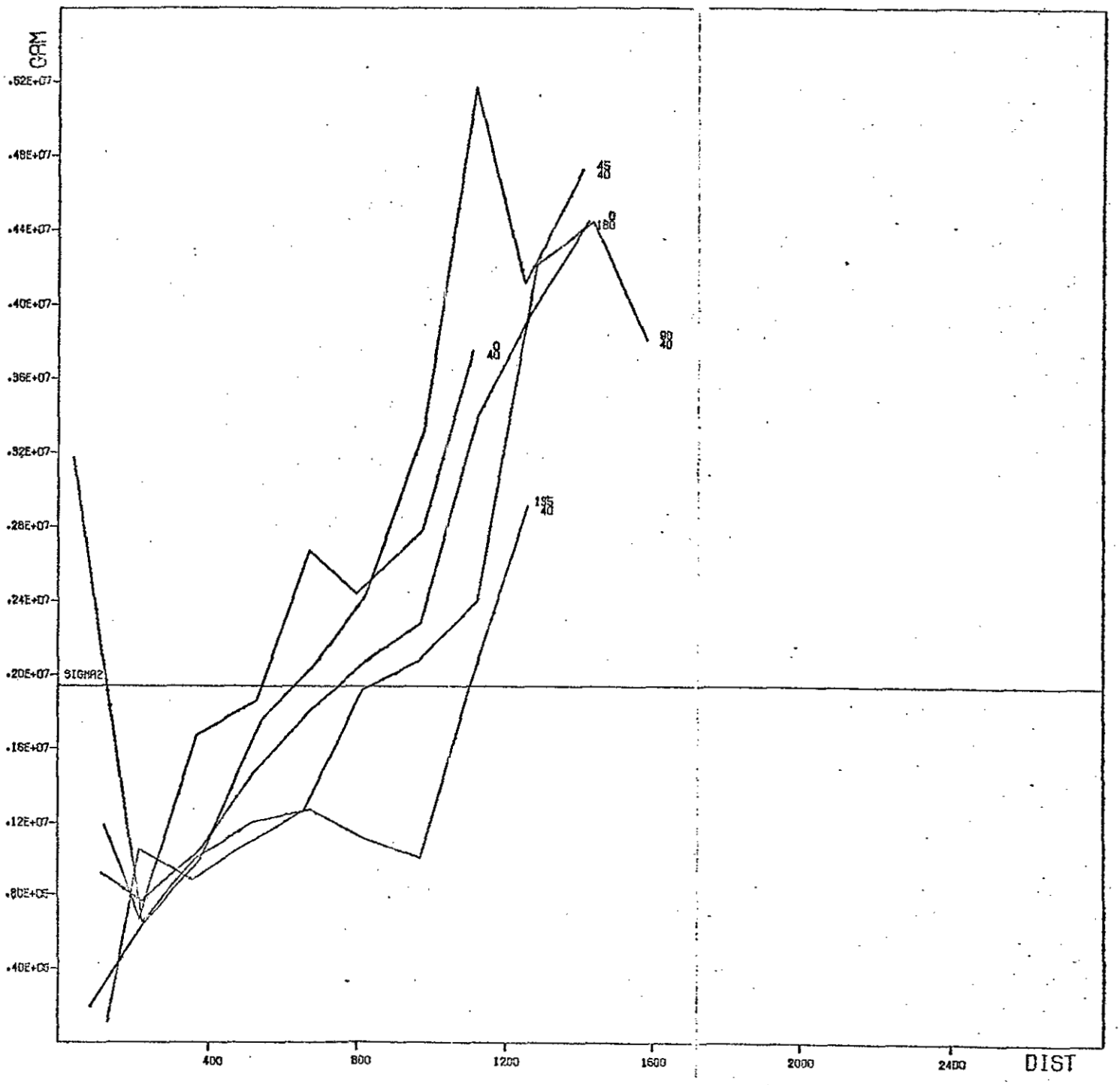
VARIOGRAMS OF BTU IN ZONE 311 (C1-1)



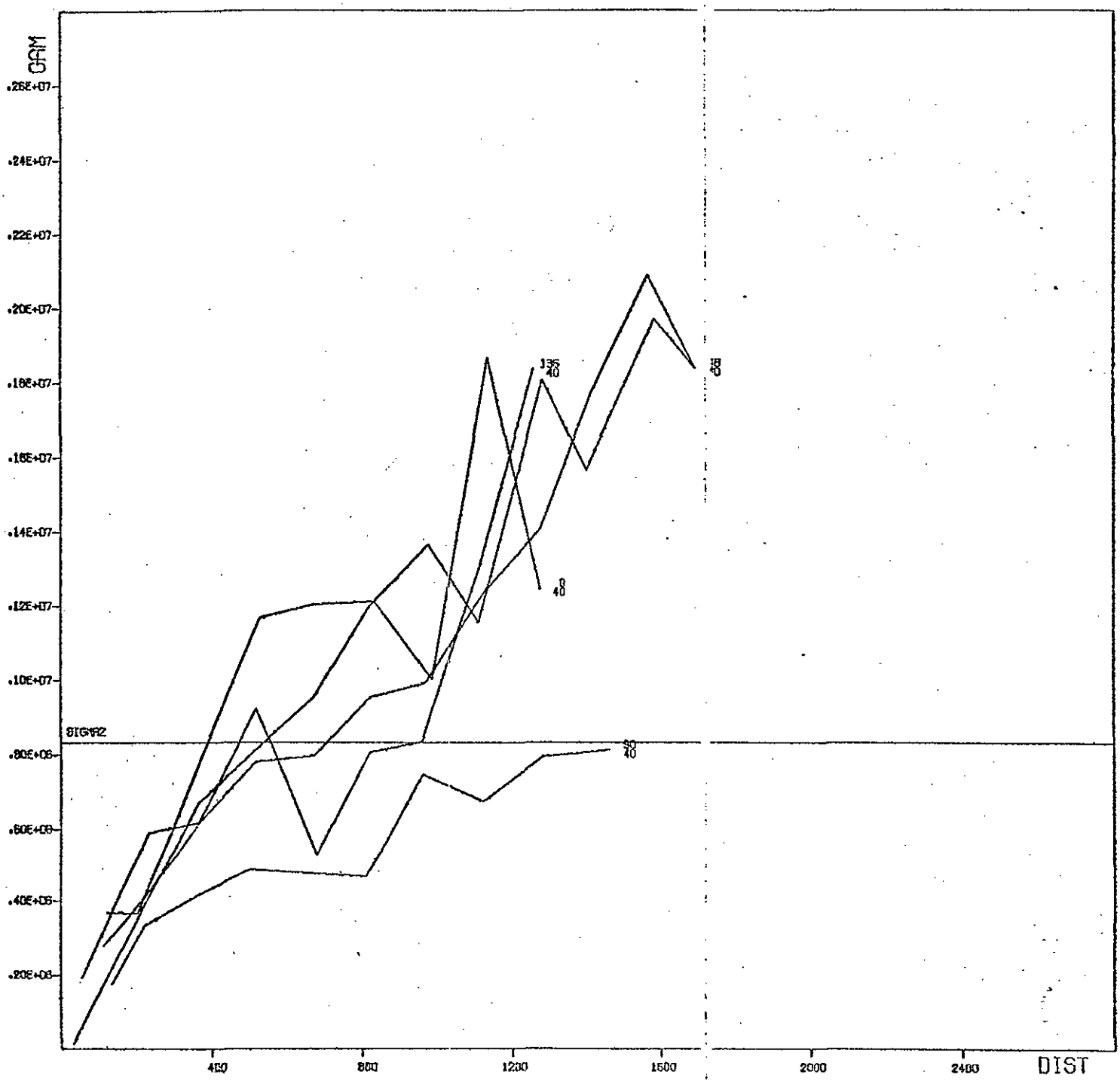
VARIOGRAMS OF BTU IN ZONE 321 (C2-1)



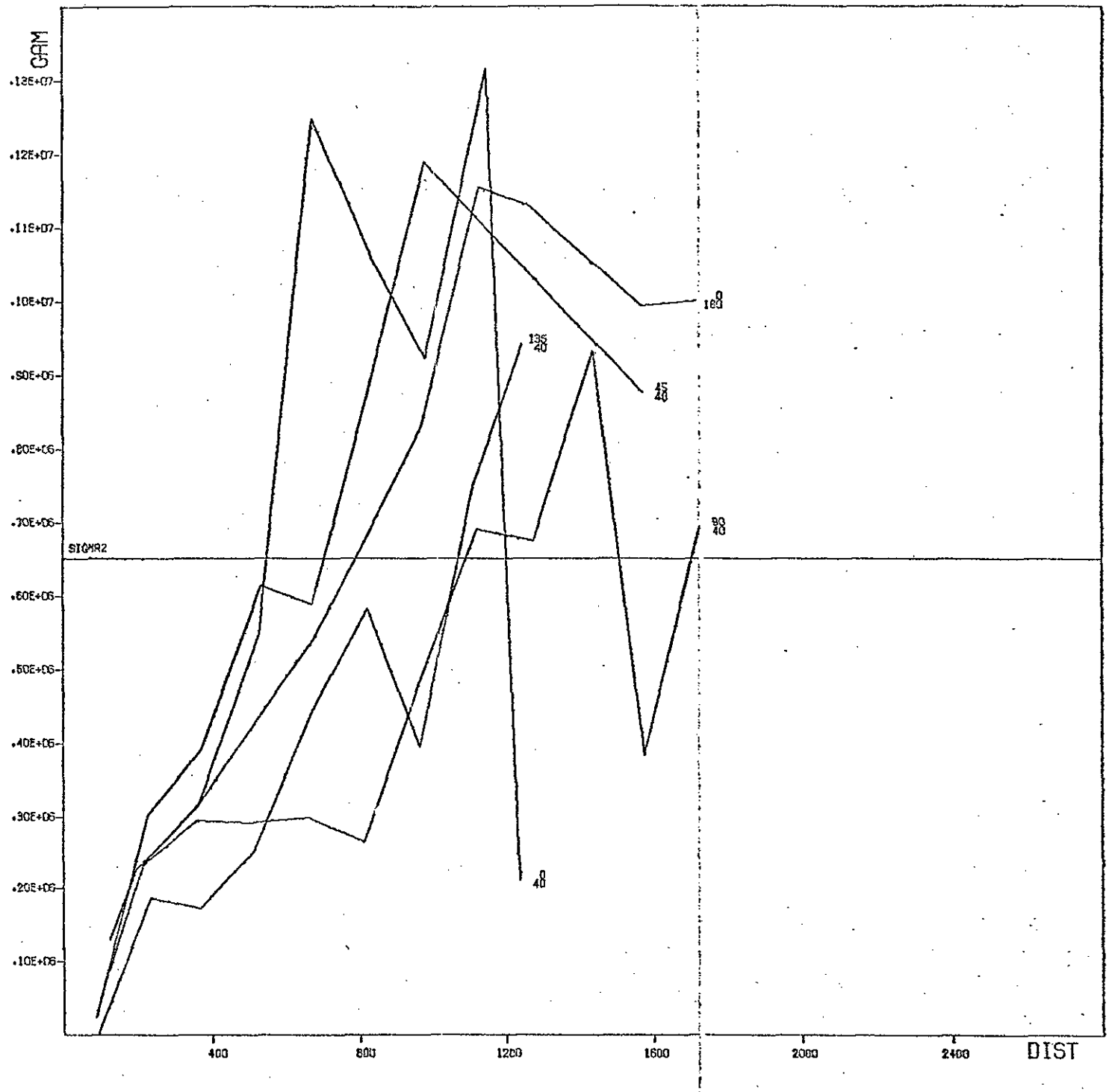
VARIOGRAMS OF BTU IN ZONE 322 (C2-2)



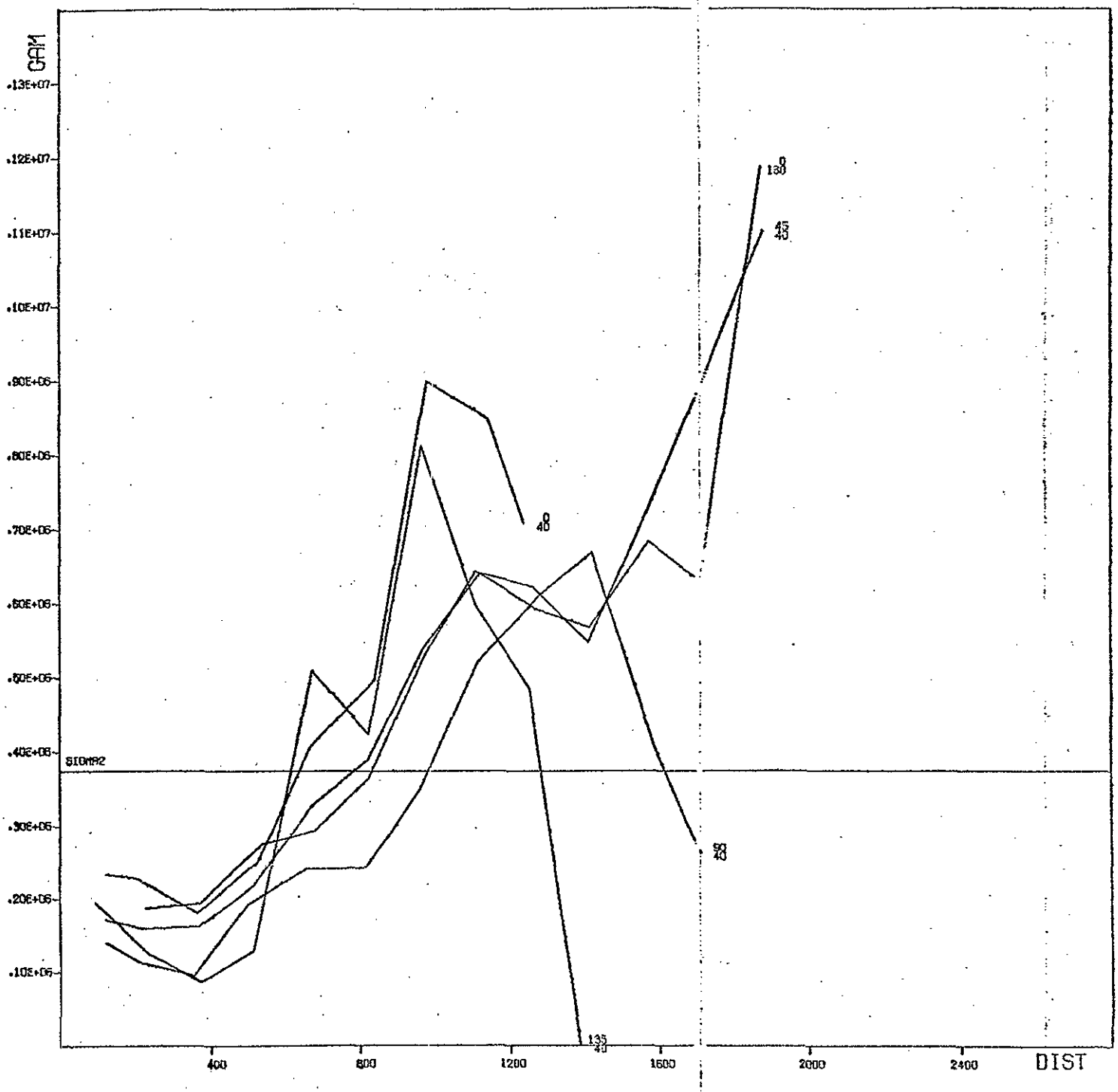
VARIABLE B.T.U. ZONE 01-1



VARIABLE B.T.U. ZONE 01-2



VARIABLE B.T.U. ZONE 01-3

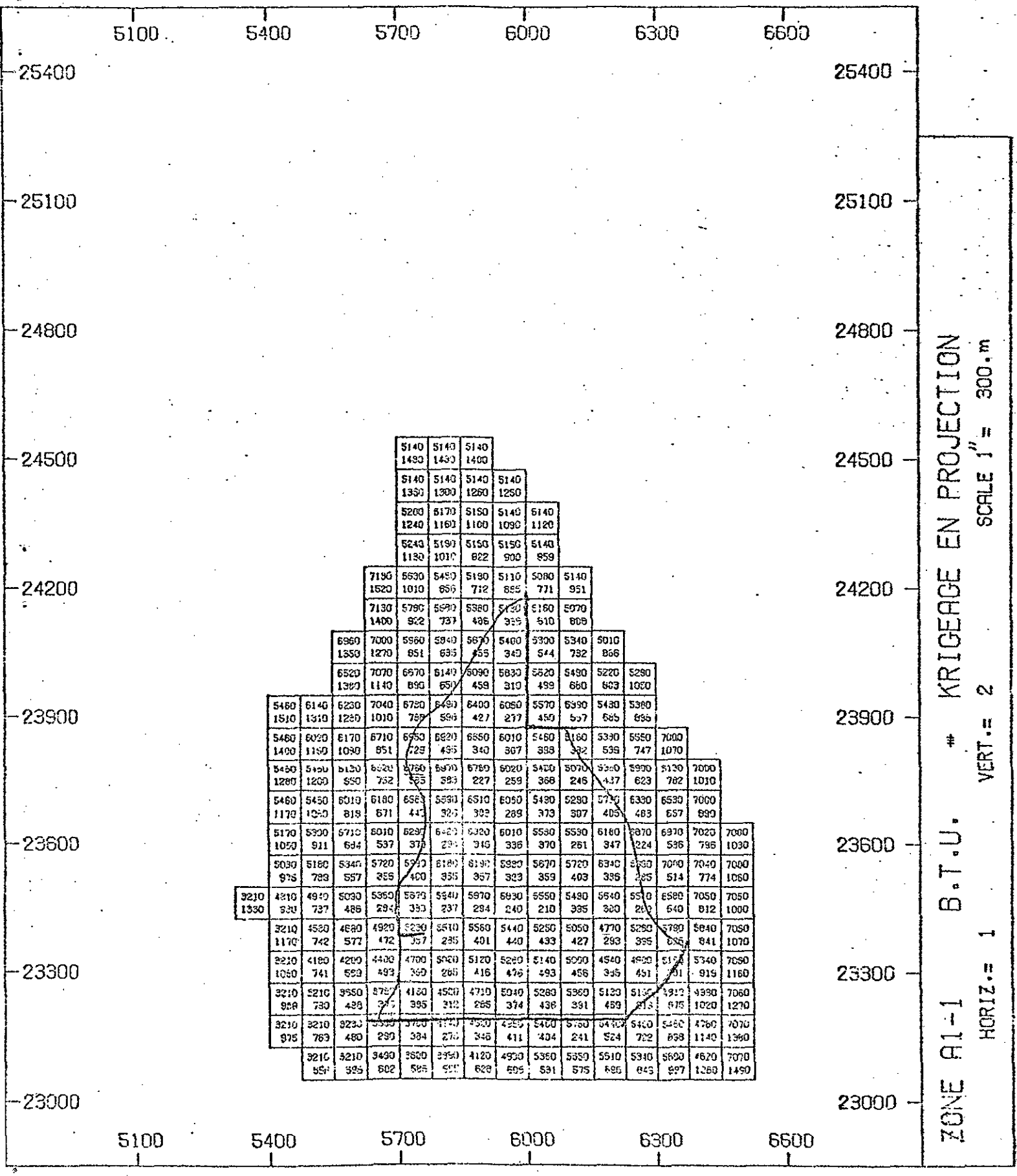


VARIABLE B.T.U. ZONE D1-4

APPENDIX 3

Maps of the estimated 75 x 75 m blocks in each layer

All the following maps have been obtained automatically, hence blocks are generated outside the extend of the deposit. The heavy line on each map shows the relevant area. Any block outside the central area should not be considered. Where a block is left blank inside a contour it means that no sufficient samples were available to estimate it. In each block one reads the estimated BTU content and its standard error of estimation.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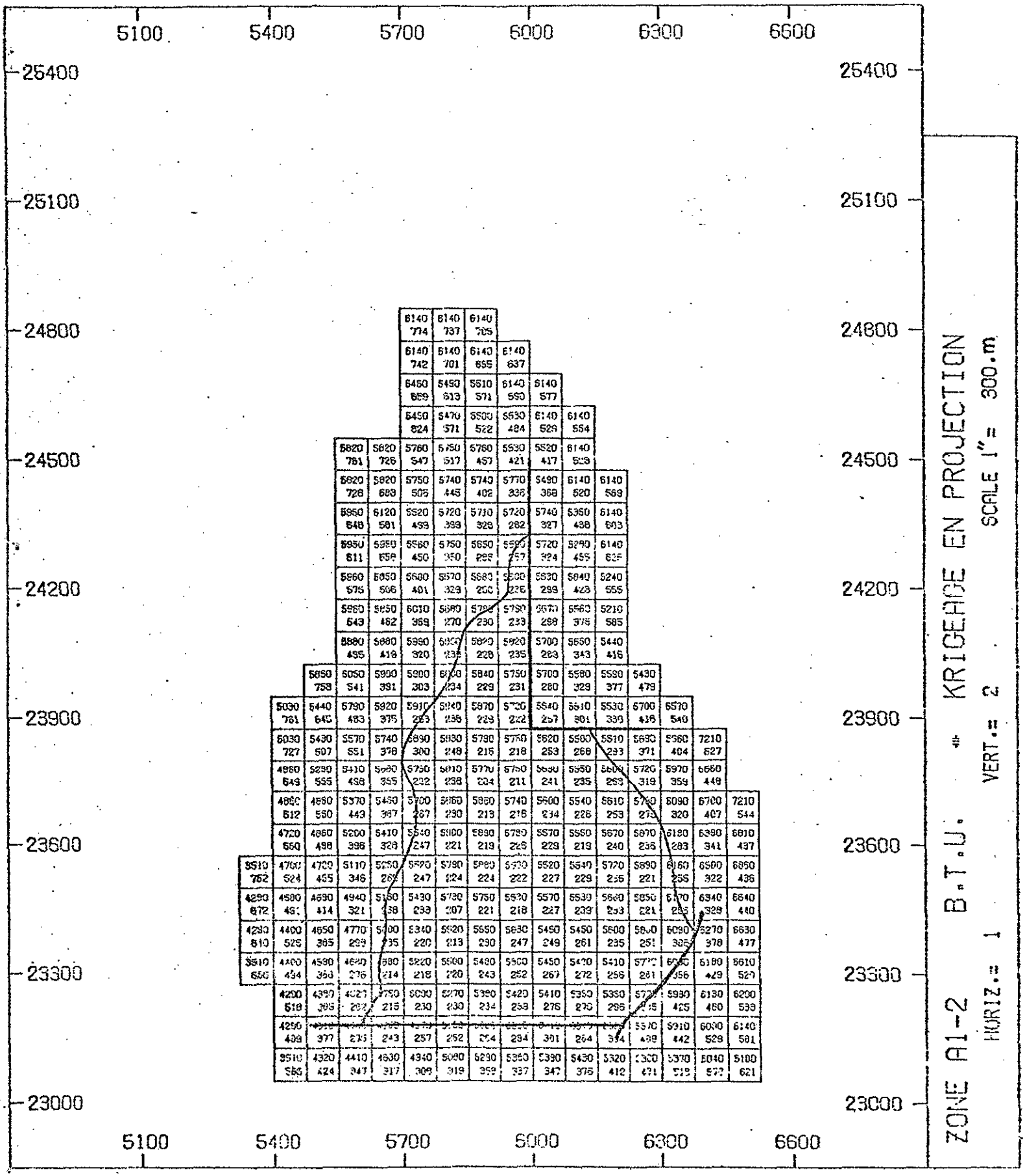
ZONE A1-1 B.T.U. * KRIGEAGE EN PROJECTION
HORIZ.= 1 VERT.= 2 SCALE 1" = 300.m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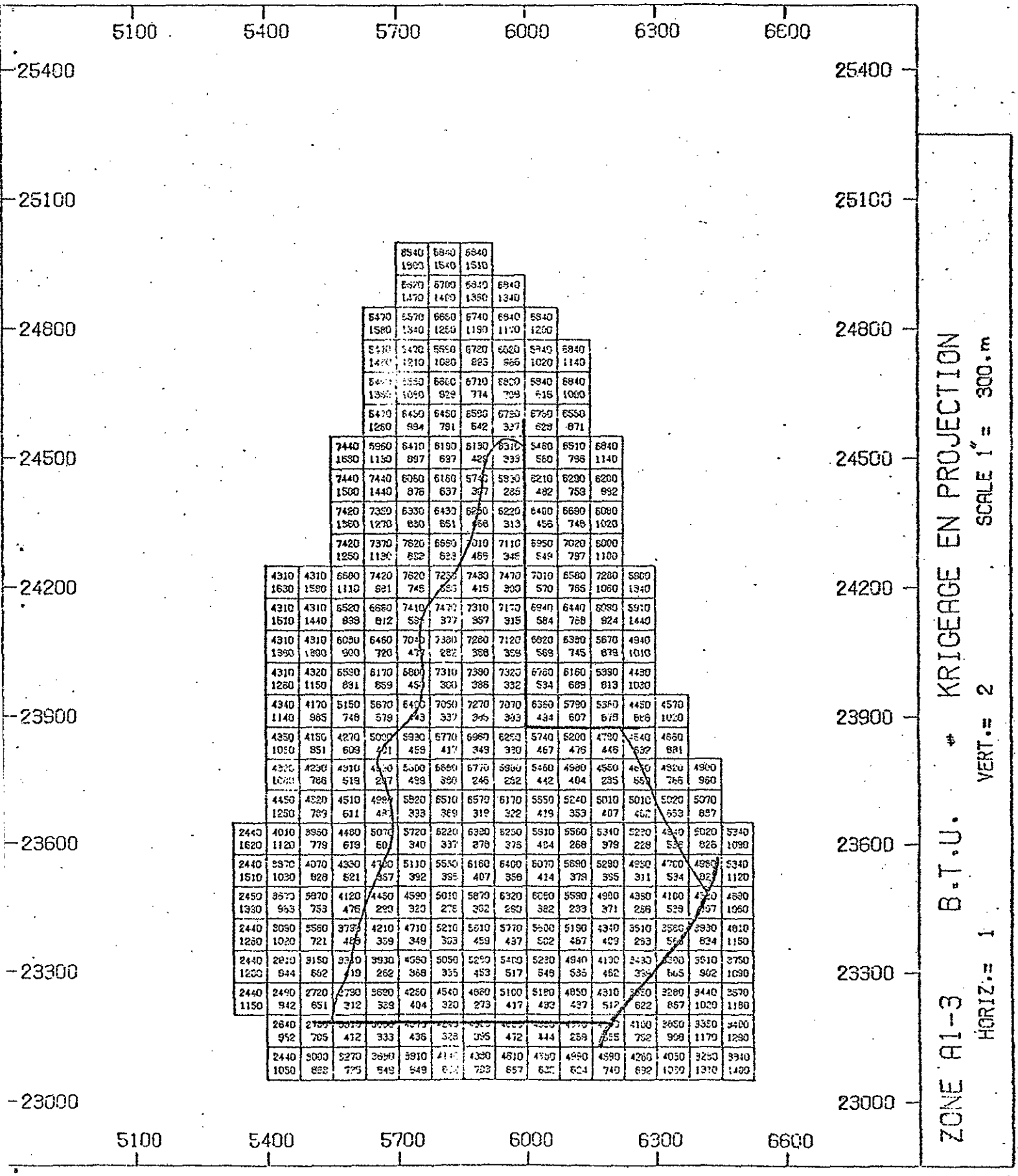
HORIZ.= 1 VERT.= 2 SCALE 1"= 300.m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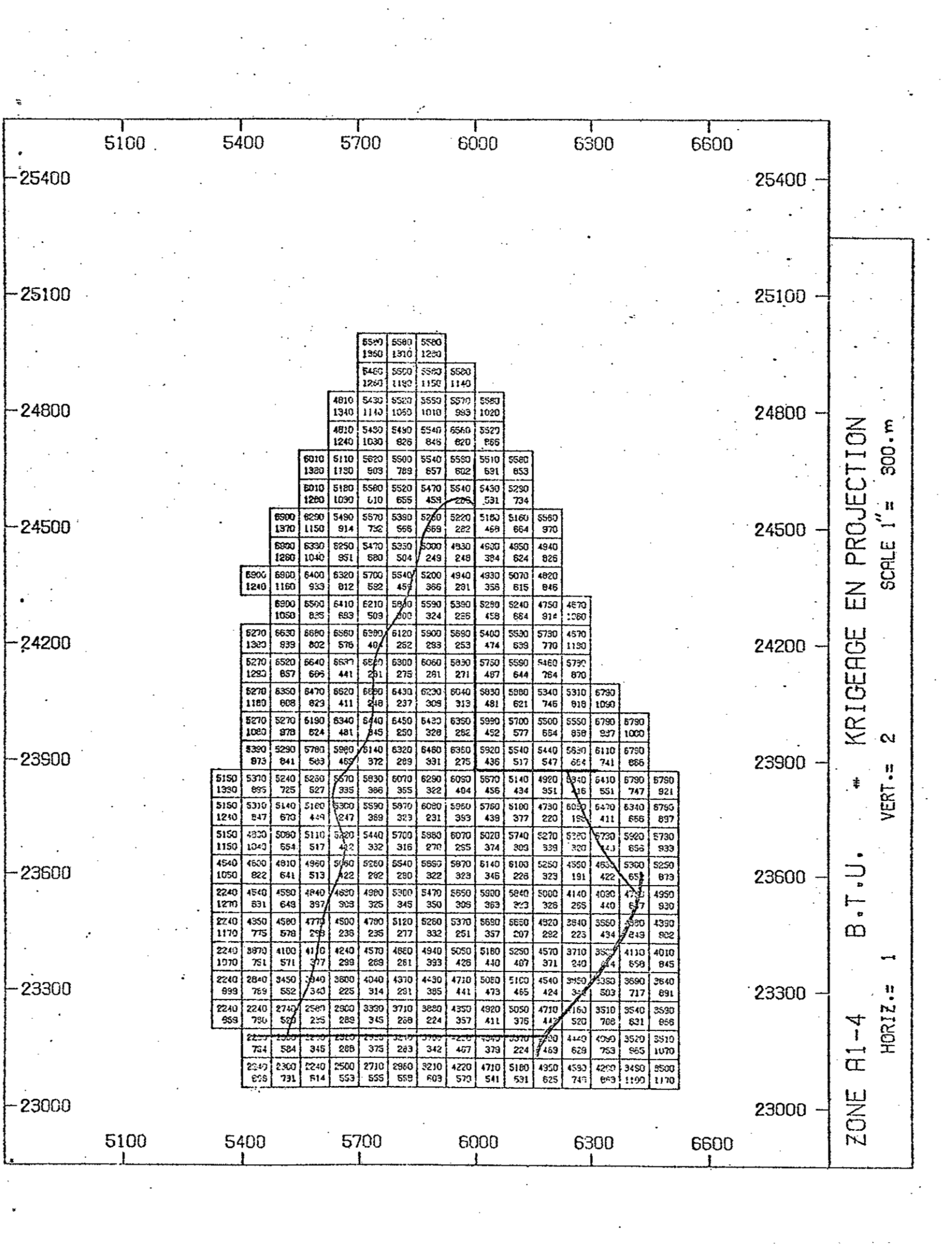
HORIZ.= 1 VERT.= 2 SCALE 1"= 300.m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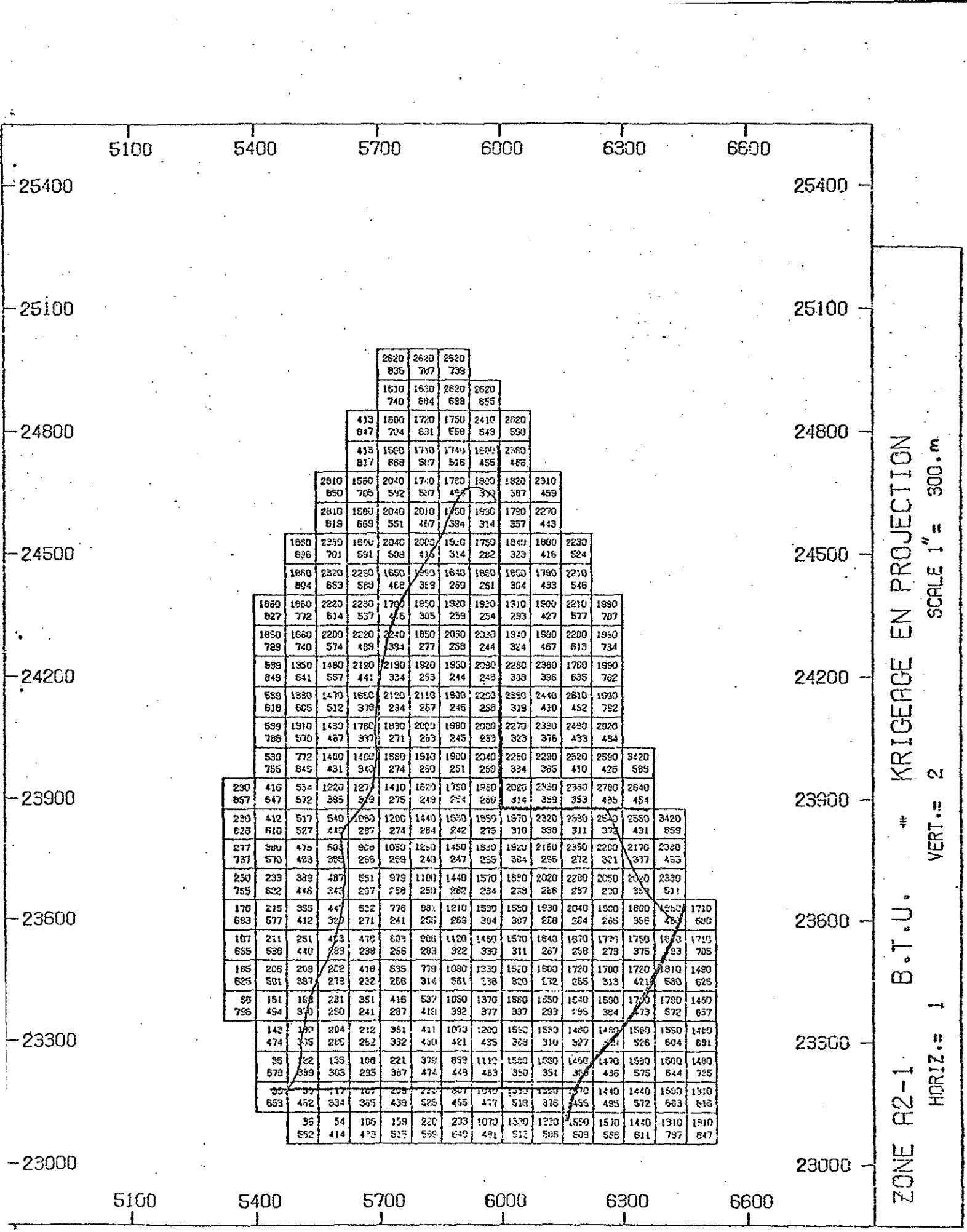
ZONE A1-4 B.T.U. * KRIGEAGE EN PROJECTION
HORIZ.= 1 VERT.= 2 SCALE 1"= 300.m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ZONE A2-1 B.T.U. * KRIGEAGE EN PROJECTION
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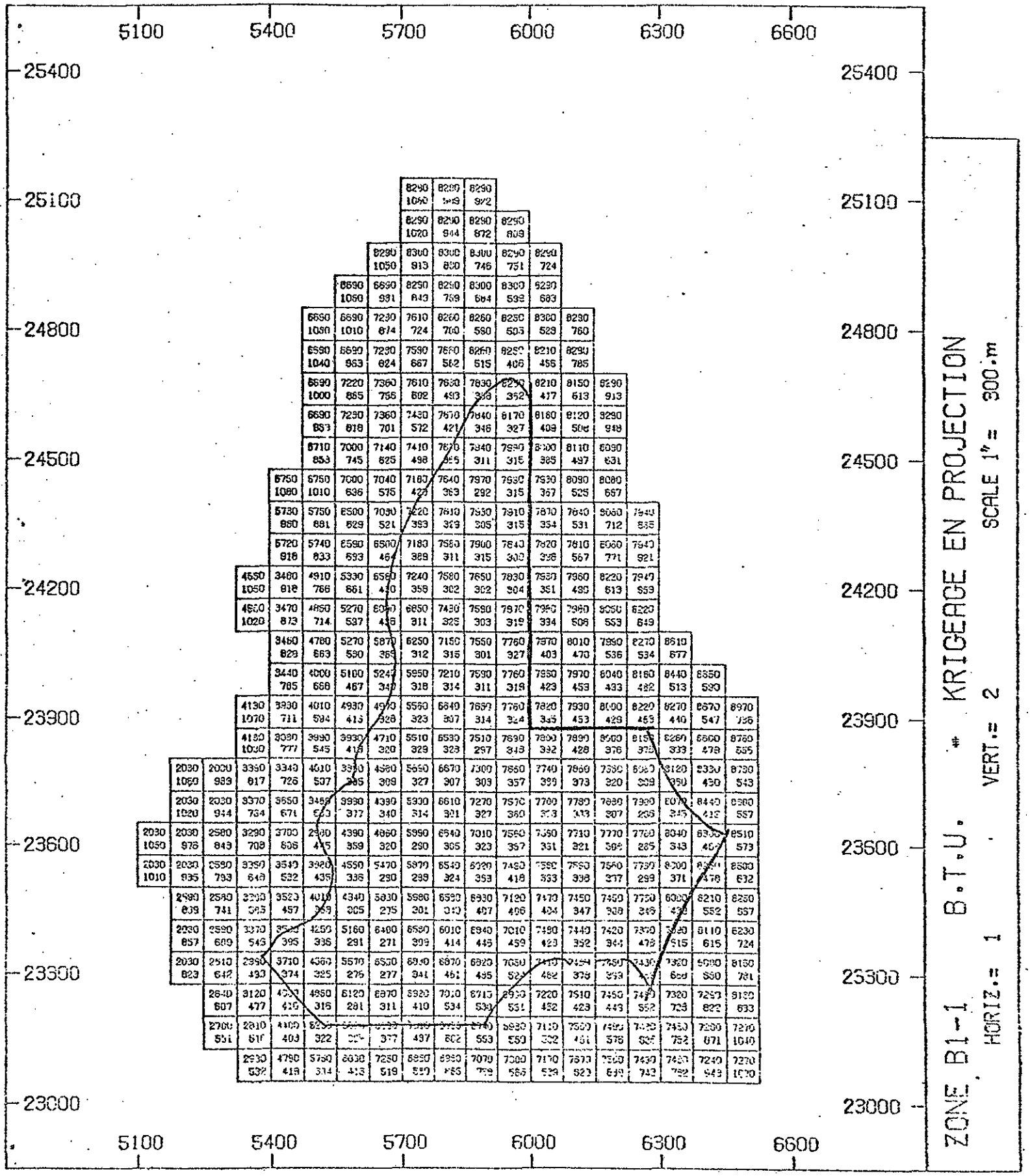
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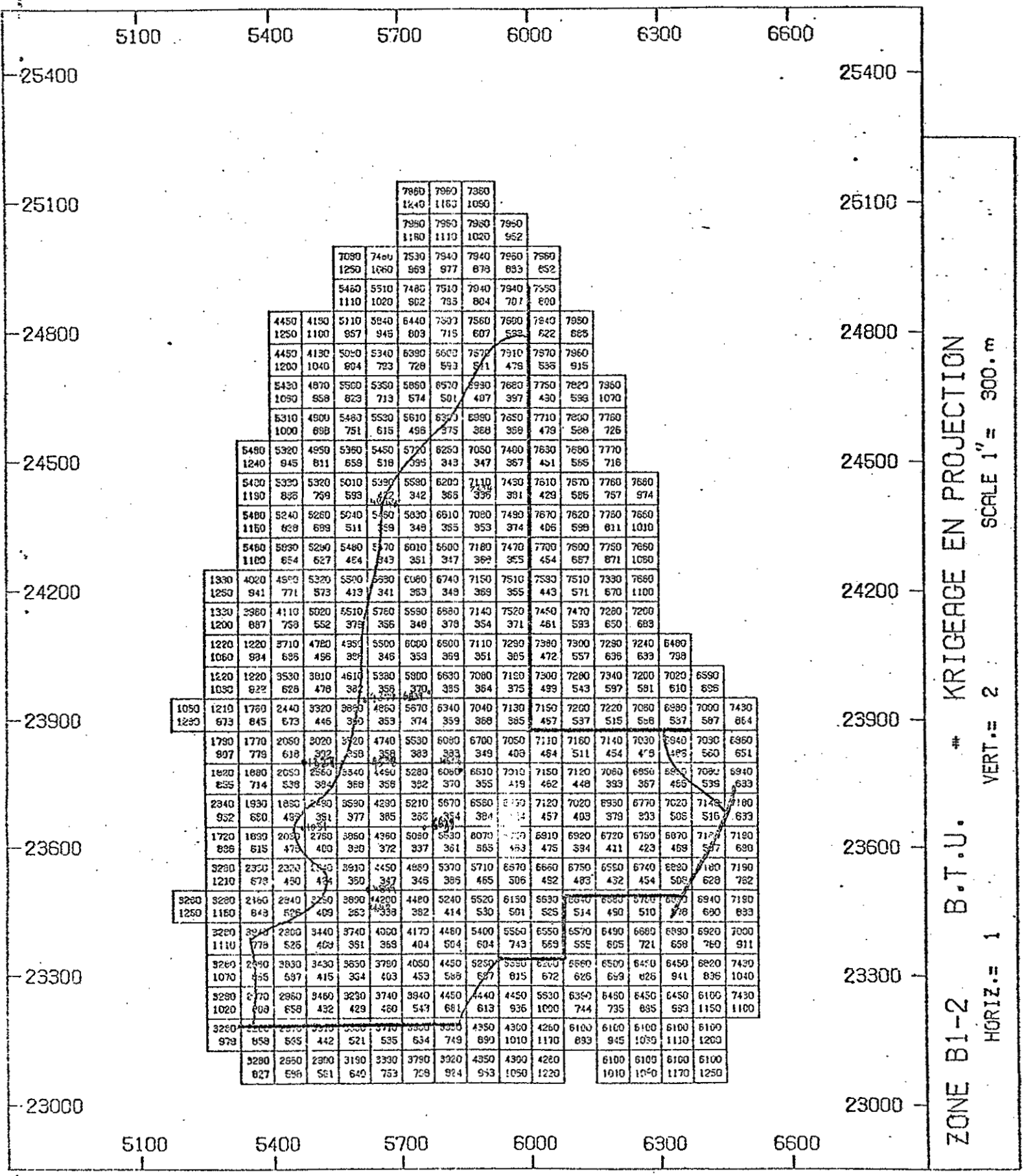
HORIZ.= 1 VERT.= 2 SCALE 1"= 300.m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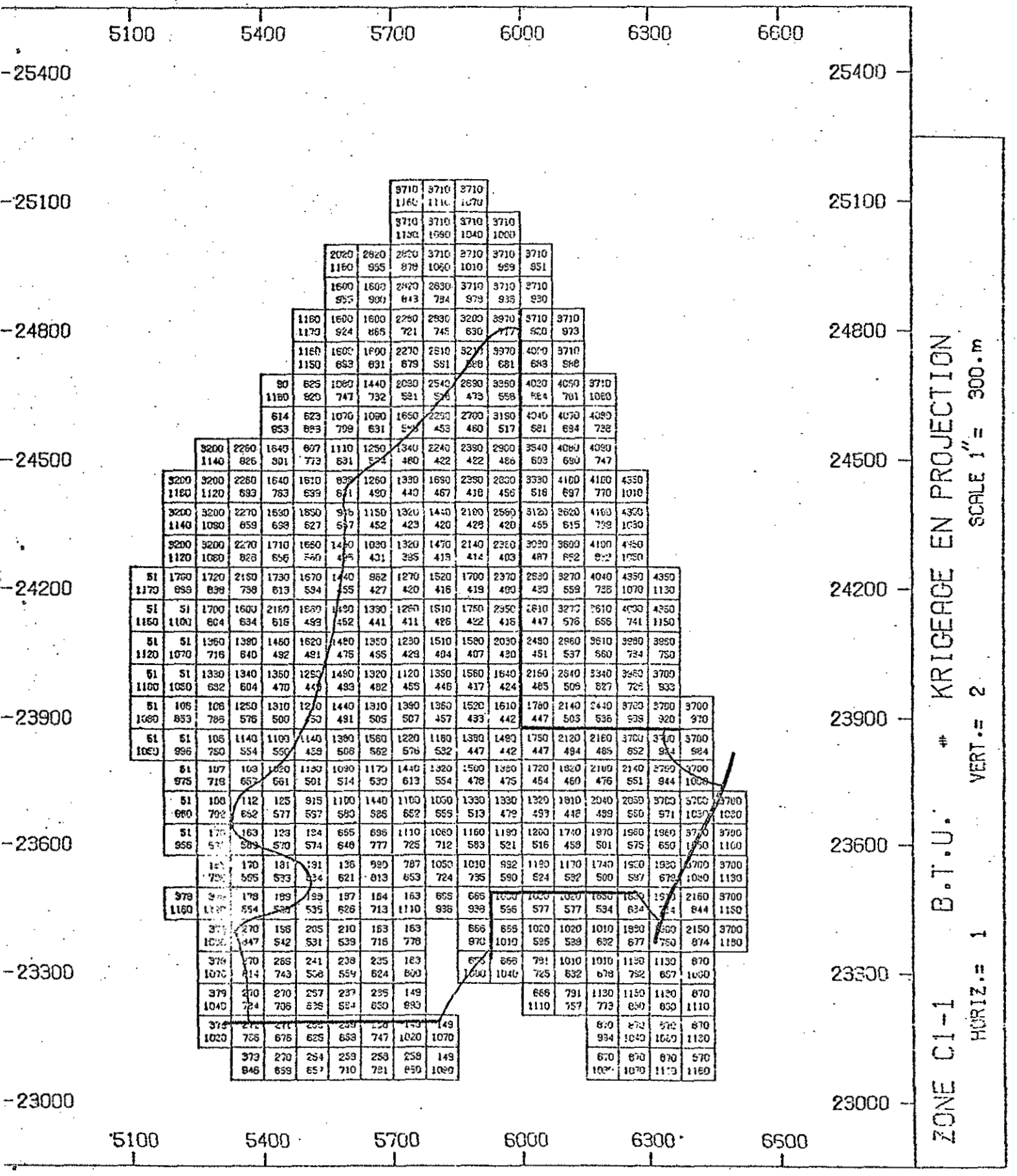
HORIZ.= 1 VERT.= 2 SCALE 1"= 300. m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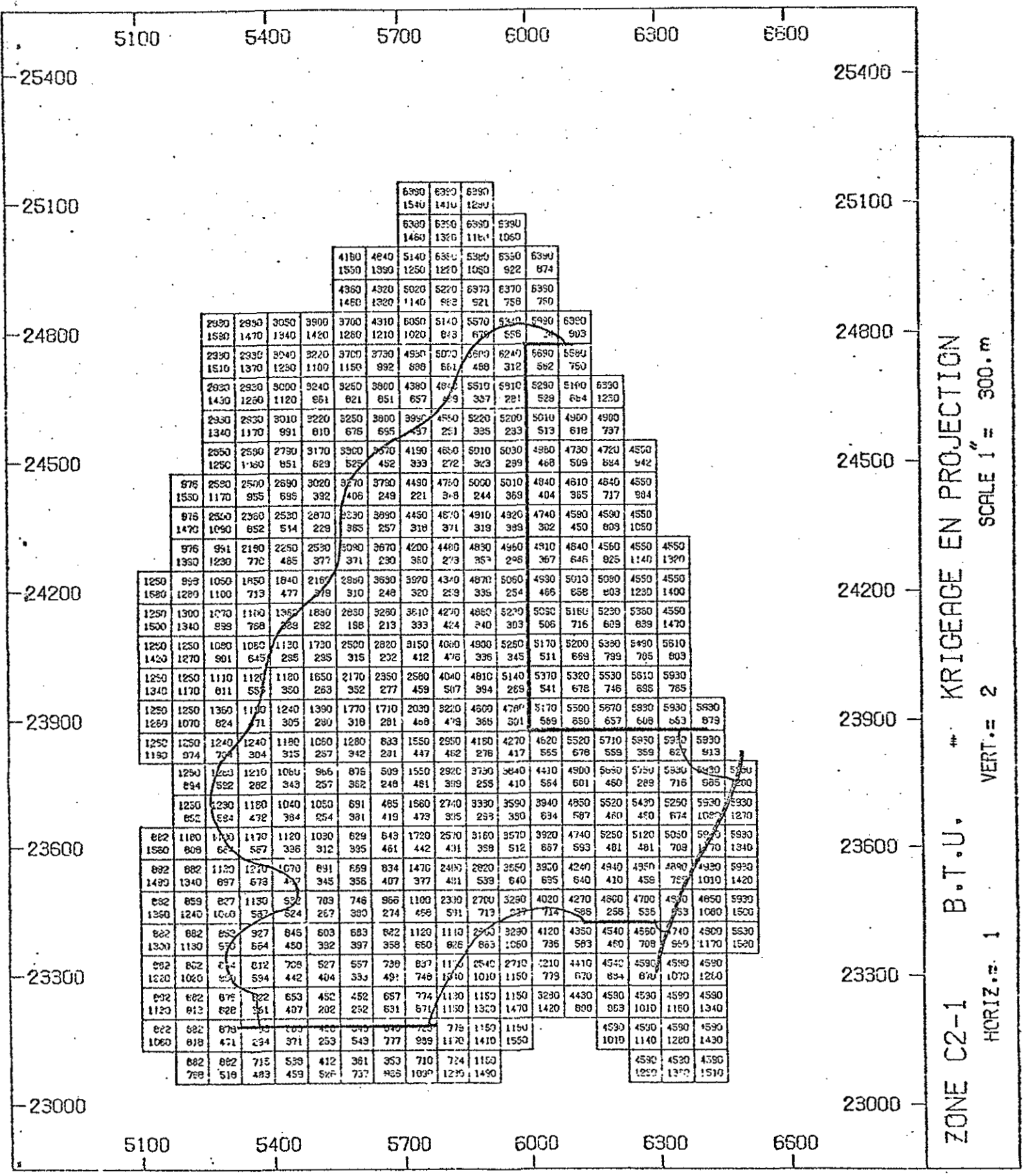
HORIZ.= 1 VERT.= 2 SCALE 1"= 300.m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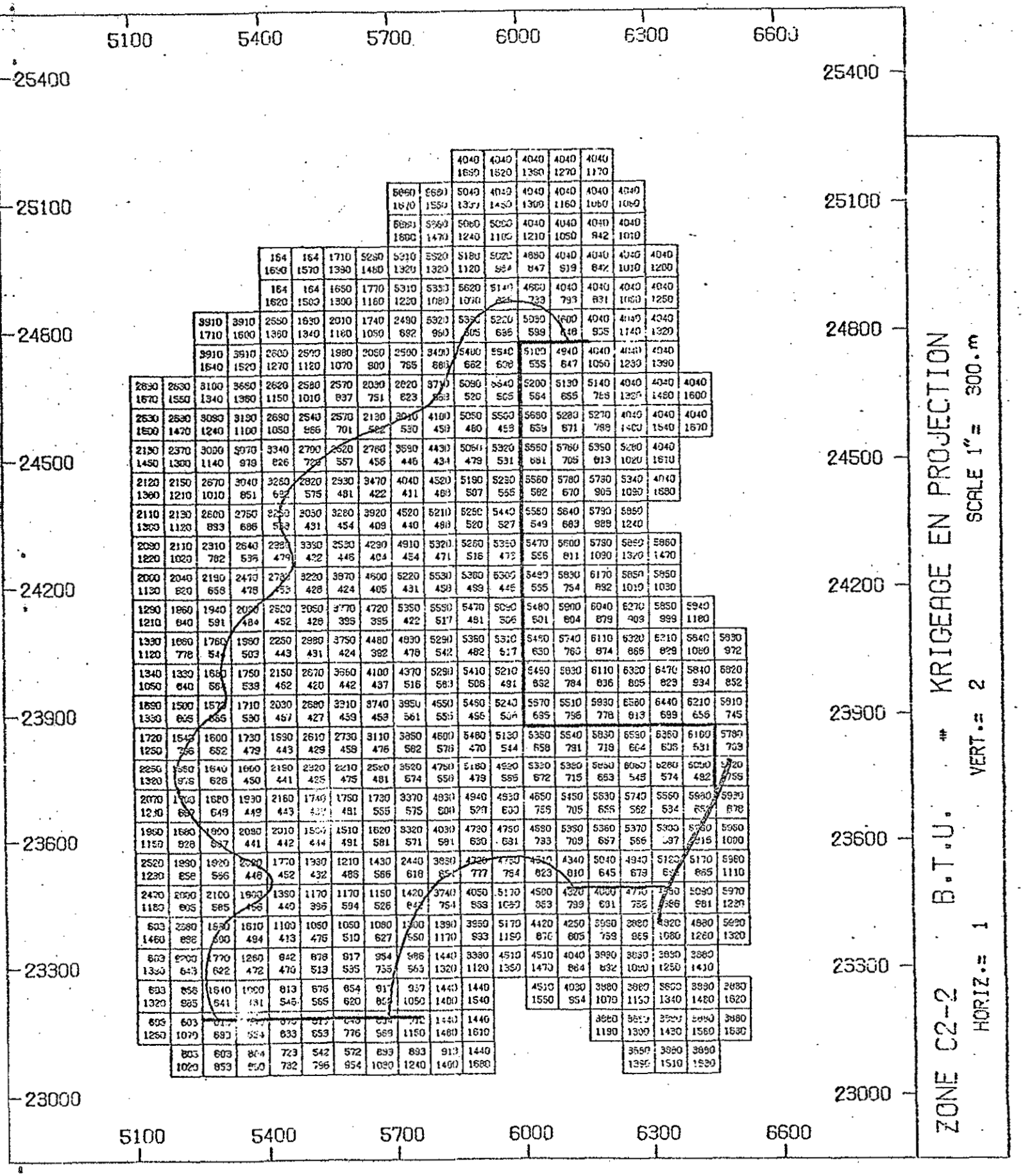
HORIZ.= 1 VERT.= 2 SCALE 1" = 300. m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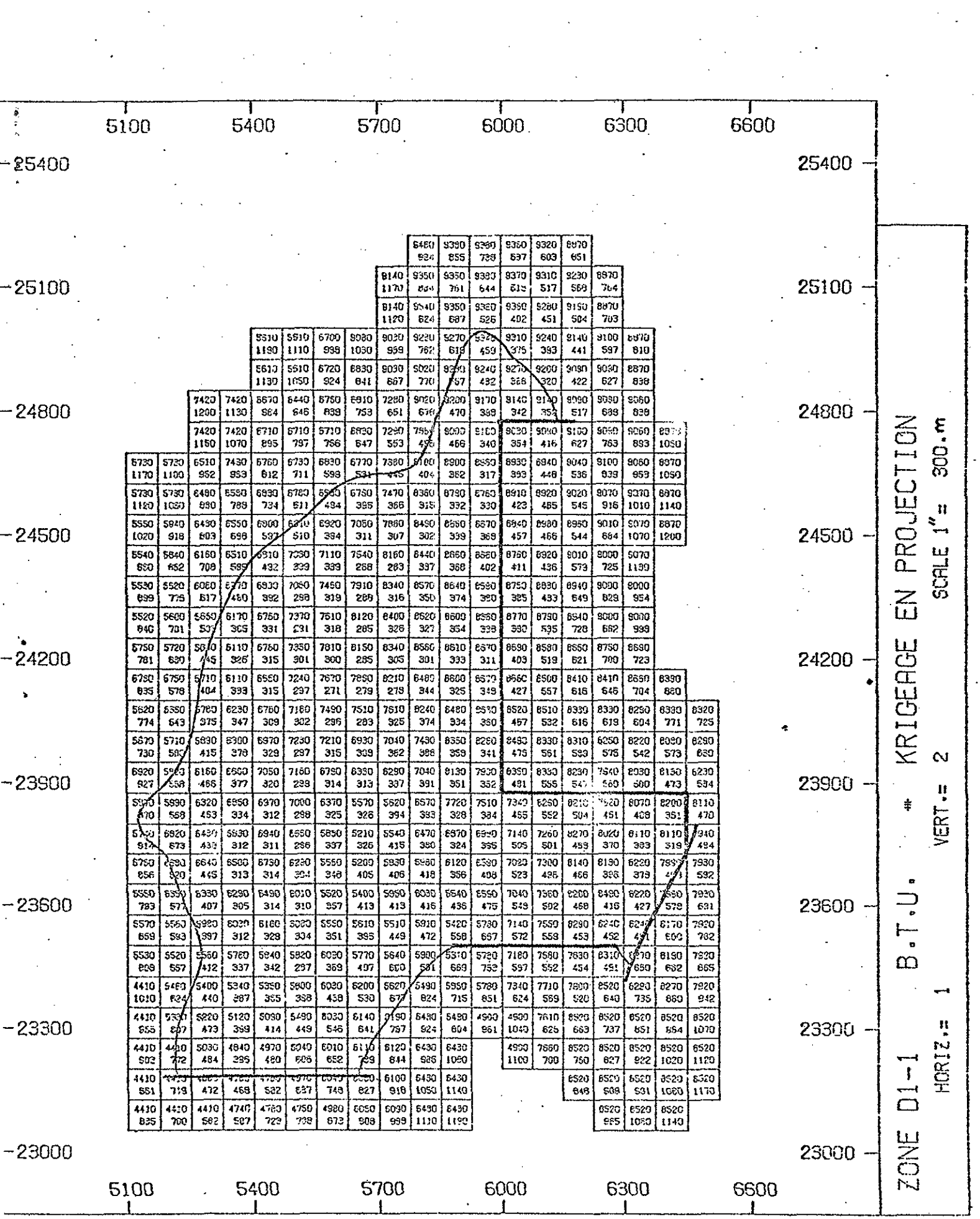
ZONE C2-2 B.T.U. * KRIGEAGE EN PROJECTION
HORIZ.= 1 VERT.= 2 SCALE 1"= 300.m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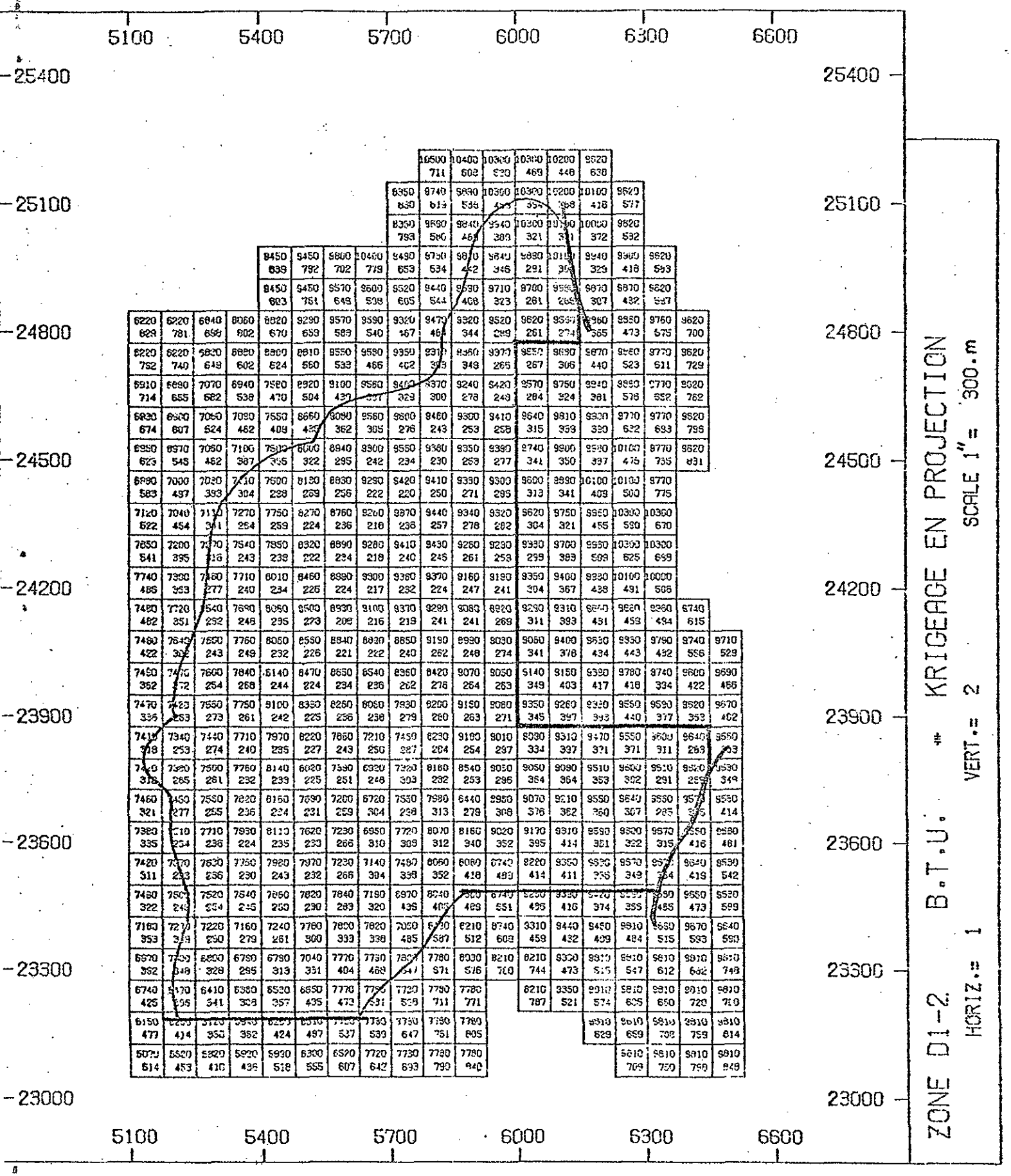
ZONE D1-1 B.T.U. * KRIGEAGE EN PROJECTION
HORIZ.= 1 VERT.= 2 SCALE 1"= 300.m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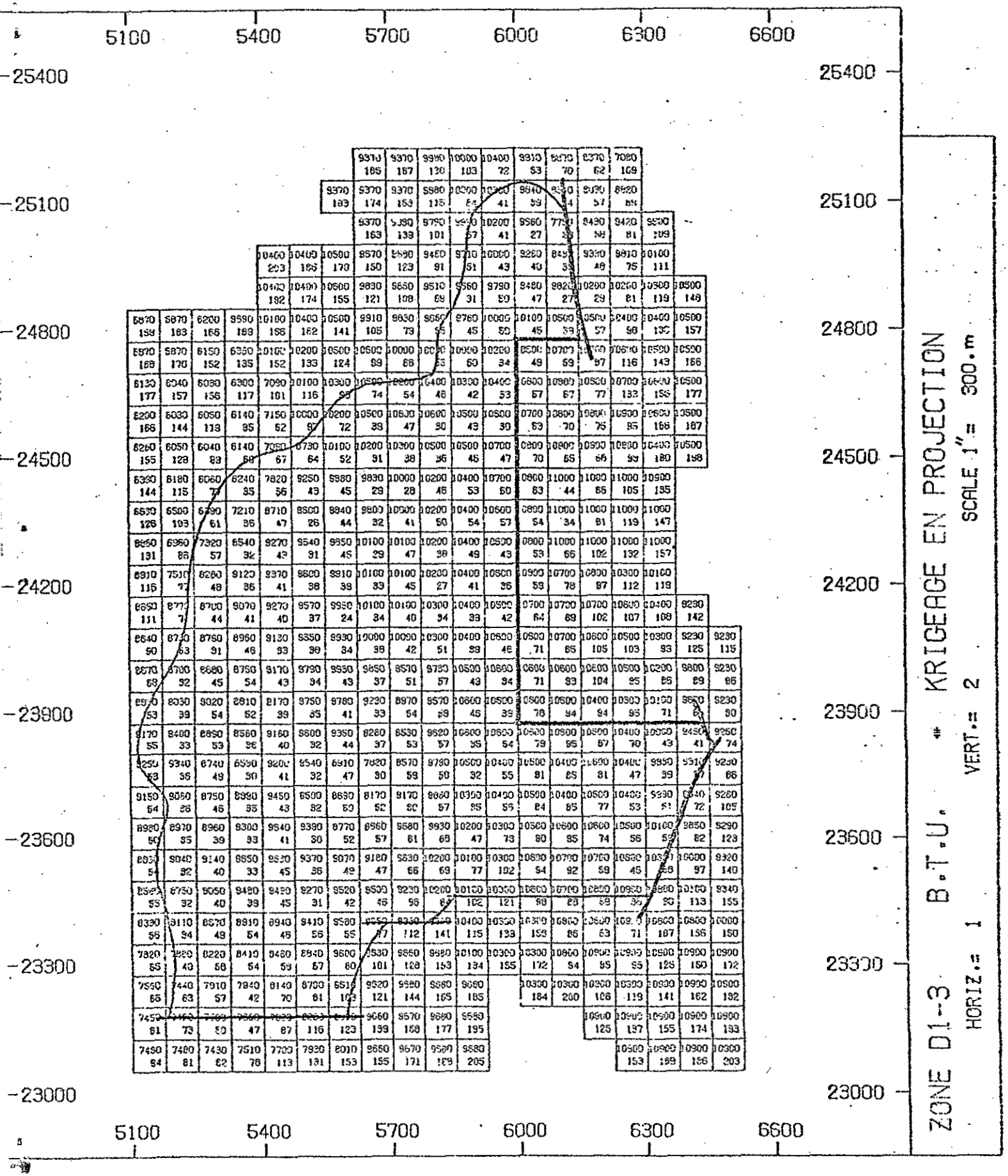
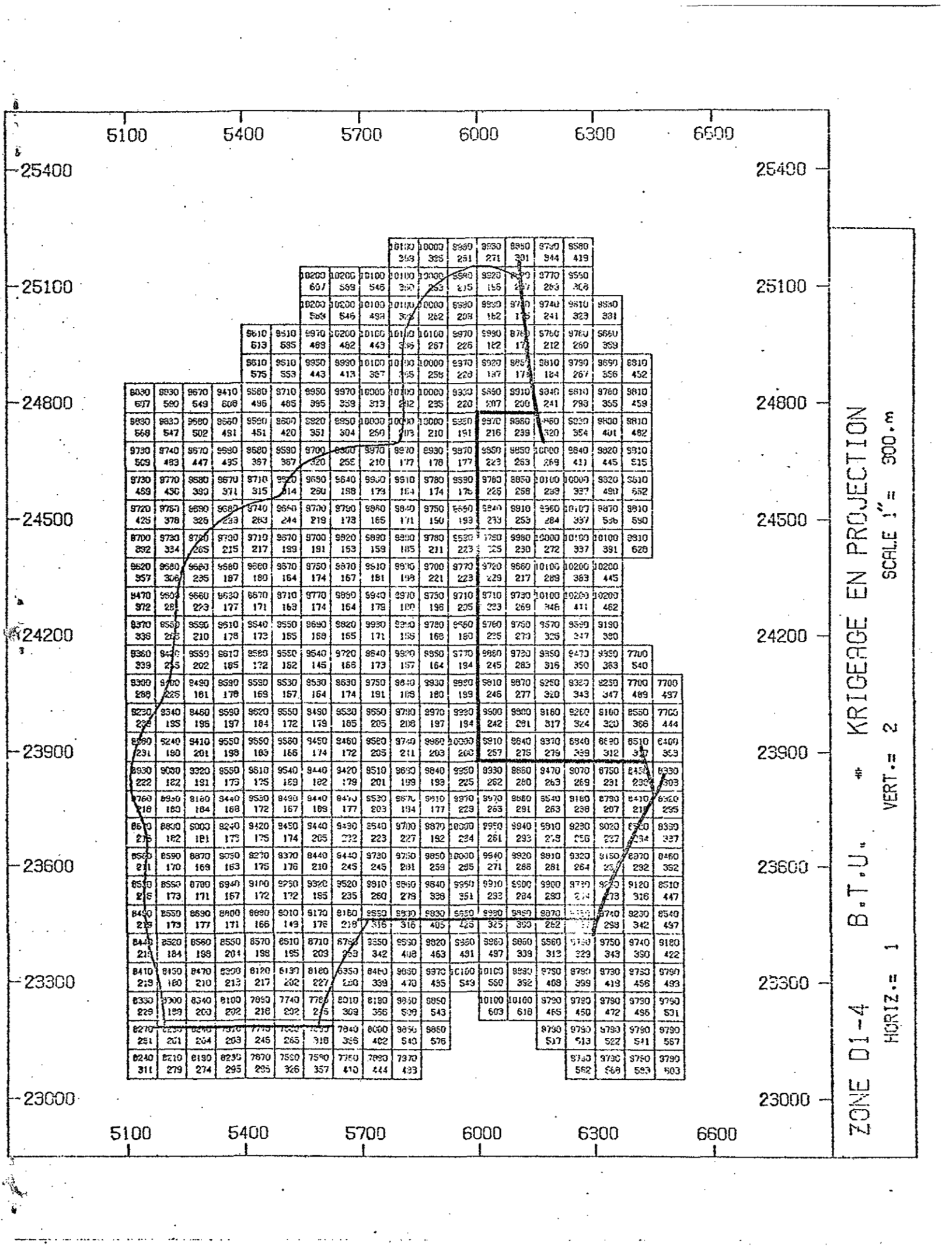
ZONE D1-2. B.T.U. * KRIGEAGE EN PROJECTION
HORIZ.= 1 VERT.= 2 SCALE 1"= 300.m

Caution - On this map, the standard errors have to be multiplied by 3.16

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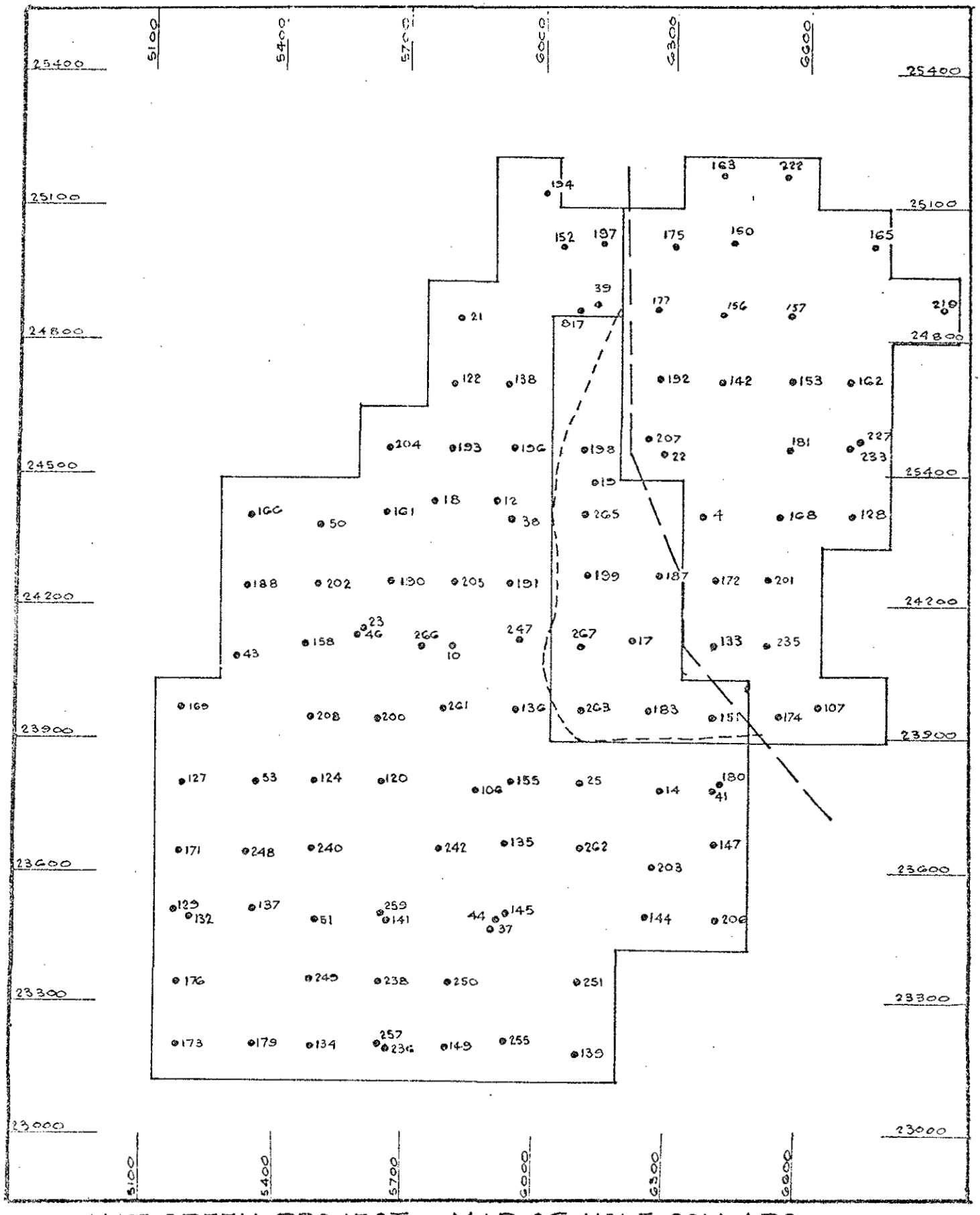
ZONE D1-4 B.T.U. * KRIGEAGE EN PROJECTION
HORIZ.= 1 VERT.= 2 SCALE 1"= 300.m



HAT CREEK PROJECT MAP OF HOLE COLLARS

SCALE 1" = 300 m