

July 9.

005107

The Grum 8705 model coordinate system was considered unsatisfactory because the lower left corner of the model was set to (0.0,0.0). This results in negative coordinates in areas immediately southwest and southeast of the model area.

A new coordinate system was created parallel to the original 8705 grid. This new grid system was tied to survey control station 1404 (earlier named VG4) located on the Blind Creek road between the Grum and Vangorda areas. UTM coordinates for this survey station are:

6,904,623.172 N
593,847.979 E
1,300.062 metres A.S.L.

VG4 was assigned the following coordinates in the new 8705 grid:

5,000.000 N
3,500.000 E
1,300.062 metres A.S.L.

Horizontal and vertical units for this grid are metres. Elevations correspond exactly to the elevation datum established in the 1979 Anvil District Orthophoto survey completed by Northwest Surveys.

The lower left corner of the model has horizontal coordinates (5418.12 N, 2237.56 E) using the new coordinate system. The range in Northings and Easting for the 8705 model are:

Northings 5418.12 - 7068.12 N
Eastings 2237.56 - 3197.56 E

Conversion from 8705 (old) coordinates to 8705 (new) coordinates is accomplished simply through translation. The resulting conversion equations are:

N (new) = N (old) + 5418.12
E (new) = E (old) + 2237.56

The following equations convert between 8705 (new) coordinates and UTM coordinates.

8705 (new) -> UTM

$$N_{UTM} = N_o + Sh * (N_{8705} * \cos X + E_{8705} * \sin X)$$
$$E_{UTM} = E_o + Sh * (E_{8705} * \cos X - N_{8705} * \sin X)$$
$$\text{Elevation (UTM)} = \text{Elevation (8705)}$$

UTM -> 8705 (new)

$$N_{8705} = \frac{(N_{UTM} - N_o) * \cos X - (E_{UTM} - E_o) * \sin X}{Sh}$$
$$E_{8705} = \frac{(N_{UTM} - N_o) * \sin X + (E_{UTM} - E_o) * \cos X}{Sh}$$

$$\text{Elevation (8705)} = \text{Elevation (UTM)}$$

Where

$$\begin{aligned} N_0 &= 6,898,020.547 \\ E_0 &= 594,040.154 \\ S_h &= 0.99950853 \\ X &= 47.7741667 \text{ degrees} = 0.833816 \text{ radians} \end{aligned}$$

The spreadsheet file GRIDS.WR1 has been revised to include these new conversion equations.

Conversion equations between the GRUM 8606 model (=G2 model) and the Grum 8705 (new) model are as follows:

$$\begin{aligned} N_{8705} &= 13,293.12 - E_{8606} \\ E_{8705} &= N_{8606} - 6,532.44 \end{aligned}$$

The G8705 model encompasses geological cross sections 41 + 081 W to 96 + 019W and long sections 12 + 027S to 19 + 075 N (all units indicated in feet). The even-numbered cross sections are spaced every 60.693 metres (199.12 feet). The even-numbered long sections are spaced every 60.96 metres (200 feet). The following tables give G8705 (new) model coordinates and row/column locations for selected cross and long sections.

Table 1. Grum 8705 (new) model. Location of geological long sections.

<u>SECTION</u>	<u>G8705 Easting</u>	<u>Column Location</u>
12 S	2245.8	2.0
10 S	2306.8	9.6
8 S	2367.7	17.3
6 S	2428.7	24.9
4 S	2489.7	32.5
2 S	2550.6	40.1
00 B/L	2611.6	47.8
2 N	2672.6	55.4
4 N	2733.5	63.0
6 N	2794.5	70.6
8 N	2855.4	78.2
10 N	2916.4	85.8
12 N	2977.3	93.5
14 N	3038.3	101.1
16 N	3099.3	108.7
18 N	3160.2	116.3

Table 2. Grum 8705 (new) model. Location of Geological cross sections.

<u>SECTION</u>	<u>68705 Northing</u>	<u>Row Location</u>
96 W	7062.4	1.4
94 W	7001.7	5.4
92 W	6941.0	9.5
90 W	6880.3	13.5
88 W	6819.6	17.6
86 W	6758.9	21.6
84 W	6698.2	25.7
82 W	6637.5	29.7
80 W	6576.8	33.8
78 W	6516.1	37.8
76 W	6455.4	41.8
74 W	6394.7	45.9
72 W	6334.1	49.9
70 W	6273.4	54.0
68 W	6212.7	58.0
66 W	6152.0	62.0
64 W	6091.3	66.1
62 W	6030.6	70.2
60 W	5969.9	74.2
58 W	5910.0	78.2
56 W	5848.5	82.3
54 W	5787.8	86.4
52 W	5727.1	90.4
50 W	5666.4	94.4
48 W	5605.7	98.5
46 W	5545.0	102.5
44 W	5484.3	106.6
42 W	5423.7	110.6