

DAFTAR PUSTAKA

- Anshari, F. 2016. Identifikasi Pola Sebaran *Seam* dan Perhitungan Sumber Daya Batubara Menggunakan Interpretasi Data Log Geofisika Pada Lapangan “F” Lahat, Sumatera Selatan. (Skripsi). Teknik Geofisika, Universitas Lampung, Bandar Lampung
- Hawadi, A. 2019. Buku Petunjuk Pelatihan Open Cut Mining. Mitra Jasa Pertambangan.
- Heryanto, R. Dkk. 1995. Geologi Regional Lembar Malinau. Kalimantan Utara 1:250.000.
- Hower, J.C. 1963. The International Handbook of *Coal* Petrography. USA: University of. Kentucky
- Thomas. L. 2012. Coal Geology Second Edition. Wiley-Blackwell.
- Mutasim. Dkk. 2010. Peningkatan Nilai Kalori Batubara Peringkat Rendah Dengan Menggunakan Minyak Tanah dan Minyak Residu. Universitas Pembangunan Nasional. Press. Jawa Timur.
- Nurchahyo, T. 2017. Analisis Keterdapatan Overpressure dan Hubungannya dengan Kondisi Geologi pada Daerah Kedungtuban dan Sekitarnya, Cekungan Jawa Timur Utara. Perpustakaan Digital ITB.
- PT. Mitrabara Adiperdana Tbk. 2013. Laporan Eksplorasi.
- Rismayana, F. Dkk. 2022. Umur Dan Lingkungan Pengendapan Sub Cekungan Tarakan, Kalimantan Utara Berdasarkan Data Palinologi Sumur Ranu. Bulletin of scientific Contribution Geology. Vol 20, 2, 59-68.
- SNI 5015:2019. Pedoman pelaporan hasil eksplorasi, sumber daya, dan cadangan batubara.

- Sriyanto, S. P. D., dan Ifantyana, I. 2016, Identifikasi Patahan Mikro Penyebab Gempa Bumi Tarakan 21 Desember 2015, Prosiding Seminar Nasional Fisika, Vol V. Hal 80.
- Sukandarrumidi. 1995. Batubara dan Gambut, Fakultas Teknik Universitas Gadjah Mada, Jogjakarta, Hal 150.
- Susilawati. 1992. Proses Pembentukan Batubara, Analisa Penelitian dan Pengembangan Geologi. Institut Teknologi Bandung
- Teichmuller, 1982. Stacsh's text book of coal petrology, 3rd., Gebruder, Berlin, Stuttgart.
- Qadaryati, N. Dkk. 2019. Penentuan Lingkungan Pengendapan Batubara Berdasarkan Karakteristik dan Maseral Batubara di PT X, Kabupaten Nunukan, Kalimantan Utara. Jurnal Geosains dan Teknologi

LAMPIRAN

Lampiran 1

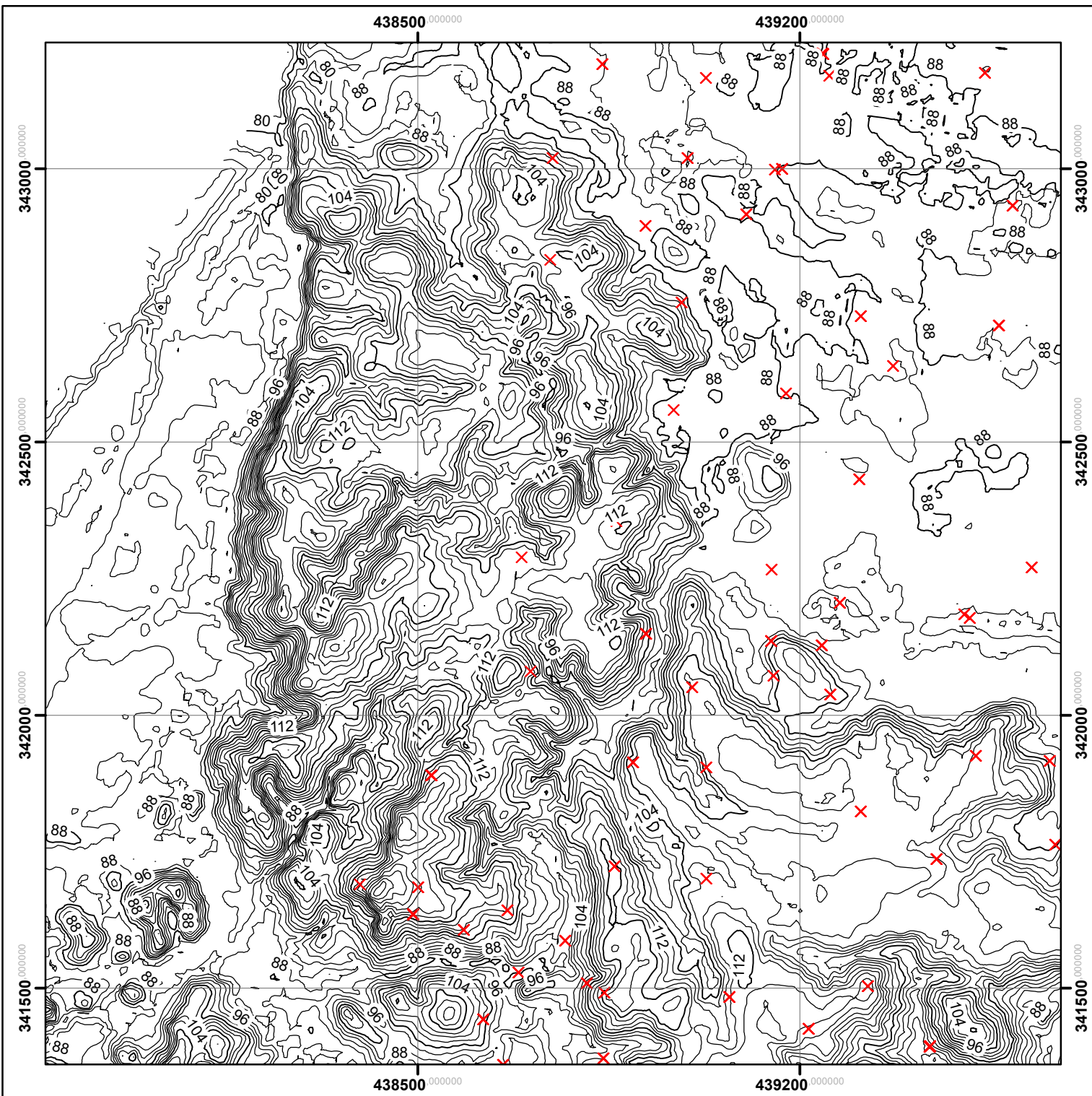
| Nama Lubang Bor | Nama Seam | Dari (M) | Ke (M) | Tebal (M) |
|-----------------|-----------|--------------|--------------|-------------|
| Y40 | A | 14,34 | 14,82 | 0,48 |
| L61YU | A | 20,3 | 21,39 | 1,09 |
| NY_04 | A | 20,57 | 21,28 | 0,71 |
| P.19 | A | 14,04 | 14,52 | 0,48 |
| Y43 | A | 29,04 | 29,35 | 0,31 |
| Y4501 | A | 14,34 | 14,57 | 0,23 |
| Y04 | A | 19,32 | 19,44 | 0,12 |
| L65YU | A | 16,17 | 17,37 | 1,2 |
| MA_C_10 | A | 21 | 22,12 | 1,12 |
| GT_Y_01R | A | 24,6 | 25 | 0,4 |
| MA_C_09 | A | 19 | 20,32 | 1,32 |
| INY_11 | A | 13,92 | 14,34 | 0,42 |
| MA_C_07A | A | 14,89 | 16,24 | 1,35 |
| GT_Y_01 | A | 24,57 | 24,79 | 0,22 |
| INY_59A | A | 15,32 | 15,9 | 0,58 |
| INY_59AR | A | 15,3 | 15,84 | 0,54 |
| Y50 | B | 38,13 | 38,85 | 0,72 |
| NY_05 | B | 8,51 | 9,14 | 0,63 |
| INY_14 | B | 35,67 | 36,32 | 0,65 |
| INY_15 | B | 23,12 | 23,8 | 0,68 |
| INY_15R | B | 23,24 | 23,98 | 0,74 |
| L61YU | B | 51,8 | 52,64 | 0,84 |
| NY_01 | B | 30,86 | 31,14 | 0,28 |
| YL_03 | B | 40,16 | 41,76 | 1,6 |
| Y10 | B | 41,4 | 42,2 | 0,8 |
| L63YU | B | 38 | 39,15 | 1,15 |
| MA_C_10 | B | 53,5 | 54,5 | 1 |
| MA_C_09 | B | 50,2 | 51,11 | 0,91 |
| GT_Y_02 | B | 66,64 | 67,28 | 0,64 |
| MA_C_07A | B | 46,96 | 47,68 | 0,72 |
| INY_10 | B | 59,65 | 60,16 | 0,51 |
| L54YU | B | 28,39 | 29,1 | 0,71 |
| MA_C_06 | B | 23,44 | 23,96 | 0,52 |
| INY_16A | B | 19,88 | 20,28 | 0,4 |
| INY_41 | B | 34,2 | 34,5 | 0,3 |
| Y39 | C | 22,72 | 25,85 | 3,13 |
| Y05 | C | 13,67 | 16,49 | 2,82 |
| Y41 | C | 26,23 | 29,44 | 3,21 |
| L45YU | C | 26,44 | 29,29 | 2,85 |
| Y46 | C | 26,13 | 29,31 | 3,18 |

| | | | | |
|-------------|---|--------------|--------------|--------------|
| Y71 | C | 7,5 | 13,6 | 6,1 |
| Y47 | C | 51,06 | 53,07 | 2,01 |
| Y50 | C | 63,4 | 67 | 3,6 |
| INY_74 | C | 1,12 | 4,56 | 3,44 |
| INY_74R | C | 1,26 | 4,64 | 3,38 |
| L44YU | C | 13,13 | 16,09 | 2,96 |
| L48YU | C | 16,02 | 19,22 | 3,2 |
| L52YU | C | 14,84 | 18,31 | 3,47 |
| NY_01 | C | 53,58 | 56,52 | 2,94 |
| L60YU | C | 32,5 | 37,03 | 4,53 |
| NY_02 | C | 43,39 | 46,82 | 3,43 |
| L55YU | C | 30,6 | 33,6 | 3 |
| Y43 | C | 66,01 | 66,94 | 0,93 |
| L17Y | C | 33,9 | 41,65 | 7,75 |
| YL_03 | C | 55,35 | 58,7 | 3,35 |
| Y10 | C | 67,49 | 71,42 | 3,93 |
| Y04 | C | 57,6 | 59,85 | 2,25 |
| MA_D_12 | C | 20,34 | 23,24 | 2,9 |
| MA_C_10 | C | 83,12 | 85,57 | 2,45 |
| INY_17 | C | 76,02 | 76,61 | 0,59 |
| GT_Y_02 | C | 100,2 | 100,7 | 0,5 |
| MA_D_03 | C | 30,42 | 33,62 | 3,2 |
| INY_11 | C | 52,24 | 55,15 | 2,91 |
| MA_C_07A | C | 74,4 | 77,93 | 3,53 |
| DH_C01_1510 | C | 0,001 | 2,95 | 2,949 |
| L59YU | C | 6 | 10,6 | 4,6 |
| YL_06 | C | 30,69 | 33,34 | 2,65 |
| L54YU | C | 52,68 | 55,95 | 3,27 |
| TPB2 | C | 0,5 | 4,3 | 3,8 |
| INY_46 | C | 39,9 | 43,16 | 3,26 |
| MA_C_06 | C | 50,55 | 53,79 | 3,24 |
| YL_04 | C | 28,36 | 31,44 | 3,08 |
| INY_16A | C | 44,69 | 48,08 | 3,39 |
| INY_47 | C | 78,2 | 81,2 | 3 |
| INY_48 | C | 55,21 | 55,79 | 0,58 |
| INY_59A | C | 53,88 | 57 | 3,12 |
| INY_59AR | C | 54,02 | 57,04 | 3,02 |
| INY_81 | C | 38,5 | 41,14 | 2,64 |
| INY_79 | C | 30,76 | 33,72 | 2,96 |
| INY_41 | C | 63,68 | 66,88 | 3,2 |
| INY_18 | C | 95,48 | 95,8 | 0,32 |
| INY_59R | C | 30,82 | 33,46 | 2,64 |
| INY_59 | C | 30,72 | 33,61 | 2,89 |

| | | | | |
|---------|---|-------|--------|------|
| INY_76 | C | 1,01 | 4,6 | 3,59 |
| INY_21 | C | 2,1 | 4 | 1,9 |
| YS_10 | D | 8,23 | 12,95 | 4,72 |
| Y39 | D | 54,31 | 60,13 | 5,82 |
| Y05 | D | 45,47 | 51,16 | 5,69 |
| L45YU | D | 57,21 | 63,24 | 6,03 |
| Y42 | D | 19,49 | 25,24 | 5,75 |
| L47YU | D | 19,34 | 24,26 | 4,92 |
| L49YU | D | 46,4 | 52,2 | 5,8 |
| Y46 | D | 61,93 | 67,25 | 5,32 |
| P.08 | D | 17,55 | 23,59 | 6,04 |
| L53YU | D | 32,06 | 38,35 | 6,29 |
| Y44 | D | 19,54 | 25,8 | 6,26 |
| Y72 | D | 67,1 | 73,9 | 6,8 |
| Y71 | D | 53,6 | 58,98 | 5,38 |
| Y56 | D | 26,16 | 32,31 | 6,15 |
| Y21 | D | 16,6 | 23,86 | 7,26 |
| P.11 | D | 31,19 | 38,47 | 7,28 |
| Y74 | D | 35,2 | 41,12 | 5,92 |
| NY_05 | D | 49,5 | 54,04 | 4,54 |
| Y70 | D | 60,8 | 66,96 | 6,16 |
| Y54 | D | 51,14 | 56,88 | 5,74 |
| Y75 | D | 37,32 | 43 | 5,68 |
| MA_D_06 | D | 51,68 | 57,2 | 5,52 |
| INY_60 | D | 4,8 | 5,68 | 0,88 |
| ISY_31 | D | 2,2 | 9,17 | 6,97 |
| INY_54 | D | 2,52 | 9,37 | 6,85 |
| INY_53A | D | 26,96 | 33,8 | 6,84 |
| INY_56 | D | 46 | 53,2 | 7,2 |
| INY_14 | D | 94,04 | 100,44 | 6,4 |
| INY_13 | D | 91,68 | 97,84 | 6,16 |
| INY_15R | D | 88,58 | 95,64 | 7,06 |
| INY_71 | D | 46,8 | 53,72 | 6,92 |
| INY_74 | D | 43,12 | 49,32 | 6,2 |
| INY_74R | D | 43,08 | 49,22 | 6,14 |
| INY_70 | D | 0,5 | 5,96 | 5,46 |
| L44YU | D | 43 | 49,07 | 6,07 |
| L46YU | D | 8,39 | 14,32 | 5,93 |
| L48YU | D | 45,3 | 51,48 | 6,18 |
| L52YU | D | 49,9 | 56,22 | 6,32 |
| L19Y2 | D | 23,8 | 30,5 | 6,7 |
| L57YU | D | 7,4 | 11,8 | 4,4 |
| P.05 | D | 19,89 | 25,61 | 5,72 |

| | | | | |
|-------------|---|---------------|---------------|-------------|
| L55YU | D | 63,7 | 69,91 | 6,21 |
| P.04 | D | 16,72 | 24,03 | 7,31 |
| P.06 | D | 17,49 | 18,67 | 1,18 |
| Y73 | D | 52,97 | 57,23 | 4,26 |
| LY1 | D | 41,66 | 47,75 | 6,09 |
| YS_18 | D | 2,14 | 5,06 | 2,92 |
| MA_D13 | D | 14,2 | 20,61 | 6,41 |
| IL_22 | D | 17,02 | 24,12 | 7,1 |
| MA_D_12 | D | 57,82 | 65,09 | 7,27 |
| MA_C_10 | D | 115,59 | 122,68 | 7,09 |
| MA_D_08 | D | 17,4 | 23,68 | 6,28 |
| INY_32 | D | 13,24 | 15,46 | 2,22 |
| INY_05 | D | 24,42 | 29,47 | 5,05 |
| MA_C_11A | D | 64,56 | 71,16 | 6,6 |
| GT_Y_01R | D | 96,8 | 100,3 | 3,5 |
| MA_D_04 | D | 6,91 | 13,24 | 6,33 |
| MA_C_12 | D | 61,34 | 66,88 | 5,54 |
| INY_06 | D | 42,46 | 49,7 | 7,24 |
| INY_29 | D | 13,32 | 19,4 | 6,08 |
| MA_D_11 | D | 43,49 | 50,25 | 6,76 |
| MA_D_09 | D | 62,49 | 69,66 | 7,17 |
| MA_C_09 | D | 74,24 | 81,04 | 6,8 |
| INY_17 | D | 118,95 | 125,12 | 6,17 |
| GT_Y_02 | D | 122,36 | 125,48 | 3,12 |
| INY_12 | D | 89,9 | 96,4 | 6,5 |
| MA_D_10 | D | 15,92 | 22,62 | 6,7 |
| MA_C_11 | D | 66,28 | 72,54 | 6,26 |
| MA_C_04 | D | 66,08 | 71,62 | 5,54 |
| INY_04 | D | 23,55 | 24,51 | 0,96 |
| DH_D01_1510 | D | 0 | 3,5 | 3,5 |
| DHD_YRD | D | 0 | 4,8 | 4,8 |
| INY_46 | D | 79 | 85,25 | 6,25 |
| INY_51 | D | 75,9 | 82,36 | 6,46 |
| IL_32 | D | 16 | 22,8 | 6,8 |
| YL_04 | D | 60,7 | 66,74 | 6,04 |
| INY_16A | D | 83,02 | 89,9 | 6,88 |
| INY_47 | D | 115,2 | 122,2 | 7 |
| INY_48 | D | 89,56 | 91,02 | 1,46 |
| INY_50 | D | 43 | 49 | 6 |
| INY_59A | D | 83,04 | 89,3 | 6,26 |
| INY_48A | D | 105,66 | 112,56 | 6,9 |
| INY_78 | D | 10,16 | 16,92 | 6,76 |
| INY_79 | D | 60,61 | 66,76 | 6,15 |

| | | | | |
|------------|---|-------------|--------------|-------------|
| INY_48AR | D | 105,64 | 112,48 | 6,84 |
| INY_41 | D | 97,47 | 104,52 | 7,05 |
| INY_39 | D | 4,1 | 8,41 | 4,31 |
| INY_75A | D | 7,43 | 10,94 | 3,51 |
| INY_59R | D | 58,52 | 64,75 | 6,23 |
| INY_59 | D | 58,4 | 64,74 | 6,34 |
| INY_56A | D | 41,21 | 48,56 | 7,35 |
| INY_21 | D | 28,2 | 34,6 | 6,4 |
| INY_28 | D | 5,44 | 7,04 | 1,6 |
| DH_OC1 | D | 0 | 1,9 | 1,9 |
| TP06A_YRD | D | 6,3 | 7 | 0,7 |
| TP07A_YRD | D | 2,5 | 5,4 | 2,9 |
| TP08_YRD | D | 3,5 | 8,6 | 5,1 |
| TP09_YRD | D | 3,4 | 6,7 | 3,3 |
| TP07B_YRD | D | 3 | 7,2 | 4,2 |
| TC01 | D | 2,7 | 3 | 0,3 |
| TC02 | D | 3,4 | 4 | 0,6 |
| TC03 | D | 3,7 | 4 | 0,3 |
| TP01 | D | 0,5 | 6,5 | 6 |
| TP02 | D | 0,5 | 5,5 | 5 |
| DD_PIT_06 | D | 36,3 | 43,18 | 6,88 |
| DD_PIT_01 | D | 33,02 | 40,4 | 7,38 |
| DD_PIT_05 | D | 32,95 | 39,77 | 6,82 |
| DD_PIT_04 | D | 35,5 | 43,35 | 7,85 |
| DD_PIT_03 | D | 35,2 | 42,57 | 7,37 |
| DD_PIT_01A | D | 38,65 | 45,95 | 7,3 |
| DD_PIT_07 | D | 57,45 | 63,05 | 5,6 |



PETA SEBARAN TITIK BOR

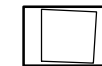
PIT North Yarder PT. Mitrabara Adiperdana Tbk,
 Kecamatan Malinau Selatan, Kalimantan Utara



Skala 1 : 10000

Oleh :
 ELISA
 D061181006

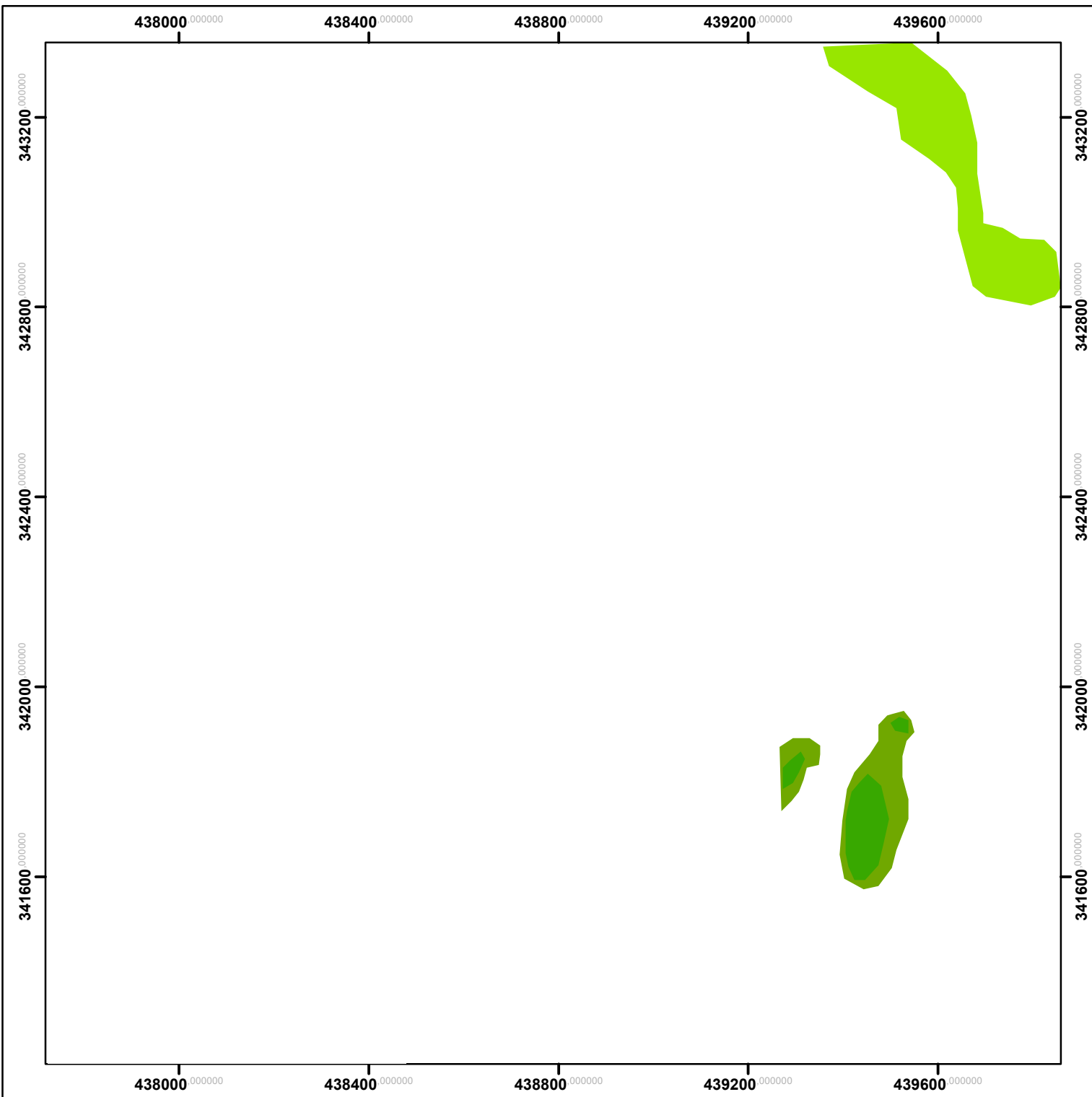
Keterangan :



Batas PIT North Yarder PT Mitrabara Adiperdana Tbk



Titik Bor



KEMENTERIAN PENDIDIKAN KEBUDAYAAN RISET DAN TEKNOLOGI
 UNIVERSITAS HASANUDDIN
 FAKULTAS TEKNIK
 DEPARTEMEN TEKNIK GEOLOGI

PETA ISOPACH SEAMA

PIT North Yarder PT. Mitrabara Adiperdana Tbk,
 Kecamatan Malinau Selatan, Kalimantan Utara

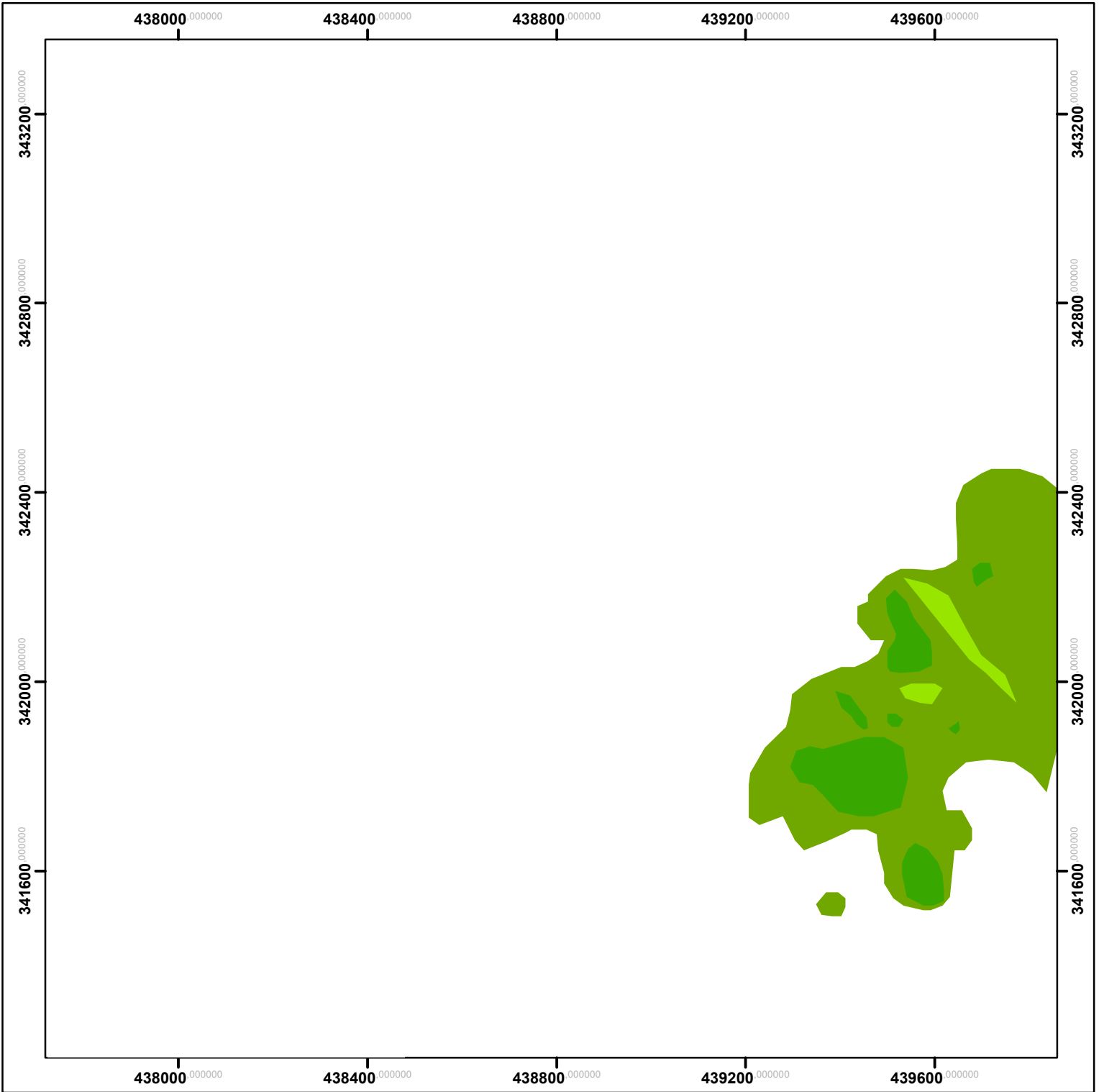


Skala 1 : 11.5000

Oleh :
 ELISA
 D061181006

Keterangan :

- 0 m
- 0,1 m - 0,5 m
- 0,5 m - 1 m



PETA ISOPACH SEAM B

PIT North Yarder PT. Mitrabara Adiperdana Tbk,
 Kecamatan Malinau Selatan, Kalimantan Utara

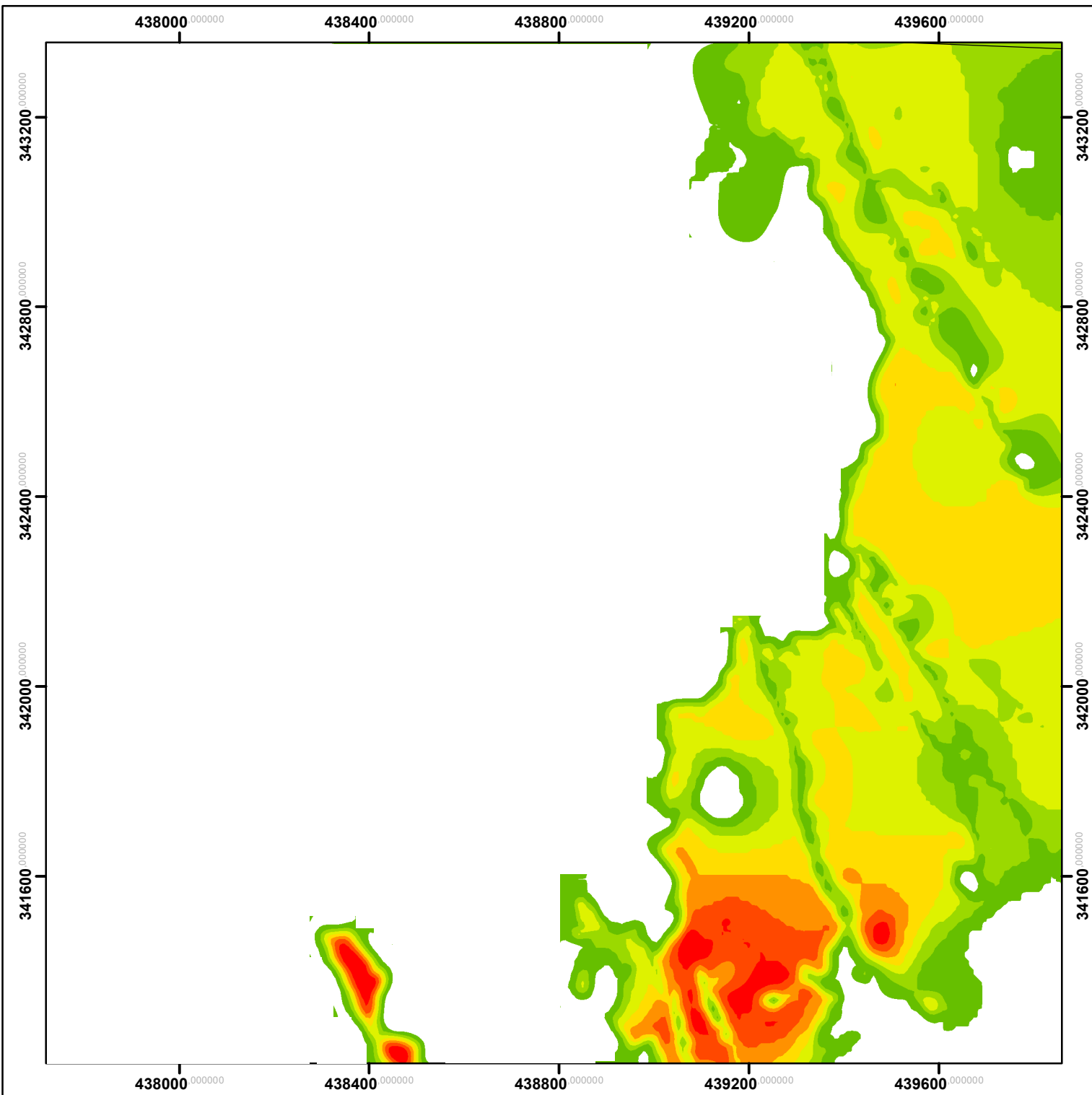


Skala 1 : 11.5000

Oleh :
 ELISA
 D061181006

Keterangan

- 0 m
- 0,1 m - 0,5 m
- 0,5 m - 1 m



KEMENTERIAN PENDIDIKAN KEBUDAYAAN RISET DAN TEKNOLOGI
 UNIVERSITAS HASANUDDIN
 FAKULTAS TEKNIK
 DEPARTEMEN TEKNIK GEOLOGI

PETA ISOPACH SEAM C

PIT North Yarder PT. Mitrabara Adiperdana Tbk,
 Kecamatan Malinau Selatan, Kalimantan Utara

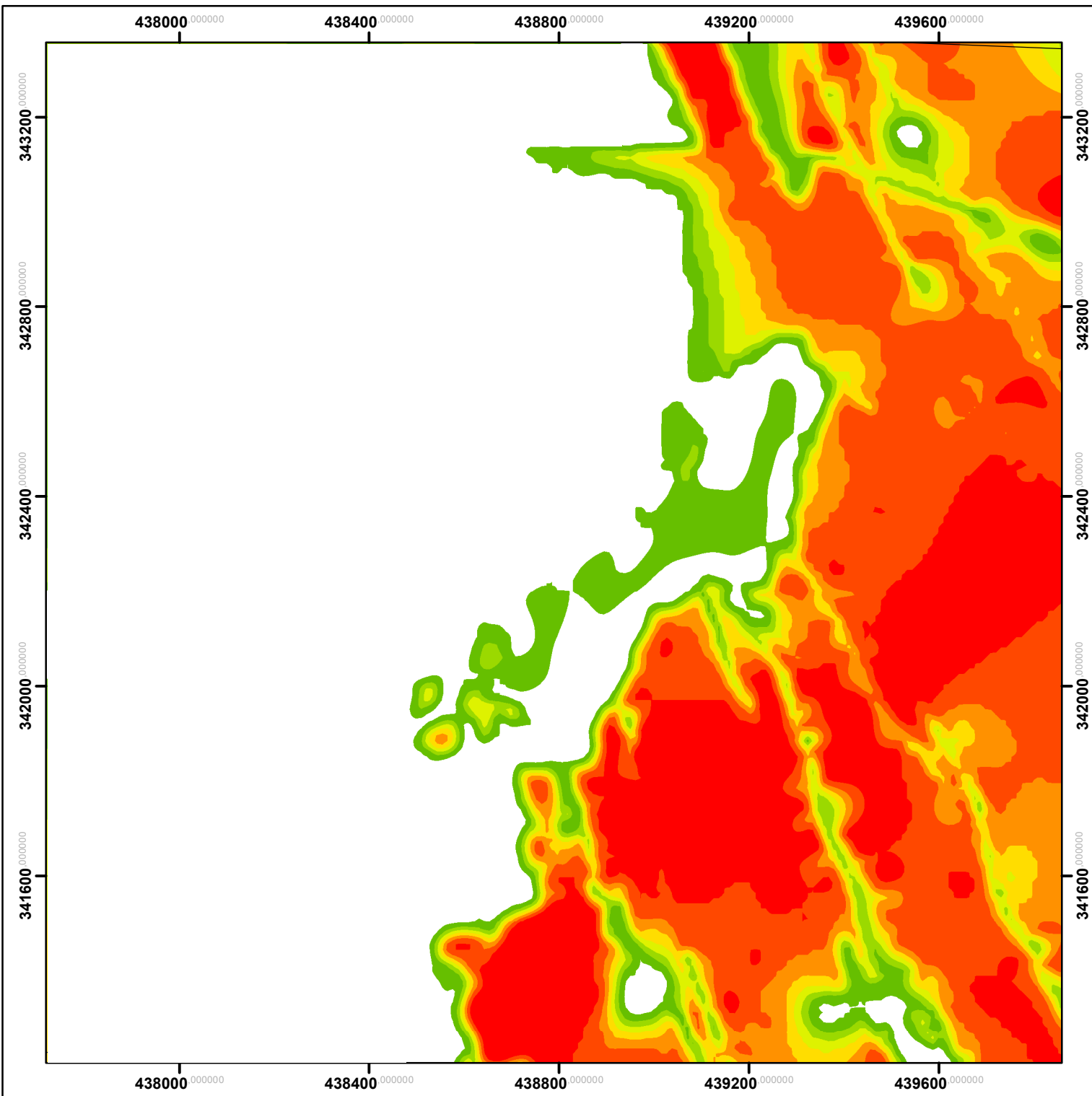


Skala 1 : 11.5000

Oleh :
 ELISA
 D061181006

Keterangan :





KEMENTERIAN PENDIDIKAN KEBUDAYAAN RISET DAN TEKNOLOGI
 UNIVERSITAS HASANUDDIN
 FAKULTAS TEKNIK
 DEPARTEMEN TEKNIK GEOLOGI

PETA ISOPACH SEAM D

PIT North Yarder PT. Mitrabara Adiperdana Tbk,
 Kecamatan Malinau Selatan, Kalimantan Utara

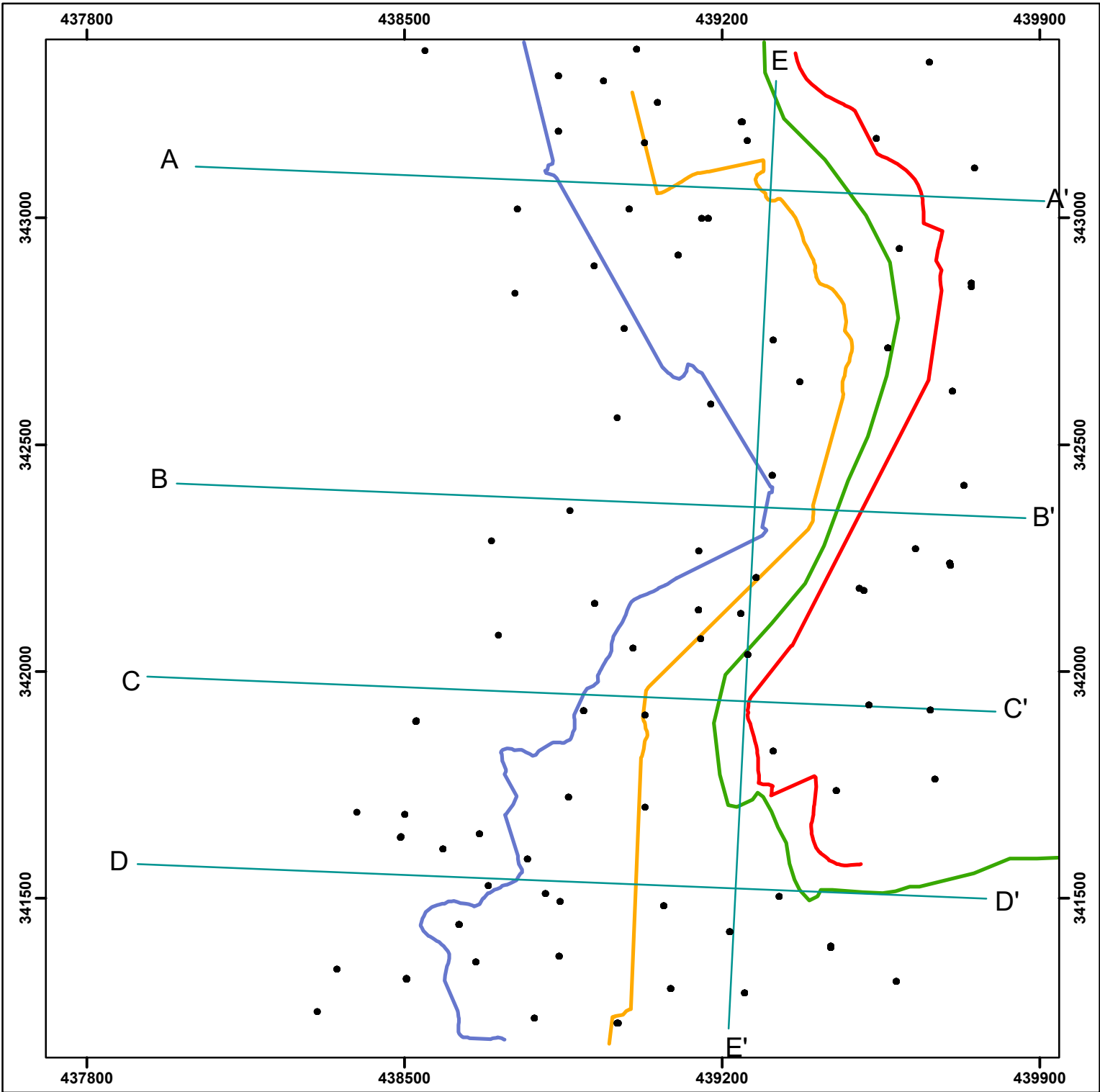


Skala 1 : 11.5000

Oleh :
 ELISA
 D061181006

Keterangan :











PETA CROPLINE

PT. Mitrabara Adiperdana Tbk, Kecamatan Malinau Selatan, Kalimantan Utara

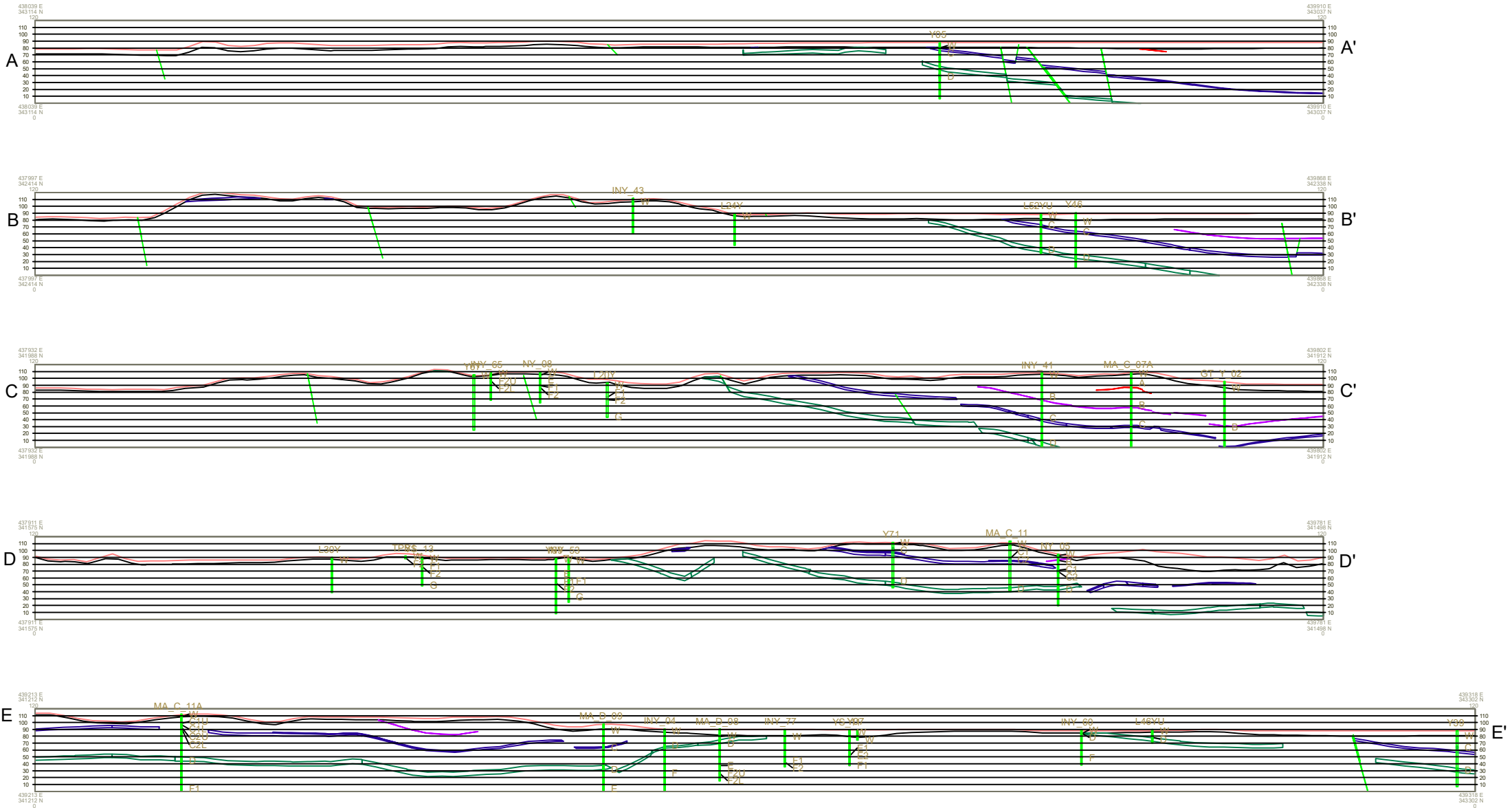


Skala 1 : 15000

Oleh :
 ELISA
 D061181006

-  Titik bor
-  Cropline seam A
-  Cropline seam B
-  Cropline seam C
-  Cropline seam D
-  Garis sayatan

LAMPIRAN 8 PENAMPANG 2 DIMENSI



LAMPIRAN 9

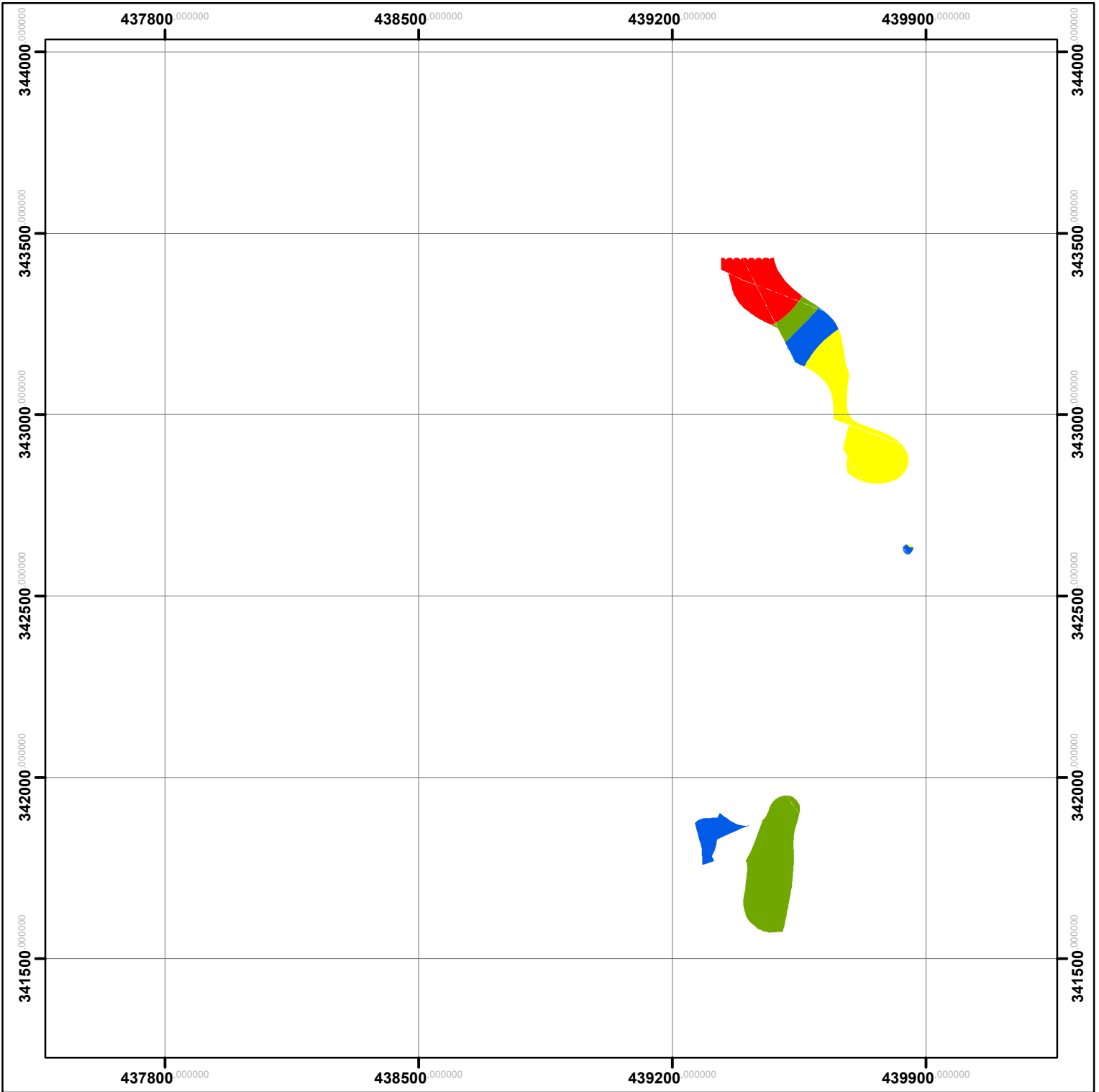
| No | Hole Name | Seam | From | To | Thick | Proximate Plus | | | | | | | | | | | |
|----|-----------|------|-------|--------|-------|----------------|---------|---------|---------|---------|---------|---------|---------|---------|------|------|-------|
| | | | | | | TM | IM | Ash | VM | FC | TS | CV GAR | CV adb | CV daf | RD | ID | HGI |
| | | | | | | gar (%) | adb (%) | adb (%) | adb (%) | adb (%) | adb (%) | cal/g | cal/g | cal/g | g/mL | g/mL | |
| 1 | Y40 | C | 53,26 | 55,51 | 2,25 | 18,49 | 13,32 | 2,25 | 42,63 | 41,80 | 0,12 | 5820,00 | 6189,00 | 7330,33 | - | - | - |
| 2 | INY_11 | C | 52,32 | 55,15 | 2,83 | 19,30 | 13,30 | 3,20 | 40,90 | 42,60 | 0,08 | 5713,00 | 6138,00 | 7351,00 | 1,33 | 1,30 | 40,00 |
| 3 | Y04 | A | 19,32 | 19,44 | 0,12 | 19,41 | 15,95 | 2,60 | 39,85 | 41,60 | 0,07 | 5497,00 | 5733,00 | 7038,67 | - | - | - |
| 4 | Y04 | C | 57,60 | 59,85 | 2,25 | 18,17 | 13,20 | 4,32 | 39,90 | 42,58 | 0,07 | 5613,00 | 5954,00 | 7218,72 | - | - | - |
| 5 | MA_C_10 | A | 21,00 | 22,12 | 1,12 | 22,71 | 15,40 | 5,14 | 40,45 | 39,01 | 0,11 | 5114,64 | 5597,95 | 7044,38 | 1,32 | 1,28 | - |
| 6 | MA_C_10 | C | 83,12 | 85,57 | 2,45 | 20,10 | 13,64 | 2,90 | 41,12 | 42,34 | 0,07 | 5528,24 | 5975,31 | 7159,84 | 1,27 | 1,24 | - |
| 7 | MA_C_09 | B | 19,85 | 20,32 | 0,47 | 21,90 | 16,10 | 3,70 | 39,90 | 40,30 | 0,14 | 5335,00 | 5731,00 | 7146,00 | 1,34 | 1,31 | 37,00 |
| 8 | GT_Y_02 | B | 66,64 | 67,28 | 0,64 | 17,94 | 12,58 | 18,89 | 34,30 | 34,23 | 0,15 | 4629,84 | 4930,19 | 7195,53 | 1,40 | 1,36 | - |
| 9 | MA_C_07A | A | 15,28 | 15,40 | 0,12 | 21,20 | 16,30 | 7,80 | 37,50 | 38,40 | 0,13 | 5120,00 | 5438,00 | 7165,00 | 1,36 | 1,33 | 38,00 |
| 10 | MA_C_07A | B | 46,96 | 47,68 | 0,72 | 22,70 | 16,00 | 3,70 | 39,60 | 40,70 | 0,12 | 5318,00 | 5779,00 | 7197,00 | 1,33 | 1,30 | 40,00 |
| 11 | MA_C_07A | C | 75,70 | 76,75 | 1,05 | 21,80 | 15,10 | 2,40 | 40,40 | 42,10 | 0,09 | 5511,00 | 5983,00 | 7252,00 | 1,32 | 1,29 | 38,00 |
| 12 | INY_10 | B | 59,65 | 60,16 | 0,51 | 18,90 | 12,30 | 12,60 | 37,20 | 37,90 | 0,21 | 4964,00 | 5368,00 | 7148,00 | 1,36 | 1,32 | 40,00 |
| 13 | MA_C_06 | B | 23,56 | 23,96 | 0,40 | 20,68 | 15,20 | 5,40 | 38,90 | 40,50 | 0,20 | 5334,00 | 5703,00 | 7183,00 | 1,33 | 1,30 | - |
| 14 | MA_C_06 | C | 50,72 | 53,79 | 3,07 | 18,43 | 14,80 | 3,20 | 40,00 | 42,00 | 0,10 | 5737,00 | 5992,00 | 7307,00 | 1,30 | 1,28 | 40,00 |
| 16 | INY_10 | B | 59,65 | 60,16 | 0,51 | 18,90 | 12,30 | 12,60 | 37,20 | 37,90 | 0,21 | 4964,00 | 5368,00 | 7148,00 | 1,36 | 1,32 | 40,00 |
| 17 | INY_16A | C | 44,69 | 48,08 | 3,39 | 21,30 | 13,40 | 3,10 | 41,20 | 42,30 | 0,08 | 5404,00 | 5946,00 | 7121,00 | 1,29 | 1,26 | 45,00 |
| 18 | INY_16A | D | 83,02 | 89,90 | 6,88 | 21,52 | 12,90 | 3,30 | 41,60 | 42,20 | 0,08 | 5422,00 | 6017,00 | 7180,00 | 1,30 | 1,26 | 43,00 |
| 19 | INY_41 | C | 63,68 | 66,88 | 3,20 | 20,37 | 15,20 | 3,20 | 40,00 | 41,60 | 0,10 | 5507,00 | 5865,00 | 7188,00 | 1,30 | 1,28 | 40,00 |
| 20 | INY_41 | D | 97,47 | 104,52 | 7,05 | 20,60 | 15,10 | 2,10 | 41,70 | 41,10 | 0,11 | 5629,00 | 6019,00 | 7269,00 | 1,28 | 1,26 | 39,00 |
| 21 | Y39 | C | 22,72 | 25,85 | 3,13 | 19,17 | 14,32 | 3,38 | 41,15 | 41,15 | 0,13 | 5649,00 | 5988,00 | 7275,82 | - | - | - |
| 22 | Y39 | D | 54,31 | 59,03 | 4,72 | 17,36 | 12,20 | 2,00 | 41,90 | 43,90 | 0,06 | 5789,00 | 6150,00 | 7167,83 | - | - | - |
| 23 | Y05 | C | 13,67 | 16,44 | 2,77 | 19,16 | 15,76 | 3,38 | 39,67 | 41,19 | 0,08 | 5641,00 | 5878,00 | 7269,35 | - | - | - |
| 24 | Y05 | D | 45,47 | 51,16 | 5,69 | 18,74 | 13,36 | 3,08 | 41,02 | 42,54 | 0,08 | 5659,00 | 6034,00 | 7221,16 | - | - | - |
| 25 | L45YU | C | 26,44 | 29,29 | 2,85 | 20,27 | 12,19 | 2,24 | 41,12 | 44,45 | 0,19 | 5627,00 | 6197,00 | 7242,02 | 1,33 | 1,29 | 47,00 |

| | | | | | | | | | | | | | | | | | |
|----|---------|---|-------|-------|------|-------|-------|------|-------|-------|------|---------|---------|---------|------|------|-------|
| 26 | L45YU | D | 57,21 | 63,24 | 6,03 | 19,79 | 13,12 | 4,48 | 40,46 | 41,94 | 0,12 | 5519,00 | 5978,00 | 7254,85 | 1,34 | 1,31 | 44,00 |
| 27 | Y46 | C | 26,13 | 29,31 | 3,18 | 20,70 | 16,18 | 3,46 | 40,53 | 39,83 | 0,10 | 5485,00 | 5798,00 | 7215,03 | 1,34 | 1,32 | 39,00 |
| 28 | Y46 | D | 61,93 | 67,25 | 5,32 | 19,91 | 15,32 | 4,52 | 40,04 | 40,12 | 0,10 | 5418,00 | 5729,00 | 7146,96 | 1,36 | 1,33 | 40,00 |
| 29 | Y71 | C | 7,54 | 13,60 | 6,06 | 22,40 | 16,50 | 2,10 | 42,00 | 39,40 | 0,20 | 5368,00 | 5776,00 | 7095,82 | - | - | 47,00 |
| 30 | Y71 | D | 54,49 | 58,98 | 4,49 | 21,80 | 15,60 | 2,20 | 40,40 | 41,80 | 0,20 | 5352,00 | 5776,00 | 7026,76 | - | - | 47,00 |
| 31 | Y47 | C | 51,06 | 53,07 | 2,01 | 19,62 | 15,94 | 2,39 | 40,10 | 41,57 | 0,17 | 5661,00 | 5920,00 | 7248,68 | - | - | - |
| 32 | Y50 | A | 38,13 | 38,83 | 0,70 | 20,72 | 13,95 | 5,19 | 38,92 | 41,94 | 0,27 | 5283,00 | 5734,00 | 7091,27 | 1,33 | 1,30 | 41,00 |
| 33 | Y50 | B | 63,40 | 67,00 | 3,60 | 20,55 | 12,51 | 8,10 | 39,84 | 39,55 | 0,10 | 5577,00 | 6141,00 | 7735,23 | 1,28 | 1,25 | 44,00 |
| 34 | INY_74 | C | 1,12 | 4,56 | 3,44 | 22,73 | 13,50 | 1,70 | 42,80 | 42,00 | 0,11 | 5358,00 | 5998,00 | 7073,00 | 1,26 | 1,23 | 42,00 |
| 35 | YS_10 | D | 8,23 | 12,85 | 4,62 | 18,96 | 11,63 | 3,00 | 41,58 | 43,79 | 0,12 | 5579,00 | 6084,21 | 7127,13 | 1,32 | 1,29 | - |
| 36 | Y42 | D | 19,49 | 25,24 | 5,75 | 18,37 | 13,36 | 2,73 | 41,55 | 42,36 | 0,08 | 5686,00 | 6035,00 | 7192,23 | - | - | - |
| 37 | L49YU | C | 16,39 | 19,80 | 3,41 | 20,73 | 12,24 | 2,03 | 42,40 | 43,33 | 0,14 | 5700,00 | 6310,00 | 7360,32 | 1,31 | 1,27 | 45,00 |
| 38 | L49YU | D | 46,40 | 52,20 | 5,80 | 19,22 | 12,91 | 1,70 | 41,10 | 44,29 | 0,12 | 5702,00 | 6148,00 | 7199,91 | - | - | - |
| 39 | Y46 | C | 26,13 | 29,31 | 3,18 | 20,70 | 16,18 | 3,46 | 40,53 | 39,83 | 0,10 | 5485,00 | 5798,00 | 7215,03 | 1,34 | 1,32 | 39,00 |
| 40 | Y46 | D | 61,93 | 67,25 | 5,32 | 19,91 | 15,32 | 4,52 | 40,04 | 40,12 | 0,10 | 5418,00 | 5729,00 | 7146,96 | 1,36 | 1,33 | 40,00 |
| 41 | Y44 | D | 24,12 | 25,80 | 1,68 | 19,80 | 15,84 | 2,20 | 40,00 | 41,96 | 0,07 | 5356,00 | 5620,00 | 6857,00 | - | - | - |
| 42 | Y72 | D | 67,21 | 73,90 | 6,69 | 21,10 | 15,80 | 2,10 | 40,70 | 41,40 | 0,16 | 5454,00 | 5820,00 | 7088,92 | - | - | 48,00 |
| 43 | Y74 | D | 35,41 | 41,12 | 5,71 | 20,89 | 14,30 | 2,42 | 40,64 | 42,64 | 0,10 | 5523,00 | 5983,00 | 7184,20 | 1,32 | 1,29 | 44,00 |
| 44 | Y75 | D | 37,32 | 43,00 | 5,68 | 16,88 | 11,73 | 2,26 | 42,79 | 43,22 | 0,16 | 5792,00 | 6151,00 | 7151,49 | 1,31 | 1,29 | 51,00 |
| 45 | Y56 | D | 26,16 | 32,13 | 5,97 | 20,95 | 16,22 | 2,64 | 39,50 | 41,64 | 0,11 | 5497,00 | 5826,00 | 7180,18 | 1,34 | 1,31 | 49,00 |
| 46 | NY_05 | D | 50,33 | 54,04 | 3,71 | 18,69 | 11,66 | 3,06 | 41,58 | 43,70 | 0,11 | 5651,00 | 6140,00 | 7199,81 | - | - | - |
| 47 | Y74 | D | 35,41 | 41,12 | 5,71 | 20,89 | 14,30 | 2,42 | 40,64 | 42,64 | 0,10 | 5523,00 | 5983,00 | 7184,20 | 1,32 | 1,29 | 44,00 |
| 48 | P.11 | D | 31,19 | 38,47 | 7,28 | 19,83 | 12,33 | 1,83 | 41,95 | 43,89 | 0,10 | 5616,15 | 6142,11 | 7155,22 | - | - | - |
| 49 | Y70 | D | 60,80 | 66,96 | 6,16 | 20,64 | 13,61 | 5,63 | 40,54 | 40,22 | 0,10 | 5531,00 | 6021,00 | 7455,42 | 1,34 | 1,30 | 45,00 |
| 50 | Y54 | D | 51,14 | 56,85 | 5,71 | 20,98 | 20,98 | 2,28 | 38,67 | 38,07 | 0,10 | 5839,00 | 5839,00 | 7608,81 | - | - | - |
| 51 | MA_D_06 | D | 51,68 | 57,18 | 5,50 | 17,41 | 11,40 | 4,00 | 41,60 | 43,00 | 0,08 | 5675,00 | 6088,00 | 7196,00 | 1,33 | 1,30 | 43,00 |
| 52 | ISY_31 | D | 2,40 | 9,17 | 6,77 | 22,60 | 13,40 | 6,70 | 40,70 | 39,20 | 0,09 | 5057,00 | 5657,00 | 7080,00 | 1,36 | 1,31 | 44,00 |
| 53 | INY_54 | D | 2,68 | 9,37 | 6,69 | 21,60 | 13,50 | 6,90 | 40,40 | 39,20 | 0,10 | 5012,00 | 5530,00 | 6947,00 | 1,37 | 1,32 | 39,00 |

| | | | | | | | | | | | | | | | | | |
|----|----------|---|-------|--------|------|-------|-------|------|-------|-------|------|---------|---------|---------|------|------|-------|
| 54 | INY_56A | D | 41,21 | 48,56 | 7,35 | 21,41 | 14,70 | 2,20 | 40,90 | 42,20 | 0,09 | 5436,00 | 5900,00 | 7100,00 | 1,27 | 1,24 | 46,00 |
| 55 | INY_14 | D | 94,04 | 100,44 | 6,40 | 20,60 | 13,30 | 2,80 | 41,00 | 42,90 | 0,09 | 5531,00 | 6039,00 | 7198,00 | 1,30 | 1,27 | 42,00 |
| 56 | INY_71 | D | 47,20 | 53,72 | 6,52 | 24,33 | 16,10 | 2,60 | 40,40 | 40,90 | 0,10 | 5339,00 | 5920,00 | 7282,00 | 1,27 | 1,24 | 42,00 |
| 57 | INY_74 | C | 1,12 | 4,56 | 3,44 | 22,73 | 13,50 | 1,70 | 42,80 | 42,00 | 0,11 | 5358,00 | 5998,00 | 7073,00 | 1,26 | 1,23 | 42,00 |
| 58 | INY_74R | D | 43,08 | 49,22 | 6,14 | 20,27 | 13,30 | 3,70 | 41,90 | 41,10 | 0,10 | 5435,00 | 5910,00 | 7120,00 | 1,30 | 1,27 | 43,00 |
| 59 | INY_70 | D | 0,50 | 5,96 | 5,46 | 23,04 | 15,30 | 1,30 | 40,60 | 42,80 | 0,10 | 5427,00 | 5973,00 | 7162,00 | 1,26 | 1,23 | 45,00 |
| 60 | YS_18 | D | 2,14 | 5,06 | 2,92 | 22,10 | 12,33 | 1,38 | 41,67 | 44,62 | 0,14 | 5474,00 | 6160,00 | 7138,72 | 1,32 | 1,27 | - |
| 61 | MA_D13 | D | 14,20 | 20,61 | 6,41 | 20,20 | 14,20 | 2,90 | 41,50 | 41,40 | 0,07 | 5508,00 | 5922,00 | 7144,00 | 1,29 | 1,26 | 44,00 |
| 62 | IL_22 | D | 17,02 | 24,12 | 7,10 | 16,80 | 11,40 | 7,20 | 40,30 | 41,10 | 0,09 | 5512,00 | 5870,00 | 7211,00 | 1,34 | 1,31 | 41,00 |
| 63 | MA_D_12 | C | 20,51 | 23,03 | 2,52 | 22,60 | 12,70 | 2,30 | 43,00 | 42,00 | 0,13 | 5440,00 | 6136,00 | 7219,00 | 1,29 | 1,25 | 44,00 |
| 64 | MA_C_10 | A | 21,00 | 22,12 | 1,12 | 22,71 | 15,40 | 5,14 | 40,45 | 39,01 | 0,11 | 5114,64 | 5597,95 | 7044,38 | 1,32 | 1,28 | - |
| 65 | MA_C_10 | C | 83,12 | 85,57 | 2,45 | 20,10 | 13,64 | 2,90 | 41,12 | 42,34 | 0,07 | 5528,24 | 5975,31 | 7159,84 | 1,27 | 1,24 | - |
| 66 | MA_D_08 | D | 17,85 | 19,35 | 1,50 | 18,60 | 12,30 | 2,20 | 42,60 | 42,90 | 0,12 | 5818,00 | 6268,00 | 7331,00 | 1,29 | 1,26 | 44,00 |
| 67 | INY_05 | D | 24,79 | 29,47 | 4,68 | 21,90 | 14,50 | 2,10 | 42,00 | 41,40 | 0,08 | 5497,00 | 6018,00 | 7216,00 | 1,29 | 1,26 | 43,00 |
| 68 | MA_C_11 | D | 66,28 | 72,44 | 6,16 | 20,64 | 15,08 | 3,87 | 39,49 | 41,56 | 0,06 | 5375,97 | 5753,14 | 7098,43 | 1,30 | 1,27 | - |
| 69 | GT_Y_01R | D | 96,80 | 100,30 | 3,50 | 18,67 | 13,99 | 3,65 | 40,47 | 41,90 | 0,08 | 5699,19 | 6027,35 | 7318,21 | 1,30 | 1,27 | 43,00 |
| 70 | MA_D_04 | D | 7,05 | 13,24 | 6,19 | 18,11 | 12,80 | 2,04 | 41,48 | 43,69 | 0,08 | 5745,08 | 6117,69 | 7182,87 | 1,26 | 1,24 | 48,00 |
| 71 | MA_C_12 | D | 61,34 | 66,88 | 5,54 | 19,36 | 15,07 | 2,12 | 40,27 | 42,54 | 0,07 | 5590,29 | 5885,03 | 7106,89 | 1,27 | 1,25 | 47,00 |
| 72 | INY_06 | C | 6,78 | 7,13 | 0,35 | 19,90 | 14,90 | 3,50 | 41,00 | 40,60 | 0,09 | 5504,00 | 5848,00 | 7167,00 | 1,33 | 1,30 | 36,00 |
| 73 | INY_06 | D | 43,27 | 49,70 | 6,43 | 23,70 | 13,80 | 1,20 | 42,80 | 42,20 | 0,08 | 5419,00 | 6122,00 | 7202,00 | 1,27 | 1,23 | 46,00 |
| 74 | INY_29 | D | 13,53 | 13,93 | 0,40 | 22,00 | 14,20 | 1,90 | 41,60 | 42,30 | 0,11 | 5493,00 | 6042,00 | 7201,00 | 1,29 | 1,26 | 43,00 |
| 75 | INY_21 | D | 28,31 | 34,64 | 6,33 | 14,90 | 12,50 | 6,20 | 40,90 | 40,40 | 0,09 | 5545,00 | 5701,00 | 7012,00 | 1,34 | 1,33 | 42,00 |
| 76 | INY_76 | C | 1,01 | 4,60 | 3,59 | 21,14 | 14,20 | 2,80 | 41,30 | 41,70 | 0,11 | 5418,00 | 5895,00 | 7102,00 | 1,30 | 1,27 | 43,00 |
| 77 | INY_59 | C | 30,79 | 33,61 | 2,82 | 17,51 | 13,20 | 3,90 | 41,80 | 41,10 | 0,10 | 5699,00 | 5997,00 | 7234,00 | 1,32 | 1,30 | 46,00 |
| 78 | INY_59R | D | 58,52 | 64,75 | 6,23 | 15,99 | 12,50 | 4,70 | 40,80 | 42,00 | 0,10 | 5709,00 | 5946,00 | 7181,00 | 1,33 | 1,31 | 42,00 |
| 79 | INY_81 | C | 38,68 | 41,14 | 2,46 | 22,70 | 15,60 | 1,80 | 40,30 | 42,30 | 0,11 | 5423,00 | 5921,00 | 7168,00 | 1,28 | 1,25 | 38,00 |
| 80 | INY_81 | D | 90,48 | 95,47 | 4,99 | 21,10 | 14,60 | 6,20 | 39,00 | 40,20 | 0,14 | 5275,00 | 5708,00 | 7207,00 | 1,30 | 1,27 | 46,00 |
| 81 | INY_59A | D | 83,57 | 89,30 | 5,73 | 18,30 | 11,70 | 2,00 | 42,90 | 43,40 | 0,12 | 5799,00 | 6270,00 | 7265,00 | 1,30 | 1,27 | 44,00 |

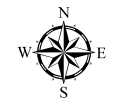
| | | | | | | | | | | | | | | | | | |
|-----|------------|---|--------|--------|------|-------|-------|-------|-------|-------|------|---------|---------|---------|------|------|-------|
| 82 | INY_59AR | C | 54,02 | 57,04 | 3,02 | 17,70 | 12,50 | 3,00 | 42,10 | 42,40 | 0,13 | 5780,00 | 6142,00 | 7269,00 | 1,32 | 1,30 | 42,00 |
| 83 | INY_47 | C | 78,41 | 81,20 | 2,79 | 21,10 | 13,20 | 3,40 | 41,00 | 42,40 | 0,11 | 5479,00 | 6025,00 | 7224,00 | 1,33 | 1,29 | 41,00 |
| 84 | INY_47 | D | 115,41 | 122,20 | 6,79 | 19,30 | 12,60 | 2,20 | 41,10 | 44,10 | 0,10 | 5650,00 | 6117,00 | 7180,00 | 1,31 | 1,28 | 43,00 |
| 85 | MA_C_06 | B | 23,56 | 23,96 | 0,40 | 20,68 | 15,20 | 5,40 | 38,90 | 40,50 | 0,20 | 5334,00 | 5703,00 | 7183,00 | 1,33 | 1,30 | - |
| 86 | MA_C_06 | C | 50,72 | 53,79 | 3,07 | 18,43 | 14,80 | 3,20 | 40,00 | 42,00 | 0,10 | 5737,00 | 5992,00 | 7307,00 | 1,30 | 1,28 | 40,00 |
| 87 | INY_46 | C | 39,90 | 43,16 | 3,26 | 21,18 | 15,20 | 3,00 | 41,10 | 40,70 | 0,13 | 5556,00 | 5978,00 | 7308,00 | 1,29 | 1,26 | 42,00 |
| 88 | INY_46 | D | 79,00 | 85,25 | 6,25 | 21,99 | 15,10 | 3,20 | 39,90 | 41,80 | 0,09 | 5430,00 | 5910,00 | 7234,00 | 1,30 | 1,27 | 42,00 |
| 89 | MA_C_07A | A | 15,28 | 15,40 | 0,12 | 21,20 | 16,30 | 7,80 | 37,50 | 38,40 | 0,13 | 5120,00 | 5438,00 | 7165,00 | 1,36 | 1,33 | 38,00 |
| 90 | MA_C_07A | B | 46,96 | 47,68 | 0,72 | 22,70 | 16,00 | 3,70 | 39,60 | 40,70 | 0,12 | 5318,00 | 5779,00 | 7197,00 | 1,33 | 1,30 | 40,00 |
| 91 | MA_C_07A | C | 75,70 | 76,75 | 1,05 | 21,80 | 15,10 | 2,40 | 40,40 | 42,10 | 0,09 | 5511,00 | 5983,00 | 7252,00 | 1,32 | 1,29 | 38,00 |
| 92 | MA_D_03 | D | 30,87 | 33,62 | 2,75 | 17,30 | 12,80 | 6,60 | 40,00 | 40,60 | 0,09 | 5590,00 | 5894,00 | 7313,00 | 1,35 | 1,33 | 40,00 |
| 93 | GT_Y_02 | B | 66,64 | 67,28 | 0,64 | 17,94 | 12,58 | 18,89 | 34,30 | 34,23 | 0,15 | 4629,84 | 4930,19 | 7195,53 | 1,40 | 1,36 | - |
| 94 | Y10 | A | 41,40 | 42,20 | 0,80 | 24,73 | 14,32 | 4,24 | 36,51 | 44,93 | 0,20 | 5113,00 | 5820,00 | 7146,37 | 1,33 | 1,28 | 46,00 |
| 95 | Y10 | C | 67,49 | 71,42 | 3,93 | 23,01 | 13,69 | 4,50 | 39,74 | 42,07 | 0,10 | 5398,00 | 6051,00 | 7396,41 | 1,34 | 1,29 | 45,00 |
| 96 | L17Y | C | 33,90 | 41,65 | 7,75 | - | 12,70 | 5,70 | 37,90 | 43,70 | 0,17 | - | 5647,00 | 6920,34 | - | - | 36,00 |
| 97 | INY_14 | B | 36,01 | 36,32 | 0,31 | 21,00 | 14,40 | 8,30 | 39,20 | 38,10 | 0,30 | 5225,00 | 5657,00 | 7318,00 | 1,39 | 1,35 | 42,00 |
| 98 | DD_PIT_07 | D | 57,45 | 63,05 | 5,60 | - | - | - | - | - | - | - | - | - | - | - | - |
| 99 | DD_PIT_01 | D | 33,02 | 40,40 | 7,38 | - | - | - | - | - | - | - | - | - | - | - | - |
| 100 | DD_PIT_01A | D | 38,65 | 45,95 | 7,30 | - | - | - | - | - | - | - | - | - | - | - | - |
| 101 | DD_PIT_03 | D | 35,20 | 42,57 | 7,37 | - | - | - | - | - | - | - | - | - | - | - | - |
| 102 | DD_PIT_04 | D | 35,50 | 43,35 | 7,85 | - | - | - | - | - | - | - | - | - | - | - | - |
| 103 | DD_PIT_05 | D | 32,95 | 39,77 | 6,82 | - | - | - | - | - | - | - | - | - | - | - | - |
| 104 | DD_PIT_06 | D | 36,30 | 43,18 | 6,88 | - | - | - | - | - | - | - | - | - | - | - | - |
| 105 | INY_28 | D | 5,84 | 7,04 | 1,20 | 17,70 | 11,80 | 9,20 | 40,30 | 38,70 | 0,32 | 5356,00 | 5740,00 | 7266,00 | 1,34 | 1,31 | 47,00 |
| 106 | INY_21 | D | 28,31 | 34,64 | 6,33 | 14,90 | 12,50 | 6,20 | 40,90 | 40,40 | 0,09 | 5545,00 | 5701,00 | 7012,00 | 1,34 | 1,33 | 42,00 |
| 107 | INY_56A | D | 41,21 | 48,56 | 7,35 | 21,41 | 14,70 | 2,20 | 40,90 | 42,20 | 0,09 | 5436,00 | 5900,00 | 7100,00 | 1,27 | 1,24 | 46,00 |
| 108 | INY_39 | D | 4,20 | 8,41 | 4,21 | 17,76 | 14,30 | 1,90 | 41,80 | 42,00 | 0,10 | 5760,00 | 6002,00 | 7162,00 | 1,28 | 1,27 | 42,00 |
| 109 | INY_48AR | D | 105,64 | 112,48 | 6,84 | 18,00 | 13,50 | 2,00 | 40,40 | 44,10 | 0,11 | 5832,00 | 6152,00 | 7280,00 | 1,28 | 1,26 | 42,00 |

| | | | | | | | | | | | | | | | | | |
|-----|---------|---|-------|-------|------|-------|-------|-------|-------|-------|------|---------|---------|---------|------|------|-------|
| 110 | INY_79 | D | 61,29 | 66,76 | 5,47 | 16,40 | 12,20 | 4,70 | 41,50 | 41,60 | 0,09 | 5748,00 | 6034,00 | 7261,00 | 1,30 | 1,28 | 47,00 |
| 111 | IL_32 | D | 16,00 | 22,80 | 6,80 | 17,68 | 13,70 | 4,80 | 40,70 | 40,80 | 0,10 | 5614,00 | 5885,00 | 7221,00 | 1,32 | 1,30 | 44,00 |
| 112 | INY_51 | D | 75,90 | 82,36 | 6,46 | 19,92 | 15,30 | 2,30 | 40,10 | 42,30 | 0,09 | 5622,00 | 5946,00 | 7216,00 | 1,28 | 1,26 | 38,00 |
| 113 | DHD_yrd | D | 0,00 | 4,80 | 4,80 | - | - | - | - | - | - | - | - | - | - | - | - |
| 114 | MA_C_04 | D | 66,08 | 71,62 | 5,54 | 18,70 | 12,30 | 3,50 | 42,20 | 42,00 | 0,11 | 5687,00 | 6135,00 | 7286,00 | 1,30 | 1,27 | 43,00 |
| 115 | MA_C_11 | D | 66,28 | 72,44 | 6,16 | 20,64 | 15,08 | 3,87 | 39,49 | 41,56 | 0,06 | 5375,97 | 5753,14 | 7098,43 | 1,30 | 1,27 | - |
| 116 | MA_D_10 | D | 16,28 | 22,22 | 5,94 | 22,70 | 12,80 | 2,10 | 42,90 | 42,20 | 0,10 | 5422,00 | 6116,00 | 7187,00 | 1,28 | 1,24 | 43,00 |
| 117 | GT_Y_02 | B | 66,64 | 67,28 | 0,64 | 17,94 | 12,58 | 18,89 | 34,30 | 34,23 | 0,15 | 4629,84 | 4930,19 | 7195,53 | 1,40 | 1,36 | - |
| 118 | MA_D_09 | D | 62,78 | 64,60 | 1,82 | 21,60 | 13,80 | 2,30 | 41,70 | 42,20 | 0,10 | 5546,00 | 6098,00 | 7268,00 | 1,29 | 1,26 | 43,00 |
| 119 | MA_D_11 | D | 43,64 | 46,56 | 2,92 | 23,20 | 12,50 | 1,70 | 42,80 | 43,00 | 0,11 | 5430,00 | 6187,00 | 7211,00 | 1,28 | 1,24 | 43,00 |



KEMENTERIAN PENDIDIKAN KEBUDAYAAN RISET DAN TEKNOLOGI
 UNIVERSITAS HASANUDDIN
 FAKULTAS TEKNIK
 DEPARTEMEN TEKNIK GEOLOGI

PETA ISOQUAL CV (Cal/g) SEAM A
 PT. Mitrabara Adiperdana Tbk, Kecamatan Malinau Selatan, Kalimantan Utara

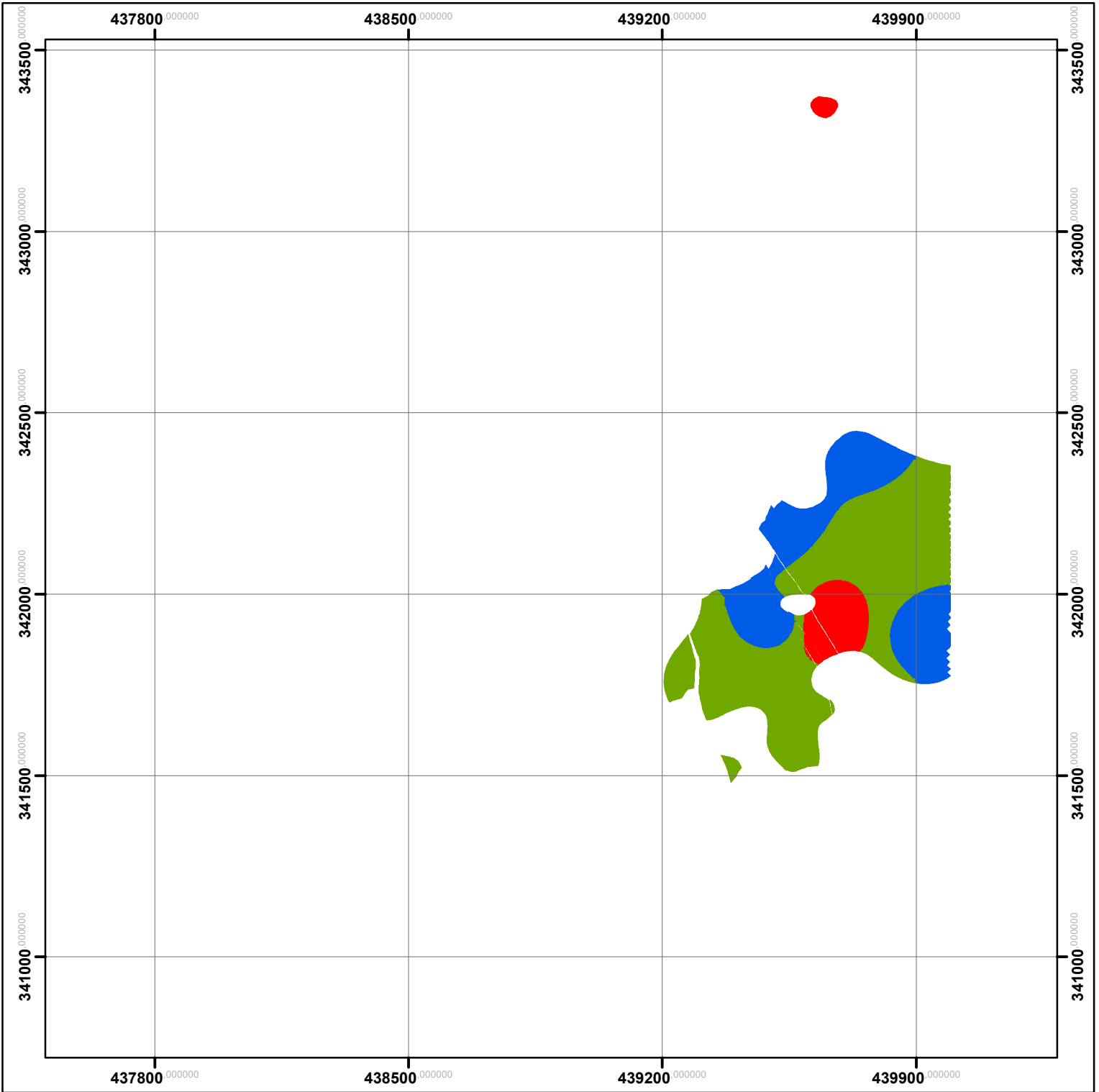


Skala 1 : 15000

Oleh :
 ELISA
 D061181006

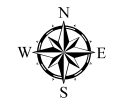
Keterangan

- 5400-5500
- 5200-5400
- 5000-5200
- 4500-5000



KEMENTERIAN PENDIDIKAN KEBUDAYAAN RISET DAN TEKNOLOGI
 UNIVERSITAS HASANUDDIN
 FAKULTAS TEKNIK
 DEPARTEMEN TEKNIK GEOLOGI

PETA ISOQUAL CV (Cal/g) SEAM B
 PT. Mitrabara Adiperdana Tbk, Kecamatan Malinau Selatan, Kalimantan Utara

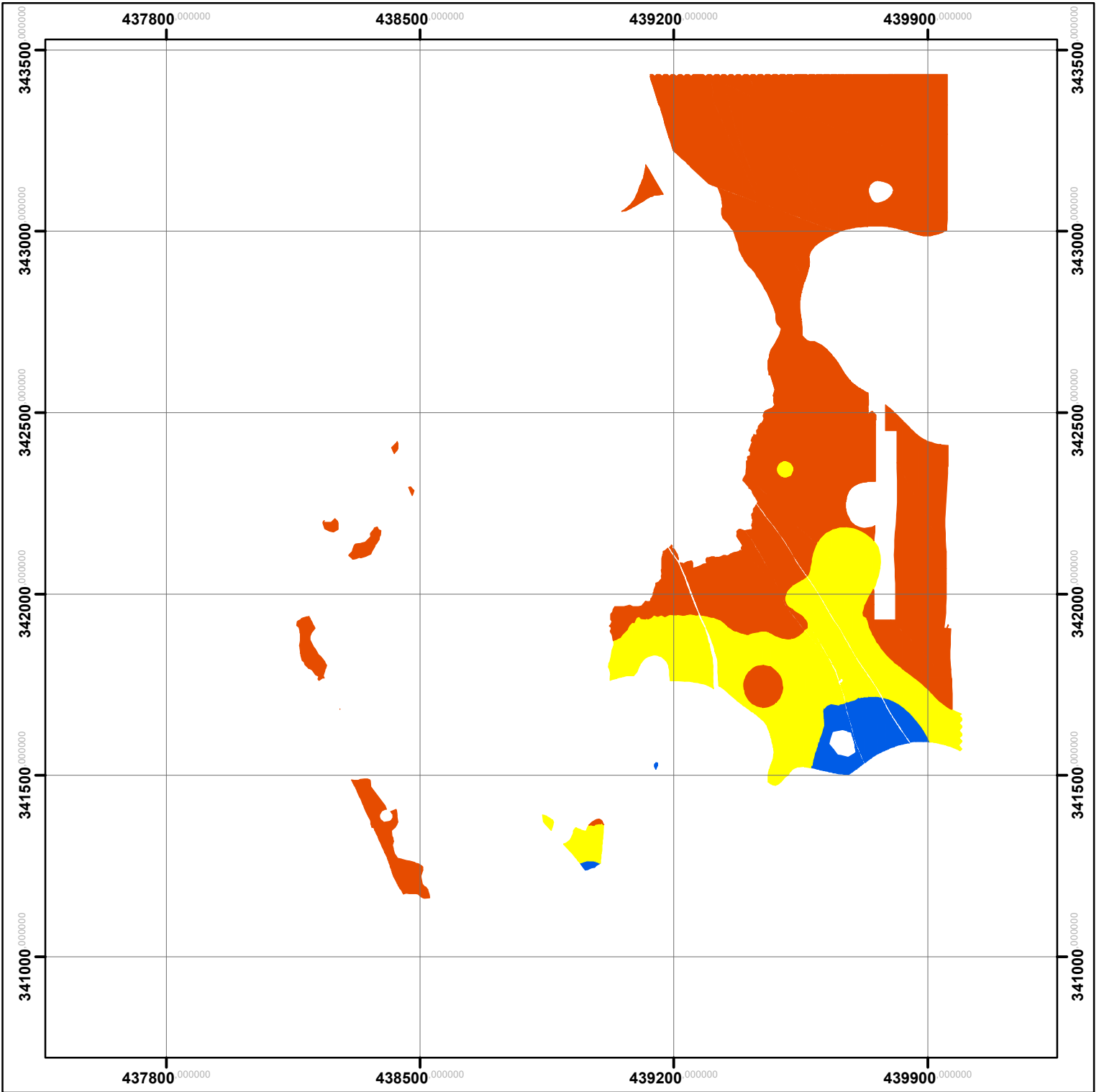


Skala 1 : 15000

Oleh :
 ELISA
 D061181006

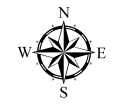
Keterangan

- 5200-5400
- 5000-5200
- 4500-5000



KEMENTERIAN PENDIDIKAN KEBUDAYAAN RISET DAN TEKNOLOGI
 UNIVERSITAS HASANUDDIN
 FAKULTAS TEKNIK
 DEPARTEMEN TEKNIK GEOLOGI

PETA ISOQUAL CV (Cal/g) SEAM C
 PT. Mitrabara Adiperdana Tbk, Kecamatan Malinau Selatan, Kalimantan Utara

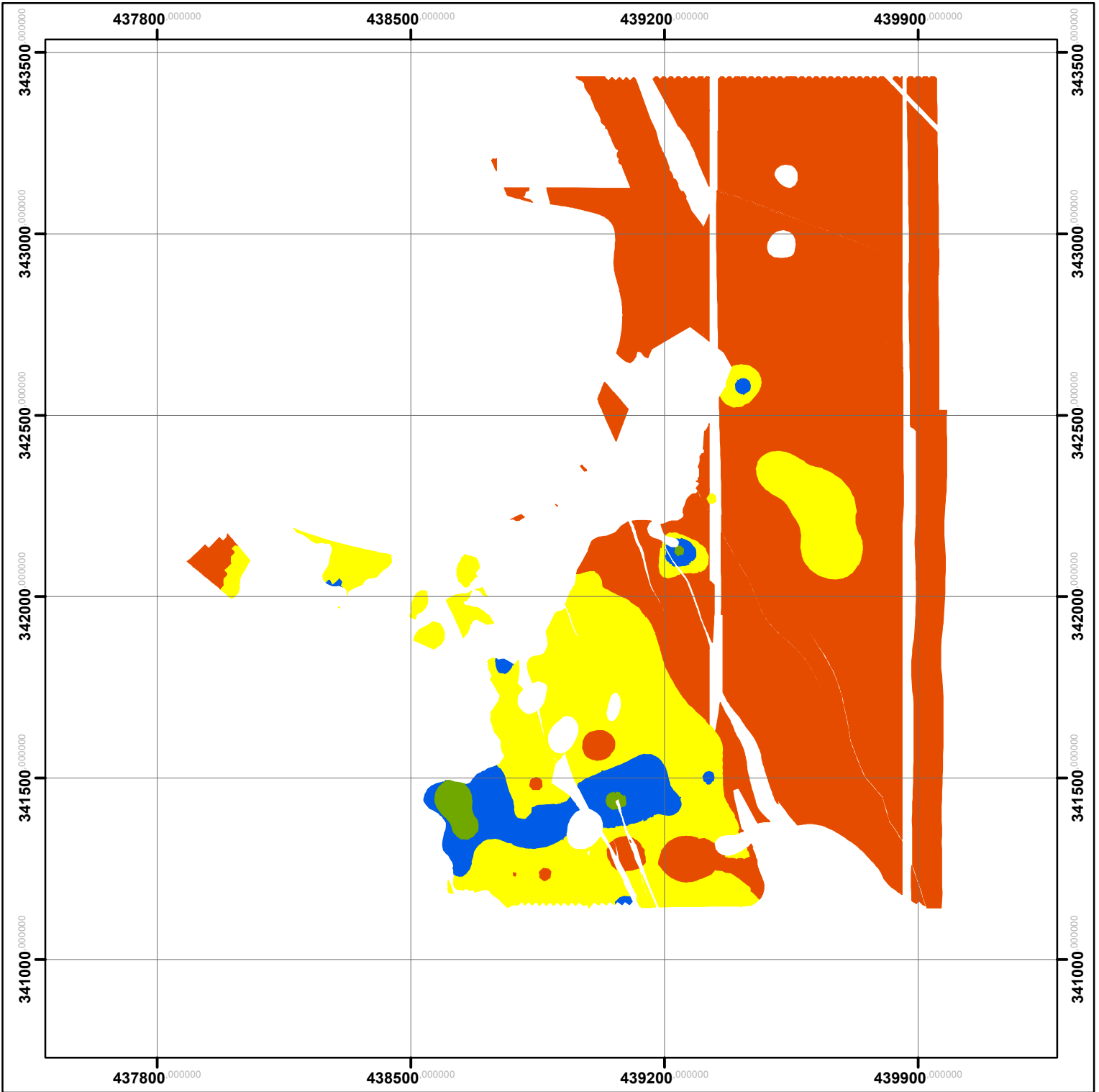


Skala 1 : 15000

Oleh :
 ELISA
 D061181006

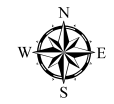
Keterangan

- >5500
- 5400-5500
- 5200-5400



KEMENTERIAN PENDIDIKAN KEBUDAYAAN RISET DAN TEKNOLOGI
 UNIVERSITAS HASANUDDIN
 FAKULTAS TEKNIK
 DEPARTEMEN TEKNIK GEOLOGI

PETA ISOQUAL CV (Cal/g) SEAM D
 PT. Mitrabara Adiperdana Tbk, Kecamatan Malinau Selatan, Kalimantan Utara

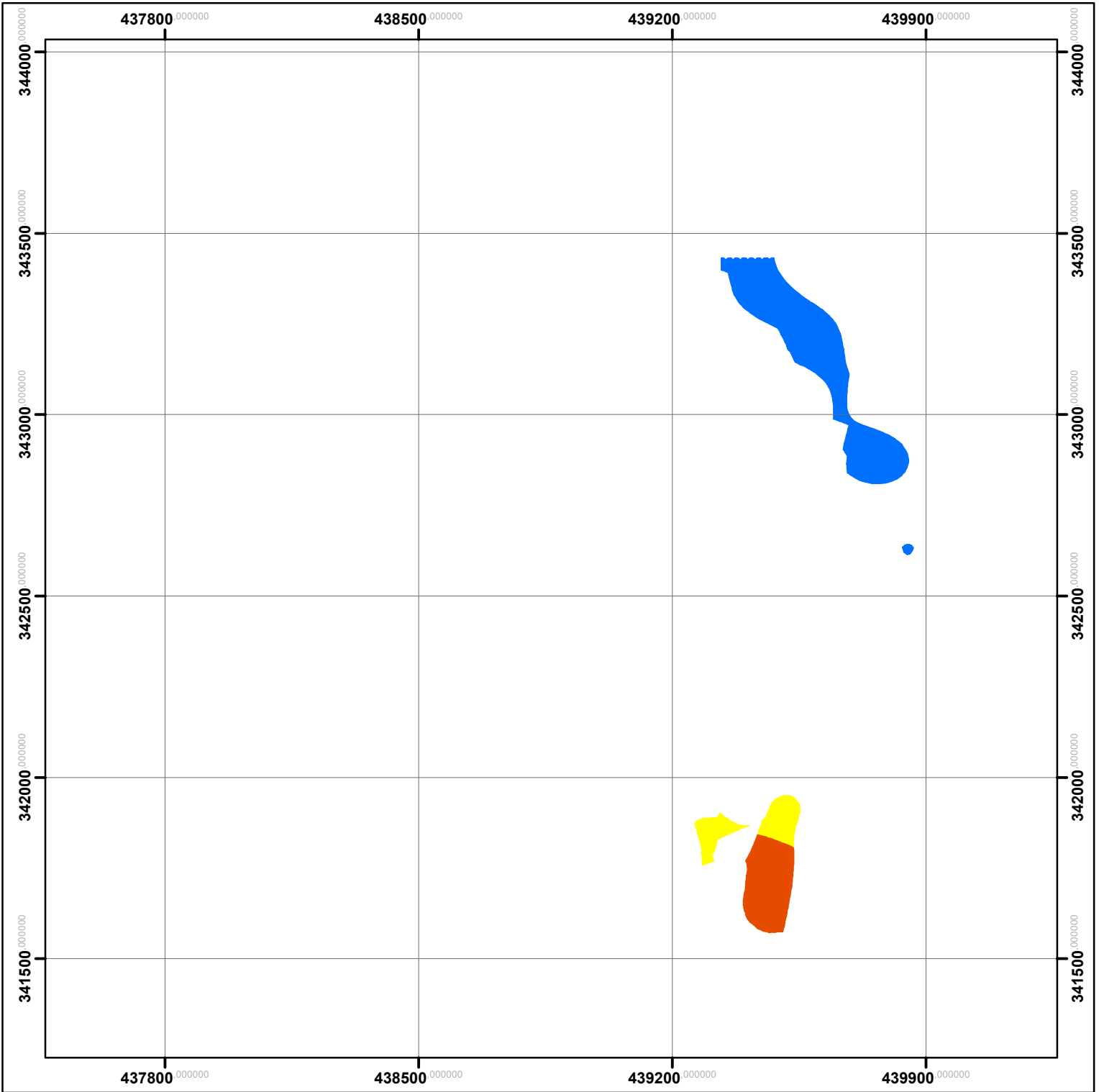


Skala 1 : 15000

Oleh :
 ELISA
 D061181006

Keterangan

- >5500
- 5400-5500
- 5200-5400
- 5000-5200



KEMENTERIAN PENDIDIKAN KEBUDAYAAN RISET DAN TEKNOLOGI
 UNIVERSITAS HASANUDDIN
 FAKULTAS TEKNIK
 DEPARTEMEN TEKNIK GEOLOGI

PETA ISOQUAL TM (%) SEAM A
 PT. Mitrabara Adiperdana Tbk, Kecamatan Malinau Selatan, Kalimantan Utara

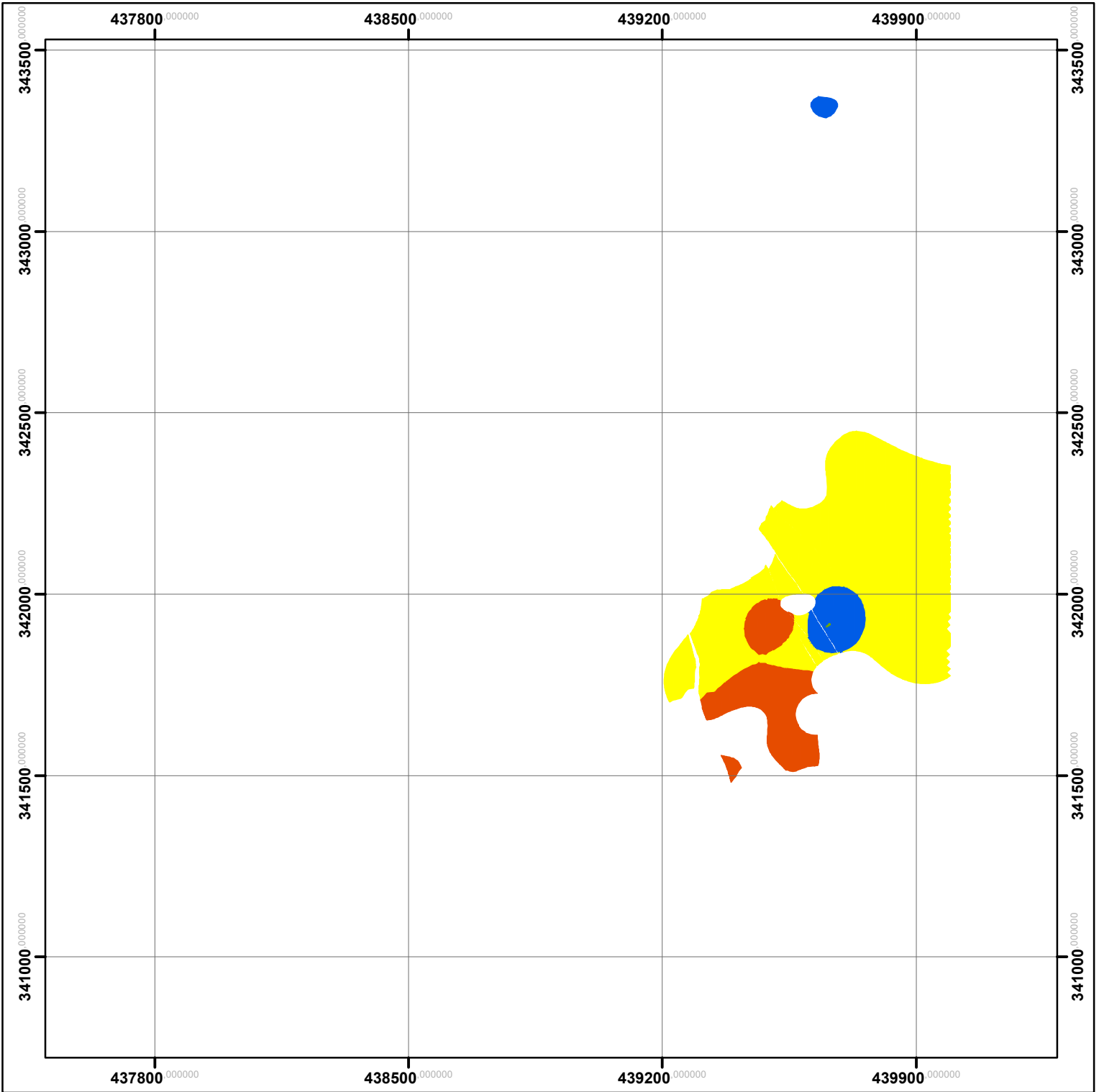


Skala 1 : 15000

Oleh :
 ELISA
 D061181006

Keterangan

- 22-24
- 20-22
- 18-20



KEMENTERIAN PENDIDIKAN KEBUDAYAAN RISET DAN TEKNOLOGI
 UNIVERSITAS HASANUDDIN
 FAKULTAS TEKNIK
 DEPARTEMEN TEKNIK GEOLOGI

PETA ISOQUAL TM (%) SEAM B
 PT. Mitrabara Adiperdana Tbk, Kecamatan Malinau Selatan, Kalimantan Utara

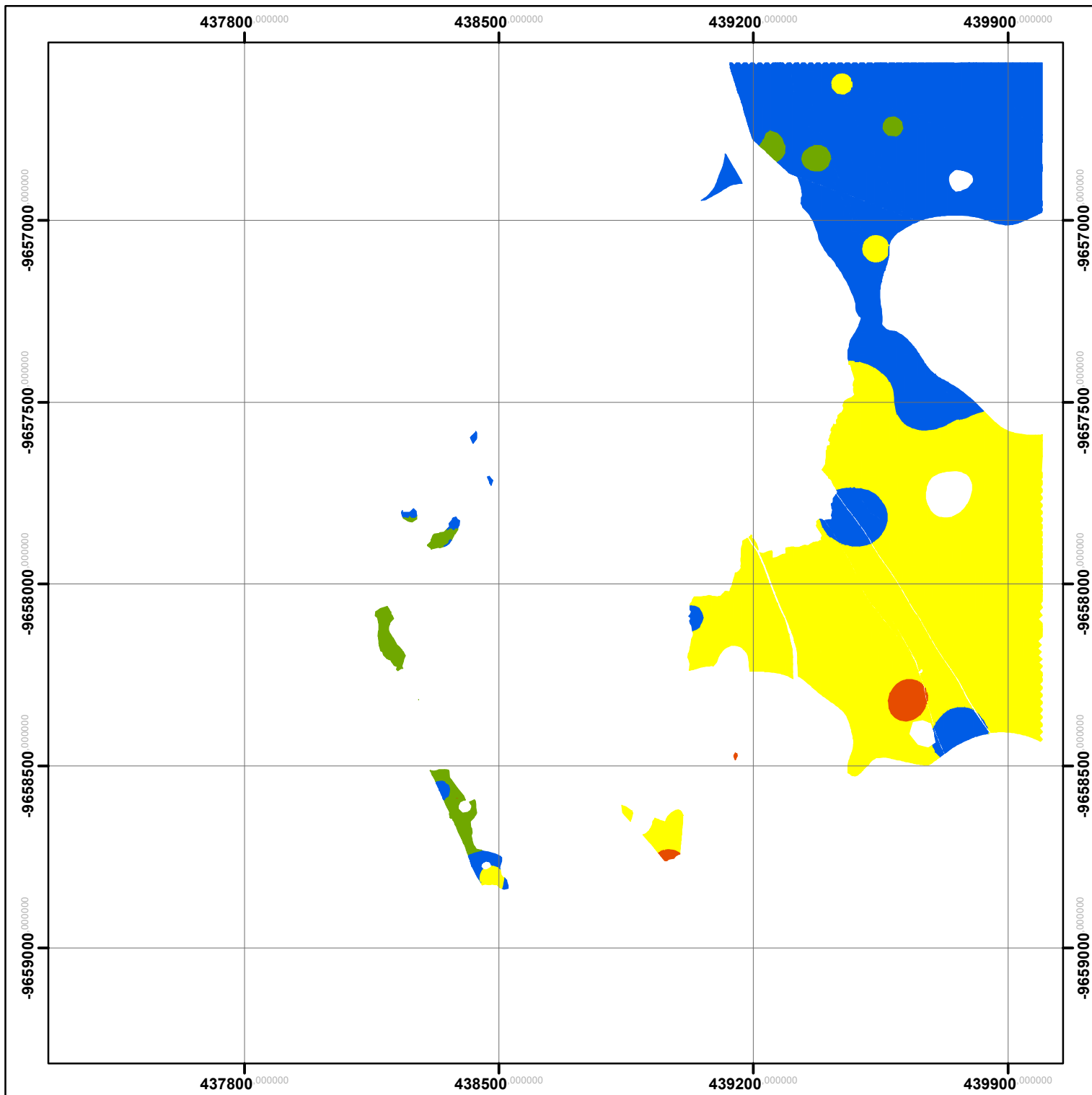


Skala 1 : 15000

Oleh :
 ELISA
 D061181006

Keterangan

- 16-18
- 18-20
- 20-22
- 22-24



KEMENTERIAN PENDIDIKAN KEBUDAYAAN RISET DAN TEKNOLOGI
 UNIVERSITAS HASANUDDIN
 FAKULTAS TEKNIK
 DEPARTEMEN TEKNIK GEOLOGI

PETA ISOQUAL TM (%) SEAM C

PT. Mitrabara Adiperdana Tbk, Kecamatan Malinau Selatan, Kalimantan Utara

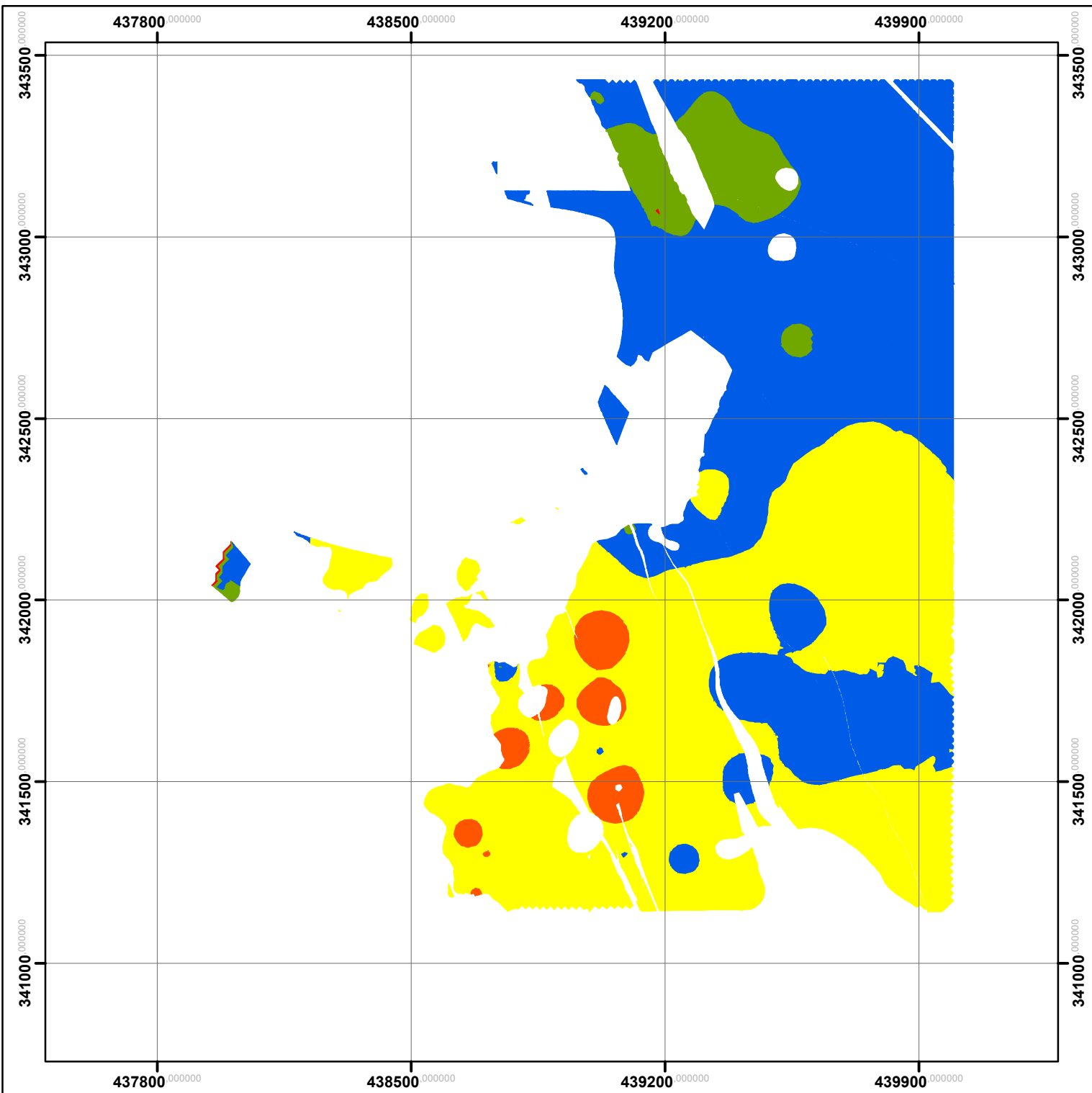


Skala 1 : 15000

Oleh :
 ELISA
 D061181006

Keterangan

- 22-24
- 20-22
- 18-20
- 16-18
- <16



PETA ISOQUAL TM (%) SEAM D

PT. Mitrabara Adiperdana Tbk, Kecamatan Malinau Selatan, Kalimantan Utara

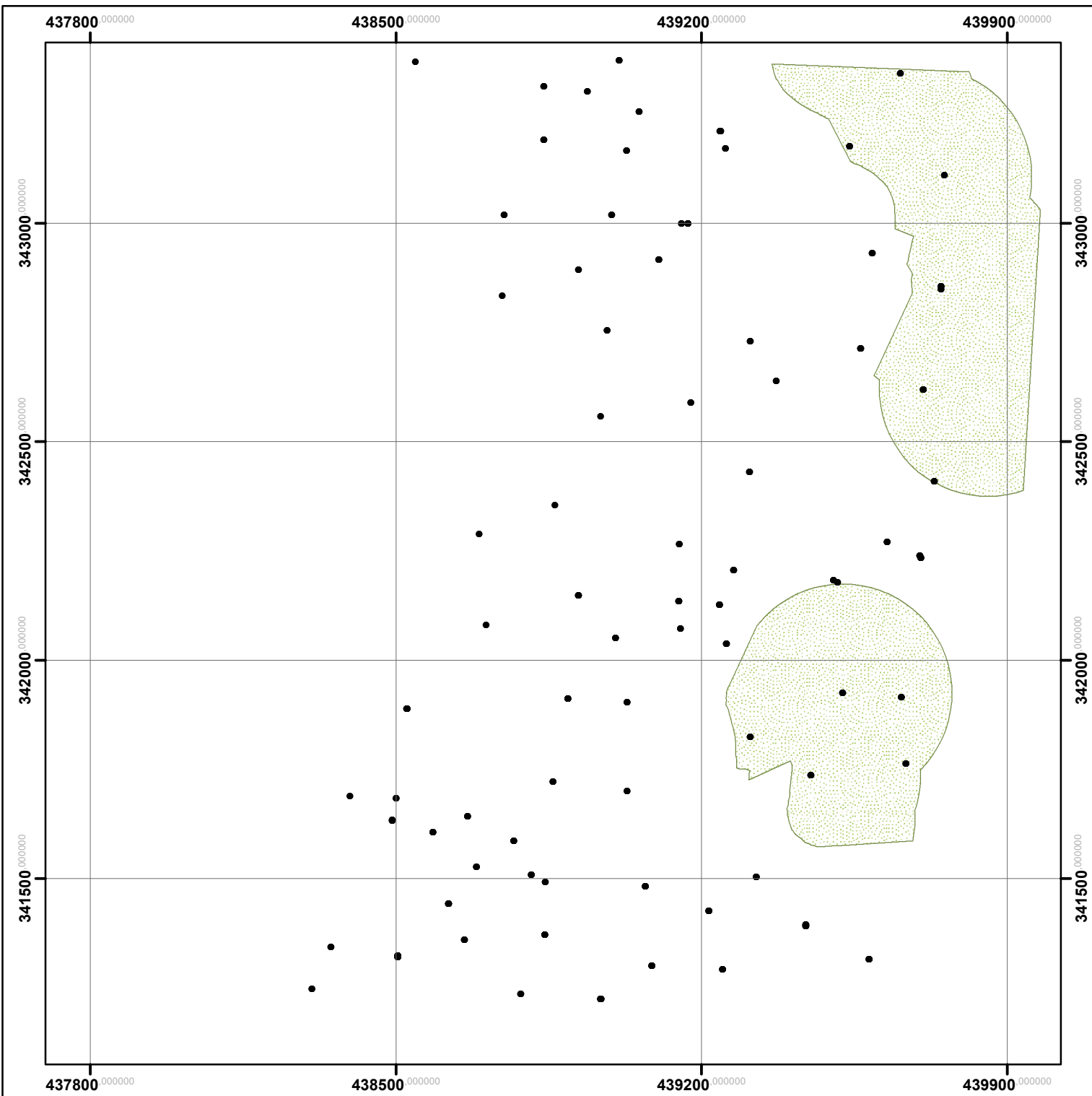


Skala 1 : 15000

Oleh :
 ELISA
 D061181006

Keterangan

- 22-24
- 20-22
- 18-20
- 16-18
- <16



KEMENTERIAN PENDIDIKAN KEBUDAYAAN RISET DAN TEKNOLOGI
 UNIVERSITAS HASANUDDIN
 FAKULTAS TEKNIK
 DEPARTEMEN TEKNIK GEOLOGI

PETA SUMBERDAYA SEAMA

PT. Mitrabara Adiperdana Tbk, Kecamatan Malinau Selatan, Kalimantan Utara

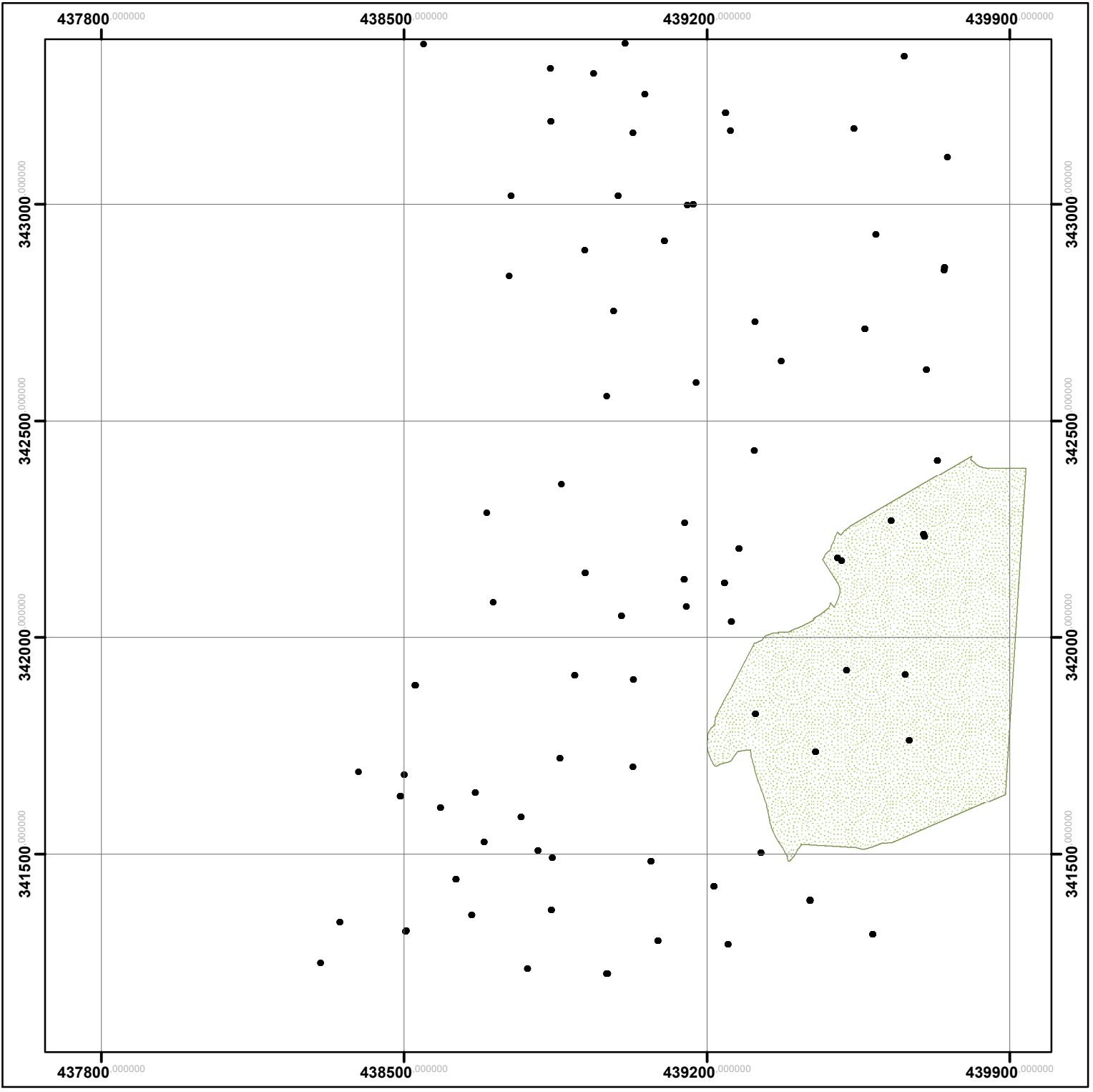


Skala 1 : 12500

Oleh :
 ELISA
 D061181006

Keterangan

-  Titik bor
-  Measured



KEMENTERIAN PENDIDIKAN KEBUDAYAAN RISET DAN TEKNOLOGI
 UNIVERSITAS HASANUDDIN
 FAKULTAS TEKNIK
 DEPARTEMEN TEKNIK GEOLOGI

PETA SUMBERDAYA SEAM B

PT. Mitrabara Adiperdana Tbk, Kecamatan Malinau Selatan, Kalimantan Utara

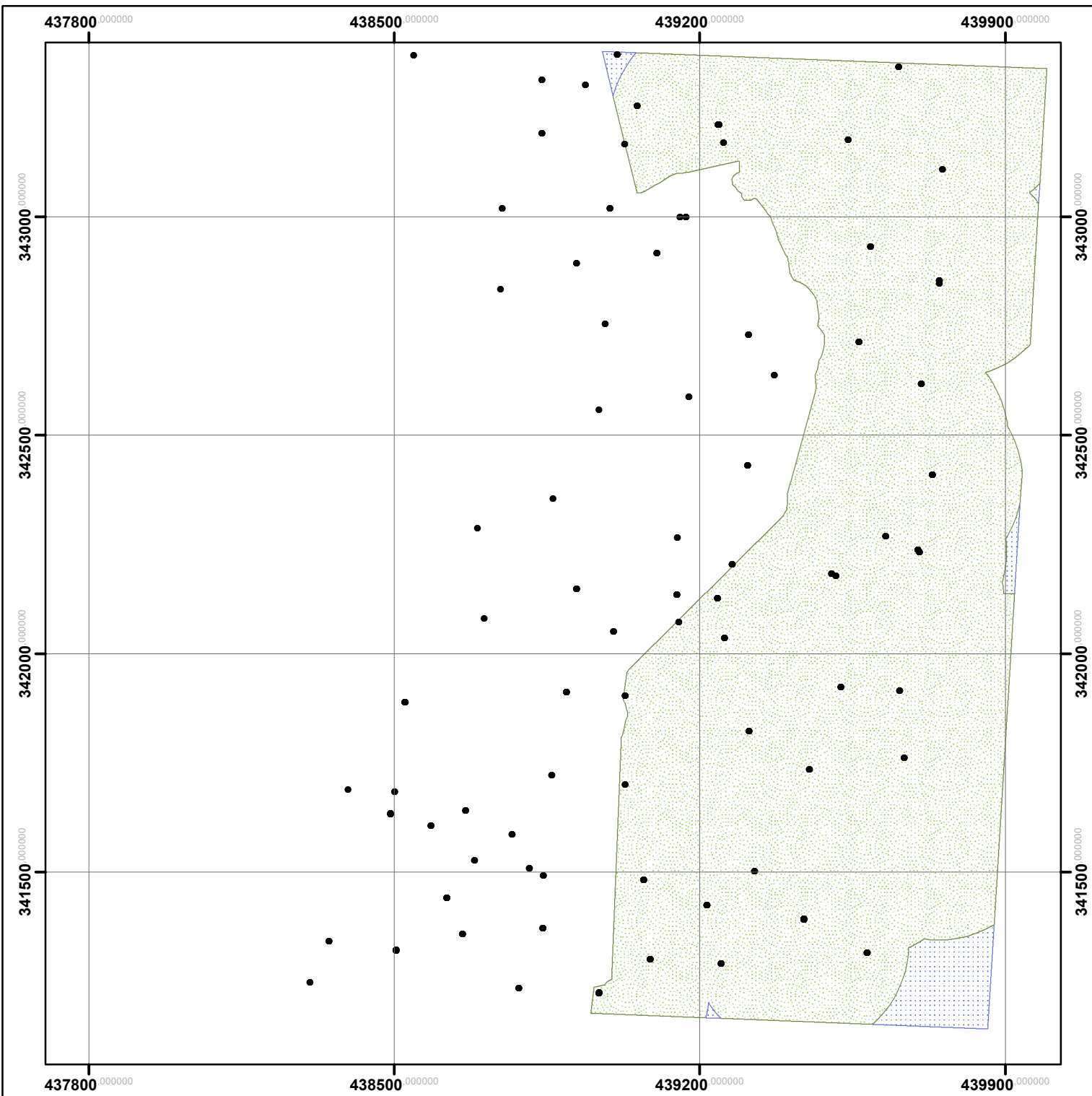


Skala 1 : 12500

Oleh :
 ELISA
 D061181006

Keterangan

- Titik bor
- Measured



KEMENTERIAN PENDIDIKAN KEBUDAYAAN RISET DAN TEKNOLOGI
 UNIVERSITAS HASANUDDIN
 FAKULTAS TEKNIK
 DEPARTEMEN TEKNIK GEOLOGI

PETA SUMBERDAYA SEAM C




PT. Mitrabara Adiperdana Tbk, Kecamatan Malinau Selatan, Kalimantan Utara

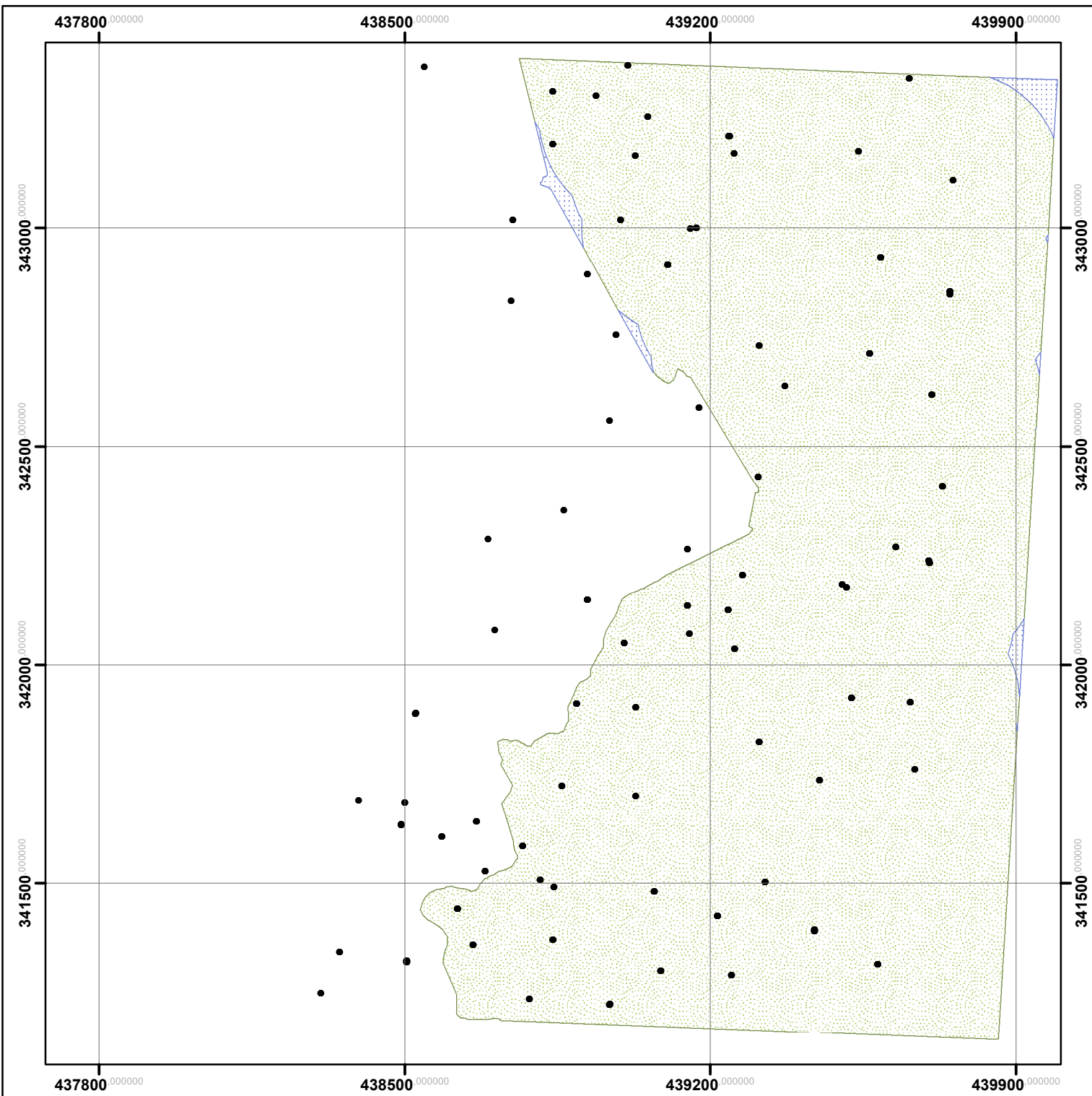


Skala 1 : 12500

Oleh :
 ELISA
 D061181006

Keterangan

-  Titik bor
-  Indicated
-  Measured



KEMENTERIAN PENDIDIKAN KEBUDAYAAN RISET DAN TEKNOLOGI
 UNIVERSITAS HASANUDDIN
 FAKULTAS TEKNIK
 DEPARTEMEN TEKNIK GEOLOGI

PETA SUMBERDAYA SEAM D




PT. Mitrabara Adiperdana Tbk, Kecamatan Malinau Selatan, Kalimantan Utara



Skala 1 : 12500

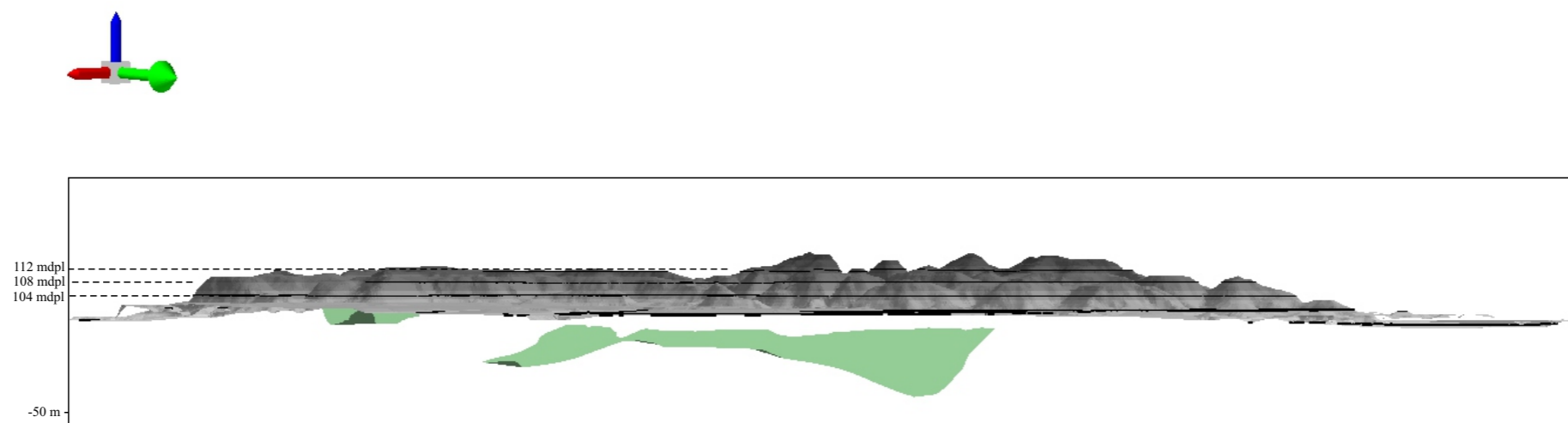
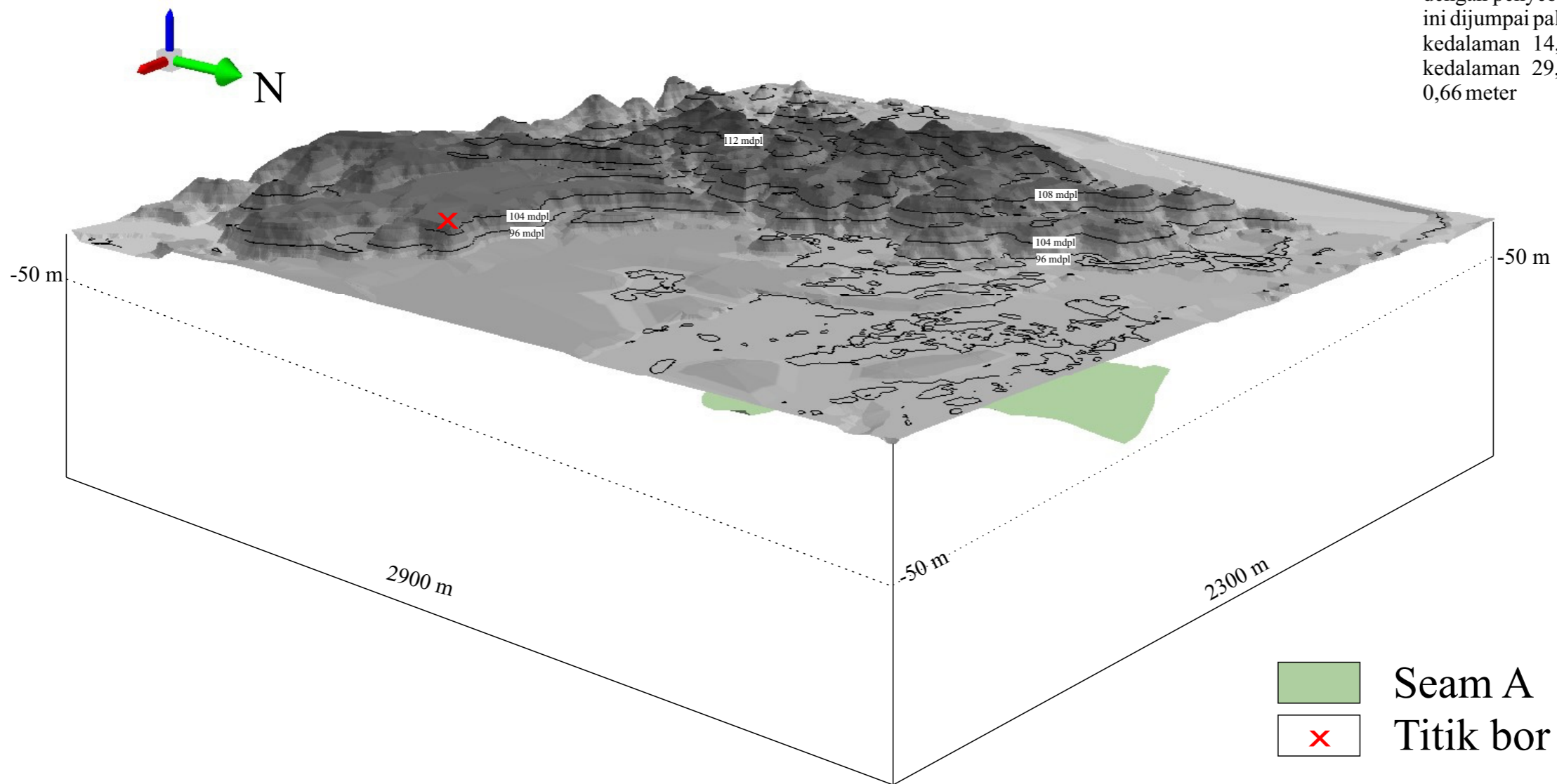
Oleh :
 ELISA
 D061181006

Keterangan

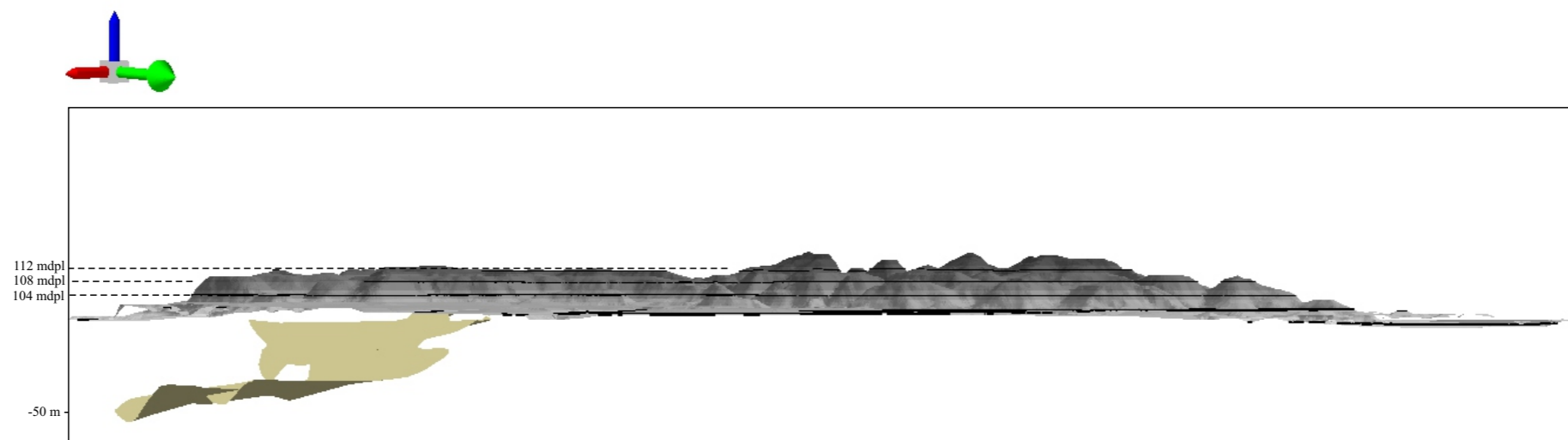
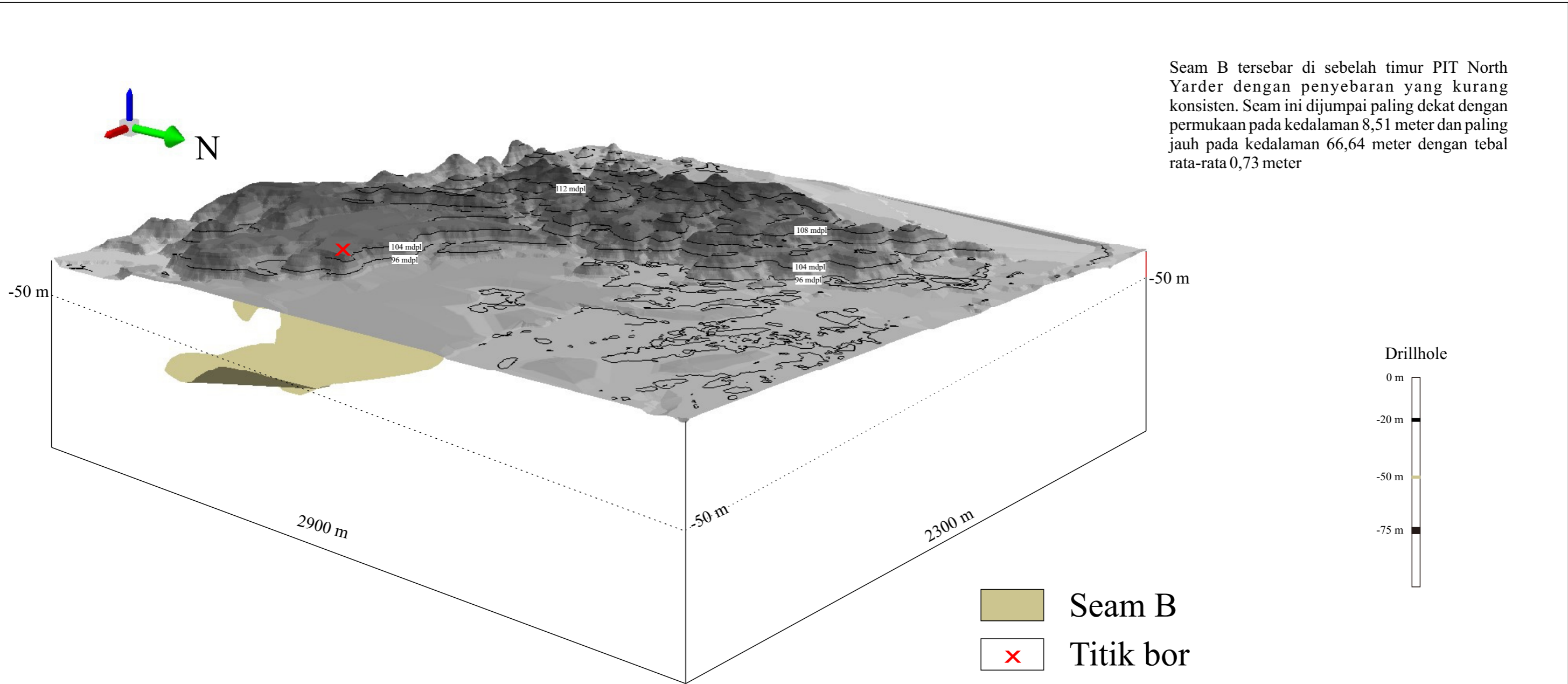
-  Titik bor
-  Indicated
-  Measured

PEMODELAN BATUBARA SEAM A PIT NORTH YARDER PT MITRABARA ADIPERDANA TBK KALIMANTAN UTARA

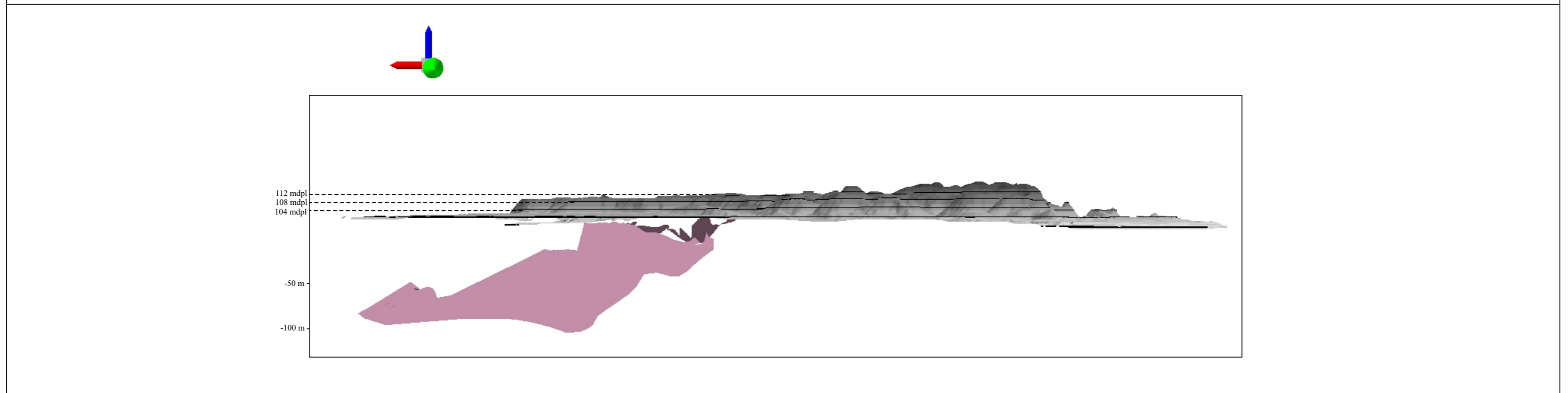
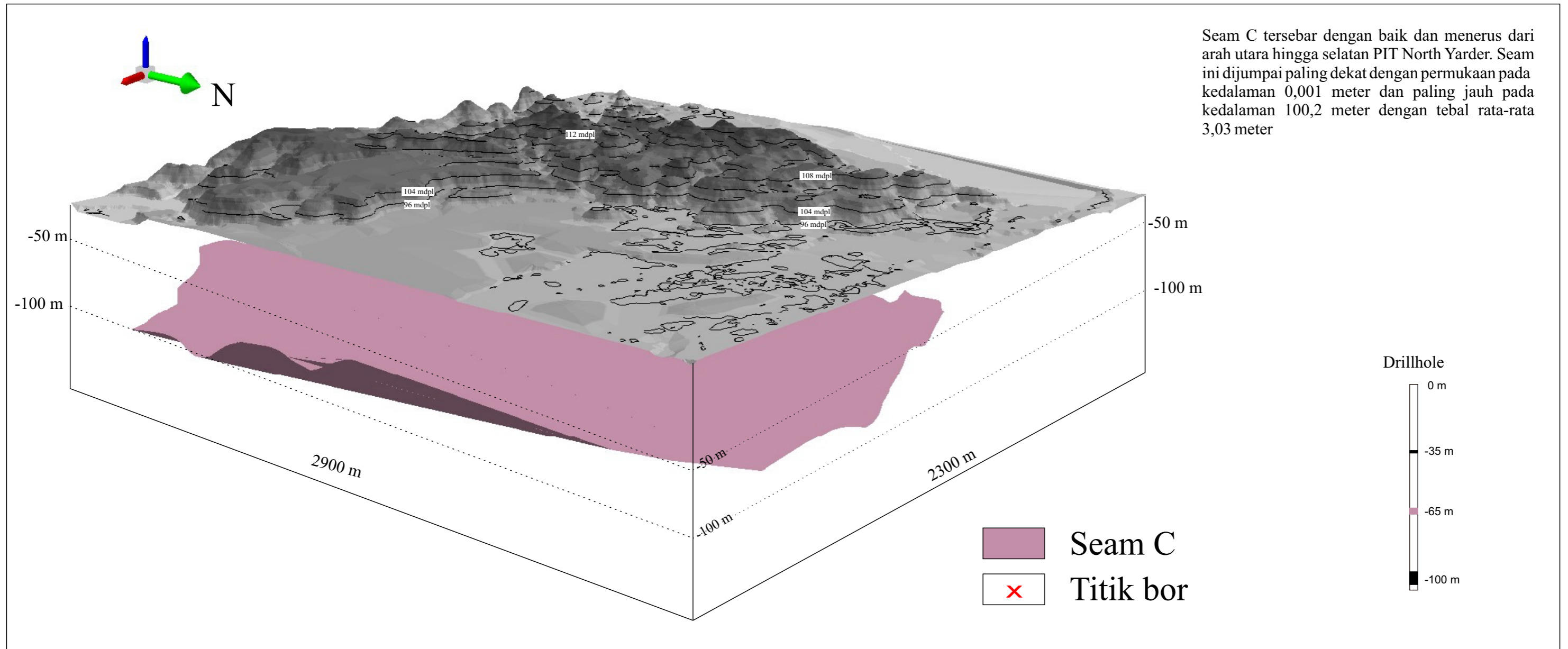
Seam A tersebar di sebelah timur PIT North Yarder dengan penyebaran yang kurang konsisten. Seam ini dijumpai paling dekat dengan permukaan pada kedalaman 14,04 meter dan paling jauh pada kedalaman 29,04 meter dengan tebal rata-rata 0,66 meter



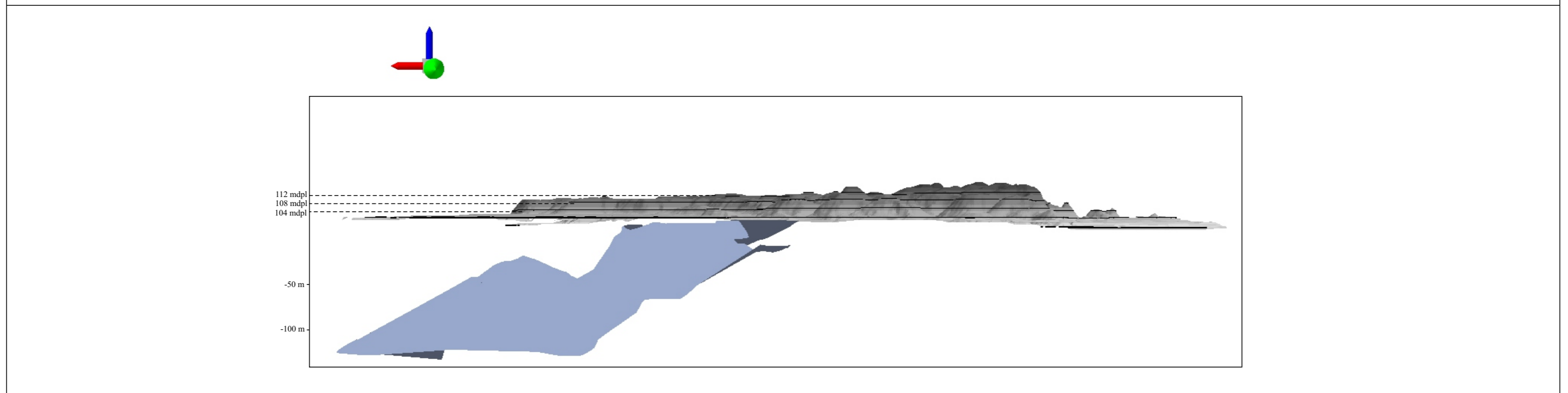
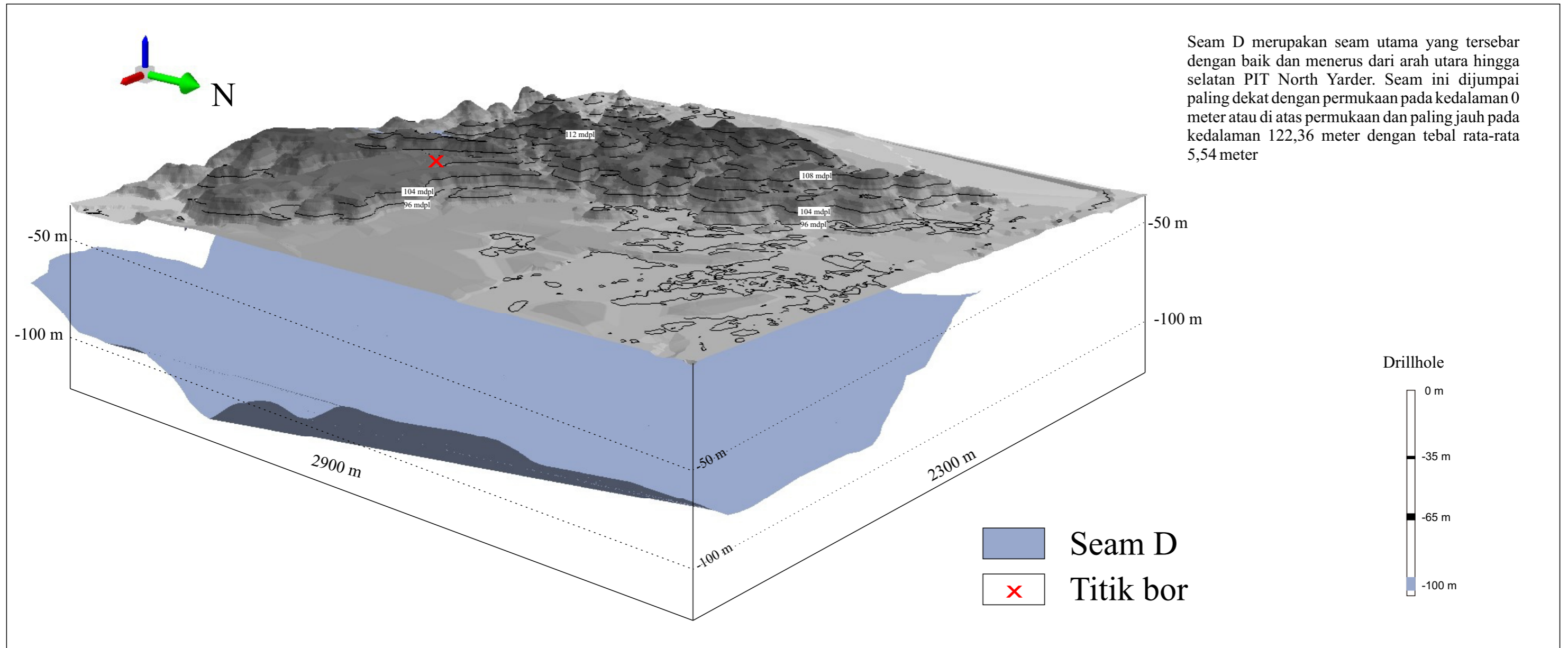
PEMODELAN BATUBARA SEAM B PIT NORTH YARDER PT MITRABARA ADIPERDANA TBK KALIMANTAN UTARA



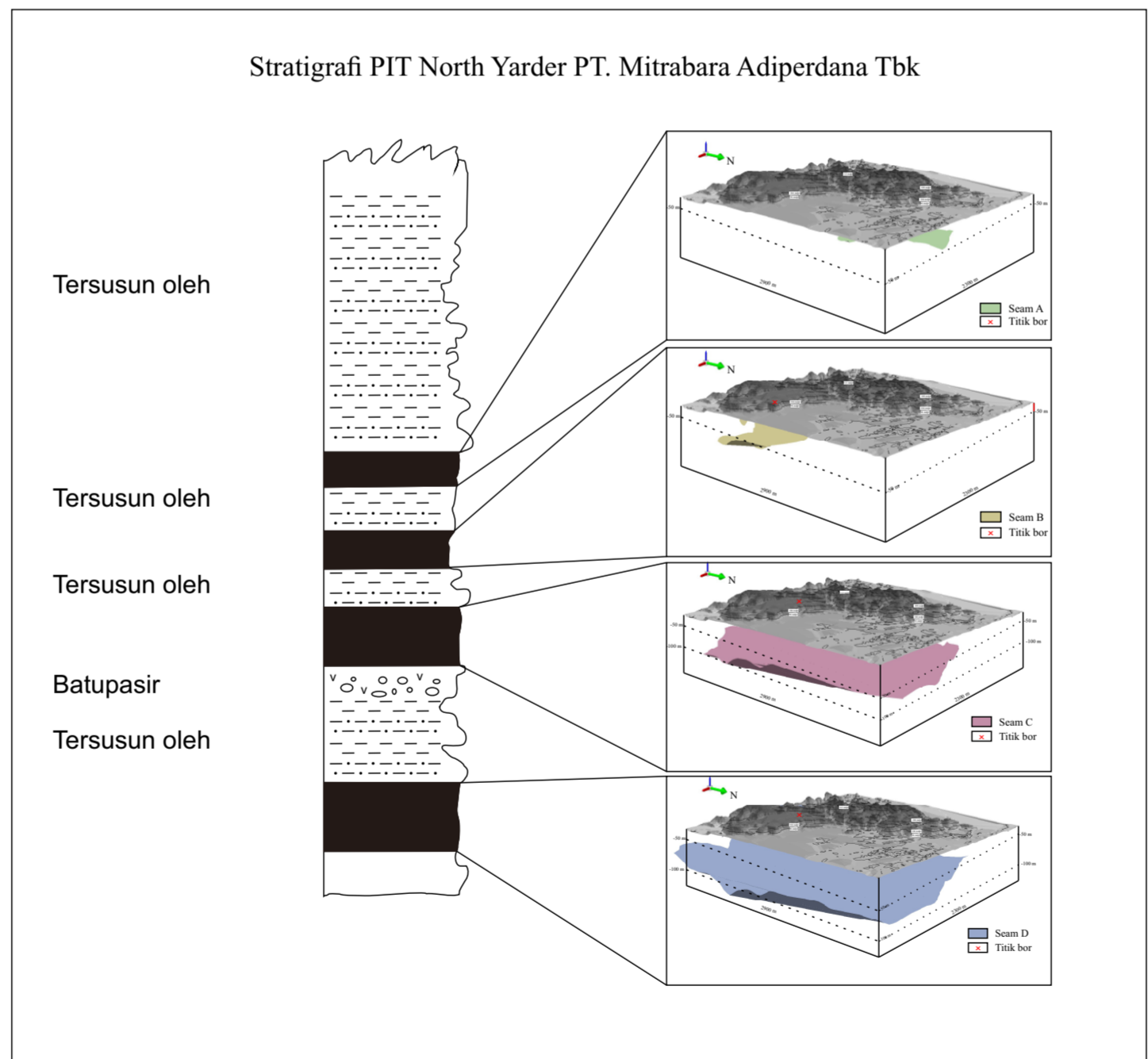
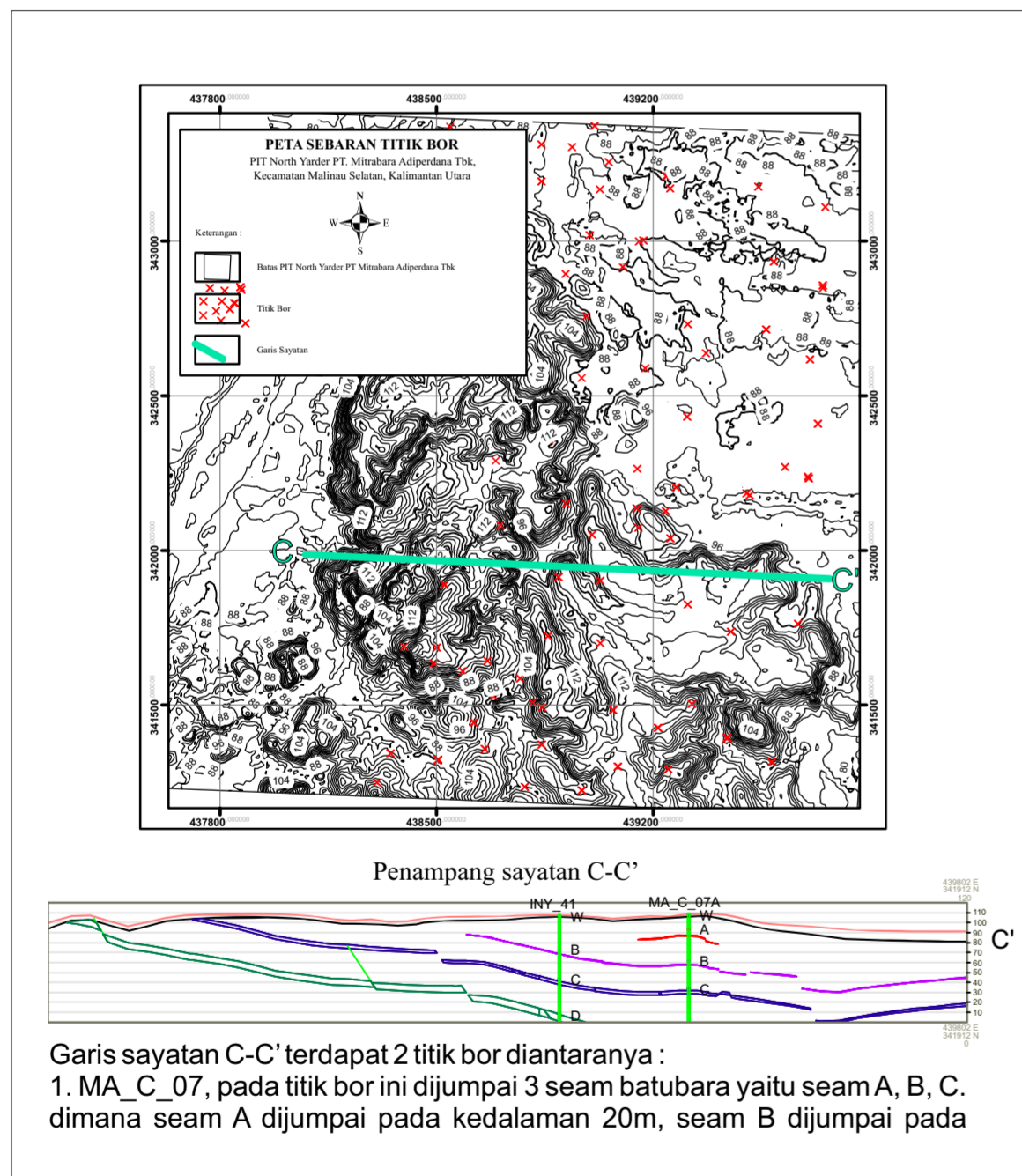
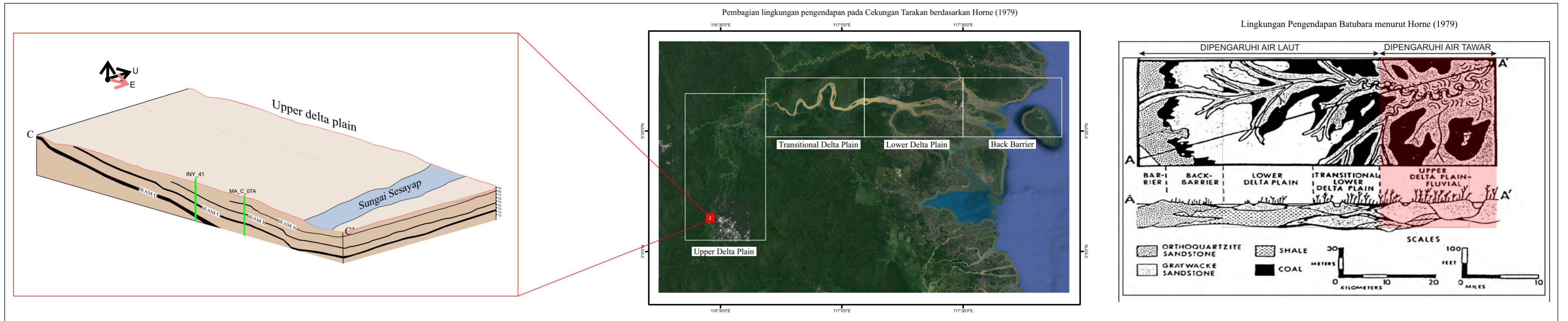
PEMODELAN BATUBARA SEAM C PIT NORTH YARDER PT MITRABARA ADIPERDANA TBK KALIMANTAN UTARA



PEMODELAN BATUBARA SEAM D PIT NORTH YARDER PT MITRABARA ADIPERDANA TBK KALIMANTAN UTARA



LINGKUNGAN PENGENDAPAN UPPER DELTA PLAIN PIT NORTH YARDER PT ADIPERDANA TBK KALIMANTAN UTARA



Penentuan kondisi lingkungan pengendapan batubara pada daerah penelitian ini didasarkan pada beberapa parameter yaitu kenampakan batubara, analisis kualitas batubara, dan ketebalan batubara. Interpretasi kondisi awal lingkungan pembentukan batubara ini dibandingkan dengan lingkungan pengendapan dari formasi dijumpainya batubara yaitu Formasi Langap di Cekungan Tarakan, sehingga dilakukan analisis urutan pengendapan dari bawah keatas.

Pengendapan batubara dimulai dari terjadinya regresi pada Cekungan Tarakan pada Kala Miosen sehingga terendapkan material sedimen dan membentuk batuan konglomerat dengan energi yang bekerja relatif sedang. Kemudian terjadi transportasi material endapan organik yang membawa material penyusun batubara ini hingga terendapkan di 5 sub cekungan yang berada di bagian Timur. Transportasi ini dipengaruhi oleh air tawar sehingga batubara mengandung sulfur yang rendah. Penurunan cekungan terus menerus terjadi hingga membentuk batubara yang semakin menebal dari seam F 0.7 meter, seam E 5.6 meter, dan seam D 7 meter. Proses pembentukan batubara ini diselingi dengan terendapkannya material pasir hingga lempung.

Proses pengendapan masih berlanjut sampai terjadinya transgresi atau naiknya permukaan air. Material yang tertransportasi dan terendapkan membentuk batuan yang berukuran lempung-

| SEAM | TEBAL | | KUALITAS | | ESTIMASI | | | LINGKUNGAN PENGENDAPAN |
|------|-------------|-------------|--------------------|------------------|----------------|-----------------|----------------|------------------------|
| | Minimum (m) | Maximal (m) | Total Moisture (%) | CV GAR (Kcal/kg) | Measured (ton) | Indicated (ton) | Inferred (ton) | |
| A | 0,12 | 1,35 | 21,8 | 5.184 | 33.712 | - | - | Upper Delta Plain |
| B | 0,28 | 1,6 | 21,4 | 5.143 | 142.445 | - | - | |
| C | 0,32 | 7,75 | 20,09 | 5.574 | 2.793.047 | 16.464 | - | |
| D | 0,3 | 7,85 | 19,89 | 5.570 | 12.846.842 | 57.571 | - | |

