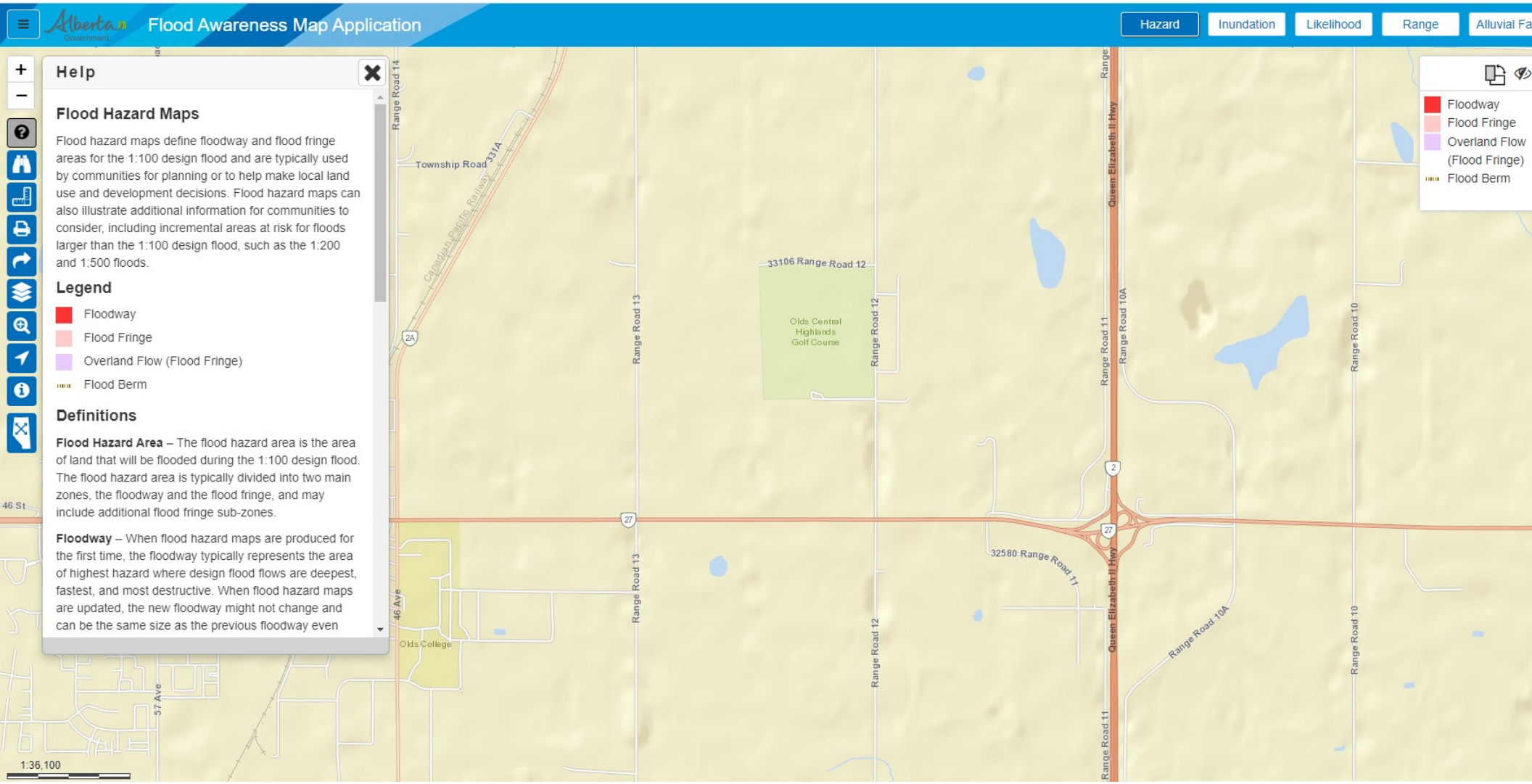
APPENDIX P

Alberta

Flood Hazards Map

Bifröst

Environmental and Remediation Services Inc.


Flood Awareness Map Application
Hazard
Inundation
Likelihood
Range
Help
Flood Hazard Maps
Flood hazard maps define floodway and flood fringe areas for the 1:100 design flood and are typically used by communities for planning or to help make local land use and development decisions. Flood hazard maps can also illustrate additional information for communities to consider, including incremental areas at risk for floods larger than the 1:100 design flood, such as the 1:200 and 1:500 floods.
Legend
Floodway
Flood Fringe
Overland Flow (Flood Fringe)
Flood Berm
Definitions
Flood Hazard Area – The flood hazard area is the area of land that will be flooded during the 1:100 design flood. The flood hazard area is typically divided into two main zones, the floodway and the flood fringe, and may include additional flood fringe sub-zones.
Floodway – When flood hazard maps are produced for the first time, the floodway typically represents the area of highest hazard where design flood flows are deepest, fastest, and most destructive. When flood hazard maps are updated, the new floodway might not change and can be the same size as the previous floodway even
Floodway
Flood Fringe
Overland Flow (Flood Fringe)
Flood Berm
Township Road 331A
Range Road 14
Canadian Pacific Railway
33106 Range Road 12
Olds Central Highlands Golf Course
Range Road 13
Range Road 12
Range Road 11
Range Road 10A
Range Road 10
Queen Elizabeth II Hwy
32580 Range Road 11
46 St
46 Ave
57 Ave
Olds College
1:36,100

APPENDIX Q

Utility Records –

Alberta One Call

Bifröst

Environmental and Remediation Services Inc.

No Records

No records were recovered (the category is applicable but the records do not exist), the records were not available (the category is applicable but the records are not available), or the records category was not applicable to this particular Phase I ESA Site.

APPENDIX R

Google Street View Photographs

Bifröst

Environmental and Remediation Services Inc.

R1. Project Site, looking northwest from the intersection of Highway 27 and Range Road 12.

R2. Typical view looking north of the Project Site showing agricultural fields.

R3. View of a road entry point into the Project Site on the southwest corner, looking north.

R4. View of the eastern property, looking northeast from the intersection of Highway 27 and Range Road 12.

R5. Drive into the farmstead to the south of the Project Site, on the eastern end, looking south.

R6. View of the farmstead plot and adjacent western agricultural fields to the south of the Project Site, looking southeast.

R7. Another view of the agricultural fields to the south and southwest of the Project Site, looking south from the western entry point along Highway 27.

R8. View of the agricultural fields to the west, looking northwest from the western entry point along Highway 27.

APPENDIX S

Web-Based Records

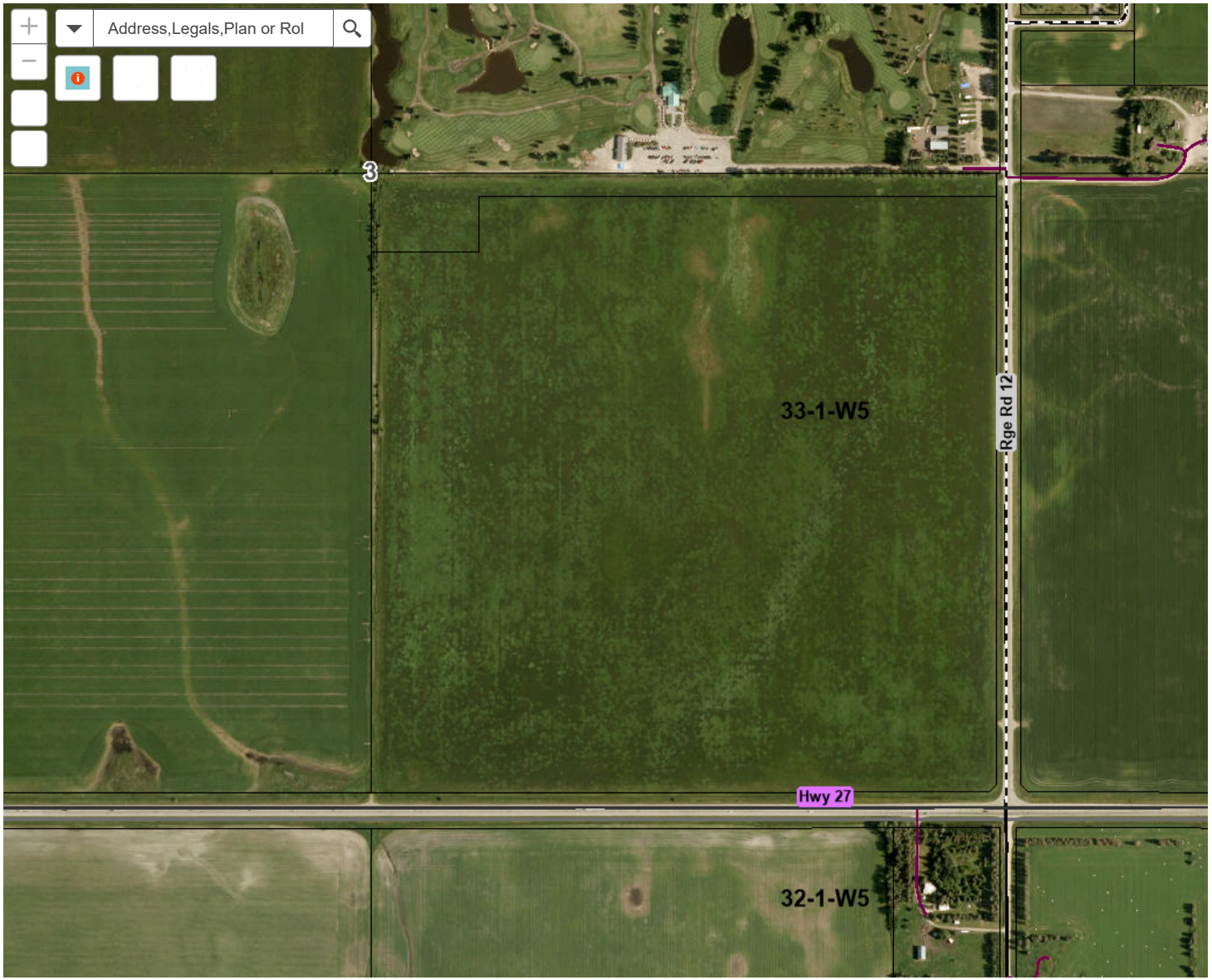
Bifröst

Environmental and Remediation Services Inc.

Mountain View COUNTY

MVC Environmentally Significant Areas (ESA's)

Based on the 2008 Summit Report



Legend

MVC_EnvironmentalFeatures

Rivers and Creeks

mvcStreamClass

- Class C (Activity Restriction)
- Class D (No Activity Restriction)
- Unclassified

Towns/Village

Road - Primary/Secondary Highways

Parcels (PGIS)

Roads - Not MVC Owned

Roads - MVC Owned

Road Surface Class

- chip sealed
- gravel
- paved
- unimproved

Roads - Outside County

Section Number Grid

200m

-114.048 51.800 Degrees

APPENDIX T

Photograph Log

Bifröst

Environmental and Remediation Services Inc.

1. The Project Site and a representative view from the southern side of the property along Highway 27, facing north.

2. View to the east along Range Road 12 of the southeastern Project Site access point, from within the property.

3. View to the south along Range Road 12 of the northeastern Project Site access point.

4. View to the south along Highway 27 of the southwestern Project Site access point, from within the property.

5. View from the grasses and other vegetation within the southern Project Site ditch.

6. View of the ditch (upper right of the photograph) along the western property boundary, facing north, that contains small trees.

7. The ditch along the northern boundary of the Project Site, which is filled with water and water-tolerant plants, facing south east.

8. View to the north along Highway 27 of the southwestern corner of the Project Site, showing a buried water line sign.

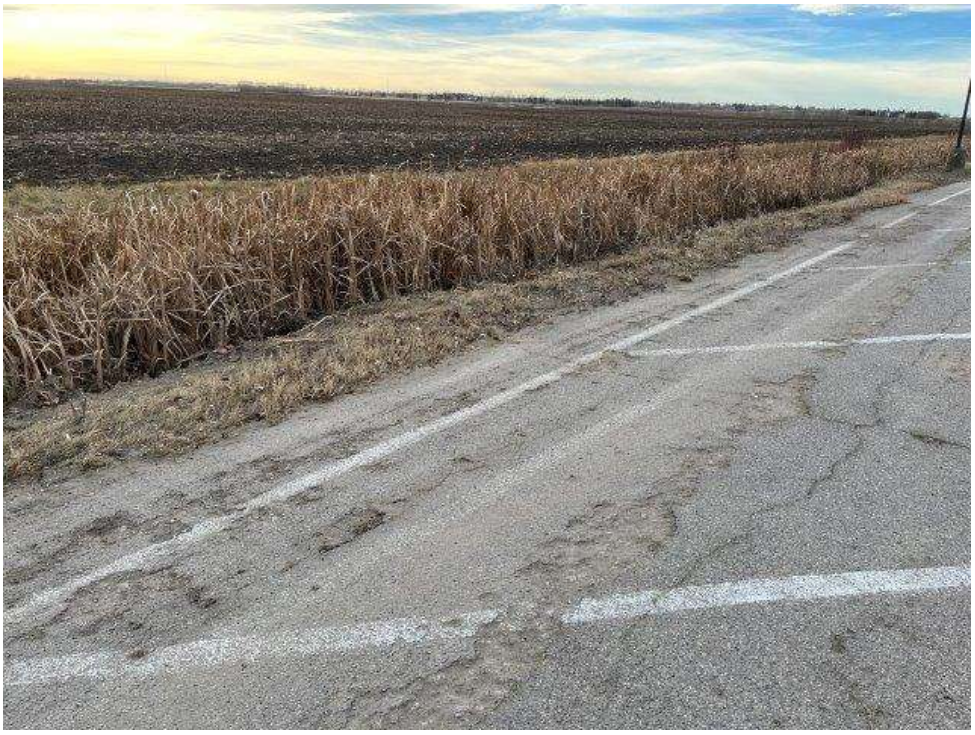
9. View north along Highway 27 of the southwestern corner of the Project Site, showing a buried fiber optic line sign.

10. View of a buried telephone cable sign along Range Road 12 in the southeastern corner of the Project Site; photograph taken facing north.

11. View of the monitoring well located in the northcentral portion of the Project Site; photograph taken facing north.

12. View of the geotechnical stand pipe piezometer located in the northcentral portion of the Project Site; photograph taken facing east.

13. View to the south along the northern Project Site boundary. The change in vegetation type past the tree indicates the location of the drainage ditch.



14. View to the south along the northern Project Site boundary. The change in vegetation type is clear and indicates the location of the drainage ditch.

15. View of the northwestern corner of the Project Site and Block A, showing the ditch and tree growth on this corner; photograph taken facing southwest.

16. View facing south west of the water line that runs from the pump house on Location 2 to the southern property line along the western property boundary.

17. View to the power lines along Highway 27 on the southern side of the Project Site access; photograph taken facing east.

18. View of the main entrance to the Olds Golf Club, west of Range Road 12; photograph taken facing northwest.

19. A pair of solid waste dumpsters at the Olds Golf Club, near the entrance off of Range Road 12; Photograph taken facing north.

20. Entrance to the maintenance area at the Olds Golf Club; photograph taken facing northwest.

21. Close up view of the ASTs (arrows) located within one of the sea cans; photograph taken facing northwest.

22. View of the Project Site to the south; drainage from the parking lot has created a wet area adjacent and into the Project Site.

23. View of the grasses and other vegetation within the drainage ditch flowing west, on the northern Project Site boundary; Photograph taken facing southwest.

24. View of the clubhouse on the Olds Golf Course; photograph taken facing north.

25. View of the pole-mounted transformers (arrow) located on the Olds Golf Course property; (arrow); photograph taken facing west.

26. View of the golf cart battery charging building; photograph taken facing west.

27. View of the AST (arrow) located on the west side of the battery charging building; photograph taken facing northeast.

28. Debris pile north of the Project Site on the Olds Golf Course property; photograph taken facing south.

29. Pump house and pole-mounted transformer located on the Olds Gold Course property; photograph taken facing west.

30. View of what appears to be a former concrete retaining wall, north of the Project Site; photograph taken facing southeast.

31. Close up view of the pipeline (arrows) leading from the pump house on the Olds Golf Course property; photograph taken facing southwest.

32. View of the farmstead (Location 3) to the northeast of the Project Site; Location 4 can be seen in the background; photograph taken facing east.

33. View of the agricultural lands associated with Location 5 (arrow), across Range Road 12; photograph taken facing southeast.

34. View of Location 6 to the southeast (arrow), to the left of the large trees; photograph taken facing south.

35. View of Location 7 to the south (arrow); photograph taken facing south.

36. View of Location 8 to the south (arrow); photograph taken facing south.

37. View of Location 10 to the west; photograph taken facing west.

APPENDIX U

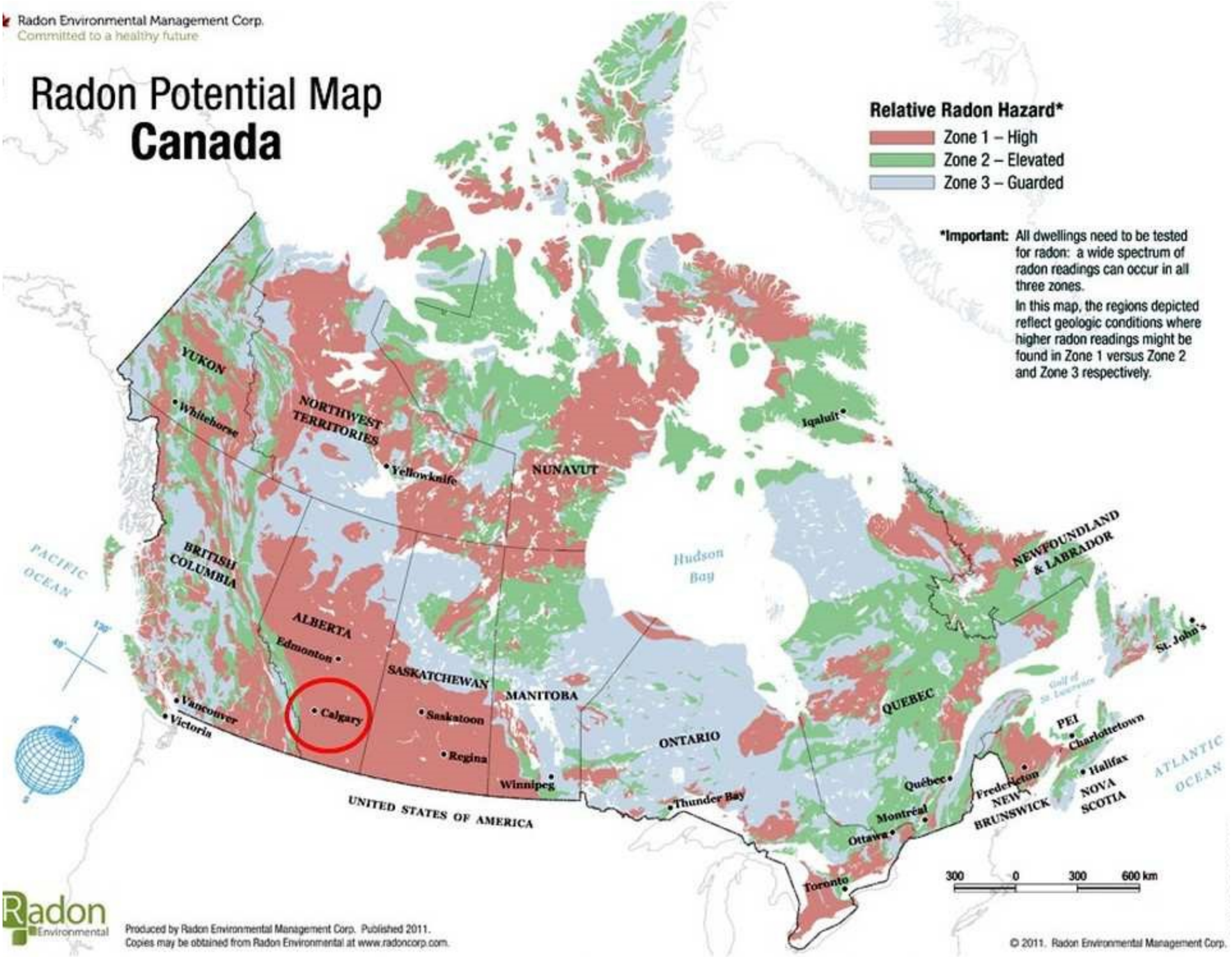
Radon Map

Bifröst

Environmental and Remediation Services Inc.

Radon Environmental Management Corp.
Committed to a healthy future

Radon Potential Map
Canada



Radon Environmental

Produced by Radon Environmental Management Corp. Published 2011.
Copies may be obtained from Radon Environmental at www.radoncorp.com.

APPENDIX V

Geophysical Surveys

Bifröst

Environmental and Remediation Services Inc.

February 13, 2024

Bifröst Environmental and Remediation
340 Midpark Way SE
Suite 300,
Calgary, Alberta T2X 1P1

Attention: Mark Lehar, P.Geo

RE: Geophyical Surveys at 07-03-033-01 W5 and 08-03-033-01 W5 , OLDS , ALBERTA

INTRODUCTION

Focused Geo was retained by ***Bifröst Environmental and Remediation*** to conduct a geophysical investigation at the above mentioned locations with the objective of finding evidence of previous industrial activity on the site, namely oil well work and determining the position of capped well if present. 07-03-033-01 W5 had a well which was abandoned,while 08-03-033-01 W5 has evidence of possible industrial activity as determined by analysis of aerial photography.

To realize the above objective an Overhauser magnetometer (MAG) and electromagnetic terrain conductivity (EM) survey were completed. MAG and EM surveys are useful for locating metals and imaging soil characteristics. The geophysical investigation was conducted on February 7 , 2024.

METHODOLOGY

The survey involved systematic grid-based scans using the Overhauser magnetometer (MAG) to identify and locate metal objects based on magnetic anomalies. Simultaneously, the electromagnetic terrain conductivity (EM) meter measured subsurface conductivity variations, providing insights into soil composition. Data collection included magnetic field strength, conductivity values and spatial coordinates.

Overhauser Magnetometer

The SmartMag Overhauser Magnetometer used for this survey is a geophysical instrument designed for measuring the Earth's magnetic field with high precision. The instrument operates based on the Overhauser effect, a quantum physics phenomenon involving the transfer of polarization between

electrons and nuclei in a magnetic field. The Overhauser effect provides high sensitivity, allowing the SmartMag Magnetometer to detect even subtle variations in the Earth's magnetic field caused by nearby magnetic materials or geological features.

Electromagnetic Terrain Conductivity Meter

The EM31-SH conductivity meter employed in this survey is manufactured by Geonics Ltd. The EM31-SH operates on the principle of electromagnetic induction. It emits a primary electromagnetic field into the ground, inducing secondary currents in conductive subsurface materials. The instrument measures the conductivity of the subsurface materials based on the response of the induced currents. Conductive materials, such as metals or saline solutions, affect the strength and phase of the secondary electromagnetic field. The EM31-SH features a dual coil configuration. One coil serves as a transmitter, emitting the primary field, while the other coil acts as a receiver, detecting the secondary electromagnetic field. This configuration enhances sensitivity and accuracy in conductivity measurements.

The EM31-SH has a field of influence of 4 m, which is the effective depth of investigation. The resultant electrical field is recorded as the ***apparent conductivity*** in milliSiemens/meter (mS/m). The Siemen is the SI unit of measurement for volume of electrical conductance and is equivalent to an Ampere/Volt. The EM31-SH simultaneously records the conductivity (quadrature phase) and magnetic susceptibility (in-phase) components of the electrical field.

DATA ACQUISITION AND PROCESSING

EM Terrain Conductivity Survey and Magnetometer

The EM31-SH is carried at about hip level (~1m above surface) while the SmartMag Magnetometer sensor is strapped to a survey rod on a backpack with a control sensor in the front for user input and monitoring. The area of interest was walked in a serpentine pattern while attempting to keep about 8 – 10 m between passes, with a sample value of collected every 1 second. About 2600 samples were collected for each survey.

Global Positioning System (GPS)

A Juniper Systems Geode GNSS receiver (GNS2) was used for all recorded data collection activities. The Geode GNS2 provides sub-meter accuracy with SBAS correction services.

Processing

The collected point data is spatially extrapolated from to a uniform grid of 1m x 1m through the statistical methodology of Kriging which accounts for both the trend (systematic spatial variation) and the spatial dependence (correlation between nearby points). Some data editing occurs prior to Kriging, such as filtering points closer that 1 m together and removing values which are > 3 x the standard deviation from the mean.

RESULTS

Three plots, apparent conductivity, inphase and magnetometer readings collected and extrapolated over the areas of interest, 07-03-033-01 W5 and 08-03-033-01 W5 are presented in the figures section (see below). ***Figure 1: apparent conductivity for 07-03-033-01 W5*** has a range of conductivity from 5 – 50 ms/m. There were two pipes located on the site and have been marked on the figure. One looked like a monitoring well with metal housing while the second was a simple 3" diameter PVC pipe protruding from the ground (see illustrations 1 and 2). ***Figure 2: INPHASE response for 07-03-033-01 W5 and Figure 3: Total Magnetic Field*** both display heterogeneous responses suggesting disturbed subsurface conditions while the Total Magnetic Field has an anomaly which corresponds to the location of the abandoned well as documented by the Government of Alberta. (https://extmapviewer.aer.ca/AERAbandonedWells/Index.html, well licence: 0072245)

Figure No. 4 – 6 provide the conductivity, inphase and magnetic field data collected over ***08-03-033-01 W5***. The data, overall is much more uniform than the data collected at *07-03-033-01 W5* with the apparent conductivity ranging from 7- 18 mS/m and the total magnetic field ranging from 55638 – 55657 nT vs 50538 – 58867 nT at *07-03-033-01 W5.* There is an anomaly at UTMz11: E703339, N5742994 which appears on all three plots, however the sensitivity of each of these instruments when in uniform site conditions should be taken into account when ascribing the cause.

Illustration 1: "monitoring well" located with 07-03-033-01W5 (see Figure 1-3 for location)

Illustration 2: 3" PVC pipe protruding from ground located within 07-03-22-01W5. (See Figures 1-3 for location)

CONCLUSIONS

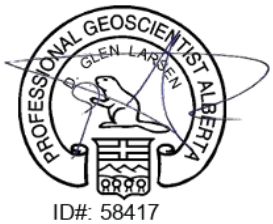
07-03-033-01 W5 has yielded geophysical data consistent with an area that has experienced soil disturbance caused by well site drilling activity. The magnetometer data has provided a reasonably strong anomaly which coincides with the documented location of the oil well location, however the presence of "monitoring well" on site, 20 m to the northeast of the documented location, needs to be further explained as to it's function. Is it possible the "monitoring well" actually leads to the well cap? The geophysical data at *08-03-033-01 W5* provided more uniform results which suggested little subsurface disturbance in spite of the aerial imagery which indicated poor vegetation growth. The low conductivity values recorded at this location would be consistent with sandy/dry soils which may account for the dearth of vegetation. The one anomaly at UTMz11: E703339, N5742994 is deemed to be too subtle to be attributed to a buried well casing, however investigating the surface once the snow melts may be worthwhile to look for possible causes.

CLOSURE

This report has been prepared with generally accepted geophysical practices for the exclusive use of ***Bifröst Environmental and Remediation***. The reported information is believed to provide a reasonable representation and interpretation of the geophysical data limited to the capabilities of the instrumentation employed, however, intrusive investigations are required to confirm the geophysical interpretations.

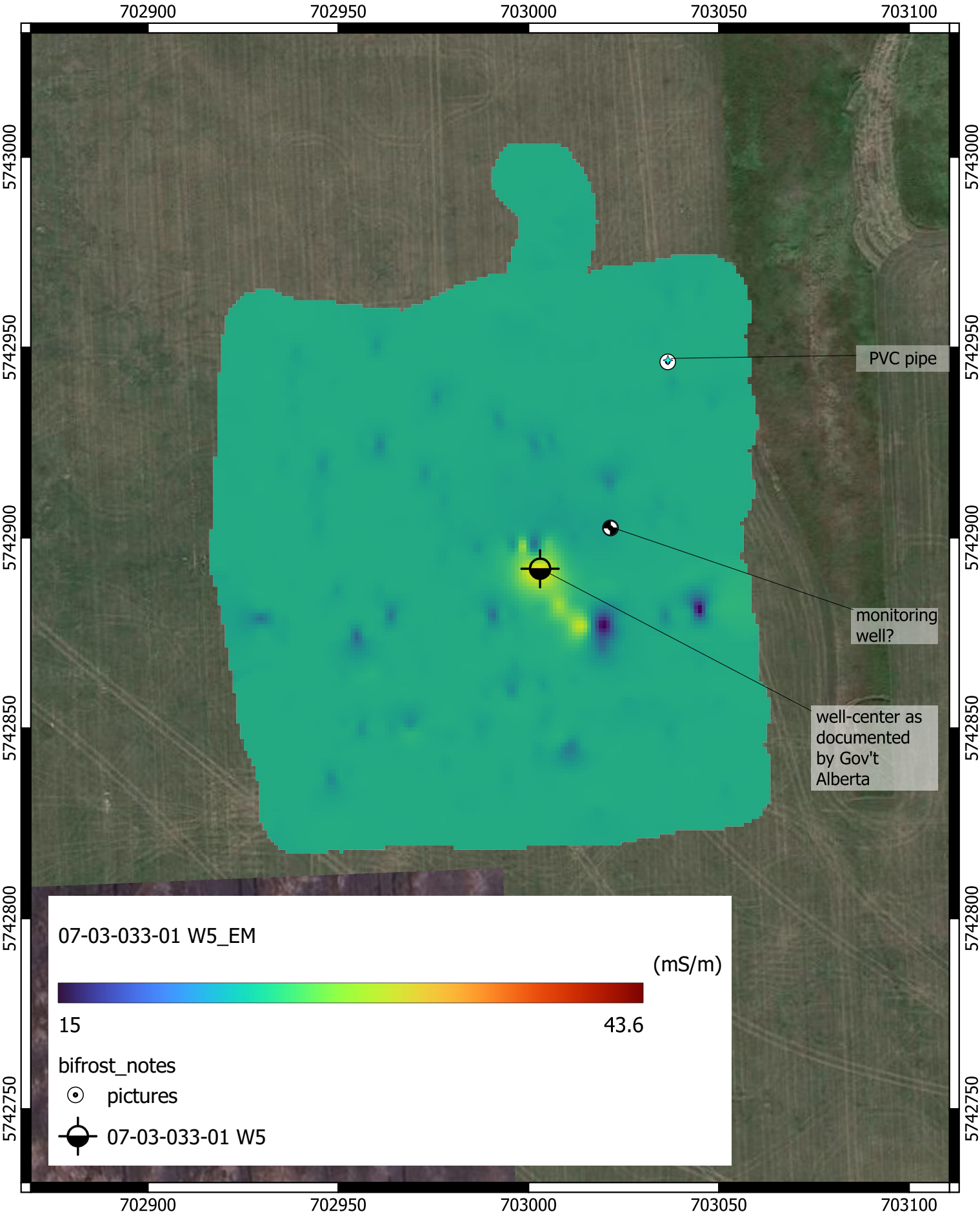
We trust this meets with your present requirements. If there should be any further inquiries please do not hesitate to contact the undersigned.

Respectfully submitted,

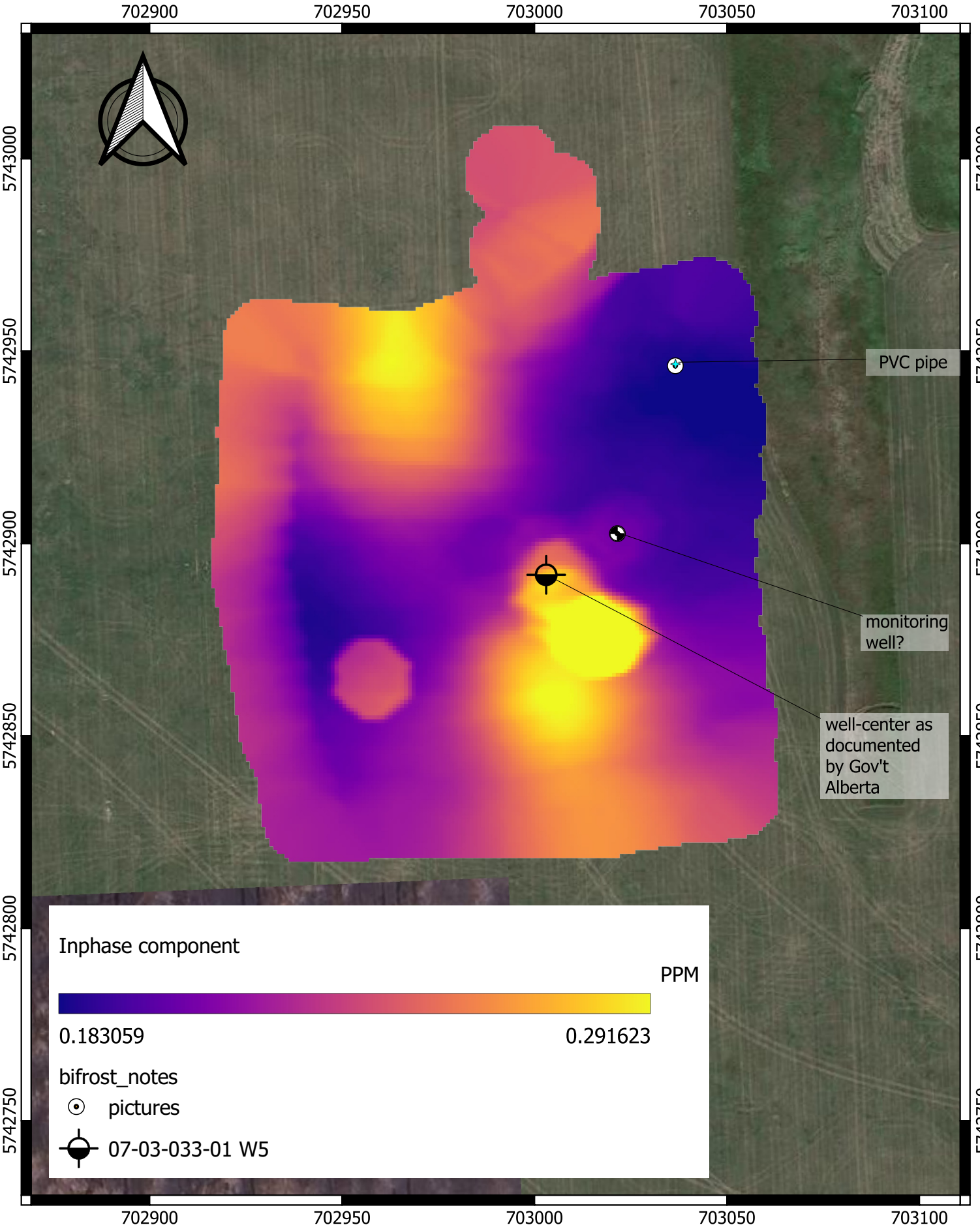


D. Glen Larsen, Principal
Focused Geo
403-390-8173

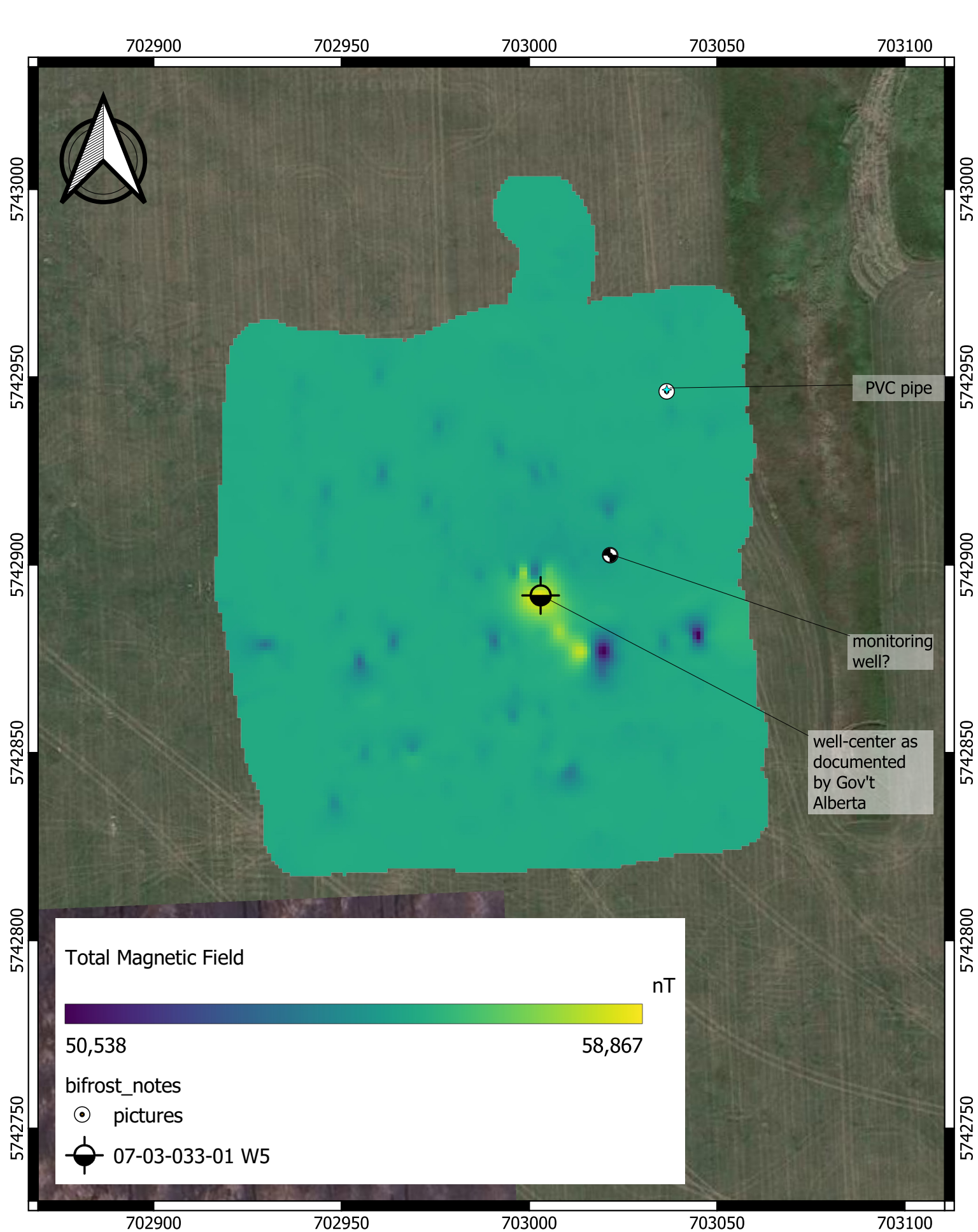
FIGURES



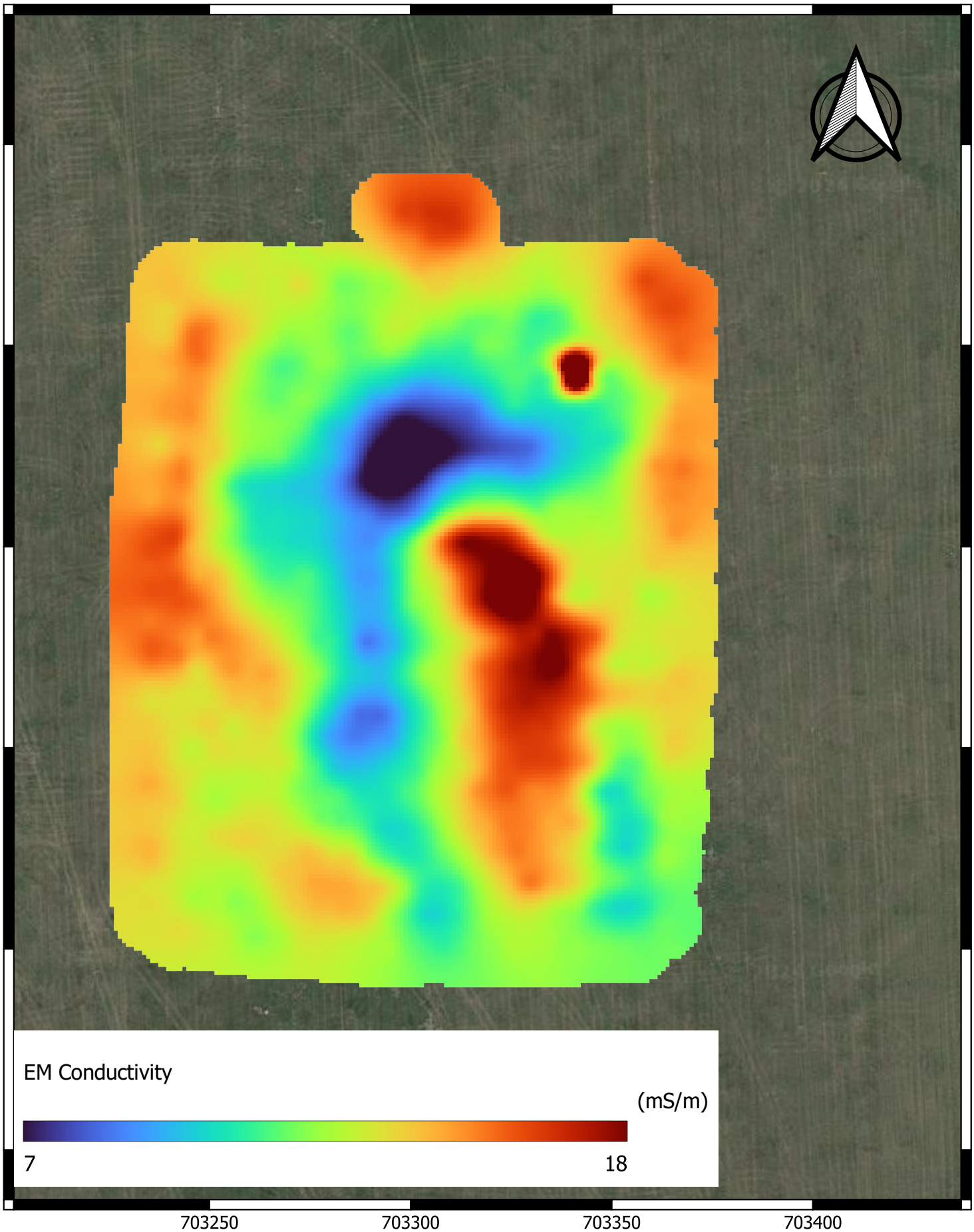
Data Acquired By: FOCUSEDgeo near-surface geophysics	Project No. 069 Survey Date: Feb 7, 2024 Surveyed By: GL Scale: 1:1250	**Figure No. 1** **EM31 - CONDUCTIVITY** **07-03-033-01 W5** **Olds, Alberta**	*Client:* Bifröst Environmental and Remediation Services Inc.



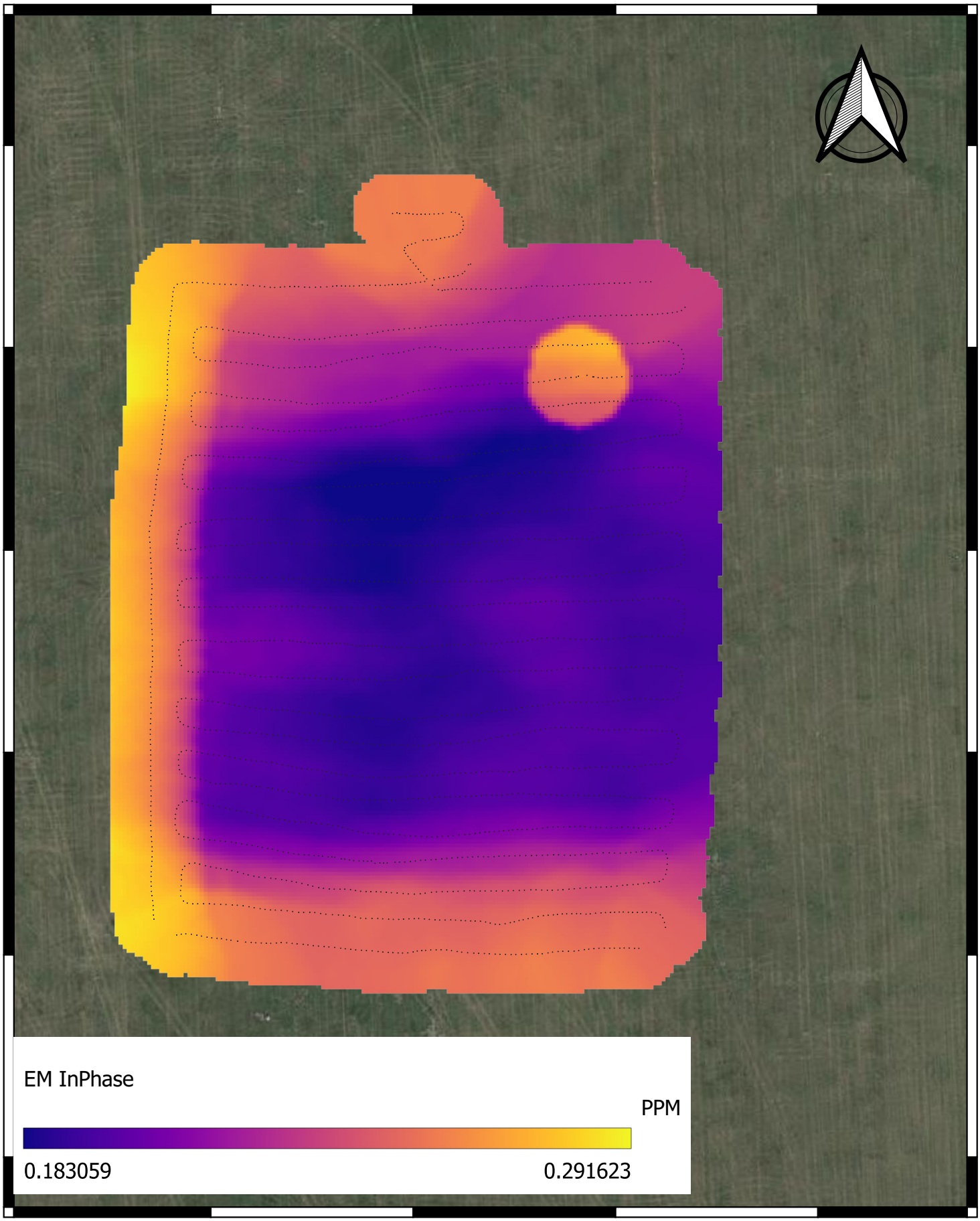
Data Acquired By: FOCUSEDgeo near-surface geophysics	Project No. 069 Survey Date: Feb 7, 2024 Surveyed By: GL Scale: 1:1250	**Figure No. 2** **EM31 - INPHASE** **07-03-033-01 W5** **Olds, Alberta**	*Client:* Bifröst Environmental and Remediation Services Inc.



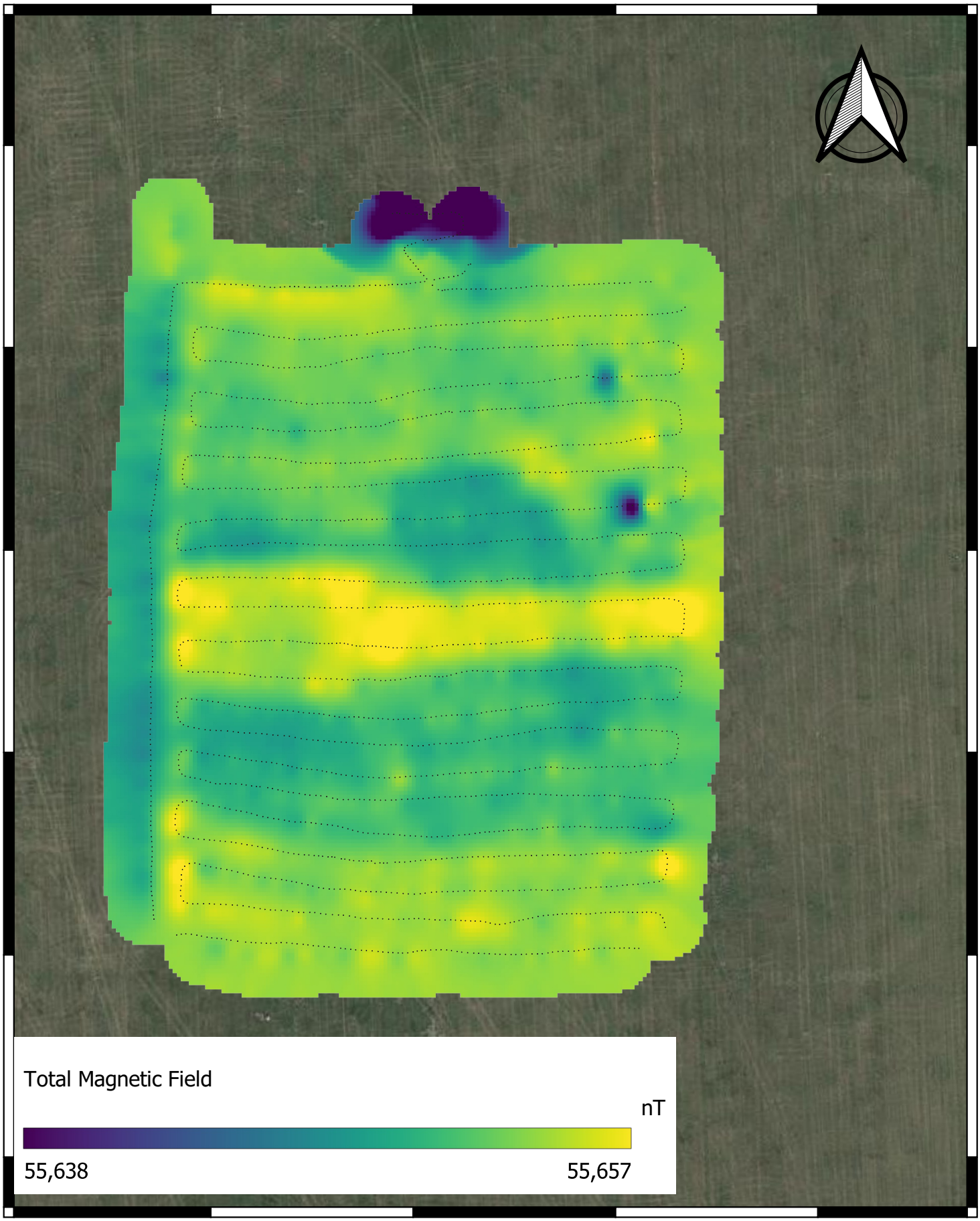
Data Acquired By: FOCUSEDgeo near-surface geophysics	Project No. 069 Survey Date: Feb 7, 2024 Surveyed By: GL Scale: 1:1250	**Figure No. 3** **Total Magnetic Field** **07-03-033-01 W5** **Olds, Alberta**	*Client:* Bifröst Environmental and Remediation Services Inc.



Data Acquired By: FOCUSEDgeo near-surface geophysics	Project No. 069 Survey Date: Feb 7, 2024 Surveyed By: GL Scale: 1:1250	**Figure No. 4** **EM - CONDUCTIVITY** **08-03-033-01 W5** **Olds, Alberta**	*Client:* Bifröst Environmental and Remediation Services Inc.



Data Acquired By: FOCUSEDgeo near-surface geophysics	Project No. 069 Survey Date: Feb 7, 2024 Surveyed By: GL Scale: 1:1250	**Figure No. 5** **EM - INPHASE** **08-03-033-01 W5** **Olds, Alberta**	*Client:* Bifröst Environmental and Remediation Services Inc.



Data Acquired By: FOCUSEDgeo near-surface geophysics	Project No. 069 Survey Date: Feb 7, 2024 Surveyed By: GL Scale: 1:1250	**Figure No. 6** **Total Magnetic Field** **08-03-033-01 W5** **Olds, Alberta**	*Client:* Bifröst Environmental and Remediation Services Inc.

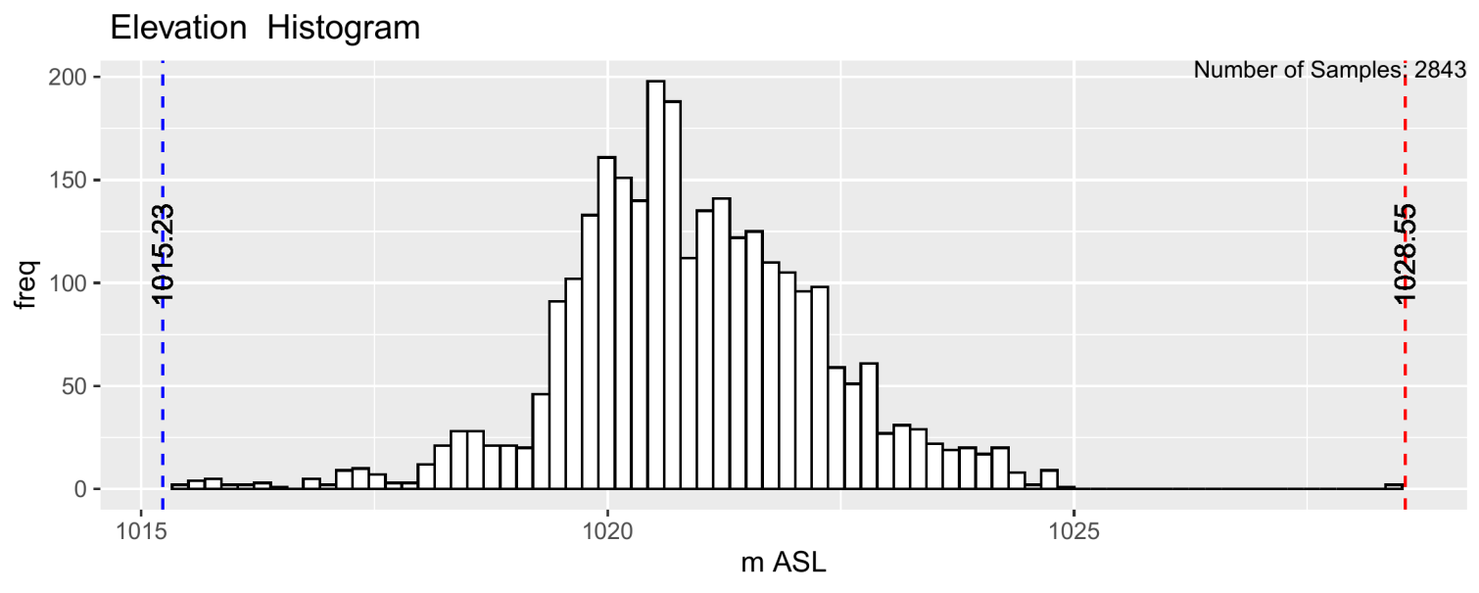
APPENDIX V1

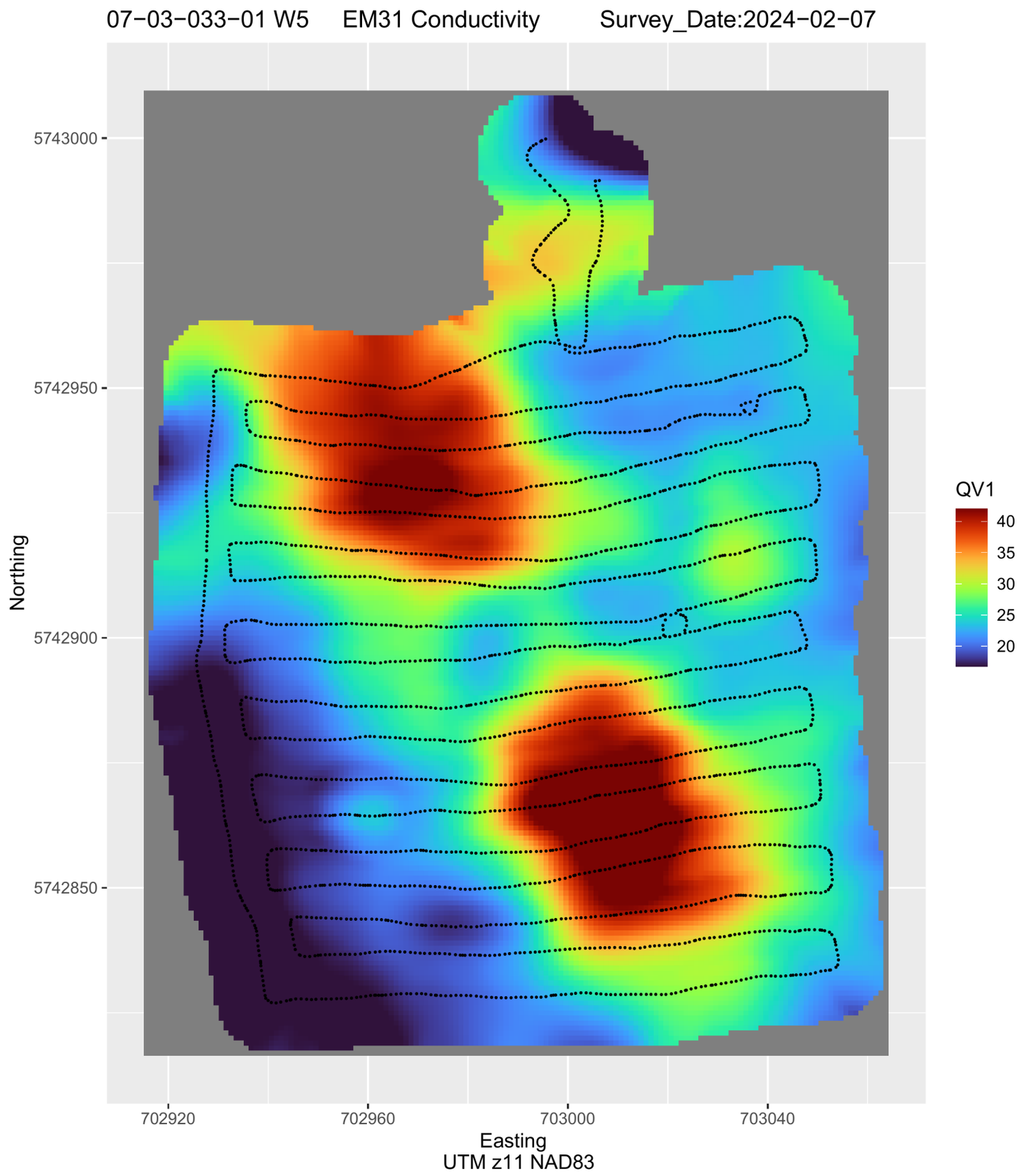
Geophysical Survey - LSD 7

Bifröst

Environmental and Remediation Services Inc.


07−03−033−01 W5 Elevation
5743000
5742950
5742900
5742850
Northing
altitude
1025
1020
702920
702960
703000
703040
Easting
UTM z11 NAD83


Elevation Histogram
Number of Samples: 2843
200
150
100
50
0
freq
1015.23
1028.55
1015
1020
1025
m ASL


07−03−033−01 W5 EM31 Conductivity Survey_Date:2024−02−07
5743000
5742950
5742900
5742850
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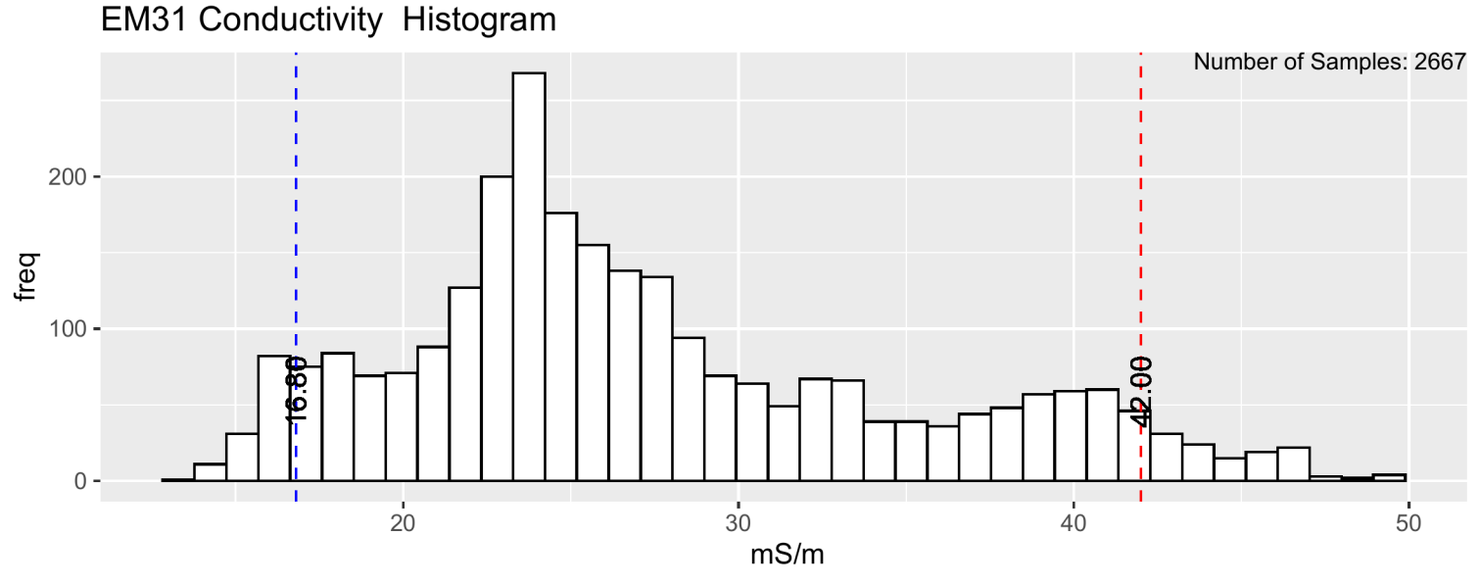
QV1
40
35
30
25
20
702920
702960
703000
703040
Easting
UTM z11 NAD83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100
0
freq
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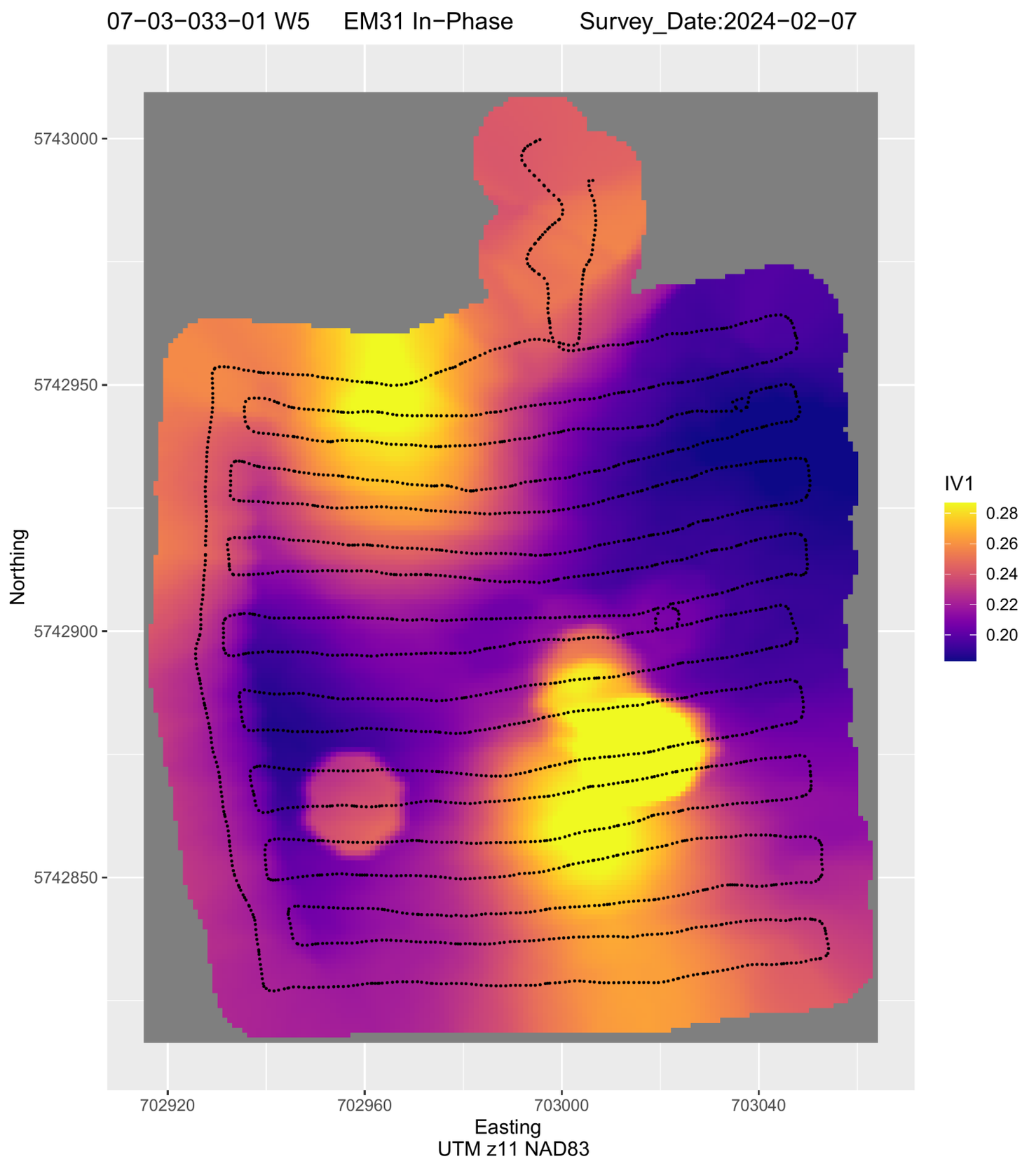
42.00
20
30
40
50
mS/m


07-03-033-01 W5 EM31 In-Phase Survey_Date:2024-02-07
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5742950
5742900
5742850
Northing
IV1
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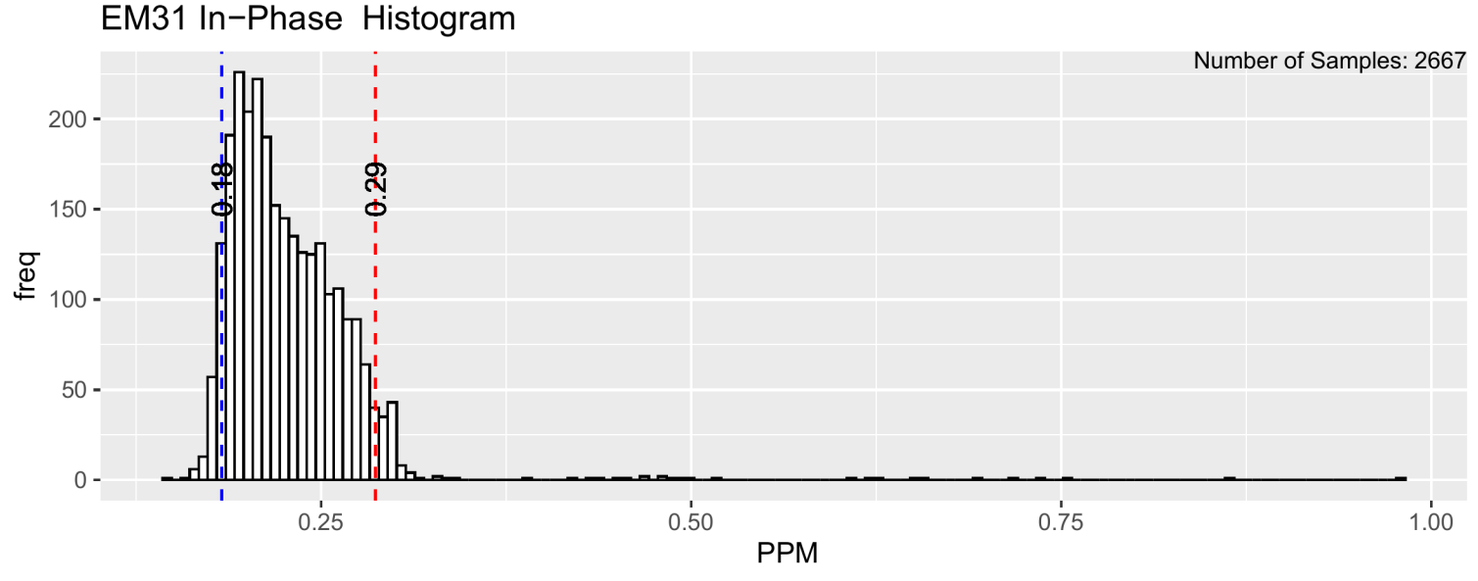
0.26
0.24
0.22
0.20
702920
702960
703000
703040
Easting
UTM z11 NAD83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50
0
freq
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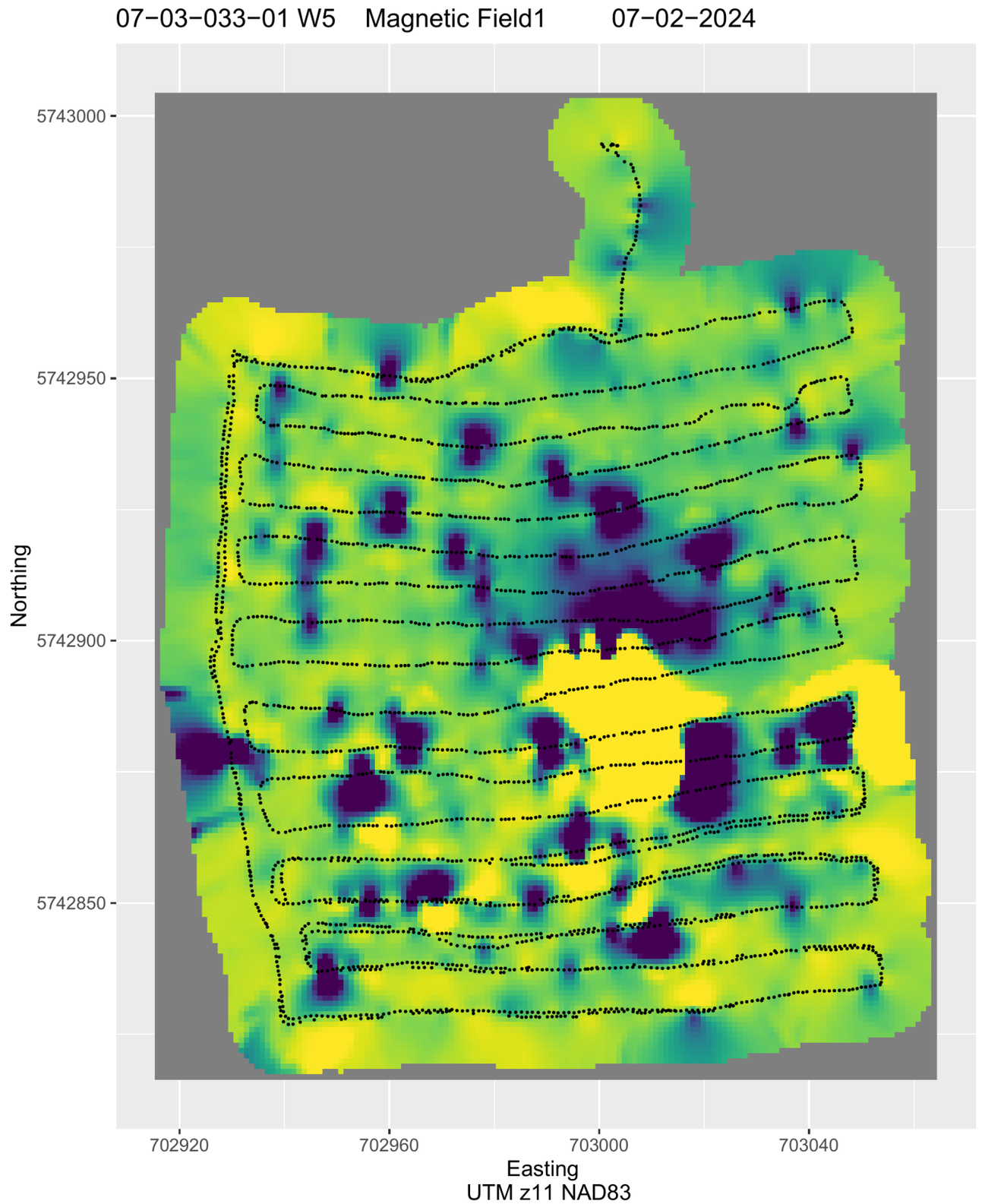
0.75
1.00
PPM


07−03−033−01 W5 Magnetic Field1 07−02−2024
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5742900
5742850
Northing
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702960
703000
703040
Easting
UTM z11 NAD83
Field1
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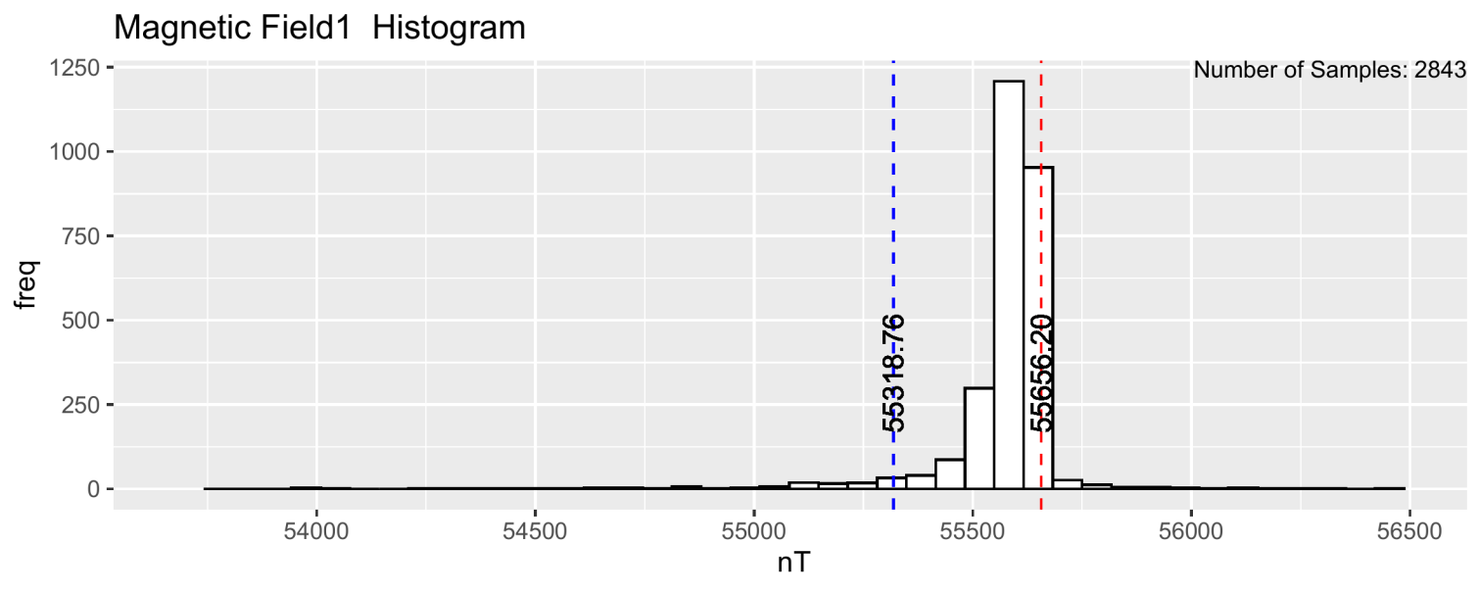
55500
55400

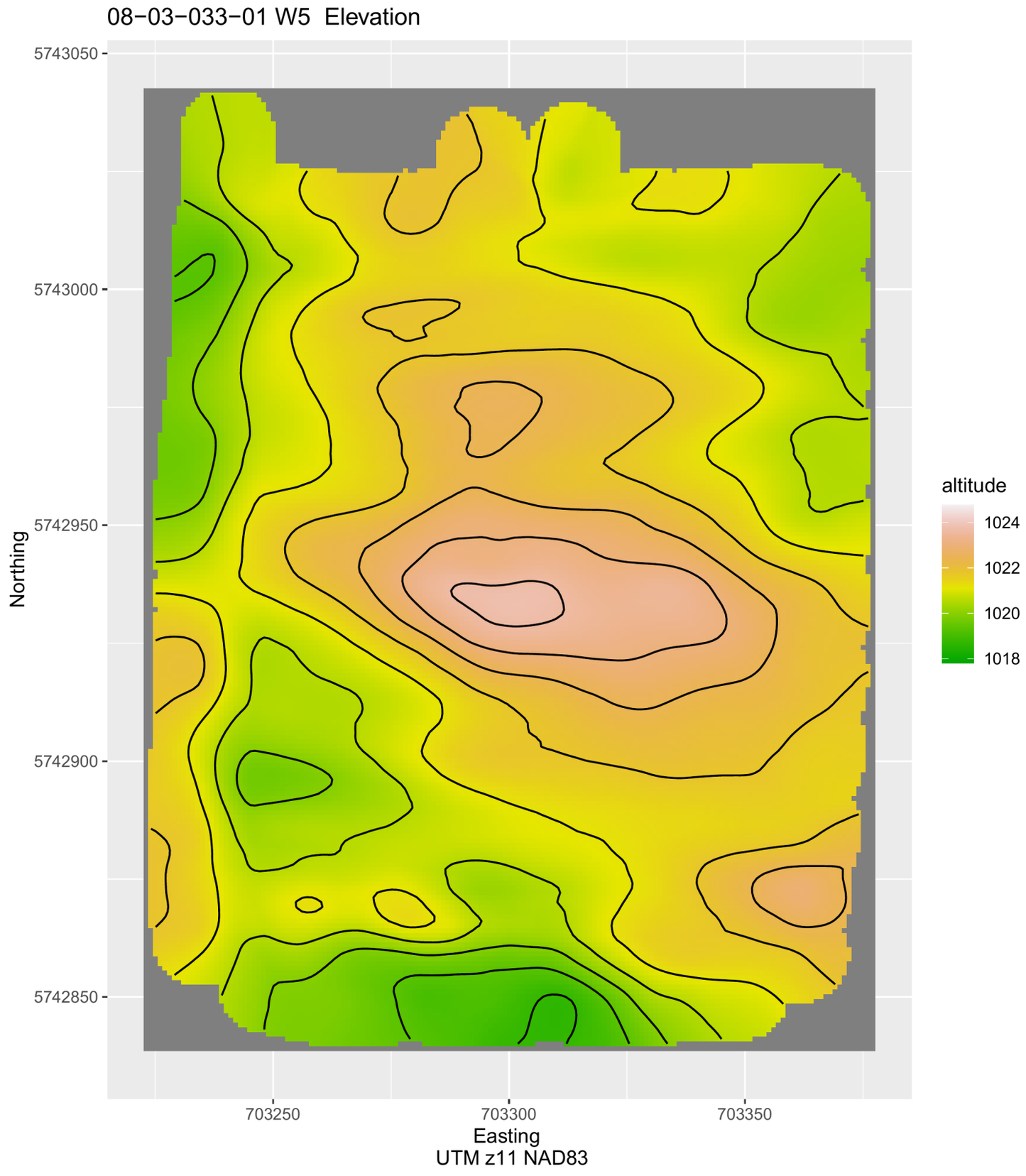

Magnetic Field1 Histogram
Number of Samples: 2843
1250
1000
750
500
250
0
freq
55318.76
55656.20
54000
54500
55000
55500
56000
56500
nT

APPENDIX V2

Geophysical Survey - LSD 8

Bifröst

Environmental and Remediation Services Inc.


08-03-033-01 W5 Elevation
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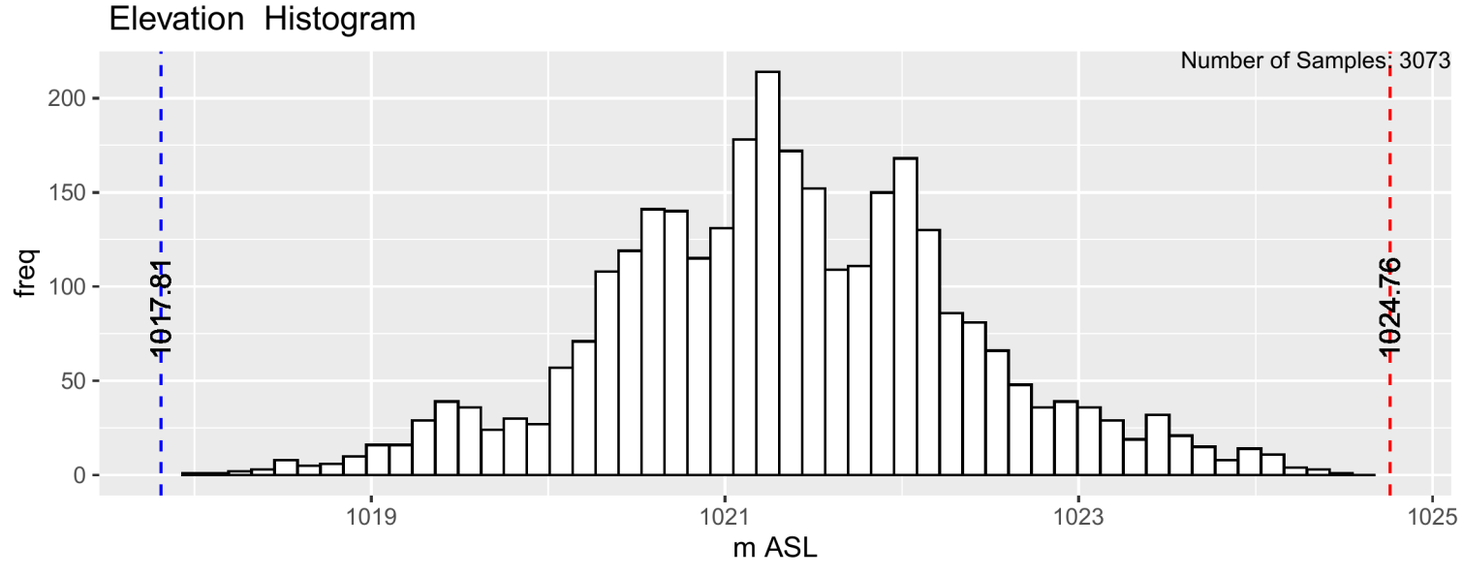
5743000
5742950
5742900
5742850
Northing
703250
703300
703350
Easting
UTM z11 NAD83
altitude
1024
1022
1020
1018


Elevation Histogram
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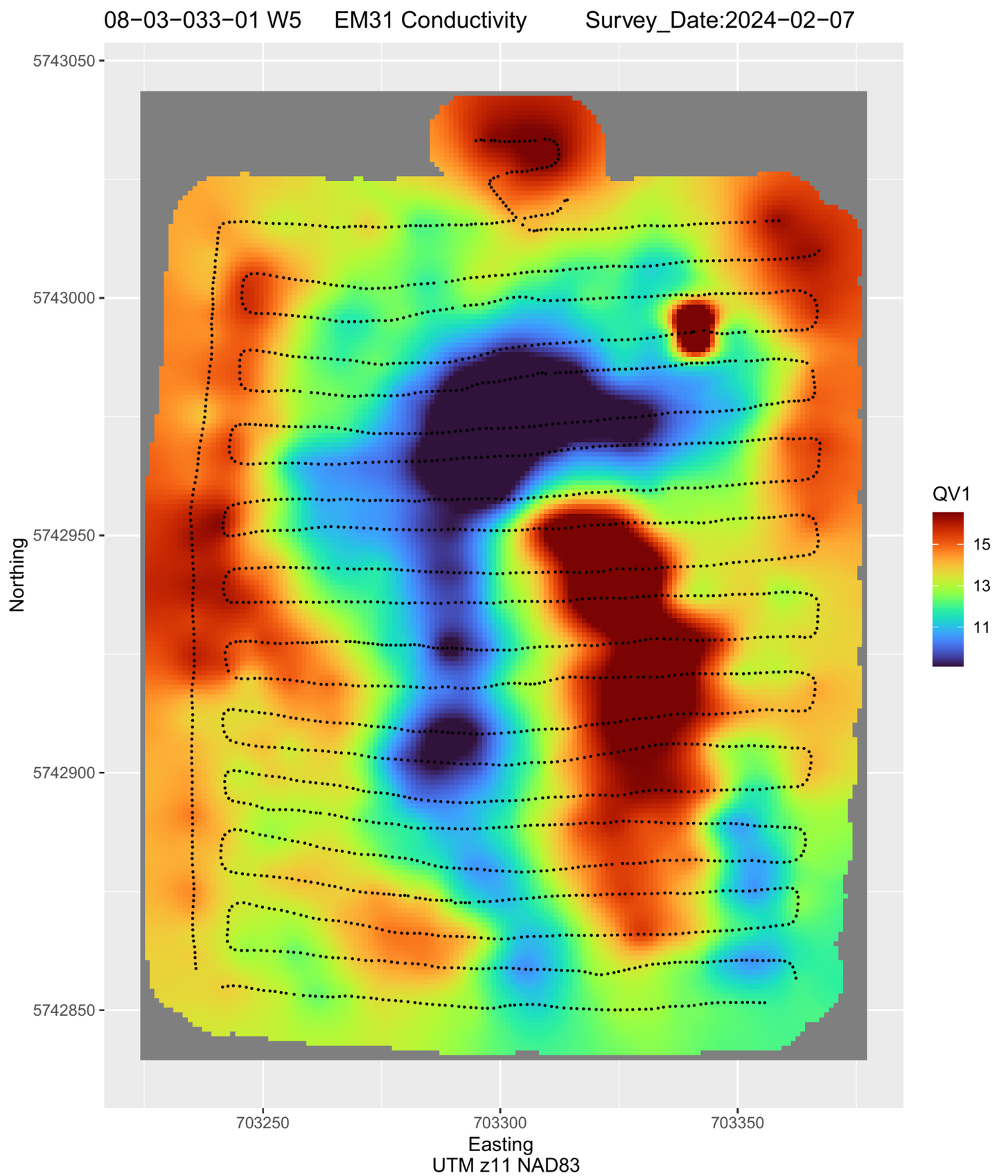
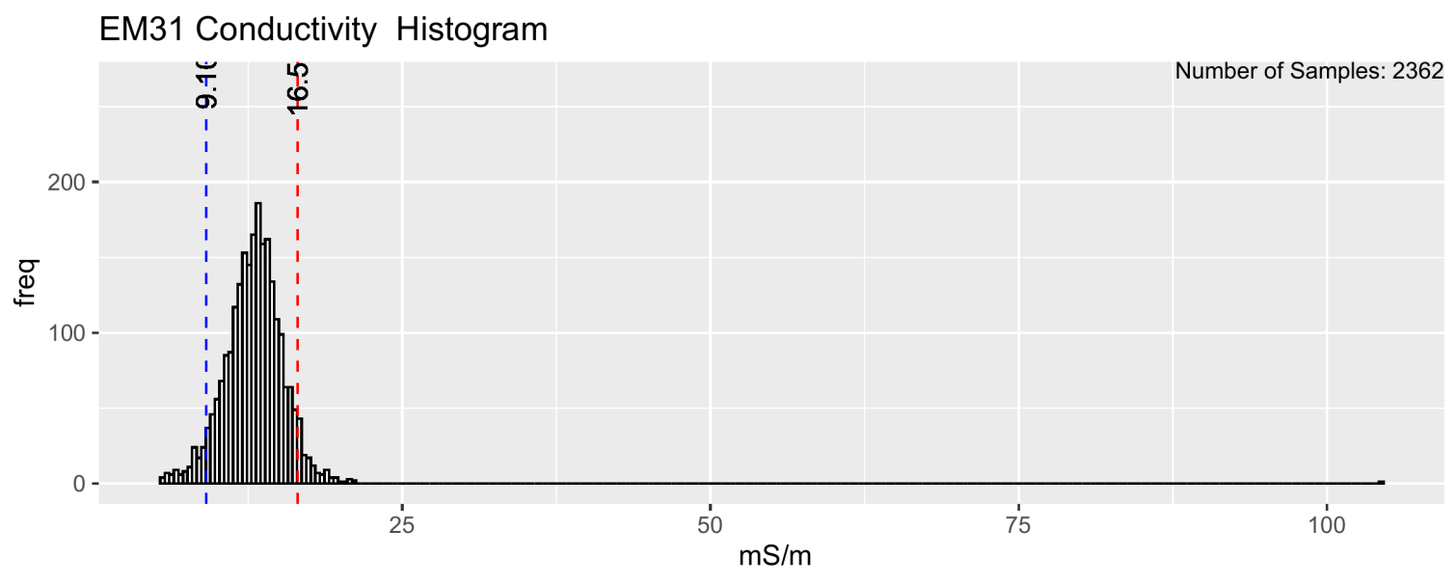
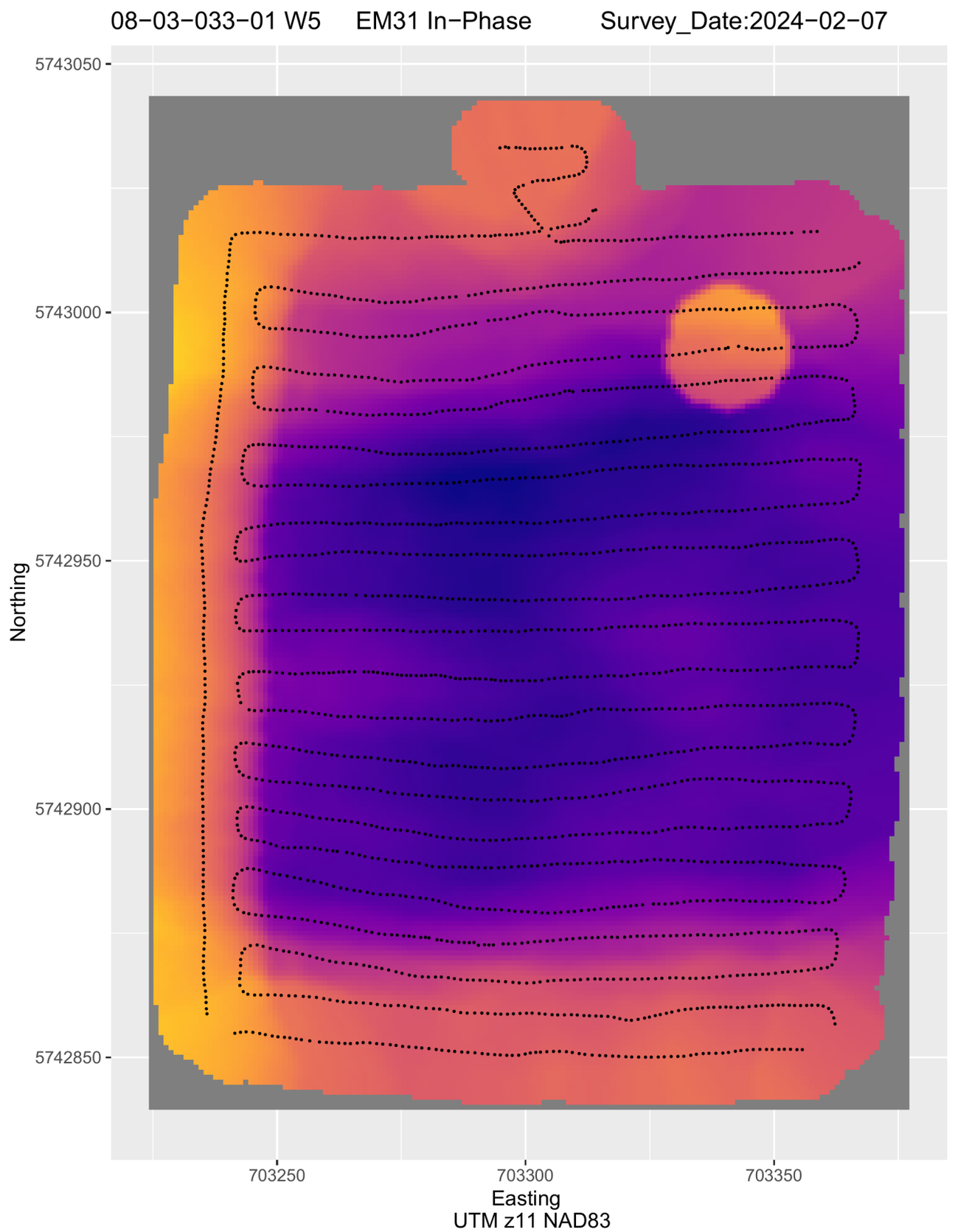
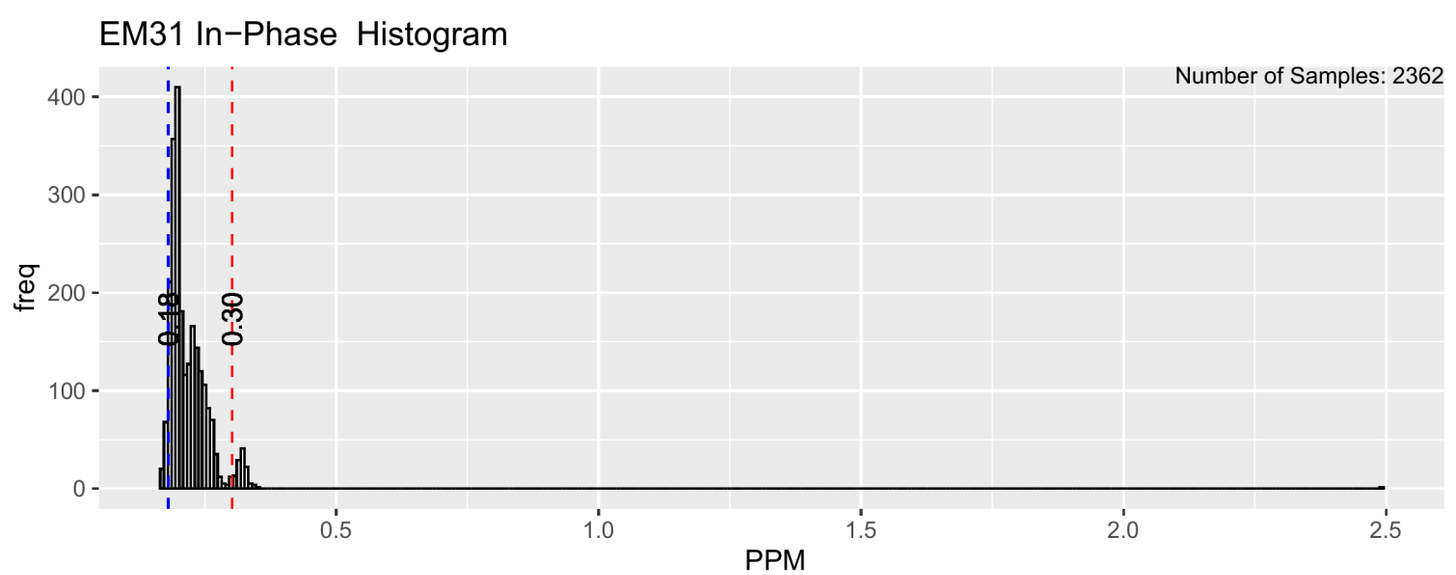
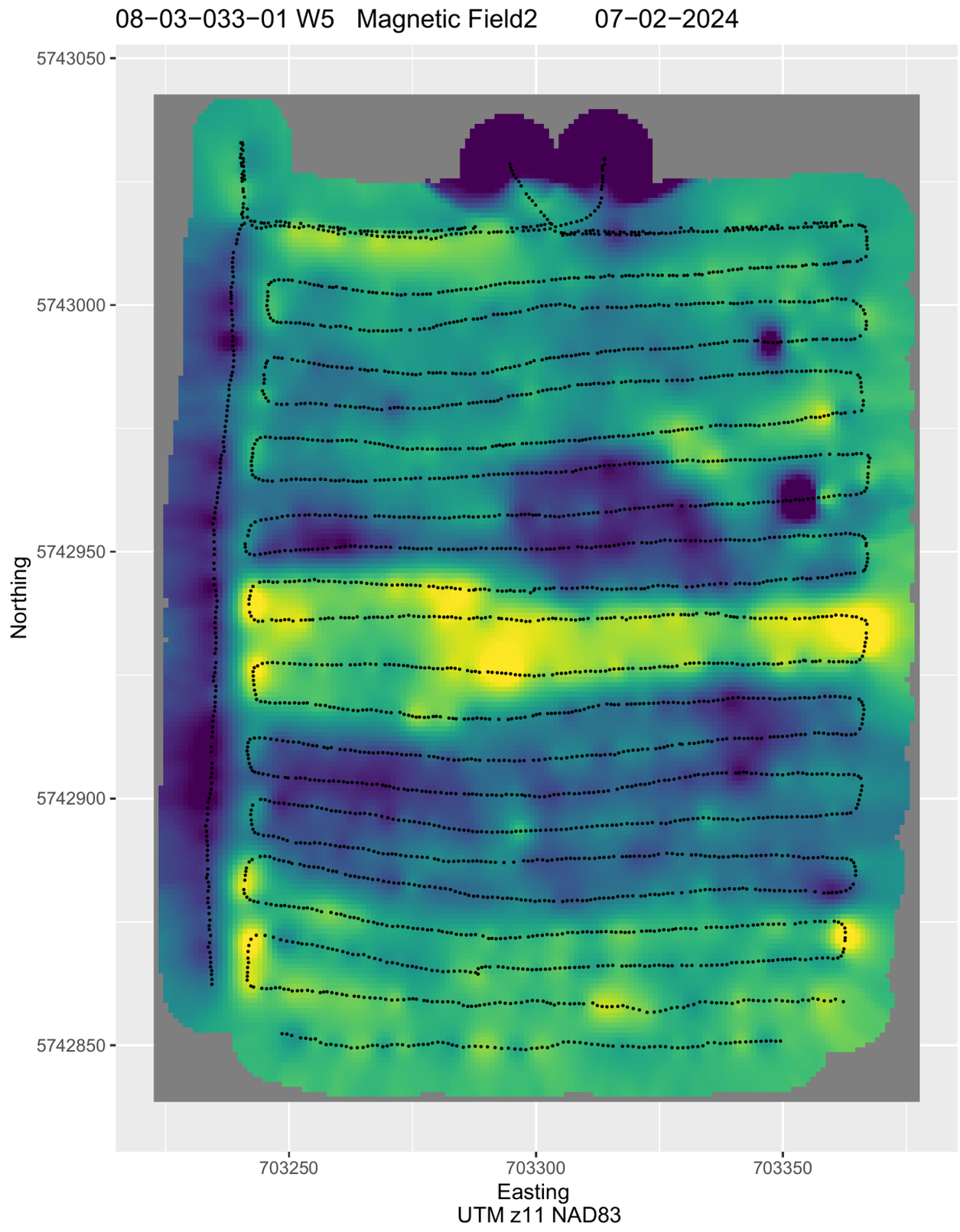
150
100
50
0
freq
1017.81
1024.76
1019
1021
1023
1025
m ASL

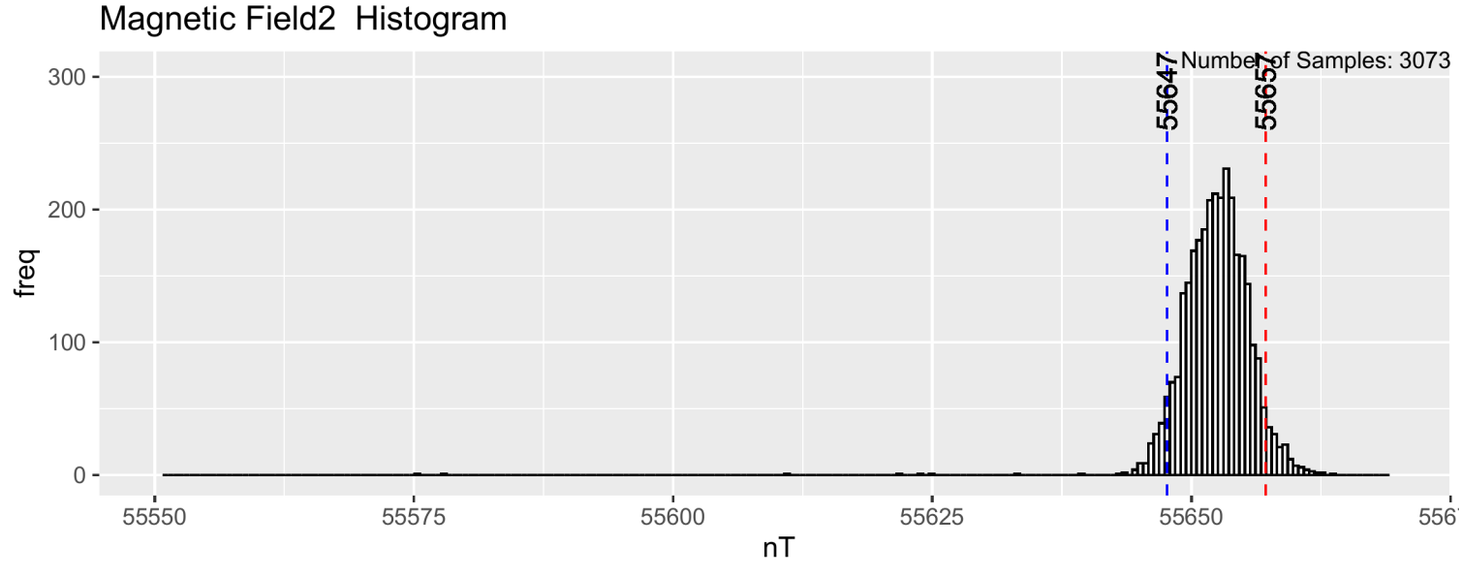

08−03−033−01 W5 EM31 Conductivity Survey_Date:2024−02−07
5743050
5743000
5742950
5742900
5742850
Northing
703250
703300
703350
Easting
UTM z11 NAD83
QV1
15
13
11


EM31 Conductivity Histogram
Number of Samples: 2362
9.1
16.5
200
100
0
freq
25
50
75
100
mS/m


08-03-033-01 W5 EM31 In-Phase Survey_Date:2024-02-07
5743050
5743000
5742950
5742900
5742850
Northing
703250
703300
703350
Easting
UTM z11 NAD83
IV1
0.30
0.27
0.24
0.21
0.18


EM31 In-Phase Histogram
Number of Samples: 2362
400
300
200
100
0
freq
0.18
0.30
0.5
1.0
1.5
2.0
2.5
PPM


08−03−033−01 W5 Magnetic Field2 07−02−2024
5743050
5743000
5742950
5742900
5742850
Northing
703250
703300
703350
Easting
UTM z11 NAD83
Field2
55655.0
55652.5
55650.0


Magnetic Field2 Histogram
Number of Samples: 3073
55647
55657
300
200
100
0
freq
55550
55575
55600
55625
55650
nT