GroundTruth Exploration

# Geophysical Report

## Ground Penetrating Report and UAV Survey on
Twenty Mile Placer Property

**Dawson Mining District**

NTS: 115N/09P
UTM Zone 7N 541000E 7048300N
Latitude: 63°33'37" N  Longitude: -140°10'28" W

Placer Claims:

| | |
|---|---|
| Phoenix 1-49 (P46296-P46345) | Joel Spurlock (100%) |
| Joe 1-50 (P46345-P46394) | Joel Spurlock (100%) |
| Dave 1 (P46435) | Joel Spurlock (100%) |

Placer Leases:

| | |
|---|---|
| ID01379 | Joel Spurlock (100%) |
| ID01380 | Deb Spurlock (100%) |

Claim Work Performed on: March 18 - 20, 2017
Lease Work Performed on: March 21, 2017

Prepared for Joel Spurlock
Written by: Isaac Fage, President, GroundTruth Exploration Inc.
March 28, 2017



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Y0B 1G0

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# 1 Introduction

## 1.1 Summary

GroundTruth Exploration Inc. conducted an exploration program on the Twenty Mile Creek. On the Twenty Mile placer claim block on claims Joe 17-50 (P46461-P46394) and Dave 1 (P46435), the lower 25 claims the block, an aerial imaging survey and a ground penetrating radar (GPR) survey was performed on March 18-20, 2017. A total of 48 cross creek profiles were surveyed on the north claims in the area of the confluence. The GPR cross creek surveys were conducted on previously unsurveyed magnetic lineament targets on the upper claims. Another aerial imaging survey was completed on the adjoining placer lease ID01379 and ID01380 and GPR surveys were also completed on both leases on March 21, 2017. A total of 10 cross creek profiles were surveyed. All surveys were done with high resolution imagery to establish exploration targets and plan a follow-up program. See Figures 1 and 2.

The goal of the exploration program is the identification of economic placer gold. This region is known for White Channel / Paradise Hill style bench gravel placer deposits. Deposits of alluvial gold is thought to be concentrated along the gravel-bedrock interface within the Twenty Mile Creek system. A similar economic deposit of that type has been found at the Ten Mile Creek and elsewhere in central Yukon.

## 1.2 Property Location and Description

The Twenty Mile Creek is located within the lower Sixty Mile River drainage system, part of the Yukon River watershed in west-central Yukon Territory. The property 65 km south-west (33° W of S) of the community of Dawson City, YT. It is centered at UTM Zone 7N 541000 7048300 within the Dawson Mining District on NTS mapsheet 115N/09. The Twenty Mile Creek area terrain is composed of moderately sloped, tree covered hills ranging in elevation from 1200 to 5000 ft. The Twenty Mile Creek area has not previously been glaciated.

## 1.3 Access

The Twenty Mile property is accessible by helicopter in summer and by snowmobile in winter via the Yukon and Sixty Mile rivers. The neighboring Ten Mile Creek placer mine can also be accessed in the summer from Dawson City by barge on the Yukon River to the mouth of the Sixty Mile River (70km) and then by cat road (12km) to the Twenty Mile. The location of the Twenty Mile Property is displayed in Figure 1. There is also an airstrip 13 km North-East of the property at the mouth of the Ten Mile.

## 1.4 Climate

The area experiences typical climatic conditions for central Yukon Territory with short, warm summers and cold winters. Temperatures in the Twenty Mile area range from -20˚C to -60˚C in the winter and 10˚C to 30˚C in the summer. Average daily maximum and minimum temperatures in nearby Dawson City range from 23.1˚C in July to -30.1˚C in January (Environment Canada, 2015).

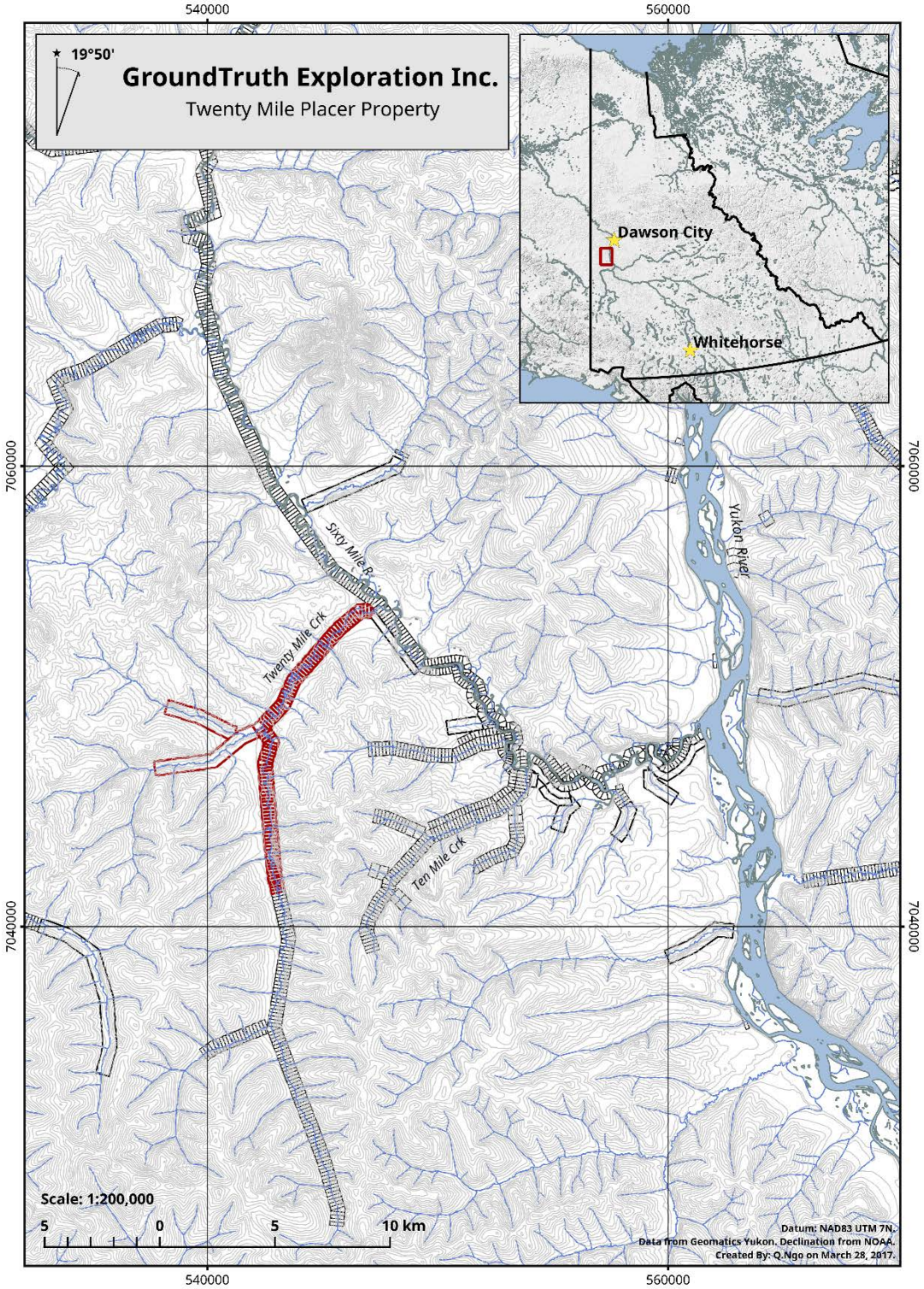


**Figure 1. Yukon Territory with location of interest**

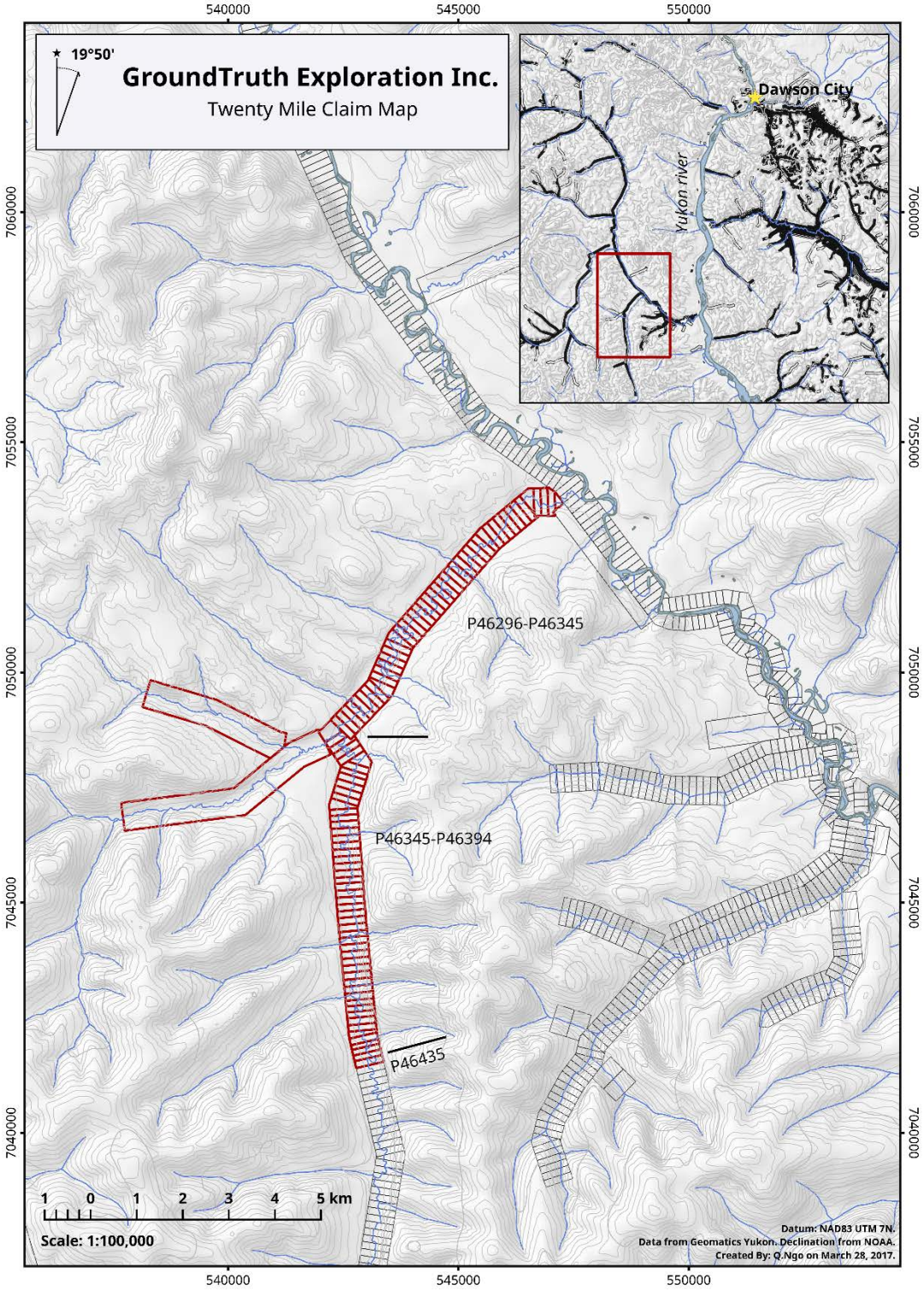


**Figure 2. Twenty Mile claim map**

## 1.5 Historical Work

The Twenty Mile placer property has undergone extensive geophysical surveys between 2009 and 2014 resulting in a ground total magnetic field survey covering the full extent of the property (Appendix C.1).

In March 2009, 181 grid lines totalling 85 line km was completed. The2009 survey was performed perpendicular to the Twenty Mile Creek, totalling 217,987 georeferenced magnetometer readings. In 2010 a four man crew from GroundTruth Exploration Inc performed further total magnetic field survey work on the property, continuing to the south of the 2009 survey. A total of 95 line km were surveyed, consisting of 285 individual lines spaced at 25m. An additional ground total magnetic field survey was conducted by GroundTruth Exploration Inc with a three man crew in 2012, covering ground to the south of the previous surveys. 80 line-km were gridded for the survey, consisting of 178 lines perpendicular to the creek, with a line spacing of 25m. The objective of the 2009, 2010 and 2012, surveys was to identify potential gold bearing, magnetite rich placer channels on the property. The surveys outlined several distinct anomalous magnetic lineaments that warranted follow-up investigation. 2014 field work took place over the 2009 and 2010 total magnetic field survey footprints. Total magnetic survey results centred on the 2014 GPR survey is outlined in Figure 3, overlying 2014 UAV survey orthoimagery. (Fage, 2012; Ryan, 2009; Ryan, 2010)

The leases do not have any historic exploration work documented.

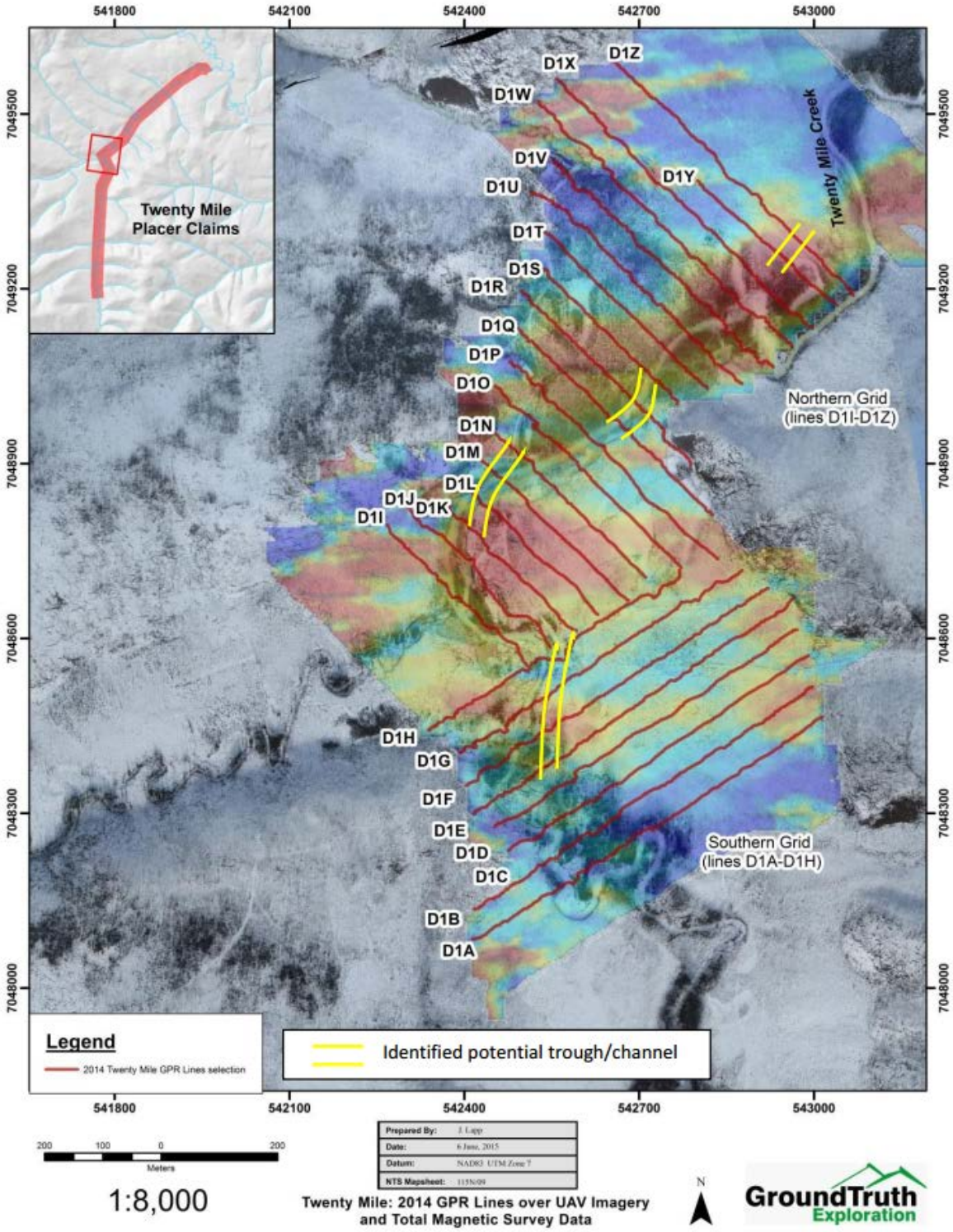


**Figure 3. 2014 GPR lines (Lapp, 2015)**

# 2 Geological Setting

## 2.1 Regional Geology

The Twenty Mile property is located within the Yukon Tanana Terrane (YTT), in the Tintina Gold Belt, a region noted for its placer gold endowment. The YTT represents a mid- to late Paleozoic continental arc system and a coeval back-arc basin that separated the Yukon Tanana arc from the western margin of Laurentia between Late Devonian and Early to Middle Triassic periods (Colpron, 2006). The YTT comprises a lower assemblage of metamorphosed sedimentary and minor volcanic rocks, unconformably overlain by three distinct sequences of predominantly arc metavolcanic rocks and associated metasedimentary rocks – the Finlayson, Klinkit and Klondike assemblages.

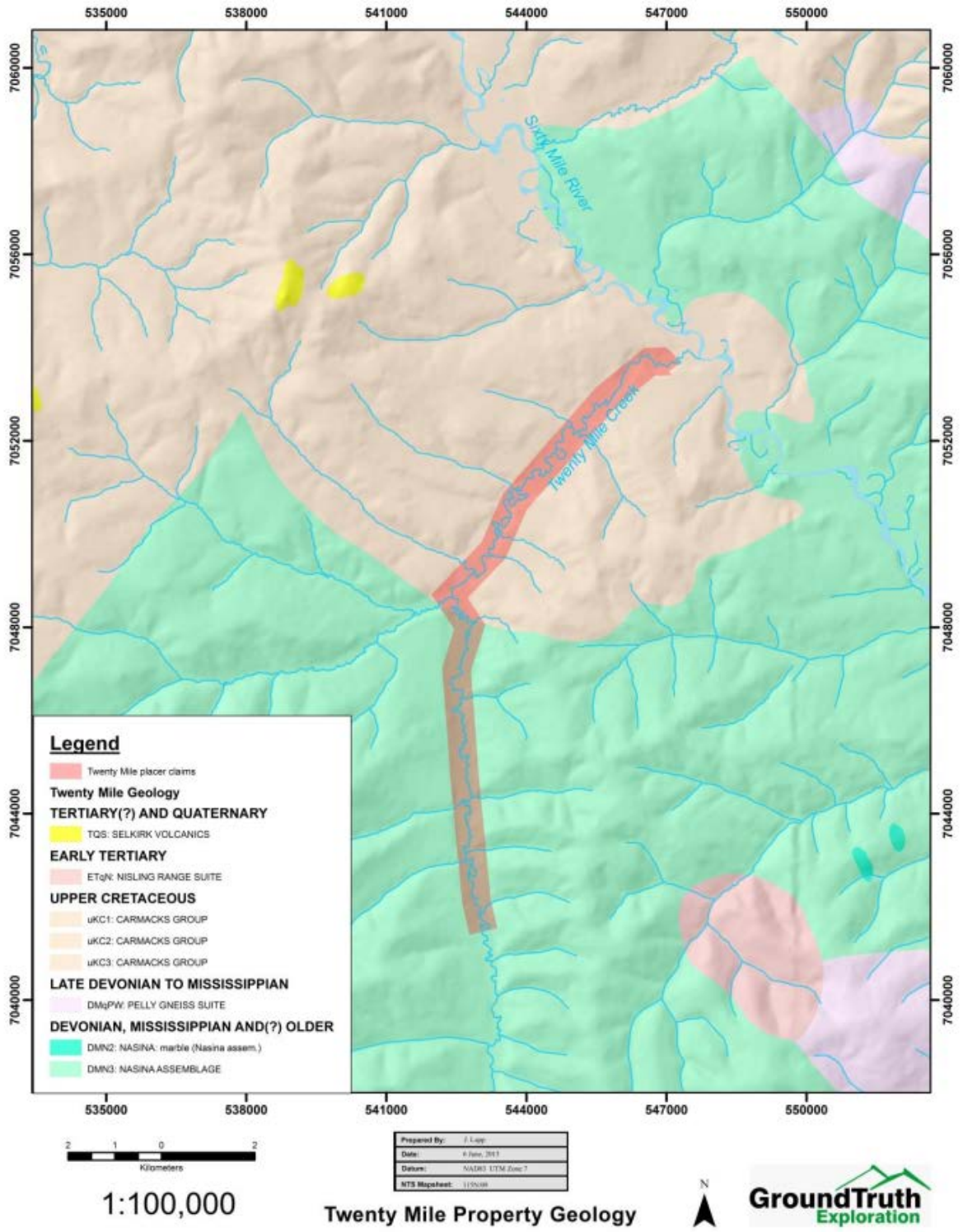


**Figure 4. Regional geology with claims (Lapp, 2015)**

## 2.2 Local Geology

Locally, the Twenty Mile placer property is underlain by the Upper Cretaceous Carmacks Volcanics unit from the mouth of the Twenty Mile Creek to 8km upstream. This unit is composed of rhyodacite and dacite, commonly biotite and hornblende phyric, dominated by lesser andesite and basalt and minor rhyolite. The upper portion of the creek is underlain by a Devonian Quartz-Mica Schist until 17 km upstream, where the stream runs along the contact between this Schist and a Devonian to Mississippian, pink to orange K-feldspar rich, granitic orthogneiss, commonly with biotite, banded to layered. The local geology of the Twenty Mile Creek area is displayed as Figure 4.

# 3 Work Performed

## 3.1 Aerial Imaging Survey (Unmanned)

The claim UAV survey was performed over a period of three days. Both surveys were staffed with a lead UAV operator and assistant UAV operator (spotter).

Photogrammetry: UAV High Resolution Imagery/Elevation Survey

The Drone survey lines and spatial resolution are approved by client prior to survey in accordance with Transport Canada UAV operating permit regulations. Typical flight time is approximately 35 minutes per flight and the operator plans accordingly with available time on ground to determine the number of flights possible per day.

### 3.1.1 Personnel and Equipment

The Drone survey is typically conducted by one trained operator and one spotter. The lead operator is responsible for coordinating efficient operation of survey and ensuring optimal data quality, the spotter is responsible for maintaining visual contact with the drone, monitoring the radio, and looking for flight path conflicts.

The following equipment is used for the completion of the survey:

| | |
|---|---|
| UAV Drone: | Ebee UAV 'Drone' with internal GPS and radio link |
| Camera: | Cannon 16 megapixel camera |
| Base Station: | Panasonic Toughbook laptop with radio link |
| Power Generation: | 1000watt Honda generator |
| GPS units: | 2x Promark3 GPS receivers (if GCPs are collected) |
| Radios: | VHF radio with aircraft frequencies |
| Processing: | Laptop computer with adequate RAM |
| Software: | Emotion software for flight planning/monitoring |
| | Pix4D for image orthorectification |

**Figure 5. Sensefly Ebee UAV drone**

### 3.1.2 Operating Procedure

The survey is completed in the field according to the following procedure:

- Survey is planned using Emotion software prior to departing for field.
- Spatial resolution, footprint, number of planned flights and launch location is determined.
- Operator arrives onsite and sets up base station, UAV unit and ensures adequate launch and landing path is available.
- Prior to launch, operator calls out on Aircraft frequencies to notify Drone survey in progress. Through duration of survey, operator calls out every 5 minutes to notify aircraft of survey in progress.
- Operator Hand launches aircraft and flies survey as planned with number of required flights and maintains visual contact with the UAV
- Data is downloaded from drone after each flight and inspected for quality.
- After survey, all imagery and drone data files are Orthorectified using Pix4D software package.

### 3.1.3 Data Processing

The collected data is downloaded in the field after every flight and checked for integrity. This allows any low quality imagery to be identified and resurveyed while onsite. The drone imagery data is processed every evening by the lead operator in the field using Pix4D software provided by Sensefly. The initial orthorectified image product is generated by an automated process. This image is then cleaned up manually within the Pix4D software by visually checking for low quality portions of the image and selecting another overlapping image for that location. The final cleaned image and DEM product is the result of this manual QC process. The final Image and DEM are georeferenced to NAD83 UTM projection. A final QC report is generated automatically with the final cleaned product.

**Standard data output:**

| | |
|---|---|
| Orthorectified Imagery: | Georeferenced Orthoimage (.png format) |
| Digital Elevation Model: | Gridded Elevation model (.png format) |
| Automated Quality Report: | Report with survey statistics (.pdf format) |

### 3.1.4 Results and Interpretation

Results on following pages. See Figures 6-9.

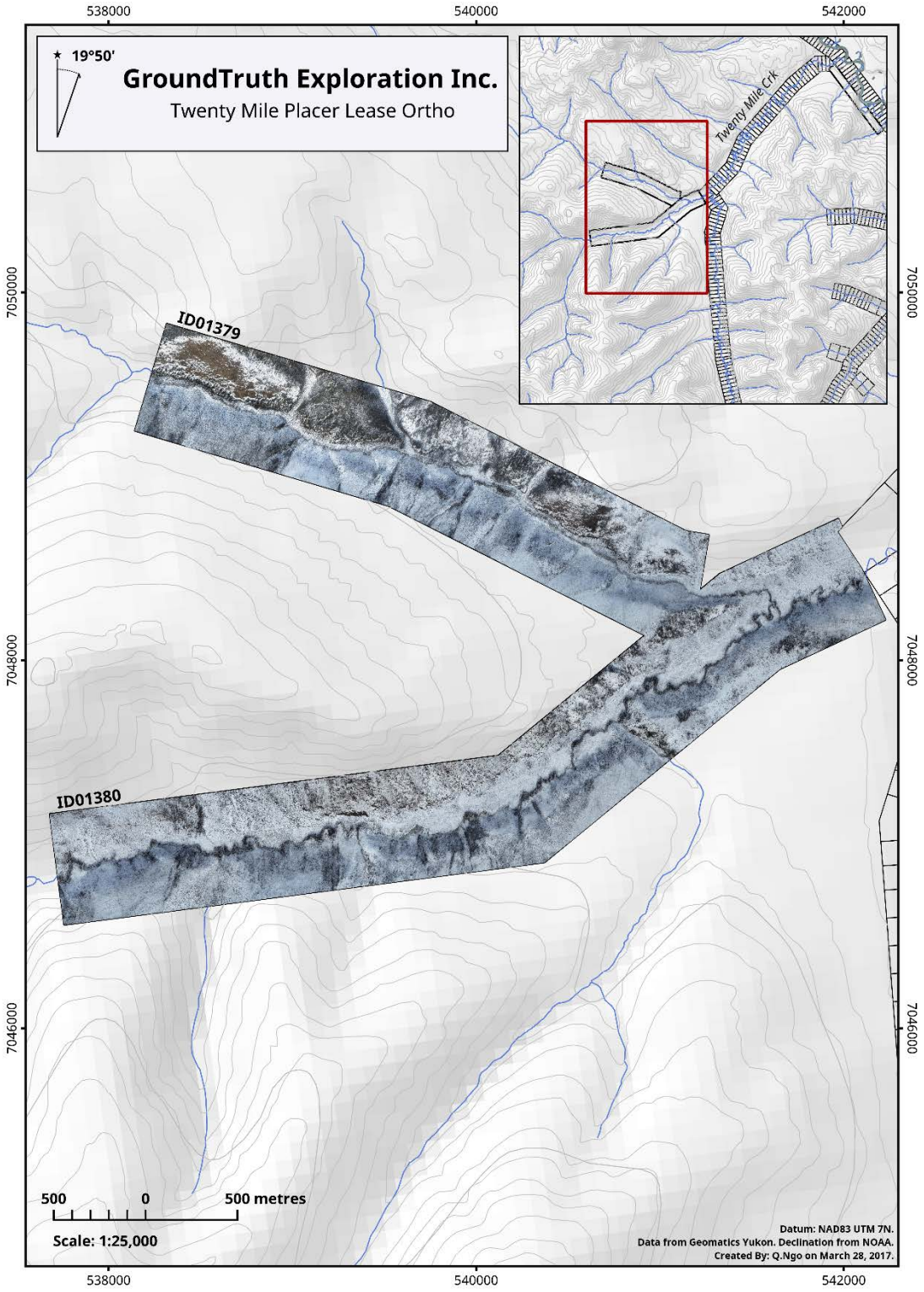


**Figure 6. Placer lease ortho**

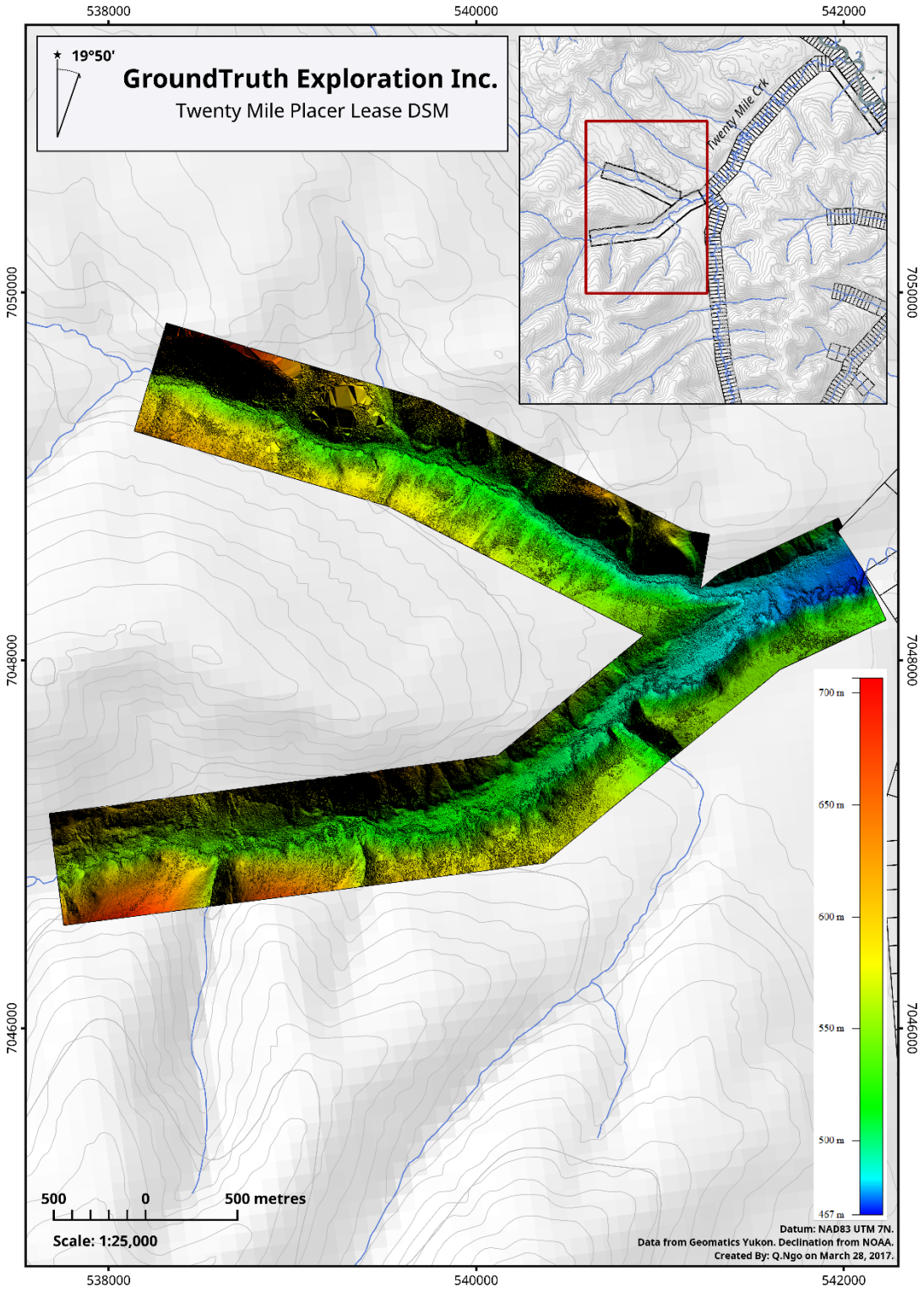


**Figure 7. Placer lease DSM**

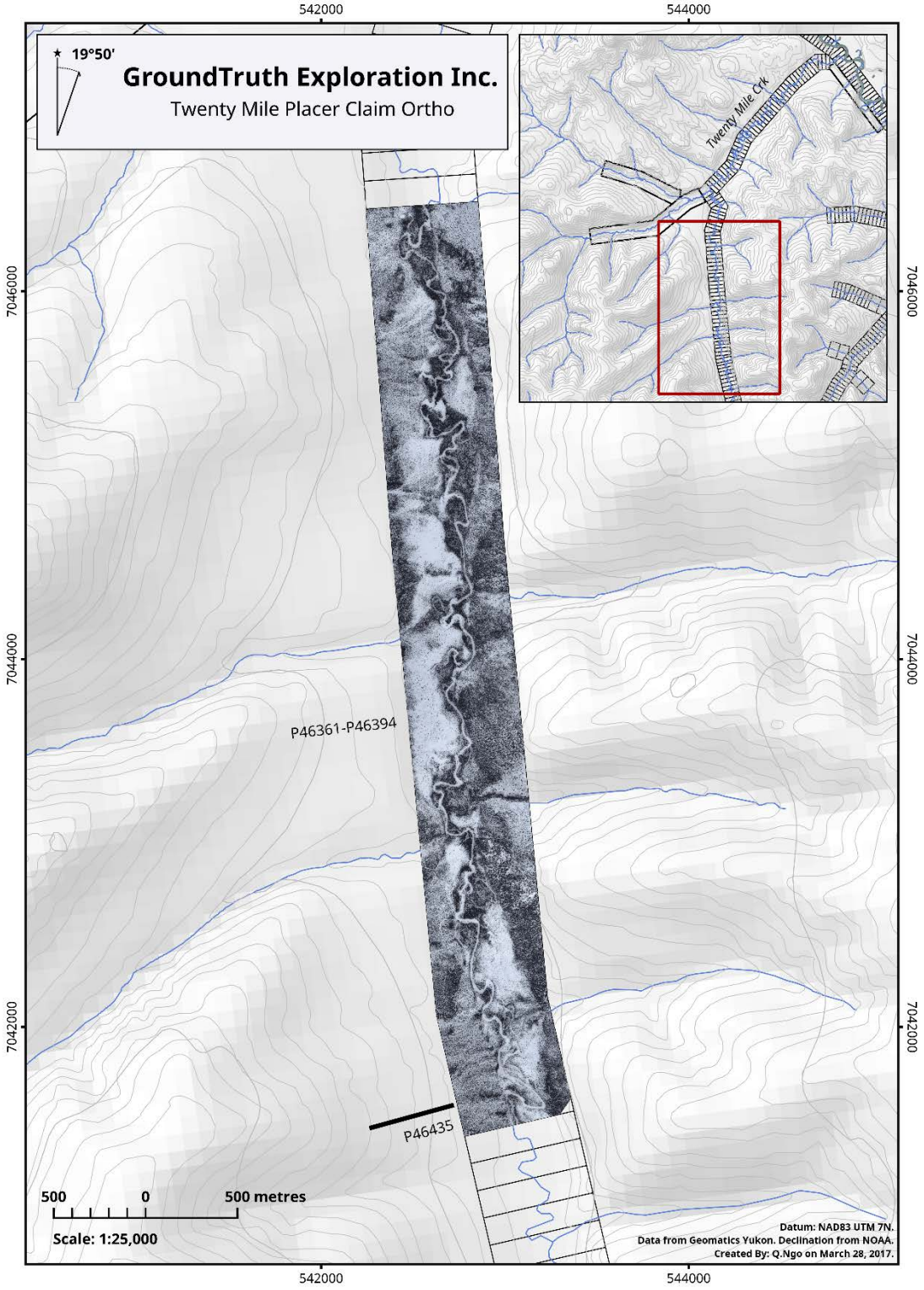


**Figure 8. Placer claims ortho**

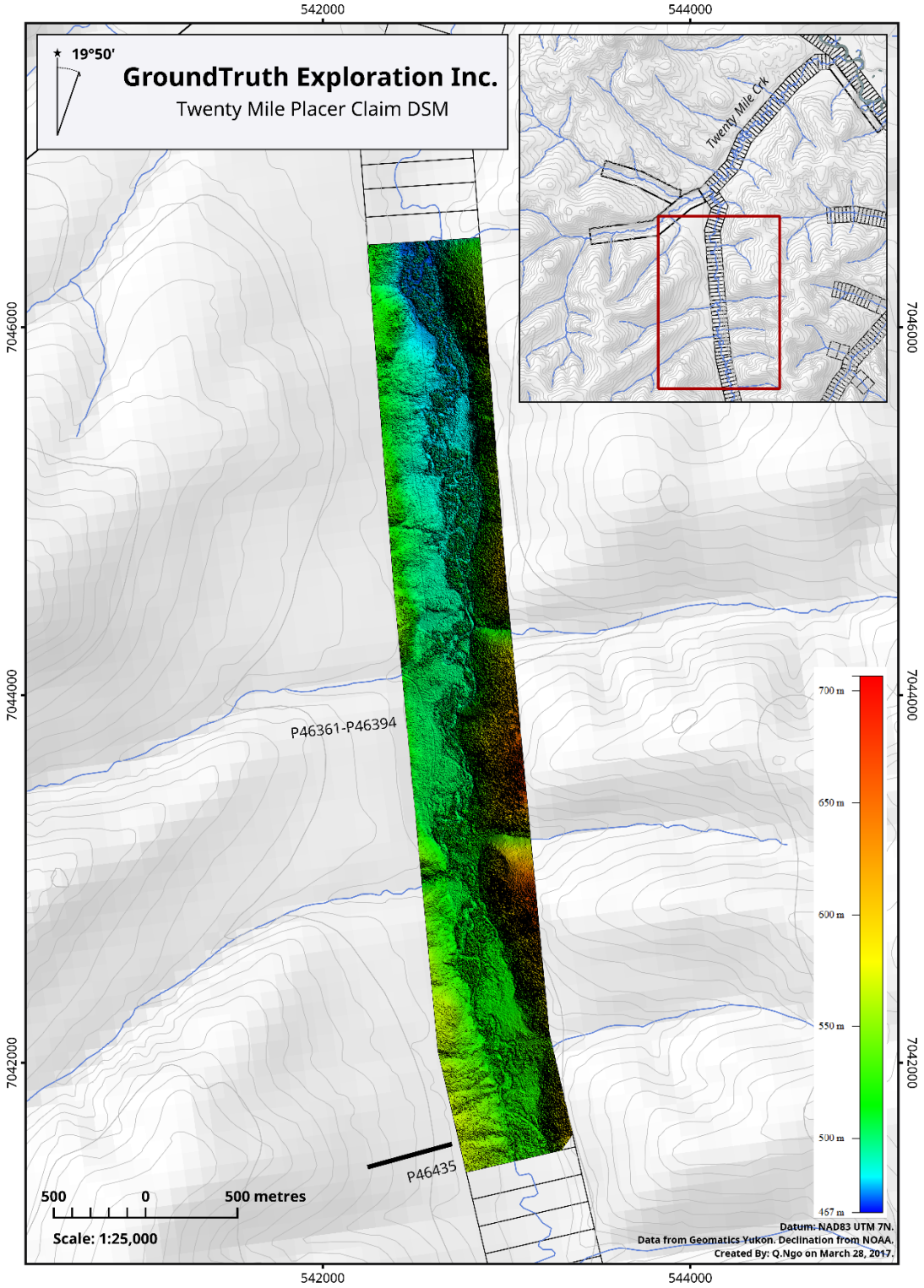


**Figure 9. Placer claims DSM**

## 3.2 Ground Penetrating Radar

Ground penetrating radar (GPR) works like seismic, in that it is based on transmitting energy to the ground and measuring the time taken for the energy to be reflected back at geological targets, be they localised ore-bodies or geological interfaces/boundaries. Instead of seismic or shock waves, GPR transmits electromagnetic energy of high frequency compared to other geophysical methods. It is a very high resolution technique that is very site specific, for example it works very well where the target is within a host rock that has a higher electrical resistivity compared to the target itself, and where there are no conductive surficial layers to absorb radar energy before reaching the target. Another important factor is that radar energy can be scattered and not captured optimally if the reflecting geology or target is not consolidated or of a certain geometry. In conducive settings GPR is a fast high resolution method, can be operated by a single person and can supplement other geophysical methods very well. For this particular project, the 30MHz UltraGPR supplied by Groundradar was used. The system works together with a differential GPS (RTK-DGPS) for data positioning and a portable data logger.

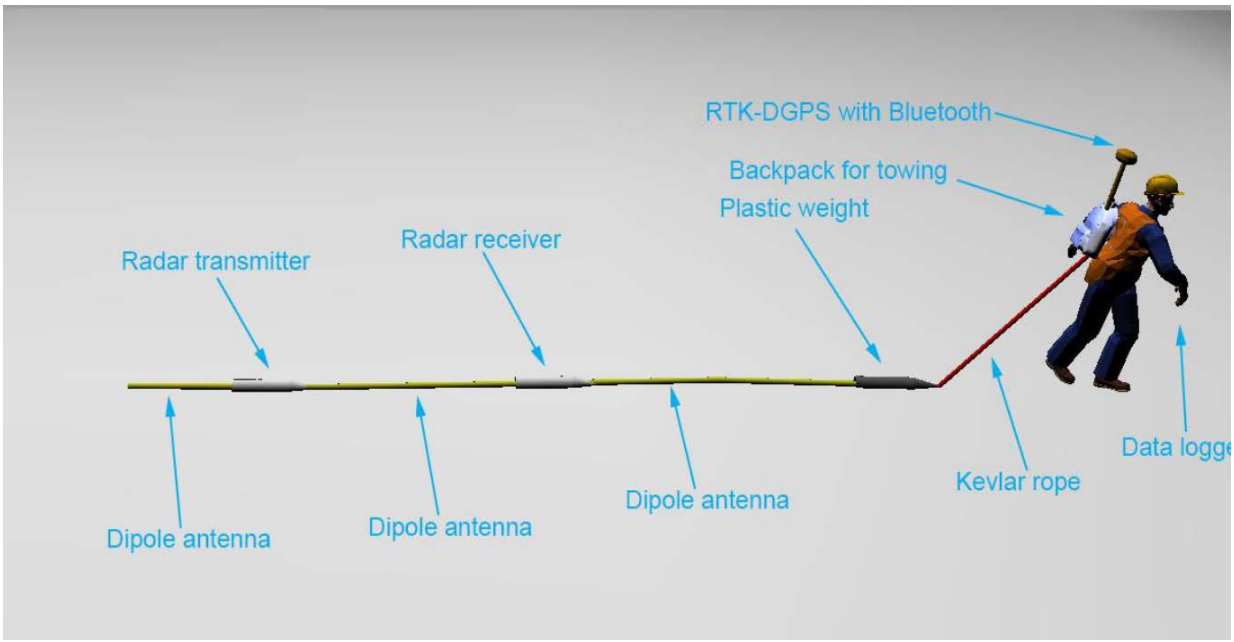


**Figure 10. UltraGPR 30MHz system**

### 3.2.1 Results and Interpretation

With the ten lines on the lease and the 48 lines on the claims, the paleochannel identified in 2014 is further verified. The depth to bedrock is determined to be between 2m and 18m. In Figures 11 and 12, the areas in red returned a high value indicating a longer travel time and therefore deeper depth.

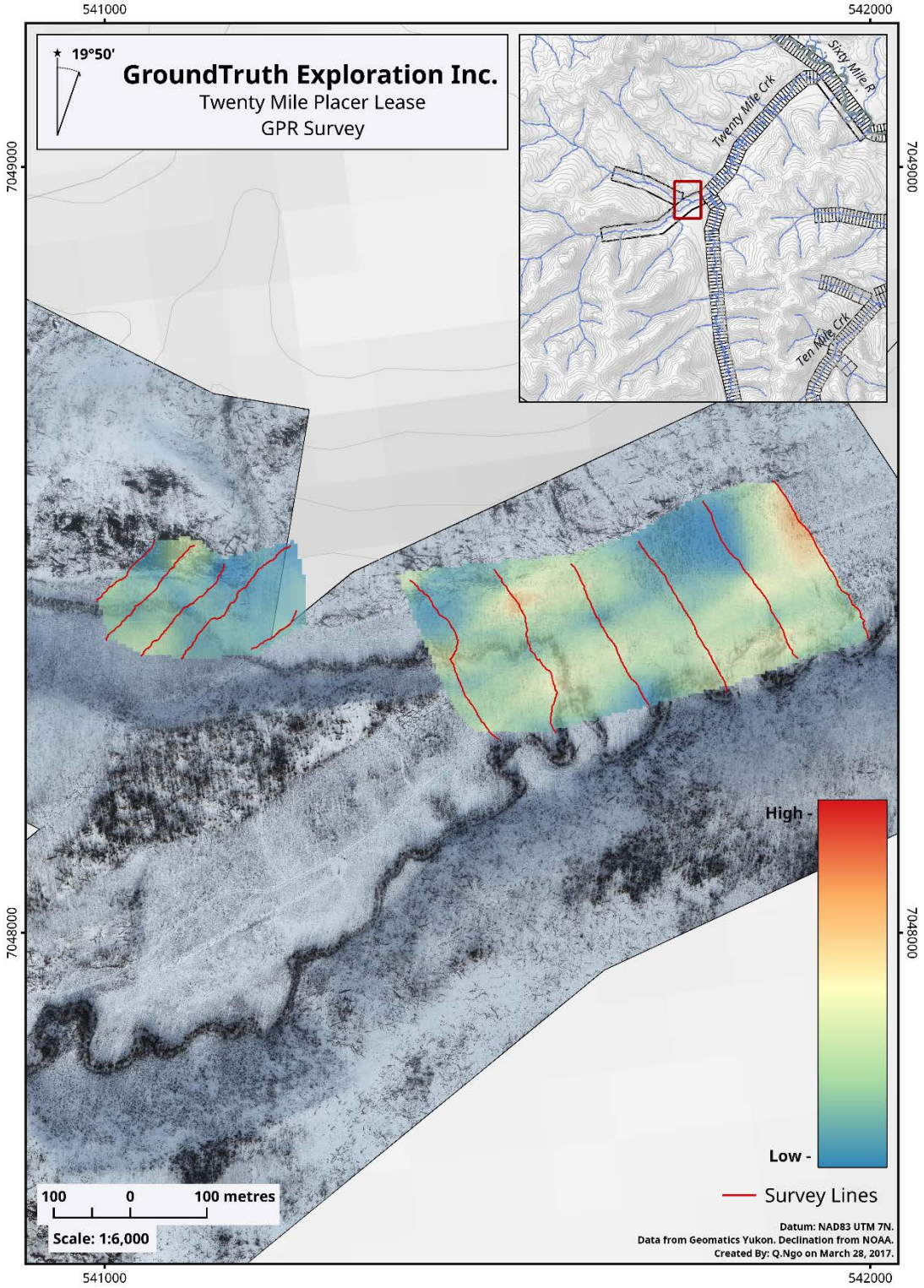


**Figure 11. Placer lease GPR survey overlain on ortho imagery**

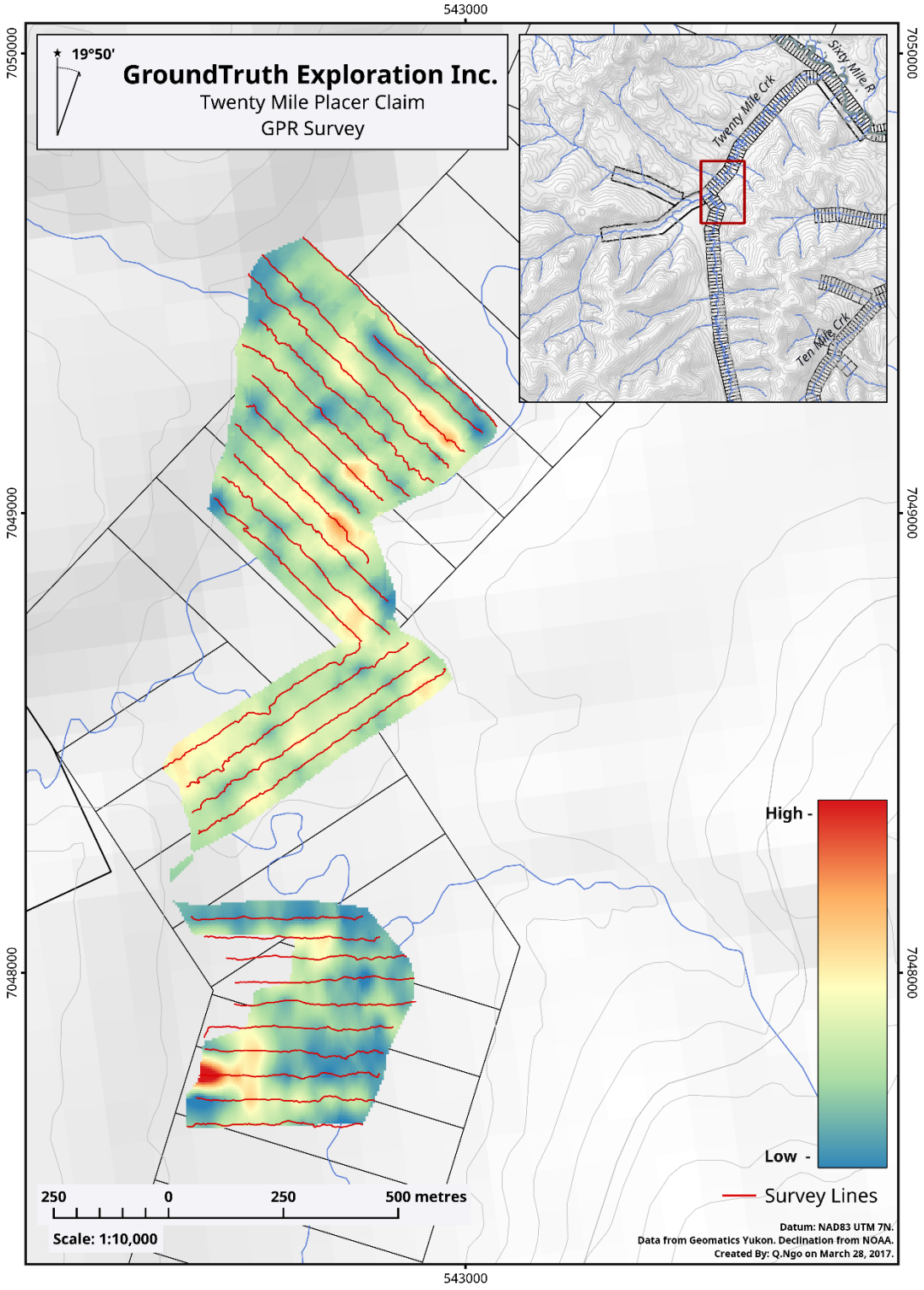


**Figure 12. Placer claim GPR survey (Northern profiles are from 2014)**

## 3.2 Discussion and Interpretation

The UAV survey is useful for interpreting the geophysical surveys to know in detail what the ground conditions are. Locations of permafrost, drainage and slope have a significant impact on geophysical surveys such as resistivity and GPR data. The imagery/topography allows us to get an accurate measurement of true valley floor width and margins from creek drainage. Future access and planning of exploration work locations will be planned from this dataset. Figures show the imagery and topographic model and the level of detail which the local topography is imaged. Basic targeting interpretations are made on the topographic model figures. It is interpreted that generally the North and East facing slope on the lease has best prospectivity for buried placer gravels. The South and West facing slope generally appears to be deeply incised and bedrock being near surface. There is an area at the top end of the lease where the valley broadens significantly and could host a significant volume of placer gravels and should be tested.

The GPR survey indicate a paleochannel, previously identified in 2014, has been verified in two separate surveys. This allows us to give high confidence to the results. While due to the nature of the geophysical method and the local geology the absolute values of the bedrock contact depth can not be stated with extreme confidence, the location of any paleoplacer deposits would occur at the lowest point in the valley bed. Thus the paleochannel, identified twice, can be verified with high confidence.

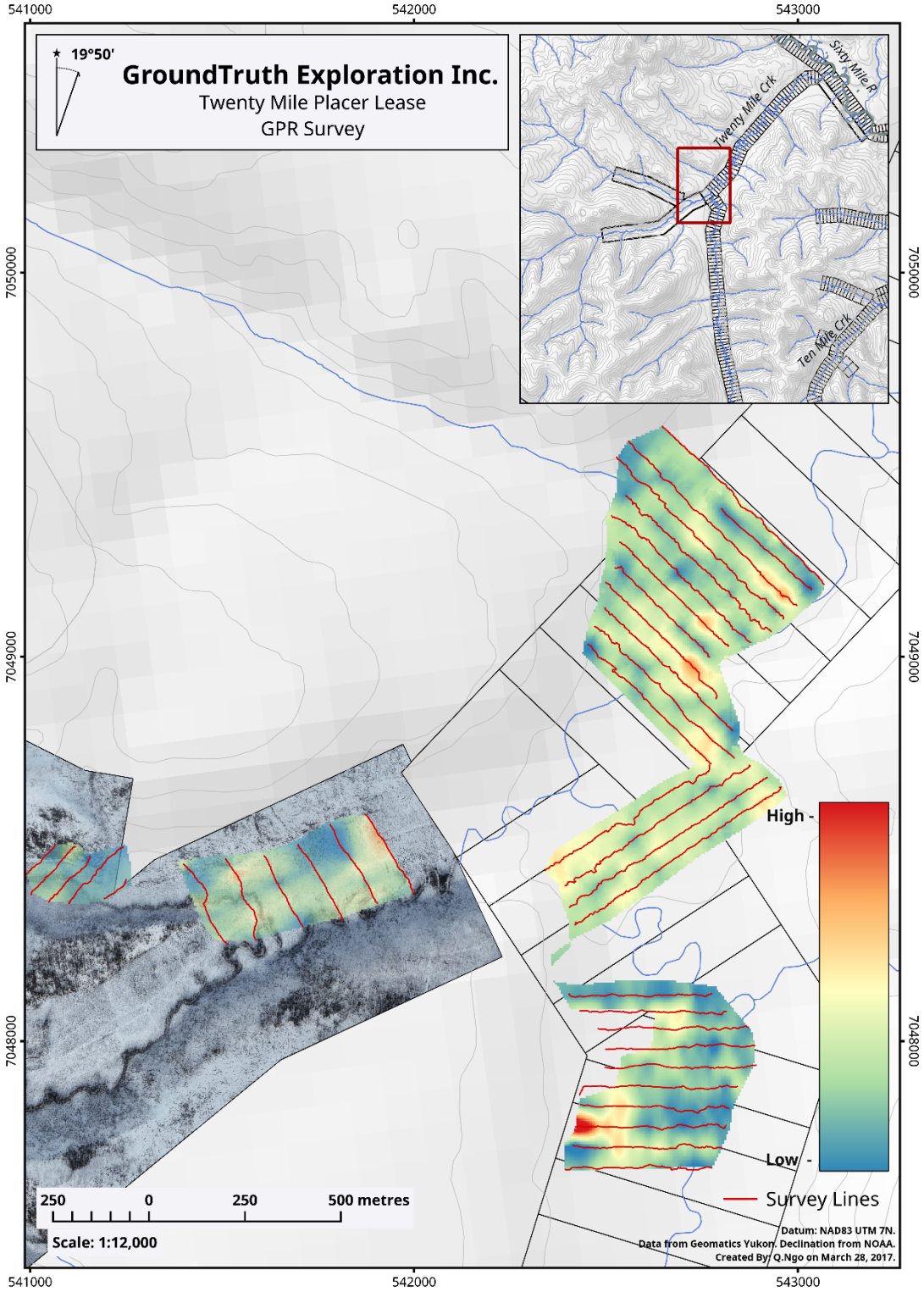


**Figure 13. Placer property GPR survey (Northern profiles are from 2014)**

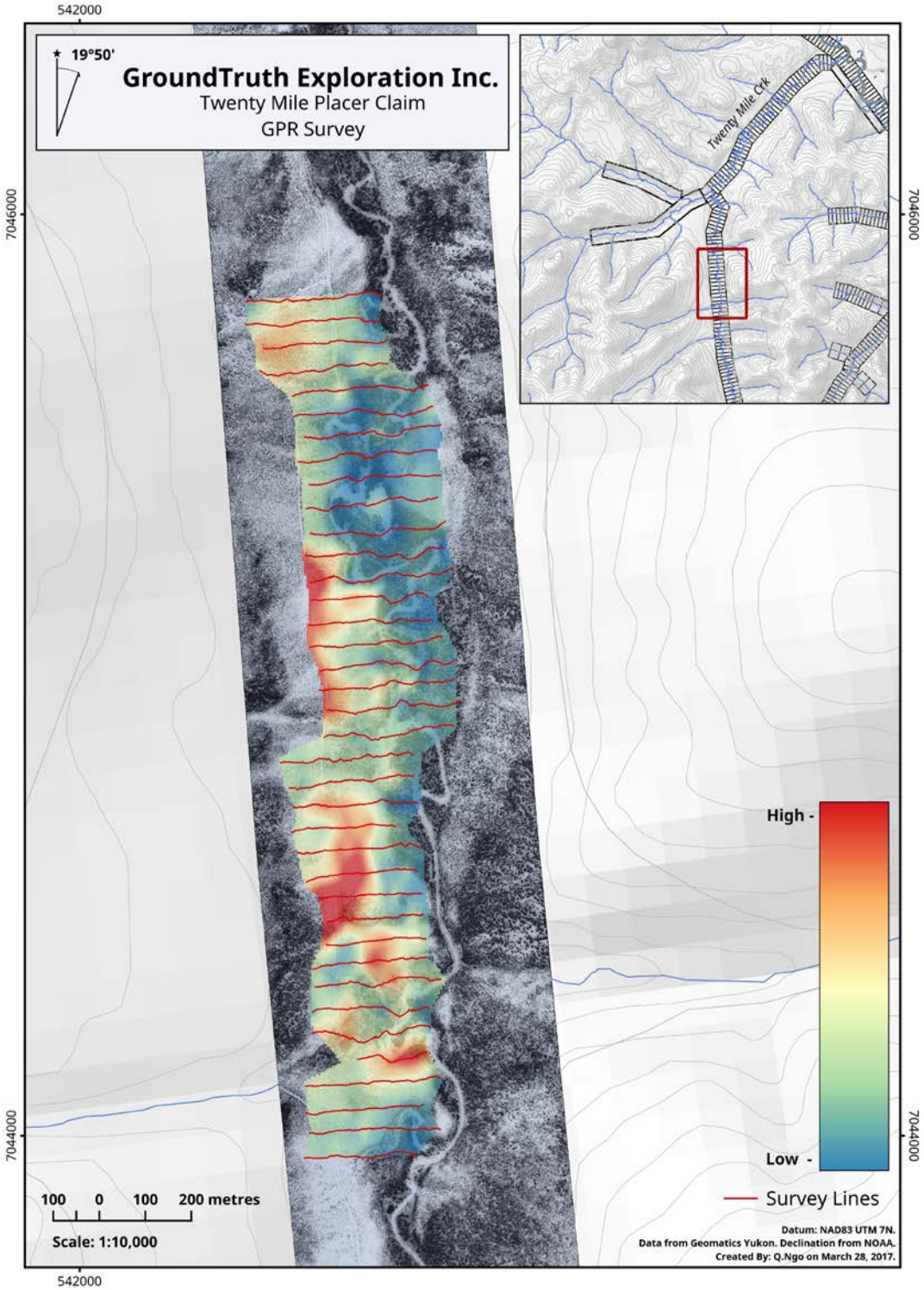


**Figure 14. Placer property GPR survey on upstream claims**

# 4 Expenditures

**Placer Exploration – Twenty Mile Claims** $ 20360

UAV Drone Survey
Ground Penetrating Radar Survey

**Placer Exploration – Twenty Mile Leases** $ 5180

UAV Drone Survey
Ground Penetrating Radar Survey

**Official certificates of expenditures with full breakdown can be found in Appendix B of this report.**

# 5 Conclusions and Recommendations

The extensive geophysical and drone mapping programs and developed targets ready for direct testing by means of drilling or test pits. Future drilling with logged materials would provide an opportunity to test and refine the geophysical interpretations and targets. Drilling or test pitting is recommended to evaluate gold grade on this property.

# 6 Qualification

I, Isaac Fage, have been president of GroundTruth Exploration Inc. in Dawson City since May 2010. I have worked continuously in Mineral Exploration since 2004. I hold an advanced diploma in Remote Sensing from the Centre of Geographic Sciences in Lawrencetown, Nova Scotia.

I have overseen the survey work described in this report on Placer Lease ID01379 and ID01380 and Placer Claims P46461-P46394 and P46435 at Twenty Mile.

Dated this 28th day of March, 2017 in Dawson, YT.

Respectfully submitted,

Isaac Fage
President
GroundTruth Exploration Inc.

# Appendix A: References

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**Additional review of various published scientific and reporting papers on the geology and mineral deposits of the region for indirect reference.

# Appendix B: Invoice

## GroundTruth Exploration Inc.: Twentymile March 2017 Survey Expenses

### Part 1: Placer Exploration - Twentymile Creek Placer Claims

**Overview:**

3 Day survey on Twentymile Claims, with Drone imagery/topo acquisition and GPR cross creek profiles.
Interpretation and Assessment Report by GroundTruth Exploration.
**Survey work was conducted before March 18, 19,20/17.**

| Ground Penetrating RADAR and UAV Drone Surveys: | Chargeout | Units | Costs | |
|---|---|---|---|---|
| **GPR Survey Wages** | | | | |
| 1 Geophysical Operator | $ 550.00 | 3 | $ 1,650.00 | |
| Field Assistant(s) | $ 385.00 | 3 | $ 1,155.00 | $ 2,805.00 |
| **GPR Survey Equipment and Processing** | | | | |
| GroundRadar 30Mhz GPR System | $ 300.00 | 3 | $ 900.00 | |
| 3rd Party GPR Processing at $100/profile | $ 100.00 | 48 | $ 4,800.00 | $ 5,700.00 |
| **UAV Drone Survey Wages** | | | | |
| 1 UAV Drone Operator | $ 500.00 | 1 | $ 500.00 | |
| 1 Assistant Operator/DGPS Surveyor | $ 385.00 | 1 | $ 385.00 | $ 885.00 |
| **UAV Drone Survey Equipment and Processing** | | | | |
| Sensefly Ebee UAV with Base Station | $ 500.00 | 2 | $ 1,000.00 | |
| Imagery Processing and Finals ($100/flight) | $ 100.00 | 8 | $ 800.00 | $ 1,800.00 |
| **Interpretation and Reporting:** | | | | |
| Assessment Report ($120/hr) (report, layout, interp/processing 12h, ) | $ 120.00 | 16 | $ 1,920.00 | $ 1,920.00 |
| | | | | |
| **Helicopter: (estimate, to be paid direct by client)** | | | | |
| 206 Jetranger - 5.8h total over 3 days (paid direct) | $ 1,250.00 | 5.8 | $ 7,250.00 | $ 7,250.00 |
| **Ground Penetrating RADAR and UAV Drone Survey Total:** | | | | **$ 20,360.00** |

### Part 2: Drone/GPR Survey on Placer Leases ID01379, ID01380

1 Day survey on Twentymile Leases, with Drone imagery/topo acquisition and GPR cross creek profiles.
Interpretation and Assessment Report by GroundTruth Exploration.
**Survey work was conducted on March 21/17**

| Ground Penetrating RADAR and UAV Drone Surveys: | Chargeout | Units | Costs | |
|---|---|---|---|---|
| **GPR Survey Wages** | | | | |
| 1 Geophysical Operator | $ 550.00 | 1 | $ 550.00 | |
| Field Assistant(s) | $ 385.00 | 1 | $ 385.00 | $ 935.00 |
| **GPR Survey Equipment and Processing** | | | | |
| GroundRadar 30Mhz GPR System | $ 300.00 | 1 | $ 300.00 | |
| 3rd Party GPR Processing at $100/profile | $ 100.00 | 10 | $ 1,000.00 | $ 1,300.00 |
| **UAV Drone Survey Wages** | | | | |
| 1 UAV Drone Operator | $ 500.00 | 1 | $ 500.00 | |
| 1 Assistant Operator/DGPS Surveyor | $ 385.00 | 1 | $ 385.00 | $ 885.00 |
| **UAV Drone Survey Equipment and Processing** | | | | |
| Sensefly Ebee UAV with Base Station | $ 500.00 | 1 | $ 500.00 | |
| Imagery Processing and Finals ($100/flight) | $ 100.00 | 6 | $ 600.00 | $ 1,100.00 |
| **Interpretation and Reporting:** | | | | |
| Assessment Report ($120/hr) (report, layout, interp/processing 4h, ) | $ 120.00 | 8 | $ 960.00 | $ 960.00 |
| **Ground Penetrating RADAR and UAV Drone Survey Total:** | | | | **$ 5,180.00** |

| | |
|---|---|
| **ID01379 (Joel Spurlock 2 mile) 2/5 of expenses** | **$ 2,072.00** |

| | |
|---|---|
| **ID01380 (Deb Spurlock 3 mile) 3/5 of expenses** | **$ 3,108.00** |

*I. Fage: March 22, 2017*

# Appendix C: Supplemental Figures

Appendix C.1: Twenty Mile Total Magnetic Field Survey