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Assessment Report on
Ground Geophysical Surveying on
at the Jackfish Property Mineral Claims
127475, 149373, 205497, 247681 and 320731

Syine Township

Thunder Bay Mining Division

District of Thunder Bay, Ontario

NTS 42D15

NAD83 Zone 16 UTM

504,107 mE 5,409,480 mN Latitude 48° 50’ 17.8”N Longitude 86° 56’ 38.5”W

July 10-15, 2018

By Troy Gill, B.Sc., MAIG.
Cl. #409847
Sanatana Resources Inc.
Cl. #10000462
#1910-925 West Georgia Street
VANCOUVER, BC, V6C 3L2

June 5, 2020

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Summary

The Jackfish property is located within the Syine Township, on the north shore of Lake Superior in northwestern Ontario, approximately 250 km east of Thunder Bay (Figure 1). In total, the Jackfish property comprises 281 combined single and boundary cell mining claims covering an area of 3,769 hectares, held under option by Sanatana Resources Inc. from three separate parties. The property is accessed by bush trails off of the Trans-Canada Highway 17. All co-ordinates quoted in text or appearing on maps are either latitude and longitude or Universal Transverse Mercator (UTM) metres easting and northing using the North American Datum 83 (NAD83) Zone 16.

The property is located in the Wawa terrane of the Superior Province of the Canadian Shield, specifically the Schreiber-Hemlo greenstone belt. The greenstone belt in the region consists of metavolcanic and metasedimentary rocks into which the Terrace Bay pluton was emplaced. The property encompasses the eastern half of the Terrace Bay pluton as well as the contact metamorphic zone and part of the the Schreiber-Hemlo greenstone belt supracrustal sequence of folded and foliated metavolcanic basalts and felsic flows and tuffs intercalated with metsedimentary rocks in the northern and eastern parts of the property. The Terrace Bay Pluton is host to numerous small historic gold and base metal occurrences and there is potential to find others, perhaps of economic significance in current times.

Historic mining and exploration on the property dates back to the late 19th century. Since then various companies explored in the area completing surveys, including geophysical surveys, mapping, trenching, sampling and drilling and discovered several mineral occurrences.

A Very Low Frequency Electromagnetic (VLF-EM) ground geophysical survey was undertaken on five of Wayne Richards cell mining claims of the Jackfish property between the dates of July 10 – 15, 2018. Only 2.16 line kilometres of the total 8.56 line kilometre VLF-EM survey covered the cell mining claims of this assessment report. This report presents the survey report and VLF-EM data as well as additional information about the property and the mining claims covered by the survey and provides some interpretations that will help to guide future exploration work on the Jackfish property.

The results of the VLF-EM survey identified several anomalous conductor trends on the property. Based on the data and image processing presented in the VLF-EM survey reports, it was concluded that this reconnaissance method of geophysical surveying using the EM-16 was a valid and useful means of identifying conductive structures on the Jackfish property.

The recommendations presented in the survey reports will be followed up on in the field over the coming seasons with prospecting, outcrop stripping and potentially drilling along the major conductive lineaments.

Introduction

A Very Low Frequency Electromagnetic (VLF-EM) ground geophysical survey was undertaken on five of Wayne Richards cell mining claims of the Jackfish property between the dates of July 10 – 15, 2018. The purpose of the work was to delineate conductive structures possibly hosting gold and basemetal mineralization within the Terrace Bay Pluton granodiorite rocks of the Schreiber- Hemlo greenstone belt. The Terrace Bay Pluton is host to numerous small historic gold and base metal occurrences and there is potential to find others, perhaps of economic significance in current times.

This report presents the survey report and VLF-EM data as well as additional information about the property and the mining claims covered by surveys and provides some interpretations that will help to guide future exploration work on the Jackfish property.

Property Location, Description and Access

The Jackfish property is located within the Syine Township, on the north shore of Lake Superior in northwestern Ontario, approximately 250 km east of Thunder Bay (Figure 1). The property is centered on 504,107 mE 5,409,480 mN (NAD 83 Zone 16) or at Latitude 48° 50' 17.8"N Longitude 86° 56' 38.5"W.

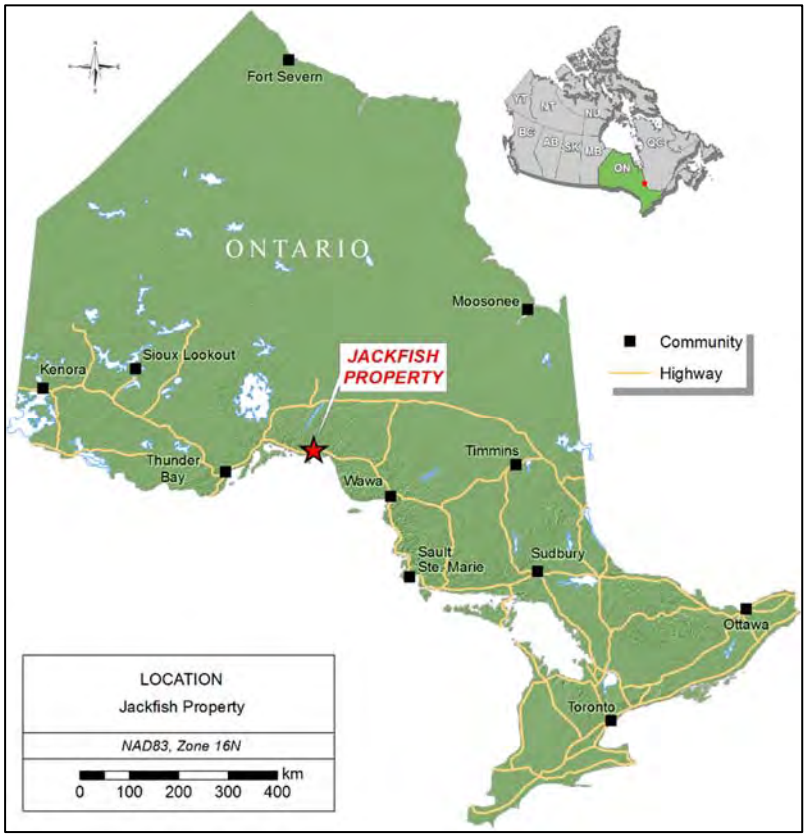


***Figure 1**: Property Location Map.*

In total, the Jackfish property comprises 281 combined single and boundary cell mining claims covering an area of 3,769 hectares, held under option by Sanatana with three optionor groups; Alto Ventures Ltd., Rudy Wahl and Richards *et al* (including Wayne Richards, Francine Richards and James Hamel). The VLF-EM surveys covered 5 cell mining claims of the Jackfish property held 100% by Wayne Richards, as listed

in Table 1 and shown on Figure 2. Other cell mining claims covered by both surveys are excluded from this report and have been filed for assessment separately.

***Table 1**: Report Cell Mining Claims.*

Tenure #	Township	Cell #	Type	Client ID	Holder
127475	SYINE	42D15E392	Boundary Cell Mining Claim	303657	100% Wayne Richards
149373	SYINE	42D15E394	Boundary Cell Mining Claim	303657	100% Wayne Richards
205497	SYINE	42D15E374	Single Cell Mining Claim	303657	100% Wayne Richards
247681	SYINE	42D15E393	Boundary Cell Mining Claim	303657	100% Wayne Richards
320731	SYINE	42D15E373	Boundary Cell Mining Claim	303657	100% Wayne Richards

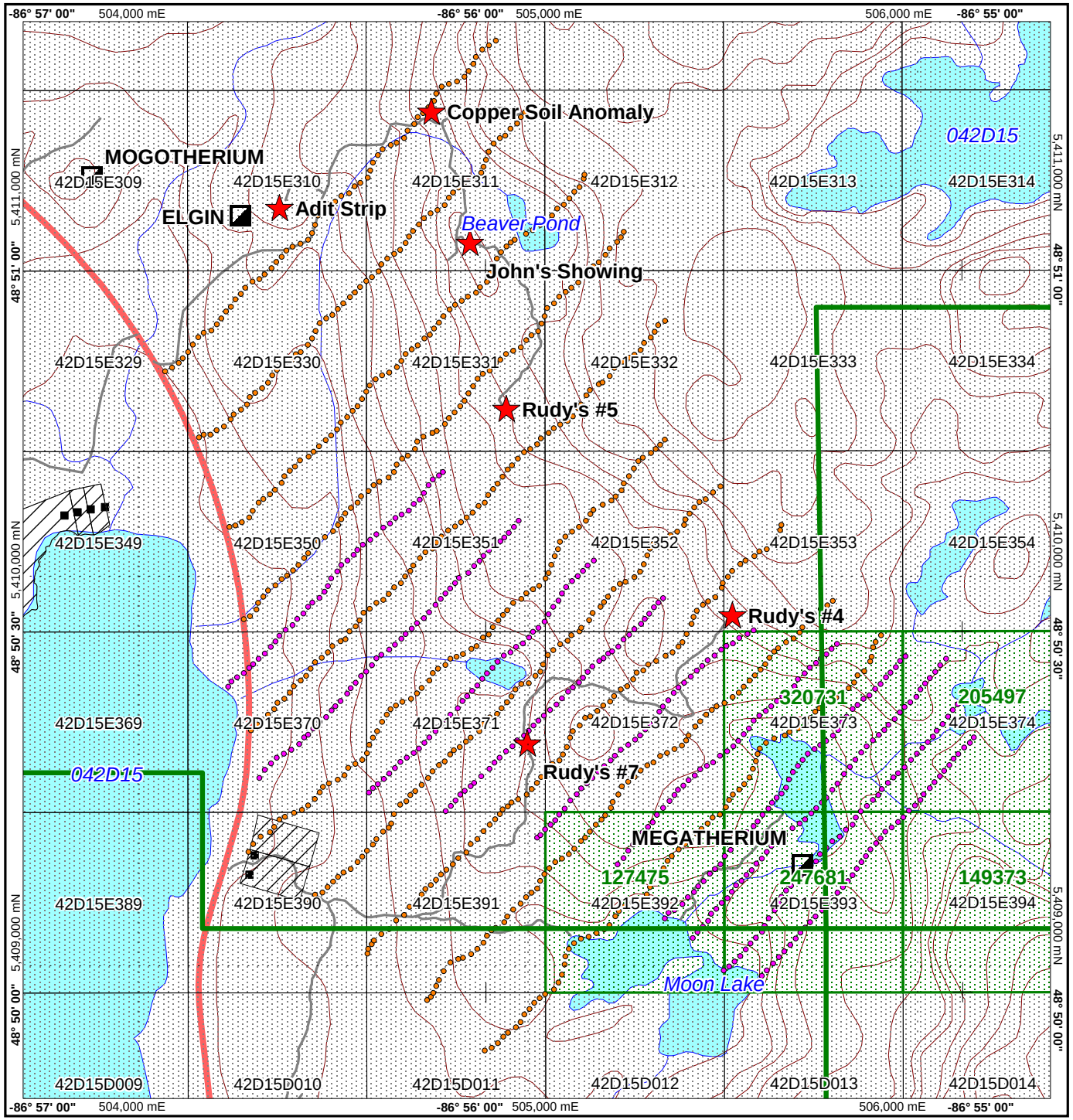
The property is accessed by travelling 20 km east of Terrace Bay or 63 km west from Marathon via Trans-Canada Highway 17. The mining claims are readily accessible off Highway 17 by all-terrain vehicle (ATV) along bush trails (Figure 2).

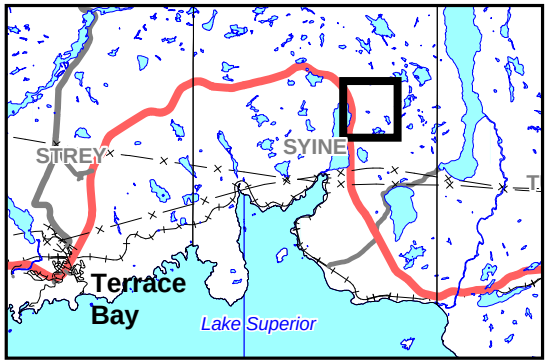
The terrain around the property is quite rugged and vegetation cover is moderately thick. There is a sparse to moderate amount of bedrock outcrop on the property, mostly along cliffs and at highway road cuttings, but exposure in the forest is commonly masked by moss cover.

All co-ordinates quoted in text or appearing on maps are either latitude and longitude or Universal Transverse Mercator (UTM) metres easting and northing using the North American Datum 83 (NAD83) Zone 16.

Property History

The exploration activity in the area of the Jackfish property started at the end of the 19th century sparked by the discovery of the Empress Mine in 1895 (Walker, 1967) in metavolcanic rocks of the Schreiber-Hemlo Greenstone Belt just north of the Terrace Bay Pluton. Relevant historical mining and exploration work conducted on the property, mostly sourced from assessment reports filed with the Ministry of Energy, Northern Development and Mines, is summarized in Table 2.





- Historical Workings
- Building
- Stripped Showings
- 2017 VLF Station
- 2018 VLF Station
- Highway 17
- Watercourse
- Trail
- Contour
- Wayne Richards Legacy Property
- Excluded Area
- Wayne Richards Cell Mining Claims
- Provincial Grid
- Land Disposition
- Waterbody

%

300 0 300 600

Metres

Jackfish Property
Report Figure 2

2017 - 2018 VLF Survey Grids, Mining Claims and Key Locations

Author:	T. Gill	Date:	June 2020
Projection:	UTM NAD83 Zone 16	Scale:	1 : 15 000
Mapsheet:	NTS 042D15	MNDM:	Thunder Bay Mining Division

***Table 2**: Historical exploration work in the property area.*

Year	Company	Type of Work	Results	Assessment Report #
1882	Elgin Silver	Underground mining from 2 adits	No production data	42D15SW8353
1932	Siville-Ferrier Syndicate	Stripping, sampling	Up to 10.29 g/t Au over 0.91 m	42D15SW8353
1982	Micham Explorations Inc.	Magnetic and electromagnetic (VLF) surveys	No magnetic anomalies; several weak to moderate conductors	42D14SE1074
1983	Rose Resource Corp.	Magnetic and electromagnetic (VLF) surveys	10 EM conductors and no significant magnetic anomalies	42D15SE0128
1983	Wasabi Resources	Airborne magnetic and EM (VLF) survey	Identified 6 EM conductors	42D15SW0088
1983	Wasabi Resources	Ground proofing of airborne EM conductors	All 6 conductors sulfide iron formation with no Au values	42D15SW0066
1984	John Ferguson	Magnetic and electromagnetic surveys	No significant mag; 2 weak VLF anomalies	42D15SW0121
1984	Goldhurst Resources	Magnetic and electromagnetic surveys	No significant mag; 11 very weak EM conductors	42D15SW0116
1984	Goldhurst Resources	Drilling, 4 drill holes; total 305.1m (1001 feet)	Drill hole 84-04: 2.87 g/t Au over 2.44 m including 6.07g/t Au over 0.91m and 0.96g/t Au over 1.22m	42D15SW0118
1985	Micham Explorations Inc.	Mapping, trenching, sampling (58 rock samples)	Highest assay 13.54 g/t Au in quartz vein at N Siville showing outside of Jackfish claims	42D15SW0114
1985	Micham Explorations Inc.	Soil sampling (1521 samples)	Two anomalous areas: Empress structure W Siville showing; Mocan valley structure	42D15SW0115
1985	Micham Explorations Inc.	Diamond drilling 4 drill holes 482.9m (1584.2 ft)	Highest assays 1166 ppb Au over 1.52m; 1588 ppb Au over 1.83m, 44.23 g/t Au over 0.61 m	42D15SW0117
1986	John Ferguson	Stripping, de-watering, trenching; sampling	Highest assay 13.03 g/t Au; 4,075 g/t Ag	42D15SW0504
1986	John Ferguson	Magnetic and electromagnetic surveys	No significant results	42D15SW0111
1987	John Ferguson	Soil sampling	No significant results	42D15SW0106
1987	Forerunner Resources	Mapping, stripping, trenching, sampling	Highest assay 93.24 g/t Au; 109.03 g/t Ag; 1.2% Cu; 7.85% Pb	42D15SW0505
1987	Micham Explorations Inc.	Diamond drilling 10 drill holes 1674m	No assays recorded	42D15SW0109
1988	Beardmore Resources	Trenching, soil sampling, bedrock sampling	Highest assays: 21.05 g/t Au plus 13.3 g/t Ag and 11.45 g/t Au plus 0.2 g/t Ag	42D15SW8353
1989	J.R. Hamel	Sampling	Highest assay 93.26 g/t Au, 82.79 g/t Ag	42D15SW0110
1991	J.R. Hamel	Stripping and sampling	Highest assay 21.05 g/t Au and 26.06g/t Ag	42D15SW0102
1992	Beavercreek Exploration (J.R. Hamel)	Drilling 2 drill holes 28.04 m (92 ft)	Highest assay 12.21 g/t Au over 1.52 m	42D15SW0002
1994	Beavercreek Exploration (J.R. Hamel)	Drilling 5 drill holes 45.1 m (148 ft)	Best result: 0.51 g/t Au over 3.05 m	42D15SW0001
1995	George Daniels et al.	Stripping, trenching, sampling, line cutting, VLF survey	16.39 g/t Au on claim #1207882 Santoy Lake; 15.77 g/t Au Syine Twp. Historic claim #1224852	42D15NW0009
1996	Big Lake Geological Consulting on behalf of J. Ferguson	Mapping, sampling	Highest assays from trench 14.3 g/t Au and 16.39 g/t Au	42D15NW0038
1996	George Daniels	Prospecting, stripping, trenching	Highest assays from trench 21.94 g/t Au	42D15NW0028
1996	Rudolph Wahl et al.,	Rock sampling (100 samples); soil sampling	No significant results	42D15SW0008
1997	Landis Mining Corp.	Evaluation of previous exploration activity in the area	20 lb composite grab sample: 22.97 g/t Au over 3.05 m from Empress structure	42D15SW2002
1998	George Daniels	Sampling	Highest assays from Jon's showing 1.45 g/t Au	42D15SW2003
1999	Cameco Gold Inc.	Line cutting; mag., IP; trenching; re-logging & re-sampling	DDH 441087-9: 8.07 g/t Au; 93.8 g/t Ag over 0.52 m; DDH 44184-7: 7.09 g/t Au; 19.8 g/t Ag over 1.4 m	42D15SW2010

Year	Company	Type of Work	Results	Assessment Report #
2000	George Daniels	Trench cleaning, minor blasting	No results	42D15SW2013
2004	Brian Fowler	Line cutting; mag; prospecting, sampling (21)	Highest assay 324 ppb Au	42D15SW2024
2005	Phoenix Matachewan Mines	Prospecting sampling (19 rock samples)	Highest assay 262 ppb Au	20000001155
2007	Wayne Richards	Prospecting, mapping, stripping, sampling (4 samples)	No Au assays; two samples >100 g/t Ag	20000003831
2007	Alto Ventures Ltd.	Mapping, prospecting and sampling (47 rock samples)	Highest assay 2,278 ppb Au	20000002005
2008	Alto Ventures Ltd.	Drilling 2 drill holes 332 m on Empress structure	0.66 g/t Au over 2.3 m	20000003772
2009	Rudolph Wahl	Prospecting, mapping, sampling (22 samples)	No significant results	I20000004525
2010	Galahad Metals	Soil sampling (619 samples), mapping trenching, sampling (89 samples)	26.8 g/t Au and 119 g/t Ag; 24.7 g/t Au and 40.4 g/t Ag at creek showing	20000005783
2010	Bond et al.	Prospecting, mapping, rock samples (63 samples) and lake sediment samples (7 samples)	309 and 459 ppb Au	20000006073
2010	Bond et al.	Drilling 2 holes 240 m	No significant results	20000006073
2012	Rudolph Wahl	Prospecting, mapping, sampling (30 samples)	1.9 g/t Au sample # 997103	20000007183
2012	Hamel et al.	Prospecting , mapping, sampling (11 samples), diamond drilling	No significant results	20000007081, 2.53866
2014	Alto Ventures Ltd.	Bedrock sampling (21 samples)	No significant results	20000008044
2016	Wayne Richards	Diamond drilling, outcrop stripping, sampling	38.3g/t and 5.21g/t Au grab samples, no significant results from drilling	20000013548
2017	Wayne Richards	Ground VLF Survey	Weak conductors identified	20000015411

Regional Geological Setting

The property is located in the Wawa terrane of the Superior Province of the Canadian Shield, specifically the Schreiber-Hemlo greenstone belt (Figure 3). The greenstone belt in the region consists of metavolcanic and metasedimentary rocks into which the Terrace Bay pluton was emplaced.

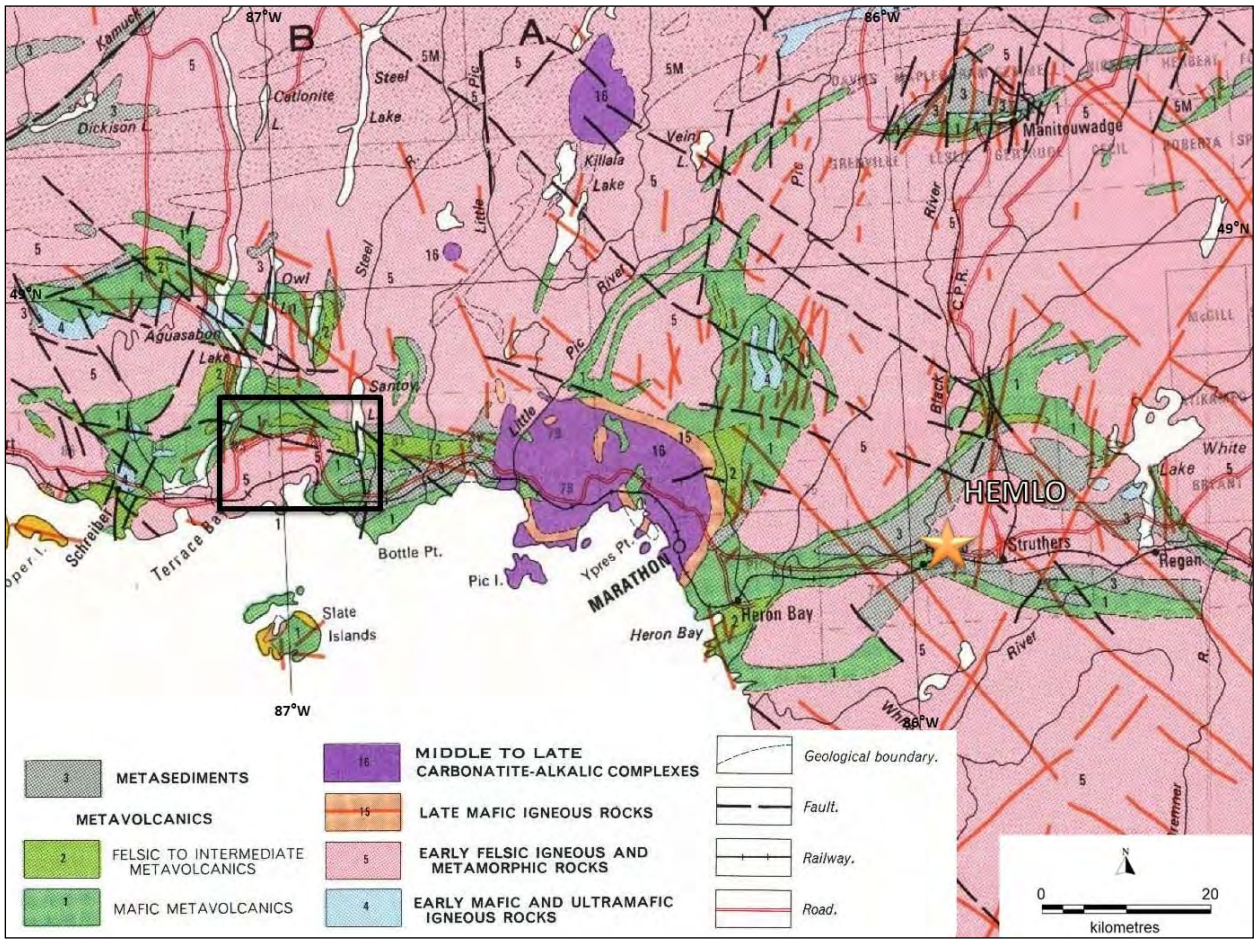
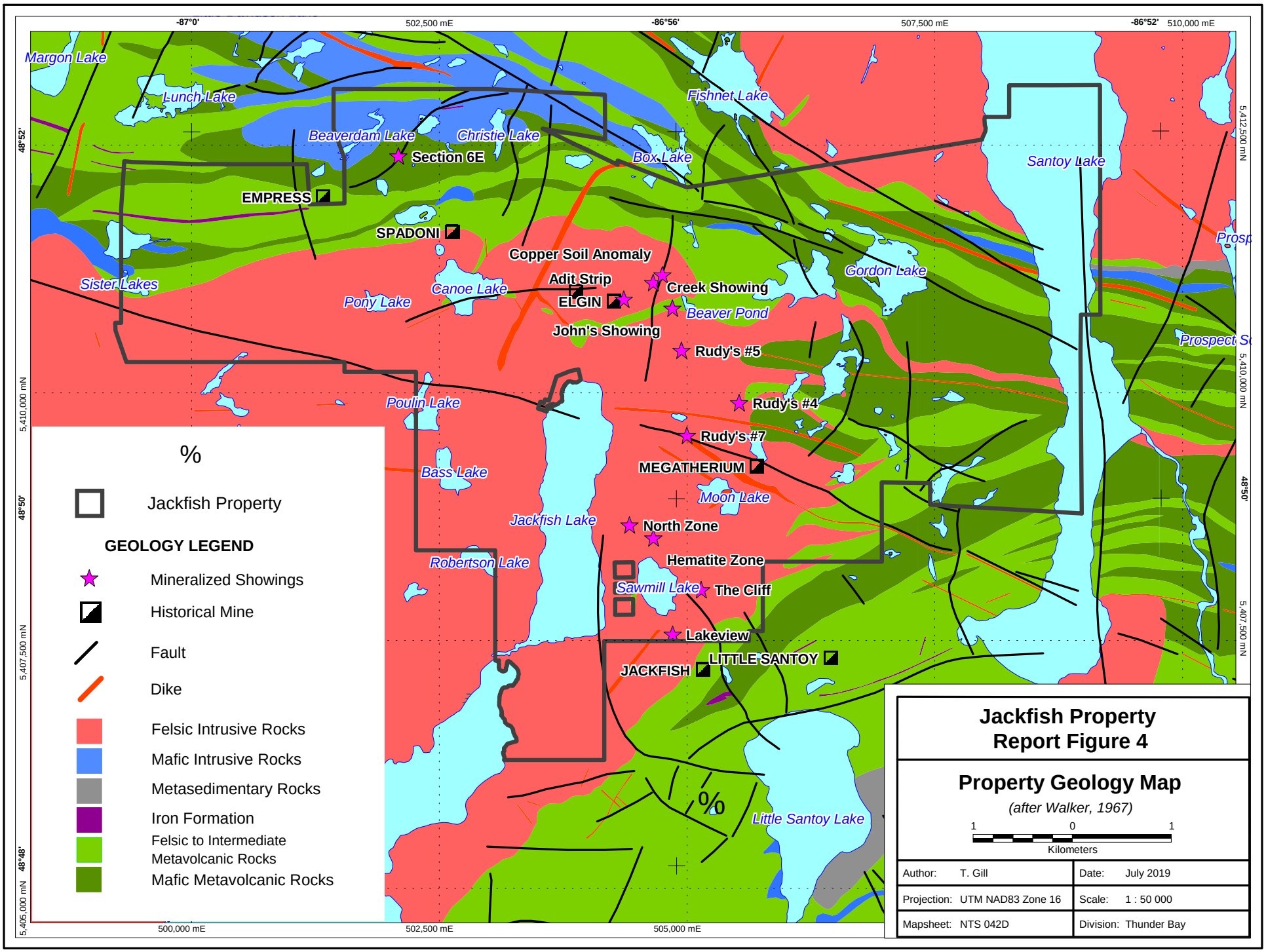


***Figure 3**: Regional Geological Setting Map (after Ayres et al, 1970).*

Property Geology and Mineralization

The Jackfish property straddles the eastern margin of the Terrace Bay Pluton where the granodiorite rocks of the intrusive come into contact with the folded and foliated supracrustal sequence of the Schreiber-Hemlo greenstone belt in a combination of an intrusive and structural setting. The various rock types that have been observed or interpreted to underlie the area are depicted on the property geology map in Figure 4.

Gold, silver and base metal mineralization is known to occur and has been mined historically from quartz-carbonate veins in three different settings across the region; as lenses or stringers within shear zones of the greenstone belt, as networks parallel to the contact between the pluton and supracrustal rocks and as fracture fill within the pluton. These styles of orogenic gold deposits are the key targets of focus for exploration activities on the Jackfish property. The more prominent historical workings and currently active mineralized showings are shown on Figure 4.


-87°0'
502,500 mE
-86°56'
507,500 mE
-86°52'
510,000 mE
48°52'
48°50'
48°48'
5,412,500 mN
5,410,000 mN
5,407,500 mN
5,405,000 mN
500,000 mE
502,500 mE
505,000 mE
Margon Lake
Lunch Lake
Beaverdam Lake
Christie Lake
Fishnet Lake
Box Lake
Santoy Lake
Section 6E
EMPRESS
SPADONI
Copper Soil Anomaly
Adit Strip
ELGIN
Creek Showing
Beaver Pond
John's Showing
Rudy's #5
Rudy's #4
Rudy's #7
MEGATHERIUM
Moon Lake
North Zone
Hematite Zone
The Cliff
Lakeview
LITTLE SANTOY
JACKFISH
Sister Lakes
Pony Lake
Canoe Lake
Gordon Lake
Poulin Lake
Bass Lake
Jackfish Lake
Robertson Lake
Sawmill Lake
Little Santoy Lake
%
Jackfish Property
GEOLOGY LEGEND
Mineralized Showings
Historical Mine
Fault
Dike
Felsic Intrusive Rocks
Mafic Intrusive Rocks
Metasedimentary Rocks
Iron Formation
Felsic to Intermediate Metavolcanic Rocks
Mafic Metavolcanic Rocks
Jackfish Property Report Figure 4
Property Geology Map
(after Walker, 1967)
1 0 1
Kilometers
Author: T. Gill
Date: July 2019
Projection: UTM NAD83 Zone 16
Scale: 1 : 50 000
Mapsheet: NTS 042D
Division: Thunder Bay

Exploration Work

A VLF-EM ground geophysical survey was undertaken to delineate conductive structures possibly hosting gold and base metal mineralization within the Terrace Bay Pluton granodiorite rocks and provide definitive targets for drill testing. The survey called the Rudy Block Grid was conducted by Superior Exploration, Adventure and Climbing Co. Ltd. in July 10 to 15, 2018. Only 2.16 line kilometres of the total 8.56 line kilometre VLF-EM survey covered the cell mining claims of this assessment report. The equipment used, field methods and data processing are all described in detail in the survey report included as Appendix 1. The VLF-EM stations measured along grid lines are shown on Figure 2 in relation to the Wayne Richards Jackfish property cell mining claims and the relevant data from the survey is provided in Appendix 2.

Interpretations

The survey report contains a section on “Discussion of Results” that identifies and describes a number of VLF anomalies and conductors based on the many images generated by data processing and inversion methods.

Conclusions and Recommendations

Based on the data and image processing presented in the VLF-EM survey report, it was concluded that this reconnaissance method of geophysical surveying using the EM-16 was a valid and useful means of identifying conductive structures on the Jackfish property.

The recommendations presented in the survey report will be followed up on in the field over the coming seasons with prospecting along the major conductive lineament that could lead to outcrop stripping or potentially drilling of the observed conductive targets from the Current Density cross sections in the report (Appendix 1).

Cost Statement and Expenditure Distribution

The bulk of the costs of the program are from the contractor who performed the survey work. These costs were paid on invoices (Appendix 3) as a total charge for services. Because the survey work traversed properties with different ownership, only the share of the costs, pro-rated by the total number of survey stations, are presented for assessment in this report (Table 3).

***Table 3**: Pro-Rated VLF-EM Survey Exploration Activity and Associated Costs Included in this Report.*

Work / Cost Type	Description	From Date	To Date	Unit	Cost / Unit	Actual Cost
Ground Geophysical Survey Work – Electromagnetics	VLF-EM field survey work, 2.16 of 8.56 Lkm	10/7/2018	15/7/2018	Lkm	$1,200	$2,592
Ground Geophysical Survey Work – Electromagnetics	Data processing and report, 2.16 of 8.56 Lkm	10/7/2018	15/7/2018	Lkm	$300	$648
Modelling or Reprocessing of Data – Data Modelling	25% share of $1,000 cost of additional maps	10/7/2018	15/7/2018	Share	$250	$250
Modelling or Reprocessing of Data – Data Modelling	Share of additional data merging and modelling 25% of $1,830	10/7/2018	15/7/2018	Share	$250	$458
Lodging	1 room for 4 nights of 6 nights total	10/7/2018	15/7/2018	Day	$89.95	$360
Food	Meals for 4 of 6 days	10/7/2018	15/7/2018	Day	$75	$300
Transport	Truck rental, 4 of 6 days	10/7/2018	15/7/2018	Day	$100	$400
Mobilization	25% share of $1,000 cost	10/7/2018	15/7/2018	Share	$250	$250
Total						**$5,257**

The costs from the survey were distributed over the cell mining claims depending on the number of stations recorded on each claim (Table 4), taking into account the legacy property area when allocating amounts of expenditure to boundary cell mining claims (Figure 2).

***Table 4**: Distribution of Pro-Rated Exploration Costs across Wayne Richards Cell Mining Claims.*

Tenure #	Type	# Units	Authorized Instrument	Exploration Expenses	Consultation Expenses
127475	Boundary Cell Mining Claim	1	N/A	$137	$0
149373	Boundary Cell Mining Claim	1	N/A	$45	$0
205497	Single Cell Mining Claim	1	N/A	$1,600	$0
247681	Boundary Cell Mining Claim	1	N/A	$1,646	$0
320731	Boundary Cell Mining Claim	1	N/A	$1,829	$0
			Total	**$5,257**	**$0**

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Statement of Qualifications

Troy Gill
1910-925 West Georgia Street
Vancouver, BC, V6C 3L2
Telephone: 604-762-0380
Email: troy@sanatanaresources.com

I, Troy Gill, do hereby certify that:

1. I am employed as Exploration Manager for Sanatana Resources Inc.

2. I am responsible for the Report titled "Assessment Report on Ground Geophysical Surveying on at the Jackfish Property Mineral Claims 127475, 149373, 205497, 247681 and 320731, Syine Township, Thunder Bay Mining Division, District of Thunder Bay, Ontario, NTS 42D15" dated June 5, 2020, and prepared for Sanatana Resources Inc.

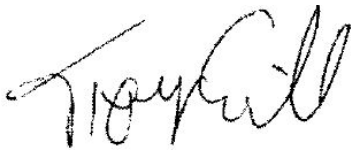
3. I hold the following academic qualifications: B.Sc. Geology (1993), University of Wollongong, NSW, Australia.

4. I am a member in good standing of the Australian Institute of Geoscientists (MAIG).

5. I have worked on a range of commodities including Au, Cu, Ni, diamonds, coal and iron ore in various geological settings in Australia and Canada since 1993.

6. This Report is compiled from data collected by or on behalf of Sanatana Resources Inc. in 2018. I conducted fieldwork, supervised the data acquisition and provided the data interpretation associated with this report.

Dated this 5th Day of June, 2020.



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Troy Gill, B.Sc., MAIG.

Exploration Manager, Sanatana Resources Inc.

Appendix 1: VLF EM-16 Survey / Interpretation Report

Over the Rudy Block Grid

VLF EM-16 Survey / Interpretation Report

Over the Rudy Block Grid

In the District of Thunder Bay, Ontario

Prepared For

Sanatana Resources Ltd.

By

Shaun Parent

Superior Exploration, Adventure & Climbing Co. Ltd.

October 9, 2018

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List of Tables and Maps

List of Appendices A (TX NAA)

List of Appendices B (TX NML)

Preamble

Superior Exploration, Adventure & Climbing Co. Ltd. is an Incorporated Company specializing in Mining Exploration and Geophysics as well as Professional climbing.

Our ground VLF surveys (YVLF) have proven themselves as a very effective way to complete geophysics on the ground in a non-invasive way. No cut lines are needed and an exploration permit is not required.

We have worked in many countries and have experience working in a wide variety of environments such as VMS, Breccia Pipes, Epithermal Veins and Shear Hosted Gold Deposits.

Shaun Parent, BSc. P. Geo is a member of the Association of Professional Geoscientists of Ontario as well as the Prospectors & Developers Association of Canada. He has over 30 years' experience working in the Geological and Geophysical Field, specializing in VLF, however, has also worked with I.P., Max Min, Surface & Borehole Pulse EM, Airborne Magnetics and Ground Magnetometer.

Sandra Slater is a member of the Prospectors & Developers Association of Canada. She has been working in the Geological/Geophysical field for over 10 years, specializing in data analysis and VLF2DMF software.

Shaun began working with the developer of the VLF2DMF software since its inception in 2008 and he and Sandra continue to do so. Many case history surveys have been completed over various ore bodies and mineralized zones with proven, successful results.

Executive Summary

This ground VLF survey was completed on the Jackfish Lake Property, District of Thunder Bay in Northern Ontario. The property is located approximately 20 km. east of Terrace Bay, Ontario and is adjacent to Highway 17 at Jackfish Lake.

The survey was carried out in June and July 2018 using a VLF EM-16 unit and a handheld Garmin GPS-60CSX. Two transmitters were read at each station: NAA 24.0 KHz – Cutler, Maine and NML 25.2 KHz- La Moure, North Dakota

A total of 8.56 Km of VLF surveying was completed. Results from this survey were merged with results from another VLF survey carried out in August 2017 over the Rudy Block.

The objective of the 2018 VLF EM-16 survey was to:

- Carry out a VLF survey and merge this data with that from the August 2017 survey
- Determine if the VLF Survey could delineate the location of the structures on which several historical showings have occurred
- Ground truth airborne EM conductors that crossed the survey area on the Rudy Block
- Identify if VLF conductors were apparent between the many old gold occurrences on the Rudy Block
- Determine if the VLF could interpret conductive zones or structures across the Rudy Block
- Obtain more detailed VLF information across the Rudy Block Grid, focusing on the Main trend that was interpreted during the August 2017 survey.

Deposit Types

Historically, Gold in the Jackfish Lake area occurs in the following structural settings.

- Mineralized shear/fault zones that occur in supracrustal rocks near the margins of the Terrace Bay batholith.
- Quartz-carbonate vein systems that parallel the batholith-supracrustal rock contact and are located at or near the contact.
- Quartz-carbonate veins that occupy late brittle fracture systems within the batholith. Magnus and Walker (2015)

Property Access

Access is by the following:

The property is adjacent to Highway 17 to the east of Jackfish Lake. It can be found behind the Jackfish Lake Cottages on the Trans-Canada Hwy in Terrace Bay, ON. A series of access roads cross most of the VLF grid.

Introduction

A VLF-EM16 survey is a relatively simple and economic geophysical survey that is used to better understand shallow, vertical and sub vertical bedrock conductors.

This report describes the findings and results of the VLF EM-16 survey utilizing the VLF2DMF processing software of which the author of this report has assisted in its development since 2007. It enables the processing and inversion of electromagnetic (EM) induction data acquired along a survey area using a Very Low Frequency (VLF) (Santos 2013)

The software generates profiles of Raw Data, Fraser Filtered Data, KH, Resistivity, JY Inversions and (2-D) Modelled Inversions.

VLF data collected in the surveyed area was also compiled onto plan maps of contoured Fraser Filter data and contours of Resistivity data.

- TX NAA Maps 4, 5 & 6
- TX NML Maps 8, 9 & 10

Personnel

The VLF EM-16 operator and GPS field navigator responsible for the collection of all raw data was Shaun Parent. Processing, Modelling and Interpretation of VLF data was completed by Sandra Slater and Shaun Parent.

Map 1 General Location Map

Map 2 Location of VLF Grid Lines

Work Performed

Fieldwork

The VLF EM-16 survey consisted of running 10 Reconnaissance lines in order to cover the Rudy Block Gold showings: 3W, 4W, 5W, 6W, 8W, 10W, 12W, 14W, 16W & 18W
Lines were spaced 200 meters apart and two frequencies were read at 20 meter stations. Each VLF station was located based on an easterly azimuth and distance from the start of the survey line at south west side.

The following parameters were used throughout the surveys:

Navy VLF Transmitters Used:

NAA Cutler, Maine (East)
Frequency: 24.0 kHz
Transmission Power: 2000 kW
Distance: 1,567 km
Azimuth: 114 degrees
Location (Nad 83): 636530E, 4944115N)

NML La Moure, North Dakota (West)
Frequency: 25.2 kHz
Transmission Power: 500 kW
Distance: 900 km
Azimuth: 248 degrees
Location (Nad 83): 551100E, 5134900N

VLF survey direction: All lines began at the southwest end. The VLF Em-16 receiver faced a direction of 44 degrees true azimuth for each reading taken.

VLF survey stations: All VLF readings were taken at approximately 20 meter stations along the survey line.

Parameters of Measurement: In-phase and Quad-phase components of a vertical magnetic field is measured as a percentage of horizontal primary fields. (Tangent of tilt angle and ellipticity). VLF transmitter NAA was to the east while transmitter NML was to the west. The transmitters are chosen so that the direction to the transmitting station is aligned to the best bedrock strike orientation.

VLF Data Collection Process

Field data was collected as follows on each surveyed line.

- Each station was saved onto the Handheld Garmin 60CSX GPS Unit
- VLF readings for each station were recorded in a notebook as In-Phase and Quadrature corresponding to the line number and station number. (See example in Table 1)
- Field information was transferred to a Garmin map source program where line and station information could be viewed.
- Garmin and VLF data were compiled onto an excel spreadsheet and then inputted into the VLF2DMF processing software. For this survey all UTM Values are NAD 83.

Table 1 Example of VLF Data Collection

Line 3W	NAA In phase	NAA Quadrature	NML In phase	NML Quadrature	Notes
10+20N	10	6	4	5	Quartz
10+40N	8	4	2	4	Rusty

Interpretation & Modelling

VLF2DMF Data Processing

All VLF data collected from this survey and relevant data from the August 2017 survey were merged together, processed and interpreted separately for TX NAA and TX NML. Although all profiles/filters explained below were used in the interpretation process, only the Raw Data, 2D Inversion Models and JY Inversion models are included in the Appendices at the end of this report.
(TX NAA - Appendix A) & (TX NML - Appendix B)

VLF2DMF Profiles & Models

Raw Data Profiles

The raw data for each frequency was plotted for each line surveyed. No filtering or smoothing of the raw data was done. The Raw Data profiles also show a cross section of topography and the calculated resistivity along the line. These profiles can be found in Appendix A (NAA) and Appendix B (NML)

Fraser Filter Plan Map with Fraser Peaks and Trends

Raw data was run through the Fraser filter. This filter transforms In-Phase cross overs and inflections into positive peak anomalies. (Fraser 1969) In-Phase inflections and cross overs are usually plus to minus, while Quadrature responses are negative to positive giving a negative peak anomaly when the Fraser Filter is applied. Fraser filter data was compiled to produce Plan Maps. (NAA Maps 4, 5) & (NML Maps 8, 9)

Fraser Pseudo Sections

Fraser Filters of various lengths are applied across the survey line

Apparent Current Density (JY) Section Models

A 2D inversion that looks for the best distribution of the density of current (JY). The output is the apparent current density with positive values associated with conductors (light blue to green to orange) and negative values associated with resistive units. (dark blue)

These profiles can be found in Appendix A (NAA) and Appendix B (NML)

K-H Profiles

Raw Data was run through the Karous-Hjelt (K-H) filter. The filter is applied to obtain a section of current density. The higher values are generally associated with conductive structures. (Karous-Hjelt 1983) If there is depth extent, this is shown on the In-phase profile as dark blue.

Resistivity Plan Maps: 4000 Ohm's

The apparent resistivity was calculated. The resistivity can be calculated if the mean environmental resistivity is known at the beginning of the VLF profile. A mean resistivity of 4000 ohm's was used for all lines. Resistivity data was compiled to produce Plan Maps. (NAA Map 6) (NML Map 10)

Model 4000 Ohm's Profiles

A resistivity of 4000 Ohm's was used to build an initial model used in the inversion to obtain a realistic cross section of the line surveyed. Conductive zones are red/yellow while resistive zones are blue. A depth scale is found on the left side of model profiles. Surface conductive zones show little depth extent, have a horizontal display and are limited in depth.

The maximum depth slice with a bedrock resistivity of 4000 Ohms is 204 meters for transmitter NAA (24.0 KHz.) and 199 meters for TX NML (25.2 KHz.).

All Inversion models have the same color scaling using a minimum resistivity of 10 and a maximum of 10,000. The vertical exaggeration of all models is 1.0.

Fraser Filter anomaly picks are found across the top of all models. These Models can be found in Appendix A (NAA) and Appendix B (NML)

Discussion of Results

The Rudy Block grid consists of 17 VLF lines. Lines 3W, 4W, 5W, 6W, 7W, 8W, 9W, 10W, 11W, 12W, 13W, 14W, 15W, 16W, 17W, 18W & 19W

VLF Anomalies

It appears that the Rudy Block grid is underlain by an Intrusive body. Some anomalies are strong and the main trend was easily interpreted. There are more, weaker anomalies occurring that could not be tied together due to the 100 meter distance between lines. A more accurate interpretation could be achieved with additional fill in lines being completed in order to verify the weaker responses and trends.

All VLF trends are bedrock conductors and were identified for TX NAA (15 trends) and TX NML (17 trends). There is one main VLF trend that follows an area of low resistivity. This is very apparent between lines 3W and 19W.

Plan Maps & Trends

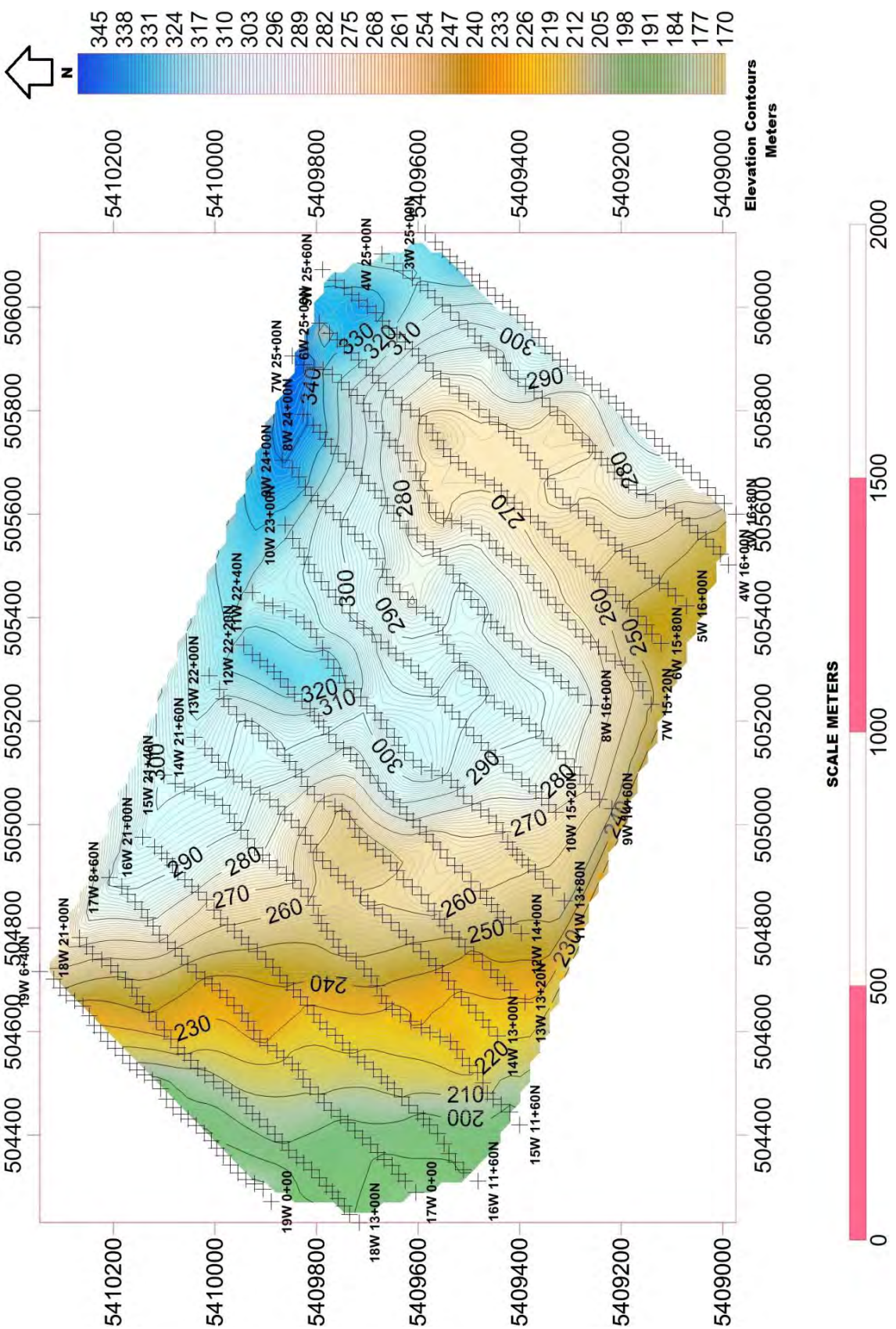
Trends are signified as the following example:

18E-B to 20E-D to 22E-E (Line 18E, VLF Pick B to Line 20E, VLF Pick D to Line 22E, VLF Pick E

Map 3 Elevation Contour Map displaying the layout of VLF lines with NAA Picks and Trends.

- It appears that the main trend across the 17 lines follows a topographic low

Map 3 Grid Elevation Map



TX NAA Maps & Trends

Map 4 Fraser Filter In-Phase Contours with NAA Picks and Trends

Map 5 Fraser Filter Quadrature Contours with NAA Picks and Trends

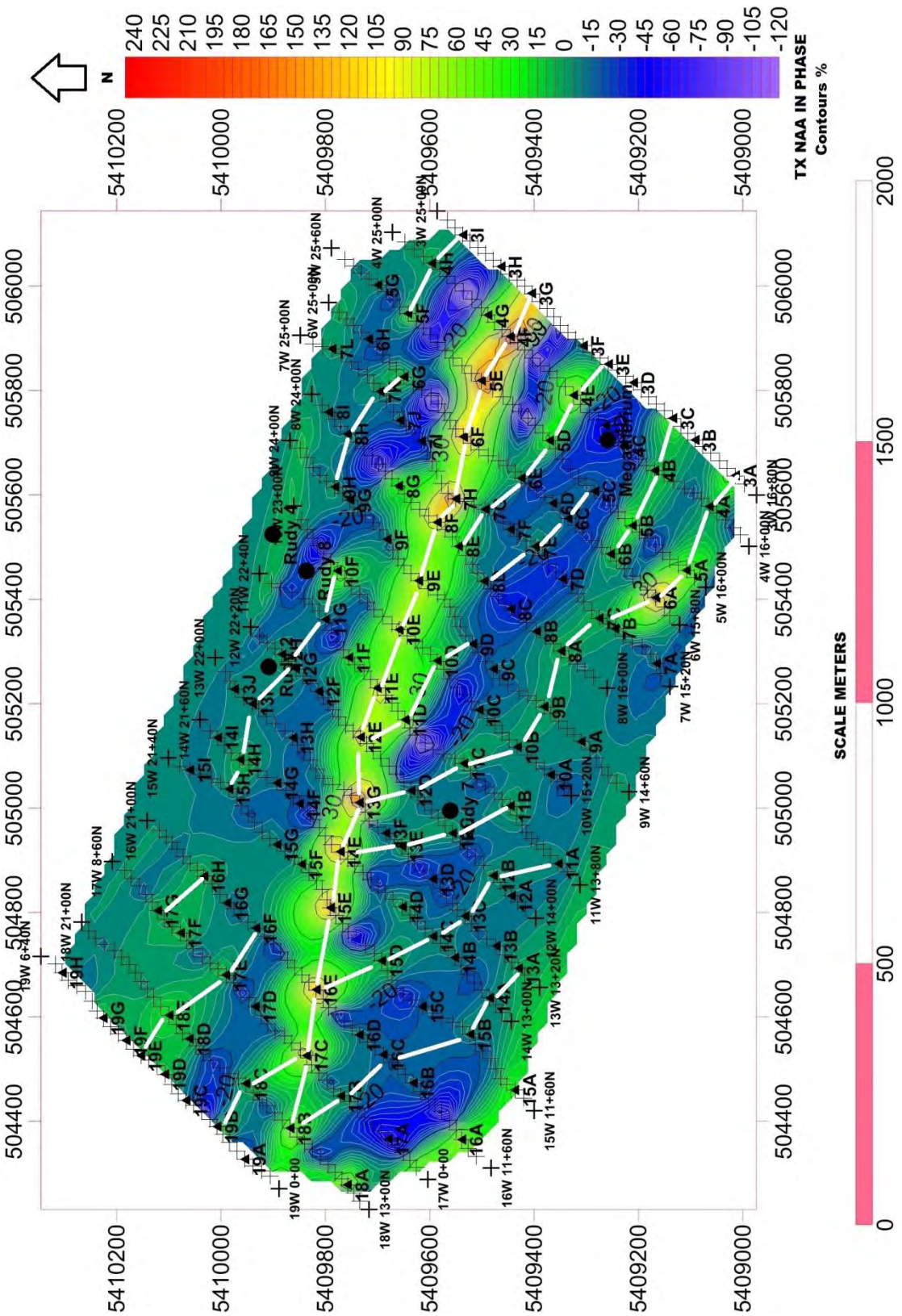
Map 6 Resistivity Contours with NAA Picks and Trends

Map 7 Google Image showing the location of NAA Picks and Trends between lines

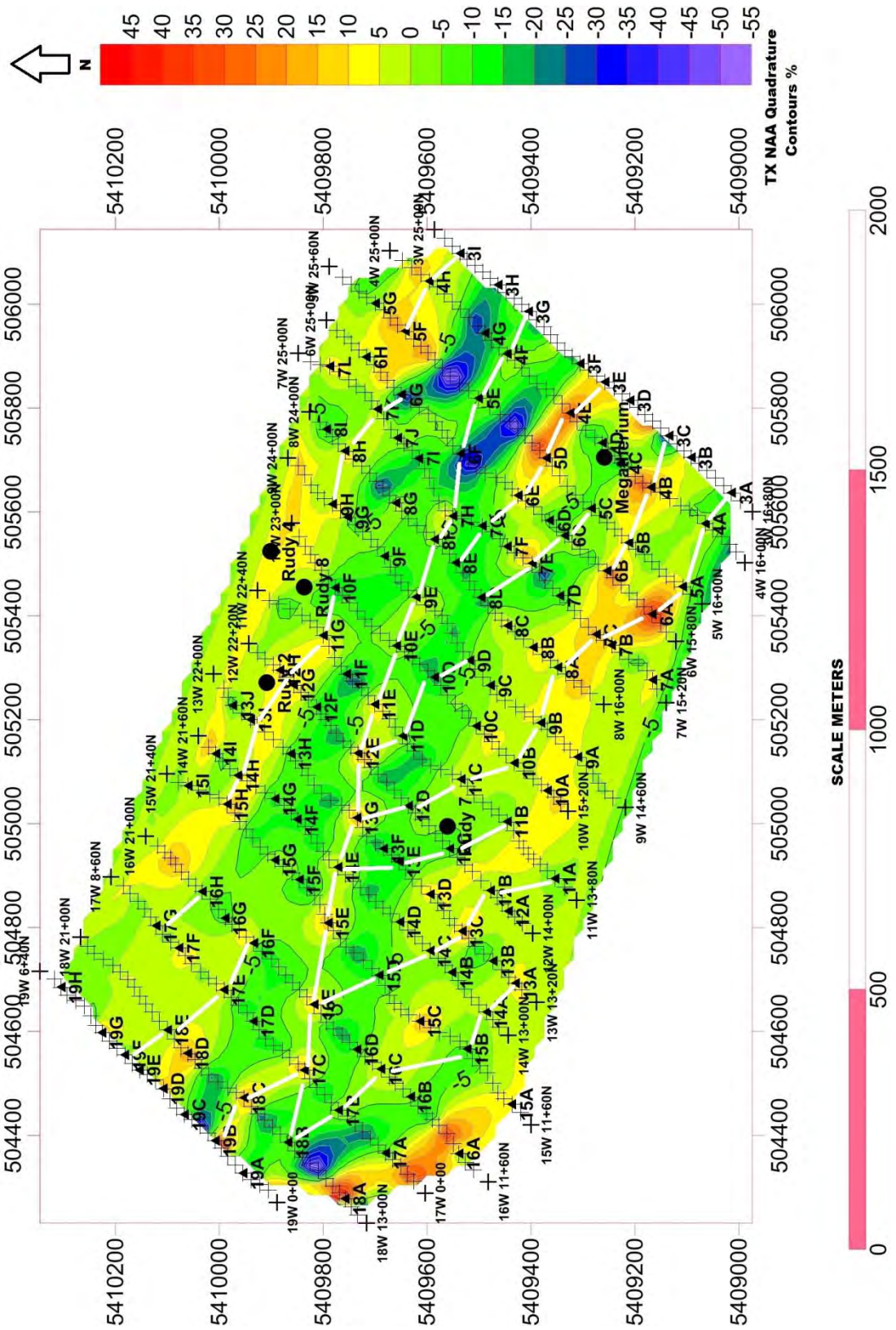
TX NAA Trends (with Main Trend 9 highlighted in **Red**)

1. 3A-4A-5A-6A-7C-8A-9B-10B-11C-12D-13C
2. 3C-4B-5B-6B
3. 11A-12B-13C-14C-15D-16E
4. 9D-10D-11D-12E
5. 13A-14A-15B-16C-17B-18B
6. 11B-12C-13E-14E
7. 5C-6C-7E-8D
8. 3E-4E-5D-6E-7G-8E
9. **3G-4F-5E-6F-7H-8F-9E-10E-11E-12E-13G-14E-15E-16E-17C-18B**
10. 3I-4H-5F
11. 6G-7K-8H-9H
12. 10F-11G-12H-13I-14H-15H
13. 17C-18C-19B
14. 16H-17G-
15. 16F-17E-18E-19F

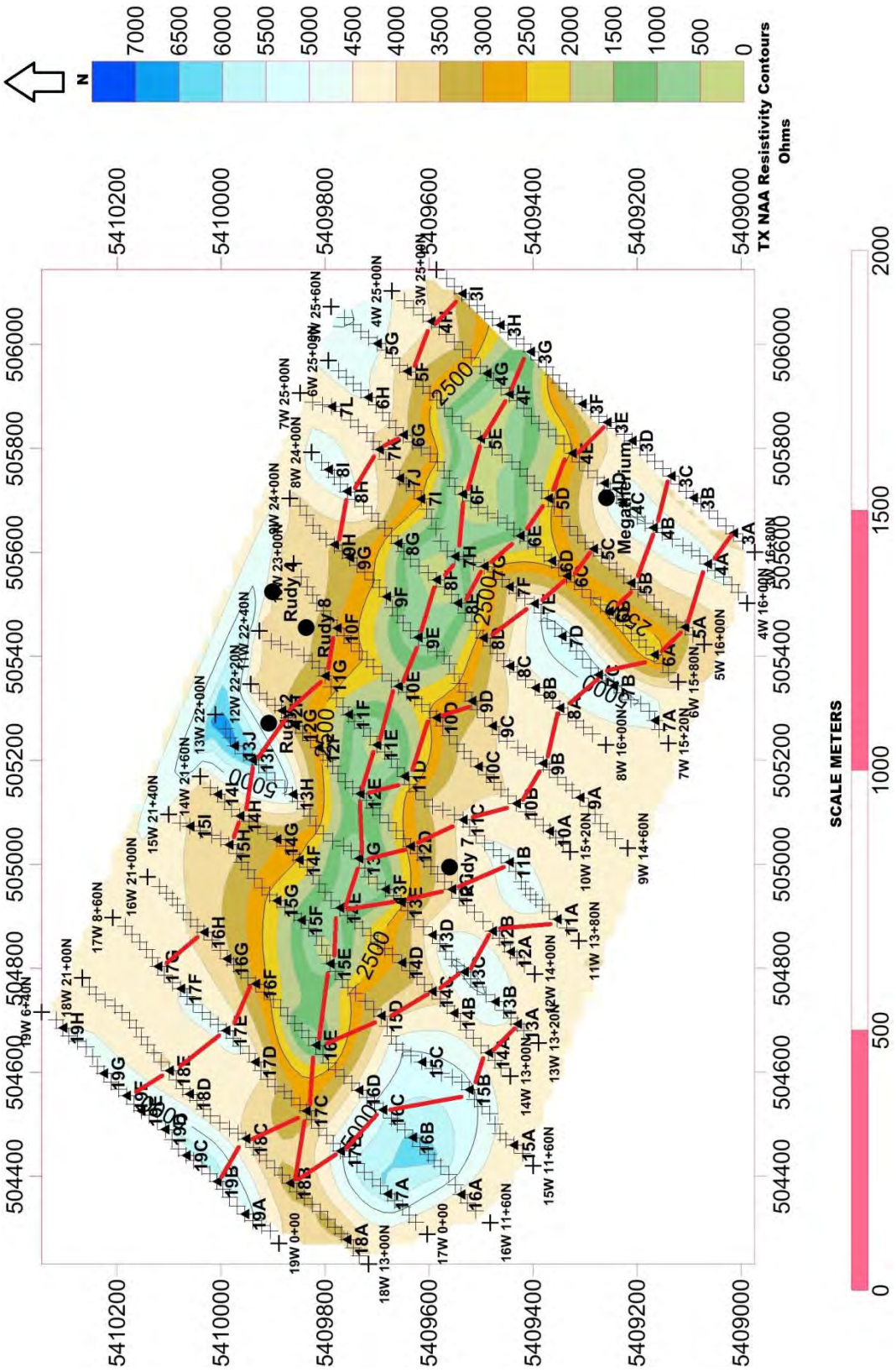
Map 4 TX NAA In-Phase Fraser Contours with Picks & Trends



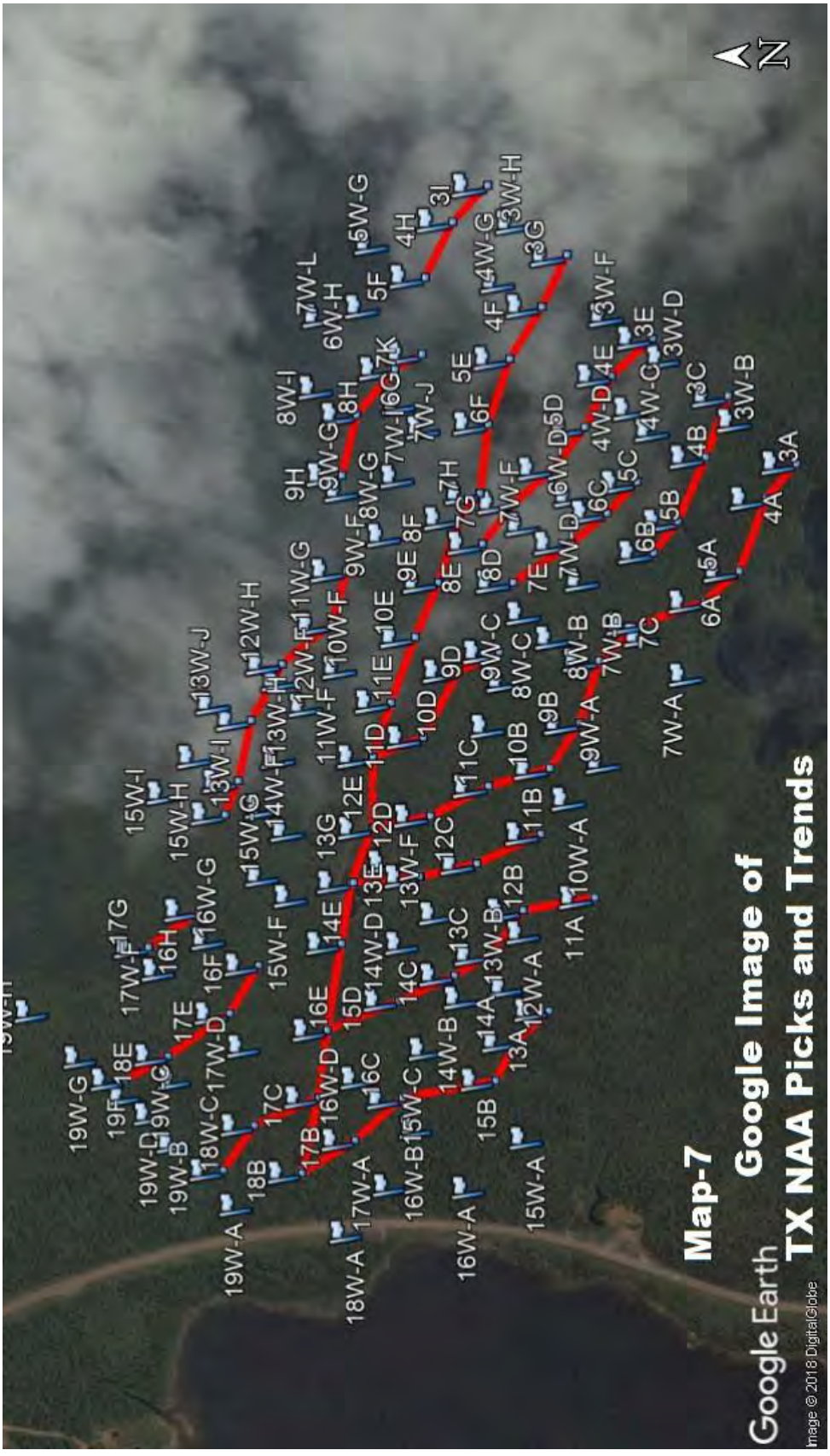
Map 5 TX NAA Quadrature Fraser Contours with Picks & Trends



Map 6 TX NAA Resistivity Contours with Picks & Trends



Map 7 Google Image of TX NAA Picks & Trends



TX NML Maps & Trends

Map 8 Fraser Filter In-Phase Contours with NML Picks and Trends

Map 9 Fraser Filter Quadrature Contours with NML Picks and Trends

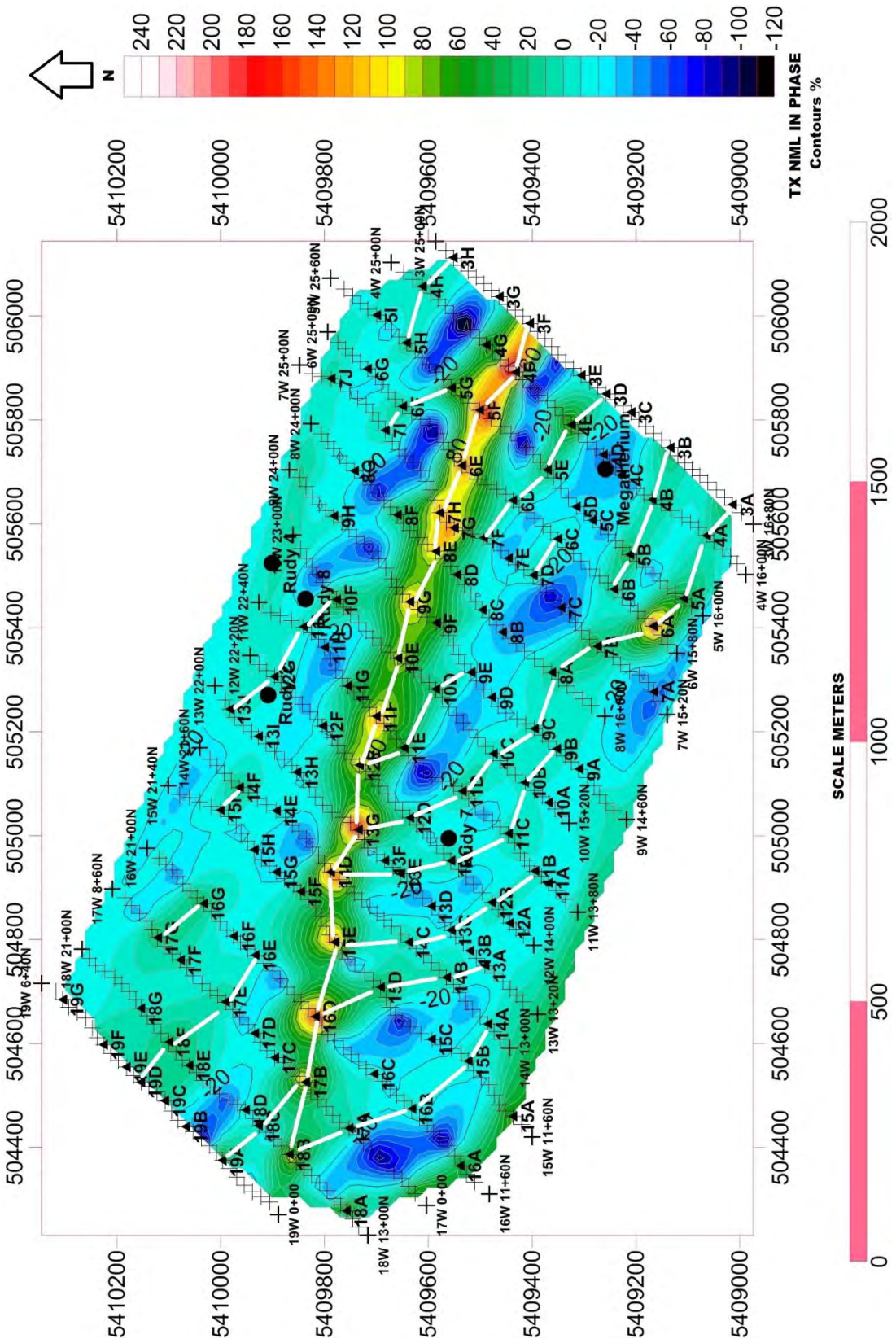
Map 10 Resistivity Contours with NML Picks and Trends

Map 11 Google Image showing the location of NML Picks and Trends between lines

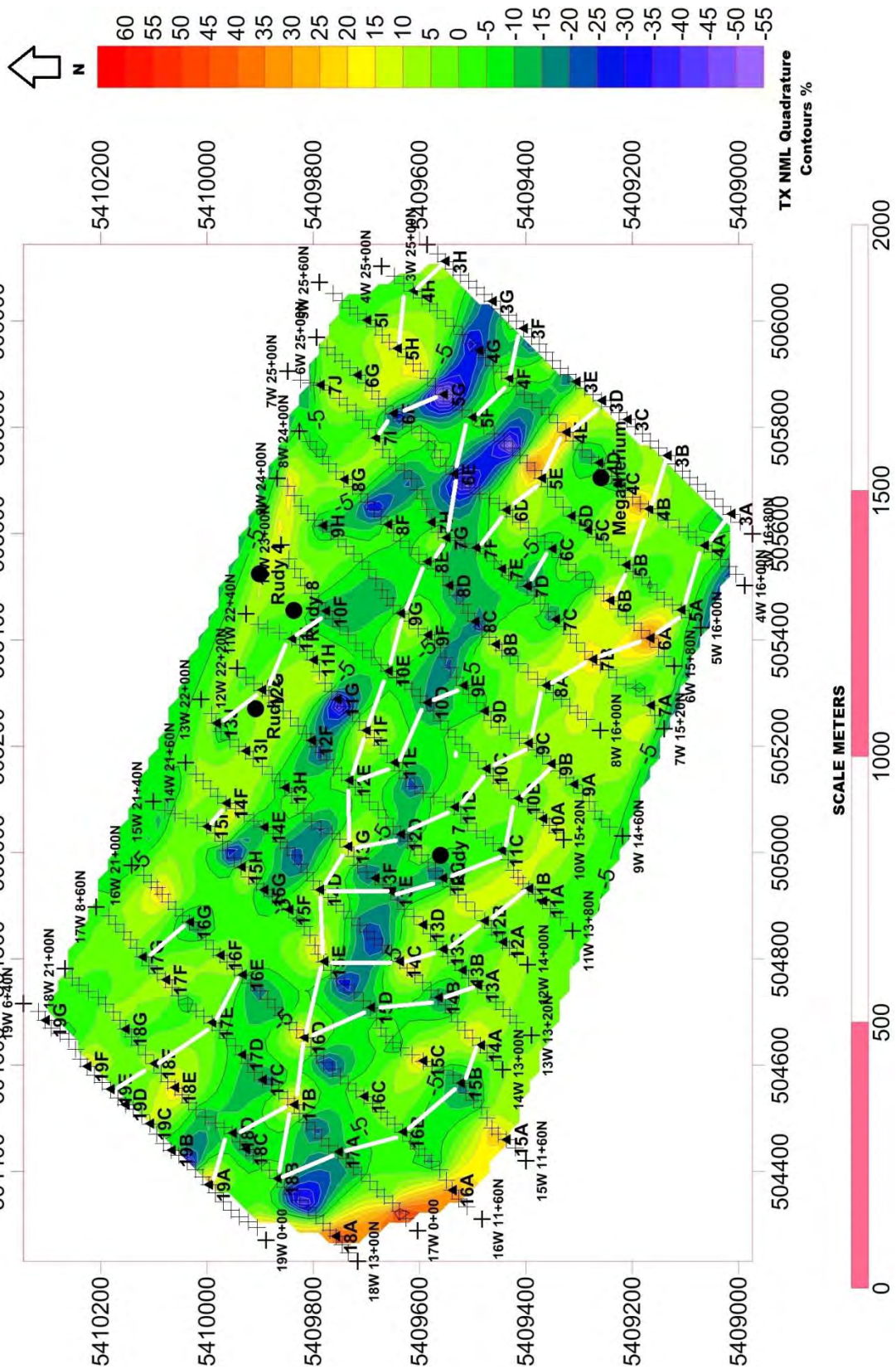
TX NML Trends (with Main Trend 9 highlighted in **Blue**)

1. 3A-4A-5A-6A-7B-8A-9C-10C-11D-12D-13G
2. 3B-4B-5B-6B
3. 11B-12B-13C-14C-15E
4. 13A-14B-15D-16D
5. 9B-10B-11C-12C-13E-14D
6. 14A-15B-16B-17A-18B
7. 6C-7D
8. 3D-4E-5E-6D-7F
9. **3F-4F-5F-6E-7H-8E-9G-10E-11F-12E-13G-14D-15E-16D-17B-18B**
10. 5G-6F-7I
11. 9E-10D-11E-12E
12. 3H-5H-5H
13. 16E-17E-18F-19E
14. 17B-18D-19A
15. 16G-17G
16. 14F-15I
17. 10F-11I-12G-13J

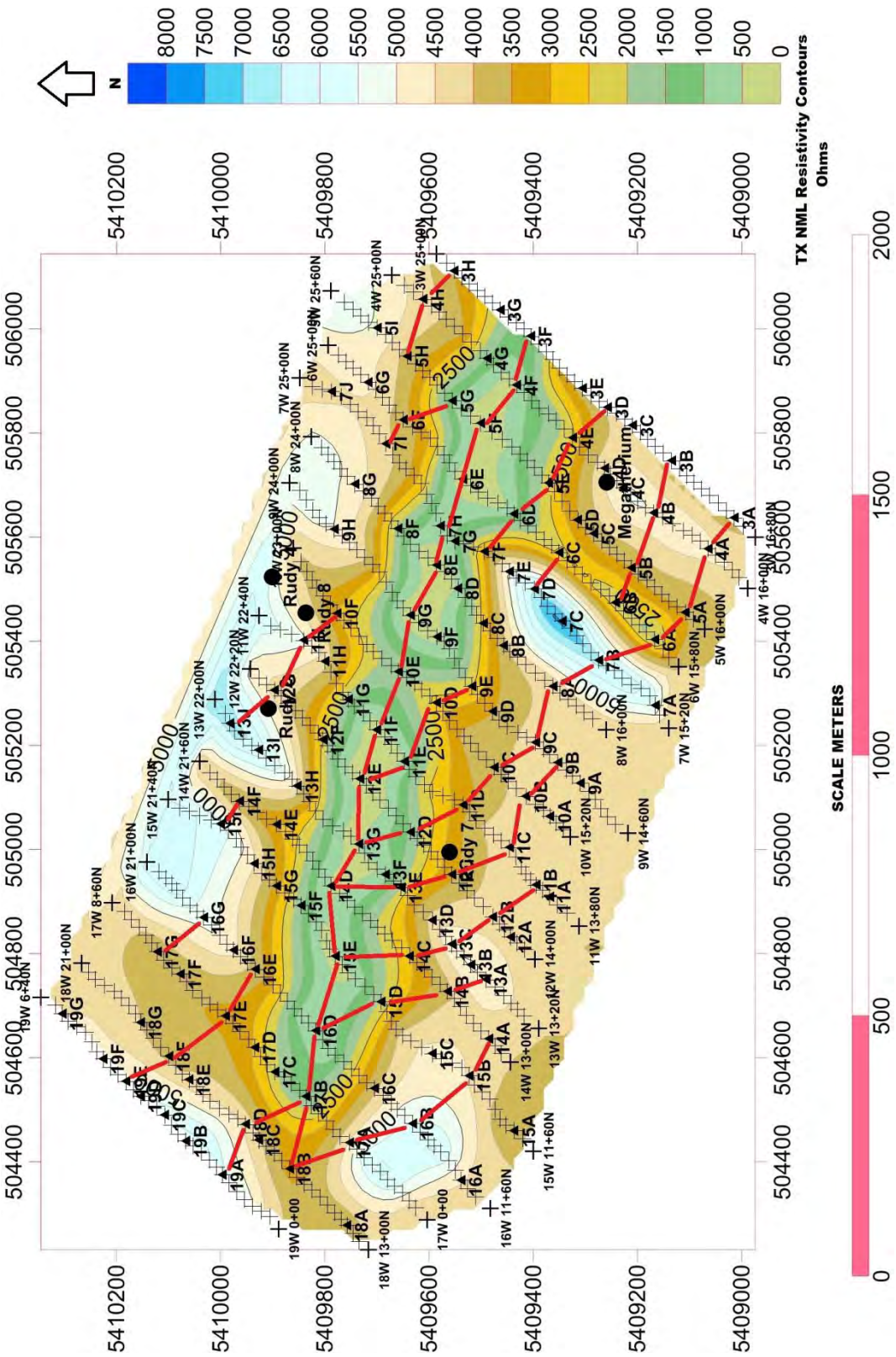
Map 8 TX NML In-Phase Fraser Contours with Picks & Trends



Map 9 TX NML Quadrature Fraser Contours with Picks & Trends



Map 10 TX NML Resistivity Contours with Picks & Trends



Map 11 Google Image of TX NML Picks & Trends

Conclusions

The Ground VLF EM-16 reconnaissance survey was successful in:

- Defining a strong VLF conductor across the Rudy Block from Line 3W to Line 18W.
  TX NAA Trend 9 (3G-4F-5E-6F-7H-8F-9E-10E-11E-12E-13G-14E-15E-16E-17C-18B)
  TX NML Trend 9 (3F-4F-5F-6E-7H-8E-9G-10E-11F-12E-13G-14D-15E-16D-17B-18B)

- Defining several weaker trends that feed into the main trend from the south at an oblique angle and ending at the Main Trend 9.

  TX NAA

Trend 1	(3A-4A-5A-6A-7C-8A-9B-10B-11C-12D-13C)
Trend 3	(11A-12B-13C-14C-15D-16E)
Trend 4	(9D-10D-11D-12E)
Trend 5	(13A-14A-15B-16C-17B-18B)
Trend 6	(11B-12C-13E-14E)
Trend 8	(3E-4E-5D-6E-7G-8E)

  TX NML

Trend 1	(3A-4A-5A-6A-7B-8A-9C-10C-11D-12D-13G)
Trend 4	(13A-14B-15D-16D)
Trend 5	(9B-10B-11C-12C-13E-14D)
Trend 8	(3D-4E-5E-6D-7F)
Trend 11	(9E-10D-11E-12E)

- Defining several weak trends on the north side of the Main Trend 9.

  TX NAA

Trend 10	(3I-4H-5F)
Trend 11	(6G-7K-8H-9H)
Trend 12	(10F-11G-12H-13I-14H-15H)
Trend 13	(17C-18C-19B)
Trend 14	(16H-17G)
Trend 15	(16F-17E-18E-19F)

  TX NML

Trend 10	(5G-6F-7I)
Trend 12	(3H-5H-5H)
Trend 13	(16E-17E-18F-19E)
Trend 14	(17B-18D-19A)
Trend 15	(16G-17G)
Trend 16	(14F-15I)
Trend 17	(10F-11I-12G-13J)

- Defining a resistivity low across the Rudy Block from Line 7W to Line 17W.
  TX NAA Trend 9 (3G-4F-5E-6F-7H-8F-9E-10E-11E-12E-13G-14E-15E-16E-17C-18B)
  TX NML Trend 9 (3F-4F-5F-6E-7H-8E-9G-10E-11F-12E-13G-14D-15E-16D-17B-18B)

Recommendations

a) Prospect along Trend 9 for both TX NAA and TX NML

b) Prospect along the southern TX NAA and TX NML Trends that intersect the Main Trend 9.

c) Produce KH Plan maps at different depths in order to determine the best VLF Bedrock responses and filter out surficial shallow responses.

d) Produce Model Plans maps at different depths in order to determine the best conductive horizons and filter out surficial and shallow responses.

e) Extend the VLF Grid east of line 3W and west of line 18E @ 100 meter spaced lines in order to follow the main NAA and NML Trend 9.

f) Prospect along the trends in areas where they pass near the known Rudy showings (# 2, #7 & #8) which are marked on the plan maps.

g) Prospect along the 2 trends that occur on both sides of the Megatherium showing which is marked on the plan maps.

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Certificate of Qualifications

I, Shaun Parent, P. Geo (LTD.) residing at 282 B Whispering Pines Road, Batchawana Bay, Ontario do certify that:

1. I am a consulting Geoscientist with Superior Exploration, Adventure & Climbing Co. Ltd.

2. I graduated with a Geological Technician Diploma from Sir Sandford Fleming College in 1986.

3. I graduated with a BSc. from the University of Toronto in 1986.

4. I am a member in good standing with the Association of Professional Geoscientists of Ontario #1955 and a member of the Prospectors and Developers Association of Canada.

5. I have been employed continuously as a Geoscientist for the past 31 years since my graduation from University.

6. The nature of my involvement with this project was to carry out the VLF Survey and the interpretation of the VLF data using the EMTOMO VLF2DMF Software of which I assisted in developing with Dr. Fernando Santos of Lisbon, Portugal.

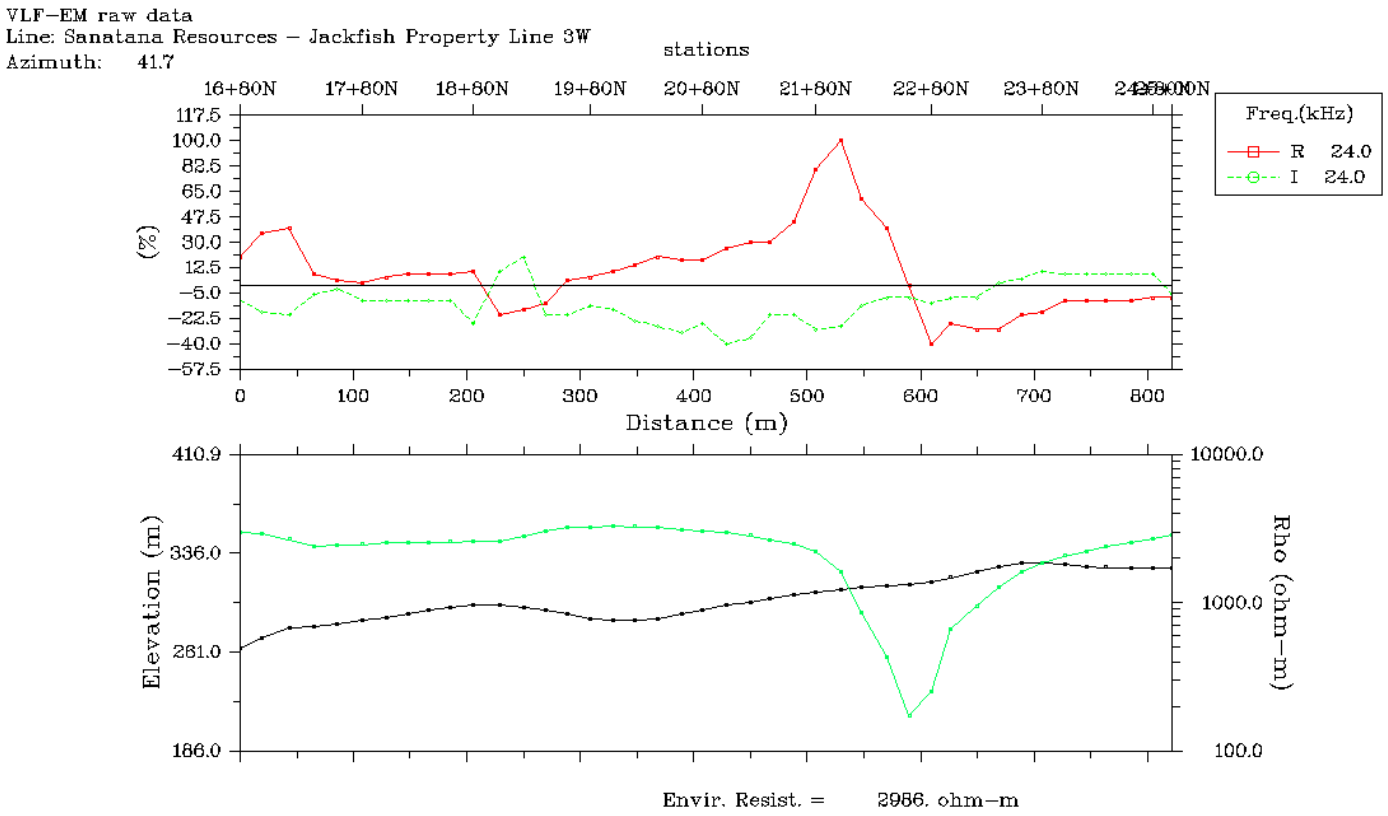
Dated this 9th day of October 2018

Shaun Parent, Dipl-Geo, BSc. P. Geo (Limited)

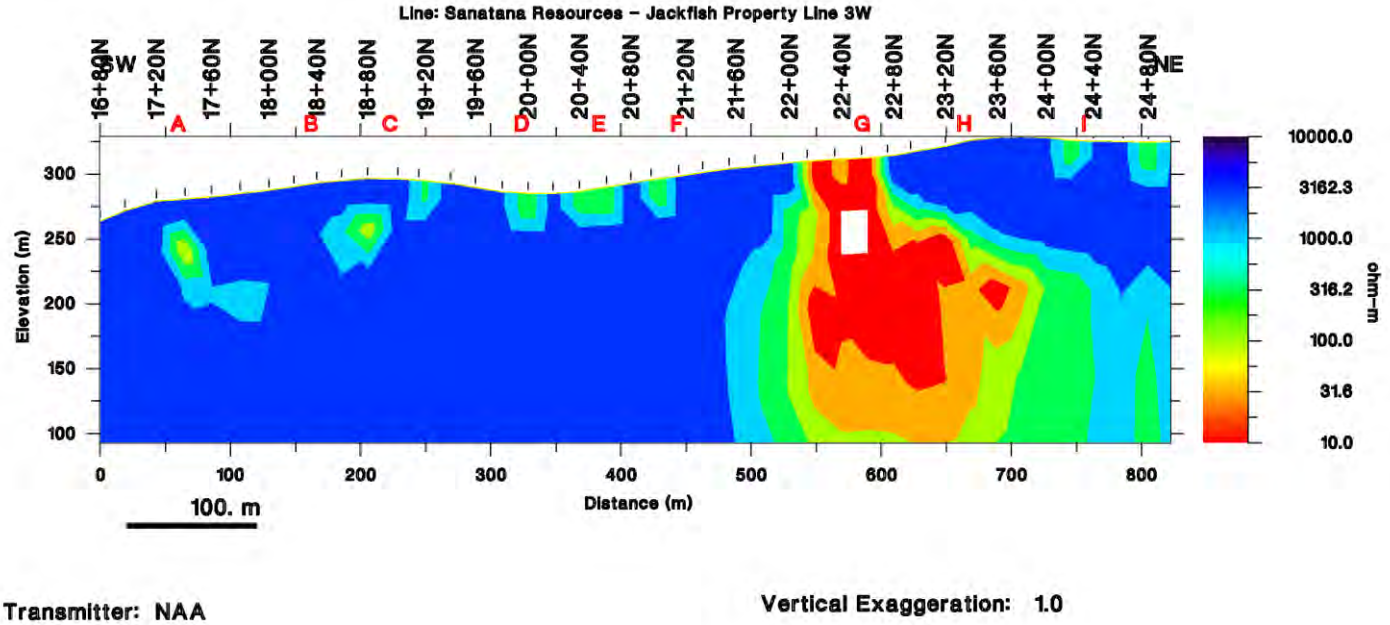
APPENDIX A

TX NAA Figures

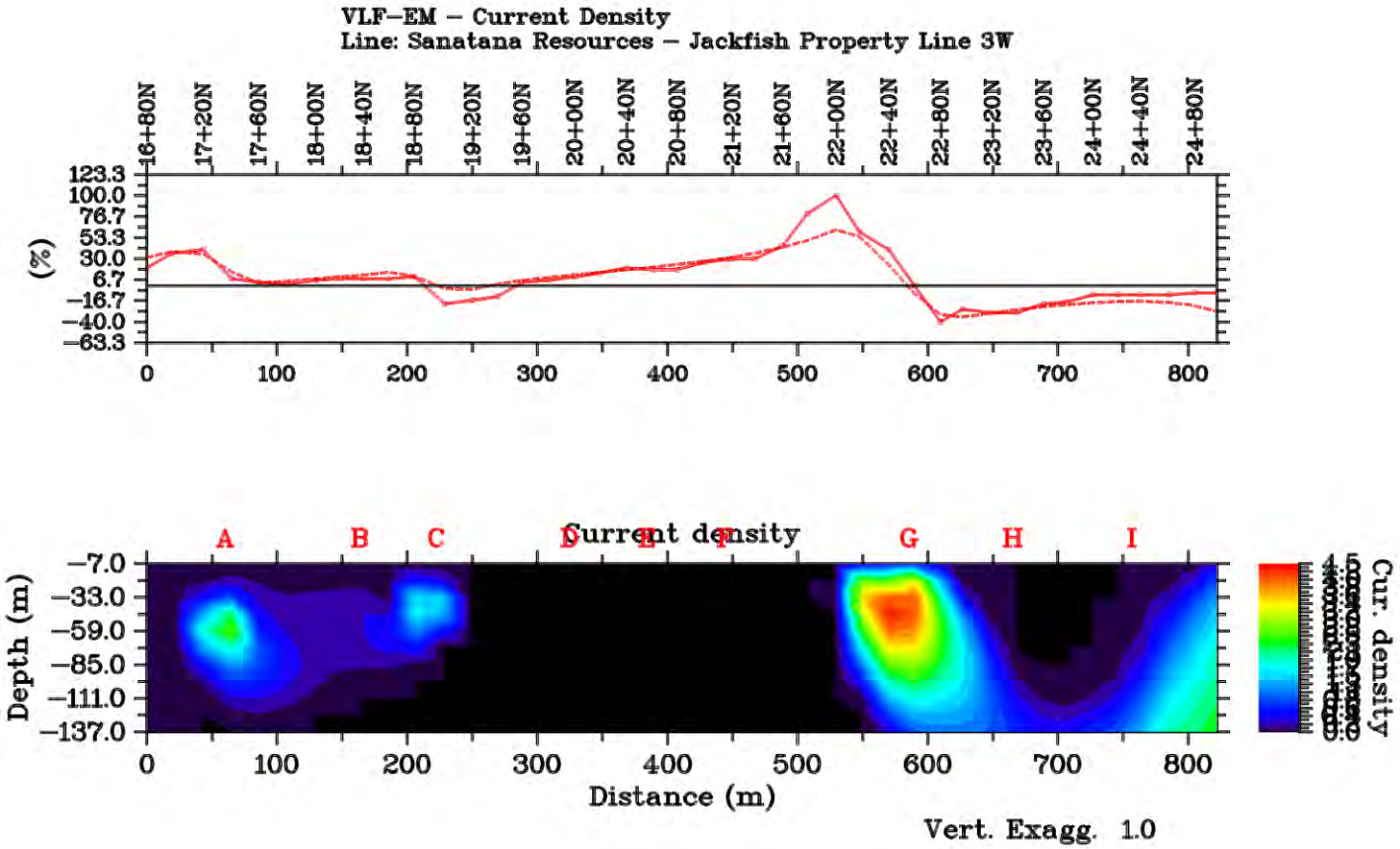
NAA Figure 1 Line 3W Raw Data Profile



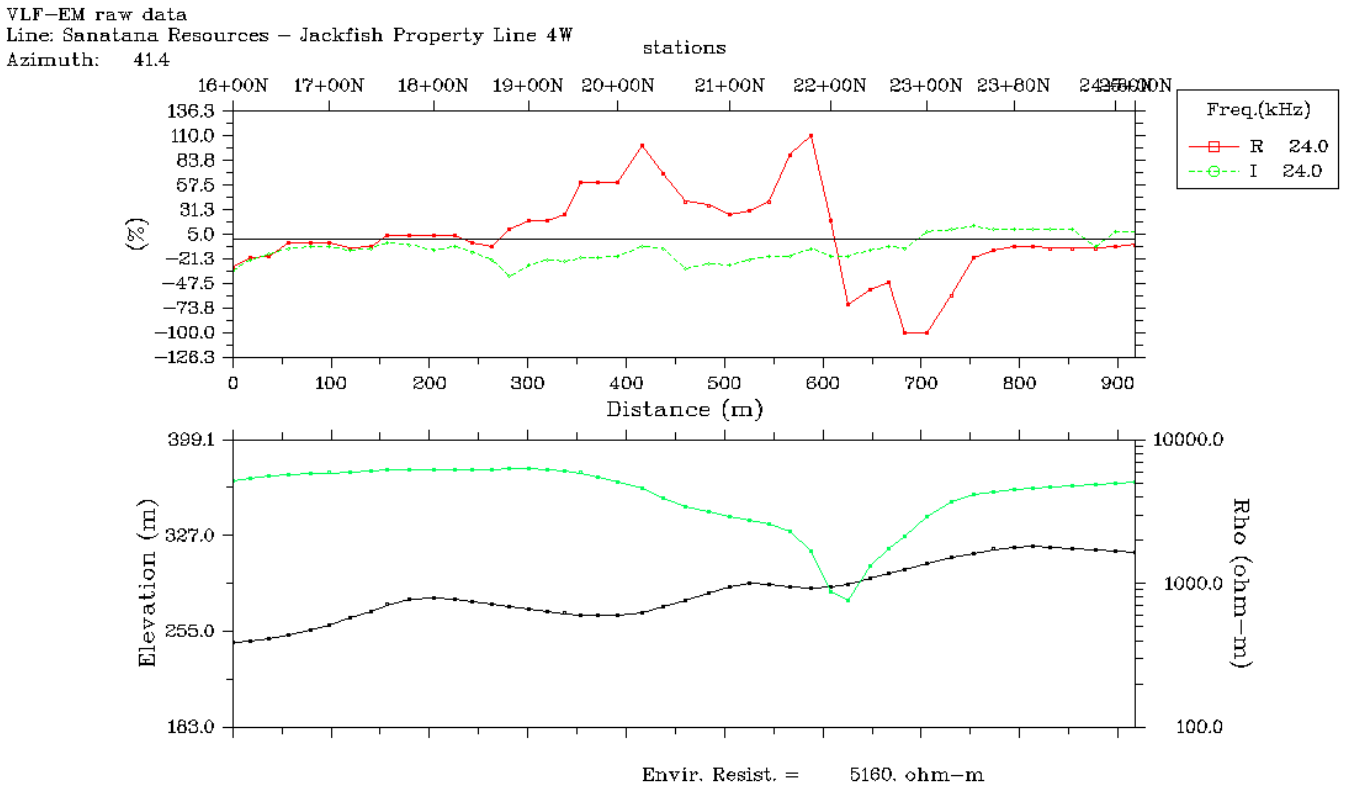
NAA Figure 2 Line 3W Model 4000 Ohm with Fraser Picks



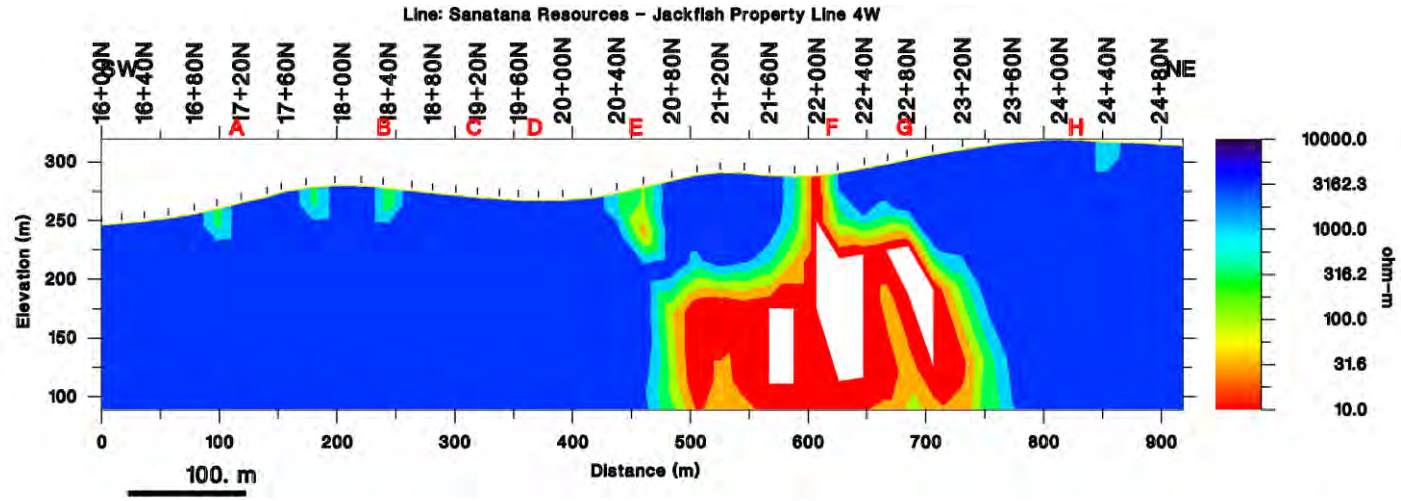
NAA Figure 3 Line 3W JY Model with Fraser Picks



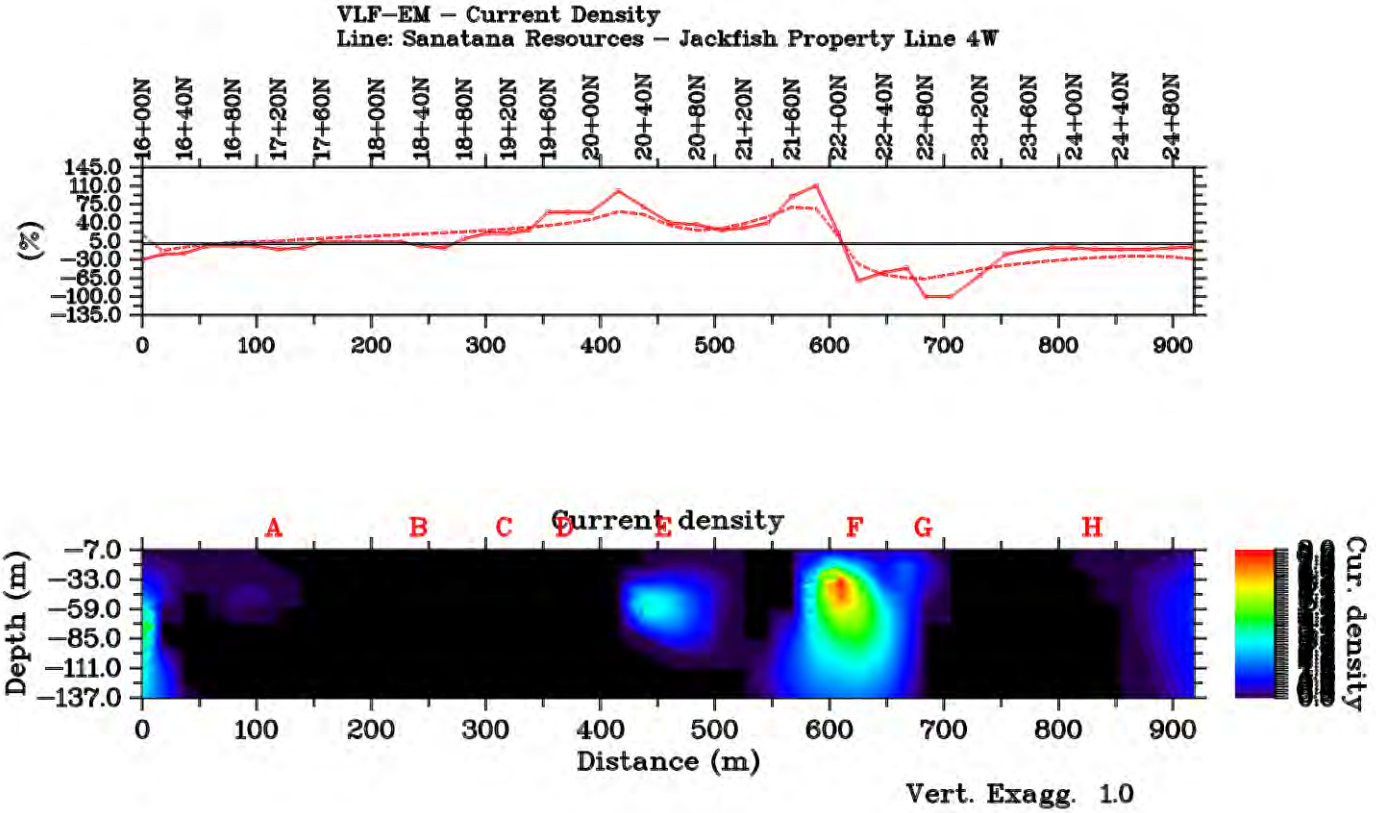
NAA Figure 4 Line 4W Raw Data Profile



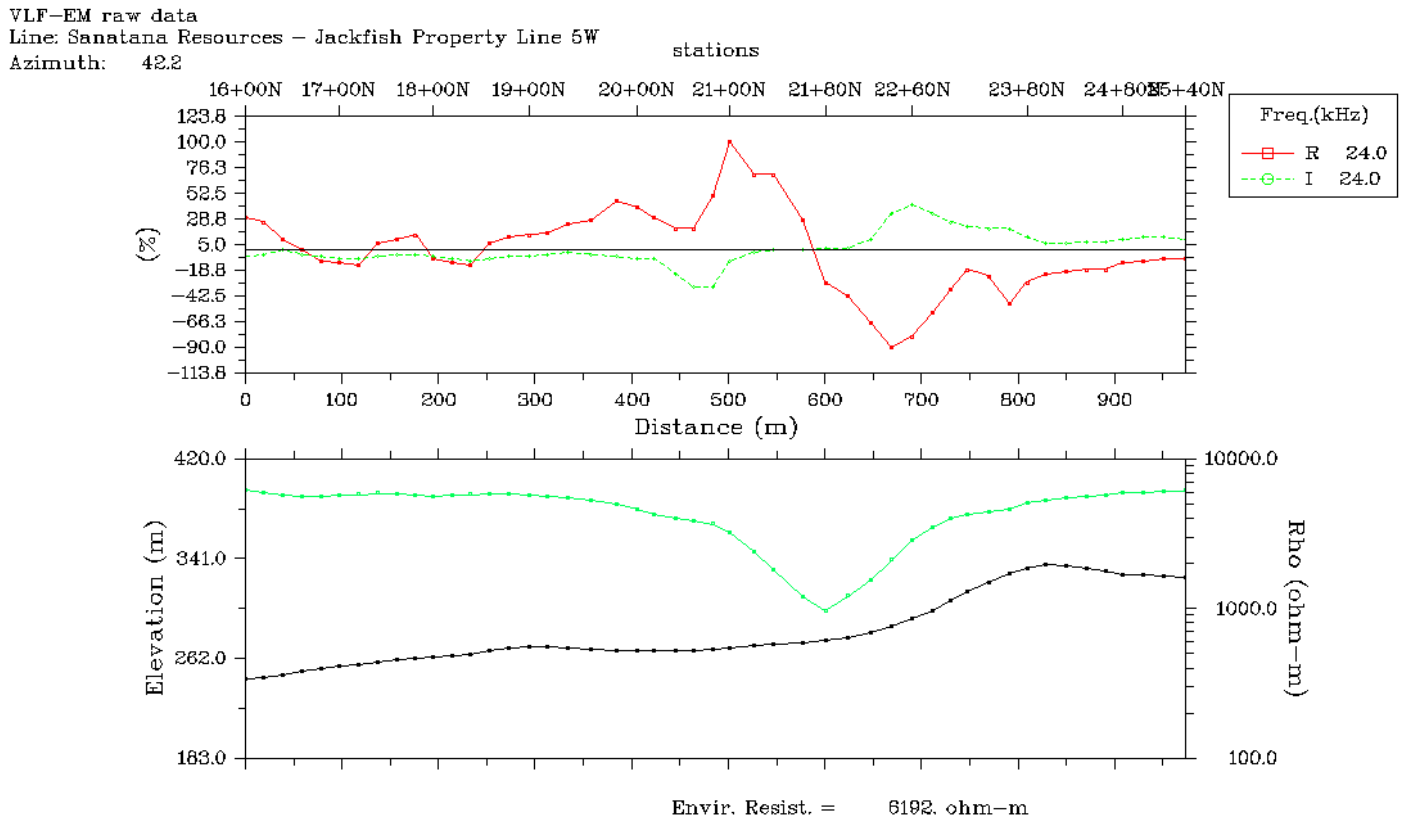
NAA Figure 5 Line 4W Model 4000 Ohm with Fraser Picks



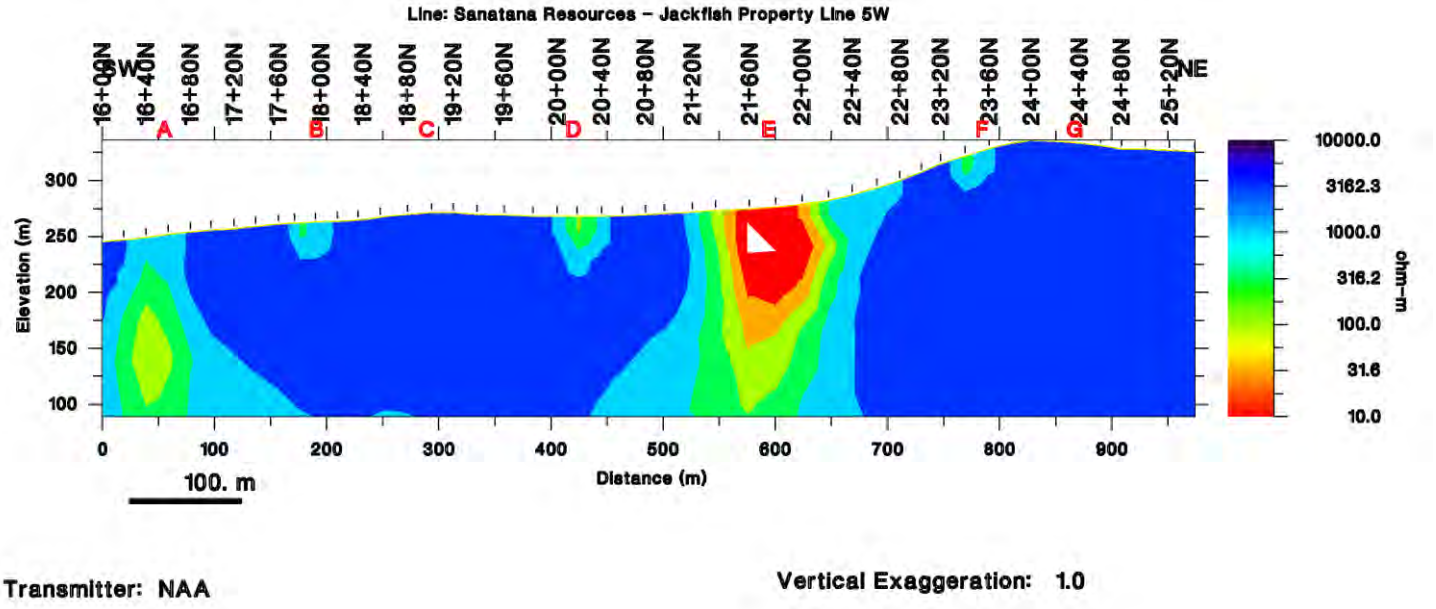
NAA Figure 6 Line 4W JY Model with Fraser Picks



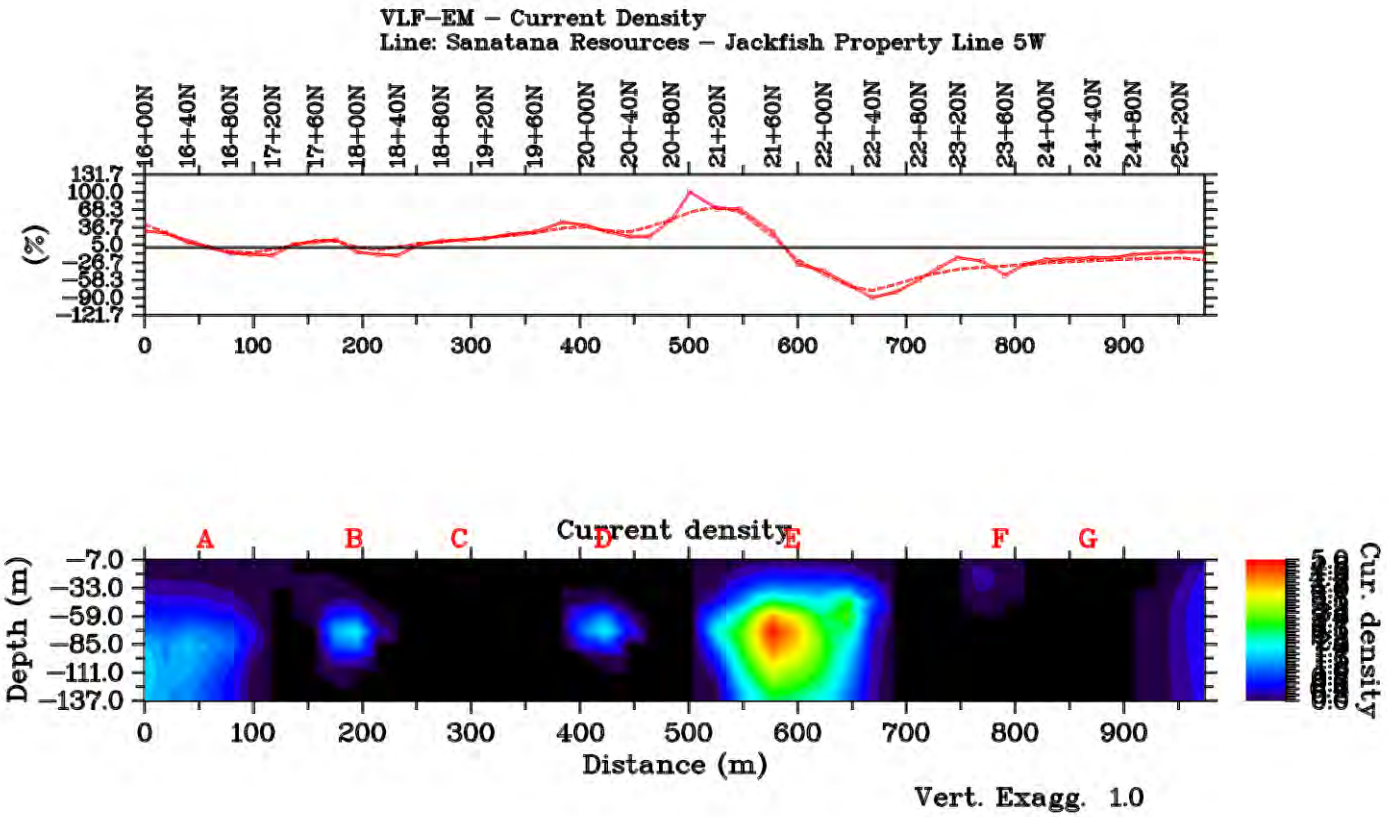
NAA Figure 7 Line 5W Raw Data Profile



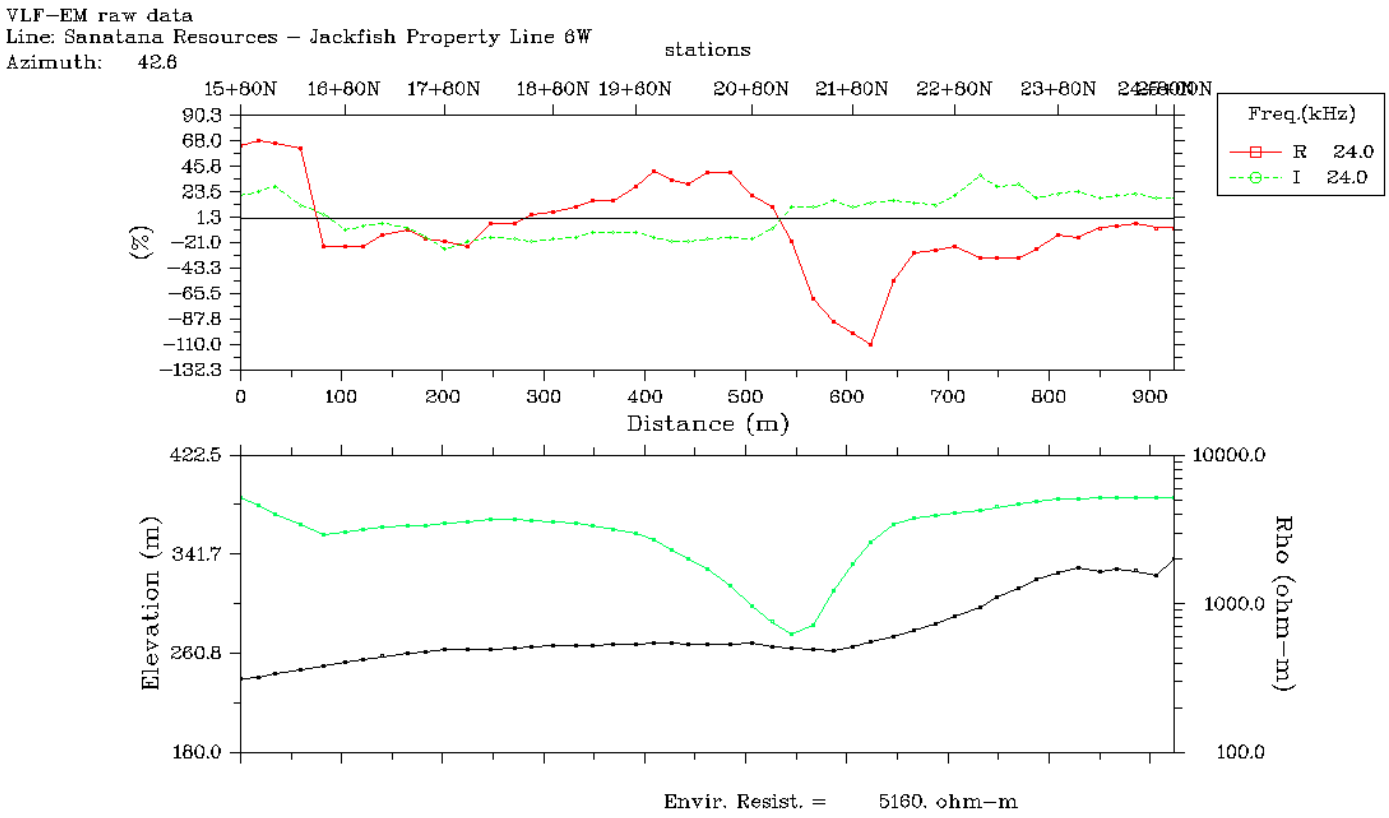
NAA Figure 8 Line 5W Model 4000 Ohm with Fraser Picks



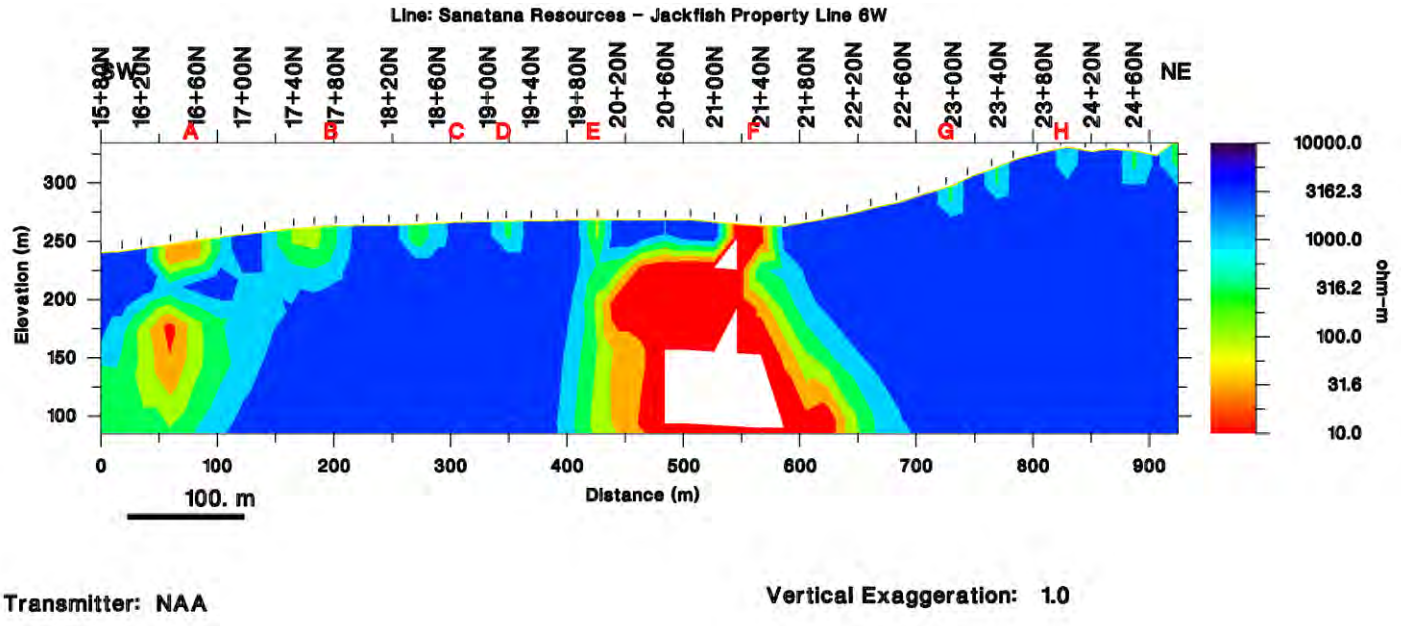
NAA Figure 9 Line 5W JY Model with Fraser Picks



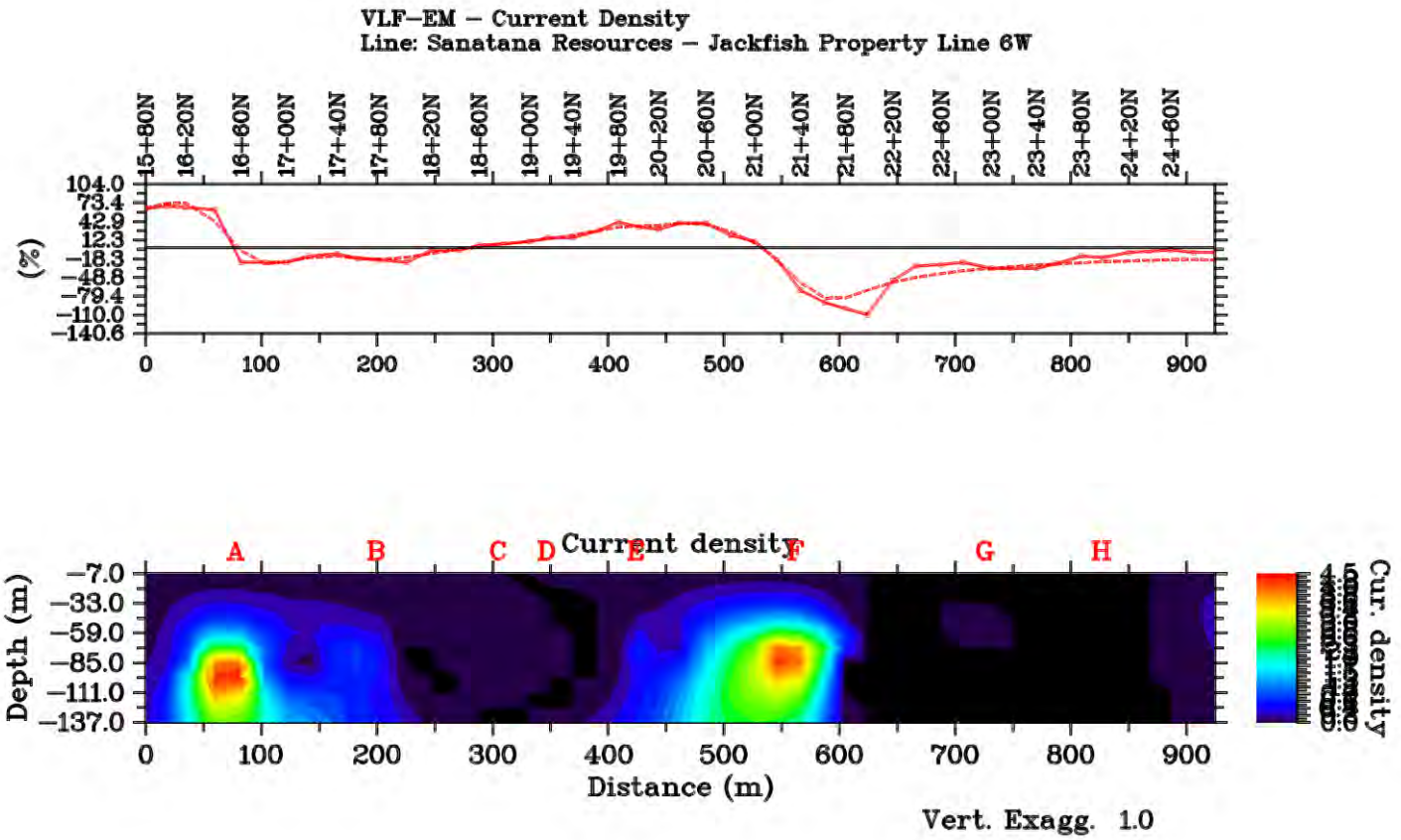
NAA Figure 10 Line 6W Raw Data Profile



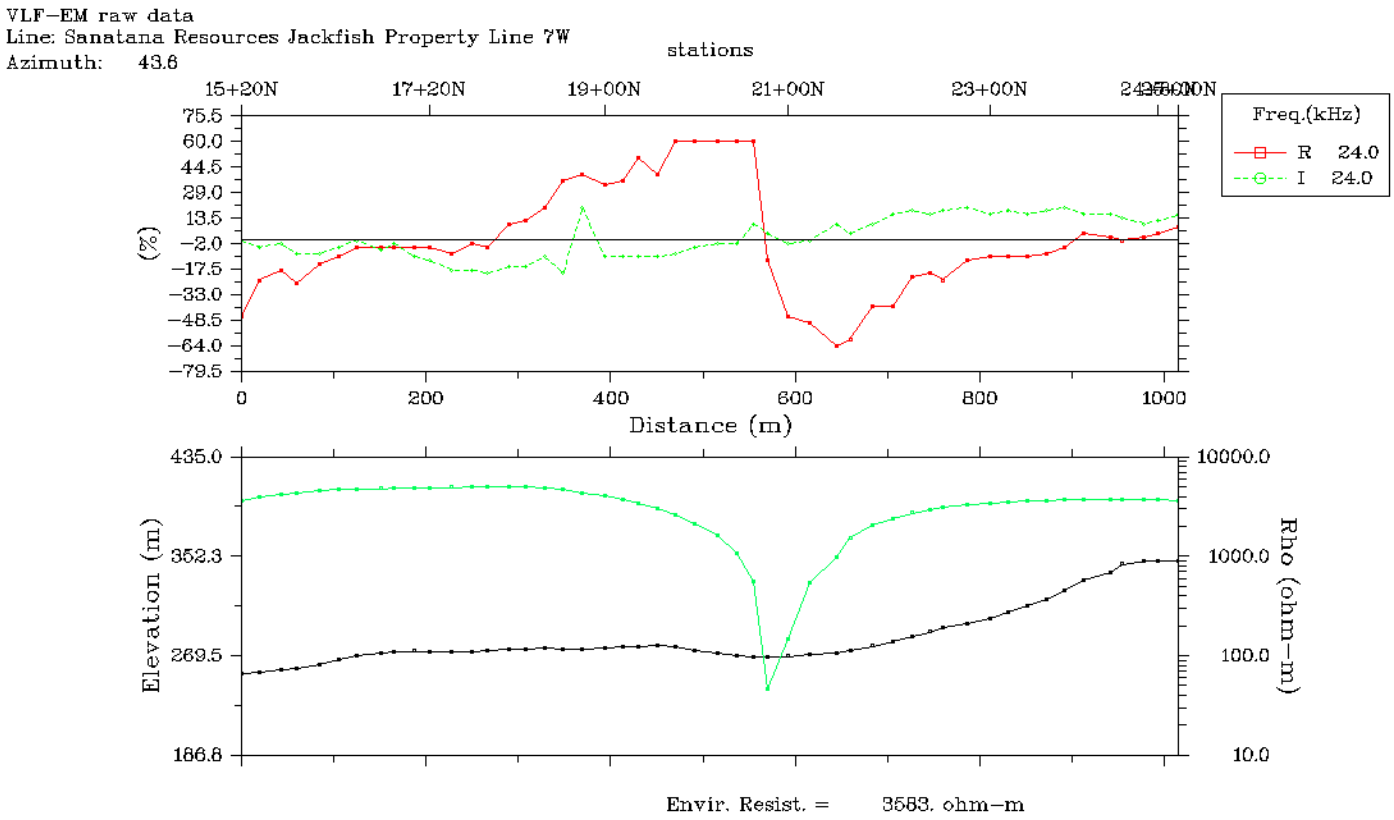
NAA Figure 11 Line 6W Model 2000 Ohm with Fraser Picks



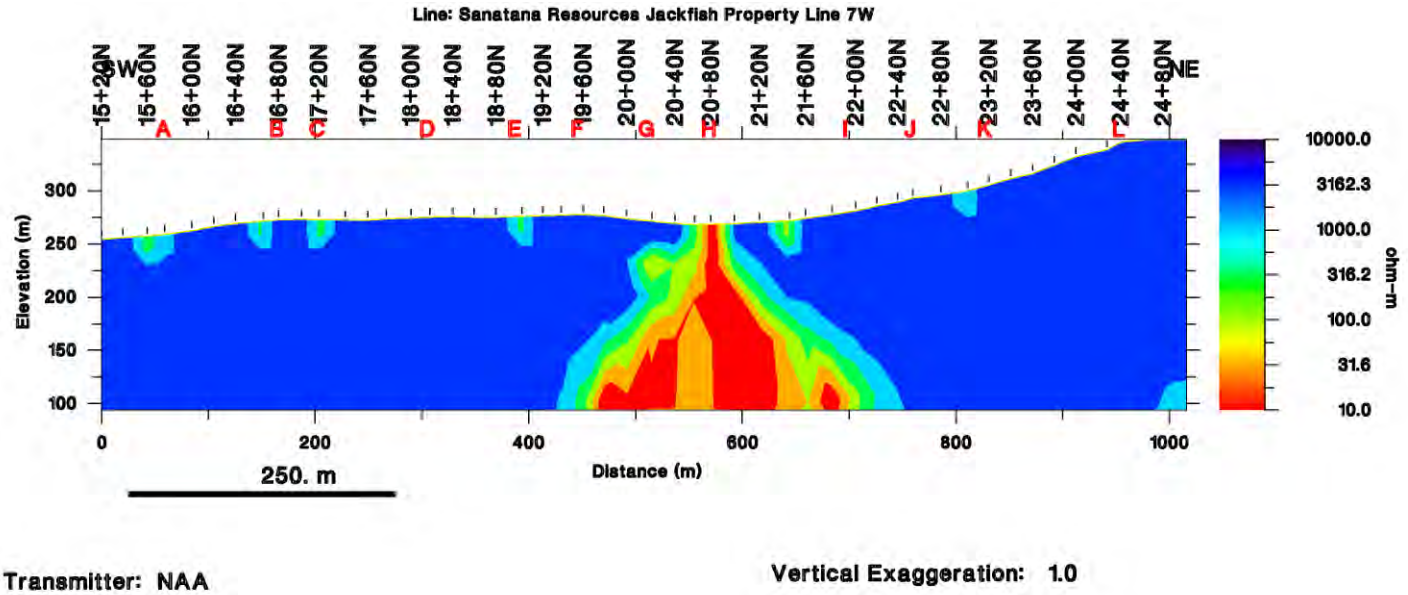
NAA Figure 12 Line 6W JY Model with Fraser Picks



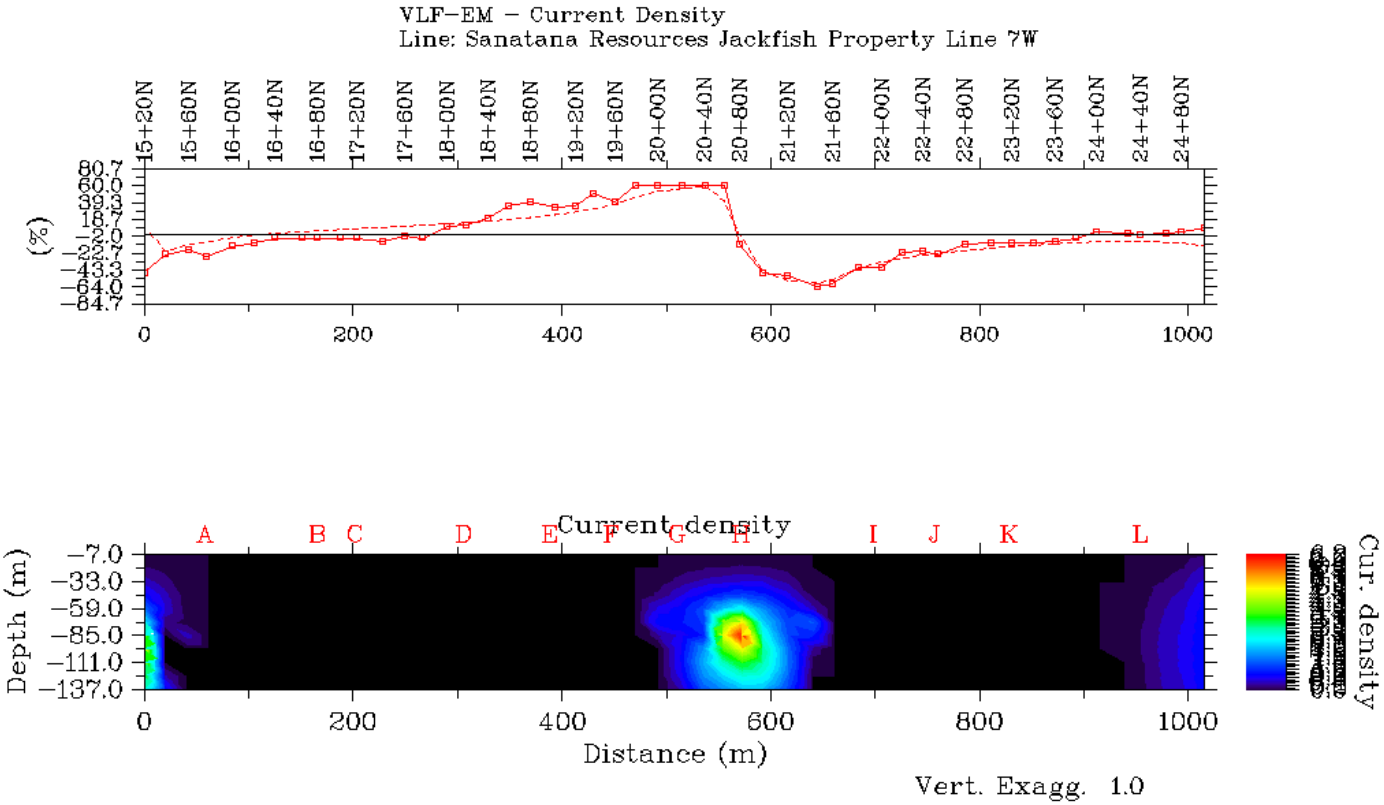
NAA Figure 13 Line 7W Raw Data Profile



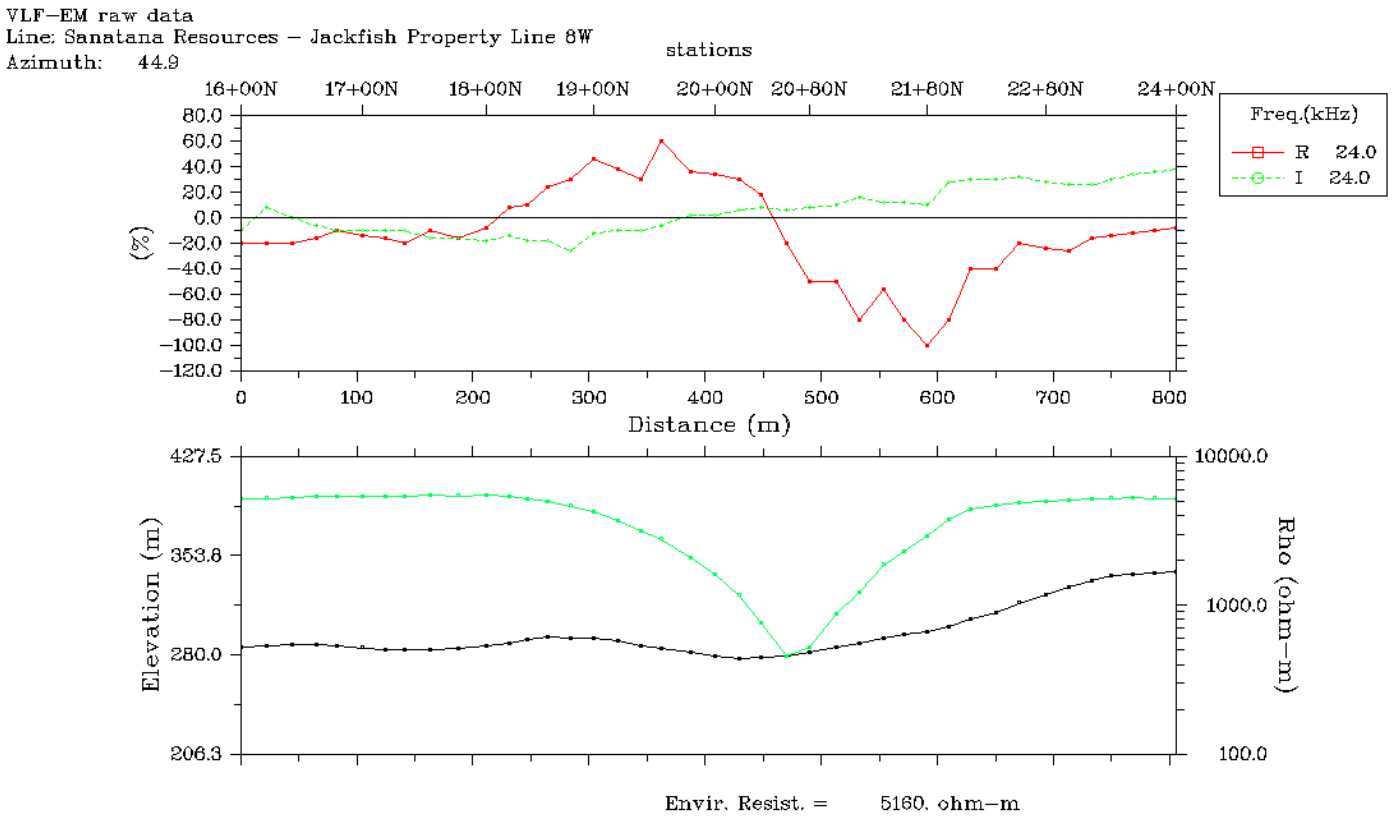
NAA Figure 14 Line 7W Model 4000 Ohm with Fraser Picks



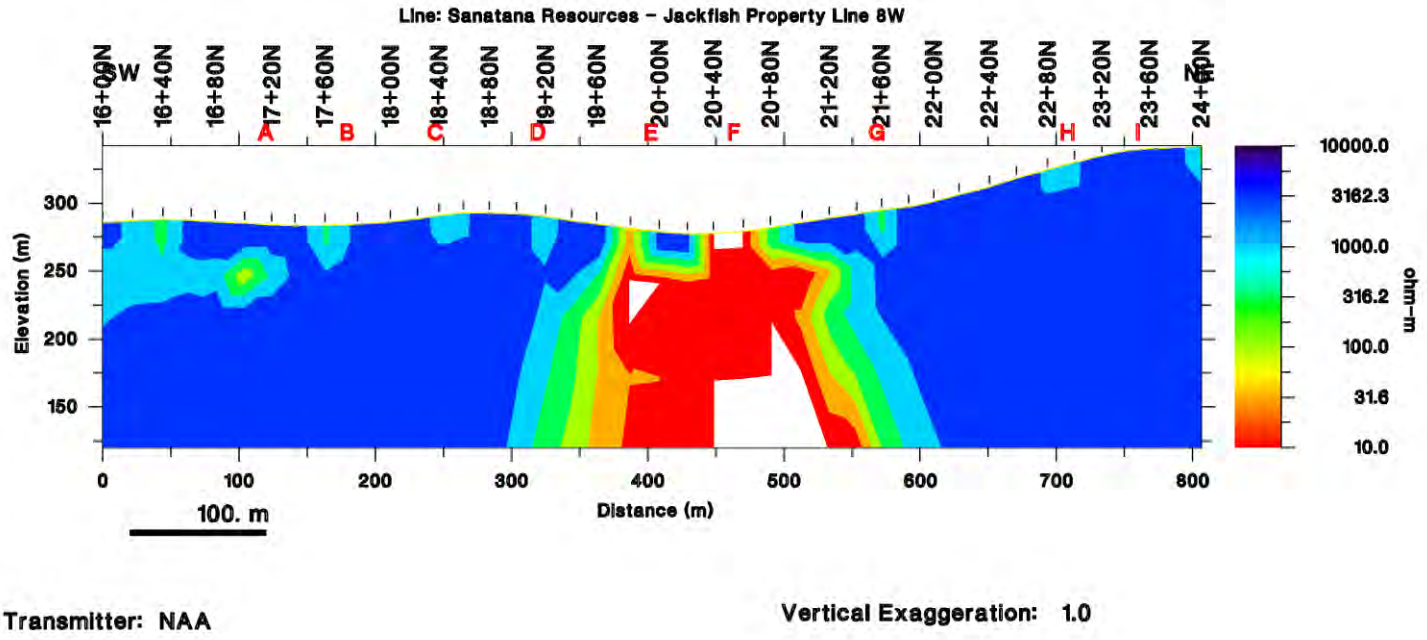
NAA Figure 15 Line 7W JY Model with Fraser Picks



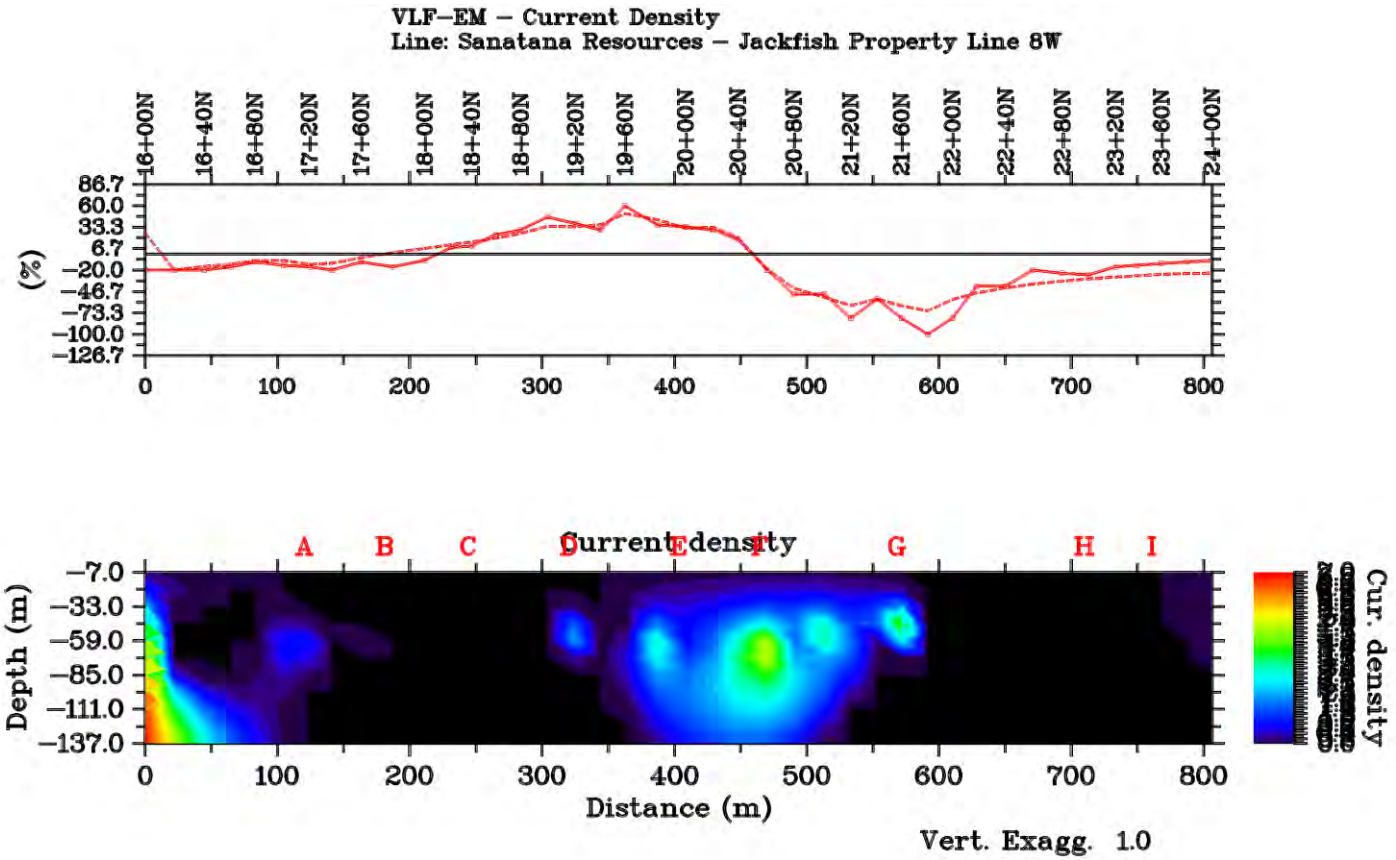
NAA Figure 16 Line 8W Raw Data Profile



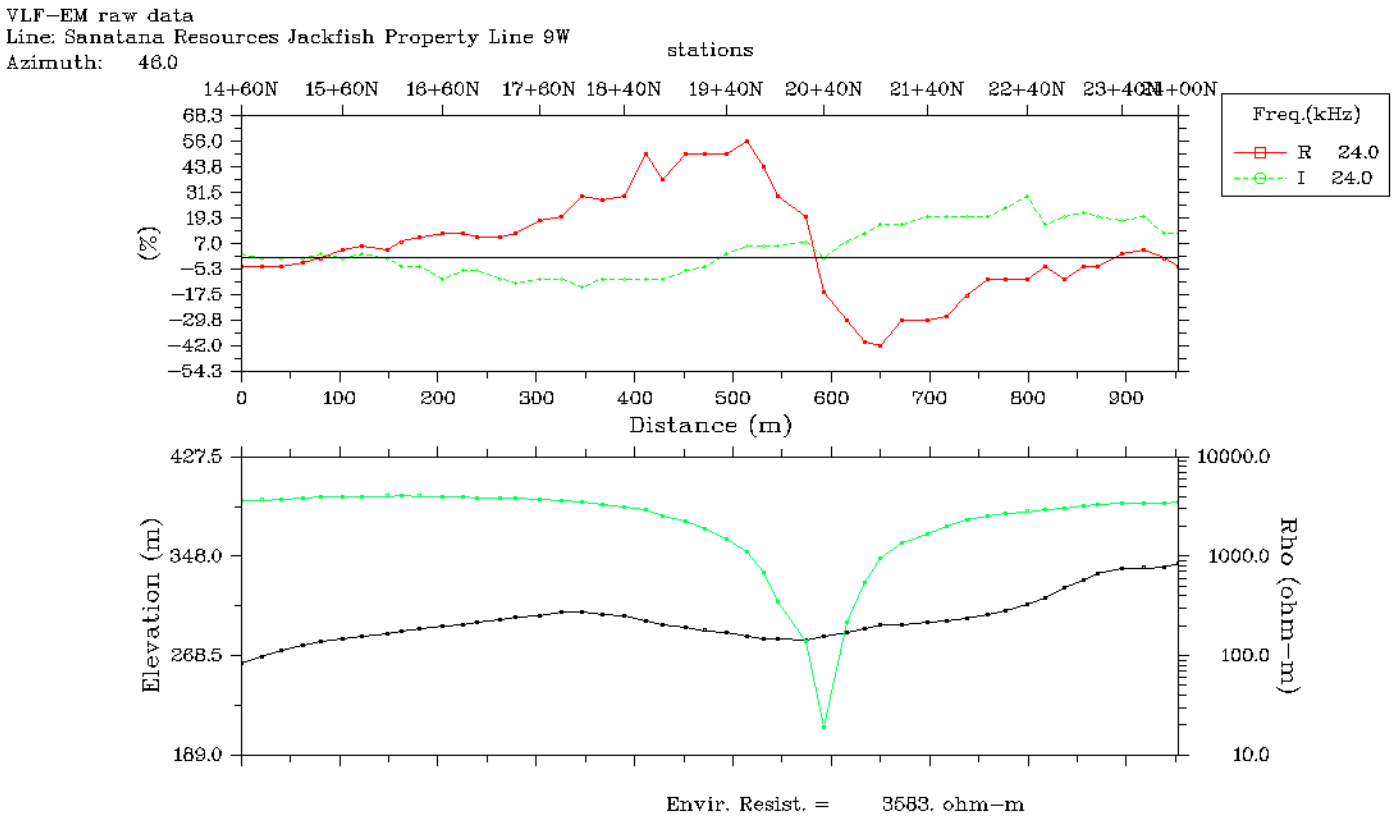
NAA Figure 17 Line 8W Model 4000 Ohm with Fraser Picks



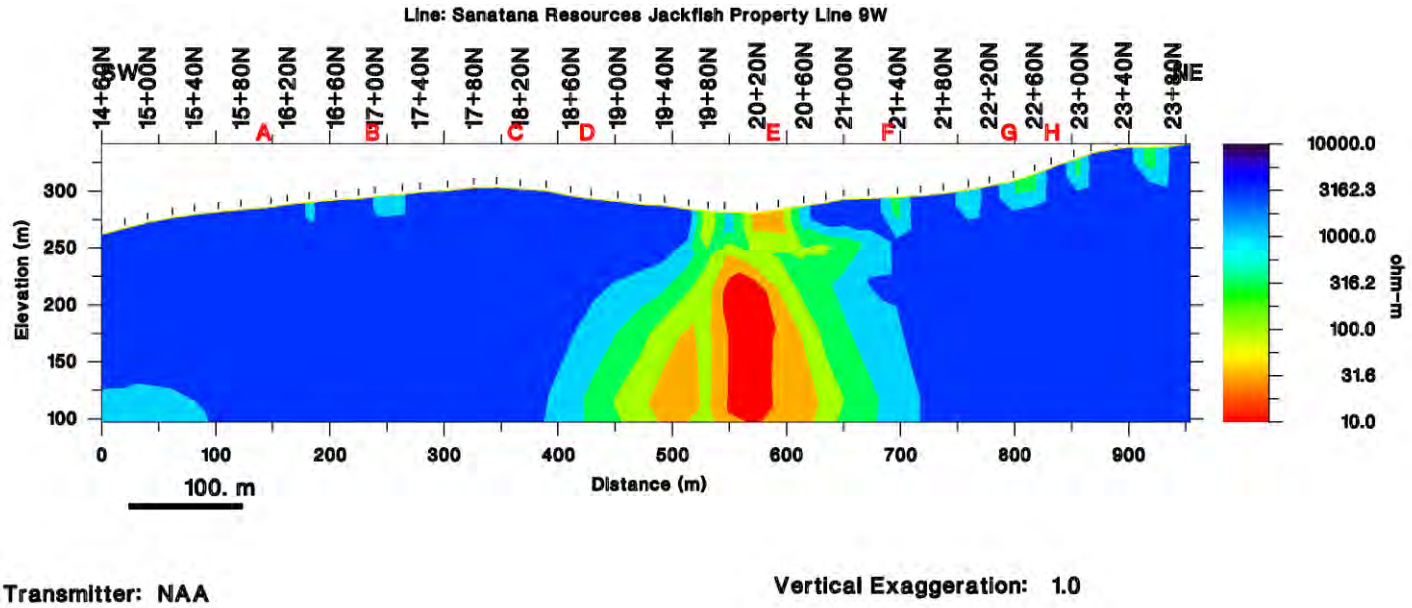
NAA Figure 18 Line 8W JY Model with Fraser Picks



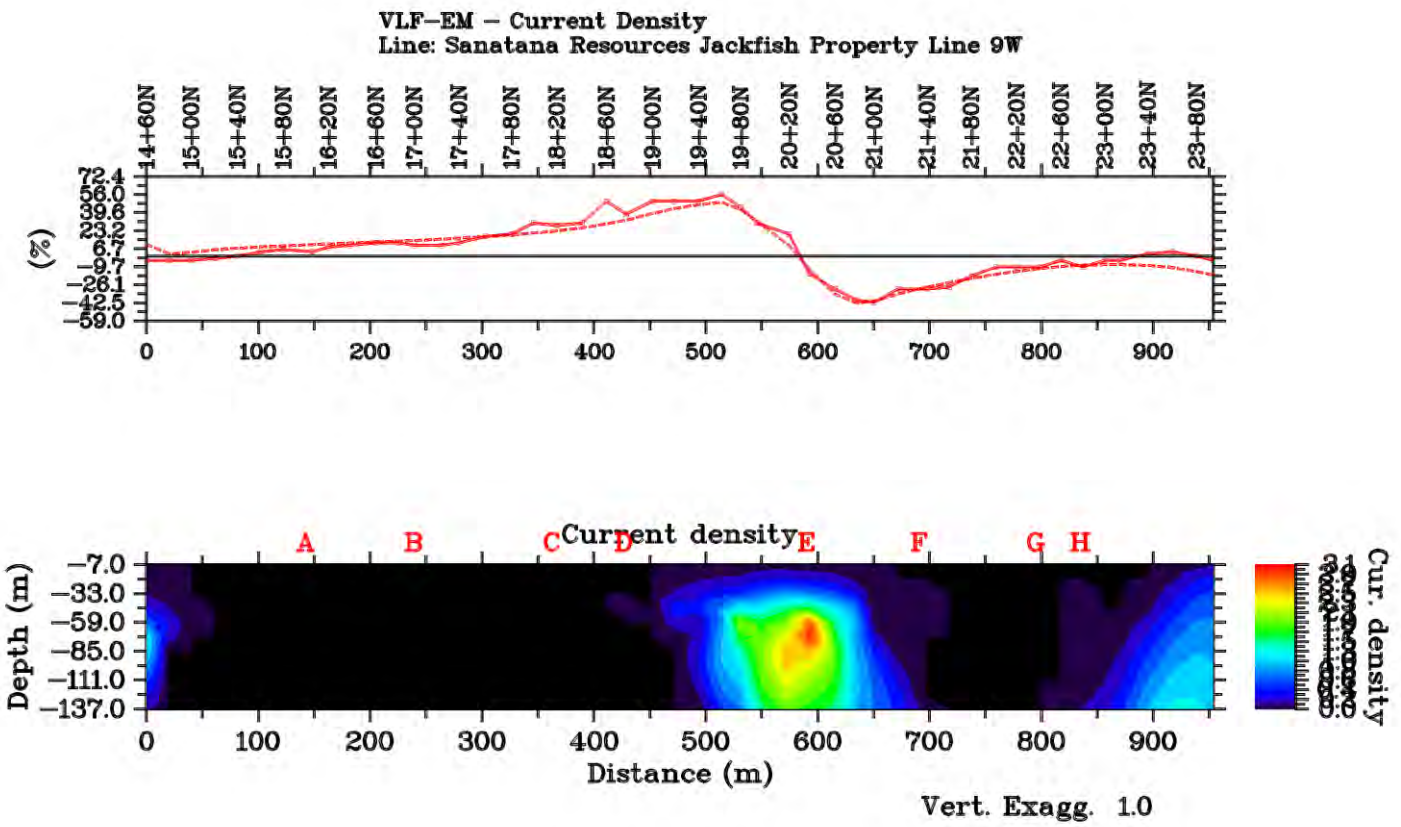
NAA Figure 19 Line 9W Raw Data Profile



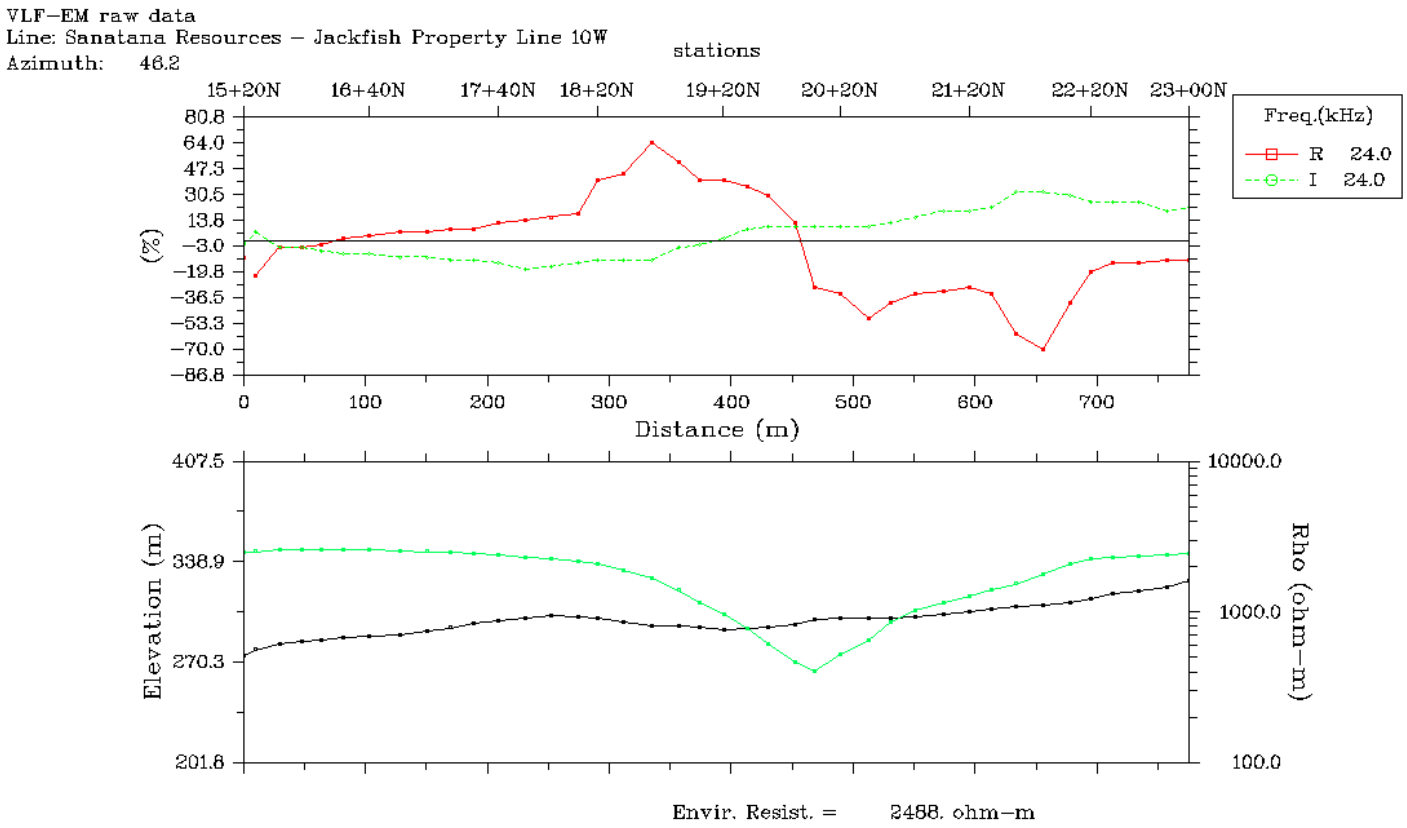
NAA Figure 20 Line 9W Model 4000 Ohm with Fraser Picks



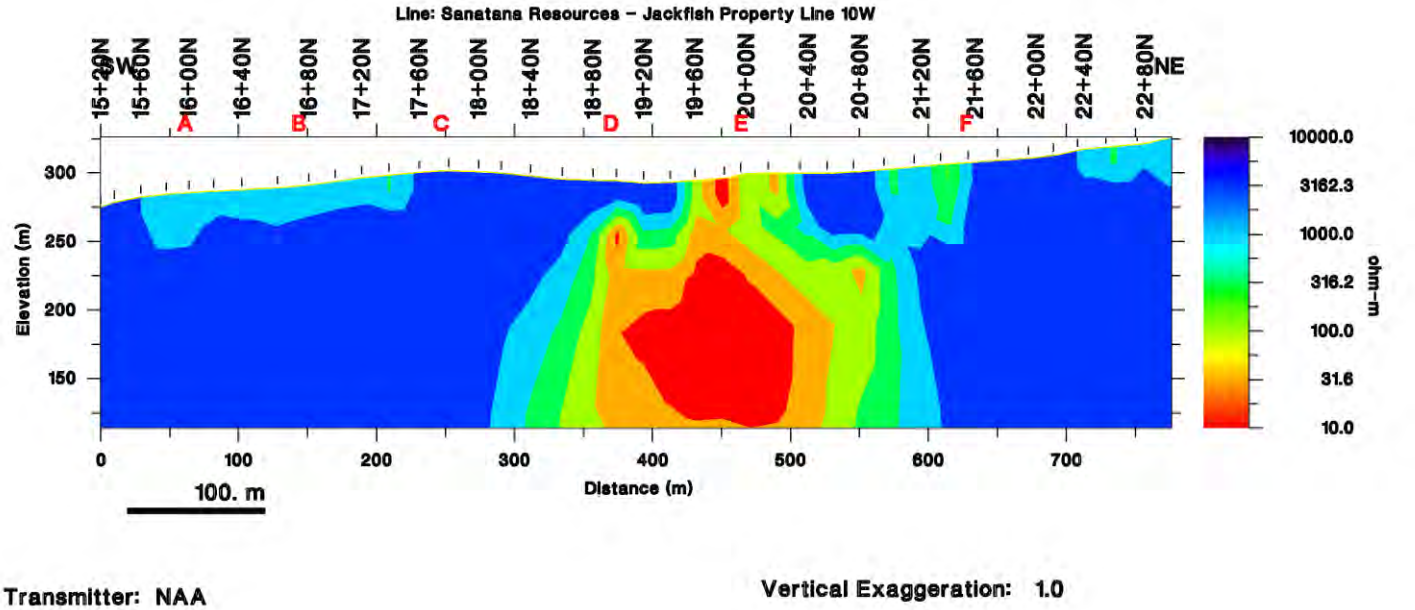
NAA Figure 21 Line 9W JY Model with Fraser Picks



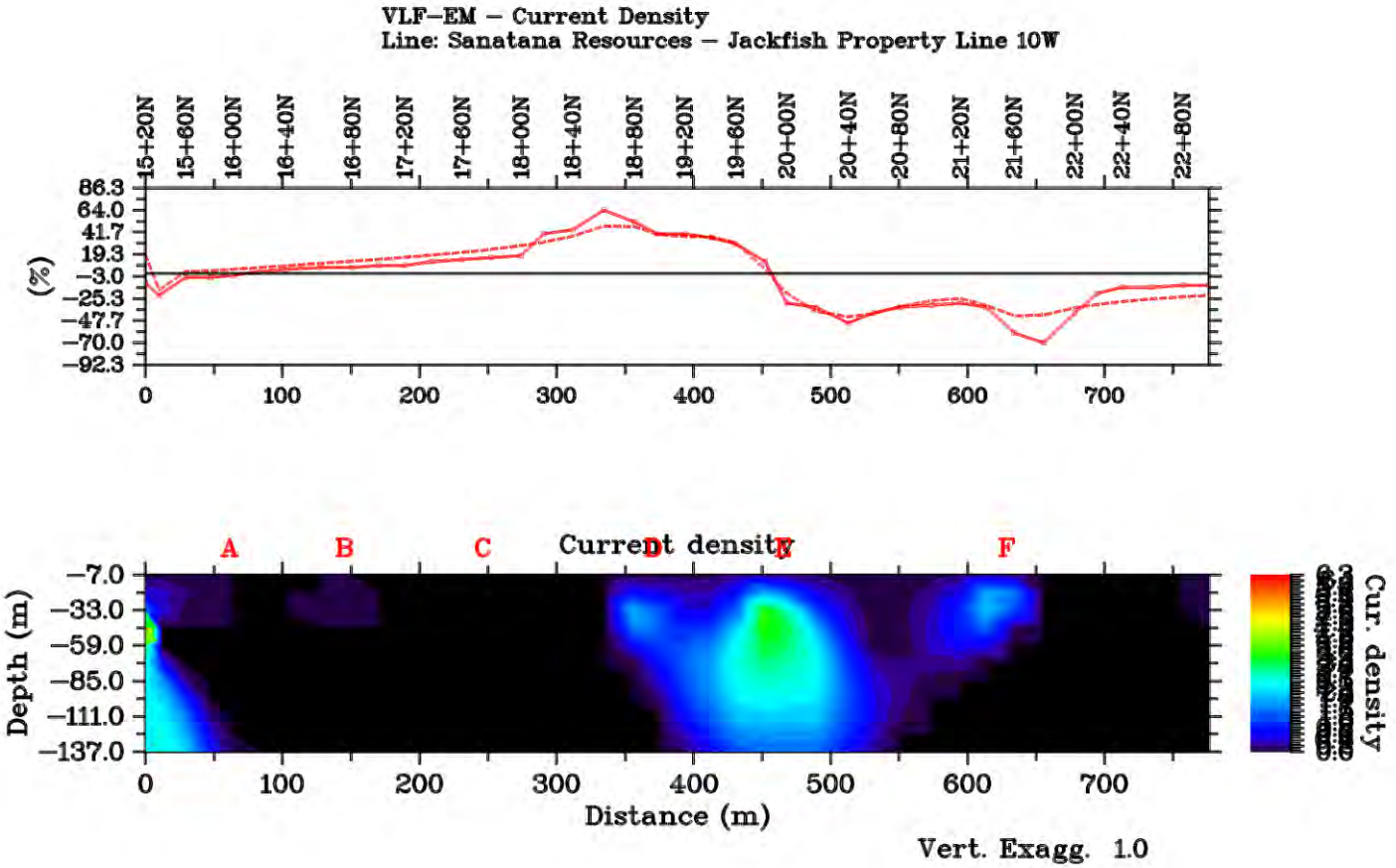
NAA Figure 22 Line 10W Raw Data Profile



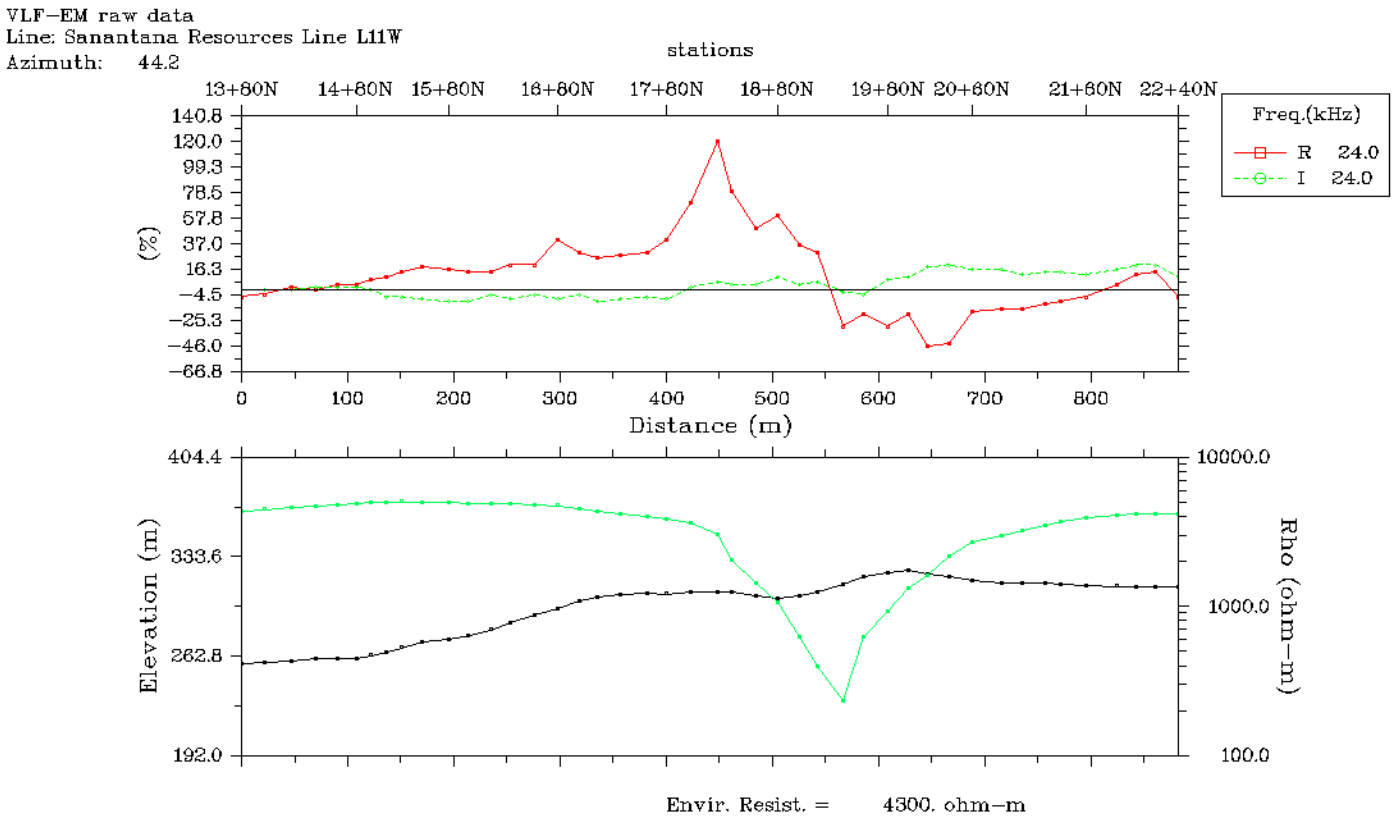
NAA Figure 23 Line 10W Model 4000 Ohm with Fraser Picks



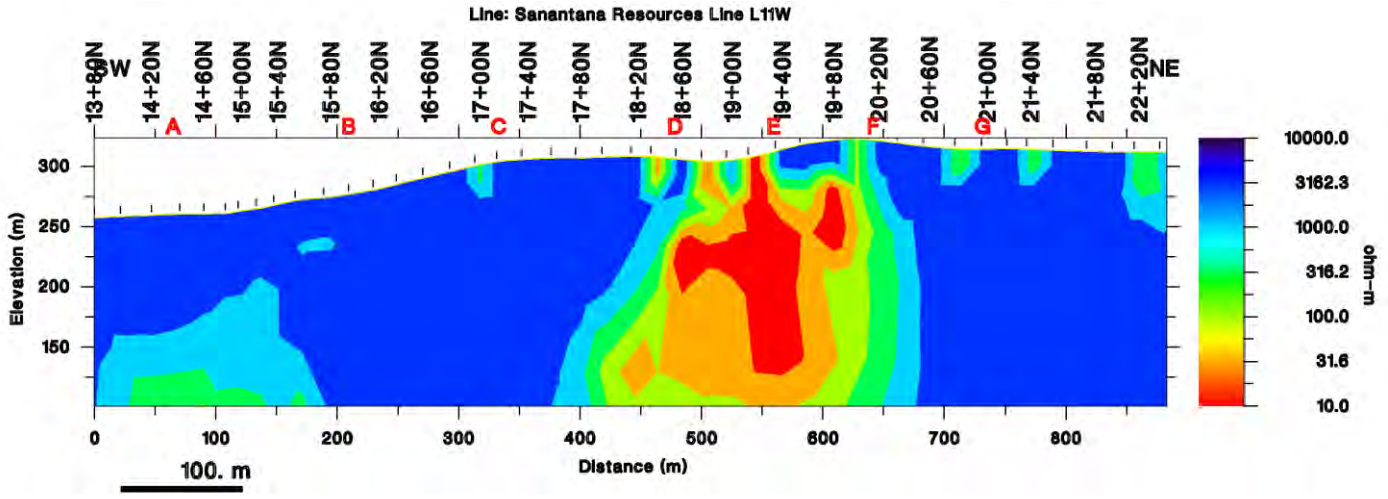
NAA Figure 24 Line 10W JY Model with Fraser Picks



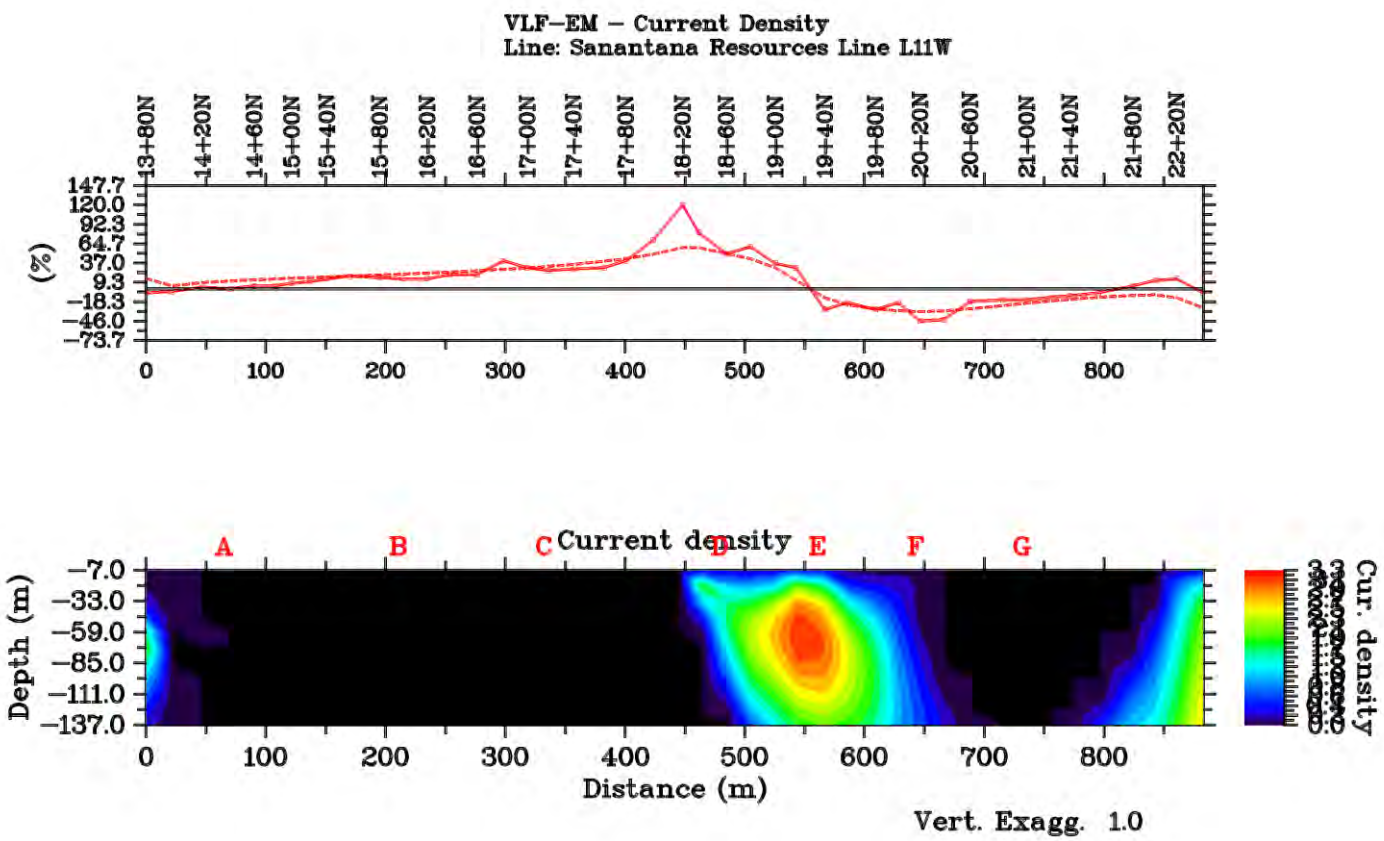
NAA Figure 25 Line 11W Raw Data Profile



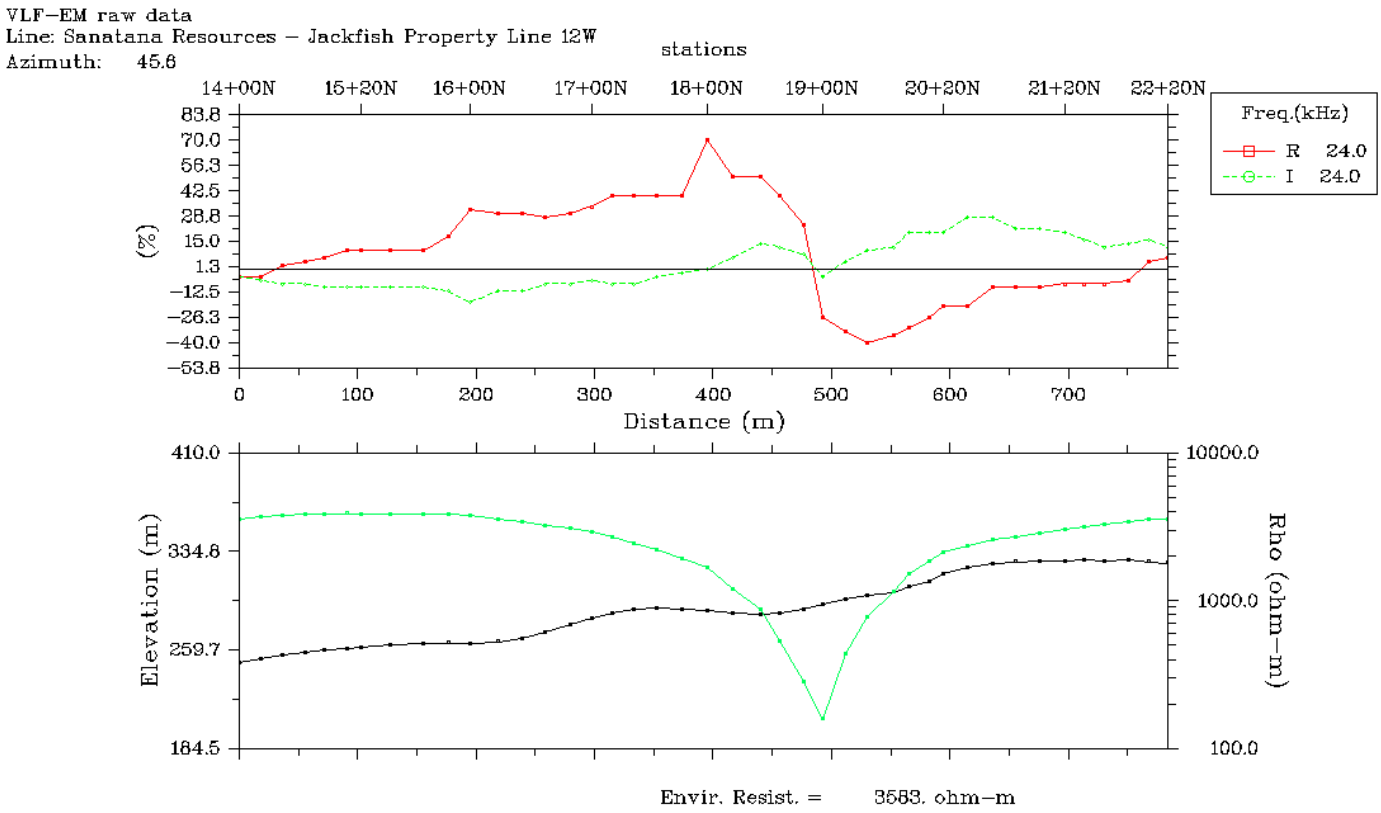
NAA Figure 26 Line 11W Model 4000 Ohm with Fraser Picks



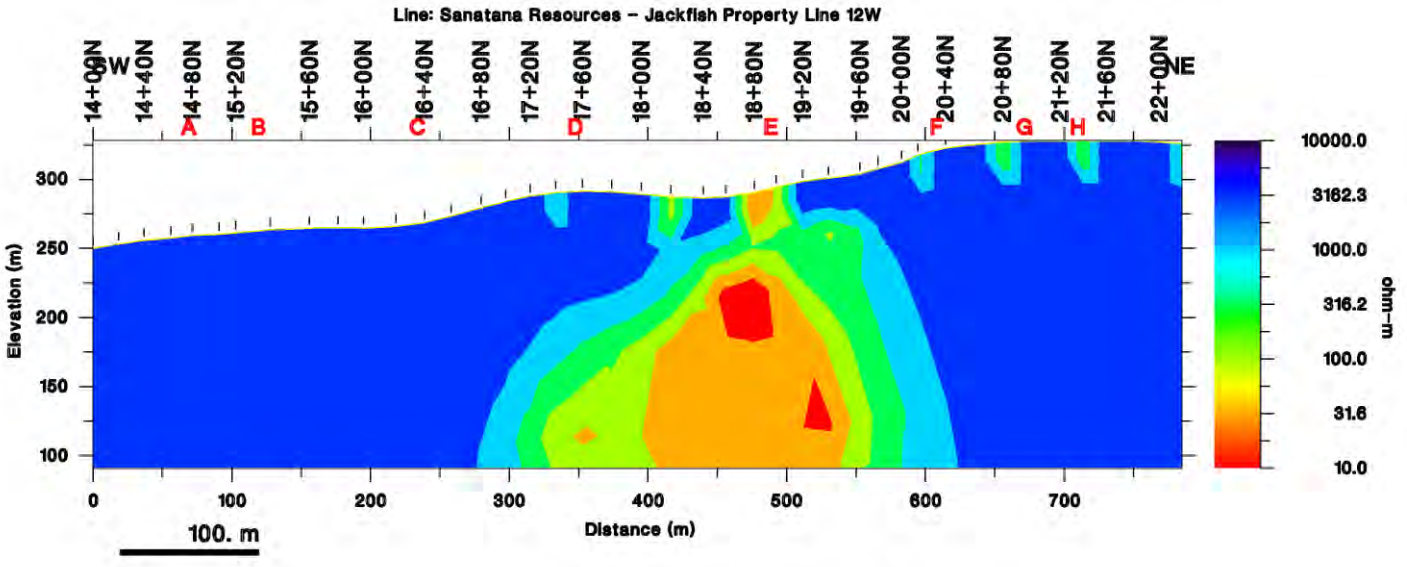
NAA Figure 27 Line 11W JY Model with Fraser Picks



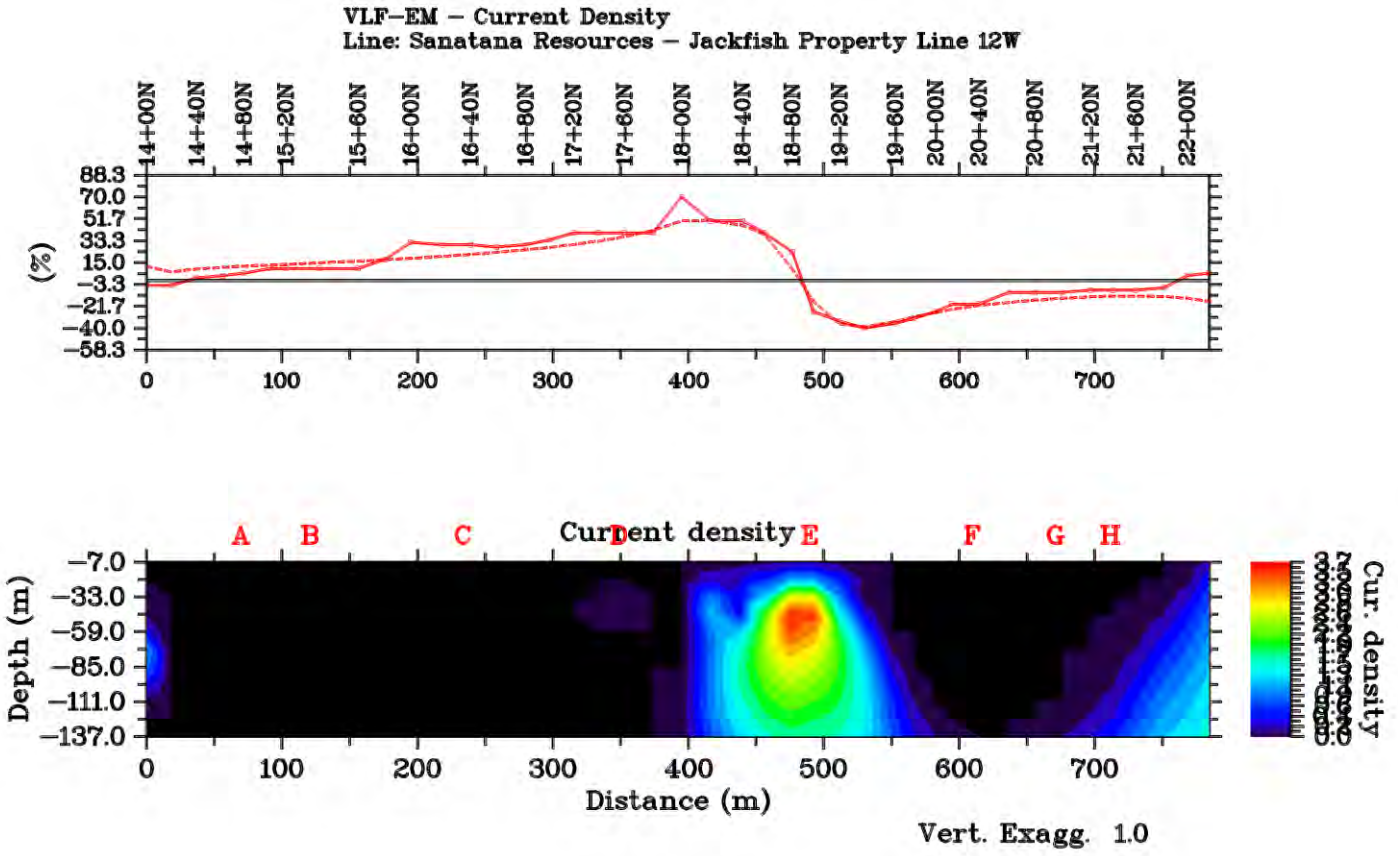
NAA Figure 28 Line 12W Raw Data Profile



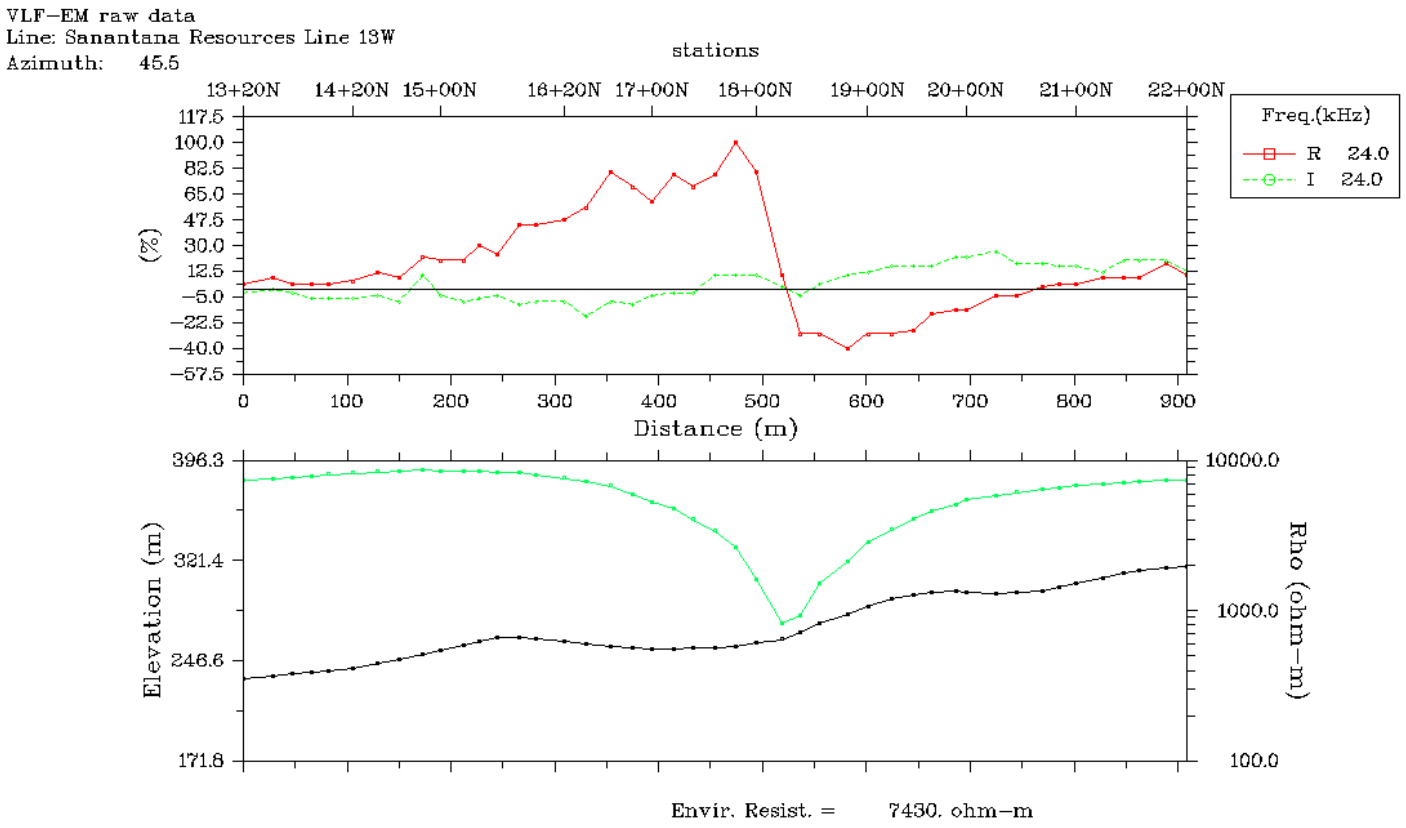
NAA Figure 29 Line 12W Model 4000 Ohm with Fraser Picks



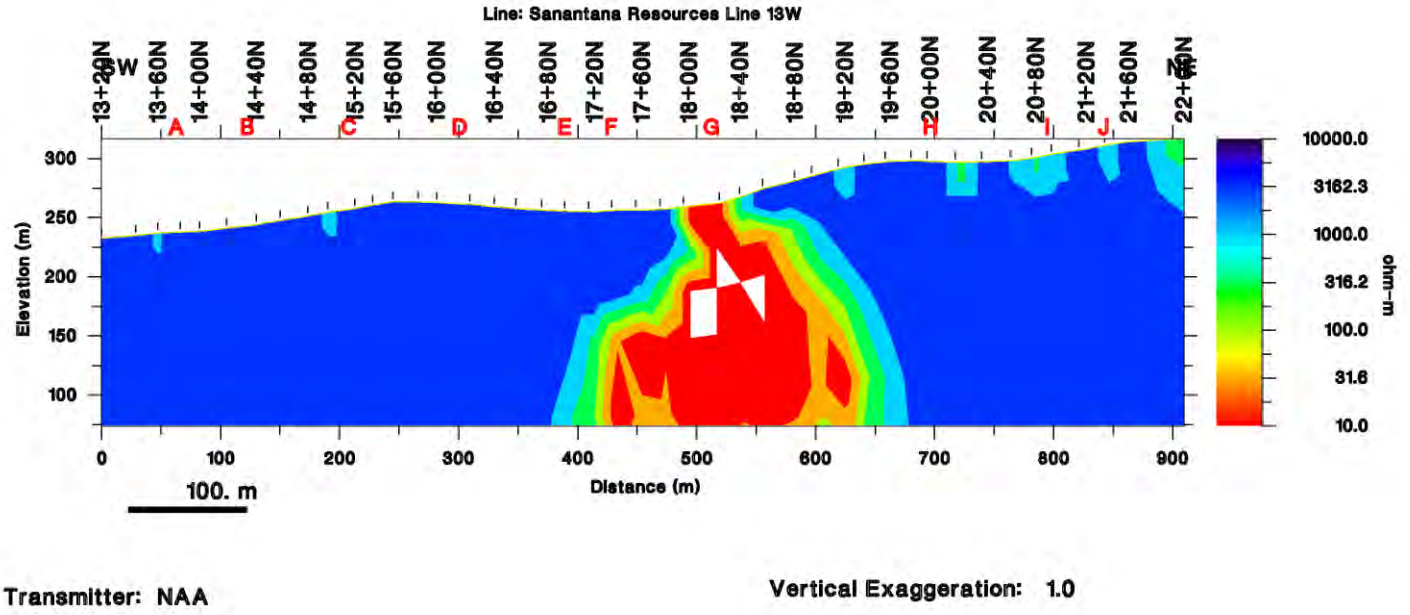
NAA Figure 30 Line 12W JY Model with Fraser Picks



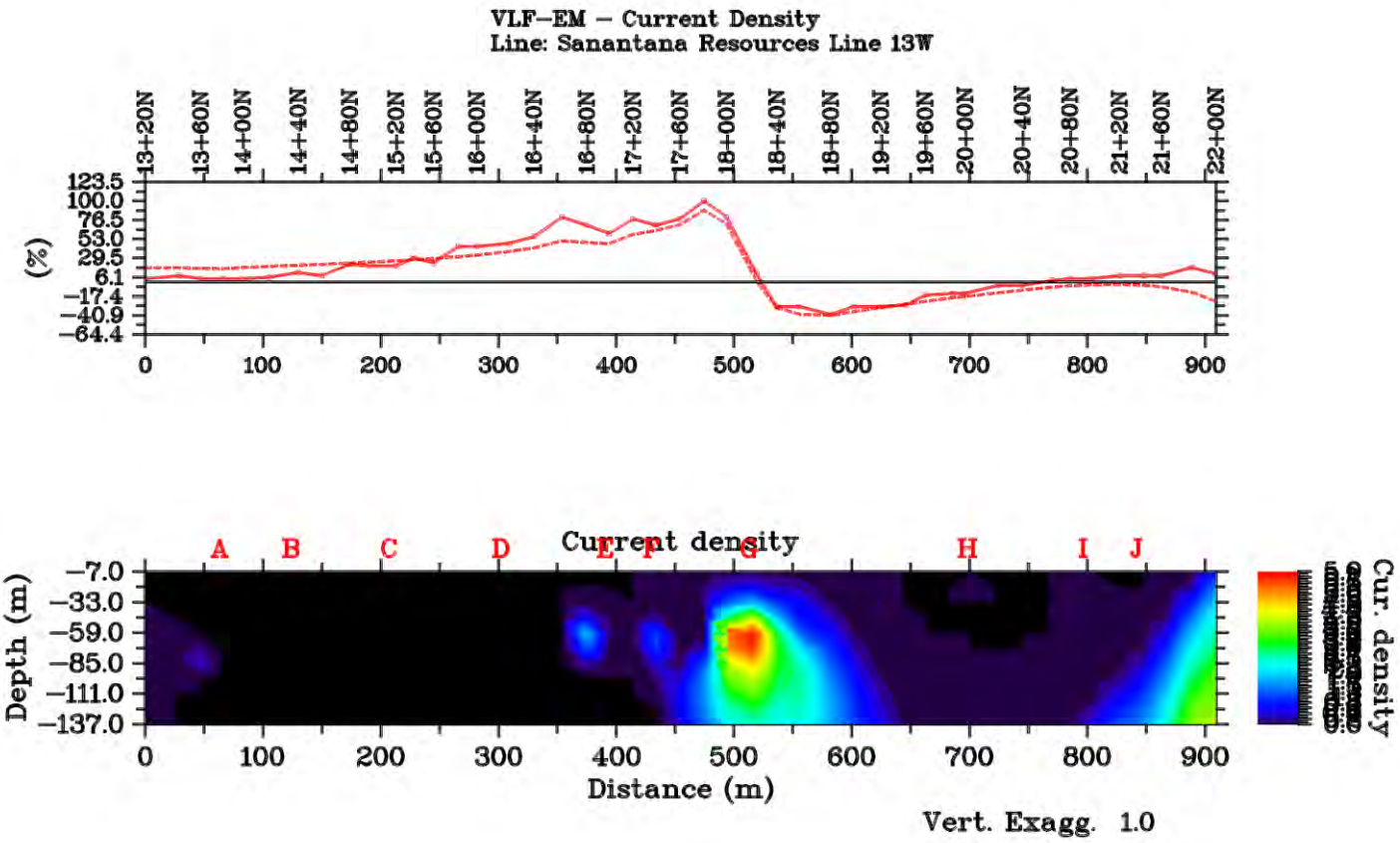
NAA Figure 31 Line 13W Raw Data Profile



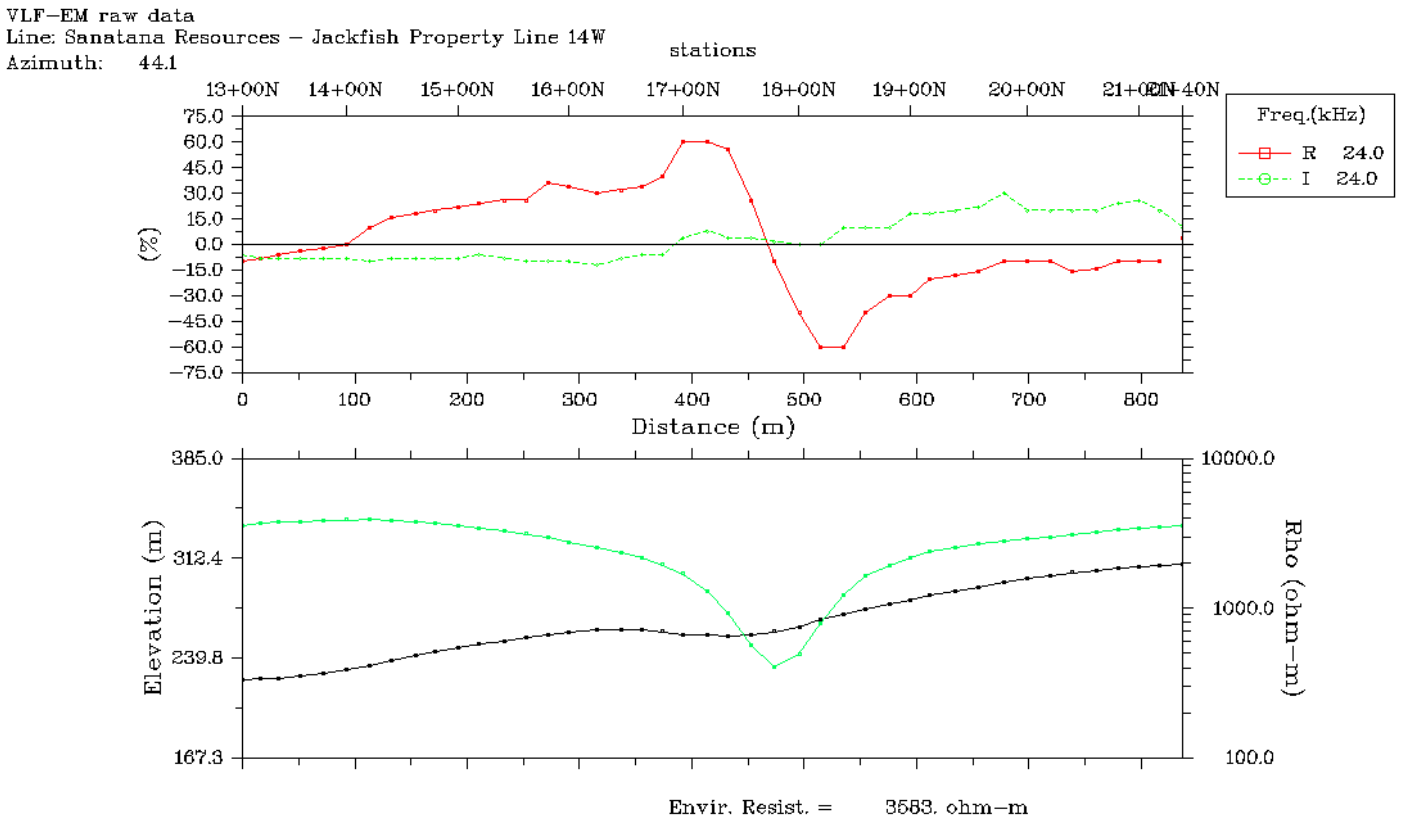
NAA Figure 32 Line 13W Model 4000 Ohm with Fraser Picks



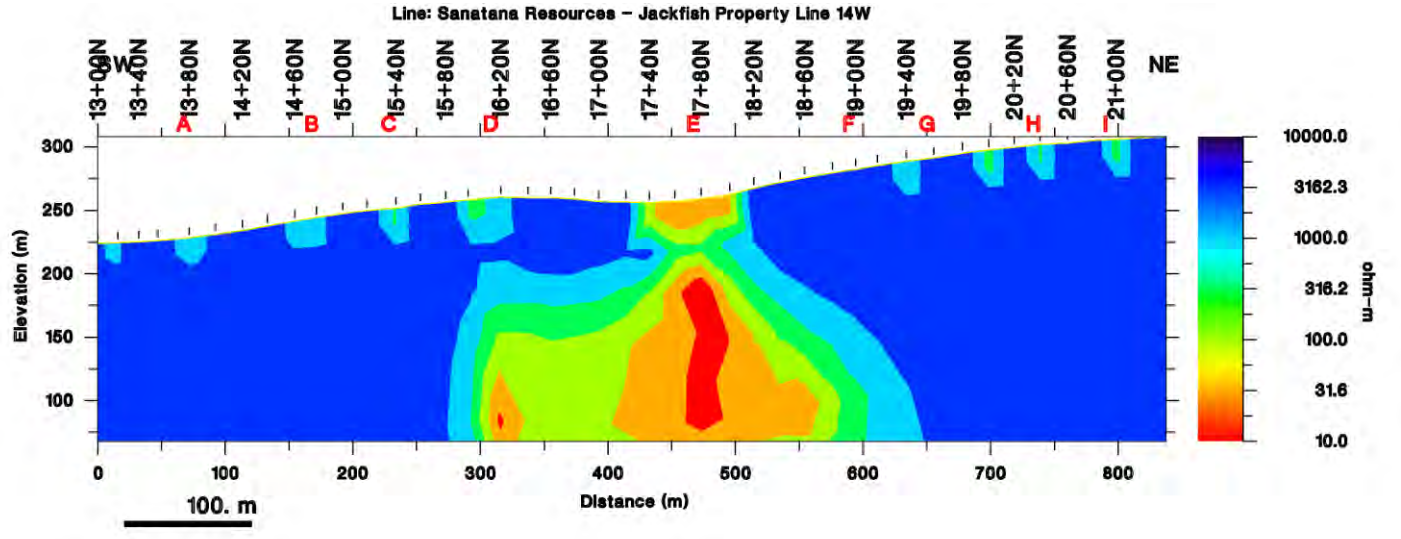
NAA Figure 33 Line 13 JY Model with Fraser Picks



NAA Figure 34 Line 14W Raw Data Profile



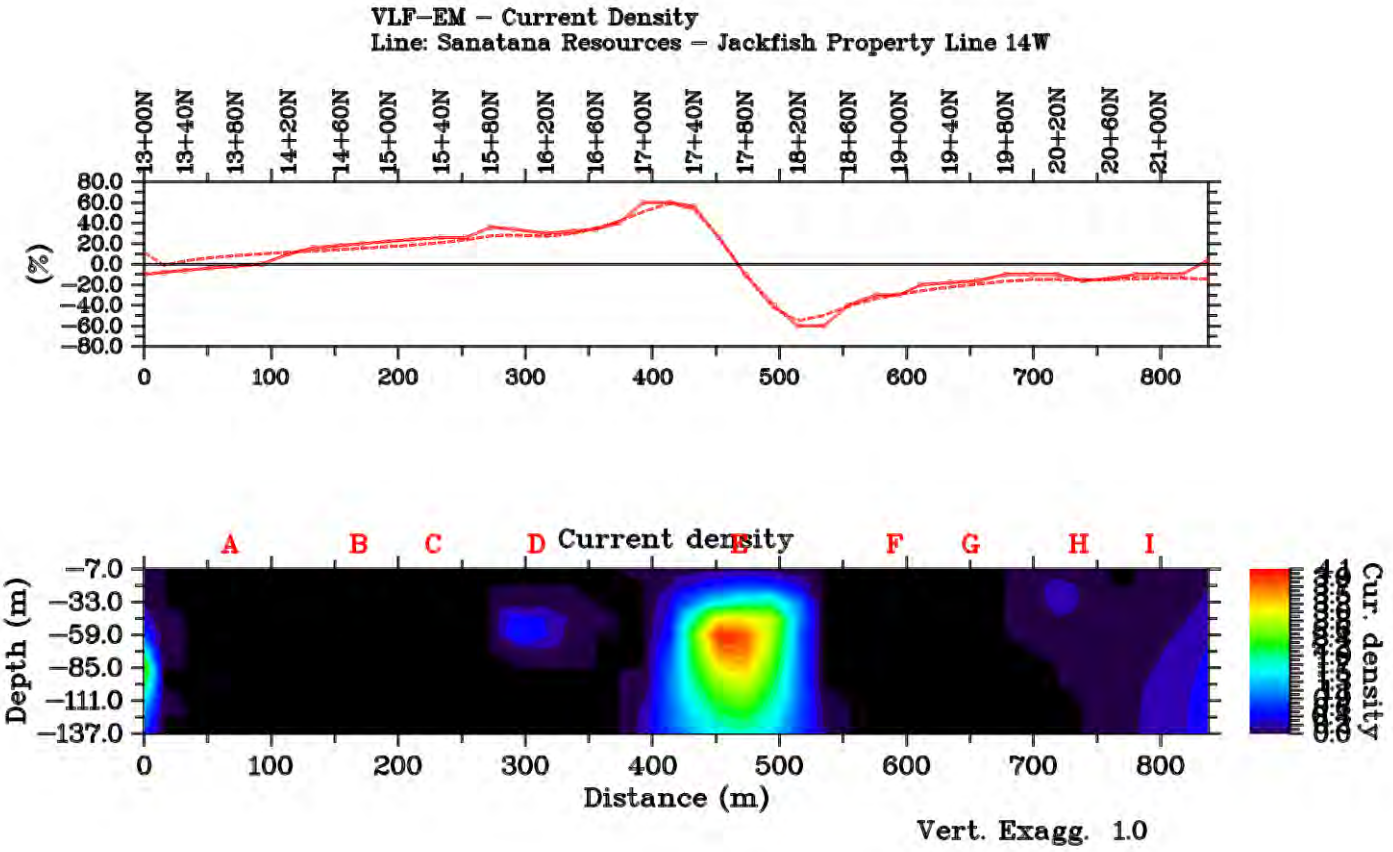
NAA Figure 35 Line 14W Model 4000 Ohm with Fraser Picks



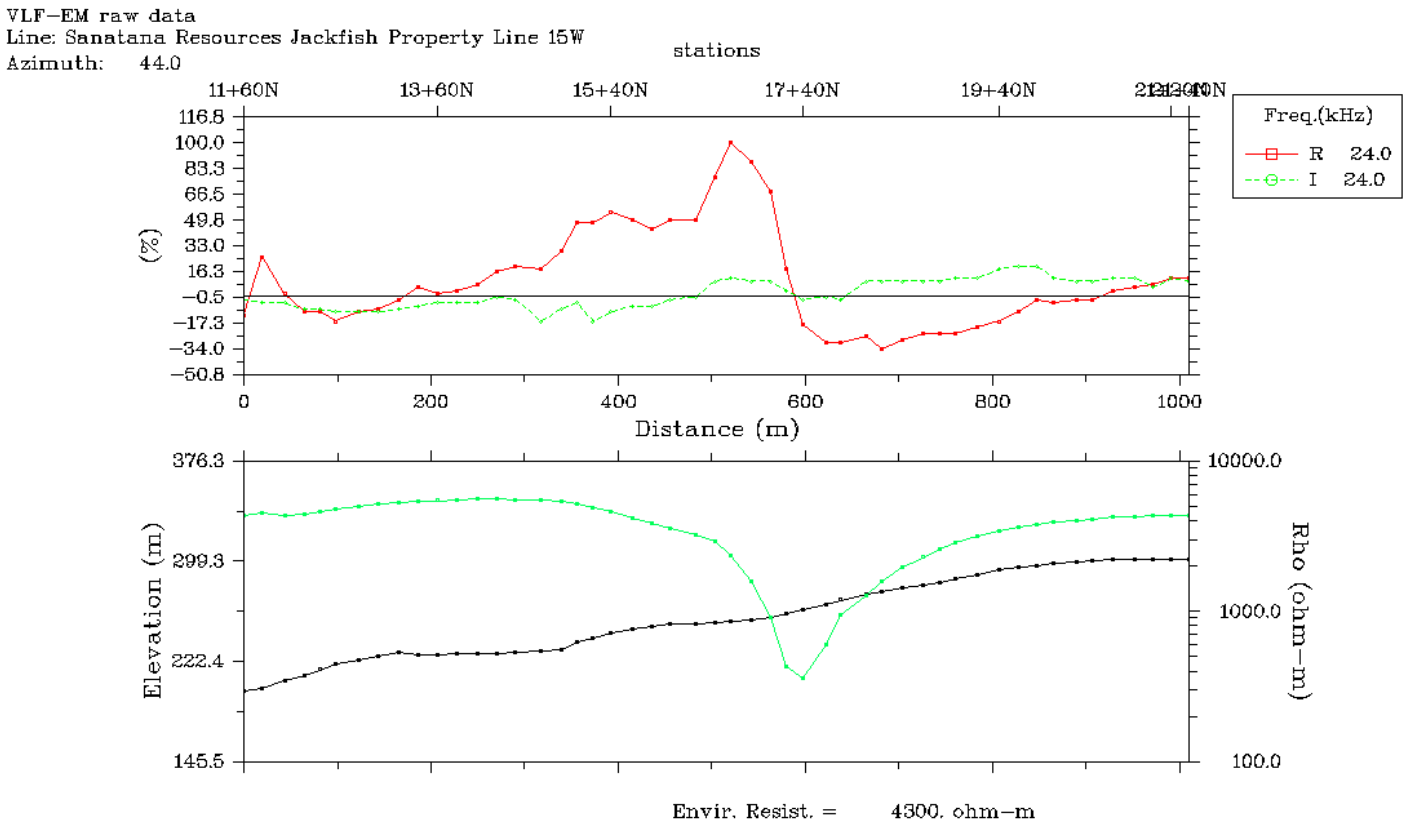
Transmitter: NAA

Vertical Exaggeration: 1.0

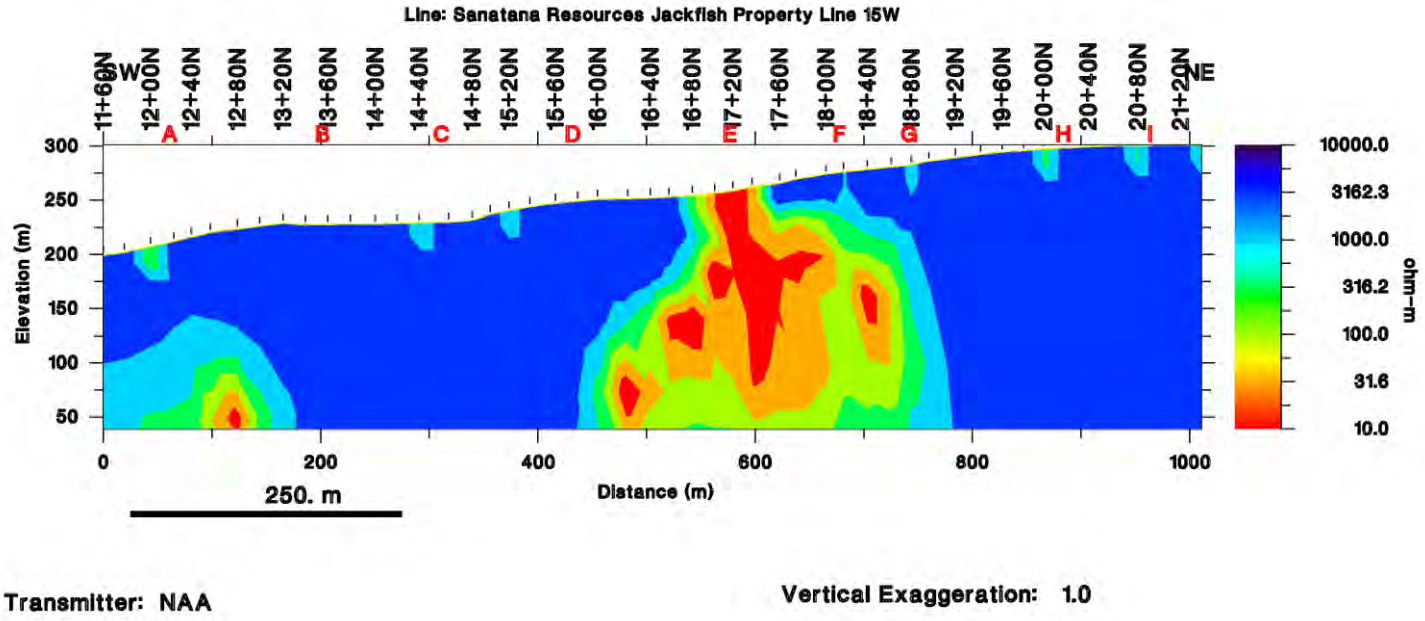
NAA Figure 36 Line 14W JY Model with Fraser Picks



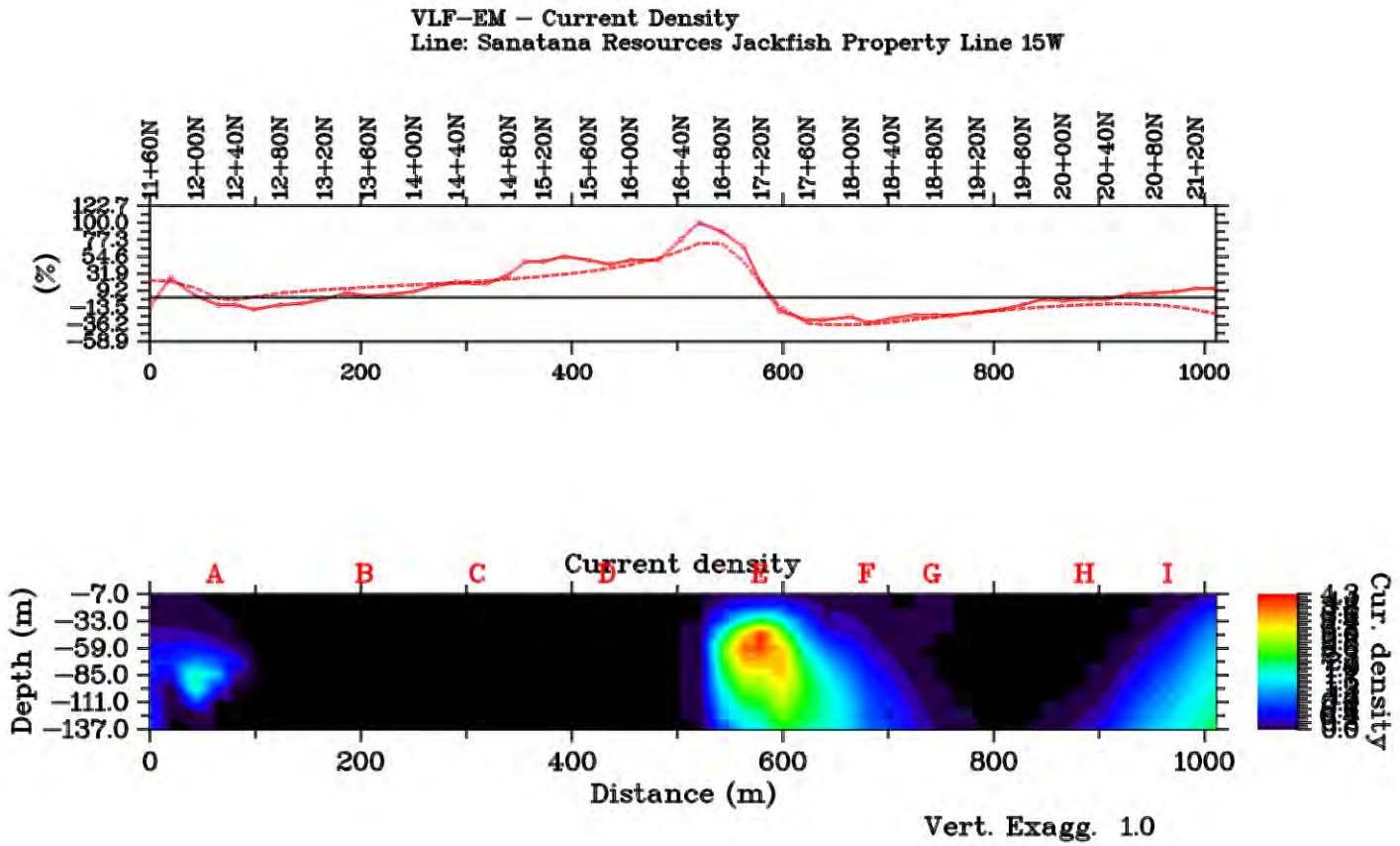
NAA Figure 37 Line 15W Raw Data Profile



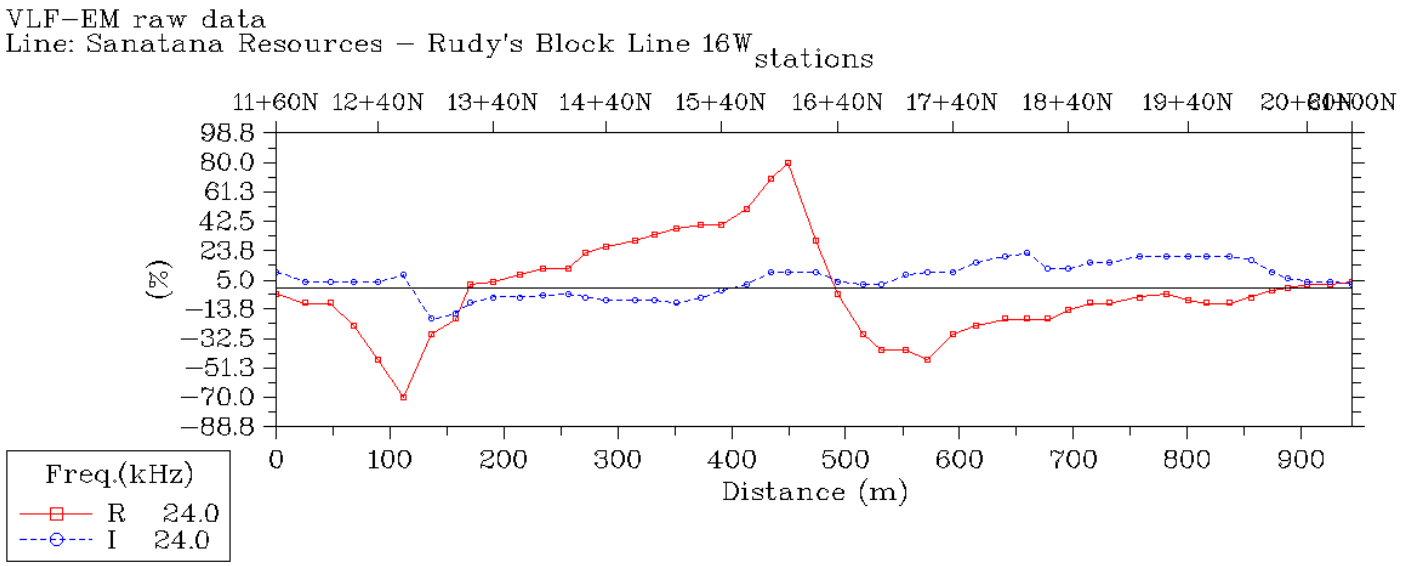
NAA Figure 38 Line 15W Model 2000 Ohm with Fraser Picks



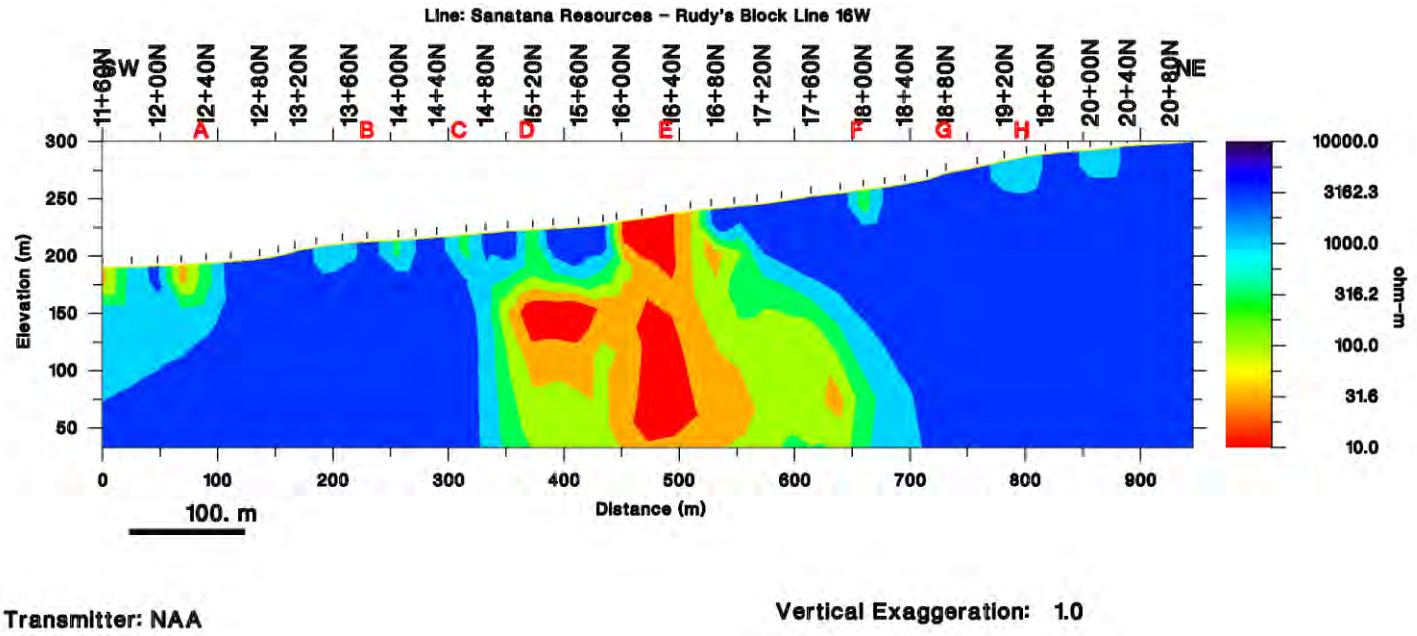
NAA Figure 39 Line 15W JY Model with Fraser Picks



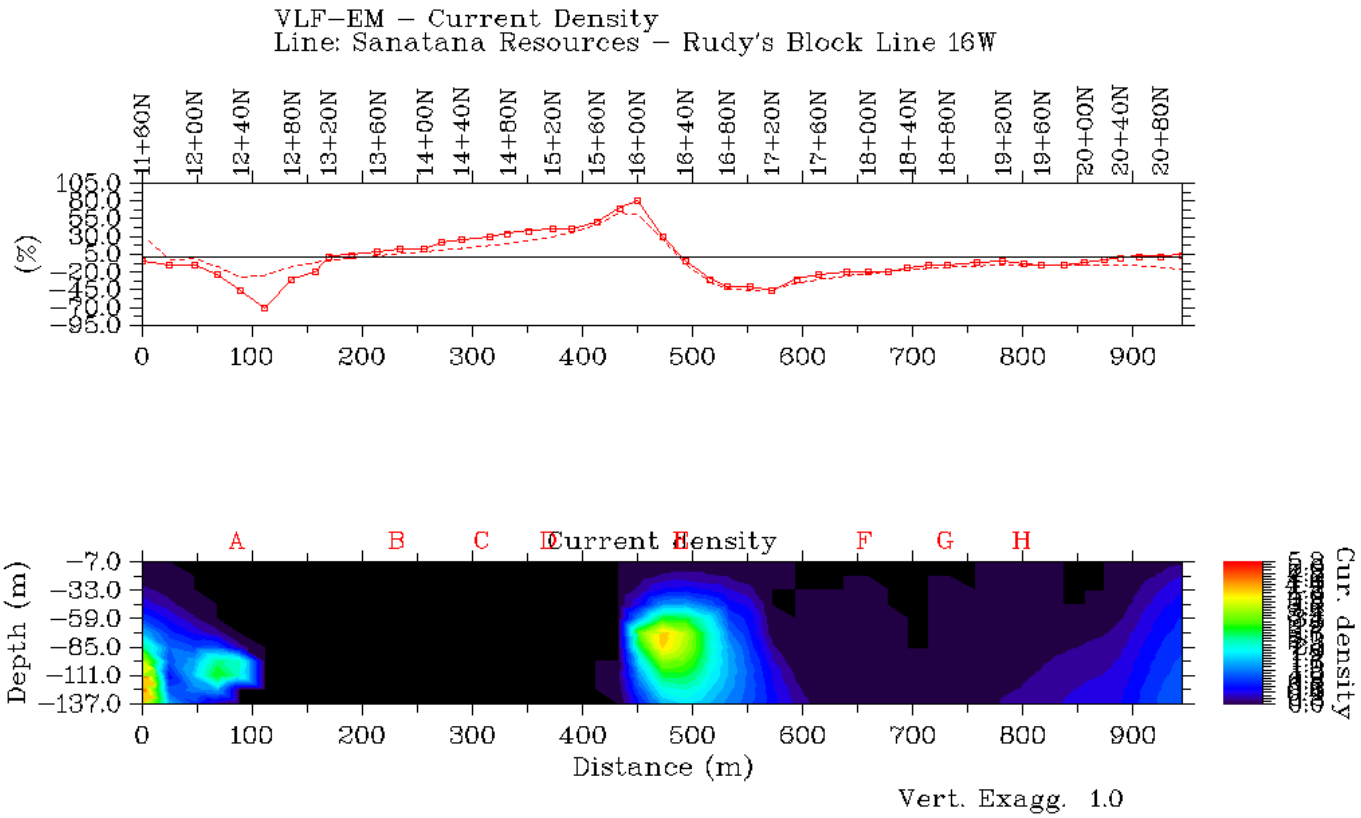
NAA Figure 40 Line 16W Raw Data Profile



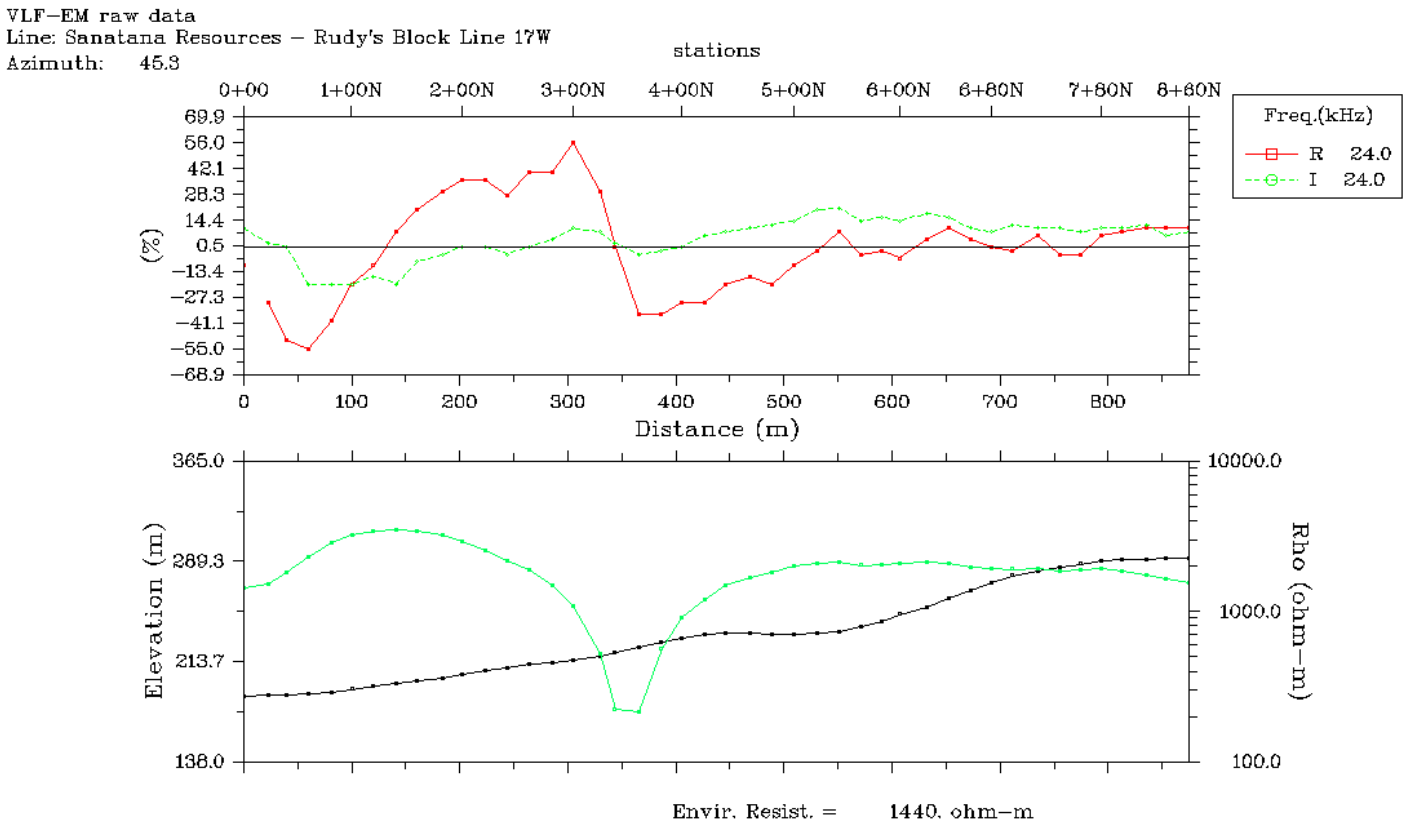
NAA Figure 41 Line 16W Model 4000 Ohm with Fraser Picks



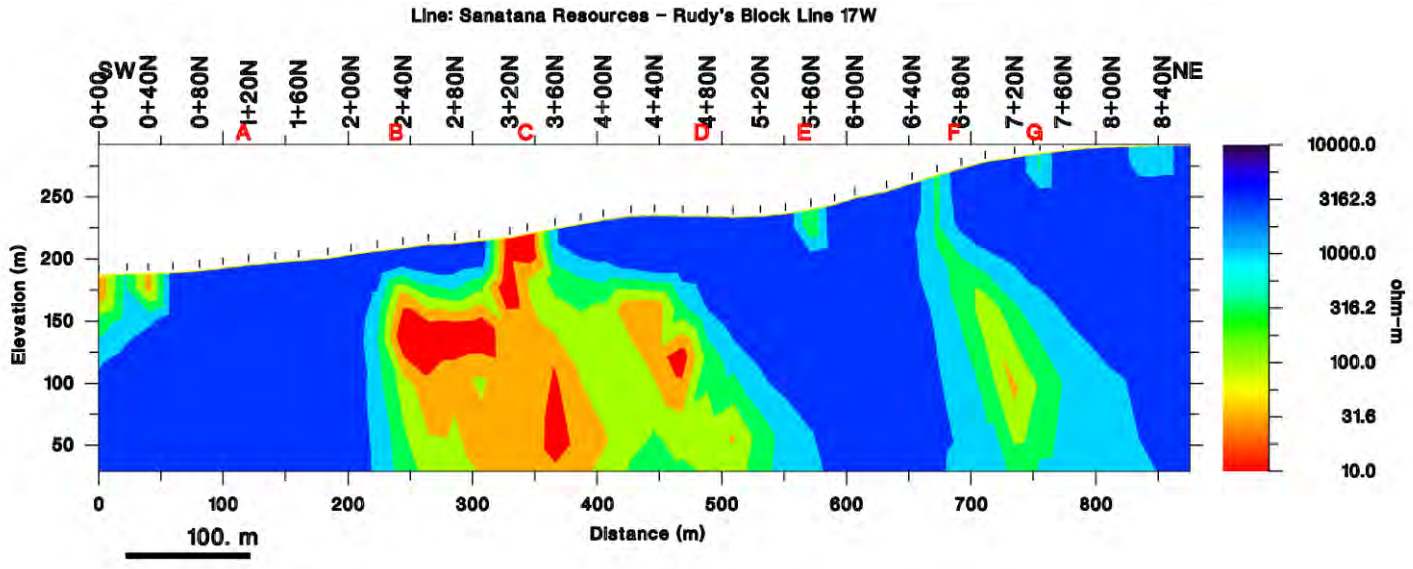
NAA Figure 42 Line 16W JY Model with Fraser Picks



NAA Figure 43 Line 17W Raw Data Profile



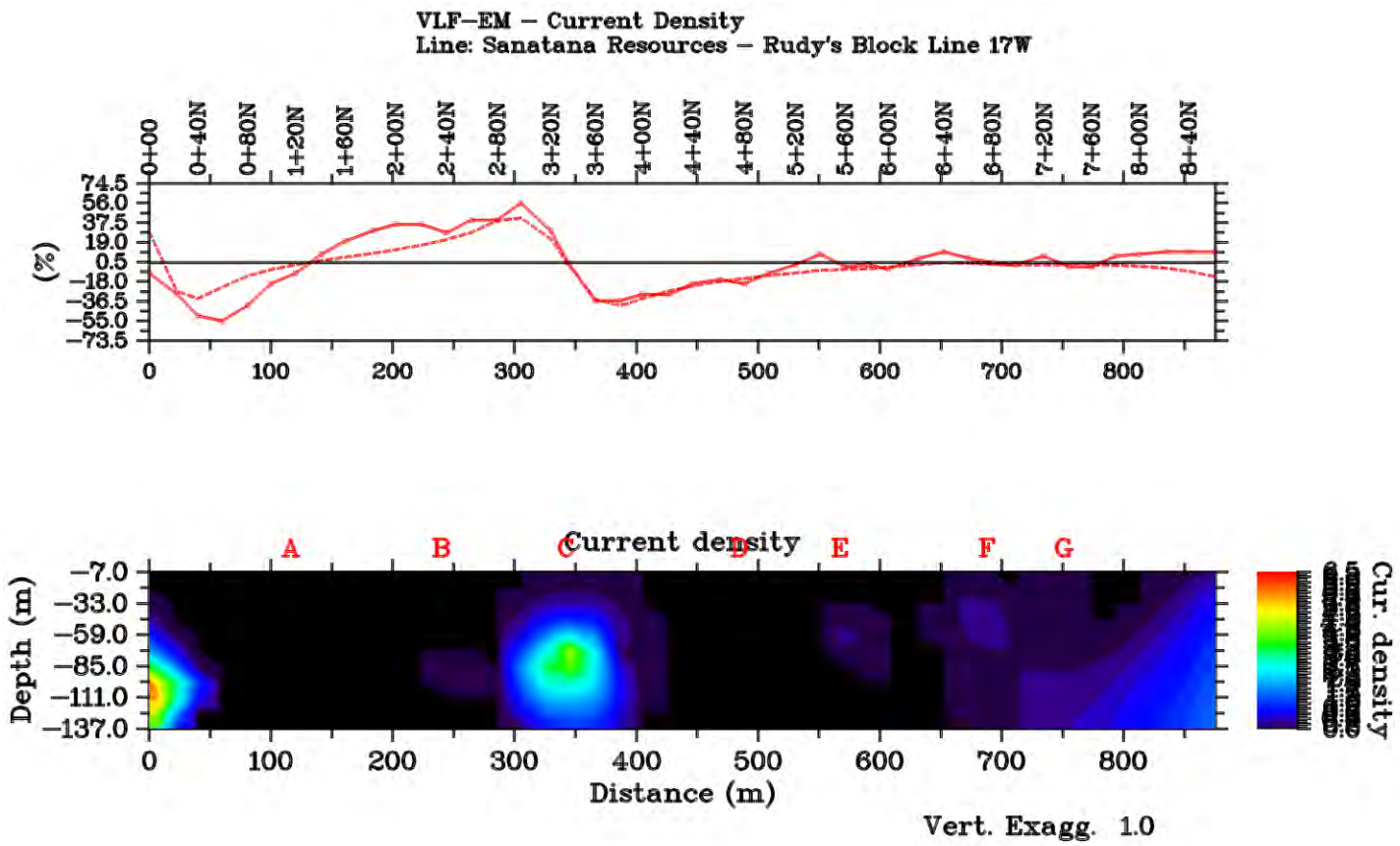
NAA Figure 44 Line 17W Model 4000 Ohm with Fraser Picks



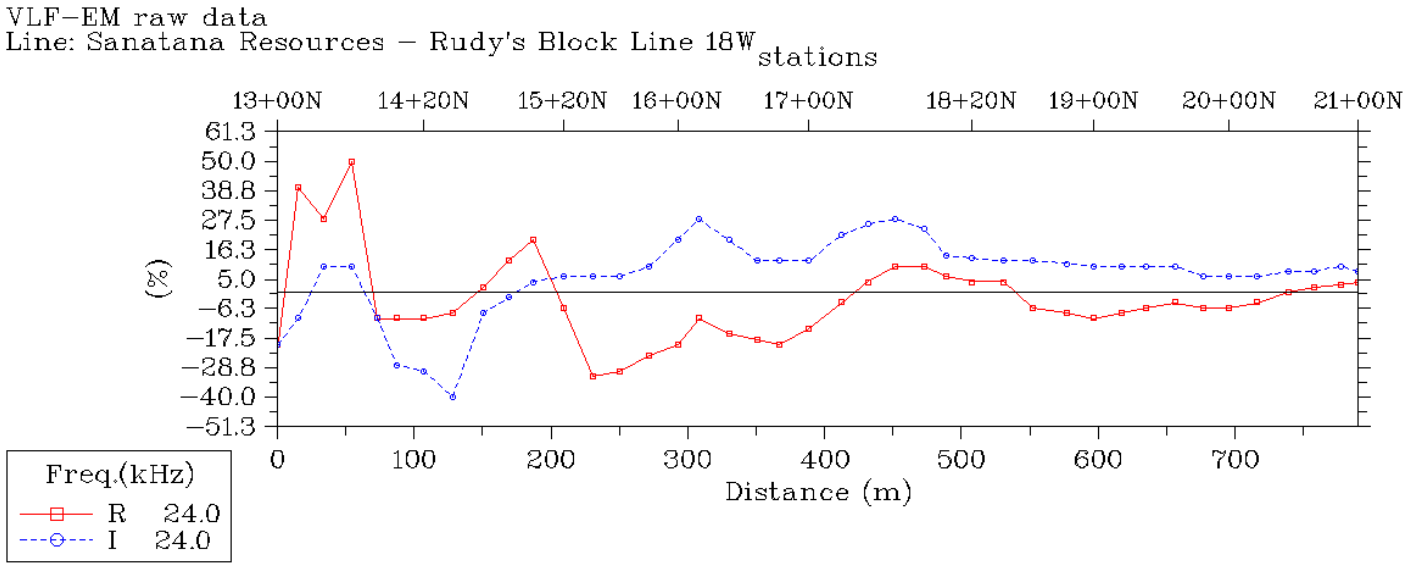
Transmitter: NAA

Vertical Exaggeration: 1.0

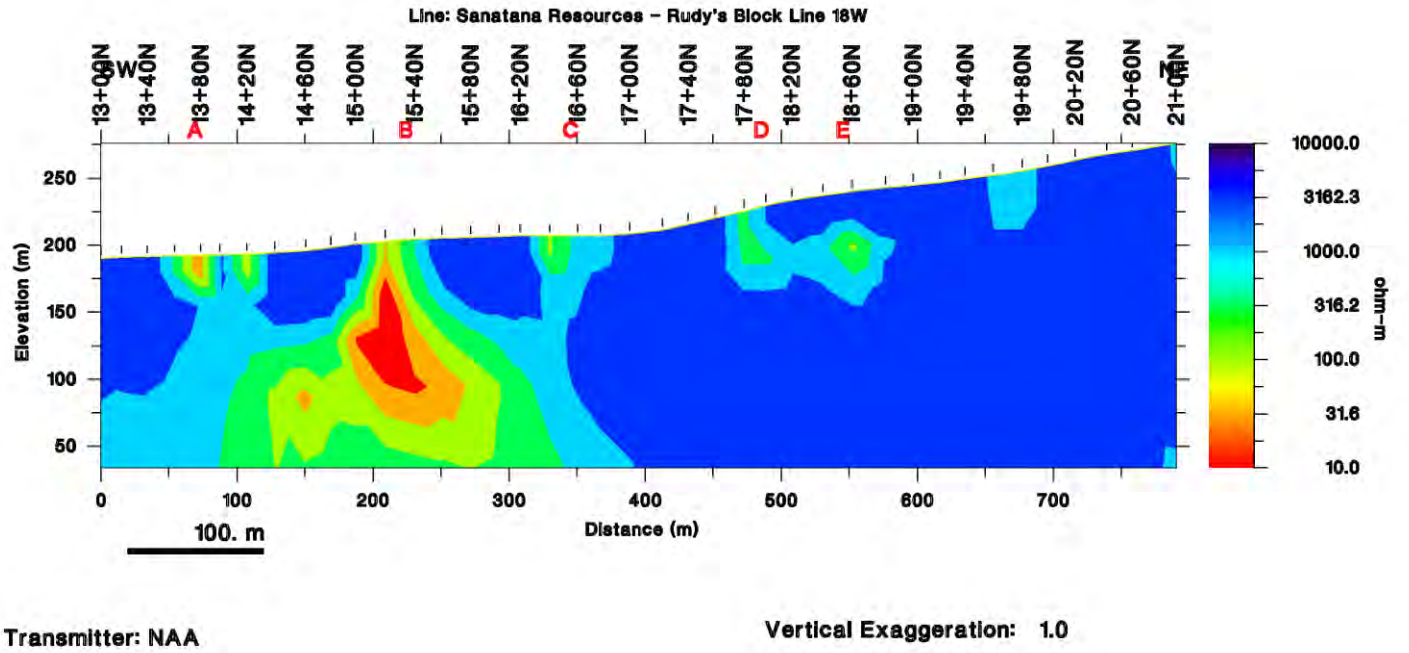
NAA Figure 45 Line 17W JY Model with Fraser Picks



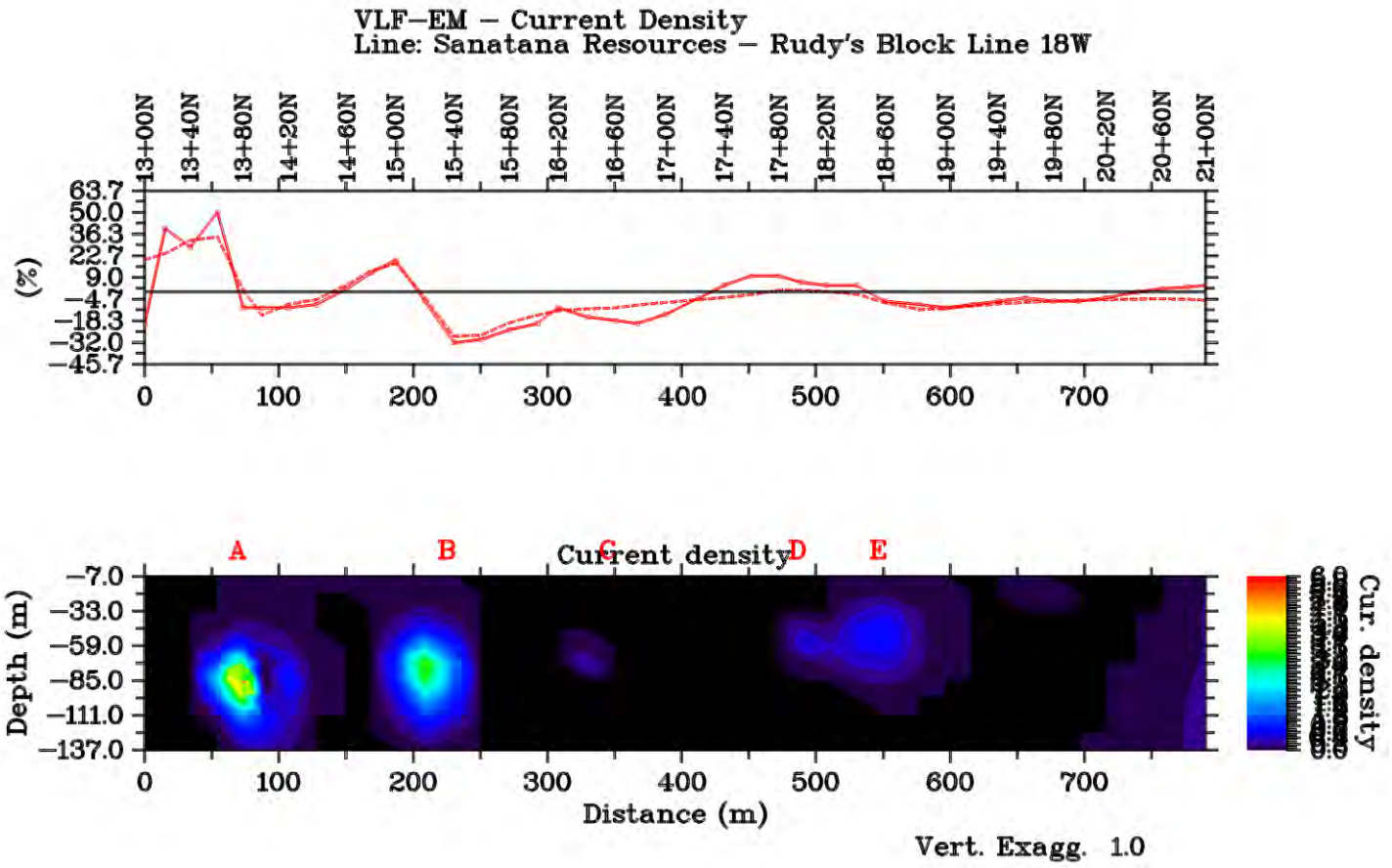
NAA Figure 46 Line 18W Raw Data Profile



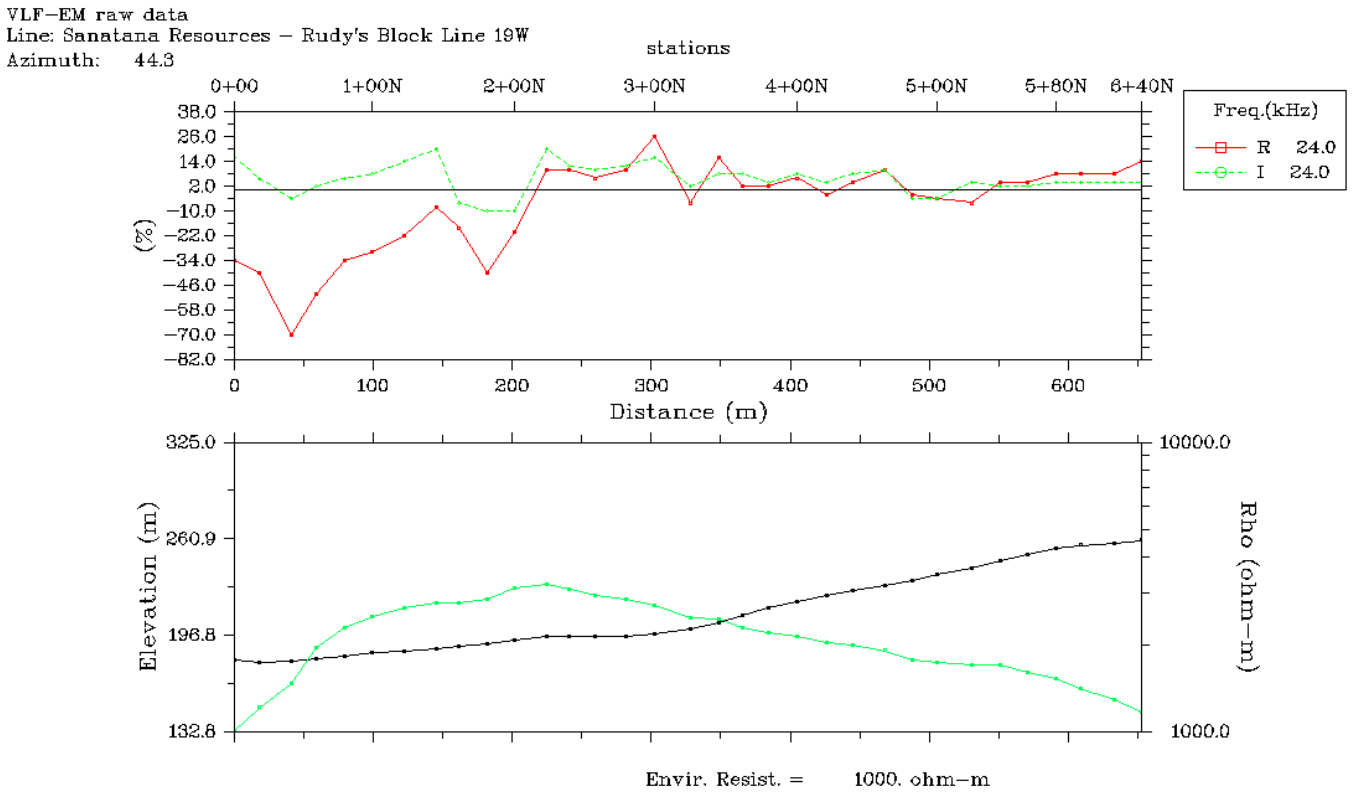
NAA Figure 47 Line 18W Model 4000 Ohm with Fraser Picks



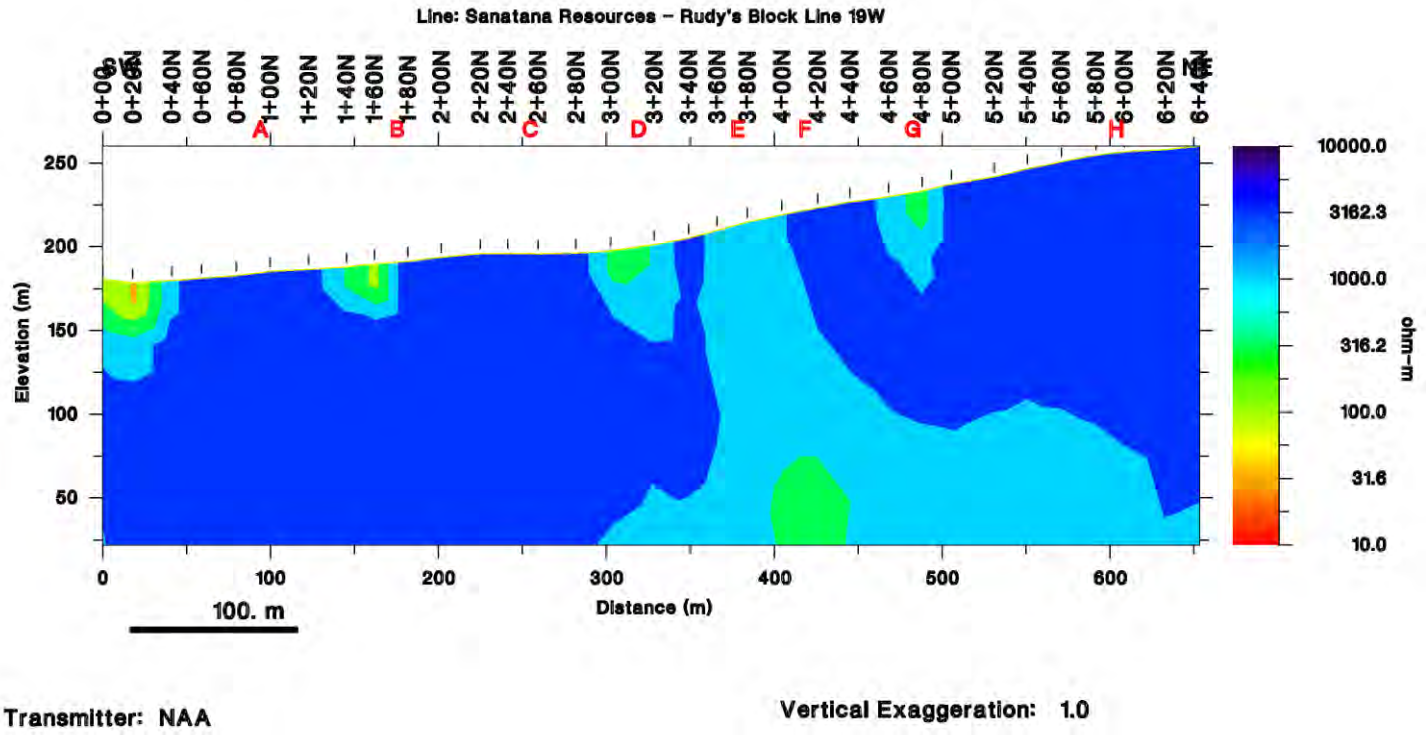
NAA Figure 48 Line 18W JY Model with Fraser Picks



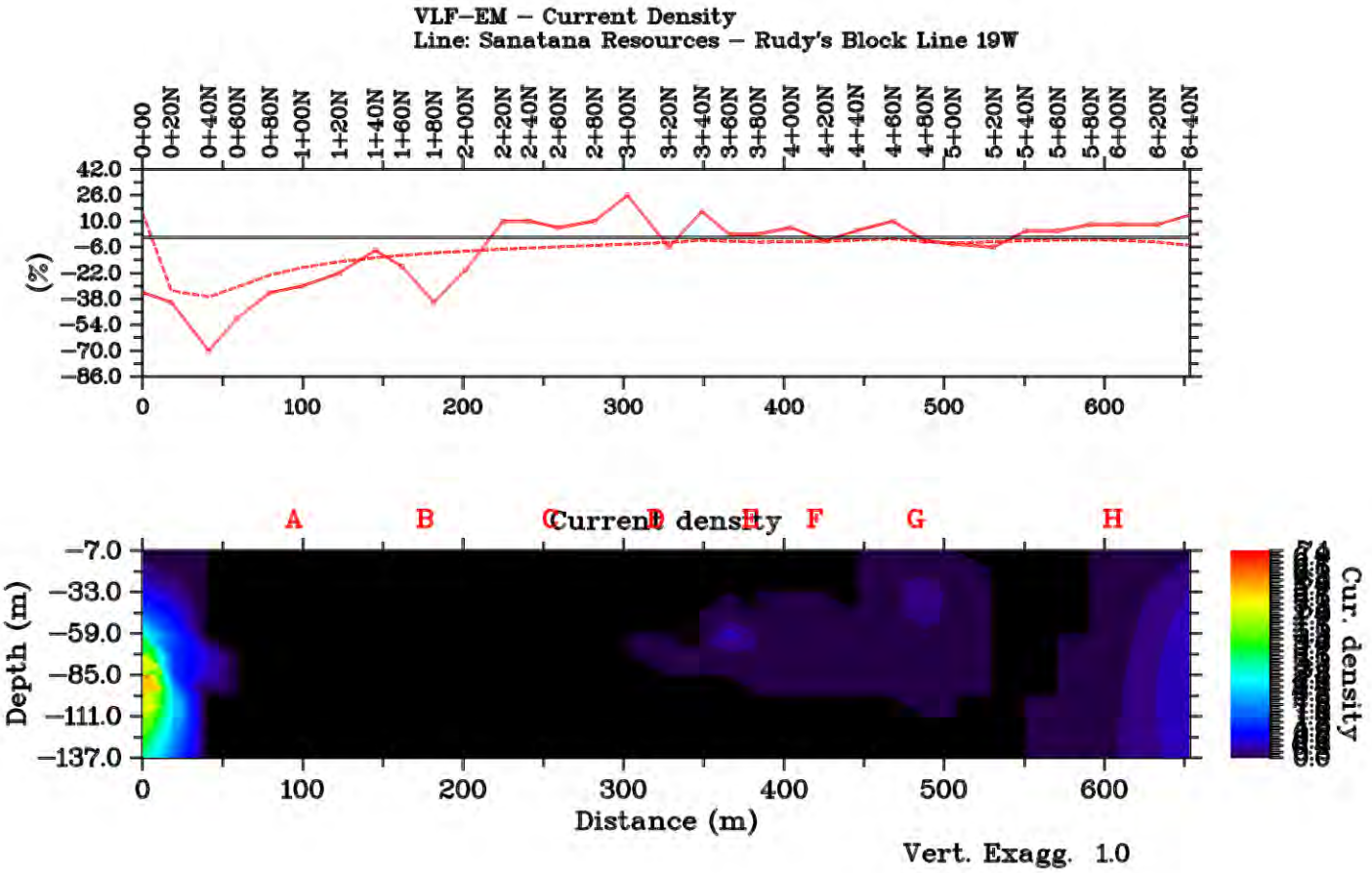
NAA Figure 49 Line 19W Raw Data Profile



NAA Figure 50 Line 19W Model 4000 Ohm with Fraser Picks



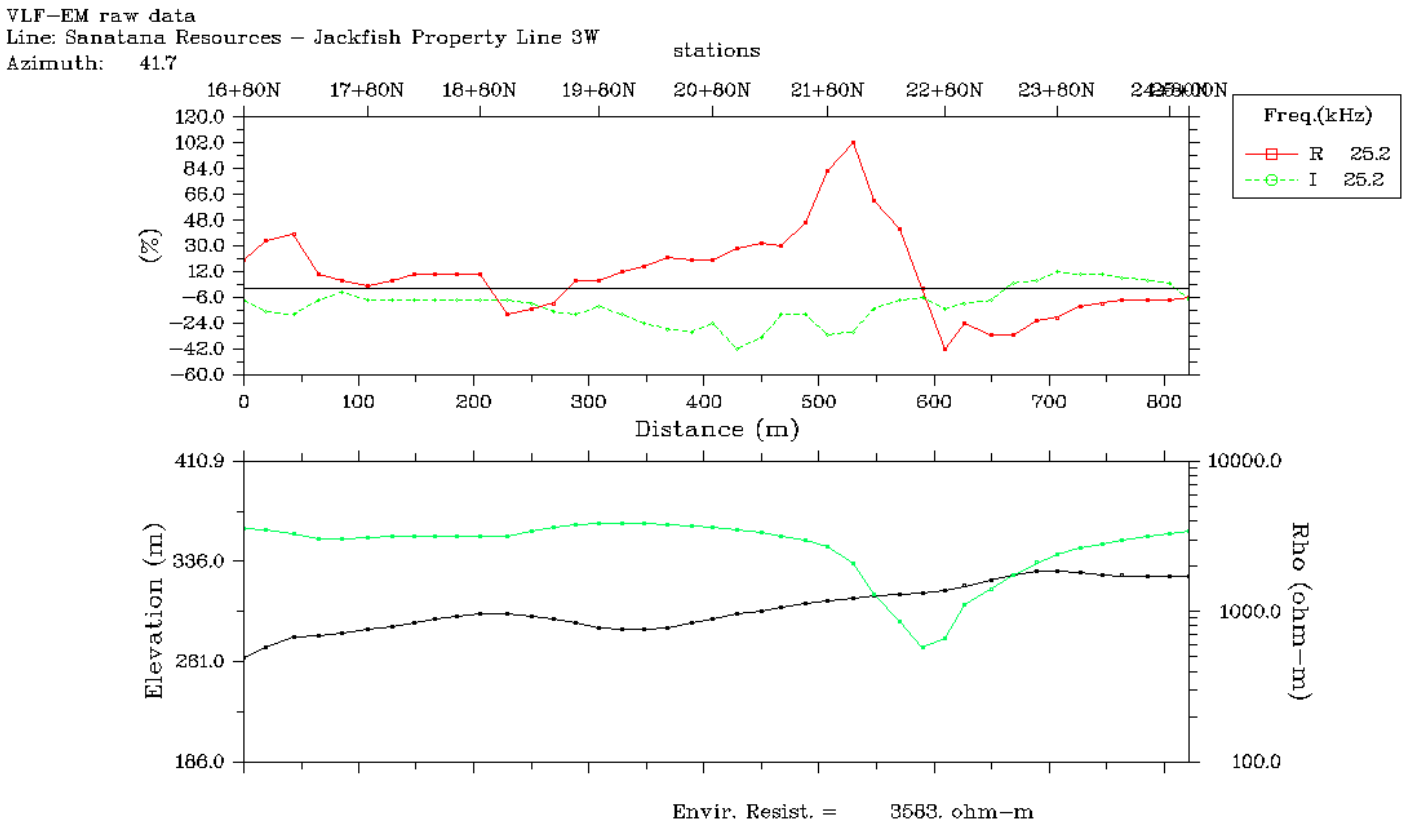
NAA Figure 51 Line 19W JY Model with Fraser Picks



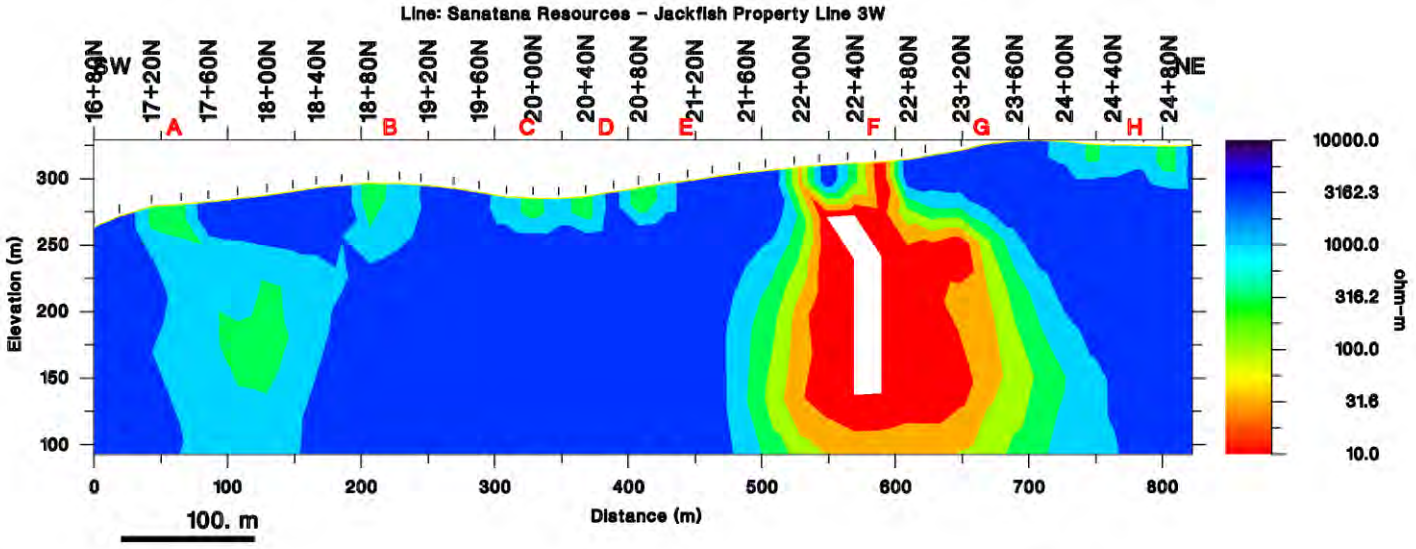
APPENDIX B

TX NML Figures

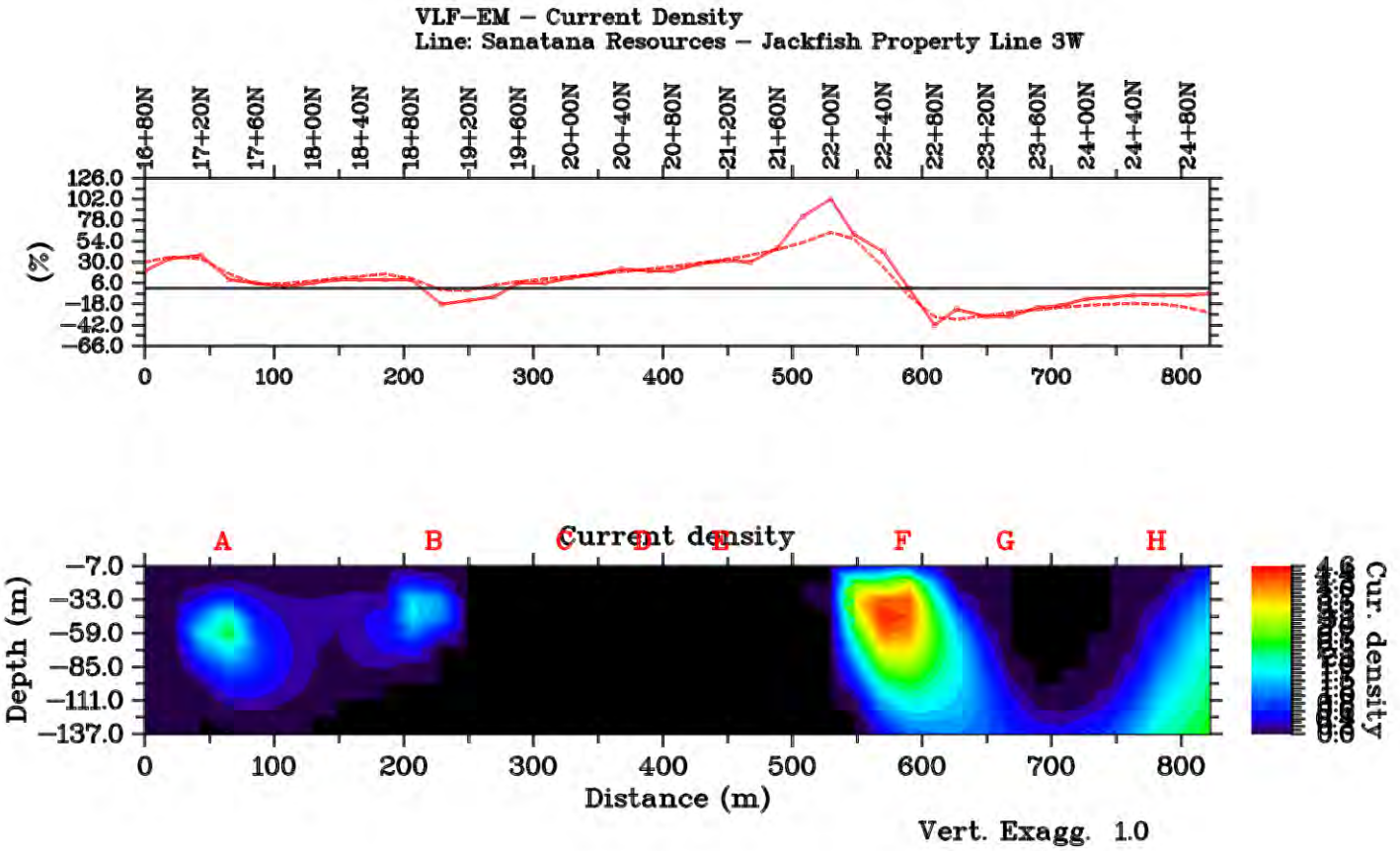
NML Figure 1 Line 3W Raw Data Profile



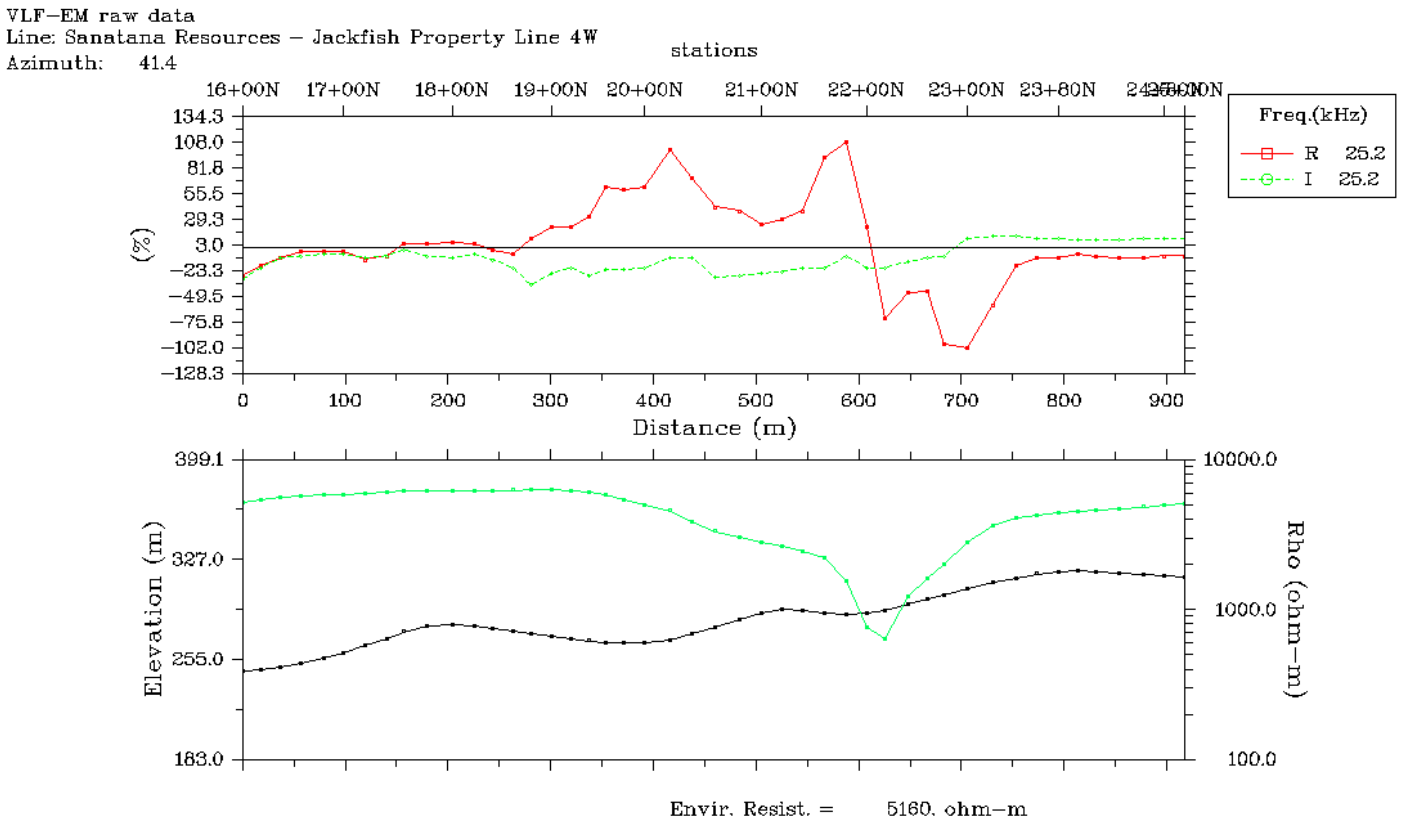
NML Figure 2 Line 3W Model 4000 Ohm with Fraser Picks



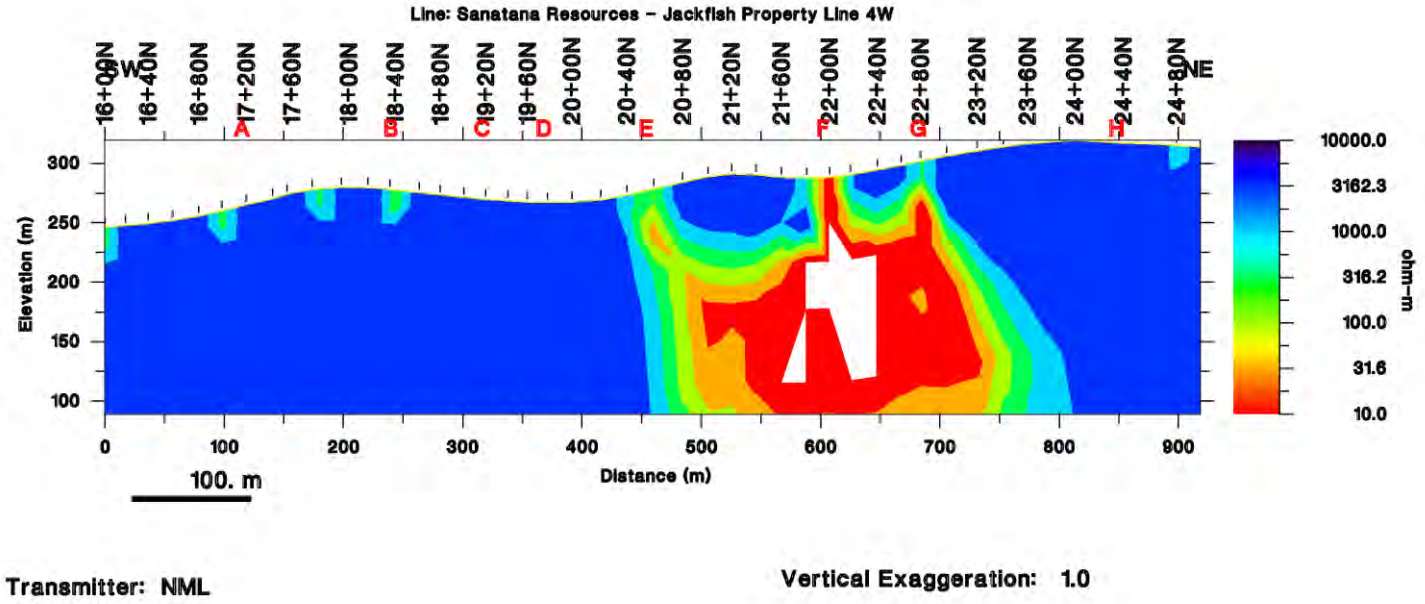
NML Figure 3 Line 3W JY Model with Fraser Picks



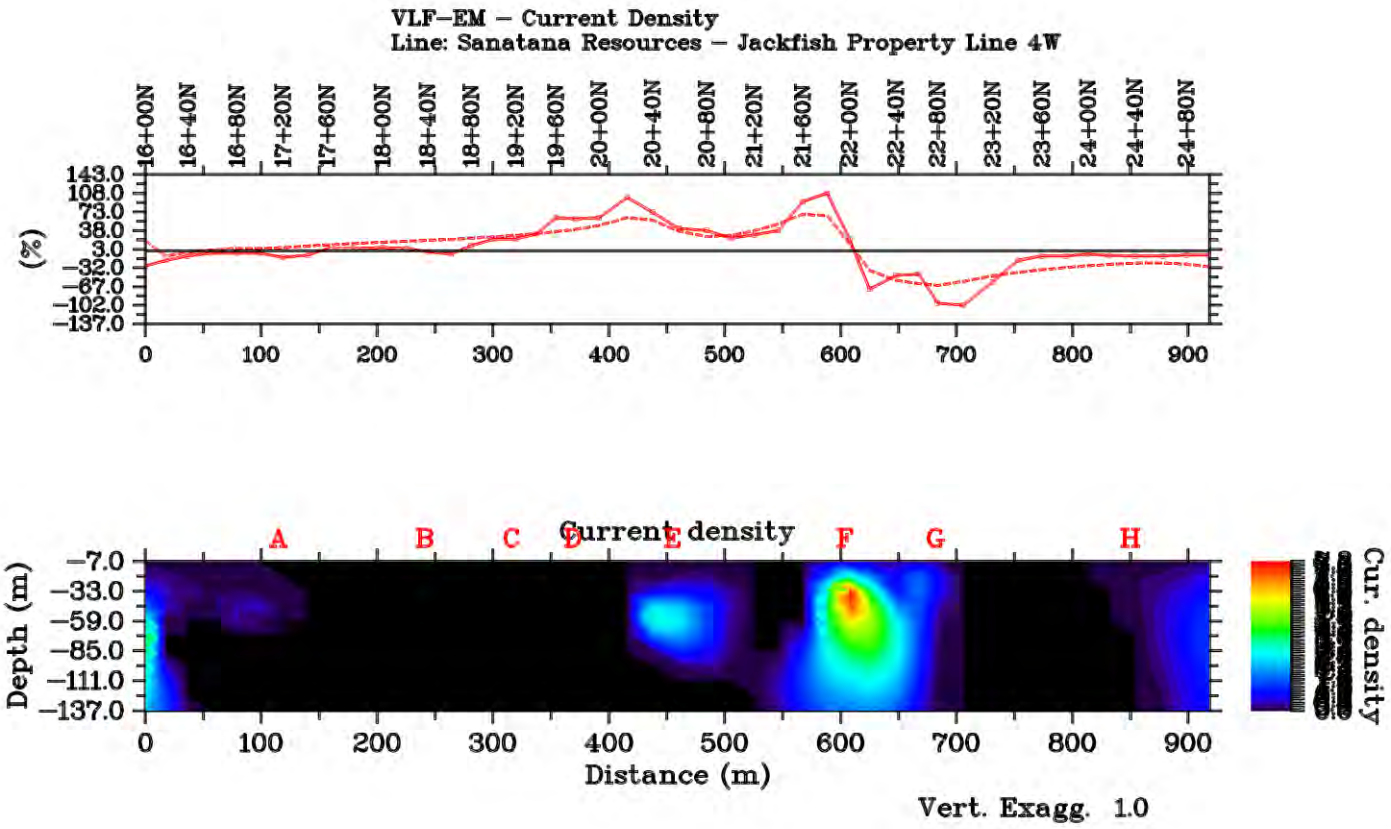
NML Figure 4 Line 4W Raw Data Profile



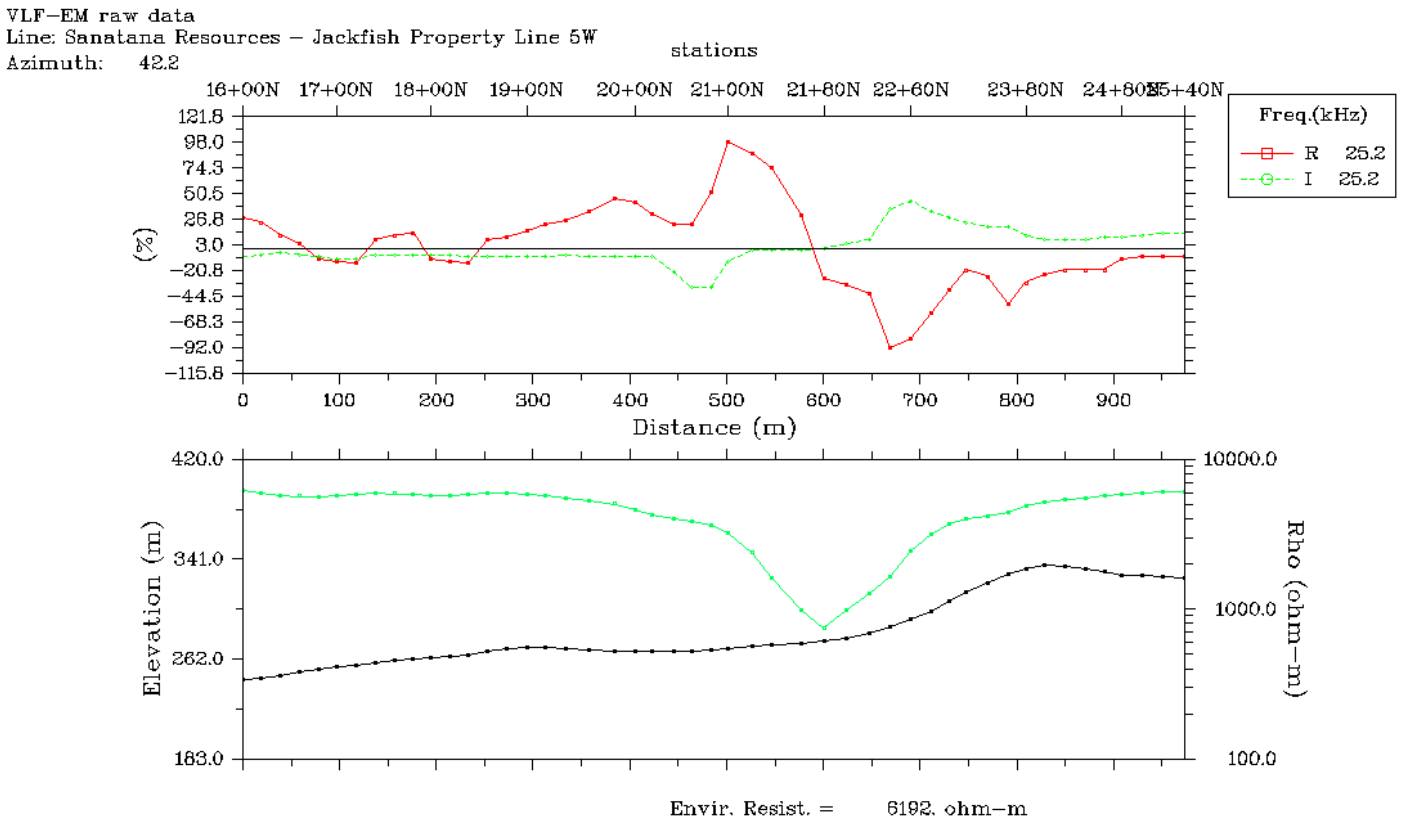
NML Figure 5 Line 4W Model 4000 Ohm with Fraser Picks



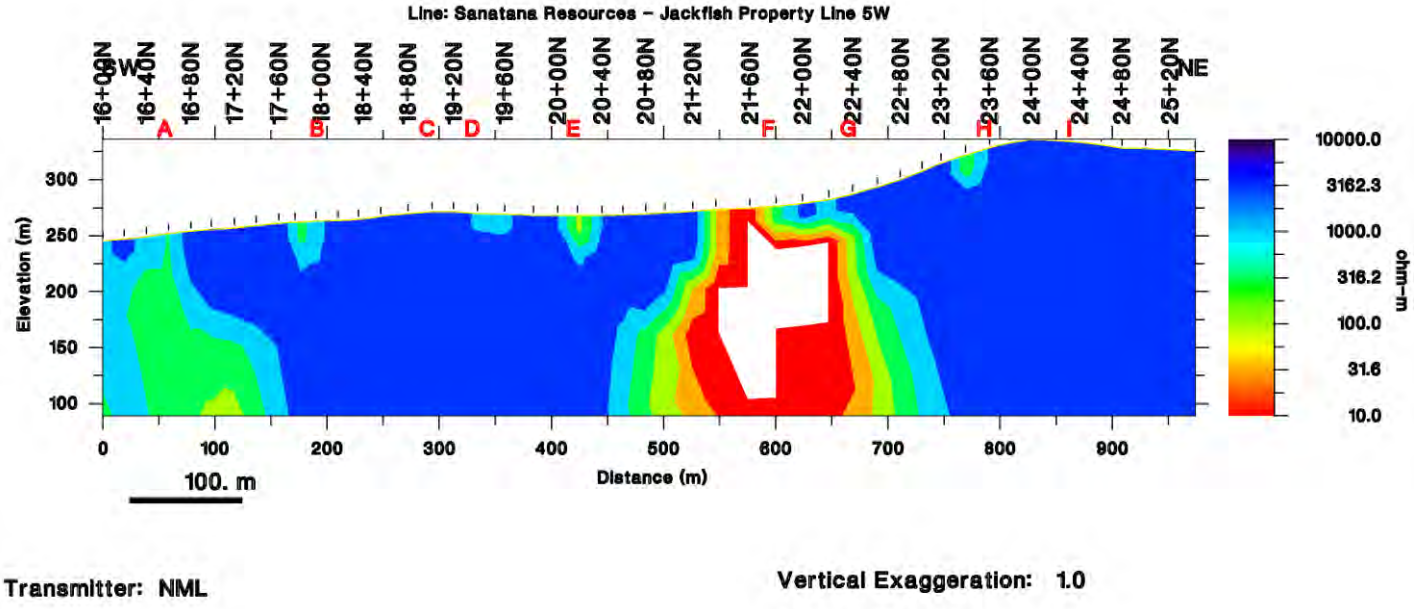
NML Figure 6 Line 4W JY Model with Fraser Picks



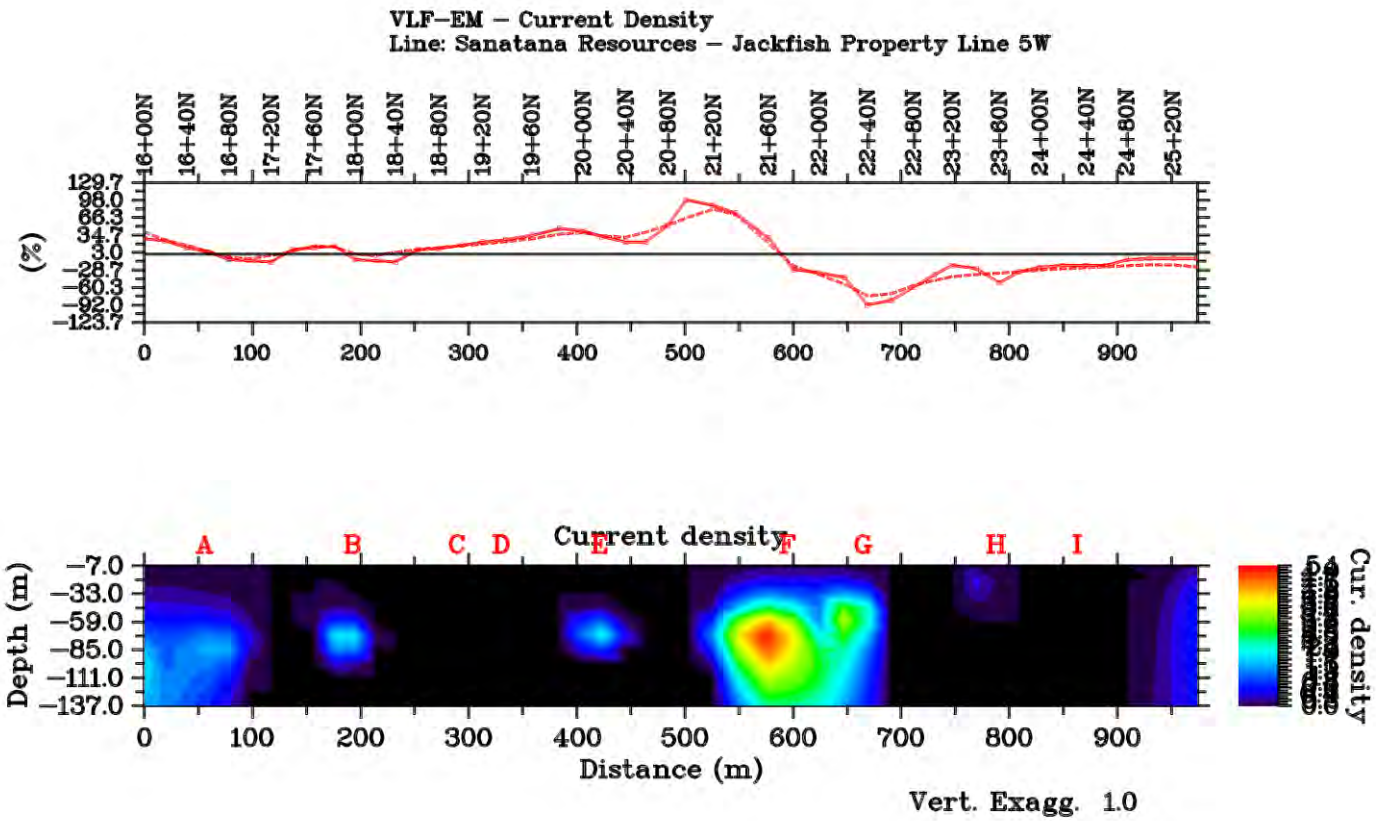
NML Figure 7 Line 5W Raw Data Profile



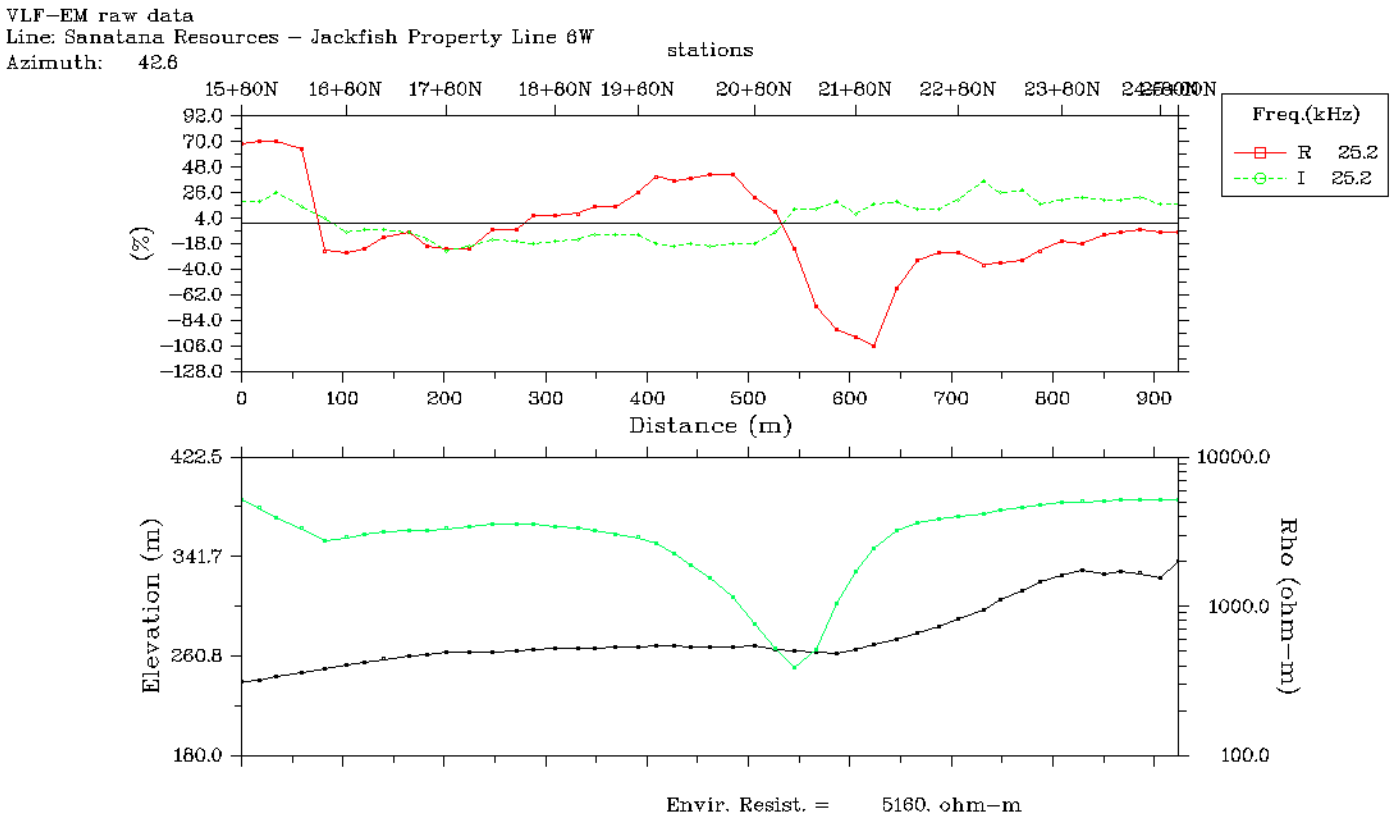
NML Figure 8 Line 5W Model 4000 Ohm with Fraser Picks



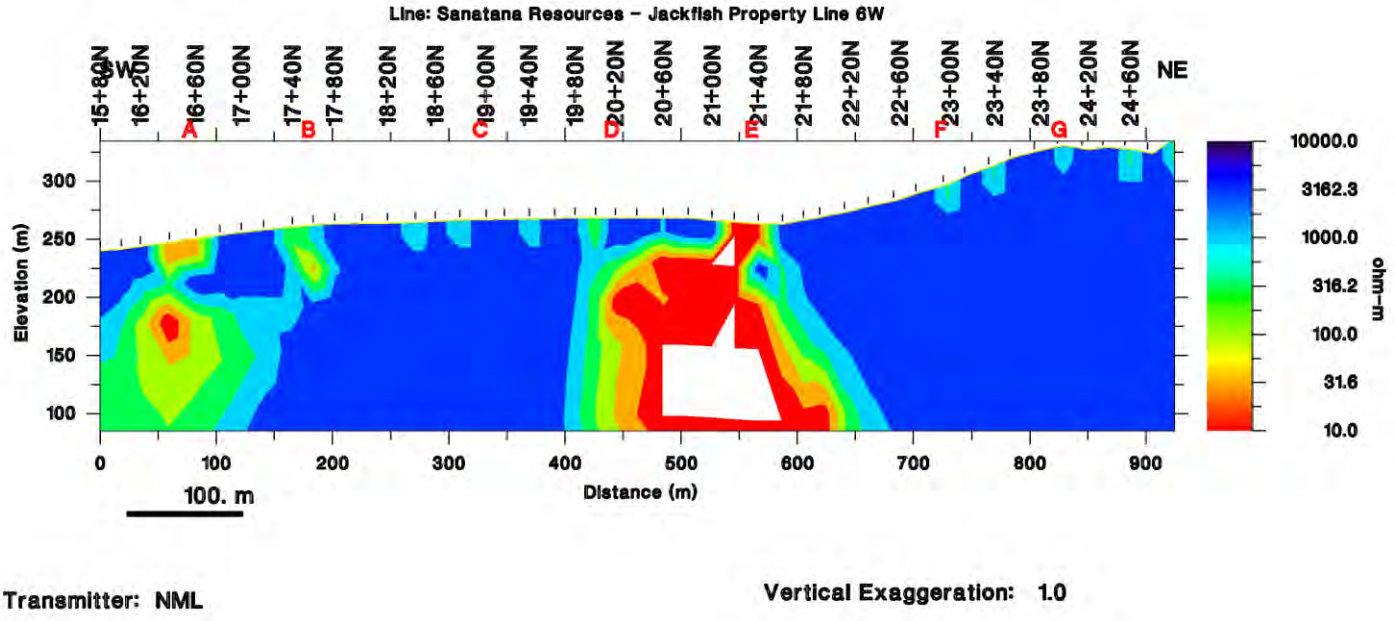
NML Figure 9 Line 5W JY Model with Fraser Picks



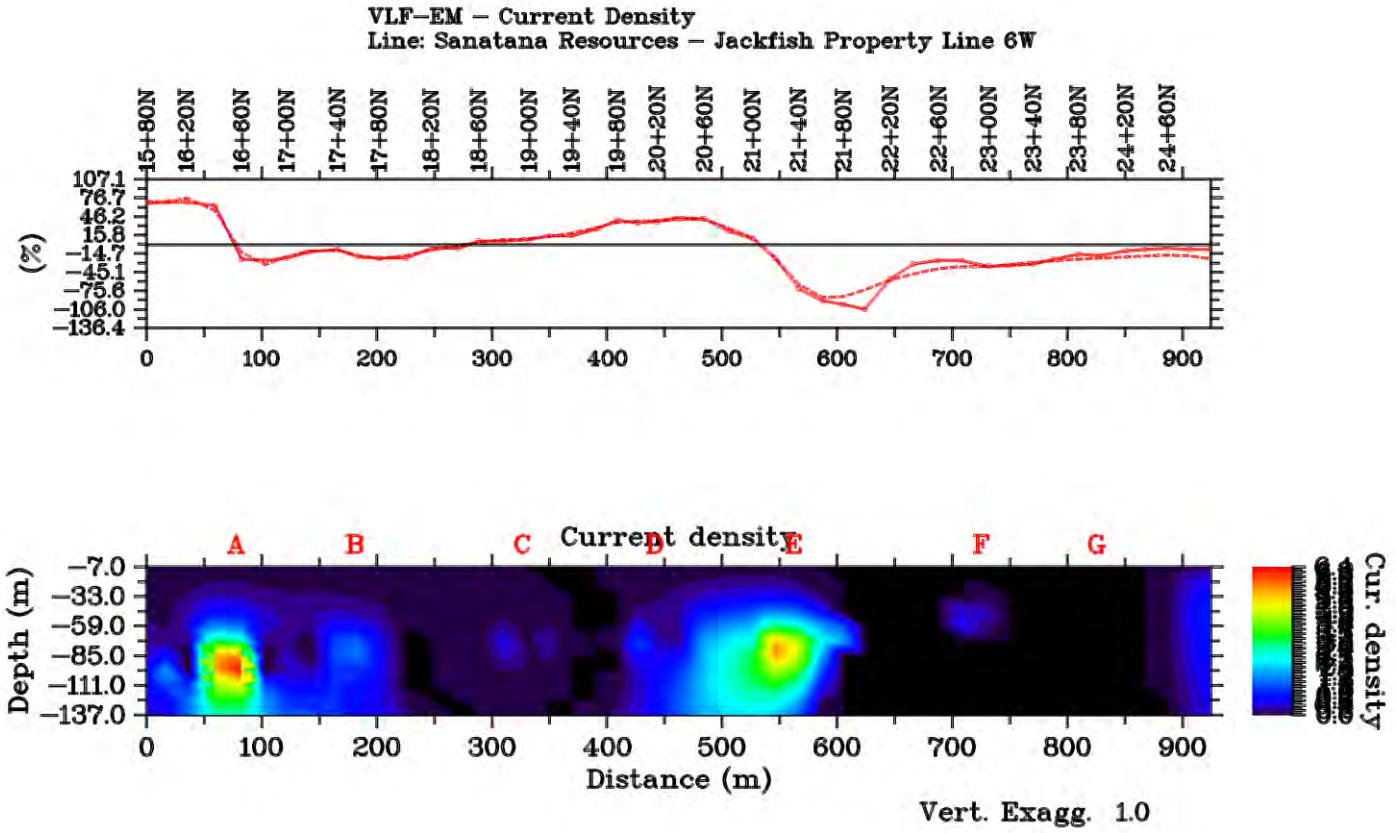
NML Figure 10 Line 6W Raw Data Profile



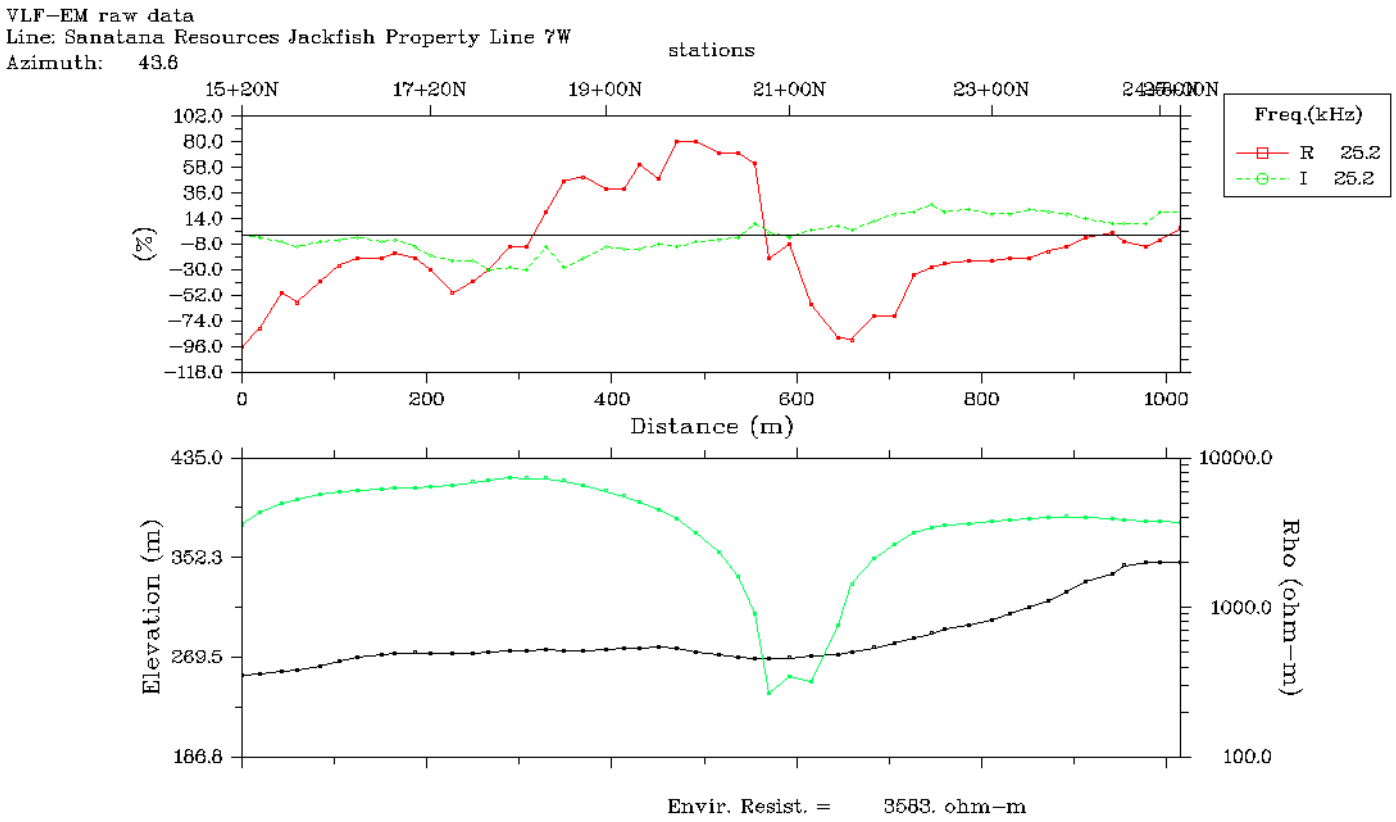
NML Figure 11 Line 6W Model 4000 Ohm with Fraser Picks



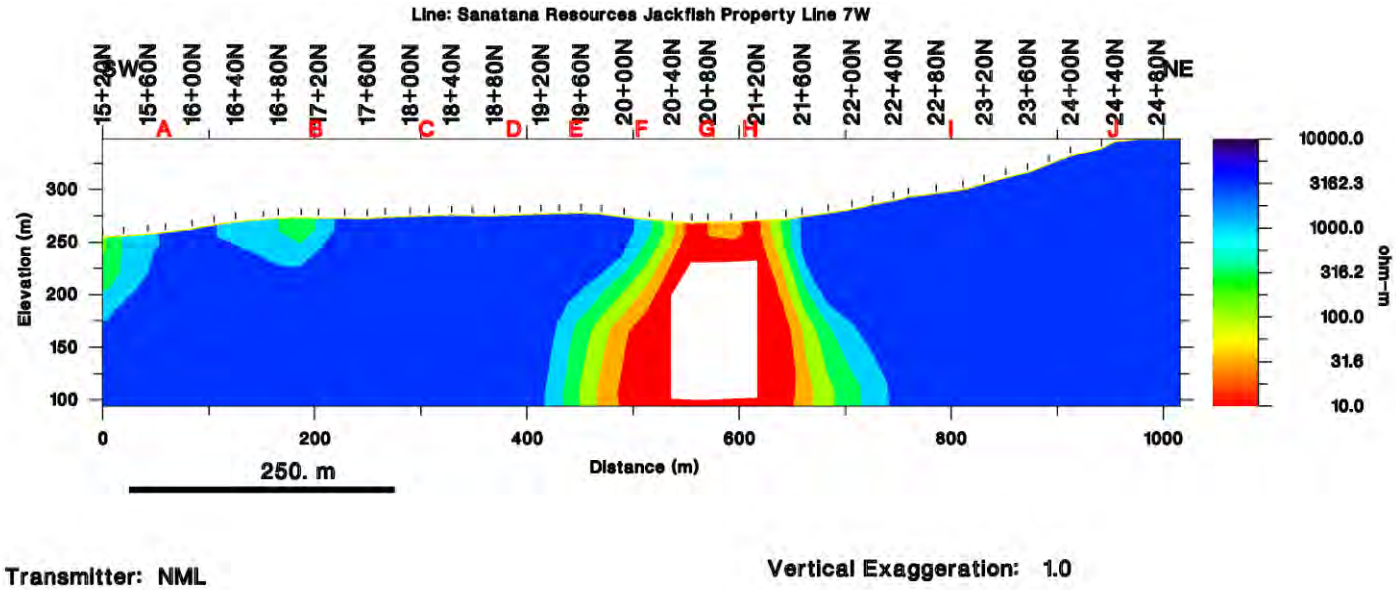
NML Figure 12 Line 6W JY Model with Fraser Picks



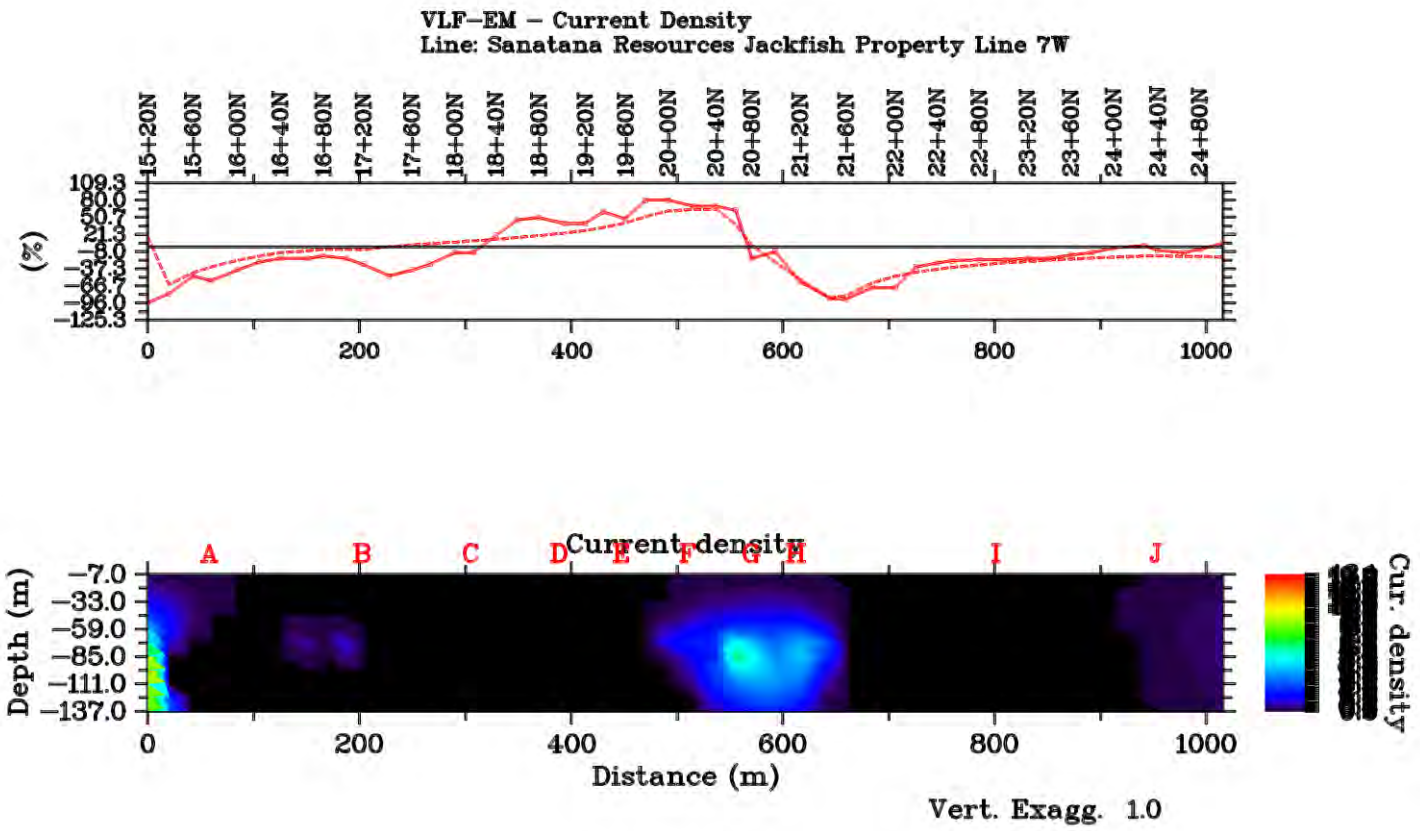
NML Figure 13 Line 7W Raw Data Profile



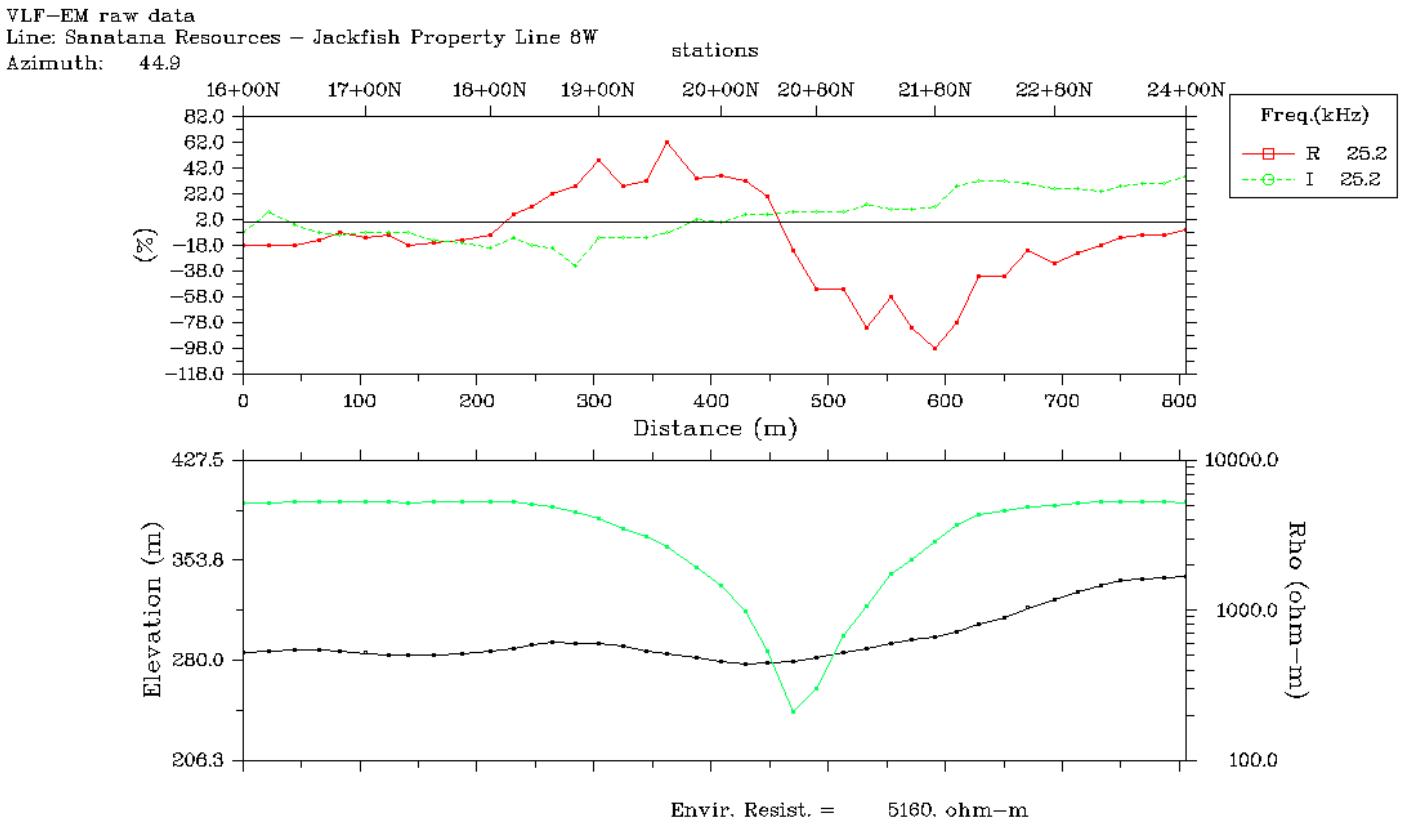
NML Figure 14 Line 7W Model 4000 Ohm with Fraser Picks



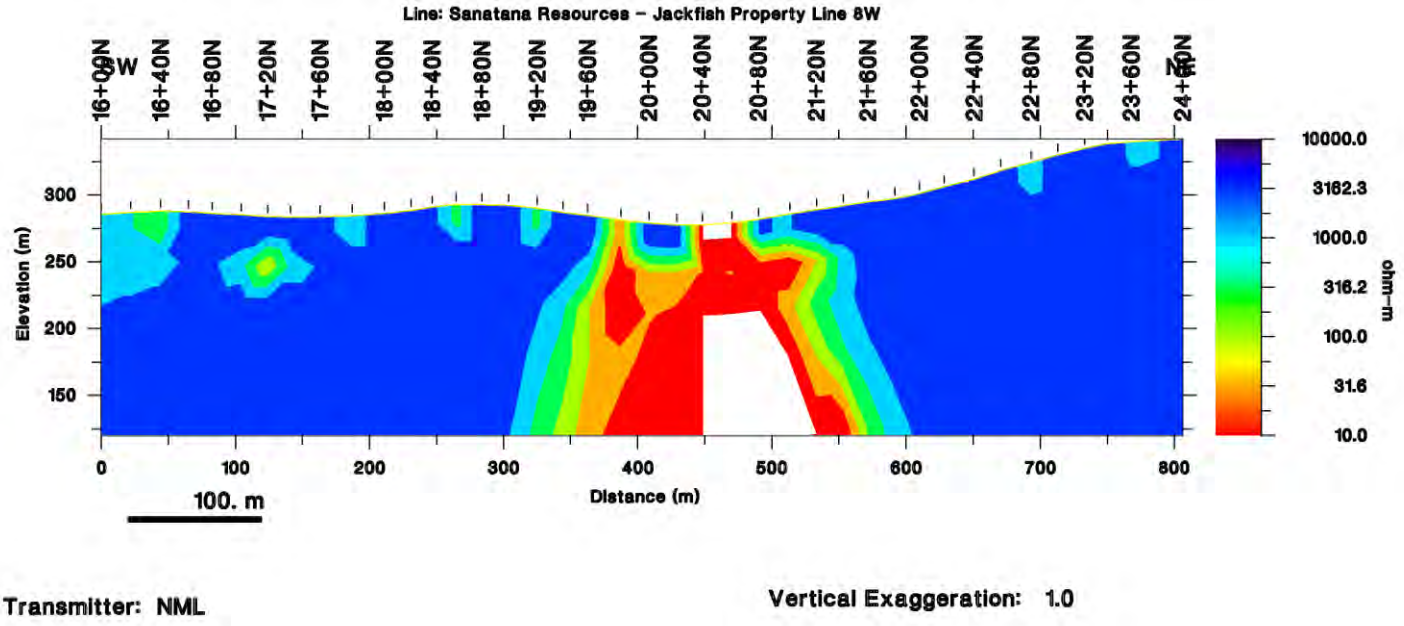
NML Figure 15 Line 7W JY Model with Fraser Picks



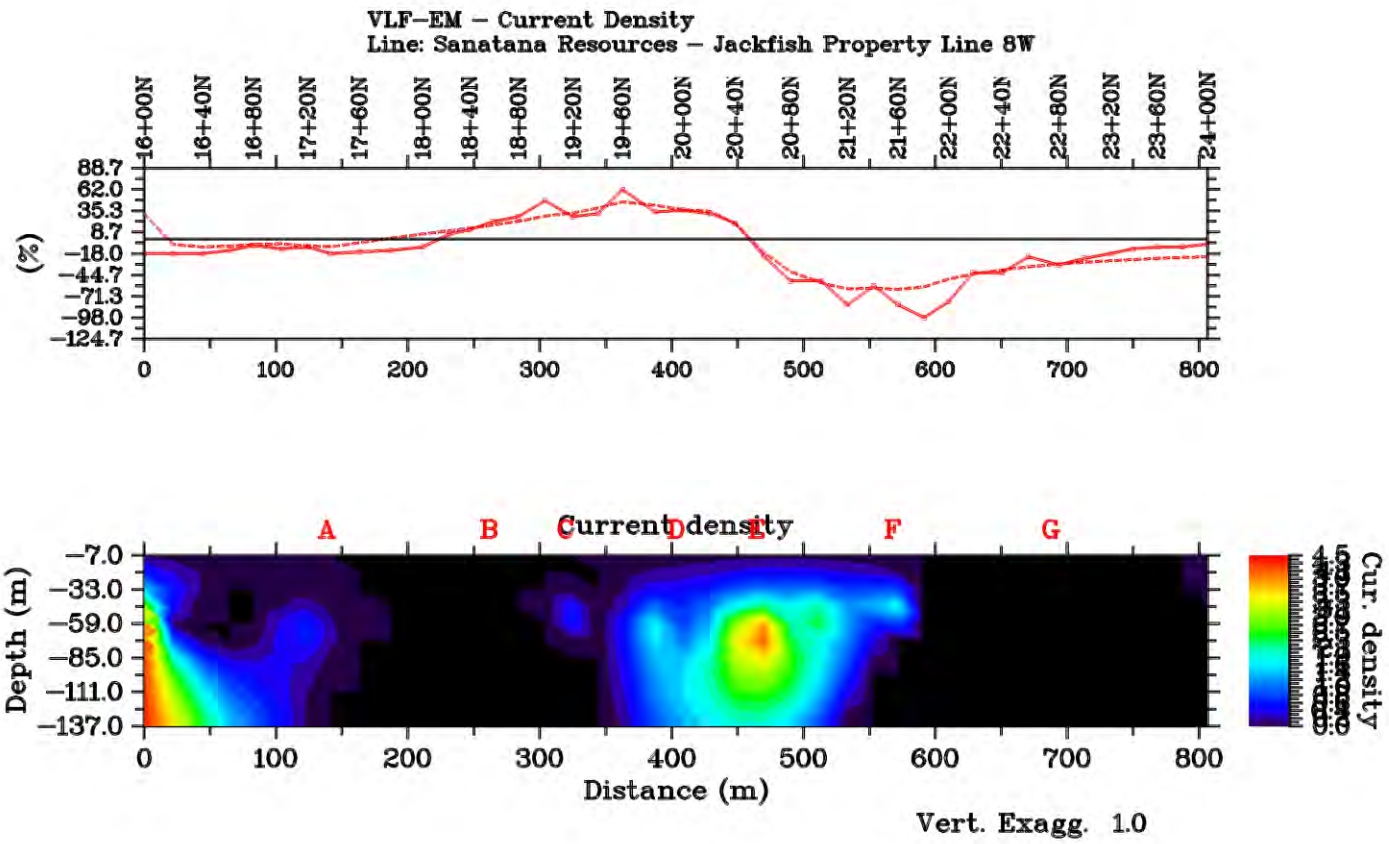
NML Figure 16 Line 8W Raw Data Profile



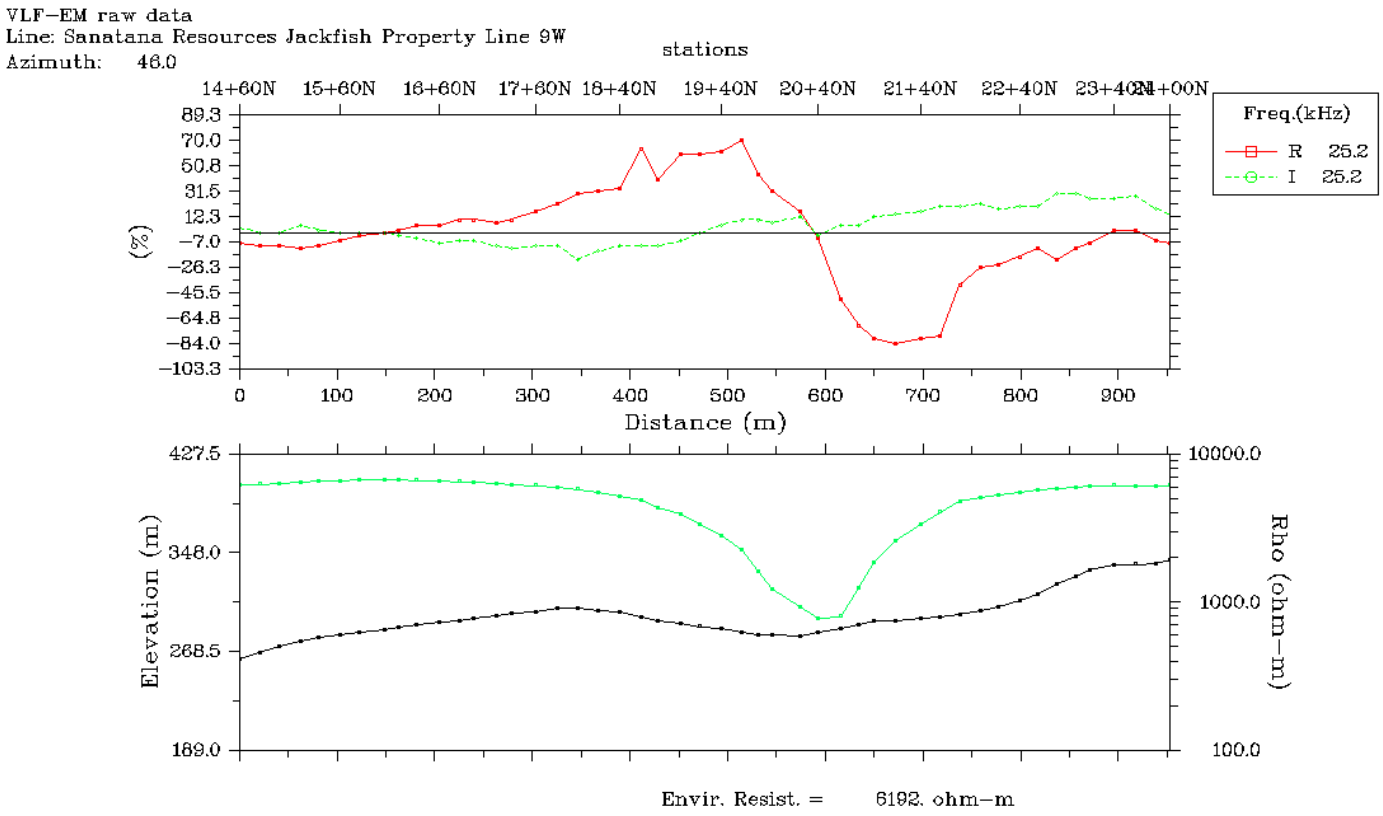
NML Figure 17 Line 8W Model 4000 Ohm with Fraser Picks



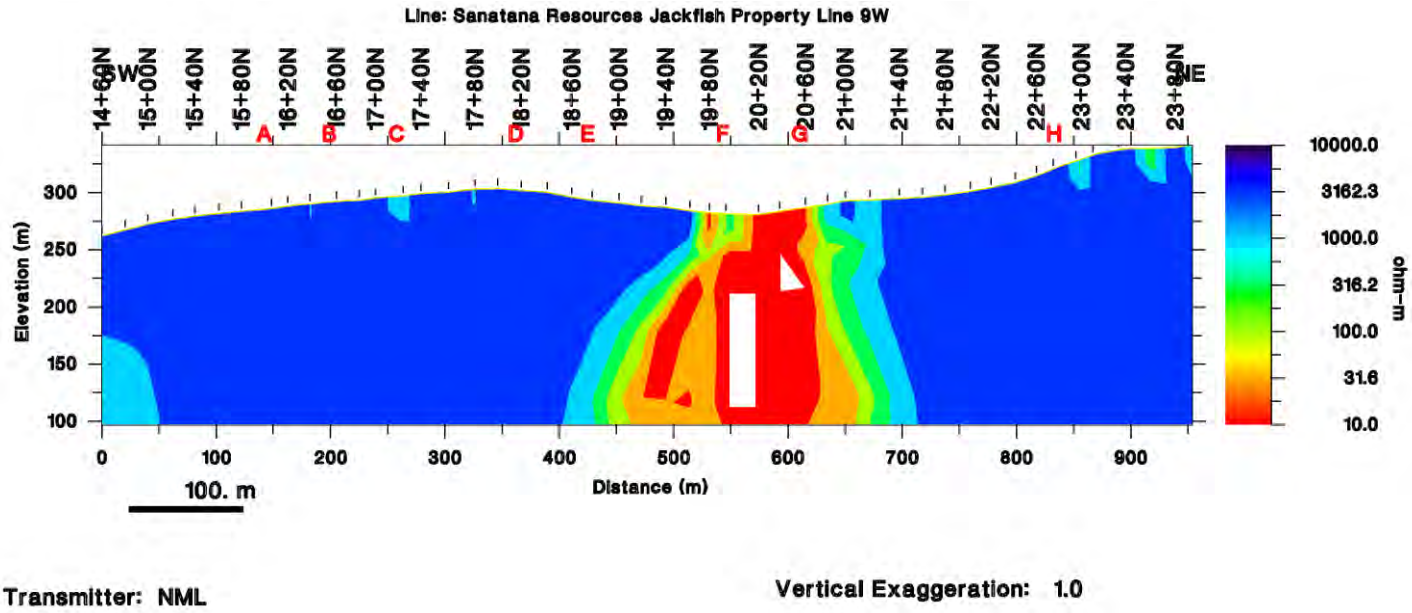
NML Figure 18 Line 8W JY Model with Fraser Picks



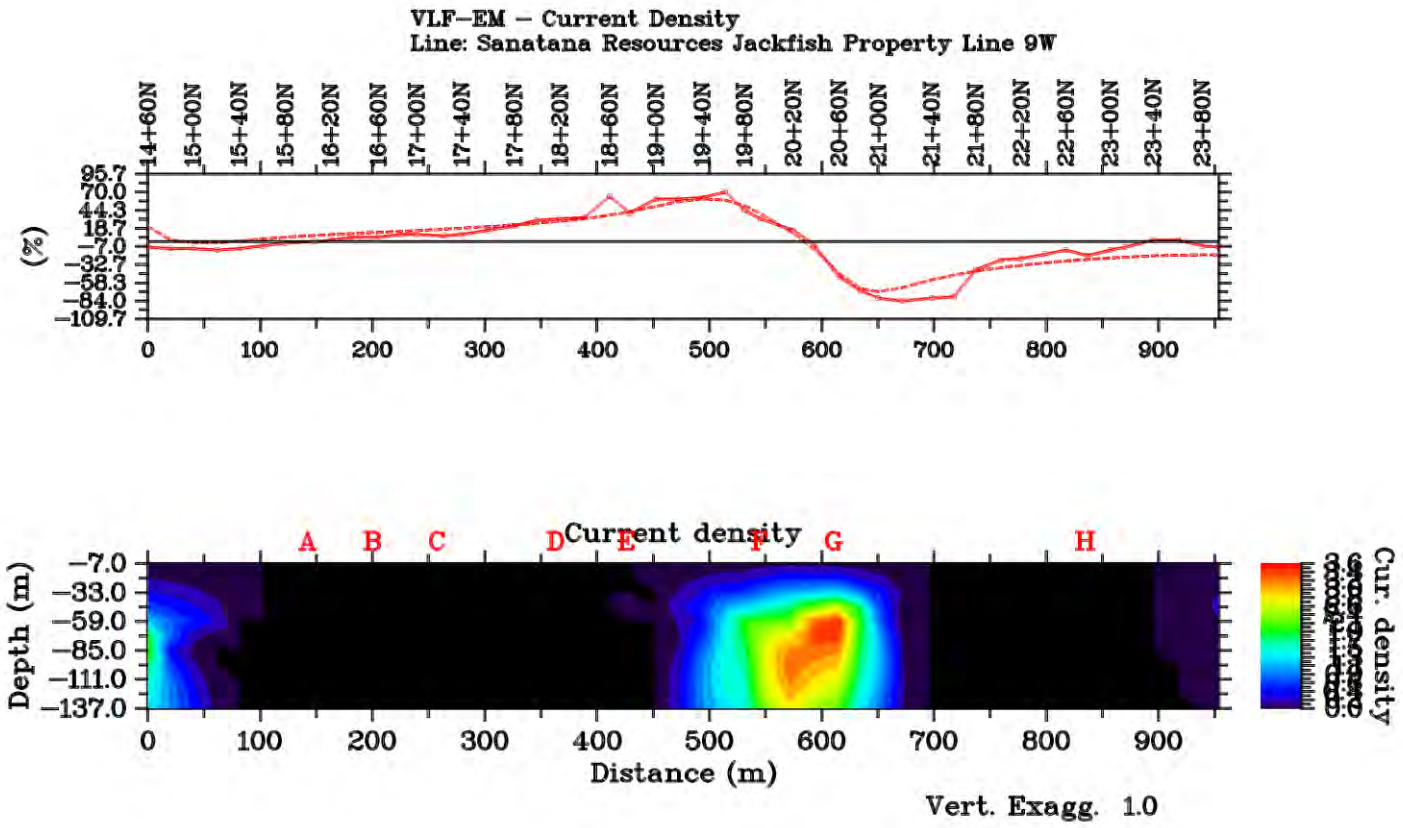
NML Figure 19 Line 9W Raw Data Profile



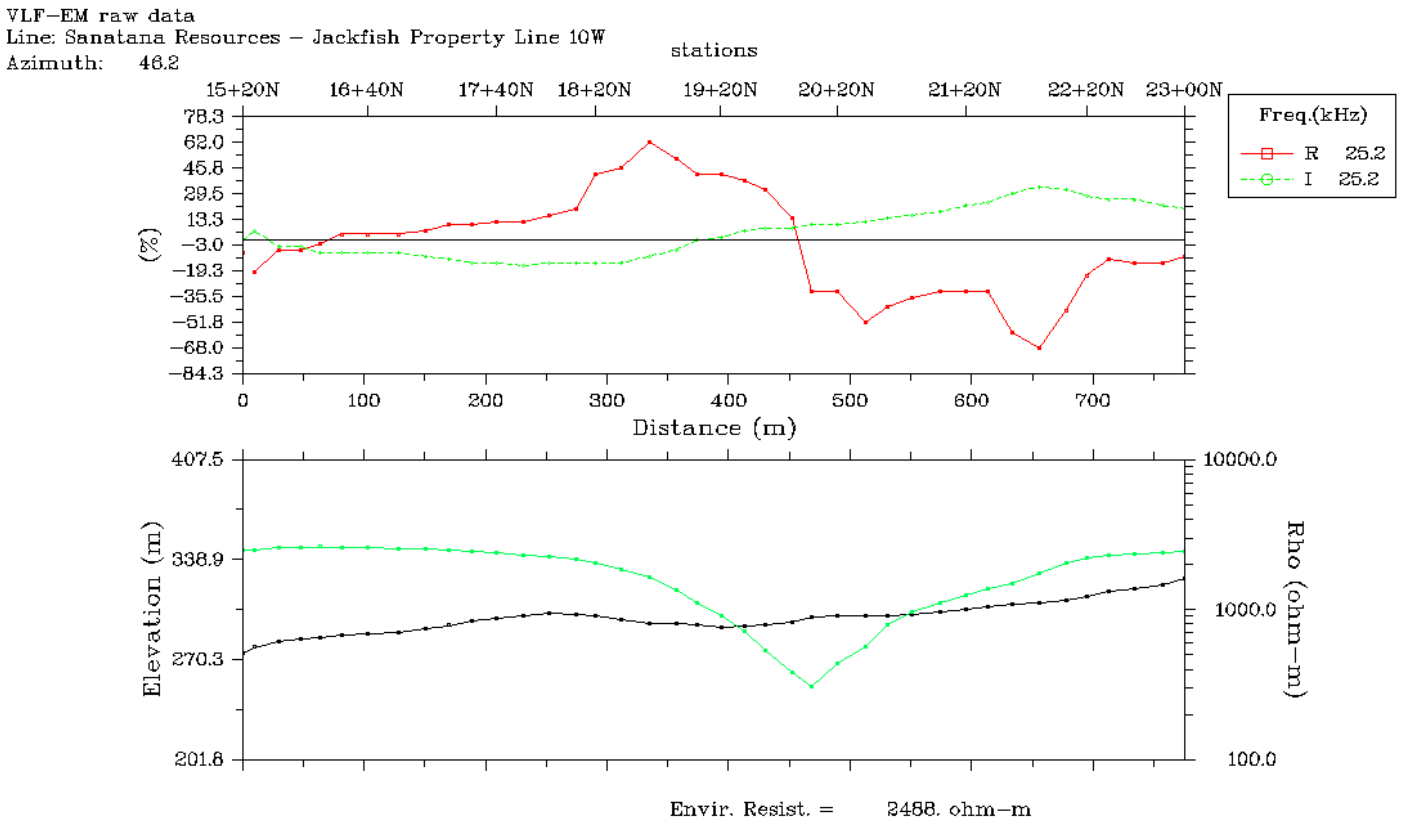
NML Figure 20 Line 9W Model 4000 Ohm with Fraser Picks



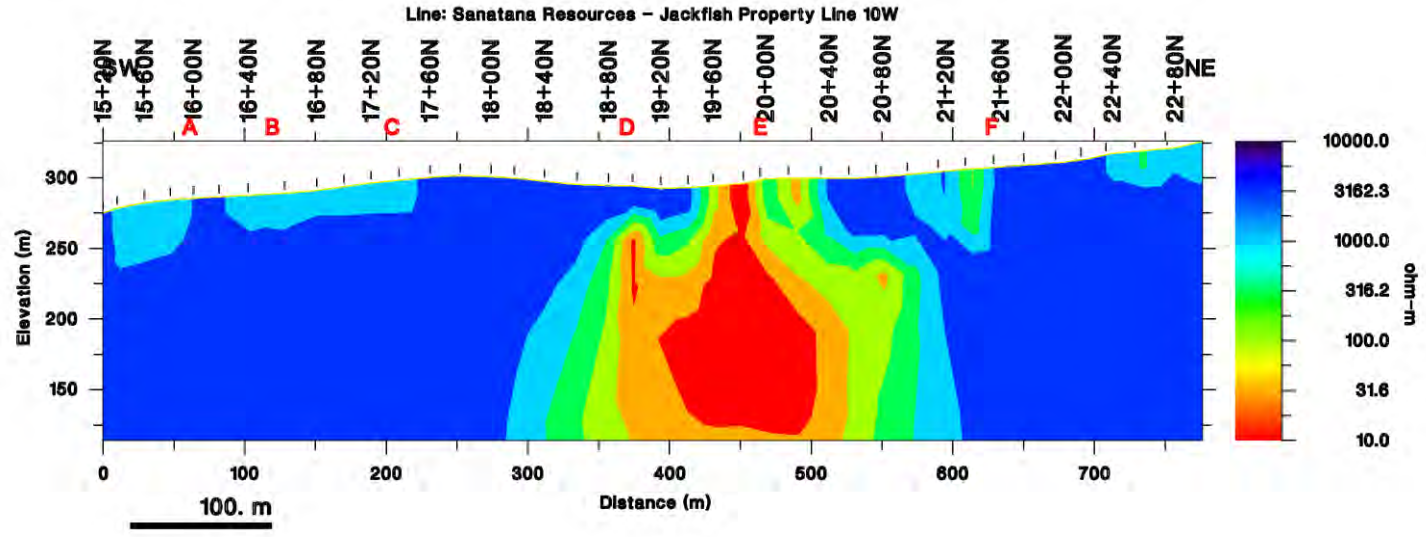
NML Figure 21 Line 9W JY Model with Fraser Picks



NML Figure 22 Line 10W Raw Data Profile



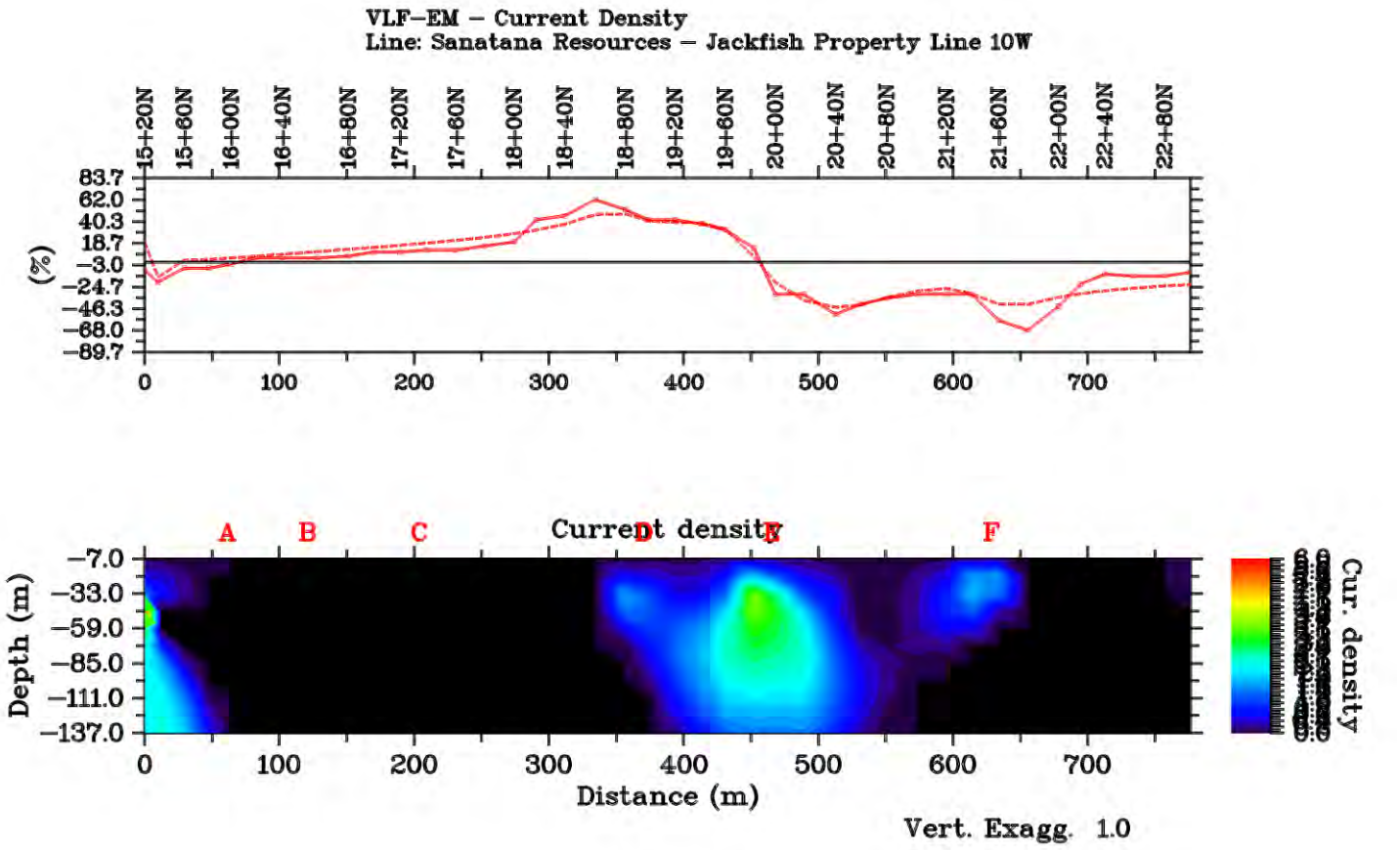
NML Figure 23 Line 10W Model 4000 Ohm with Fraser Picks



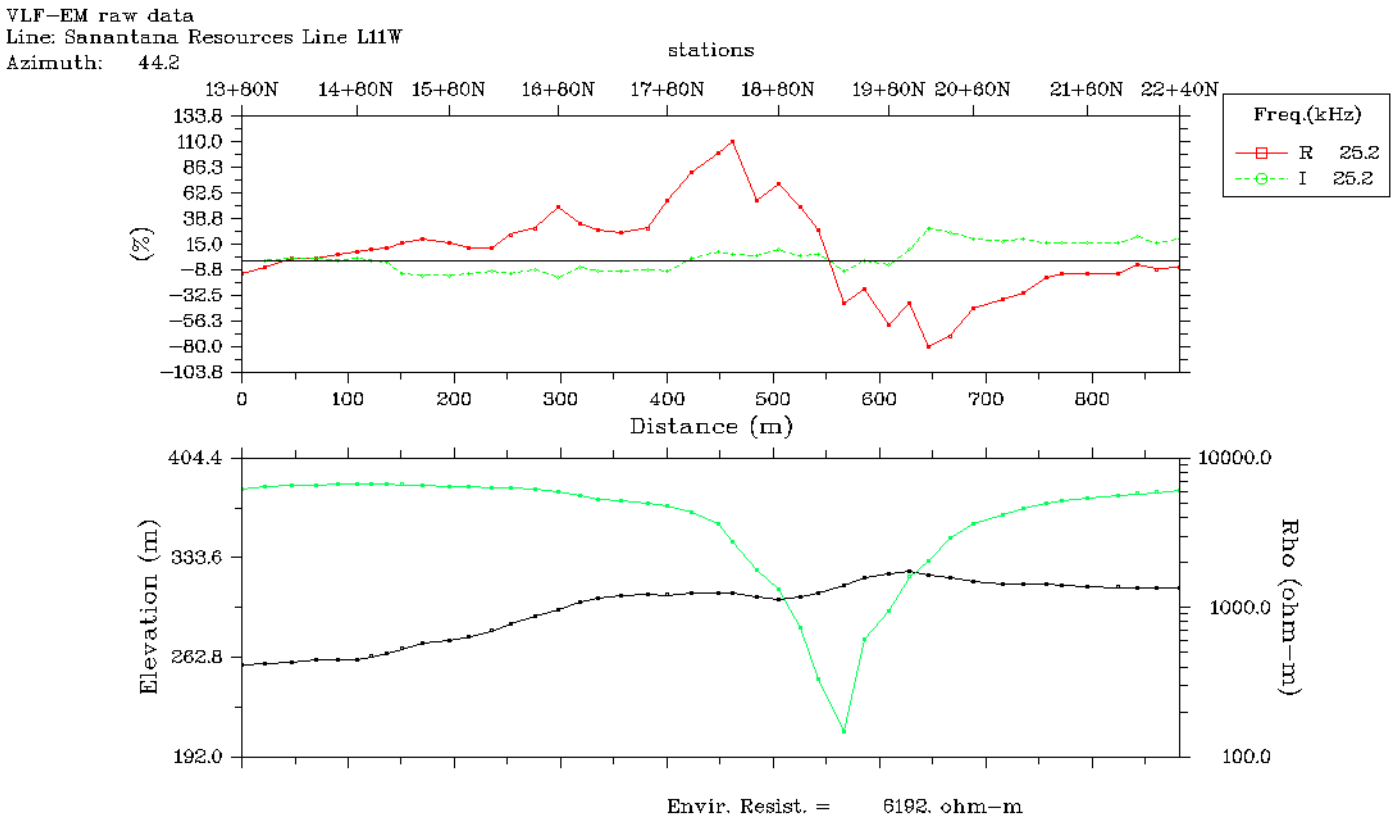
Transmitter: NML

Vertical Exaggeration: 1.0

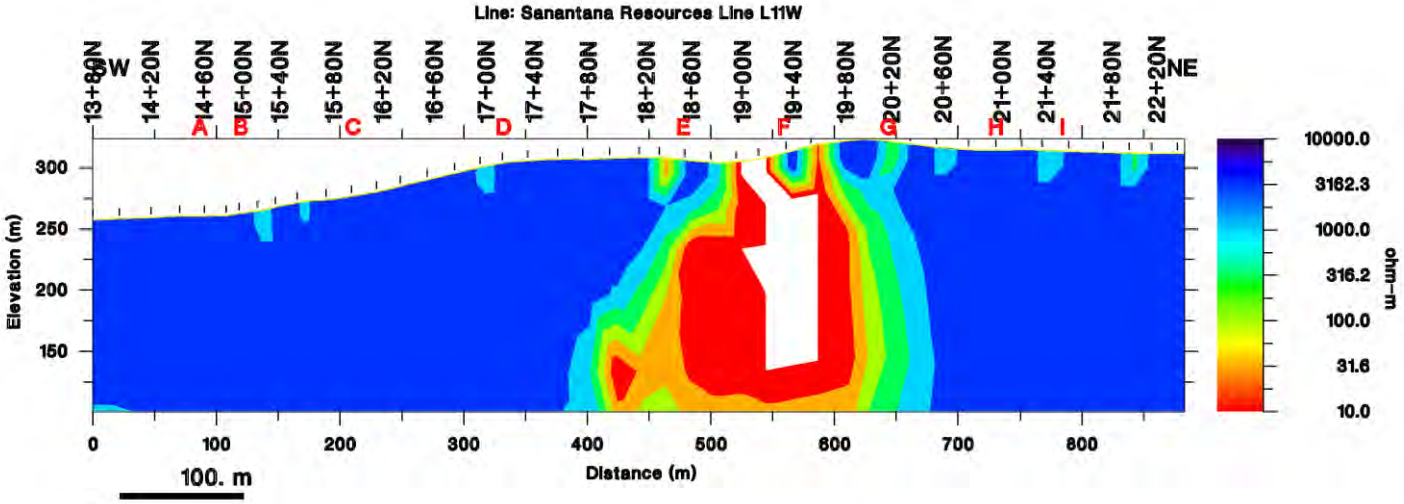
NML Figure 24 Line 10W JY Model with Fraser Picks



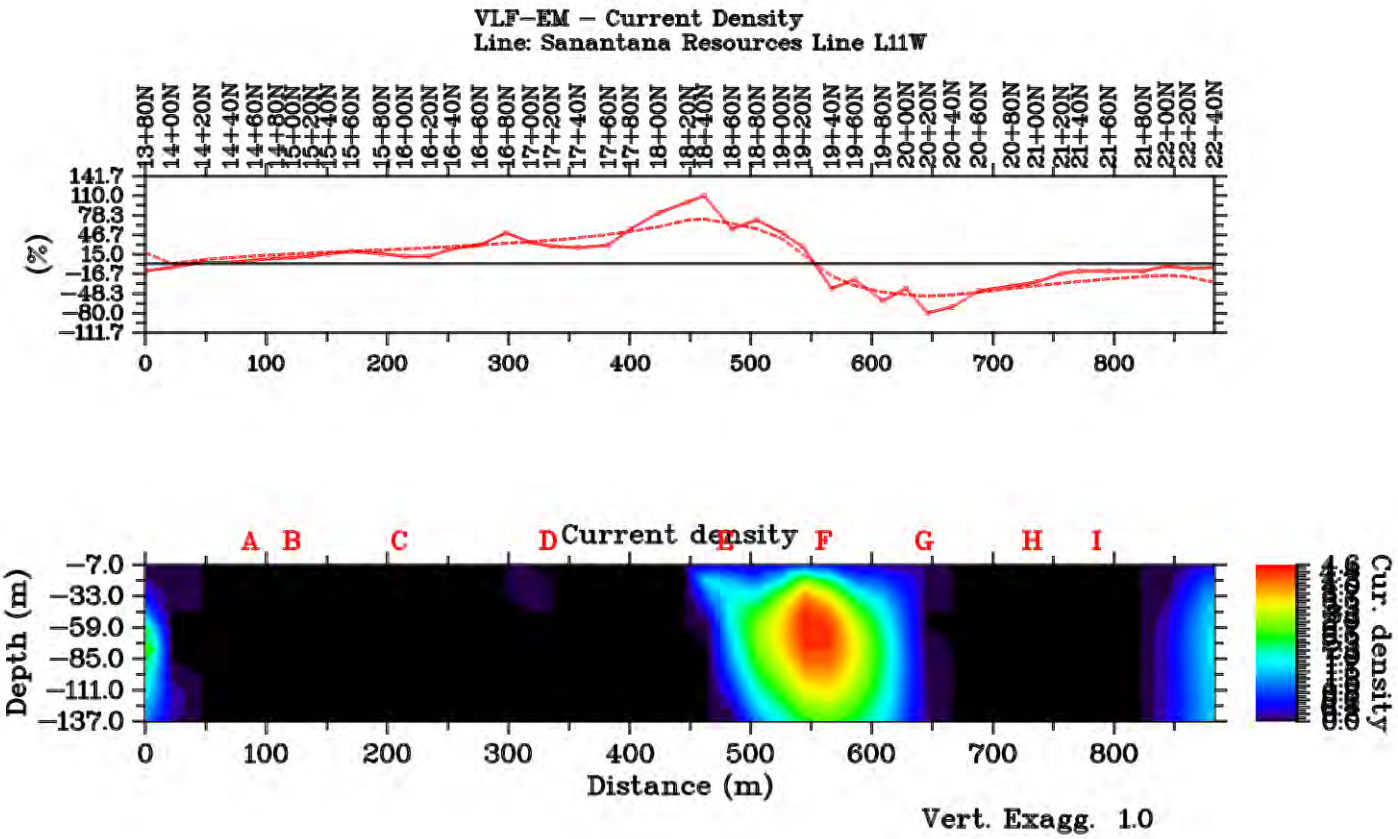
NML Figure 25 Line 11W Raw Data Profile



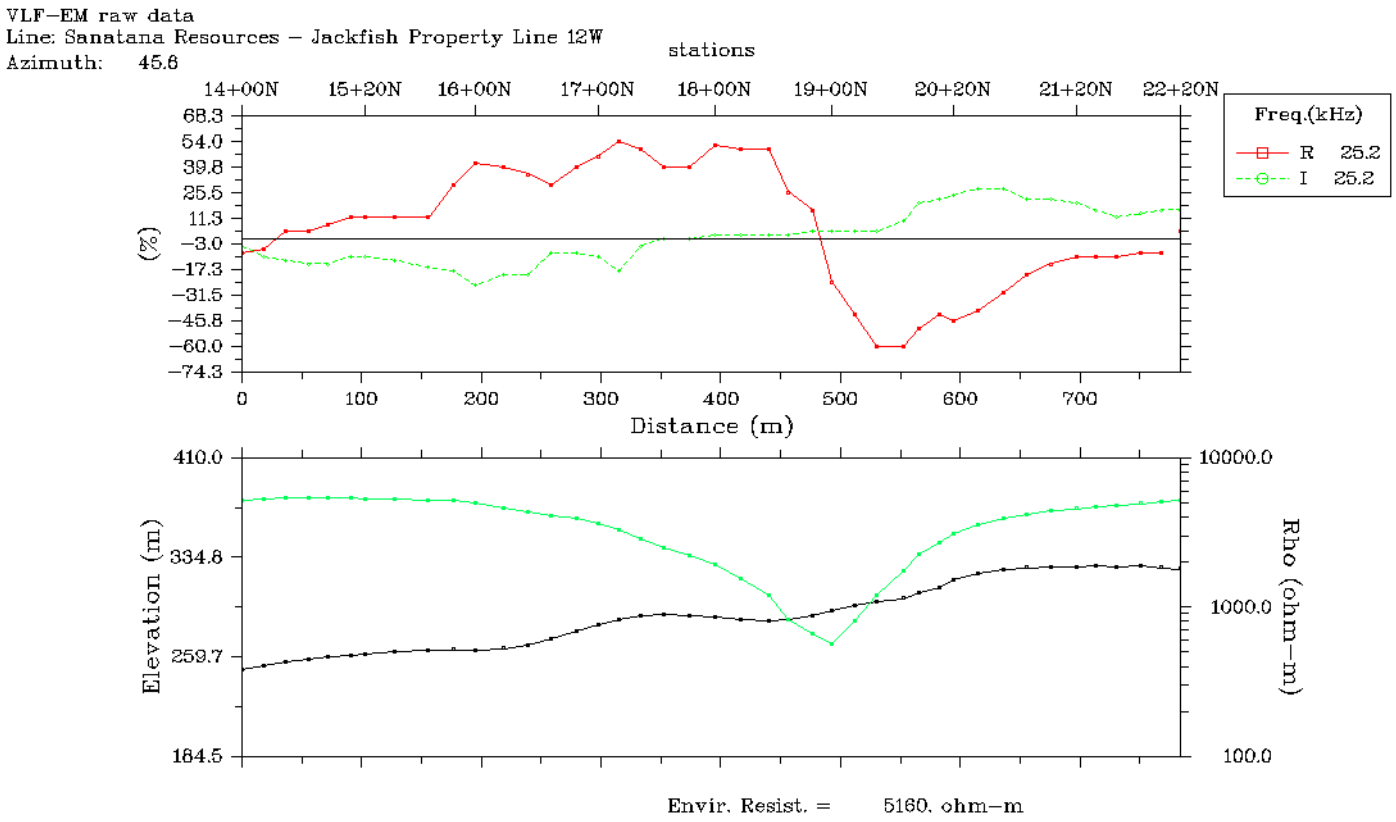
NML Figure 26 Line 11W Model 4000 Ohm with Fraser Picks



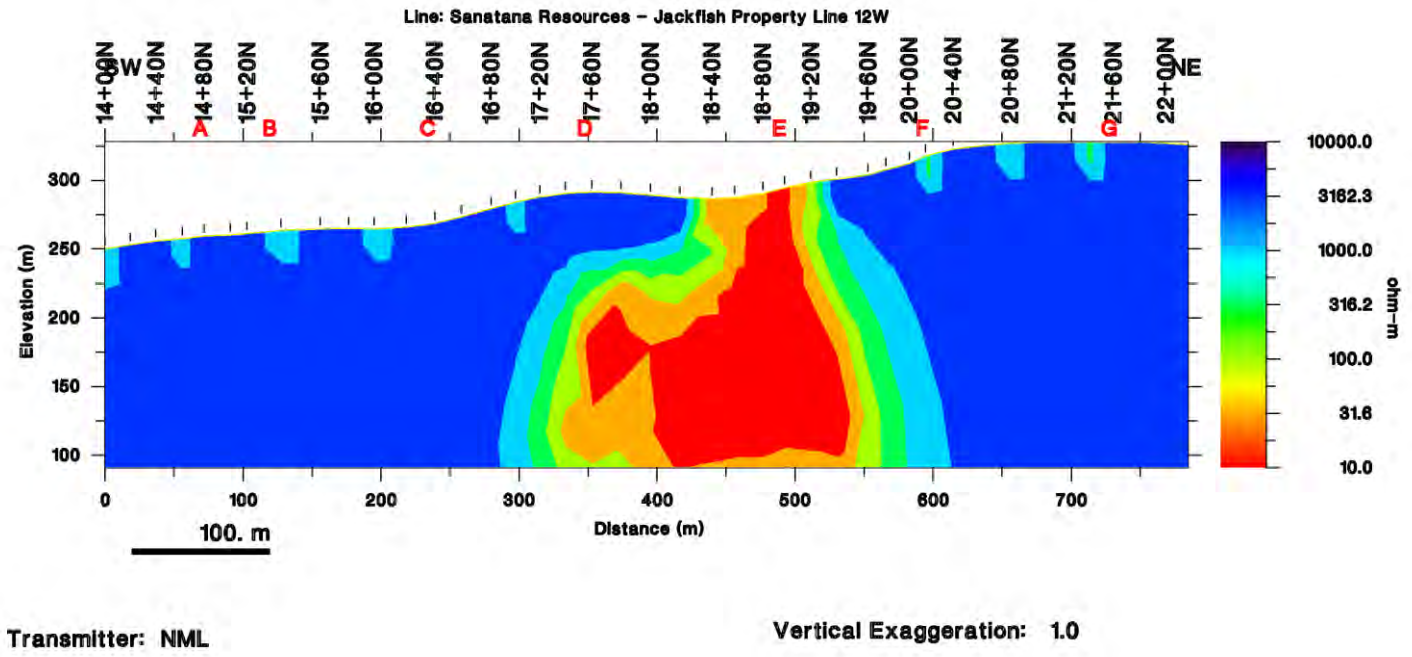
NML Figure 27 Line 11W JY Model with Fraser Picks



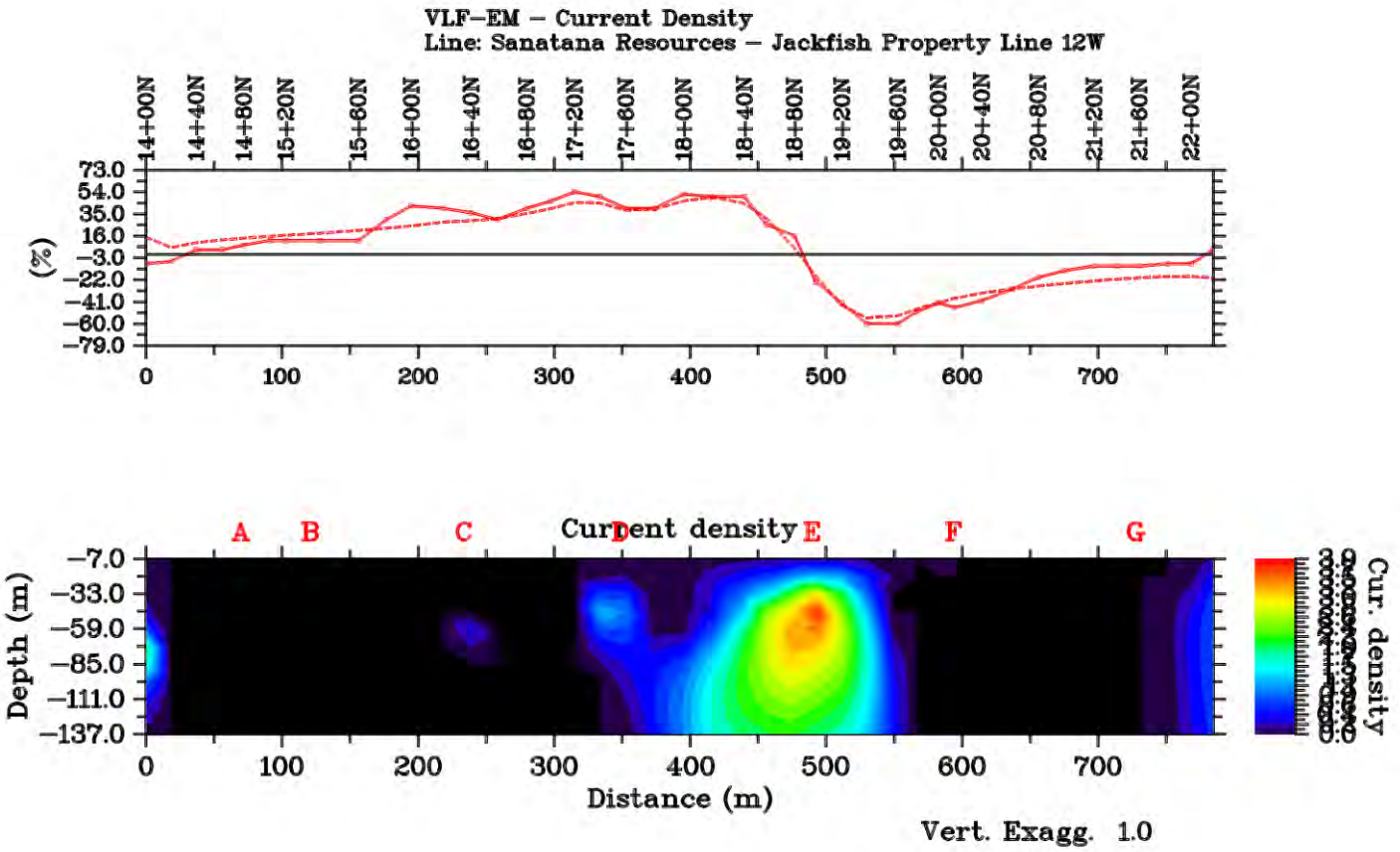
NML Figure 28 Line 12W Raw Data Profile



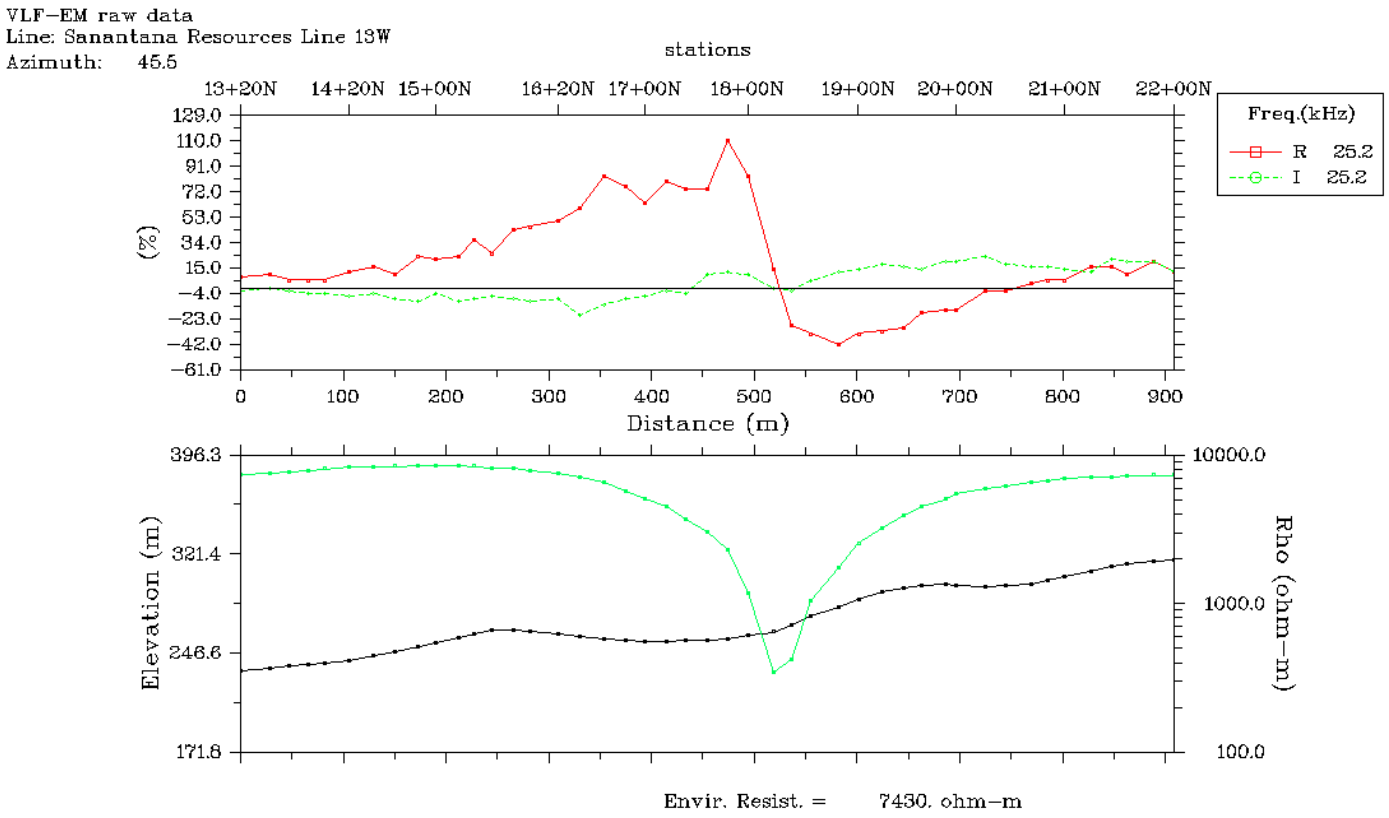
NML Figure 29 Line 12W Model 4000 Ohm with Fraser Picks



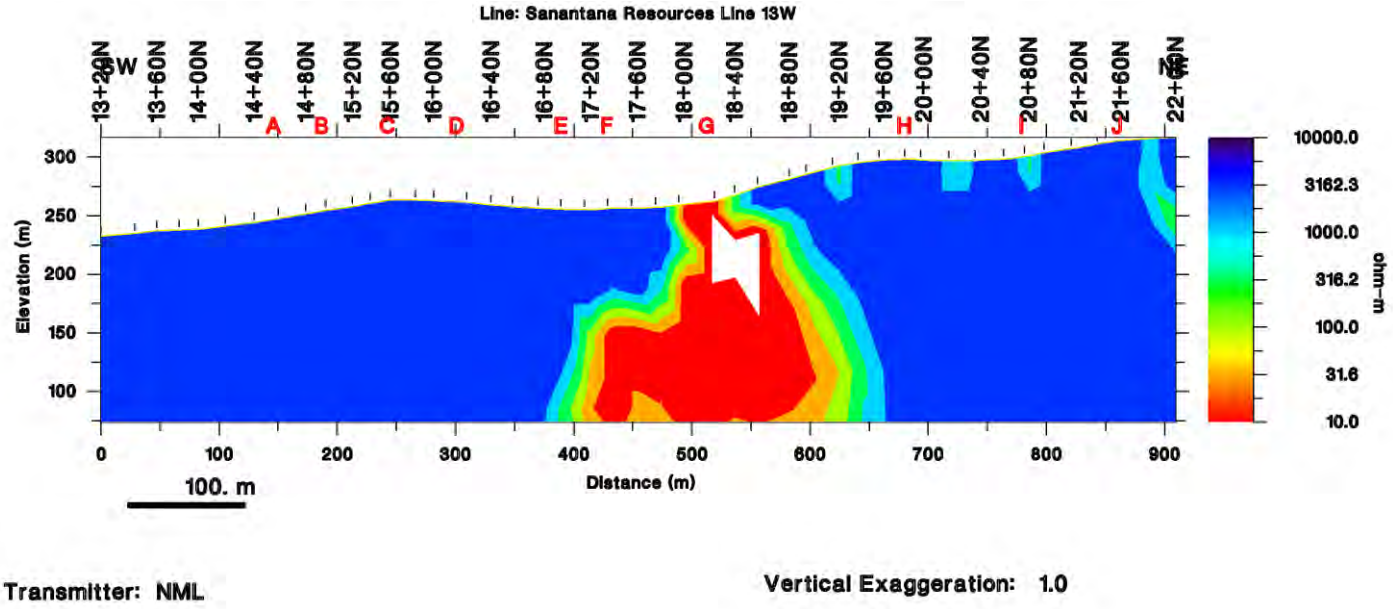
NML Figure 30 Line 12W JY Model with Fraser Picks



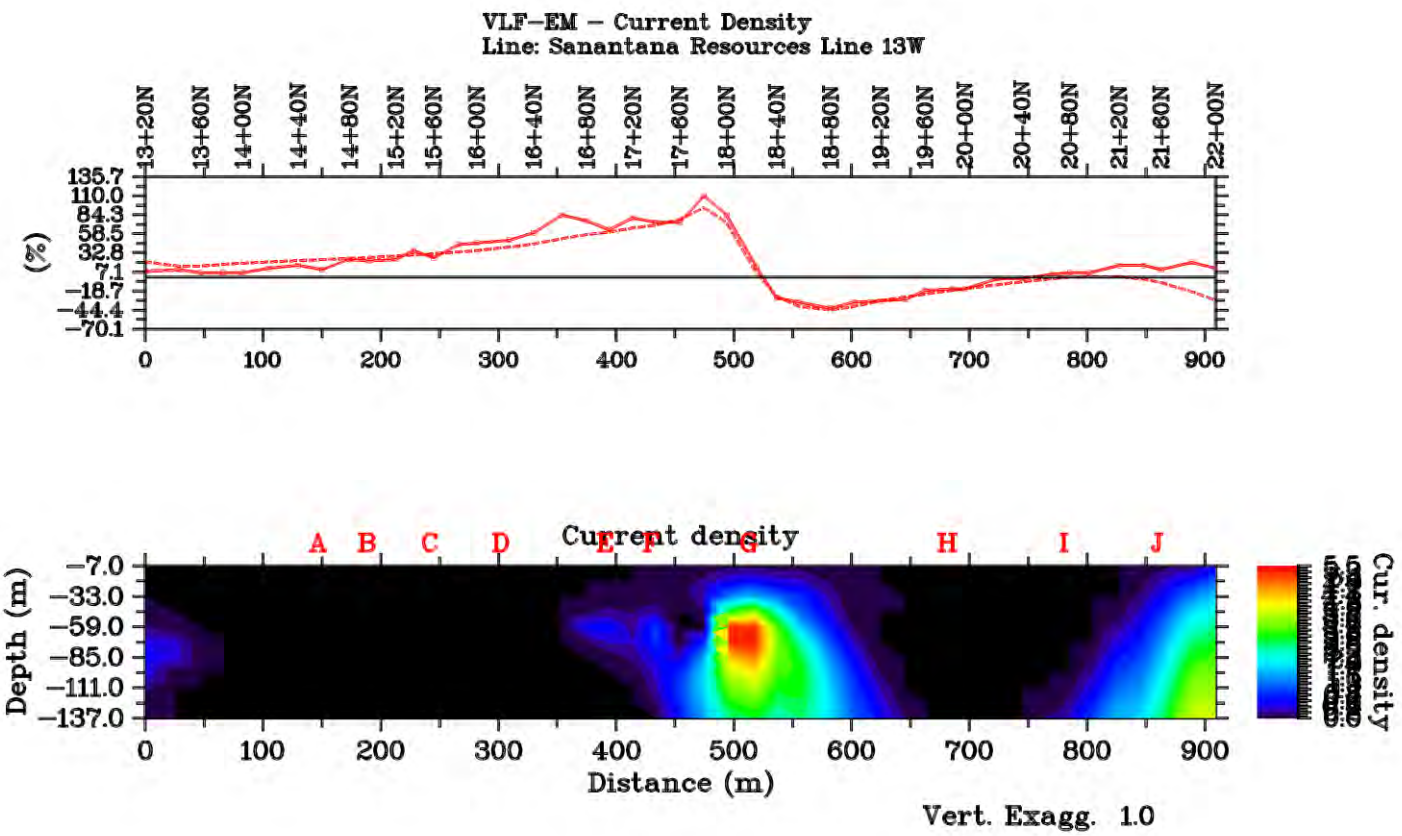
NML Figure 31 Line 13W Raw Data Profile



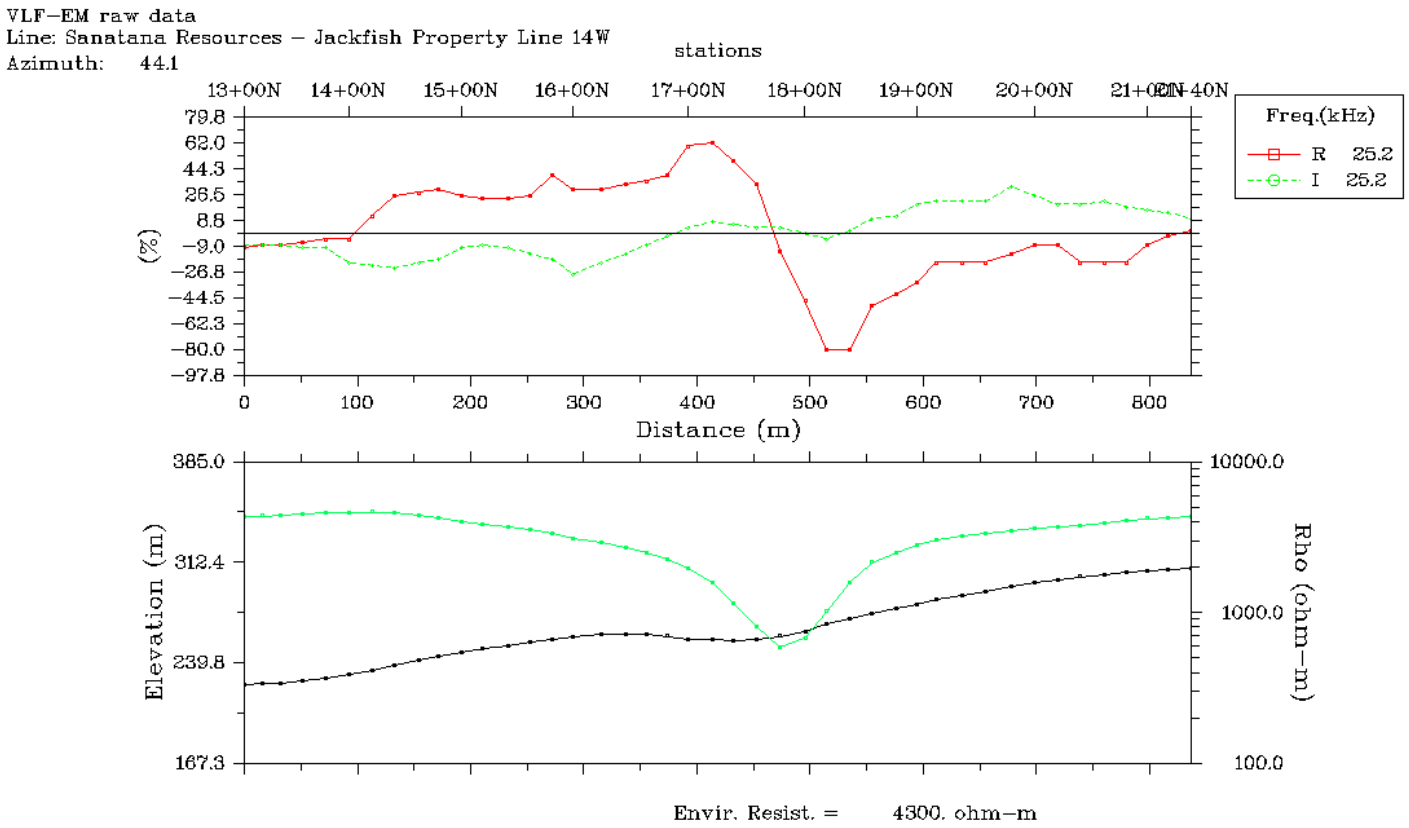
NML Figure 32 Line 13W Model 4000 Ohm with Fraser Picks



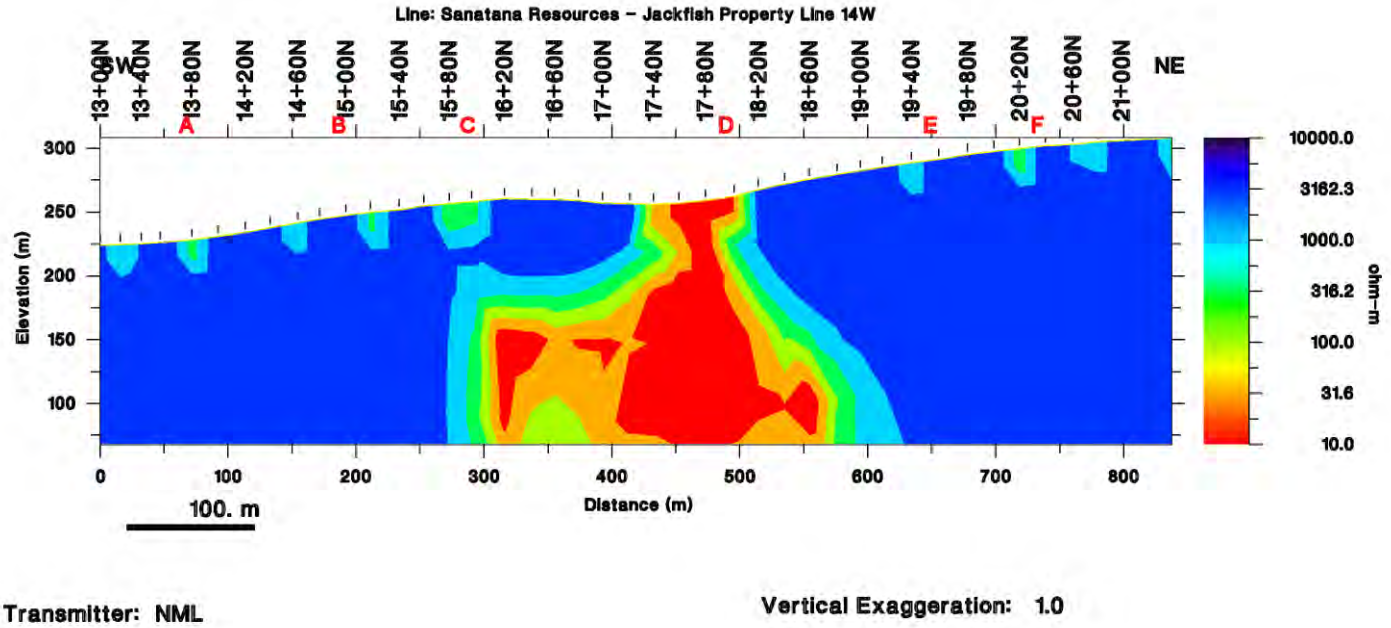
NML Figure 33 Line 13W JY Model with Fraser Picks



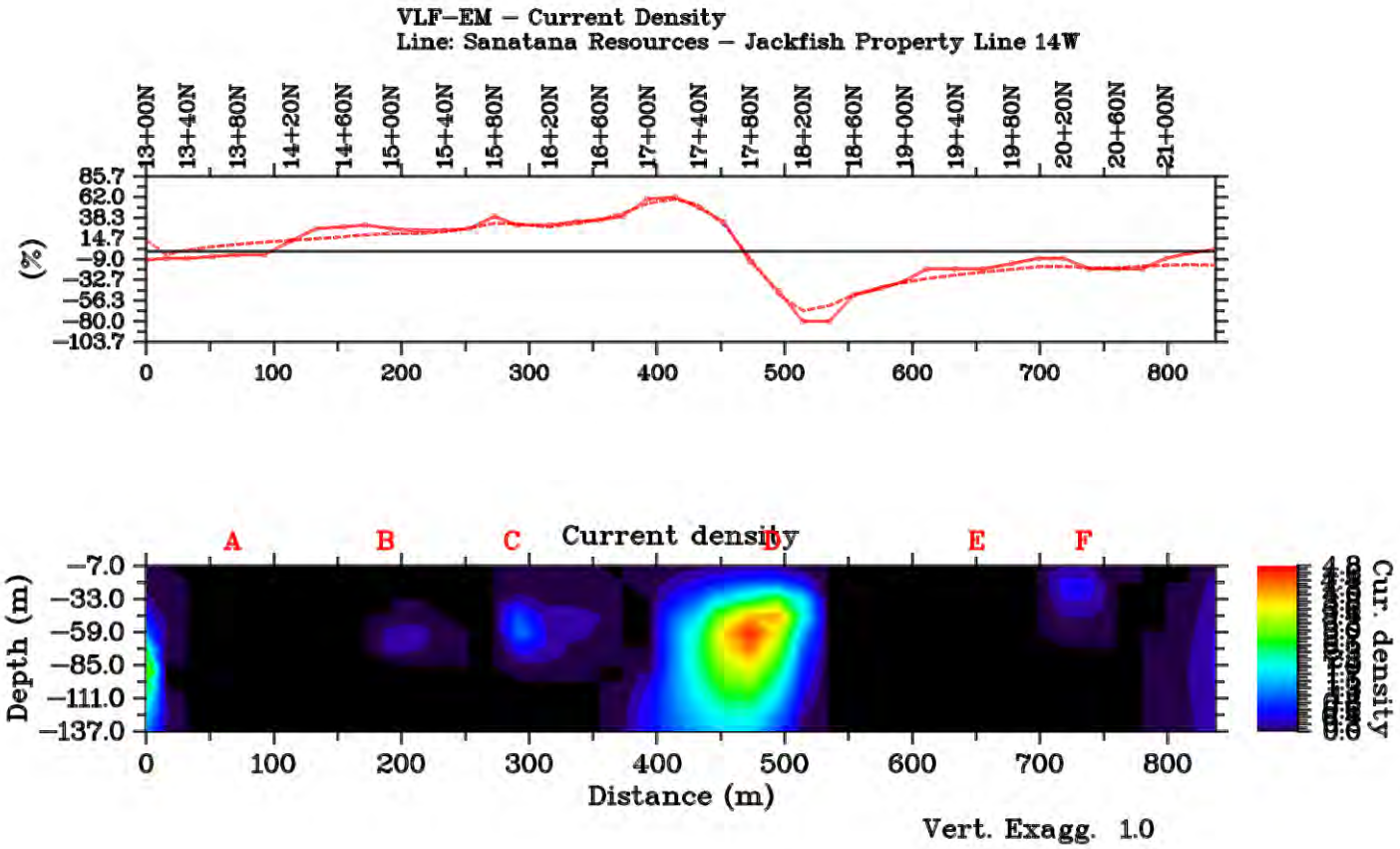
NML Figure 34 Line 14 Raw Data Profile



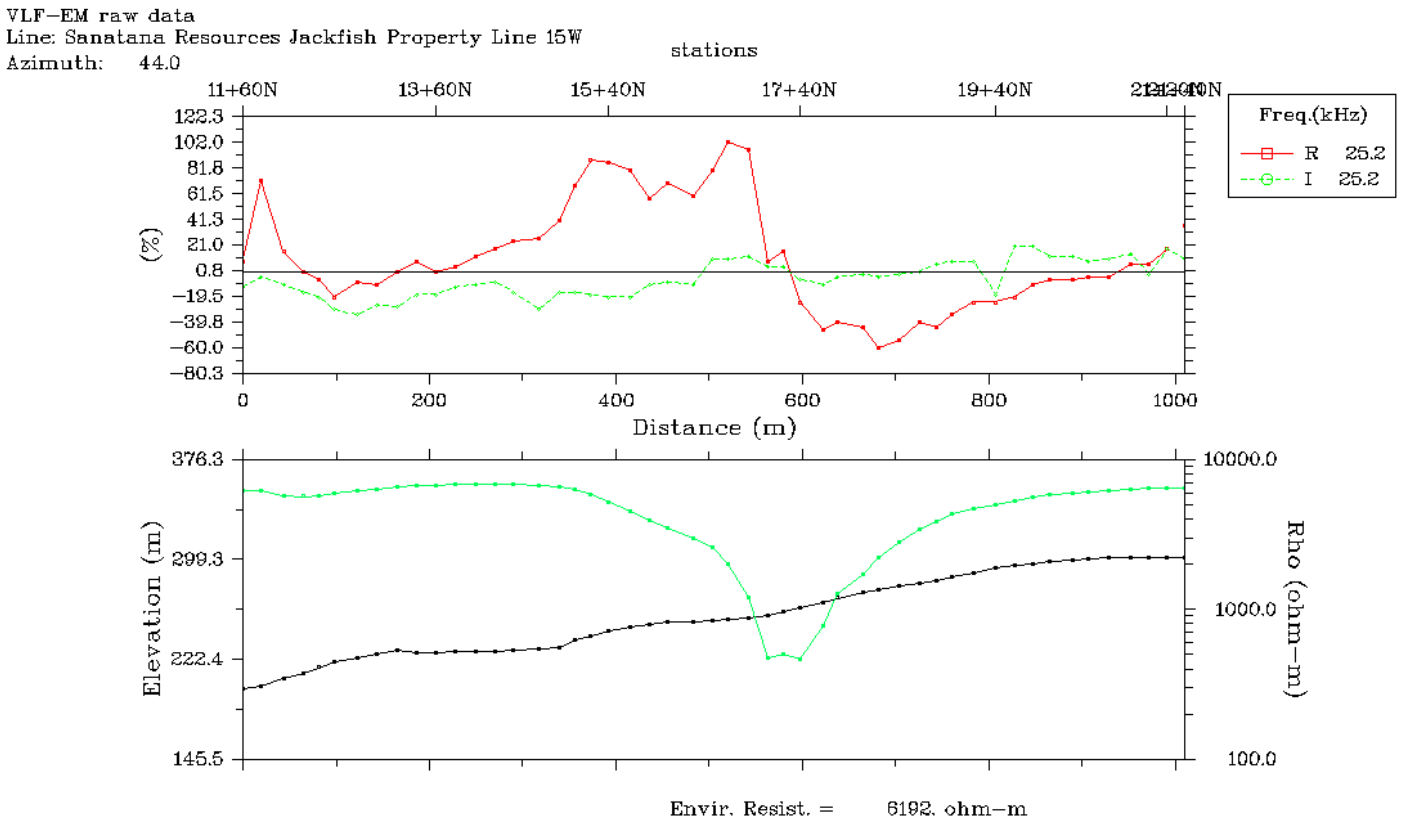
NML Figure 35 Line 14W Model 4000 Ohm with Fraser Picks



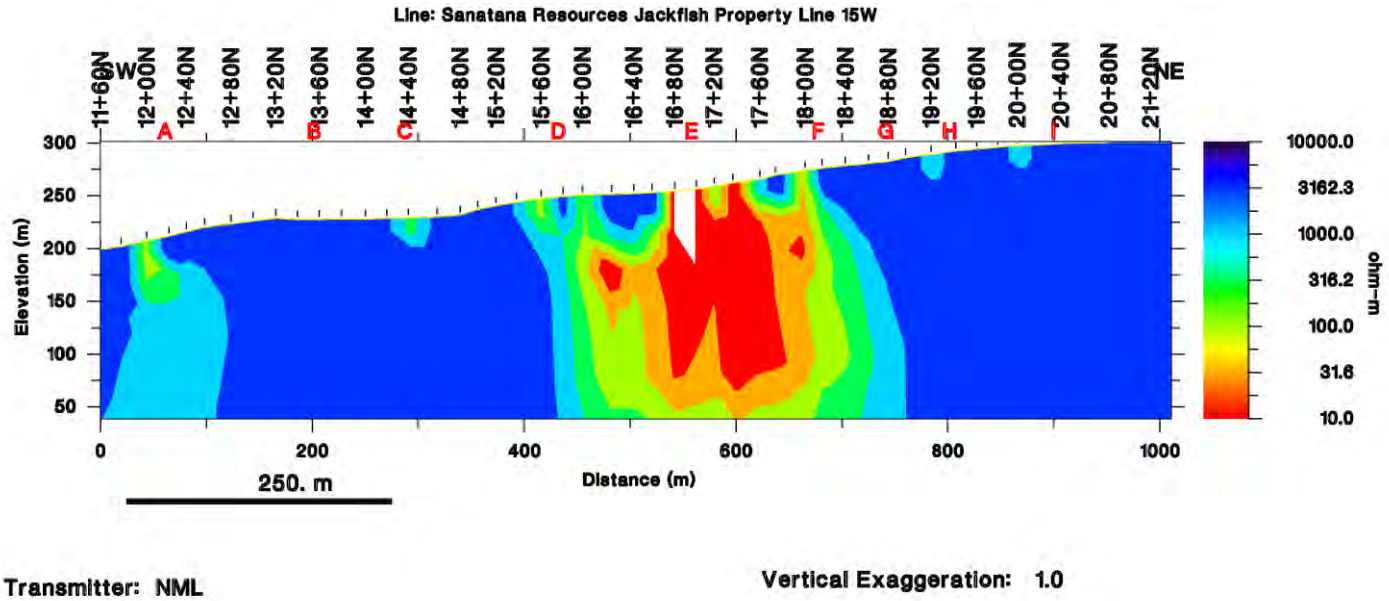
NML Figure 36 Line 14W JY Model with Fraser Picks



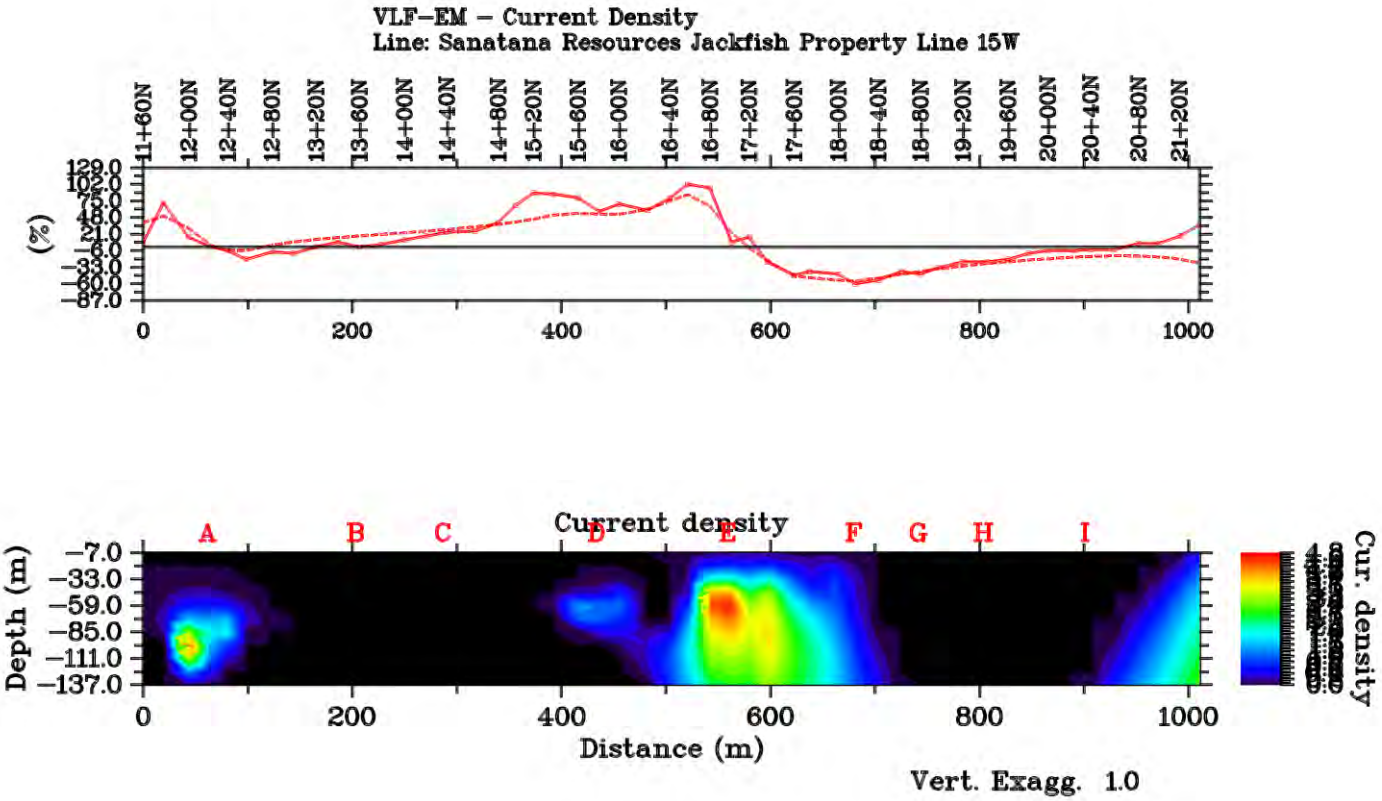
NML Figure 37 Line 15W Raw Data Profile



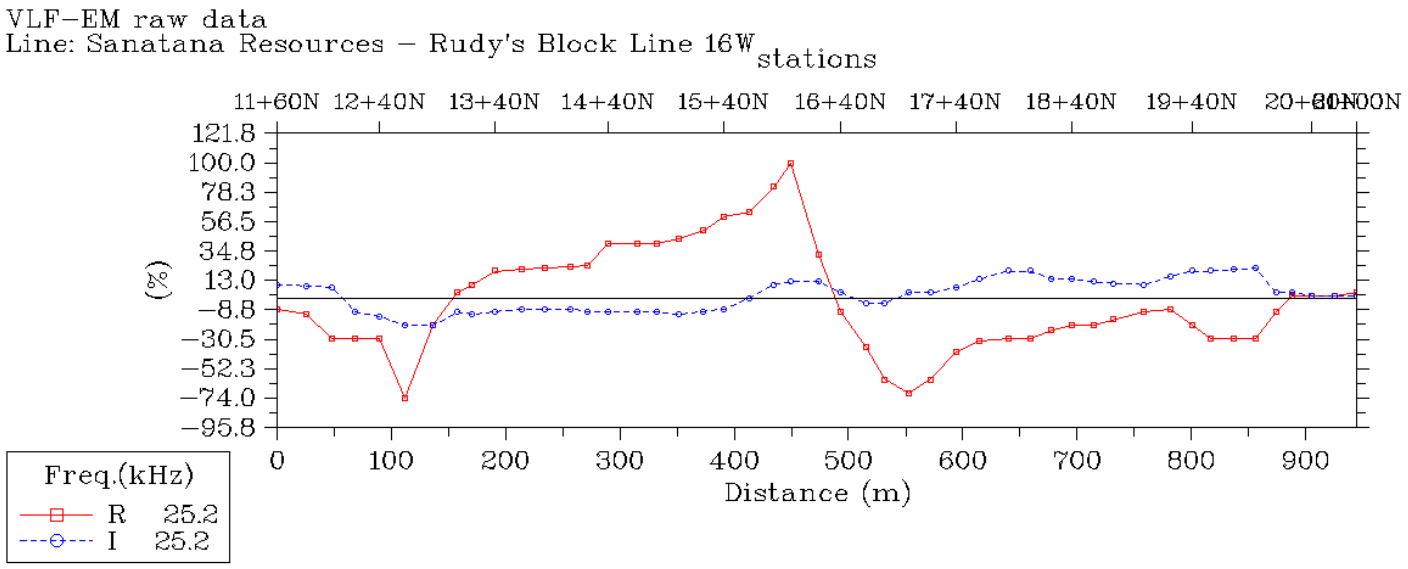
NML Figure 38 Line 15W Model 4000 Ohm with Fraser Picks



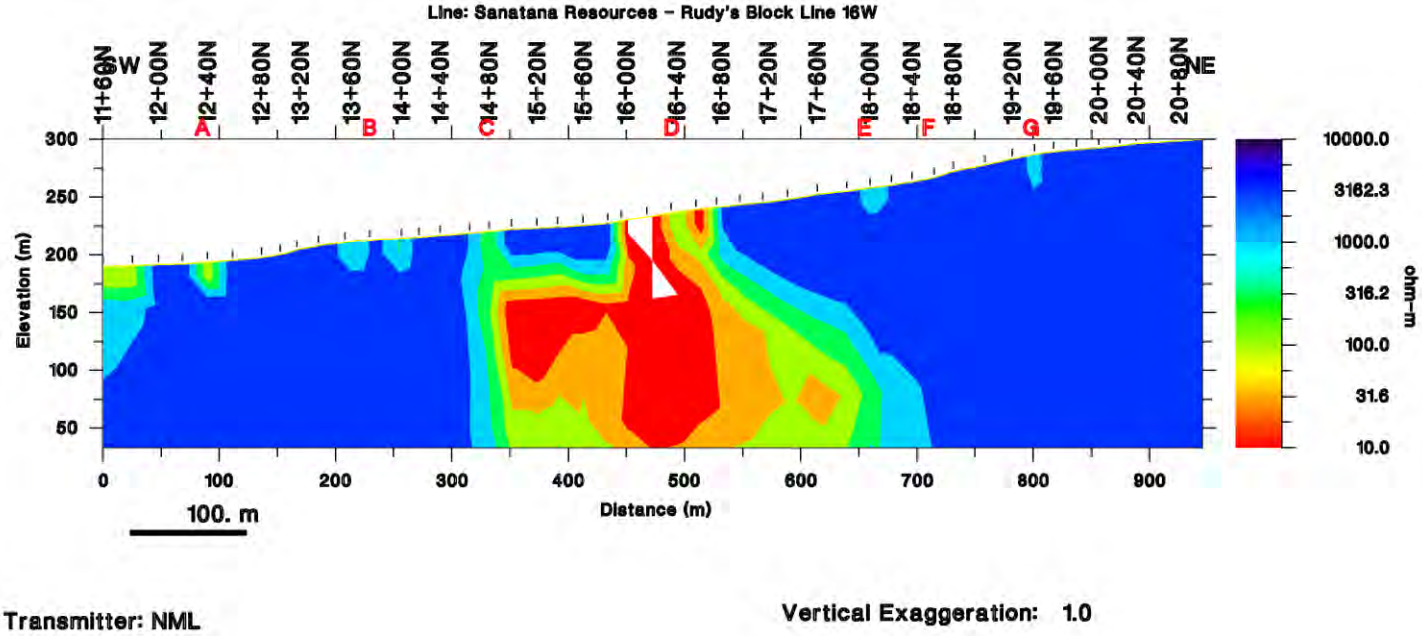
NML Figure 39 Line 15W JY Model with Fraser Picks



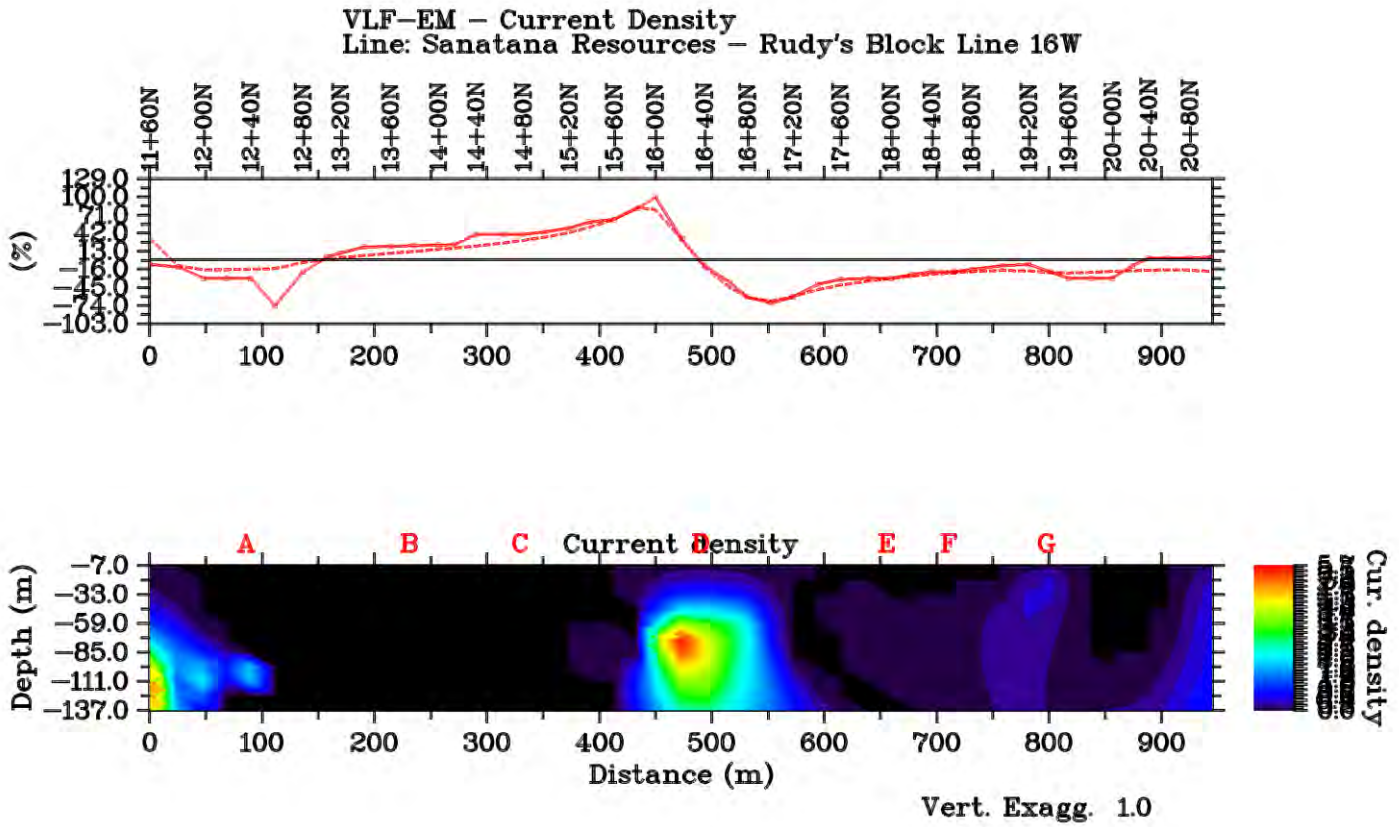
NML Figure 40 Line 16W Raw Data Profile



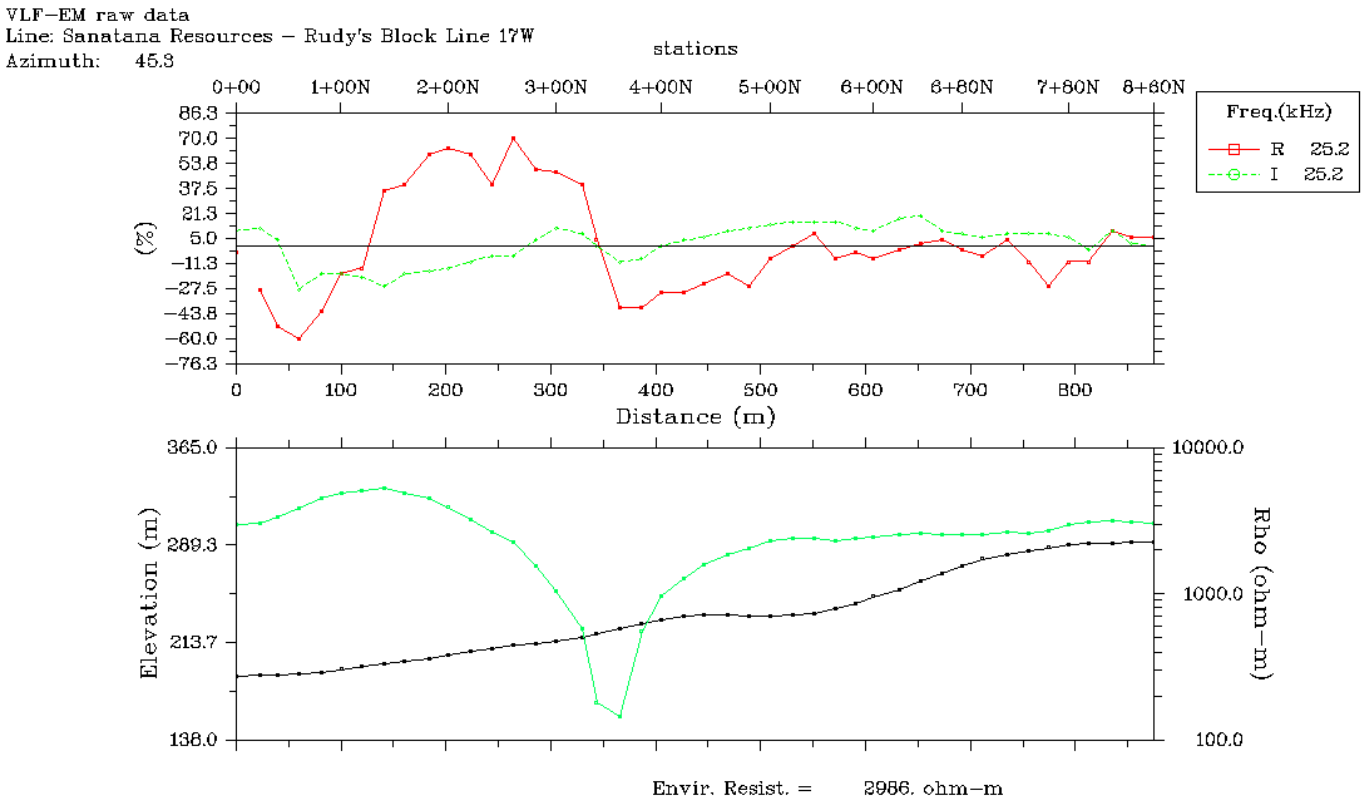
NML Figure 41 Line 16W Model 4000 Ohm with Fraser Picks



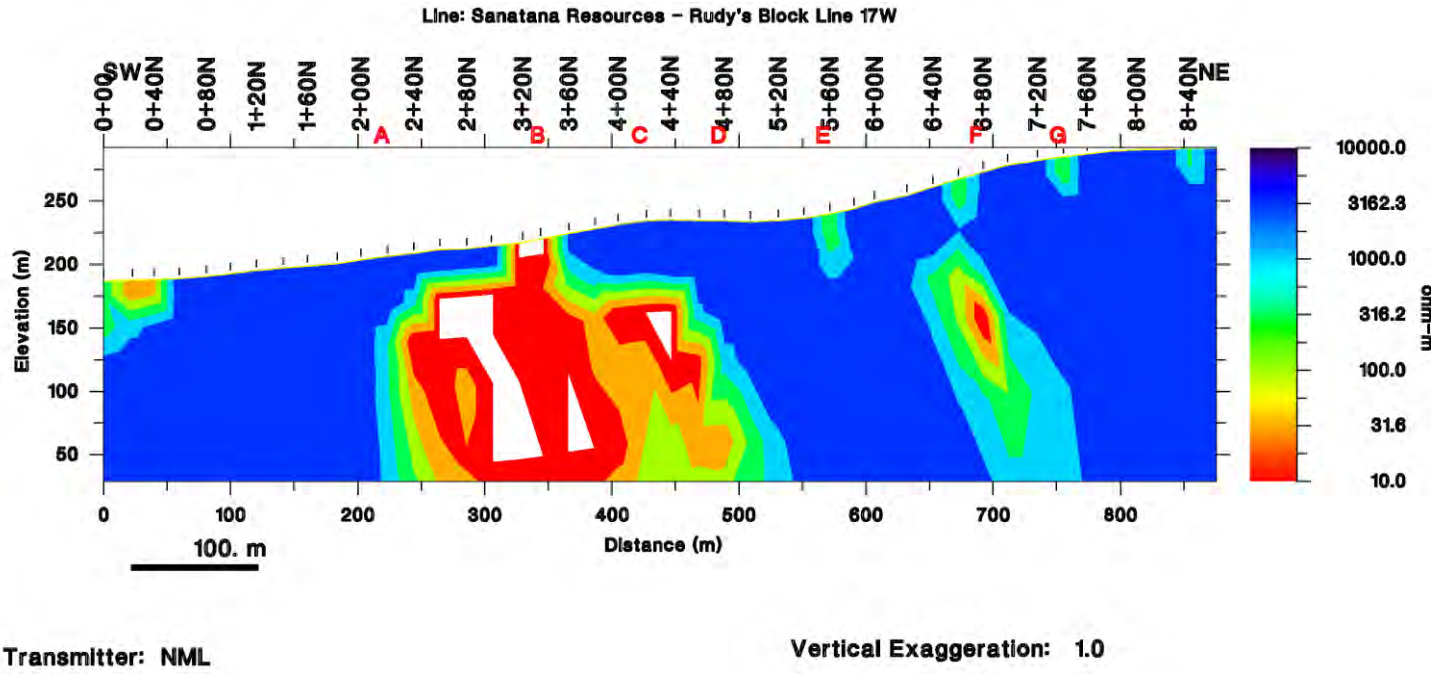
NML Figure 42 Line 16W JY Model with Fraser Picks



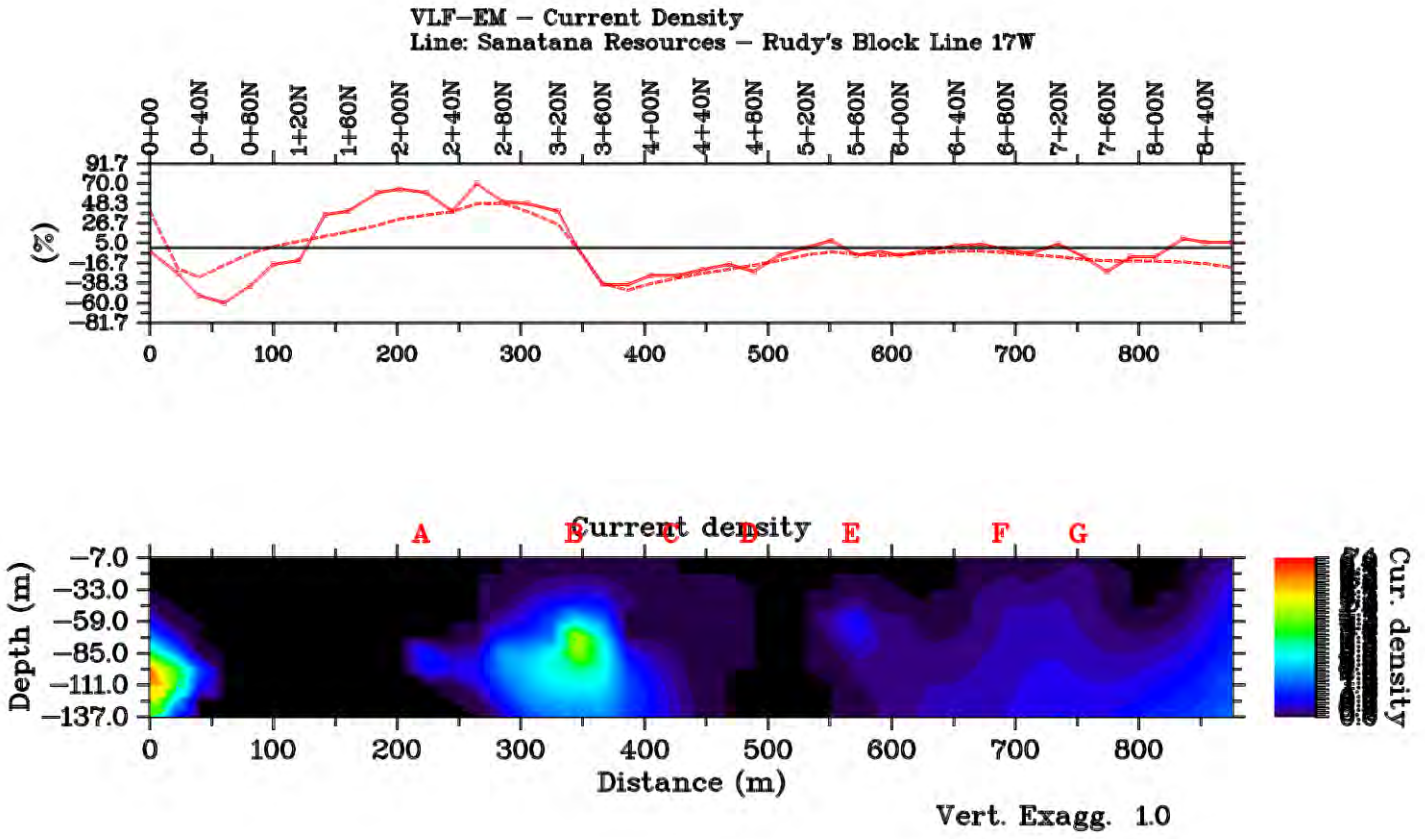
NML Figure 43 Line 17W Raw Data Profile



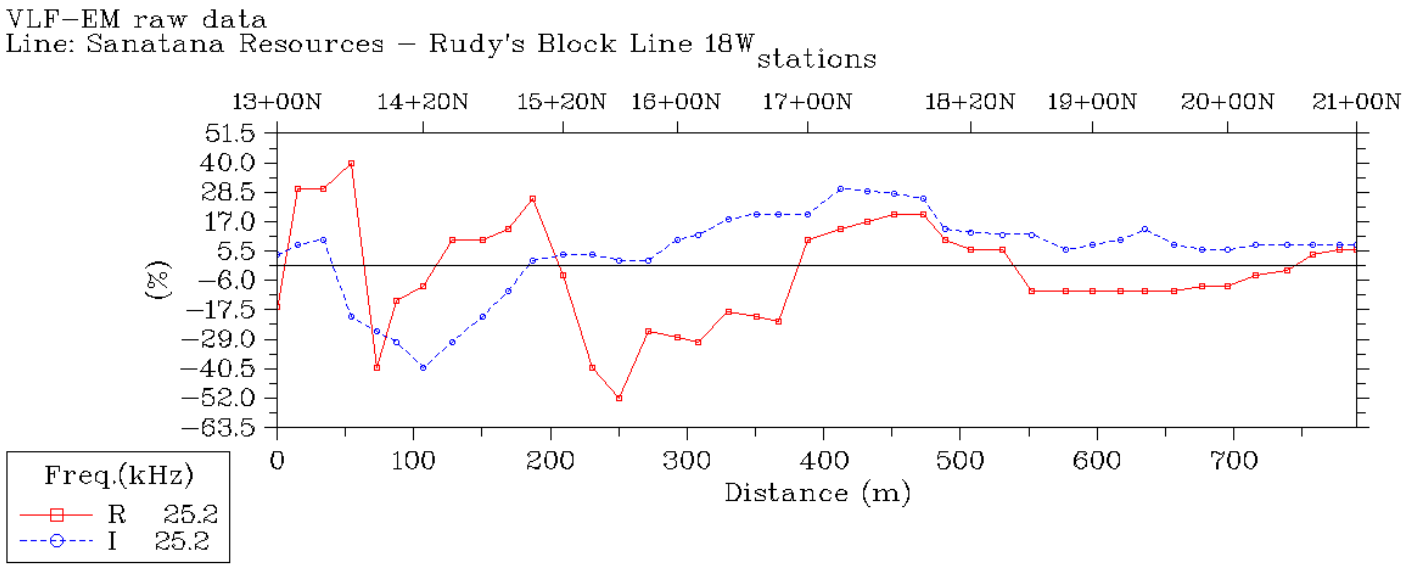
NML Figure 44 Line 17W Model 4000 Ohm with Fraser Picks



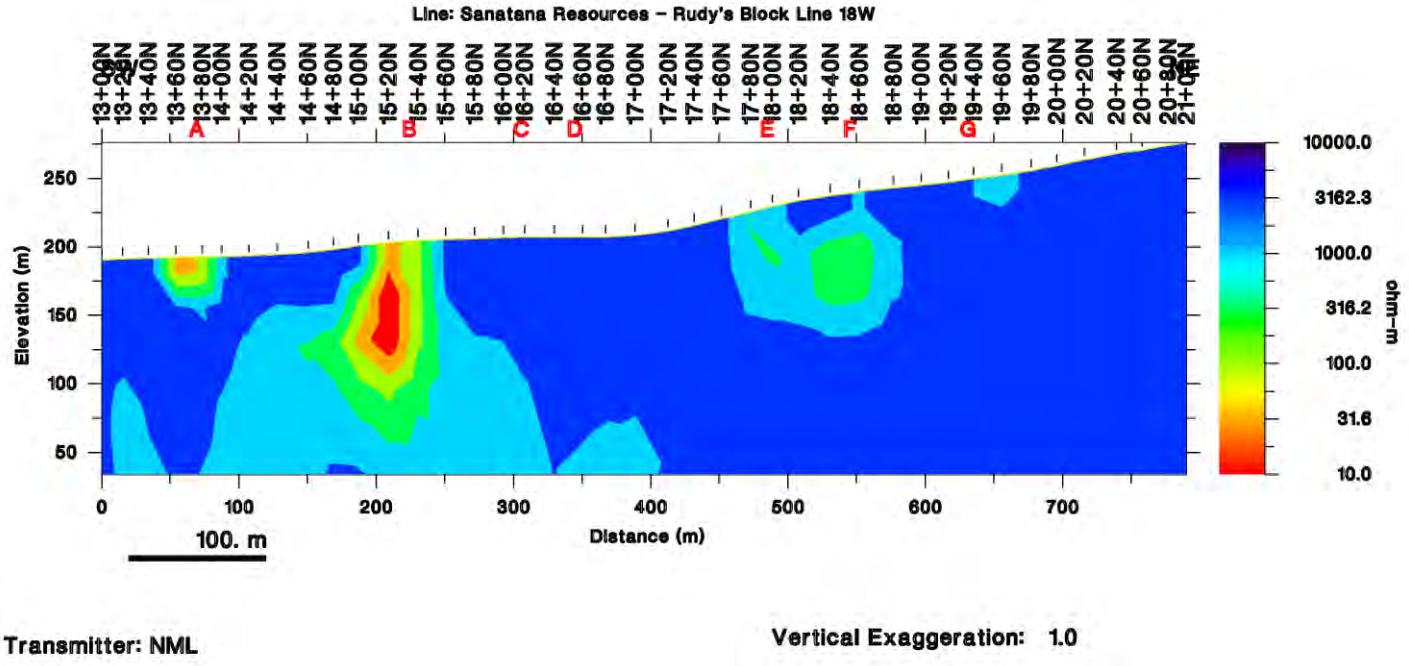
NML Figure 45 Line 17W JY Model with Fraser Picks



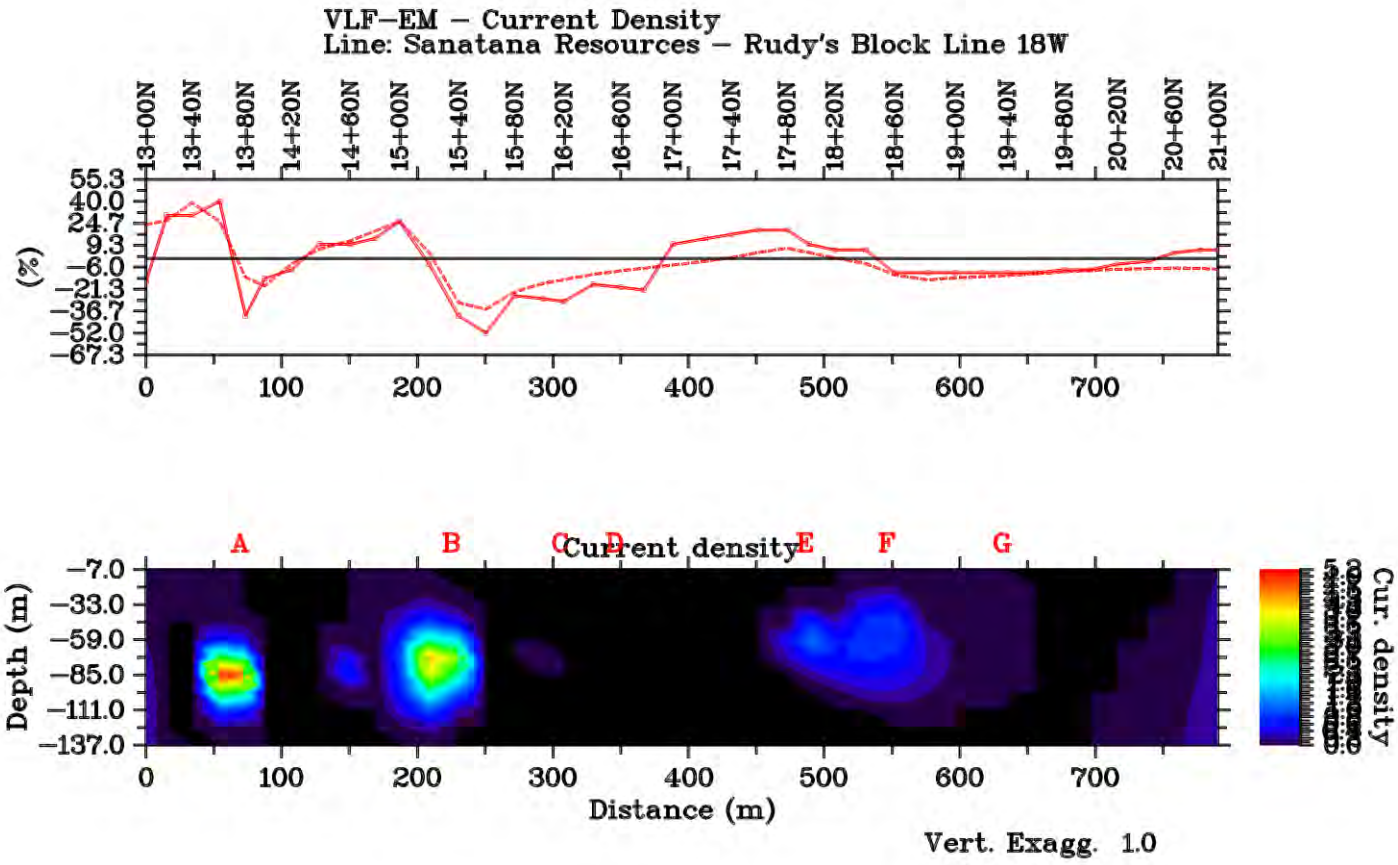
NML Figure 46 Line 18W Raw Data Profile



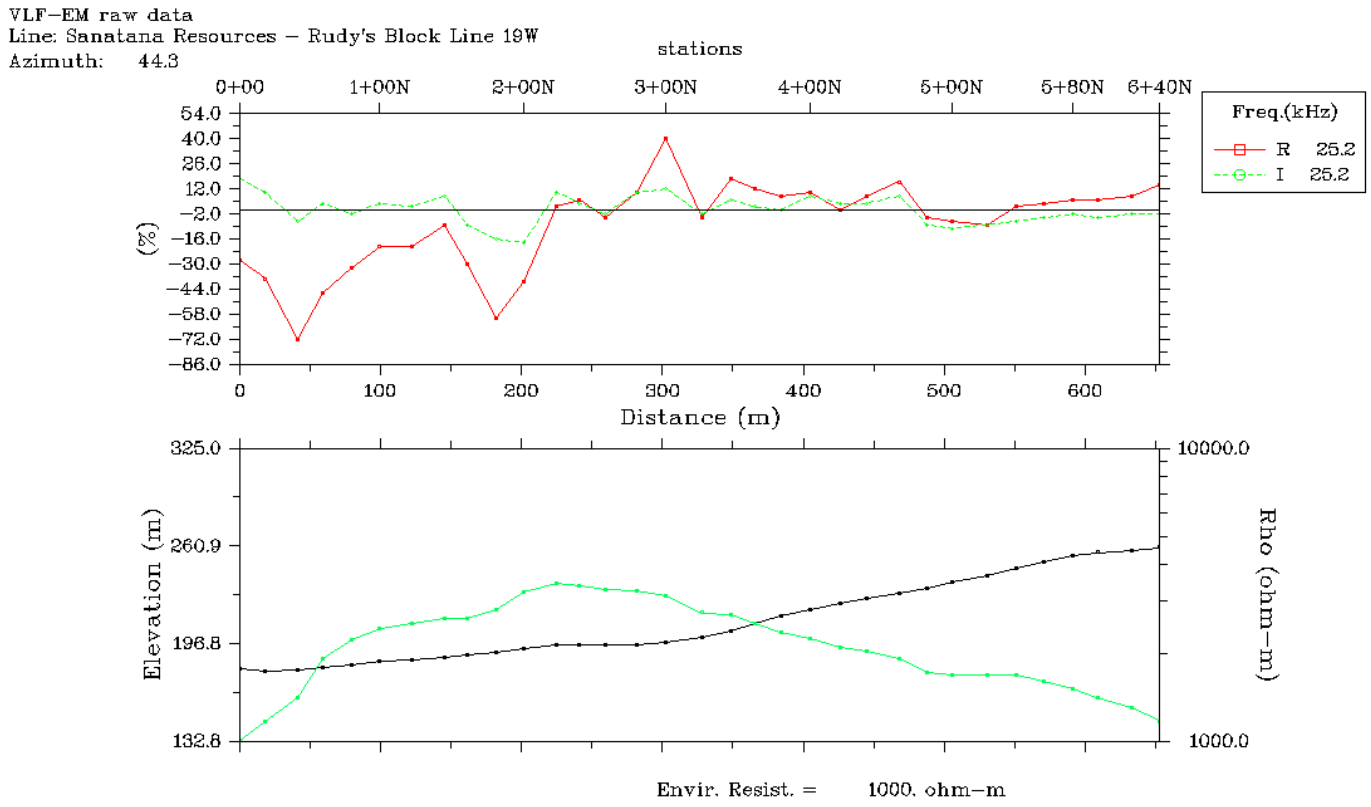
NML Figure 47 Line 18W Model 4000 Ohm with Fraser Picks



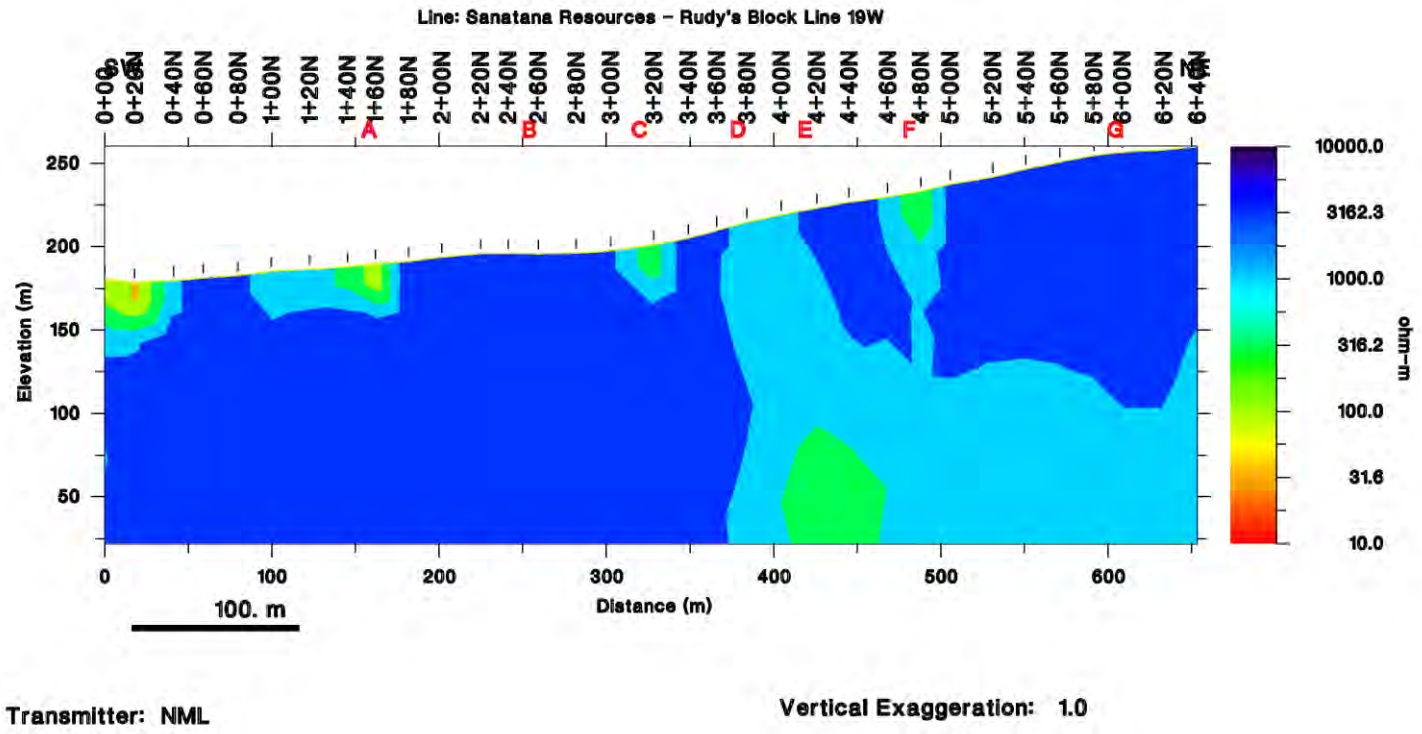
NML Figure 48 Line 18W JY Model with Fraser Picks



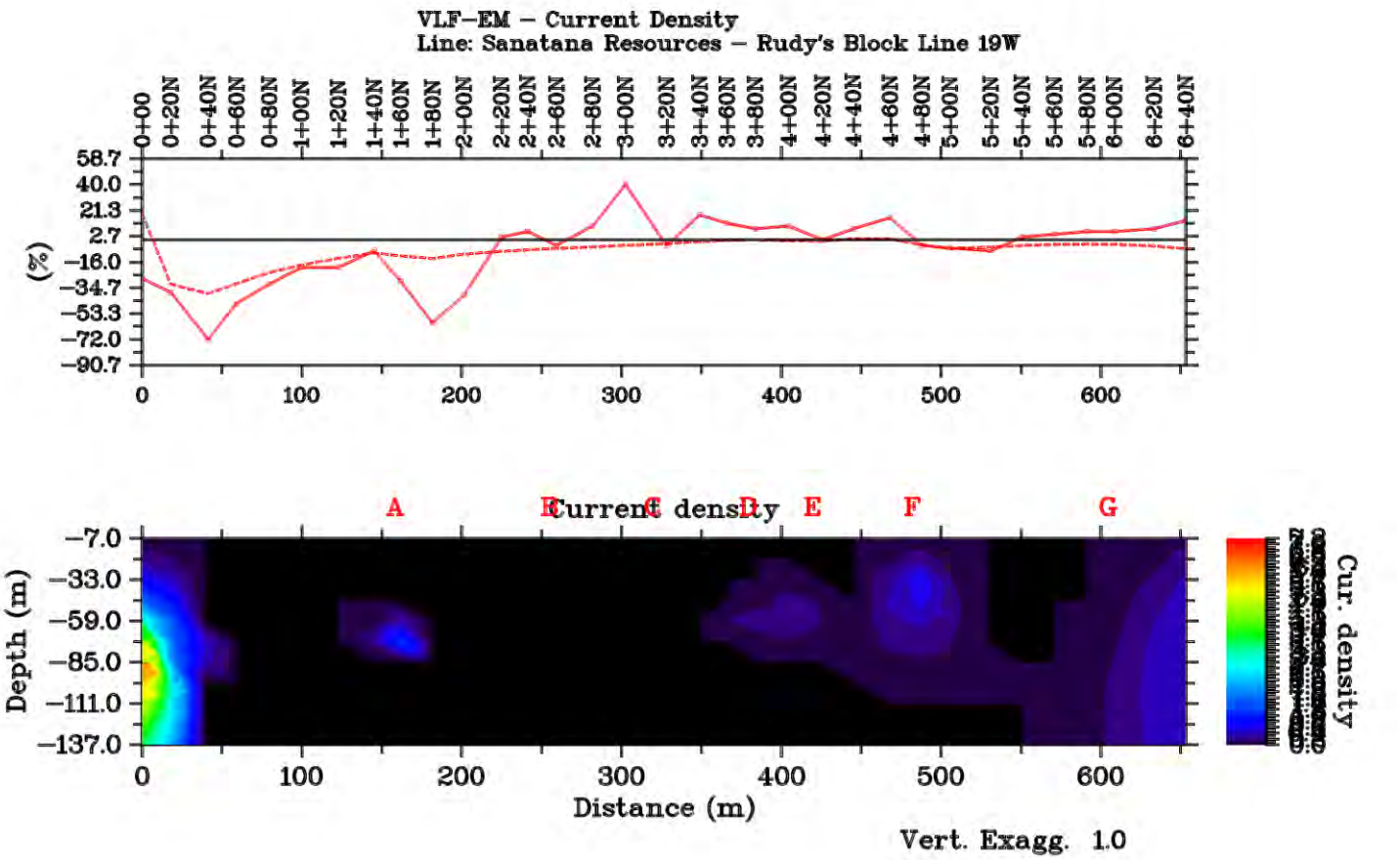
NML Figure 49 Line 19W Raw Data Profile



NML Figure 50 Line 19W Model 4000 Ohm with Fraser Picks



NML Figure 51 Line 19W JY Model with Fraser Picks



Appendix 2: VLF-EM Data

Sanatana Resources - Jackfish Property

Raw VLF Data - 2018 Rudy Block Survey

					NAA		NML	
Line Number	StationID	Easting	Northing	Elevation	In-Phase	Out-Phase	In-Phase	Out-Phase
L3W	16+80N	505600	5408974	248	20	-10	20	-8
L3W	17+00N	505613	5408988	253	36	-18	34	-16
L3W	17+20N	505629	5409006	276	40	-20	38	-18
L3W	17+40N	505644	5409022	278	8	-6	10	-8
L3W	17+60N	505658	5409037	280	4	-2	6	-2
L3W	17+80N	505673	5409053	282	2	-10	2	-8
L3W	18+00N	505687	5409070	283	6	-10	6	-8
L3W	18+20N	505699	5409085	285	8	-10	10	-8
L3W	19+20N	505768	5409159	297	-16	20	-14	-10
L3W	19+40N	505781	5409173	298	-12	-20	-10	-16
L3W	19+60N	505794	5409187	294	4	-20	6	-18
L3W	19+80N	505808	5409202	290	6	-14	6	-12
L3W	20+00N	505821	5409217	289	10	-16	12	-18
L3W	20+20N	505833	5409232	286	14	-24	16	-24
L3W	20+40N	505844	5409249	280	20	-28	22	-28
L3W	20+60N	505856	5409266	286	18	-32	20	-30
L3W	20+80N	505867	5409281	288	18	-26	20	-24
L3W	21+00N	505879	5409298	292	26	-40	28	-42
L3W	21+20N	505893	5409314	294	30	-36	32	-34
L3W	21+40N	505905	5409327	298	30	-20	30	-18
L3W	21+60N	505917	5409344	302	44	-20	46	-18
L3W	21+80N	505933	5409355	302	80	-30	82	-32
L3W	22+00N	505950	5409369	306	100	-28	102	-30
L3W	22+20N	505963	5409381	308	60	-14	62	-14
L3W	22+40N	505978	5409398	310	40	-8	42	-8
L3W	22+60N	505993	5409411	311	0	-8	0	-6
L3W	22+80N	506007	5409425	312	-40	-12	-42	-14
L3W	23+00N	506015	5409440	313	-26	-8	-24	-10
L3W	23+20N	506031	5409456	314	-30	-8	-32	-8
L3W	23+40N	506043	5409471	319	-30	2	-32	4
L3W	23+60N	506057	5409486	324	-20	5	-22	6
L3W	23+80N	506068	5409500	329	-18	10	-20	12
L3W	24+00N	506081	5409515	332	-10	8	-12	10
L3W	24+20N	506092	5409531	328	-10	8	-10	10
L3W	24+40N	506104	5409543	326	-10	8	-8	8
L3W	24+60N	506119	5409560	326	-10	8	-8	6
L3W	24+80N	506134	5409572	324	-8	8	-8	4
L3W	25+00N	506144	5409586	325	-8	-6	-6	-8
L4W	16+00N	505502	5408988	244	-30	-34	-28	-32

Sanatana Resources - Jackfish Property

Raw VLF Data - 2018 Rudy Block Survey

					NAA		NML	
Line Number	StationID	Easting	Northing	Elevation	In-Phase	Out-Phase	In-Phase	Out-Phase
L4W	16+20N	505516	5408998	246	-20	-22	-18	-20
L4W	16+40N	505530	5409011	248	-18	-16	-10	-10
L4W	16+60N	505545	5409025	248	-4	-10	-4	-8
L4W	16+80N	505559	5409042	249	-4	-8	-4	-6
L4W	17+00N	505571	5409057	253	-4	-8	-4	-6
L4W	17+20N	505585	5409072	258	-10	-12	-12	-10
L4W	17+40N	505601	5409087	263	-8	-10	-8	-8
L4W	20+20N	505766	5409303	267	100	-8	100	-10
L4W	20+40N	505781	5409319	267	70	-10	72	-10
L4W	20+60N	505800	5409331	268	40	-32	42	-30
L4W	20+80N	505816	5409349	275	36	-26	38	-28
L4W	21+00N	505833	5409362	283	26	-28	24	-26
L4W	21+20N	505841	5409380	288	30	-22	30	-24
L4W	21+40N	505854	5409396	290	40	-18	38	-20
L4W	21+60N	505870	5409410	294	90	-18	92	-20
L4W	21+80N	505885	5409425	292	110	-10	108	-8
L4W	22+00N	505899	5409438	286	20	-18	22	-20
L4W	22+20N	505908	5409453	281	-70	-18	-72	-20
L4W	22+40N	505924	5409469	292	-54	-12	-46	-14
L4W	22+60N	505938	5409483	294	-46	-8	-44	-10
L4W	22+80N	505950	5409494	294	-100	-10	-98	-8
L4W	23+00N	505966	5409509	299	-100	8	-102	10
L4W	23+20N	505983	5409528	306	-60	10	-58	12
L4W	23+40N	505998	5409544	308	-20	14	-18	12
L4W	23+60N	506012	5409559	312	-12	10	-10	10
L4W	23+80N	506026	5409574	316	-8	10	-10	10
L4W	24+00N	506039	5409588	319	-8	10	-6	8
L4W	24+20N	506049	5409603	320	-10	10	-9	8
L4W	24+40N	506064	5409620	318	-10	10	-10	8
L4W	24+60N	506078	5409639	320	-10	-8	-10	10
L4W	24+80N	506090	5409656	316	-8	8	-8	10
L4W	25+00N	506103	5409671	314	-6	8	-8	10
L5W	16+00N	505423	5409071	245	30	-6	28	-8
L5W	16+20N	505435	5409086	246	26	-4	24	-6
L5W	21+00N	505766	5409431	269	100	-10	98	-12
L5W	21+20N	505781	5409451	269	70	-2	88	-2
L5W	21+40N	505794	5409467	272	70	0	74	-2
L5W	21+60N	505811	5409492	272	28	0	30	-2
L5W	21+80N	505826	5409510	274	-30	2	-28	0

Sanatana Resources - Jackfish Property

Raw VLF Data - 2018 Rudy Block Survey

					NAA		NML	
Line Number	StationID	Easting	Northing	Elevation	In-Phase	Out-Phase	In-Phase	Out-Phase
L5W	22+00N	505840	5409529	276	-42	2	-34	4
L5W	22+20N	505855	5409547	276	-67	10	-42	8
L5W	22+40N	505869	5409563	279	-90	34	-92	36
L5W	22+60N	505885	5409578	284	-80	42	-84	44
L5W	22+80N	505900	5409592	290	-58	34	-60	34
L5W	23+00N	505914	5409605	296	-36	26	-38	28
L5W	23+20N	505925	5409618	304	-18	22	-20	24
L5W	23+40N	505941	5409633	310	-24	20	-26	20
L5W	23+60N	505954	5409650	320	-50	20	-52	20
L5W	23+80N	505966	5409664	326	-30	12	-32	12
L5W	24+00N	505981	5409676	332	-22	6	-24	8
L5W	24+20N	505997	5409690	337	-20	6	-20	8
L5W	24+40N	506007	5409709	337	-18	8	-20	8
L5W	24+60N	506019	5409724	338	-18	8	-20	10
L5W	24+80N	506031	5409738	329	-12	10	-10	10
L5W	25+00N	506045	5409754	330	-10	12	-8	12
L5W	25+20N	506058	5409771	328	-8	12	-8	14
L5W	25+40N	506073	5409788	326	-8	10	-8	14
L6W	22+00N	505765	5409577	263	-110	14	-106	16
L6W	22+20N	505783	5409590	268	-54	16	-56	18
L6W	22+40N	505796	5409605	272	-30	14	-32	12
L6W	22+60N	505806	5409625	277	-28	12	-26	12
L6W	22+80N	505818	5409639	281	-24	20	-26	20
L6W	23+00N	505833	5409659	288	-34	38	-36	36
L6W	23+20N	505846	5409669	292	-34	28	-34	26
L6W	23+40N	505861	5409685	302	-34	30	-32	28
L6W	23+60N	505876	5409694	312	-26	18	-24	16
L6W	23+80N	505891	5409710	319	-14	22	-16	20
L6W	24+00N	505905	5409723	324	-16	24	-18	22
L6W	24+20N	505919	5409740	330	-8	18	-10	20
L6W	24+40N	505930	5409752	334	-6	20	-8	20
L6W	24+60N	505944	5409766	336	-4	22	-6	22
L6W	24+80N	505955	5409782	310	-8	18	-8	16
L6W	25+00N	505969	5409794	338	-8	18	-8	16
L8W	23+60N	505766	5409799	338	-12	34	-10	30
L8W	23+80N	505779	5409813	340	-10	36	-10	30
L8W	24+00N	505793	5409826	342	-8	38	-6	36

Appendix 3: Invoices Supporting Exploration Costs