STONEROL

MANAGEMENT REPORT

1st of October 2013 to 30th of September 2014

2014

STONEROL

TABLE OF CONTENTS

STONEROL

LETTER OF THE CHAIRMAN

Stonerol Oy, Helsinki

Letter of the Chairman

Dear Investors

The resource industry is in a continued financial crisis world-wide. During the last twelve months the effects have become more and more dramatic. In order to understand what is happening, one has to take a look at the long-term developments of the past. In the 1960ies to 1980ies the global resource industry was strongly driven and financed by the large diversified resource conglomerates and major oil companies. The next period from 1990 to 2010 was dominated by the stock markets as the main financing machine for thousands of global projects in exploration and resource development all over the world. Especially the stock markets in Australia, Canada and London were the driving forces for hundreds of new listings.

What we are facing now is the end of this period. Too many projects, often with thoughtful motives, have been put in place. The fact is: There are just not that many really good resource assets that justify to be mined in an economic fashion. In addition, the enormous number of illegal operations worldwide is uncontrollable and much larger than we believe in the Western media. Therefore, many economic forecasts of global demand and supply are not correct.

So, what is ahead for the resource industry? In my mind there is no doubt that the next ten years will be a period during which private entrepreneurs will be the financing source for resource exploration and development. It is no longer the stock market.

Since the beginning of our activities in Finland, at Stonerol Oy we have had a long-term vision and strategy for our exploration activities. Four years ago, the resource industry was still booming and full of optimism. We have never counted on this boom and also not on the stock market. Thanks to our careful long-term planning and our independent financing, Stonerol Oy did not have to change the way it works. We think and act as true entrepreneurs and not like employees of large cooperations. We work with the right people and watch our dollars.

In our fourth year of activity, we like Finland more than ever and it is definitely our place to be. By now, we have focused 100% on the North of Finland. Compared to many other countries in the world, Finland guarantees a proper legal system and our rights of ownership. From a geological point of view Finland is not an easy place, but it still offers great opportunities to discover untapped mineral resources. Most importantly we have great admiration and respect for the people of Finland who are pleasant and efficient to work with. Looking at the globe today, I cannot find many other places like this.

On the operational side we have made good progress with expanding our land bank and specialised exploration knowhow. We are totally unemotional when it comes to reviewing the pros and cons of a resource asset. Within our Group we speak in clear words about difficult and complex exploration matters. We are only interested in results from the geological reality - whether there is the realistic outlook for a substantial economic resource, yes or no. This is the way we will continue.

I am happy to report that we have concluded our first drilling campaign at the beginning of 2014. Planning, timing, execution and efficiency of the drilling in the Tervola region were excellent, but unfortunately our drilling results were just not good enough. That is part of the nature of our business as explorers. I can only reiterate from last year's report, what our senior geological adviser, Mr Markku Iljina, always says: **"Exploration is all about *where* to start and *when* to stop."**

With kind regards,
Sincerely yours

Dr. Markus Elsasser
Chairman

STONEROL

REPORT OF THE MANAGING DIRECTOR

Stonerol Oy, Helsinki

Report of the Managing Director

Dear Reader,

The feeling of the name Stonerol, when it rolls on my tongue, brings to mind the greenfields and the reservations we have in the North of Finland, all the boulders and stones we have investigated, all the samples of soil we have taken during these past four years and the drill-holes that awoke our hopes.

Where do the boulders come from? Have they always been there or has the Ice Age rolled them down from far North? What about the more than a thousand samples that our talented and diligent geology students have taken? Will they disclose their secret? Is there a hidden treasure buried deep down in the earth? And the drill-holes, is the gold eluding us? Should we perhaps have decided on a site just five meters to the right or to the left? So far, the only gold we have is encircled in the letter O of STONEROL.

At the moment the market of financing and money rising is difficult. Prices for minerals have gone down from low to new very low. The setbacks have been very hard. I admire the vision of Dr. Markus Elsasser. The tides are going to turn and he has the guts and time to wait out this recession.

After all, the future of Finland lies in her metals. They will help her to rise to new prosperity. The gold belt that runs from Norway and Sweden through Finland to Russia is still much unexplored. We have all the facilities required. The metals are there, they just have to be unearthed. We have a great infrastructure and excellent roads, available workforce and skilled geologists. Our authorities and laws are reliable, once you have secured a claim, you can be sure that no one else will trespass upon your rights.

Stonerol has started building a first class exploration company and this work will continue. For me the time has come to give over to a younger generation. With gratitude I think back on the exciting journey that Stonerol has been, on the wonderful friends I have won during this time and even on some hilarious incidents.

I have been accepted as a member of "Vuorimiesyhdistys" (The Mountain Men´s Association) and was therefore invited to the annual seminar and the subsequent dinner and dance. As the dress code was tuxedo, I was wearing my most beautiful silk gown and jewelry so my husband stated with dry humor: "It´s hard for me to realize that I´m married to a man.

Sonja Grefberg is now taking over and I have full confidence in her. We have worked together previously on many occasions and I have learnt to appreciate her as a very talented, target-oriented and trustworthy person. I wish Sonja all the success in her new role and hope she will find it as exciting and fulfilling as I have.

STONEROL
For a golden future
Yours very sincerely

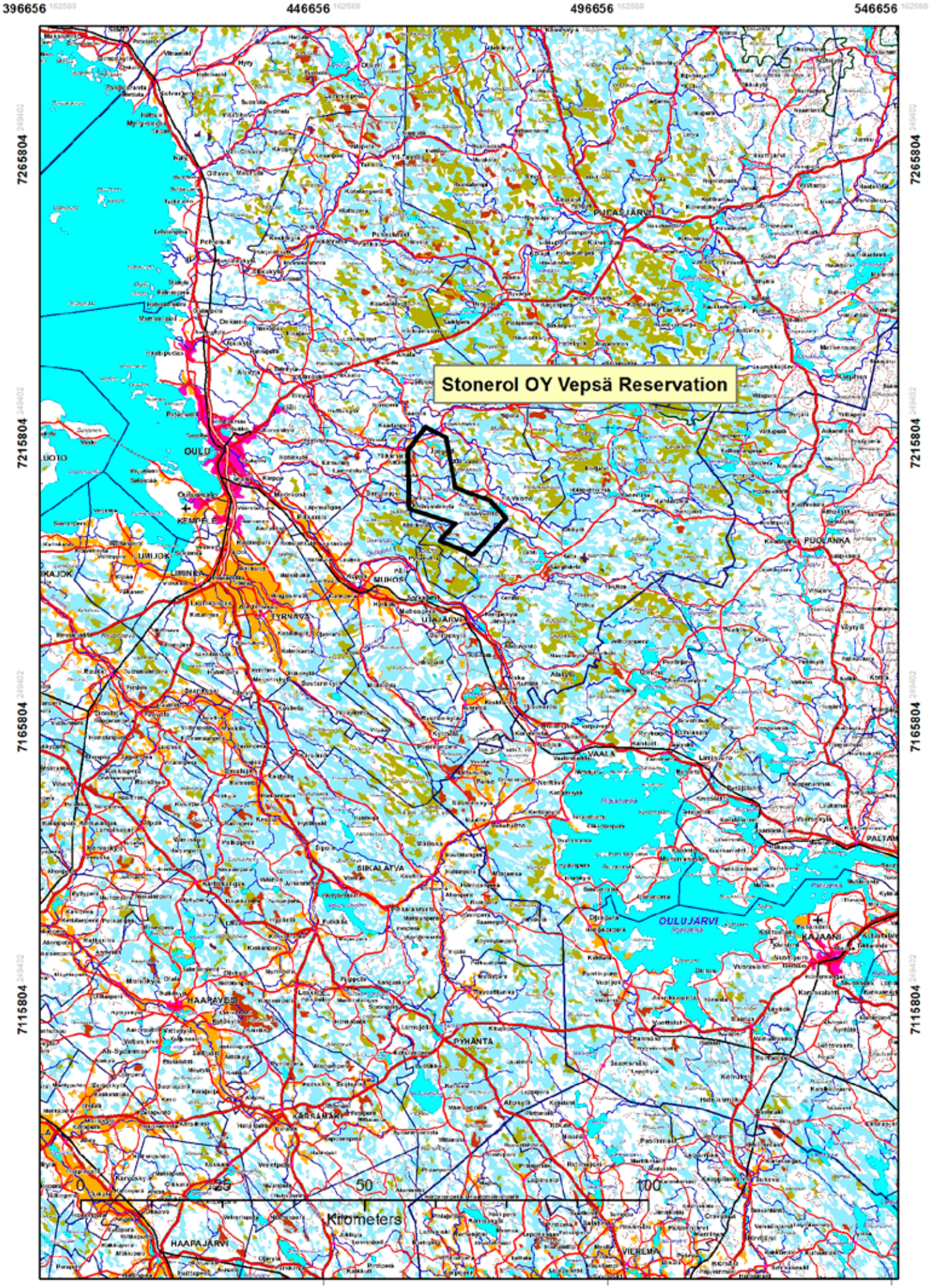
Ann Bjurström
Managing Director

STONEROL

MAPS ¦ CLAIM RESERVATION AREA:

Vepsä

Riihilampi


396656
446656
496656
546656
7265804
7215804
7165804
7115804
Stonerol OY Vepsä Reservation
OULU
KEMPELE
LIMINKA
MIIKOS
TYRNÄVÄ
UTAJÄRVI
PUOLANKA
VAALA
SIIKALATVA
OULUJÄRVI
KAJAANI
HAAPAVESI
PYHÄNTÄ
KANNUS
HAAPAJÄRVI
VIERUMÄ
0
25
50
100
Kilometers


570582
620582
7193777
7143777
7093777
Stonerol OY Riihilampi Reservation
SUOMUSSALMI
KUHMO
Ala-Vieksi
Ylä-Vieksi
Ontojärvi
Lentua
Lammasjärvi
Kilometers
0
12,5
25
50

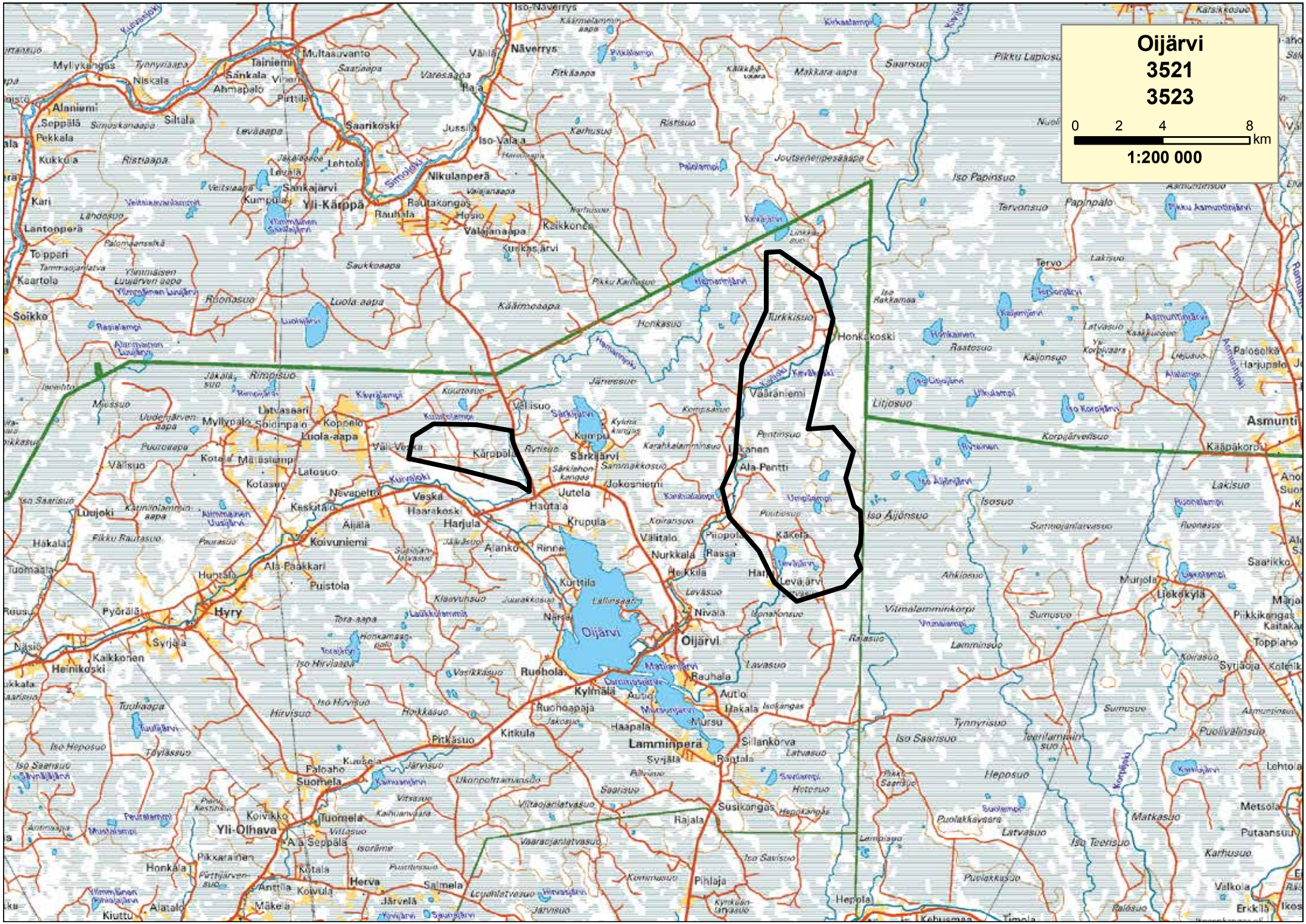
STONEROL

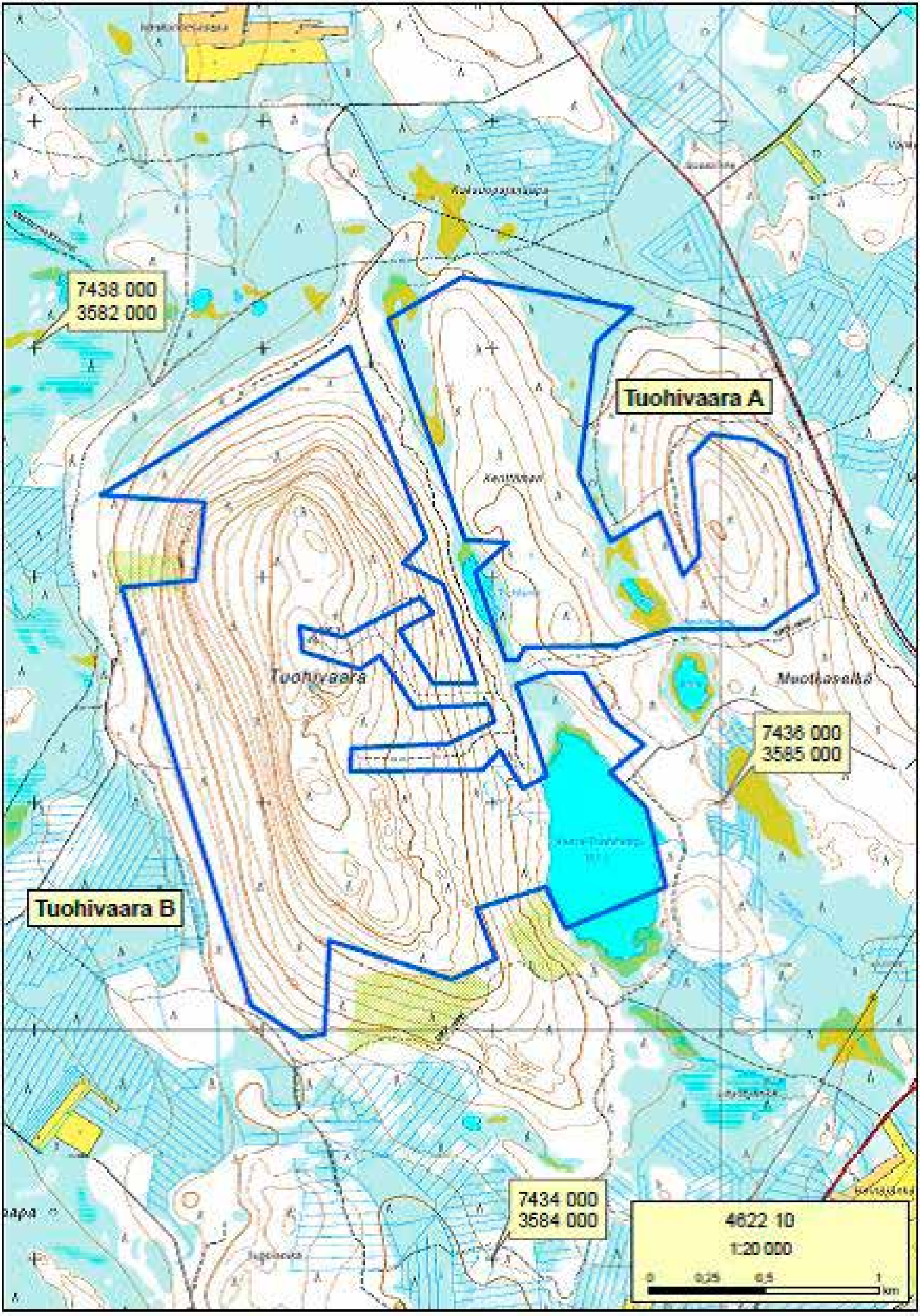
MAPS ¦ CLAIM APPLICATION AREA:

Oijärvi

Tuohivaara

Kelloselkä


Oijärvi
3521
3523
0 2 4 8 km
1:200 000


7438 000
3582 000
Tuohivaara A
Tuohivaara
7436 000
3585 000
Tuohivaara B
7434 000
3584 000
4622 10
1:20 000
0
0,25
0,5
1
km


Stonerol Oy Kelloselkä reservation Notification
SAVUKOSKI
PELKOSENNIEMI
SALLA
KEMIJÄRVI
Kemijärvi

STONEROL

REPORT ON TERVOLA

OCTOBER 17, 2013

for Stonerol Oy by Markku Iljina

Tervola

-processing of aerogeophysical data
-geophysical ground measurements
-drilling plan
-results of field sampling

October 17, 2013

For Stonerol Oy by Markku Iljina

Processing of aerogeophysical data

Stonerol Oy contracted GTK to process aerogeophysical data in Lehmikumpu claim reservation area, Tervola. Large number of various derivatives (Appendix A) were produced. The aim was set to locate non-magnetic electrical conductors.—Non-magnetic areas were chosen as the magnetic rocks in the area are volcanites, which are fairly well exposed (outcropped) and no mineralisation has been found this far in them. Increased amounts of sulphide minerals in the rock make the rock electrical conductive.

Analysis of aerogeophysical data indicated 4-5 anomaly zones, which on geophysical and geological grounds popped up of higher interest. These zones are electrical conductors in non-magnetic rock. Zones are outlined in the Fig. 1. It also became evident that the existing geological map is inconsistent with the geological map (Fig. 2), as conductive zones crosscut lithological contacts. On geophysical and geological grounds the anomaly zones were grouped into three groups: G1 under line 1, G2 lines 2-3, and G3 line 4.

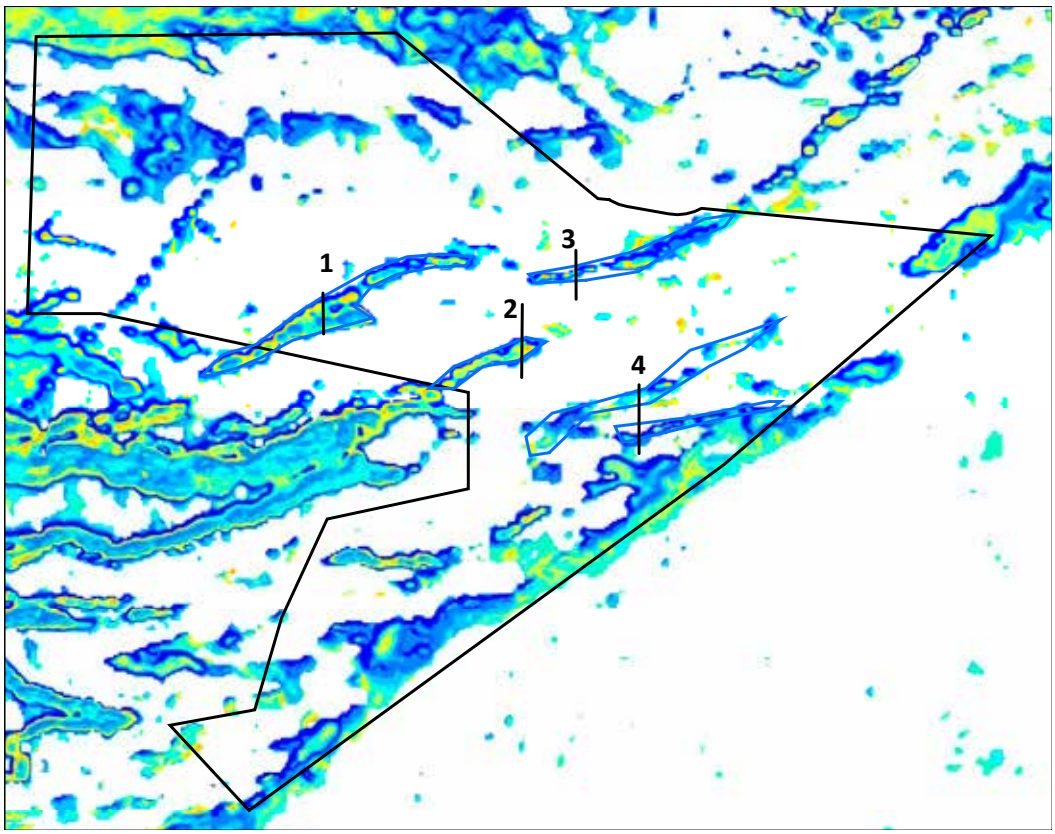


Fig. 1. Processed aerogeophysical map (EM Real/Imaginary ratio). Conductors interpreted of highest interest are outlined by blue line. Black lines (lines 1-4) are ground geophysical measurement lines.

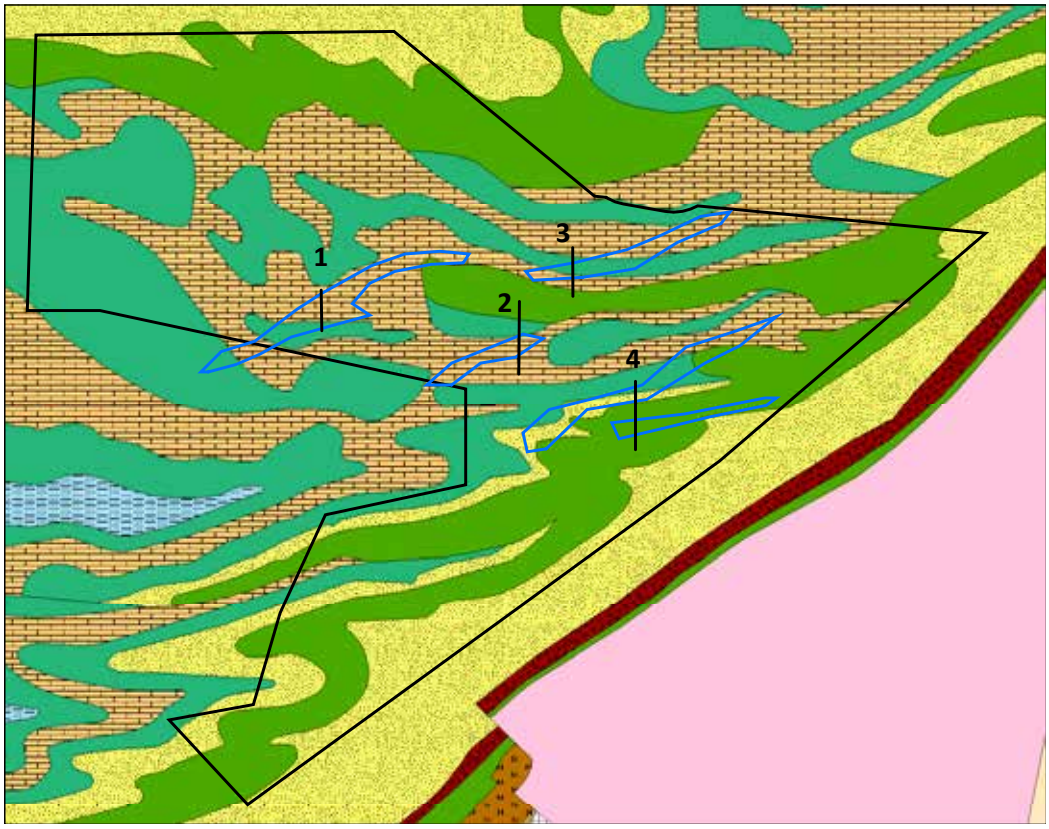


Fig. 2. Geological map of the claim reservation area. Conductors interpreted to have highest interest are outlined by blue line. Black lines are ground geophysical measurements lines. Note the crosscutting relation of electrical conductors and lithological boundaries and location of conductors in dolomite. Dolomite should not contain any conductive minerals, but geophysics indicates unknown conductors.

Ground geophysical measurements

On basis of processed aerogeophysical data four test lines (lines 1-4) were planned for ground geophysical measurements, see Figs 1-2. The selected methods for measurements were magnetic and IP (Induced Polarisation):

Magnetic: Measures "magnetism" (susceptibility) i.e. shows positive anomaly, if bedrock is magnetic.

Induced polarisation, IP: Measures electrical properties of bedrock. It consists of two parameters:

Resistivity: Indicates resistivity of bedrock; rock with sulphides has lower resistivity.

IP Chargeability: Indicates even small amounts of sulphide minerals in bedrock. Elevated chargeability refers rock to contain disseminated sulphides.

Results of these measurements are presented in Appendix B. The same Appendix presents also higher priority targets, which show lowered resistivity and increased chargeability, and are non-magnetic. Planned drill holes are also modelled in Appendix B

Proposed drilling programme

Planned drill holes are modelled in Appendix B. The programme ends up to 710 m and consists of six holes (PH 1-6, Fig. 3) on lines 1-3, there are no holes proposed on line 4 at this stage.

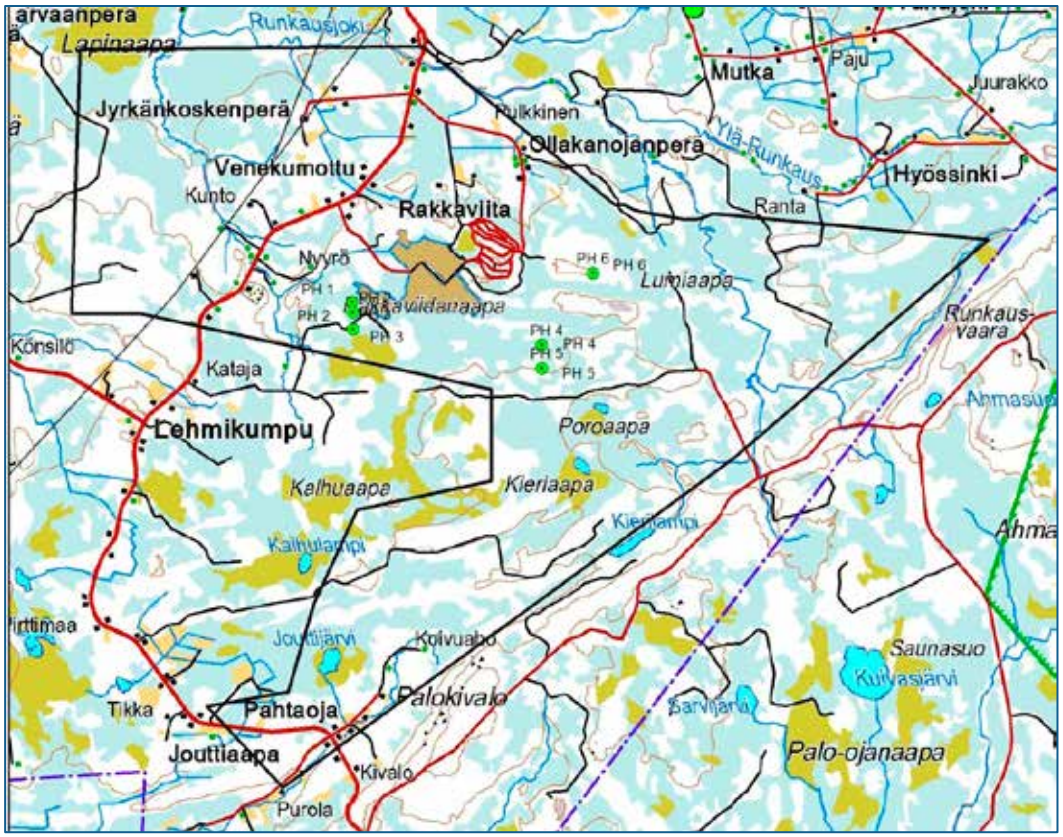


Fig. 3. Location of six planned drill holes (PH 1-6) on topographic map.

Results of field sampling

Appendix C presents the results of field sampling.

VARIOUS DERIVATIVES PROCESSED FROM AEROGEOPHYSICAL DATA

Tervola / Lehmikumpu Airborne Geophysics

Colorshaded ECW-images, ESRI's shapes and grids included to delivery:

Airborne magnetic:

ECW-IMAGES

Mag_TMI_1.ecw	(Total Magnetic Intensity, ver. 1)
Mag_TMI_2.ecw	(Total Magnetic Intensity, ver. 2)
TDR_up20.ecw	(Tilt Derivative of TMI, upward continued 20 m)
TDR_up50.ecw	(Tilt Derivative of TMI, upward continued 50 m)
TDR_up100.ecw	(Tilt Derivative of TMI, upward continued 100 m)
TDR_up200.ecw	(Tilt Derivative of TMI, upward continued 200 m)
TDR_up500.ecw	(Tilt Derivative of TMI, upward continued 500 m)
HD_TDR_up20.ecw	(Horizontal derivative of TDR_up20)
HD_TDR_up50.ecw	(Horizontal derivative of TDR_up50)
HD_TDR_up100.ecw	(Horizontal derivative of TDR_up100)
Analytic_Signal.ecw	(Analytic signal of Total Magnetic Intensity)

Airborne electromagnetic:

ECW-IMAGES

EM_Real.ecw	(inphase=real component, f=3 kHz)
EM_Imag.ecw	(quadrature=imaginary component, f=3 kHz)
EM_ReperIm.ecw	(Real/Imag ratio, computed for the areas where real>80ppm)
EM_ReperIm.tif	(...same in TIFF-format)
EM_Apperent_Res.ecw	(Apparent resistivity calculated for homogenous halfspace)

Airborne radiometric:

ECW-IMAGES

Rad_Total.ecw	(Total gamma radiation)
Rad_U.ecw	(Uranium)
Rad_Th.ecw	(Thorium)
Rad_K.ecw	(Potassium)
Rad_K_per_Th.ecw	(K / Th -ratio calculated for the areas, where K>0.4%)
Rad_U_per_Th.ecw	(U / Th -ratio calculated for the areas, where K>0.4%)

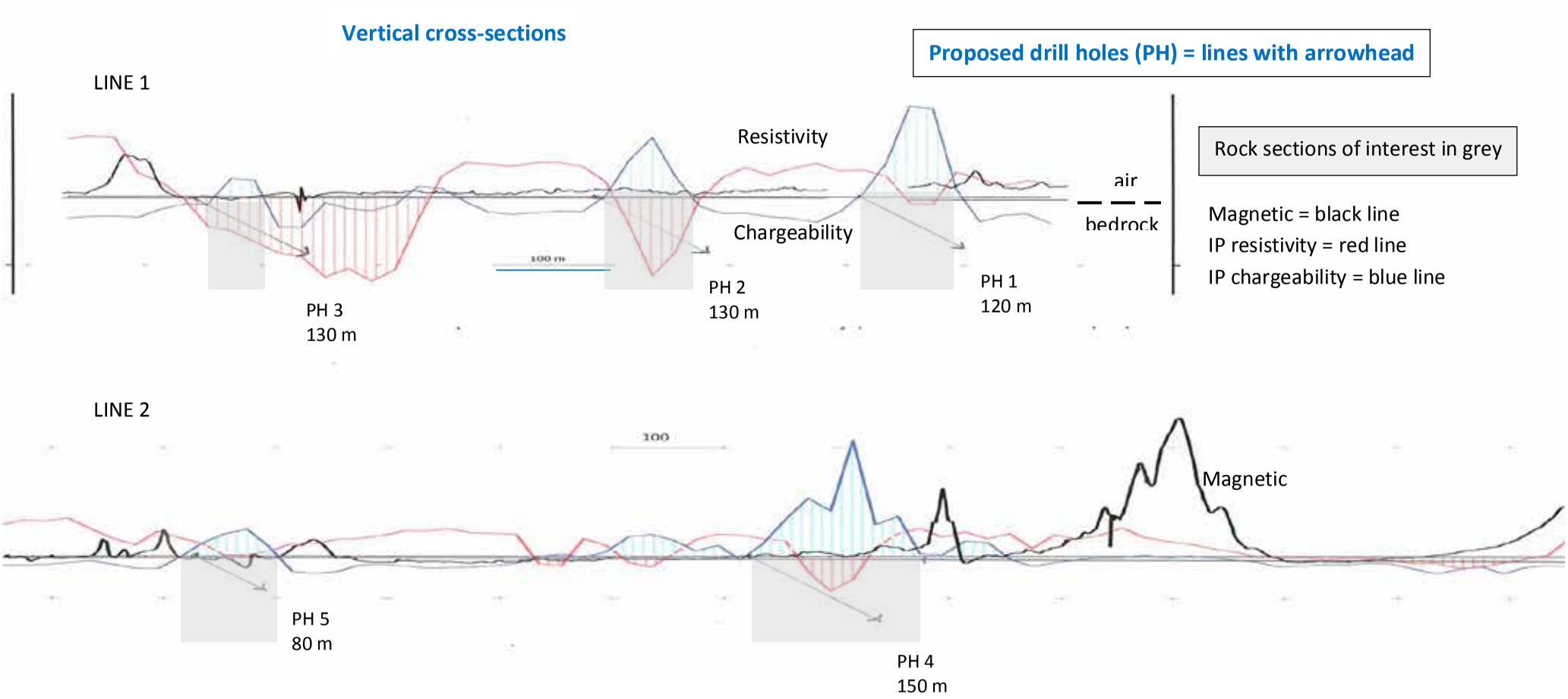
Shapes:

Mg_TDR_Worms.shp	(TDR 0-contours for 20, 50, 100, 200, 500 and 1000 m upward continued magnetic IGRF-65 anomalies)
TDR_20m.shp	(TDR 0-contours for 20m upward continued anomaly)
TDR_50m.shp	(TDR 0-contours for 50m upward continued anomaly)
TDR_100m.shp	(TDR 0-contours for 100m upward continued anomaly)
TDR_200m.shp	(TDR 0-contours for 200m upward continued anomaly)
TDR_500m.shp	(TDR 0-contours for 500m upward continued anomaly)
TDR_1000m.shp	(TDR 0-contours for 1000m upward continued anomaly)
Lehmikumpu_AOI.shp	(the Area Of Interest)
Reservation_Lehmikumpu.shp	(Reservation area Lehmikumpu, Stonerol Oy)

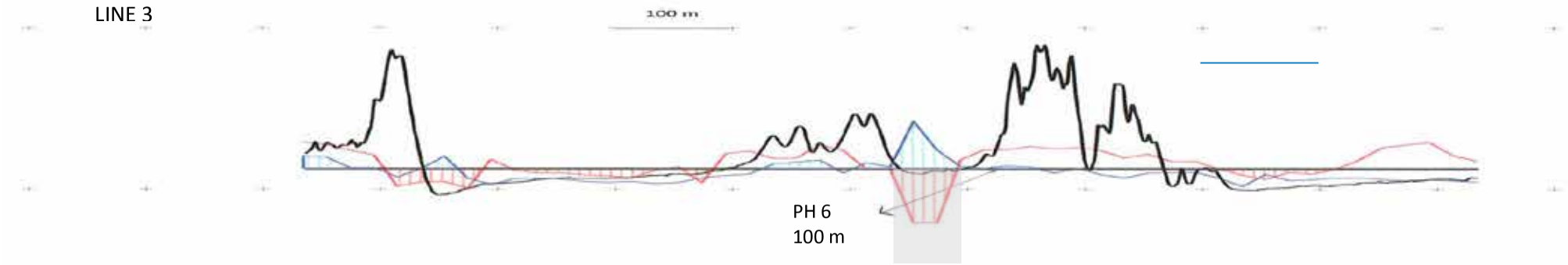
ESRI GRIDS:

mag_tmi	Magnetic total intensity
em_real	Electromagnetic inphase=real component, f=3 kHz
em_imag	Electromagnetic quadrature=imaginary component, f=3 kHz
em_appa	Apparent resistivity calculated for homogenous halfspace
reperim	Real/Imag ratio, computed for the areas where real>80ppm
rad_tot	Total gamma radiation
rad_u	Uranium
rad_th	Thorium
rad_k	Potassium
rad_kperth	Potassium/Thorium ratio
rad_uperth	Uranium/Thorium ratio
pca_1	Principal component analysis of magnetic, electromagnetic real component and total radiation
pca_2	Principal component analysis of magnetic and electromagnetic real component

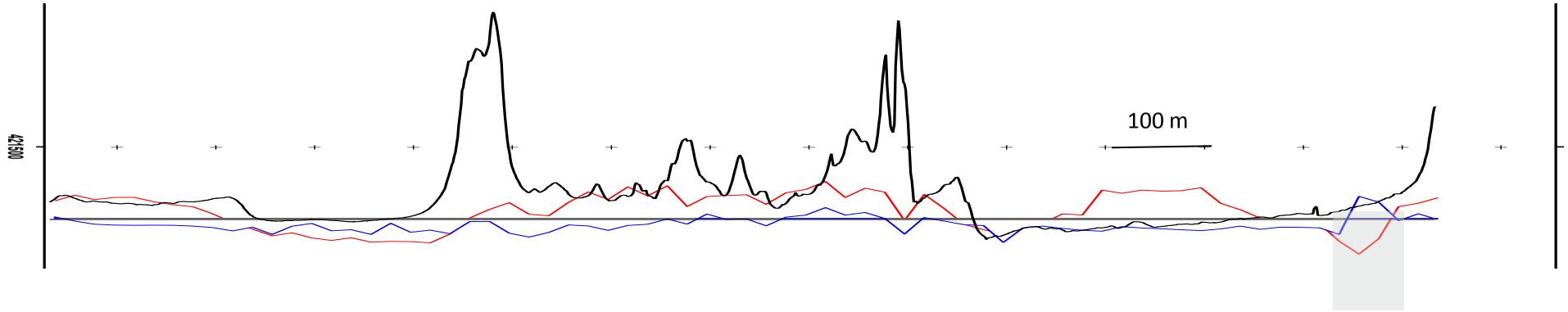
RESULTS OF GROUND GEOPHYSICAL MEASUREMENTS AND PROSED DRILL HOLES



LINE 3

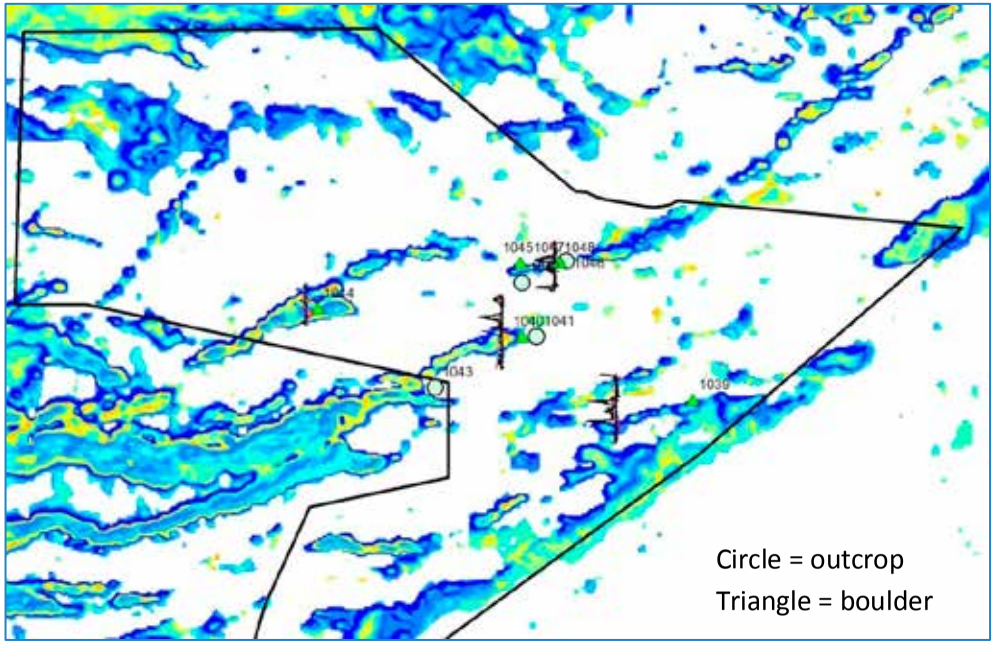


LINE 4



DESCRIPTION AND ANALYTICAL DATA (ABOVE), AND INDEX MAP (BELOW) OF TERVOLA SAMPLES.

SampleID	Northing	Easting	Z	Type	Description	Ag	As	Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	S	Sb	Zn	Au	Pd	Pt
1039	7326220	423280	100	Boulder	Mafic volcanite, cavities. Magnetic. Few sulphide grains and grain aggregate. 50*50*40 cm3	<1	<10	<1	26.6	89.0	127.0	46600	820	<2	53.9	11	740.0	<20	133.0	<10	21	18
1040	7327508	419796	96	Boulder	Gabbro-like mafic rock. Not magnetic. Sporadic sulphide. May be long traveller. 30*30*30 cm3	<1	<10	<1	27.2	64.8	86.5	41300	401	<2	57.8	<10	1810.0	<20	43.6	<10	28	17
1041	7327508	420081	95	Outcrop	Mafic volcanite. Some sulphides in quartz veinlets, amygdales. Slightly magnetic. May also be 5*4*2 m3 boulder.	<1	<10	<1	14.1	75.4	234.0	52600	583	<2	28.2	<10	882.0	<20	21.6	<10	11	10
1042	7328606	419786	97	Outcrop	Mafic volcanite. Sporadic sulphides. Not magnetic.	<1	<10	<1	13.1	53.1	64.7	28800	308	<2	25.6	<10	105.0	<20	24.6	<10	27	16
1043	7326462	418005	90	Outcrop	Tuffite. Few sulphide grains.	<1	<10	<1	12.3	70.4	61.2	23900	371	<2	33.5	<10	288.0	<20	24.5	<10	21	14
1044	7328088	415608	77	Boulder	Very local looking boulder. Pyrite blebs up to 2 cm in diametre, quartz eyes. 1.5*1*1 m3	<1	<10	<1	35.8	114.0	125.0	46700	1500	<2	59.9	<10	1850.0	<20	49.5	<10	20	13
1045	7329012	419753	89	Boulder	Mafic volcanite. 1-4 cm long and 1-3 mm wide quartz veinlets. Little bit sulphides in these veinlets.	<1	<10	<1	10.9	76.4	104.0	71700	628	<2	26.2	<10	93.5	<20	36.8	<10	<10	<10
1046	7329046	420686	92	Outcrop	Mafic volcanite. Schistosity 340/89	<1	<10	<1	13.5	57.8	45.2	27500	470	<2	26.4	<10	0.0	<20	30.7	<10	19	11
1047	7329014	420573	76	Boulder	Mafic volcabite. Quartz filled cavities. Some sulphide grains. 30*20*30 cm3.	<1	<10	<1	15.8	79.9	53.2	40400	1160	<2	46.3	<10	368.0	<20	34.9	<10	28	16
1048	7329012	420530	76	Boulder	Mafic volcanite. Quartz eyes and some sulphides.	<1	<10	<1	15.4	53.4	190.0	31600	496	<2	30.3	<10	321.0	<20	42.3	18	26	11



STONEROL

MINUTES SKYPE DISCUSSION
OCTOBER 17, 2013

Conclusion / Summarisation of the Skype Discussion on October 17th, 2013

Participants:

- Dr. Markku Iljina
- Dr. Markus Elsasser
- Ann Bjurström
- Gaby Strausak

THE GREATER SALLA AREA

Varvikko

The claim application has been withdrawn from TUKES.

Känespella

The claim application at TUKES has been cancelled.

Aatsinki

The claim application at TUKES has been cancelled.

Tuohivaara

Markku Iljina took 16 boulder samples and 9 outcrop samples on his field visit. Laboratory results were all negative. But due to much higher MMI values we will keep our claim application running. The area in the east has 347 hectares and the area in the west has 159 hectares. Claim cost per year would be € 10'000.--.

Once we have the claim application or a save arrangement with the land owner, we must identify the best spots for a few drill holes. If these turn out to be negative, we have to leave the area.

Kelloselkä

For the new area *Kelloselkä* a claim reservation (which would give us 2 years of no cost of prospecting) has been lodged and we are waiting for the official approval.

Markku Iljina has been to the GTK drill core archive in Loppi (60 km from Helsinki). There he studied samples from four (4) old drill holes taken by another company in 1984 (name of the company: Lapin Malmi – was a joint venture between the companies Rautaruukki Oy and Outokumpu Oy). Markku Iljina picked in total 61 samples from the four drillings. These 61 samples are now being cut by GTK and will then be analysed at the state owned laboratory (Labtium). We expect to receive the results approximately at the end of this year. The estimated costs for the total analysis and work will be € 4'000.--.

Once we have the official reservation we have 2 years time to work on *Kelloselkä*. The reason for choosing *Kelloselkä* was the interesting GTK prospectivity analysis result.

OIJÄRVI

The claim reservation runs out in January 2014. The GTK prospectivity analysis has been done. The results show several interesting spots. We will study this prospecitivity analysis in detail during Autumn/Winter 2013, so that we can narrow down the promising, smaller claim application areas. Once this is decided, we must send in our claim application before January 2014.

This subject should be handled at the next Skype conference, including the question what kind of claim application we should choose in the neighbourhood to the west towards the big Agnico-Eagle Mines' property (on the map Markku Iljina identified this area with an oval).

LEHMIKUMPU, TERVOLA

Based on Markku Iljina's report dated October 7, 2013 (Tervola, Processing of Aerogeophysical Data, Geophysical Ground Measurements and Drilling Plan) it has been decided to go for a drill program as follows: PH2: 130 m; PH4: 150 m and PH6: 100 m (as an alternative to PH4, it would also be possible to go for PH1: 120 m).

Markku Iljina immediately to start to get the land owners' permission and to get the drilling done in November 2013, so that we have results from the laboratory in time to make decision on claim application request area in size and/or if at all, prior to January 20th, 2014. Markku Iljina personally to supervise the drilling program in the field.

If by mid November we do not see any progress with appointing drilling company/land owners, we will try to identify a claim application area around the planned drill holes PH1 – PH6 so that we can request for a claim application in January 2014 and we will do the drilling later.

ILOMANTSI

The final decision has been made that we will concentrate on the north of Finland. Therefore, the claim reservation for Ilomantsi in the south of Finland will run out in January 2014 and we do no work in this area.

Next Skype meeting: **Wednesday, November 6th, 2013, 9.30 a.m. CET/ 10.30 a.m. EET**.
Markku Iljina to contact all parties.

Transcript writer: Gaby Strausak / 17.10.2013

STONEROL

MINUTES SKYPE DISCUSSION
NOVEMBER 15, 2013

Conclusion / Summarisation of the Skype Discussion on November 15th, 2013

Participants:

- Dr. Markku Iljina (MI)
- Dr. Markus Elsasser (ME)
- Ann Bjurström (AB)
- Gaby Strausak (GS)

THE GREATER SALLA AREA

Tuohivaara

After discussions with an expert at GTK, MI has now identified more clearly interesting and promising areas, parts of them outside of our claim application request in the Southeast. Therefore, MI will work out a more focused claim application area and will personally speak with the TUKES people what can be done to have a better application. We should find a diplomatic solution.

(Some of our MMI samples have a response ratio of over 50, some even over 100. This is an indication for a high anomaly.)

Kelloselkä

The Kelloselkä area claim reservation has been lodged. However, we are still waiting for the official approval.

The 61 samples that MI picked from four old drill holes (these were taken by another company), are being analysed at the state owned laboratory (Labtium). We are still awaiting the laboratory's analytical results.

OIJÄRVI

1) We will not do further work on the smaller claim reservation area in the West and we will let this claim reservation run out in January 2014.

2) With regards to the bigger claim reservation area in the East: MI highlighted to us the crosscutting structures coming from the Southwest and from the North (to the eastern border of our reservation area). MI will lodge a claim application for this crosscutting area of approx. 100 ha. Because of the neighbour Agnico-Eagle we have to be very secretive of what we have in mind.

MI to work on this and prepare what kind of drilling will make sense. Discussions of next steps will be in February 2014, when ME will visit Finland.

LEHMIKUMPU, TERVOLA

Based on MI's report dated October 17th, 2013 a final decision has been made that we go for the following drill program: PH2: 130 m; PH4: 150 m and PH6: 100 m.

MI to produce the maps for lodging our claim application, covering lines 1, 2 and 3. The size to cover the "hot spots" will be around 100 ha each, costs: EUR 2'000.- per year and per line.

Claim application should be lodged before Christmas 2013.

Realistic time for the drill company to start working is in late February 2014.

Markus Elsasser to visit Finland during the drilling program in February 2014.

In order to get a profile in the non-geological world, a journalist will write a report on Stonerol Oy. The article is meant to be for the general public. AB knows a freelance journalist who already agreed on writing this report. AB to invite the journalist once ME's travel plans are clearer.

MI met a few land owners, and they are all very positive on this. MI will now inform the land owners and the forest company about the timing in February 2014.

ILOMANTSI

For strategic reasons we will concentrate on the North of Finland. The claim reservation for Ilomantsi in the South of Finland will run out in January 2014. However, we will keep all Ilomantsi data on file.

Next Skype meeting: **Tuesday, December 17th, 2013, 14.00 p.m. CET/ 15.00 p.m. EET**.
MI to contact all parties.

Transcript writer: GS and ME/ 15.11.2013

STONEROL

MINUTES SKYPE DISCUSSION
DECEMBER 20, 2013

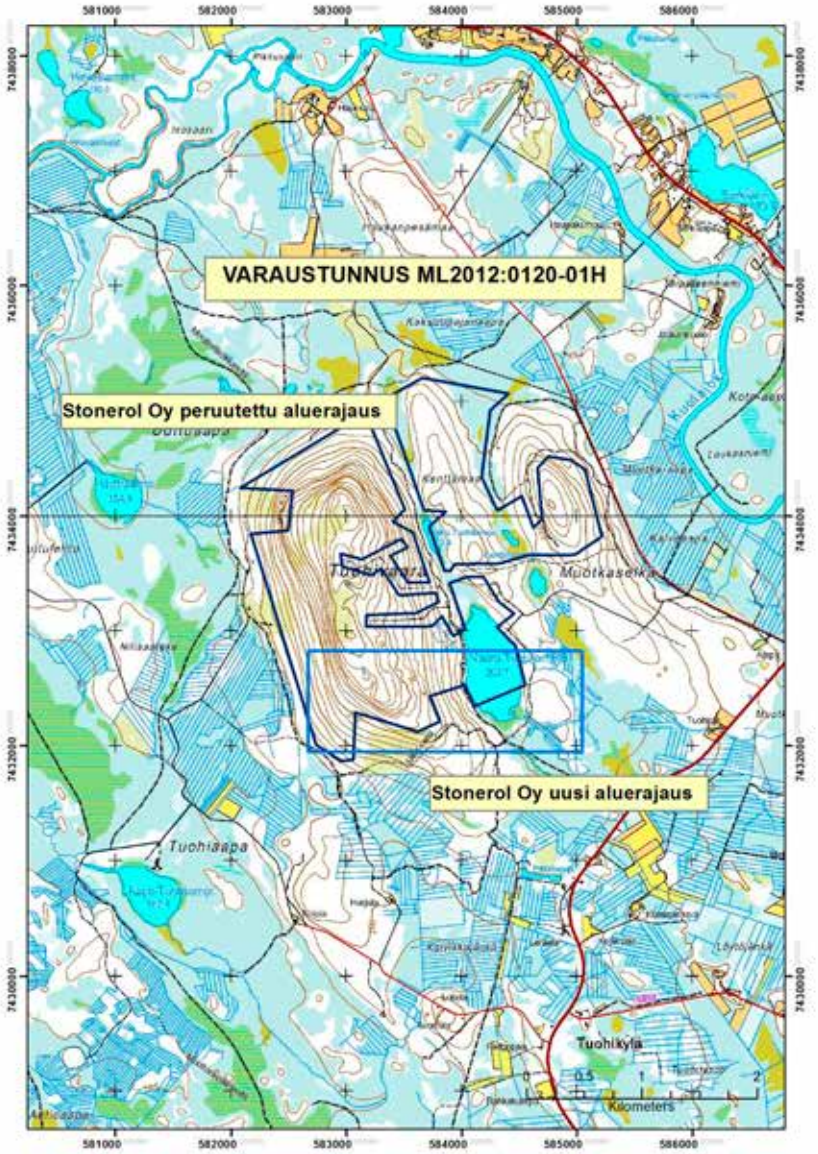
Conclusion / Summarisation of the Skype Discussion on December 20th, 2013

Participants:

- Dr. Markku Iljina (MI)
- Dr. Markus Elsasser (ME)
- Ann Bjurström (AB)
- Gaby Strausak (GS)

THE GREATER SALLA AREA

Tuohivaara



The exploration permit application area was reduced to 209.1 hectares. The reason for this was to get the most interesting MMI data area included, which was more to the Southeast rather than our old application area, which had more land in the Northwest.

At the moment an especially promising area is located east of the lake plus one on the other side of the lake.

The challenge for 2014 will be to work out what kind of further work is justified to see whether the claimed area includes mineralisation or not. Recommendation: most likely, only drilling will give us the answer.

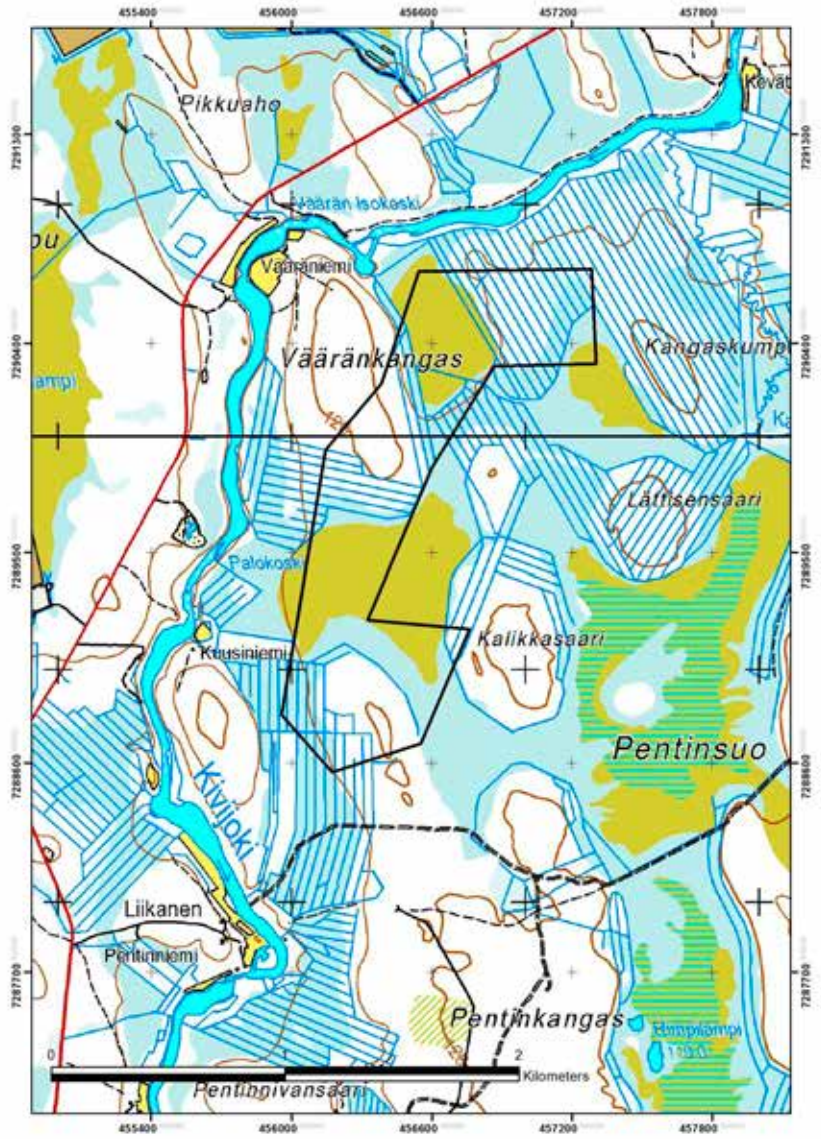
Kelloselkä

The claim reservation has been accepted/approved. The reservation is valid until August 14th, 2015. We have now time to think whether we will do anything on it or not. At present this is not our first priority.

The 61 samples that Markku Iljina picked from four old drill holes (drilled by another company), have been analysed at the state owned laboratory (Labtium). The results were negative, i.e. no gold was found, assay results at the end of this memorandum.

OIJÄRVI

We will not do further work on the smaller claim reservation area in the West and we will let this claim reservation run out in January 2014.

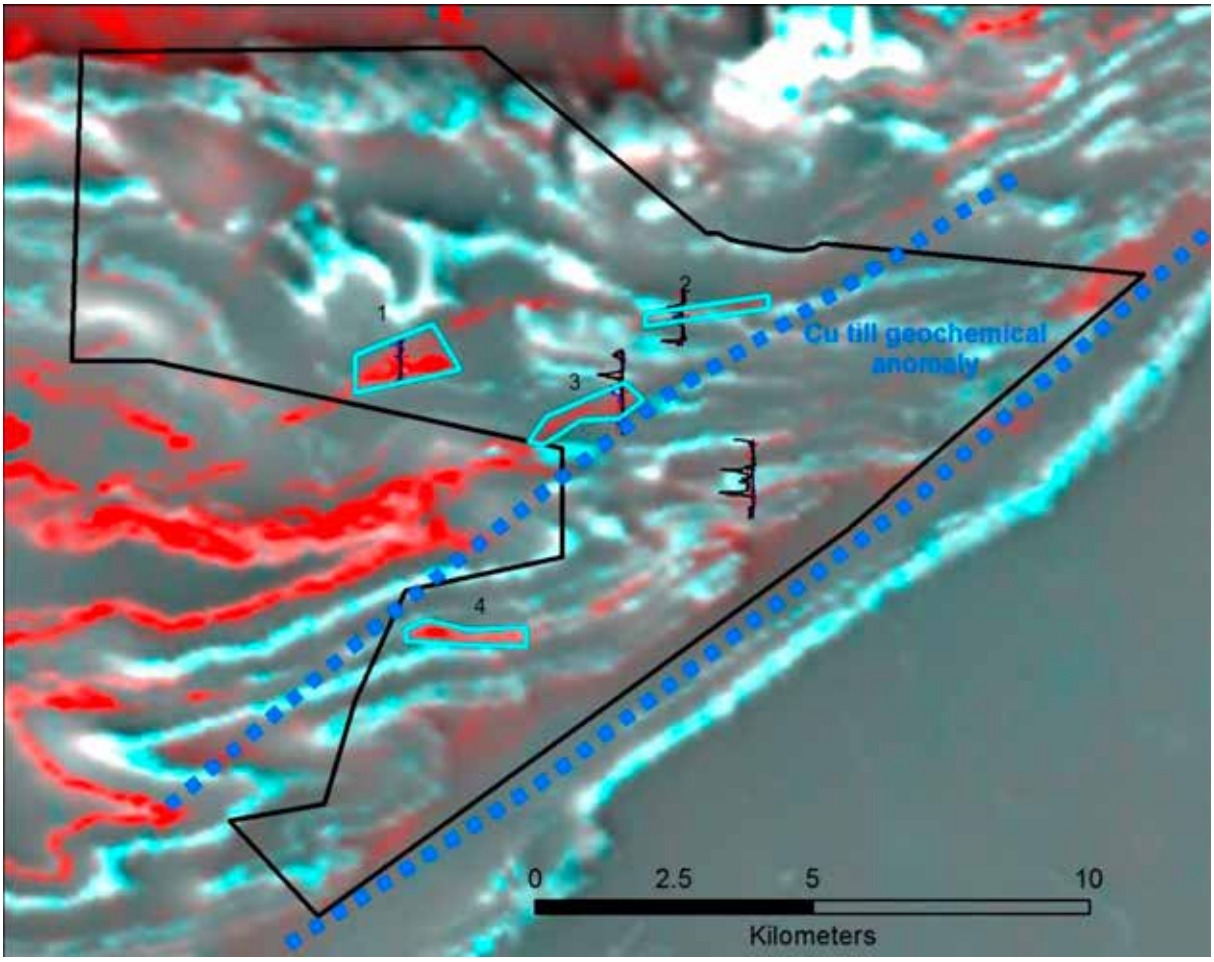


With regards to the bigger claim reservation area in the East: Markku Iljina had highlighted to us the crosscutting structures coming from the Southwest and from the North (to the eastern border of our reservation area). The choosing was based on the prospectivity analysis which we have ordered from GTK. Markku Iljina lodged an exploration permit application covering above mentioned more prospective area. This exploration permit application to be called Pentinsuo and it has been registered as arrived, but not yet approved. The size is 116.7 ha.

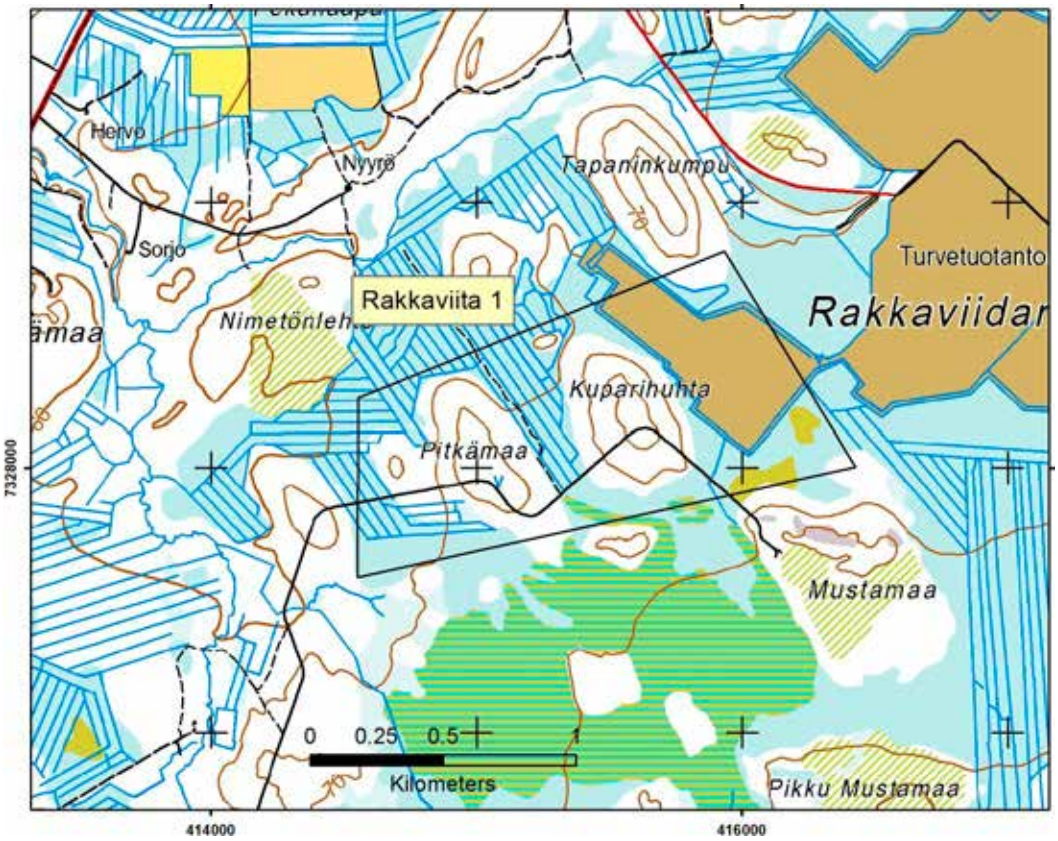
Next steps in 2014 will be to do ground geophysical work first, followed by possible drilling. Discussions will be in February 2014, when Markus Elsasser visits Finland.

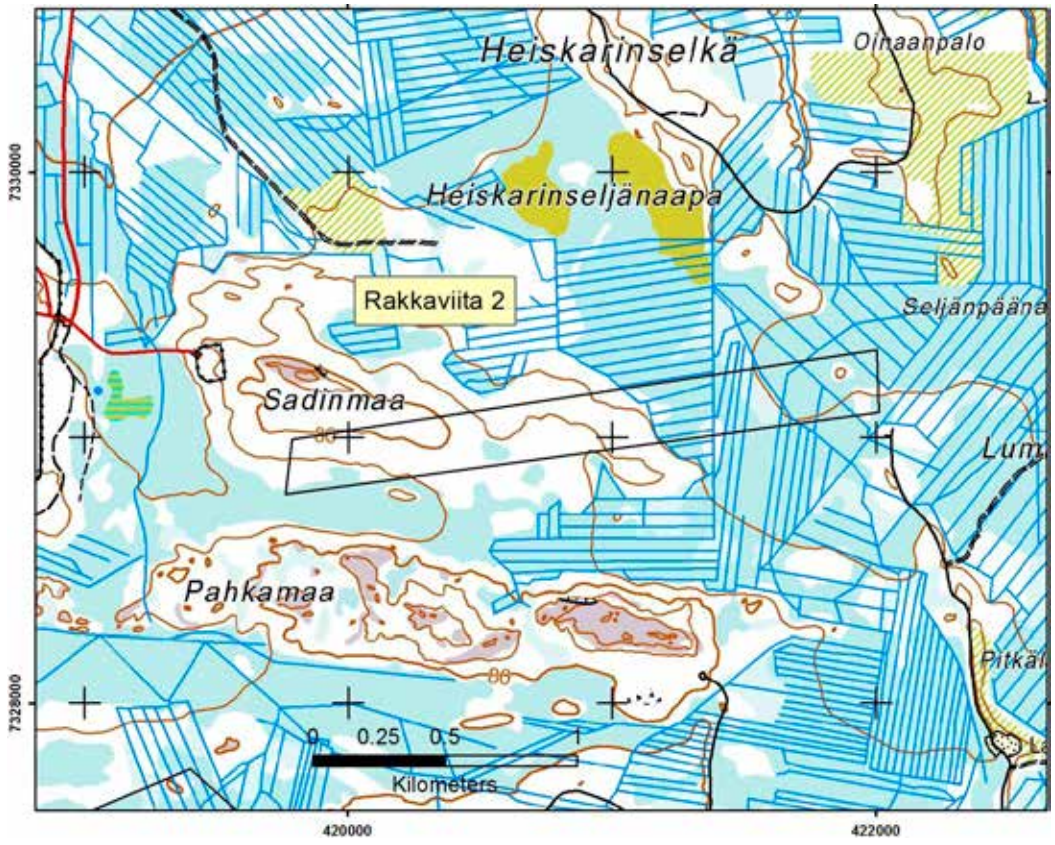
LEHMIKUMPU, TERVOLA

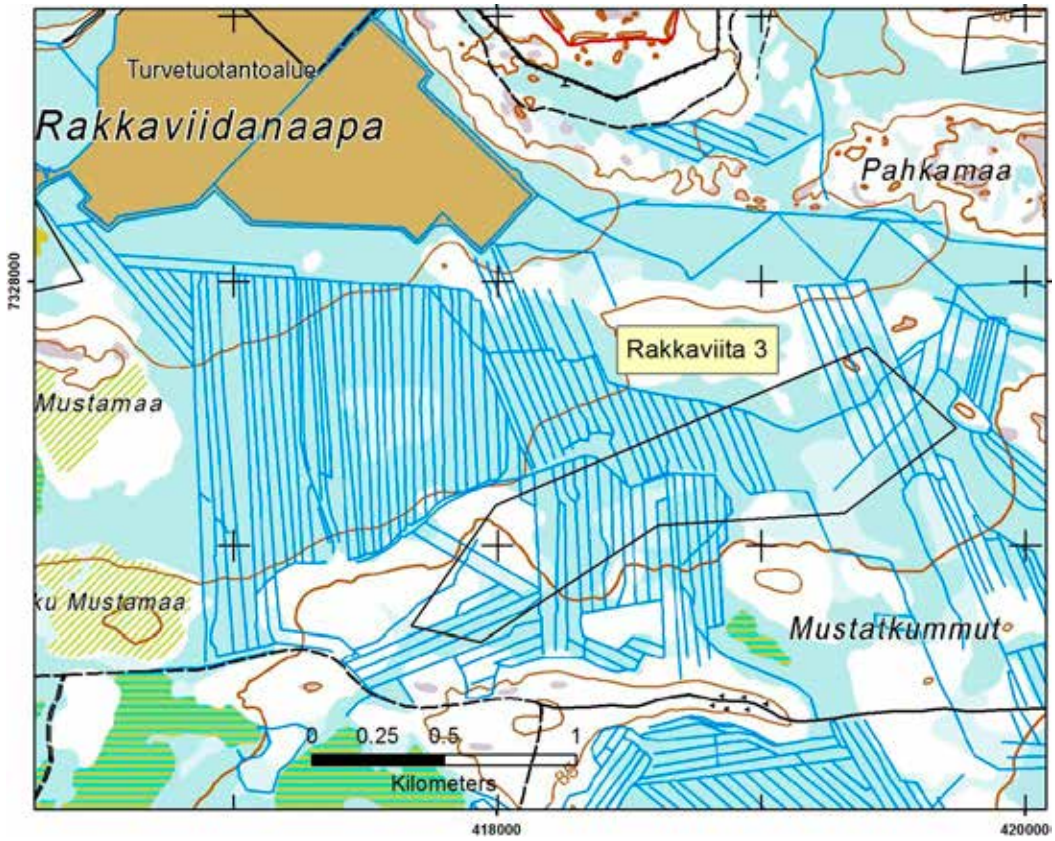
We had earlier ordered four ground geophysical test lines from GTK after processing aerogeophysical data, also made by GTK. Three of those test lines indicated good electrical non-magnetic conductors, and a three drill hole drilling programme was designed to test them. However, further inspection of the aerogeophysical material suggested an additional target area (no 4), which was subsequently included into the exploration permit application package. The exploration permit application package is now composing of four areas called Rakkaviita 1-4. Total size of the area is 331.5 hectares. Markku Iljina lodged the application.

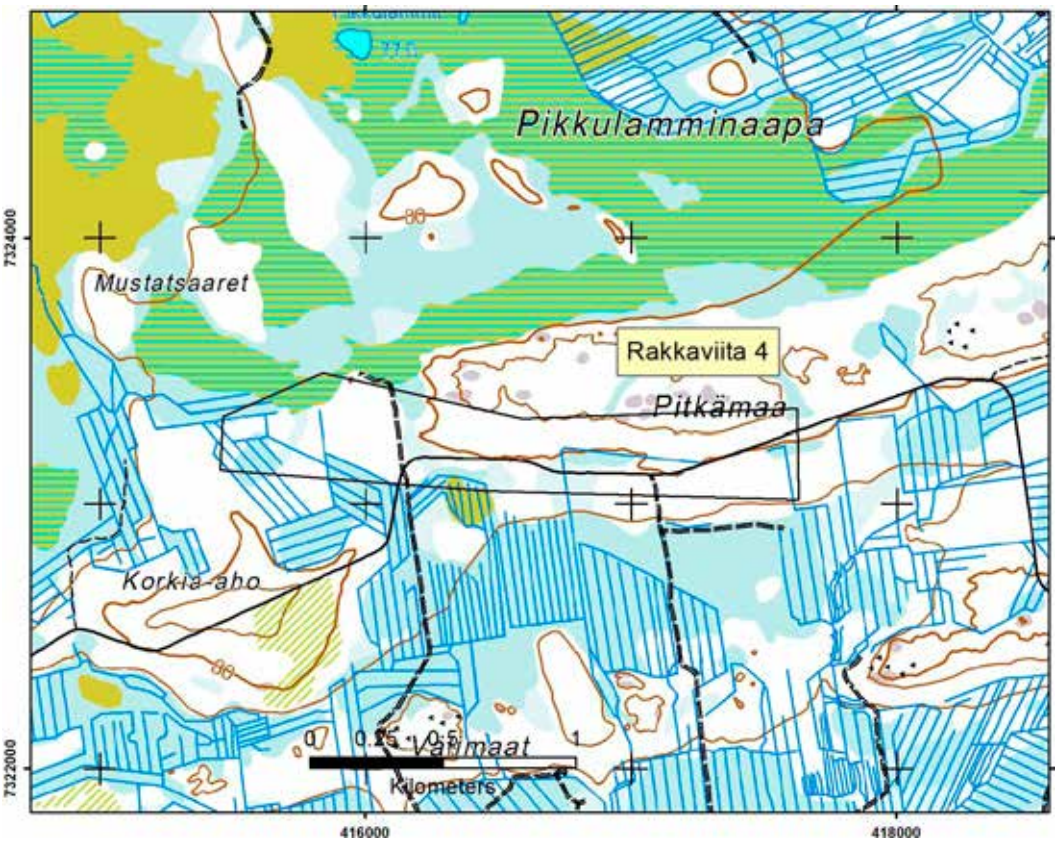


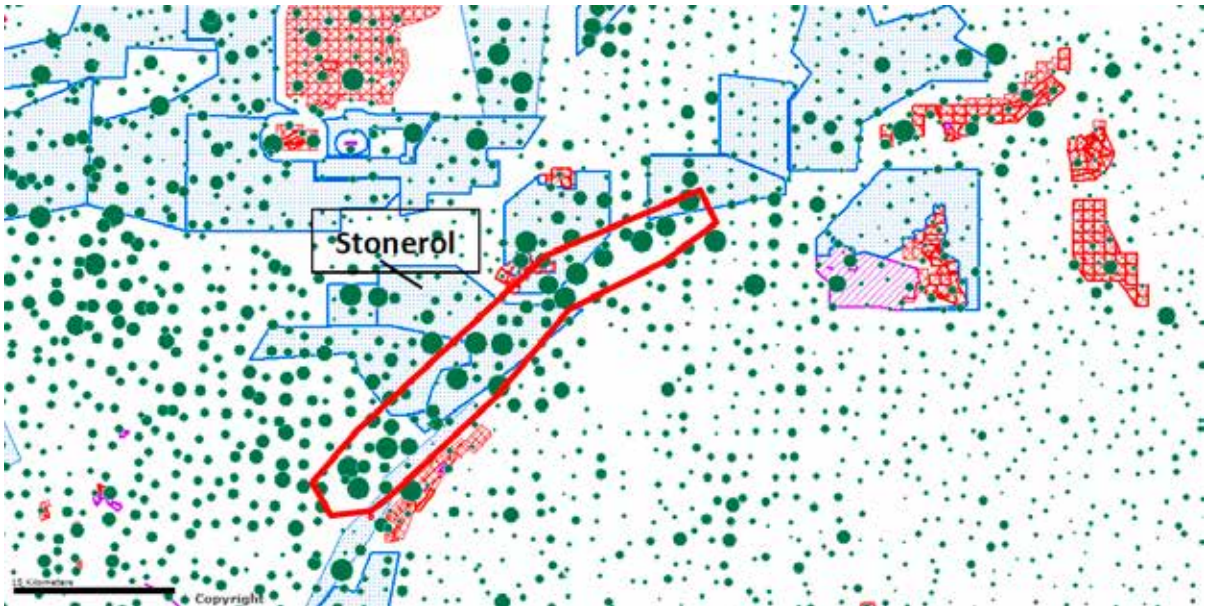
Stonerol exploration permit application areas Rakkaviita 1-4, and zone of copper anomaly in till geochemistry. The background coloured map is Principal Component Analysis based on magnetic and electromagnetic data.


Hervo
Nyyrö
Tapaninkumpu
Sorjo
Turvetuotanto
Rakkaviita 1
Rakkaviidan
Nimetönleh
Kuparihuhta
Pitkämaa
Mustamaa
Pikku Mustamaa
0 0.25 0.5 1
Kilometers
7328000
414000
416000


Heiskarinselkä
Oinaanpalo
Heiskarinseljänaapa
Rakkaviita 2
Seljänpääna
Sadinmaa
Pahkamaa
0 0.25 0.5 1
Kilometers
7330000
7328000
420000
422000


Turvetuotantoalue
Rakkaviidanaapa
Pahkamaa
Rakkaviita 3
Mustamaa
ku Mustamaa
Mustatkummut
0 0.25 0.5 1
Kilometers
7328000
418000
420000


Pikkulamminaapa
Mustatsaaret
Rakkaviita 4
Pitkämaa
Korkia-aho
Valmaat
0 0.25 0.5 1
Kilometers
7324000
7322000
416000
418000



GTK till geochemical data. Copper anomalous zone marked by red line.

After winter time, when the snow and ice is gone, we will decide whether we continue exploration on the area number 4. Ground geophysical works similar to what was done on areas 1-3 is only possible when the ground is not frozen.

Drilling company agreed to start working on February 17th 2014. Working period will be roughly two to three days per hole (= approx. 2 working weeks in total). Markus Elsasser to visit Finland during the drilling program.

In order to get a profile in the non-geological world, a journalist should write a report on Stonerol Oy. The article is meant to be for the general public. Ann Bjurström knows a freelance journalist who already agreed on writing this report. Ann Bjurström to give the journalist the advance information that the interview will take place mid February 2014. Ann Bjurström to invite the journalist once ME's travel plans are set.

ILOMANTSI

For strategic reasons we will concentrate on the North of Finland. The claim reservation for Ilomantsi in the South of Finland will run out in January 2014. However, we will keep all Ilomantsi data on file.

Next Skype meeting: **Wednesday, January 15th, 2014, 9.00 a.m. CET/ 10.00 a.m. EET**.
MI to contact all parties.

Transcript writer: GS / 20.12.2013

Assays results of old drill holes AT-1 – AT-4 of Kelloselkä, Greater Salla area.

ID	From	To	Length	Ag	As	Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	S	Sb	Zn	Au	Pd	Pt
	[m]	[m]	[m]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppb]	[ppb]	[ppb]
Drill hole AT-1																				
1056	84.10	95.50	11.40	<1	<10	2	16	47	106	71400	105	7	83	<10	58000	<20	11	<10	<10	<10
Drill hole AT-2																				
1057	43.00	54.10	11.10	<1	11	1	58	251	132	98000	385	2	247	13	988	<20	101	<10	<10	<10
1058	54.10	67.60	13.50	<1	<10	<1	27	48	105	84200	748	21	132	21	48900	<20	3	<10	<10	<10
1059	67.60	73.40	5.80	<1	<10	<1	32	36	66	111000	1820	9	97	17	53900	<20	11	<10	<10	<10
1060	73.40	78.20	4.80	<1	<10	<1	11	28	27	142000	2120	<2	35	<10	33400	<20	18	<10	<10	<10
1061	78.20	84.30	6.10	<1	<10	<1	9	35	39	156000	1640	<2	43	<10	42100	<20	15	<10	<10	<10
1062	84.30	87.30	3.00	<1	<10	<1	12	26	42	188000	2220	<2	41	12	34900	<20	15	<10	<10	<10
1063	87.30	90.70	3.40	<1	<10	1	5	19	17	169000	2130	<2	18	<10	14300	<20	14	<10	<10	<10
1064	90.70	96.00	5.30	<1	<10	<1	14	33	34	221000	3750	3	30	<10	15600	<20	31	<10	<10	<10
1065	96.00	98.90	2.90	<1	<10	<1	14	12	10	161000	4000	<2	24	<10	2110	<20	25	<10	<10	<10
1066	98.90	102.00	3.10	<1	<10	<1	13	27	44	168000	2210	5	34	10	22400	<20	35	<10	<10	<10
1067	102.00	106.30	4.30	<1	<10	<1	10	21	19	173000	2380	2	26	14	17000	<20	39	<10	<10	<10
1068	106.30	110.90	4.60	<1	<10	<1	14	31	34	154000	3060	<2	38	<10	30300	<20	24	<10	<10	<10
1069	110.90	114.00	3.10	<1	<10	1	11	52	80	125000	1100	2	64	<10	56900	<20	16	<10	<10	<10
1070	114.00	116.30	2.30	<1	<10	<1	15	24	63	89300	741	3	90	15	46400	<20	17	<10	<10	<10
1071	116.30	126.00	9.70	<1	<10	<1	52	19	77	83400	243	21	297	<10	64900	<20	83	<10	<10	<10
1072	126.00	134.20	8.20	<1	<10	<1	8	48	62	133000	686	3	80	17	74700	<20	15	<10	<10	<10
1073	134.20	138.30	4.10	<1	<10	<1	8	51	78	134000	1230	4	69	<10	61500	<20	12	<10	<10	<10
Drill hole AT-3																				
1074	15.00	29.70	14.70	<1	<10	<1	19	61	107	147000	1930	2	65	12	60300	<20	19	<10	<10	<10
1075	29.70	34.30	4.60	<1	<10	<1	12	26	34	184000	2170	2	57	13	49100	<20	77	<10	<10	<10
1076	34.30	42.30	8.00	<1	<10	<1	18	21	37	177000	2120	<2	65	16	26500	<20	145	<10	<10	<10
1077	42.30	49.80	7.50	<1	18	2	27	49	81	89100	87	18	163	11	71100	<20	68	<10	<10	<10
1078	49.80	52.50	2.70	<1	<10	<1	1	9	11	9350	49	<2	7	<10	291	<20	14	<10	<10	<10

ID	From	To	Length	Ag	As	Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	S	Sb	Zn	Au	Pd	Pt
_	[m]	[m]	[m]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppb]	[ppb]	[ppb]
1079	52.50	55.50	3.00	<1	<10	<1	24	34	60	104000	78	16	155	24	73400	<20	132	<10	<10	<10
1080	55.50	58.50	3.00	<1	<10	<1	17	44	47	77400	241	3	95	<10	49500	<20	22	<10	<10	<10
1081	58.50	63.00	4.50	<1	<10	<1	23	42	100	124000	370	2	120	<10	71600	<20	34	<10	<10	<10
1082	63.00	64.40	1.40	<1	12	<1	15	36	75	91200	228	10	94	15	56200	<20	18	<10	<10	<10
1083	64.40	70.10	5.70	<1	<10	<1	27	21	58	93400	176	21	124	12	56000	<20	5	<10	<10	<10
1084	70.10	71.40	1.30	<1	<10	<1	9	3	20	59800	1220	6	23	<10	7590	<20	93	<10	<10	<10
1085	71.40	74.80	3.40	<1	<10	<1	29	20	57	117000	198	27	144	24	64400	<20	9	<10	<10	<10
1086	74.80	77.80	3.00	<1	<10	<1	28	22	59	81900	155	12	108	19	48000	<20	12	<10	<10	<10
1087	77.80	80.60	2.80	<1	<10	<1	32	35	96	100000	186	5	111	16	56700	<20	18	<10	<10	<10
1088	80.60	84.20	3.60	<1	<10	<1	20	46	59	84500	187	22	118	19	48400	<20	12	<10	<10	<10
1089	84.20	86.30	2.10	<1	<10	1	23	32	98	168000	524	8	143	<10	83700	<20	23	<10	<10	<10
1090	86.30	89.50	3.20	<1	<10	<1	21	25	77	113000	162	25	120	<10	64800	<20	10	<10	<10	<10
1091	89.50	93.90	4.40	<1	<10	<1	21	41	76	90500	354	4	97	25	50100	<20	22	<10	<10	<10
1092	93.90	100.60	6.70	<1	20	<1	15	32	90	107000	755	10	66	<10	37600	<20	22	<10	<10	<10
1093	100.60	103.50	2.90	<1	19	<1	8	33	47	97100	1120	4	45	20	31800	<20	26	<10	<10	<10
1094	103.50	110.85	7.35	<1	38	<1	9	16	52	106000	902	8	69	16	56100	<20	18	<10	<10	<10
1095	110.85	117.40	6.55	<1	28	<1	11	24	26	150000	1880	<2	24	10	15500	<20	18	<10	<10	<10
1096	117.40	119.60	2.20	<1	<10	<1	6	28	27	154000	1920	<2	22	<10	18200	<20	14	<10	<10	<10
1097	119.60	125.00	5.40	<1	<10	<1	12	29	47	140000	2610	3	50	14	43100	<20	12	<10	<10	<10
1098	125.00	127.60	2.60	<1	<10	<1	9	18	52	109000	2790	10	92	17	43300	<20	5	<10	<10	<10
1099	127.60	134.00	6.40	<1	<10	<1	4	8	13	41500	3560	<2	16	21	5630	<20	<1	<10	<10	<10
1100	134.00	137.70	3.70	<1	<10	<1	5	13	25	37300	2620	<2	45	13	5280	<20	<1	<10	<10	<10
1101	137.70	142.80	5.10	<1	<10	<1	36	135	77	58400	1760	2	329	<10	15000	<20	<1	<10	<10	<10
1102	142.80	147.30	4.50	<1	<10	<1	42	407	59	74900	2060	<2	249	17	14600	<20	20	<10	<10	<10
1103	147.30	154.80	7.50	<1	23	<1	47	459	100	65800	1740	<2	262	<10	5570	<20	18	<10	<10	<10
1104	154.80	160.90	6.10	<1	<10	<1	55	1300	95	86800	1080	<2	582	19	208	<20	37	<10	<10	15
1105	160.90	164.80	3.90	<1	<10	<1	65	1240	87	87800	992	<2	592	22	322	<20	51	<10	<10	12
1106	164.80	169.20	4.40	<1	<10	<1	66	1130	120	87600	931	<2	575	16	424	<20	67	<10	<10	12

ID	From	To	Length	Ag	As	Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	S	Sb	Zn	Au	Pd	Pt
_	[m]	[m]	[m]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppm]	[ppb]	[ppb]	[ppb]
1107	169.20	176.50	7.30	<1	18	<1	64	1040	171	84700	709	<2	522	22	903	<20	87	<10	<10	13
1108	176.50	182.50	6.00	<1	<10	<1	37	48	214	77800	1320	2	53	25	8540	<20	131	<10	<10	<10
1109	182.50	186.80	4.30	<1	<10	<1	67	83	211	103000	502	18	194	17	48200	<20	169	<10	<10	<10
Drill hole AT-4																				
1049	41.00	45.40	4.40	<1	<10	<1	54	541	106	68800	852	3	379	16	24	<20	62	<10	<10	<10
1050	45.40	57.00	11.60	<1	<10	<1	36	186	91	57700	497	7	244	15	2420	<20	17	<10	<10	<10
1051	57.00	66.40	9.40	<1	<10	<1	34	19	133	108000	1900	16	149	23	69900	<20	99	<10	11	<10
1052	66.40	70.40	4.00	<1	<10	<1	28	23	109	126000	2670	10	92	<10	70700	<20	51	<10	<10	<10
1053	70.40	74.10	3.70	<1	<10	<1	10	21	38	97600	6030	3	29	<10	22300	<20	20	<10	<10	<10
1054	74.10	80.80	6.70	<1	17	<1	11	46	53	137000	1820	5	56	27	50800	<20	24	<10	<10	<10
1055	80.80	87.10	6.30	1	<10	<1	13	22	75	94100	1730	15	91	14	52000	<20	4	<10	<10	<10

STONEROL

MINUTES SKYPE DISCUSSION

JANUARY 15, 2014

Conclusion / Summarisation of the Skype Discussion on January 15th, 2014

Participants:

- Dr. Markku Iljina (MI)
- Dr. Markus Elsasser (ME)
- Ann Bjurström (AB)
- Gaby Strausak (GS)

AKANVAARA CHROME PROJECT

Akanvaara claim application area is about 4'750 hectares. Chrome deposits in Northern Finland are being held by Kipu Metals Corporation. Kipu Metals Corporation has put in claim application on this chrome deposits. MI recons that the claim application is most likely to be accepted. Eventually, the company is looking for a venture capital for this project and they are interested in discussing project development with third parties. Kipu Metals Corporation's headoffice is in Vancouver, British Columbia in Canada. We have previously made contact with Mr Michael Hudson at Kipu Metals Corporation.

We cannot close a deal in Akanvaara before Kipu Metals Corporation received the grant of the application.

To contact Michael Hudson and express our intention. Still, we are awaiting the outcome of the application.

So far, the aerogradiometric data details are unknown. GTK's intention is to release the aerogradiometric data and reports by the end of this year.

MI is in contact with Mr Ossi Leinonen, a former Chief Mine Geologist at Outokumpu Chrome Oy Kemi Mine, who works now for Tukes in Rovaniemi.

We need to keep an eye on Tukes referring the claim application. If the application gets rejected, the land gets free for everyone, we will then review it again. We might approach Tukes and put in a claim reservation ourselves. However, it is important to look at the aerogradiometric data first before we might downsize the area.

AB and MI to attend the Kaivosteollisuus 2014 conference on February 4th, 2014 in Helsinki. The conference is about the present situation and the future of the Finnish mining situation. Casually, Michael Hudson will be one of the speakers.

KOILLISMAA NI-CU-PLATINUM-GOLD PROJECT

MI is very familiar with this project and has thorough geological understanding of it. In February 2013, Finore Mining Inc. signed an option agreement with Nortec Minerals Corporation and has an option to earn a 100% interest in an advanced-stage palladium-platinum-gold-copper-nickel project in Finland. However, due to financial difficulties of Finore, Nortec has now controlling majority (>50% of shares) in Finore after mutual business arrangements. The project is known as Koillismaa and is composed of two separate deposits, namely Kaukua and Haukiaho.

Koillismaa has high potential to grow in size as both Kaukua and Haukiaho deposits are open. So much work has been done already. This project could be a good one and very interesting for us and it offers a long-term component.

This could be a true substance for a Finland listed company. Therefore, MI to talk to the Nortec Minerals' people and express them our interest in this project. We will then find out how their reaction will be and whether they will make an offer.

LEHMIKUMPU, TERVOLA

We lodged the application for an exploration permit of "Rakkaviita 1-4" Total size of the area is 331.5 hectares.

MI to double-check with the drilling company whether they can meet our work plan and drill the holes on February 17th 2014. When will the first drill core be? What will the estimated working period be? As soon as we receive the drilling company's confirmation ME to book his travel arrangements.

Also, AB to organise details for the interview along with the journalist. The interview should take place after ME visited the field.

Next Skype meeting: **Friday, January 17th, 2014, 9.00 a.m. CET / 10.00 a.m. EET**.
to confirm the timelines of the Rakkaviita 1-4 project.

Monday, March 17th, 2014, 14.00 p.m. CET / 15.00 p.m. EET
regular team Skype meeting

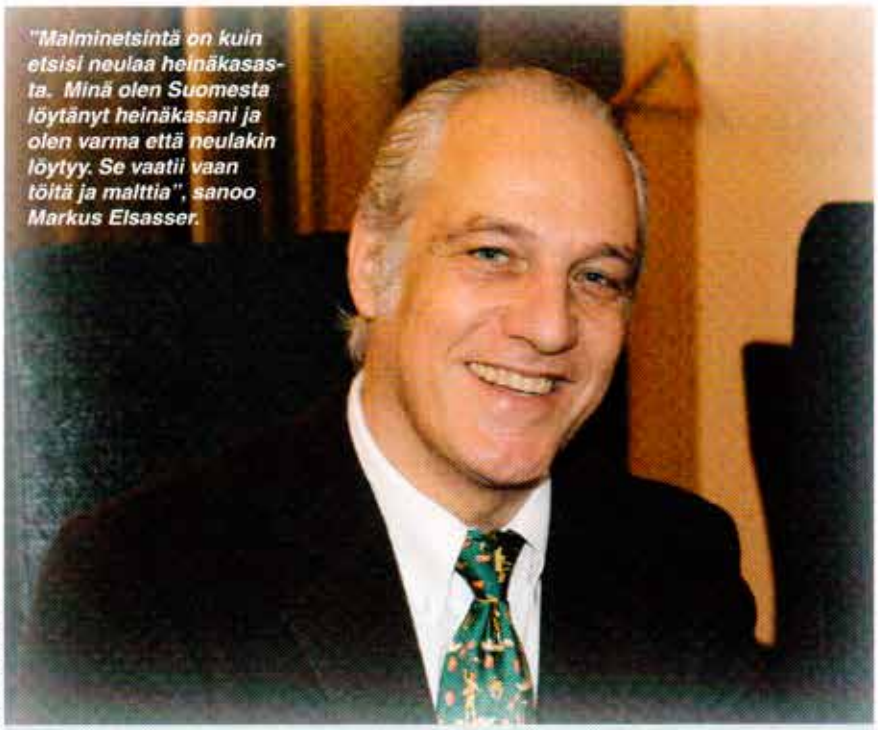
Transcript writer: GS/MI / 16.01.2014

STONEROL

ARTICLE ON STONEROL OY IN GEOLOGICAL MAGAZINE "MATERIA 2.2014"

FEBRUARY 2014

Original Copy of Article in Finnish



"Malminetsintä on kuin etsisi neulaa heinäkasasta. Minä olen Suomesta löytänyt heinäkasani ja olen varma että neulakin löytyy. Se vaatii vaan töitä ja malttia", sanoo Markus Elsasser.

Kuva Leena Forsten

Saksalainen finanssimies uskoo Suomeen kaivosmaana

Teksti ***Bo-Eric Forstén***

Vuonna 1956 Heidelbergissä syntynyt DBA Markus Elsasser ehti suurlähettilään poikana asua Lontoossa, Hongkongissa, Pariisissa ja Kairossa ennen kuin lähti Kölnin yliopistoon lukemaan taloustiedettä. Talousmiehenä hän loi menestyksekkään uran kemian- ja elintarviketeollisuuden palveluksessa Australiassa ja Singaporessa.

Tänään hän toimii Antwerpenista käsin, jossa hänellä on useampi rahoitusyhtiö ja tutkimusyksikkö. Aina Australian päivistään lähtien Markus Elsasser on pitänyt mineraalivarantoja ja niiden hyödyntämistä fokuksessa. Eniten tietoa ja kokemusta hänellä on kullan, tinan ja timanttien etsinnästä. Hän on mukana eriasteisissa malminetsintäprojekteissa Skandinaviassa, Australiassa ja Brasiliassa sekä timanttiprojektissa Afrikassa .

Suomella on erikoisasema Markus Elsasserin mineraalimaailmassa. Hän oli kauan etsinyt omille rahoilleen investointiympäristöä, jossa kohtuullisin kustannuksin on realistiset mahdollisuudet saavuttaa isojakin asioita, jos on tuuri matkassa. Toronton PDAC:ssa 6-7 vuotta sitten GTK:n edustajat saivat hänet kiinnostumaan Suomesta. GTK-laisten puheet malminetsinnän luvatusta maasta jäivät mieleen. Kun vierailu Suomeen vain vahvisti kuvaa lupaavasta kaivosmaasta, hän perusti maahamme malminetsintäyrityksen Stonerol Oy.

Toiminta lähti liikkeelle GTK:n arkistosta. Sieltä saatujen tietojen ja vihjeiden perusteella yritys on tehnyt varausilmoituksia ja hakenut malminetsintälupia eri kohteista, jotka sitten kenttätutkimuksissa on otettu lähempään tarkasteluun.

Stonerol operoi kevyellä organisaatiolla. Hallituksen puheenjohtajana Markus Elsasser vastaa päätöksenteosta, ja Suomessa hallinnolliset asiat ovat toimitusjohtaja **Ann Bjurströmin** käsissä.

Ann Bjurström on toisen teollisuudenalan yksityisyrittäjänä luonut menestyksekkään uran, joten yhteistyö ja asioiminen viranomaisten ja muiden toimijoiden kanssa on hänelle tuttua. ◣

Greenfield Stonerolin mielessä

"Stonerol ei ole kiinnostunut vanhoista projekteista. Haluamme tutkia sellaista, mitä muut eivät ole löytäneet. Suomen kallioperästä huomattava osa on "Greenfieldiä", josta voi löytyä mitä vaan", toteaa **Markus Elsasser** tavatessamme hänet ja yhtiön toimitusjohtaja **Ann Bjurströmin** helmikuisena aamupäivänä Helsingissä

Markus Elsasser on pirteä ja valloittava ilmestys. Mistään ei voi päätellä, että hänellä on varhainen herätys (03.45) takanaan Rovaniemellä. Lapissa hän on ollut seuraamassa Stonerolin ensimmäisen koeporausohjelman käyntiinlähtöä. Hän on ilmeisen tyytyväinen kokemaansa.

Talousmiehenä Markus Elsasser näkee kaivannaisteollisuuden asiat toisessa valossa kuin alan edustajat yleensä, ja hän osaa ilmaista näkemyksiään mieleenpainuvalla tavalla.

Tässä muutama esimerkki.

Miten Greenfield-puheeseesi on Suomessa suhtauduttu?

"Lähinnä olen saanut kuulla, että taidat olla vähän vinksahtanut. Mutta täällä olemme kuitenkin."

Mitkä ovat onnistumismahdollisuudet?

"Suomen kallioperä tarjoaa siihen hyvät mahdollisuudet. Maassanne ovat kaikki muutkin malminetsintään vaikuttavat asiat kohdallaan. Stonerol on taas yksityinen, riippumaton yritys, joka pystyy seuraamaan pitkäjänniteistä visiotaan. Meillä on oma ajatusmaailmamme sekä tahtoa ja ammattitaitoa toteuttaa se. Ylläpidämme jatkuvaa, systemaattista etsintätoimintaa."

Mitä se käytännössä tarkoittaa?

"Käymme järjestelmällisesti läpi GTK:n sähköistä tietopankkia ja valitsemme sen perusteella tutkimus-

kohteet. Seuraava vaihe on näytteiden otto ja analyysi. Asiantuntijalausuntojen perusteella teen päätöksen joko jatkotoimenpiteistä tai hylkäämisestä. Olemme kolmessa vuodessa analysoineet 1200 maanäytettä ja ensimmäiseen koeporaukseen ryhdyttiin vasta nyt. Koeporauksen hoiti ADC mallikkaasti. Taktiikkamme on edetä varovaisesti ja ottaa jokaisesta asiasta oppia. Tärkeää tällaisessa toiminnassa on, että pää pysyy kylmänä. Pitää uskoa faktoihin ja osata arvioida, milloin mikäkin kohde on syytä hylätä, kuten yhtiön geologisena asiantuntijana konsultoiva kokenut malminetsijä **Markku Iljinakin** korostaa."

Teillä on ollut tutkimuskohteita myös Etelä-Suomessa. Nyt toiminta on keskittynyt pohjoiseen. Miksi näin?

"Vuonna 2011 päätimme rajoittaa tutkimuksemme alueelle, jossa arviomme mukaan todennäköisyys kultamalmien löytämiseen on suurin. Pohjois-Suomi on mieluisa toimintaympäristö. Pohjoisessa ymmärretään kaivannaistoiminnan olemusta ja merkitystä aivan eri tavalla kun Etelä-Suomessa."

Miksi kulta on etusijalla?

"On yksinkertaista olla tekemisissä sellaisen metallin kanssa, jonka markkinahinta määräytyy maailmanlaajuisesti ja jolle löytyy valmiit markkinointikanavat. Eikä kullan korvaamisesta rahamarkkinoiden ja yksityishenkilöiden sijoituskohteena muilla materiaaleilla ole ollut merkkejä."

Valitsit Suomen kaivosmaaksesi, millä perustein?

"Suomi on osa Fennoskandian kilpeä, josta voi löytää mitä vaan. Samalla Suomi tarjoaa malminetsijälle erinomaisen toimintaympäristön. Suomen valtiota on onniteltava siitä, että se aikoinaan perusti GTK:n. Tutkimuslaitoksen tietopankki on ainutlaatuinen ja sen palvelut ensiluokkaiset. Infra on muihin kaivosmaihin verrattuna erinomainen. Metsäteollisuuden ansiosta tieverkosto löytyy kaukaisimmiltakin seuduilta. Lainsäädäntö toimii. On osaavia ja ammattitaitoisia ihmisiä ja palveluverkosto on kattava. Riittääkö?"

Mikä voisi olla paremmin?

"Teidän pitäisi saada poliittiset päätöksentekijät ymmärtämään, että Suomen maaperässä on rikkauksia tarjolla."

Miten Stonerol on selvinnyt suomalaisesta byrokratiasta?

"Muihin maihin verrattuna se ei ole mitenkään ainutlaatuista. Voin saada muualla nopeammin lupia, mutta silloin niihin usein liittyy erilaisia reunaehtoja tai velvoitteita. Suomessa maankäyttö on kallista, mutta säännöt ovat selkeät. Kun valtaus on saatu, se koskee kaikkia eteen tulevia mineraaleja tai metalleja. Näin ei ole kaikissa maissa. Eivät viranomaiset pahaa tarkoita, he tekevät sen työn mikä heille on annettu. Stonerolilla on hyvät kokemukset viranomaisten tavasta toimia."

Miten yksityinen yritys pärjää kaivannaisalalla?

"Kun liikutetaan omaa rahaa, on sekä onnistumisen että riskien arviointi hyvin tarkkaa. Kun lisäksi toimii yksinkertaisesti ja kustannustehokkaasti voi luoda itselleen kilpailuedun. Marginaaleilla on taipumusta levitä herkästi, kun kysymys on muiden rahasta. Raportteihin saattaa herkästi livahtaa mukaan raportintekijän omia olettamuksia. On vaikeaa säilyttää objektiivisuutensa varsinkin silloin, kun hinnat ovat nousussa. Tunteet ja toiveet saattavat hämärtää päätöksentekoprosessia."

Onko kaivosalalla riittävästi taloustietoa?

"Isoissakin kansainvälisissä kaivosyhtiöissä ympäri maailmaa esiintyy talousasioissa yllättävän paljon tietämättömyyttä ja osaamattomuutta. Alalla tuijotetaan liian hanakasti raaka-ainehintojen kehitystä, varsinkin nousun aikaan. Taloudelliset realiteetit jäävät taka-alalle. Osa alan ihmisistä on ollut koko työuransa ajan saman yhtiön palveluksessa, eivätkä tunne riittävästi ympäröivää maailmaa."

Miten on teknisen osaamisen laita?

"On siinäkin ollut puutteita. Kaivostoiminnassa innovaatiot ovat olleet harvassa. Uuden teknologian käyttöönotossa on hidasteltu ja oltu turhan varovaisia. Tänään on syytä panostaa ympäristöasioihin. Kukaan ei halua elää saastuneessa maailmassa."

Mitä pitäisi tehdä?

"On totuttava ajatukseen, etteivät vanhat ajat enää palaa, asioita on mietittävä uusista lähtökohdista. Tänään kulutusmarkkinoita ei voida enää jakaa teollistamisasteen mukaan. Taloustoiminta puskee joka suunnasta. Hidasta kasvua ei ole kuin Euroopassa. Samalla kuluttajien käytös ei enää seuraa talouden kasvua. IT-maailman välityksellä länsimaiset arvot ja kulutusmallit ovat levinneet melkein maailman joka kolkkaan. Käyttötarkoitus ei enää yksin ratkaise. Brändi-ajattelu on lyönyt itsensä läpi kaukaisillakin markkinoilla. Tämä käy esimerkiksi selityksenä siihen, että Audi ja Mersu myyvät hyvin Kiinassa. Alan kannalta hyvä asia on, että metalleja ja mineraaleja tarvitaan entistä enemmän."

Mitä sinä ja Stonerol tahdotte tehdä Suomessa?

"Olen itse ansainnut rahat, jotka satsaan, mitään perintörahoja ne eivät ole. Uskon projektiin. Riskit ovat tiedossa, mutta aikaa riittää. Olen 58 vuotta ja minulla on 20- ja 14-vuotiaat pojat. Olisi hienoa löytää heille leipäpuu. Katsotaan kymmenen vuoden päästä, missä mennään." ◣

Kuva: Leena Forsten

Stonerol Oy:n toimitusjohtaja Ann Bjurström ja yhtiön omistaja ja hallituksen puheenjohtaja Markus Elsasser.

STONEROL

ARTICLE ON STONEROL OY IN GEOLOGICAL MAGAZINE "MATERIA 2.2014"

FEBRUARY 2014

English Translation of the Article

Photo:
"Ore prospection is like searching for a needle in a haystack. I have found the haystack in Finland and am sure that the needle will also be found. It requires only work and patience" says Markus Elsasser.

German financier believes in Finland as a mining country

DBA Markus Elsasser, born in Heidelberg in 1956, has lived as a diplomat's son in London, Hong Kong, Paris and Cairo, before going to the University of Cologne to study economics. As an economist he made a successful career within chemical- and food industries while working in Australia and Singapore.

Today he has several private finance companies and a research office in Antwerp, Belgium.
Ever since his days in Australia Markus Elsasser has held mineral resources and their exploitation in focus. He has most information and experience in the prospection of gold, tin and diamonds.
He is involved in various degrees of ore prospection in Scandinavia, Australia and Brazil. In Africa the company participates in a diamond project.

Finland has a special position in Markus Elsasser's mineral world. He had for a long time been searching for an investment environment for his money, in which there were realistic possibilities to achieve important goals with reasonable costs, if luck were on his side. At the Toronto PDAC 6-7 years ago the GTK representatives aroused his interest in Finland. He remembered the talks of GTK people concerning the promised land of ore exploration. When his visit to Finland emphasized the picture of a promising mining country, he established the ore exploration company Stonerol Oy in our country.

Activities began from the GTK archives. Based on information and hints obtained from there the company has made reservations and applied for ore prospection permits in different locations, which have later been taken into closer examination in field studies.

Stonerol operates with a slim organization. As Chairman of the Board **Markus Elsasser** is responsible for decisions, and in Finland administrative matters are in the hands of managing director **Ann Bjurström.** She has, as a leader of another industry, pursued a successful career whereby collaborating and dealing with the authorities and other parties are familiar to her.

Greenfield in Stonerol's mind

"Stonerol is not interested in old projects. We want to investigate in areas that others have not found. A considerable part of the Finnish bedrock is "Greenfield", where one can find anything", Markus Elsasser stated when we met him together with the company's managing director Ann Bjurström on a February morning in Helsinki.

Markus Elsasser is a dynamic and captivating. One can nowhere deduce that he had an early wake-up call (03.45) behind him in Rovaniemi. He was in Lapland to assist at the start of Stonerol's first prospection drilling program. He was clearly satisfied with what he experienced.

As an economist Markus Elsasser sees the mining industry from a different view to that of representatives of the industry in general, and he can express his opinions in a memorable manner.

Here are some examples:

What has been the reaction to your Greenfield announcements in Finland?
"I have mainly heard that 'you are a bit twisted'. But we are here anyway."

What are the possibilities of success?
"The Finnish bedrock offers good possibilities for that. In your country all other ore prospection factors are in place. Stonerol is on the other hand a private, independent company, which can follow its long-term vision. We have our own thoughts as well as the will and skill to accomplish them. We pursue continuous and systematic prospection activity.

What does it mean in practical terms?
"We systematically go through the GTK electronic data bank and select our locations for investigation. The next step is sample-taking and analysis. Based on the expert opinions I decide on either further action or dismissal.
During three years we have analyzed 1200 earth samples and we have only now begun our first trial prospection. The prospection by ADC went smoothly. Our tactics are to advance carefully and learn from each step. In this kind of activity it is important to keep a cool head. One must believe in facts and be able to evaluate when a location should be abandoned, as emphasized also by the company's geologist expert and consultant, experienced ore prospector, Dr. Markku Iljina."

You have had exploration locations also in Southern Finland. Now activities concentrate on Northern Finland. Why is that?
"In 2011 we decided to limit our explorations to areas within which we estimated the probability of finding gold ore are the greatest. Northern Finland is a favourable environment for these activities. In the North they understand the character and importance of the mining industry in a way very different to that of Southern Finland.

Why is gold in the forefront?
"It is simple to deal with a metal, the market price of which is defined worldwide and for which there are ready marketing channels. Furthermore, there have been no signs of replacing gold by other materials on the money markets and as private investments.

You selected Finland as your mining country, on what grounds?
"Finland is part of the Fennoscandian Shield, within which one can find anything. At the same time Finland offers the ore prospector an excellent environment. The Finnish Government should be congratulated on having created the GTK in its time. The data bank of this investigation authority is unique and its service is first class. Infrastructure compared with other countries is excellent. Thanks to the forestry industry the road network covers even the remotest areas. Legislation functions. There are knowledgeable and skilled people, and the service network has good coverage. Is this enough?"

What could be better?
"You should get your political decision-makers to understand that there are riches to be found in Finnish soil."

How has Stonerol managed with Finnish bureaucracy?
"Compared with other countries it is nothing unique. I can obtain permits more quickly elsewhere, but often there are other limiting conditions or obligations involved. In Finland, the use of the land is expensive, but the rules are clear. When the claim has been acquired, it concerns all minerals and metals found. That is not the case in all countries. The authorities are not ill-willing, they perform the job they have been assigned to. Stonerol has good experiences on the authorities' mode of operation."

How does a private company manage within the mining industry?
"When you operate with your own money both, success and risk evaluation are very exact. When, in addition to that, you operate in a simple and cost-effective way you can create a competing edge for yourself. Margins tend to expand easily when you operate with money from others. Reports might easily include the report author's own assumptions. It is difficult to maintain objectivity, especially when prices are rising. Feelings and hopes might blur the decision-making process."

Is there enough economic know-how within the mining industry?
"Also in large, international mining companies around the world, there is a surprising amount of ignorance and lack of skills concerning economic matters. Usually the price development of raw materials is followed too closely, especially during price increases. Economic realities remain in the background. Some people within the trade have spent their whole working career in the service of the same company, and do not know enough about the world around them."

What is the situation with technical know-how?
"There have been shortcomings there, too. Within the mining industry innovations have been scarce. Implementation of new technology has been slow and people have been unnecessarily cautious. Today we have reason to invest in environmental issues. Nobody wants to live in a polluted world."

What should we do?
"We must get used to the idea that old times are not returning, things must be considered from new premises. Today the consumer markets can no longer be divided according to the degree of industrialization. Economic activity closes in on all sides. The only area of slow growth is Europe. At the same time consumer behavior no longer follows economic growth. Through the IT-world the western values and consumer habits have spread into almost every corner of the earth. Usage purpose is no longer the sole solution. Brand-mindedness has penetrated even the remotest markets. This can be, for example, an explanation why Audi and Mercedes sell well in China. From our industry's point of view it is good that metals and minerals are increasingly needed."

What do you and Stonerol want to do in Finland?
"I myself have earned the money I invest, there are no inherited funds. I believe in the project. The risks are known, but there is sufficient time. I am 58 years old and have 20- and 14-year old boys. It would be very nice to find them so-called breadfruit. Let us see where we are in 10 years' time."

Photo: Stonerol Oy's managing director Ann Bjurström and the company owner and chairman of the board Markus Elsasser.

STONEROL

MINUTES SKYPE DISCUSSION

MARCH 17, 2014

Conclusion / Summarisation of the Skype Discussion on March 17th, 2013

Participants:

- Dr Markku Iljina (MI)
- Dr Markus Elsasser (ME)
- Ann Bjurström (AB)
- Gaby Strausak (GS)

LEHMIKUMPU, TERVOLA

The drilling company met our work and time schedule and drilled the holes mid February 2014. Site visit by ME and MI. Logging and sampling of drill core was completed on March 6th. 78 samples were marked, cut and taken to Labtium by GTK for analysis. Five holes were drilled. The holes are called TER 1-5 (TER = short for Tervola). Total amount of drilling was 516.30 metres for all five drill holes:

Hole ID	Length in metres
TER-1	152.30
TER-2	91.00
TER-3	99.20
TER-4	49.30
TER-5	124.50
Total	**516.30**

Geology turned out to be much more variable when studied more closely compared to the very first observations in the field. MI concludes that there was no intersection of any ore grade base metal concentrations. Anomalous concentrations could be there. For gold, we need to await the chemical assays.

MI suggests that he will write a technical report of the Tervola drilling program, including exact figures, charts, maps and pictures. GS to use some information out of it to include in the Nassim Gold Exploration Report (this Exploration Report is not meant for geologists).

Out of curiosity;- MI to check with the drilling company how many water was used in total for these five drillings.

ME points out that many thanks goes to MI for organising this drilling program professionally and cost-efficient, and for choosing the right people and the right drilling company.

Are there any decisions to make for the other areas/projects (such as the Akanvaara chrome project or the Koillismaa Ni-Cu-Platinum-Gold project)? → No, there are no urgent decisions to make. We will wait for the results to come back from the laboratory and then we will move forward with decisions and further activities.

AB to double-check with the journalist from "Materia" when the article will be published in the magazine.

AB to check the journalist's availability for an interview together with ME. Preferably between May 13th – 16th, 2014. ME to travel to Helsinki for this interview and for a meeting with AB and MI. Details to be discussed in due date.

AB spoke to a potential candidate who should replace AB after her retirement. AB will send us this candidate's CV for consideration.

Next Skype meeting: **Friday, April 11th, 2014, 10.00 a.m. CET/ 11.00 a.m. EET**.
MI to contact all parties. Unfortunately, AB will be unable to attend as she will be out of the office.

Transcript writer: GS / 19.03.2014

STONEROL

REPORT ON TERVOLA DRILLING PROGRAM

APRIL 4, 2014

for Stonerol Oy by Markku Iljina

Technical report of Tervola drilling program

April 4, 2014

For Stonerol Oy by Markku Iljina

Background

Stonerol Oy chose Tervola area as one of its target areas in 2012 when the company did apply for and was subsequently granted an Exploration Notification area. Since that Stonerol Oy has done field recognition mapping and sampling in 2012 and 2013. In addition to those works Stonerol Oy ordered from GTK processing of aerogeophysical data covering the Exploration Notification area and its surroundings in 2013. Based on above works Stonerol Oy ordered from GTK four geophysical ground survey lines in late 2013, chosen methods were magnetic and Induced Polarisation (IP). Results of the year 2013 operations are reported by the signer in the report dated on October 17th, 2013.

Results of processing of aerogeophysical data, results of ground geophysical measurements, and geological interpretation encouraged Stonerol Oy to proceed with a drilling program, which was executed in February 2014. Drilling was done by Arctic Drilling Company Oy (ADC) and supervised by the signer. This report summarises the results of this drilling campaign.

Location of Tervola target area and the two prospects

Figure 1 shows the location of the target area in respect to the other Stonerol Oy target areas. More detailed positioning of the drilling sites is depicted in the Figures 2-4. Tervola target area consists of two separate prospects; *the First prospect* was tested by four drill holes (TER-1-4) while only one drill hole (TER-5) was sunken to test *the Second prospect*. Position of each drill hole relative to the ground geophysical survey is depicted in the Figure 5.

Figure 1. Position of Tervola target in respect to the other Stonerol Oy targets.

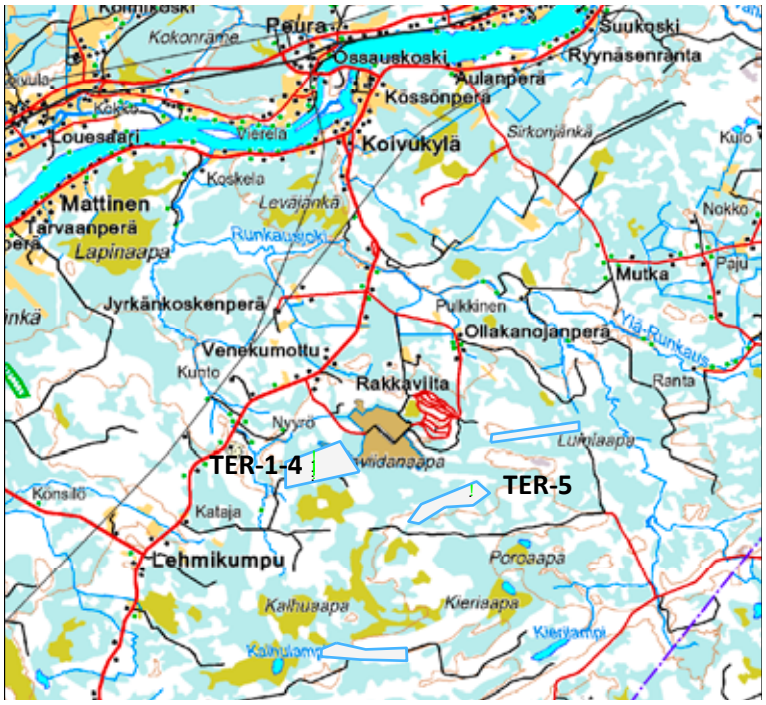


Figure 2. Location of drill holes TER-1-5 (circles) and Stonerol Oy applications for Exploration Permits (blue polygons).

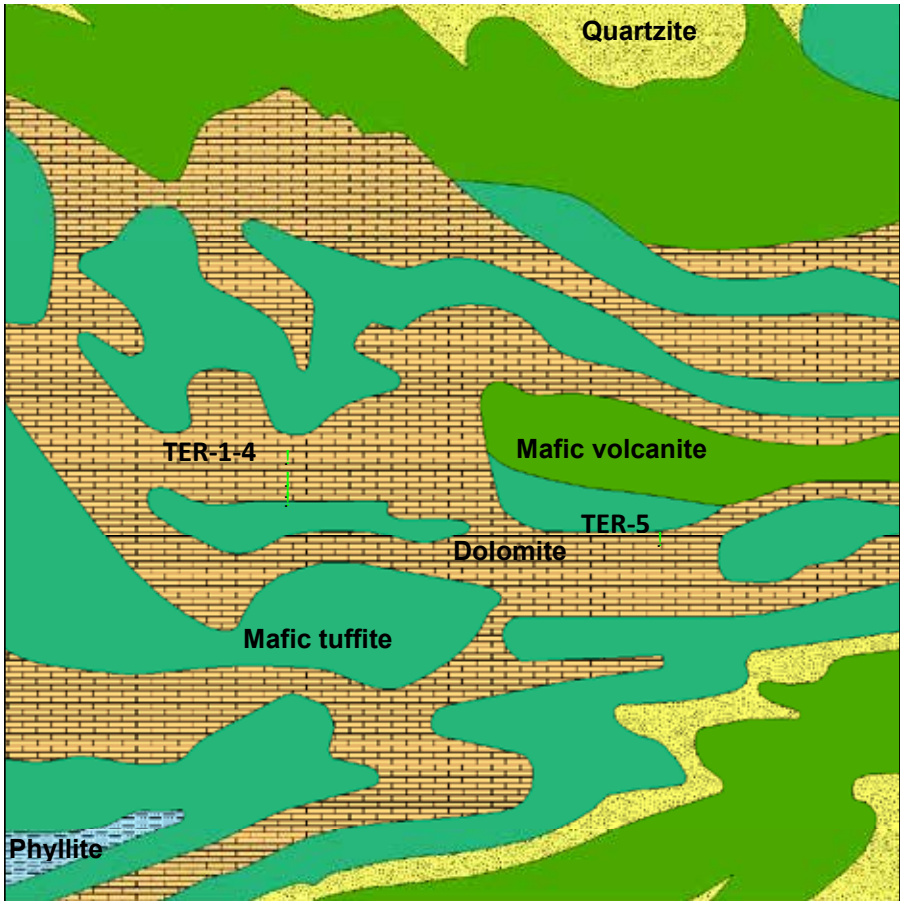


Figure 3. Position of drill holes (circles) on the geological map.

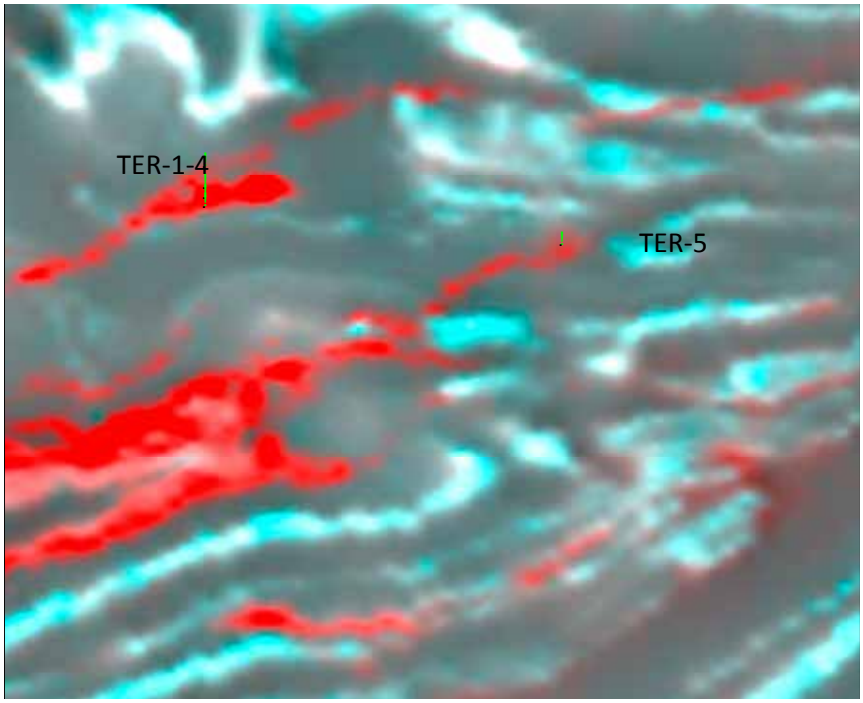


Figure 4. Location of drill holes TER-1-5 (circles) on processed aerogeophysical map. Processing is based on magnetic and EM data and made by GTK.

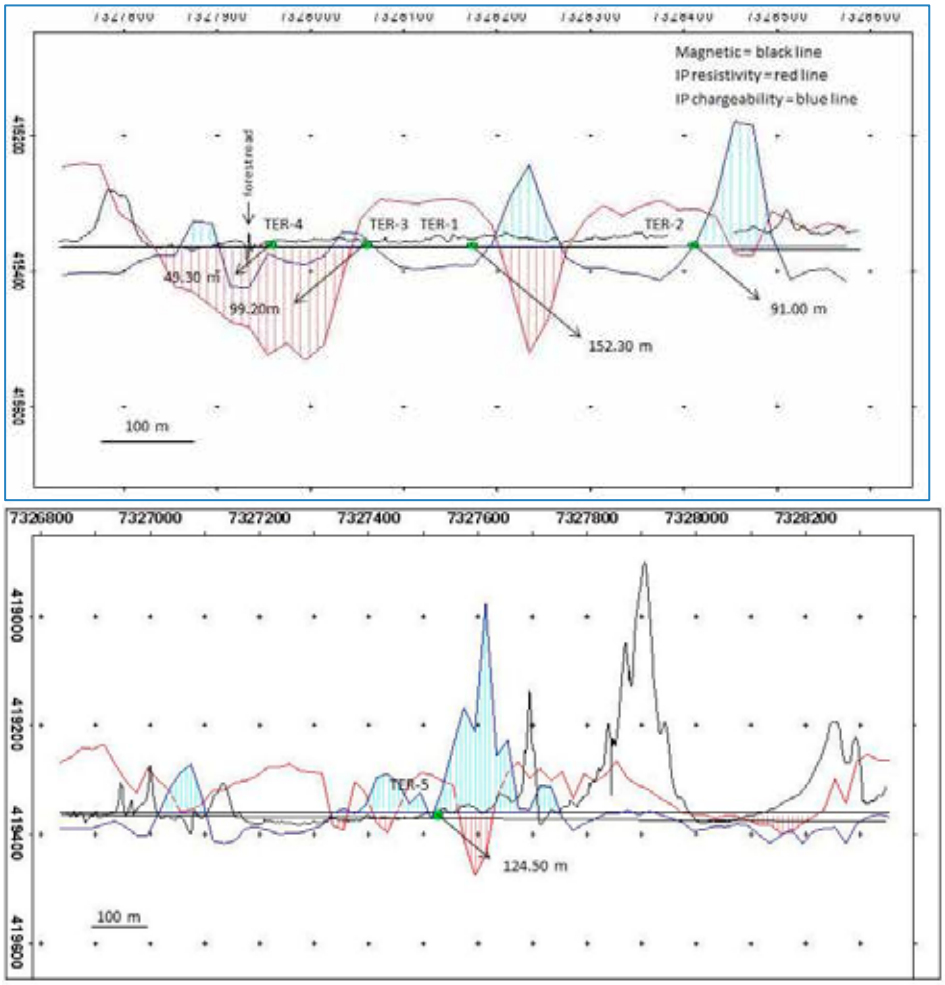


Figure 5. Position of drill holes TER-1-5 relative to the ground geophysical surveys.

Technical parameters, core logging and sampling

Drilling was done using BQTK drill rod size, which produced core 40.7 mm in diameter. Total amount of drilling was 516.30 meters in five drill holes (Table 1). There was no casing left in holes after finishing the hole. Also, no deviation surveys of bearing and dip angles were made.

Table 1. Location, orientation, and end depths of the drill holes.

Hole ID	Easting*	Northing*	Bearing	Dip	Length [m]
TER-1	415363	7328173	360°	40°	152.30
TER-2	415363	7328410	360°	40°	91.00
TER-3	415363	7328060	180°	40°	99.20
TER-4	415363	7327958	180°	40°	49.30
TER-5	419367	7327526	360°	40°	124.50
				Total	**516.30**

*ETRS89-TM35FIN

The core was taken to GTK core storage in Rovaniemi by the signer, who also logged and sampled the core. Total amount of 78 half core samples was taken (sample numbers 1110-1187). Cutting was done by the GTK, which also took samples to laboratory of Labtium for the base and precious metal assays. Total length of cut and assayed core was 205.50 meters.

Results of core logging

The lithology observed in the drill cores turned out to be much more versatile as what the geological map would let predict (Fig. 3). This versatility is in contrast parallel to what the processed aerogeophysical data suggested. Lithology consists of deposited volcanogenic, clastic, and chemical sediments. Principal rock types are phyllite, tuffite, black schist (graphite schist), quartzite, conglomerate, and marble. More detailed descriptions of rock types are given in Appendix A while Appendix B contains a gallery of drill core photographs.

Drill holes TER-1-4

Drill holes TER-1-4 (Figures 4 and 5) tested larger, electrically conductive but non-magnetic area, which according to ground geophysical survey turned out to be consisted of three separate conductive bodies with differing electromagnetic properties (Fig. 5). Inspection of rock types resulted to conclusion that it is the graphite rich schist (black schist), which causes the conductivity anomalies intersected by the drill holes TER-1, -3, and -4. The drill hole TER-2 is not reported to contain graphite and the EM conductivity is likely due to sulphide laminae forming large two dimensional plates. These layer parallel laminae, hosted by phyllite, were more frequent between 63-83m. In addition to black schist, rock types intersected include mainly clastic sediments of variable grain size and mineralogy (phyllite, quartzite, conglomerate). Black schists contain minor amounts of iron sulphides up to 1-2 %. Trace amounts of sulphides is also present in phyllites and conglomerates.

Drill hole TER-5

Drill hole TER-5 was drilled to test a smaller, elongated conductive anomaly (Fig. 4), which in ground survey gives very high IP chargeability anomaly (Fig. 5). This drill hole cored very heterogeneous section of rapidly variable rock types (Appendix A) composed of clastic and also volcano-clastic sediments like quartzite, conglomerate, phyllite, and tuffite. In addition to these also carbonaceous sediments metamorphosed to marble were encountered. The drill hole didn't intersect such amounts sulphides, which unquestionably could cause the wide conductivity anomaly measured in the ground geophysical survey. At the moment, the phyllite between 85-98 m, especially the six meters in between 89-95m, is the best candidate for the conductive body.

However, the conductive layer is wider in the ground geophysical measurement than the intersected phyllite layer possibly suggesting that the phyllite layer gets thicker towards to the surface.

Small amounts of iron sulphides were unevenly distributed throughout the hole in various rocktypes while graphite was not identified in this study. Highest amounts of sulphides were between 89-95 m hosted by a phyllite. Conspicuous amounts of sulphides were also observed in conglomerates (Figs B7 and B8, Appendix. B).

Results of chemical assays

Chemical assays were ordered from Finland state owned accredited laboratory of Labtium in Rovaniemi. Applied methods were Labtium code 510P (aqua regia digest followed by ICP) for base metals and 704P (fire-assay followed by ICP) for precious metals (gold, platinum, and palladium). Total amount of samples were 78 amounting to 205.50 m in length. The cutting was done by the GTK while Labtium was in response of crushing and milling.

Assays came back with insignificant precious metal values, but elevated base metal, especially Zn concentrations were detected (Table 2 and App. C). In anomalous samples Zn concentrations varied between 500-1,000 ppm, Cu reached 300 ppm and Pb 400 ppm. Closer look reveals that most of the anomalous values are hosted by black schist or phyllite or rocks in immediate contact with those rock types (Table 2). Black schist is a well-known rock type of its often anomalous metal concentration, which however, only very seldom are economic. Phyllite can, in Tervola case and in this respect, be compared with black schist as the latter commonly occurs as frequent layers in the former the principal difference being the graphite content in the black schist.

Conclusion

The association of most of the anomalous base metal concentrations with black schists degreases their significance and analytical results (including those of base and precious metals) do not refer to mineralising processes to have taken place in the close vicinity of drilling sites. On the other hand, the amount of drilling is insufficient to exclude the presence of metal deposits in greater Tervola area. Some anomalous metal concentrations were also found outside of black schist, but their relevance cannot be assessed due to lack of sufficient data. Documented metal enrichments and geochemical anomalies in Tervola area (Peräpohja Schist Belt) verify the metal potential of the area. These enrichments include the several drill hole and outcrop observations made by Mawson Oy and Vähäjoki Au deposit. The Vähäjoki deposit locates 6.5 km to NNE from the drilling site TER-5 and the deposit is reported to contain 10.5 Mt @ 0.2 ppm Au, 1,600 ppm Cu and 290 ppm Co. Host rocks for Vähäjoki include mafic volcanite, marble and phyllite. *–In summary, results do not show any specific targets for further exploration but neither do deny the ore potential of the greater Tervola area and Stonerol Oy properties.*

Table 2. Collection of base metal anomalous drill core sections with rock types indicated. Anomalous samples highlighted and anomalous metal values in bold. One weight-% = 10,000 ppm (g/t) and 1 ppm = 1000 ppb.

TER-1

From m	To m	Length m	ID	Cu ppm	Mo ppm	Ni ppm	Pb ppm	Zn ppm	Au ppb	Rock type
88.60	91.70	3.10	1123	123	12	130	32	44	<10	Black schist
91.70	93.90	2.20	1124	142	17	142	17	73	<10	Black schist
93.90	95.30	1.40	1125	143	53	169	**400**	202	17	Black schist
95.30	98.30	3.00	1126	39	6	72	53	138	<10	Black schist
98.30	101.20	2.90	1127	20	3	57	52	76	<10	Black schist
101.20	104.30	3.10	1128	48	7	96	71	159	22	Black schist
104.30	107.30	3.00	1129	59	9	143	65	108	31	Black schist
107.30	110.30	3.00	1130	193	44	294	193	**433**	23	Black schist
110.30	113.30	3.00	1131	255	58	246	25	24	<10	Black schist
113.30	114.10	0.80	1132	77	<2	64	15	36	<10	Black schist
114.10	115.15	1.05	1133	**298**	<2	758	35	48	<10	Clastic sediment
115.15	118.15	3.00	1134	158	<2	524	50	93	<10	Clastic sediment

TER-2

From m	To m	Length m	ID	Cu ppm	Mo ppm	Ni ppm	Pb ppm	Zn ppm	Au ppb	Rock type
65.00	68.00	3.00	1140	10	<2	11	56	188	<10	Phyllite
68.00	71.00	3.00	1141	11	3	11	19	95	<10	Phyllite
71.00	74.00	3.00	1142	11	<2	13	61	**455**	<10	Phyllite
74.00	77.00	3.00	1143	10	<2	21	71	119	<10	Phyllite
77.00	80.00	3.00	1144	5	<2	20	91	234	<10	Phyllite

TER-3

From m	To m	Length m	ID	Cu ppm	Mo ppm	Ni ppm	Pb ppm	Zn ppm	Au ppb	Rock type
41.05	44.00	2.95	1155	112	23	297	95	65	16	Black schist
44.00	40.00	*No assays*								Black schist
50.00	53.00	3.00	1156	196	92	472	82	**986**	12	Black schist
53.00	59.00	*No assays*								Black schist
59.00	62.00	3.00	1157	250	111	370	89	**666**	11	Black schist
62.00	68.00	*No assays*								Black schist
68.00	71.00	3.00	1158	116	46	168	56	253	<10	Black schist

TER-5

From m	To m	Length m	ID	Cu ppm	Mo ppm	Ni ppm	Pb ppm	Zn ppm	Au ppb	Rock type
49.90	52.90	3.00	1175	10	4	17	<10	188	<10	Tuffite
52.90	55.90	3.00	1176	13	3	19	11	165	<10	Tuffite
55.90	58.90	3.00	1177	11	4	14	20	**580**	<10	Tuffite/sediment
58.90	61.90	3.00	1178	5	<2	7	14	130	<10	Clastic sediment

APPENDIX A. Drill core logs

Drill hole TER-1

From [m]	To [m]	Rock type	Describtion
0.00	13.60	Overburden	
13.60	38.75	Phyllite	Relatively homogenous, very finely laminated layering. Some sulphides in the last meter.
38.75	45.20	Conglomerate	Heterogenous, tectonised, clasts barely identifiable.
45.20	45.23	Massive sulphide vein	Composed of iron sulphides, obviously two generations of pyrite (one forming larger euhedral grains) plus minor pyrrhotite.
45.23	52.50	Conglomerate	Like 38.75-45.20 m.
52.50	64.00	Conglomerate	Coarser clasts of various sedimentary rock types. Clear elongation. Resembles breccia in places. Some sulphides.
64.00	114.10	Black schist	Small amount of iron sulphides forming 1 mm wide laminae and wormlets. Graphite forms erratic thumb size blebs, but is generally very fine grained. Lots of core loss till 92 m totalling to 2.30 m. Last 22 m intact.
114.10	152.30	Sandstone	*Summary log:* Varies from minor quartzite sections through impure quartzite to clayish rock. May contain some volcanic debris. Brownish to 133.50m. First meter sulphide bearing. Core angle about 45°.
	EOH		*Summary log:* Core angle about 45°.

Drill Hole TER-2

From [m]	To [m]	Rock type	Describtion
0.00	10.90	Overburden	
10.90	18.00	Sandstone	Thin bedded sedimentary rock, mostly impure quartzite.
18.00	18.38	Quartz vein	
18.38	26.15	Sandstone	Like 10.90-18.00 m.
26.15	56.20	Phyllite	Contains coarser grained sedimentary layers. Sulphides at 28 and 42m.
56.20	82.90	Phyllite	One millimetre wide Fe sulphide laminae from 63m onwards.
82.90	91.00	Quartzite	Heterogenous section of variably impurity bearing quartzite. Erratic sulphide (pyrite?) grains and a stringer.
	EOH		*Summary log:* Carbonate present throughout the core, often with sulphides. Section 63.5-83m may be the EM conductor targeted. Core angle about 45°.

Drill Hole TER-3

From [m]	To [m]	Rock type	Describtion
0.00	9.90	Overburden	
9.90	11.80	Phyllite	Broken bedrock or boulder.
11.80	29.55	Phyllite	Some sulphides at 15.30m.
29.55	35.55	Quartzite	Impure quartzite, last 1.8m pure quartzite. Some sulphides, especially in last meters. Core loss totalling to 70cm.
35.55	39.30	Black schist	
39.30	41.05	Phyllite	
41.05	99.20	Black schist	
		EOH	*Summary log:* In black schists the amount of graphite varies between 50-90% the rest being silicates and iron sulphides. Core angle about 45°. Amount of sulphides <10%.

Drill hole TER-4

From [m]	To [m]	Rock type	Describtion
0.00	12.60	Overburden	
12.60	23.40	Black schist	
23.40	28.20	Phyllite	
28.20	49.30	Black schist	
	EOH		*Summary log:* In black schists the amount of graphite varies between 50-90% the rest being silicates and iron sulphides. Amount of sulphides <10%. Core angle about 45°.

Drill hole TER-5

From [m]	To [m]	Rock type	Describtion
0.00	11.80	Overburden	
11.80	24.10	Quartzite	Impure quartzite.
24.10	25.20	Conglomerate	
25.20	28.10	Quartzite	Impure quartzite.
28.10	30.20	Conglomerate	
30.20	32.10	Quartzite	Impure quartzite.
32.10	39.30	Siltstone	Like quartzite, but contains little sericite.
39.30	49.30	Tuffite	Laminar layering.
49.30	57.00	Tuffite	Very fine grained, massive, structureless.
57.00	68.90	Sandstone	Not true sandstone, but merely very heterogeneous section of impure quartzite and other type of (volcano-)sedimentary layers. Quartz segregations.
68.90	74.30	Tuffite	Partly coarser clastic sediment material.
74.30	85.15	Conglomerate	Not necessarily true conglomerate, but merely a section composed of larger quartz segregations and variable clastic sediments. Tectonised (brecciated?).
85.15	98.25	Phyllite	Fine grained, massive. Section 89-94.5 m blacker in colour containing also elevated amounts of iron sulphides.
98.25	117.75	Marble	Hard rock indicating substantial quartz content.
117.75	124.50	Tuffite	Volcano-sedimentary rock
		EOH	*Summary log:* Most of the contacts between rock type very gradual. Section 89-94.5m may be the EM conductor targeted. Erratically iron sulphides throughout the hole: 21.20m patchy blebs 30.10m euhedral pyrite grain 41.10m grains 47.80m pyrite wormlets 51.70-52.00m pyrite in cavities and cleavage planes 54.60-55.00m larger irregular patches 57.60-58.60m matrix/sparse network of sulphides 61.80m veinlets 65.20m erratic patches up to 2 cm in diameter 66.60m fissure fill 75.00m euhedral pyrite grains up to 0.5 cm in diameter 79.50m fissure fill 89-94.5m veinlets, grains, wormlets, patches 107.80m erratic patches up to 2 cm in diameter 111.80m one veinlet Core angle about 45°.

APPENDIX B. Drill core photographs

Fig. B1. Massive Fe sulphide vein bordered by white veins with sulphide blebs, TER-1, 99m.

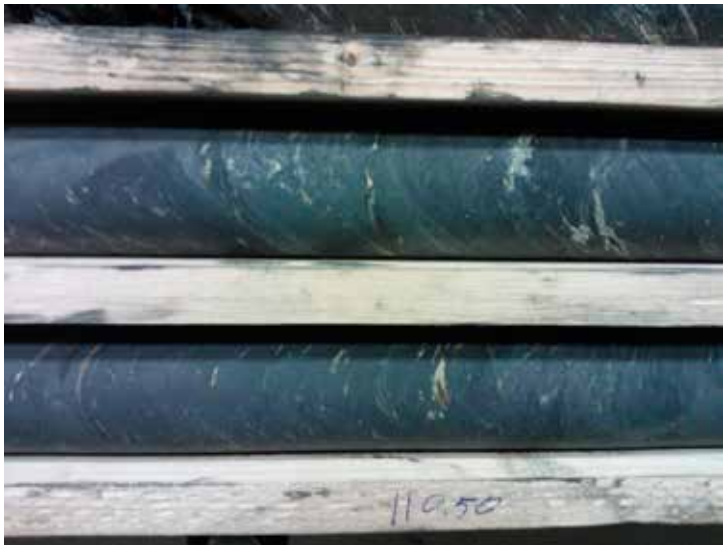


Fig. B2. Iron sulphides in black schist, TER-1, 110m.

Fig. B3. Coarser grained clastic sedimentary rock, TER-2, 20m

Fig. B4. Impure calcareous quartzite and marble looking rock, TER-2, 88m

Fig. B5. Conglomerate, TER-5, 29m.

Fig. B6.Heterogeneous clastic sediment, sericite bearing. TER-5, 34m.

Fig. B7. Heterogeneous section of tectonised volcano-clastic and clastic sediments with scattered iron sulphides (s), see enlargement below. TER-5, 60m.

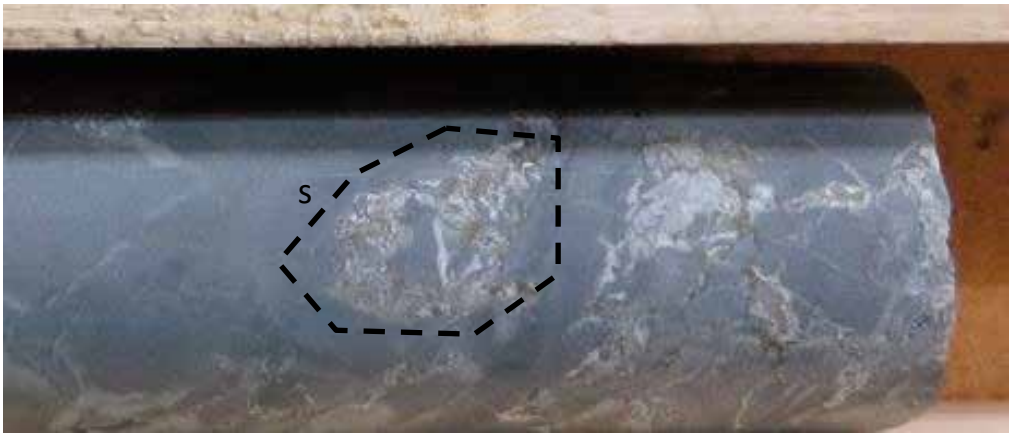


Fig. B8. An enlargement from the photo above depicting the style of iron sulphide occurrence (s). TER-5, 61m.

APPENDIX C. Assay results of drill core

10,000 ppm = one weight-% and 1 ppm = 1,000 ppb.

Sample	From	To	Length	Ag	As	Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	S	Sb	Zn	Au	Pd	Pt
	m	m	m	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppb	ppb	ppb
TER-1																				
1110	38.00	41.00	3.00	<1	11	<1	9	14	29	17600	663	<2	15	19	595	<20	22	<10	<10	<10
1111	45.00	45.50	0.50	<1	<10	<1	20	10	123	39500	725	<2	47	17	28000	<20	16	<10	<10	<10
1112	52.00	53.00	1.00	<1	19	<1	9	21	3	18800	706	<2	23	<10	149	<20	21	<10	<10	<10
1113	61.80	64.80	3.00	<1	<10	<1	11	29	45	25300	1050	5	44	30	5360	<20	48	<10	<10	<10
1114	64.80	67.50	2.70	1	19	<1	17	60	88	33800	991	32	147	40	17600	<20	95	<10	<10	<10
1115	67.50	70.50	3.00	<1	<10	<1	22	81	74	37100	815	14	128	25	20900	<20	59	<10	<10	<10
1116	70.50	73.50	3.00	1	15	<1	21	76	68	31900	618	14	104	38	17600	<20	35	<10	<10	<10
1117	73.50	76.30	2.80	1	<10	<1	30	90	94	36700	461	15	145	38	23300	<20	28	<10	<10	<10
1118	76.30	79.30	3.00	2	16	<1	27	79	103	37900	841	11	135	44	24300	<20	40	<10	<10	<10
1119	79.30	81.00	1.70	<1	<10	<1	22	73	176	41900	571	14	204	22	29300	<20	49	<10	<10	<10
1120	81.00	83.10	2.10	<1	<10	<1	22	62	116	41400	828	15	144	17	26200	<20	71	<10	<10	<10
1121	83.10	85.60	2.50	<1	22	<1	29	59	134	39800	243	28	168	56	27300	<20	50	<10	<10	<10
1122	85.60	88.60	3.00	1	16	2	22	73	134	37100	593	14	146	92	23400	<20	85	<10	<10	<10
1123	88.60	91.70	3.10	1	<10	<1	16	116	123	37300	947	12	130	32	18100	<20	44	<10	<10	<10
1124	91.70	93.90	2.20	2	14	<1	26	83	142	41000	574	17	142	17	26200	<20	73	<10	<10	<10
1125	93.90	95.30	1.40	3	62	3	46	41	143	57800	1200	53	169	400	47700	<20	202	17	<10	<10
1126	95.30	98.30	3.00	<1	41	2	15	32	39	37900	3350	6	72	53	32600	<20	138	<10	<10	<10
1127	98.30	101.20	2.90	1	46	<1	22	21	20	55400	4130	3	57	52	53900	<20	76	<10	<10	<10
1128	101.20	104.30	3.10	<1	105	2	80	34	48	73100	3120	7	96	71	74700	<20	159	22	<10	<10
1129	104.30	107.30	3.00	<1	90	<1	67	34	59	74200	4040	9	143	65	76900	<20	108	31	12	<10
1130	107.30	110.30	3.00	1	102	6	64	26	193	75500	1140	44	294	193	74400	<20	433	23	16	<10
1131	110.30	113.30	3.00	<1	14	<1	29	26	255	46100	1200	58	246	25	31200	<20	24	<10	<10	<10
1132	113.30	114.10	0.80	1	14	<1	27	42	77	37000	1620	<2	64	15	14000	<20	36	<10	<10	<10
1133	114.10	115.15	1.05	1	<10	<1	116	609	298	94900	963	<2	758	35	52000	<20	48	<10	<10	<10
1134	115.15	118.15	3.00	1	<10	<1	72	556	158	85700	888	<2	524	50	29200	<20	93	<10	<10	<10

Sample	From	To	Length	Ag	As	Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	S	Sb	Zn	Au	Pd	Pt
	m	m	m	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppb	ppb	ppb
TER-2																				
1135	24.30	24.65	0.35	<1	<10	<1	15	48	5	46400	188	<2	25	<10	401	<20	55	<10	<10	<10
1136	26.10	27.95	1.85	<1	16	<1	26	72	79	69300	446	2	51	51	513	<20	164	<10	<10	<10
1137	41.15	42.30	1.15	<1	13	<1	36	93	103	96800	702	<2	60	19	1260	<20	168	<10	<10	<10
1138	59.00	62.00	3.00	<1	<10	<1	6	15	8	50900	463	<2	11	23	2670	<20	106	<10	<10	<10
1139	62.00	65.00	3.00	<1	<10	<1	5	16	6	52600	460	3	9	25	4580	<20	105	<10	<10	<10
1140	65.00	68.00	3.00	<1	<10	<1	3	16	10	51600	349	<2	11	56	7170	<20	188	<10	<10	<10
1141	68.00	71.00	3.00	<1	18	<1	6	13	11	53300	377	3	11	19	10800	<20	95	<10	<10	<10
1142	71.00	74.00	3.00	<1	13	2	5	10	11	39400	889	<2	13	61	5970	<20	455	<10	<10	<10
1143	74.00	77.00	3.00	<1	<10	<1	5	22	10	28300	619	<2	21	71	3170	<20	119	<10	<10	<10
1144	77.00	80.00	3.00	<1	<10	1	4	13	5	24600	837	<2	20	91	1540	<20	234	<10	<10	<10
1145	80.00	82.90	2.90	<1	12	<1	7	18	16	27000	883	2	21	35	3000	<20	96	<10	<10	<10
1146	82.90	85.00	2.10	<1	16	2	28	49	92	34000	726	<2	52	79	12600	<20	140	<10	<10	<10
1147	85.00	87.20	2.20	<1	<10	<1	8	31	8	23500	703	<2	18	<10	1130	<20	43	<10	<10	<10
TER-3																				
1148	14.00	17.00	3.00	<1	17	<1	29	87	29	73300	573	<2	67	34	1130	<20	109	<10	<10	<10
1149	27.80	29.60	1.80	<1	12	<1	22	83	29	62300	859	<2	63	14	3140	<20	84	<10	<10	<10
1150	29.60	31.40	1.80	1	<10	<1	24	33	95	51000	758	<2	69	82	22800	<20	60	<10	<10	<10
1151	31.40	35.55	4.15	<1	19	<1	11	7	76	32300	1810	4	24	45	12400	<20	38	<10	<10	<10
1152	35.55	36.80	1.25	<1	252	1	58	15	88	90300	338	31	216	47	89700	<20	45	17	<10	<10
1153	36.80	39.30	2.50	<1	158	<1	61	18	123	97900	304	21	251	53	95700	<20	91	<10	<10	<10
1154	39.30	41.05	1.75	<1	21	<1	10	10	20	19100	2240	3	42	15	11100	<20	36	<10	<10	<10
1155	41.05	44.00	2.95	<1	167	<1	62	24	112	125000	212	23	297	95	132000	<20	65	16	<10	12
1156	50.00	53.00	3.00	1	150	11	51	68	196	75100	1170	92	472	82	75500	<20	986	12	20	13
1157	59.00	62.00	3.00	1	158	9	64	65	250	78000	560	111	370	89	84300	<20	666	11	14	<10
1158	68.00	71.00	3.00	1	68	3	36	44	116	47600	788	46	168	56	49500	<20	253	<10	<10	<10
1159	77.00	80.00	3.00	<1	85	2	49	49	79	72300	2080	28	155	31	76000	<20	183	<10	<10	<10
1160	86.00	89.00	3.00	<1	110	4	49	51	121	68900	887	45	238	43	72200	<20	381	<10	12	11
1161	95.00	98.00	3.00	1	69	5	37	47	128	45500	832	57	248	44	44600	<20	362	<10	<10	<10

Sample	From	To	Length	Ag	As	Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	S	Sb	Zn	Au	Pd	Pt
	m	m	m	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppb	ppb	ppb
1162	98.00	99.20	1.20	<1	89	3	41	53	118	54400	1670	49	214	28	55100	<20	284	<10	<10	<10
TER-4																				
1163	12.60	16.00	3.40	1	63	1	23	48	81	42100	921	25	162	43	36400	<20	135	<10	<10	<10
1164	16.00	19.40	3.40	<1	80	1	35	23	105	41300	863	59	220	74	38000	<20	138	<10	<10	<10
1165	19.40	23.40	4.00	<1	71	<1	37	13	68	57600	1230	12	119	52	55500	<20	56	<10	<10	<10
1166	23.40	26.40	3.00	<1	51	<1	29	11	76	40400	1500	7	67	67	37800	<20	52	<10	<10	<10
1167	26.40	28.20	1.80	1	26	<1	15	6	35	16700	2090	6	26	13	10600	<20	25	<10	<10	<10
1168	28.20	31.20	3.00	<1	91	<1	42	21	65	75300	1030	11	171	73	78400	<20	134	<10	<10	<10
1169	37.20	40.20	3.00	<1	122	<1	51	16	91	93900	146	20	271	126	100000	<20	189	<10	<10	<10
1170	46.20	49.30	3.10	<1	119	2	37	15	84	88400	674	22	271	50	92700	<20	212	<10	<10	10
TER-5																				
1171	19.95	23.00	3.05	<1	<10	<1	8	38	20	26700	200	<2	15	<10	566	<20	22	<10	<10	<10
1172	28.80	31.60	2.80	<1	18	<1	26	58	38	63700	846	<2	42	36	1070	<20	149	<10	<10	<10
1173	40.30	43.30	3.00	<1	<10	<1	6	18	23	41200	874	2	12	12	2350	<20	71	<10	<10	<10
1174	46.90	49.90	3.00	<1	<10	<1	9	55	13	26200	550	2	43	30	4920	<20	156	<10	<10	<10
1175	49.90	52.90	3.00	<1	20	<1	6	13	10	24700	623	4	17	<10	4540	<20	188	<10	<10	<10
1176	52.90	55.90	3.00	<1	<10	<1	6	7	13	31200	658	3	19	11	6620	<20	165	<10	<10	<10
1177	55.90	58.90	3.00	<1	11	3	10	7	11	36300	853	4	14	20	8390	<20	580	<10	<10	<10
1178	58.90	61.90	3.00	<1	<10	1	4	3	5	34000	926	<2	7	14	2740	<20	130	<10	<10	<10
1179	64.70	67.20	2.50	<1	<10	<1	4	13	11	29700	801	3	19	21	2000	<20	50	<10	<10	<10
1180	73.40	76.20	2.80	<1	17	<1	6	13	5	31500	922	<2	13	<10	2640	<20	154	<10	<10	<10
1181	78.45	81.45	3.00	<1	<10	<1	6	13	8	31700	893	4	12	11	1530	<20	170	<10	<10	<10
1182	81.45	84.30	2.85	<1	<10	<1	9	49	9	30300	658	<2	26	19	1100	<20	48	<10	<10	<10
1183	88.00	91.10	3.10	<1	13	<1	9	38	14	31800	813	<2	24	24	6520	<20	269	<10	<10	<10
1184	91.10	94.00	2.90	<1	<10	1	15	64	38	34900	590	<2	37	37	7000	<20	169	<10	<10	<10
1185	94.00	97.00	3.00	<1	10	<1	15	38	29	39400	742	<2	31	12	1800	<20	64	<10	<10	<10
1186	106.60	109.60	3.00	1	25	<1	13	17	30	24500	804	<2	14	25	458	<20	51	<10	<10	<10
1187	110.75	113.75	3.00	<1	<10	<1	11	18	19	25500	844	<2	18	<10	989	<20	20	<10	<10	<10

STONEROL

MINUTES SKYPE DISCUSSION

APRIL 11, 2014

Conclusion / Summarisation of the Skype Discussion on April 11th, 2013

Participants:

- Dr Markku Iljina (MI)
- Dr Markus Elsasser (ME)
- Gaby Strausak (GS)

Absent:

- Ann Bjurström (AB)

LEHMIKUMPU, TERVOLA

Referring to the chemical assays the best detected results were for Zn concentrations with a range from 500 to 1'000 ppm. Unfortunately, the host rock was mainly black schist (graphite), phyllite or rocks in immediate contract with those rock types. From this it follows that the finding is most probably not economic. The Greater Tervola area indicates definitely the promise for ore bodies but we have no specific indication to continue exploration within the limited budget that Stonerol Oy has. Starting from our parameters and their interpretation, which were electrically conductive and non-magnetic rock bodies, we did what we could do with our 500 metre drill program.

In consideration and in comparing our other possibilities elsewhere we decided to leave Tervola and withdraw our claim application request. The possibility to sell the claim together with our data, is seen too low. MI to instruct AB how to get in contact with the appropriate people for initiating the withdrawal.

The drill core and assay rejects are stored at GTK at present. Our preferred option is to give this material to the national drill core archive in Loppi (75 km from Helsinki), rather than paying a monthly fee for storage. MI to contact GTK to check the one-time transport cost and to get this dispatch organised.

NEW PROJECT GENERATION

MI to study and analyse public GTK data for Northern and Eastern Finland. The idea is, after further detailed study and discussions, to add claim reservations to our land bank.

OUR CURRENT HOLDINGS

- Oijärvi

And in the Greater Salla Area:

- Tuohivaara
- Kelloselkä

The decision of when and how to proceed in these areas and with what kind of measures, will be taken after we have other selection of new claim reservation/target from the *New Project Generation* (see second point on page 1).

OIJÄRVI

MI to focus on the *New Project Generation*. Decisions on Oijärvi to be done after. As long as we cannot attract a financial partner we should move forward step by step only.

INVESTMENT TARGETS

We are potentially interested in the Koillismaa project (palladium-platinum-base-metals) from Nortec Minerals / Finore Mining. MI to get in contact with these people to express our interest.

On the other two potential investment targets, it was decided not to continue with the Mustavaara vanadium-iron project, but keep Akanvaara chrome in mind, however, with lower priority than the Koillismaa project.

Next Skype meeting: **Thursday, June 5th, 2014, 8.00 a.m. CET/ 9.00 a.m. EET**.
MI to contact all parties.

Transcript writer: GS/MI - 11.04.2014

STONEROL

MINUTES SKYPE DISCUSSION

JUNE 05, 2014

Conclusion / Summarisation of the Skype Discussion on June 5th, 2013

Participants:

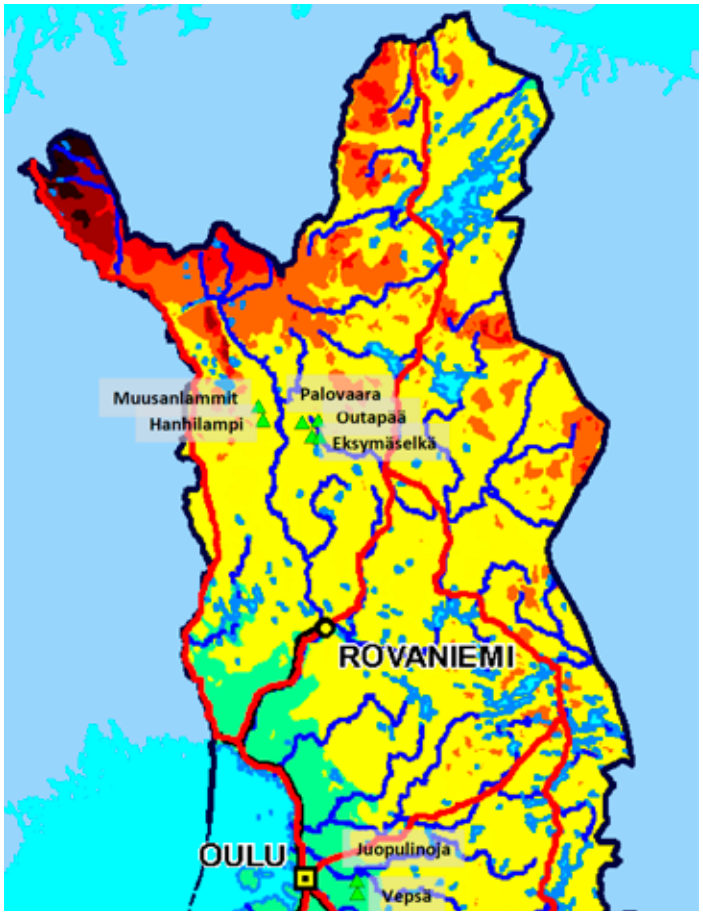
- Dr Markku Iljina (MI)
- Dr Markus Elsasser (ME)
- Ann Bjurström (AB)
- Gaby Strausak (GS)

PROJECT GENERATION / NEW TARGETS

MI wrote a so called 'project generation report' for Stonerol Oy in favour to discuss new potential targets. We have all read this report and summarise the decisions below.

The following seven key observations from the prospects have been discussed: 1) Muusanlammit, 2) Palovaara, 3) Hanhilampi, 4) Eksymäselkä, 5) Outapää, 6) Juopulinoja and 7) Vepsä

The location of the targets discussed are:



Muusanlammit, **Palovaara**, **Hanhilampi** and **Eksymäselkä** look promising and the decision was made that we should go for these four targets. These targets are all up north, whereas the other targets are either too close to nature conservation or non-gold prospects, and therefore more difficult to develop. The area where those chosen four targets are to find is well developed and not very hilly, convenient to reach and to work on.

Outapää is too sensitive due to his closeness to a national park → we should not choose this one.

Juopulinoja and Vepsä both show underexplored uncommon mineralisation type → we do not want to go into another metal, it is tungsten. Therefore, we will not choose these ones either.

MI suggests not to do claim applications, but to do claim reservations that are valid for two years. He will define the locations and put everything together for our claim reservation lodgement.

We do not speak to people that work no longer for GTK, and we do not any public talk until we get our claim reservations approved. This is to avoid any risks.

PROJECTS/AREAS WE STILL HOLD

The greater Salla Area – Tuohivaara

The exploration permit application area was reduced, application pending. We have MMI indication.

- Decision was made that a low-budget electromagnetic and magnetic geophysical work should be done. GTK could do the work (easiest way to find out whether the MMI data is fruitful) however, MI to check whether there are other companies that could do this work (availability and pricewise).

After, we will decide on how to move forward.

The greater Salla Area –Kelloselkä

Resembles geological Tuohivaara.

- We will see what the outcome will be for Tuohivaara. If there were negative results, we have no reason to move forward with Kelloselkä.

Oijärvi/Pentinsuo

Ground geophysical work should be done, followed by possible drilling.

- MI to order the processing data from GTK. Together with a GTK expert to interpret whether it makes sense to do the drilling.

If the results were negative we will have no other work program on geophysical work.

Considering Markku's and GTK's schedules over the next months, all work on our on-going projects can be done by the end of September 2014.

Next Skype meeting: **Thursday, July 3rd, 2014, 8.00 a.m. CET/ 9.00 a.m. EET**.

Transcript writer: GS/MI - 06.06.2014

STONEROL

EXPENDITURE CALCULATION OF THE TERVOLA DRILLING CAMPAIGN

JUNE 17, 2014

Expenditure calculation of the Tervola drilling campaign

ADC drilling invoice	33'614.60	
Clearing of roads, water supply	6'150.00	
Clearing of access track, lumberjack	1'016.70	
Accommodation, motel in Tervola	403.27	
Marking sticks and container for assay rejects	65.40	
Drilling preparation and supervising costs	7'694.15	Including day charges, car hires etc.
Assay costs	2'978.68	
Licences for vehicles, planned hole 6, PH6	248.00	Forest administration
Permission for drilling and licences for vehicles, TER-5	1'030.24	Forest administration
Damages of forest, TER-5	805.00	Forest administration
Damages of forest, TER-1-4	278.62	
GTK core cutting and sample preparation	2'393.00	Core cutting, assisting work, facility rent
SUM	**56'677.66**	
€/m	**109.78**	

STONEROL

MINUTES SKYPE DISCUSSION

JULY 03, 2014

Conclusion / Summarisation of the Skype Discussion on July 3rd, 2013

Participants:

- Dr Markku Iljina (MI)
- Dr Markus Elsasser (ME)
- Gaby Strausak (GS)

Absent:

- Ann Bjurström (AB)

PROJECT GENERATION / NEW TARGETS

In our last Skype discussion we agreed to put in claim reservation for the following four targets: Muusanlammit, Palovaara, Hanhilampi and Eksymäsekä. Reservation request was sent in right after our meeting but unfortunately, we soon received the answer that all four areas are taken therefore, the lodgement has been rejected. Hence, those areas were already reserved at the time MI was doing his work. MI found out that Tukes's public mining register maps were not up-to-date and that is why we could not have known this beforehand.

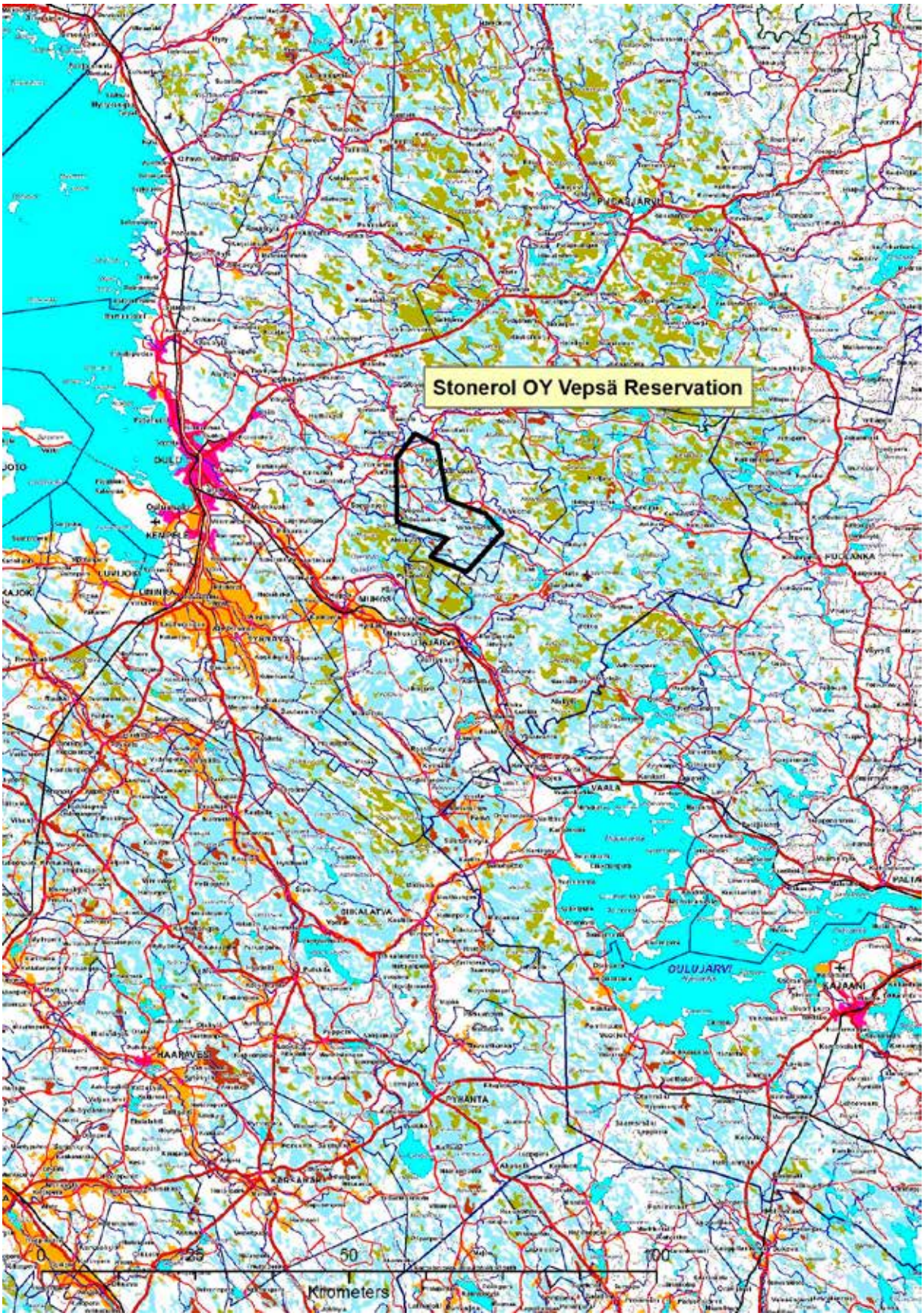
Following this discussions, new non-gold areas were taken into consideration, also outside of Lapland. MI identified two potential areas: Vepsä and Riihilampi.

Vepsä

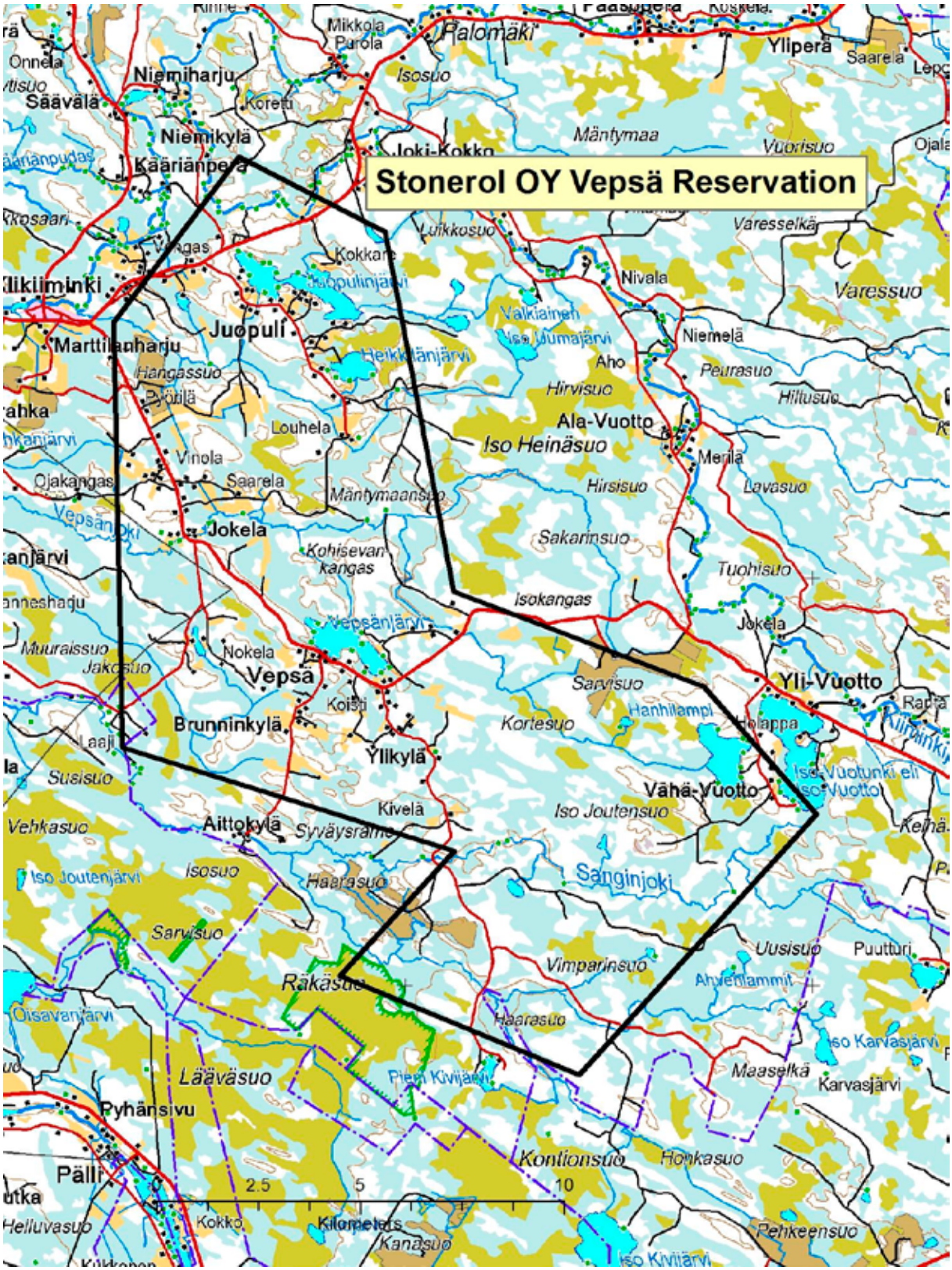
Size of the area is 18'314 ha. It is located 50 km East from Oulu (the third biggest town in Finland). The area is little explored alloy metals prospect, i.e. tungsten and zinc. Both metals are shown in the entire hosting schist belt. There is no housing, claims/exploration permits or nature reservation conflicts. Vepsä has been observed and some drilling has been done by GTK. Also, the company Rautaruukki Oy (an iron-ore company) had done some work there in the 1980ies. It looks like the area is not taken.

- A reservation application has been loged, Tukes confirmed the receipt of the application and we are now awaiting their approval.

Detailed maps of the area are shown on page 2 and 3 in this summary.



Vepsä reservation application area



Vepsä reservation application area in detail

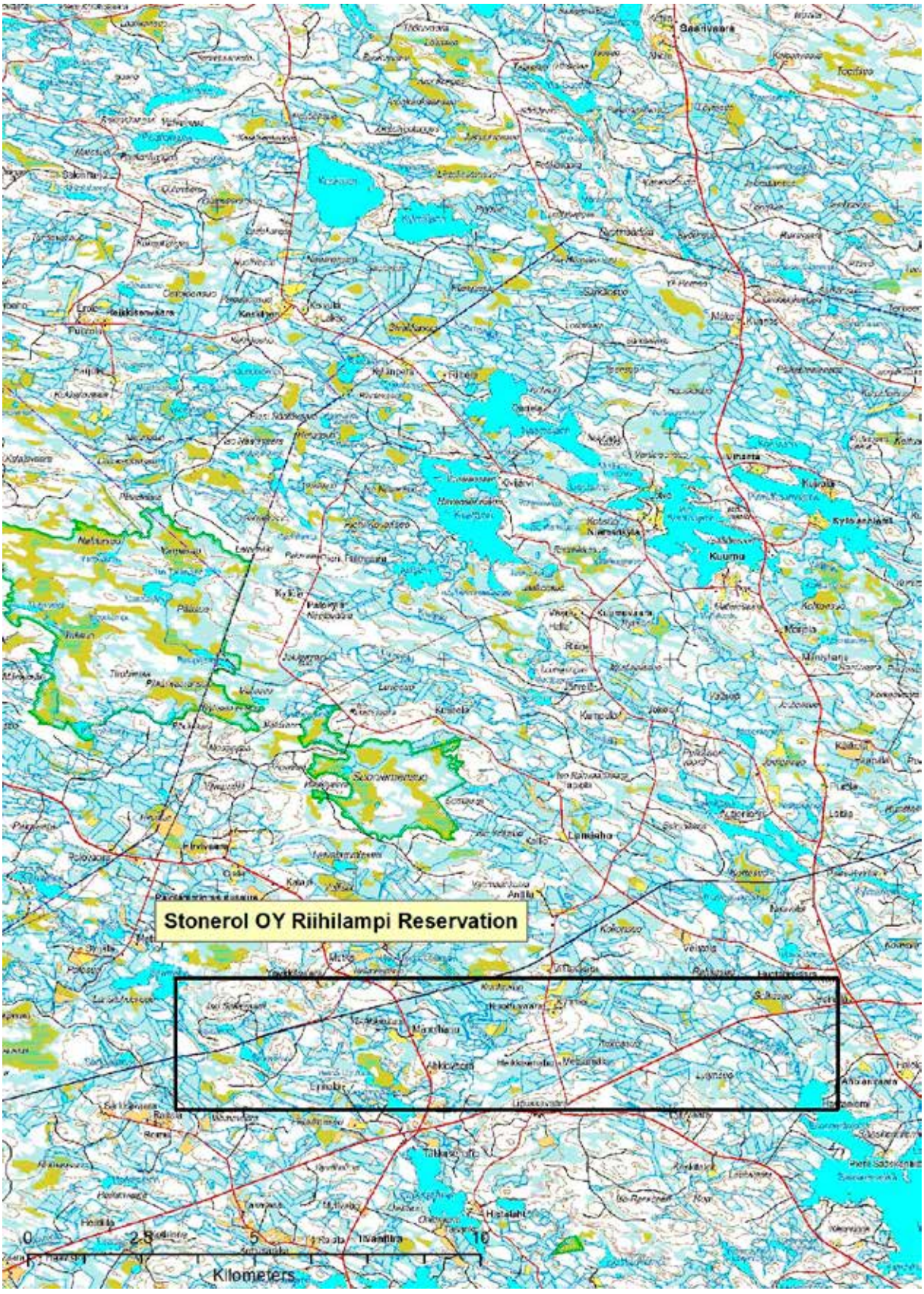
Riihilampi

Size of the area is 4'242 ha. It is located Central/Eastern Finland, close to the Russian border. The area is a little explored target for nickel, zinc and maybe a little bit of silver. Kylmäpuro is part of the Riihilampi area, also little explored, and is also a zinc target.

- A reservation application has been loged, Tukes confirmed the receipt of the application and we are now awaiting their approval.

Detailed maps of the area are shown on this and next page.

Riihilampi reservation application area



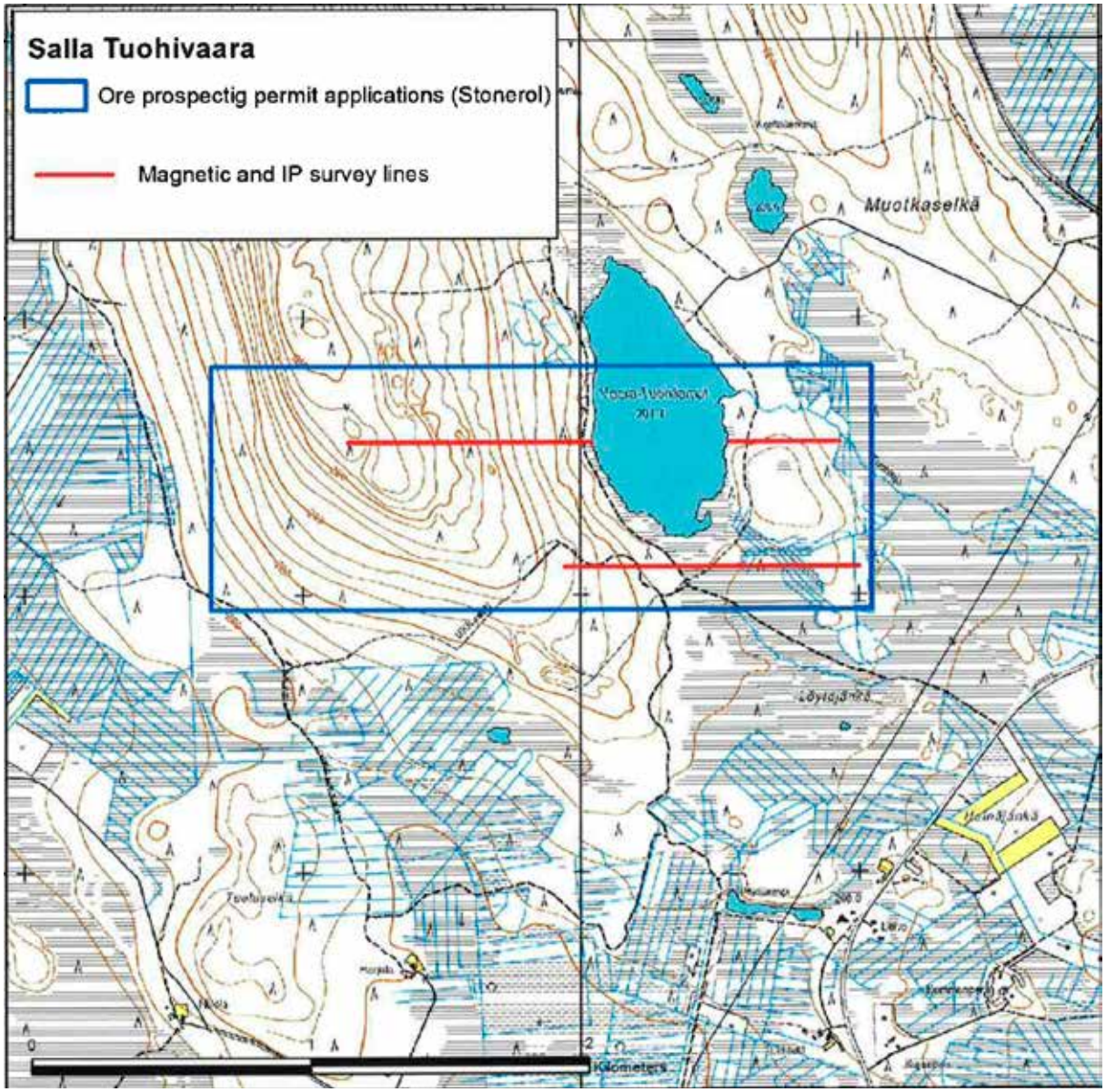
Riihilampi reservation application area in detail

PROJECTS/AREAS - STILL IN PROCESS

The greater Salla Area – Tuohivaara

Low-budget electromagnetic and magnetic geophysical work has been done by GTK: Three measurements were needed, if we were to proceed to the drill phase. These three measurements are marked in red in the map below; 1) east of the lake, 2) west of the lake and 3) south of the lake.

- We are awaiting GTK's test results. Decision on how to move forward to be done once the outcome is known.



The greater Salla Area –Kelloselkä

Resembles geological Tuohivaara.

- We will see what the outcome will be for Tuohivaara. If there were negative results, we have no reason to move forward with Kelloselkä.

Oijärvi/Pentinsuo

Adequate ground geophysical work had been done by GTK. The processing data is available and should be sufficient for interpretation.

- MI to sit together with a GTK expert to interpret whether it makes sense to do the drilling. We will then get map and ideas for a drilling.

DIAMONDS

91 diamond samples that were taken from the Salla area are available from Perth, Western Australia.

- MI is in correspondence with diamond people at GTK and is in process of finding out whether it makes sense in using these Salla MMI samples in diamond exploration and whether the diamond testing is feasible or not. Awaiting technical and cost investigations.

Next Skype meeting: **Thursday, August 28th, 2014, 8.00 a.m. CET/ 9.00 a.m. EET**.

Transcript writer: GS/MI - 03.07.2014

STONEROL

ARTICLE ON STONEROL OY IN NEWSPAPER "KALEVA"

AUGUST 9 2014

Original Copy of Article in Finnish

tulisi lähes kolmannes kalojen leikkuriin.

Seppänen on vartioimut merkittävää aarrekirstua. Hänen käsiensä kautta ovat kulkeneet Pohjois-Pohjanmaan elyn yritystuet ja samalla satojen yrittäjien kohtalot.

kevaana kolme miljoonaa.

"Se on käytetty."

Ja nyt sitten tämä: Oulussa työttömien määrä kasvaa, mutta Brysseli leikkaa alkaneella rahoituskaudella yritysten tukirahoista 30 prosenttia.

Jostakin olisi äkkiä saatava kansallista rahaa tulevien uu-

tajiksi tähtäävia malleikkaasti. Elyä taas auttavat päätöksenteossa uudet verkkoinstrumentit.

"Pääsääntöisesti oikeita yrityksiä rahoitetaan", Seppänen luottaa.

Vaikuttavuus on tärkein kriteeri rahoituksen saamiseksi. "Kotimaan markkinat ovat pie-

200 000 euron haarukassa yritystä kohti.

"Se on merkittävä apu alkuvaiheessa oleville yrityksille. Ei ole säästöjä tai vakuuksia."

"Kun raha vähenee, voidaan avustus kohdistaa rajattuihin toimenpiteisiin, ulkopuolisiin asiantuntijapalveluihin tai tuot-

suuri merkitys arvioida, millainen osaaminen yrityksessä on, ja nähdä mahdollisuudet", Seppänen toteaa.

Säästökeinona on esitetty, ettei ely enää vierailisi kohteissa.

"Juuri vierailuja yrittäjät arvostavat joka kyselyssä", Seppänen puolustaa.

Kullanetsintä vireillä Oulun seudulla

Saksalaissijoittaja Stonerol Oy on toiminut Suomessa pian neljä vuotta

Arja Mikkola Kaleva

OULU Yksityinen saksalainen sijoittaja on tehnyt yrityksensä nimissä varauksen Muhoksen, Oulun ja Utajärven alueelta tutkiakseen mahdollisia kaivosmineraaleja.

Yrittäjä Markus Elsässer innostui Suomen maaperän rikkauksista jo lähes vuosikymmen sitten.

Elsässerin yritys Stonerol Oy täyttää syyskuussa neljä vuotta. Italiasta lomalta tavoitetun sijoittajan mukaan yrityksellä on Suomessa jatkuvasti varalla 3-5 kohdetta.

Uusin kohde on Vepsä Oulun itäpuolella. Tukesin hyväksymä alue käsittää runsaat 180 neliökilometriä.

Vataaja otaksuu, että alueella olisi muun muassa kultaa, sinkkiä, kuparia ja volframia.

Rautaruukki on 1980-luvulla tehnyt tutkimuksia seudulla. Mahdollisia uusia kairauksia suunnitellaan maanomistajien luvalla aikaisintaan ensi kesänä.

Elsässer on vielä lupauksissaan varovainen, sillä viime vuonna kairaukset Tervolassa vetivät vesiperän.

Stonerol pyrkii tehokkuuteen ja systemaattisuuteen, joten se työllistää hankkeissaan geologin Rovaniemellä läpi vuoden.

Kesällä on kenttätyötä tarjottu Sallan seudulla myös geologiopiskelijoille.

"Olen aina säästänyt. Jos ostan kaksi uutta asuntoa vuodessa, niin miksen sijoittaisi niitä rahoja tähän toimintaan", Elsässer sanoo investoinneistaan.

58-vuotiaalla yrittäjällä on kaupallinen koulutus ja kokemusta kemianteollisuudesta.

Kaivosteollisuudesta hän innostui työskennellessään Australiassa 1990-luvun vaihteessa. Virheistä taas on voinut ottaa oppia piensijoittajana useissa kaivosalan firmoissa.

Elsässer toimii myös hallituksen jäsenenä ruotsalaisessa, Venäjällä kultaa kaivavassa Kopy

Goldfieldissä.

Suomen luonnonvarat löytyivät aikoinaan GTK:n avulla, kun se esittäytyi Kanadassa kaivosalan messuilla: "Maailman paras laitos."

"Suomen raaka-ainerikasta maaperää on hyödynnetty epätyypillisesti", Elsässer arvioi.

Sijoittaja epäilleekin, että GTK tanssi ennen täysin Outokummun eli valtion kaivosintressien mukaan.

> **Olen aina säästänyt. Jos ostan kaksi uutta asuntoa vuodessa, niin miksen sijoittaisi niitä rahoja tähän toimintaan."**
>
> **Markus Elsässer**
> yrittäjä
> Stonerol Oy

"Ei löydy perusteita sille, että tutkitaan viisi vuotta jostakin eikä 500 metriä sivusta."

Elsässerin mielestä suomalaiset eivät tiedä, miten hyvässä maassa asuvat.

Ihmiset ovat luotettavia, infrastruktuuri toimii, tiet vievät perille eikä tarvitse ensin edes kiivetä vuorten yli.

Halpaa täällä ei tosin ole. "Kaivosalaa koskevat maksut ovat erittäin kovat suhteessa muihin maihin. Onneksi ihan alussa on edullista."

Kaikkein vaikeinta on tehdä ratkaisu lopettamisesta tai jatkamisesta. "Aika ei ole ongelma, ongelma on päättää, mikä on järkevää ja mikä ei."

Elsässer muistuttaa, että poraamisen on sanottu tappaneen monen kaivosyrityksen.

"Tässä on paljon riskejä. Tätä ei saa kuvitella liian romanttiseksi", hän huomauttaa.

Raaka-ainemarkkinatkin ovat olleet alamaissa jo pari vuotta. Maailmalta saisi nyt kaivosfirmoja halvalla. Yksin Australiassa on 10 000 työtöntä geologia.

Tilastojen mukaan mineraalilöydön todennäköisyys on ylipäänsä pieni.

"Ehkä vain yksi tuhannesta kohteesta johtaa tulokseen."

Toisaalta ei Tansaniassakaan etsitty timantteja, koska maailman johtava firma De Beers ei pitänyt sitä mahdollisena. Kunnes tuli mies, joka löysin timantin autonrenkaansa alta.

koulutuksessa ja kehittämises

Oululaisten yritysten pitää ryl liiketoimintaan. Monella yrity liian vahvalla prioriteetillä ja T tulee rekrytoida kansainväliste tuksen jäseniä ja avainhenkilö

Tässä kuten muissakin tulevi tärkeintä ovat hyvin nopea asei toimenpiteet. Tulevaisuus on ji kannata tyytyä valtiovallan alr

Pohjoinen bisnes esillä Oulussa kuun lopussa

OULU Oulussa 29.8. SuperPark Areenalla järjestettävä Northern Glow -tapahtuma esittelee pohjoisen bisneksen menestystarinoita ja pohjoisuuden tarjoamia mahdollisuuksia Suomelle.

Ensimmäistä kertaa järjestettävä Northern Glow - pohjoinen bisnes kasvattaa voittajia -tapahtuma nostaa keskusteluun arktisuuden mahdollisuuksia Suomelle. Tapahtuman taustavoimina toimivat Oulun kaupunki, Oulun yliopisto, Pohjois-Pohjanmaan liitto ja Yle Oulu sekä useat alueen yritykset.

Tapahtuma koostuu neljästä teemasta, jotka keskittyvät älykkääseen kaupunkiin, perinteisten toimialojen muutostarpeeseen, kasvuun ja innovaatioihin sekä arktisuuteen. (Kaleva)

Verkkokauppa.com kasvatti nopeasti liikevaihtoaan

HELSINKI Verkkokauppa.com:in tulos pysyi suunnilleen viime vuoden tasolla. Yhtiön huhti-kesäkuun tulos ennen veroja

STONEROL

REPORT ON VEPSÄ AND RIIHILAMPI RESERVATION AREAS

AUGUST 19 2014

for Stonerol Oy by Markku Iljina

Exploration summary of Vepsä and Riihilampi reservation areas

August 19, 2014

For Stonerol OY by Markku Iljina

Exploration summary of Vepsä and Riihilampi reservation areas

Both Vepsä and Riihilampi reservation areas are composed of two separately reported mineral deposit indications (Fig. 1). More detailed location maps are presented in Appendix A. Geological maps of both areas are in App. B.

Fig. 1. Location of claim reservation areas. For explanation, see text.

Vepsä reservation area, Zn and W

The two Vepsä indications, Juopulinoja and Vepsä proper, are both confined to roughly north-south trending mafic volcanite and mica schist (Fig. 2). These indications are little explored alloy metals, tungsten and zinc, prospects. Both tungsten and zinc showings are known in the entire hosting schist belt known as Kiiminki Schist Belt. High-grade, but pocket size Zn-Pb-Au-Ag occurrences are known to NW from Stonerol Oy reservation area. In total 74 drill holes amounting to 8,180 meters are archived from Stonerol Oy Vepsä claim reservation area.

Mineral indications do spatially follow mafic volcanite, which is accompanied by dolomite, skarn, chert, and iron formations (App. B).

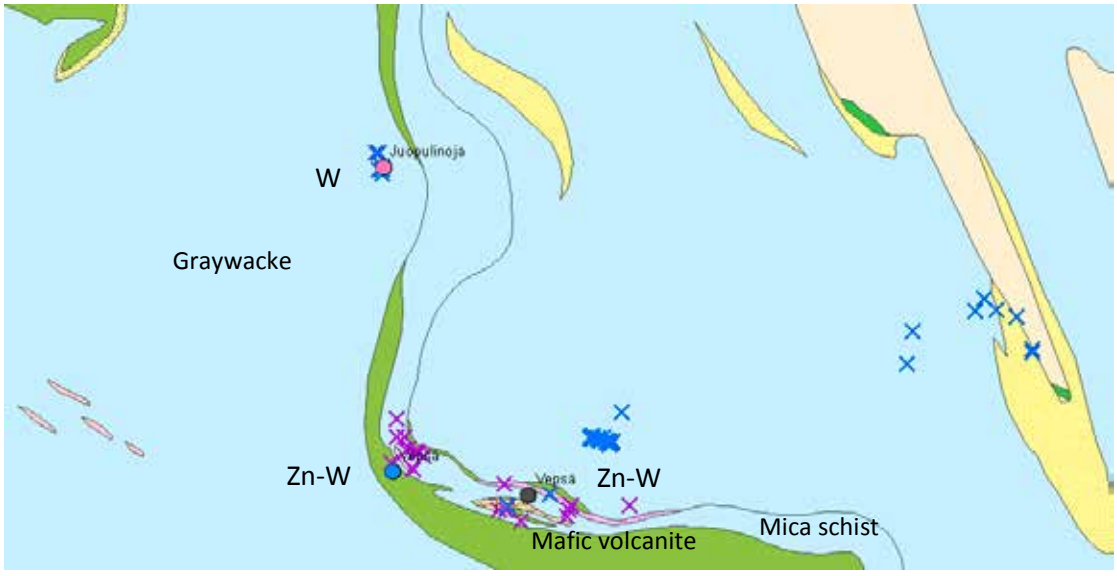


Fig. 2. Juopulinoja tungsten (W) and Vepsä zinc-tungsten (Zn-W) prospects on geological map. Archived drill holes crosses.

EXPLORATION HISTORY, VEPSÄ PROPER ZN-W

Rautaruukki Oy (1973–82): Regional exploration covering most of the Kiiminki Schist Belt. Exploration concentrated in tungsten including, at least, bedrock mapping, glaciogenic boulder survey and localised magnetic, electric and gravimetric ground surveys, till geochemical survey, diamond drilling. Scheelite bearing boulder and tungsten geochemical anomalies are reported in Vepsä.

Rio Tinto Zinc (mid-'90es): Diamond exploration. Drilled one drill hole in Stonerol Oy Vepsä reservation area in 1996.

GTK (1970's–1999, 1996–2000): (in co-operation with University of Oulu) bedrock mapping, glaciogenic boulder surveys, high- and low-altitude airborne magnetic, electric and radiometric survey, ground magnetic, gravity, VLF-R and slingram surveys, regional and localised till and peat geochemical surveys, percussion drilling into uppermost 3 m of bedrock, and detailed petrographic and geochemical investigations of the black shales. GTK also tested bedrock surface by drilling.

EXPLORATION HISTORY, JUOPULINOJA W

Rautaruukki Oy: Geophysical ground measurements, geochemical sampling, diamond drilling.

Rautaruukki Oy reports Juopulinoja (including nearby Sadinharju prospect) drill holes to contain small amounts of scheelite (tungsten mineral) throughout, but deemed concentration uneconomic without assaying concentrations. Scheelite was hosted by skarn-dolomite rock. Large areal geochemical anomalies of Zn, Cu, and W (App. C).

Riihilampi reservation area, Ni and Zn

Stonerol Oy Riihilampi reservation area has been subjected in to nickel, zinc, silver, and diamond exploration in the past. Base metals have been explored by GTK and private Finnish company Kajaani Oy the latter extending exploration to drilling phase. The company is reported to have drilled ten drill holes (five in Riihilampi proper, five in Kylmäpuro) totalling 1,346 meters. Rio Tinto Zinc ltd together with its Finnish alliance company Luikonlahti Oy is reported to have done also diamond exploration in the reservation area and to have sunken four drill holes.

Results of the past exploration have not led to further exploration.

Riihilampi, nickel

Discovery By Kajaani Oy. In summer 1984 Mr. Antero Kilponen sent to Kajaani Oy a serpentinite sample from Iivantiira area in Kuhmo that contained 2 wt. % nickel, 0.12 wt. % copper, 0.05 wt % cobalt, 0.1 ppm Au and 0.7 ppm Pd. In spring 1987 Kajaani Oy made 5 diamond drill holes to the Riihilampi serpentinite lens and found the nickel mineralisation.

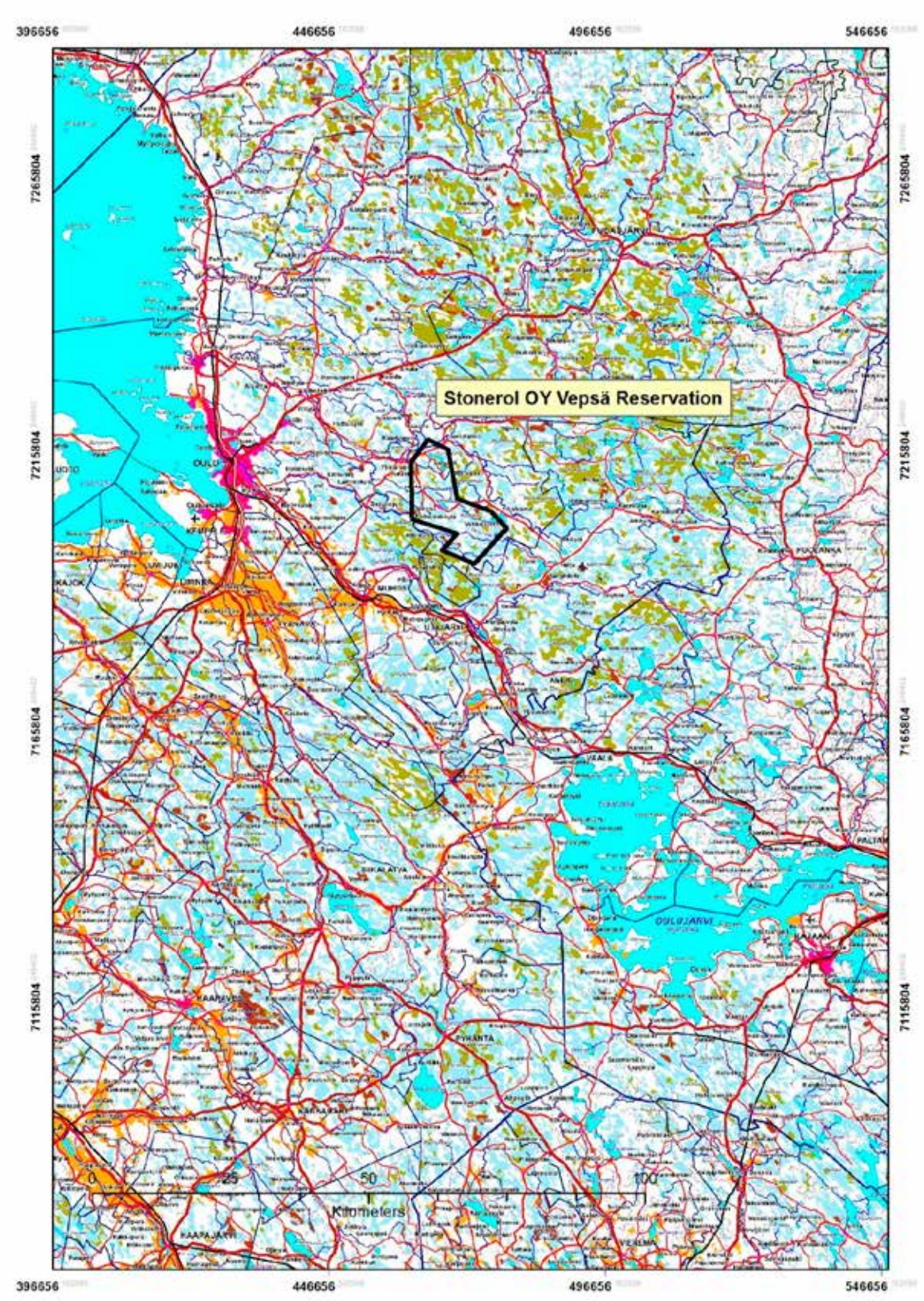
GTK report:

The Riihilampi nickel occurrence is located in one "mini" greenstone belt in the eastern side of the Kuhmo greenstone belt, about 40 km north from the centre of Kuhmo. The Riihilampi deposit is not very well known (only 5 drill holes) and there are no other publications than one archive report. The deposit is mainly of disseminated nickel mineralisation type hosted by an about 300 m long and 50-100 m thick komatiitic serpentinite lens (olivine mesocumulate), which is surrounded by Archaean tonalite gneiss and amphibolites. According to the 5 drill holes nickel content varies between 0.2-0.4 wt %. Anyway the drill hole no. 5 contains 2-3 cm thick massive sulphide "vein" just between the serpentinite lens and the wall rock (hornblende gneiss). Old, about 10 cm long sample (92.84-92.94 m) was reported to cotain 2.39 wt % Ni and new analysis from interval 92.64-92.94 (30 cm) gave 0.59 wt % Ni. The PGE content is even but quite low (0.02-0.25 ppm), but also the nickel content of these samples were low. The nickel-richest sample contains 0.25 ppm PGEs (Pd 0.16 ppm).

Kylmäpuro, zinc

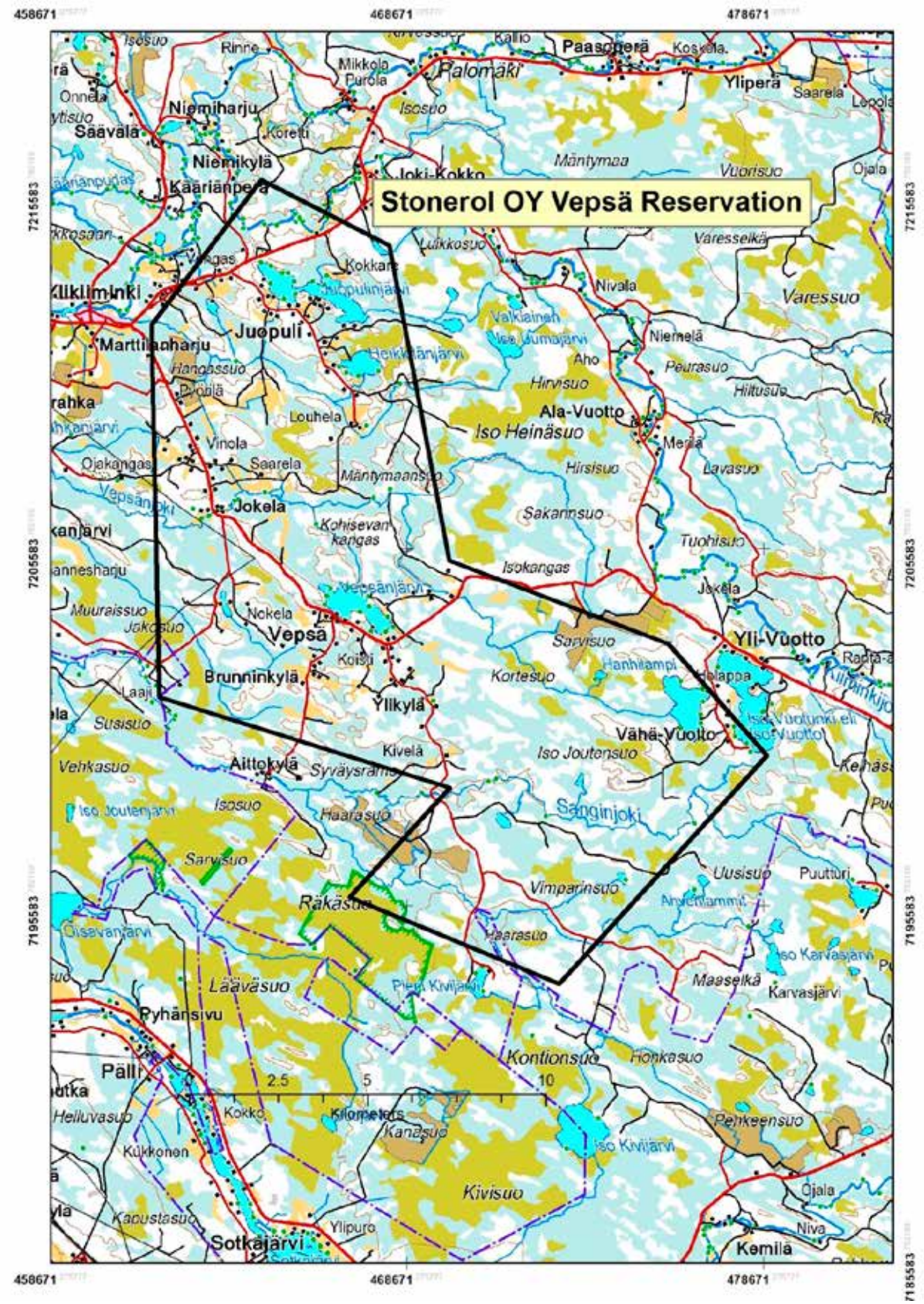
Best sections	1–3 m @ 0.4% Zn, 0.1% Pb, 50 ppm Ag
Discovery	By Kajaani Oy: Zn- and Pb-rich boulder samples provided by amateur prospectors led the company to the area; the deposit was discovered by core drilling guided by basal till geochemistry sampled by percussion drilling.
Exploration history	Kajaani Oy (1981–1990): Bedrock mapping, magnetic and slingram ground survey, percussion drilling into bedrock surface through the overburden, diamond drilling.

Appendix A Reservations on location map



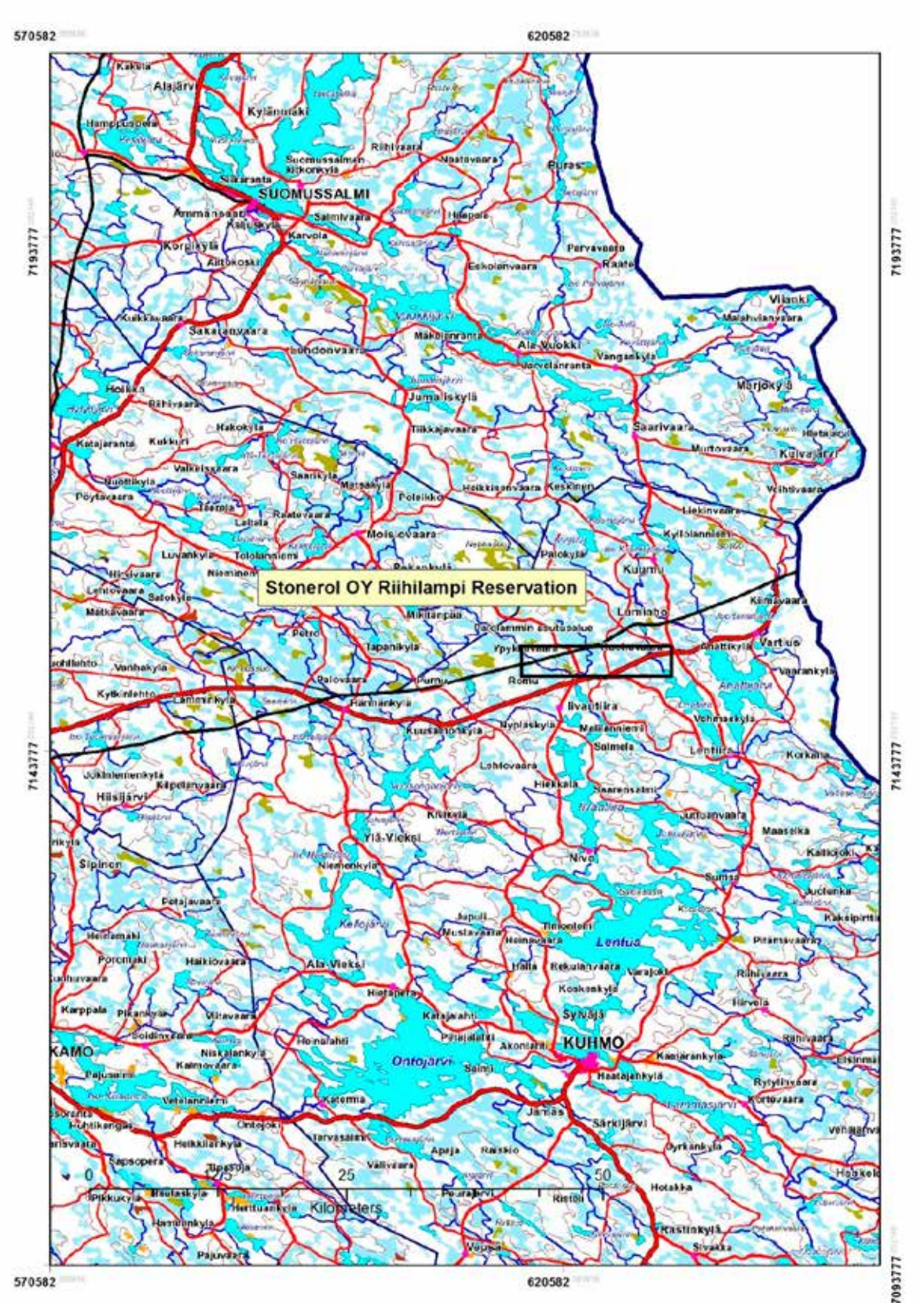
Vepsä reservation on larger scale road map.

Appendix A Reservations on location map



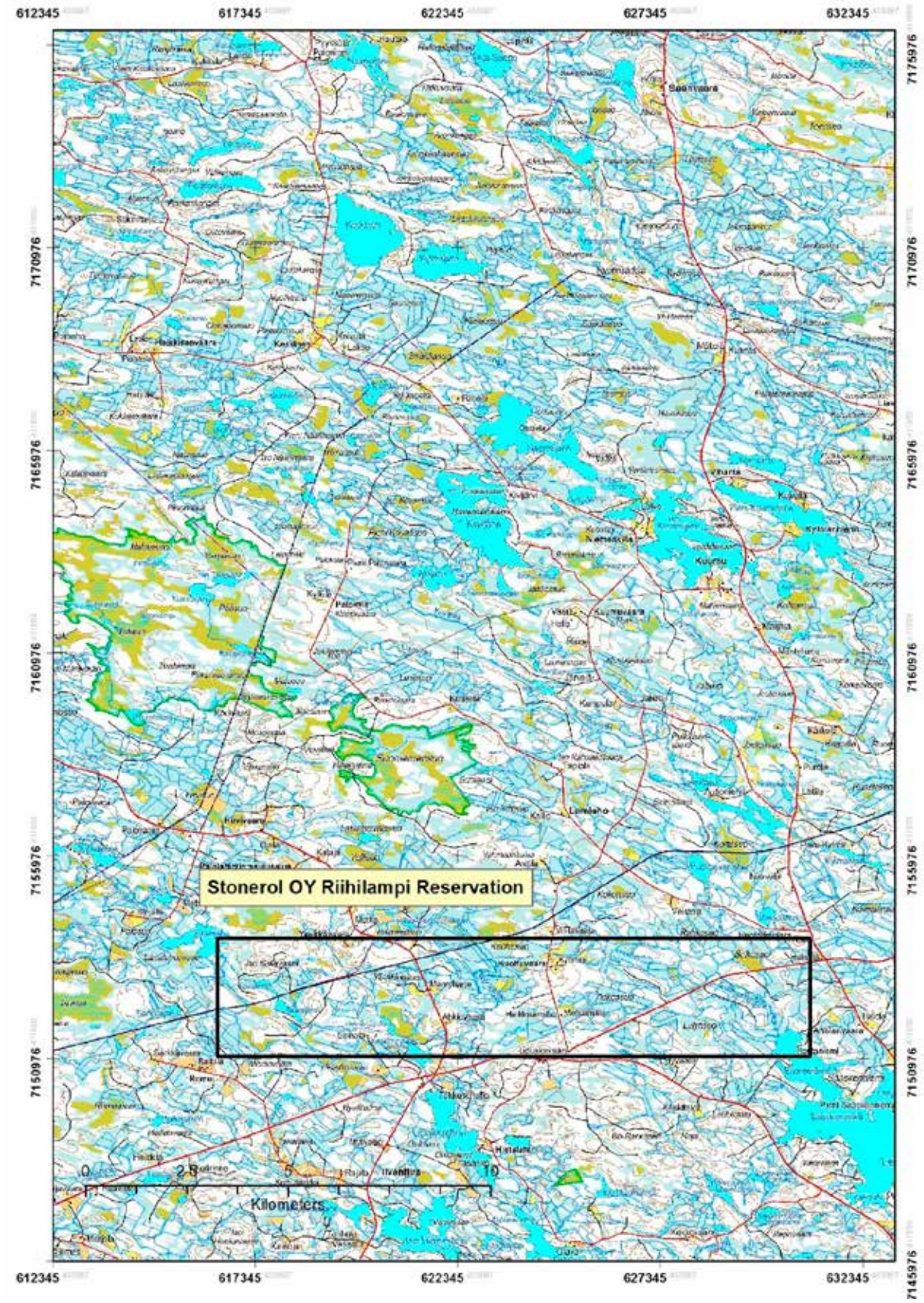
Vepsä reservation on smaller scale road map.

Appendix A Reservations on location map



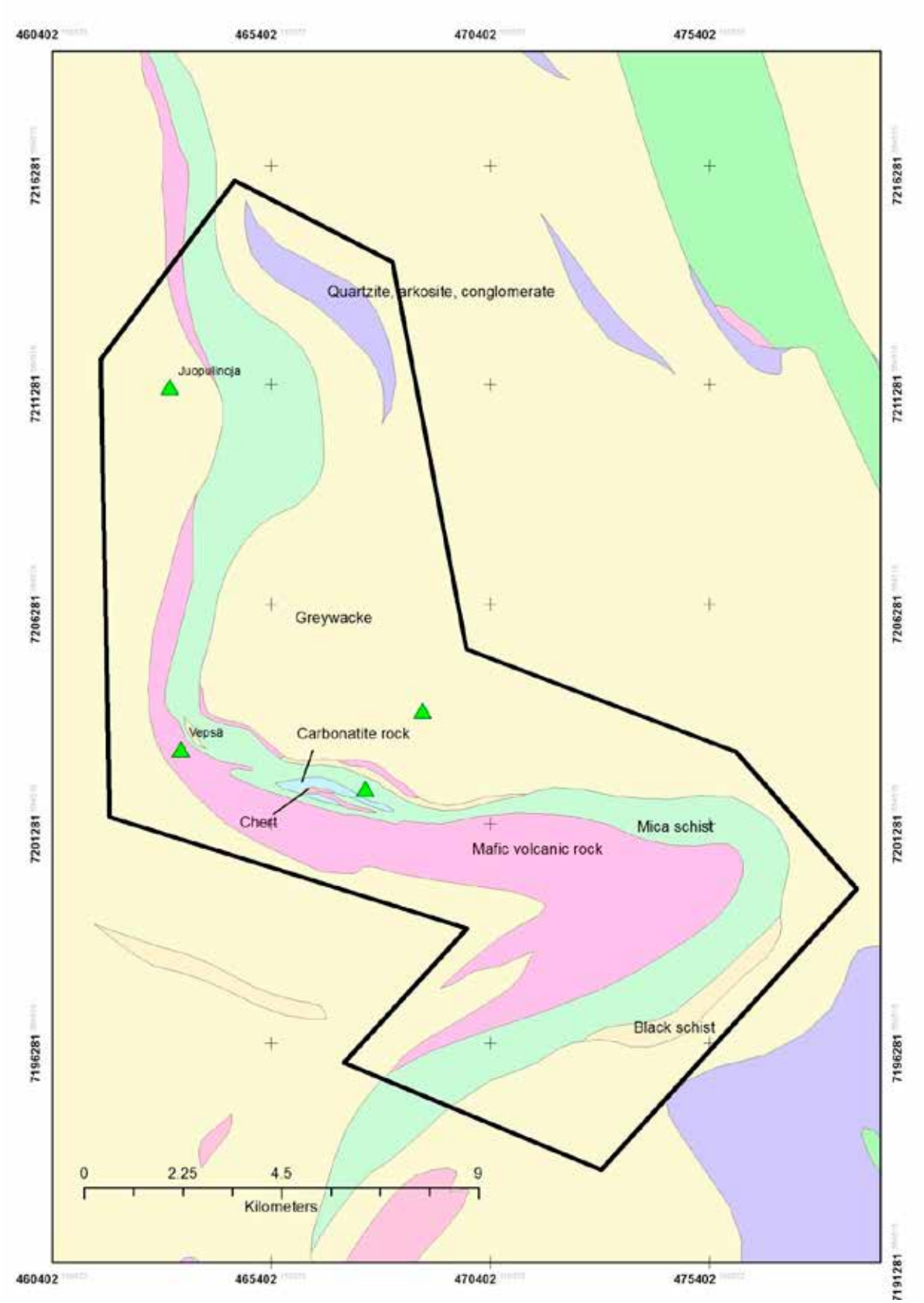
Riihilampi reservation on larger scale road map.

Appendix A Reservations on location map



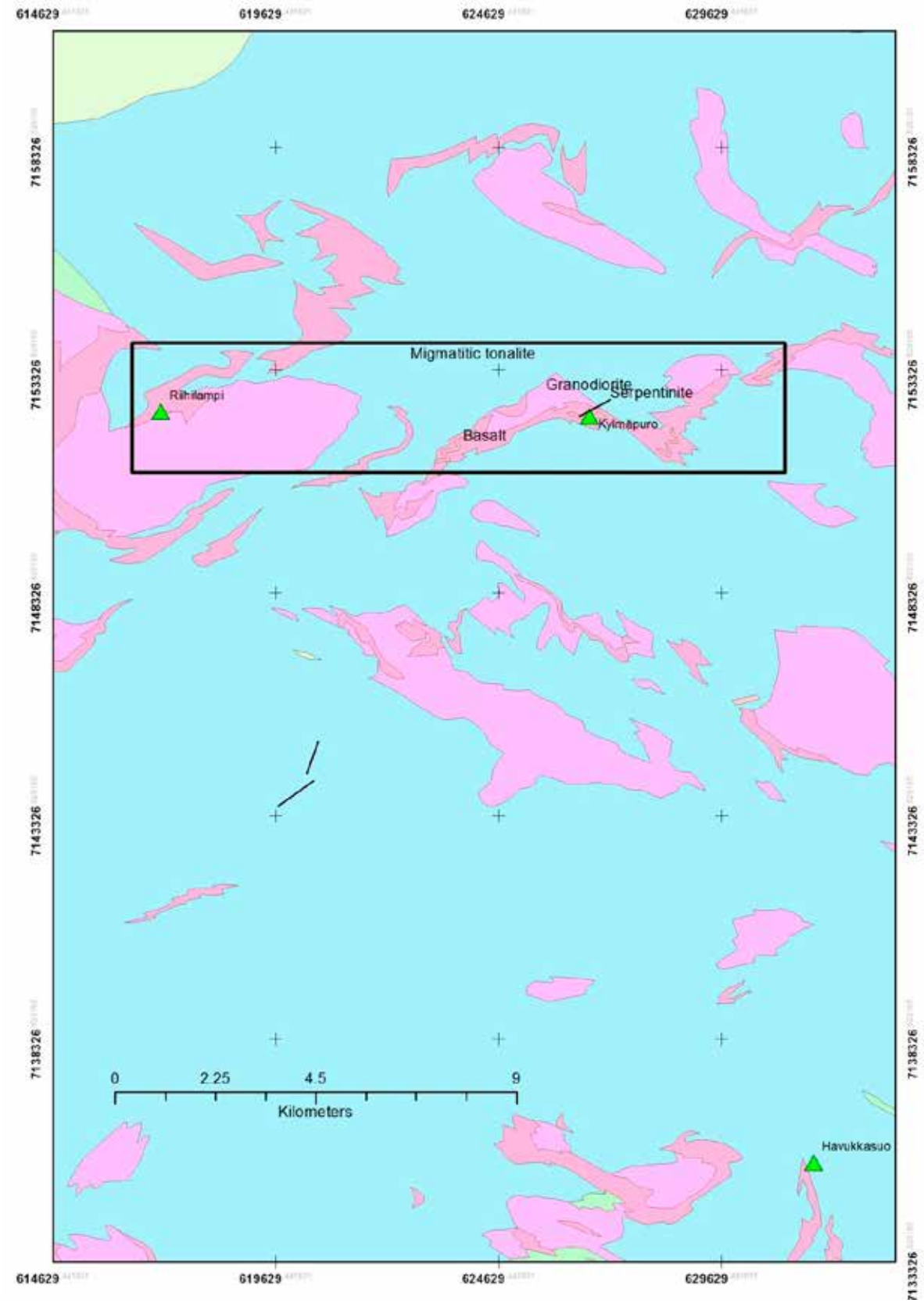
Riihilampi reservation on smaller scale road map.

Appendix B Geological maps of reservations areas



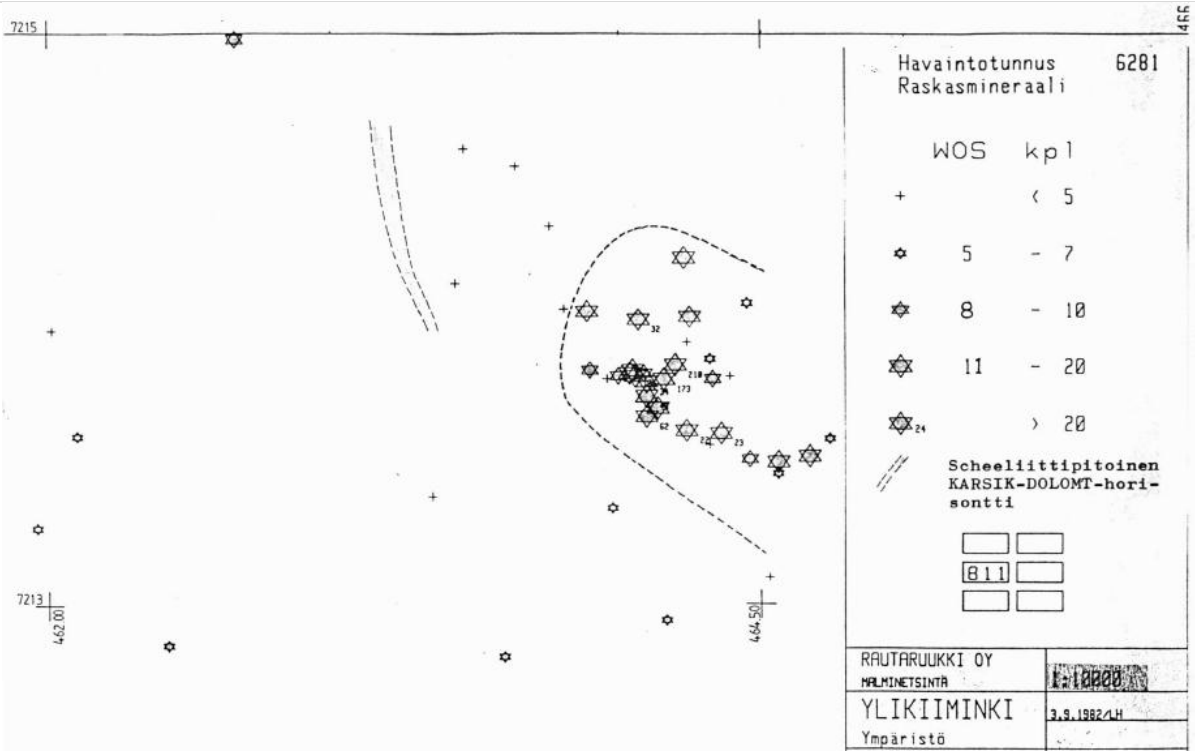
Detailed geological map of the Vepsä reservation area.

Appendix B Geological maps of reservations areas

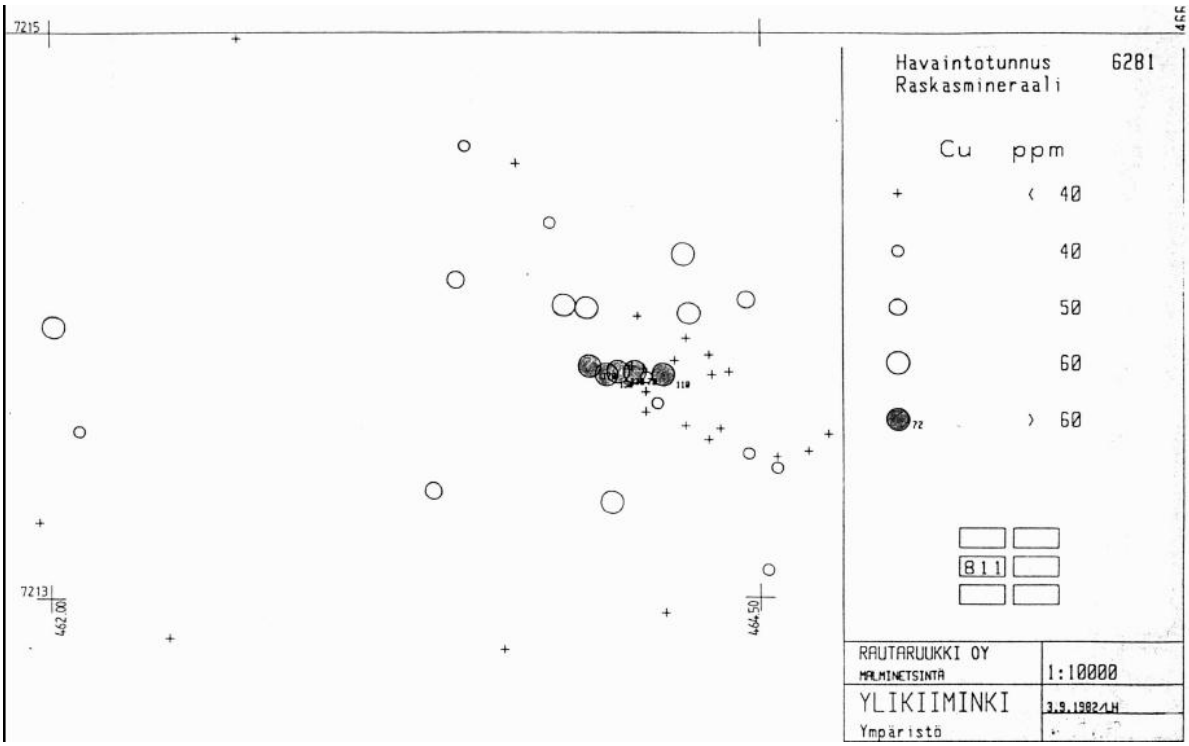


Detailed geological map of the Riihilampi reservation area.

Appendix C Geochemical maps of Juopulinoja prospect (Vepsä)

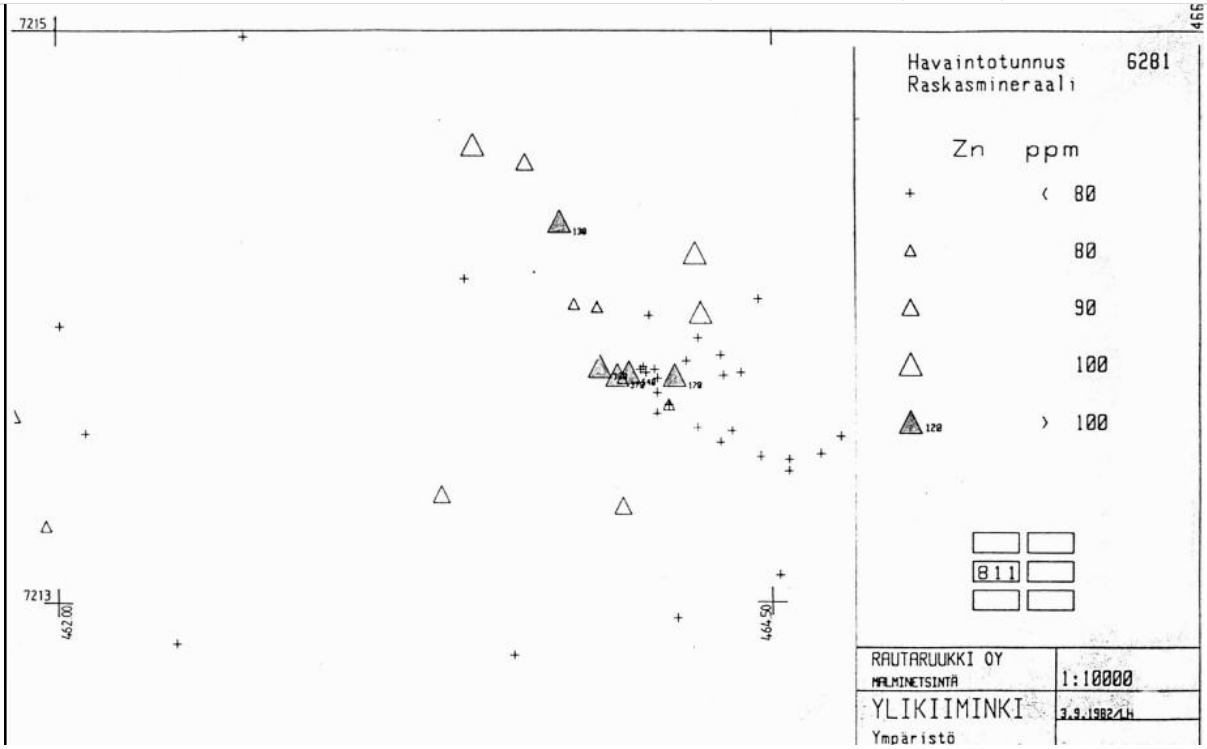


Counts of scheelite (tungsten mineral) grains in heavy mineral separate of till (kpl = pieces). Juopulinoja prospect in the Vepsä reservation area.



Amount of copper in heavy mineral separate of till, ppm = g/t. Juopulinoja prospect in the Vepsä reservation area.

Appendix C Geochemical maps of Juopulinoja prospect (Vepsä)



Amount of zinc in heavy mineral separate of till, ppm = g/t. Juopulinoja prospect in the Vepsä reservation area.

STONEROL

MINUTES SKYPE DISCUSSION

SEPTEMBER 04, 2014

Conclusion / Summarisation of the Skype Discussion on September 4th, 2013

Participants:

- Dr Markku Iljina (MI)
- Dr Markus Elsasser (ME)
- Ann Bjurström (AB)
- Gaby Strausak (GS)

PROJECT GENERATION / NEW TARGETS

Vepsä

Our reservation application has been approved. Further project work to be discussed.

Further development

Some months ago, a junior geologist (woman) sent us an application including her CV as Stonerol Oy had attracted her attention. She is very interested in Stonerol Oy and keen on working for us. As we did not have any job opportunities available at that time and still do not have, we kept her CV on file.

Last month, she noted that our reservation application for Vepsä had been granted. She then sent us a letter of enquiry, explaining that she had done field work in the same geological formation which hosts our Vepsä prospect and that she had measured high silver contents there (close to the city Oulu).

- MI to meet up with this woman to get a first impression, to get to know her better and to find out what she intends to do next. We are still unable to offer her a full-time employment at Stonerol Oy however, we consider to have a field excursion to see her findings.
- MI will find out if her findings were worthwhile to explore (of course after MI checked the geological map). In any case, we should lodge in a small reservation application for this area, asap. We do not know yet, whether this area has already been taken or if someone else is already in front of 'the queue'.
- MI to go on field excursion with her at our Vepsä target. See what her opinion is on this.
- Our proposal to her: EUR 200.- plus EUR 39.- for meeting and field visit (expenditure of time: approx. 2 working days).

Riihilampi

Our reservation application has been approved. MI to do a field trip still before snowfall. Further project work to be discussed.

Tungsten: Please refer to the extra attachment; a report from the European Commission writing about critical raw materials profiles. Tungsten is mentioned on page 193 to page 202.

- Our winter work program (for broader 2015 summer plan): MI to do in-depth research on the metal tungsten. If we were successful, we might get support from the EU because of the strategy we are working with.

Oijärvi/Pentinsuo

This will be our next drilling target during winter 2014/2015 because Oijärvi looks more attractive compared to Tuohivaara. Drilling can be done, even if there was snow.

- MI to present GTK's finding and make planning suggestions.

The greater Salla Area – Tuohivaara

We will make any decisions on Tuohivaara after we are finished with the work at Oijärvi. Tuohivaara looks less attractive compared to Oijärvi.

- MI to present GTK results to us.

DIAMONDS

The diamond samples have arrived from Australia (taken from the ex-Salla area).

- MI to handle the testing for diamonds.

Next Skype meeting: **Monday, October 20th, 2014, 8.00 a.m. CET/ 9.00 a.m. EET**.

Transcript writer: GS/ME - 04.09.2014

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APPENDIX TO THE MINUTES FROM SEPTEMBER 04, 2014

Extract from European Commission Report writing about Critical Raw Materials for the EU of interest: TUNGSTEN

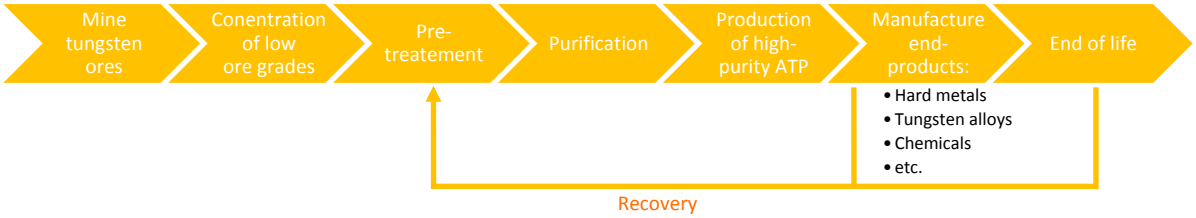
1.19 Tungsten (Wolframium)

1.19.1 Introduction

Tungsten (W, atomic number 74) is relatively rare in the Earth's crust with an estimated abundance of 1.5 ppm.[a] Tungsten has the highest melting point of all metals[b]; therefore it is used for manufacturing filaments for light bulbs, which is the most common application[c]. Another special property is its high density of 19.26g/cm^3; hence the name for this material is derived from the Swedish expression "tung sten" which means heavy stone.[d] Thus, tungsten is 19.3 times heavier than water and 1.7 times heavier than lead. In its unprocessed state, tungsten is brittle and consequently difficult to work.[e] Tungsten carbide is one of the hardest materials (2350 DPH30).[d] Due to this characteristic, it is used for cutting tools which represents the largest use of the element tungsten.[f]

A supply chain map for tungsten is shown in Figure 203. After mining, the ore is concentrated, usually nearby. After this stage the concentrated ore is mixed with in-process and end-of-life scrap and pre-treated to remove impurities. After this stage ammonium paratungstate (APT) is most commonly produced; this is the most common intermediate, used to manufacture other tungsten chemicals and products. All these stages occur within the EU to some extent; mining and concentration occurs on a smaller scale than the upstream processes.

Figure 203: Supply chain map for tungsten



Note: Orange colour represents stages of the supply chain which take place in Europe to some extent

1.19.2 Supply

Primary sources, production and refining

In nature, tungsten does not occur in metallic form but in 45 minerals[g], of which only two, wolframite and scheelite, have any economic importance.[h] Economically recoverable ores contain 0.1-2.5% WO_3.[b] With few exceptions, tungsten is mined in relatively small underground mines which extract less than 2,000 tonnes of ore per day.[i] For commercial trading 65-75% WO_3 content is required for further refining; hence the ores first have to be treated.[j] Beside tungsten ores, today about 30% of tungsten scrap is used as raw material.[k]

[a] Metalle: Die Refraktärmetalle Niob, Tantal, Wolfram, Molybdän und Rhenium, Winnacker-Küchler, 2012

[b] Ullmann's Encyclopedia of Industrial Chemistry: Tungsten, Tungsten Alloys, and Tungsten Compounds, Wiley-VCH Verlag GmbH & Co. KGaA, 2012

[c] European Mineral Statistics 2007-2011, British Geological Survey, 2013

[d] Encyclopedia of the elements: Tungsten, Enghag, Wiley-VCH Verlag GmbH & Co. KGaA, 2004

[e] Facts on File Dictionary of Chemistry (4th edition), Daintith, 2005

[f] European Mineral Statistics 2007-2011, British Geological Survey, 2013

[g] International Mineral Association (IMA), Commission on New Minerals, Nomenclature and Classification: List of Mineral Names, 03/2009 (updated 02/2012)

[h] ITIA www.itia.info

[i] Audion, Labbé, avec collaboration extérieure de la CEIS (2010) - Panorama mondial 2011 du marché du tungstène. Rapport public. BRGM/RP-61341-FR

[j] Audion, Labbé, avec collaboration extérieure de la CEIS (2010) - Panorama mondial 2011 du marché du tungstène. Rapport public. BRGM/RP-61341-FR

[k] Metalle: Die Refraktärmetalle Niob, Tantal, Wolfram, Molybdän und Rhenium, Winnacker-Küchler, 2012

Common processes to obtain tungsten concentrates from ores are sorting, gravity separation, froth flotation, magnetic, and electrostatic separation.[a] The ore-dressing plants are usually close to the mines to keep transportation costs low.[b] Economically, the most important tungsten ores are wolframite and scheelite. The latter is concentrated by gravimetric methods or froth flotation or a combination of both, while wolframite is treated with gravity methods and/or magnetic separation to obtain tungsten ore concentrates.[m]

Following this first concentration step, a pre-treatment of the derived concentrates and of some scrap is applied to remove remaining impurities.[m] Subsequently, APT (chemical formula: $(NH_4)10[H_2W_{12}O_{42}]*H_2O$), which is the main and highly pure intermediate product, is produced.[j] APT is in turn used to produce the chemicals blue and yellow tungsten oxide and tungstic acid, as well as tungsten metal, tungsten powder, ferrotungsten, and other tungsten alloys.[j]

Supply details

Major tungsten deposits are located in China, Canada and Russia.[m] The biggest deposits in Europe currently in use are situated in Portugal and Austria[c] (Table 49).

Table 49: World tungsten mine production and reserves, tonnes of tungsten content

Country	Mine production 2011	Mine production 2012 [e]	Reserves
USA	NA	NA	140,000
Austria	1,100	1,100	10,000
Bolivia	1,100	1,100	53,000
Canada	1,970	2,000	120,000
China	61,800	62,000	1,900,000
Portugal	820	820	4,200
Russia	3,500	3,500	250,000
Other countries	2,700	3,000	760,000
World total (rounded)	**73,100**	**73,000**	**3,200,000**

Source: Mineral Commodity Summaries: Tungsten, US Geological Survey, 2013
(e) Estimated. (NA) Not available.

In 2010, about 85% of the world's tungsten production came from China (Figure 204). Other than China, there are several tungsten producing countries, such as Russia, Bolivia, Vietnam, Austria, Rwanda and Portugal, which make minor contributions to global tungsten production. China is not only the most important supplier of tungsten but also its largest consumer. To ensure the domestic supply, the Chinese government has put a range of measures to limit exports of several kinds of tungsten.[d] The EU relies heavily on tungsten imports. Europe's import dependence for tungsten is estimated at 74%.[e]

[a] Lassner, Schubert: Tungsten - Properties, Chemistry, Technology of the Element, Alloys, and Chemical Compounds, Kluwer Academic, 1999

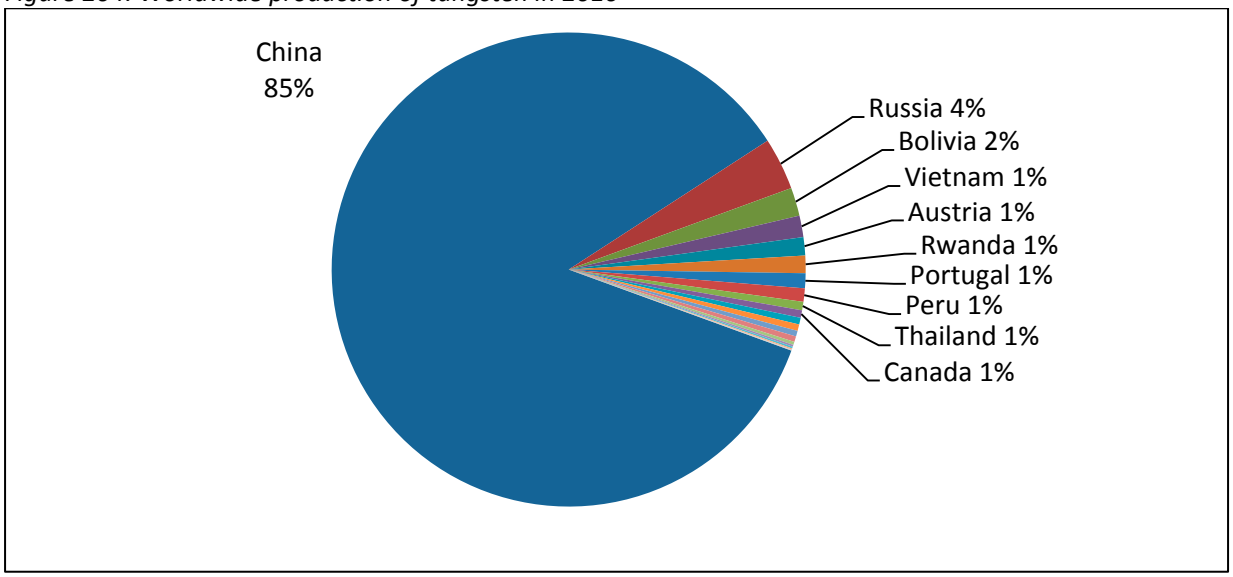
[b] Ullmann's Encyclopedia of Industrial Chemistry: Tungsten, Tungsten Alloys, and Tungsten Compounds, Wiley-VCH Verlag GmbH & Co. KGaA, 2012

[c] Encyclopedia of the elements: Tungsten, Enghag, Wiley-VCH Verlag GmbH & Co. KGaA, 2004

[d] Metal Pages, World Tungsten Report, 2012

[e] Polinares working paper n. 14, European dependence on and concentration tendencies of the material production, March 2012

Figure 204: Worldwide production of tungsten in 2010

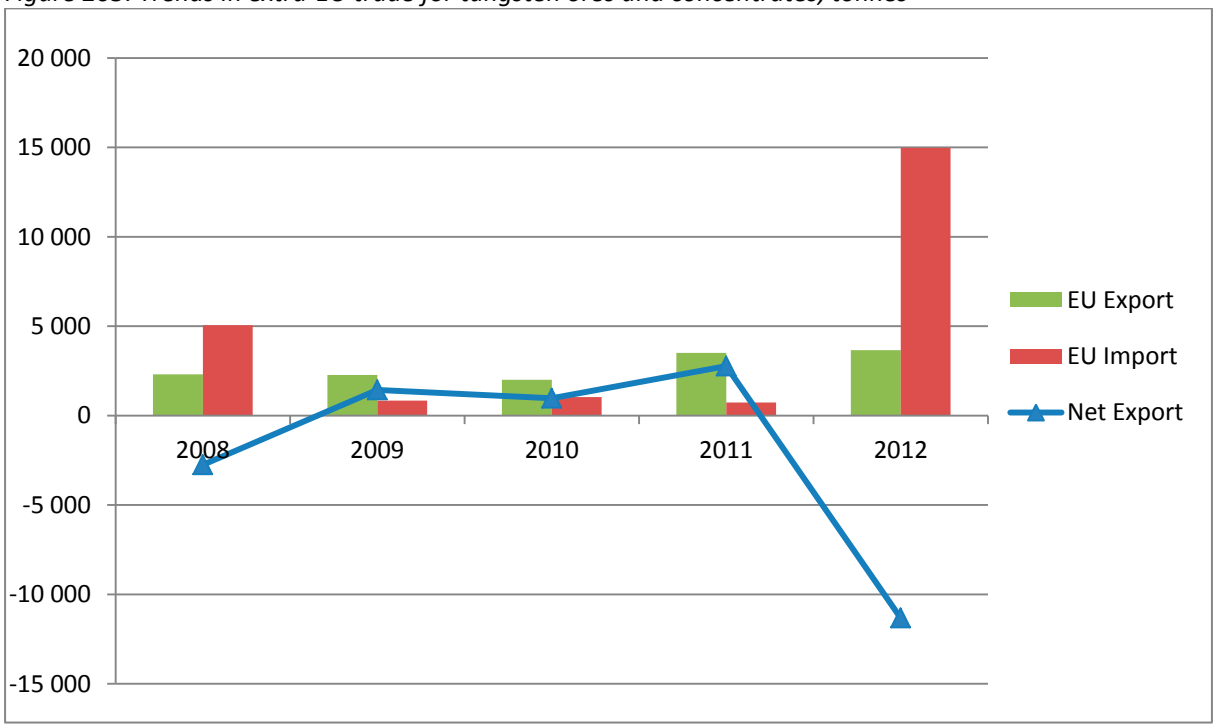


Source: World Mining Data 2012

EU trade flows and consumption

Trade flow data for the past five years shows that, after a period of relative balance in import and export, there has been a large growth in import in the last year – imports grew even further up to 70 000 t in 2013. These figures do not include trade of substances and articles derived from tungsten ores and concentrates such as APT.

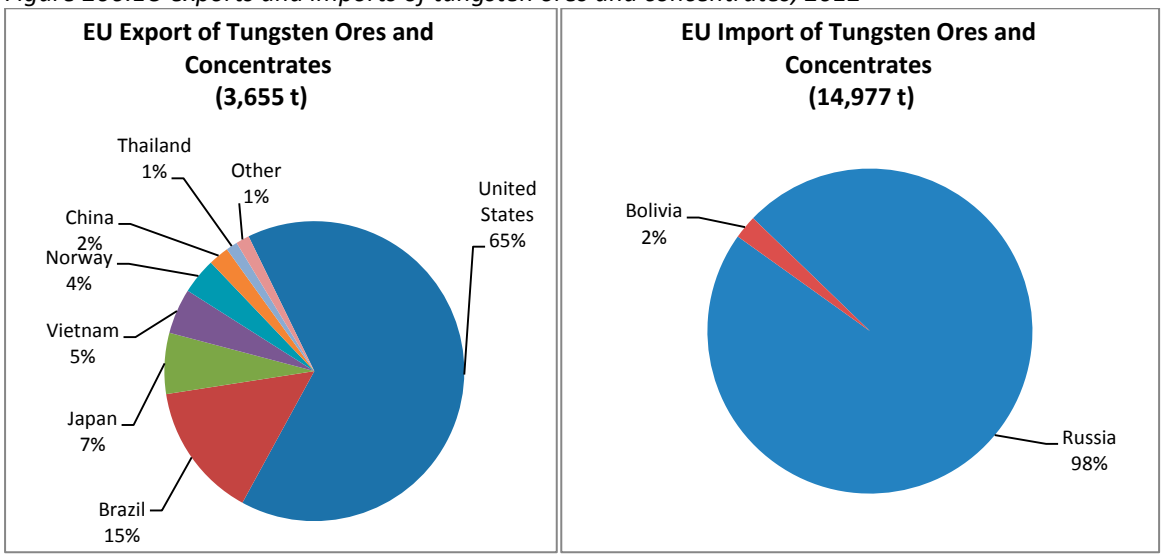
Figure 205: Trends in extra-EU trade for tungsten ores and concentrates, tonnes



Source: Eurostat-Comext Database, Code 26110000 [Accessed November 2013]

Data for 2012 shows that the major export partners of the EU are the USA, Brazil, Japan, and several other countries (Figure 206). By contrast, data for EU imports show that they are dominated by Russia, exceeding total Russian supply, indicating that this is imported to Russia prior to export to the EU.

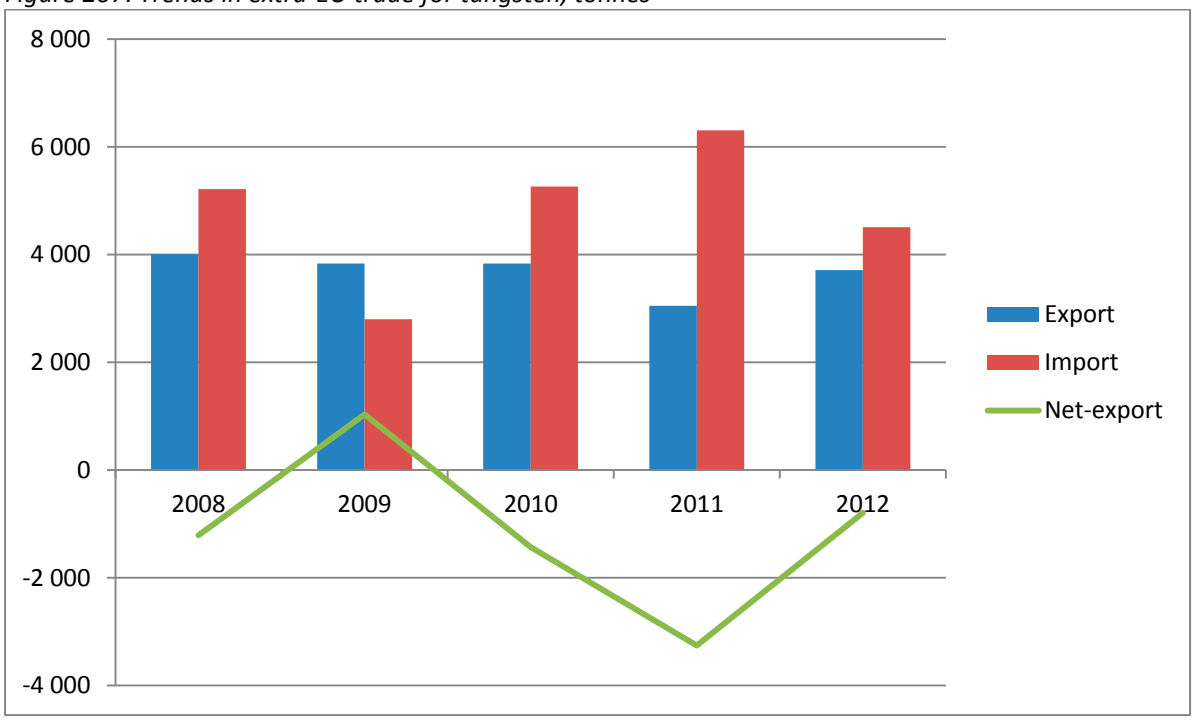
Figure 206:EU exports and imports of tungsten ores and concentrates, 2012



Source: Eurostat-Comext Database, Code 26110000 [Accessed November 2013]

Trends for unwrought tungsten, articles of tungsten and tungsten waste and scrap are shown in Figure 207. The EU is overall a net-importer importer importing on average 1,100 tonnes between 2008 and 2012. These figures do not include all forms of tungsten and are therefore not complete.

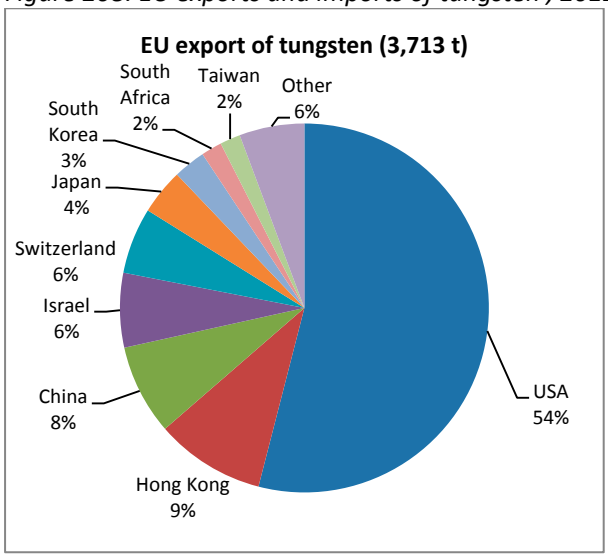
Figure 207: Trends in extra-EU trade for tungsten, tonnes

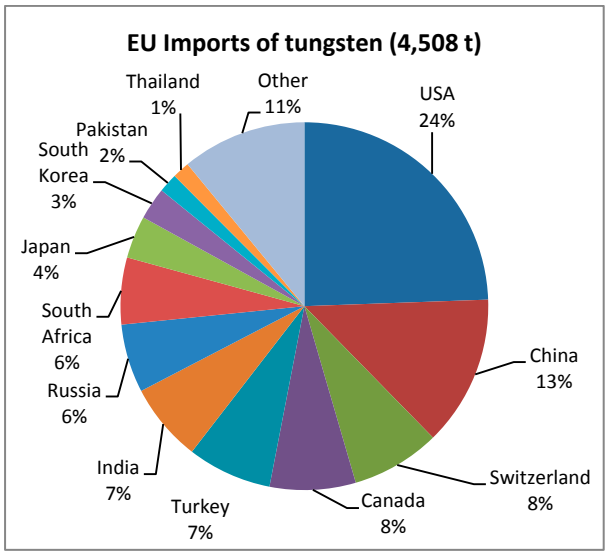


Source: Eurostat-Comext Database, CN 8101, tungsten "wolfram" and articles thereof, n.e.s.; tungsten waste and scrap (excl. Ash and residues containing tungsten) [Accessed November 2013]

Figure 208 shows the major trading partners for unwrought tungsten, articles of tungsten and tungsten waste and scrap. As can be seen, the US is both the major importer and exporter of these materials. This likely to be due to different forms of tungsten being produced and used in different countries.

Figure 208: EU exports and imports of tungsten , 2012



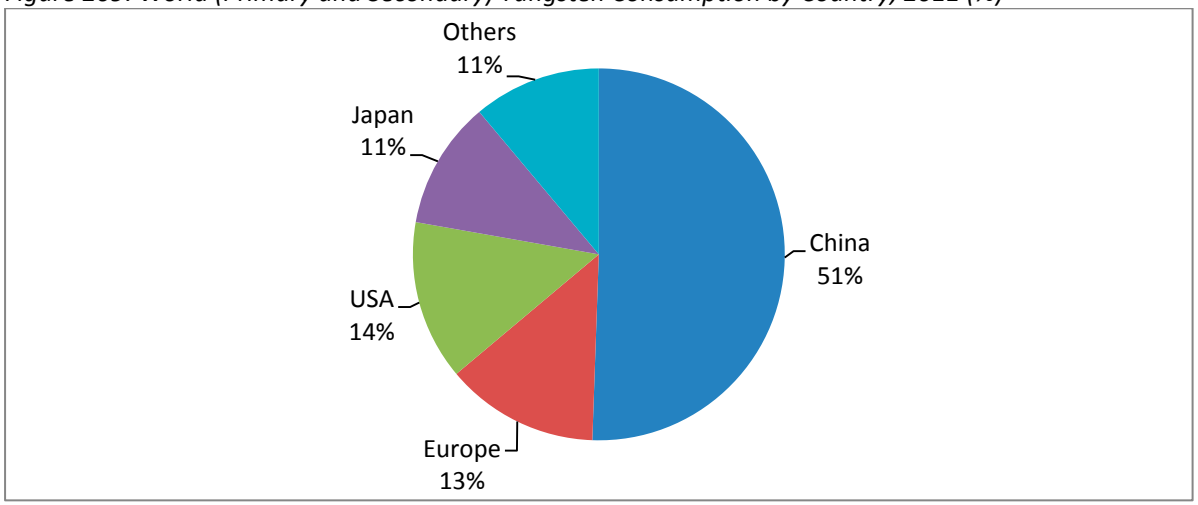


Source: Eurostat-Comext Database, CN 8101, tungsten "wolfram" and articles thereof, n.e.s.; tungsten waste and scrap (excl. Ash and residues containing tungsten) [Accessed November 2013]

Europe's share of world primary and secondary tungsten consumption is estimated at 12,000 tonnes or 13% of the world total of 90,000 tonnes for 2011.

China is the world's largest tungsten consumer, with approximately half of total world consumption. The United States accounts for 14% and Japan 11%, with 11% in other countries (Figure 209).

Figure 209: World (Primary and Secondary) Tungsten Consumption by Country, 2011 (%)



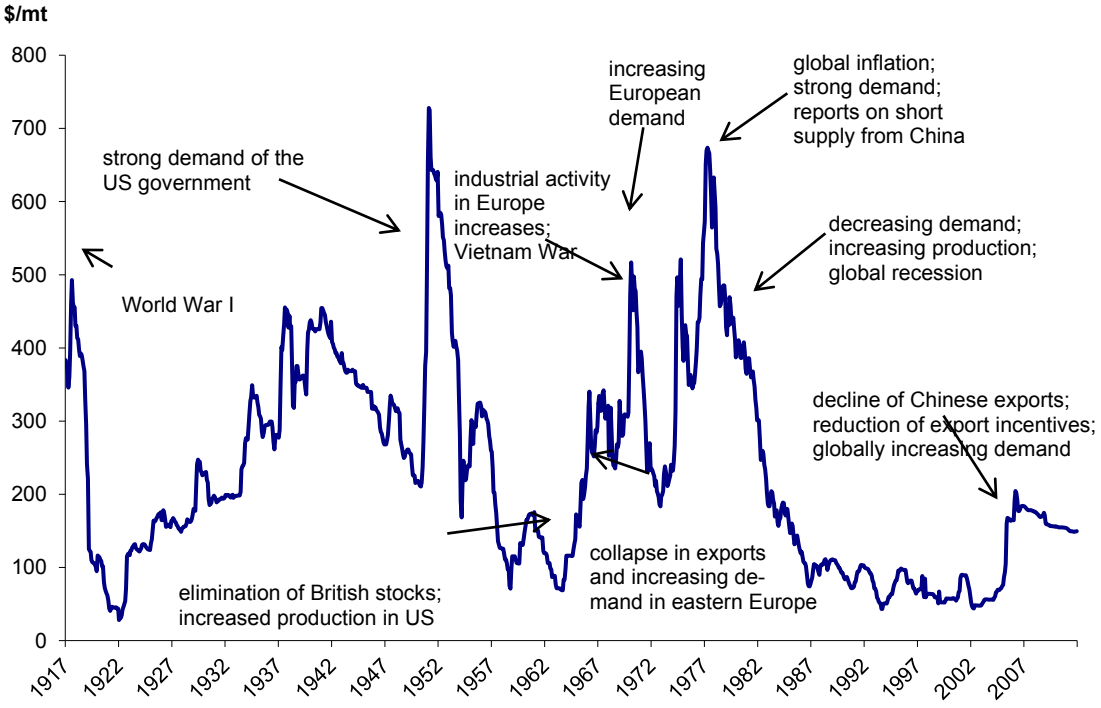
Source: Roskill Presentation (December 2012), Tungsten: Trends in demand and a short primer on China

1.19.3 Demand

Prices and markets

Due to its exceptional properties, tungsten has been considered economically important throughout the last century. Figure 210 shows how the different supply and demand situations worldwide influenced tungsten prices during that time. Tungsten prices have been more stable and less volatile during the 1980s and 1990s compared to historical trends. It was not until 2005/2006 that prices climbed again when global demand increased while Chinese exports declined. [a]

Figure 210: Development of real tungsten prices (Prices are deflated, 2011 = 100).



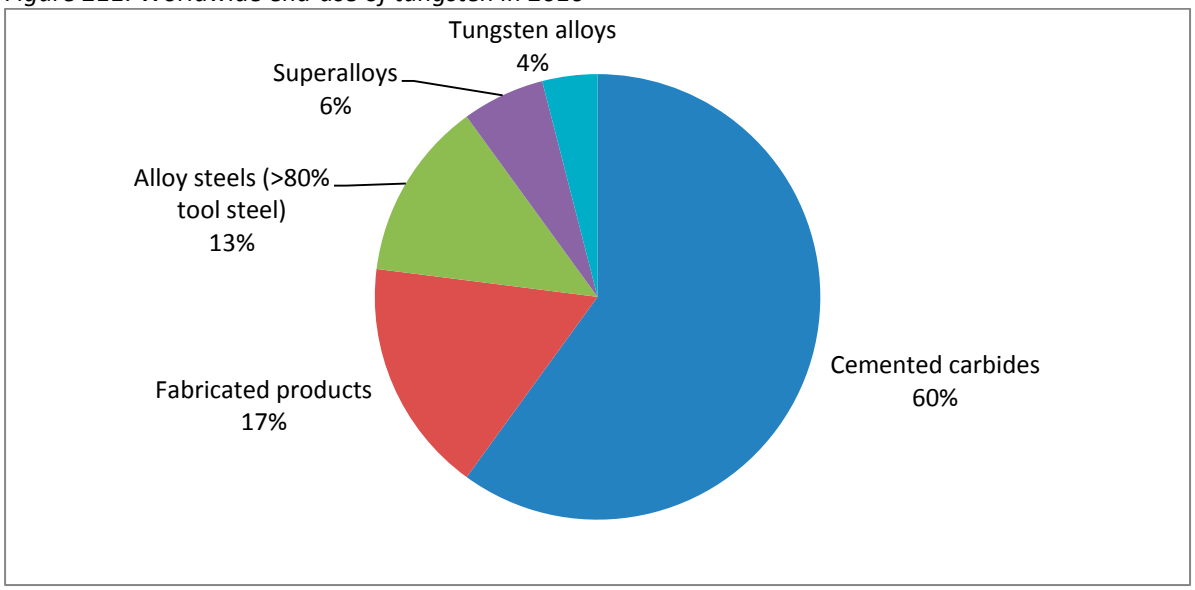
[a] DERA, HWWI (2013) Ursachen von Preispeaks, -einbrüchen und –trends bei mineralischen Rohstoffen. April 2013.

Source: DERA, HWWI (2013) Ursachen von Preispeaks, -einbrüchen und –trends bei mineralischen Rohstoffen (Causes of price peaks, collapses and trends of mineral raw materials), Hamburg Institute of International Economics (HWWI) in contract for Deutsche Rohstoffagentur (DERA). April 201, translated into English by Fraunhofer ISI

Applications

Due to its exceptional physical properties, tungsten is used for a wide range of applications. The largest share (60%) is used for the production of cemented carbides. The rest is used for fabricated products, alloy steels, super alloys and tungsten alloys (Figure 211). Worldwide data is shown as European data was not available at the time of writing.

Figure 211: Worldwide end-use of tungsten in 2010



Source: Critical Raw Materials for the EU 2010

The majority of tungsten is used for hard metals whose main component is tungsten carbide (WC). They are characterized by high wear resistance even at high temperatures. Therefore hard metals are used for cutting and drilling tools.[a] Similar properties arise from the addition of tungsten to steel.[a]

The widest range of applications is represented by tungsten alloys. They are used in lighting technology, electrical and electronic technology, high-temperature technology (e.g. furnaces, power stations), welding, spark erosion, space travel and aircraft devices, armaments and laser technology.[a]

1.19.4 Outlook

The outlook forecast for the world tungsten supply and demand is shown in Figure 212. Overall market growth for tungsten is expected to be reasonably strong, with annual growth forecast at around 4.5% per year to 2020. Particularly strong growth is expected in the tungsten chemicals sector, with the size of this market segment expected to double by 2020. Demand growth in the more established cemented carbides, steel alloy and tungsten products will be slightly more moderate at 3-4% per year.

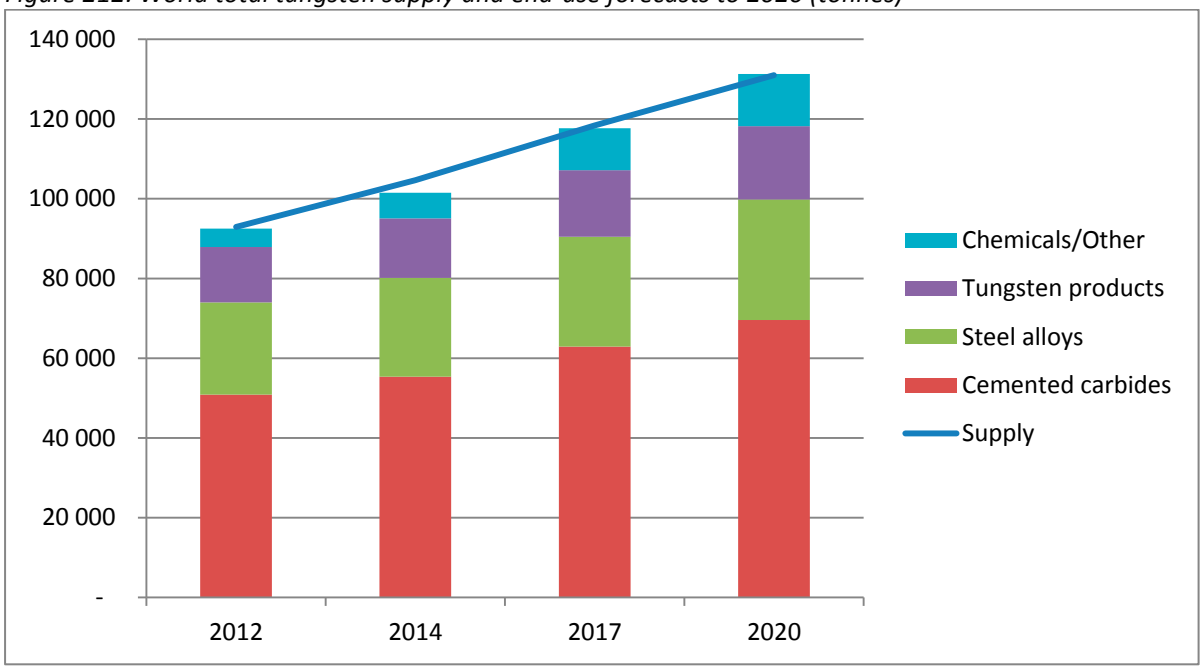
On the supply side, higher prices have stimulated greater interest in both new mine projects and also recycling. Considerable growth is expected to take place for secondary production, in particular. The share of secondary tungsten is anticipated to increase from around a quarter to nearer a third of total world tungsten supply by 2020. In terms of primary production, Asia's share of world tungsten mine production is expected to fall below 80% by 2020, with corresponding increases in Europe, North America and Australia, where there are quite a number of development projects. Some of these have reported

[a] Ullmann's Encyclopedia of Industrial Chemistry: Tungsten, Tungsten Alloys, and Tungsten Compounds, Wiley-VCH Verlag GmbH & Co. KGaA, 2012

mine plans for the life of the mines of only 4-5 years; although it is likely that the mines will continue beyond these initial life times, as further reserves are identified and exploited.

Overall, the market for tungsten is expected to remain roughly in balance, with a small surplus opening up by 2014, as some new mines reach the market. However, by 2017 and 2020, demand is expected to catch up again with these scheduled production increases.

Figure 212: World total tungsten supply and end-use forecasts to 2020 (tonnes)

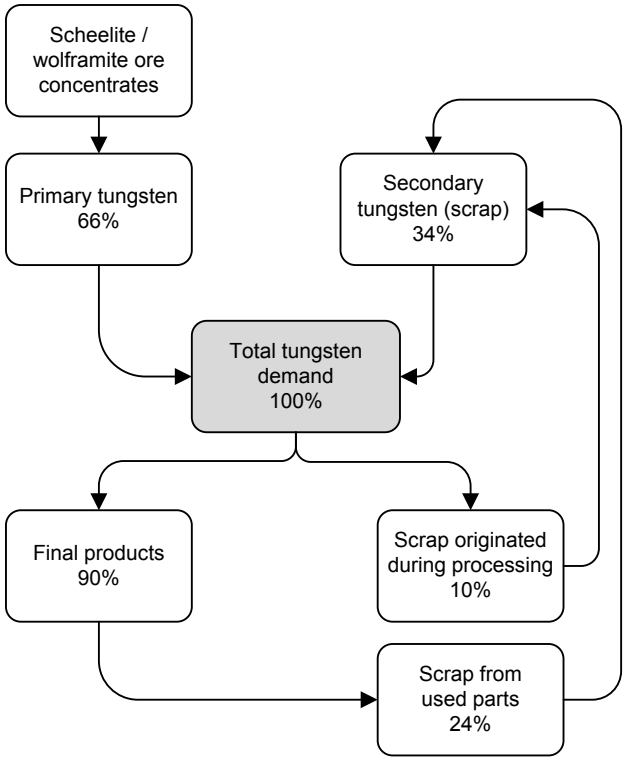


Source: Roskill Information Services for 2013 CRM study

1.19.5 Resource efficiency and recycling

Compared to tungsten-bearing ores, tungsten scrap has high tungsten content; therefore recycling is important to supply the total tungsten demand (Figure 213). Moreover the value of further metals in tungsten alloys (e.g. tantalum, cobalt, nickel) leads to economic recycling, as well as environmental benefits.[a] In the quantitative assessment, a recycling rate of 0.37 has been used.

Figure 213: Tungsten flowchart: Primary and secondary tungsten



Source: Ullmann's Encyclopedia of Industrial Chemistry: Tungsten, Tungsten Alloys, and Tungsten Compounds, Wiley-VCH Verlag GmbH & Co. KGaA, 2012

Due to tungsten's unique properties, substitutes for most applications result in a loss of performance or in an increased cost; however, there are some potential substitutes for tungsten. In cemented carbides and other applications, tungsten and its compounds can be replaced by molybdenum, titanium, ceramics depleted uranium or hardened steel. For lightning equipment tungsten filaments can be substituted by carbon nanotube filaments, light-emitting diodes or other light sources.[a]

Figure 214: Substitutability of tungsten scoring used in the analysis

Use	Substitutability score
Tungsten alloys	0.7
Superalloys	1.0
Fabricated products	1.0
Alloy steels (mainly tool steel, >80%)	0.7
Cemented carbides	0.7

[a] Mineral Commodity Summaries: Tungsten, US Geological Survey, 2013

1.19.6 Specific issues

China - the world's largest supplier of tungsten ores, concentrates and intermediates - has placed restrictions on exports of these materials. The export quota for tungsten has been falling over time, reducing from 15,700 tonnes to 15,400 tonnes between 2011 and 2012. [a] A trade dispute is currently underway at the World Trade Organisation on the legality of China's export quota system.

According to the Directive 2005/32/EG the European Parliament establishes a framework for ecodesign requirements for energy using products. As a consequence, some kinds of incandescent lamps were phased out from the EU market from 2009 to 2012.[b] However, the amount of tungsten used for light bulbs represents only a minor part of the total quantity of tungsten traded worldwide.

[a] World Tungsten Summary, Metal Pages Ltd. 2012

[b] ec.europa.eu/energy/efficiency/ecodesign/doc/committee/2008_12_08_technical_briefing_household lamps.pdf, retrieved online: 30 August 2013

Drilling Program Photographs, Tervola in February 2014

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