

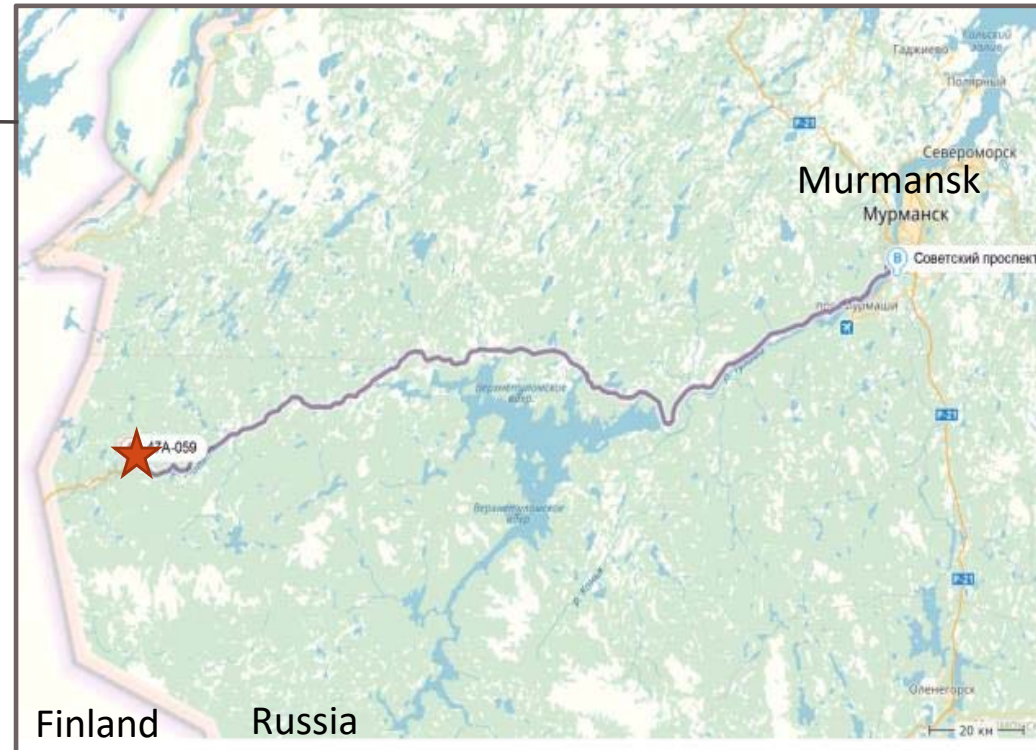
# Skytevarn Project

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INDUSTRIAL (ABRASIVE) GARNET PLACER DEPOSIT

LOTTA, MURMANSK REGION, NORTH-WEST RUSSIA

# Location



# License



Subsoil license MYP 00922 TP «Skytevarn Resources» LLC 2018 – 2023.





# Geology

Placer garnet deposit Skytevarn is located within beach medium-grained sands, formed as a result of rewashing of glacial sediments in sea lagoon environment 8000 years ago.



Area of occurrence

3 sq. km

Sand volume

11 million m<sup>3</sup>

Garnet content

280 kg/m<sup>3</sup> (18 mass.%)

Total garnet resources on licence area is 9.1 Mt

# Characteristics of garnet sands

Average size distribution of garnet sands from Skytevarn placer, mm

			80 mesh	120 mesh	
Class	>0.8	>0.315	>0.16	>0.071	<0.071
Wt. %	0.21	23.6	45.9	23.1	7.19

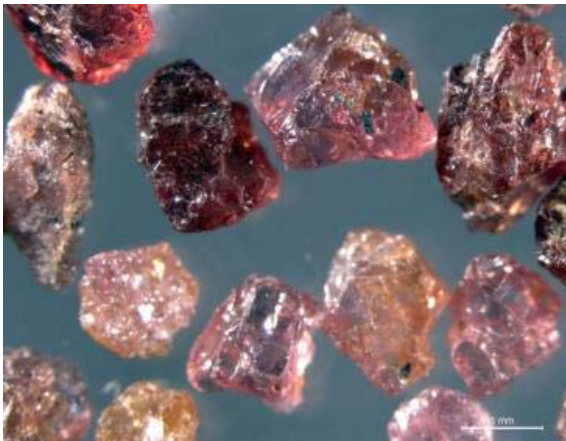
Garnet content (based on 74 samples):

Min = 3.8 wt.%

Max = 45.5 wt.%

Average = 17.8 wt. %

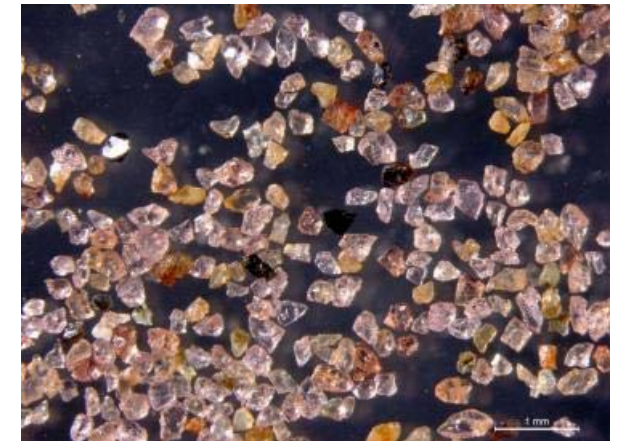
Almandin-pyrope garnet from Skytevarn placer, poorly-rounded grains. Scale bar – 1 mm



size fraction -2+1 mm



size fraction -0,8+0,5 mm



size fraction -0,3+0,16 mm

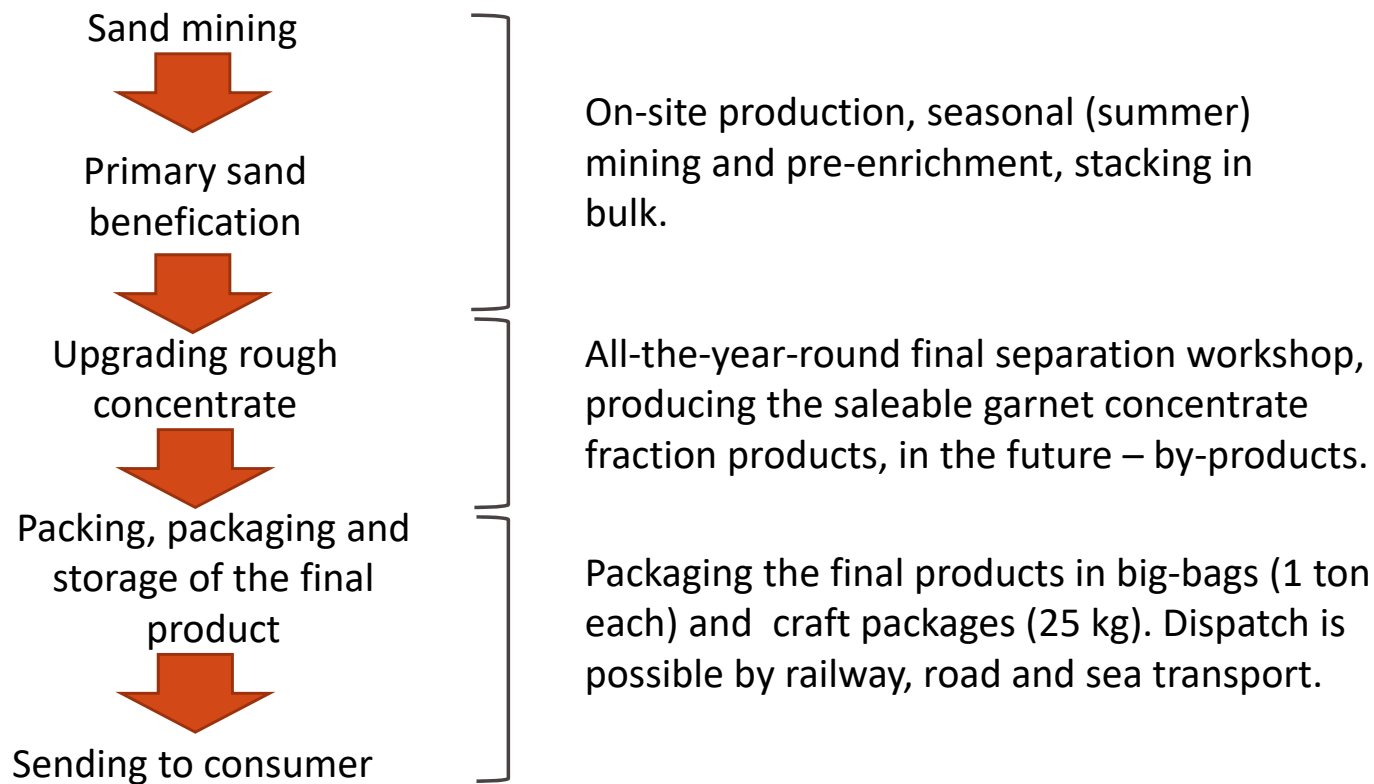
# Resource estimation

Estimated resources of sand and garnet on Skytevarn area								
Category	Area, m <sup>2</sup>	Volume, m <sup>3</sup>	Bulk density, t/m <sup>3</sup>	Ore-bearing ratio	Sand reserves, t	Garnet content, %	Garnet reserves, t	Average thickness of sands, m
Inferred resource (Russian reserves C1)	120 000	746 821	1.66	0.7	867 806	17	147 527	4.4
Inferred resource (Russian reserves C2)	932 837	7 092 548	1.66	0.7	8 241 541	17	1 401 062	5.3
Estimated resources of sand and garnet on Kollokoski area								
Category	Area, m <sup>2</sup>	Volume, m <sup>3</sup>	Bulk density, t/m <sup>3</sup>	Ore-bearing ratio	Sand reserves, t	Garnet content, %	Garnet reserves, t	Average thickness of sands, m
Inferred resource (Russian reserves C1)	90 000	598 397	1.66	0.7	695 337	15	104 301	4.7
Inferred resource (Russian reserves C2)	658 610	3 551 222	1.66	0.7	4 126 520	15	618 978	3.8
Estimated resources of sand and garnet on Madsash area								
Category	Area, m <sup>2</sup>	Volume, m <sup>3</sup>	Bulk density, t/m <sup>3</sup>	Ore-bearing ratio	Sand reserves, t	Garnet content, %	Garnet reserves, t	Average thickness of sands, m
Inferred resource (Russian resources P1)	1 571 230	3 992 523	1.66	0.7	4 639 312	15	695 897	1.8



# Technological chain of planned production of garnet concentrate

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# Economics

Parameters	Unit	Production options		
Annual sand production rate	kt/year	65	260	655
	thousand m <sup>3</sup> /year	40.6	162.5	409.4
Amount of saleable concentrate	t	9 926	39 705	100 027
Annual net income	mln \$	-1.41	2.50	8.95
Capital costs	mln \$	1.91	2.70	4.14
Operating costs	mln \$	3.41	4.98	9.28
Full annual cost of final product	mln \$	2.04	8.14	20.51
Total expenses for 1t of garnet sand	\$/t	52.45	19.17	14.17
Value of garnet sand	\$/t	31.32	31.32	31.32
<b>NPV</b>	mln \$	-9.52	14.06	52.85
<b>IRR</b>	%	-	106.41	263.96
<b>PI</b>	unit	-3.5	5.6	12.0



# Project development stages

<b>1 stage</b>	Exploration, placing commercial minerals on the State balance sheet, obtaining a mining license	<u>Costs:</u> approximately \$1 mln; Period – 2 years
<b>2 stage</b>	Designing, construction, start up operations	<u>Costs:</u> approximately \$7.7 mln (depending on production rate); Period – 2 years
<b>3 stage</b>	Mining, selling the final product on internal and external market	NPV \$14,06 mln, IRR 106% (based on 260 kt/year production rate), Payoff period 2,5 years

# Contacts

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