KRUTA BALKA BLOCK WITH KRUTA BALKA PROSPECTIVE FIELD

Mineral: main minerals - tantalum ores, niobium ores, lithium ores, rubidium ores, cesium-containing ores; accompanying minerals: feldspar, quartz, muscovite, granodiorite, vein quartz, amphibolite.
Type, period of subsoil use: 20-years licenses for exploration, pilot development and production.

Location: Berdyansk district of Zaporizhzhya region, 2.5 km southwest of Radyvonivka village and 5.5 km north of Osypenko village, on the right bank of Berda river. The T-08-19 highway is 150 m to the west and the M-14 highway is 2.6 km to the south.
Block area: 146.69 ha.

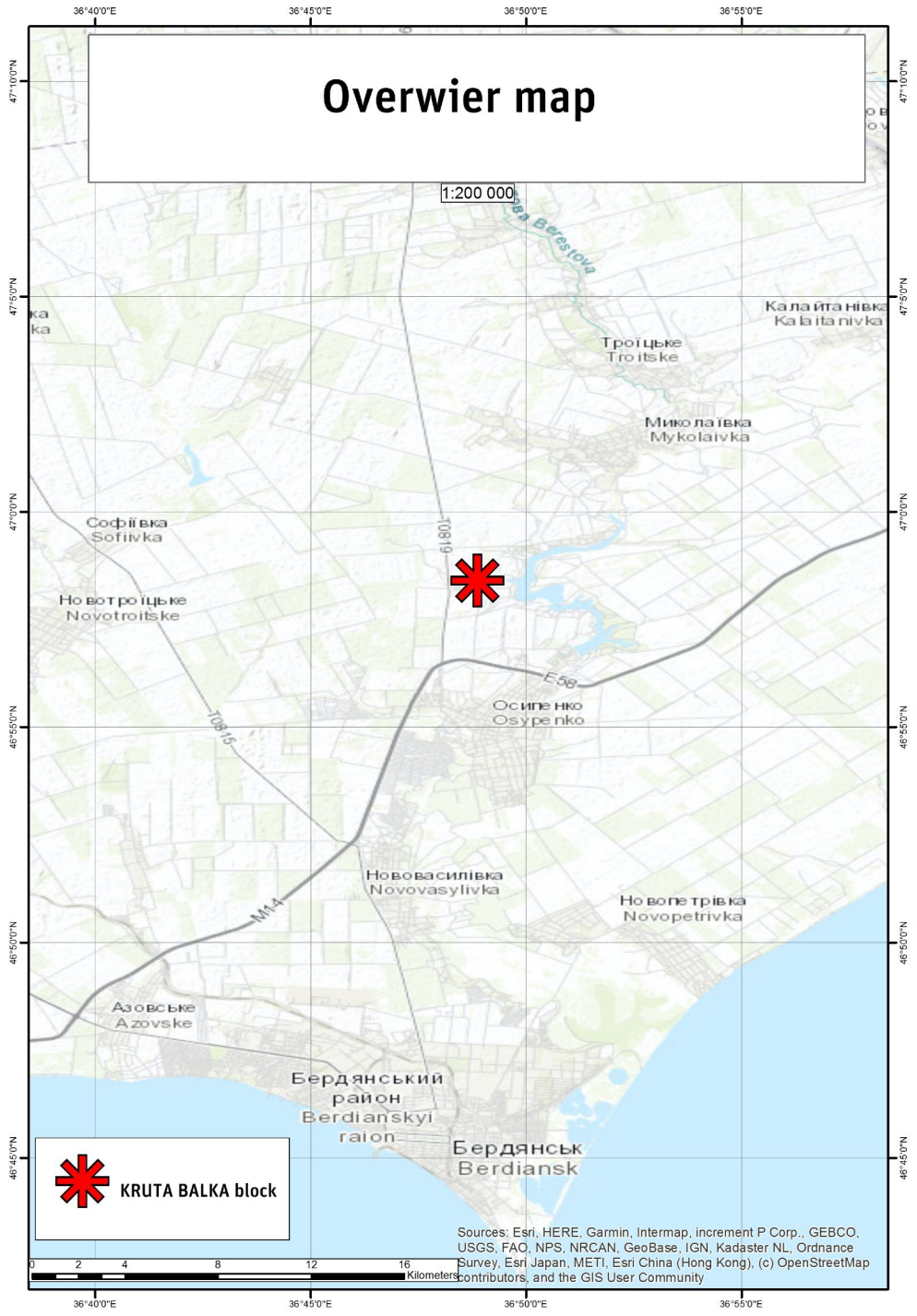
Geological summary: The structure of the complex rare-metal prospective field of the Kruta Balka involves rocks of the Archean (West Pryazovska series) and Lower Proterozoic (Central Pryazovska series) metamorphic complexes, weak metamorphosis of Lower Proterozoic intrusions of basic and ultrabasic composition, as well as vein formations (pegmatites and quartz veins). Within prospective field, conditionally, considering the morphology, material composition and chemistry of pegmatites, there are three ore-bearing zones, in which the blocking of reserves is performed separately. Within the first ore-bearing zone, the concentration of tantalum pentoxide varies from 0.001% to 0.268%, niobium pentoxide 0.001-0.036%, lithium oxide - 0.008%-4.0%, rubidium oxide - 0.006-0.094%, cesium oxide - 0.001-0.041%. The maximum concentrations of tantalum are typical for the zones of medium-coarse-grained albite (clevelandite) and the maximum lithium content is confined to the quartz-albite-spodumene zones. After the fall, the concentration of tantalum and lithium increases slightly. Within the middle ore-bearing zone, the increased content of tantalum pentoxide is typical for mica-feldspar and spodumene zones, where it reaches maximum values of 0.176%. In other areas, the tantalum pentoxide content ranges from 0.001 to 0.06%. Niobium in pegmatites is distributed more evenly and forms concentrations from 0.01% to 0.029%. Highest concentrations of lithium are characterized for pegmatites of the second ore-bearing zone. The content of lithium oxide in general ranges from 0.02% to 6.55%, with maximum concentrations that is typical for quartz-spodumene and quartz-albite-spodumene zones. All zones of pegmatites are characterized by the presence in a variable amount of niobium pentoxide - 0.0015-0.022%, rubidium oxide 0.005-0.395%, cesium oxide - 0.001-0.129%, zirconium dioxide - 0.002-0.06%, tin - 0.001%, the amount of liquid land up to 0.009%, beryllium oxide - 0.0006-0.02%. Within the lower ore-bearing zone, the content of tantalum pentoxide varies in the range of 0.001-0.0188%, niobium pentoxide - 0.001-0.009%, lithium oxide - 0.02-1.43%, rubidium oxide - 0.001-0.096%, cesium oxide - 0.001-0.033%. Concentrations of liquid lands (up to 0.007%) have been established at certain intervals. Pegmatites, except for tantalum niobates, contain spodumene, feldspar, muscovite and quartz. Taking into account simple engineering-geological and hydrogeological conditions the open method of further development of deposits is the most advisable one. Available geological information: In 1967-1975, the Artemgeology Trust discovered a complex tantalum-lithium-cesium manifestation called Kruta Balka during exploration within the Sorokin Tectonic Zone. In 1972-1974, prospecting was carried out on the manifestation area and in 1975 the reconnaissance network was condensed, which ensured the receipt of materials corresponding to the stage of preliminary reconnaissance. As a result of the performed works, the reserves of the main minerals were preliminarily calculated - tantalum ores, niobium ores, lithium ores contained in pegmatites and cesium-containing ores, rubidium ores and lithium ores contained in mica and tinned rocks and accompanying minerals. According to the conclusion of the State Research and Design Institute of Rare Metal Industry (Giredmet JSC), feldspar concentrate can be used in the glass and abrasive industries. In terms of chemical composition, it complies with GOST 13451-68, which was in force at the time, for feldspar and quartz-feldspar raw materials for the glass industry. The chemical composition of quartz concentrate complies with GOST 2138-74, which was in force at the time, on molding sands. In addition, after appropriate research, it may be suitable for the production of fine ceramics and electrodes. After research, mica concentrate can be used in the rubber, paint and roofing industries, in the production of cement putty, plastics, etc. The rock outcrop at the deposit is represented by various amphibolite, metamorphic shales, metaultrabasites, vein quartz and granodiorites. Physico-mechanical studies carried out for metamorphic shales, meta-ultrabasites and amphibolites have established the fundamental possibility of using them as raw materials for the manufacture of crushed stone.

Resources/reserves assessment: Pre-calculated reserves of tantalum ores, niobium ores, lithium ores which are contained in pegmatites and cesium-containing ores, rubidium ores and lithium ores, which are contained in mica and tinned rocks. Reserves are rated by C1 and C2 categories. Information on the amount of mineral reserves is limited. The amount of feldspar concentrate in ore processing without losses will be 809.8 thousand tons. The amount of quartz concentrate in the enrichment of pegmatites without losses will be 582.6 thousand tons. The amount of mica concentrate in the enrichment of pegmatite without losses will be 205.1 thousand tons. The rock outcrop at the deposit is represented by various amphiboles, metamorphic shales, metaultrabasites, vein quartz and granodiorites. The reserves of these rocks are estimated – 3,624 thousand m3. Preliminary calculated reserves of vein quartz are 11.3 thousand m3, granodiorites - 402.2 thousand m3.

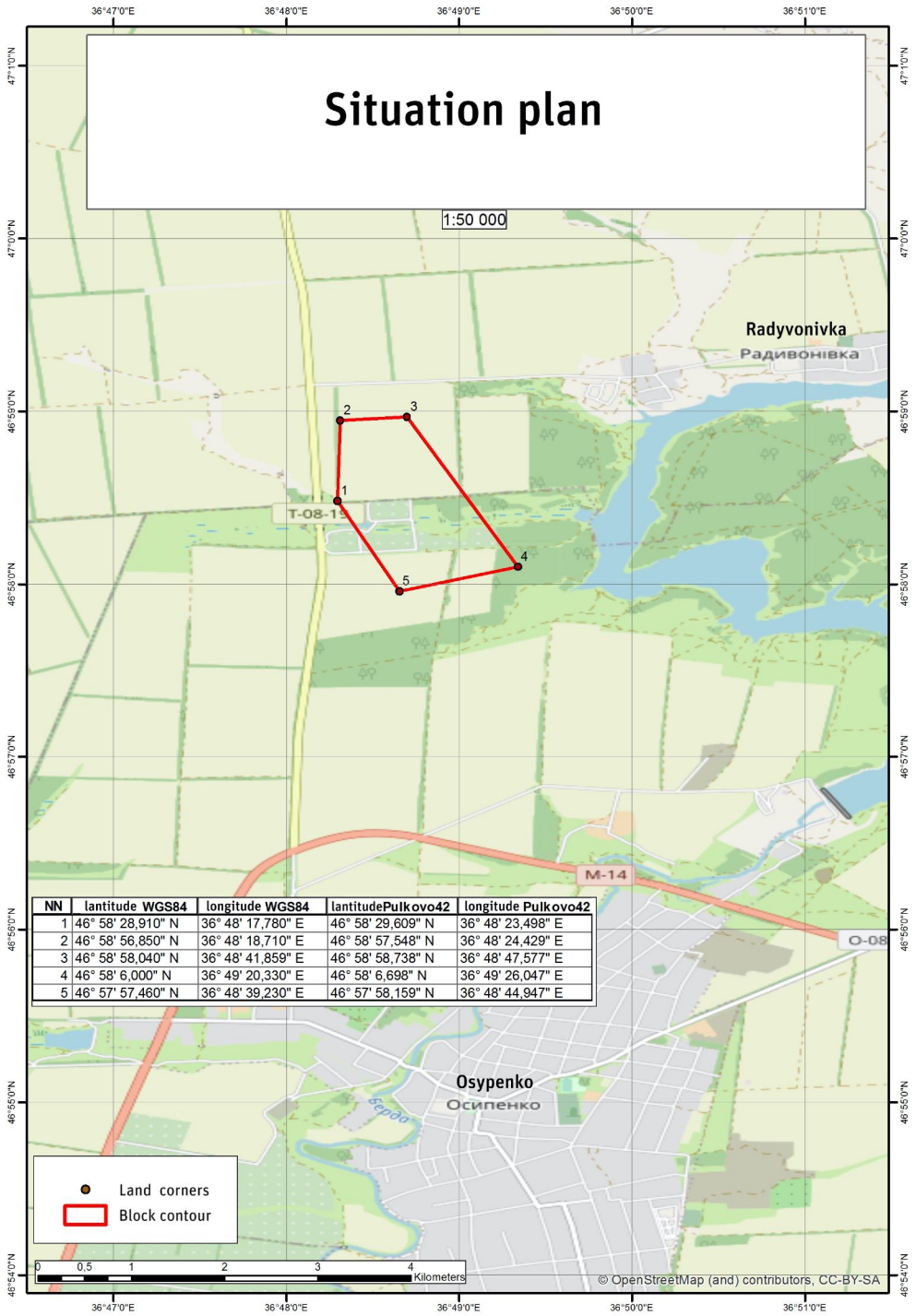
Available geological reports:
http://geoinf.kiev.ua/wp/geologichni-zviti.php?rep=fnd_shifr.rdf&schifr=36934
http://geoinf.kiev.ua/wp/geologichni-zviti.php?rep=fnd_shifr.rdf&schifr=43779
http://geoinf.kiev.ua/wp/geologichni-zviti.php?rep=fnd_shifr.rdf&schifr=40025

Minimum work program. Provided by Mining terms Model agreements and defined in "Work Program" annex.
Model agreements are listed at the link: https://www.geo.gov.ua/primirni-ugodi-pro-umovi-koristuvannya-nadrami/

Overwier map



Situation plan



NN	lantitude WGS84	longitude WGS84	lantitudePulkovo42	longitude Pulkovo42
1	46° 58' 28,910" N	36° 48' 17,780" E	46° 58' 29,609" N	36° 48' 23,498" E
2	46° 58' 56,850" N	36° 48' 18,710" E	46° 58' 57,548" N	36° 48' 24,429" E
3	46° 58' 58,040" N	36° 48' 41,859" E	46° 58' 58,738" N	36° 48' 47,577" E
4	46° 58' 6,000" N	36° 49' 20,330" E	46° 58' 6,698" N	36° 49' 26,047" E
5	46° 57' 57,460" N	36° 48' 39,230" E	46° 57' 58,159" N	36° 48' 44,947" E

TANTAL AND LITHIUM ORE RROSPECTIVE AREA KRUTA BALKA OF KRUTA BALKA PROMISING ACCUMULATION

■	1	2320683500:02:006:0016
■	2	2320683500:02:006:0025
■	3	2320683500:02:006:0024
■	4	2320683500:02:006:0023
■	5	2320683500:02:006:0063
■	6	2320683500:02:006:1064
■	7	2320683500:02:006:0022
■	8	2320683500:02:006:0026
■	9	2320683500:02:006:0021
■	10	2320685500:01:001:0616
■	11	2320685500:01:001:0617
■	12	2320685500:01:001:0618
■	13	2320685500:01:001:0006
■	14	2320685500:01:001:0004
■	15	2320685500:01:001:0005
■	16	2320685500:01:001:0011
■	17	2320685500:01:001:0009
■	18	2320685500:01:001:0612
■	19	2320685500:01:001:0621
■	20	2320685500:01:001:0611
■	21	2320685500:01:001:0626
■	22	2320685500:01:001:0614
■	23	2320685500:01:001:0619
■	24	2320683500:02:006:0138

■ State / municipal property
■ Private property
■ Not specified

Information on land plots, in particular by cadastral number, can be obtained on the Public Cadastral Map of Ukraine:
https://cutt.ly/Fx0CuBg