DNR Open-File Project 400: Establishing the Potential for Lithium Mineralization on State-Managed Mineral Rights

Data released on June 14, 2017

These files are to accompany the certificate of analysis from ALS Minerals received by the DNR on April 27, 2017. They show the whole rock and trace geochemical compositions of four rock samples collected from a granitic pegmatite dike located near Orr, Minnesota. Samples were hammered off of outcrops occurring on Public School Trust lands. Mass of the samples submitted for analysis ranged from 2.24 to 6.40 kg.

orr2_samples_re17063583.pdf

This certificate of analysis from ALS Minerals provides whole rock and trace element analyses for pegmatite samples collected by the DNR. In order to get a good characterization of the rocks, several different analytical methods were used to determine element and compound quantities. The methods are summarized in the table below:

Analytical Method	**Element or Compound Analyzed**
lithium borate fusion followed by acid digestion and analysis by inductively coupled plasma atomic emission spectroscopy (ICP-AES)	SiO_2, Al2O_3, Fe_2O_3, CaO, MgO, Na_2O, K_2O, Cr_2O_3, TiO_2, MnO, P_2O_5, SrO, and BaO
lithium borate fusion followed acid digestion and analysis by inductively coupled plasma mass spectrometry (ICP-MS)	Ba, Ce, Cr, Cs, Dy, Er, Eu, Ga, Gd, Ge, Hf, Ho, La, Lu, Nb, Nd, Pr, Sm, Sn, Sr, Ta, Tb, Th, Tm, U, V, W, Y, Yb, and Zr
Leco furnace	S and C
four acid digestion and analysis by ICP-AES	Ag, Be, Cd, Co, Cu, Li, Mo, Ni, Pb, Sc, and Zn
aqua regia digestion and analysis by ICP-MS	As, Bi, Hg, In, Re, Sb, Se, Te, and Tl
combustion furnace and analysis by infrared spectrometry	water (H_2O^+) that makes up parts of crystal structures
drying furnace and analysis by gravimetric procedure	water (H_2O^-) trapped in the nooks and crannies of the rocks (interstitial water)

Analytical Method	Element or Compound Analyzed
potassium hydroxide fusion and analysis by ion chromatography	Cl and F
sodium hydroxide fusion and analysis by ICP-MS	B
fire assay and analysis by atomic absorption spectroscopy	Au

orr2_samples_print_results_re17063583.xlsx

These DNR data tables provides sample locations as UTM coordinates, quick descriptions of the rock samples, and analytical results. It is formatted for easy viewing and printing.

orr2_samples_gis_results_re17063583.xlsx

These DNR data tables provide sample locations as UTM coordinates, a quick descriptions of the rock samples, and analytical results. Viewer-friendly formatting has been removed.

orr2_bulk_samples.pdf

This DNR map displays the general location of the ORR2 area and where the samples were collected from.