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**DIGITAL COMPILATION OF GEOCHEMICAL DATA FOR
HISTORICAL SAMPLES FROM OCCURRENCES OF
STRATEGIC AND CRITICAL ELEMENTS IN ALASKA: PART I - RARE-
EARTH ELEMENTS (REE)**

by

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Digital compilation of geochemical data for historical samples from occurrences of strategic and critical elements in Alaska: Part I - Rare-earth elements (REE)

by

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INTRODUCTION

The State of Alaska's *Strategic and Critical Minerals (SCM) Assessment* project, a State-funded Capital Improvement Project (CIP), is designed to evaluate Alaska's statewide potential for strategic and critical mineral resources. The *SCM Assessment* project is being implemented by the Alaska Division of Geological & Geophysical Surveys (DGGS), and involves obtaining new airborne-geophysical, geological, and geochemical data. For the geochemical part of the *SCM Assessment* project, thousands of geochemical-sample analyses and locations from historical U.S. Bureau of Mines (USBM), U.S. Geological Survey (USGS), Bureau of Land Management (BLM), DGGS, Alaska Territorial Department of Mines, Alaska Division of Mines and Minerals, and Bureau of Indian Affairs (BIA) reports are being compiled into digital format by DGGS. The objective is to update the State of Alaska's statewide digital geochemical database in order to more clearly identify areas with SCM potential.

For this report, DGGS digitally compiled sample and analyses documentation, geochemical assays, and location information for more than 4,400 historical samples. These samples were originally collected to investigate occurrences of strategic and critical elements, and occurrences with other commodities, throughout Alaska (see *Original References* section below).

The text, analytical data, and method tables associated with this report are being released in digital format as PDF files and .csv files and are available from the DGGS website (doi:[10.14509/29473](https://doi.org/10.14509/29473)). Complete documentation for each sample is available by querying the DGGS Web Geochem database (<http://dggs.alaska.gov/webgeochem/>).

DOCUMENTATION OF METHODS

SAMPLE COLLECTION, PREPARATION, AND ANALYTICAL METHODS

Historical sample-collection procedures are documented in the original publications (see *Original References* section below).

Sample preparation procedures and analytical methods used by the collecting agencies' staff varied over the years and from project to project. For documentation information, see the reports listed in the *Original References* section below, and the digital files associated with this DGGS report.

DGGS DIGITAL DATA COMPILATION AND DOCUMENTATION

Digital tables of geochemical-analytical data were compiled by DGGS for each sample, and where available, we included documentation of sample type and preparation methods, as well as the analytical method for each element

(see digital files associated with this report). DGGs used optical character recognition (OCR) software to scan and extract data from paper or PDF versions of the reports. In many cases, the numerical-data and text conversions were only partially correct. Each OCR-derived digital table was carefully checked against the original report and corrected manually. Other tables were entered manually and then checked against the original report for possible errors. Great effort was made to interpret and correct obvious typographical errors in the original data, however, when no reasonable correction could be determined the original printed value was included in this digital data set. Data compiled includes: sample number, sample material, results of geochemical analyses by element, sample preparation, and analytical methods by element.

For each sample, data tables contain either assay values or coded-value placeholders (null = not analyzed; -1 = the element's assay result is less than the lower detection limit for the method; -2 = the element's assay result is greater than the upper detection limit for the method).

Location data for each sample were derived by DGGs staff by scanning station-location map figures from individual reports, georegistering the map figures in ArcGIS v. 10.2.2, creating a point layer of station locations, extracting latitude-longitude coordinates, and linking them to their associated sample number in the geochemical-data tables. Location data for each sample are presented in latitude and longitude coordinates in decimal degrees with NAD27 datum and Clarke 1866 spheroid.

ORIGINAL REFERENCES

- Armbrustmacher, T.J., 1989, Minor element content, including radioactive elements and rare-earth elements, in rocks from the syenite complex at Roy Creek, Mount Prindle area, Alaska: U.S. Geological Survey Open-File Report 89-146, 11 p. <http://dggs.alaska.gov/pubs/id/11781>
- Barker, J.C., 1979, A trace element study of the Circle mining district, Alaska: U.S. Bureau of Mines Open-File Report 57-79, 74 p. <http://dggs.alaska.gov/pubs/id/21431>
- Barker, J.C., 1981, Mineral investigations in the Porcupine River drainage, Alaska: U.S. Bureau of Mines Open-File Report 27-81, 189 p., 2 sheets, scale 1:250,000. <http://dggs.alaska.gov/pubs/id/21368>
- Barker, J.C., 1984, Concentrations of cobalt and other metals in the western Crazy Mountains, interior Alaska: U.S. Bureau of Mines Open-File Report 213-84, 44 p. <http://dggs.alaska.gov/pubs/id/21496>
- Barker, J.C., 1985, Sampling and analytical results of a Mineral reconnaissance in the Selawik Hills area, northwestern Alaska: U.S. Bureau of Mines Open-File Report 43-85, 67 p. <http://dggs.alaska.gov/pubs/id/21409>
- Barker, J.C., 1991, Investigations of rare-earth and associated elements, Zane Hills pluton, northwestern Alaska: U.S. Bureau of Mines Open-File Report 36-91, 33 p. <http://dggs.alaska.gov/pubs/id/21393>
- Barker, J.C., and Clautice, K.H., 1977, Anomalous uranium concentrations in artesian springs and stream sediments in the Mount Prindle area, Alaska: U.S. Bureau of Mines Open-File Report 130-77, 19 p. <http://dggs.alaska.gov/pubs/id/21486>
- Barker, J.C., and Lamal, Kathryn, 1988, Investigation of rare-earth-element occurrences near Kook Lake: U.S. Bureau of Mines Field Report, 19 p. <http://dggs.alaska.gov/pubs/id/23103>
- Barker, J.C., and Mardock, C.L., 1990, Rare-earth element and yttrium-bearing dikes near Dora Bay, southern Prince of Wales Island, Alaska: U.S. Bureau of Mines Open-File Report 19-90, 41 p. <http://dggs.alaska.gov/pubs/id/21356>

- Barker, J.C., and Roberts, W.S., 1985, A copper–cobalt occurrence in the Cape Krusenstern area, northwestern Alaska: U.S. Bureau of Mines Open-File Report 33-85, 16 p. <http://dggs.alaska.gov/pubs/id/21381>
- Barker, J.C., and Swainbank, R.C., 1985, A tungsten-rich porphyry molybdenum occurrence at Bear Mountain, northeast Alaska: U.S. Bureau of Mines Open-File Report 8-85, 64 p. <http://dggs.alaska.gov/pubs/id/21326>
- Brosgé, W.P., Reiser, H.N., and Moore, T.E., 1977, Chemical analyses of 97 stream-sediment samples from the Coleen and Christian quadrangles, northern Alaska: U.S. Geological Survey Open-File Report 77-458, 4 p., 1 sheet, scale 1:250,000. <http://dggs.alaska.gov/pubs/id/11161>
- Burleigh, R.E., 1991, Evaluation of the tin–tungsten greisen mineralization and associated granite at Sleitat Mountain, southwestern Alaska: U.S. Bureau of Mines Open-File Report 35-91, 41 p. <http://dggs.alaska.gov/pubs/id/21388>
- Burleigh, R.E., 1992, Examination of the Win Tin prospect, west-central Alaska: U.S. Bureau of Mines Open-File Report 92-92, 23 p. <http://dggs.alaska.gov/pubs/id/21468>
- Burleigh, R.E., 1992, Tin mineralization of the Won prospect, west-central Alaska: U.S. Bureau of Mines Open-File Report 85-92, 21 p. <http://dggs.alaska.gov/pubs/id/21457>
- Burton, P.J., Warner, J.D., and Barker, J.C., 1984, Reconnaissance investigation of tin occurrences at Rocky Mountain (Lime Peak), east-central Alaska: U.S. Bureau of Mines Open-File Report 31-85, 44 p. <http://dggs.alaska.gov/pubs/id/21377>
- Clough, A.H., and Hayden, T.J., 1988, 1985–1986 mineral investigations in the southern Chilkat Range, southeast Alaska: U.S. Bureau of Mines Open-File Report 13-88, 25 p., 3 sheets. <http://dggs.alaska.gov/pubs/id/21345>
- Clough, A.H., and Redman, E.C., 1991, Section C: West Lynn Canal subarea, *in* U.S. Bureau of Mines, Mineral investigations in the Juneau Mining District, Alaska, 1984–1988, Volume 2—Detailed mine, prospect, and mineral occurrence descriptions: U.S. Bureau of Mines Special Publication vol. 2C, 44 p. <http://dggs.alaska.gov/pubs/id/24876>
- Foley, J.Y., Hinderman, T., Kirby, D.E., and Mardock, C.L., 1984, Chromite occurrences in the Kaiyuh Hills, west-central Alaska: U.S. Bureau of Mines Open-File Report 178-84, 20 p. <http://dggs.alaska.gov/pubs/id/21495>
- Foley, J.Y., LaBerge, R.D., Grosz, A.E., Oliver, F.S., and Hirt, W.C., 1995, Onshore titanium and related heavy-mineral investigations in the eastern Gulf of Alaska region, southern Alaska: U.S. Bureau of Mines Open-File Report 10-95, 125 p. <http://dggs.alaska.gov/pubs/id/21334>
- Foley, J.Y., and Barker, J.C., 1981, Tungsten investigations near VABM Bend, eastern Alaska: U.S. Bureau of Mines Open-File Report 29-81, 24 p. <http://dggs.alaska.gov/pubs/id/21374>
- Foley, J.Y., and Barker, J.C., 1985, Chromite deposits along the Border Ranges fault, southern Alaska (in two parts); 1. Field investigations and descriptions of chromite deposits: U.S. Bureau of Mines Information Circular 8990, 58 p. <http://dggs.alaska.gov/pubs/id/21281>
- Foley, J.Y., and Barker, J.C., 1986, Uranium occurrences in the northern Darby Mountains, Seward Peninsula, Alaska: U.S. Bureau of Mines Information Circular 9103, 27 p. <http://dggs.alaska.gov/pubs/id/21286>
- Miller, T.P., Elliott, R.L., Finch, W.I., and Brooks, R.A., 1976, Preliminary report on uranium-, thorium-, and rare-earth-bearing rocks near Golovin, Alaska: U.S. Geological Survey Open-File Report 76-710, 13 p. <http://dggs.alaska.gov/pubs/id/11096>
- Reed, B.L., and Miller, T.P., 1980, Uranium and thorium content of some Tertiary granitic rocks in the southern Alaska Range: U.S. Geological Survey Open-File Report 80-1052, 7 p. <http://dggs.alaska.gov/pubs/id/12251>

- Roberts, W.S., 1984, Economic potential for chromium, platinum, and palladium in the Mount Hurst ultramafics, west-central area, Alaska: U.S. Bureau of Mines Open-File Report 22-84, 52 p.
<http://dggs.alaska.gov/pubs/id/21363>
- Southworth, D.D., 1984, Columbium in the gold- and tin-bearing placer deposits near Tofty, Alaska: U.S. Bureau of Mines Open-File Report 174-84, 21 p. <http://dggs.alaska.gov/pubs/id/21492>
- Stablein, N.K., 1980, Report on the mineral resource investigations of six areas of central and northeastern Alaska, Contract No. GJ8X-33(80): U.S. Bureau of Mines Contract Report, 188 p., 10 sheets, scale 1:250,000. <http://dggs.alaska.gov/pubs/id/22663>
- Still, J.C., 1984, Copper, gold, platinum, and palladium sample results from the Klukwan mafic/ultramafic complex, southeast Alaska: U.S. Bureau of Mines Open-File Report 21-84, 53 p.
<http://dggs.alaska.gov/pubs/id/21360>
- Sutley, S.J., Ryder, J.T., Light, T.D., and Weber, F.R., 1987, Analytical results and sample locality map of rock samples from the White Mountains Recreation Area, Livengood and Circle quadrangles, east-central Alaska: U.S. Geological Survey Open-File Report 87-284, 61 p., 2 sheets, scale 1:63,360.
<http://dggs.alaska.gov/pubs/id/11676>
- Warner, J.D., Dahlin, D.C., and Brown, L.L., 1988, Tin occurrences near Rocky Mountain (Lime Peak), east-central Alaska: U.S. Bureau of Mines Information Circular 9180, 24 p. <http://dggs.alaska.gov/pubs/id/21294>
- Warner, J.D., Mardock, C.L., and Dahlin, D.C., 1986, A columbium-bearing regolith on upper Idaho Gulch, near Tofty, Alaska: U.S. Bureau of Mines Information Circular 9105, 29 p. <http://dggs.alaska.gov/pubs/id/21288>
- Warner, J.D., and Dahlin, D.C., 1989, Tin occurrences associated with the Ohio Creek pluton, Chulitna region, south-central Alaska: U.S. Bureau of Mines Open-File Report 5-89, 29 p.
<http://dggs.alaska.gov/pubs/id/21314>