



MINERAL-ORIENTED GEOLOGIC MAPPING OF THE FORTY MILE MINING DISTRICT

by D.J. Szumigala

INTRODUCTION AND PROJECT FOCUS

The Alaska Division of Geological & Geophysical Surveys (DGGS) is completing year two of a three-year field-based geologic mapping program in the Fortymile mining district. The Fortymile project is part of DGGS's airborne geophysical/geological mineral inventory project, a special multi-year investment by the state of Alaska to expand the knowledge of Alaska's mineral resources and catalyze private-sector mineral development. The mineral inventory project began in 1992 as a means of systematically inventorying about 40 million acres of state-owned uplands that have a high mineral potential. The Fortymile portion of the project began in 1998.

The Fortymile mining district is the oldest placer gold camp in Alaska. Alluvial gold was first discovered on Franklin Gulch in the Fortymile River area in 1886. More than 535,000 ounces of gold have been produced from the district, but less than 300 ounces of this production has been from lode mining. Located in eastern Alaska near the Alaska-Yukon border, this mining district is drained by the Fortymile River system that flows northeastward into the Yukon River. Much of the Fortymile River and select tributaries have a federal Wild and Scenic River status and an irregular buffer zone that varies from a fraction of a mile to several miles from either bank. Competing interests, such as recreational activities versus placer mining and a variety of landowners (federal, state, private, and Native) require a balanced land-use plan. The Taylor Highway provides road access through the eastern and central portions of the district and the DGGS map area.

DGGS efforts are focused on determining and understanding the geologic environments of the Fortymile mining district, especially with respect to placer gold and lode mineralization. No large-scale source(s) for the district's abundant placer gold resource have been located, although several lode gold prospects are present in the study area. Other potential mineral deposit types

include plutonic-hosted gold deposits, copper-molybdenum porphyry deposits, ultramafic-hosted platinum deposits, and volcanogenic massive sulfide deposits.

A major factor impeding mineral exploration in the Fortymile mining district as well as much of Alaska is extensive, thick vegetation cover that limits rock exposure. Airborne geophysics is a valuable tool for projecting geologic units between sparse outcrops and for identifying anomalous geologic conditions beneath alluvial and vegetation cover, which may be associated with lode mineralization.

In addition to bedrock geologic mapping and sampling, DGGS is conducting surficial studies in the Fortymile area to address the potential for additional placer gold resources, location and character of construction materials for future development, and potential geologic hazards that may impact all future users. After 100 years of placer mining, identified and tested productive ground is rather limited and placer miners are searching for new ground. Studies identifying various surficial units, especially with regard to gold potential, may guide new placer exploration and development. Analysis and correlation of volcanic tephra partings and radiocarbon age analyses of organic samples are being used for age control within unconsolidated deposits and to help establish Quaternary stratigraphy.

PREVIOUS GEOLOGIC WORK

Paleozoic(?) metamorphic rocks are the most extensive rock units in the Fortymile mining district. Previous geologic mapping by Foster (1969) in the Eagle A-2 Quadrangle identified a high-grade metamorphic gneiss and schist unit and a low-grade greenstone and phyllite unit of the Yukon-Tanana terrane. Foster (1969) also mapped granodiorite of the Taylor Mountain batholith and small granitic intrusions and assigned them through Mesozoic ages. Tertiary detrital sedimentary rocks and basalt were thought to overlie all earlier units.

Later workers assigned most of the high-grade metamorphic rocks to the Taylor Mountain subterrane (or assemblage) of the Yukon–Tanana terrane due to its association with the Taylor Mountain Batholith, and the remainder to the Lake George subterrane (or assemblage) (orthogneiss with continental affinity) (Dusel-Bacon and Hansen, 1992; Foster and others, 1994; Hansen and Dusel-Bacon, 1998). Foster's low-grade metamorphic rock package was divided into the Seventymile (oceanic volcanic and sedimentary rocks) and Taylor Mountain subterrane (oceanic and marginal basin rocks) by Dusel-Bacon and Hansen (1992) and Hansen and Dusel-Bacon (1998).

Contacts between these various Yukon–Tanana assemblages are currently mapped as thrust faults (Foster and others, 1994) but are commonly shown as high-angle faults on earlier maps (Foster, 1969).

DGGS FIELD STUDIES IN THE FORTY MILE AREA

DGGS conducted detailed airborne magnetic and electromagnetic (EM) geophysical surveys over approximately 1,035 square miles of the Fortymile mining district in 1998 and began geologic mapping in the Eagle A-2 Quadrangle during 1999. The DGGS crew is mapping at 1:50,000 scale in the field, with final geologic maps to be produced at 1:63,360 scale. To date, DGGS geologists have spent over 400 person-days mapping in the Fortymile geophysical area. Truck, ATV,

motorboat, raft, and helicopter logistics have supported the fieldwork. These field studies provide detailed bedrock, surficial, structural, stratigraphic, paleontologic, and geochronologic data (Szumigala and others, 2000a; Szumigala and others, 2000b). In conjunction with geologic mapping, major- and trace-element geochemical sampling provide data to address the origin of mineralization.

Results of recent mapping by DGGS do not support some of the current terrane assignments in the Fortymile area. DGGS interpretation of outcrops, thin sections, and major- and trace-element compositions of the metamorphic rocks indicate that the stratigraphy of the region is different than that assembled by earlier workers, and requires a complete rethinking of terrane assignments in easternmost Alaska.

A large portion of the geophysical area in the northern Eagle A-2 Quadrangle was burned by forest fire in 1999. The burn area provided wonderful rock exposures and allowed tracing of various rock units across the area, and we have been able to confirm that there are mappable rock units within the high-grade metamorphic rocks. Rocks previously assigned to Foster's (1969) high-grade metamorphic gneiss and schist unit consist of middle to upper amphibolite-facies quartz–biotite gneiss and schist interlayered with lesser amounts of amphibolite, quartzite, marble, augen gneiss, and orthogneiss. Several of these units have distinct geophysical signatures that can be used as stratigraphic markers.



Large outcrop of marble and gneiss on north side of Butte Creek, northwestern corner of Eagle A-2 Quadrangle. Exposure enhanced by 1999 wildfire. Photo by David Szumigala.

Some augen gneiss bodies mapped in the “Taylor Mountain terrane” are indistinguishable in texture and major oxide composition from augen gneiss bodies in the “Lake George terrane.” Likewise, trace-element compositions of two amphibolite types in the “Taylor Mountain terrane” are indistinguishable from amphibolite units in the “Lake George terrane.” These amphibolites have trace-element signatures that best fit an arc-related environment and a marginal-basin tectonic setting. We also recognize an additional amphibolite type that is strongly enriched in a variety of incompatible elements and displays within-plate compositional characteristics.

In the immediate Chicken area, Foster’s “metamorphic rocks of the Chicken area” unit is actually a mixture of greenschist-facies and amphibolite-facies rocks. Foster’s unit appears to represent greenschist-facies metamorphosed pre-Triassic extensional basalt and sedimentary rocks (greenstone, phyllite, metagraywacke, metatuff, and marble) and an underlying gabbroic sill/dike complex. Major- and trace-element analyses bear out field and petrographic identification of metavolcanic rocks of the Chicken area as representing a range from basalt to rhyolite, with a significant dacitic component. The terrane to which this greenschist-facies package belongs is unclear, but rock compositions resemble the Mississippian to Jurassic Rampart volcanic assemblage much more than units of the Seventymile ophiolite package.

Preliminary $^{40}\text{Ar}/^{39}\text{Ar}$ data from igneous rocks, along with previously published dates (Szumigala and others, 2000; Newberry, 1998; Wilson and others, 1985; Cushing, 1984) indicate that pluton ages in the Eagle A-2 Quadrangle are Triassic, Jurassic, or Cretaceous. These age differences have important implications for potential relationships between magmatic events and mineralization. Compositional variations in plutonic rocks of the Fortymile area correlate well with the different ages of plutonism. In particular, the late Triassic Taylor Mountain batholith (TMB), although a large composite body, consistently yields compositions of quartz diorite and tonalite. The younger (Jurassic) body north of Chicken, invariably shown as part of the TMB is, in contrast, granitic in composition. The most compositionally distinctive body is the Jurassic Napoleon pluton which has low normative and modal quartz contents and is dominated by monzonite to quartz monzonite. Intermediate- to granite-composition dikes occur sporadically through the region; their compositions are compatible with those of larger Jurassic and Triassic plutons. Felsic, leucocratic dikes and small plutons, which appear to cut across foliation of metamorphic rocks, are most likely of Cretaceous or Tertiary age.

All felsic-intermediate plutonic rocks investigated to date have trace-element characteristics similar to those

of volcanic-arc granitoids, suggesting at least two (Triassic–Jurassic and mid-Cretaceous) periods of subduction-related magmatism in the region. In contrast, trace-element compositions of Tertiary(?) felsic volcanic rocks resemble those of within-plate volcanic rocks, consistent with the bimodal character of early Tertiary magmatism in the region.

Spheroidally weathering gabbro and diabase crop out in the Chicken and Napoleon Creek areas as dikes, fault slivers, and interior portions of thick flows(?). Based on trace element character, they are within-plate basalt, compositionally indistinguishable from early Tertiary basalts seen elsewhere in interior Alaska and central Yukon Territory.

Quaternary terrace gravels occur up to 600 feet above present creeks and rivers. The terrace gravels contain local concentrations of placer gold. High terrace gravels are at least Pliocene age and may correlate with the White Channel gravel in the Klondike area of the Yukon (Yeend, 1996). Gold-bearing creek gravels rest unconformably on Tertiary sedimentary rocks (Yeend, 1996). Late Pleistocene(?) mammal fossils are common in the



Marble and skarn outcrop exposed by intense 1999 wildfire in Buckskin Creek area, north-western Eagle A-2 Quadrangle. Sixteen-inch hammer for scale. Photo by David Szumigala.

gold-bearing creek gravels, but are rarely present in the frozen muck overlying the gravels. Unsorted colluvium consisting of gravel, sand, silt, and clay is sporadically present within and along stream valley margins (Yeend, 1996).

Extensive high-angle faulting suggested by geophysical data was corroborated in the field. Preliminary structural mapping and geophysical interpretations indicate significant movement along high-angle faults with north-south, northeast, and northwest orientations. The relative timing of these different fault orientations is still unknown and requires further field study, as well as modeling of the available geophysical data. Relatively young uplift is indicated by variably perched late Tertiary gravel deposits (up to 800 feet above current stream level), variably entrenched meanders in several drainages, and discontinuous, structurally controlled exposures of early Tertiary gabbro and sedimentary rocks. It is clear that the structural picture for the region is more complex than shown on previously published maps. The recognition of abundant high-angle structures will significantly affect mineral exploration strategies for the Fortymile mining district.

The Fortymile mining district has had an important role in the development of accretionary terrane models for the Yukon-Tanana uplands, yet its lithological, structural, and mineralogical character still remains relatively poorly understood. Recent DGGs geologic mapping has established that various metamorphic rock assemblages in the Eagle A-2 Quadrangle contain map-

pable units that will define stratigraphy in this portion of the Yukon-Tanana terrane. Correlating these geologic units with other subterrane in the Yukon-Tanana uplands requires additional mapping and geochemical study. DGGs's integrated geophysical/geological program in the Fortymile area is providing a modern geologic framework for this region, providing the State with updated inventories of geologic resources to guide planning activities, and identifying additional areas of potential interest. Past experience has shown that a thorough understanding of the geologic framework of an area acts as a catalyst for development and paves the way for future exploration. We anticipate similar results in the Fortymile mining district.

REFERENCES

- Cushing, G.W., 1984, The tectonic evolution of the eastern Yukon-Tanana upland, Alaska: MS Thesis, State University of New York, Albany, NY, 255 p.
- Dusel-Bacon, Cynthia, and Hansen, V.L., 1992, High-pressure amphibolite-facies metamorphism and deformation within the Yukon-Tanana and Taylor Mountain terranes, eastern Alaska, in Bradley, D.C., and Dusel-Bacon, Cynthia, editors, Geologic studies in Alaska by the U.S. Geological Survey, 1991: U.S. Geological Survey Bulletin 2041, p. 140-159.
- Foster, H.L., 1969, Reconnaissance geology of the Eagle A-1 and A-2 quadrangles Alaska: U.S. Geological Survey Bulletin 1271-G, 30 p., 1 sheet, scale 1:63,360.



Boudinaged quartz vein parallel to flat-lying foliation in leucocratic biotite-quartz-feldspar gneiss. Boudinage ("sausage" structure) results from stretching of the rock during deformation event(s). Outcrop near Buckskin Creek, northwestern portion of Eagle A-2 Quadrangle. Photo by David Szumigala.

- Foster, H.L., Keith, T.E.C., and Menzie, W.D., 1994, Geology of the Yukon–Tanana area of east-central Alaska, in Plafker, George, and Berg, H.C., editors, *The Geology of Alaska*: Boulder, Colorado, Geological Society of America, *The Geology of North America*, v. G-1, p. 205–240.
- Hansen, V.L., and Dusel-Bacon, Cynthia, 1998, Structural and kinematic evolution of the Yukon–Tanana upland tectonites, east-central Alaska: A record of late Paleozoic to Mesozoic crustal assembly: *Geological Society of America Bulletin*, v. 110, no. 2, p. 211–230.
- Newberry, R.J., Layer, P.W., Burleigh, R.E., and Solie, D.N., 1998, New $^{40}\text{Ar}/^{39}\text{Ar}$ dates for intrusions and mineral prospects in the eastern Yukon–Tanana Terrane, Alaska; regional patterns and significance, in Gray, J.E. and Riehle, J.R., editors, *Geologic studies in Alaska by the U.S. Geological Survey, 1996*: U.S. Geological Survey Professional Report 1595, p. 131–159.
- Szumigala, D.J., Newberry, R.J., Werdon, M.B., Finseth, B.A., Pinney, D.S., and Flynn, R.L., 2000a, Major-oxide, minor-oxide, trace-element, and geochemical data from rocks collected in a portion of the Fortymile mining district, Alaska, 1999: Alaska Division of Geological & Geophysical Surveys Raw Data File 2000-1, 26 p., 2 sheets, scale 1:63,360.
- Szumigala, D.J., Newberry, R.J., Werdon, M.B., Finseth, B.A., and Pinney, D.S., 2000b, Preliminary geologic map of a portion of the Fortymile mining district, Alaska, 1999: Alaska Division of Geological & Geophysical Surveys Preliminary Interpretive Report 2000-6, 1 sheet, scale 1:63,360.
- Wilson, F.H., Smith, J.G., and Shew, Nora, 1985, Review of radiometric data from the Yukon crystalline terrane, Alaska and Yukon Territory: *Canadian Journal of Earth Sciences*, v. 22, p. 525–537.
- Yeend, W.E., 1996, Gold placers of the historical Fortymile River region, Alaska: *U.S. Geological Survey Bulletin* 2125, 75 p.

Dear Readers:

This fall DGGGS is starting two new projects. One is the design and development of a geologic database system and the second is a rural community geology program. Both projects are important for Alaska.

DGGGS does not have a database management system to efficiently acquire, manage, and electronically incorporate the maps and quantitative data from past geologic work in Alaska into ongoing projects or to construct responses to ad hoc information queries from the private sector or state government. We commonly compile and synthesize such legacy data to answer inquiries, but each instance is a research project in itself. (*What data is available? Where are the data files? What form are they in? What is in them? How do we merge them?*) The magnitude of the problem of managing data has increased because of the volume of new geophysical data the Division has generated in addition to ongoing geologic studies and because of the need for the private sector, and DGGGS itself, to access the data electronically.

For the past three years, DGGGS has been working cooperatively on the *Minerals Data and Information Rescue* project with three federal agencies (U.S. Geological Survey, U.S. Bureau of Land Management, and U.S. Forest Service) to identify and electronically compile existing data pertinent to Alaska's mineral resources. Although this is a mineral-oriented project, in practice it is more difficult to exclude non-mineral geologic data than to include it. Therefore, from a data management perspective, all DGGGS geologic data and

much of the fundamental federal geologic data for Alaska will be incorporated into the interagency system. The goal of DGGGS is to have in place by the end of calendar year 2002 a functioning, publicly available Alaska geologic-data management system that will provide access to all this data.

Regarding our second new program, at DGGGS we believe that in rural Alaska there are issues of community concern that can benefit from a better understanding of the local or pertinent regional geology. DGGGS geologists have the expertise to increase the understanding of the geologic resource potential for energy and economic opportunities in specific regions surrounding rural communities, to provide guidance on natural hazard mitigation, and to locate construction materials. Our rural community geology program will be structured to build communication links with key communities throughout rural Alaska. The objective of this outreach will be to learn about specific problems in various regions of the state and to work with local leaders to seek solutions for the kinds of problems that fall within the scope of the DGGGS mission.

We look forward to meeting the challenges that these new enterprises entail.

Sincerely,



Milton A. Wiltse
Director and State Geologist

PUBLICATIONS

- GPR 2000-25.** Total magnetic field of parts of the Aniak and Iditarod mining districts, southwestern Alaska, by L.E. Burns, Stevens Exploration, and Fugro Airborne Surveys, 2000, 2 sheets, scale 1:63,360. Topography included. Full-color plot from electronic file, 600 dpi. Made on request. \$26.
- GPR 2000-26.** Total magnetic field of parts of the Aniak and Iditarod mining districts, southwestern Alaska, by L.E. Burns, Stevens Exploration, and Fugro Airborne Surveys, 2000, 2 sheets, scale 1:63,360. Magnetic contours and section lines included. Full-color plot from electronic file, 600 dpi. Made on request. \$26.
- GPR 2000-27.** Color shadow magnetic map of parts of the Aniak and Iditarod mining districts, southwestern Alaska, by L.E. Burns, Stevens Exploration, and Fugro Airborne Surveys, 2000, 2 sheets, scale 1:63,360. Full-color plot from electronic file, 600 dpi. Made on request. \$26.
- GPR 2000-28.** Total magnetic field and electromagnetic anomalies of parts of the Aniak and Iditarod mining districts, southwestern Alaska, by L.E. Burns, Stevens Exploration, and Fugro Airborne Surveys, 2000, 2 sheets, scale 1:63,360. Magnetic contours and section lines included. Diazo. Made on request. \$50.
- GPR 2000-29.** Total magnetic field and electromagnetic anomalies of parts of the Aniak and Iditarod mining districts, southwestern Alaska, by L.E. Burns, Stevens Exploration, and Fugro Airborne Surveys, 2000, 2 sheets, scale 1:63,360. Magnetic contours, simplified electromagnetic anomalies, and section lines included. Blueline. \$6.
- GPR 2000-30A.** Total magnetic field and detailed electromagnetic anomalies of parts of the Aniak and Iditarod mining districts, southwestern Alaska (parts of Iditarod B-5 and B-6 quadrangles), by L.E. Burns, Stevens Exploration, and Fugro Airborne Surveys, 2000, 1 sheet, scale 1:31,680. Magnetic contours, detailed electromagnetic anomalies, and section lines included. Blueline. \$3.
- GPR 2000-30B.** Total magnetic field and detailed electromagnetic anomalies of parts of the Aniak and Iditarod mining districts, southwestern Alaska (parts of Iditarod B-4 and B-5 quadrangles), by L.E. Burns, Stevens Exploration, and Fugro Airborne Surveys, 2000, 1 sheet, scale 1:31,680. Magnetic contours, detailed electromagnetic anomalies, and section lines included. Blueline. \$3.
- GPR 2000-30C.** Total magnetic field and detailed electromagnetic anomalies of parts of the Aniak and Iditarod mining districts, southwestern Alaska (parts of Iditarod A-5 and A-6 quadrangles), by L.E. Burns, Stevens Exploration, and Fugro Airborne Surveys, 2000, 1 sheet, scale 1:31,680. Magnetic contours, detailed electromagnetic anomalies, and section lines included. Blueline. \$3.
- GPR 2000-30D.** Total magnetic field and detailed electromagnetic anomalies of parts of the Aniak and Iditarod mining districts, southwestern Alaska (parts of Iditarod A-4 and A-5 quadrangles), by L.E. Burns, Stevens Exploration, and Fugro Airborne Surveys, 2000, 1 sheet, scale 1:31,680. Magnetic contours, detailed electromagnetic anomalies, and section lines included. Blueline. \$3.
- GPR 2000-30E.** Total magnetic field and detailed electromagnetic anomalies of parts of the Aniak and Iditarod mining districts, southwestern Alaska (part of Sleetmute D-7 Quadrangle), by L.E. Burns, Stevens Exploration, and Fugro Airborne Surveys, 2000, 1 sheet, scale 1:31,680. Magnetic contours, detailed electromagnetic anomalies, and section lines included. Blueline. \$3.
- GPR 2000-30F.** Total magnetic field and detailed electromagnetic anomalies of parts of the Aniak and Iditarod mining districts, southwestern Alaska (part of Sleetmute D-6 Quadrangle), by L.E. Burns, Stevens Exploration, and Fugro Airborne Surveys, 2000, 1 sheet, scale 1:31,680.

ORDERING INFORMATION

For each publication ordered, include both the publication title and number. Mail orders are payable in advance. Make check or money order in U.S. currency and payable to the **State of Alaska**. Credit cards are not accepted. Telephone orders are accepted by the Fairbanks office between 8 a.m. and 5 p.m. Alaska time. Fax and email requests are accepted any time; these orders will be invoiced. If you would like to leave your order on voice mail, this can also be done 24 hours a day and you will be invoiced.

SHIPPING & HANDLING

- Domestic postage - \$1.00/copy of each report
- Canada and Mexico - \$1.50/copy of each report
- All other international - \$2.50 surface
\$5.00 air/copy of each report
- For rolled-map orders requiring mailing tubes, include an additional \$3.50.

WHERE TO ORDER

Publications of the Division of Geological & Geophysical Surveys are available over the counter, by mail, phone, fax, or email from the DGGs Fairbanks office:

ATTN: Geologic Communications Section—Sales
Alaska Division of Geological & Geophysical Surveys,
794 University Avenue, Suite 200
Fairbanks, AK 99709-3645
(907) 451-5020 Fax (907) 451-5050
Email: dggspubs@dnr.state.ak.us

Prices of DGGs publications are subject to change. Increases in costs make it necessary to raise the selling prices of many publications offered. It is not feasible for DGGs to change the prices stated in previous announcements and publications in stock, so the prices charged may differ from the prices in the announcements and publications. Overpayments of \$2 or less will not be refunded.

- Magnetic contours, detailed electromagnetic anomalies, and section lines included. Blue line. \$3.
- GPR 2000-30G.** Total magnetic field and detailed electromagnetic anomalies of parts of the Aniak and Iditarod mining districts, southwestern Alaska (part of Sleetmute C-7 Quadrangle), by L.E. Burns, Stevens Exploration, and Fugro Airborne Surveys, 2000, 1 sheet, scale 1:31,680. Magnetic contours, detailed electromagnetic anomalies, and section lines included. Blue line. \$3.
- GPR 2000-30H.** Total magnetic field and detailed electromagnetic anomalies of parts of the Aniak and Iditarod mining districts, southwestern Alaska (part of Sleetmute C-6 Quadrangle), by L.E. Burns, Stevens Exploration, and Fugro Airborne Surveys, 2000, 1 sheet, scale 1:31,680. Magnetic contours, detailed electromagnetic anomalies, and section lines included. Blue line. \$3.
- GPR 2000-31.** 7200 Hz coplanar resistivity of parts of the Aniak and Iditarod mining districts, southwestern Alaska, by L.E. Burns, Stevens Exploration, and Fugro Airborne Surveys, 2000, 2 sheets, scale 1:63,360. Topography included. Full-color plot from electronic file, 600 dpi. Made on request. \$26.
- GPR 2000-32.** 7200 Hz coplanar resistivity of parts of the Aniak and Iditarod mining districts, southwestern Alaska, by L.E. Burns, Stevens Exploration, and Fugro Airborne Surveys, 2000, 2 sheets, scale 1:63,360. Resistivity contours and section lines included. Full-color plot from electronic file, 600 dpi. Made on request. \$26.
- GPR 2000-33.** 7200 Hz coplanar resistivity of parts of the Aniak and Iditarod mining districts, southwestern Alaska, by L.E. Burns, Stevens Exploration, and Fugro Airborne Surveys, 2000, 2 sheets, scale 1:63,360. Resistivity contours and section lines included. Blue line. \$6.
- GPR 2000-34.** 900 Hz coplanar resistivity of parts of the Aniak and Iditarod mining districts, southwestern Alaska, by L.E. Burns, Stevens Exploration, and Fugro Airborne Surveys, 2000, 2 sheets, scale 1:63,360. Topography included. Full-color plot from electronic file, 600 dpi. Made on request. \$26.
- GPR 2000-35.** 900 Hz coplanar resistivity of parts of the Aniak and Iditarod mining districts, southwestern Alaska, by L.E. Burns, Stevens Exploration, and Fugro Airborne Surveys, 2000, 2 sheets, scale 1:63,360. Resistivity contours and section lines included. Full-color plot from electronic file, 600 dpi. Made on request. \$26.
- GPR 2000-36.** 900 Hz coplanar resistivity of parts of the Aniak and Iditarod mining districts, southwestern Alaska, by L.E. Burns, Stevens Exploration, and Fugro Airborne Surveys, 2000, 2 sheets, scale 1:63,360. Resistivity contours and section lines included. Blue line. \$6.
- GPR 2000-37.** Flight lines of parts of the Aniak and Iditarod mining districts, southwestern Alaska, by L.E. Burns, Stevens Exploration, and Fugro Airborne Surveys, 2000, 2 sheets, scale 1:63,360. Topography included. Blue line. \$6.
- GPR 2000-38.** Set of 2 CD-ROMs containing profile data, gridded data, vector data, and location information of 2000 geophysical survey data for parts of the Aniak and Iditarod mining districts, southwestern Alaska, by L.E. Burns, Stevens Exploration, and Fugro Airborne Surveys, 2000. Gridded data in Geosoft and ASCII format. Vector data consists of data contour lines and is in dxf format. \$40.
- GPR 2000-39.** CD-ROM containing gridded data, vector data, and location information of 2000 geophysical survey data for parts of the Aniak and Iditarod mining districts, southwestern Alaska, by L.E. Burns, Stevens Exploration, and Fugro Airborne Surveys, 2000. Gridded data in Geosoft and ASCII format. Vector data consists of data contour lines and is in dxf format. \$20.
- GPR 2000-41.** Portfolio of aeromagnetic and resistivity maps of parts of the Aniak and Iditarod mining districts, southwestern Alaska, by L.E. Burns, 2000, 18 p. Includes color and shadow maps. Maps fit 8½" x 11" sheet. \$18.
- PIR 2000-6.** Preliminary geologic map of a portion of the Fortymile mining district, Alaska 1999, by D.J. Szumigala, R.J. Newberry, M.B. Weldon, B.A. Finseth, and D.S. Pinney, 2000, 1 sheet, scale 1:63,360. \$13.
- PIR 2000-7.** Preliminary geologic map of the Iron Creek area, Talkeetna Mountains B-5 Quadrangle, Alaska, 2000, by M.B. Weldon, J.R. Riehle, J.M. Schmidt, R.J. Newberry, and G.H. Pessel, 1 sheet, scale 1:63,360. \$13.
- PIR 2000-8.** Biostratigraphy report, 129 outcrop samples, western DeLong Mountains (Tingmerpuk), North Slope, Alaska, 2000, by M.B. Mickey and Hideyo Haga, 99 p., 1 sheet. \$24.
- PIR 2000-9.** Summary report in the geology and hydrocarbon potential of foothills at the northwestern DeLong Mountains, western Brooks Range, Alaska, 2000, by C.G. Mull, 16 p. \$2.50
- RI 2000-1A.** Geologic map of the Sagavanirktok B-1 Quadrangle, eastern North Slope, Alaska, by R.R. Reifentuhl, C.G. Mull, E.E. Harris, D.L. LePain, D.S. Pinney, and W.K. Wallace, 15 p., scale 1:63,360. \$18.
- RI 2000-1B.** Interpretive bedrock geologic map of the Sagavanirktok B-1 Quadrangle, eastern North Slope, Alaska, by R.R. Reifentuhl, C.G. Mull, E.E. Harris, D.L. LePain, and W.K. Wallace, 11 p., scale 1:63,360. \$16.
- RI 2000-1C.** Reconnaissance surficial-geologic map of the Sagavanirktok B-1 Quadrangle, eastern North Slope, Alaska, by D.S. Pinney, 6 p., 1 sheet, scale 1:63,360. \$14.
- RI 2000-1D.** Reconnaissance engineering-geologic map of the Sagavanirktok B-1 Quadrangle, eastern North Slope, Alaska, by D.S. Pinney, 2 p., 1 sheet, scale 1:63,360. \$13.
- RI 2000-2.** Geologic map of the Coke Basin-Kukpowruk River area, DeLong Mountains D-2 and D-3 quadrangles, Alaska, by C.G. Mull, E.E. Harris, R.R. Reifentuhl, and T.E. Moore, 1 sheet, scale 1:63,360. \$13.
- RI 2000-3.** Interpretive bedrock-geologic map of the Petersville (Yentna) mining district, Alaska, by D.J. Szumigala, D.S. Pinney, D.L. LePain, S.A. Liss, L.E. Burns, K.H. Clautice, J.L. Mayer, and A.M. McCarthy, 1 sheet, scale 1:63,360. \$13.

State of Alaska
Department of Natural Resources
Division of Geological & Geophysical Surveys
794 University Avenue, Suite 200
Fairbanks, AK 99709-3645

NEW GEOPHYSICAL DATA FOR MINERAL EXPLORATION NEAR ANIAK (PARTS OF THE IDITAROD AND SLEETMUTE QUADRANGLES)

The Alaska Division of *Geological & Geophysical Surveys* (DGGs) is pleased to announce the release of the geophysical data and maps for the airborne geophysical surveys acquired near Aniak in southwestern Alaska. The survey was sponsored by the U.S. Bureau of Land Management and was managed by DGGs. The electromagnetic and total field aeromagnetic survey results will be presented as a series of full color and contour maps at 1:63,360 scale. The data covers approximately 1,240 square miles. Location maps are provided on our web site or can be faxed on request. See *New Publications* for a list of available reports.

Please send address corrections to:

Newsletter, Alaska Division of Geological & Geophysical Surveys, 794 University Ave., Suite 200, Fairbanks, AK 99709-3645
fax (907)451-5050 email: joni@dnr.state.ak.us

Visit our web page at <http://www.dggs.dnr.state.ak.us>

**STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS**

Mail order to:

Division of Geological & Geophysical Surveys
Attn: Geologic Communications Section
794 University Avenue, Suite 200
Fairbanks, Alaska 99709-3645

E-mail dggspubs@dnr.state.ak.us
<http://www.dggs.dnr.state.ak.us>
Phone: (907) 451-5020
Fax: (907) 451-5050

REPORT NO.	TITLE	QUANTITY	UNIT PRICE	POSTAGE	TOTAL
Total amount due					

*Domestic postage \$1.00 per copy of each report ordered
Canada and Mexico, \$1.50 per copy of each report ordered
All other international, \$2.50 surface, \$5.00 air mail per
copy of each report ordered*

Ship publication(s) to:

Name _____

Organization _____

Address _____

City, State _____ Zip _____

Payment must accompany your order. Make check or money order payable to **STATE OF ALASKA**. We cannot accept credit cards.