LEGEND

Note - This legend is common to National Geochemical Reconnaissance Map 15-1976, Open File 419, Map 15-1976, Open File 419 and Map 16-1976, Open File 420

QUATERNARY
- [A] Unconsolidated glacial and alluvial deposits

DEVONIAN
- [B] SARTINDIL, shale and conglomerate; ESK, BRANT RIVER FORMATION: limestone, shale and conglomerate; ESK, JUNKIN CREEK FORMATION: sandstone and conglomerate; ESK, BATZ RIDE FORMATION: shale and siltstone
- [C] Granite and gabbro
- [D] Marble green and maroon shale and brown siltstone
- [E] KENO HILL QUARTZITE: massive quartzites, minor slate and phyllite

SILURIAN
- [F] LOWER SILURIAN: metamorphosed equivalents of shale, phyllite and minor quartzite, fine, limestone and basalt

TRIASSIC
- [G] HORNADAY FORMATION: limestone and shale; unnamed clastics and carbonates

PERMIAN
- [H] TRAUBACH FORMATION: grey chert and limestone; FAY, JUNKIN CREEK FORMATION: limestone, shale, carbonates and clastics; undifferentiated

CARBONIFEROUS TO PERMIAN
- [I] UNNAMED FORMATION: shale and limestone; HART RIVER FORMATION: shale, siltstone and limestone; tributary Group undivided: fine, limestone, siltstone and shale; ROCKY MOUNTAIN GROUP: conglomerate, limestone, sandstone and shale; undifferentiated

DEVONIAN TO CARBONIFEROUS
- [J] EARN FORMATION: black shale; BATZA RIDGE FORMATION: chert, mainly conglomerate and chert-grain sandstone; shale, argillite, limestone and minor chert-bearing conglomerate and quartzite

JURASSIC TO MIDDLE CRETACEOUS
- [K] BEDDIS FORMATION: limestone; CHANCELLA FORMATION: limestone; MICHELLE FORMATION: limestone and shale; unnamed limestone, sandstone, conglomerate and minor shale

CRETACEOUS AND OLIGOCENE
- [L] HOOD RIVER FORMATION: shale, limestone, black chert and argillite, minor quartzite and chert-pebble conglomerate

CRETACEOUS
- [M] Dolomite and limestone; argillaceous limestone and dolomitic limestone; minor shale

JURASSIC
- [N] Limestone and dolomite, minor red shale; unnamed clastics; BU, ROCKY MOUNTAIN GROUP: limestone, shale and sandstone; FERNIE GROUP: limestone, shale and sandstone; UNDEFINED: limestone, unnamed dolomite and limestone

PRECAMBRIAN AND/OR LATER
- [O] Dark green volcanic rocks, breccia, tuff, agglomerate, shale, greywacke and minor limestone

PRECAMBRIAN
- [P] Quartzite, limestone, quartz-pebble conglomerate, gneiss and green schist, chlorite schist, quartz-mica schist, phyllite, limestone and minor shale

UNKNOWN
- [Q] Unnamed carbonates and clastics

PRECAMBRIAN
- [R] HAYDEN GROUP: mudstone, limestone, iron formation and dolomite

MISSISSIPPIAN
- [S] KATHLEEN FORMATION: sandstone and dolomite; TSICHITA FORMATION: sandstone and dolomite; unnamed carbonates, shale and gypsum
- [T] EARN GROUP: undivided; black shale, phyllite, grey and minor chert clastics, limestone, black shale, sandstone and siltstone
- [U] MILLIGAN BAR CITY DOLOMITE
- [V] Argillite, shale, phyllite quartzite, dolomite, conglomerate and siltstone of Proterozoic Y

Drift-covered areas.....
Geological contact.....
Fault.....

Geology generalized for geochemical maps by W.D. Goodfellow from Rush Creek (1960) and Larsen Creek (1968) by L.H. Green (G.S.C. Mem. 364, 1970) and Wind River (1966) and Hart River (1968) by D.F. Norris (G.S.C. Open File 279, 1975)

Geological cartography by the Geological Survey of Canada

Base-map assembled by the Geological Survey of Canada from maps published at the same scale by the Surveys and Mapping Branch in 1974, 1975

Mean magnetic declination 1977, 30°52.3' East, decreasing 2.5' annually. Readings vary from 30°25.3' E to 31°19.3' E close to NTS/105 boundary

Elevations in feet above mean sea-level

GEOCHEMICAL SYMBOLS AND DATA PRESENTATION

The absolute background and anomalous concentrations, and the contrast between them will vary regionally depending on factors such as the physiography, geology, the sample media and the chemistry of the elements determined.

Regionally, the highest background values are found in the Bermuda, Byllite and Richardson Mountains, and the Eagle Plains and Bonnet Plume basins. Most of the sediment in streams intersecting mountain terrain has been derived by the mechanical breakdown of bedrock and glacial drift and is transported downstream by the energy of the heavy spring run-off. Stream sediments range in size from fine silt to boulders with only minor organic matter present. By contrast, streams intersecting the Eagle Plains and Bonnet Plume basins carry sediment derived largely from the fine, clay and organic-silt sediment. Under these conditions, organic matter may be expected to play a significant role in the transport and deposition of certain elements (eg. Fe, Zn, Cu, Co, Mn, etc.) and may therefore produce spurious anomalies. It is suspected that fluid deposition, such as sediment composition, present in the data from the Eagle Plains and Bonnet Plume basins may be anomalously high.

The geology of the survey area is represented by sedimentary, volcanic and intrusive rocks that range in age from Lower(?) Proterozoic to Upper Cenozoic, with the greatest areal representation in the Upper Paleozoic. Mineral deposits are known associated with the Proterozoic sedimentary and volcanic rocks of the Richardson Mountains. Other geological environments that are considered to have a high potential for mineral deposits are the Devonian shale, chert, limestone, basalt and dolostone in the Folinsbi shales as a source of base metals and the Devonian to the Mesozoic and Cenozoic sedimentary basins such as the Eagle Plains and Bonnet Plume basins as a source of oil as faults and unconformities which may serve as favourable traps for accumulation of oil.

Because of the mechanical derivation of stream sediments from mountainous terrain, the geochemistry is strongly influenced by the chemistry of the underlying rocks. For example shales, or their metamorphic equivalents, which are common in Proterozoic, Paleozoic and Mesozoic rocks, are known to contain anomalous amounts of many other elements determined which is reflected in the geochemistry of the stream sediments. Therefore, it is suggested that each stream system be evaluated in terms of the local geology before any exploration decisions are made on the data.

The element associations expected for particular types of mineralization must also be considered when evaluating geochemically anomalous stream sediments. For example, Pb, Zn and Ag are commonly found in the same deposit associated with the Proterozoic sedimentary and volcanic rocks of the Richardson Mountains. Other geological environments that are considered to have a high potential for mineral deposits are the Devonian shale, chert, limestone, basalt and dolostone in the Folinsbi shales as a source of base metals and the Devonian to the Mesozoic and Cenozoic sedimentary basins such as the Eagle Plains and Bonnet Plume basins as a source of oil as faults and unconformities which may serve as favourable traps for accumulation of oil.

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The element associations expected for particular types of mineralization must also be considered when evaluating geochemically anomalous stream sediments. For example, Pb, Zn and Ag are commonly found in the same deposit associated with the Proterozoic sedimentary and volcanic rocks of the Richardson Mountains whereas Mo, F and Cu a lesser extent Mo would be expected to be associated with primary W mineralization in alkaline plutons. Secondary dispersion patterns developed in the overburden may be useful in identifying regional geochemical trends that may be, at least in part, controlled lithologically. Anomalous geochemical trends within these regional patterns should then be evaluated for possible mineralization on the basis of not only the absolute concentrations but also element interrelations.

The geochemical data for each sediment or water site is graphically represented as one of 15 symbols; if a sample was collected but there is no data available a dot is plotted. The symbols are arranged so that they first increase in size to the eighth class and then in the ninth class decrease in size. The largest symbol is used at the low end of the scale are used to recognize weakly anomalous concentrations below the analytical detection limits, or in the data group containing the detection limit. The symbols are based on a geometric progression of the square root of 2 (1.414). The data can be zoomed and into arbitrary division has been chosen for the maps. Canada wide series of maps constituting the National Geochemical Reconnaissance.

The class interval for each element determined is unique. The class assignment is based on the histogram and cumulative frequency plot for the total survey data from one, or more contiguous, open file sheets covered in one field season.

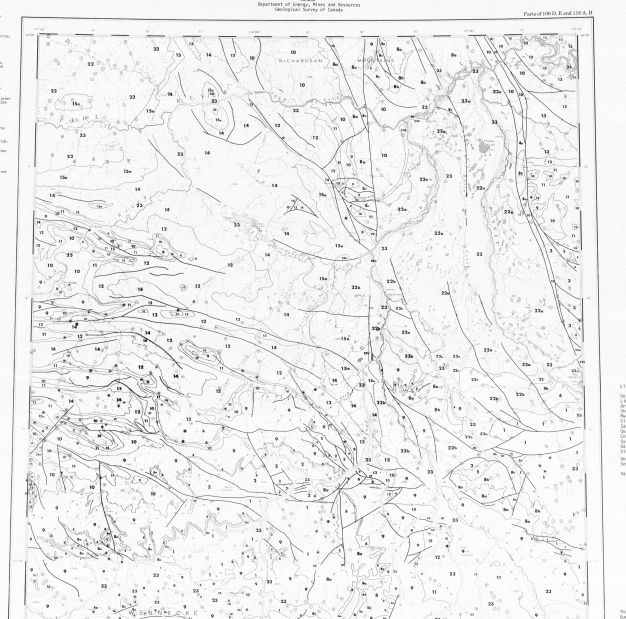
For eights symbol is used for the model group as defined by the histograms, this group usually includes the medians of the data as defined by the R.A (50%) point on the cumulative frequency plot. Above and below the remaining 14 symbols are shown for uniform an appropriate graphical legend.

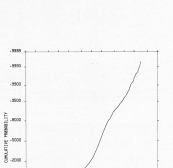
The raw data symbol maps are only intended to assist the rapid inspection of the data and to point out areas worthy of follow-up work. For detailed study of the thorough investigation, the field and analytical data recorded on the data listings should be consulted. To assist in the appraisal of the data in terms of the symbol maps, histograms, tables of statistical parameters and cumulative frequency plots, easily derived from within each bedrock unit, or broad lithologic unit, is presented below the histogram. In many instances, the table will also illustrate, more clearly than the map, the distribution of more abundant trends on bedrock type. It must, however, be realized that some of these trends may be represented by superimposed distribution the data for individual map or lithologic units. Consequently, the normal distribution except where the concentration of an element at or below the detection limit for a large number of samples (e.g. U and F in water, Bo, Mo and U in sediment). In such cases, the median will be used to define the class interval and the mean will not represent the total population. Therefore, caution must be exercised when using the table of summary statistics to establish background and anomalous concentrations for use in the field.

To complementarily study an area, all available geological, environmental and recorded data should be utilized. The data separation by bedrock type can often be improved by combining two data intervals and defining local threshold levels based on the most detailed and up-to-date knowledge available.

Canada
Department of Energy, Mines and Resources
Geological Survey of Canada

Parts of 106 D, E and 116 A, H





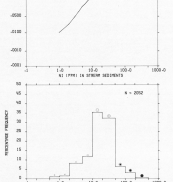


Table of Summary Statistics for Sample Media (sediments by Geometric Lithologies

Lithology	No. of Samples	Geometric Mean	Mean	Arithmetic S.D.	E.M.S
Dolomite	50	9	12	15	128
Limestone	103	14	17	15	108
Argillite	106	15	25	38	138
Shale	407	31	36	35	94
Quartzite	15	15	19	19	100
Siltstone	35	25	29	19	63
Sandstone	212	23	27	29	107
Quartzite	113	46	49	26	53
Conglomerate	10	13	16	9	56
Chert	57	17	28	39	137
Basalt	18	65	105	97	92
Diorite	6	25	28	16	58
Unclassified Sedimentary Rock	66	28	63	61	101

Data collected up to 1976

NATIONAL GEOCHEMICAL RECONNAISSANCE MAP 15-1976
OPEN FILE 419

Resource Geophysics and Geochemistry Division

Geological Survey of Canada, Ottawa

Planning and coordination by staff of the Geochemistry Section, Resource Geophysics and Geochemistry Division, Geological Survey of Canada Sub-Arctic Regional and Economic Geology Division.
Field operations supervised by N.G. Lund and W.D. Goodfellow
Analytical contract supervised by J.J. Lynch
Data monitoring and compilation by R.G. Garrett, N.G. Lund and D.F. Sibbick

Contractors

Sample preparation by Golder Associates
Chemical analysis by Chemex Labs Ltd.

This map forms one of a series of 45 sheets released under Geological Survey of Canada, Open Files 419, 419 - 423. The Open Files consists of data for 12 elements each for stream sediments, percent loss on ignition, 2 elements for stream waters and sample site location

The data are also available in digital form. For further information please contact

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Ottawa, Ontario K1A 0E9

NATIONAL GEOCHEMICAL RECONNAISSANCE MAP 15-1976

NICKEL IN STREAM SEDIMENTS

LABORATORY RECONNAISSANCE PROGRAM

Scale 1:250,000

This map has been scanned from a scanned version of the original map. Some colour separation combination shows may be required

NATIONAL GEOCHEMICAL RECONNAISSANCE MAP 15-1976
OPEN FILE 419
NORTHERN YUKON TERRITORY, 105
NICKEL