REGIONAL GEOCHEMICAL SURVEYS RGS 16 — WHITESAIL 93E* AND RGS 17 — SMITHERS 93L WEST-CENTRAL BRITISH COLUMBIA

By S. Zastavnikovich and W. M. Johnson

INTRODUCTION

During July and August 1986 the British Columbia Ministry of Energy, Mines and Petroleum Resources conducted two regional geochemical stream and lake sediment and water sampling surveys (RGS 16 and 17) covering the Whitesail and Smithers map sheets (Figure 6-6-1).

The Ministry organized and supervised all components of RGS 16. Sampling and analytical work were funded from the second year of the British Columbia/Canada Mineral Development Agreement (MDA). Data processing will be carried out by the Department of Energy, Mines and Resources (EMR), Ottawa.

The Ministry funded organization, supervision and sample collection activities for RGS 17 while EMR funded the sample preparation, analyses and data processing. Field supervision for both surveys was provided by S. Zastavnikovich under the direction of W. M. Johnson.

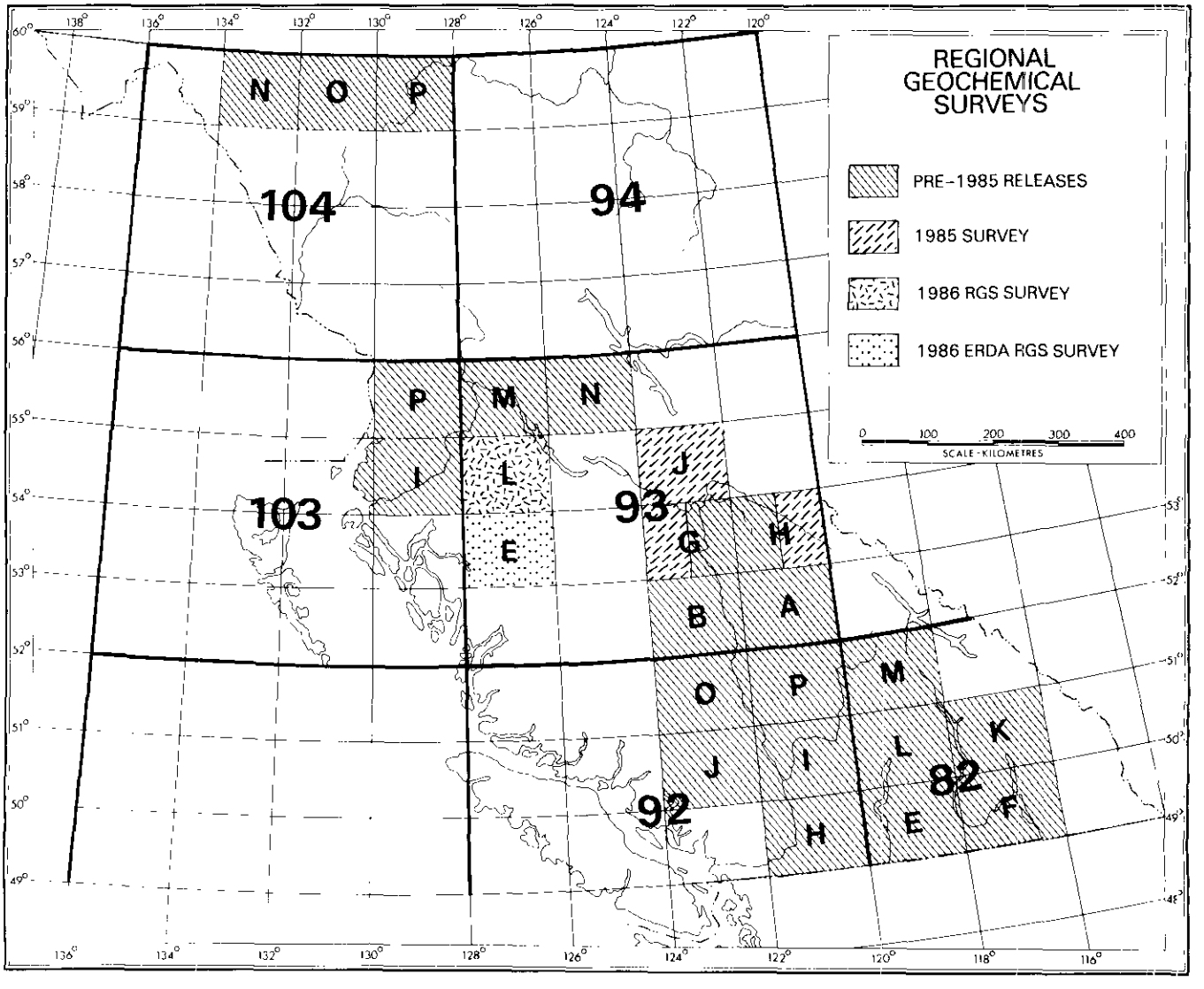

Figure 6-6-1. Location map for regional geochemical surveys carried out in British Columbia.

* This project is a contribution to the Canada/British Columbia Mineral Development Agreement.

British Columbia Ministry of Energy, Mines and Petroleum Resources, Geological Fieldwork, 1986, Paper 1987-1.

SAMPLING DENSITY

Both surveys were concluded successfully within the contracted time frame. In the RGS 16 Whitesail map area, covering approximately 14 600 square kilometres, 1114 lake and stream sites were sampled, for an average density of one sample per 13.1 square kilometres. In the RGS 17 Smithers map area, covering approximately 14 400 square kilometres, 1093 lake and stream sites were sampled, also yielding an average density of one sample per 13.1 square kilometres.

When they become available, field and analytical data are processed, then plotted on maps at a scale of 1:250 000. Release of open file maps and summaries of field data and statistics is expected in June 1987.

METHODOLOGY

Field sampling for RGS 16 and RGS 17 was carried out by McElhanney Engineering Services Ltd. The contractor's crew consisted of an average of five men. Access was good on 93L, but poor on 93E due to mountainous terrain. Helicopters were used to access sample sites that could not be reached by truck, motorcycle, fixed-wing aircraft or boat. McElhanney contracted with Quasar Helicopters for helicopter support.

Water samples are analysed for uranium, fluorine and pH.

Stream sediments are analysed for zinc, copper, lead, nickel, cobalt, silver, manganese, iron, arsenic, molybdenum, tungsten, mercury, uranium, antimony, cadmium, barium and loss-on-ignition (LOI).

PHYSIOGRAPHY AND GEOLOGY

The Whitesail and Smithers map areas straddle the major physiographic boundary between the Coast Crystalline Belt and several subdivisions of the Intermontane Belt. Based on the subdivisions of Stuart S. Holland (1976), the Kitimat Ranges of the Coast Mountains occupy the southwestern third of the Whitesail sheet, while the Bulkley and the Babine Ranges of the Hazelton and Skeena Mountains form the northwestern half of the Smithers map area. The Nechako portion of the Interior Plateau occupies the eastern halves of both map sheets.

As described by Holland, the dominantly granitic Kitimat Ranges are characterized by round-topped, dome-like mountains with peaks from 2200 to 2500 metres and northerly facing cirques. These ranges have been over-ridden by the ice sheet, which left behind deep U-shaped river valleys with numerous hanging valleys in the steep walls and glaciers in the cirques.

The Bulkley, Babine and Tahtsa Ranges, representing the mountainous and highland portions of the Interior Plateau, are wedged between the Kitimat Mountains to the northwest and west and the low-lying Nechako Plateau to the east. The Bulkley River, draining northwards from Morice Lake into the Skeena River, separates the Hazelton Range from the Skeena Mountains. South of Morice Lake the drainage is eastward across the Nechako Plateau to the Fraser River system through the valleys of Tahtsa, Troitsa, Whitesail and Eutsuk Lakes, all at about 900 metres elevation. The serrate ridges and peaks are between 2100 and 2500 metres high, with glaciers in most northeast-facing cirques. The mountains are largely underlain by Mesozoic sedimentary and volcanic rocks intruded by isolated stocks and small granitic batholiths of Cretaceous age. The lakes occupy ice-modified valleys extending eastwards from within the granitic Coast Range Mountains onto the Nechako Plateau. Ice, which accumulated in the mountains to the west, flowed eastward across the Tahtsa Ranges and through the lake valleys onto the plateau and onwards toward the Rocky Mountains.

The Nechako Plateau is an area of low relief, with undissected expanses of flat or gently rolling country and a sparse stream drainage network. Over much of the plateau flat or gently dipping Tertiary lava flows cover the older sedimentary and volcanic rocks of the Takla and Hazelton Groups and intrusive rocks of Late Jurassic and Cretaceous age. From the Ootsa Valley the ice moved east and northeasterly, while along the Babine Valley it moved southeast, then veered to the northeast. Myriads of lakes occupy the plateau, ranging in size from small ponds to Babine Lake, and some 20 per cent of the samples taken were lake sediments.

In the southwestern section of the plateau, several round-topped mountains rise sharply above the general upland surface. These monadnocks on the Late Tertiary erosion surface result from the resistance to erosion of granitic stocks and their contact metamorphic aureoles. Granitic intrusions of Late Cretaceous and Early Tertiary age, often with associated porphyry copper and molybdenum mineralization, intrude Mesozoic volcanic and sedimentary rocks throughout the sampled area of the Intermontane Belt (Carter, 1981).

The physiographic extremes in the sampled area are reflected by wide variations in vegetation and drainage patterns. The plateau is heavily forested, except in areas flooded by numerous beaver dams along the dendritic stream valleys. The high mountains are characterized by herringbone drainage patterns. Steep valley sides were sometimes an obstacle to helicopter access.

REFERENCES

Carter, N.C. (1981): Porphyry Copper and Molybdenum Deposits, West-central British Columbia, *B.C. Ministry of Energy, Mines and Petroleum Resources*, Bulletin 64, 150 pages.

Holland, Stuart S. (1976): Landforms of British Columbia, A Physiographic Outline, Reprinted 1976, *B.C. Ministry of Energy, Mines and Petroleum Resources*, Bulletin 48, 138 pages.