

QUEST-Northwest Project: New Regional Geochemical Survey and Sample Reanalysis Data, Northwestern British Columbia (NTS 104F, G, H, I, J, K)

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Introduction

Since 2005, Geoscience BC has supported significant enhancements to the British Columbia regional geochemical database (Jackaman, 2011a). As part of the QUEST-Northwest Project, the database is being further upgraded with new field survey results and sample reanalysis data. This information will be compiled as part of a large-scale geoscience initiative, which to date has included stream-based infill sampling and the reanalysis of sediment pulps saved from previous government-funded surveys. Results will generate a vast array of geochemical information that complements other components of the QUEST-Northwest Project, such as the airborne geophysical surveys and bedrock mapping (Simpson, 2012; Logan, 2012, respectively). This collection of high-quality geoscience information will help promote and stimulate exploration interest in the project area.

Northwestern BC has been the focus of several government-funded reconnaissance-scale regional geochemical surveys completed between 1987 and 2004 (Lett, 2005). Although results from this work produced a solid base of geochemical information that has guided numerous exploration activities, limitations associated with sample site density and the existing geochemical database identified a need to increase the number of sample sites and upgrade the ca-

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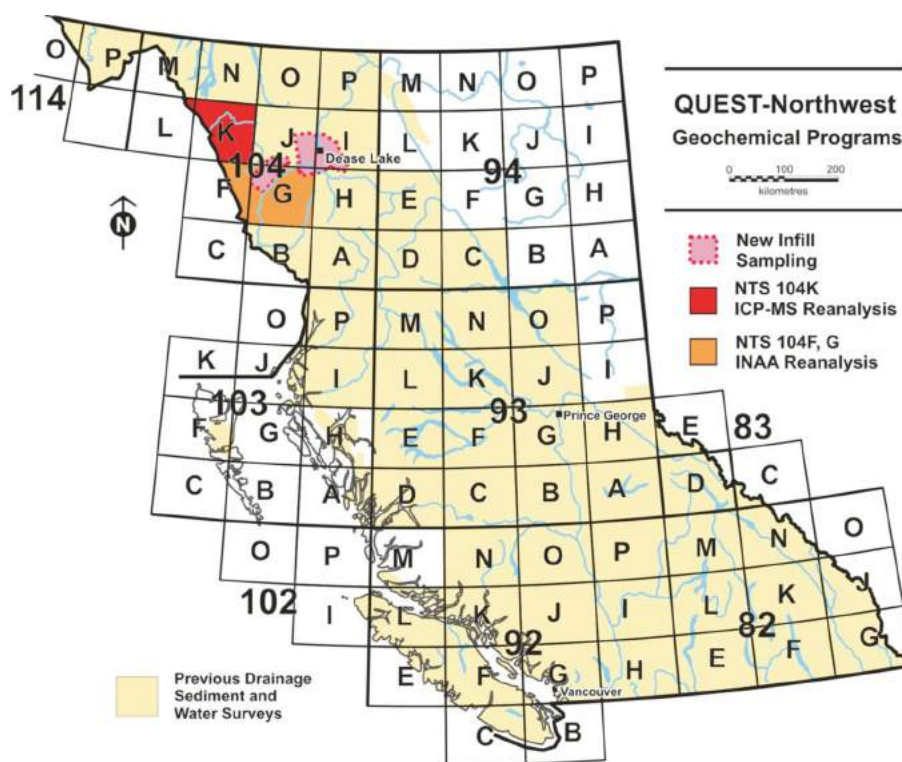


Figure 1. Location of the 2011 QUEST-Northwest geochemical infill sampling and reanalysis programs, northwestern British Columbia.

capacity of the associated analytical package. To address these deficiencies, stream-based infill sampling was conducted over parts of the study area and the reanalysis of archived sediment pulps is also being completed.

QUEST-Northwest Project Area

Sample reanalysis work covers NTS 104F, G and K 1:250 000 map areas (Figure 1). The infill sampling component included parts of NTS 104G, H, I and J 1:250 000 map areas. To co-ordinate geochemical coverage with the airborne geophysics work, the stream sampling was divided into the Telegraph Creek and Dease Lake survey areas (Figure 2).

The Telegraph Creek survey covers an area of more than 3500 km² and extends west from the community of Telegraph Creek, straddling the wide and heavily forested

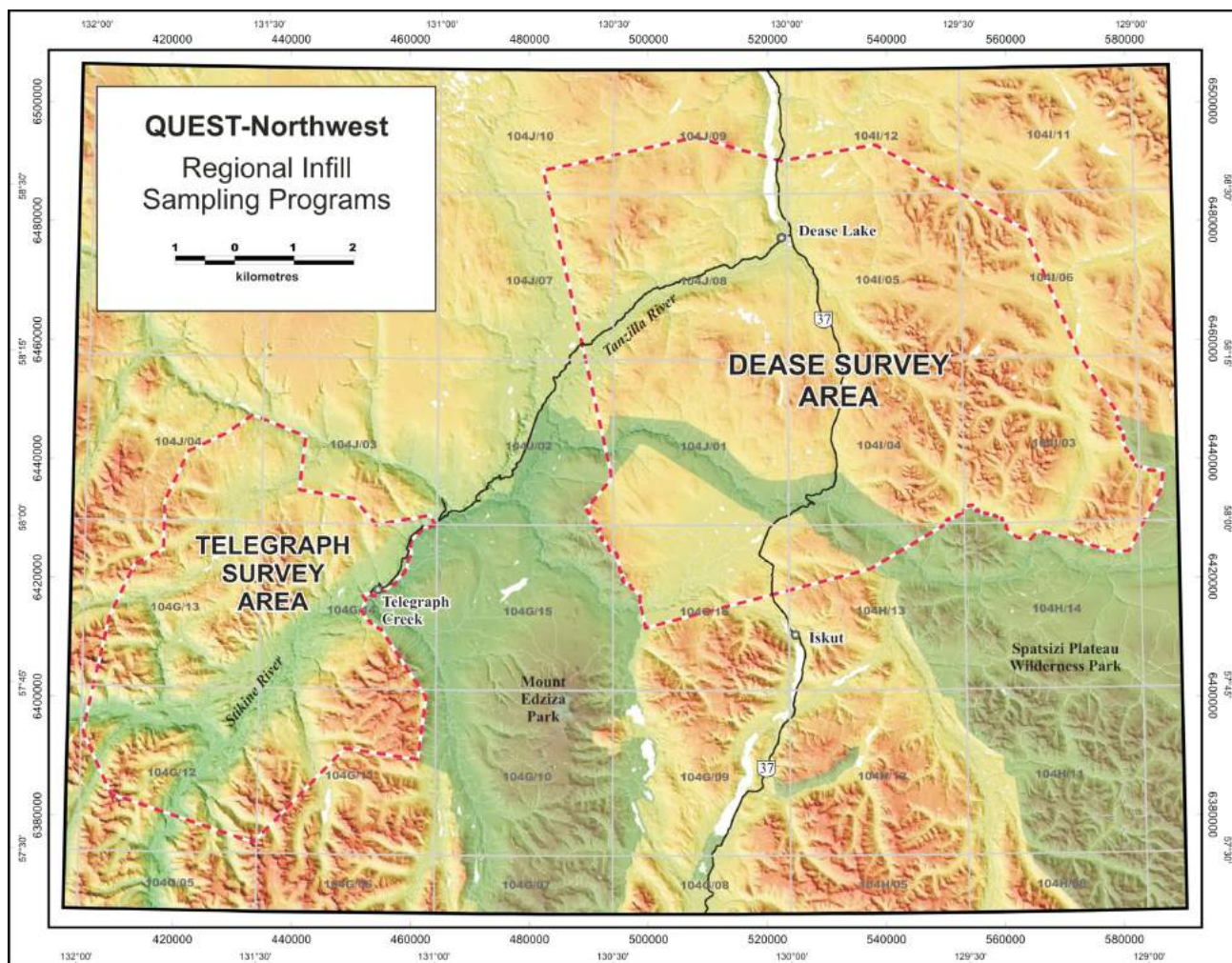


Figure 2. Locations of Telegraph Creek and Dease Lake infill sampling areas (indicated by the dashed red outlines), northwestern British Columbia.

Stikine River valley. To the west and south of the valley, the area is characterized by high rugged peaks of the Boundary Ranges, and to the north, the more subdued mountains of the Tahltan Highland (Holland, 1976). The Dease Lake survey covers more than 5500 km² and also includes parts of the Stikine River valley and the Tanzilla River valley. The area extends east into the Stikine Ranges of the Cassiar Mountains.

In low-lying regions of the survey areas (Figure 3), access was limited by thick tree cover. In addition, the availability of suitable sample material was often hampered by poorly developed stream drainages associated with extensive wetland cover. Exposed areas at higher elevations (Figure 4) provided excellent access to streams and numerous opportunities to improve the overall sample site coverage.

QUEST-Northwest Infill Surveys

Using helicopter support, stream-based sample collection was carried out in August 2011. A total of 441 stream sediment and water samples were systematically collected. Combined with previous survey results, the sample site density was increased to one site every 7 km². The sampling generally included approximately 2 kg of sediment material and 250 mL of clear water obtained from the active stream channel of first-order drainages. Field observations of location, sample information and site characteristics were recorded for each site. Samples were transported back to field camps in the community of Telegraph Creek and near Iskut along Highway 37, where the samples were catalogued and sediments were drip-dried in a contaminant-free structure and water bottles were stored in a cool, dark location.

At the completion of the field program, stream sediment samples were dried and sieved to –80 mesh (<177 µm) and were shipped to Eco Tech Laboratory Ltd. (Kamloops, British Columbia). To monitor and assess accuracy and precision of analytical results, control reference material, analytical duplicate and field duplicate samples are included in each block of 20 samples. Once processed, splits of the sediment samples will be forwarded to Acme Analytical Laboratories Ltd. (Vancouver, British Columbia) and Becquerel Laboratories Inc. (Mississauga, Ontario). The sample pulps will be analyzed for 53 analytes by inductively coupled plasma–mass spectrometry (ICP-MS) using an aqua-regia digestion and instrumental neutron activation analysis (INAA) for 32 elements. Loss-on-ignition and fluorine content will also be determined for stream sediment samples. Streamwater was measured for pH and conductivity at each site and fluoride will be determined from the raw streamwater samples.

All components of the survey are conducted to protocols maintained by the National Geochemical Reconnaissance (NGR) and BC Regional Geochemical Survey (RGS) programs (Ballantyne 1991; Friske and Hornbrook, 1991).

QUEST-Northwest Sample Reanalysis

As part of the NGR program, the map areas targeted for reanalysis were previously surveyed in 1987 as part of a joint federal-provincial initiative (Gravel and Matysek, 1988). At that time, sediment samples were analyzed for a limited range of metals by aqua-regia digestion–atomic absorption spectrometry (AAS), and for gold by lead collection fire assay. By design, samples have been routinely retained for all surveys completed in BC. The availability of these samples has provided the opportunity to generate up-to-date analytical information for samples collected during older surveys.

In co-operation with the BC Geological Survey (BCGS) and Natural Resources Canada (NRCan), samples from the 1987 surveys were retrieved from storage facilities in Ottawa. A total of 997 drainage-sediment pulps from NTS 104K plus quality-control samples have been recovered from storage and delivered to Acme Analytical Laboratories Ltd. (Vancouver, British Columbia) and are being analyzed by an ultratrace aqua-regia digestion (0.5 g) ICP-MS package for 53 elements. In addition, 1399 drainage-sediment pulps from NTS 104F and 104G plus quality-control samples have been recovered from storage and shipped to Becquerel Laboratories Inc. and are being analyzed by INAA for 34 elements.

Results of this reanalysis work will add up to 87 new elements to the existing geochemical database and will provide greater data continuity with more recent survey work and other data reanalysis initiatives such as the Geoscience



Figure 3. Thick forest coverage characteristic of the Stikine River valley, northwestern British Columbia.



Figure 4. Typical higher elevation valley in the Stikine Ranges, northwestern British Columbia.

BC-funded Northern BC Sample Reanalysis Project (Jackaman, 2011b).

Data Release Information

Results of the reanalysis work are scheduled to be published in January 2012 and the new infill survey results will be released in the late spring 2012. Prior to release, the analytical information is carefully scrutinized using established quality-control measures, such as blind duplicate samples and control reference materials. Approved analytical information is digitally merged with complete and accurate sample site location information and field observations. The final release packages include detailed descriptions of the work and will be publicly available free of charge from the Geoscience BC and the BCGS websites in a variety of digital data formats. In combination with other geoscience information, careful assessments of the published data will help identify exploration opportunities associated with regional geochemical trends and individual sample anomalies.

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