MINERAL OCCURRENCE DATA SYSTEM

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ABSTRACT

The Mineral Occurrence Data System (MODS) is a three-part database consisting of a manual Mineral Inventory File, mineral occurrence maps on geological bases and a computerized Mineral Inventory Database. The MODS contains information on approximately 4000 mineral occurrences and is designed to offer fast and easy access to information on the province's mineral resources.

INTRODUCTION

The Mineral Occurrence Data System (O'Driscoll *et al.*, 1991) consists of a manual Mineral Inventory File, mineral occurrence maps on geological bases and a computerized database. The project is designed to offer an efficient information service on all the mineral occurrences in Newfoundland and Labrador (Figure 1).

Most of the MODS information was compiled from a systematic search of mineral exploration company-assessment files. Other sources of information include publications of the Newfoundland Department of Mines and Energy, the Geological Survey of Canada, news items from the press, publications in geological and mining journals, and personal communications from mining-company and government personnel.

MANUAL MINERAL INVENTORY FILE

The manual Mineral Inventory File is part of the National Mineral Inventory and consists of mineral occurrence reports that summarize all data on known mineral occurrences in the province. The file presently contains approximately 4000 reports, which includes coverage for all the Island of Newfoundland (Figure 2) and selected areas in Labrador (Figure 3).

The Mineral Inventory File is continually being updated. This file was started in 1978, and since then, much new geological mapping and exploration have been carried out and many new occurrences have been discovered. Updates were done in the past only on land tenure and major mineral occurrences. Areas that have been updated with new mineral occurrence descriptions include all of NTS 12A, and major parts of NTS 12B and 12H map areas. In addition, industrial

minerals for all of the Island of Newfoundland have been documented.

Mineral occurrence maps containing updated geological bases have been published at a 1:250 000 scale and are available upon request. In addition, selected areas have been published at 1:50 000 and 1:100 000 scales. These maps contain locations, a listing and a brief description of the occurrences. An industrial minerals map of the Island of Newfoundland at 1:1 000 000 scale on a geological base, is now available. This map contains locations, a listing and a brief description of occurrences.
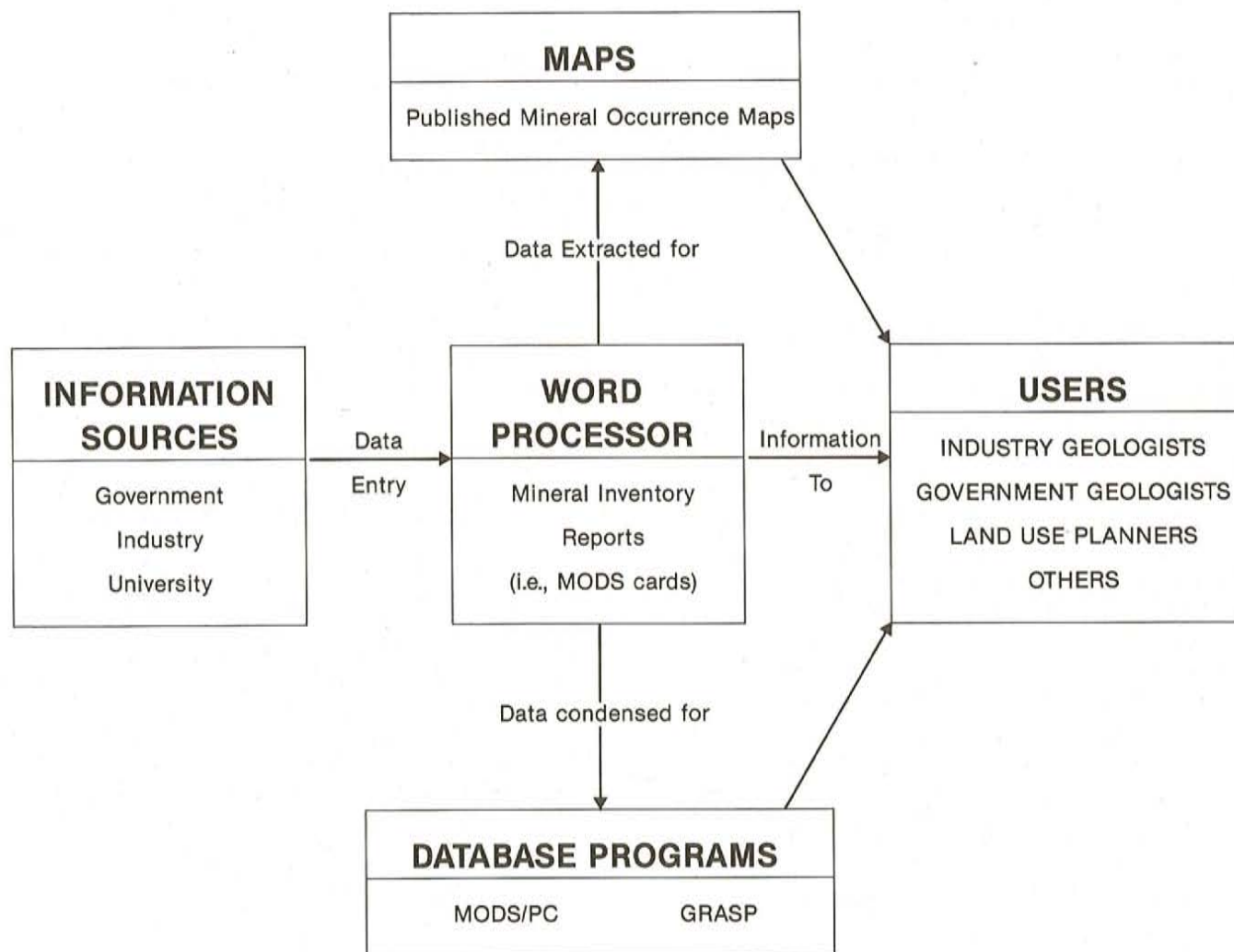
COMPUTERIZED MINERAL INVENTORY DATABASE

Since 1978, a computerized Mineral Inventory Database, which parallels the manual file, has been developed and maintained. This database contains information selectively extracted from the manual file and presently resides on a Hewlett Packard 9000/750 Unix-based network server, located at the Geological Survey Branch, Department of Mines and Energy, 95 Bonaventure Avenue, St. John's. The Geological Retrieval and Synopsis Program (GRASP) developed by the United States Geological Survey (Bowen and Botbol, 1975) is used to manage and manipulate the database. Although GRASP is a powerful program that allows complex searches to be performed, it is not user friendly or available for microcomputers. In the past, in order for users to access the computerized Mineral Inventory Database a visit to the Geological Survey Branch offices and the help of MODS personnel was required.

DEVELOPMENT OF MODS/PC

With the proliferation of microcomputers and the need for easier access to MODS information, it was decided to

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[1] Geoscience Data Centre

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                              │          MAPS            │
                              ├──────────────────────────┤
                              │ Published Mineral        │
                              │ Occurrence Maps          │
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                                    ▲
                              Data Extracted for
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INFORMATION SOURCES — Government, Industry, University

Data Entry →

WORD PROCESSOR — Mineral Inventory Reports (i.e., MODS cards)

Information To →

USERS — INDUSTRY GEOLOGISTS, GOVERNMENT GEOLOGISTS, LAND USE PLANNERS, OTHERS

Data condensed for

DATABASE PROGRAMS — MODS/PC   GRASP

The three components of the Mineral Occurrence Data System (MODS) are mineral inventory reports, mineral occurrence maps and the computerized database. These can be used either individually or collectively.

A user may study the mineral occurrence map of an area to identify occurrences of interest and can then peruse the mineral inventory reports to find detailed information on one or more specific mineral occurrence(s).

Occasionally a user may want less detailed information on all occurrences of a particular type, for example, vein type, located over a large geographic area. Particular information can be selected from the database and saved on disk, displayed on screen or printed out in a report.

Mining company personnel or individuals interested in claim staking will first want to assess an area's mineral potential. Information retrieved by searching MODS/PC can be used to focus and define geographic areas of interest. More detailed information can be obtained from mineral inventory reports or from the list of references given in each report.

Figure 1. *Organization and operation of the Mineral Occurrence Data System.*
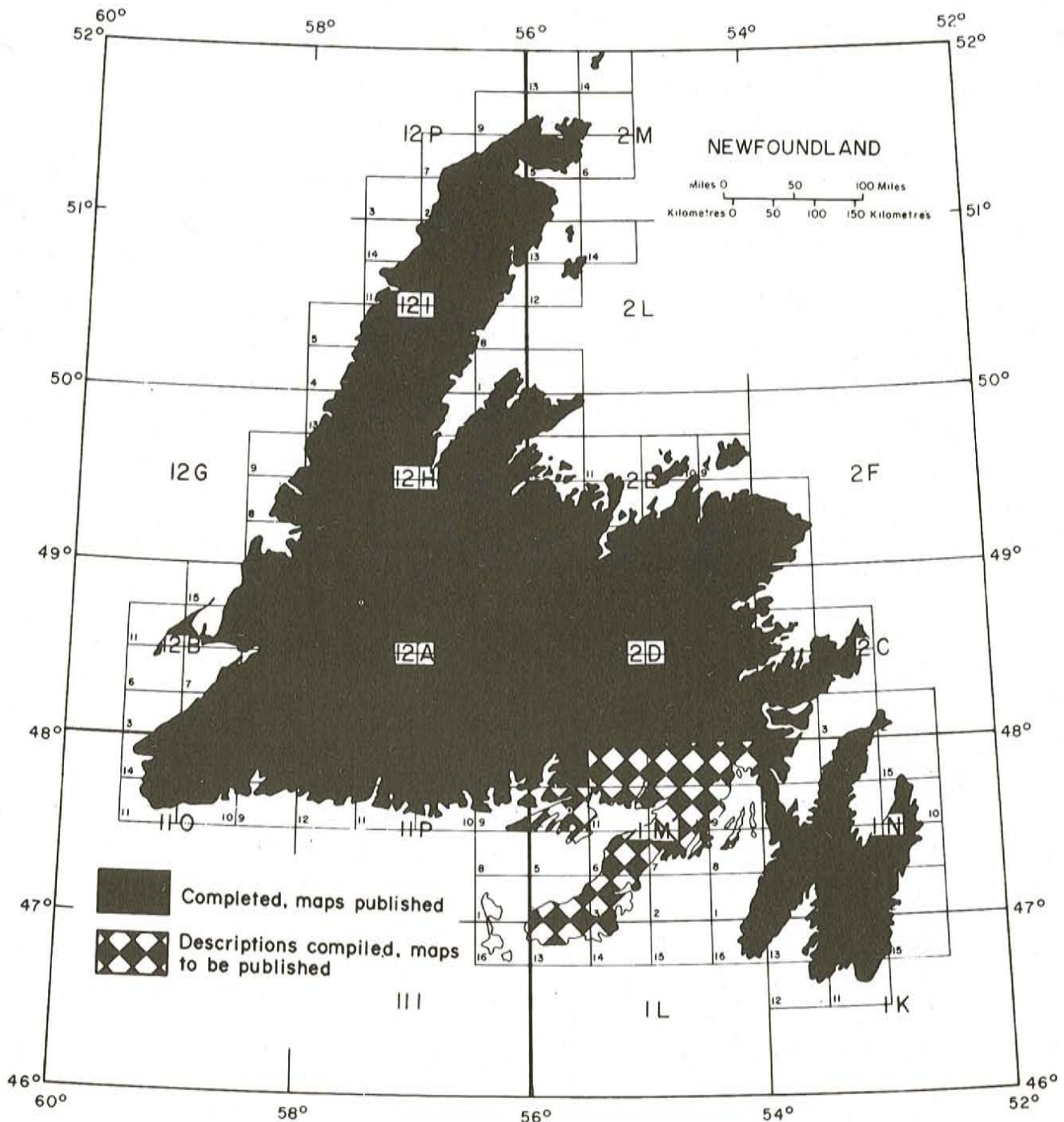
Figure 2. *Index map for Mineral Occurrence Data System project, insular Newfoundland.*

develop a microcomputer version of this information system in 1990 (Stapleton *et al.*, 1991; Stapleton and Parsons, 1991). The Mineral Occurrence Data System microcomputer application (MODS/PC V1.0) was written in-house by W. Keith Parsons, Systems Analyst with the Geological Survey Branch of the Department of Mines and Energy. It was written in the R:Base Database language (V2.11) and compiled using the R:Base compiler (V1.02). R:Base was chosen as the development tool because of the program's support of long string fields and the availability of a vendor-supplied compiler.

The minimum system requirements needed to run the MODS/PC program include an IBM-compatible microcomputer with an 80286 processor, 640 K of RAM, a hard disk, and a CGA videocard/monitor. As well, the system must have at least 475 K of free memory. To achieve this, certain memory resident programs may have to be deactivated.

The MODS/PC system is distributed on four 5¼" diskettes or one 3½" diskette in a compressed format. An
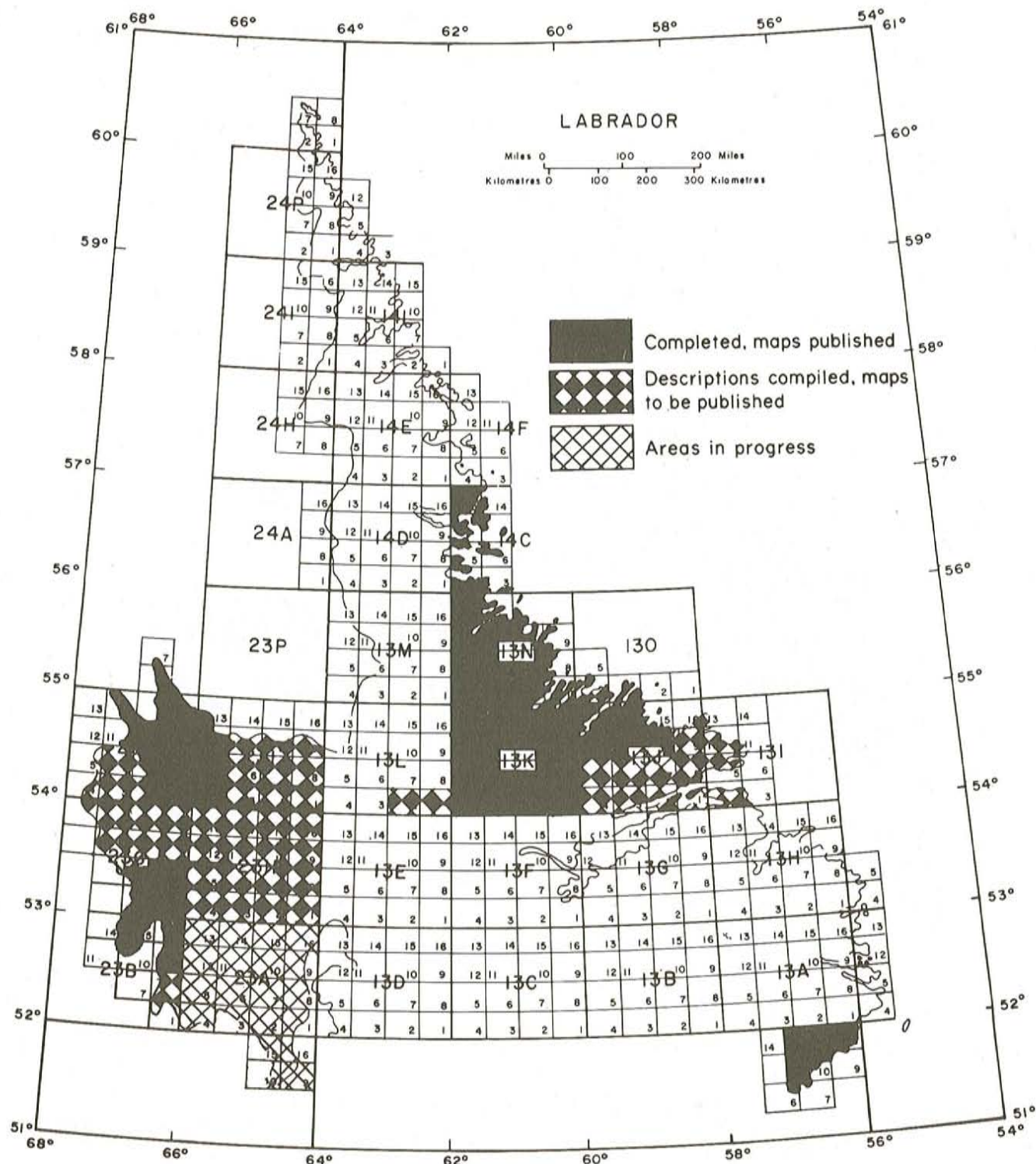
Figure 3. *Index map for Mineral Occurrence Data System project, Labrador.*

installation program (install.exe) aids the user in setting up the system by checking the target microcomputer's parameters, copying files to the hard disk, and decompressing these files. PKZIP, the industry-standard compression utility distributed by PKware Inc., is used to compress the MODS/PC system. Possession of the compression software is unnecessary as the files are in a self-extracting executable format. The compression ratio is better than ten to one so considerable hard-disk space is required to install the databases.

The user may select between Newfoundland occurrences (2682 records occupying 6.5 Mb), Labrador occurrences

(1347 records occupying 3.3 Mb) or a demonstration dataset (168 records occupying 454 kb). The program itself occupies about 400 kb of hard-disk space.

The MODS/PC program is menu-driven and provides the user with complete access to the computerized Mineral Occurrence Data System. The program allows the user to search, view and output occurrences from the database. Custom-designed searches are achieved by setting conditions and using Boolean logic to combine these conditions in different ways. Data portability is provided by the ability to write data to an ASCII delimited file. This allows input of a user-selected dataset to other application programs such as spreadsheets and databases or portability to other types of computer systems such as non-DOS microcomputers, workstations, or mainframes. Full user documentation is supplied with the program.

Each mineral deposit is described by a single MODS record, which has fifty-nine information fields. More detailed information on the deposit can be obtained by consulting key references listed in each record or by examining the hard-copy mineral inventory reports maintained at the Geological Survey Branch. These reports will allow information to be traced back to its source publication.

MODS/PC VERSION (1.1)

MODS/PC Version (1.1) is now available to the public. The only change to the program is the ability to install all databases in the same directory and to switch between them without exiting from the MODS/PC program. This first update also includes the addition of over 200 new records to both the Newfoundland and Labrador datafiles. By selecting the new option 7, (Database) from the main menu, the user may choose between either NFLD, LABR or DEMO databases. This provides the user with less cumbersome access to all databases.

RED INDIAN LAKE (NTS 12A) MAP

Earlier this year mineral inventory and geological compilation work was completed on the Red Indian Lake (NTS 12A) map sheet and the mineral occurrence map was published at 1:250 000 scale (Map 91-172). The map documents 428 mineral occurrences that are plotted on the most up-to-date geological base map of the area. A mineral inventory report on each occurrence has been compiled and are maintained at the Geological Survey Branch, 95 Bonaventure Avenue, St. John's, Newfoundland. Information on all new occurrences for 12A have been coded and the records have been appended to the MODS/PC database.

The Red Indian Lake map area contains the Ordovician Victoria Lake Group, which is subdivided into the Tulks Hill Volcanics and the Tally Pond Volcanics. "These two formations are characterized by linear belts of predominantly felsic pyroclastic rocks having intercalated mafic flows, pillow lava, tuff, agglomerate and breccia" (Evans *et al.*, 1990). The

Tulks Hill and Tally Pond belts contain some of the highest mineral potential areas in the province and are recognized by mineral exploration companies to host some of the best base-metal—gold plays in the country. The Red Indian Lake mineral occurrence map is of great interest to people involved in mineral exploration.

WORK IN PROGRESS

Work in progress includes the compilation of the geology of the Burin Peninsula area (NTS 1M, 1L) and the updating of mineral occurrence information on the Sandy Lake (NTS 12H) map sheet. The Burin Peninsula area is the only area of insular Newfoundland without a published mineral occurrence map. The NTS 12H map was published in 1983 and except for the Jackson's Arm—Sops Arm area, has not been updated. In western Labrador, efforts are being concentrated on compiling mineral occurrence information on the Evening Lake (NTS 23G) map sheet.

MODS USERS

The MODS is used primarily by mineral exploration company personnel, however, it is also used by mineral exploration consultants, geotechnical consultants, personnel and students of academic organizations and the general public.

The MODS is used daily by government geologists in land-use planning. Advice is given to various departments of government in establishing wilderness areas, hydro developments, provincial and national parks, and any other developments that may conflict with future mineral exploration and development. In addition, municipal councils and the Department of Municipal Affairs are advised of the location, extent, and nature of mineral deposits in specific areas, so that new housing and commercial developments, municipal parks, water reservoirs and sewage-disposal systems can be located, where possible, in areas of low mineral potential.

Copies of the file are made available to the various agencies of the federal government such as the Mineral Policy Sector and the Geological Survey of Canada. These are then adapted to the National Mineral Inventory, MINSYS and CANMINDEX.

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