

Drill Core Library Activities in 2013

M. J. O'Neill

Introduction

The Nova Scotia Department of Natural Resources (DNR) Drill Core Library in Stellarton acquires and archives drill cores, well cuttings and other geological sample materials obtained from exploration, evaluation and development projects throughout Nova Scotia. The main intent is to facilitate further investigation and research of the province's geology and its geological resources, such as industrial and metallic minerals; energy resources, such as oil, gas and coal; and infrastructure commodities, such as aggregate resources.

These sample materials are derived from various exploration and development projects conducted by the private sector, as well as from DNR field work and other government or academic sources. The DNR Core Library also acts as the repository for core and well cuttings obtained from drilling done under the jurisdiction of the Nova Scotia Department of Energy.

The Core Library's large collection of valuable drill core currently totals about 700 000 m from more than 7,500 holes drilled throughout the province. Other archived materials include well cuttings (predominantly from oil and gas drilling), rock slabs, geochemical samples (silts, till, soils, lake sediments and bio-geochemical materials) and large samples of various industrial mineral commodities such as limestone, barite and building stone. Unless held as confidential, all core and cuttings are available for examination by interested parties and may be sampled subject to certain constraints and conditions. Many drill logs, geophysical logs, reports and maps (both published and unpublished) are also available for consultation.

All visitors are advised to make contact well in advance by phoning (902) 755-7186 or by e-mailing oneillmj@gov.ns.ca. Clients should note that safety policies require that they bring and wear work

boots at the facilities when viewing sample materials. Safety glasses are provided for clients during their use of core splitters and saws. Clients are generally required to do their own layout and pick-up of core boxes, which may involve some heavy lifting. The use of work gloves is recommended.

Facilities and Services

The main Core Library facility is located centrally in Nova Scotia at 105–109 Acheron Court in the Stellarton Industrial Park, Pictou County, which is 2 km off the Trans-Canada Highway (Highway 104) at exit 23.

Five buildings occupy a total of 4000 m², including 375 m² of laboratory space and 120 m² of office space. All buildings are filled beyond their capacity, making it difficult to acquire core from new exploration work. An extra 230 m² of storage space, provided by the Nova Scotia Department of Energy since 2008, is located on a separate lot 500 m from the main facility. Some additional core is stored in an older storage building in Debert, Colchester County, 75 km west of Stellarton. Free parking is available at all facilities.

Most core is stored in standard 1.5 m (5 ft.) long wooden boxes or trays with capacities of 4.6 to 7.6 m (15 to 25 ft.) of core, depending on the core diameter. The majority of boxes weigh from 15 to 35 kg per box, although some are as much as 45 kg. Much of the drill core in storage was measured and marked in imperial units when drilled, so the boxes and depth markers are often labelled in feet rather than metres. Boxes of core are stored by strapping them onto custom-made wooden pallets—generally about 20 to 50 boxes per pallet—and the pallets are stacked vertically in rows. The storage areas only have basic lighting and are unheated. Individual pallets are retrieved by forklift from storage as needed and are transferred by DNR staff to the core examination labs, where the core boxes may be laid

out for viewing on benches, portable stands or the floor. A large paved yard may also serve as a core box layout area during good weather. The Core Library is equipped with a binocular microscope, a portable UV light, weighing scales, an SG balance, core-splitters and diamond saws, which are all available for use by clients. Clients are responsible for carrying out and documenting their own sampling, subject to the approval and guidance of Core Library staff. Analyses and other data generated from sampling must be forwarded by clients to Core Library staff within 60 days of sampling.

A small reference library area with tables, chairs and a microfiche reader/scanner/printer is available for clients and staff. The library collection includes a complete set of microfiche for older exploration assessment reports, open file reports and maps. The Mineral Resources Branch no longer microfilms any reports; all assessment reports received and released from confidential status have been electronically scanned and are now available free of charge as downloadable PDFs via NovaScan on the Branch website. Paper copies of many reports, papers and maps published by the Mineral Resources Branch are also available for reference, together with a selection of Geological Survey of Canada papers, memoirs, bulletins and maps. Unpublished information (logs, sections, maps, reports, analyses, etc.) is available at the Core Library for some drillholes.

A public broadband Internet connection is not available at the Core Library; clients wishing to consult web-based reports and logs during core examination may prefer to download the required files prior to their visit, or staff can assist by downloading files to a client's portable USB storage device.

New Acquisitions in 2013

The total amount of core received by the Core Library in 2013 was approximately 5600 m. The library received 1639 m of core from Mount Cameron Minerals; representing 14 holes, the core was drilled for graphite in 2008 and 2010 in the Boisdale Hills area, Cape Breton County. Core from nine holes (1906 m total) were received from Ayarco Gold Corporation Limited, which drilled

the holes for gold exploration at Kemptville in 2003 and 2011. The library recovered one hole of core from drilling that Acadia Mineral Ventures undertook at Gold Lake, Halifax County in 1988. Finally, Thundermin Resources Incorporated donated 1886 m of core from the six holes drilled in 2012 for base metals, copper, silver and gold in the Stirling area, Richmond County (Fig. 1).

Drill core donated to the Core Library is often in poor condition due to neglect and poor stewardship. Everyone should be aware that the *Mineral Resources Regulations* under the *Mineral Resources Act* state that drill core must be retained in standard core boxes at the drill site or at a core storage facility and that precautions must be taken to secure the drill core against weather and vandalism. The boxes should be identified with weatherproof labels that indicate the drillhole number, core interval represented and the date and name of the company for which the drill core was obtained.

2013 Client Activity

Clients typically include private sector geologists and prospectors working in the mineral exploration sector or in the oil and gas sector, as well as geologists with the Geological Survey of Canada, DNR (Mineral Resources Branch) and the Nova Scotia Department of Energy. University students and research staff, consultants, architects and engineers also make use of the facilities.

During 2013, client activity for lab activities (use of core, cuttings or other samples) was 141 person-days; approximately 48 additional person-days of client activity were spent on various uses of the facility, including access to information and equipment (Table 1). This represents a moderate level of activity within a normal range. These figures do not include off-site activity when core or cuttings were loaned out. The figures should not be analysed too critically as many factors influence the number of clients and the days spent in the lab.

Core Library Database

The department's Drill Core Database provides basic information on all drill core held at the Core Library facilities, including operational data such



Figure 1. Loading Thundermin Resource's donated drill core

as storage location and number of boxes per hole. The database includes linkages to the Drillholes Database, which provides more detailed information about each hole than the Drill Core Database and includes links and references to logs, maps and reports. The Drill Core database can be searched by single or multiple fields, such as place name, company name, hole number, map sheet or year. The database is updated continually, and at the end of December 2013, it contained records for approximately 7,590 holes that have core or cuttings in the Core Library.

An on-line version of the Drill Core Database, based on Microsoft SQL Server, continues to be tested and updated by Core Library staff and Geological Information Services staff at the Halifax office. It will be available for public access when the improvements and updates are complete. Queries should be directed to Mick O'Neill at the Core Library for all drillhole information and data.

Following the recent addition of new and updated hole data to the Drill Core Database, there remain 239 holes in the Core Library's collection of

archived core for which data are either not yet available in the Drillholes Database or for which a match has not yet been identified. However, this represents less than four percent of the holes for which core are available in the Core Library. This number will diminish as records are found or as 'orphan' core is discarded as having insufficient value for retention.

Drillholes Database

At the start of 2013, the department's Drillholes Database contained records for 24,092 surface drill holes. During the year, 1,178 new records were added, bringing the total number at the end of 2013 to 25,270 drillholes. Two hundred and fifty-two new holes reported in assessment reports submitted to DNR between mid-2010 and mid-2011 were added as their confidential status expired. The new data brings the database more up-to-date and complete, although an indeterminate amount of older data still remains to be captured. Also, data from recent assessment reports are only added when the reports are removed from confidential status, meaning that most data is at least two-years

Table 1: Client activity at the Core Library in recent years.

Year	Lab activities: person-days	Other visitors: person-days
2007	193	58
2008	209	61
2009	72	48
2010	225	55
2011	110	36
2012	155	50
2013	141	48

old before it is added to the database. In the last four years, 8,160 new holes have been added to the Drillholes Database.

The lack of co-ordinates in many older assessment reports, where drillhole collars were referenced only to a local grid, resulted in inaccurate or missing data in the database. Using the ArcGIS software program ArcMap, maps from these reports were scanned and georeferenced to determine the required co-ordinates for the drillhole collar locations. Over the last four years 3,232 existing records were updated with better collar locations. Due to a major effort over the last few years, most old exploration assessment reports are now available online as downloadable PDFs. This makes georeferencing historical drilling easier because the images of large maps are already scanned and available for use in ArcMap.

Over the course of about 100 years ending in 1996, the government of Nova Scotia operated a diamond-drilling division, which drilled 8,048 holes either as a contactor to the mining and other industries or for its own purposes. While much of these data are already in the Drillholes Database, there is a need to capture information for holes that have not yet been included. To this end, a spreadsheet is being populated with existing data from the Drillholes Database and from *Drilling Logs of Government Core Drills*. The spreadsheet will serve as a tool to identify what data remain to be found or updated. The Core Library contains survey data for some of the more recent government drilling (1975 to 1996), and these data are being added to the Drillholes Database to give more accurate collar locations for some holes.

Many other drillholes are still not recorded in the database, but they will be added as relevant information is obtained. Information sources include a variety of both published and unpublished reports, maps and files, including old annual reports of the Nova Scotia government and the Geological Survey of Canada, as well as various open file reports and even some assessment reports that were previously overlooked. Drilling on mine leases is not reported to the department, so old mine records are generally the only source for those data.