

Drill Core Library Activities, April 2020 to March 2021

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Introduction

The Nova Scotia Department of Natural Resources and Renewables (NRR) 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 field work and other government or academic sources. The 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 Natural Resources and Renewables.

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. In addition, the archived materials include well cuttings (predominantly from oil and gas drilling), rock slabs, geochemical samples (silts, till, soils, lake sediments, and biogeochemical materials), and large samples of various industrial mineral commodities, such as limestone, barite, and building stone. All core and cuttings (unless held confidential) are available for examination by interested parties and may be sampled subject to certain constraints and conditions.

All visitors are advised to make contact well in advance by phoning (902) 497-3427 or by e-mail to Alex.MacKay@novascotia.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. Free parking is available at the Core Library. Six buildings occupy close to 5000 m², including 375 m² of laboratory space and 120 m² of office space.

Most core is stored in standard 1.5-metre-long (5 ft.) 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 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, a specific gravity 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 by e-mail within 60 days of sampling.

In the summer of 2016, the Nova Scotia Mineral Incentive Program, using funds left over from the 2015-16 program, funded the purchase of an XRF analyzer by the Nova Scotia Prospectors Association (NSPA). It is a Niton XL3t 950 GOLDD+ Mining XRF analyzer with Soils and Mining Modes. It is capable of analyzing up to 37 elements with the additional purchase of REE Element Suite (Y, La, Ce, Pr, Nd, U and Th) in the Mining Mode.

The XRF analyzer is owned by the NSPA, which oversees its use and handles all bookings for the unit. The analyzer is stored at the Drill Core Library in Stellarton. The analyzer is only used to test samples from Nova Scotia. The analyzer may not be rented or provided to a third party for a fee. The department will be provided with results and location data for all samples run on the unit.

Unpublished information (logs, sections, maps, reports, analyses etc.) is available at the Core Library for some drillholes.

A public WiFi Internet connection is available at the Core Library.

New Acquisitions

The Core Library received core from two drillholes between April 1, 2020, and March 31, 2021. The holes have not yet been properly catalogued in the Drillhole Database, therefore only brief notes on these holes are presented here.

Core from one hole was delivered by Basin Metals from work conducted on their Rawdon Hills project in 2020. Six core boxes were delivered from drillhole BM-19-02.

Core drilled at North Ogden was received from Henry Schenkels from his 2020 Mineral Resources Development Fund financed drilling (167 m from drillhole NO-20-05).

Additional rocks, slabs, and powders were received from Sandra Barr of Acadia University on projects she has conducted in Nova Scotia over the last thirty years.

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 Resource 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.

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 and NRR (Geoscience and Mines Branch). University students and research staff, consultants, architects, and engineers also make use of the facilities.

Total client activity for the 2020–2021 fiscal year was 128 person-days for use of core, cuttings or other samples, and the XRF (Table 1). The figures should not be analysed too critically as many factors influence the number of clients and the days spent in the lab. The Core Library was also shut down twice due to COVID-19 precautions, from March 24 to July 5, 2020 and from December 9 2020 to January 4, 2021.

Drill Core Database

The department's Drill Core Database provides basic information on all drill core held at the Core Library facilities, including operational data such as storage location and number of boxes per hole. The Drill Core Database is linked to the Drillhole Database, which provides more detailed information about each hole and includes links and references to logs, maps, and reports.

The Drill Core Database can be searched by single or multiple fields, for example by place name, company name, hole number, map sheet, or year. The database is updated continually, and at the end of March 2021 it contained records for approximately 6,690 surface holes having core or cuttings in the Core Library. Cores from nearly 600 underground and offshore holes are also stored at the Core Library. An on-line version of the Drill Core Database (https://gesner.novascotia.ca/dcdh/core_querysearch/corequerysearch.aspx), based on Microsoft SQL Server, was released in 2016.

Table 1. Client activity for the Nova Scotia Drill Core Library in recent years.

Year	Person days: using core	Person days: other visitors
2011	110	36
2012	155	50
2013	141	48
2014	106	30
2015	183	39
2016	120	69
2017	80	49
2018	171	47
2019	136	57
2020	90	38

Queries should be directed to the Core Library Geologist for all drill core information and core data searches. Even with the new and updated information recently added to the database, there are still holes represented the Core Library's collection of archived core for which data are not yet available in the Drillholes Database, or for which a match has not yet been identified.

Drillholes Database

As of March 31, 2021, the department's Drillholes Database contained records for 28,418 surface drillholes. Information from approximately 11,300 new holes has been added to the Drillholes Database in the last eleven years.

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 GIS 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 eleven years, over 14,000 existing records were updated with better collar locations. Collar locations of all surface drillholes from 1952 to the present have now been entered or updated.

Over the course of about 100 years, ending in 1996, the Government of Nova Scotia operated a diamond-drilling division that 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* to use 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 these data.

Due to a major effort over the last few years, most old exploration Assessment Reports are now available online as downloadable PDFs through NovaScan. This makes georeferencing historical drilling easier as large maps are now available as one image to bring into ArcMap, from which proper UTM co-ordinates can be determined.

An online version of the Drillhole Database, based on Microsoft SQL Server, became available online in 2016 at https://gesner.novascotia.ca/dcdh/Drillhole_querysearch/queryEntry.aspx. This database contains information from approximately 28,100 drillholes, and there are over 39,000 references associated with these holes. A single drillhole will have one or more references associated with it. This generally consists of a reference when the hole is drilled and subsequent references when further work is done on the hole (e.g. extensions, geophysics, sampling).

Sample Cataloguing

The Core Library contains numerous soil, till, rock and many other types of samples. Over the last few years, summer students were hired to catalogue the approximately 250 pallets of non-core material and also the cabinets of geochemical samples. The cataloguing is now complete, and a separate database will be created to capture this information and make it accessible to the public.