

# Aggregate Program Activities in 2012

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## Introduction

The focus of the Aggregate Program in 2012 was the continued preparation of a digital dataset for the Annapolis Valley Stone Resource Project. This project is a regional study of the stone potential in Hants, Kings, Annapolis, Digby and Yarmouth counties. The occurrences, deposits and potential products that are being documented include sand and gravel, bedrock aggregate, dimension stone, rip rap and armourstone, landscape stone, clay and other specialty stone applications. The digital dataset being constructed consists of site descriptions, aggregate test results, photos, resource assessment information and comments related to environmental and land-use issues that can affect resource development.

The interpretation of this data is being done in conjunction with an examination of LIDAR (Light Detection and Ranging) and DEM (Digital Elevation Model) imagery, orthophotographs and geological maps, with the objective of producing 1:50 000 scale bedrock and surficial resource maps. Due to the critical importance of aggregate for construction and infrastructure development in the region, the majority of the research effort has been directed at mapping the aggregate resource. The dataset will also contain other industrial minerals data that could lead to new business development.

The project work has also provided an opportunity to look at the resources from a future perspective and to anticipate the challenges that society will face in order to meet the demands for some of these basic, yet critical materials. An example is the need to look at alternatives to the traditional sources of glacial meltwater sand, which are being consumed at an accelerating rate. The eventual need to replace these diminishing deposits may require extremely costly haulage from distant sources. A possible future solution being examined in this study is the beneficiation of thick sandy till deposits in the

region. Another example is the need for fine-grained materials in applications where barriers resistant to liquid penetration are important. Dam structures, landfills (caps and liners) and remediated contaminated sites commonly require compacted soils that can prevent water leakage or the contamination of groundwater. Although pure clay deposits are the optimum materials for this purpose, they are often not available because of issues such as the quantities required, distance from the site and haulage costs. An alternative examined in this study is the thick clay-rich till deposits that are commonly found in proximity to these structures. Because replacement landfills will continue to be needed and public controversy will continue to surround them, identifying where the best deposits for this purpose occur in the region and promoting their protection as a critical land use is seen as an important goal.

## Program Activities in 2012

Editing of the digital resource maps and dataset, which began in January, 2012, was the sole activity of the Aggregate Program during this year. The focus of this work was correcting errors and modifying text in the transcribed field notes for approximately 6000 site descriptions. The editing was conducted in conjunction with examining the digitally formatted geological maps, orthophotographs, DEM and LIDAR imagery. Point locations for pits, quarries and road exposures were compared with the orthophotographs and moved if a location discrepancy could be determined and accurately corrected. Numerous previously undocumented pits and quarries were identified on the orthophotographs and added to the database, although these sites have not yet been verified by field examination.

LiDAR imagery for the Annapolis Valley was used to identify and delineate thick glaciofluvial

deposits, which tend to make the best exploration targets for future aggregate development. Ice contact glaciofluvial deposits are typically variable in thickness, and this is an effective tool for narrowing the search for economic sand and gravel deposits. High resolution orthophotographs were used to identify high concentrations of glacial boulders on the upland areas in the western half of the study area. These high quality images revealed numerous boulder deposits that may have potential as sources of natural rip rap and armourstone.

With the generous assistance of the Geological Information Services (GIS) group, approximately 80% of the data points have been reviewed and corrections made.

## **Planned Activities In 2013**

It is anticipated that the changes to the digital dataset will be completed by the spring of 2014. Its completion will require limited field work to (1) check inconsistencies or errors encountered during the editing stage, and (2) collect data for important, previously undocumented extraction sites. The project will also require the continued support of the GIS group to make many of the corrections in the dataset and construct the resource maps.