



## BRITISH COLUMBIA AGGREGATE INVENTORY PROJECT

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### INTRODUCTION

In 1994, the Geological Survey Branch launched an initiative focused on the province's aggregate resources. The background and goals of this program have been summarized previously (Bobrowsky *et al.*, 1995).

During 1995, progress was made on three fronts.

- Interested parties were invited to participate in a two-day forum and workshop on the aggregate resources of the province. The meeting addressed concerns and requirements in aggregate resource management. Case studies from Canadian and U.S. jurisdictions provided valuable background to the discussions.
- The digital inventory of private aggregate pits in British Columbia has been completed.
- Aggregate potential mapping has been initiated with a pilot study in the Prince George area.

### AGGREGATE FORUM

The Aggregate Forum and Workshop was held March 30-31, 1995, in Richmond. The forum was primarily sponsored by the Ministry of Energy, Mines and Petroleum Resources and the Ministry of Transportation and Highways. Co-sponsors included the Planners Institute of British Columbia, the Commission on Geological Sciences for Environmental Planning, the University of British Columbia (Department of Mining and Mineral Process Engineering), and the University of Northern British Columbia (Natural Resources and Environmental Studies).

The first day comprised an open forum, with 104 participants attending, all having an interest in the aggregate industry of British Columbia. They included aggregate producers, engineering and geotechnical consultants, community planners (Municipal, Regional and First Nations), academia (UBC, UNBC, SFU, UVic), provincial government (MEMPR, MoTH, MoF) and federal government (DIAND, NRC). Out-of-province participants came from Ontario, Alberta, Yukon, Washington State, California and the United States Geological Survey (Colorado, Arizona).

Fifteen talks were presented dealing with the aggregate market in Canada and the U.S.A., aggregate

geology and inventory in British Columbia, the management of aggregate resources, and methods of mapping and assessing aggregate resource potential (Bobrowsky *et al.*, in preparation).

The second day consisted of a workshop with a smaller group of about forty participants, all interested specialists in the field of aggregate inventory and mapping. Participants were divided into three discussion groups which considered the need for, and make up of:

- a provincial aggregate inventory,
- qualitative aggregate resource potential maps, and
- quantitative aggregate resource potential maps.

The three groups presented summaries of their discussions to the workshop as a whole in the afternoon, for further input.

Broad consensus was reached during the two days of the forum concerning the need for a single province-wide inventory of aggregate pits. There was also strong support for aggregate potential mapping at 1:50 000 scale with the undertaking of a pilot project as a means of developing suitable methodologies.

### PROVINCIAL INVENTORY

Information about aggregate pits in British Columbia is collected and managed primarily by two ministries. The Ministry of Transportation and Highways gathers data on some 4000 to 5000 public pits in order to ensure an adequate supply of good quality gravel is available for construction, maintenance and rehabilitation of highways in the province. These data have been managed by the Ministry of Transportation and Highways using three systems: ADIS (aggregate deposit information system), ARMS (aggregate resource management system) and RAAMS (regional aggregate account management system). These are being replaced by a new system, GMSS, which is a compilation of the previous three separate systems. Assembly of this new database will allow for the elimination of errors in location and status of pits and the completion of missing data fields.

In British Columbia, aggregate pits are designated as mines. As such, the Ministry of Energy, Mines and Petroleum Resources is responsible for their planning, management and regulation, including permitting, health, safety and reclamation. Owners or operators of all private aggregate pits must file Notices of Work as part of the permitting and reclamation process. Our efforts to establish a provincial inventory of private pits (Matheson *et al.*, 1996) have been based on these files. Individual pit

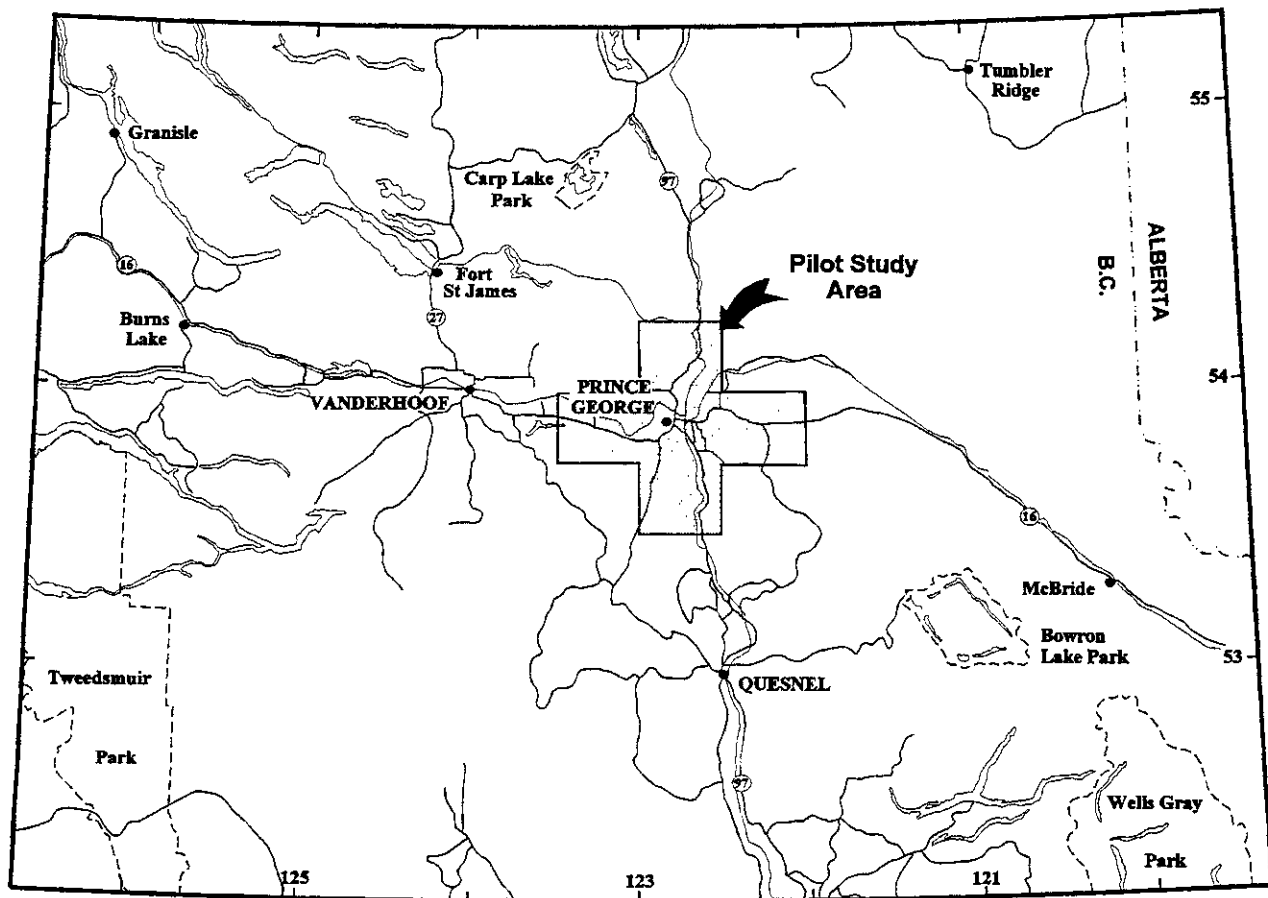


Figure 1. Location of the Prince George pilot study for aggregate potential maps.

identifications and locations were obtained, reviewed and upgraded. The locations were plotted on 1:50 000-scale base maps, digitized and compiled in a simple dBase format. In total, over six hundred currently permitted pits, and a lesser number of reclaimed pits, have been located accurately for inclusion in the database. Where possible, the landform associated with each pit has also been determined.

## AGGREGATE POTENTIAL MAPPING

Participants in the Aggregate Forum recognized the utility of aggregate potential maps for the good management of the resource and general landuse planning at the regional and local levels. Several approaches to assessing that potential have been made in other jurisdictions (e.g. Gartner *et al.*, 1981; Fox *et al.*, 1987; Bliss and Page, 1994). The Forum recommended a pilot project be undertaken as a means of evaluating the efficacy of these methods in British Columbia.

An aggregate potential map typically outlines areas of aggregate potential as polygons on the map and ranks the potential of the areas qualitatively from high to low. The parameters used in the derivation of the rankings,

including landform type, quantity of sand *versus* gravel, volume estimate, thickness of deposit, etc., are also detailed on the map. On-site geotechnical evaluation is still required to quantitatively confirm the aggregate potential of any specific target. However, the maps provide a quick "first approximation" for alternative land use by also identifying areas which hold little or no potential for aggregate resources. Ultimately, such maps save those planners, developers and producers involved in aggregate considerable effort and cost by focusing attention on select areas.

The pilot study is being undertaken in the Prince George area, covering five 1:50 000-scale map sheets forming a cross centred on the city of Prince George (Figure 1) and including the major transportation corridors in the area. The study area has a reasonable endowment of aggregates but suffers from problems in the management of the resource and conflicts with other land uses. Methodologies developed here should also be applicable elsewhere in British Columbia. The project has the support and cooperation of the Ministry of Transportation and Highways, the Ministry of Forests, the City of Prince George, the Regional District of Fraser - Fort George, and faculty members of the University of Northern British Columbia. These partners will not only be invaluable sources of relevant technical data, but also

provide input on the effectiveness of the presentation format of final products.

All data are being assembled in digital format, and will be managed and analysed in a geographic information system (ARC/INFO™). Resultant aggregate potential maps, with accompanying report and documentation, will be released as an Open File in 1996.

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## NOTES