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**GEOLOGICAL SURVEY OF CANADA
OPEN FILE 7688**

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WORLD TIN AND TUNGSTEN DEPOSIT DATABASE

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This publication comprises a database of World tin and tungsten deposits compiled by the Working Group on Tin and Tungsten, International Association on the Genesis of Ore Deposits (IAGOD). The majority of these deposits are associated with felsic to intermediate intrusive igneous rocks. Variations of this class include mineralized stockworks and veins, greisens, skarns, and replacement deposits in predominantly carbonate-rich sedimentary rocks. Significant tin and tungsten deposits also occur as placer deposits and as volcanic-associated deposits. This database has been compiled primarily from published literature and, in the absence of published references, from the personal knowledge of the compilers. Resource estimates¹ captured in this database are historical and do not conform to Securities Commission National Instrument 43-101 standards, regardless of how they have been classified.

The database was first proposed in 1999, and was completed in 2007 after the termination of the World Minerals Geoscience Database Project (WMGDP: 1998-2004), a project sponsored jointly by the Geological Survey of Canada and exploration companies². The first version appeared on Natural Resources Canada's Geoscience Data Repository web portal World and Canadian Minerals Deposits in 2007 and was updated in 2008. Resource estimates for a few deposits in northern Canada were updated in 2014, but otherwise the data remain current to early 2008. Index level excerpts of the database were used for the map: World distribution of tin and tungsten deposits (Sinclair et al., 2011). The only access NRCan now provides to World and Canadian deposit databases are Web Map Services (WMS). They are used by external web map portals which display them as points with no attribute data as components of geospatial mashups. The aim of this Open File is to make the full database and its supporting database management utilities available to those that can use them, and to provide simple attributed derivative ESRI® Shape and Google Earth™ files, and folders of deposit and deposit group reports with index.html files which serve as Tables of Contents.

The database schema used for this database (Chorlton et al, 2007) was developed for the WMGDP. The web-style **Documentation** folder, modified from Laramée (2004), contains a thorough description of the WMGDP schema and supporting data management interfaces included with it in the folder **GlobalDBSystem321**, and can be read using an Internet browser by clicking on the file **default.htm**. During the WMGDP, compilers (deposit specialists) and company sponsors suggested topics to be included in the schema. They also provided helpful feedback for the functionality of the data management interfaces. This resulted in incremental updates between releases to company sponsors. World and Canadian lode gold databases (Gosselin and Dubé, 2005a, b) were released in schema 3.19, the version used for the final release 3.6 to company sponsors in 2004. The schema, now at version 3.21, release 3.7, is a major update of version 3.19, with the addition of extra tables required for Canada-only deposits for compilations under the Northern Resource Development and Northern Mineral Resource Development programs.

The GlobalDB System schema (diagram page 6) includes sets of tables that can be used to describe six entities (things): deposits/occurrences, deposit groups, mines, production figures, resource figures, and references. The deposits and deposit groups modules describe locations, deposit type and subtype, names, country and province, commodities, geological ages, host rocks, related igneous rocks, mineralization styles, coincident features, radiometric dates, tectonic settings, shape and dimensions, NTS areas, qualified comments, links to other databases, geophysical /geochemical signature, sample data, and compilation stage and progress. The service tables: entities, tabledoc, links, columndoc, tabpages, and lookup explicitly define the entities, tables, links between tables, fields, interface tab pages, and the lookup tables, to completely define the schema. Two additional service tables: dbversion and unitcvsn, provide the title, version and authors of the current database, and conversion factors (to metric) for the production and resource figures, respectively. The service tables, described above, should be consulted before transferring this data across database management programs and platforms, or rebuilding the data management applications when the application interfaces supplied with this Open File can no longer be used because of changes to the Windows® operating system.

Standalone custom Windows® application interfaces, developed by Robert M. Laramée³, enable a user with a 32 bit computer equipped with the Windows operating system to browse, filter, and obtain output from this database. They are included in this Open File in the folder **GlobalDBSystem321**. All applications require an ADO connection file, or Microsoft® data link, to each database for which they are to be used, created in the folder under the same folder that houses the application interfaces⁴. By convention, WMGDP compilers installed a folder GlobalDBSystem under Program Files on the local C: drive, but the GlobalDBSystem321 folder and files can be saved anywhere and no installation is required. Instructions for creating the mandatory Microsoft data link file are included under “**Defining database aliases**” in the **Documentation\default.htm** and in the standalone file **HowtoADO.rtf**.

GShellBrowser allows a user to browse the database record by record, and offers the same tab page view of the data offered by the original data entry interface, GShellADO, known in short form as **GShell**. The latter only works under the Windows® XP and earlier Windows operating systems, and has been included in this package for users that still have a Windows XP computer (disconnected from the Internet because Microsoft no longer supports it by supplying Security updates), or have an XP emulator installed. GQueryADO, known as **GQuery** for short, provides a user the means to filter the occurrences based on attribute values, to build a template for a custom spreadsheet and export this spreadsheet or a default summary spreadsheet, and to create folders of occurrence reports for the full set or subsets of the deposits in the database. Both GShellBrowser and GQuery work under Windows 7 once the pre-requisite ADO connection file has been created.

There are three additional programs in GlobalDBSystem321: **GQ_ADO_XtraTables**, **Documenter**, and **GDBSTools**. The program GQ_ADO_XtraTables builds or rebuilds summary tables for the use of GQuery, which improved performance over an older method of creating these summary tables on the fly. The program Documenter allows users to examine each table and field of each category of table (Data, Junction, Lookup, and Service depending on their roles), which complements the more general web page style documentation. Finally, GDBSTools provides a database manager with utilities that can check the internal integrity of the database, time stamp a new release and export SQL data scripts of the contents of the connected database. These SQL scripts can be used to populate a new database created with GlobalDBSchema321.sql in one of many SQL-enabled relational database management systems available today⁵.

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FOOTNOTES

¹DISCLAIMER – RESOURCE/RESERVES DATA

Her Majesty the Queen in Right of Canada, represented by the Minister of Natural Resources (NRCan), does not warrant or guarantee the accuracy, completeness or fitness for any purpose of Reserve and Resource information (Data) contained in this database, including whether the Data is compliant with any securities regulations or standards, and NRCan does not assume any liability with respect to any damage or loss incurred as a result of the use made of the Data.

Resource and reserve figures are historical in nature. The Data source provided with each set of figures should be cited if the Data are re-reported.

²ACKNOWLEDGEMENTS

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Dome Exploration Inc., Randgold Resources Ltd., Rio Tinto Mining and Exploration Limited, Teck Cominco Limited and Western Mining Corporation. W. D. Sinclair managed this project on behalf of the Geological Survey of Canada, L. B. Chorlton coordinated schema, tool development, and compilation, and R. M. Laramée implemented the schema, developed the applications for GlobalDBSystem, and provided technical support to compilers.

³ DISCLAIMER – APPLICATIONS AND DATABASE

The Geological Survey of Canada (GSC) has endeavored to develop and produce this product with a minimum of errors. GSC does not, however, warrant that the product is error free nor will GSC or its Minister and officials accept liability for any loss of profits or revenue, or any other form of loss or damage relating to the use of this product.

⁴ CAUTION: UTILITIES MAY NOT WORK ON SOME WINDOWS COMPUTERS

While the WMGDP and successive projects have been successfully using Global DBSystem since the year 2000, there are now imitations due to the evolution of the Windows operating system and the introduction of 64 bit computers. In order to use GShellBrowser.exe, GQueryADO.exe, GQ_ADO_XtraTables.exe, Documenter.exe, and GDBSTools.exe, you must first create a data link file to allow connection between the program and the database (see “Defining database aliases” under Documentation). It is known that these instructions will not work on Windows 64 bit computers, and the interfaces will not work on computers with operating systems other than Windows®. At present, the data entry and browsing program GShellADO (GShell) will not work under Windows Operating Systems greater than XP, but is included here for anyone who might have an older operating system on a computer disconnected from the Internet or who has an XP emulator.

⁵ LOADING A WMGDP DATABASE USING SQL SCRIPTS

SQL scripts are provided here for anyone with an SQL-enabled database management system (DBMS) and the technical skill to modify the scripts according to the requirements of their software. We have loaded the data onto InterBase and PostgreSQL for the use of applications that emulate GQuery for the Internet and the contents of folders for loading the schema reflect our own processes. There are subtle differences in the scripts for loading the database schema among DBMSs, and some tweaks applied to the schemas supplied in this publication were specific to the Query applications. The scripts for inserting the data into the empty database schema are standard, and only one insert script is supplied per database.

GlobalDB System Database Schema

Upgrade Level 21 -- 2005/03/02
by Robert M. Laramée, G.S.C.

