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Miscellaneous Release—Data 313

Interactive Graphic Borehole Logs And Hydrostratigraphic Correlations, Orangeville–Fergus Three-Dimensional Study Area

by A.K. Burt and J.E. Chartrand

Miscellaneous Release—Data 313

Interactive Graphic Borehole Logs and Hydrostratigraphic Correlations, Orangeville–Fergus Three-Dimensional Study Area; by A.K. Burt and J.E. Chartrand. This release contains borehole information from drilling programs conducted in the Orangeville–Fergus area of southwestern Ontario in 2008, 2009 and 2010. A total of 43 PQ (8.5 cm) diameter continuous cores were obtained using a mud rotary drill. The cores were logged, photographed and sampled on site. This information, supplemented with laboratory data (pebble counts, particle size analysis and carbonate analysis), was used to classify the sediments into a series of hydrostratigraphic units. The data consist of detailed graphic logs presented on interactive and printable maps accessible via a hyperlinked portable document format (PDF) file, best accessed and viewed using Adobe® Reader®. This release also contains a slideshow of drilling operations and background information, including the conceptual geologic model and descriptions of the hydrostratigraphic units. Also included in this release are the complete data set, as Microsoft® Excel® 2003 and Microsoft® Access® 2003 files, and a fully functioning ESRI® ArcGIS® project containing files used to build the hydrostratigraphic map. This release is a preliminary product designed to make information available to clients prior to the completion of the wireframe surfaces, three-dimensional block model and detailed Groundwater Resources Study (GRS).

This publication can be downloaded from

http://www.geologyontario.mndm.gov.on.ca/mndmaccess/mndm_dir.asp?type=pub&id=MRD313

MISCELLANEOUS RELEASE—DATA 313

INTERACTIVE GRAPHIC BOREHOLE LOGS AND HYDROSTRATIGRAPHIC CORRELATIONS, ORANGEVILLE–FERGUS THREE-DIMENSIONAL STUDY AREA

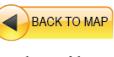
A.K. Burt and J.E. Chartrand

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The data consist of detailed graphic logs presented on interactive and printable maps accessible via a hyperlinked portable document format (PDF) file. This release also contains a slideshow of drilling operations and background information, including the conceptual geologic model and descriptions of the hydrostratigraphic units. The hyperlinked PDF document is best viewed and accessed using Adobe® Reader®. A free copy of the software may be obtained from <http://get.adobe.com/reader/> (Microsoft Windows® Reader® does not support the interactive features of this PDF document).

For optimal viewing, a monitor resolution of 1280×1024 to 2560×1600 is recommended. To improve performance of this data release on your computer, it is recommended that the entire folder be copied onto your computer's hard drive. The folder structure and file-folder naming convention must be maintained.

Interactive PDF Document

Opening the file titled Interactive PDF_MR313.pdf will launch Adobe® Reader® (if it is set as your default PDF reader) and will open a clickable contents page (Figure 1). A purple message bar (Figure 2) may appear in the reader window, but this can be ignored. The pages in the PDF document are navigated via clickable buttons (for example  and ), interactive map elements denoted by an orange border (Figure 3), and the Page Thumbnails tabs on the left sidebar in Adobe Acrobat® (Figure 4). Once the PDF document is open, one can switch between various software applications that are open using Microsoft® Windows® tabs (Figure 5). It is also possible to move from page to page by scrolling up and down with your mouse wheel.

Each of the circular orange-bordered pictures on the first, or contents, page links to a different page in the PDF document. Clicking on the  button at the bottom of other pages in the document returns the user to the contents page. The  symbol indicates a “tech tip” that provides guidance on using the page. The “tech tip” box is static on the contents page, but on all other pages, one can prompt a “tech tip” box to appear by hovering the mouse cursor over the  symbol.

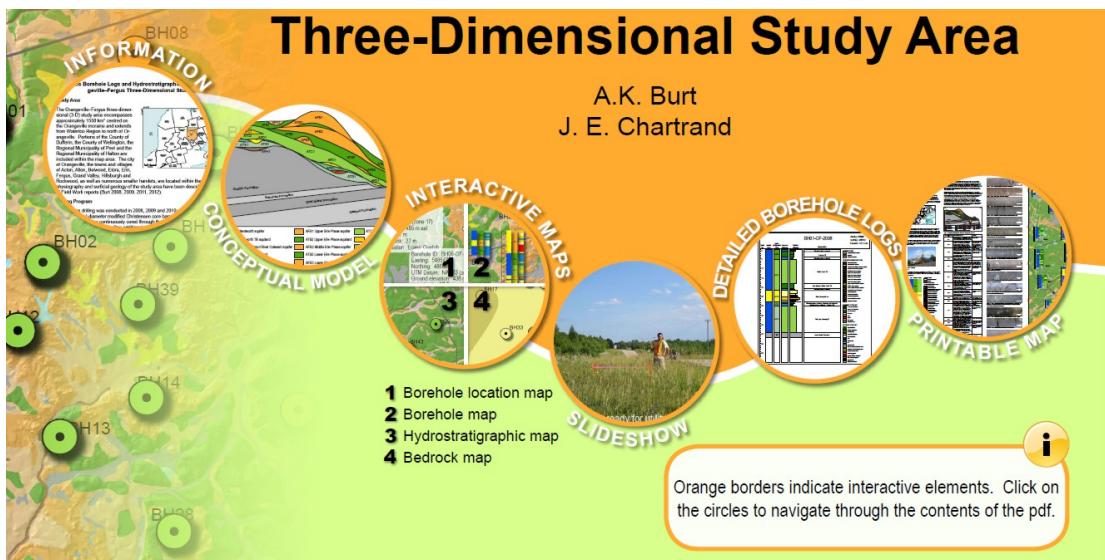


Figure 1. A portion of the contents page. Each of the circular, orange-bordered pictures links to a different page in the PDF document. The symbol indicates a “tech tip” that provides guidance in using the page. On the contents page the tech tip is static, or permanently visible.

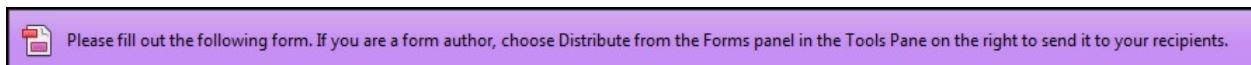


Figure 2. The purple message bar that may appear just below the reader toolbar section. Just ignore it.

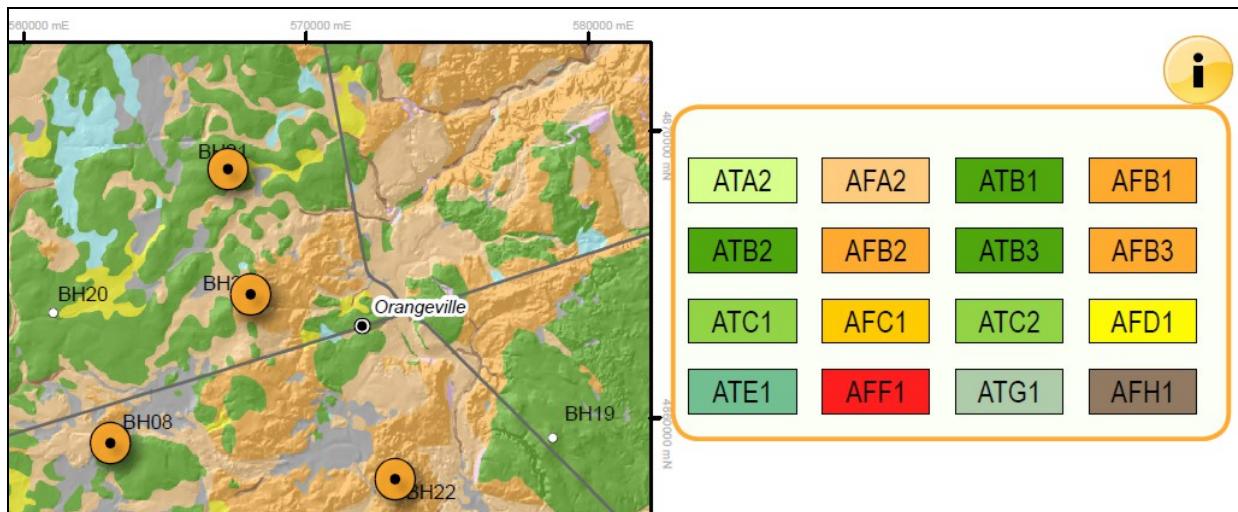


Figure 3. Clickable map elements (the coloured boxes) surrounded by an orange border. Clicking on a coloured rectangle will display large coloured dots indicating which boreholes intersected that unit. Four out of the 6 boreholes shown on the screen capture intersected unit AFB1.

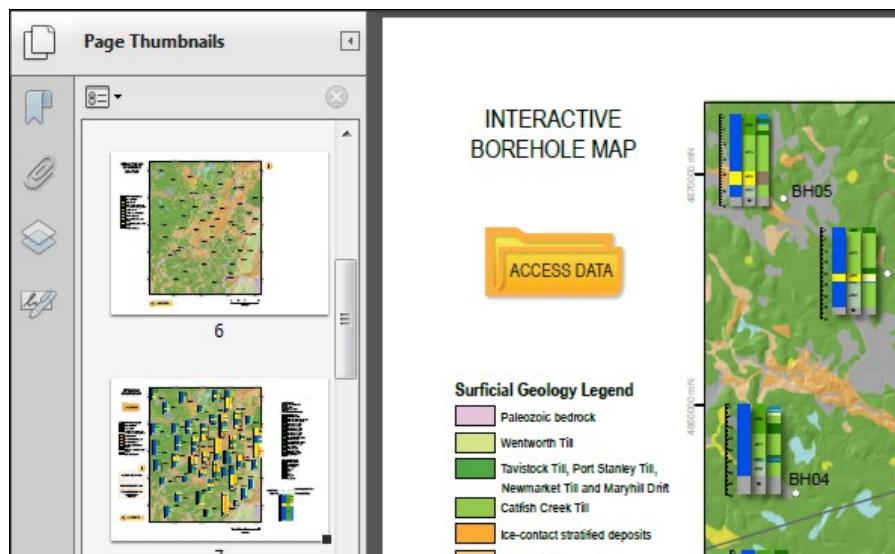


Figure 4. The Page Thumbnails tab and a portion of the interactive borehole map.

	BH04	BH04-OF-2008	31.15	36.25	Highly weathered Lower Guelph Formation
40	BH04	BH04-OF-2008	36.25	39.25	Lower Guelph Formation
41	BH05	BH05-OF-2008	0	2.7	Glaciolacustrine sediment and debris flows: retreat of Tavistock ice
42	BH05	BH05-OF-2008	2.7	4.8	Coarse-textured Tavistock Till
43	BH05	BH05-OF-2008	4.8	6.4	Tavistock Till
44	BH05	BH05-OF-2008	6.4	18.25	Catfish Creek Till
45	BH05	BH05-OF-2008			

Ready | Borehole locations / Aquifer class / Hydrostratigraphic codes / Summary lithology / Detailed lithology / Interpretation / Print this page

Figure 5. Microsoft® Windows® tabs used to navigate between software applications.

INFORMATION

The “Information” section in the interactive PDF document consists of 3 pages providing background information on the study area and drilling program, the structure of the borehole logs, descriptions of each hydrostratigraphic unit and references. (Photos mentioned in the hydrostratigraphic unit descriptions table refer to core photos on the first printable map at the end of the document.) Move from page to page using the Page Thumbnails tabs (*see Figure 4*) or by scrolling up and down with your mouse wheel.

CONCEPTUAL MODEL

The Conceptual Model page provides an idealized cross-section of the hydrostratigraphic units across the Orangeville–Fergus 3-D study area. Clicking the button opens a print menu. It is important to adjust the “pages to print” range so that only the required pages are printed. The clickable buttons will not be printed.

INTERACTIVE MAPS

There are 4 interactive maps that display borehole locations, borehole logs, the distribution of individual hydrostratigraphic units and drilled bedrock formations. Move from map to map by returning to the contents page using the  button and making another selection by choosing the appropriate quadrant (1, 2, 3 or 4) in the Interactive Maps orange-bordered circle; one can also move map to map by using the Page Thumbnails tabs or scrolling up and down with your mouse wheel.

Borehole Location Map: This displays the location of each borehole. Scrolling over the borehole name displays additional information about the borehole, including coordinates, collar elevation, borehole depth, depth to bedrock and the bedrock formation intersected.

Interactive Borehole Map: This displays the graphic logs for each borehole. Buttons at the bottom left-hand corner of the map display different combinations of logs (Figure 6) and corresponding legends.

Clicking the  button opens a Microsoft® Excel® file containing the complete dataset. A “launch file” warning message (Figure 7) will appear when this button is selected, but this can be eliminated by checking the “Do not show this message again” box and then clicking on the Open button. The small Microsoft® Windows® tabs at the bottom of the screen (*see Figure 5*) can be used to navigate back to Adobe® Reader® and the borehole map. Closing Microsoft® Excel® will also return you to the borehole map.

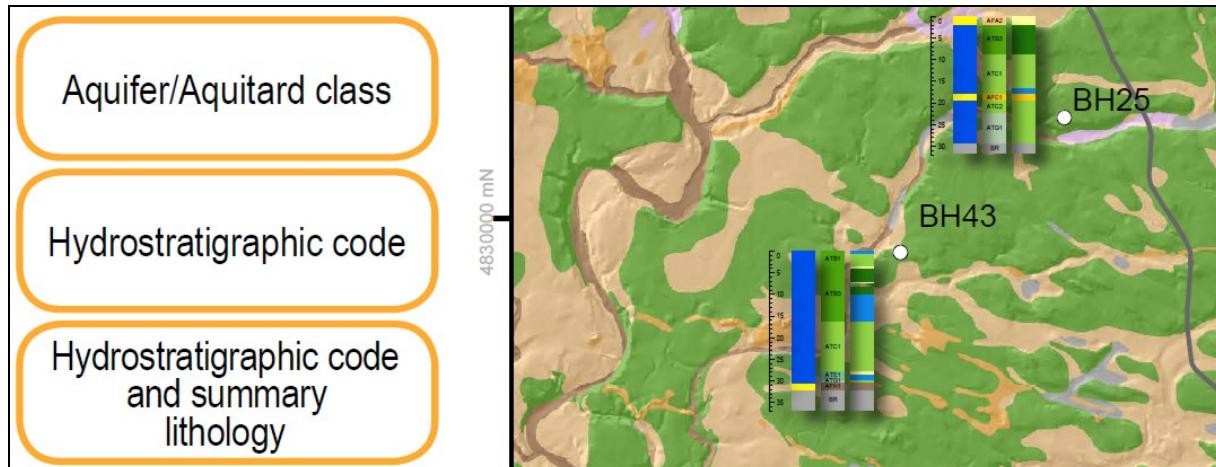


Figure 6. A section of the Interactive Borehole Map. Clicking on the orange boxes displays different combinations of logs.

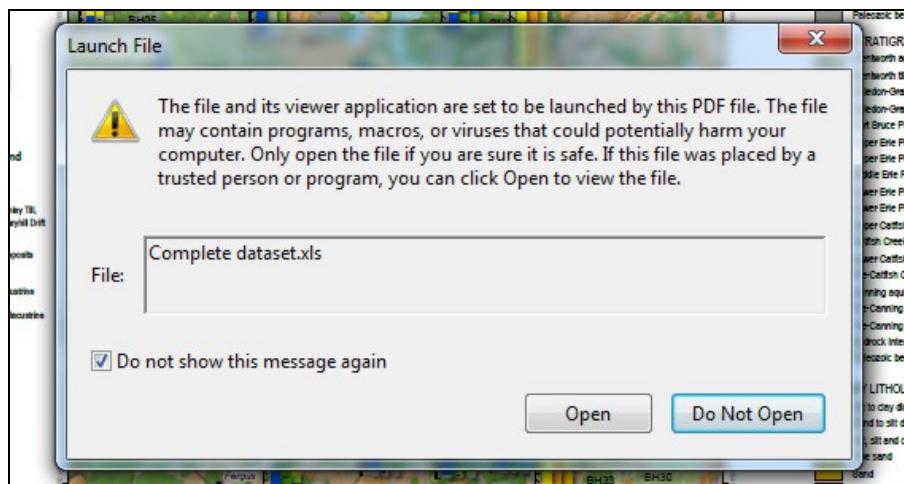


Figure 7. The warning message that appears the first time an external file is opened.

Hydrostratigraphic Map: This displays the spatial distribution of each hydrostratigraphic unit. Clicking on any one of the coloured rectangles at the top right-hand corner of the map will display large coloured circles on the map indicating which boreholes intersected that unit (for example, see Figure 3). A detailed description and example core photos will appear on the right-hand side of the map. Clicking the button opens a fully functioning ESRI® ArcGIS® project containing the geoTIFFs, shapefiles and layerfiles used to build this map. ESRI® ArcGIS® software must be installed on the computer to view this project.

Bedrock Map: This displays the spatial distribution of each bedrock formation intersected by the boreholes. Clicking on the coloured circles at the top right-hand corner of the map will display large coloured circles on the map indicating which boreholes intersected that formation. Example core photos will appear on the right-hand side of the map.

SLIDESHOW

This page launches a short video slideshow of drilling operations. Start the video by clicking anywhere on the video image or on the video “play” button at the bottom left of the video image. The video control bar (start, pause, fast forward, etc.) is revealed by moving the cursor to the bottom of the image box.

DETAILED BOREHOLE LOGS

The full graphic log (aquifer class, hydrostratigraphic code, summary lithology, detailed lithology and interpretation) for each of the 43 boreholes is presented on separate pages following the slideshow page. Move from log to log using the Page Thumbnails tabs (see Figure 4) or by scrolling up and down with your mouse wheel. Additionally, individual borehole logs may be opened by clicking on the borehole name on the Interactive Borehole Map (Figure 8). Clicking on the button at the bottom of a borehole log navigates back to the Interactive Borehole Map allowing another borehole log to be selected for viewing.

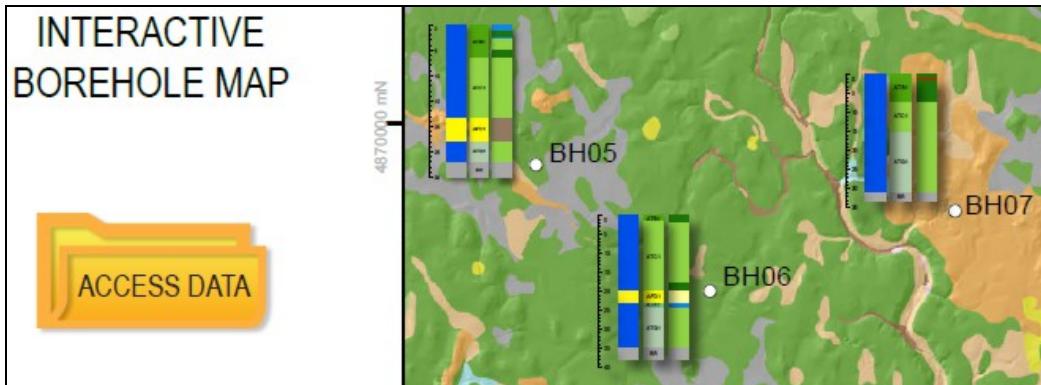


Figure 8. A section of the Interactive Borehole Map. Clicking on the borehole name (for example, BH05) will open the corresponding borehole log.

PRINTABLE MAPS

The final section of the interactive PDF document is a set of 2 poster-sized borehole maps with side notes. The side notes on the first map includes background information, the conceptual model with detailed descriptions, example core photos and references. The second map, accessed by clicking the

button at the bottom of the map, using the Page Thumbnails tabs (*see Figure 3*) or scrolling down with your mouse wheel, omits the detailed descriptions and core photos. Clicking the

button opens your print menu. It is important to adjust the “pages to print” range so that only the required pages are printed. It is recommended that the maps be printed on a plotter. The clickable buttons will not be printed.

Data Files

The data files consist of 7 Microsoft® Excel® tables and a Microsoft® Access® database that may be opened from the root directory. The Microsoft® Excel® Complete Dataset file, which contains all the data present in the 6 other Microsoft® Excel® data files, may also be opened from the interactive PDF document (button on the Interactive Borehole Map page). The data contained in each file are summarized below.

Location: This table provides information on the location of each borehole. The borehole ID number (short and long), Easting and Northing (NAD83 Zone 17), the elevation of the borehole collar in metres, the depth of the borehole in metres, the depth to bedrock in metres and the end-of-hole bedrock formation reached.

Hydrostratigraphic codes: A series of regional-scale hydrostratigraphic units that are based on the stratigraphic relationships between the till formations and intervening stratified sediments. These units form important aquifers and aquitards across the region. The borehole ID number (short and long), Easting and Northing (NAD83 Zone 17), depth in metres (from and to), hydrostratigraphic unit (name and code) and aquifer classification are provided.

Aquifer class: A simple aquifer / potential aquifer, aquitard or Paleozoic bedrock classification based on the dominant sediments within each hydrostratigraphic unit. In this table consecutive aquifer or aquitard

units have been merged. The borehole ID number (short and long), depth in metres (from and to) and classification are provided.

Detailed lithology: Detailed written logs for each borehole. The borehole ID number (short and long), depth in metres (from and to), lithology classification and detailed sediment description are provided.

Summary lithology: The consolidated version of the borehole lithology that removes details such as the presence of a sand layer in a gravel package. The borehole ID number (short and long), depth in metres (from and to) and a summary lithology classification are provided.

Interpretation: Interpreted depositional environments and formations (where appropriate). The borehole ID number (short and long), depth in metres (from and to) and a short interpretative statement are provided.

Complete dataset: All of the previously described tables contained in one package. The complete dataset has been provided in both Microsoft® Excel® table and a Microsoft® Access® database formats.

GIS Files

A series of shapefiles and layerfiles have been prepared using ESRI® ArcGIS® 10.1 software. They may be accessed from the interactive PDF document ( ACCESS DATA button on the Interactive Display of the Spatial Distribution of Hydrostratigraphic Units map) or from the Hydrostratigraphic units.mxd file within the folder GIS Files using ESRI® ArcGIS® 10.1 or ArcGIS® 9.0. In addition, the shapefiles and layerfiles located in the folder “GIS Files” may be accessed with earlier versions of ArcGIS® software or other full-feature GIS software. The Base Layers folder contains shapefiles and associated layerfiles for the borehole locations, select communities and roads. GeoTIFFs have been provided for the surficial and bedrock geology of the Orangeville–Fergus three-dimensional study area. The Hydrostratigraphic Units folder contains shapefiles and associated layerfiles for each hydrostratigraphic unit (AFA2, AFB1, ATB2, etc.) and the borehole bedrock formations. The data indicate the spatial distribution of boreholes intersecting each unit.