Waterloo HYDROGEOLOGIC

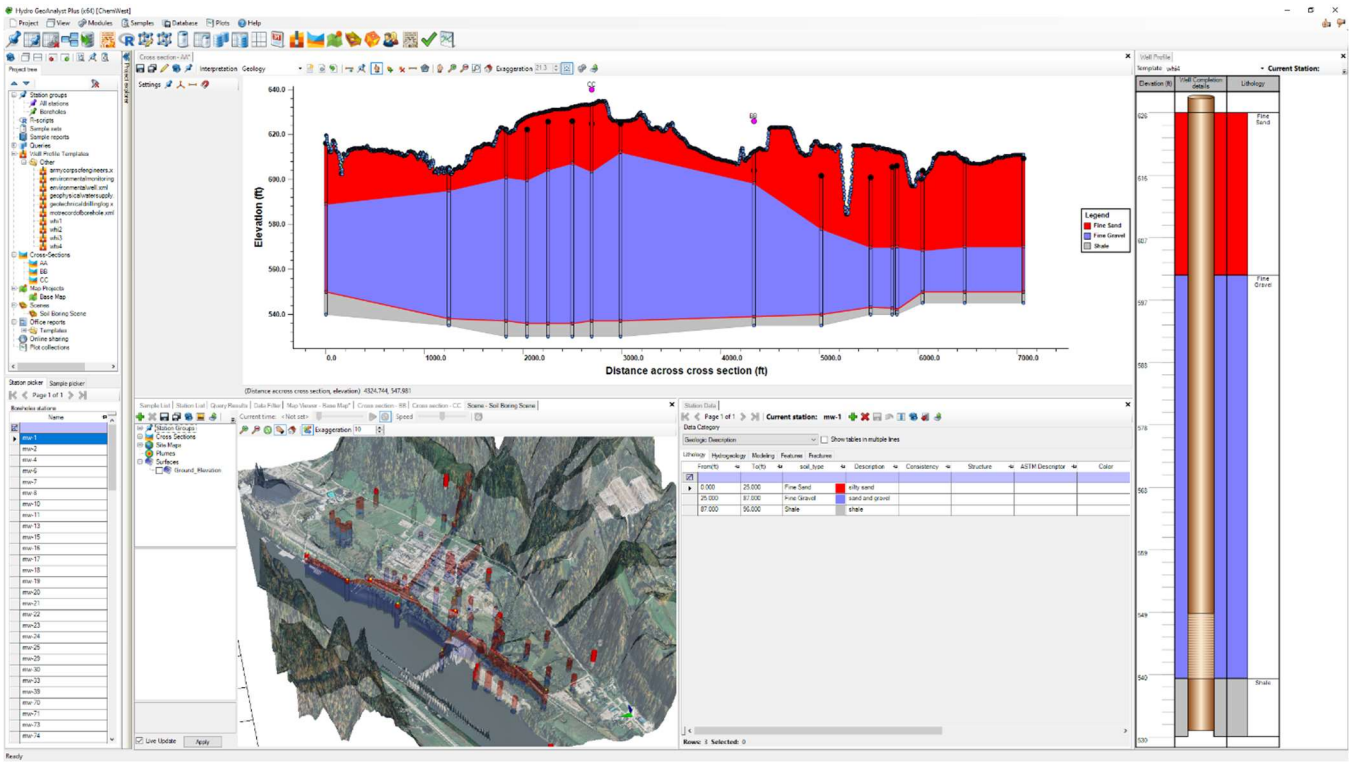
Hydro GeoAnalyst 12.0

Environmental Data Management, Analysis, & Visualization Software

Hydro GeoAnalyst (HGA) is our premium groundwater and environmental data management system. HGA organizes environmental data into a single repository with a comprehensive set of modules and tools that enable users to efficiently manage, analyze, visualize, and report on environmental and hydrogeologic data.

HGA is a powerful tool for environmental and geoscience professionals working in mining, oil & gas, environmental services, water resource management, and related governmental agencies. HGA enables teams to organize and analyze large volumes of data in an effective and efficient way to make informed decisions about environment and water resources management.

Hydro GeoAnalyst Plus (HGA+) is an extended edition of HGA that includes an integrated, powerful tool set to plot, analyze, and report on water quality and geochemical data. HGA+ combines the geochemical analysis features available in AquaChem, including data science tools available in the R-Console and geochemical modeling via an integrated link with PHREEQC and PHREEQCI.



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HGA Improvements

Version 12 of HGA includes the following improvements:

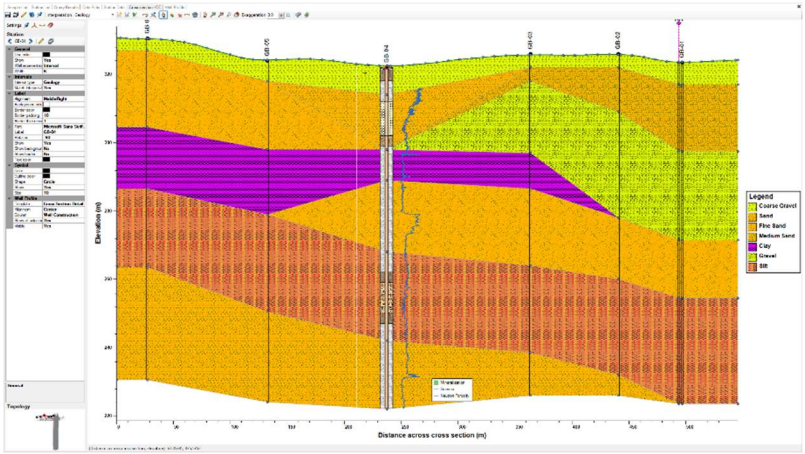
HGA 64-Bit Edition

The 64-Bit Edition of Hydro GeoAnalyst now covers all available functionality. New and updated 64-bit capable modules include:

- **Cross Section Viewer**: Build custom expressions to evaluate and populate a desired sample field or parameter (*see below*).
- **Scene Viewer**: Visualize datasets including boreholes, surfaces, maps, cross sections, and plumes in 3D.
- **3D Interpolation**: Interpolate 3D datasets into static or transient plumes that can be visualized and animated in the 3D Scene Viewer.

Cross Section Viewer

New 64-bit module Cross Section Viewer allows you to build cross sections more efficiently:



- **Define Cross Sections**: Update older existing cross sections, pick from a list of stations to include in a new cross section, or define a cross section using the Map Viewer (see below)
- **Interpretations**: define cross sections along the same transect based on interpretations of the geology, hydrogeology, and/or model layers
- **Auto-generate**: automatically (re)build cross section interpretations based on intervals in applicable boreholes and intersecting cross sections
- **Edit**: edit and refine cross section interpretations using a variety of tools, including digitizing, snapping, and splitting
- **Include Well Profiles**: include custom well profiles for one or more boreholes along cross sections
- **Easy Migration**: Automatically open existing cross sections developed in the legacy Cross Section Editor.

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Map Viewer

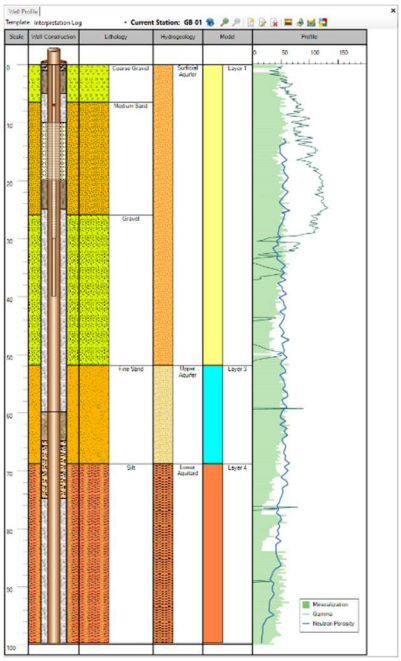
The Map Viewer module has been enhanced to include:

- **Define Cross Sections:**
  - digitize new lines or use an existing line to define new cross sections
  - add mapped boreholes within a specified buffer
  - add an optional surface to define topography along the cross section

- **Display Cross Sections:** drag and drop cross sections onto the map to display the paths/transects of all cross sections in the project

Well Profile

The Well Profile Module has been enhanced to include:



- **Date Range for Water Levels**: water level symbols can be limited to measurements within a specified date range
- **Hydrogeology Column**: add an interval column for hydrogeology interpretations of the borehole intervals and/or show this interval in the well construction column.
- **Model Layers Column**: add an interval column for model layer interpretations of the borehole intervals and/or show this interval in the well construction column.
- **Auto-generate Hydrogeology and Model intervals**: specify a mapping between specific geologic layers and corresponding Hydrogeology and Model intervals and then autocomplete intervals for these tables for the active well or all wells in the active given station group.

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Usability and Other Enhancements

HGA and HGA+ include the following additional enhancements:

- **Template Manager**: new optional setting to force database tables and fields that are set to not be shown as hidden throughout the application, including in modules that typically show all fields, such as in the Query Builder and the Data Filter views
- **Print to PowerPoint Templates**: the default Print to PowerPoint templates have been updated with a clean and consistent style.
- **User Feedback Buttons**: quickly provide anonymous feedback using thumbs up/down buttons.
  Note: since the mechanism is *anonymous*, we will not be able to respond. Please reach out to our support team if you need a response

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HGA+ Improvements

The following features have been added to the Hydro GeoAnalyst Plus Edition:

Integrated Geochemical Modeling (PHREEQC)

HGA Plus includes integrated cross-functionality with the basic features of PHREEQC, the popular geochemical modeling program developed by the USGS:

- **Thermodynamic Databases**: Import thermodynamic databases into the project and map database species to project parameters
- **Saturation indices/Activities**: Calculate the saturation indices and activities for one or more simples and seamlessly reimport the results into the project database, in a few button clicks
- **Basic Geochemical Modeling**: Prepare basic geochemical models of one or more samples
    - Basic simulations include a streamlined graphical interface to include a variety of physicochemical processes occurring simultaneously or in a series of sequential steps, including:
        - Mixing
        - Changes in Temperature and/or Pressure,
        - Reversible and Irreversible Reactions, and
        - Phase Reactions such as:
            - Solution/dissolution with equilibrium phases,
            - Sorption/desorption via exchange assemblages,
            - Solution/Gas phase assemblages
    - The resulting PHREEQC input file can be run directly from within the HGA Plus interface and results can be imported into the database for further analysis and visualization, including plotting, mapping, and reporting.
    - The resulting PHREEQC input file can be supplemented with user-generated inputs, for scenarios where advanced users require some additional complexity.
- **Advanced Geochemical Modeling**: Quickly and easily migrate samples to the PHREEQCi/PREEQC for windows interface in a few clicks, when more advanced modeling is required.

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For a full version history, see the HGA readme file at: https://www.waterloohydrogeologic.com/hydro-geoanalyst-readme/

Waterloo HYDROGEOLOGIC

219 Labrador Drive, Suite 201
Waterloo, ON
N2K 4MB, Canada

sales@waterloohydrogeologic.com
www.waterloohydrogeologic.com

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