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Upcoming Professional Courses:

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- » [NGWA - GIS Data Management for Groundwater Modelers](#)
- » [NGWA The MODFLOW Course](#)

Tips & Tricks

Product News

AquiferTest Pro v.4.0 now includes....

- Data Contouring
- Advanced Derivative Analysis
- Trends Correction
- Enhanced GUI Design
- New Diagnostic Graphs and more...



AquiferTest Upgrades starting from only US\$295!

(includes new version, technical support, plus much more!)

Upgrade your **AquiferTest Pro** license today and receive all the new benefits offered with AquiferTest Pro 4.0! Call (519) 746-1798 or email sales@waterloohydrogeologic.com.

Advanced Pumping Test Analysis using Derivatives

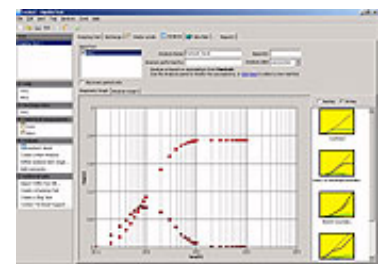
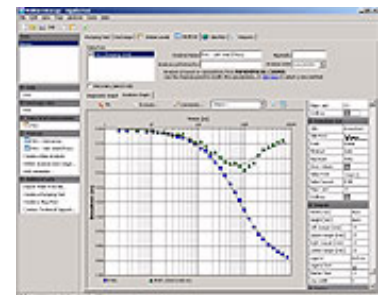
The Challenge:

Analyzing pumping test data is an important step when identifying aquifer properties such as hydraulic conductivity, storativity, and transmissivity. Traditionally, groundwater professionals will compare drawdown data to "solution methods" or "type curves" such as Theis, Cooper-Jacob, and Neuman to estimate these properties. Selecting the most appropriate type curve for the aquifer conditions can be a challenging task, and also represents the single most important step to analyzing pumping test data.

The Solution:

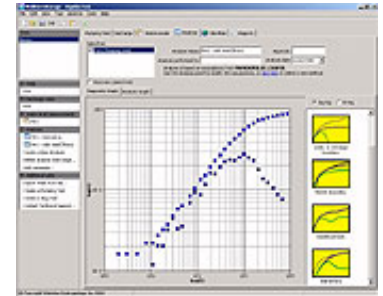
Assessing pumping test data using Time vs. Drawdown derivative curves is an ingenious approach to pre-determining the optimal type-curves to use for a pumping test analysis. Derivative curve matching exaggerates pumping test data in a manner that highlights typical aquifer responses to a variety of conditions. These include:

- **Aquifer Type (confined, unconfined, leaky, or fractured)**
- **Aquifer Extent (infinite, recharge boundary, and barrier boundary)**
- **Isotropy (isotropic, anisotropic)**
- **Discharge (variable, constant)**



- **Well Penetration (fully, partially)**
- **Data Type (recovery, drawdown)**

The pre-determination of these conditions allows for a much better understanding of the aquifer properties, thereby assisting the groundwater professional to choose the most appropriate solution method for the specific site conditions. As a result, derivative analyses represent an important step in determining the best solution method, and remove the guesswork out of selecting the appropriate type curve. Derivative analysis is now available with [AquiferTest Pro v.4.0](#).



To learn more about AquiferTest Pro v.4.0, you can visit our website at:

Website: http://www.waterloohydrogeologic.com/software/aquifertest_pro/aquifertest_pro_ov.htm

Email: sales@waterloohydrogeologic.com

Phone: (519) 746-1798



Training News

WHI's Line-Up of Environmental & Groundwater Modeling Courses!

The 2005 Waterloo Hydrogeologic Open Enrollment schedule has been set. In response to comments from groundwater professionals who have taken our Groundwater Modeling Courses in the past, and from those who would like to attend courses in the future, WHI has combined the strengths of our previous Groundwater Modeling, Advanced Groundwater Modeling, and Model Calibration courses into one [Applied Groundwater Flow & Contaminant Transport Modeling](#) course. This course includes updated lecture material, as well as new hands-on laboratories to support the new course material. WHI has also created a new short course entitled [GIS Data Management for Groundwater Modelers](#), which teaches the theory and hands-on application of GIS data integration and interpolation to support groundwater modeling efforts, as well as 3-dimensional visualization of modeling results in Visual MODFLOW, HydroGeo Analyst and GIS environments.

Click on the titles below and see which courses are appropriate for you!

- » [Applied Groundwater Flow & Contaminant Transport Modeling](#) - NEW
- » [Groundwater Contamination & Remediation](#) - UPDATED
- » [Finite Element Groundwater Modeling](#) - UPDATED
- » [Aquifer Test Analysis](#) - NEW
- » [Unsaturated Zone Modeling and Evaluation of Landfill Impacts](#) - UPDATED
- » [The Human Health Risk Assessment Course](#) - NEW
- » [Water Quality Data Management & Modeling](#) - UPDATED
- » [Regulatory Review of Hydrogeology Studies](#) - UPDATED
- » [GIS Data Management for Groundwater Modelers](#) - NEW

Who Can Benefit?

- » Experienced hydrogeologists with no prior groundwater modeling experience
- » Regulators who review modeling reports
- » Managers who want to understand what the modelers are doing
- » Experienced modelers who want to enhance their skills
- » Students who want to acquire new skills
- » Lawyers who want to understand some of the technical issues
- » Industry professionals who want to understand more about what their consultants are telling them

For further details on any of these courses, please visit our [website](#), or contact Miln Harvey, WHI Training Manager, at (519) 746-1798 x233.

Can't make it to one of our Open Enrollment Courses?
Call us about our [On-Site Custom](#) courses designed to suit your specific needs!

APPLIED GROUNDWATER FLOW & CONTAMINANT TRANSPORT MODELING



Theory and Hands-on Applications using MODFLOW-2000, MODPATH, MT3D & WinPEST

Simple to complex applications of groundwater flow and contaminant transport models are covered in this 4-day hands-on course. Groundwater resource topics include model development and calibration to groundwater heads and flows, new well development, capture zone delineation, well interference, and stream impact investigations. Contaminant transport topics include model development and calibration to contaminant concentration, source area design, concentration boundary choice, solver comparison, and 3D visualization of flow and transport results. This course is ideally suited for hydrogeologists and modelers with some field investigation and modeling experience who wish to advance their modeling knowledge, and whose responsibilities include model development, review, planning, and project management.

Course Objectives and Benefits

- » Apply Visual MODFLOW Pro to 3D groundwater flow and contaminant transport projects
- » Use MODFLOW-2000 to develop several groundwater flow models
- » Calibrate your groundwater models to observed field data
- » Use MODPATH particle tracking features to determine preferential flow paths and delineate capture zones
- » Use ZoneBudget to assess subregional water budgets within your groundwater model
- » Simulate 3D contaminant transport using RT3D, MT3DMS & MT3D99
- » Use WinPEST to improve model calibration and understand model uncertainty

[Sao Paulo, Brazil](#)
[August 23 - 26, 2005](#)

[Dubai](#)
[Sept 19-22, 2005](#)

[Waterloo, Ontario](#)
[Sept 27 - 30, 2005](#)

[Santiago, Chile](#)
[Sept 27 - 30, 2005](#)

[Ankara, Turkey](#)
[Oct 11-14, 2005](#)

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AQUIFER TEST ANALYSIS



Principles of Pumping Test Design and Techniques for Data Analysis

A wide variety of techniques can be applied to analyzing aquifer tests. This course covers the theory behind the techniques and provides an opportunity to obtain hands-on experience in analyzing aquifer test data collected from a variety of conditions.

Course Objectives and Benefits

- » Planning a pumping test
- » Principles of aquifer test analysis
- » Porous and fractured media
- » Isotropic/anisotropic conditions
- » Confined, leaky, and unconfined aquifers

[Waterloo, Ontario](#)
[July 13 - 14, 2005](#)

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FINITE ELEMENT GROUNDWATER MODELING



Advanced Applications for Saturated/Unsaturated Flow & Transport, Density-Dependent Flow, and Heat Transport

Advanced applications of groundwater flow and contaminant transport models using the Finite Element method are covered in this 4-day hands-on course. This course provides a more complete understanding of the use and applicability of finite elements in groundwater modeling, and includes such topics as groundwater flow and transport modeling, principles of unsaturated flow, fracture flow modeling, thermal transport, and density-dependent flow modeling. This course is ideally suited for groundwater modelers who wish to advance their modeling knowledge, and apply finite elements-using FEFLOW- to more complex modeling designs.

[Waterloo, Ontario](#)
[Sept 13 - 16, 2005](#)

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Course Objectives and Benefits

- » Understand when to use finite-element vs. finite-difference modeling
- » Apply FEFLOW to 3D groundwater flow and contaminant transport problems
- » Simulate unsaturated zone flow using FEFLOW
- » Simulate density-driven groundwater flow (e.g. saltwater intrusion) using FEFLOW
- » Simulate fracture flow modeling using FEFLOW, and compare to a research case study
- » Introduce the Interface Manager and the concept of model calibration to observed field data

WATER QUALITY DATA MANAGEMENT & MODELING



Applications using AquaChem and USGS PHREEQC

The large quantity and range of environmental groundwater data types presents a challenge to professionals who wish to develop a comprehensive interpretation of a suite of data. This course provides hands-on experience in temporal and spatial data interpretation, including the use of convenient computer software for organizing and plotting the data.

[Waterloo, Ontario](#)
[Sept 21 - 23, 2005](#)

[Register Now](#)

- » Planning a data collection program
- » Interpreting temporal and spatial data densities
- » Quality control issues
- » Applied geochemical modeling
- » How to use AquaChem

GIS DATA MANAGEMENT FOR GROUNDWATER MODELERS



Understanding Data Sources, Data Analysis and Visualization

This 3-day hands-on course presents an introduction to the management and analysis of groundwater data for [Visual MODFLOW](#) modelers. Topics include the data types used in groundwater models, the coordinate systems, datums and map projections in a GIS, the interpolation of data within the GIS (kriging, natural neighbor analysis, ...), the development of model layers (cross-sectional analysis of site hydrogeology) and parameter fields for groundwater model construction, and the import and export of different types of data from the GIS system to the groundwater model and back to the GIS system. Other topics that will be covered include 2-D and 3-D visualization of model input and model output. This course is ideally suited for groundwater modelers who wish to develop a comprehensive understanding of the sources of data that are used in groundwater models, the interpolation of this data for modeling, and the interchange of information between the groundwater model and the GIS system.

[Waterloo, Ontario,](#)
[December 6-8, 2005](#)

Course Objectives and Benefits

- » Understand the integration between the GIS system and Visual MODFLOW
- » Assess the applicability of MapInfo, Surfer and HydroGeo Analyst for developing a GIS
- » Use HydroGeo Analyst to develop model cross-sections and layer interfaces
- » Use HydroGeo Analyst to interpolate layer elevations and export them to Visual MODFLOW
- » Export Visual MODFLOW results to GIS and prepare report figures
- » Develop animation files of Visual MODFLOW results and insert them into client presentations

[Register Now](#)

CUSTOM DATA MANAGEMENT & MODELING

Data management, analysis and visualization are key components in the modeling process, and have an important impact on site characterization, hydrogeologic conceptualization and numerical model development.

This 4-day course looks at the integration between site characterization, groundwater modeling and risk assessment software for analyzing contaminated sites. The first part of the course analyzes the integration of GIS software, using [HydroGeo Analyst](#), in the development of calibrated groundwater models (using [Visual MODFLOW](#)), and the implications of data uncertainty in model predictions.

The second part of this course analyzes the integration between groundwater modeling results and risk characterization software. [RISC Workbench](#) will be used as a risk characterization tool, and integrated with the output from groundwater models to assess the impact of common contaminants on the risk to Human Health.

[Budapest, Hungary](#)
[Oct. 4 - 7, 2005](#)

[Register Now](#)

The NEW MODFLOW Course

The MODFLOW Course Theory & Hands-on Applications using MODFLOW-2000, MODPATH, MT3D & WinPEST

Course Description

The course begins with an introduction to the ground water modeling process, providing lectures and hands-on exercises in topics that range from data sources and evaluation, conceptual model development, numerical model implementation and model calibration and prediction. Presentations alternate between the theory behind each course topic and practical exercises to implement the concepts using [Visual MODFLOW Pro](#). This course is a hands-on course. Attendees will spend 2 ½ days of the 4-day course using the computer to complete exercises.

New exercises have been developed to show the attributes of MODFLOW-2000, MODPATH, ZoneBudget, MT3D and RT3D, and how they can be used as part of a hydrogeologic modeling analysis. The course then looks at automated parameter estimation using WinPEST to evaluate the quality of model calibration using error statistics to help decide when a model is calibrated. The course goes beyond these introductory topics and provides advice on how to develop a model efficiently, and how to choose appropriate parameter distributions and boundary conditions to effectively represent the groundwater flow system that is being modeled.

[Princeton, NJ](#)
[Oct 25 -28, 2005](#)

[Register Now](#)

To register for this course you must be a member of the NGWA, if you are not please call NGWA Customer Service at 800.551.7379, or [email](#)

GIS Data Management for Groundwater Modelers Site Characterization with HydroGeo Analyst



This 2-day hands-on course presents an introduction to the management and analysis of groundwater data for [Visual MODFLOW](#) modelers. Data management begins with the development of a site GIS using a common georeference system, which integrates the many different sources of groundwater data that are needed to develop a groundwater model. This data is then interpreted and interpolated within the GIS to generate model cross-sections, parameter distributions, model layer interfaces and model boundary conditions as part of developing the hydrogeologic conceptualization. This conceptual model is imported to Visual MODFLOW for the development of the numerical groundwater model. The course then looks at generating model results that can be visualized in 2D and 3D in Visual MODFLOW and exported to GIS for post-processing. Topics include the data types used in groundwater models, the coordinate systems, datums and map projections in a GIS, data interpolation using GIS, model layer development (cross-sectional analysis of site hydrogeology), definition of parameter fields for model construction, and the import and export of different types of data to/from the GIS system and the groundwater model. The benefits of this course include the development of an understanding of the complete integration between the GIS system, regardless of the one that is chosen, and the Visual MODFLOW groundwater model. This course is ideally suited for groundwater modelers who wish to develop a comprehensive understanding of the sources of data that are used in groundwater models, the interpolation of this data for modeling, and the interchange of information between the groundwater model and the GIS system.

[Columbus, Ohio](#)
[Oct. 19 - 20, 2005](#)

[Register Now](#)

To register for this course you must be a member of the NGWA, if you are not please call NGWA Customer Service at 800.551.7379, or [email](#)



[For our full 2005 training schedule, click here!](#)



[To request your free 2005 Training Course Schedule Catalog, click here!](#)

For more information about our course offerings, visit our website or contact us today:

Website: www.waterloohydrogeologic.com/training/training.htm

Email: training@waterloohydrogeologic.com

Phone: (519) 746-1798

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Tips & Tricks

Frequently asked HydroGeo Analyst Questions, Part 2

In May of this year, the Tips and Tricks section addressed a number of common [HydroGeo Analyst](#) questions. This month, Part 2 of the series provides more questions along with their answers.

Q: I am having difficulties accessing (seeing) the local instance of MSDE (I cannot create a new project).

A: WHI has found that as a result of installing some of the updates for Windows Operating systems, some ports that are required by HydroGeo Analyst may be closed or disabled.

Simply follow these instructions to resolve this issue:

1. NWLink IPX/SPX Protocol Disabled

Steps to resolve:

1. Select Start / Run,
2. Type **svrnetcn** in the Run dialog box and ok.
3. The NWLink IPX/SPX protocol may be disabled in the SQL Server Network Utility dialog box. If so, highlight it and select Enable to enable this protocol, then select ok.
4. You will also have to stop and re-start your SQL server for these changes to take effect.

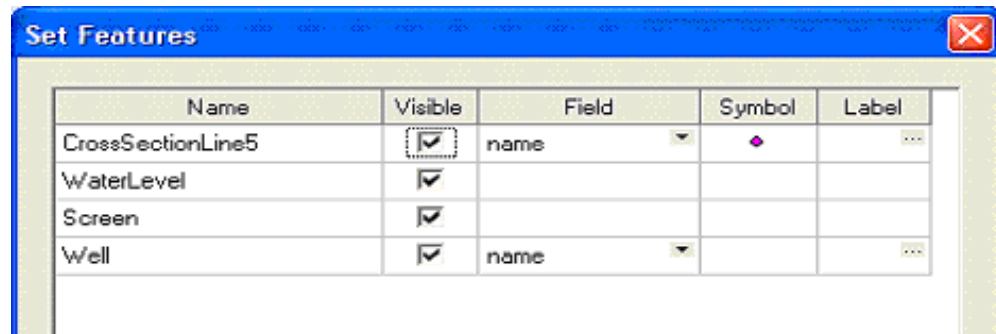
2. Windows Firewall for User Datagram Protocol (UDP) Port 1434


Steps to resolve:

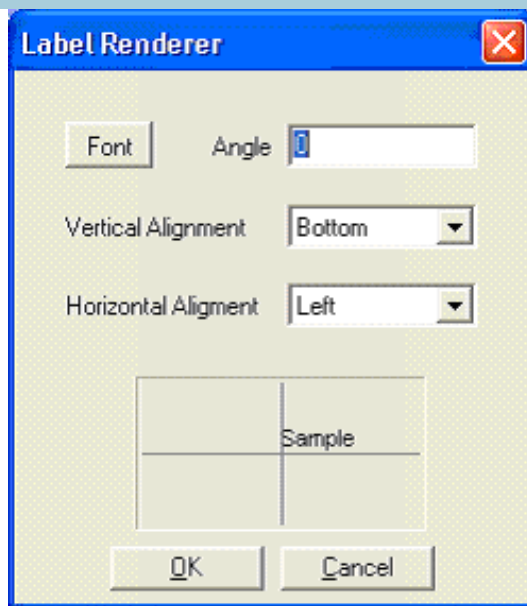
1. Click Start, and then click Run.
2. In the Run dialog box, type **Firewall.cpl**, and then click OK.
3. In the Windows Firewall dialog box, click Add Port on the Exceptions tab.
4. In the Port number box, type 1434, and then click the UDP button.
5. Type a name in the Name box for the port, such as SQL Server UDP, and then click OK.
6. On the Exceptions tab, you will see the new service. To enable the port, click to select the check box next to your new service, and then click OK.

Q: How can I get the well names to show up on the cross section instead of the well ID's?

A: You can change this option by selecting Edit-Set Features from the Main Menu. Here you will find the option to change the field used to label the wells (as seen in the screen shot below).



Additionally, the Label Renderer (displayed by clicking the  button in the Label field) allows you to customize the label further.



Q: I am unable to back up my database; I receive the message "Unable to Back up database".

A: Please ensure you are not trying to save your back-up to a mapped (network) drive. SQL server does not allow you to back up a database to a mapped drive; you will need to save the backup to your local hard drive.

Q: When I look at Help / About I find my serial number says "Illegal Copy" even though I entered a valid serial number when installing the software.

A: This message indicates your user log in does not have appropriate permissions to run the software. You must have Local Power User Rights (unaltered from the default settings) when running HG Analyst.

Q: I wish to use feet as the default length unit, I have been using the Template Manager and changing each individual field to use feet instead of meters - is there a quicker way?

A: WHI has created an Imperial version of the Environmental Template where all units are Imperial by default. Please contact our Technical Support department (techsupport@waterloohydrogeologic.com) to request this template.

If you have questions about your HydroGeo Analyst software, please feel free to contact WHI's Technical Support department via email at:

Email: techsupport@waterloohydrogeologic.com

Web: <http://www.waterloohydrogeologic.com/support.htm>

Thank you for reading this month's edition of WHI E-News! For more information about our products and services please use the links below!

[Visit our Website](#) - See what Waterloo Hydrogeologic Inc. has to offer!

[Software Division](#) - Check out our groundwater modeling software.

[Consulting Division](#) - Visit our Consulting Division on the web to see how we can help you.

[Training Division](#) - Visit our Training Division on the web to find a course in your area.

[Equipment Division](#) - WHI is now selling groundwater monitoring equipment.

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