



GeoGraphix®

Discovery Release Notes

2013.0

copyright © 2013 by LMK Resources, Inc

December 2012

Discovery™ Software Version

2013.0

Release Notes

Contents

Contents

What's in This Release	1
Introduction.....	2
System Requirements.....	4
<i>Discovery Workstation & Laptops</i>	5
<i>Discovery Project Server</i>	7
Compatibility with OpenWorks Software	9
Compatibility Table	10
New Features	11
GeoAtlas	11
Cursor Tracking between XSection and GeoAtlas	11
Discovery 3D	12
Search for Wells.....	12
Selection of Wells Domain	12
Synchronization with Wells List.....	12
Deviated Wellbore Update.....	12
SlimDX Upgrade	12
DirectX Upgrade.....	12
Unity and Prizm (CAL) upgrade.....	13
Display Horizons	13
Display Depthslices and Timeslices	13
SmartSECTION	14
COSMO 8.1	14
Reload a Single Well	14
Interpretation Options Improvements	14
smartSTRAT Tie Points Page.....	15
smartSTRAT Target Line Properties	16
smartSTRAT Vertical Panel Readout Improvement	17
WellBase.....	18
WellBase Survey Page	18
WellBase Layer Create	18

Engineer's Dashboard Improvements.....	18
64 bit Database.....	19
XSection.....	20
Well Removal	20
Use for UDE Interval	20
Cursor Tracking	21
SeisVision	23
Formation Observation Numbers.....	23
Horizon Options - Snap	23
R5000 SeisWorks Fault Format.....	23
Depth Values in TVDSS.....	23
Display of Wells	23
Imported Wells Message.....	24
MATLAB Replacement.....	24
Enhanced Pick Parameters	24
Third Party Applications.....	25
International Trade Compliance	26
Definitions.....	26
Contacting Support	28



What's in This Release

The **2013.0 release** of Discovery™ and Discovery™ on OpenWorks® software is devoted to improving stability and performance. It also provides defect fixes that address issues and simplify use.

To go directly to the new features, defect fixes, known issues and system requirements for the Discovery application, click on the blue links below:

[New Features](#)

[Fixed Issues](#)

[Known Issues](#)

[System Requirements](#)

An [Introduction](#) to the Discovery 2013.0 software release is also provided in this document.

Introduction

GeoGraphix is pleased to announce the release of the Discovery™ and Discovery™ on OpenWorks® 2013.0 software.

This release contains many improvements to the performance and stability for Discovery. This guide provides information on what to look for in this release and will help you get the most out of Discovery 2013.0.

Important information regarding system requirements, installation, new improvements, and valuable resources that will allow you to get the most out of the Discovery™ 2013.0 release is included in this volume.

Note: If working in a network environment, in order for all computers to work together on shared projects, ALL computers (clients and servers) must be updated to the same version of the software. It is intentional that computers with different versions of GeoGraphix software cannot and should not be connected with each other.

The Discovery 2013.0 release contains the following products:

GeoGraphix® Discovery™ 2013.0 is our integrated product suite that incorporates shared data management and geological, petrophysical, and geophysical interpretation tools. It utilizes a Sybase (GXDB) database in Discovery mode, or accesses the OpenWorks/SeisWorks (Oracle) database in Discovery on OpenWorks mode. The Discovery tools consist of the following:

Geological Suite

DataManager™ includes ProjectExplorer™, Coordinate System Manager™, WellBase™, SeisBase™, QueryBuilder™, LandNet™, LeaseMap™, and ZoneManager™.

- The GeoGraphix Discovery and Discovery on OpenWorks project and data management engine

GeoAtlas™

- The map display and montage environment working on ESRI MapObjects

IsoMap®

- The gridding contouring engine, featuring 10 powerful gridding algorithms

XSection™

- A fully integrated geological interpretation tool

Prizm™

- An interactive petrophysical and log analysis system

Discovery™ smartSECTION® with Discovery FrameBuilder™

- The next generation geologic modeling and cross section tool for complex structural and sequence stratigraphic analysis and unconventional well planning and monitoring

Discovery™ 3D

- The advanced 3D scene viewer that uses the most recent video and X-Box tools to display Seismic and Geologic data in three dimensions

Geophysical Suite

SeisVision™

- The SeisVision comprehensive 2D/3D seismic interpretation system, which also includes a dynamic real-time link to SeisWorks/OpenWorks™

pStaX™

- The post stack processing module for enhancing seismic character and detecting anomalies related to geologic features

SCAN™

- The patented semblance calculation for enhanced fault interpretation

Seismic Modeling

LogM Advanced Synthetics™

- The Geophysical application used for interactively editing well logs and evaluating synthetic trace character response

LogM Modeling™

- The 2D forward seismic waveform, ray tracing and structural modeling tool to predict seismic response away from the well

STRUCT™ Model Entry

- The comprehensive forward seismic structural modeling tool that is used to determine the seismic response of complex geologic structures in areas where there is little or no well control

Landmark Connectivity

Discovery™ on OpenWorks®

- Enables the Discovery tools to access OpenWorks and SeisWorks projects, and uses the OpenWorks and SeisWorks data within the Discovery framework

Xchange Tools

WellXchangePlus™

- Transfer well information to or from two Discovery projects, or between Discovery and OpenWorks

SeisXchange™

- Transfer seismic data between SeisVision and SeisWorks

GridXchange

- Transfer of map point sets and grids from Discovery to OpenWorks

Note: SeisBase, LandNet, LeaseMap, LogM ModelBuilder (LogM Modeling), and LogM Well Editor (LogM Advanced Synthetics) are not available in the current version of Discovery on OpenWorks.

System Requirements

On the following pages, you will find hardware and software system requirements tables for this release of Discovery and Discovery on OpenWorks:

- Discovery Workstation
- Discovery Project Server

System requirements can vary considerably, depending on your computing environment and software objectives. Please contact your Sales Representative or Customer Support if you have questions or need more information about system requirements.

Important Notes:

- ***Clients using Discovery on OpenWorks must upgrade to OpenWorks 5000.8.1.1 and SeisWorks 5000.0.3.2***
- ***Please also refer to the GeoGraphix Customer Support Portal (<http://css.lgc.com/CustomerSupport/CustomerSupportHome.jsp>) for up-to-date information on system requirements for all GeoGraphix products.***

Discovery Workstation & Laptops

Operating System Requirements		
Supported Operating System	RAM	CPU
Windows® 7 Professional x64 Or Windows® 7 Enterprise x64 Or Windows® 7 Ultimate x64	2 GB Minimum 8 GB recommended	Pentium 4 class or better Dual processors/cores
Notes		
<p>Note 1 – Current service pack versions are listed. We recommend using the latest Microsoft service packs and security patches.</p> <p>Note 2 – Actual available RAM on 32 bit platforms will generally be less than 4 GB due to OS limitations.</p>		

Graphics Hardware Requirements		
Application Support Level	Required Operating System	Required Graphics Hardware
All Discovery Applications including Discovery 3D	Supported Windows® 7	DirectX 11 capable hardware (see note 2)
Discovery Applications except for Discovery 3D	All Supported	All Supported
Notes		
<p>Note 1 – Microsoft DirectX End-User Runtime (June 2010) is required to run Discovery 3D.</p> <p>Note 2 – To run Discovery 3D, it is recommended that an NVIDIA DirectX 11 compatible card be used. Other DirectX 11 compatible cards that support “Compute Shader 4.0” should work but have not been tested. Windows Vista requires SP2 or later and the Platform Update for Windows Vista. Installing this update enables selected DirectX 11 technologies on Windows Vista. Both Windows Vista and Windows 7 systems may need to install the latest display drivers for the hardware.</p>		

Additional Requirements and Recommendations

- DVD-ROM required for media install. Download install available through Landmark Software Manager (LSM).
- DCOM configured to allow remote access. Only necessary if sharing projects.
- Microsoft .NET 4.0 runtime required.

Discovery Workstation (continued)

Optional Software Requirements	
For spreadsheet import utility in WellBase, SeisBase, and Lease-Map	Excel 2003 or 2007
For Selected Help files	Adobe reader
For Discovery on OpenWorks, GridXchange, SeisXchange	OpenWorks for Windows 5000.0.8.0 – Basic or Full (recommended) Install available on LSM. (See Notes below) and SeisWorks 5000.0.3.2 (for seismic workflows)
For ESRI georeferenced images and ESRI CAD file import in Geo-Atlas	ESRI ArcGIS Runtime Engine 9.3.1 or 10.0, SP3 (found in the Discovery 2013.0 Third Party Install)
For LOGarc™ Version 3.2.1.00 access in smartSECTION	To use the LOGarc™ feature the LOGarc™ Version 3.2.1.00 software must be downloaded from IHS LogTech Canada, LTD and a valid account must be in place. You must have administrator rights to the computer on which you will load the software.
For TracPlanner Xpress in Discovery	WellPlanning for Discovery 2013.0 (contained within the DecisionSpace 5000.0.3.0 install, which is available on the LSM). Oracle Express Client or Oracle 10g Client 10.2.0.4 (32 bit)

The OpenWorks Full install requires Hummingbird Exceed. The Oracle client installation in use with the OpenWorks Full installation requires that the “Administrator” option be selected. The “Administrator” option type includes the SQL Plus and the Oracle Database Utilities components, which are needed to run Discovery on OpenWorks, as part of the total OpenWorks package.

Hummingbird Exceed is not required for the OpenWorks Basic install. If OpenWorks Basic installation is used, the Oracle client installation can use the “Administrator” option, which will include all of the needed components. Or, the Oracle client installation for the OpenWorks Basic installation can use the “Custom” installation type. However, with this install type the following components must be installed:

- Oracle Database Utilities 10.2.0.1.0
- SQL*Plus 10.2.0.1.0
- Oracle JDBC/THIN Interfaces 10.2.0.1.0
- Oracle Net 10.2.0.1.0

After these Oracle components are installed, run the upgrade patch to Oracle 10g 10.2.0.4 (32 bit)

Discovery Project Server

Operating System Requirements		
Supported Operating System	RAM	CPU
Windows® Server 2003 Standard x64 or Windows® Server 2003 Enterprise x64	4 GB Minimum 8-16 GB Recommended	Pentium 4x64 class or better Multiple (2-4) processors/cores
Windows® Server 2008 R2 Standard x64 or Windows® Server 2008 R2 Enterprise x64	4 GB Minimum 8-16 GB Recommended	Pentium 4x64 class or better Multiple (2-4) processors/cores
Notes		
Note 1 – Memory recommendations beyond 4 GB are only beneficial when running large (>2 GB) cache sizes for the database engine.		
Note 2 – Client applications (e.g. WellBase) are not supported on server OS versions.		
Note 3 – Current service pack versions are listed. We recommend using the latest Microsoft service packs and security patches.		

Additional Requirements and Recommendations

- DVD-Rom required for media install. Download install available.
- DCOM configured to allow remote access

Server performance is subject to a large number of variables. It is impossible to give specific recommendations here, but these are some guiding principles to use. In general, multi-user performance of a GeoGraphix project server is best when the server is dedicated to GeoGraphix and not shared with other applications, especially database applications. In addition, consideration should be made for the number of GeoGraphix users and the size and number of concurrently accessed projects. At some point having multiple project servers becomes a better solution than having all users on one server. Generally, somewhere between 10 and 20 users is when a second server might be suggested.

Networking

Networking performance depends on the number of users trying to access a server simultaneously as well as the bandwidth requirements for those users. Recommendations for server bandwidth typically specify server connectivity at a higher bandwidth than an individual user. For instance, users running at 100 Mbit should be accessing a server running on a 1 Gbit backbone. If users are at 1 Gbit, consider running multiple 1 Gbit connections on the server.

Discovery Project Server (continued)

Database Cache

A large database cache is an important factor to consider when dealing with multiple users accessing large databases. A cache size of up to 1.8 GB is available using basic database startup settings. Larger cache sizes are available but these require special configuration.

Storage

A great deal of Discovery's access patterns on a server deal with file I/O. Database access, raster images and seismic data are examples of files that benefit substantially from a fast disk sub-system. Server environments also place a high importance on data integrity and reliability. At a minimum, consider using a RAID 5 (striped with parity) array. As the size of disks increase, you may also want to consider a hot swap drive and/or RAID 6 (striped with dual parity). Using a controller card with its own cache can also help improve performance.

Network Attached Storage (NAS), Storage Area Networks (SAN), and Other Non-Windows Storage Solutions

There are two typical methods used for accessing external storage devices from a project server; iSCSI and CIFS.

- iSCSI allocates a block of storage on the external device and makes it appear to be a physical disk on the project server. This has the advantage of a 100% compliant file system. However since the external device sees the allocation as one big file, it makes backup and restore of individual files using the external device's capabilities problematic. Standard backup and restore from the server still work.
- Using CIFS for external storage devices depends greatly on the vendor's implementation of the CIFS protocol used by the Windows platform. In general, a 100% compliant implementation of CIFS for a performant system is required. In particular, vendor's implementation of the "File Change/Notify" functionality has been problematic. Devices based on Windows Storage Server should be 100% compatible since it shares its components with Windows. Implementations based on UNIX/Linux are where problems occur due to the fact that the kernel level support is not there.

Compatibility with OpenWorks Software

The Discovery™ on OpenWorks® (DOW) software directly links a *Discovery*™ application to the data in an OpenWorks® project, and provides a shared project environment for interpretation applications. Landmark Software has delivered the OpenWorks and DOW software for Release 5000 and will continue to provide updates and enhancements to these products. When planning your uptake of Release 5000 and verifying your workflow, you should consider version compatibility between the OpenWorks software and the Discovery on OpenWorks software.

In the Compatibility Table below, the table indicates the level of compatibility of previous releases and of upcoming scheduled and planned releases. This table will be updated as new releases are planned. The objective is to provide closely coupled compatible versions of the software to allow you to more easily take up current releases.

LMKR performs full release testing for those combinations indicated as *Release*, **R**, in the table, but may not exercise full release testing on other version combinations. For these iterative releases, LMKR performs compatibility testing between the OpenWorks and DOW software (indicated as *Compatibility*, **C**, in the table). See the table below for the level of testing for each version combination. Although LMKR does not anticipate any integration issue, it is recommended that customers also verify compatibility in their own environment.

LMKR supports the versions listed as *Release* in the table. However, while LMKR has completed compatibility testing, LMKR/GeoGraphix Support may not be able to fully support the versions listed as *Compatibility* in the table. When requesting support for a *Compatibility* environment, LMKR/GeoGraphix Support works on a best effort basis to troubleshoot any issues, and if an issue needs additional attention, LMKR/GeoGraphix Support reports such issues to LMKR Research & Development. LMKR/GeoGraphix Support cannot guarantee any resolution service levels associated with issues from a *Compatibility* environment.

Combinations which have not been tested, either in the full release or in a compatibility environment, are indicated by **U** (*untested*). **P** indicates the indicated versions are *probably incompatible*, as the OpenWorks version has a newer development kit (devkit) than that of the indicated DOW version. Blank cells in the table indicate that OpenWorks and Discovery are incompatible and will *not operate together*.

For the most current version of this information and an overview of suggested compatibility test paths please refer to Landmark Graphics Technical Support Solution Document 170465.

Compatibility Table

		Discovery on OpenWorks							
		OW License 5000	DOW License 5000.02			DOW License 5000.01			
		Discovery Version	2013.0	2012.0.0	5000.0.2.5	5000.0.2.1	5000.0.2.0	5000.0.1.1	5000.0.1.0
OpenWorks Version	OW 5000.8.1.1	R							
	OW 5000.8.0.0		R						
	OW 5000.0.3.5		C	R					
	OW 5000.0.3.0		C	C	R				
	OW 5000.0.2.9		U	U	U	U			
	OW 5000.0.2.8		U	U	U	U			
	OW 5000.0.2.7		U	R	R	R			
	OW 5000.0.2.2							R	P
	OW 5000.0.2.0								C
	OW 5000.0.1.7								R
	OW 5000.0.1.6								C
	OW 5000.0.1.5								C
	OW 5000.0.1.4								U
	OW 5000.0.1.2								U
	OW 5000.0.1.1								
	OW 5000.0.0.3							R	P

Legend

R = Release level full testing

C = Compatibility level basic testing

U = Untested

P = Probably incompatible since OW and Discovery are running different OW devkits

A blank cell indicates that OW and Discovery are incompatible

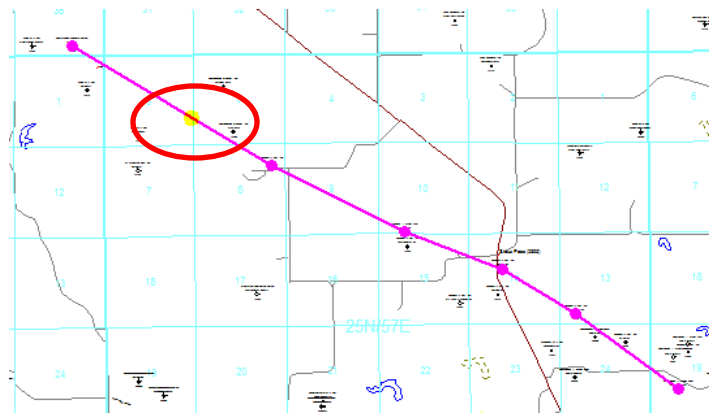
New Features

This section contains a brief description of the exciting new features included in the 2013.0 release.

GeoAtlas

Cursor Tracking between XSection and GeoAtlas

Cursor tracking between XSection and GeoAtlas has been implemented in Release 2013.0. When a cross section is active in XSection the cursor position is shown in map view in GeoAtlas. The cursor position on the cross section shows as a yellow dot along the line of section. The Tracking point color can be changed in GeoAtlas using the Colors page of the Options dialog box, which is accessed using the **Tools >> Options** menu command.



Discovery 3D

Search for Wells

Starting with the 2013.0 release you can search for wells on the Wells tab of Discovery 3D. You can search for wells based on Well ID, Operator and Well Name.

Selection of Wells Domain

Starting with Discovery 2013.0 two checkboxes have been added on the Wells tab. The time and Depth boxes select the domain of wells shown on the 3D View.

Synchronization with Wells List.

There have been improvements with the synchronization of the internal lists in Discovery 3D that manage the interaction with the 3D Scene and the data selector well list, which manages the interaction with the user and internal lists. The outcome of the improvements is that the well list now stays synchronized with the objects on the 3D Scene.

Deviated Wellbore Update

You can now update a deviated wellbore path on the 3D Scene without having to close the 3D Scene. A command has been added to the right-click context menu on the 3D Scene when a well is selected on the scene. The **Refresh Well Data** command will update the well survey with any new information that was added to the project after the creation of the 3D Scene.

SlimDX Upgrade

The latest SlimDX version has been implemented in Discovery 2013.0. This performance upgrade takes advantage of the latest SlimDX new features and bug fixes.

DirectX Upgrade

The latest version of the DirectX technology has been implemented in Discovery 3D 2013.0. The upgraded version allows performance improvements by utilizing new features and bug fixes.

Unity and Prizm (CAL) upgrade

Unity and Prizm (CAL) third party software has been upgraded to the latest versions to improve performance, and take advantage of new features and bug fixes.

Display Horizons

Starting with this release of Discovery 3D you can now display SeisVision Horizons in either depth or time in Discovery 3D.

Display Depthslices and Timeslices

Starting with the 2013.0 release of Discovery 3D you can now display seismic depthslices and timeslices on the 3D Scene.

SmartSECTION

COSMO 5000.8.1.1

The latest version of COSMO, the underlying modeling engine for smartSECTION, has been incorporated into the software. This change is mostly hidden from users but takes advantage of the latest COSMO features and bug fixes.

Reload a Single Well

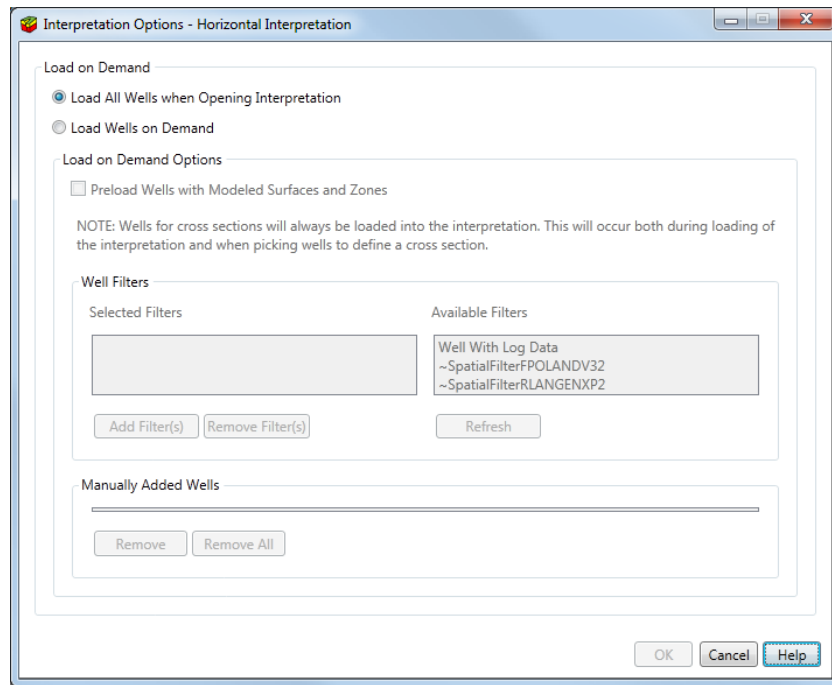
You now have the ability to reload a single well without having to Refresh All Views. If a well is loaded into an interpretation and well information changes in WellBase or Prizm, etc. you can reload that single well either using the Map View or the Cross Section view without having to reload all wells in the project.

In Map View select the well, right-click and select Reload Well from the context menu.

In Cross Section View select the well, right-click and select Reload Well from the context menu.

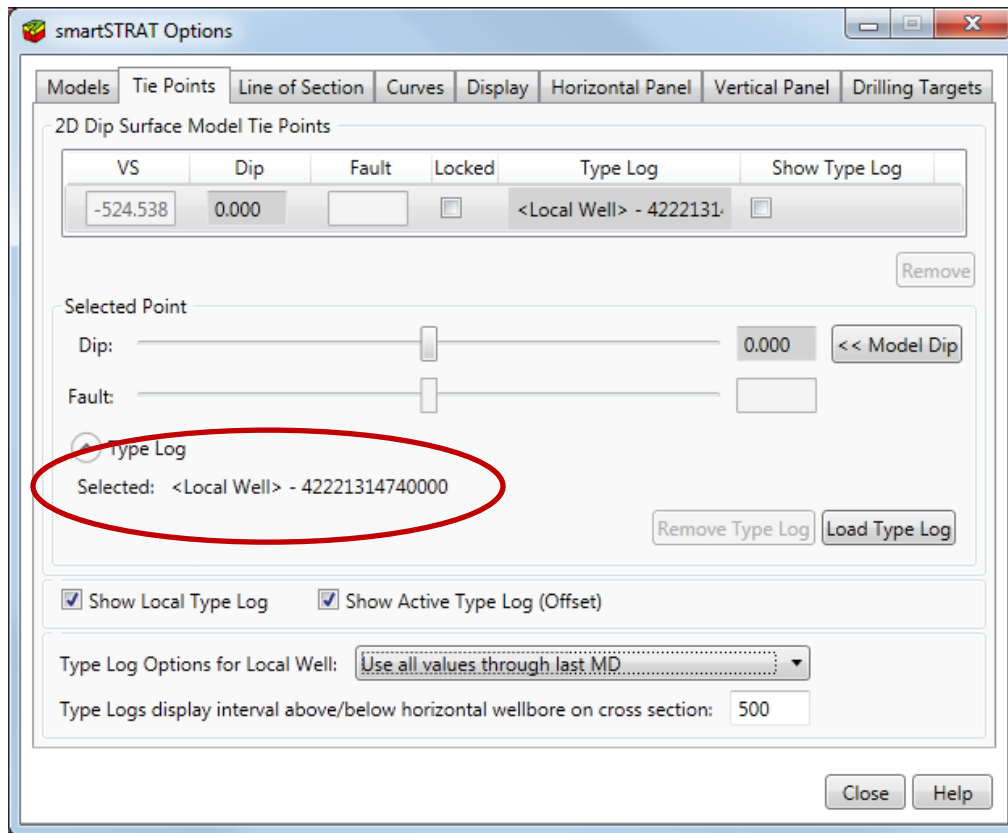
Interpretation Options Improvements

You can now change the Interpretation Options prior to opening a saved interpretation (**Edit >> Interpretation Options**). Changing the Interpretation Options can greatly reduce the number of wells loaded when the interpretation is opened. Reducing the number of wells loaded into the Interpretation greatly reduces the amount of time required to open projects with many wells and surfaces.



smartSTRAT Tie Points Page

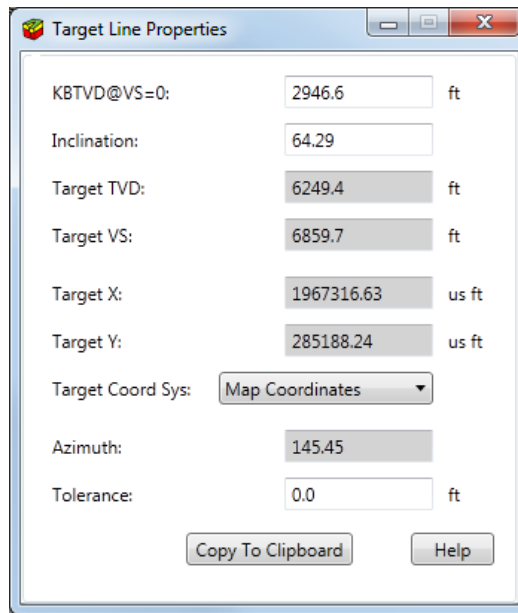
Several enhancements have been added to the smartSTRAT tool **Options** dialog box. One of these improvements is to list the Local Type Log Unique Well ID on the Tie Points Page.



This change reduces the confusion over which well is used as the Local Type Log

smartSTRAT Target Line Properties

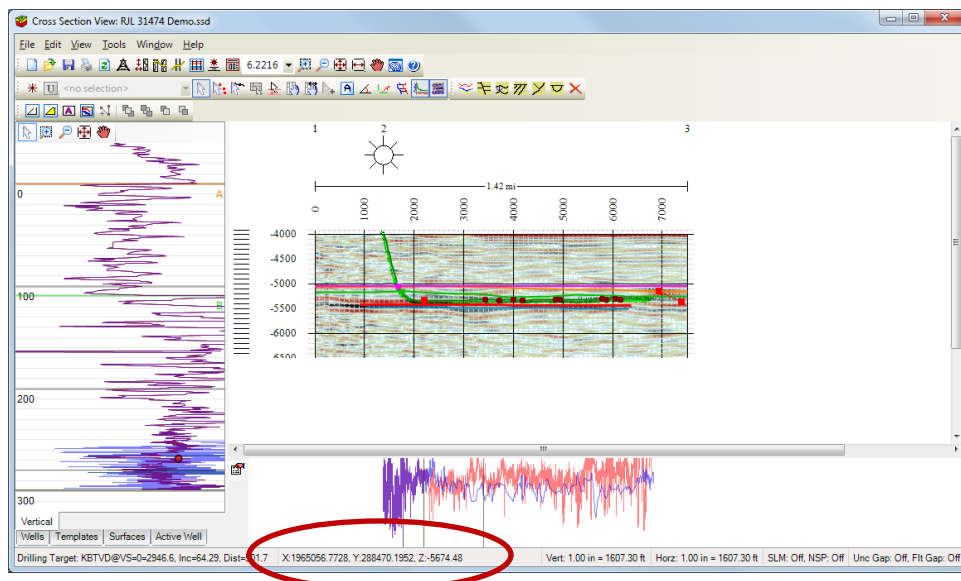
Enhanced Target Line Properties now include the target point X and Y location in the Map Display coordinate system, Database coordinate system or Latitude/Longitude.



Target Line Properties have been simplified to remove information that is not needed by drilling engineers. The Distance, Delta TVD, Delta VS, Origin TVD and the Origin VS have been removed.

smartSTRAT Vertical Panel Readout Improvement

The TVD position of the cursor on the cross section now appears at the bottom of the Vertical Panel along with the X and Y coordinates



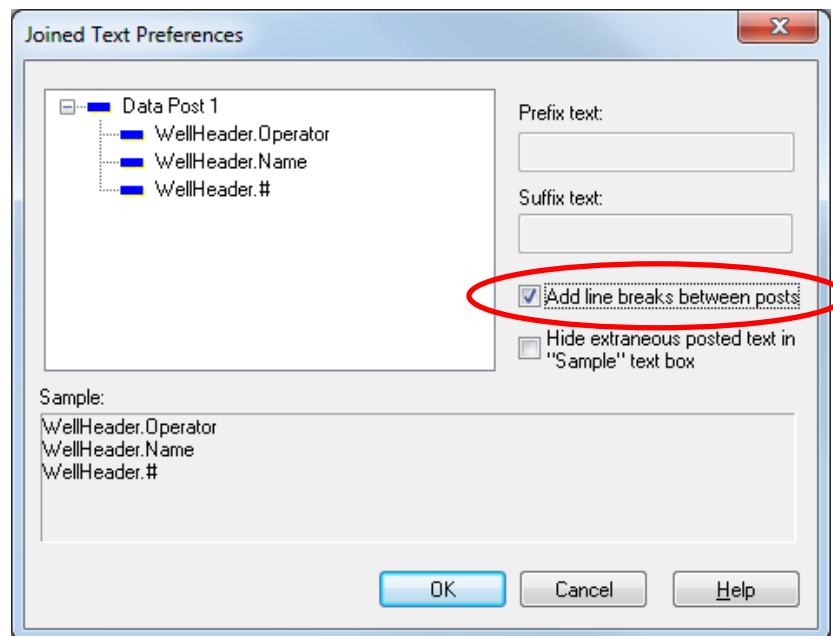
WellBase

WellBase Survey Page

Starting with Release 2013.0 the **Survey Page** of the WellBase Information Manager now contains North Reference box. The North Reference cannot be edited, rather it is informational and intended to indicate if a directional survey imported from an IHS well data file is in reference to true north or grid north.

WellBase Layer Create

You can now use the Joined Text Preferences dialog box to add line breaks between each line of posted text.



With this option selected, the Sample view shows each posting on a different line.

Engineer's Dashboard Improvements

In WellBase 2013.0 several improvements have been made to the Engineer's Dashboard that enhance performance.

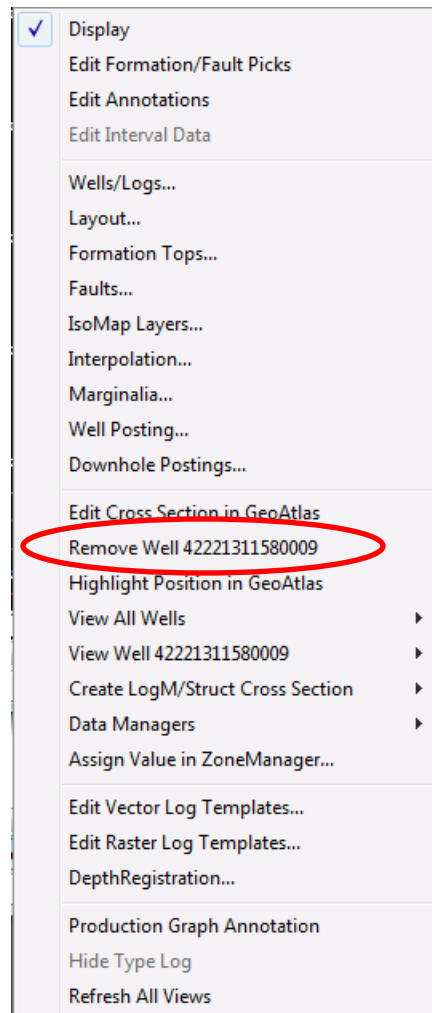
64 bit Database

Sybase 64 has been implemented in Discovery 2013.0. The new version of Sybase is used for better database performance.

XSection

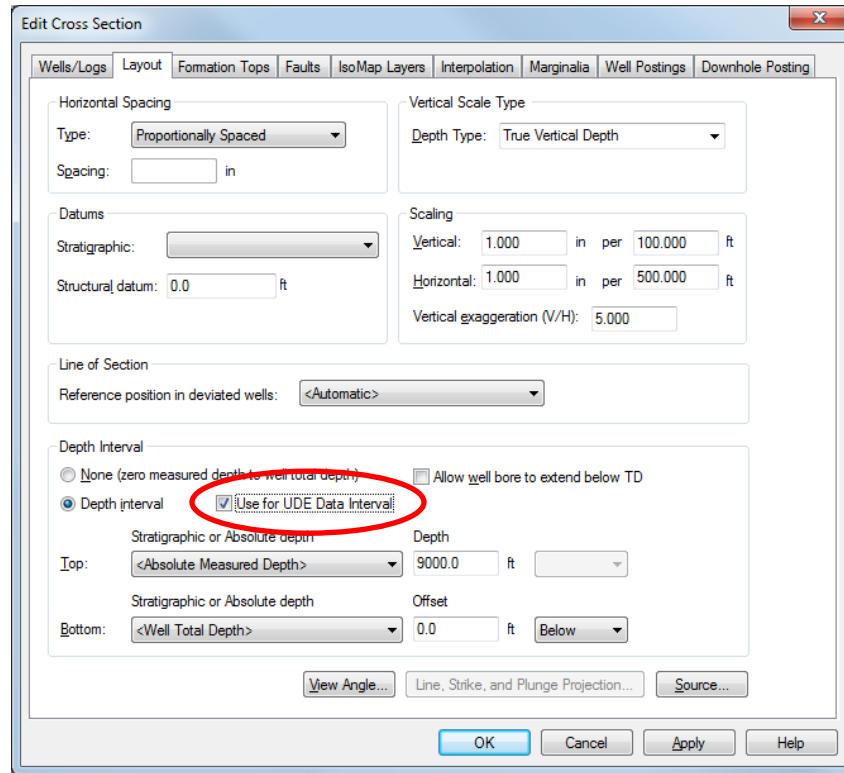
Well Removal

Starting with XSection 2013.0 you now have the ability to remove a well from the cross section using a right-click menu command (Right-click on a well and select Remove Well <UWID>).



Use for UDE Interval

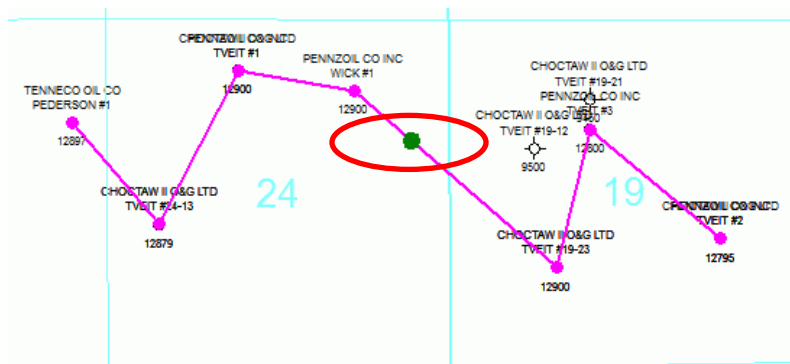
A new checkbox has been added to the Layout page of the Edit Cross Section dialog box. The Use for UDE Data Interval checkbox, when checked, will limit the calculations for the active User Defined Equations (UDE) or Prizm External Model (PEM) to the depth interval set in the Depth Interval group box on the Layout page.



This option is useful for using a data interval different from the Depth Interval settings for the UDE and PEM calculations.

Cursor Tracking

The position of the cursor on the cross section can now be viewed in map view in GeoAtlas. When a map is showing in GeoAtlas and the cursor is moved along the cross section a yellow dot appears on the line of section. The color of the tracking dot can be changed in GeoAtlas using the Colors page of the Options dialog box, which is accessed using the **Tools >> Options** menu command.





SeisVision

Formation Observation Numbers

Formation Observation Numbers are listed on the Formation List dialog box and can now be posted in map view or on seismic views. The Observation Numbers appear in parenthesis next to the formation name or code. The controls to toggle on or off the Observation number postings are located on the **Formation/Fault Annotation** dialog box (**Formations >> Default Formation Annotation or Wells >> Default Formation Annotation**) for the seismic view postings and on the **Active/Default Map Display Properties** dialog box (click the **Wells** tab on the **Active** or **Default Map Display Properties** dialog box) for the Map View displays.

Horizon Options - Snap

The Snap direction has been added to the Snap Horizon page of the Horizon Options dialog box (Horizons >> Options >> Snap Horizon). You can snap the horizon picks to the event listed in the Snap To box on the same page. There are three settings; UP, Down, and Nearest.

For example if Peak is selected in the Snap To box, selecting Up in the Snap box will snap the Horizon to the closest peak above the Horizon. If Down is selected, the Horizon picks will snap to the closest peak below the Horizon. If Down is selected, the Horizon picks will snap to the nearest peak below the Horizon. IF Nearest is selected (The default setting), the Horizon picks will snap to the nearest peak (up or down).

R5000 SeisWorks Fault Format

You now have the option to import and export faults in R5000 SeisWorks format or in the older R2003 SeisWorks format Using the Fault Manager..

Depth Values in TVDSS

All features in SeisVision now show depth values for trace and interpretation data in True Vertical Depth Subsea.

Display of Wells

With this release of SeisVision, there is more control over which wells are displayed on seismic sections. New options on the Well Display Options dialog box allow you to Display wells within X feet/meters of wellhead and Display wells within X feet/meters of any part of the Wellbore. The default values are reduced to five feet or one meter to show only those wells that intersect the seismic line.

Imported Wells Message

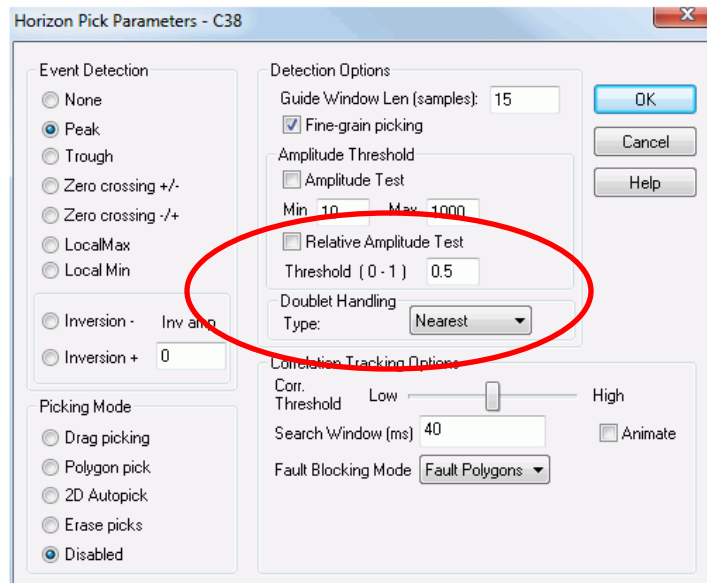
The message that appears after wells have been imported into the seismic interpretation now includes a reminder to turn on a velocity survey. The message reads, “Could not Depth to Time Convert Well because the interpretation’s velocity or datum was not set and no velocity survey is active”.

MATLAB Replacement

The MATLAB code in the SeisVision software has been replaced with our own proprietary code, which results in a significant performance improvement.

Enhanced Pick Parameters

Two new controls have been added to refine the picking of Horizons in SeisVision. The controls are located on the Horizon Pick Parameters dialog box (Horizons >> Edit Pick Parameters) and on the Auto Track Page of the Horizon Manager. The commands are identical in each location.



The New commands are:

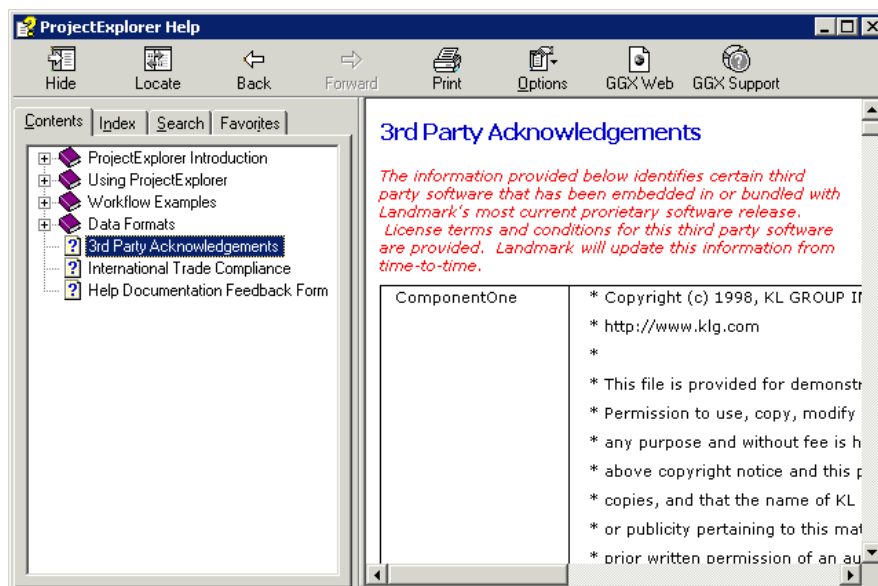
- **Relative Amplitude Test** – Use this option to check the goodness amplitude match during the Horizon picking process.
- **Doublet Handling** – Use this option to control the picking of doublets encountered while picking Horizons. You can set this control to pick the Nearest event, the strongest event, the top event of the doublet, the bottom event of the doublet, or to stop picking when a doublet is encountered.

Third Party Applications

Halliburton and LMKR use various third-party applications in the development of its software.

Halliburton and LMKR acknowledge that certain third party code has been bundled with, or embedded in, its software. The licensors of this third party code, and the terms and conditions of their respective licenses, may be found in the Discovery Help files. To access the third party applications:

1. In any Discovery application select Help >> Contents.
2. On the Help window contents page locate the Third Party Acknowledgements Help topic as shown below.



International Trade Compliance

This application is manufactured or designed using U.S. origin technology and is therefore subject to the export control laws of the United States. Any use or further disposition of such items is subject to U.S. law. Exports from the United States and any re-export thereafter may require a formal export license authorization from the government. If there are doubts about the requirements of the applicable law, it is recommended that the buyer obtain qualified legal advice. These items cannot be used in the design, production, use, or storage of chemical, biological, or nuclear weapons, or missiles of any kind.

The ECCN's provided in Release Notes represent Halliburton's opinion of the correct classification for the product today (based on the original software and/or original hardware). Classifications are subject to change. If you have any questions or need assistance please contact us at:

FHOUEXP@halliburton.com

Under the U.S. Export Administration Regulations (EAR), the U.S. Government assigns your organization or client, as exporter/importer of record, responsibility for determining the correct authorization for the item at the time of export/import. Restrictions may apply to shipments based on the products, the customer, or the country of destination, and an export license may be required by the Department of Commerce prior to shipment. The U.S. Bureau of Industry and Security provides a website to assist you with determining the need for a license and with information regarding where to obtain help.

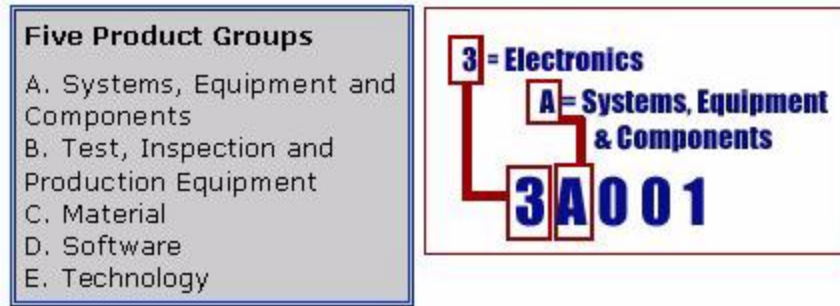
The URL is:

<http://www.bis.doc.gov>

Definitions

CCATS (Commodity Classification Automated Tracking System) - the tracking number assigned by the U.S. Bureau of Industry and Security (BIS) to products formally reviewed and classified by the government. The CCATS provides information concerning export/re-export authorizations, available exceptions, and conditions.

ECCN (Export Control Classification Number) -The ECCN is an alpha-numeric code, e.g., 3A001, that describes a particular item or type of item, and shows the controls placed on that item. The CCL (Commerce Control List) is divided into ten broad categories, and each category is further subdivided into five product groups. The CCL is available on the [EAR Website](#).



The ECCN Number, License Type, and the CCATS Numbers for this product are included in the table below. Also included is the date the table was last updated.

Product/Component/R5000	ECCN Number	License	CCATS Number	Last Date Updated
Discovery	5D002	ENC	G063964	11/5/2009
Landmark Software Manager (LSM)	5D002	ENC	G058319	2/11/2008
OpenWorks	5D002	ENC	G054746	2/11/2008

Contacting Support

Landmark software operates Technical Assistance Centers (TACs) in Australia, the United Kingdom, and the United States. Additional support is also provided through local support offices around the world.

- [Support Via Web Portal](#)
- [Technical Assistance Centers](#)
- [Regional Offices](#)

Support via Web Portal

Support information is available through the LMKR website, or the Landmark Customer Support internet page. You can also submit a support request directly to GeoGraphix Customer Support through the Landmark Customer Support Portal making sure to select GeoGraphix as the product. This will ensure it is placed into the LMKR/GeoGraphix support queue.

<http://css.lgc.com/InfoCenter/index?page=home>

To request support in the Landmark Customer Support Portal:

1. In the **PIN** and **Password** text boxes in the Please Sign In area, enter your registered personal identification number and password.
2. Click the **Sign In** button.
3. In the Case & Defect Information area, click the **Create A New Case** link.
4. In the **Create Case** area, fill in the necessary information. Provide details about your technical concern, including any error messages, the workflow steps where the problem occurred, and attachments of screen shots that display the problem. To help understand the concern, you can also attach other files too, such as example data files.
5. Click the **Submit** button. A support analyst in the nearest Technical Assistance Center will respond to your request.

Technical Assistance Centers

Asia, Pacific

8:00 am - 5:00 pm Local Time
Monday-Friday, excluding holidays

61-8-9481-4488 (Perth, Australia)

Toll Free 1-800-448-488
Fax: 61-8-9481-1580
Email: apsupport@lgc.com

Europe, Africa, Middle East

9:00 am - 5:30 pm Local Time
Monday - Friday, excluding holidays

44-1372-868686 (Leatherhead, UK)

Fax: 44-1224-723260 (Aberdeen, UK)
Fax: 44-1372-868601 (Leatherhead, UK)
Email: support@lgc.com

Latin America

(Spanish, Portuguese, English)
7:00 am - 5:00 pm Local Time

713-839-3405 (Houston, TX, USA)

Fax: 713-839-3646
Email: soporte@lgc.com

North America

7:00 am - 5:00 pm Rocky Mountain Time
Monday - Friday, excluding holidays

713-839-2200 (Houston, TX, USA)

Toll Free 1-877-435-7542
(1-877-HELP-LGC)
Fax: 303-996-2186
Email: Solutions@geographix.com

Regional Offices

For contact information for regional offices, see the Contact Support page located at:

<http://css.lgc.com/InfoCenter/index?page=contact§ion=contact>

If problems cannot be resolved at the regional level, an escalation team is called to resolve your incidents quickly.

Helpful Internet Links

Name	Website Address
LMKR home page	http://www.lmkr.com
Landmark Support Portal	http://css.lgc.com/InfoCenter/index?page=home
Landmark Software and Services home page	http://halliburton.com/landmark
SyBase home page	http://www.sybase.com
Microsoft SQL Server home page	http://www.microsoft.com/sqlserver
Oracle home page	http://www.oracle.com

**© 2012 LMKR/Halliburton
All Rights Reserved**

This publication has been provided pursuant to an agreement containing restrictions on its use. The publication is also protected by Federal copyright law. No part of this publication may be copied or distributed, transmitted, transcribed, stored in a retrieval system, or translated into any human or computer language, in any form or by any means, electronic, magnetic, manual, or otherwise, or disclosed to third parties without the express written permission of:

LMK Resources, Inc
2107 Denver Place, South Terrace
999 18th Street, Suite 650, Denver, CO, USA
Phone:303-996-2150, FAX: 303-996-2186
Internet: www.lmkr.com/geographix

Trademarks

3D Drill View, 3D Drill View KM, 3D Surveillance, 3DFS, 3DView, Active Field Surveillance, Active Reservoir Surveillance, Adaptive Mesh Refining, ADC, Advanced Data Transfer, Analysis Model Layering, ARIES, ARIES DecisionSuite, Asset Data Mining, Asset Decision Solutions, Asset Development Center, Asset Development Centre, Asset Journal, Asset Performance, AssetConnect, AssetConnect Enterprise, AssetConnect Enterprise Express, AssetConnect Expert, AssetDirector, AssetJournal, AssetLink, AssetLink Advisor, AssetLink Director, AssetLink Observer, AssetObserver, AssetObserver Advisor, AssetOptimizer, AssetPlanner, AssetPredictor, AssetSolver, AssetSolver Online, AssetView, AssetView 2D, AssetView 3D, BLITZPAK, CasingLife, CasingSeat, CDS Connect, Channel Trim, COMPASS, Contract Generation, Corporate Data Archiver, Corporate Data Store, Data Analyzer, DataManager, DataStar, DBPlot, Decision Management System, DecisionSpace, DecisionSpace 3D Drill View, DecisionSpace 3D Drill View KM, DecisionSpace AssetLink, DecisionSpace AssetPlanner, DecisionSpace AssetSolver, DecisionSpace Atomic Meshing, DecisionSpace Nexus, DecisionSpace Reservoir, DecisionSuite, Deeper Knowledge. Broader Understanding., Depth Team, Depth Team Explorer, Depth Team Express, Depth Team Extreme, Depth Team Interpreter, DepthTeam, DepthTeam Explorer, DepthTeam Express, DepthTeam Extreme, DepthTeam Interpreter, Design, Desktop Navigator, DESKTOP-PVT, DESKTOP-VIP, DEX, DIMS, Discovery, Discovery 3D, Discovery Asset, Discovery Framebuilder, Discovery PowerStation, DMS, Drillability Suite, Drilling Desktop, DrillModel, Drill-to-the-Earth-Model, Drillworks, Drillworks ConnectML, DSS, Dynamic Reservoir Management, Dynamic Surveillance System, EarthCube, EDM, EDM AutoSync, EDT, eLandmark, Engineer's Data Model, Engineer's Desktop, Engineer's Link, ESP, Event Similarity Prediction, ezFault, ezModel, ezSurface, ezTracker, ezTracker2D, FastTrack, Field Scenario Planner, FieldPlan, For Production, FZAP!, GeoAtlas, GeoDataLoad, GeoGraphix, GeoGraphix Exploration System, GeoLink, Geometric Kernel, GeoProbe, GeoProbe GF DataServer, GeoSmith, GES, GES97, GESExplorer, GMAPlus, GMI Imager, Grid3D, GRIDGENR, H. Clean, Handheld Field Operator, HHFO, High Science Simplified, Horizon Generation, I2 Enterprise, iDIMS, Infrastructure, Iso Core, IsoMap, iWellFile, KnowledgeSource, Landmark (*as a service*), Landmark (*as software*), Landmark Decision Center, Landmark Logo and Design, Landscape, Large Model, Lattix, LeaseMap, LogEdit, LogM, LogPrep, Magic Earth, Make Great Decisions, MathPack, MDS Connect, MicroTopology, MIMIC, MIMIC+, Model Builder, Nexus (*as a service*), Nexus (*as software*), Nexus View, Object MP, OpenBooks, OpenJournal, OpenSGM, OpenVision, OpenWells, OpenWire, OpenWire Client, OpenWire Direct, OpenWire Server, OpenWorks, OpenWorks Development Kit, OpenWorks Production, OpenWorks Well File, PAL, Parallel-VIP, Parametric Modeling, PetroBank, PetroBank Explorer, PetroBank Master Data Store, PetroStor, PetroWorks, PetroWorks Asset, PetroWorks Pro, PetroWorks ULTRA, PlotView, Point Gridding Plus, Pointing Dispatcher, PostStack, PostStack ESP, PostStack Family, Power Interpretation, PowerCalculator, PowerExplorer, PowerExplorer Connect, PowerGrid, PowerHub, PowerModel, PowerView, PrecisionTarget, Presgraf, PressWorks, PRIZM, Production, Production Asset Manager, PROFILE, Project Administrator, ProMAGIC, ProMAGIC Connect, ProMAGIC Server, ProMAX, ProMAX 2D, ProMAX 3D, ProMAX 3DPSDM, ProMAX 4D, ProMAX Family, ProMAX MVA, ProMAX VSP, pSTax, Query Builder, Quick, Quick+, QUICKDIF, Quickwell, Quickwell+, Quiklog, QUIKRAY, QUIKSHOT, QUIKVSP, RAVE, RAYMAP, RAYMAP+, Real Freedom, Real Time Asset Management Center, Real Time Decision Center, Real Time Operations Center, Real Time Production Surveillance, Real Time Surveillance, Real-time View, Reference Data Manager, Reservoir, Reservoir Framework Builder, RESev, ResMap, RTOC, SCAN, SeisCube, SeisMap, SeisModel, SeisSpace, SeisVision, SeisWell, SeisWorks, SeisWorks 2D, SeisWorks 3D, SeisWorks PowerCalculator, SeisWorks PowerJournal, SeisWorks PowerSection, SeisWorks PowerView, SeisXchange, Semblance Computation and Analysis, Sierra Family, SigmaView, SimConnect, SimConvert, SimDataStudio, SimResults, SimResults+, SimResults+3D, SIVA+, SLAM, SmartFlow, smartSECTION, Spatializer, SpecDecomp, StrataAmp, StrataMap, StrataModel, StrataSim, StratWorks, StratWorks 3D, StreamCalc, StressCheck, STRUCT, Structure Cube, Surf & Connect, SynTool, System Start for Servers, SystemStart, SystemStart for Clients, SystemStart for Servers, SystemStart for Storage, Tanks & Tubes, TDQ, Team Workspace, TERAS, T-Grid, The Engineer's DeskTop, Total Drilling Performance, TOW/cs, TOW/cs Revenue Interface, TracPlanner, TracPlanner Xpress, Trend Form Gridding, Trimmed Grid, Turbo Synthetics, VESPA, VESPA+, VIP, VIP-COMP, VIP-CORE, VIPDataStudio, VIP-DUAL, VIP-ENCORE, VIP-EXECUTIVE, VIP-Local Grid Refinement, VIP-THERM, WavX, Web Editor, Well Cost, Well H. Clean, Well Seismic Fusion, Wellbase, Wellbore Planner, Wellbore Planner Connect, WELLCAT, WELLPLAN, WellSolver, WellXchange, WOW, Xsection, You're in Control. Experience the difference, ZAP!, and Z-MAP Plus are trademarks, registered trademarks, or service marks of Halliburton.

All other trademarks, service marks and product or service names are the trademarks or names of their respective owners.

Note

The information contained in this document is subject to change without notice and should not be construed as a commitment by Halliburton. Halliburton assumes no responsibility for any error that may appear in this manual. Some states or jurisdictions do not allow disclaimer of expressed or implied warranties in certain transactions; therefore, this statement may not apply to you.