

Petra 2022

New Features

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July 2022

Release Dates:

Petra 2021 (v. 3.15): July 6th, 2021

Petra 2021 Hot Fix 1 (v. 3.15.1): August 17th, 2021

Petra 2021 Hot Fix 2 (v. 3.15.2): September 19th, 2021

Petra 2021 Hot Fix 3 (v. 3.15.3): November 3rd, 2021

Petra 2021 Hot Fix 4 (v. 3.15.4): April 7th, 2022

Petra 2022 (v. 3.16): July 5th, 2022

All versions available via download:

<http://onlinehelp.ihs.com/Energy/Petra/HelpCenter/Content/Downloads.htm>

Agenda

1. Overview of new features added in Petra 2022:
 1. New Computes
 2. Raster Log Maintenance Updates
 3. Main Functionality Improvements
 4. Deviated Borehole Data Posting
 5. Additional Map Module Enhancements
 6. Cross-Section Enhancements
2. Live Demo of highlighted features
3. 2023 Road Map
4. Q&A!



Petra Roadmap

July
2021

v. 2021 (3.15)

- Overlay Sub-Folders
- Map Quick list enhancements
- Transparency controls for contour color fill in Map
- New Computes:
 - Deviation Survey data extraction
 - Completions data extraction
- Date queries for Deviation Surveys
- Additional save/load templates for x-section settings dialogs
- Ascii export updates

July
2022

v. 2022 (3.16)

- New Deviation Survey compute to calculate inclination and azimuth
- Fm Tops IF-THEN-ELSE compute
- Updates to Blue Marble projection systems
- New query categories
- Raster log maintenance updates
- Expanded data category options for posting along worm-track
- Multiple survey per well posted on map
- Map functionality improvements
- Cross-Section well highlight features

2022 SP1
&
2023

v. 2022 SP (3.16) and 2023 (3.17)

- New Direct Connections to Bulk Log Database (*WLD, Kingdom*)
- New Direct Connections to North American Data Model (Snowflake)
- Gun-Barrel/Wine-Rack diagram analysis
- Workflow Automation Tool
- Updates to User Interface
- Customer Feedback and Enhancement requests

Main Module Enhancements and New Features

New Deviation Survey Computes

- **Calculate Inclination and Azimuth from DX/DY**
 - > Update deviation survey table with new calculated numbers
 - > Options for Computation Method (Default is Minimum Curvature)
 - > IHS RAW data stored for original records
 - > Bulk and single well compute options

Benefits:

- *Option to populate and use inc/azi values if any survey in the project does not contain these values*
- *Bulk computes to update multiple surveys*

The screenshot shows the IHS software interface for calculating inclination and azimuth from survey data. The main window displays a 3D wellbore model with a red line representing the well path. The 'Compute Inclination/Azimuth From Survey' dialog box is open, showing options for computation method (Tangential, Average Angle, Balanced Angle, Radius of Curvature, Minimum Curvature) and compute for (All Project Wells, All Wells Selected In Main, Current Well Only). The 'Current Well Only' option is selected, and the well name 'WSN = 2655' is entered. The dialog box also includes 'Export' and 'Import' buttons. The background window shows a table of survey data with columns for MD, TVD, Inclination, and Azimuth.

MD	TVD	Inclination	Azimuth
0.00	0.00	0.000	0.000
122.00	122.00	0.000	0.000
190.00	190.00	0.000	0.000
263.00	263.00	0.000	0.000
348.00	347.99	0.000	0.000
417.00	416.99	0.000	0.000
513.00	512.99	0.000	0.000
602.00	601.99	0.000	0.000
685.00	684.98	0.000	0.000
774.00	773.97	0.000	0.000
839.00	838.97	0.000	0.000
879.00	878.97	0.000	0.000
975.00	974.97	0.000	0.000
1065.00	1064.97	0.000	0.000
1156.00	1155.97	0.000	0.000
1255.00	1254.97	0.000	0.000
1354.00	1353.97	0.000	0.000
1444.00	1443.97	0.000	0.000
1464.00	1463.97	0.000	0.000
1554.00	1553.97	0.000	0.000
1653.00	1652.97	0.000	0.000
1750.00	1749.97	0.000	0.000
1845.00	1844.97	0.000	0.000
1933.00	1932.97	0.000	0.000
2028.00	2027.97	0.000	0.000
2124.00	2123.97	0.000	0.000
2220.00	2219.85	0.000	0.000
2313.00	2312.85	0.000	0.000
2409.00	2408.85	0.000	0.000
2504.00	2503.85	0.000	0.000
2599.00	2598.85	0.000	0.000
2694.00	2693.84	0.000	0.000
2789.00	2788.84	0.000	0.000
2883.00	2882.84	0.000	0.000
2978.00	2977.84	0.000	0.000
3073.00	3072.84	0.000	0.000
3168.00	3167.84	0.000	0.000

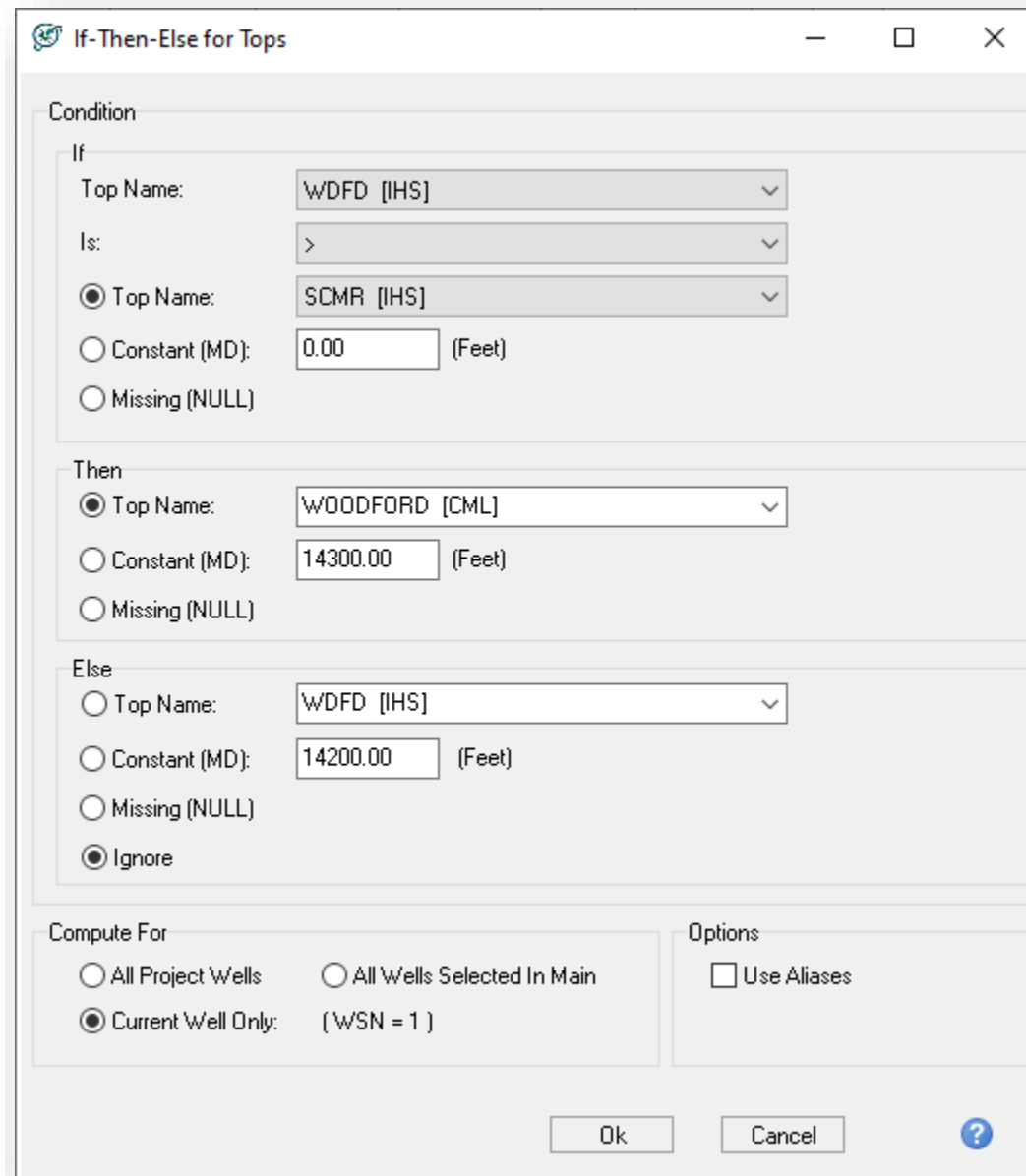
New Formation Top Computes

- **IF-THEN-ELSE:**

- > Performs a conditional data substitution on a selected formation top according to the entered criteria
 - If the selected top meets the set condition, **then** assign that top another top name, a constant value, or a null value.
 - If the selected top does not meet the set condition, then (**Else**) assign that top another top name, a constant value, a null value, or ignore the operation.

Benefits:

- *Possible reasons to use this tool might be to correct erroneously loaded tops*
- *Or to build a continuous unconformity surface across a basin*



If-Then-Else for Tops

Condition

If

Top Name: WDFD [IHS]

Is: >

☒ Top Name: SCMR [IHS]

☐ Constant (MD): 0.00 (Feet)

☐ Missing (NULL)

Then

☒ Top Name: WOODFORD [CML]

☐ Constant (MD): 14300.00 (Feet)

☐ Missing (NULL)

Else

☐ Top Name: WDFD [IHS]

☐ Constant (MD): 14200.00 (Feet)

☐ Missing (NULL)

☒ Ignore

Compute For

☐ All Project Wells

☐ All Wells Selected In Main

☒ Current Well Only: (WSN = 1)

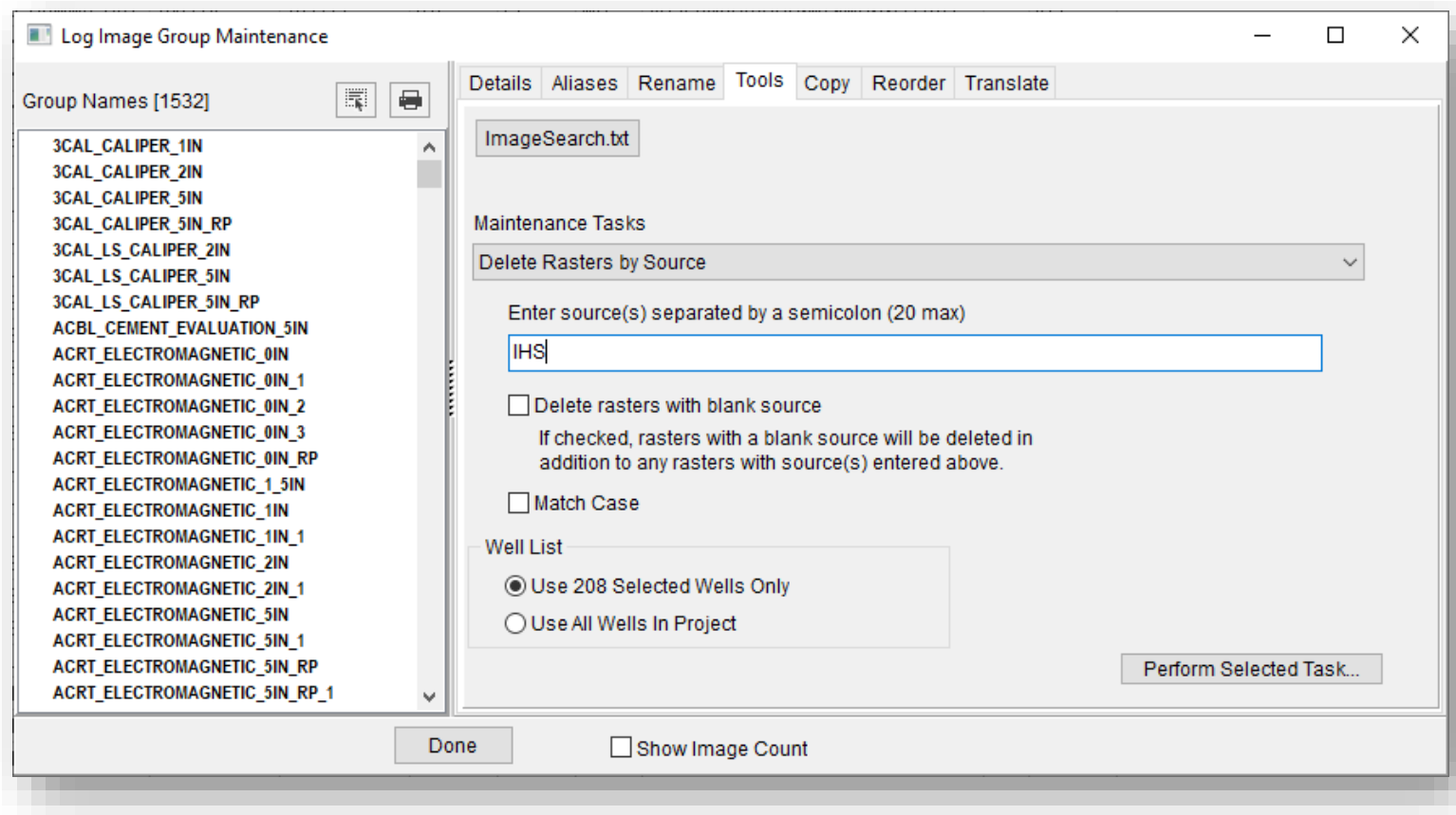
Options

☐ Use Aliases

Ok Cancel ?

Raster Log Maintenance Updates

- Delete raster logs by source
- Apply selected well list to maintenance tasks:
 - > Export summary report
 - > Resolve image paths
 - > Add missing well records to LIC
 - > Find/Replace LIC/TIF path prefixes
 - > Delete uncalibrated rasters
 - > Change blanks to underscores in LIC
 - > Resolve duplicate LIC references
 - > Delete association if LIC/TIF files not found
 - > Delete pay from LIC files
 - > Convert file references to UNC names
 - > Create report showing groups to merge
 - > Replace LIC/TIF paths
 - > Change LIC references
 - > Set image source for groups and wells
 - > Delete rasters by source



Benefits:

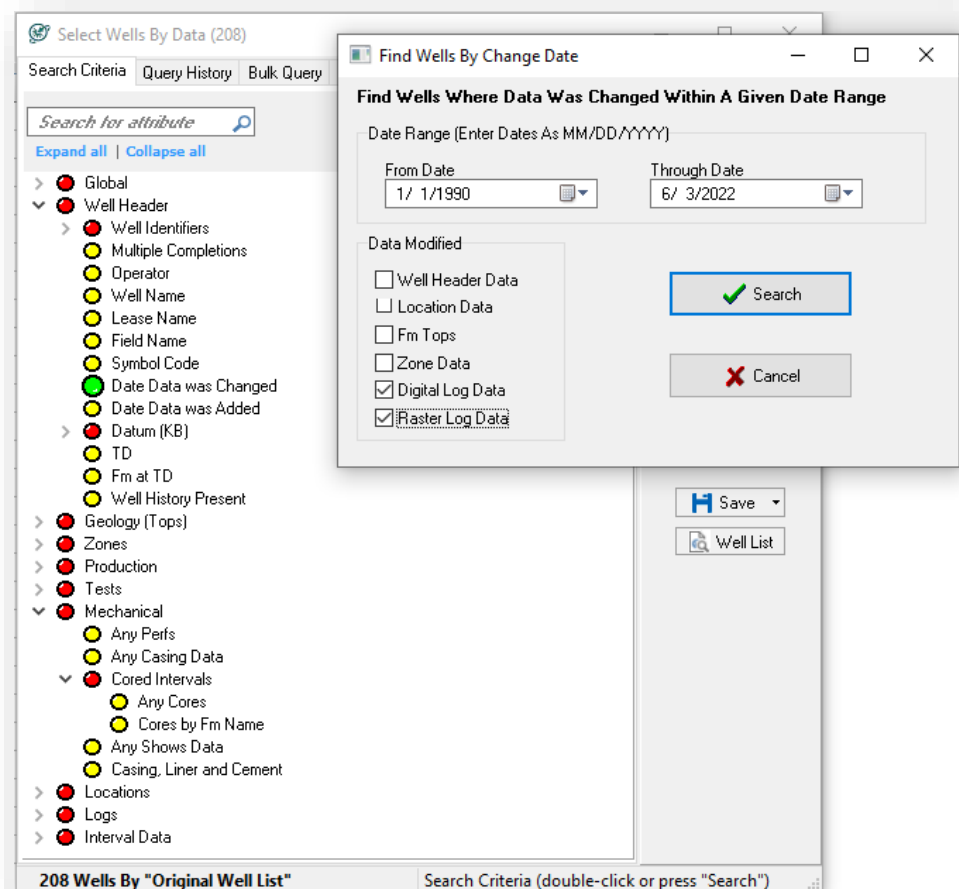
- Easier project maintenance and cleanup for raster logs

Main Functionality Improvements

- Zone order save/load template
- Queries:
 - > Raster and digital log import and modified dates
 - > Core by Formation Name
- Perf remarks added to header column
- Adjustable window boxes in ASCII importer

Benefits:

- *Small efficiency updates to speed up day to day workflows*



	Perf Type	Source	Fm Name	Top	Base	Interval	From Date	To Date	Comp Type	Remarks
+	Active			8124	8183	59	08/10/2000	mm/dd/yyyy		Perf shot 1
+	Active			9600	10444	844	08/10/2000	mm/dd/yyyy		Perf shot 2
+	Active			9600	9752	152	08/10/2000	mm/dd/yyyy		Perf shot 3
+	Active			9600	9686	86	08/10/2000	mm/dd/yyyy		Perf shot 4
+	Active			9702	9752	50	08/10/2000	mm/dd/yyyy		Perf shot 5
+	Active			9912	10444	532	08/10/2000	mm/dd/yyyy		Perf shot 6

Main Functionality Improvements

- Logs statistics quality flag
- Jump to map with zoom level options
- Well remarks added to Spreadsheet
- Multi-well selection from well list pane
 - > Delete wells from database
 - > Highlight color and clear
 - > Add to WSN
 - > Drop from Main

Benefits:

- *Small efficiency updates to speed up day to day workflows*

WSN	UWI (APINum)	Well Remarks
39	35049215900000	
40	35049215900001	Well Status: GAS-WD
41	35049215900002	Well Status: D&AWD
42	35049216460000	
43	35049216460001	Well Status: OIL-WD
44	35049216460002	Well Status: OIL-WD
45	35049216460003	Well Status: 2OILWD
46	35049216720000	
47	35049216900000	
48	35049216900001	Well Status: OIL-WD
49	35049217120000	
50	35049217120001	Well Status: GAS-WD
51	35049217470000	
52	35049218090000	
53	35049218090001	Well Status: 2GASWD
54	35049218720000	12.650 TD PER IHS [RVH] - THIS WAS A RE-ENTRY BY TXO
55	35049218720001	Well Status: GAS-WD
56	35049218720002	Well Status: OIL-WD
57	35049218760000	
58	35049218880000	
59	35049220100000	
60	35049221190000	
61	35049221370000	
62	35049222420000	
63	35049223260000	
64	35049223260001	Well Status: OIL-WD
65	35049223630000	

WSN	Unique Well ID	Well Label
606	35051210420000	FOWLER#1-9
607	35051210430000	PURSLEY#5

Delete Selected Wells

The 25 well(s) currently selected will be deleted from the project.
(Using Fast Delete Method)

Are You Sure?

Yes No

618	35051211310000	WOOTEN#1-29
619	35051211400000	WOOTEN TRUST#1-30
620	35051211420000	WOOTEN#1-32
621	35051211600000	S E BRADLEY A#M-12A
622	35051211650000	MAHAFFEY#1-25
623	35051211680000	MOZELL SNYDER#1-29
624	35051211710000	BARRINGTON#9-1
625	35051211750000	LAWSON E#1
626	35051211920000	OWENS#1-10
627	35051211990000	HUGHES#1-13
628	35051212100000	SHIR-LEA#1-8
629	35051212120000	HOLLY SUE#1-25
630	35051212160000	BURKES RANCH#23-1
631	35051212170000	RUSSELL#1
632	35051212350000	KAY#1-2
633	35051212370000	MIDDLE RYAN A#1
634	35051212470000	PALMER 6#1
635	35051212500000	SINCLAIR A#1
636	35051212520000	CUNNINGHAM#1-27
637	35051212670000	WINHAM#27-A
638	35051212700000	CUNNINGHAM SWD#23-A
639	35051212720000	GARRISON#1-10
640	35051212730000	BERTHA FRICK#3-23
641	35051212820000	CLEARY#1A
642	35051212870000	MAURER-MCCASLAND#1-
643	35051212900000	RHODES#2
644	35051213000000	SWENSON#1
645	35051213110000	B A CURVIN#1-14
646	35051213270000	SPENCER A#1
647	35051214100000	HOLLAND#1

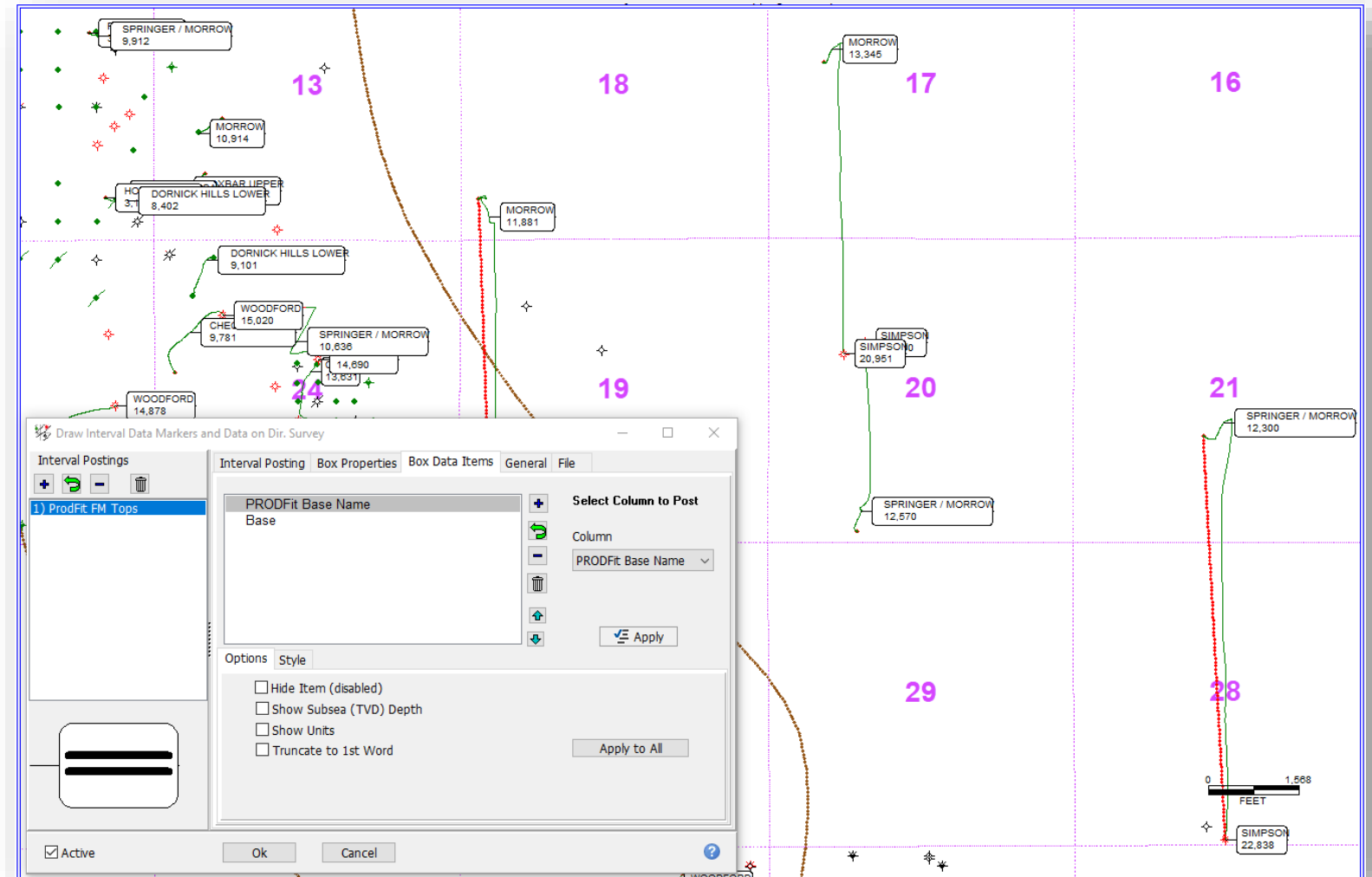
Map Module Enhancements and New Features

Deviated Borehole Data Posting

- Post data along worm-track
 - > Interval data Z value and text items
 - > Perf labels:
 - Top and Base Depths
 - Remarks
 - > Zone attribute items

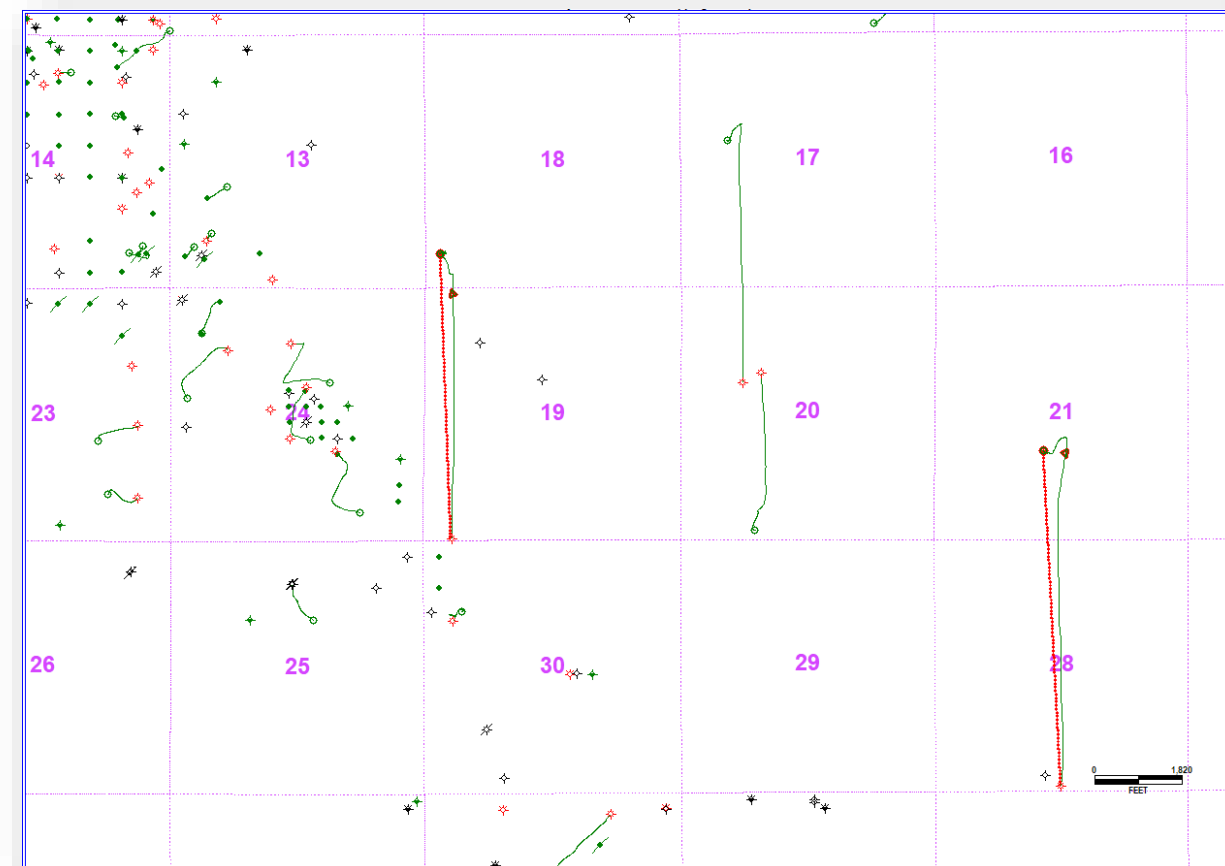
Benefits:

- *More options for posting and visualizing well and production data along a deviated borehole*



Map Module Enhancements

- Plot multiple deviation surveys on Map
- Select overlay polygons with digitized polygon
- Expanded zoom options:
 - > Jump to Map (from Main) updated
 - > Zoom on center point
- Smooth/simplify multiple overlay lines
- Bubble Map Updates
 - > New Legend tab added
 - > Legends applicable for normal and pie bubble mode in one-color
- Grid Volumetrics option to compute for zoomed in map area



Benefits:

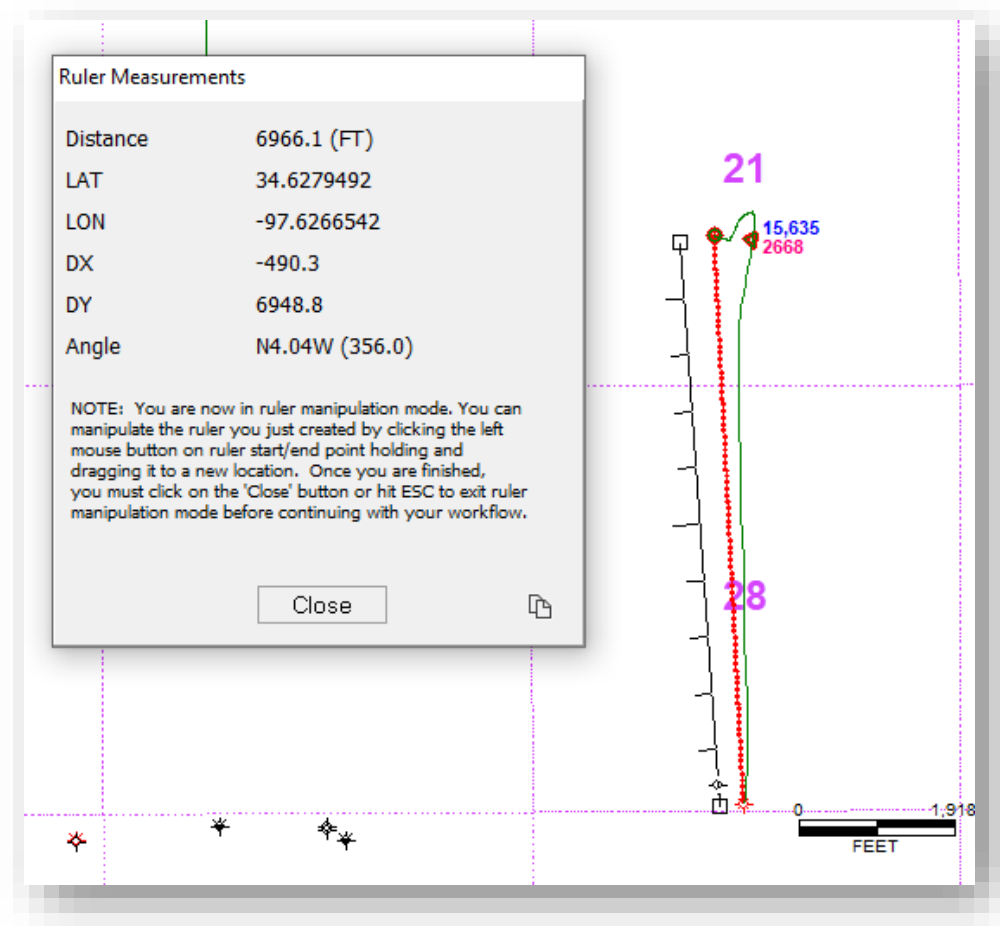
- *Option to see planned/proposed and drilled surveys posted per well*

Map Module Enhancements

- Data Posting:
 - > Landing location spot posting added
 - > Turn off Wells in Quick List without turning off Data Posting
- WSN/DWL Quick List:
 - > List sorting
 - > Expanded number of file adds to QL
- Ruler and Polygon:
 - > Moveable vertices with updated measurements
 - > Measurement dialog able to be copied to clipboard

Benefits:

- *Updated data posting to accommodate landing location*
- *Dynamic measurement updates*



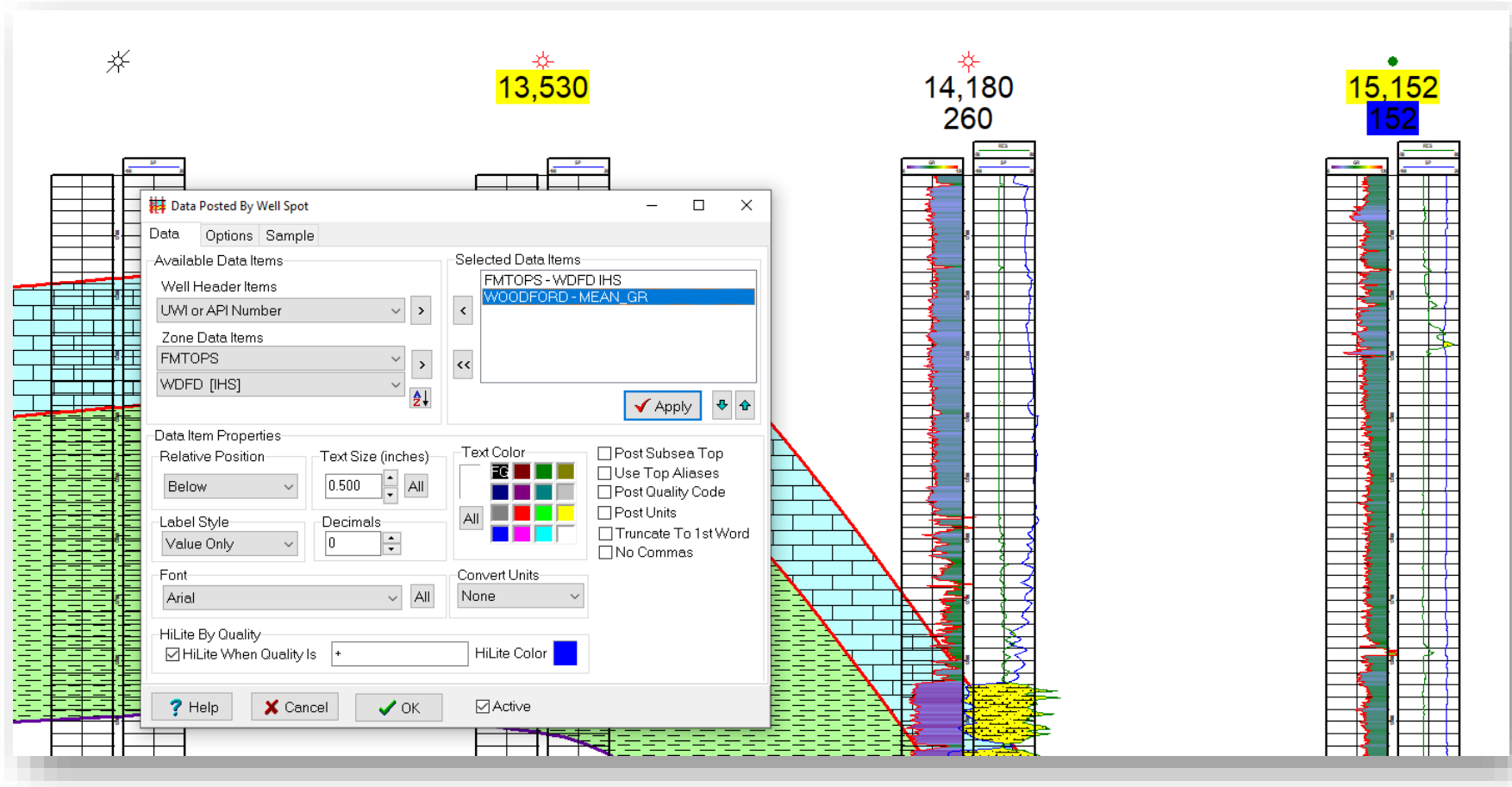
Cross-Section Enhancements and New Features

Cross-Section Enhancements

- Hide top from Single Well
- Highlight by Quality added to Data Posted by Well Spot

Benefits:

- Visually identify key wells while in Cross Section



Petra 2023 Road Map

Petra 2023 and **Beyond** Roadmap Overview

- **Petra/Kingdom Project Data Sync Tool**

- Well data
- Production
- Zones
- Digital Logs
- Grids

- **Main**

- Direct Connect migration to Bulk Logs database (same as Kingdom and Well Log Downloader)
- Direct Connect migration to North American ADM content database
- Updates to latest Blue Marble version
- Work-flow builder and automation tool
- Import file format updates
- Export updates
- Added parameters to Deviation Survey computes

- Remarks section for Project Tab
- Client feedback enhancement requests

- **Map**

- Continued overlay updates
- Borehole sticks/Worm tracks colored by attribute selection
- Multiple Map Modules
- Client feedback enhancement requests

- **Cross-Section & Directional Well Module**

- Data posting location options (SHL/BHL)
- Gun-barrel/Wine-Rack diagrams
- Multiple Cross-Sections
- Client feedback enhancement requests

*Completed feature

Tentative list as of June 2022

IHS Markit Log Data Connections

- Direct Connect to the Bulk Log Download Database
- Accesses same log database as Kingdom and Well Log Downloader

Well Log Downloader (1.2.7.0) - (new job)

File View Help

Please specify your search filters below:

Attribute: UWI
Operator: Contains
Value:
Add

Province/State:

Select download options:

Region/Country: ☒ United States ☐ Canada ☐ North America

Type: ☒ Digital ☒ Digital Raw Curve ☒ Raster

Options: ☒ Data and Catalog ☐ Catalog only ☐ Data only

☐ Limit new/updated data to:

Catalog Units: ☒ Imperial ☐ Metric

Destination: C:\Users\carley\Documents\WellLogDownloader

Directory Options:

☒ Country/State/County/Name
☐ Country/State/County/Code
☐ Country/State/County/Code/County/Name
☐ Country/State/County/Code/County/Name/County/Code
☐ None

Display	Type	UWI	Mnemonic	Depth	Correction Method	Log Top Depth	Log Base Depth	Kb Elevation	Ground Elevation	Service Class
Get Log	Raster	35007248250000	HRI	MD	1672 (ft)	6370 (ft)	2404.0 (ft)	2392.0 (ft)		ARRAY INDUCTION
Get Log	Raster	35007248250000	MEL	MD	5250 (ft)	6230 (ft)	2404.0 (ft)	2392.0 (ft)		MICRO RESISTIVITY
Get Log	Raster	35007248260000	CALI, CNT, GR, LDT	MD	5000 (ft)	8597 (ft)	2870.0 (ft)	2857.0 (ft)		CALIPER, DENSITY, GAMMA RAY, NEUTRON
Get Log	Raster	35075219530000	CNT, GR, LDT, MTL	MD	4300 (ft)	12888 (ft)	1557.0 (ft)	1537.0 (ft)		DENSITY, GAMMA RAY, MICRO RESISTIVITY, NEUTRON
Get Log	Raster	35077213020000	CALI, CN, GR, ZDL	MD	6400 (ft)	11200 (ft)	597.0 (ft)	580.0 (ft)		CALIPER, DENSITY, GAMMA RAY, NEUTRON
Get Log	Raster	35011230020000	CALI, GR, HDIL	MD	9495 (ft)	10365 (ft)	1842.0 (ft)	1826.0 (ft)		ARRAY INDUCTION, CALIPER, GAMMA RAY
Get Log	Raster	35017236740000	GR, ML, XYCAL	MD	6200 (ft)	10194 (ft)	1309.0 (ft)	1294.0 (ft)		CALIPER, GAMMA RAY, MICRO RESISTIVITY
Get Log	Raster	35017236740000	3CAL, GR, HDIL, SPL	MD	546 (ft)	10189 (ft)	1309.0 (ft)	1294.0 (ft)		ARRAY INDUCTION, CALIPER, GAMMA RAY, SPONTANEOUS POTENTIAL
Get Log	Raster	35079212870000	CBL, CCL, GR	MD	0 (ft)	1766 (ft)				CEMENT EVALUATION, COLLAR LOCATOR, GAMMA RAY
Get Log	Raster	35079212880000	CCL, CMT, GR	MD	15 (ft)	5200 (ft)	626.0 (ft)	613.0 (ft)		CEMENT EVALUATION, COLLAR LOCATOR, GAMMA RAY
Get Log	Raster	35079214340000	CBT, CMT, GR	MD	7 (ft)	689 (ft)		529.0 (ft)		CEMENT EVALUATION, GAMMA RAY
Get Log	Raster	35019247800000	CBL	MD	20 (ft)	2978 (ft)				CEMENT EVALUATION
Get Log	Raster	35019247870000	DIL, GR, SP	MD	152 (ft)	5380 (ft)				GAMMA RAY, INDUCTION, SPONTANEOUS POTENTIAL
Get Log	Raster	35033210770000	CBL, CCL, GR	MD	7 (ft)	2610 (ft)	1077.0 (ft)	1071.0 (ft)		CEMENT EVALUATION, COLLAR LOCATOR, GAMMA RAY
Get Log	Raster	35035214320000	GR, RES	MD	101 (ft)	872 (ft)		946.0 (ft)		ELECTRIC LOG, GAMMA RAY
Get Log	Raster	35081237070000	CBL, CCL, GR	MD	3176 (ft)	5518 (ft)	1016.0 (ft)	1008.0 (ft)		CEMENT EVALUATION, COLLAR LOCATOR, GAMMA RAY
Get Log	Raster	35081237070000	HRI	MD	478 (ft)	5631 (ft)	1016.0 (ft)	1008.0 (ft)		ARRAY INDUCTION
Get Log	Raster	35099219690000	DSI	MD	11300 (ft)	13138 (ft)	1737.0 (ft)	1714.0 (ft)		DIPLOLE
Get Log	Raster	35099219700000	CAL, CNL, CPD, GR	MD	4945 (ft)	12778 (ft)	1711.0 (ft)	1685.0 (ft)		CALIPER, DENSITY, GAMMA RAY, NEUTRON
Get Log	Raster	35085210260000	AIL, EL, SFE	MD	724 (ft)	9301 (ft)				ARRAY INDUCTION, ELECTRIC LOG, LATEROLOG
Get Log	Raster	35091212770000	CAL, CNL, CPD, GR	MD	625 (ft)	2378 (ft)	667.0 (ft)	657.0 (ft)		CALIPER, DENSITY, GAMMA RAY, NEUTRON
Get Log	Raster	35099242160000	AIL, SFE	MD	770 (ft)	7482 (ft)	1419.0 (ft)	1405.0 (ft)		ARRAY INDUCTION, LATEROLOG
Get Log	Raster	35099242620000	CBT, CCL, GR, USIT	MD	2350 (ft)	8645 (ft)	1625.0 (ft)	1608.0 (ft)		CEMENT EVALUATION, COLLAR LOCATOR, DIPOLE, GAMMA RAY
Get Log	Raster	35103236980000	CBL	MD	2725 (ft)	4698 (ft)	1096.0 (ft)	1089.0 (ft)		CEMENT EVALUATION

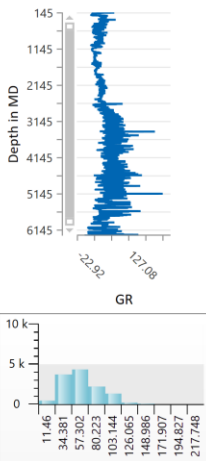
Import IHS Markit Well Logs

Search: Active Boreholes ☒ Digital Logs ☒ Raster Logs Filters ☐ Curve name ☐ Curve type ☐ Depth ☒ Include Raw Digital Logs

Drag a column header and drop it here to group by that column

	UWI	Well Name	Curve	Type	Calibrated	Raw	Sample Rate/S
R	05033060080000	HUSKY-B-UNIT	CALI,GR,SLT	ACOUSTIC,BOREHOLE,LITHOLOGY	Yes	N/A	
R	05033060080000	HUSKY-B-UNIT	GR,SLT	ACOUSTIC,LITHOLOGY	Yes	N/A	
D	05033060080000	HUSKY-B-UNIT	SP	LITHOLOGY		Digital	
D	05033060080000	HUSKY-B-UNIT	SN	RESISTIVITY		Digital	
D	05033060080000	HUSKY-B-UNIT	RHOB	POROSITY		Digital	
D	05033060080000	HUSKY-B-UNIT	ILD	RESISTIVITY		Digital	
D	05033060080000	HUSKY-B-UNIT	GR	LITHOLOGY		Digital	
D	05033060080000	HUSKY-B-UNIT	DT	ACOUSTIC		Digital	
D	05033060080000	HUSKY-B-UNIT	DRHO	POROSITY		Digital	
D	05033060080000	HUSKY-B-UNIT	DPHI	POROSITY		Digital	
D	05033060080000	HUSKY-B-UNIT	CILD	RESISTIVITY		Digital	
D	05033060080000	HUSKY-B-UNIT	CALI	BOREHOLE		Digital	
R	05033060490000	SQUAW CANYON	CL,DIL	COMPLETION,RESISTIVITY	Yes	N/A	
R	05033060490000	SQUAW CANYON	LITH	LITHOLOGY	Yes	N/A	
R	05033060490000	SQUAW CANYON	CNT,FDT,GR	LITHOLOGY,POROSITY	Yes	N/A	
R	05033060490000	SQUAW CANYON	FACD	GEOLOGY	Yes	N/A	

1 of 1851 selected Digital Log Options Add new curves and skip existing curves Prefix Suffix Log Unit Conversion Options



Benefits: Log data consistency between multiple IHS Markit geoscience software products

Directional Well Module: Wine-rack/Gun-Barrel Diagram View

- **Wine-rack/Gun-Barrel view:**
 - Aids in well-spacing analysis and pad planning and design
 - Advanced analysis to visualize the midpoints of a wellbore in relation to other wellbores and formations
 - Cross-section perpendicular to the lateral length
- **Well data inputs:**
 - Deviation surveys
 - Grids and Fm tops
 - Zone data, production data

Directional Well Module: Wine-rack/Gun-Barrel Diagram View

- Plan > “Wine-rack Profile”
- Select wells >
 - Well by well
 - Line and corridor
- Give option to select depth reference point by:
 - Toe
 - Heel (based off calculations like dev surv extract)

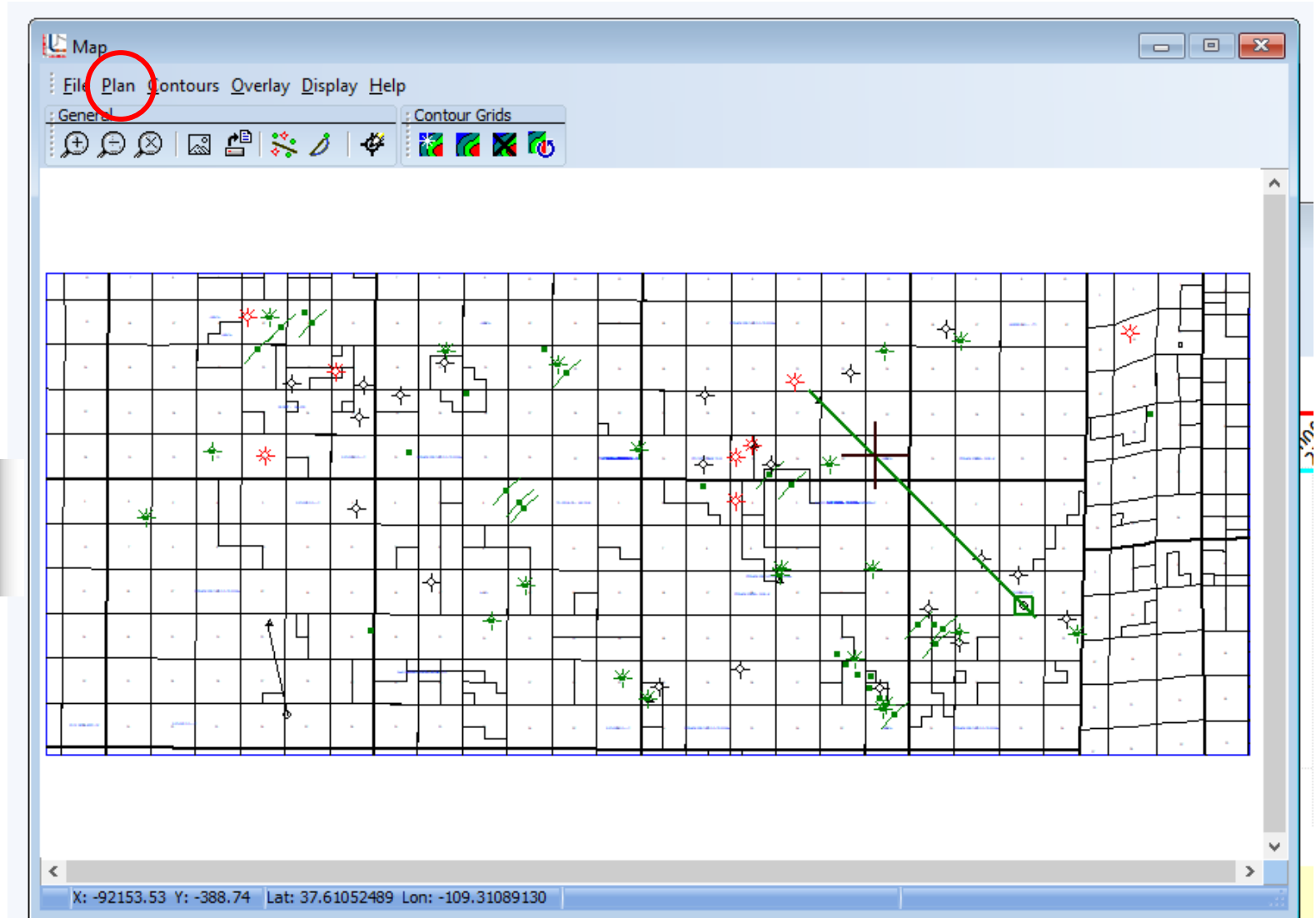
Starting Depth

Start At: ☒ MD ☐ Zone

☐ Inclination >= Zone Item

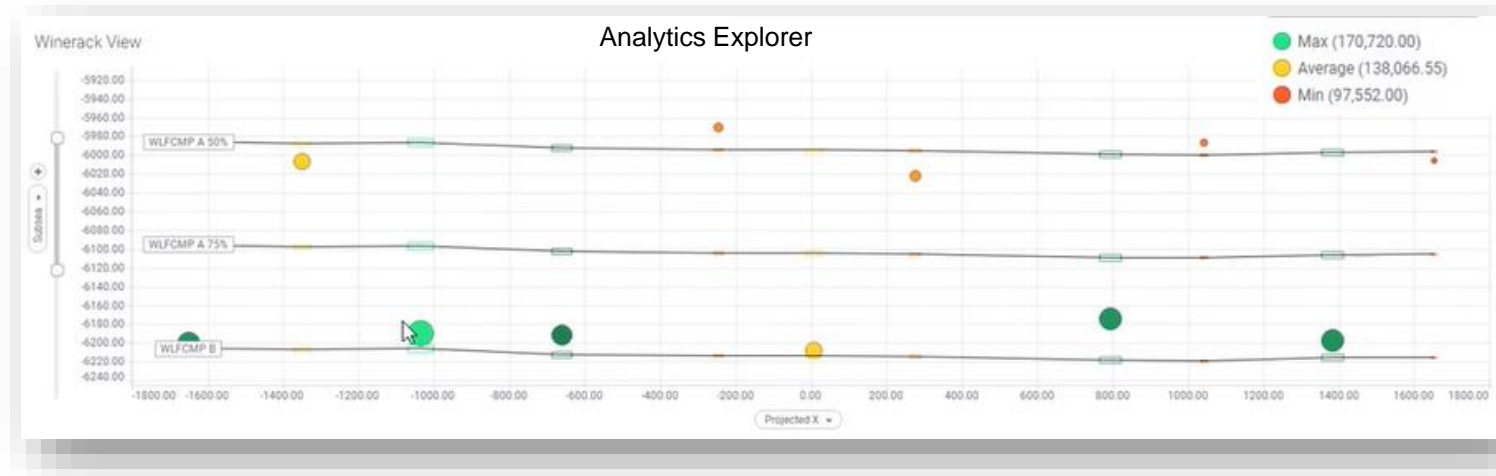
☐ Formation Top

- Midpoint
- Go to Profile View



Directional Well Module: Wine-rack/Gun-Barrel Diagram View

- Gun-barrel (hole sizing) with option to “Size by”
 - Default (standard size on the screen)
 - Based on zone attribute
 - Defined radius (similar to Bubble map)
- Go to DWM Profile View
 - Y axis: depth
 - X axis: distance
- Additional option to plot Fm tops or grids



Z Data Radius Options Sample File Wells Color Scale

Select Z Data Used For Bubbles

PRODUCTION Stats... Auto Stats

O_404ISMY Z Data...

☐ Use Aliases ☐ Disabled

Value Range

Min 0 Max 2200000 Defaults...

☐ Ignore Data Outside Range ☒ One Color Mode

Interval 100000

Apply Following Transform To Data

None Apply To All

Z Data Radius Options Sample File Wells Color Scale

Bubble Scaling

☐ Constant Radius 0.12 Inches

☒ Vary Radius as Units/Inch 2200000

☐ Scale Maximum Z Value to XY Map Units

☐ Scale to XY Map Units XY Map Units

☐ Values are XY Units (Apply Map Scale)

☐ Limit Radius To ☒ Inches ☐ XY Units

Minimum 0 Maximum 2

Questions? Feedback?

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S&P Global Commodities Insight

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