HDS2000

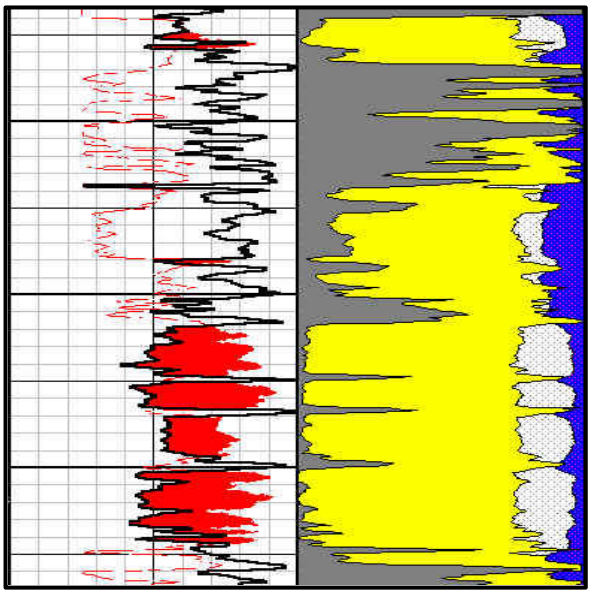
"probably the best log analysis program in the world"

The **HDS LOG ANALYSIS PROGRAM** was first conceived, developed and copyrighted in the mid 1980's by **HYDROCARBON DATA SYSTEMS, INC.** of Houston, Texas. It started life as a basic interpretation application, which was designed to make the processing of multiple calculations easier for a well-site geologist. Over a very short period the program grew with the addition of more functionality and in 1985 a decision was made to release it as a commercial product. This first version, now called **HDS**, ran on an MS-DOS platform and soon developed into a very powerful and versatile tool with a considerable user base. In the early 90's it became obvious that HDS had to move into a Windows environment in order to meet the power requirements of the users and to keep abreast of ever changing technology. The move to Windows proved to be a changing point for the company, as the Windows version of HDS attracted a greater number of users, including petrophysicists, educational establishments, governments and other sectors of the oil and gas industry. This continuing evolution of the HDS system has now resulted in their latest release, a very powerful and versatile interactive 32 Bit MS Windows application. The HDS user base has now increased to over 350 installations worldwide and the company has a comprehensive pro-active (and reactive) development program in place.

Hydrocarbon Data Systems employs a small but dedicated team of specialists to further develop, enhance and support the HDS software. The team includes: programmers, geologists and a petrophysicist whose combined efforts continue to produce the most reliable and robust piece of log analysis software on the market today.

The original concept behind the HDS software was to make an easy-to-use but effective tool for geologists and engineers. Hydrocarbon Data Systems understood the needs of these individuals and as a result incorporated some very basic principals in their software design. These principals, which are still in effect today, are as follows:

- the ease in which log data is input into the program
- versatile data editing routines
- the flexibility and complexity of the calculations
- the variety of printout options to aid in the analysis and
- easy integration of HDS data with other software packages



The HDS program addresses most of the major requirements of a petrophysical package, which are as follows:

- File Management Utilities
- Single and Multi-Well Analysis
- Multiple Data Input Routines
- Versatile Data Editing Routines
- Flexible Cross Plot Routines
- Complete Calculation Suite
- Payzone Summaries
- Comprehensive Log Plots
- ASCII Data Output Files
- Imperial or Metric Log Units
- Complete Help Files

In addition to the above HDS also has numerous other in-built functions and tools (which in some cases are quite unique to HDS) and which are described in brief on the following pages. Further information can also be supplied by Hydrocarbon Data Systems or their agents.

PROGRAM FLOW

The HDS program has been developed in a Windows environment and utilizes all the functionality of Windows to make the software easy to use and understand plus ensure that new users have the shortest possible learning curve. The screens are designed to be uncluttered and clear and the user is given the option to carry out either in-depth or simple quick look analysis through a point and click menu system.

HDS functions are controlled and operated via Windows 32-bit drop-down menus or interactive icons, through the use of a mouse or cursor. The Main Menu controls the branching of the program and gives the user full access to all major program functions. Data is input into HDS through either digitized input, an ASCII file, a DLIS file or an LIS file and can be input as TVD (True Vertical Depth) or measured depth.

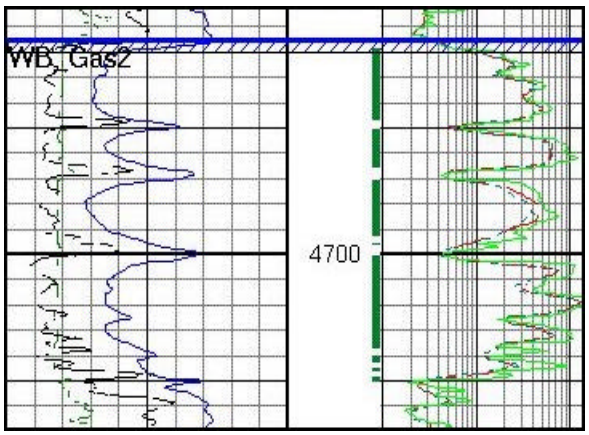
WELL INFORMATION

Well Description: This option lists identification data of the well being investigated. The fields in the Well Description are Path & File Name, Operator, Well & Field Name, Location, Legal Description, County, State, A.P.I Number, Wireline Company and the Processing Units of the file.

Borehole Environment: The primary function of this option is to control the depths and the logging parameters for the log calculations. This section will store five log runs of data. Most environmental corrections will require input of the parameters from the log header.

Directional Surveys: The program can accept up to 1000 directional surveys from a source such as a multishot. The inputs include measured Depth, Inclination Angle and Drift Angle/Azimuth. TVD and Total Rectangular Coordinates are computed instantly. Five computation methods are available including "Radius of Curvature". You may also initialize several thousand feet down the hole by setting the rectangular coordinates at a given depth. This function allows for an accurate Pay Count total using TVD rather than measured depth units.

Formation Tops: This option will set user defined zones of interest under designated formation names. The formations can be used in various printouts and summary files and all multi-well options. The information is set graphically or spreadsheet. When the Paycount Summary Option is accessed in combination with Formation Tops, values such as Sw and Average Porosity are saved to disk in a format accessed by most commercially available database programs for mapping and reserve estimates.



Other Information: Includes Perforation; Data Drill Stem Test (DST); Repeat Formation Test (RFT); Sidewall Cores. All information is set from the visual (graphical) or spreadsheet mode.

LOG DATA Input/Edit

Data Editing: There is a number of editing tools supplied with the software that are accessible in spreadsheet or graphical (visual) formats. The **Data Editor Menu** accesses the following data manipulation routines:

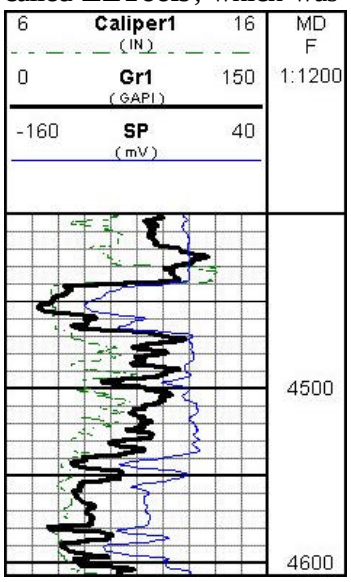
Interactive Depth ShiftBaseline Shift		Units Conversion	Curve
SmoothingDespike	Graphical Patching	Normalize Data	Rescale
CurvesMath Toolkit	Splice		

The data is saved as a new version of the curve. The original data or the edit data can be referenced, processed or reviewed in most any option. A note is created and posted to the Process History table. The note will include the procedure and the curve name of any new data.

The **Depth Shifting** option will move the log data on a linear shift or stretch/squeeze mode. The log curves and the zones to be shifted are user defined or you can use the auto-correlation mode where the program performs a coefficient of the correlation.

Statistics: A statistical review of the log data can be viewed and/or printed in both text and Histogram formats. The data can be normalized using a multi-well model.

DLIS & LIS Input/Output: This function is performed using a third party piece of software called **EZTools**, which was developed and is licensed by Oilware, Inc. in conjunction with HDS. **EZLIS and EZDLIS** feature direct conversion to HDS Data Format and supports DLIS/LIS tape or disk files. The software will read 800 and 1600 bpi data and most 9 track tape drives and converts directly to the HDS format or an ASCII data format. A Catamount, Overland, AKS or IDT controller card is required.



EZLIS is licensed and sold separately to the HDS software, and may require a service call for installation.

ASCII File Reader: This program will read most ASCII data formats including hundreds of interpretations of the LAS format. It is the quickest method of creating an HDS data file. You can view the entire ASCII file before the conversion process commences and the types of data and the zones of interest for the HDS file can be user defined. When the HDS file is created the ASCII source file will remain in its original data structure.

Digitize Log Input: The Log Digitizing module supports most commercially available tablets. The data input is in a point mode or in a stream mode for extremely fast input of log data. The log data can be entered in intervals varying from 0.1 - 10 in units of feet or meters. When entering data via digitizing tablet, a 200-foot section of log on a 5-inch scale with 7 data curves can be digitized in 5 to 15 minutes depending on your individual speed.

The information that is input with the digitizing tablet is sorted numerically and meshed with the other log data on file. If you digitize over an existing curve or point, the program will automatically save the latest information. All data entered from the digitizing mode can be edited.

All track origins and scales are user defined in the setup. This eliminates errors in stretched or reproduced logs. Both linear and logarithmic scales are available before digitizing.

The input data is all depth related and the program accepts the curve information in any from any wirieline data tool. This includes but is not limited to:

- Gamma Ray
- Spectral Gamma Ray
- EPT – Propagation
- Caliper (Holesize Data)
- Bulk Density Corr.
- Conductivity
- User Defined Data
- Neutron Porosity
- Density Porosity
- Spontaneous Potential
- Production Log Data
- Tension
- Photo Electric (Pe)
- NML
- Delta t (Dt)
- Sonic Porosity
- Bulk Density
- Resistivity Data
- Pulse Neutron (TDT)
- Micro Logs

Core Data Input: This option will read most ASCII core data files or the data can be input via keyboard. All editing functions offered in the Log Data Editor are available with this option. Core data can be used in calculations and cross plots and it is available for graphical output. The following is a list of acceptable data:

- Length
- Gamma Ray
- Probable Production
- Oil % (Pore Volume)
- Water % (Pore Volume)
- K Permeability - Max & Min
- Core Description
- Production Code
- Description
- Grain Density
- Core Porosity

Environmental Corrections are available for most logging company charts. The visual interface displays the input curve, the output curve and the correction factor. The corrections are available for:

- Gamma Ray
- Neutron - Cased Hole
- Induction Standoff
- Density
- Invasion
- Rxo Mudcake
- Neutron - Open Hole
- Resistivity

LOG CALCULATIONS

All processing can be accomplished in visual (graphical) or spreadsheet mode. The following is a list of the major calculations and options performed through user defined specifications.

Shale / Clay Volume

- Gamma Ray Index - Linear
- Gamma Ray - Non Linear 10 models
- Spectral GR
- Spontaneous Potential
- Neutron-Sonic
- Multi-Clay Method
- Neutron
- Density-Neutron (Matrix or Ratio)
- Sonic Dispersed Shale Model

Neutron Log Options

- Neutron – 15 Charts
- User Defined Matrix
- Effective Porosity Corrections

Density Log Options

- RhoB via Density Porosity
- Porosity via RhoB
- Effective Porosity
- User Defined Matrix
- Variable Pore Fluid Density

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- RhoB via Density Porosity
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Neutron – Density Options

· Straight Average · Sum of Squares · Weighted Average · Gas Corrected

Sonic Log Options

· Raymer/Hunt or Wyllie · Hydrocarbon Corr. · Shale - Dispersed or Laminated
· Variable Matrix and Fluid. · Compaction Corr.

Cross Plot Porosity – Multiple Matrix Solutions for

· Neutron – Density · Neutron - Sonic · Density – Sonic

Water Resistivity

· Rw corrected for temperature · Rw via Salinity · Resistivity of Free Water (Rwf)
· Rw via SP method · Rw via Rwa method · Resistivity of Bound Water (Rwb)
· Rw via Pickett Plot · Rw via Hingle Plot · Resistivity of Mixed Water (Rwm)

Resistivity

· Rt (Induction Log or Laterolog) · Flushed Zone Resistivity · Laterolog - Seq. or Sim.
· Exponential Sxo

Water Saturation Models

· Archie · Fertl Method · Dual Water Analysis (2 Methods)
· Simandoux (3 Methods) · Indonesian · Waxman-Smits (3 Methods)
· Shell Equation · Pulsed Neutron · User Defined Formation Factor

Permeability

· Coates & Dumanoir · Wyllie & Rose · User Defined

Lithology Determination

· Cross Plot Porosity · Sand/Shale Environment · Rho Matrix Apparent
· Neutron-Sonic · P.E. – 3-4 Mineral Model · M - N Plot
· Dt Matrix Apparent

VB Scripting – User-Defined Equations

· Full Screen Editor · If-Then-Else Logic · Run Simultaneous Equation s

True Vertical Depth

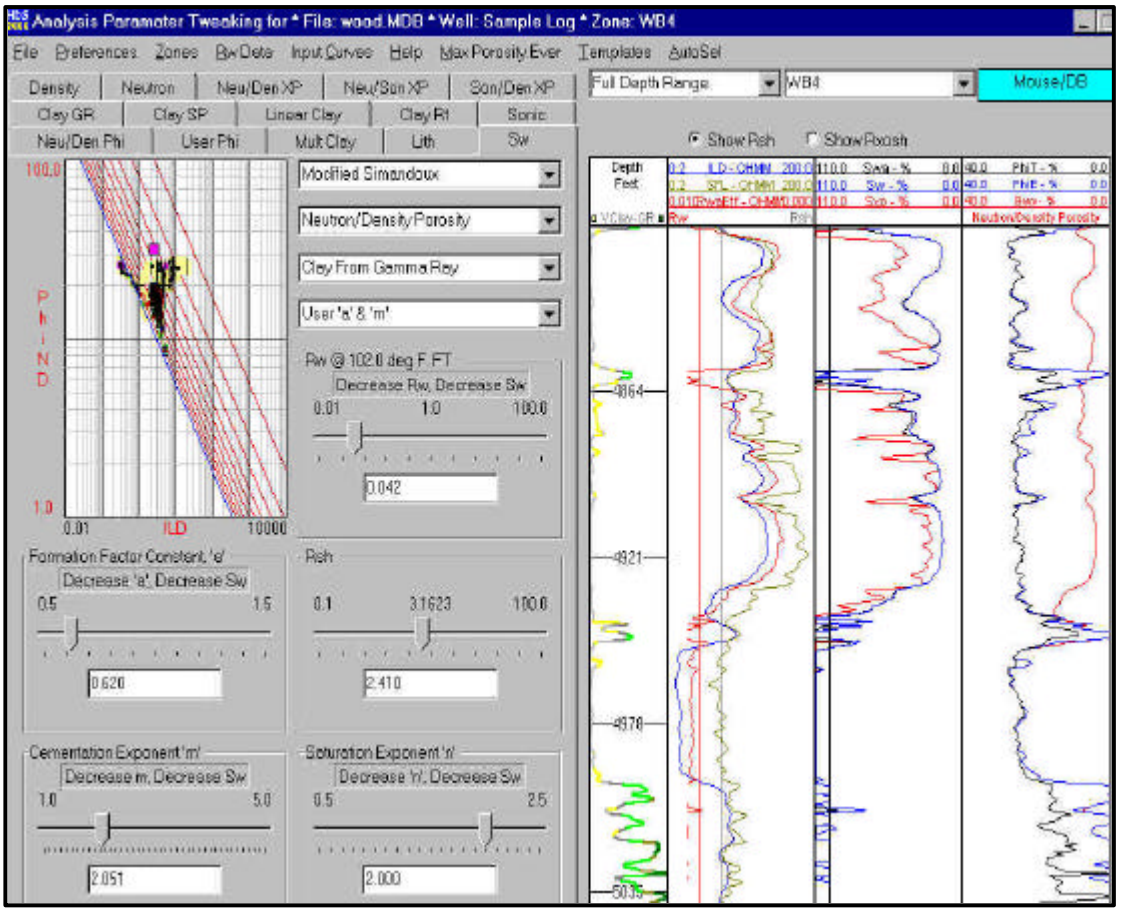
· Radius of Curvature Method· Input All Surveys or Initialize the Rectangular Coordinates for first depth

Miscellaneous Equations

· Bulk Volume Water (BVW) · Movable Oil Saturation (MOS) · Movable Hydrocarbon Index (Sw/Sxo)
· Water Saturation Ratio (Swr) · Residual Oil Saturation (ROS) · Badhole Logic
· Irreducible Water Saturation (Swi) · Hydrocarbon Pore Volume (HPV) · Coal Logic

As many as twenty (20) calculation templates can be built and saved to meet your general needs as new files are created. The option, Master Default File, will save a set of calculation options and parameters in a calculation template. This is particularly useful when working with several wells in a particular field or trend. Any formula or parameter set from a calculation template can be overwritten in the Calculation Options.

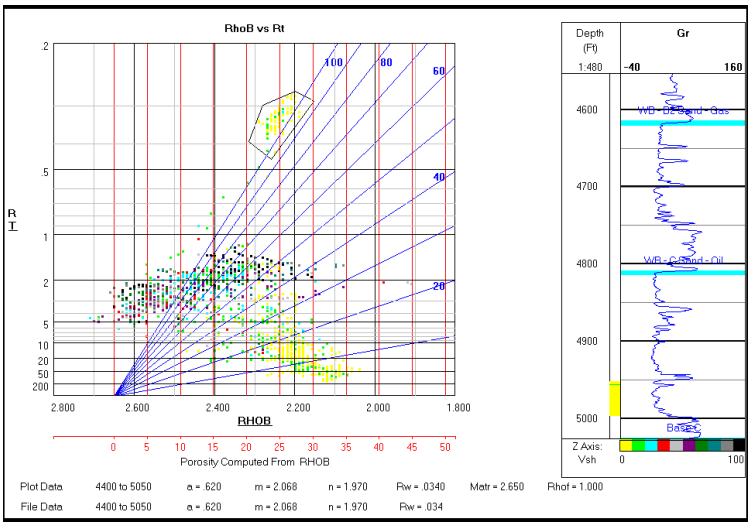
Tweak (Interactive Parameter Setup): is a new routine for interactively setting most of the petrophysical parameters for a given zone. The results of any parameter change are instantly shown on the screen. The menus for each parameter group includes a cross plot (representing standard chart books), input boxes and choice lists, numeric slider controls, and log plots with the input and processed curves. The parameters can be set with the numeric sliders, entering a value in the input boxes, clicking on the log plots, clicking on the cross plots, and in some cases clicking on a histogram.



In addition to the user selections, an automatic parameter selection (AutoSel) can be called. This option will determine parameters for a reservoir based on geo-statistics. The analytical menus include multiple shale/clay options, all single porosity setup, the full range of cross plot porosity options, multiple water saturation models with associated parameters and lithology determination. The water saturation menu gives the user the choice of toggling through all of the possible porosities, single and multiple shales, formation factors, and saturation equations with immediate review.

The program will perform the analysis on a zone by zone basis which is defined by the user. All parameters set in the module are moved forward to other sections of the software for end product processing. There are petrophysical tips interlaced through the program to assist the analyst.

CROSS PLOT options include Hingle Cross Plots, Pickett Cross-Plots, M-N Cross Plots, Porosity Lithology Cross-Plots and User Defined Cross-Plots. In total there are 23 preset cross plots plus an unlimited number of user defined plots. The cross plots feature a user defined curve fitting and data identification of depth in reference to a log curve. Multi-well cross plots and log plot options are now available as new feature in this section.



The User Defined Cross Plots can access any three curves for X, Y and Z-axis. All scales are user selectable. The graphs can be log/log, log/linear or linear/linear. This option has curve fit math routines. On screen editing is offered on all cross plots.

MULTI-WELL OPTIONS

The multi-well options will work with a group of well files from a user-defined project. The routines are:

· **Calculations** · **Pay Summaries** · **Log Plots** · **Crossplots** · **Cross Sections**

Once a well list is built, the data can be run through any number of routines and generate your desired output. The pay summary output can include multiple well files over set formations all written to one file (ASCII or Excel). This file can easily be moved to any mapping or reserves package. The cross section plot includes (x) number of wells that can be tied structurally or stratigraphically. The crossplot options include a curve normalizing routine.

PRINTOUT OPTIONS

The Printout options consist of Tabular Form, Payzone Averaging, Formation Averaging, and Log Plots. All printouts can be viewed on the screen, printed on the selected printer or saved as a disk file (ASCII/BMP). The proceeding pages include some of the output options included in this package.

Log Plot options produce a user-defined image of input data, process data (calculated) and/or core data. All curves, tracks and scales are set by the user or a user defined template. The complete Windows palette of colors and patterns is available. The output of the plot can be printed on most printers and plotters.

Other primary features are: up to 8 tracks plus the depth track on any plot; unlimited curves (input/calculated/core) per track; all curves are user defined; 8 selections for width of the track; user-defined vertical scale options; line type selection (7 styles); perforation markers; pay zone markers; formation labels; annotation of text; DST's; RFT's; core markers; log foot notes; print as measured depth, SubSea or TVD; on screen editing; all plots saved as templates for future use with other well log files.

Tabular Form will print all log data and all calculated data. There are user-defined settings for all output curves and the depth ranges. A summary of all calculation options is available with all text printouts.

Payzone Summaries will apply user-defined cutoffs from any calculation or input data. One or any combination of cutoffs can be used in this option. The printout will display the total hydrocarbon feet and the average values from the data that meets the designated criteria. This printout will access the whole file or user defined formations. If formations are used each formation is summarized and printed separately.

HDS -- Pay Summary Report

OPERATOR: HDS O&G
WELL NAME: Sample Log — Date: 09-27-2001
COUNTY: Liberty — Time: 12:23
STATE: Texas — A.P.I. NUMBER: 12345-5678

Total Feet	Vsh	Porosity	Sw	Bvw	Bvh
WB - 1 Sand - Gas (4437.0 – 4480.0)					
23.5000	11.485	24.500	28.345	6.842	4.150
WB - 3 Sand - Gas (4613.5 – 4754.0)					
111.5000	5.184	24.736	12.293	2.948	24.294

WB - 4 Sand - Oil (4807.5 – 4952.0)

114.5000	3.425	26.104	21.323	5.435	23.666

Final Totals -- All Formations

249.5000	4.970	25.342	17.949	4.456	52.110

Current Pay Zone Cutoff Filters & Calculation Options

Vsh 40.00 – Max.; Porosity 18.00 – Min.; Sw 50.00 – Max.

(Vsh) -- Shale Volume

VShale Model:	Gamma Ray – Larinov – Teriary
Gamma Max. - Min:	92.4, 8.22

(PhiD) -- Density Porosity

Density Matrix:	2.65
Pore Fluid Density:	1.00
Calc. Effective Density:	Yes
Effective Density:	18.00

(PhiN) -- Neutron Porosity

Neutron Log Type:	HALLIBURTON DSNII
Neutron Matrix:	Sandstone
Calc. Effective Neutron:	Yes
Effective Neutron:	44.6281

(PhiND) -- Neutron-Density Porosity

Neutron-Density Model:	Gas Corrected Density
Hydrocarbon Density:	0.34
Core Corr. 1 - 200%:	100.00

(Rt) -- True Resistivity

Rt Source:	RILD

(Rw) -- Water Resistivity

Known Rw:	0.034 @ 133.97F
Temperature Corr.:	Yes

(Sw) -- Water Saturation

Water Saturation Model:	Archie Eq.
Tortuosity (A):	0.62
Cementation Exponent (M):	2.06
Saturation Exponent (N):	1.97
Porosity Source for Sw:	PhiND

MAJOR PROGRAM FUNCTIONS

- Flexible Management of all Data Curves and Data Sets
- Robust Data Loading Options
- Complete Set of Data Editing Tools
- Zonal Interpretation.
- The user may set any variable interactively on log or spreadsheet.
- All variables have default values if they are not set by the user.
- All Models display required support information
- All Options are saved with Calculated Data for reuse.
- Complex Lithology Determination.
- Interactive and Full Featured Cross Plots
- Statistics
- Batch File Processing.

Hydrocarbon Data Systems have a number of projects underway to further improve and extend the capabilities of HDS. Some of these projects are listed below and most have been recommended by the user base.

- →Synthetic Seismogram
- →True Stratigraphic Thickness
- →True Vertical Thickness
- →Production Log Analysis
- →Active X Interface
- →Volumetrics
- →NMR Interpretation
- →Base Map Interface

Hydrocarbon Data Systems also offer consulting services in petrophysical applications, training, digitizing and tape conversion services.

To learn more about the HDS Log Analysis Program and our other products and services please contact:

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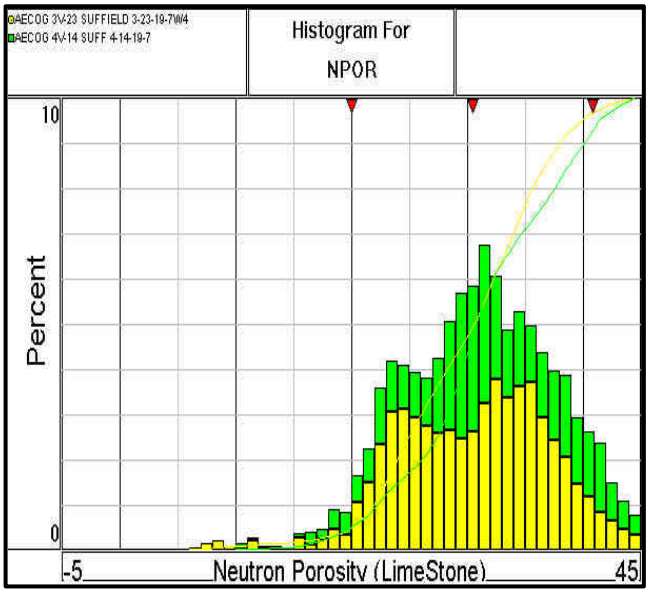
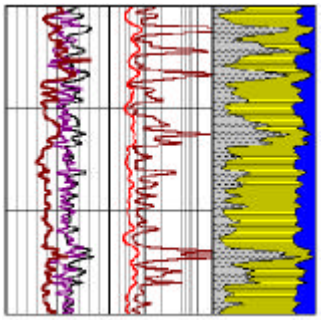
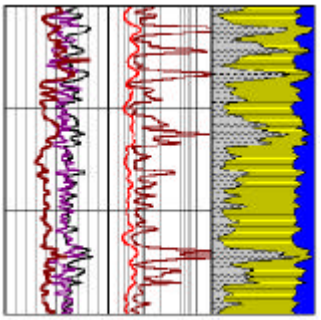


HDS World Wide User List

AEA (PEDSU) - Winfrith, UK / AEC Oil & Gas - Calgary, AB / AGIP Petroleum - Houston, TX / AKDIMPEX - Budapest, Hungry /Alta Mesa Resources - Houston, TX / Altana Expl.oration - Calgary, AB / AmBrit Energy Corporation - Dallas, TX / Amerac Energy - Houston TX / Amerada Hess Denmark - Coppenhagen, Denmark / Amerada Hess UK - London, UK / American Cometra - Ft. Worth, TX / Ampol Exploration - Denver, CO / ANR Storage - Detroit, MI / Antara Resources - Houston, TX / Apache Corp. - Houston, TX / Asesoria Eng. - Bogata, Columbia / Ashland Expl. - Lagos, Nigeria / Statoil - Houston, TX / Atomic Energy Authority (AEA - PEDSU) - Winfrith, UK / Apex Petroleum, Inc - Denver, CO / B.M. Faulkner, Assoc. - Bend, OR / Ballard Explor. - Billings, MO / Ballard Explor. - Denver, CO / Ballard Explor. - Houston, TX / Barrett Resources - Houston, TX / Barrett Res. - Denver, CO / Bass - New Orleans, LA / BHP Petroleum - Houston, TX / BIA - Golden, CO / Blue Range Resources - Calgary, AL / Brabant Petroleum - Kent, UK / Brasoil UK - London, UK / British Gas plc. - Reading, UK / Brock Engineering - Mason, MI / Bureau of Land Management -Milwaukee, WI / Burlington Oil & Gas - Houston, TX / Burlington Oil & Gas - Farmington, NM / Burlington Oil & Gas - Midland, TX / Cabot O&G - Houston, TX / Calvalley Petroleum Inc. - Calgary, AL / Cairn Energy - Dallas, TX / Carol Peavy - Golden, CO / Canadian Cometra - Calgary, AB / Canadian Natural Resources - Calgary, AB / Cenex - Billings, MT / Century Offshore - New Orleans, LA / Chapman Engineering - Calgary, AB / Chieftain Intl. - Dallas, TX / Cieco Ltd. - London, UK / CMG -Calgary, AB / CMS Nomeco - Jackson, MI / CMS Nomeco - Houston, TX / Coastal O & G - Houston, TX / Coda Energy - Dallas, TX / Cody Energy - Denver, CO / Colirini Engineering - New Orleans, LA / Contract Drilling Inc. - Houston, TX / Cox Resources - Dallas, TX / Crescent Technology, Inc - New Orleans / DDD Energy - Houston, TX / Deminex Argentinia - Buenos Aires, Argentinia / Deminex Norge - Olso, Norway / TX / DMB Energy - Calgary, AB / Dugan Prod. - Farmington, NM / Eastern States Oil & Gas - Alexandra, VA / Edinburgh Petroleum Services, LTD - Edinburgh, UK / Edwin A. Epstein Jr. Operating, Co. - Las Vegas, NA / Elf Petroland BV - The Hague, NL / Elf Qatar - Qatar / Elf France - Pau, France / El Paso Natural Gas - Houston, TX / Enron Capital - Houston, TX/ Enron Expl. - Trinidad / Enron Expl. - Kaula Lumpur / Enron Expl. Int. - Houston, TX / Enron Gas Supply - Houston, TX / Enron O & G - Houston, TX / Enron O & G - Calgary, AB / Enron O&G - Denver, CO / Enserch Expl. - Corporate Lic. / Equitable Resources - Houston, TX / Equitable Resources - Kingsport, TN / Exxon Company, USA - Houston, TX / F. Garb & Assoc. - Dallas, TX / Falcon Petroleum Con. - Houston, TX / Felmont Oil Corporation - Houston, TX / First Energy Corporation - Houston, TX / Flores & Rucks - Lafayette, LA / Forest Oil - Lafayette, LA / Forest Oil - Denver, CO / Forest Oil - Calgary, AB / Forrest Garb & Associates - Dallas, TX / Frontier Nat Gas - Ok. City, OK / G. Ostroff & Assoc. - Houston, TX / Geopet Consultors C.A. - Caracas, Venezuela / Giant Expl. & Prod - Farmington, NM / Global Nat, Res. - Houston, TX / GRL Production Services Co. - Houston, TX / Halliburton Energy Services - Houston, TX / Halliburton Energy Services – PuertoLaCruz, Venezuela / Halliburton Energy Services - Denver, CO / Halliburton Energy Services - Midland, TX / Harken Energy - Dallas, CO / Harken Colombia - Bogota, Colombia / Harken International Ltd - Houston, TX / Holden Energy - Oklahoma City, OK / Houston Energy - Lafayette, LA / HS Resources - Denver, CO / Hungarian Academy of Sciences - Budapest, Hungary / Hunt Oil - Houston, TX / Hunt Oil - Dallas, TX / Hunt Petroleum -Dallas, TX / Idemitsu Oil Ex. - Tokyo, Japan / Idemitsu Oil Expl. - Miri, Mal. / Idemitsu Oil Expl. - Oslo, Norway / Illinois Power - Decatur, IL / Indonesia Petroleum Ltd - Tokyo, Japan / Indonesia Petroleum Ltd - Jakarta, Indonesia / Impex Offshore - Tokyo, Japan / Impex Offshore - Jakata, Indonesia / Ingeneria Tecnosinergia CA - Caracas, Venezuela / Institute for Pet. & Geophisical Res. (IPGR) - Holon, Israel / Internal Revenu Service (IRS) - Dallas, TX / IPGR - Holon, Israel / JMK Consulting - Ok. City, OK / JR Butler & Co. - Houston, TX / K-2 Energy - Calgary, AB / Kerr McGee - Houston, Tx / Kerr McGee - London UK / King Ranch O & G - Houston, TX / Koch Expl. - Wichita, KS / Konur Petroleum, SA -Jakarta, Indonesia / L. Keeling & Assoc. - Tulsa, OK / LAGOVEN - Maricabo, VEN / LFP Seismic - London, UK / Lone Star Gas Pipeline Co. - Dallas, TX / LL & E - Denver, CO / LL & E - Houston, TX / LSU - Baton Rouge, LA / Manning International Petrophysics - Houston, TX / Marathon Oil - Ok. City, OK / Matador Petroleum -Dallas, TX / McDaniels & Assoc. - Calgary, AB / McMoran O & G - New Orleans, LA / MEMPR - Victoria, BC / Meridian Oil - Denver, CO / Meridian Oil - Houston, TX / Meridian Oil - Midland, TX / Meridian Oil - Farmington, NM / Mermis Engineering - Houston, TX / Mich. Consolidated - Detroit, MI / Michigan Public Services - Lansing, MI / Midcon Services - Houston, TX / Miller Energy - Kalamazoo, MI / Miller Oil - Trav. City, MI / Mobil Explor & Prod. - Buenos Aires, Argentinia / Mosbacher Energy -Houston, TX / Mosbacher Energy - Caracus, Ven. / National Energy Board - Calgary, AB / Netherland, Sewell & Associates - Dallas, TX / Nippon Oil - Tokyo / Nippon Oil Houston, TX / Nippon Oil - London / Nippon Oil Ex. - Kuala Lumpur / North Central Oil Corporation - Houston, TX / North Central Res. - Houston, TX / Ocean Energy Inc. Lafayette, LA / Outtrim Szabo - Calagary, AL / Panex Corporation - Sugar Land, TX / Patina Oil & Gas - Denver, CO / Perolera Santa Fe S.A. - Houston, TX / Petrobras, U.K Ltd. - London, UK / PETROCI - Abidjan, Ivory Coast / Petrolific Explor. - Denver, CO / Phillips Petro. - Houston, TX / Phillips Petro. - Calgary, AB / Placid Oil Company - Dallas, TX / Plains Resources - Houston, TX / Platt, Sparks Assoc. - Austin, TX / Plus Petrol - Buenos Aires, Argentia / Pogo



Prod. - Houston, TX / Pogo Prod. - Midland, TX / P-R-O Management - Dallas, TX / PTOS - Houston, TX / PTT Expl & Prod - Bangkok / Qatar General Petro. - Doha, Qatar / Rose Exploration - Denver, CO / Ryder Scott Co. - Houston, TX / S.A. Consultores - Maricaibo, VEN. / SA Holditch & Assoc. - College St, TX / Samedan Oil - Houston, TX / Samedan Oil Int. - Houston, TX / Samedan Tunisia - Tunis, Tunisia / Sanchez-O'Brien - Houston, TX / Sandefer Oil & Gas Inc. - Houston, TX / Santa Fe International - Houston, TX / Santa Fe Energy - Houston, TX / Scepter Resources - Calgary, AB / Seagull-Houston - Houston, TX / Seneca Resources - Houston, TX/ Shell Intenational - The Hague / Snyder Oil Corp. - Ft. Worth, TX / Snyder Oil Corp. -Denver, CO / Sociedad Internacional Petrolera - Santiago, Chile / Sonat



Expl. - Ok. City, OK / Southern Union Explor. - Dallas, TX / Southwesterrn Energy - Ok. City, OK / Status Engineering - Calgary, AB / Stone Energy Corporation - Lafayette, LA / Spinnacker Explor. - Houston, TX / Summit Reso urces - Calgary, AB / Swanson Consulting - Houston, TX / Taylor Energy - New Orleans / Teikoku Oil - Caracus, Venezuela / Telesis Energy - London, Ont. / Tenneco Gas - Houston, TX / Texaco Permian - Denver, CO / Texaco USA - Denver, CO / Texaco Prod. - Bakersfield, CA / Texas A&M - College St, TX / Texland Petroleum - Ft. Worth, TX / TexStar N.A. - Houston, TX / TRACS – Aberdeen, Scotland / UMC Petroleum - Houston, TX / UMC Petroleum - Denver, CO / Unocal - Sugarland, TX / Unocal Thailand - Bangkok, Thailand / Unocal Vietnam - Hocaimecitx, Vietnam / Univ. of Columbia - Bogata, Columbia / USL - Lafayette, LA / Vastar Resources - Houston, TX / Vaughn Petro. - Dallas, TX / Veasey & Assoc. - Baton Rogue, LA / VEBA – The Hague, NL / VRMT Intl. - Houston, TX / Wagner & Brown - Midland, TX / Wainoco Oil - Calgary, AB / Westcoast Energy - Calgary, AB / Western Atlas E&P Ser. - Houston, TX / Western Atlas E&P Ser. - London, UK / Western Gas Processors - Denver, CO / Williams Energy Group - Houston, TX / Wilson & Aluko - San Antonio, TX / Wintershall Nordzee - The Hague,NL / Wintershall Oil - Calgary, AB / Wolverine G & O - Gr. Rapids, MI / Zilka Energy - Houston, TX // This space is reserved for your company!