Bibliography of Well-Log Applications
Annual Update: September 1, 1990 to October 1, 1991

by

Stephen E. Prensky

Open-File Report 91-0588A

November 1991

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature

1 U.S. Geological Survey, Box 25046, MS 971, Denver, CO, 80225
<table>
<thead>
<tr>
<th>TOPIC</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>ii</td>
</tr>
<tr>
<td>Part A: Basic Well Logging</td>
<td>1</td>
</tr>
<tr>
<td>1. Fundamentals of Well Logging and Well Log Interpretation</td>
<td>1</td>
</tr>
<tr>
<td>I. Books and Review Papers</td>
<td>1</td>
</tr>
<tr>
<td>II. Electric Logging and General Formation Evaluation (Including Petrophysics and Case Histories)</td>
<td>2</td>
</tr>
<tr>
<td>III. MWD (Measurement While Drilling)</td>
<td>19</td>
</tr>
<tr>
<td>IV. Cased Hole and Production Logging; Determination of ROS</td>
<td>22</td>
</tr>
<tr>
<td>V. Acoustic Logging (Including P and S, Full Waveform, Borehole Seismic, and VSP)</td>
<td>26</td>
</tr>
<tr>
<td>VI. Nuclear Logging; Geochemical Logging (Elemental Analysis)</td>
<td>31</td>
</tr>
<tr>
<td>VII. Shaly Sands</td>
<td>33</td>
</tr>
<tr>
<td>VIII. Borehole Gravimetry</td>
<td>35</td>
</tr>
<tr>
<td>IX. Permeability Determination from Logs</td>
<td>35</td>
</tr>
<tr>
<td>X. Borehole Imaging and Applications (Including BHTV, FMS, Radar)</td>
<td>36</td>
</tr>
<tr>
<td>XI. Temperature Logging; Determination of Static BHT; Applications of BHT data; Heat-Flow and Geothermics</td>
<td>41</td>
</tr>
<tr>
<td>XII. Conditions and Special Situations Affecting Tool Response</td>
<td>43</td>
</tr>
<tr>
<td>XIII. Crossplot Techniques and Applications</td>
<td>44</td>
</tr>
<tr>
<td>XIV. Computer and Programmable Calculator Programs for Log Analysis</td>
<td>44</td>
</tr>
<tr>
<td>XV. Schlumberger International Well Evaluation Conferences</td>
<td>44</td>
</tr>
<tr>
<td>XVI. Reprint Volumes</td>
<td>44</td>
</tr>
<tr>
<td>XVII. Bibliographies</td>
<td>45</td>
</tr>
<tr>
<td>XVIII. Well-Log-Response Charts</td>
<td>45</td>
</tr>
</tbody>
</table>

Part B: Applications | 46 |

2. General Geological and Geotechnical Applications | 46 |
3. Determination of Facies and Depositional Environment | 51 |
4. Identification of Depositional Environments by SP and GR Pattern | 52 |
5. Dipmeter Applications | 53 |
6. Applications of Artificial Intelligence (AI) and Expert Systems | 53 |
7. Well-Log Data Processing (Including Log Correlation and Analyses) | 54 |
8. Natural Gamma-Ray Spectrometry | 55 |
10. Tight (Low-Permeability) Gas Sandstones | 56 |
11. Abnormal Pressure Detection and Evaluation | 58 |
12. Oil and Gas Shales | 59 |
13. Heavy Oil and Tar Sandstones | 60 |
14. Coal and Coalbed Methane | 60 |
15. Fracture Detection and Evaluation; Wellbore Breakouts and In-Situ Stress Analysis | 61 |
16. Permafrost and Gas Hydrates | 67 |
17. Evaporites | 67 |
19. Ground Water Applications | 68 |
20. Igneous and Metamorphic Rocks (Including DSDP and ODP results) | 71 |

Part C: Listing of Citations by First Author | 74 |
Introduction

The purpose of this bibliography is to emphasize the *application* and various uses of well-log data. The topical organization is loosely based on research interests within the U.S. Geological Survey (USGS). The following general criteria are applied to papers to determine whether they will be included: 1) the paper must be written in English, 2) it must be obtainable by a research library, 3) most of the paper should discuss a particular application of well-log data or have immediate impact on the use of such data. Consequently, papers concerning theoretical or mathematical subjects (i.e., modeling), instrumentation design and development, and laboratory research, are generally excluded. For lack of space, abstracts are excluded (except for extended abstracts) and cross-indexing has been kept to a minimum.

This update has over 750 new and updated references. For the cumulative edition (through September 1, 1990), readers are referred to Prensky (1990).

I wish to acknowledge the assistance of the staff at the Denver branch of the USGS library, especially that of Ms. Suzanne Powers. Their diligence, in tracking down and obtaining the papers listed herein, has made this bibliography possible.

Reference

Part A: BASIC WELL LOGGING

1. FUNDAMENTALS OF WELL LOGGING AND WELL-LOG INTERPRETATION

I. Books and Review Papers


II. Electric Logging and General Formation Evaluation
(Including Petrophysics and Case Histories)
(See also VII. Shaly sand; 18. Mineral evaluation)


Pearce, M.S., 1989, Long-term properties of clay, water-based drilling fluids, in International symposium on class I and II well technology [Dallas, Texas, May 9-11], proceedings: Underground Injection Practices Council, Oklahoma City, OK, p. 115-132.


ResTech Houston, 1988, Formation evaluation from improved sampling and analysis of mud gas and cuttings, workshop proceedings: Gas Research Institute Report No. GRI-88/201, variously paginated


III. MWD (Measurement While Drilling)


Desbrandes, R., 1990, An overview of measurement while drilling/logging while drilling technology, in Measurement while drilling symposium [February 26-27, Baton Rouge], proceedings: Louisiana State University, p. 5-46.


IV. Cased Hole and Production Logging: Determination of ROS
(See also V. Nuclear logging)

Ahmed, U., 1990, Production logging as an integral part of horizontal well transient pressure test, SPE-20980, in
Europec 90, SPE European petroleum conference [October 22-24, The Hague] proceedings: Society of

and sonic-logging data, SPE-19004, in SPE joint Rocky Mountain regional/low permeability reservoirs


Bigelow, E.L., and Domangue, E.J., 1990, An effective new technology for evaluation of cement integrity: the
Segmented Bond Log, paper Y, in 13th European formation evaluation symposium transactions: Society of
Professional Well Log Analysts, Budapest Chapter, 12 p.

20585, in SPE annual technical conference exhibition proceedings, v. omega, Formation evaluation and
reservoir geology: Society of Petroleum Engineers, p. 579-590

Bonnie, R.J.M., 1991, Evaluation of various pulsed neutron capture logging tools under well-defined laboratory
conditions, paper OO, in 32nd annual logging symposium transactions: Society of Professional Well Log
Analysts, 11 p.

Broglia, C., and Ellis, D., 1990, Effect of alteration, formation absorption, and standoff on the response of the
thermal neutron porosity log in gabbros and basalts—Examples from Deep Sea Drilling Project-Ocean
Drilling Program sites: Journal of Geophysical Research, v. 95(B6), June 10, p. 9171-9188.

Butsch, R.J., and Vacca, H.L., 1990, Experimental pulsed-neutron porosity for gas-filled boreholes in the Gulf Coast,
SPE-20588, in SPE annual technical conference exhibition proceedings, v. omega, Formation evaluation and


technical conference and exhibition proceedings, v. omega, Formation evaluation and reservoir geology:
p. 780-785.

Catala, G., de Montmollin, V., Hayman, A., Hutin, R., Rouault, G., Guillot, D., Jutten, J., Qureshi, Y., Kelly, B., Piot,
B., Simien, T., and Toma I., 1991, Modernizing well cementing design and evaluation: Schlumberger Oilfield
Review, v. 3(2), April, p. 55-71.

Chopra, P.N., de Bruyn, C.J., and Mathew, P.J., 1989, Demonstration of a primary calibration of a formation density
Cigni, M., and Magrassi, M., 1990, Radioactive and sonic measures recorded in cased hole—how to use them to quantitatively evaluate the remaining hydrocarbon saturation, paper HH, in International well logging symposium transactions: Society of Professional Well Log Analysts, Beijing Chapter, 23 p.


Hunt, E., 1991, Frac height may increase away from well bore: Oil and Gas Journal, v. 89(8), February 25, p. 33-36.


McKinley, R.M., 1989, Temperature and noise logging for noninjection related fluid movement, in International symposium on class I and II well technology [Dallas, Texas, May 9-11], proceedings: Underground Injection Practices Council, Oklahoma City, OK, p. 45-63.


V. Acoustic Logging
(Including P and S, Full Waveform, Borehole Seismic, and VSP)
(See also 15. Fracture detection)


VI. Nuclear Logging: Geochemical Logging (Elemental Analysis)
(See also IV. Cased hole logging; 18. Mineral evaluation)


VII. Shaly Sands
(See also II. Electric logging)


VIII. Borehole Gravimetry


ResTech Houston, 1988, Borehole gravity and gradiometry, workshop proceedings: Gas Research Institute Report No. GRI-88195, variously paginated


IX. Permeability Determination From Logs

(See also V. Acoustic logging; VII. Shaly sands; 15. Fracture detection)


X. Borehole Imaging and Applications
(Including BHTV, FMS, and Radar)
(See also II. Electric logging; V. Acoustic logging; 6. Dipmeter applications; 15. Fracture detection)


**XI. Temperature Logging, Determination of Static BHT; Applications of BHT Data; Heat-flow and Geothermics**

(See also 21. Geothermal logging)


XII. Conditions and Special Situations Affecting Tool Response


XIII. Crossplot Techniques and Applications


XIV. Computer and Programmable Calculator Programs for Log Analysis


XV. Schlumberger International Well Evaluation Conferences

None

XVI. Reprint Volumes

XVII. Bibliographies


XVIII. Well-Log-Response Charts

None
Part B: APPLICATIONS

2. GENERAL GEOLOGICAL AND GEOTECHNICAL APPLICATIONS


Moos, D., and Zoback, M.D., 1990, Utilization of observations of well bore failure to constrain the orientation and magnitude of crustal stresses—Application to continental, Deep Sea Drilling Project, and Ocean Drilling Program boreholes: Journal of Geophysical Research, v. 95(B6), June 10, p. 9305-9325.


Tazioli, G.S., 1989, Nuclear and tracer techniques applied to civil engineering problems in fractured rocks, in Isotope techniques in the study of the hydrology of fractured and fissured rocks [advisory group meeting on the application of isotope techniques in the study of the hydrology of fractured and fissured rocks (Vienna, November 17-21, 1986), proceedings]: International Atomic Energy Agency, Vienna, Austria, 253-285.
3. DETERMINATION OF FACIES AND DEPOSITIONAL ENVIRONMENT


4. IDENTIFICATION OF DEPOSITIONAL ENVIRONMENTS BY SP AND GR PATTERNS

None
5. DIPMETER APPLICATIONS


6. APPLICATIONS OF ARTIFICIAL INTELLIGENCE (AI) AND EXPERT SYSTEMS
(See also 7. Well-Log Data Processing)


7. WELL-LOG DATA PROCESSING
(Including Log Correlation and Analysis)


8. NATURAL GAMMA-RAY SPECTROMETRY


55
9. ORGANIC CARBON DETERMINATION AND SOURCE ROCK EVALUATION


10. TIGHT (LOW-PERMEABILITY) GAS SANDSTONES
(See also VII. Shaly Sands)


Gas Research Institute, 1991, Well logging and log analysis, chapter 5, in Executive summary of SFE No. 3; application of advanced technologies in tight gas sandstones, Travis Peak and Cotton Valley Formations: In Focus—Tight Gas Sands, v. 7(1), p. 17-22.


11. ABNORMAL PRESSURE DETECTION AND DETERMINATION


12. OIL AND GAS SHALES


13. HEAVY OIL AND TAR SANDSTONES


14. COAL AND COALBED METHANE


15. FRACTURE DETECTION AND EVALUATION;
WELLBORE BREAKOUTS AND IN SITU STRESS ANALYSIS
(See also 19. Ground water; 20. Igneous rocks; 21. Geothermal logging)


Moos, D., and Zoback, M.D., 1990, Utilization of observations of well bore failure to constrain the orientation and magnitude of crustal stresses—Application to continental, Deep Sea Drilling Project, and Ocean Drilling Program boreholes: Journal of Geophysical Research, v. 95(B6), June 10, p. 9305-9325.


Moser, H., and Drost, W., 1989, Application of single and multiwell techniques in fractured rocks, in Isotope techniques in the study of the hydrology of fractured and fissured rocks [advisory group meeting on the application of isotope techniques in the study of the hydrology of fractured and fissured rocks (Vienna, November 17-21, 1986), proceedings]: International Atomic Energy Agency, Vienna, Austria, 223-237.


Tazioli, G.S., 1989, Nuclear and tracer techniques applied to civil engineering problems in fractured rocks, in Isotope techniques in the study of the hydrology of fractured and fissured rocks [advisory group meeting on the application of isotope techniques in the study of the hydrology of fractured and fissured rocks (Vienna, November 17-21, 1986), proceedings]: International Atomic Energy Agency, Vienna, Austria, 253-285.


16. PERMAFROST AND GAS HYDRATES


17. EVAPORITES

Curial, A., 1987, Paleogene saline and hypersaline sedimentation in Bressan (France), a comparison of the log and lithologic data; well log study of the Etrez field and basin synthesis [in French]: Documents des Laboratoires de Géologie, Lyon, no. 100, 192 p.

18. MINERAL EXPLORATION AND EVALUATION


19. GROUND WATER APPLICATIONS

(See also 15. Fracture detection; 20. Igneous rocks)


Lyle, R., 1989, Demonstration of mechanical integrity utilizing radioactive tracer surveys, in International symposium on class I and II well technology [Dallas, Texas, May 9-11], proceedings: Underground Injection Practices Council, Oklahoma City, OK, p. 65-73.


McKinley, R.M., 1989, Temperature and noise logging for noninjection related fluid movement, in International symposium on class I and II well technology [Dallas, Texas, May 9-11], proceedings: Underground Injection Practices Council, Oklahoma City, OK, p. 45-63.


Rehfeldt, K.R., 1989, Application of the borehole flowmeter method to measure spatially variable hydraulic conductivity at the MADE site, in Conference on new field techniques for quantifying the physical and chemical properties of heterogeneous aquifers, proceedings: National Well Water Association, Dublin, Ohio, p. 419-443.


Waller, P., and McCormick, T., 1989, A comparison of results of internal mechanical integrity testing of large diameter class I municipal injection wells using both pacers and radioactive tracer methodologies, in International symposium on class I and II well technology [Dallas, Texas, May 9-11], proceedings: Underground Injection Practices Council, Oklahoma City, OK, p. 75-103.


Wiesneneck, J.B., 1989, Practical experience with oxygen activation logging in south Mississippi, in International symposium on class I and II well technology [Dallas, Texas, May 9-11], proceedings: Underground Injection Practices Council, Oklahoma City, OK, p. 7-24


20. IGNEOUS AND METAMORPHIC ROCKS (Including DSDP and ODP Results)

(See also 15. Fracture detection; 19. Ground water; 21. Geothermal)


21. GEOTHERMAL WELL-LOG EVALUATION
(See also XI. Temperature logging; 15. Fracture detection; 19. Ground water; 20. Igneous rocks)


Part C: FIRST AUTHOR LISTING


Cigni, M., and Magrassi, M., 1990, Radioactive and sonic measures recorded in cased hole–how to use them to quantitatively evaluate the remaining hydrocarbon saturation, paper HH, in International well logging symposium transactions: Society of Professional Well Log Analysts, Beijing Chapter, 23 p.


Curial, A., 1987, Paleogene saline and hypersaline sedimentation in Bressan (France), a comparison of the log and lithologic data; well log study of the Etrez field and basin synthesis [in French]: Documents des Laboratoires de Géologie, Lyon, no. 100, 192 p.


Desbranades, R., 1990, An overview of measurement while drilling/logging while drilling technology, in Measurement while drilling symposium [February 26-27, Baton Rouge], proceedings: Louisiana State University, p. 5-46.


84


Gas Research Institute, 1991, Well logging and log analysis, chapter 5, in Executive summary of SFE No. 3; application of advanced technologies in tight gas sandstones, Travis Peak and Cotton Valley Formations: In Focus—Tight Gas Sands, v. 7(1), p. 17-22.


Hunt, E., 1991, Frac height may increase away from well bore: Oil and Gas Journal, v. 89(8), February 25, p. 33-36.


Lapointe, Ph., and Karachanian, H., 1990, Sedimentology and diagenesis—basic keys to reservoir layering; example of the Umm Shaif Arab zone C reservoir, SPE-21322: Society of Petroleum Engineers, unsolicited paper, 15 p.


Lyle, R., 1989, Demonstration of mechanical integrity utilizing radioactive tracer surveys, in International symposium on class I and II well technology [Dallas, Texas, May 9-11], proceedings: Underground Injection Practices Council, Oklahoma City, OK, p. 65-73.


McKinley, R.M., 1989, Temperature and noise logging for noninjection related fluid movement, in International symposium on class I and II well technology [Dallas, Texas, May 9-11], proceedings: Underground Injection Practices Council, Oklahoma City, OK, p. 45-63.


Moos, D., and Zoback, M.D., 1990, Utilization of observations of wellbore failure to constrain the orientation and magnitude of crustal stresses—Application to continental, Deep Sea Drilling Project, and Ocean Drilling Program boreholes: Journal of Geophysical Research, v. 95(B6), June 10, p. 9305-9325.


Moser, H., and Drost, W., 1989, Application of single and multiwell techniques in fractured rocks, in Isotope techniques in the study of the hydrology of fractured and fissured rocks [advisory group meeting on the application of isotope techniques in the study of the hydrology of fractured and fissured rocks (Vienna, November 17-21, 1986), proceedings]: International Atomic Energy Agency, Vienna, Austria, 223-237.


112


Pearce, M.S., 1989, Long-term properties of clay, water-based drilling fluids, in International symposium on class I and II well technology [Dallas, Texas, May 9-11], proceedings: Underground Injection Practices Council, Oklahoma City, OK, p. 115-132.


Rehfeldt, K.R., 1989, Application of the borehole flowmeter method to measure spatially variable hydraulic conductivity at the MADE site, in Conference on new field techniques for quantifying the physical and chemical properties of heterogeneous aquifers, proceedings: National Well Water Association, Dublin, Ohio, p. 419-443.


ResTech Houston, 1988, Borehole gravity and gradiometry, workshop proceedings: Gas Research Institute Report No. GRI-88195, variously paginated

ResTech Houston, 1988, Formation evaluation from improved sampling and analysis of mud gas and cuttings, workshop proceedings: Gas Research Institute Report No. GRI-88/201, variously paginated


116


Sillman, S.E., and Neuzil, C.E., 1990, Borehole determination of formation thermal conductivity using a thermal pulse from injected fluid: Journal of Geophysical Research, v. 95(B6), June 10, p. 8697-8704


Tazioli, G.S., 1989, Nuclear and tracer techniques applied to civil engineering problems in fractured rocks, in Isotope techniques in the study of the hydrology of fractured and fissured rocks [advisory group meeting on the application of isotope techniques in the study of the hydrology of fractured and fissured rocks (Vienna, November 17-21, 1986), proceedings]: International Atomic Energy Agency, Vienna, Austria, 253-285.


Wall, P., and McCormick, T., 1989, A comparison of results of internal mechanical integrity testing of large diameter class I municipal injection wells using both pacers and radioactive tracer methodologies, in International symposium on class I and II well technology [Dallas, Texas, May 9-11], proceedings: Underground Injection Practices Council, Oklahoma City, OK, p. 75-103.


Wiesneneck, J.B., 1989, Practical experience with oxygen activation logging in south Mississippi, in International symposium on class I and II well technology [Dallas, Texas, May 9-11], proceedings: Underground Injection Practices Council, Oklahoma City, OK, p. 7-24


125


