

## The Data Cleanse Diet: Your guide to a healthier log database

Daniel Hallau, Senior Geologist, The Discovery Group



*The Discovery Group offers courses in petrophysics for your people, at your location, at a date convenient to your needs and internal schedules. The courses will benefit geologists, engineers, geophysicists, and geotechs, and can be of benefit to other specialists who routinely work with those geotechnical specialists. The best class size is from about 10 to 25 people from a variety of specialties who can share their professional experiences in the context of a greater understanding of petrophysics.*

**Synopsis:** Well log data is messy. Inconsistencies in well log measurements derive from differences between vendors, logging tools, tool vintages, borehole conditions, corrections applied (or not), etc. Bad data lurks on well logs, ready to throw off your analysis and lead to spurious answers. Sorting through it all and emerging at the other end with a dataset that is useful and meaningful can be a daunting and difficult task.

In this course, we teach tried and true methods for improving your log database for better log analysis and interpretations. You'll gain a strong and coherent understanding of issues surrounding well log data validity and consistency, how to assess its quality, and how to fix it when necessary.

### *The course:*

- Offers everything you need to know for assessing the quality of your log data;
- Focuses on best practices for cleaning and managing log data;
- Introduces a variety of well log normalization techniques;

### *Course topics include:*

- Causes of well log data problems and inconsistencies;
- What data should be collected from well log headers;
- What to tell the digitizers and how to check their work;
- Best practices for curve selection when you are drowning in logging mnemonics;
- How to identify problems with logs, and how to fix those problems;
- Cleaning your log data;
- Well log normalization methods and best practices;
- Log data quality control.

**Length:** 1 day (optional 2<sup>nd</sup> day)

**Equipment needed:** *First day: None. Optional second day: Your personnel with access to your geological and petrophysical software and your data.*

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**Agenda:** The times shown are best estimates based on previous presentations of the course. The times will vary to some extent, depending on the questions and comments of the class. Questions and comments based on the experience of the class participants are welcome, and often provide insights to local conditions and methods which would not otherwise be presented.

While formal break times are noted in the schedule, shorter breaks are often taken, as dictated by class needs.

## Day 1

Course Logistics, Introduction  
Issues with log data and causes; what to look out for  
Well log headers  
Digitization  
*Lunch*  
Cleaning your data  
Normalization

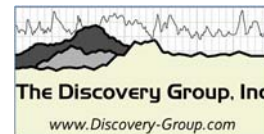
Time for hands-on exercises, which the class can do individually or in small groups, is included in the above schedule.

## Day 2 (optional)

We offer an optional Day 2, where the course instructor comes to *your* office to help with log data cleaning and normalization of *your* datasets, using *your* software. This is a great way to jumpstart the log database cleaning and normalization process for your team.

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### About the instructor:



Dan Hallau is a Senior Geologist with The Discovery Group, Inc. After joining the discovery Group nearly a decade ago, Dan has worked on dozens of projects dealing with stratigraphy, geological interpretation, petrophysics, geomechanics, chemostratigraphy, data management, log normalization, photomicroscopy, vitrinite reflectance microscopy, and tool theory. In each of these projects, the key to success is usually a clean and consistent dataset. Each project usually starts with a giant pile of data, and Dan and his Discovery Group colleagues have become experts in sorting, managing, assessing, fixing, and normalizing well log data.

Dan earned a B.A. in Geology with Honors, and a B.A. in French from the University of Wisconsin-Madison in 2006. He spent a summer in central Australia working as a research assistant and conducting his own research, and he subsequently completed

his senior thesis on lower-crustal structural regimes based on that field work. He earned a M.Sc. in Geology from the Colorado School of Mines in 2014. His Master's degree work focused on Permian carbonates, phosphorites, and cherts from the Phosphoria Formation in west-central Wyoming.

Dan is a member of the American Association of Petroleum Geologists (AAPG), the Rocky Mountain Association of Geologists (RMAG), Society for Sedimentary Geology (SEPM, as well as the local RMS-SEPM chapter), the Society of Petrophysicists and Well Log Analysts (SPWLA), The Society for Organic Petrology (TSOP), and served on the Board of Directors of the Denver Well Logging Society (DWLS) in 2010-2011.

Contact information for Dan:

303-831-1515 ext. 211

danielhallau@discovery-group.com