

Procedure for Obtaining High Quality Normal-Resistivity Logs

Normal resistivity logs considered to be of high quality are those for which the scanned .PDFs are legible and which contain data over the depth interval for which AEM data will be acquired. Prior to opening the .PDF that contains the data for a given resistivity log, it is difficult to assess these two factors, thus, our recommendation is to find as many resistivity logs as possible for a given survey area, and select the first 10 that can be described as “high quality”.

There are two main sources for the resistivity logs: 1) resistivity logs that were recorded during the drilling of a water well, and 2) oil and gas wells. To retrieve the first type of resistivity log, one approach is to contact the relevant county-level agency as they will likely know about the existence of any monitoring wells that have resistivity logs; in Butte County we obtained this information from the Butte County Department of Water and Resource Conservation. For the second type of resistivity logs, the following procedure should be followed.

- 1) Use the well finder web application provided by California’s Geologic Energy Management Division (formerly called the Division of Oil, Gas, and Geothermal Resources, or DOGGR) to download a spreadsheet containing, among other summary information, the API number of every oil and gas well in the survey area. The well finder application can be found at the following URL:
<https://maps.conservation.ca.gov/doggr/wellfinder/>
- 2) Navigate to the following file server in a web browser:
<ftp://ftp.consrv.ca.gov/pub/oil/WellRecord/>
The file server is organized with a separate folder for every county. The folders are named after the last three digits of the county FIPS code as defined for the US census. A lookup table for every county FIPS code in the United States can be found here:
<https://desktop.arcgis.com/en/arcmap/latest/extensions/business-analyst/counties.htm>
The last 8 digits of the API numbers contained in the spreadsheet downloaded in step 1 will match the names of the folders inside each county level folder. These relevant wells should have all of their files downloaded.
- 3) The downloaded .PDFs containing the resistivity log data (filenames typically end with log) should be opened, the quality of the scans assessed and logging depth interval determined. This process continues until the desired number of resistivity logs is found.

The process of navigating through the folder structure and downloading every file for the relevant well API numbers can be done manually; however, we recommend the creation of a script to automatically download the relevant files. We also note that, unlike the lithology logs associated with water wells, the location information retrieved from the well finder web application for oil and gas wells is generally very accurate so manual location of the resistivity log is not needed.