

Appendix F

DOCUMENTATION FOR EXPLORATION CELL MAPS

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ASCII files having a .cls extension contain map data that display oil and gas exploration and development. They are divided into two types of files with a different set of variables for each type. The first type shows exploration and development by region and has a reg prefix before the region number (e.g. reg1.cls). The second type of file shows exploration and development by province or play and has a file or fil prefix (e.g., file0107.cls). The province files are identified by the province number followed by 00. The play files are identified by the four digit play number (e.g., file0107.cls).

The .cls files consist of a series of records, each of which contains a sequential identifying number and geographic coordinates in decimal degrees. Each record represents the center of a cell that is approximately one-quarter mile by one-quarter mile (region, province, or play maps). The geographic coordinates for the center of each cell were calculated using the program weller3.for. A commented copy of weller3.for and the associated data file clarke.dat are located in the "programs" subdirectory. The program weller3.for determined which well or wells were in a given cell and replaced the geographic coordinates of the wells with the appropriate cell center coordinates. The resultant temporary well files were then sorted by geographic location, which grouped all wells in each cell together in the well file. Well files for regions or provinces contained all the wells for that particular area. Well files for plays contained only those wells that can be identified by the bottom-hole stratigraphy as having at least penetrated the top of the play. Therefore, those wells that had no bottom-hole stratigraphic data appeared only in the region and province files. For each temporary well file, the program gridder1.for determined, for each cell, whether any exploration or production had taken place.

Regional Exploration Cell Files (reg prefix)

The data contained in the cell files with a reg prefix were calculated by Richard F. Mast and Lois P. Williams using FORTRAN programs designed by Richard F. Mast and David H. Root of the USGS. In order to determine where areas of oil and gas exploration and production had occurred, the program utilized two data sources: (1) the Petroleum Information, Inc., Well History Control System (WHCS), a database of oil and gas well information compiled by Petroleum Information Corporation; and (2) data digitized from State oil and gas maps. If WHCS contained any information within a particular cell regarding exploration, that data was used to classify the cell. However, another method was used to calculate the values of the cells in those areas known to be historically productive of oil or gas, but where WHCS data is lacking or incomplete; these are usually areas of very old production. In this second method, the missing

productive areas were digitized from State oil and gas maps and a program determined which cells fell within any field outline. If a cell fell within a digitized field, it was assigned a value based upon how the field was characterized with respect to oil and gas production on the State map. However, if a cell fell within the boundary of one of those fields, but also contained a well that had a record within the WHCS, the record from WHCS took precedence.

The large size (approximately 85 MB) of the file for the National-level exploration cell map may be inconvenient for many users, so the data have been divided into eight regional level files (reg#.cls) corresponding to the eight assessment regions. The offshore Federal waters are not strictly part of any of the eight regions. The data for the Federal waters have been separated and are available in file fedoffsh.cls, which is located in the fedoffsh directory.

Each record has 10 fields, comma-delimited. After the last record, a line occurs with a single end statement. The data in the cell files with the reg prefix have the following format:

- (1) Sequential identifying number. This number is provided as a unique identifier to each record in a file.
- (2) Longitude value of the cell center in decimal degrees. By convention, values in the Western Hemisphere are assigned a negative value.
- (3) Latitude value of the cell center in decimal degrees. By convention, values in the Northern Hemisphere have a positive value.
- (4) Exploration level. Single integer values of 1 through 9. The WHCS Initial Class well data were used to determine the exploration level for each cell. The exploration level codes for the cells and WHCS initial classes are as follows:

<u>Exploration level code</u>	<u>Equivalent WHCS initial class</u>
1 = Outpost or extension test	1
2 = Shallower pool test	2
3 = Deeper pool test	3
4 = New pool wildcat	4
5 = New field wildcat	5
6 = Development well	6
7 = Stratigraphic test, core hole, core test 7, 8, and 9 or injection well	
8 = Unclassified or service well	0
9 = Geothermal well	G

If there are several wells in a cell, the cell is assigned the lowest initial class value of any well within the cell.

(5) Production status. Single integer values of 1, 2, 3 or 4.

Production Status Code

- 1 = Cell contains at least one productive oil well, but no productive gas wells
- 2 = Cell contains at least one productive gas well, but no productive oil wells
- 3 = Cell contains at least one productive oil well and at least one productive gas well or one well producing both oil and gas
- 4 = Cell contains no producing wells

(6) Completion year. Two spaces, integer value. These values are calculated by decade. If more than one well was contained within the cell, the value was assigned from the earliest completed well within the cell (e.g., code 98 means that the earliest well in the cell was completed in the 1980's). A code of 81 (1810) indicates no data.

(7) Production year. Two spaces, integer value. These values are also calculated by decade. If more than one producing well was contained within a cell, the value was assigned from the earliest productive well within the cell, e.g. code 98 means that the earliest production was in the 1980's. A code of 81 (1810) indicates no data. Non-producing cells are coded as 10.

(8) Number of wells per cell. Single integer value.

Number of wells per cell code

- 0 = Cell contains no identified wells. Cells filled in from State oil and gas maps have this code.
- 1 = Cell contains 1 well.
- 2 = Cell contains 2 - 4 wells.
- 3 = Cell contains 5 - 8 wells.
- 4 = Cell contains 9 - 16 wells.
- 5 = Cell contains 17 - 32 wells.
- 6 = Cell contains 33 - 64 wells.
- 7 = Cell contains 65 - 128 wells.
- 8 = Cell contains 129 - 256 wells.
- 9 = Cell contains more than 256 wells.

(9) Number of producing wells per cell. Single integer value.

Number of producing wells per cell code

- 0 = Cell contains no producing wells.
- 1 = Cell contains 1 producing well.
- 2 = Cell contains 2 - 4 producing wells.
- 3 = Cell contains 5 - 8 producing wells.
- 4 = Cell contains 9 - 16 producing wells.
- 5 = Cell contains 17 - 32 producing wells.
- 6 = Cell contains 33 - 64 producing wells.
- 7 = Cell contains 65 - 128 producing wells.
- 8 = Cell contains 129 - 256 producing wells.
- 9 = Cell contains more than 256 producing wells.

(10) Total depth. Single integer value. This code represents the greatest depth recorded for any well within a cell.

Total depth code

- 0 = no value
- 1 = 1 - 1,000 feet
- 2 = 1,001 - 2,000 feet
- 3 = 2,001 - 4,000 feet
- 4 = 4,001 - 8,000 feet
- 5 = 8,001 - 12,000 feet
- 6 = 12,001 - 16,000 feet
- 7 = 16,001 - 20,000 feet
- 8 = greater than 20,000 feet

Province and Play Exploration Cell Files (file or fil prefix)

The data contained in the files with a file or fil prefix were also calculated by Richard F. Mast and Lois P. Williams using FORTRAN programs designed by Richard F. Mast and David H. Root of the USGS. This program utilized only data from the Well History Control System of Petroleum Information Corporation. Each province geologist involved in the National Oil and Gas Assessment specified the stratigraphic intervals involved in each of his or her plays. WHCS data were used to determine those cells that contained wells penetrating the top of the specified stratigraphic interval, and also to determine those cells producing from the specified stratigraphic interval. It was assumed that a well that penetrated any formations below those in the specified stratigraphic interval also penetrated the formations of the specified interval.

Each record has four fields, comma-delimited. After the last record, a line occurs with a single end statement. The data in the cell files with the file or fil prefix have the following format:

- (1) Sequential identifying number. This number is provided as a unique identifier to each record in a file.
- (2) Longitude value of the cell center in decimal degrees. By convention, values in the Western Hemisphere are assigned a negative value.
- (3) Latitude value of the cell center in decimal degrees. By convention, values in the Northern Hemisphere have a positive value.
- (4) Production Status. Single integer values of 1, 2, 3 or 4.

Production status code

1 = Cell contains at least one productive oil well from the stratigraphic interval, but no productive gas wells

2 = Cell contains at least one productive gas well from the stratigraphic interval, but no productive oil wells

3 = Cell contains at least one productive oil well and at least one productive gas well from the stratigraphic interval or one well producing both oil and gas from the stratigraphic interval

4 = Cell contains wells that penetrated formations stratigraphically in or below the specified interval, but contains no wells producing from the stratigraphic interval