

## EXCHANGE FORMAT FOR DIRECTIONAL SURVEYS

An example of a complete MMS ASCII file is shown Attachment 2. The first column in the table below represents the equivalent header type codes and column numbers for the UKOOA P7/2000 data exchange format for well deviation data for format comparison. The MMS Type codes cover columns 1-5, the MMS Item name cover columns 7-41, and the MMS format statements begin in column 43 and end in column 130 with no leading spaces. MMS has added the following cards: “H0112 WellNameSuffix”, “H0114 BottomHoleLeaseNumber”, “H0624 TieinMeasuredDepth” and “H00625 TieinTotalVerticalDepth”. The format description is given in FORTRAN style (i.e. F=float, A=character, I=integer, X=space). Example (A4, 2X, F6.3) = ABCD 11.111.

### Header Records are as follows:

UKOOA Type	MMS Type	MMS Item	MMS Format	Description
H0001	H0001	FormatNameVersion	A20	Format Name and Version: MMS-P7/2000 Version 1.0 or UKOOA P7_v2000 1.01
H0002	H0002	FormatType	I1	Format Type: ASCII = 1, XML = 2
H0110	H0110	WellName	A58	Well Name: The name assigned to the well. It may be a special name or the name of the property to which the well belongs. More information and specific details on Well Naming and Numbering Standards can be found in NTL 2000-N07 (e.g., AJ001).
	<i>H0112 Added Card</i>	BottomHoleLeaseNumber	A8	Well Name Suffix: The well name suffix is an extension to the well name which identifies each wellbore and indicates the number of times a well has been sidetracked or bypassed. An 8-character suffix to the well number that identifies a sidetrack (ST) or bypass (BP) and the sidetrack and bypass number (e.g., STNNBPNN). An original hole will have a suffix of ST00BP00, the first sidetrack off the original borehole will have a suffix of ST01BP00, the first bypass off the original borehole will have a suffix of ST00BP01. If the first sidetrack is bypassed, the suffix will be ST01B01. More information and specific details on Well Naming and Numbering Standards can be found in NTL 2000-N07 (e.g., ST00BP01).
	<i>H0114 Added Card</i>	BottomHoleLeaseNumber	A6	Lease Number: The lease number assigned by the Minerals Management Service to the lease that contains the bottomhole location of a borehole. More information and specific details on Well Naming and Numbering Standards can be found in NTL 2000-N07 (e.g., G09999, Y09999, A09999, or P09999).
H0130	H0130	Unique WellIdentifier	A58	API number: A unique well identification number consisting of (left justified) a two-digit state code (or pseudo for Offshore), a three-digit county code (or pseudo for Offshore), a five-digit unique well code and, a two-digit sidetrack code as defined in API Bulletin D12A (e.g., 177561234501).
H0170	H0170	ParentWellIdentifier	A58	Parent Well Identifier: The unique well identification number or API number of the borehole that establishes a hierarchy of wellbores. The Parent Well Identifier References the wellbore from which the current wellbore was kicked off. The first ten digits of the 12-digit API Number of the parent wellbore must be equivalent to the subsequent sidetrack or bypass boreholes. The 11 <sup>th</sup> and 12 <sup>th</sup> digits will be “00” for the original borehole (e.g., 177671234500).
H0200	H0200	GeodeticDatum	A58	Geodetic Datum Code: A common abbreviation for the reference horizontal datum that specifies the type of geodetic reference Systems used in the collection of spatial data. Refer to NTL No. 2002-G12 for more specific instructions (e.g., NAD27).
H0210	H0210	ProjectionIdentification	A53	Projection Identification: The type of projection used to represent the Earth as a 2-deminisional map. More specifically, a specific type of representation that identifies the type of coordinate projection used to describe the point (x-y) values. Examples of map projections: UTM Zones, Transverse Mercator, Lambert and State Plans such as UTM 15 or Louisiana Lambert.
H0300	H0300	ElevationReference	A58	Elevation Reference: The physical reference point used to measure depth elevations. The following Operator elevation reference codes can be used: KB Kelly Bushing, DF Drill Floor, RT Rotary Table, RB Rotary Bushing, MT Drill Floor Mat, GL Ground Level, CE Casing Flange, SL Sea Level, TS Topographic Sheet, EY Estimated, IN Interpolated, ES Echo Sopunder, or UN Unknown. In addition, the elevation reference is equal to the UKOOA’s Well Reference Point (WRP) (e.g., KB or Kelly Bushing).
H0390	H0390	Elevation	F8.2	Elevation: The distance from the physical reference point to the datum. The Measured Depth Elevation in depth units from the Elevation Reference to mean sea level. For the MMS, mean sea level will be considered equal to the UKOOA’s Vertical Reference Datum (VRD) (e.g., 109.00).

UKOOA Type	MMS Type	MMS Item	MMS Format	Description
H0400	H0400	Operator	A58	Operator: The person the lessee(s) designates as having control or management of operations on the leased area or a portion thereof. An operator can be a lessee; the MMS-approved designated agent of the lessee(s), or holder of operating rights under an MMS- approved operating rights assignment. If multiple vendors have run the survey, list the survey company that created the composite survey (e.g., Big Exploration Inc.).
H0440	H0440	Survey Company	A58	Survey Company: The Contractor, Service Provider, or business associate, such as an individual or company that conducts the inclination survey (e.g., Hamberger Well Services).
H0450	H0450	Survey Date	14,2(12)	Survey Completion Date: The full date on which the last run of the composite survey is completed. The required format is a four-digit year, the month, and day in YYYYMMDD form. January 1, 2000 would be 200000201.
H0500	H0500	AzimuthReference	A16	North Reference: The geographic reference used to measure azimuths. (T-True, M-Magnetic, G-Grid, and U-Unknown.). A directional survey submitted in Grid North is the current requirement in 30 CFR250 Subpart D – Oil and Gas Drilling Operations (e.g., G or Grid).
H0510	H0510	MagneticDeclination	F6.3	Magnetic Declinations: The angle between magnetic and geographical meridians at any location, expressed in (+/-) degrees east or west to indicate the direction of magnetic north from true north. West of the zero declination line is negative, East of the zero declination line is positive (e.g., +0.894).
H0520	H0520	GridConvergence	F6.3	Grid Convergence: The horizontal angle in (+/-) degrees at a point between true north and grid north. The angle is proportional to the longitude difference between a location and central meridian. Grid convergence is positive east of the central meridian of a projection and negative west of the central meridian (e.g., -1.252).
	<i>H0624 Added Card</i>	TieinMeasuredDepth	F8.2	Tie in Measured Depth: The measured depth or distance from the Elevation Reference to the tie-in-point of the survey when a survey begins below the Elevation Reference. The tie-in-point is the shallowest point of a survey that is used to link its depth to an original wellbore, previous wellbore, or from a lateral to a spoke in a horizontal well (e.g., 011309.00).
	<i>H0635 Added Card</i>	TieinTotalVerticalDepth	F8.2	Tie in Total Vertical Depth: The vertical depth or distance from the Elevation Reference point to the tie-in point of the survey (e.g., 011292.27).
H0630	H0630	TieinYoffset	F8.2	Tie in Y Offset: The North or South distance between a vertical axis passing through the tie in point and a vertical axis passing through the zero vertical elevation point. A positive number denotes North, a negative number South (e.g., 475.60).
H0635	H0635	TieinXoffset	F8.2	Tie in X Offset: The East or West distance between a vertical axis passing through the tie in point and a vertical axis passing through the zero vertical elevation point. A positive number denotes East, a negative number West (e.g., 2668.50).
H0700	H0700	Remarks	A58	Remarks: Information describing or explaining the reason data were not collected, lost, or not timely provided to the Minerals Management Service (e.g., "Survey does not reach TD because the borehole collapsed & stuck bit.").

An example of a complete MMS ASCII file is shown Attachment 2. Data records will start with Data Column Descriptions on the first line of the data followed by “|” between each item (i.e., D | MeasuredDepth | Azimuth | ToolType). The Data Section Identifier (D) covers columns 1, the Measured Depth columns 3-10, the Inclination columns 12-18, the Azimuth columns 20-26, the Tool Type columns 28-30 and the Station Type in column 32. The format description is given in FORTRAN style (i.e., F-float, A-character, I-integer, X-space). Example (A4, 2X, F6.3) = ABCD 11.111.

Data Records are as follows:

<b>UKOOA Column Description</b>	<b>MMS Column Description</b>	<b>Column No.</b>	<b>Format</b>	<b>Data Description</b>
Col 1: Data Section Identifier	Col 1: D	1	A1	Data Section Identifier: In order to recognize data records (e.g., D).
Col 2: Measured Depth	Col 2: MeasuredDepth	3-10	F8.3	Measured Depth: The distance in depth units increasing along path of the wellbore from the elevation reference to the measurement point. Each field will have the 2 decimal places recorded with real data or zeros and right justified (e.g., 11309.00).
Col 3: Inclination	Col 3: Inclination	12-18	F7.3	Inclination: The vertical angular measurement of deviation of the well path from its vertical orientation. Submit this number in degrees decimal to the accuracy of three decimal places where zero degrees is vertical downwards and 90 degrees is horizontal (e.g., 015.250).
Col 4: Aximuth	Col 4: Azimuth	20-26	FT.3	Azimuth: The horizontal angular measurement azimuth of the well path projected into a horizontal plane. Submit this number in degrees decimal where the range of the azimuth is between zero and 360 degrees (e.g., 092.66).
Col 5: Survey Tool Type	Col t: ToolType	28-30	13	Tool Type: Choose from types of instruments used to take the measurements: 1. Inclination Only 2. Magnetic (Film based on single shot or multishot) 3. Electronic Magnetic Single Shot or multishot 4. Dipmeter or other FE wireline log 5. MWD or steering tool 6. Conventional Gyro (Film based on single shot or multishot) 7. North seeking Gyro 8. Inertial 9. Unknown
Col. 6: Station Type	Col 6: Station Type	32	A1	Station Type: S=Surveyed, P=Planned, E=Projected or Estimated, or O=Other (e.g., S).

## EXAMPLE OF AN ASCII FILE FOR DIRECTIONAL SURVEYS

0000000011111111122222222233333333344444444455555555666666667777777788888888999999990000000011111111122222222223  
 12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890

```

H0001 FormatNameVersion      MMS-P72000 Version 1.0
H0002 Format Type            1
H0110 WellName               AJ001
H0112 WellNameSuffix         ST01BP00
H0114 BottomHoleLeaseNumber  G 1000
H0130 UniaueWellIdentifier   177671234501
H0170 ParentWellIdentifier   177671234500
H0200 GeodeticDatum          NAD27
H0210 ProjectionIdentification Louisiana Lambert
H0300 ElevationReference     KB
H0390 Elevation              109.00
H0400 Operator               Big Exploration Inc.
H0440 SurveyCompany          Hamberger Well Services
H0450 SurveyDate             20000101
H0500 AzimuthReference       Grid
H0510 MagneticDeclination    +0.894
H0520 GridConvergence        -1.252
H0614 TieinMeasuredDepth     11309.00
H0625 TieinTotalVerticalDepth 11292.27
H0630 TieinYoffset           -080.00
H0635 TieinXoffset           0154.00
H0700 Remarks                Survey does not reach total depth because the borehole collapsed & stuck bit in hole.
D | MeasuredDepth | Inclination | Azimuth | ToolType | StationType
    
```

```

D 10300.00 003.135 062.299 2 S
D 10400.00 003.906 064.918 2 S
D 10500.00 005.060 068.945 2 S
D 10600.00 006.243 072.882 2 S
D 10700.00 007.721 075.160 2 S
D 10800.00 009.710 078.994 2 S
D 10900.00 010.440 093.918 2 S
D 11000.00 011.710 087.837 2 S
D 11100.00 013.260 090.148 2 S
D 11200.00 014.310 091.365 2 S
D 11309.00 000.000 092.660 2 S
D 11475.00 000.710 087.550 2 S
D 11570.00 001.370 092.460 2 S
D 11665.00 000.220 112.590 2 S
D 11761.00 002.440 239.350 2 S
D 11855.00 003.510 235.450 2 S
D 11951.00 004.090 237.720 2 S
D 12047.00 004.240 237.310 2 S
D 12143.00 004.490 236.770 5 S
D 12248.00 005.070 241.74C 5 E
    
```

0000000011111111122222222233333333344444444455555555666666667777777788888888999999990000000011111111122222222223  
 12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890