DEPARTMENT OF THE INTERIOR

MINERALS MANAGEMENT SERVICE

DIRECTIONAL SURVEY
REPORTER'S HANDBOOK

(applicable for wells spud after July 26, 2004)

For Use in Reporting Directional Surveys for Outer Continental Shelf Wells

Foreword

This Directional Survey Reporter's Handbook is designed to aid the person submitting these reports addressed in the operating regulations 30 CFR Part 250. Requirements for submitting a copy of the directional survey report are detailed on the following pages.

This revision incorporates changes resulting from issuance of Notices to Lessees 2004-G07 and 2004-N03 and numbering changes reflected in the Code of Federal Regulations.

This document can be found online at:
http://www.gomr.mms.gov/homepg/mmsforms/REPHANDBK_DIRSVY.pdf.

This Directional Survey Reporting Handbook provides guidance for lessees/operators to submit directional survey data to MMS in accordance with reporting requirements under 30 CFR 250 and Notice to Lessees (NTL) 2004-N03 for wells that are spud after July 26, 2004. *Reporting requirements for wells spud prior to July 26, 2004* can be found in NTL 2004-G07.

Significant updates in this handbook include Section numbering changes in the CFR. Additionally, there were reporting requirements changes in 30 CFR 250.468, 461, and 469 as well as NTL Nos. 2004-N03 and NTL 2004-G07 and their respective Attachments.

- 30 CFR 250.468 and 469 replace Sections 401 and 416 regarding directional survey requirements.

- 30 CFR 250.468 stipulates what well records are required for submittal to MMS and allows each Region to specify well records reporting and submission guidelines.

- 30 CFR 250.469 allows the MMS to require additional well reports and records of operations.

- 30 CFR 250.461 specifies requirements for directional and inclination surveys.

- 30 CFR 250.466 and 467, respectively, stipulate what surveys must be kept and submitted and how long these records must be kept.

- NTL No. 2004-G07 supercedes NTL Nos. 97-06 (and its Attachments) and NTL No. 98-18. NTL No, 2004-G07 defines new procedures for well records submittal, submittal delinquent dates, and correct locations where well records must be sent.

- NTL No. 2004-N03 supercedes Attachment 2 of NTL 2004-G07. NTL No. 2004-N03 and its Attachment defines a new data exchange format on how to submit directional surveys required by 30 CFR 250.461, 468, and 469.

- As a reminder, NTL No. 2002-G12 describes requirements for datums and datum transformations for the GOMR for well data.

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Code of Federal Regulations (CFR)

The Code of Federal Regulations (CFR) (e.g. 30 CFR 250) provides general and permanent rules published in the Federal Register. The Code is divided into 50 tittles (e.g. Title 30 – Mineral Resources) which represent broad areas subject to Federal regulations. Each title is divided into chapters (e.g. Chapter II – Minerals Management Service, Department of the Interior) which usually bear the name of the issuing agency. Each chapter is further sub-divided into parts (e.g. Part 250 – Oil and Gas and Sulfur Operations in the Outer Continental Shelf) covering specific regulatory areas. Title 30 – Mineral Resources – Chapter II – Minerals Management Service (MMS), Department of the Interior, Part 250 – Oil and Gas and Sulphur Operations in the Outer Continental Shelf (OCS) contains regulations for OCS mineral activities. The CFR can be found online at: http://www.gpoaccess.gov/cfr/index.html and 30 CFR 250 can be found online at: http://www.access.gpo.gov/nara/cfr/waisidx_99/30cfr250_99.html.

Who must file?

Any operator of a lease or unit on the Federal OCS who has drilled a well for the purposes of exploration for, or development of, oil or gas resources. This includes wells currently drilling, previously drilled and temporarily abandoned, or previously drilled and completed. 30 CFR 250.468 and 469 specify that directional and vertical-well surveys are required to be submitted.

What Directional Surveys must be conducted?

The regulations at 30 CFR 250.461 contain the following requirements for directional and inclination surveys.

- Inclinational surveys shall be obtained on all vertical wells at intervals not exceeding 1,000 feet during the normal course of drilling.

- Directional surveys giving both inclination and azimuth shall be obtained on all directional wells at intervals not exceeding 500 feet during the normal course of drilling and at intervals not exceeding 100 feet in all portions of the hole when angle-changes are planned.

- On both vertical and directionally drilled wells, directional surveys giving both inclination and azimuth shall be obtained at intervals not exceeding 500 feet prior to or upon setting surface or intermediate casing, liners, and at total depth.

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- A composite dipmeter directional survey or a composite measurement-while-drilling (MWD) directional survey including a listing of the directionally computed inclinations and azimuths on a well classified as vertical will be acceptable as fulfilling the applicable requirements of this paragraph. In the event a composite MWD survey is run, a multi-shot survey shall be obtained at each casing point in order to confirm the MWD results.

- Wells are classified as vertical if the calculated average of inclination readings weighted by the respective interval lengths between readings from surface to drilled depth does not exceed 3 degrees from the vertical. When the calculated average inclination readings weighted by the length of the respective interval between readings from the surface to drilled depth exceeds 3 degrees, the well is classified as directional.

What information must be filed?

According to 30 CFR 250.468(a), "you must submit copies of logs or charts of electrical, radioactive, sonic, and other well-logging operations; directional and vertical-well surveys; velocity profiles and surveys; and analysis of cores to MMS." The MMS may also require additional well reports and records of operations (30 CFR 250.469). Under these authorities, the well records that you must submit to the MMS GOMR include the following:

One digital copy and one paper copy of the final <u>composite</u> directional survey.

- Make sure that the paper copy is comparable to the digital copy.
- Submit these survey results on IBM PC compatible 3.5-inch diskettes or CD ROM coded in ASCII (see Appendix of this Handbook).
- According to 30 CFR 250.461(d) (2), "You must correct all surveys to Universal-Transverse-Mercator-Grid-north or Lambert-Grid-north after making the magnetic-to-true-north correction."
- Please identify the UTM or Lambert zone, show the magnetic and grid corrections used and include a listing of the directionally computed inclinations and azimuths.
- Use the specific formatting for directional data described in the attached Appendix**,** "*Directional Survey Exchange Format".* This is excerpted from NTL No. 2004-N03, Attachment 1.
- We encourage direct submittal of the completed survey from the acquiring service company.

Do not submit copies of separate interim runs to the MMS GOMR. Send final composites only. If your use of more than one vendor prevents the consolidation of the separate surveys within a well, submit the final composite survey from each vendor.

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When must the Survey be submitted?

30 CFR 250.468 allows each Region to specify well records reporting and submission guidelines. NTL No. 2004-G07 defines new procedures for GOMR well records submittal requirements and delinquent dates. It specifies that **directional surveys must be submitted within 30 days of the "Date Operations Completed"** of the last logging run (MWD/LWD or wireline) that you report in Item 13 of the Well Activity Report (Form MMS-133) for each 12-digit wellbore, sidetrack, and/or bypass.

The MMS GOMR recognizes that in certain situations (e.g., borehole or mechanical problems) it is not practical to submit individual sidetrack or bypass data for short penetrated intervals. In those cases, you may request a departure from us for the timely submittal of such data. If you request it, the MMS GOMR Technical Data Management Section (TDMS) Office may grant you a departure under 30 CFR 250.142 for a new required date for submitting the data pertaining to that well.

The MMS will provide reminders and notices or initiate remedies such as issuing Incidents of Non-compliance when the required data are not received in a timely manner.

Where directional surveys, reports and related correspondence must be sent?

Related correspondence, inquiries, and data should be submitted to the appropriate OCS Region at the corresponding address below.

For GOMR data, data files may be sent via email at the discretion of the operator in lieu of mailing. **However, note that the MMS gateway is not encryption-protected at this time.** When digital data submission is sent by E-mail also include the name, address, and telephone number of the person to contact to provide additional information.

Region	Mail Directional Surveys to:	Send comments or questions to:
Gulf of Mexico and Atlantic Region	Minerals Management Service (MS 5020) Technical Data Management Section 1201 Elmwood Park Boulevard New Orleans, Louisiana 70123-2394 Phone: (504) 736-2887 Fax: (504) 736-2857	Keith Welsh 504-736-2539 or Keith.Welsh@mms.gov E-mail: tdms@mms.gov
Alaska Region	Minerals Management Service (MS8200) Office of Field Operations 949 E 36th Avenue, Suite 308 Anchorage, Alaska 99508-4363 Phone: (907) 271-6065	Doug Choromanski 907-271-6448 or Douglas.Choromanski@mms.gov

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Pacific Region	Minerals Management Service (MS 7100) Office of Reservoir Evaluation and Production 770 Paseo Camarillo Camarillo, California 93010 Phone: (805) 389-7700 Fax: (504) 736-2857	Mike Brickey 805-389-7701 or Michael.Brickey@mms.gov E-mail: rep@mms.gov

Amended Reporting and Situations requiring correction.

In the event of an incorrectly identified survey or misidentified survey information, please submit corrected information to the appropriate address cited above with a notation to indicate that information is a corrected copy. Examples of misidentified information may include wrong API number, wrong well name suffix, wrong well bore name, or invalid survey data points, etc.

Related Links:

The Code of Federal Regulations can be found at:
http://www.gpoaccess.gov/cfr/index.html (CFR main link)
http://www.access.gpo.gov/nara/cfr/waisidx_99/30cfr250_99.html (30 CFR 250)

An overview of OCS Regulations and Auxiliary links can be found at:
http://www.gomr.mms.gov/homepg/regulate/regs/reg_sum.html

Notice to Lessees and Information to Lessees and Operators can be found at:
http://www.gomr.mms.gov/homepg/regulate/regs/ntlltl.html

NTL No. 2004-N03 Directional and Inclination Survey Data Submission Requirements
Effective Date: July 26, 2004

NTL No. 2004-G07 Well Records Submittal (pdf file)
Effective Date: April 20, 2004
Note: Attachment 2 has been replaced with NTL No. 2004-N03

NTL No. 2004-G07 Addendum 1 Change of MMS Contractor Receiving Digital Well Log Drilling Records and Additional Well Log Curves to Submit
Effective Date: June 1, 2004

NTL No. 2000-G03 Functional Responsibility of MMS Regulations
Effective Date: January 28, 2000

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[NTL No. 2000-N07 Well Naming and Numbering Standards](#)
Effective Date: May 1, 2001

[NTL No. 2002-G05 Open Hole Log and Survey Information for the Weekly Activity Report](#)
Effective Date: June 11, 2002

[NTL No. 2002-G12 Revised North American Datum 83 Implementation Plan for the Gulf of Mexico](#)
Effective Date: November 4, 2002

NTLs for the Alaska OCS Region can be found at:
http://www.mms.gov/alaska/regs/NTLS.HTM

NTLs for the Pacific OCS Region can be found at:
http://www.mms.gov/omm/pacific/offshore/ntls/ntllist.htm

NOAA National Geodetic Survey links
[National Spatial Reference System: Datums, Networks, Coordinate Systems](#)
[Multi-Purpose Land Information Systems: The Guidebook](#) (pdf format)
[The State Coordinate Systems (A Manual for Surveyors) SP 235](#) (pdf format)

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APPENDIX A

Directional Survey Exchange Format

Specifications for digital reporting of data on diskette or compact disc

- Diskette suitable for any IBM PC computer or compatible 3.5" diskette or compact disc coded in ASCII mode standard as shown in the examples.
- A record consists of 130 bytes, including the carriage-return and line-feed (HEX 'ODOA').
- A file is a group of header records and data records physically separated by an inter-record gap (a blank record) and terminating with a control Z (HEX '1A').
- A file cannot span multiple diskettes or compact discs.
- The diskette or compact disc may contain numerous surveys as long as each file has the appropriate header and data points.
- Label each disk so that its format and content can be readily ascertained. This labeling shall include; MMS assigned unique 12-digit API Number: (e.g. 700123456000), the Well Name/Number (e.g. AA001), the Well Name Sidetrack-Bypass Suffix (e.g. ST01BP01), and Bottom hole Lease Number (e.g. G1000), and the contractor, if available.
- The disk label should identify the name, address, and telephone number of the person to contact should problems occur.

Directional survey report paper copy format

- Per NTL No. 2004-G07, the paper copy must be <u>comparable</u> to the digital copy. Paper copies should be legible.
- Submit directional surveys using the exchange format specified in NTL No. 2004-N03 (supercedes the exchange format in NTL No. 2004-G07).
- Submission dates for paper and digital copies of the directional survey are the same, that is, 30 days after "DATE OPERATIONS COMPLETED" on MMS FORM 133.

Do not submit copies of separate interim runs to the MMS GOMR. Send final <u>composites</u> only. If your use of more than one vendor prevents the consolidation of the separate surveys within a well, submit the final composite survey from each vendor.

Subdivision of content

- A directional survey should contain header records (indicated with an "H"), data records (indicated with a "D"), and terminate with an end-of-file marker.

- Header records should precede the first data record in the file. There should be a set of header records for each borehole with a unique 12-digit API number. The header records should be in a format that consists of the following items. Identify each header record with an "H" as the first character of the record, an MMS header type codes, a blank space, then followed by the relevant data. The "H", space, and header 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. There should be a set of header records for each borehole with a unique 12-digit API number. In addition, enter a <carriage return> after the last column used in each header record in lieu of blank spaces. Do not include any spacing between words in the MMS Column Description as shown in the chart and example below. Insert one blank line, but do not insert any

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data or information between your last header record and the first set of data points.

- Identify each Data record with a "D" as the first character of the record. As many data records as necessary may be used within a file. 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.

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APPENDIX A.1 - EXCHANGE FORMAT FOR DIRECTIONAL SURVEYS

An example of a complete MMS ASCII file is shown Appendix A.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.

UKOOA Type	MMS Type	MMS Item	MMS Format	Description
H0001	H0001	FormatNameVersion	A20	Format Name and Version: MMS-P7/2000_v1.0 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).
	H0112 Added Card	WellNameSuffix	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).
	H0114 Added Card	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	UniqueWellIdentifier	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).

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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 11th and 12th 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 Sounder, 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 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).
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	SurveyCompany	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	SurveyDate	I4,2(I2)	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 20000101.
H0500	H0500	AzimuthReference	A16	North Reference: The geographic reference used to measure azimuths. (T-True,

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				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).
	H0624 Added Card	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).
	H0625 Added Card	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.").

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An example of a complete MMS **ASCII** file is shown Appendix A.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¦ Inclination¦ Azimuth¦ ToolType¦ StationType¦). 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:

UKOOA Column Description	MMS Column Description	Column No.	Format	Data Description
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	F8.2	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: Azimuth	Col 4: Azimuth	20-26	F7.3	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 5: ToolType	28-30	I3	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).

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APPENDIX A.2
EXAMPLE OF AN ASCII FILE FOR DIRECTIONAL SURVEYS
(effective July 26, 2004)

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000000000111111111122222222223333333333444444444455555555556666666666777777777788888888889999999999
9900000000001111111111222222222223
1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567
89012345678901234567890123456789


H0001 FormatNameVersion               MMS-P7/2000_v1.0
H0002 Format Type                     1
H0110 WellName                        AJ001
H0112 WellNameSuffix                  ST01BP00
H0114 BottomHoleLeaseNumber           G 1000
H0130 UniqueWellIdentifier            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
H0624 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 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 12248.00 005.070 241.740    5 E


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9900000000001111111111222222222223
1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567
89012345678901234567890123456789
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