

East (m)	North (m)	RT Elev. [ft] @msl	GL Elev. [ft] @msl
459054.5	9508656.8	49	0

East (m)	North (m)	Elevation [ft] @msl
459054.6	9508672.1	-5

Datum [m amsl] 0.0

Replacement Velocity (constant) [ft/s]	rv=	5000
Seismic Reference Datum from RT (constant) [ft]	d=	49.0
Vertical Distance from RT to Source (constant) [ft]	sz=	54.0
Eastwards Horizontal Offset from Wellhead to Source (constant) [ft]	wse=	0.3
Northwards Horizontal Offset from Well to Source (constant) [ft]	wsn=	50.2

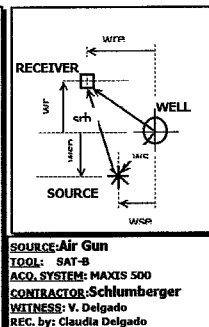
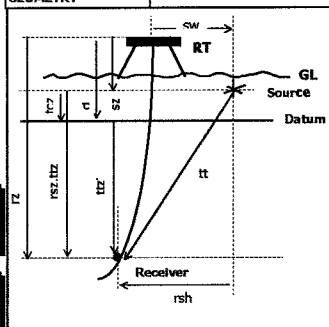
Well to Source
offset: [ft]
50.2Well to Source
azimuth: [deg]
0.4

LO6-23
CHECK-SHOT
FINAL VELOCITY REPORT

Date of run: JUN 7, 2001

Date of report delivery: **JUN 29, 2001**

**GENERAL
GEOMETRY**



DISTRIBUTION
LIST:

- 1.
- 2.
- 3.
- 4.
- 5.

RT: Rotary Table
 FR: Ground Level
 VW : replacement velocity [f/s]
 d : Vertical distance from RT to Datum
 sz : Vertical Distance from RT to Source
 rz : Vertical Distance from RT to Receiver

$$wsh$$
 : Horizontal Distance from Source to Wellhead

wsr : East offset from Source to Wellhead

wsm : North offset from Source to Wellhead

wrr : East offset from Receiver to Wellhead

wrrn : North offset from Receiver to Wallhead

 s_{rh} : Horizontal Distance from Source to R

tt :Travel Time from Source to Receiver

ttz :Vertical Travel Time from Source to Receiver

tez :Vertical Correction Time from Source to Datum

ttz^{*} : Vertical Travel Time from Datum to Source

$$I_{\text{av}} = \text{Interval Velocity}$$

SIGN CONVENTION:

Eastwards, Northwards and Downwards distances are positive.
Downwards time is positive.

NOTE:
Unless it be specified, all distances are in feet from RT.

GEOSCIENCES
Central File

DATE _____

**Vertical Correction
Time from Source to
Datum [ms]**

tcz=	-1.0
------	------

Datum [m amsl]=>	0.0
------------------------	-----

TAKING INTO ACCOUNT MWD DEVIATION DATA

[illegible]

Well coordinates (origin Bogota)

East (m)	North (m)	RT Elev. [ft] @msl	GL Elev. [ft] @msl
459054.5	9508656.8	49	0

Source coordinates (origin Bogota)

East (m)	North (m)	Elevation [ft] @msl
459054.6	9508672.1	-5

Datum [m amsl] 0.0

Replacement Velocity (constant) [ft/s]	rv=	5000
Seismic Reference Datum from RT (constant) [ft]	d=	49.0
Vertical Distance from RT to Source (constant) [ft]	sz=	54.0
Eastwards Horizontal Offset from Wellhead to Source (constant) [ft]	wse=	0.3
Northwards Horizontal Offset from Well to Source (constant) [ft]	wsn=	50.2

Well to Source offset: [ft]
50.2

Well to Source azimuth: [deg]
0.4

PETRO-TECH PERUANA S.A.

LO6-23

CHECK-SHOT

FINAL VELOCITY REPORT

GEOSCIENCES STUDY:

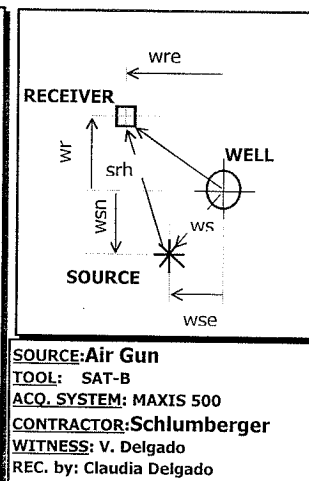
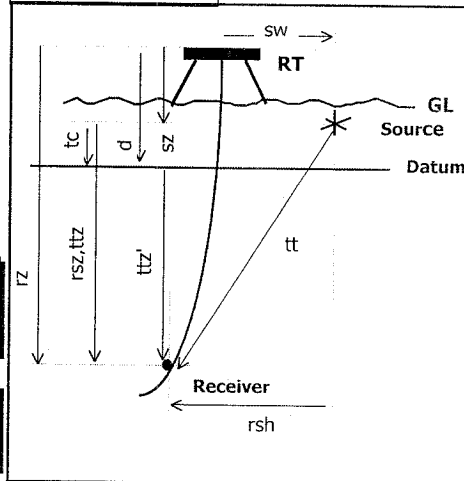
July 2, 2001

Date of run: JUN 7, 2001

SECT. OF GEOLOGIST

Date of report delivery: JUN 29, 2001

GENERAL GEOMETRY



DISTRIBUTION LIST:

- 1.
- 2.
- 3.
- 4.
- 5.

SOURCE: Air Gun
TOOL: SAT-B
ACQ. SYSTEM: MAXIS 500
CONTRACTOR: Schlumberger
WITNESS: V. Delgado
REC. by: Claudia Delgado

DEFINITIONS TABLE

RT: Rotary Table
GL: Ground Level
rv: replacement velocity [ft/s]
d: Vertical distance from RT to Datum
sz: Vertical Distance from RT to Source
rz: Vertical Distance from RT to Receiv.

wsh: Horizontal Distance from Source to Wellhead
wse: East offset from Source to Wellhead
wsn: North offset from Source to Wellhead
wre: East offset from Receiver to Wellhead
wsn: North offset from Receiver to Wellhead
srh: Horizontal Distance from Source to Receiver

tt: Travel Time from Source to Receiver
ttz: Vertical Travel Time from Source to Receiver
tcz: Vertical Correction Time from Source to Datum
ttz: Vertical Travel Time from Datum to Source
av: Average Velocity from Datum
iv: Interval Velocity

SIGN CONVENTION:

Eastwards, Northwards and Downwards distances are positive.
Downwards time is positive.

NOTE:

Unless it be specified, all distances are in feet from RT.

Vertical Correction Time from Source to Datum [ms]	tcz=	-1.0
--	------	------

Datum [m amsl]=>	0.0
------------------	-----

TAKING INTO ACCOUNT MWD DEVIATION DATA

TAKING INTO ACCOUNT MWD DEVIATION DATA

Tops	(Comments)	Receiver Vertical Depth (Deviation Survey) [f]	East Offset from Well to Receiver (Deviation Survey) [f]	North Offset from Well to Receiver (Deviation Survey) [f]	Horizontal Offset from Source to Receiver (computed) [f]	Vertical Offset from Source to Receiver (computed) [f]	* Bad pick (?)	Travel Time from Source to Receiver (measured) [ms]	Vertical Travel Time from Source to Receiver (computed) [ms]	Vertical Travel Time from Datum (computed) [f]	Average Velocity from Datum (computed) [f/s]	Interval Velocity (computed) [f/s]
		r	rz	wre	wrn	srh	srz	tt	ttz	ttz'	av	iv
		498.0	497.99	1.41329	1.56962	48.6	444.0	77.31	76.8	77.8	5,768	544
		499.0	498.99	1.41897	1.57593	48.6	445.0	79.15	78.7	79.7	5,647	8,422
		1000.0	999.95	5.69857	6.32889	44.2	946.0	138.32	138.2	139.2	6,833	8,481
		1575.0	1574.82	13.78571	15.17322	37.5	1520.8	206.01	206.0	207.0	7,373	7,897
		2000.0	1989.37	-30.49302	-54.15422	108.8	1935.4	258.85	258.4	259.4	7,479	8,619
		2492.0	2427.79	-148.23744	-242.23157	328.0	2373.8	312.25	309.3	310.3	7,666	10,324
		2999.0	2876.66	-282.00555	-436.16913	562.4	2822.7	359.73	352.8	353.8	9,504	10,155
		3595.0	3411.35	-420.89294	-659.80939	825.6	3357.3	417.52	405.4	406.4	9,534	12,621
		4160.0	3923.98	-542.50055	-863.77148	1063.0	3870.0	462.58	446.1	447.1	9,679	13,019
		4646.0	4376.02	-629.05328	#####	1241.1	4322.0	500.21	480.8	481.8	10,302	12,143
		5311.0	5012.33	-720.49695	#####	1433.7	4958.3	555.03	533.2	534.2	9,713	13,088
		5553.0	5237.73	-770.95319	#####	1521.1	5183.7	573.61	550.4	551.4	9,963	11,755
		5892.0	5542.62	-861.37799	#####	1667.8	5488.6	602.36	576.3	577.3	10,211	12,549
		6342.0	5944.24	-980.62622	#####	1870.1	5890.2	638.27	608.3	609.3	9,675	12,129
		6799.0	6354.13	-1083.19910	#####	2072.1	6300.1	675.98	642.1	643.1	9,804	11,648
		7300.0	6802.18	-1227.10000	#####	2293.9	6748.2	718.85	680.6	681.6	9,908	10,762
		7782.0	7231.29	-1368.50000	#####	2511.2	7177.3	763.30	720.5	721.5	9,955	14,870
		8083.0	7490.39	-1455.30000	#####	2664.4	7436.4	783.83	737.9	738.9	10,071	10,581
		8263.0	7648.90	-1503.60000	#####	2749.6	7594.9	800.70	752.9	753.9	10,081	14,231
		8841.0	8177.20	-1627.90000	#####	2983.4	8123.2	841.60	790.0	791.0	10,276	10,969
		9000.0	8325.30	-1656.10000	#####	3041.3	8271.3	856.10	803.5	804.5	10,287	10,294

CENTRAL FILE
Geosciences

STUDY:

GEOSCIENCES

MAP
SLOT
GEOLOGICAL

Mario Chavez

From: Emilio Sopprani [esopprani@bogota.oilfield.slb.com]
Sent: Friday, June 29, 2001 5:07 PM
To: chavez@petro-tech.com.pe; vilca@petro-tech.com.pe; Pedro Blondet; Jose Martinez; Jose Vasquez
Subject: Resultados Sismica para LO6-23



Lobo-6-23.xls

Señores

Adjunto sirvanse encontrar los resultados (Tabla de Verticalizaciones de Tiempo) para el pozo de la referencia.
Tan pronto se tengan los PDS files les seran enviados.
Por favor no duden en contactarse con nosotros (Jose Martinez) sobre cualquier duda al respecto.

Muchas Gracias

Emilio Sopprani
DCS - PCE

GEOSCIENCES STUDY:	
MAP	OF
Sect.	OF
GEOLOGIST	

Well File

LO6-23

Schlumberger

Survey Report - Standard

Report Date: 09-Jun-2001	Survey / DLS Computation Method: Minimum Curvature / Lubinski
Client: Petro-Tech Peruana S.A.	Vertical Section Azimuth: 213.800°
Field: Lobitos	Vertical Section Origin: N 0.000 ft, E 0.000 ft
Structure / Slot: Platform LO6 (WGS84) / Slot #23	TVD Reference Datum: KB
Well: Well LO6-23	TVD Reference Elevation: 50.000 ft relative to MSL
Borehole: Borehole LO6-23	Sea Bed / Ground Level Elevation: 0.000 ft relative to MSL
UWI / API#:	Magnetic Declination: +1.516°
Survey Name / Date: LO6-23 MWD Survey / May 10, 2001	Total Field Strength: 28875.250 nT
Tort / AHD / DDI / ERD ratio: 103.371° / 3050.76 ft / 5.533 / 0.366	Magnetic Dip: 14.828°
Grid Coordinate System: UTM Zone 17S - WGS84, Meters	Declination Date: May 10, 2001
Location Lat / Long: S 4 26 42.554, W 81 22 8.641	Magnetic Declination Model: BGM 2000
Location Grid N/E Y/X: N 9508656.830 m, E 459054.520 m	North Reference: True North
Grid Convergence Angle: +0.02860485°	Total Corr Mag North -> True North: +1.516°
Grid Scale Factor: 0.99962075	Local Coordinates Referenced To: Well Head

Station ID	MD (ft)	Incl (°)	Azim (°)	TVD (ft)	VSec (ft)	N/S (ft)	E/W (ft)	Closure (ft)	at Azim (°)	DLS (°/100ft)	TF (°)
Tie-In	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		42.0 M
13 3/8" shoe @ 1500'	1537.00	1.50	42.00	1536.82	-19.91	14.95	13.46	20.12	42.00	0.10	-148.8 M
	1681.00	5.60	211.20	1680.64	-14.75	10.34	11.08	15.15	46.99	4.92	2.9 G
	1745.00	9.60	212.40	1744.06	-6.29	3.16	6.60	7.32	64.45	6.25	10.1 G
	1837.00	14.60	215.90	1833.99	12.97	-12.72	-4.32	13.44	198.73	5.49	-3.1 G
	1901.00	17.40	215.40	1895.51	30.60	-27.06	-14.59	30.74	208.33	4.38	-56.9 G
	1962.00	18.70	209.60	1953.51	49.48	-43.00	-24.71	49.59	209.88	3.63	-51.5 G
	1993.00	19.70	206.00	1982.79	59.61	-52.02	-29.45	59.78	209.52	5.00	0.0 G
	2056.00	22.40	206.00	2041.58	82.03	-72.35	-39.37	82.37	208.55	4.29	37.8 G
	2119.00	25.30	211.10	2099.20	107.37	-94.68	-51.59	107.82	208.59	5.64	16.4 G
	2182.00	28.20	212.90	2155.45	135.71	-118.71	-66.63	136.13	209.31	4.78	25.5 G
	2245.00	28.40	213.10	2210.92	165.58	-143.76	-82.90	165.95	209.97	0.35	-102.3 G
	2338.00	28.30	212.10	2292.76	209.73	-180.96	-106.69	210.07	210.52	0.52	59.7 G
	2400.00	28.70	213.50	2347.25	239.30	-205.82	-122.72	239.63	210.80	1.26	75.2 G
	2463.00	29.00	215.70	2402.43	269.69	-230.84	-139.98	269.97	211.23	1.75	78.8 G
	2524.00	29.10	216.70	2455.76	299.29	-254.74	-157.47	299.48	211.72	0.81	-146.3 G
	2587.00	28.60	216.00	2510.94	329.66	-279.22	-175.49	329.79	212.15	0.96	-139.0 G
	2697.00	27.60	214.10	2607.98	381.45	-321.63	-205.25	381.54	212.55	1.22	-125.9 G
	2791.00	27.50	213.80	2691.32	424.92	-357.69	-229.53	425.00	212.69	0.18	180.0 G
	2949.00	26.70	213.80	2831.97	496.90	-417.50	-269.57	496.97	212.85	0.51	-127.1 G

CENTRAL FILE
Geosciences

3106.00	26.40	212.90	2972.41	567.07	-476.12	-308.15	567.14	212.91	0.32	-99.2 G
3263.00	26.30	211.40	3113.10	636.72	-535.11	-345.24	636.81	212.83	0.43	-132.4 G
3421.00	26.10	210.90	3254.87	706.40	-594.81	-381.32	706.54	212.66	0.19	131.0 G
3579.00	25.80	211.70	3396.94	775.48	-653.89	-417.24	775.66	212.54	0.29	-147.1 G
3704.00	25.60	211.40	3509.57	829.64	-700.08	-445.60	829.86	212.48	0.19	-142.4 G
3830.00	25.00	210.30	3623.49	883.42	-746.30	-473.22	883.69	212.38	0.60	152.6 G
3988.00	24.60	210.80	3766.92	949.58	-803.38	-506.90	949.93	212.25	0.29	-168.6 G
4113.00	23.80	210.40	3880.93	1000.74	-847.48	-532.99	1001.15	212.17	0.65	-161.0 G
4270.00	22.90	209.60	4025.07	1062.83	-901.37	-564.10	1063.33	212.04	0.61	-171.5 G
4426.00	21.20	208.90	4169.66	1121.21	-952.45	-592.73	1121.83	211.89	1.10	-169.6 G
4581.00	19.90	208.20	4314.79	1175.39	-1000.24	-618.74	1176.15	211.74	0.85	180.0 G
4739.00	18.50	208.20	4464.00	1227.10	-1046.03	-643.30	1228.01	211.59	0.89	174.9 G
4896.00	16.30	208.90	4613.81	1273.85	-1087.28	-665.72	1274.89	211.48	1.41	-165.0 G
5036.30	15.60	208.20	4748.70	1312.24	-1121.14	-684.15	1313.40	211.39	0.52	0.0 G
5099.33	15.70	208.20	4809.40	1329.16	-1136.12	-692.18	1330.37	211.35	0.16	0.0 G
5162.10	16.10	208.20	4869.77	1346.27	-1151.28	-700.31	1347.54	211.31	0.64	-26.5 G
5225.00	16.50	207.50	4930.14	1363.83	-1166.89	-708.55	1365.17	211.27	0.71	22.3 G
5274.00	17.00	208.20	4977.06	1377.88	-1179.37	-715.15	1379.26	211.23	1.10	11.9 G
5346.00	19.20	209.60	5045.49	1400.16	-1198.95	-725.97	1401.61	211.20	3.11	44.3 G
5478.00	22.80	218.10	5168.73	1447.34	-1237.97	-752.49	1448.73	211.29	3.57	110.6 G
5507.00	22.70	218.80	5195.48	1458.52	-1246.75	-759.46	1459.85	211.35	1.00	17.3 G
5538.60	23.60	219.50	5224.53	1470.89	-1256.38	-767.31	1472.16	211.41	2.98	-110.7 G
5597.00	23.30	217.40	5278.11	1494.05	-1274.58	-781.76	1495.23	211.52	1.52	72.9 G
5629.00	23.40	218.20	5307.49	1506.70	-1284.60	-789.53	1507.83	211.58	1.04	-18.3 G
5660.00	24.40	217.40	5335.83	1519.23	-1294.53	-797.23	1520.32	211.63	3.39	-9.1 G
5723.00	26.63	216.60	5392.68	1546.32	-1316.20	-813.55	1547.34	211.72	3.58	22.7 G
5753.00	27.63	217.50	5419.38	1559.98	-1327.12	-821.80	1560.96	211.77	3.60	58.9 G
5799.00	27.80	218.10	5460.10	1581.32	-1344.02	-834.91	1582.24	211.85	0.71	180.0 G
5862.00	27.30	218.10	5515.96	1610.38	-1366.95	-852.89	1611.20	211.96	0.79	180.0 G
5957.00	27.20	218.10	5600.42	1653.75	-1401.18	-879.73	1654.46	212.12	0.11	-115.9 G
6051.00	26.90	216.70	5684.13	1696.41	-1435.14	-905.69	1697.03	212.26	0.75	-119.4 G
6145.00	26.70	215.90	5768.04	1738.75	-1469.29	-930.79	1739.31	212.35	0.44	-99.7 G
6240.00	26.60	214.50	5852.95	1781.35	-1504.11	-955.35	1781.86	212.42	0.67	-108.4 G
6335.00	26.40	213.10	5937.97	1823.73	-1539.33	-978.93	1824.24	212.45	0.69	-108.8 G
6428.00	26.10	211.00	6021.38	1864.84	-1574.19	-1000.76	1865.36	212.45	1.05	90.0 G
6459.00	26.10	211.10	6049.22	1878.47	-1585.87	-1007.79	1879.00	212.44	0.14	-90.0 G
6490.00	26.10	210.30	6077.05	1892.08	-1597.60	-1014.75	1892.63	212.42	1.14	-90.0 G
6516.00	26.10	209.60	6100.40	1903.50	-1607.51	-1020.46	1904.06	212.41	1.18	0.0 G
6540.00	26.10	209.60	6121.96	1914.03	-1616.69	-1025.68	1914.60	212.39	0.00	0.0 G
6572.00	26.20	209.60	6150.68	1928.09	-1628.95	-1032.64	1928.69	212.37	0.31	90.0 G
6603.00	26.20	209.90	6178.50	1941.74	-1640.84	-1039.44	1942.36	212.35	0.43	-24.0 G

	6664.00	26.40	209.70	6233.18	1968.70	-1664.29	-1052.87	1969.36	212.32	0.36	-146.5 G
	6700.00	26.20	209.40	6265.45	1984.61	-1678.17	-1060.73	1985.30	212.30	0.67	-65.9 G
	6729.00	26.30	208.90	6291.46	1997.40	-1689.37	-1066.98	1998.10	212.28	0.84	83.0 G
	6791.00	26.60	213.20	6346.98	2024.96	-1713.01	-1081.22	2025.69	212.26	3.13	96.9 G
	6885.00	26.40	219.40	6431.12	2066.81	-1746.77	-1106.01	2067.48	212.34	2.95	-155.0 G
	6916.00	25.84	218.80	6458.95	2080.40	-1757.36	-1114.62	2081.04	212.39	2.00	0.0 G
	6979.00	26.30	218.80	6515.54	2107.98	-1778.94	-1131.97	2108.55	212.47	0.73	19.6 G
	7011.00	27.20	219.50	6544.12	2122.32	-1790.11	-1141.07	2122.86	212.51	2.98	58.4 G
	7043.00	27.40	220.20	6572.55	2136.92	-1801.38	-1150.47	2137.41	212.56	1.18	126.1 G
	7074.00	27.30	220.50	6600.09	2151.07	-1812.23	-1159.69	2151.53	212.62	0.55	-164.9 G
	7105.00	26.80	220.20	6627.70	2165.07	-1822.97	-1168.82	2165.50	212.67	1.67	122.8 G
	7136.00	26.60	220.90	6655.39	2178.90	-1833.56	-1177.87	2179.29	212.72	1.20	122.9 G
	7167.00	26.40	221.60	6683.14	2192.62	-1843.96	-1186.99	2192.97	212.77	1.20	134.4 G
	7198.00	26.10	222.30	6710.94	2206.19	-1854.16	-1196.16	2206.51	212.83	1.39	0.0 G
	7230.00	26.40	222.30	6739.64	2220.19	-1864.62	-1205.68	2220.47	212.89	0.94	38.4 G
	7262.00	26.80	223.00	6768.25	2234.35	-1875.16	-1215.39	2234.59	212.95	1.59	180.0 G
	7293.00	26.70	223.00	6795.93	2248.12	-1885.37	-1224.91	2248.33	213.01	0.32	-46.8 G
	7388.00	27.00	222.30	6880.69	2290.52	-1916.92	-1253.98	2290.65	213.19	0.46	-134.3 G
	7482.00	26.40	220.90	6964.67	2332.36	-1948.50	-1282.02	2332.43	213.34	0.92	-134.4 G
	7576.00	26.10	220.20	7048.98	2373.64	-1980.09	-1309.05	2373.68	213.47	0.46	-30.3 G
	7670.00	27.20	218.80	7132.99	2415.60	-2012.63	-1335.86	2415.61	213.57	1.35	-23.5 G
	7764.00	29.60	216.70	7215.67	2460.19	-2047.99	-1363.20	2460.20	213.65	2.77	-26.8 G
	7796.00	30.30	216.00	7243.40	2476.15	-2060.86	-1372.67	2476.16	213.67	2.44	-39.1 G
Start Multishot Survey	7880.00	31.40	214.30	7315.51	2519.21	-2096.08	-1397.45	2519.21	213.69	1.67	176.8 G
	7973.00	30.50	214.40	7395.27	2567.04	-2135.57	-1424.44	2567.04	213.70	0.97	-149.9 G
	8068.00	29.90	213.70	7477.38	2614.82	-2175.16	-1451.20	2614.82	213.71	0.73	175.4 G
	8162.00	28.70	213.90	7559.35	2660.82	-2213.39	-1476.79	2660.83	213.71	1.28	155.2 G
	8256.00	26.50	216.20	7642.65	2704.35	-2249.05	-1501.77	2704.35	213.73	2.60	-164.1 G
	8351.00	25.30	215.40	7728.11	2745.82	-2282.70	-1526.04	2745.82	213.76	1.32	-108.8 G
	8445.00	24.90	212.40	7813.23	2785.68	-2315.78	-1548.28	2785.68	213.77	1.42	-174.2 G
	8539.00	24.10	212.20	7898.77	2824.65	-2348.73	-1569.11	2824.65	213.75	0.86	-150.5 G
	8633.00	23.20	210.90	7984.88	2862.33	-2380.86	-1588.85	2862.33	213.72	1.11	-143.0 G
	8727.00	22.40	209.30	8071.53	2898.68	-2412.37	-1607.12	2898.68	213.67	1.08	-168.1 G
	8822.00	21.70	208.90	8159.58	2934.22	-2443.53	-1624.47	2934.23	213.62	0.75	180.0 G
	8916.00	21.20	208.90	8247.07	2968.47	-2473.62	-1641.08	2968.49	213.56	0.53	27.4 G
	9010.00	21.70	209.60	8334.56	3002.73	-2503.61	-1657.88	3002.77	213.51	0.60	---

Survey Error Model: Wolff & deWardt 1.0000 sigma
Surveying Programme:
MD From (ft) MD To (ft) EOU Freq Survey Tool Type
0.00 9010.00 Act-Stns Anadrill MWD