

Expertest Seismic Services



VELOCITY SURVEY

**NARINGAL #1
SEISMIC LINE
VICTORIA**

for

SANTOS

recorded by

EXPERTEST Pty. Ltd.

processed by

EXPERTEST Pty. Ltd.

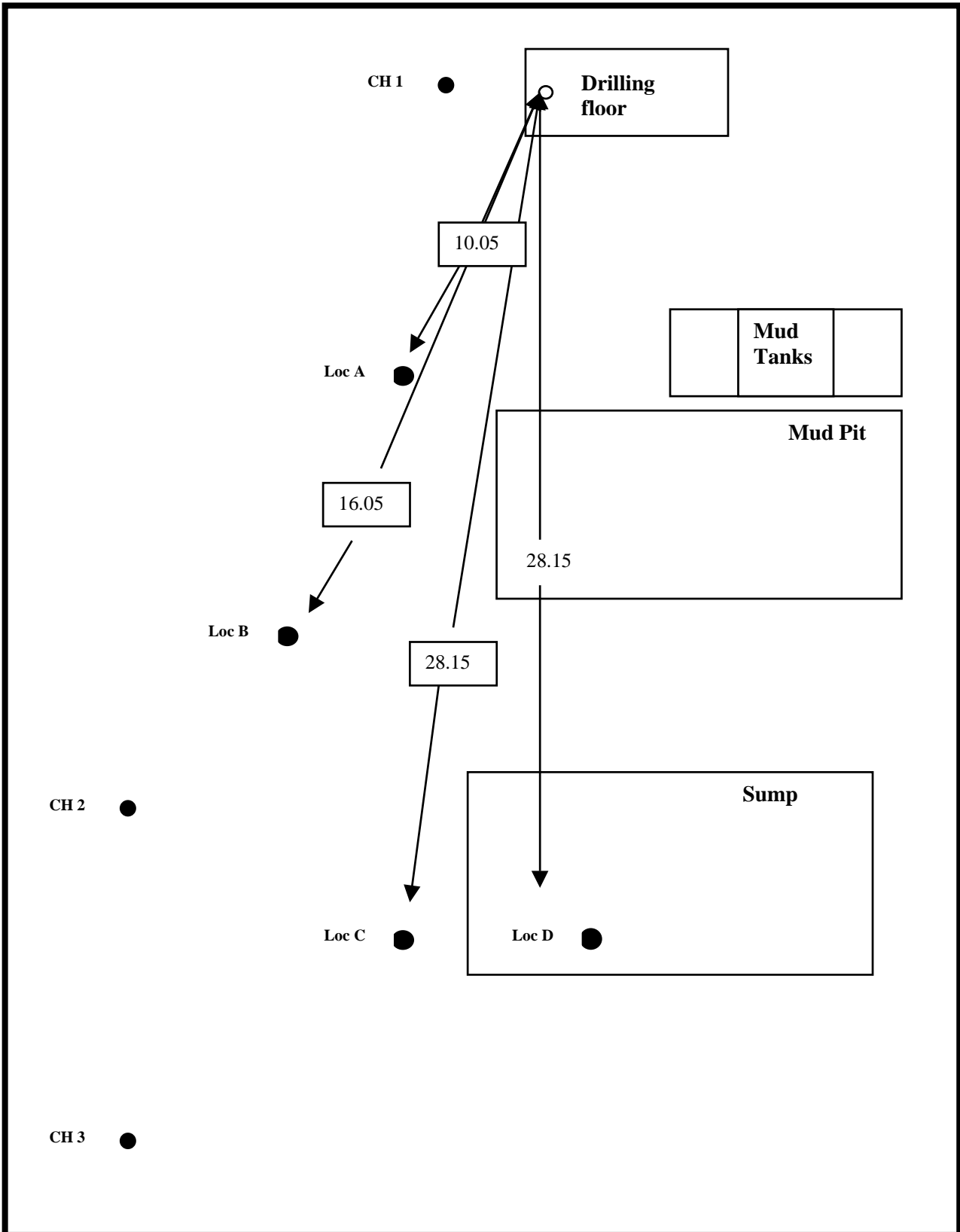
Brisbane, Australia

06-06-2003

Velpro 1.0

CONTENTS

SUMMARY	...	...	...	3
GENERAL INFORMATION	...	...	...	3
EQUIPMENT	...	...	...	4
RECORDING	...	...	...	5
PROCESSING				
Elevation Data	...	...	...	6
Shot Location Data	...	...	...	6
Recorded Data	...	...	...	6
Correction for Instrument				
Delay and Shot Offset	...	...	...	7
Calibration of Sonic Log				
Method	...	...	...	7
Results	...	...	...	8
Trace Playouts	...	...	...	8
FIGURES				
Figure 1	Shot Location Sketch	...	...	2
Figure 2	Time – Depth Curve	...	...	16
Figure 3	Velocity Curves	...	...	17
Figure 4	Trace Playouts	...	...	18
TABLES				
Table 1	Corrections for pit Fatigue	...	...	9
Table 2	Correction for shot Offset	...	...	10
Table 3	Checkshot – Sonic Deviation	...	...	12
Table 4	Time – Depth Curve Values	...	...	13



NARINGAL #1

SHOT POINT LOCATION SKETCH

SANTOS

Figure 1

SUMMARY

Expertest Pty. Ltd. conducted a velocity survey for SANTOS in the NARINGAL #1 well, VICTORIA. The date of the survey was the Thursday, 31 January 2002.

The results of the survey, which are considered to be reliable, have been used to calibrate the Sonic Log.

The energy source used was Powergel

GENERAL INFORMATION

Name of Well : NARINGAL #1

Coordinates : Latitude 38° 27' 18.32"S
: Longitude 142° 44' 22.33"E

Location : OTWAY BASIN, Seismic Line

Date of Survey : Thursday, 31 January 2002

Wireline Logging : Reeves Wireline

Weather : FINE

Operational Base : Brisbane

Operator : S BAGGOTT

Shooter : R.SOROCZYNSKI

Client Representative : DUNCAN NEW

EQUIPMENT

Downhole Tool

Veldata Camlock Tool 100 (90 mm dia.)

Sensors:

6 HIS 4.5Hz, 215 ohm, high temperature (300° F)
detectors, connected in series – parallel.
Frequency response, 8 – 300 Hz, within 3 dB

Preamplifier:

48 dB fixed gain.
Frequency response, 8 – 200 Hz, within 3 dB

Reference Geophone:

Mark Products L1, 4.5 Hz

Recording Instrument

System ID, VDLS 16 Recording system

Windows based high resolution seismic acquisition system

Computer	: Pentium™ portable computer
Resolution	: A/D conversion, 16 bit
Dynamic Range	: 96 dB
Total Gain	: 134.dB
Data Channels	: 8 maximum
Display	: A4 inkjet printer, 300 DPI

RECORDING

Energy Source : POWERGEL

Shot Location : Mud Pit

Charge Size : 1

D & E Shot Depth : 0.5

Mud Pit Shot Offset : 28.15 METRES bearing 30°.

Recording Geometry : see Figure 1 "Shot Point Location Sketch"

Shots were recorded on 3 ½ " floppy disk. Print outs of the shots used are included with this report.

The sample rate was 500 uSec across the entire survey.

Channel Allocation

Channel 1 : Auxiliary ch.1, surface channel

Channel 2 : Auxiliary ch. 2, surface channel

Channel 3 : Time Break Confirmation

Channel 4 : Downhole Geophone

PROCESSING

Elevation Data

Elevation of KB : 54 METRES above sea level
Elevation of Ground : 49 METRES above sea level
Elevation of Datum : 0 METRES above sea level
Depth Surveyed : 1680 METRES below KB
Depth of Casing : 378 METRES below KB
Sonic Log Interval : 370 to 1695 METERS below KB

Shot Location Data

Shot A : Elevation	49	Offset	10.05	METRES
Shot B : Elevation	49	Offset	16.05	METRES
Shot C : Elevation	49	Offset	28.15	METRES
Shot D : Elevation	47.5	Offset	28.15	METRES

Instrument Delay : 2.5 MSec
Surface Velocity : 1000 m/sec

Recorded Data

Number of shots recorded	: 31
Number of shots processed	: 31
Number of levels recorded	: 21
Data quality	: good
Noise levels	: low

Correction for Instrument Delay and Shot Offset

The first arrival times from the auxiliary surface channel was used to calculate pit fatigue corrections, which were then applied to the times recorded for the downhole channel. These pit fatigue corrections are shown in TABLE 1.

TABLE 2 shows the corrections for instrument delay and for shot offset. The one-way vertical datum to geophone times (T(gd)) shown in TABLE 2 were used to calibrate the sonic log. The corrected times (T(corr)) shown in TABLE 2 are the recorded times plus any corrections for pit fatigue. The one-way vertical surface to geophone times (T(vert)) in TABLE 2 have been obtained by

- Subtraction of the instrument delay from the corrected first arrival time
- Geometric corrections to give vertical times, and correct for shot offset
- Shot static correction to correct for the depth of the shot below ground level at the wellhead using a correction velocity of 1000 m/sec

The one-way vertical geophone to datum time (T(gd)) was then obtained by subtracting the surface to datum time of 29.0 msec from T(vert). The one-way vertical geophone to datum times were used to plot the Time – Depth Curve, Figure 2.

Calibration of Sonic Log – Method

Sonic times were adjusted to checkshot times using a polynomial derived least squares fit correction to the sonic transient times. The section of sonic log inside casing was excluded from the calibration.

Differences between the shot and sonic times occur as the sonic tool measures the local velocity characteristics of the formation with a relatively high frequency signal, whereas the downhole geophone records the bulk velocity with a signal of significantly lower frequency.

Calibration of Sonic Log – Results

The discrepancies between shot and sonic interval velocities were generally small. Checkshot intervals of less than 15 or 20m tend to yield anomalous interval times, however the results are quite consistent, as can be seen in TABLE 3. The largest discrepancy of 12.41 $\mu\text{sec} / \text{m}$ occurred over the interval 965 to 1013 m.

The total sonic drift over the well was 20.3 msec.

The calibrated sonic times were then used to calculate the average, Interval and RMS velocities and to plot the velocity curves. TABLE 4 shows the velocities calculated from the calibrated sonic times, and these velocities are plotted in figure 3.

Trace Playouts

Figure 4A is a shot order plot of all raw data traces used

Figure 4B is a depth order plot of selected data traces

Figure 4C is a plot of the auxiliary surface channels 1 & 2

Figure 4D is a plot of the Time Break Confirmation, Channel 3.

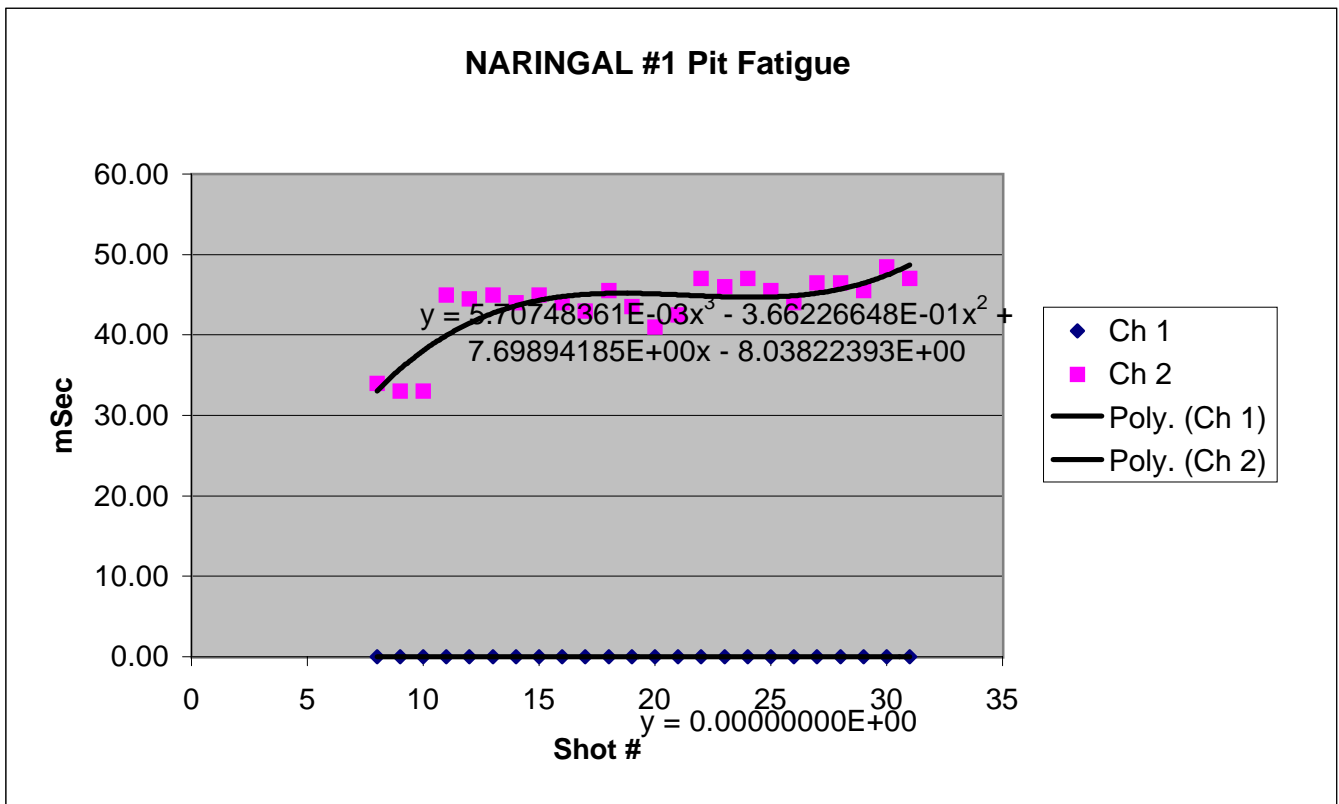
TABLE 1

Corrections for Pit Fatigue

WELL: NARINGAL #1

CLIENT: SANTOS

Shot #	First break Ch 1	First break Ch 2	Ch 1 Correction	Ch 2 Correction	Correction, msec
8	0.00	34.00	0.00	-0.96	-0.50
9	0.00	33.00	0.00	2.75	1.50
10	0.00	33.00	0.00	5.04	2.50
11	0.00	45.00	0.00	-5.07	-2.50
12	0.00	44.50	0.00	-3.03	-1.50
13	0.00	45.00	0.00	-2.30	-1.00
14	0.00	44.00	0.00	-0.37	0.00
15	0.00	45.00	0.00	-0.69	-0.50
16	0.00	44.00	0.00	0.77	0.50
17	0.00	43.00	0.00	2.05	1.00
18	0.00	45.50	0.00	-0.33	0.00
19	0.00	43.50	0.00	1.68	1.00
20	0.00	41.00	0.00	4.11	2.00
21	0.00	42.50	0.00	2.49	1.00
22	0.00	47.00	0.00	-2.14	-1.00
23	0.00	46.00	0.00	-1.25	-0.50
24	0.00	47.00	0.00	-2.31	-1.00
25	0.00	45.50	0.00	-0.78	-0.50
26	0.00	44.00	0.00	0.88	0.50
27	0.00	46.50	0.00	-1.31	-0.50
28	0.00	46.50	0.00	-0.80	-0.50
29	0.00	45.50	0.00	0.93	0.50
30	0.00	48.50	0.00	-1.07	-0.50
31	0.00	47.00	0.00	1.72	1.00



COMPANY : SANTOS

WELL : NARINGAL #1

SURVEY DATE : Thursday, 31 January 2002

Velocity Data Pty. Ltd.

Elevations : datum 0.0
 gl 49.0
 kb 54.0

Latitude: 38° 27' 18.30" S
Longitude: 142° 44' 22.33" E

Shot Data : elevation offset
 shot a 49.0 10.1
 shot b 49.0 16.1
 shot c 49.0 28.2
 shot d 47.5 28.2

Survey units : METRES
Times: mSec

Energy source : POWERGEL
Rig identification : ODE 30
Logger : SBAGGOTT

Instrument delay: 2.50
Surface velocity: 1000.00

Time to datum: 29.00

TABLE 2

Corrections for shot offset

WELL: NARINGAL #1

CLIENT: SANTOS

Time to Datum : 29.00 mSec

shot #	shot location		geophone depth		T(rec)	T(corr)	T(vert)	T(gd)	T(gd)		Check shot		Velocities	
	depth		kb	datum					Average	Interval	distance	time	Average	Interval	RMS
2	A	0.5	54.0	0.0	33.0	33.0	32.9	0.0			0.0			
1	A	0.5	54.0	0.0	33.0	33.0	32.9	0.0						
3	B	0.5	54.0	0.0	31.5	31.5	30.5	0.0						
5	C	0.5	54.0	0.0	36.0	36.0	32.0	0.0						
4	C	0.5	54.0	0.0	36.0	36.0	32.0	0.0						
7	D	0.5	54.0	0.0	37.0	37.0	34.1	0.0						
6	D	0.5	54.0	0.0	36.0	36.0	28.5	29.0	29.0					
31	D	0.6	215.0	161.0	112.5	112.5	109.0	80.6	80.6	161.0	80.6	1997.5	1997.5	1997.5
8	D	0.6	385.0	331.0	191.5	191.5	188.5	160.1	160.1	170.0	79.5	2067.7	2138.8	2068.9
30	D	0.5	435.0	381.0	219.0	218.5	215.5	187.0	187.0	50.0	27.0	2037.0	1854.8	2039.4
29	D	1.0	658.0	604.0	320.5	321.0	318.2	290.2	290.2	223.0	103.2	2081.2	2161.5	2083.6
28	D	0.5	729.0	675.0	349.5	349.5	346.7	318.2	318.2	71.0	28.0	2121.0	2532.6	2127.0
27	D	0.5	780.0	726.0	369.0	369.0	366.3	337.8	337.8	51.0	19.5	2149.4	2612.6	2158.0
26	D	1.0	900.0	846.0	409.0	410.0	407.3	379.3	379.3	120.0	41.5	2230.4	2888.7	2249.6
25	D	0.8	1019.0	965.0	453.5	453.5	450.8	422.6	422.6	119.0	43.3	2283.6	2749.6	2305.8
24	D	0.5	1067.0	1013.0	473.0	472.0	469.3	440.8	440.8					
10	D	0.9	1067.0	1013.0	472.5	472.5	469.8	441.7	441.7					
9	D	0.8	1067.0	1013.0	472.5	472.5	469.8	441.6	441.4	48.0	18.8	2295.0	2552.0	2316.9
23	D	0.8	1215.0	1161.0	522.5	522.0	519.4	491.1	491.1	148.0	49.7	2364.0	2976.4	2391.9
22	D	0.5	1367.0	1313.0	575.0	574.0	571.4	542.9	542.9	152.0	51.8	2418.5	2936.1	2449.0
21	D	1.5	1440.0	1386.0	595.5	596.5	593.9	566.4	566.4	73.0	23.5	2447.0	3105.4	2479.7
20	D	1.5	1490.0	1436.0	608.5	610.0	607.4	579.9	579.9	50.0	13.5	2476.3	3702.3	2515.0
19	D	1.0	1527.0	1473.0	622.5	622.5	619.9	591.9	591.9	37.0	12.0	2488.6	3082.5	2527.8
18	D	0.6	1545.0	1491.0	631.0	630.0	627.4	599.0	599.0	18.0	7.1	2489.1	2534.8	2527.8
17	D	1.0	1570.0	1516.0	635.5	636.0	633.4	605.4	605.4	25.0	6.4	2504.1	3904.8	2546.3
16	D	1.0	1578.0	1524.0	638.5	638.5	635.9	607.9	607.9					
11	D	0.8	1578.0	1524.0	640.0	640.0	637.4	609.2	608.6	8.0	3.2	2504.3	2539.2	2546.3
15	D	0.8	1591.0	1537.0	644.0	643.5	640.9	612.7	612.7	13.0	4.1	2508.7	3169.9	2550.9
14	D	0.9	1610.0	1556.0	650.0	650.0	647.4	619.3	616.0	19.0	3.3	2526.0	5713.1	2578.5
13	D	0.8	1680.0	1626.0	670.0	669.5	666.9	638.7	638.7					
12	D	0.8	1680.0	1626.0	670.0	670.0	667.4	639.2	638.9	70.0	23.0	2544.8	3049.3	2596.8

TABLE 3

Checkshot / Sonic Deviation Data

WELL :

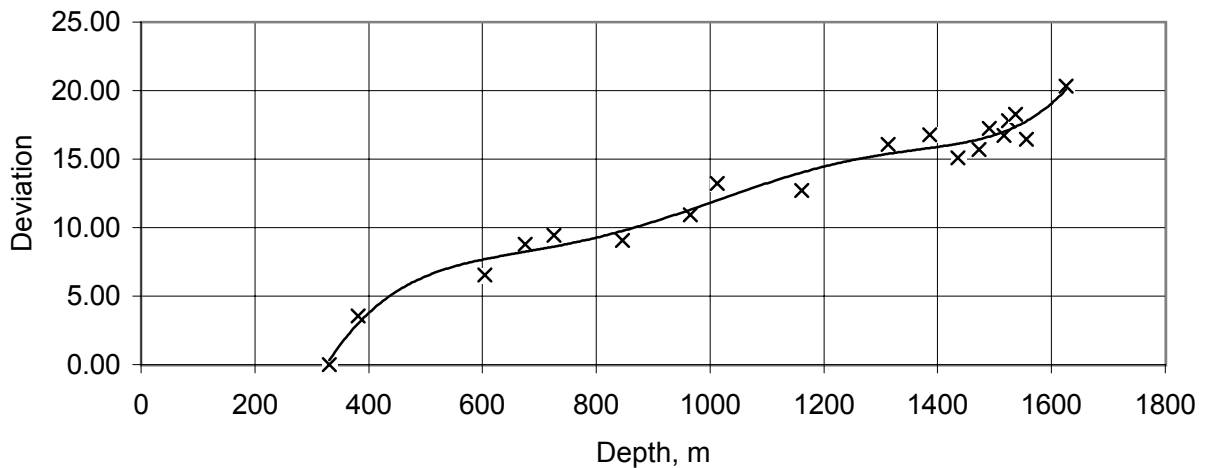
NARINGAL #1

CLIENT:

SANTOS

Depth m(datum)	T(Sonic) datum, mSec	T(Checkshot) datum, mSec	Deviation Shot-Sonic	Sonic Interval mSec	Shot Interval mSec	Interval Correction mSec	Cumulated Correction
331	160.09	160.09	0.00				0.00
381	183.49	187.04	3.55	23.40	26.96	3.55	3.55
604	283.65	290.21	6.56	100.16	103.17	3.01	6.56
675	309.44	318.25	8.80	25.79	28.03	2.25	8.80
726	328.35	337.77	9.42	18.91	19.52	0.61	9.42
846	370.23	379.31	9.08	41.88	41.54	-0.33	9.08
965	411.65	422.59	10.93	41.43	43.28	1.85	10.93
1013	428.15	441.40	13.24	16.50	18.81	2.31	13.24
1161	478.41	491.12	12.71	50.26	49.72	-0.53	12.71
1313	526.81	542.89	16.08	48.39	51.77	3.38	16.08
1386	549.64	566.40	16.75	22.84	23.51	0.67	16.75
1436	564.82	579.90	15.08	15.18	13.51	-1.67	15.08
1473	576.20	591.90	15.70	11.38	12.00	0.62	15.70
1491	581.77	599.01	17.23	5.57	7.10	1.53	17.23
1516	588.67	605.41	16.74	6.90	6.40	-0.50	16.74
1524	590.77	608.56	17.79	2.10	3.15	1.05	17.79
1537	594.38	612.66	18.28	3.61	4.10	0.49	18.28
1556	599.55	615.99	16.44	5.17	3.33	-1.84	16.44
1626	618.63	638.94	20.31	19.08	22.96	3.87	20.31

$y = 2.28299613E-17x^6 - 2.88785055E-14x^5 - 2.14380390E-10x^4 + 6.45774654E-07x^3 - 7.02909801E-04x^2 + 3.47979332E-01x - 5.86010398E+01$ Polynomial deviation



x Deviation — Poly. (Deviation)

Table 4.1

Time Depth Curve Values

WELL: NARINGAL #1 CLIENT : SANTOS
 Calibrated Sonic Velocities used for calculations

Depth m(datum)	T(sonic) datum, msec	Velocities		
		Interval	Average	RMS
331	160.4	2063	2063	2063
335	162.6	1853	2061	2061
340	165.4	1788	2056	2056
345	168.2	1740	2051	2051
350	170.8	1970	2049	2050
355	173.3	2002	2049	2050
360	175.8	1991	2048	2049
365	178.3	1979	2047	2048
370	180.9	1955	2046	2046
375	183.5	1918	2044	2045
380	186.0	1999	2043	2044
381	186.5	2051	2043	2044
385	188.6	1914	2042	2043
390	191.0	2015	2041	2042
395	193.5	2001	2041	2042
400	196.1	1986	2040	2041
405	198.5	2068	2041	2041
410	200.9	2047	2041	2042
415	203.2	2156	2042	2043
420	205.6	2112	2043	2044
425	207.9	2135	2044	2045
430	210.3	2142	2045	2046
435	212.6	2133	2046	2047
440	215.0	2116	2047	2048
445	217.4	2056	2047	2048
450	219.9	2030	2047	2047
455	222.3	2057	2047	2048
460	224.8	2051	2047	2048
465	227.2	2061	2047	2048
470	229.6	2051	2047	2048
475	232.1	2024	2047	2048
480	234.5	2051	2047	2048
485	237.0	2043	2047	2048
490	239.3	2102	2047	2048
495	241.7	2162	2048	2049
500	244.0	2131	2049	2050
505	246.3	2145	2050	2051
510	248.7	2163	2051	2052
515	251.0	2098	2052	2052
520	253.4	2090	2052	2053
525	255.8	2091	2052	2053
530	258.2	2112	2053	2054
535	260.5	2141	2054	2055
540	262.8	2157	2055	2055
545	265.2	2151	2055	2056
550	267.5	2167	2056	2057
555	269.8	2129	2057	2058
560	272.1	2149	2058	2059
565	274.5	2119	2058	2059
570	277.0	2042	2058	2059

Depth m(datum)	T(sonic) datum, msec	Velocities		
		Interval	Average	RMS
575	279.3	2136	2059	2060
580	281.6	2125	2059	2060
585	283.8	2329	2061	2062
590	285.9	2356	2064	2065
595	288.1	2267	2065	2066
600	290.1	2590	2069	2070
604	291.3	3087	2073	2076
605	291.7	3241	2074	2078
610	293.1	3356	2081	2086
615	294.8	2973	2086	2092
620	296.5	2998	2091	2098
625	298.4	2612	2094	2102
630	300.4	2471	2097	2105
635	302.4	2592	2100	2108
640	304.4	2400	2102	2110
645	306.3	2639	2105	2114
650	308.3	2492	2108	2117
655	310.4	2487	2110	2119
660	312.4	2498	2113	2122
665	314.2	2701	2116	2126
670	315.8	3140	2122	2132
675	317.7	2668	2125	2136
680	319.6	2544	2127	2138
685	321.6	2553	2130	2141
690	323.5	2602	2133	2144
695	325.3	2872	2137	2149
700	327.2	2564	2139	2151
705	329.1	2601	2142	2154
710	331.0	2655	2145	2158
715	332.9	2611	2148	2160
720	334.8	2691	2151	2164
725	336.6	2740	2154	2167
726	337.0	2862	2155	2168
730	338.6	2520	2156	2170
735	340.7	2315	2157	2171
740	342.8	2401	2159	2172
745	344.6	2843	2162	2176
750	346.1	3233	2167	2182
755	347.7	3124	2171	2187
760	349.4	3023	2175	2192
765	351.1	2931	2179	2196
770	352.8	2885	2183	2200
775	354.6	2771	2186	2203
780	356.3	2985	2189	2208
785	358.0	2941	2193	2212
790	359.7	2885	2196	2216
795	361.4	2879	2200	2219
800	363.2	2791	2202	2222
805	364.9	3042	2206	2227
810	366.6	2880	2209	2230

Table 4.2

Time Depth Curve Values

WELL: NARINGAL #1 CLIENT : SANTOS
 Calibrated Sonic Velocities used for calculations

Depth m(datum)	T(sonic) datum, msec	Velocities		
		Interval	Average	RMS
815	368.5	2642	2212	2233
820	370.4	2699	2214	2235
825	372.1	2884	2217	2239
830	374.0	2693	2220	2241
835	375.8	2707	2222	2244
840	377.7	2612	2224	2246
845	379.6	2643	2226	2248
846	380.0	2638	2226	2248
850	381.6	2524	2228	2250
855	383.5	2567	2229	2251
860	385.4	2704	2232	2254
865	387.1	2895	2235	2257
870	389.0	2562	2236	2259
875	391.0	2619	2238	2260
880	392.7	2911	2241	2264
885	394.4	2962	2244	2267
890	396.1	2857	2247	2270
895	397.9	2734	2249	2272
900	399.8	2646	2251	2274
905	401.7	2689	2253	2276
910	403.5	2757	2255	2279
915	405.2	2922	2258	2282
920	407.1	2672	2260	2284
925	408.8	2879	2263	2287
930	410.6	2759	2265	2289
935	412.4	2842	2267	2292
940	414.2	2706	2269	2294
945	416.0	2836	2272	2296
950	417.7	2954	2274	2299
955	419.6	2680	2276	2301
960	421.3	2926	2279	2304
965	423.0	2956	2282	2307
970	424.8	2694	2283	2309
975	426.8	2553	2285	2310
980	428.6	2744	2287	2312
985	430.4	2761	2289	2314
990	432.2	2820	2291	2316
995	434.0	2762	2293	2318
1000	435.8	2836	2295	2321
1005	437.5	2789	2297	2323
1010	439.3	2929	2299	2326
1013	440.2	3320	2301	2328
1015	440.8	3195	2303	2329
1020	442.4	3067	2306	2333
1025	444.1	2996	2308	2335
1030	445.8	2838	2310	2338
1035	447.7	2691	2312	2339
1040	449.5	2793	2314	2341
1045	451.3	2753	2315	2343
1050	453.2	2607	2317	2344

Depth m(datum)	T(sonic) datum, msec	Velocities		
		Interval	Average	RMS
1055	455.1	2619	2318	2345
1060	457.0	2715	2320	2347
1065	458.8	2702	2321	2349
1070	460.6	2904	2323	2351
1075	462.3	2842	2325	2353
1080	464.3	2574	2326	2354
1085	466.2	2626	2328	2355
1090	468.0	2712	2329	2357
1095	469.9	2686	2330	2358
1100	471.8	2647	2332	2359
1105	473.5	2886	2334	2361
1110	475.1	3082	2336	2364
1115	476.9	2823	2338	2366
1120	478.6	2961	2340	2368
1125	480.3	2908	2342	2371
1130	482.0	2905	2344	2373
1135	483.6	3048	2347	2375
1140	485.4	2914	2349	2377
1145	487.1	2925	2351	2380
1150	488.8	2916	2353	2382
1155	490.5	2935	2355	2384
1160	492.1	3097	2357	2386
1161	492.4	3041	2358	2387
1165	493.7	3077	2360	2389
1170	495.4	3056	2362	2392
1175	497.0	3131	2364	2394
1180	498.6	3031	2367	2397
1185	500.3	2973	2369	2399
1190	501.8	3237	2371	2402
1195	503.5	3066	2374	2404
1200	505.2	2869	2375	2406
1205	506.8	3098	2378	2409
1210	508.4	3096	2380	2411
1215	510.1	3014	2382	2413
1220	511.7	3223	2384	2416
1225	513.3	2995	2386	2418
1230	515.0	2913	2388	2420
1235	516.7	3048	2390	2422
1240	518.4	2938	2392	2424
1245	520.0	3120	2394	2427
1250	521.6	3021	2396	2429
1255	523.2	3127	2399	2431
1260	524.9	3023	2400	2433
1265	526.5	3126	2403	2436
1270	528.1	3150	2405	2438
1275	529.7	3108	2407	2440
1280	531.4	2961	2409	2442
1285	533.1	2932	2411	2444
1290	534.8	2966	2412	2446
1295	536.4	3070	2414	2448

Table 4.3

Time Depth Curve Values

WELL: NARINGAL #1 CLIENT : SANTOS
 Calibrated Sonic Velocities used for calculations

Depth m(datum)	T(sonic) datum, msec	Velocities		
		Interval	Average	RMS
1300	538.0	3058	2416	2450
1305	539.7	2984	2418	2452
1310	541.3	3116	2420	2454
1313	542.2	3414	2422	2456
1315	542.8	3243	2423	2457
1320	544.3	3301	2425	2460
1325	545.9	3242	2427	2462
1330	547.4	3241	2430	2465
1335	549.0	3121	2432	2467
1340	550.6	3226	2434	2470
1345	552.2	3135	2436	2472
1350	553.8	3070	2438	2474
1355	555.4	3088	2440	2476
1360	557.0	3036	2441	2478
1365	558.6	3196	2444	2480
1370	560.2	3244	2446	2482
1375	561.8	3064	2448	2484
1380	563.5	2997	2449	2486
1385	565.1	2978	2451	2487
1386	565.5	3141	2451	2488
1390	566.7	3274	2453	2490
1395	568.2	3304	2455	2492
1400	569.7	3211	2457	2495
1405	571.3	3129	2459	2497
1410	572.9	3282	2461	2499
1415	574.5	3123	2463	2501
1420	576.0	3214	2465	2503
1425	577.6	3239	2467	2505
1430	579.1	3247	2469	2508
1435	580.6	3271	2471	2510
1436	580.9	3225	2472	2510
1440	582.3	3028	2473	2512
1445	583.8	3231	2475	2514
1450	585.4	3243	2477	2516
1455	587.0	3067	2479	2518
1460	588.6	3151	2481	2520
1465	590.2	3115	2482	2522
1470	591.7	3248	2484	2524
1473	592.6	3221	2485	2525
1475	593.3	3014	2486	2526
1480	594.9	3138	2488	2527
1485	596.5	3126	2489	2529
1490	598.1	3142	2491	2531
1491	598.4	3115	2492	2531
1495	599.5	3537	2494	2534
1500	601.0	3506	2496	2536
1505	602.6	3106	2498	2538
1510	604.1	3364	2500	2540
1515	605.4	3759	2502	2544
1516	605.7	3801	2503	2544

Depth m(datum)	T(sonic) datum, msec	Velocities		
		Interval	Average	RMS
1520	606.8	3665	2505	2547
1524	607.9	3518	2507	2549
1525	608.2	3553	2508	2550
1530	609.6	3405	2510	2552
1535	611.1	3357	2512	2554
1537	611.7	3301	2513	2555
1540	612.6	3362	2514	2556
1545	614.1	3369	2516	2559
1550	615.6	3392	2518	2561
1555	617.0	3468	2520	2564
1556	617.3	3526	2521	2564
1560	618.5	3487	2522	2566
1565	620.0	3355	2524	2568
1570	621.5	3268	2526	2570
1575	623.0	3222	2528	2572
1580	624.6	3168	2530	2574
1585	626.2	3170	2531	2575
1590	627.8	3164	2533	2577
1595	629.3	3364	2535	2579
1600	630.7	3377	2537	2581
1605	632.3	3187	2538	2583
1610	633.7	3460	2540	2585
1615	635.3	3151	2542	2587
1620	636.9	3289	2544	2589
1625	638.4	3205	2545	2591
1626	638.7	3125	2546	2591

Figure 2

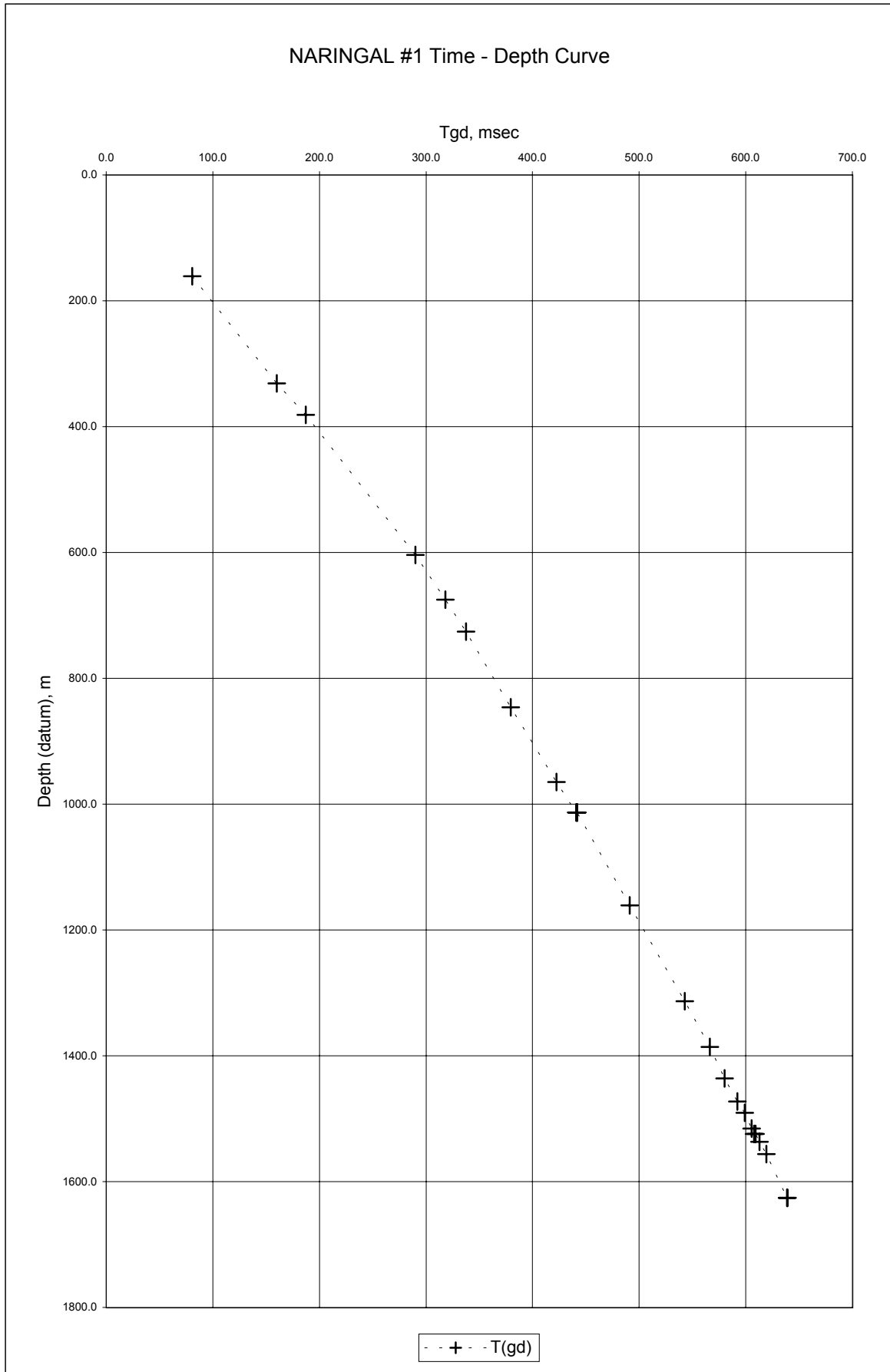
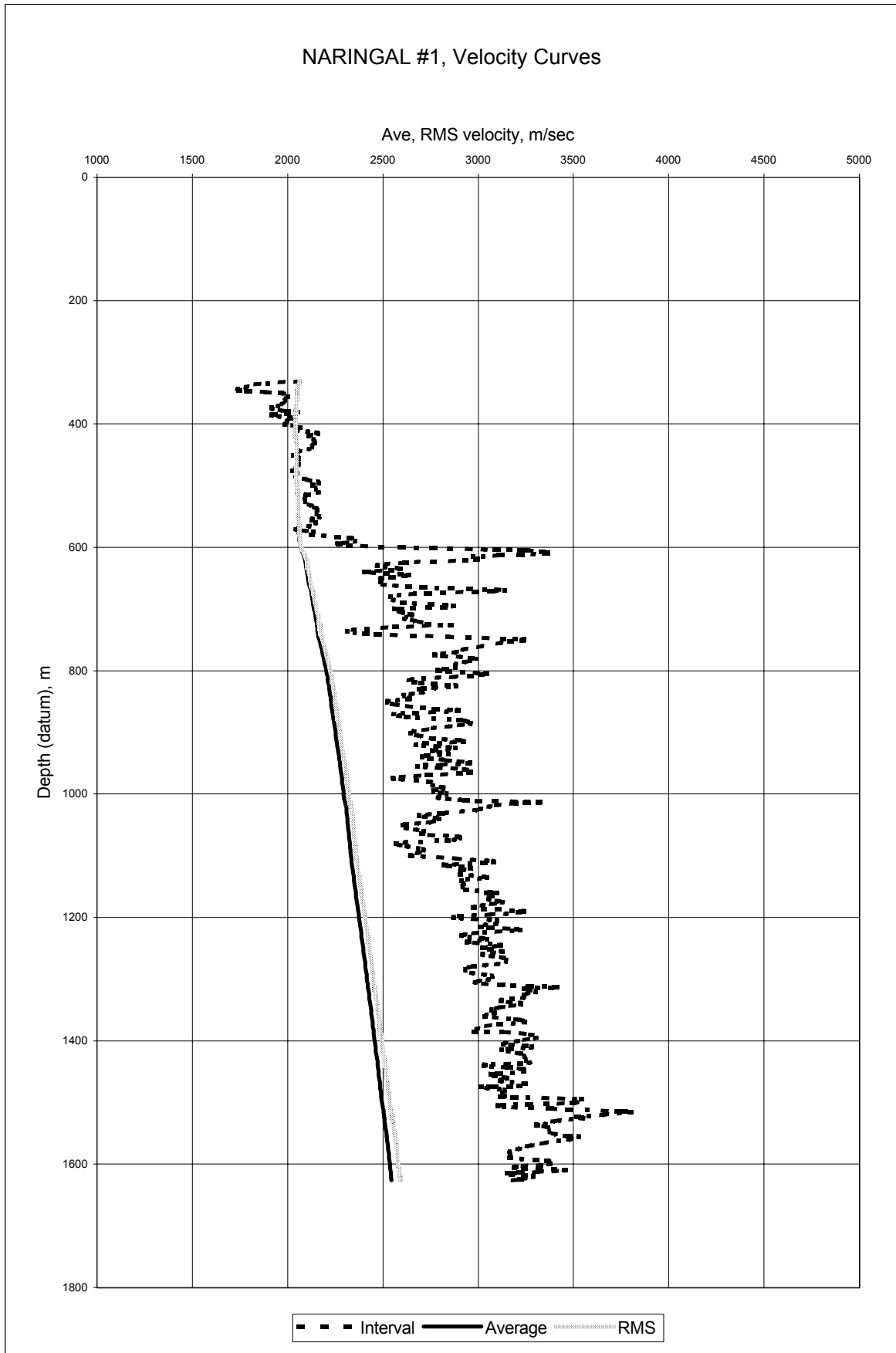
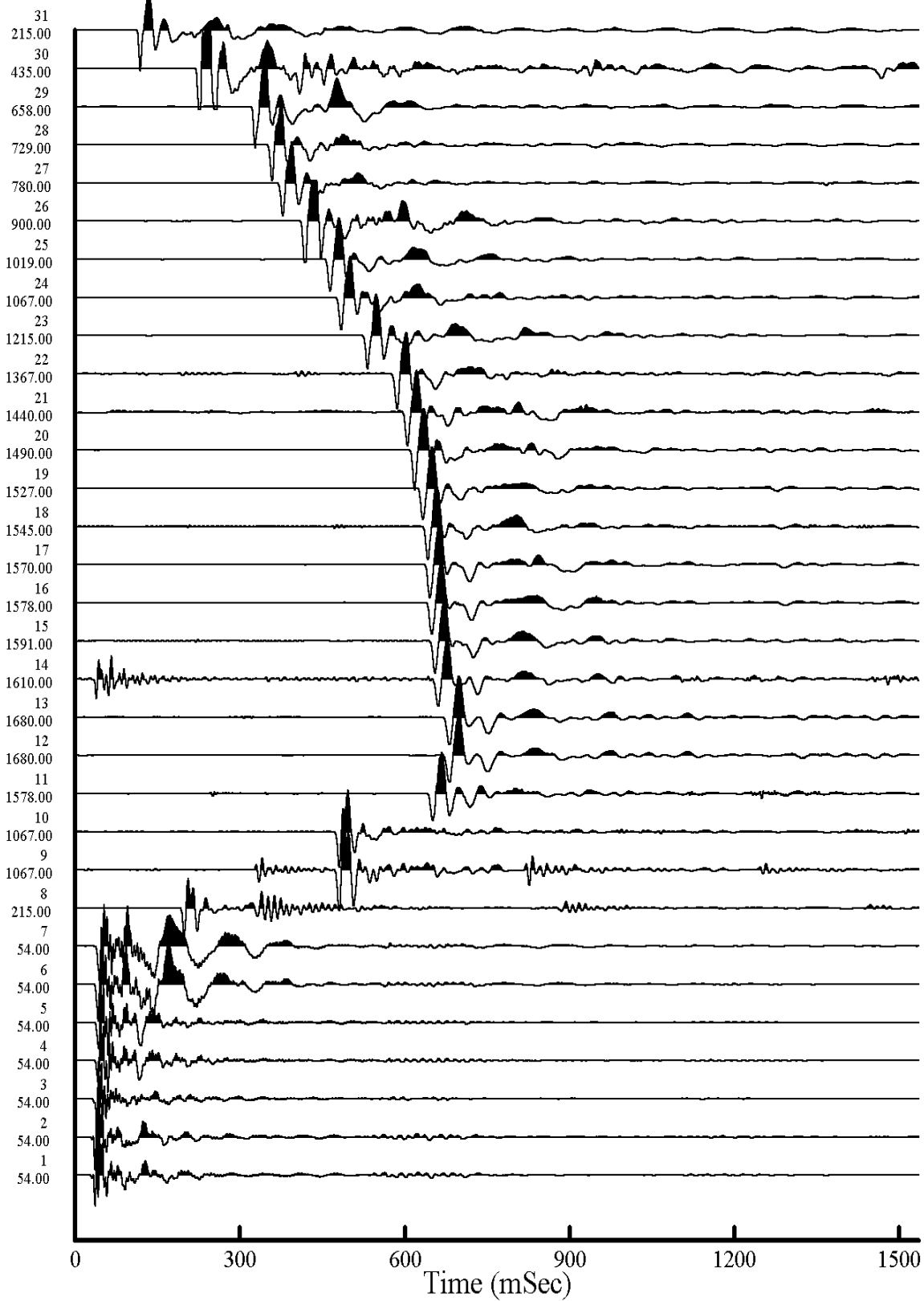


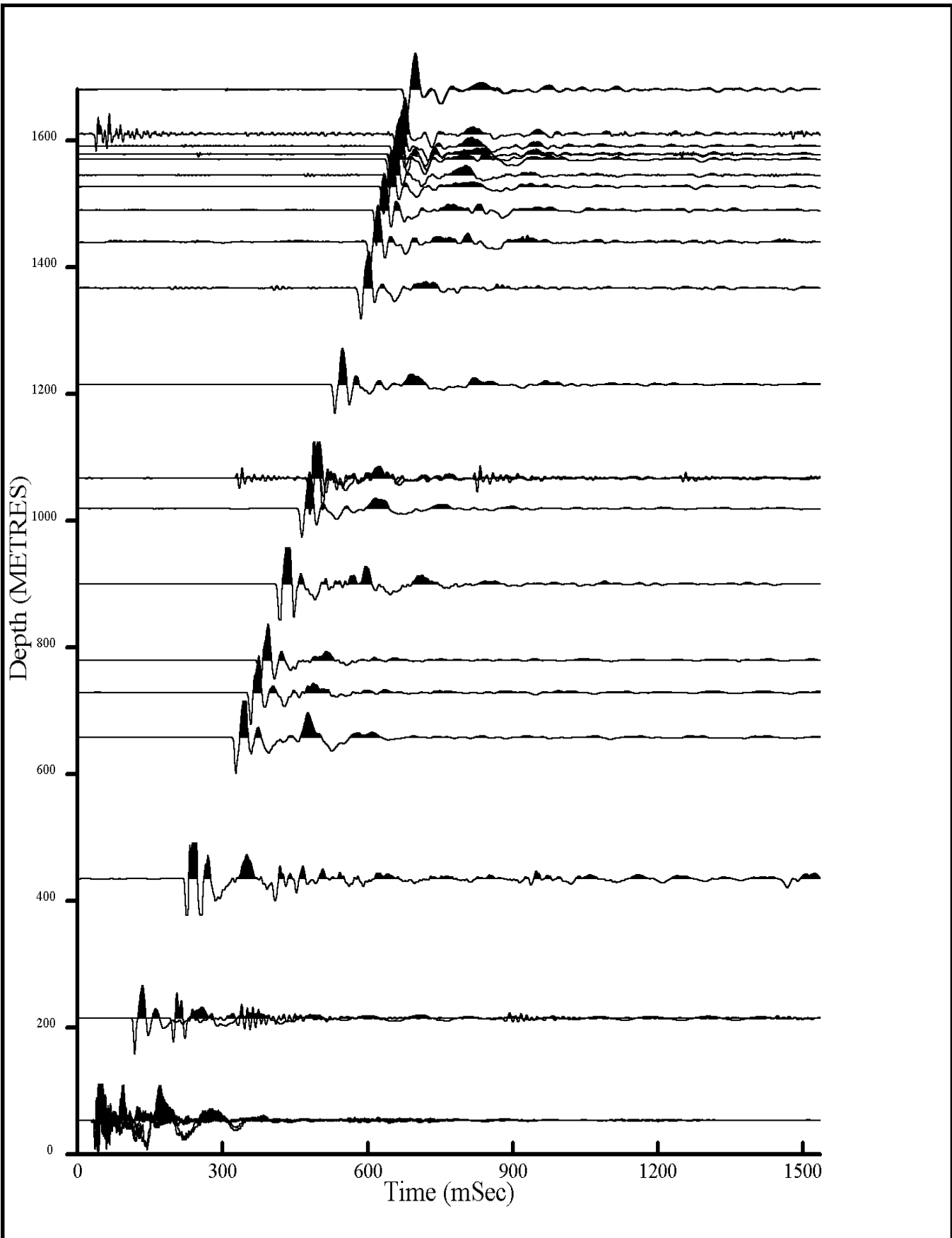
Figure 3





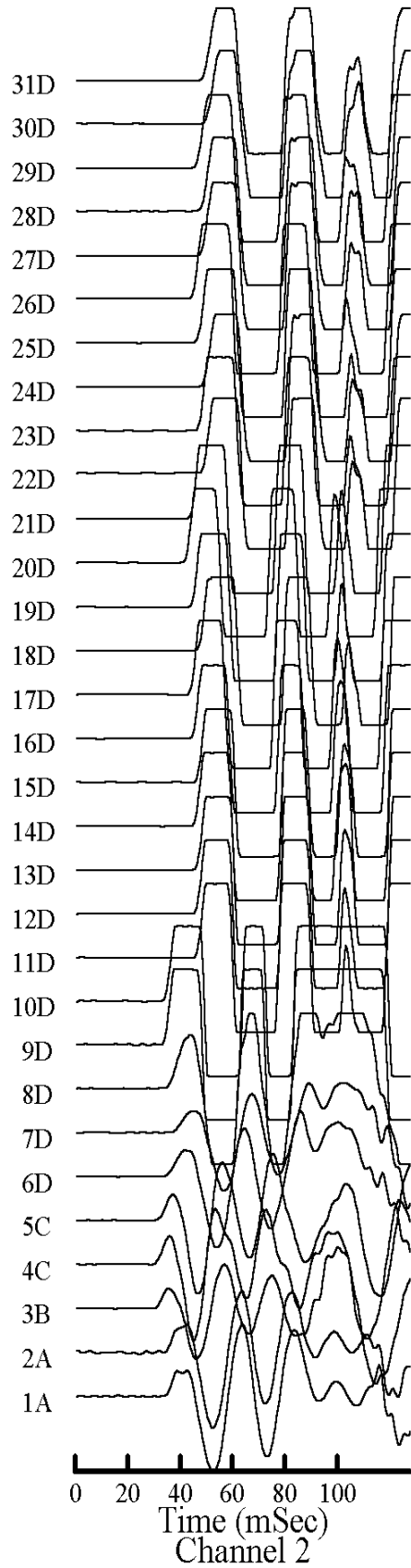
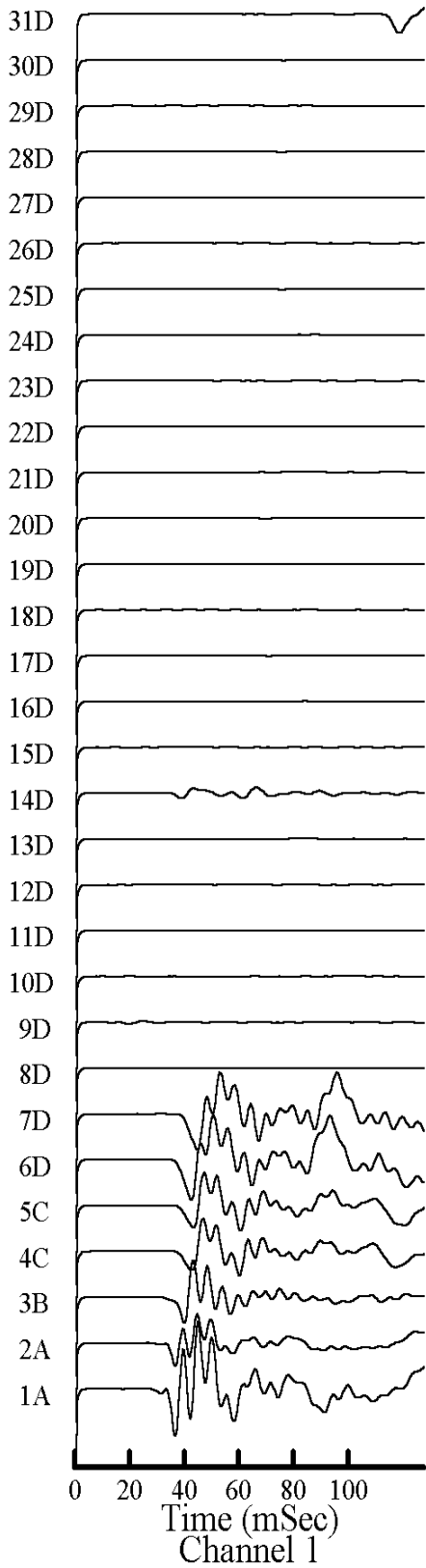
NARINGAL #1

VELOCITY SURVEY TRACE DISPLAY



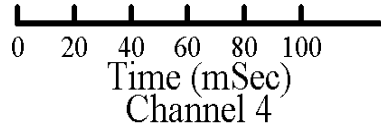
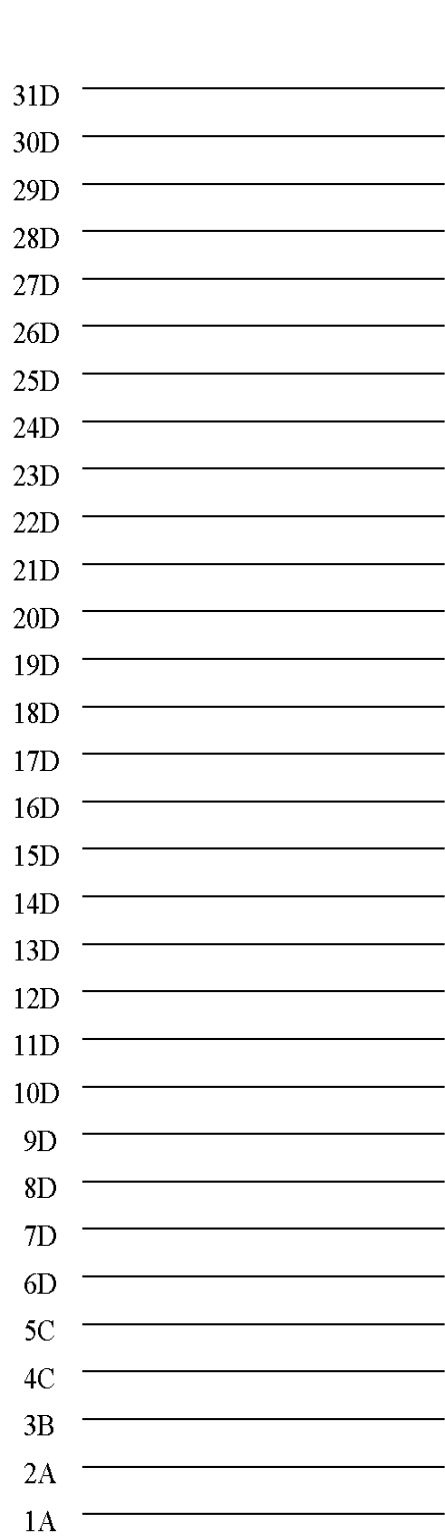
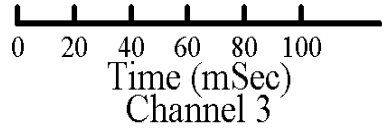
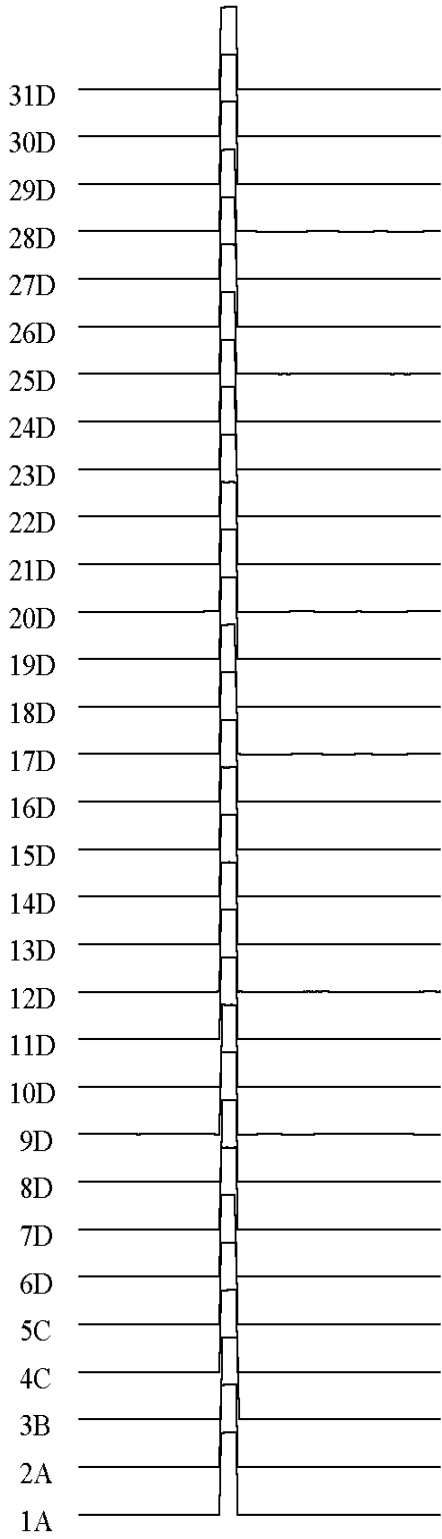
NARINGAL #1

VELOCITY SURVEY TRACE DISPLAY



NARINGAL #1

VELOCITY SURVEY TRACE DISPLAY
AUXILIARY CHANNELS



NARINGAL #1

VELOCITY SURVEY TRACE DISPLAY
AUXILIARY CHANNELS