

Expertest Seismic Services



VELOCITY SURVEY

KAROON MEGASCOLIDES #2

VICTORIA

for

KAROON GAS

recorded by

SGS EXPERTEST Pty. Ltd.

processed by



Brisbane, Australia

12-2-2007

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SUMMARY

Expertest Pty Ltd conducted a velocity survey for Karoon Gas at the Megascolides#2 well site. The date of the survey was 1st February 2007. This was subsequently processed by Velseis Processing Pty Ltd in Brisbane, Australia.

The results of the survey were used to calibrate the sonic log.

The energy source used was an Air Gun.

GENERAL INFORMATION

Name of Well : Megascolides#2

Coordinates : Latitude 38'14'5.2 S
: Longitude 145'53'39 E

Location : KG05 offset from SP303

Date of Survey : 1 February 2007

Wireline Logging : Precision Energy Services

Weather : FINE

Operational Base : Brisbane

Operator : Don Blick

Shooter : Adrian

Client Representative: Dave Horner

EQUIPMENT

Downhole Tool

90mm Camlock 7 conductor probe

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 3dB

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 : Airgun
Shot Location : Mud Pit
D Shot Depth : 3.0 metres
Mud Pit Shot Offset : 47.5 metres
Recording Geometry : see Figure 1 "Shot Point Location Sketch"

Shots were recorded to hard disk and emailed to Brisbane for processing. 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

Megascolides-2 Velocity Survey

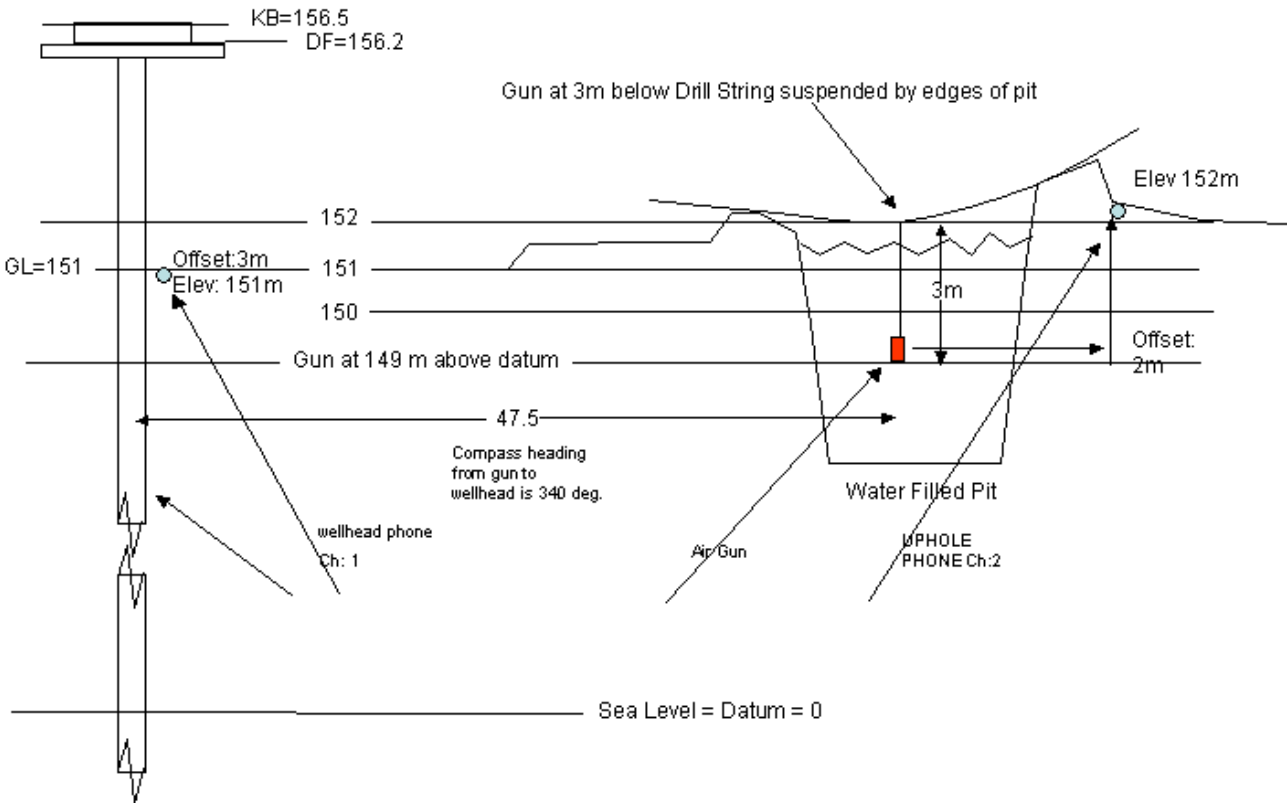


Figure 1. Shot Location Sketch

PROCESSING

Elevation Data

Elevation of KB : 156.5 m above sea level

Elevation of Ground: 151 m above sea level

Elevation of Datum : 0 m above sea level

Depth Surveyed : 2130 m below KB

Depth of Casing : 507 m below KB

Sonic Log Interval : 156.5 to 2130 m below KB

Shot Location Data

Shot A : Elevation N/A Offset Units metres

Shot B : Elevation N/A Offset Units metres

Shot C : Elevation N/A Offset Units metres

Shot D : Elevation 149.0 Offset 47.5 Units metres

Instrument Delay : 2.5 Msec

Surface Velocity : 1023 m/sec

Recorded Data

Number of shots recorded : 38

Number of shots processed : 25

Number of levels recorded : 25

Data Quality : Good

Noise Levels : Low

Correction for Instrument Delay and Shot Offset

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

Table 2 shows the corrections for instrument delay and shot offset. The one-way vertical datum to geophone times ($T(\text{gd})$) shown in Table 2 were used to calibrate the sonic log. The corrected times ($T(\text{corr})$) shown in Table 2 are the recorded times plus any corrections for pit fatigue. The one-way vertical surface to geophone times ($T(\text{vert})$) 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

The one-way vertical geophone to datum time ($T(\text{gd})$) was then obtained by adding the surface to datum time of 79.6 msec from $T(\text{vert})$ and applying the shot static correction to correct for the depth of the shot below ground level at the wellhead using a correction velocity of 1023 m/sec. 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 (Table 3). 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 hole was cased above 507m below KB. Generally it is not possible to calibrate the sonic within casing.

The discrepancies between shot and sonic interval velocities were generally small. The total sonic drift over the well was 17.5 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.

Table 1 Corrections for Pit Fatigue

WELL: MEGASCOLIDES#2 CLIENT: KAROON GAS

Shot #	First break Ch 1	First break Ch 2	Ch 1 Correction	Ch 2 Correction	Correction, msec
1	45.50	11.00	0.78	0.60	0.50
2	45.50	11.00	0.72	0.31	0.50
3	47.50	11.50	-1.33	-0.45	-1.00
4	47.00	11.50	-0.88	-0.68	-1.00
5	47.00	11.50	-0.93	-0.88	-1.00
6	46.50	11.50	-0.47	-1.06	-1.00
7	45.00	9.00	0.99	1.29	1.00
8	45.50	9.50	0.45	0.66	0.50
9	45.00	9.50	0.92	0.55	0.50
10	45.00	9.00	0.88	0.97	1.00
11	47.00	11.50	-1.15	-1.60	-1.50
12	45.00	9.00	0.83	0.84	1.00
13	45.50	9.00	0.30	0.80	0.50
14	45.50	9.50	0.27	0.28	0.50
15	46.50	11.50	-0.75	-1.74	-1.00
16	46.00	9.50	-0.28	0.26	0.00
17	46.50	11.50	-0.80	-1.74	-1.50
18	45.50	9.50	0.18	0.27	0.00
19	45.00	9.00	0.65	0.79	0.50
20	45.50	9.50	0.13	0.31	0.00
21	45.50	9.50	0.11	0.33	0.00
22	45.50	10.00	0.09	-0.15	0.00
23	45.50	9.50	0.06	0.37	0.00
24	47.50	11.00	-1.96	-1.11	-1.50
25	45.50	9.50	0.01	0.40	0.00
26	45.00	9.50	0.48	0.41	0.50
27	45.50	9.50	-0.05	0.41	0.00
28	45.00	9.50	0.42	0.40	0.50
29	44.50	9.50	0.89	0.37	0.50
30	47.50	11.00	-2.15	-1.16	-1.50
31	44.50	10.00	0.81	-0.21	0.50
32	44.50	9.50	0.77	0.23	0.50
33	45.00	9.50	0.23	0.15	0.00
34	44.50	10.00	0.68	-0.45	0.00
35	45.50	9.50	-0.37	-0.08	0.00
36		9.00		0.28	0.50
37	45.50	9.50	-0.48	-0.39	-0.50
38	45.00	8.50	-0.05	0.42	0.00

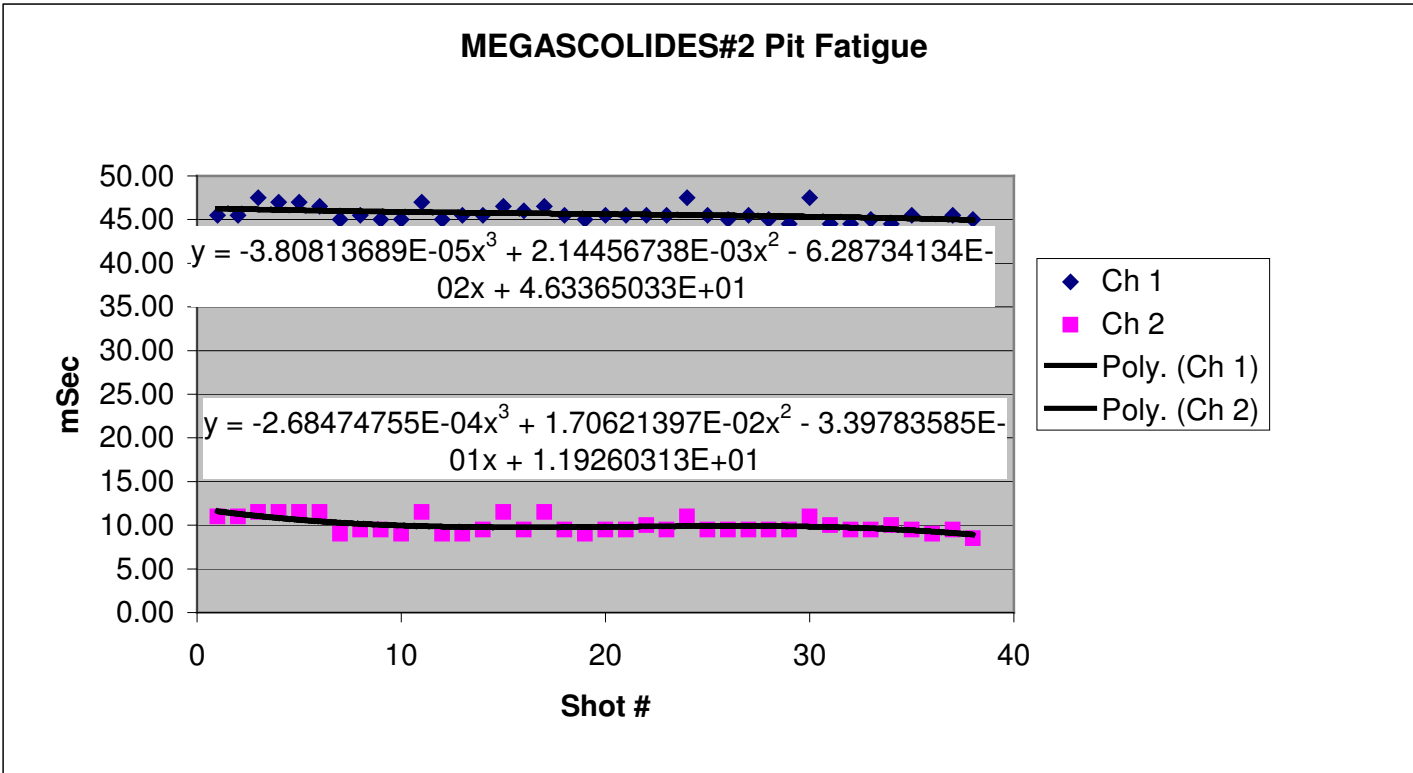
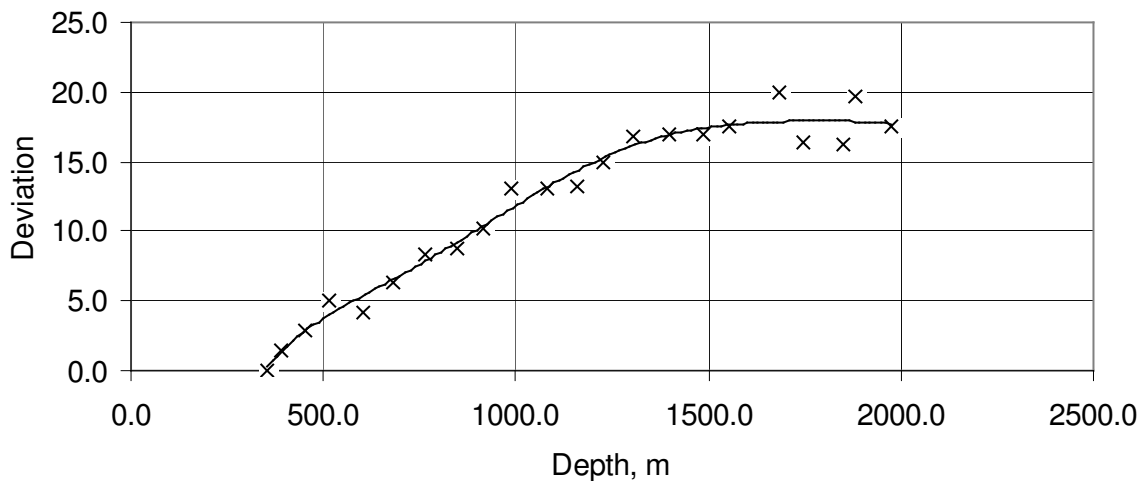


Table 3 Checkshot/Sonic Deviation

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
353.5	190.6	190.6	0.0				0.0
388.5	200.8	202.2	1.4	10.1	11.6	1.4	1.4
453.5	219.0	221.8	2.8	18.2	19.6	1.4	2.8
515.5	234.8	239.9	5.1	15.8	18.1	2.3	5.1
600.5	257.7	261.9	4.2	22.9	22.1	-0.9	4.2
678.5	278.2	284.5	6.3	20.5	22.6	2.1	6.3
766.5	302.2	310.5	8.3	24.0	26.0	2.1	8.3
845.5	322.3	331.1	8.7	20.1	20.5	0.4	8.7
913.5	339.9	350.1	10.2	17.5	19.0	1.5	10.2
988.5	360.1	373.1	13.1	20.2	23.0	2.8	13.1
1080.5	385.5	398.7	13.1	25.5	25.5	0.1	13.1
1160.5	404.0	417.2	13.2	18.5	18.5	0.0	13.2
1224.5	418.2	433.2	15.0	14.2	16.0	1.8	15.0
1303.5	436.4	453.2	16.8	18.2	20.0	1.8	16.8
1398.5	459.2	476.2	17.0	22.8	23.0	0.2	17.0
1488.5	479.8	496.7	17.0	20.6	20.5	-0.1	17.0
1553.5	494.8	512.3	17.5	15.0	15.5	0.5	17.5
1686.5	526.3	546.3	20.0	31.5	34.0	2.5	20.0
1748.5	540.9	557.3	16.3	14.7	11.0	-3.7	16.3
1848.5	566.6	582.8	16.2	25.7	25.5	-0.1	16.2
1883.5	575.1	594.8	19.7	8.5	12.0	3.5	19.7
1973.5	596.3	613.8	17.5	21.2	19.0	-2.2	17.5

Polynomial deviation

$$y = -1.80102051E-17x^6 + 1.38835191E-13x^5 - 4.22887892E-10x^4 + 6.42259433E-07x^3 - 5.11700128E-04x^2 + 2.19144466E-01x - 3.58045349E+01$$



× Deviation — Poly. (Deviation)

Table 4 Calibrated Time – Depth Curve Values

Depth m(datum)	T(sonic) datum, msec	Velocities			Depth m(datum)	T(sonic) datum, msec	Velocities		
		Interval	Average	RMS			Interval	Average	RMS
388.5	202.6	0	0	0	635.00	273.1	3354	2325	3497
390	203.0	3429	1921	3429	640.00	274.5	3736	2332	3502
395	204.4	3495	1932	3480	645.00	275.8	3750	2339	3506
400	205.9	3459	1943	3471	650.00	277.1	3987	2346	3515
405	207.3	3500	1953	3480	655.00	278.5	3534	2352	3515
410	208.8	3427	1964	3467	660.00	280.1	3164	2357	3508
415	210.2	3531	1974	3479	665.00	281.4	3688	2363	3512
420	211.7	3303	1984	3451	670.00	282.8	3725	2370	3515
425	213.2	3421	1994	3447	675.00	284.1	3831	2376	3521
430	214.7	3333	2003	3433	680.00	285.4	3708	2383	3524
435	216.1	3440	2013	3434	685.00	286.9	3342	2388	3521
440	217.5	3677	2023	3456	690.00	288.4	3441	2393	3519
445	218.9	3439	2033	3455	695.00	289.8	3472	2398	3518
450	220.5	3309	2041	3443	700.00	291.2	3456	2403	3517
455	221.9	3404	2050	3440	705.00	292.7	3405	2409	3516
460	223.3	3532	2060	3446	710.00	294.2	3259	2413	3512
465	224.7	3661	2069	3460	715.00	295.7	3413	2418	3510
470	226.1	3649	2079	3471	720.00	297.2	3389	2423	3508
475	227.4	3629	2088	3480	725.00	298.7	3327	2427	3505
480	228.8	3806	2098	3497	730.00	300.1	3538	2433	3506
485	230.1	3741	2108	3509	735.00	301.5	3650	2438	3508
490	231.4	3708	2117	3519	740.00	302.9	3518	2443	3508
495	232.8	3795	2127	3531	745.00	304.3	3477	2448	3508
500	234.1	3668	2136	3537	750.00	305.8	3513	2453	3508
505	235.5	3662	2144	3543	755.00	307.1	3701	2458	3510
510	236.8	3770	2154	3552	760.00	308.5	3604	2464	3512
515	238.2	3548	2162	3552	765.00	310.0	3323	2468	3509
520	239.8	3225	2169	3539	770.00	311.4	3676	2473	3511
525	241.3	3184	2175	3525	775.00	312.7	3684	2478	3513
530	242.8	3340	2182	3518	780.00	314.1	3680	2483	3515
535	244.3	3437	2190	3516	785.00	315.5	3586	2488	3516
540	245.7	3479	2197	3514	790.00	316.9	3617	2493	3517
545	247.2	3516	2205	3514	795.00	318.2	3751	2499	3520
550	248.6	3384	2212	3510	800.00	319.6	3636	2503	3522
555	250.0	3548	2220	3511	805.00	321.0	3562	2508	3522
560	251.4	3683	2227	3516	810.00	322.3	3731	2513	3525
565	252.9	3443	2234	3514	815.00	323.6	3754	2518	3527
570	254.3	3398	2241	3511	820.00	325.0	3696	2523	3529
575	255.8	3409	2248	3508	825.00	326.3	3761	2528	3532
580	257.3	3297	2254	3502	830.00	327.7	3535	2533	3532
585	258.8	3410	2261	3500	835.00	329.0	3881	2538	3535
590	260.2	3592	2268	3502	840.00	330.3	3952	2543	3540
595	261.5	3699	2275	3507	845.00	331.6	3876	2548	3543
600	262.9	3738	2283	3512	850.00	333.0	3531	2553	3543
605	264.4	3336	2289	3508	855.00	334.4	3525	2557	3543
610	265.8	3459	2295	3507	860.00	335.8	3683	2561	3544
615	267.3	3380	2301	3504	865.00	337.2	3480	2565	3544
620	268.7	3491	2307	3504	870.00	338.5	3889	2570	3547
625	270.2	3363	2313	3501	875.00	339.9	3590	2574	3548
630	271.6	3464	2319	3500	880.00	341.3	3497	2578	3547

Depth m(datum)	T(sonic) datum, msec	Velocities		
		Interval	Average	RMS
885	342.7	3538	2582	3547
890	344.2	3496	2586	3546
895	345.5	3809	2591	3549
900	346.7	4070	2596	3554
905	348.0	3984	2601	3558
910	349.3	3783	2605	3560
915	350.7	3602	2609	3560
920	352.1	3558	2613	3560
925	353.6	3274	2616	3557
930	355.0	3466	2619	3557
935	356.4	3630	2623	3557
940	357.8	3586	2627	3557
945	359.2	3472	2631	3557
950	360.7	3365	2634	3555
955	362.1	3622	2637	3556
960	363.4	3925	2642	3559
965	364.9	3253	2644	3556
970	366.4	3435	2648	3555
975	367.8	3576	2651	3555
980	369.2	3551	2654	3555
985	370.5	3702	2658	3556
990	371.9	3663	2662	3557
995	373.4	3352	2665	3555
1000	374.9	3370	2668	3554
1005	376.4	3285	2670	3551
1010	377.9	3267	2672	3549
1015	379.4	3470	2675	3548
1020	380.8	3476	2679	3548
1025	382.2	3514	2682	3548
1030	383.7	3396	2684	3546
1035	385.1	3505	2687	3546
1040	386.6	3328	2690	3544
1045	388.1	3515	2693	3544
1050	389.5	3416	2696	3543
1055	390.9	3734	2699	3545
1060	392.3	3455	2702	3544
1065	393.7	3531	2705	3544
1070	395.1	3527	2708	3544
1075	396.6	3402	2710	3543
1080	398.0	3517	2713	3542
1085	399.4	3690	2717	3543
1090	400.6	4013	2721	3547
1095	401.8	4162	2725	3551
1100	403.1	3894	2729	3553
1105	404.4	3961	2733	3556
1110	405.6	4242	2737	3560
1115	406.7	4227	2741	3564
1120	408.1	3650	2744	3565
1125	409.5	3516	2747	3564
1130	410.9	3698	2750	3565

Depth m(datum)	T(sonic) datum, msec	Velocities		
		Interval	Average	RMS
1135.00	412.1	4193	2754	3569
1140.00	413.2	4381	2759	3574
1145.00	414.3	4449	2763	3579
1150.00	415.5	4396	2768	3584
1155.00	416.6	4392	2772	3589
1160.00	417.7	4416	2777	3594
1165.00	419.1	3787	2780	3595
1170.00	420.4	3637	2783	3595
1175.00	421.6	4224	2787	3599
1180.00	422.9	4007	2790	3601
1185.00	424.1	4213	2794	3605
1190.00	425.2	4510	2799	3610
1195.00	426.4	4179	2803	3613
1200.00	427.5	4322	2807	3617
1205.00	428.6	4459	2811	3622
1210.00	429.8	4487	2816	3627
1215.00	430.9	4425	2820	3631
1220.00	432.0	4530	2824	3636
1225.00	433.1	4353	2828	3640
1230.00	434.5	3628	2831	3640
1235.00	435.9	3714	2833	3640
1240.00	437.3	3529	2836	3640
1245.00	438.6	3855	2839	3641
1250.00	439.9	3730	2841	3641
1255.00	441.2	4055	2845	3644
1260.00	442.4	4041	2848	3646
1265.00	443.6	4268	2852	3649
1270.00	444.7	4483	2856	3653
1275.00	445.8	4512	2860	3658
1280.00	447.0	4156	2864	3660
1285.00	448.2	4166	2867	3663
1290.00	449.3	4629	2871	3668
1295.00	450.4	4626	2876	3672
1300.00	451.5	4508	2880	3677
1305.00	452.7	3987	2883	3678
1310.00	454.1	3743	2885	3679
1315.00	455.4	3646	2887	3678
1320.00	456.8	3757	2890	3679
1325.00	458.1	3647	2892	3679
1330.00	459.5	3576	2894	3678
1335.00	460.8	3791	2897	3679
1340.00	462.1	3926	2900	3680
1345.00	463.4	3781	2902	3680
1350.00	464.7	4043	2905	3682
1355.00	465.9	4058	2908	3684
1360.00	467.1	4338	2912	3687
1365.00	468.2	4507	2916	3691
1370.00	469.3	4372	2919	3694
1375.00	470.5	4121	2922	3696
1380.00	471.8	4012	2925	3698

Depth m(datum)	T(sonic) datum, msec	Velocities		
		Interval	Average	RMS
1385	472.9	4359	2929	3701
1390	474.2	4046	2932	3702
1395	475.4	3962	2934	3704
1400	476.6	4317	2938	3706
1405	477.7	4535	2941	3710
1410	478.8	4359	2945	3713
1415	480.1	4003	2947	3714
1420	481.4	3857	2950	3715
1425	482.5	4342	2953	3718
1430	483.6	4451	2957	3721
1435	484.8	4275	2960	3724
1440	485.9	4399	2963	3727
1445	487.1	4365	2967	3729
1450	488.2	4394	2970	3732
1455	489.5	3980	2972	3733
1460	490.8	3804	2975	3734
1465	492.0	4213	2978	3736
1470	493.2	4182	2981	3738
1475	494.3	4404	2984	3741
1480	495.4	4579	2987	3744
1485	496.6	4137	2990	3746
1490	497.9	3951	2993	3747
1495	499.0	4394	2996	3749
1500	500.1	4560	2999	3753
1505	501.3	4425	3002	3755
1510	502.5	4107	3005	3757
1515	503.6	4390	3008	3759
1520	504.8	4155	3011	3761
1525	506.0	4130	3014	3763
1530	507.3	3990	3016	3764
1535	508.4	4440	3019	3766
1540	509.5	4393	3022	3769
1545	510.6	4503	3026	3772
1550	511.7	4559	3029	3775
1555	513.1	3819	3031	3775
1560	514.5	3563	3032	3774
1565	515.8	3685	3034	3774
1570	517.2	3635	3036	3773
1575	518.5	3682	3037	3773
1580	519.7	4518	3040	3776
1585	520.8	4380	3043	3778
1590	522.1	3852	3045	3778
1595	523.3	4233	3048	3780
1600	524.6	3833	3050	3780
1605	525.8	3952	3052	3781
1610	527.0	4439	3055	3783
1615	528.2	3935	3057	3784
1620	529.3	4701	3061	3787
1625	530.3	4857	3064	3791
1630	531.4	4728	3067	3795

Depth m(datum)	T(sonic) datum, msec	Velocities		
		Interval	Average	RMS
1635.00	532.6	4185	3070	3796
1640.00	533.7	4450	3073	3798
1645.00	534.8	4532	3076	3801
1650.00	535.8	4838	3079	3805
1655.00	536.9	4845	3083	3808
1660.00	538.0	4437	3085	3811
1665.00	539.2	4229	3088	3812
1670.00	540.3	4403	3091	3814
1675.00	541.4	4746	3094	3818
1680.00	542.5	4658	3097	3821
1685.00	543.6	4519	3100	3823
1690.00	544.8	3989	3102	3824
1695.00	546.0	4190	3104	3825
1700.00	547.2	4258	3107	3827
1705.00	548.2	4692	3110	3830
1710.00	549.4	4356	3113	3831
1715.00	550.4	4808	3116	3835
1720.00	551.5	4561	3119	3837
1725.00	552.7	4300	3121	3839
1730.00	553.9	4221	3123	3840
1735.00	555.1	3998	3125	3841
1740.00	556.3	4119	3128	3842
1745.00	557.5	4144	3130	3843
1750.00	558.8	3929	3132	3843
1755.00	560.1	4060	3134	3844
1760.00	561.3	4126	3136	3845
1765.00	562.5	4029	3138	3846
1770.00	563.8	3911	3139	3846
1775.00	565.0	3990	3141	3846
1780.00	566.3	3851	3143	3846
1785.00	567.6	3838	3145	3846
1790.00	568.9	3832	3146	3846
1795.00	570.3	3799	3148	3846
1800.00	571.6	3757	3149	3846
1805.00	572.9	3717	3150	3845
1810.00	574.3	3684	3152	3845
1815.00	575.6	3750	3153	3844
1820.00	577.0	3704	3154	3844
1825.00	578.4	3635	3156	3843
1830.00	579.7	3600	3157	3842
1835.00	581.1	3548	3158	3841
1840.00	582.5	3663	3159	3841
1845.00	583.9	3560	3160	3840
1850.00	585.2	3759	3161	3839
1855.00	586.6	3840	3163	3839
1860.00	587.9	3831	3164	3839
1865.00	589.2	3806	3165	3839
1870.00	590.5	3709	3167	3839
1875.00	591.9	3636	3168	3838
1880.00	593.3	3663	3169	3837

Figure 2. Time – Depth Curve

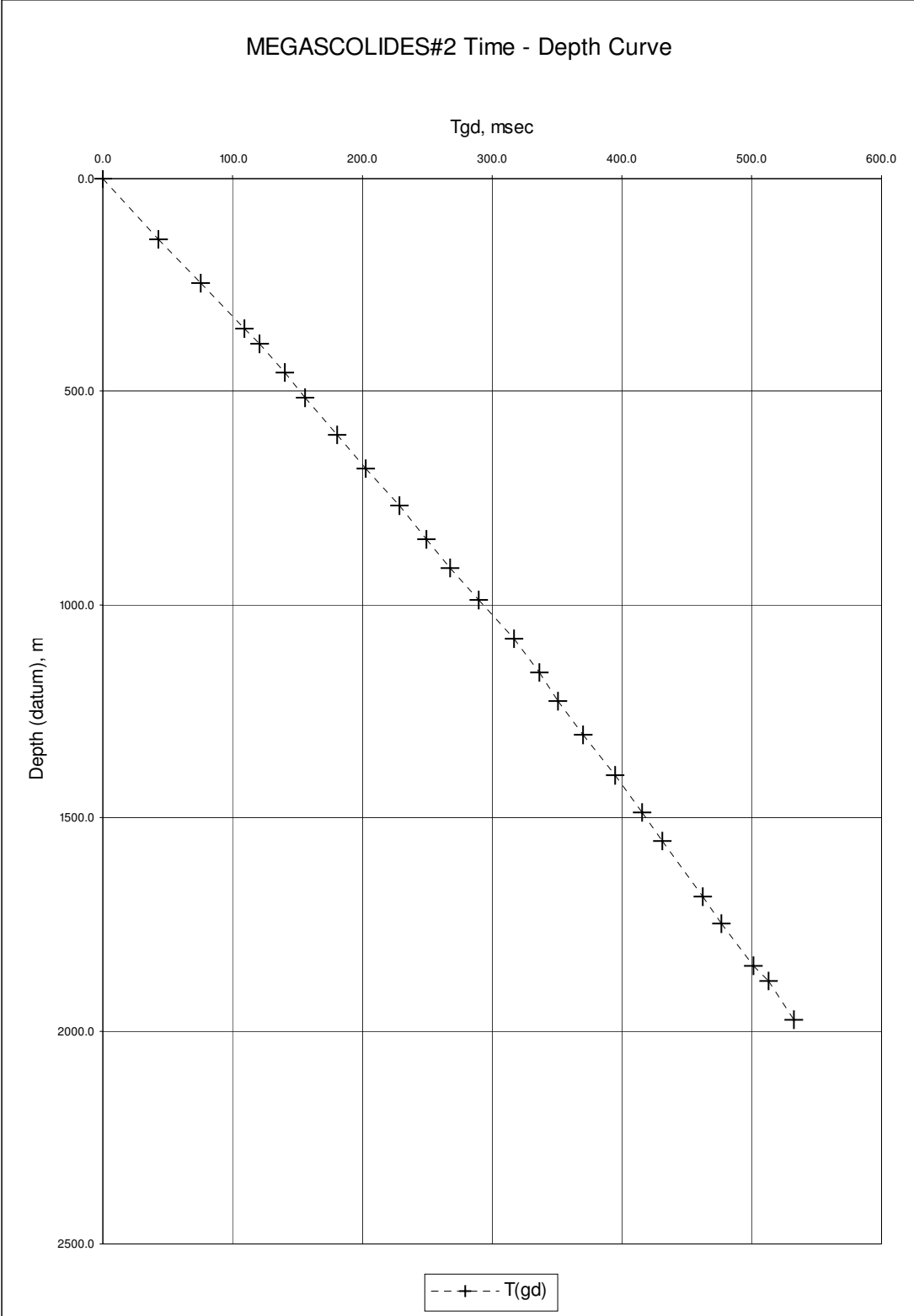


Figure 3. Interval, Average and RMS velocity curves

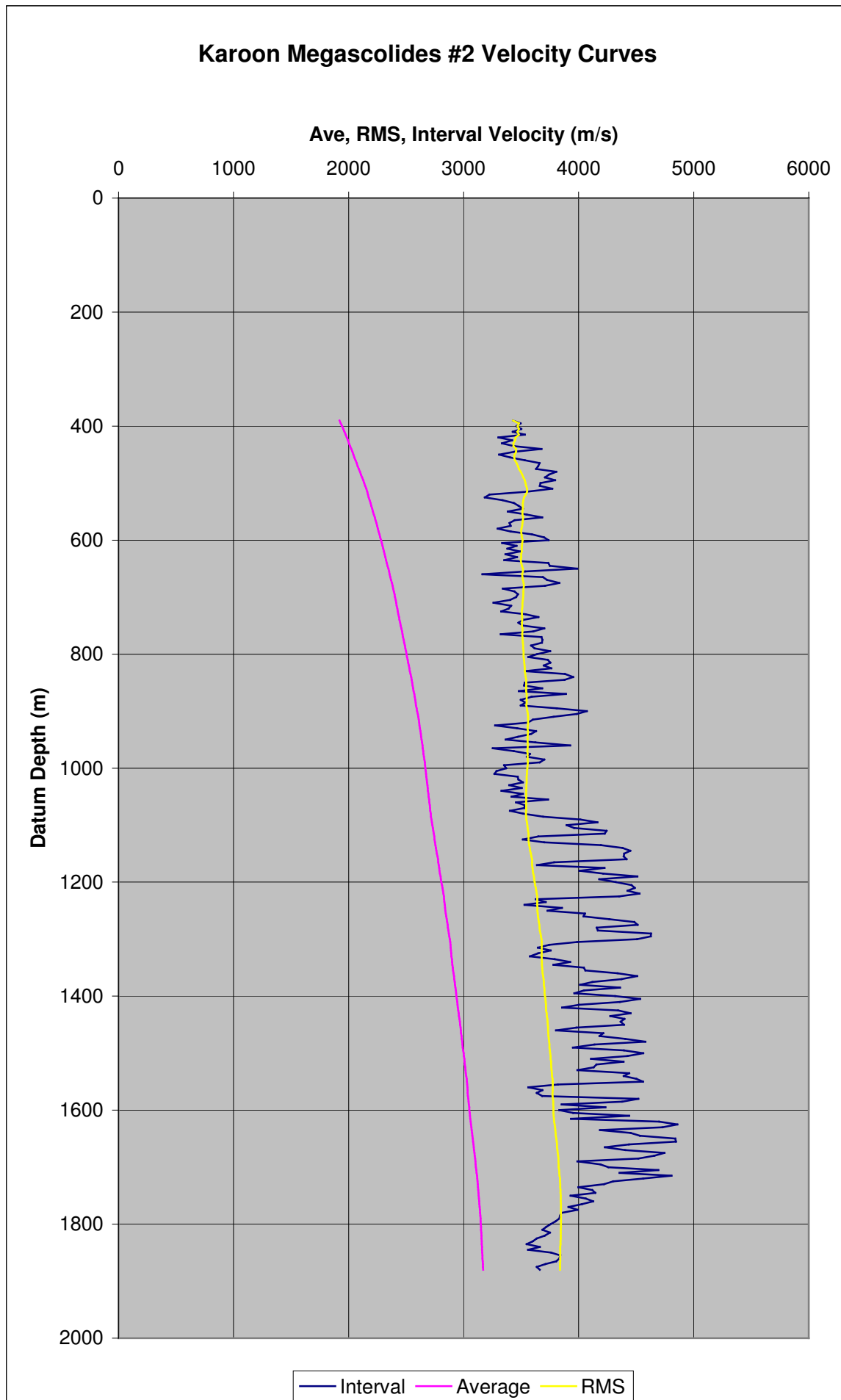
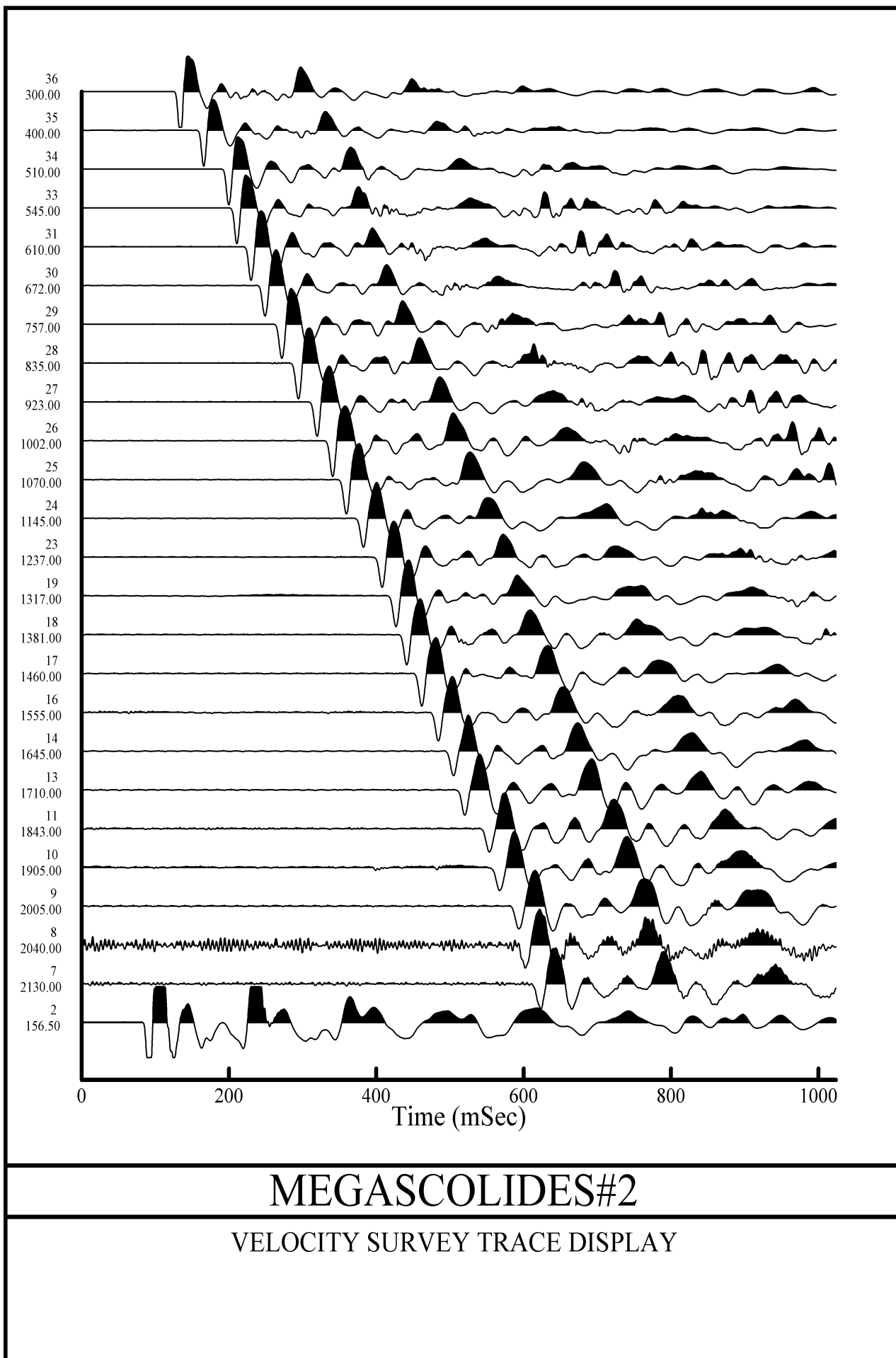
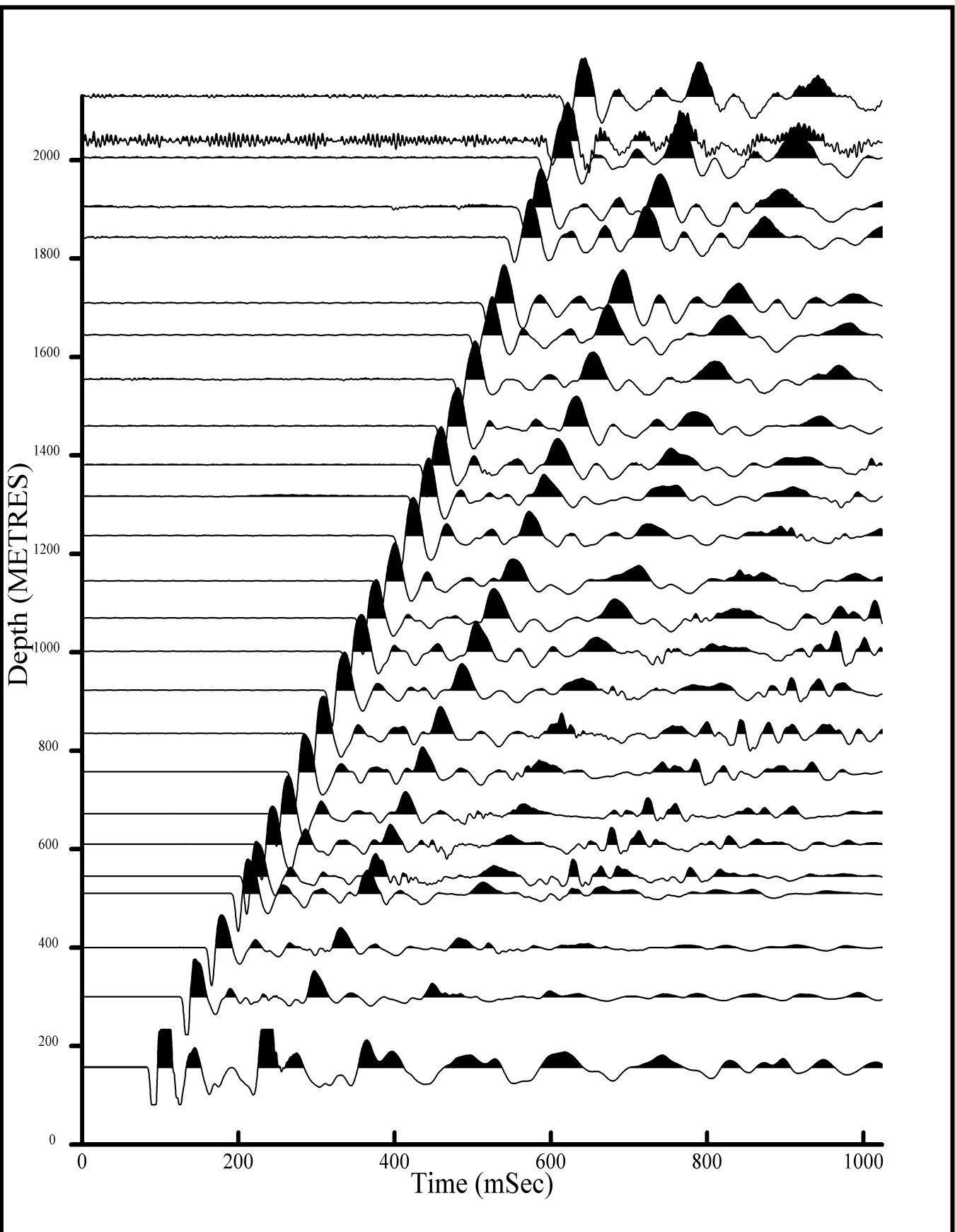


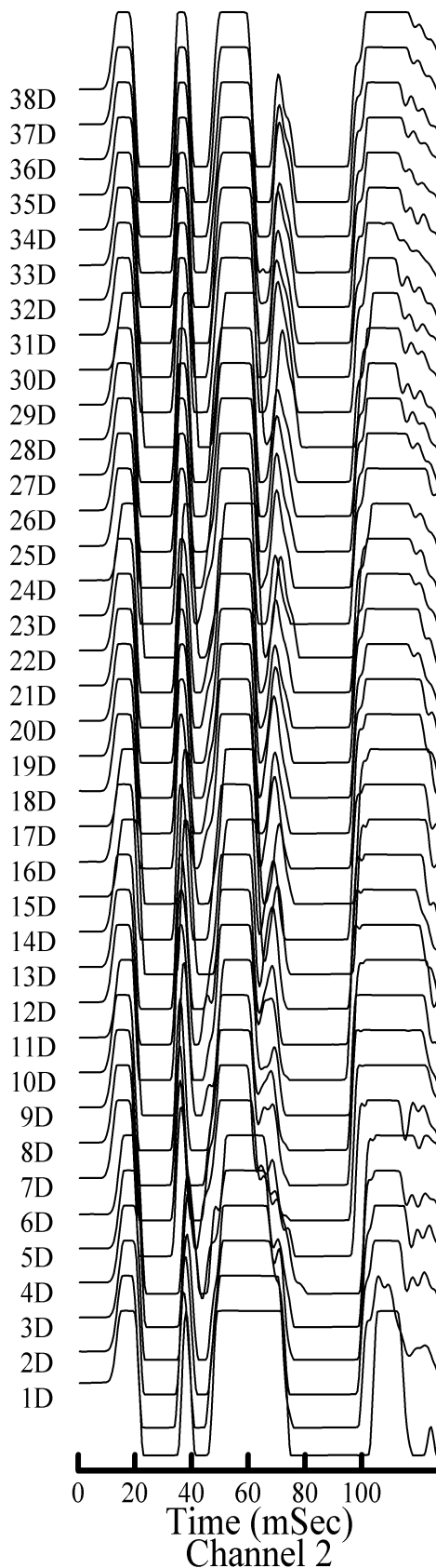
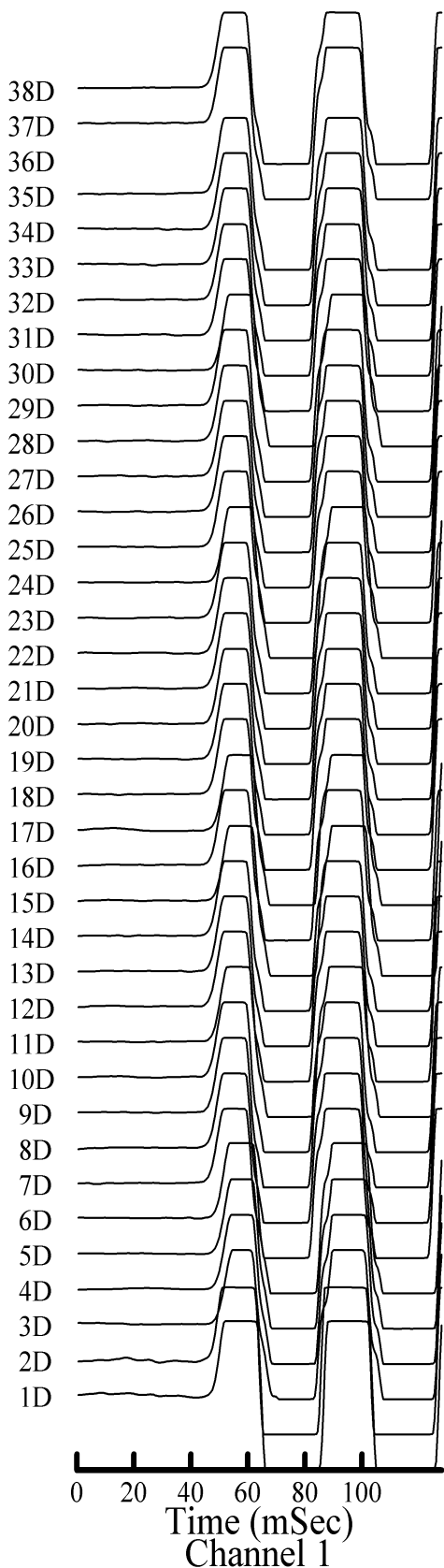
Figure 4. Trace Playouts





MEGASCOLIDES#2

VELOCITY SURVEY TRACE DISPLAY



MEGASCOLIDES#2

VELOCITY SURVEY TRACE DISPLAY
AUXILIARY CHANNELS