CHECK SHOT COMPUTATIONS

COMPANY : University of Svalbard
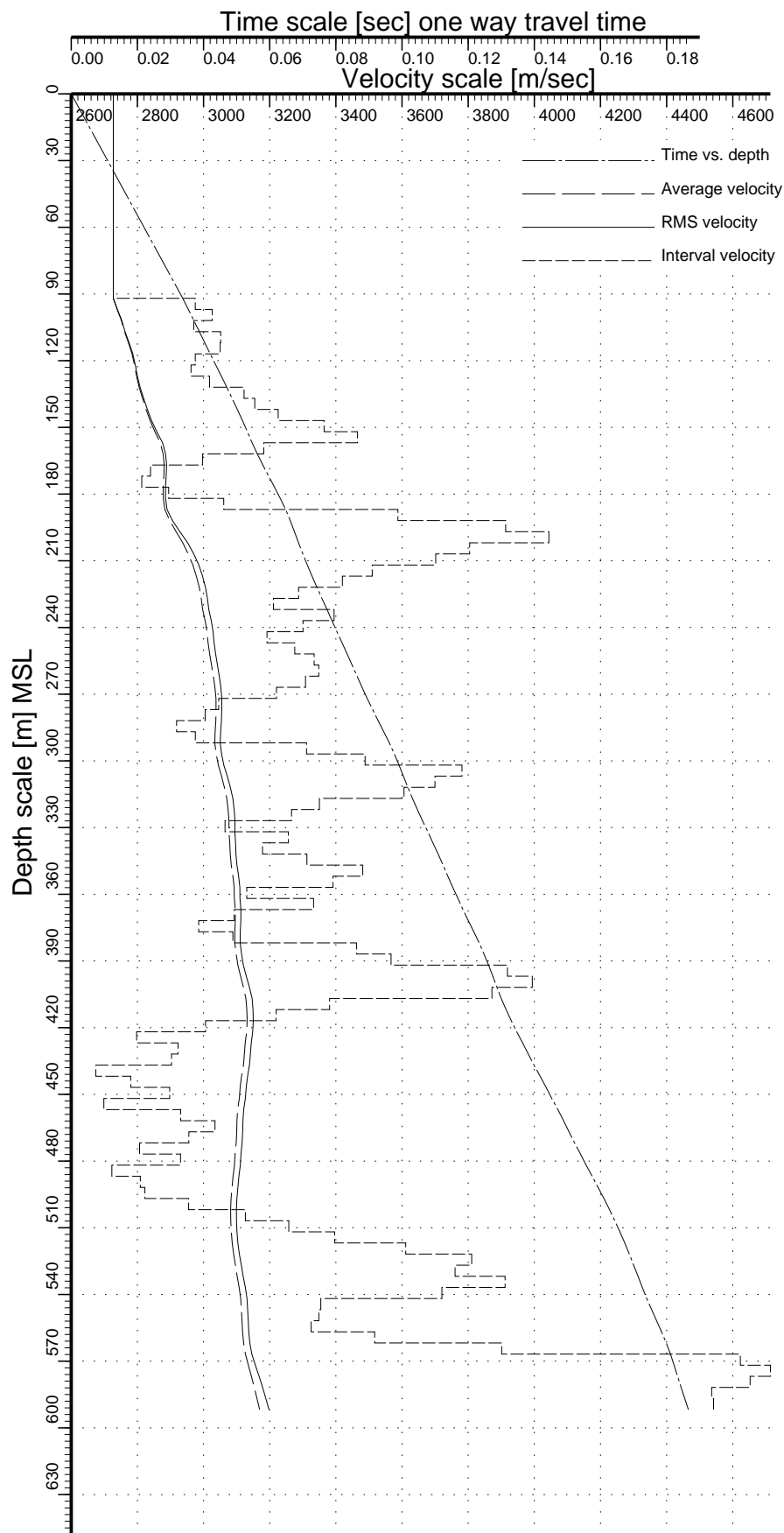
WELL   : DH4

DATE   : Mon May 24 15:12:57 2010


```
ELEVATION OF KELLY BUSHING (MSL ) ......... =       8.1 METRES
ELEVATION OF SEISMIC REFERENCE DATUM  (GL) =       0.0 METRES
DEPTH OF SOURCE BELOW SURFACE ............ =       0.0 METRES
SOURCE TO MONITOR OFFSET ................. =      81.0 METRES
ELEVATION OF SURFACE AT SOURCE (MSL )..... =      -4.9 METRES
REPLACEMENT VELOCITY ..................... =     2000. METRES/S
VELOCITY AT SURFACE  ..................... =     2000. METRES/S
SOURCE OFFSET FROM WELLHEAD............ =    143.5    59.0 METRES
```

DEFINITIONS OF VARIABLES AND TERMS USED IN COMPUTATION

RKB = Rotary Kelly Bushing	TV =	Vertical travel time from source to receiver
MSL = Mean Sea Level	TE =	Travel time correction from source to datum
D = Measured depth below RKB	TC =	Corrected vertical time from datum to geophone
TVD = True vertical depth below RKB	AV.VEL. =	Average velocity from datum to geophone
Z = True vertical depth of geophone below MSL	RMS VEL. =	RMS velocity from datum to geophone
X = Horiz. distance between source and geophone	INT.Z =	Interval depth between geophone levels
SH = Distance from source to nearfield hydroph.	INT.TC =	Interval time between geophone levels
T = Measured time from source to geophone	INT.VEL. =	Interval velocity between geophone levels

University of Svalbard, DH4, Check Shot Report

READ WELL SERVICES

![READ WELL SERVICES]	UIOB	WELL : DH4

Display no : **V1**	Velocity plot	Scale :	Depth 1: 3000. Time 50.0 cm./sec. Velocity 1: 20000.

Time scale [sec] one way travel time

0.00 0.02 0.04 0.06 0.08 0.10 0.12 0.14 0.16 0.18

Velocity scale [m/sec]

2600 2800 3000 3200 3400 3600 3800 4000 4200 4400 4600

Depth scale [m] MSL

— · — · — Time vs. depth
— — — — Average velocity
———— RMS velocity
- - - - - Interval velocity

CHECK SHOT COMPUTATIONS

COMPANY : University of Svalbard
WELL   : DH4

REC. NO .	D	TVD	Z	X	T	TV	TE	TC	AV.VEL.	RMS.VEL.	INT. Z	INT. TC	INT. VEL
	M	M	M	M	S	S	S	S	M/S	M/S	M	S	M /S
											91.9	0.0337	2727
	100.0	100.0	91.9					0.0337	2727	2727			
											5.0	0.0017	2975
2	105.0	105.0	96.9	155.2	0.0241	0.0329	0.0025	0.0354	2739	2739			
											5.0	0.0017	3026
3	110.0	110.0	101.9	155.2	0.0247	0.0346	0.0025	0.0370	2752	2753			
											5.0	0.0017	2970
4	115.0	115.0	106.9	155.2	0.0255	0.0363	0.0025	0.0387	2761	2763			
											5.0	0.0016	3052
5	120.0	120.0	111.9	155.2	0.0263	0.0379	0.0025	0.0404	2773	2775			
											5.0	0.0016	3050
6	125.0	125.0	116.9	155.2	0.0271	0.0396	0.0025	0.0420	2784	2786			
											5.0	0.0017	2975
7	130.0	130.0	121.9	155.2	0.0280	0.0412	0.0025	0.0437	2791	2794			
											5.0	0.0017	2962
8	135.0	135.0	126.9	155.2	0.0289	0.0429	0.0025	0.0454	2798	2800			
											5.0	0.0017	3018
9	140.0	140.0	131.9	155.2	0.0299	0.0446	0.0025	0.0470	2805	2808			
											5.0	0.0016	3122
10	145.0	145.0	136.9	155.2	0.0308	0.0462	0.0025	0.0486	2816	2819			

READ WELL SERVICES

CHECK SHOT COMPUTATIONS

COMPANY : University of Svalbard
WELL   : DH4

REC. NO .	D	TVD	Z	X	T	TV	TE	TC	AV.VEL.	RMS.VEL.	INT. Z	INT. TC	INT. VEL
	M	M	M	M	S	S	S	S	M/S	M/S	M	S	M /S
											5.0	0.0016	3155
11	150.0	150.0	141.9	155.2	0.0317	0.0478	0.0025	0.0502	2826	2830			
											5.0	0.0016	3226
12	155.0	155.0	146.9	155.2	0.0325	0.0493	0.0025	0.0518	2838	2843			
											5.0	0.0015	3364
13	160.0	160.0	151.9	155.2	0.0334	0.0508	0.0025	0.0533	2853	2859			
											5.0	0.0014	3465
14	165.0	165.0	156.9	155.2	0.0342	0.0523	0.0025	0.0547	2869	2876			
											5.0	0.0016	3182
15	170.0	170.0	161.9	155.2	0.0352	0.0538	0.0025	0.0563	2878	2885			
											5.0	0.0017	2997
16	175.0	175.0	166.9	155.2	0.0363	0.0555	0.0025	0.0579	2881	2889			
											5.0	0.0018	2840
17	180.0	180.0	171.9	155.2	0.0376	0.0573	0.0025	0.0597	2880	2887			
											5.0	0.0018	2813
18	185.0	185.0	176.9	155.2	0.0390	0.0590	0.0025	0.0615	2878	2885			
											5.0	0.0017	2895
19	190.0	190.0	181.9	155.2	0.0403	0.0608	0.0025	0.0632	2879	2885			
											5.0	0.0016	3061
20	195.0	195.0	186.9	155.2	0.0415	0.0624	0.0025	0.0648	2883	2890			

READ WELL SERVICES

CHECK SHOT COMPUTATIONS

COMPANY : University of Svalbard
WELL   : DH4

REC. NO .	D	TVD	Z	X	T	TV	TE	TC	AV.VEL.	RMS.VEL.	INT. Z	INT. TC	INT. VEL
	M	M	M	M	S	S	S	S	M/S	M/S	M	S	M /S
											5.0	0.0014	3588
21	200.0	200.0	191.9	155.2	0.0424	0.0638	0.0024	0.0662	2898	2906			
											5.0	0.0013	3913
22	205.0	205.0	196.9	155.2	0.0431	0.0651	0.0024	0.0675	2917	2929			
											5.0	0.0012	4044
23	210.0	210.0	201.9	155.2	0.0439	0.0663	0.0024	0.0687	2938	2952			
											5.0	0.0013	3805
24	215.0	215.0	206.9	155.2	0.0447	0.0676	0.0024	0.0701	2954	2971			
											5.0	0.0014	3702
25	220.0	220.0	211.9	155.2	0.0457	0.0690	0.0024	0.0714	2968	2986			
											5.0	0.0014	3510
26	225.0	225.0	216.9	155.2	0.0467	0.0704	0.0024	0.0728	2979	2997			
											5.0	0.0015	3420
27	230.0	230.0	221.9	155.2	0.0478	0.0718	0.0024	0.0743	2987	3006			
											5.0	0.0015	3287
28	235.0	235.0	226.9	155.2	0.0490	0.0734	0.0024	0.0758	2993	3012			
											5.0	0.0016	3211
29	240.0	240.0	231.9	155.2	0.0502	0.0749	0.0024	0.0774	2998	3016			
											5.0	0.0015	3395
30	245.0	245.0	236.9	155.2	0.0514	0.0764	0.0024	0.0788	3005	3024			

READ WELL SERVICES

CHECK SHOT COMPUTATIONS

COMPANY : University of Svalbard
WELL   : DH4

REC. NO .	D	TVD	Z	X	T	TV	TE	TC	AV.VEL.	RMS.VEL.	INT. Z	INT. TC	INT. VEL
	M	M	M	M	S	S	S	S	M/S	M/S	M	S	M /S
											5.0	0.0015	3301
31	250.0	250.0	241.9	155.2	0.0526	0.0779	0.0024	0.0804	3011	3029			
											5.0	0.0016	3192
32	255.0	255.0	246.9	155.2	0.0539	0.0795	0.0024	0.0819	3014	3032			
											5.0	0.0015	3276
33	260.0	260.0	251.9	155.2	0.0552	0.0810	0.0024	0.0835	3019	3037			
											5.0	0.0015	3334
34	265.0	265.0	257.0	155.2	0.0564	0.0825	0.0024	0.0850	3024	3042			
											5.0	0.0015	3348
35	270.0	270.0	262.0	155.2	0.0576	0.0840	0.0024	0.0865	3030	3048			
											5.0	0.0015	3308
36	275.0	275.0	267.0	155.2	0.0589	0.0855	0.0024	0.0880	3035	3053			
											5.0	0.0016	3220
37	280.0	280.0	272.0	155.2	0.0602	0.0871	0.0024	0.0895	3038	3056			
											5.0	0.0016	3046
38	285.0	285.0	277.0	155.2	0.0616	0.0887	0.0024	0.0912	3038	3055			
											5.0	0.0017	3005
39	290.0	290.0	282.0	155.2	0.0631	0.0904	0.0024	0.0928	3038	3055			
											5.0	0.0017	2918
40	295.0	295.0	287.0	155.2	0.0646	0.0921	0.0024	0.0945	3035	3052			

University of Svalbard, DH4, Check Shot Report

READ WELL SERVICES

CHECK SHOT COMPUTATIONS

COMPANY : University of Svalbard
WELL   : DH4

REC. NO .	D	TVD	Z	X	T	TV	TE	TC	AV.VEL.	RMS.VEL.	INT. Z	INT. TC	INT. VEL
	M	M	M	M	S	S	S	S	M/S	M/S	M	S	M /S
											5.0	0.0017	2975
41	300.0	300.0	292.0	155.2	0.0661	0.0938	0.0024	0.0962	3034	3051			
											5.0	0.0015	3311
42	305.0	305.0	297.0	155.2	0.0674	0.0953	0.0024	0.0977	3039	3055			
											5.0	0.0014	3488
43	310.0	310.0	302.0	155.2	0.0686	0.0967	0.0024	0.0992	3045	3062			
											5.0	0.0013	3781
44	315.0	315.0	307.0	155.2	0.0697	0.0980	0.0024	0.1005	3055	3072			
											5.0	0.0014	3700
45	320.0	320.0	312.0	155.2	0.0708	0.0994	0.0024	0.1018	3063	3081			
											5.0	0.0014	3606
46	325.0	325.0	317.0	155.2	0.0720	0.1008	0.0024	0.1032	3071	3089			
											5.0	0.0015	3350
47	330.0	330.0	322.0	155.2	0.0733	0.1023	0.0024	0.1047	3075	3093			
											5.0	0.0015	3266
48	335.0	335.0	327.0	155.2	0.0747	0.1038	0.0024	0.1062	3077	3095			
											5.0	0.0016	3065
49	340.0	340.0	332.0	155.2	0.0762	0.1054	0.0024	0.1079	3077	3095			
											5.0	0.0015	3256
50	345.0	345.0	337.0	155.2	0.0776	0.1070	0.0024	0.1094	3080	3097			

READ WELL SERVICES

CHECK SHOT COMPUTATIONS

COMPANY : University of Svalbard
WELL   : DH4

REC. NO .	D	TVD	Z	X	T	TV	TE	TC	AV.VEL.	RMS.VEL.	INT. Z	INT. TC	INT. VEL
	M	M	M	M	S	S	S	S	M/S	M/S	M	S	M /S
											5.0	0.0016	3178
51	350.0	350.0	342.0	155.2	0.0790	0.1085	0.0024	0.1110	3081	3099			
											5.0	0.0015	3312
52	355.0	355.0	347.0	155.2	0.0803	0.1100	0.0024	0.1125	3084	3101			
											5.0	0.0014	3481
53	360.0	360.0	352.0	155.2	0.0816	0.1115	0.0024	0.1139	3089	3107			
											5.0	0.0015	3391
54	365.0	365.0	357.0	155.2	0.0829	0.1130	0.0024	0.1154	3093	3110			
											5.0	0.0016	3130
55	370.0	370.0	362.0	155.2	0.0844	0.1145	0.0024	0.1170	3094	3111			
											5.0	0.0015	3332
56	375.0	375.0	367.0	155.2	0.0858	0.1160	0.0024	0.1185	3097	3114			
											5.0	0.0016	3093
57	380.0	380.0	372.0	155.2	0.0872	0.1177	0.0024	0.1201	3097	3113			
											5.0	0.0017	2985
58	385.0	385.0	377.0	155.2	0.0888	0.1193	0.0024	0.1218	3095	3112			
											5.0	0.0016	3089
59	390.0	390.0	382.0	155.2	0.0903	0.1210	0.0024	0.1234	3095	3111			
											5.0	0.0014	3463
60	395.0	395.0	387.0	155.2	0.0916	0.1224	0.0024	0.1249	3099	3116			

READ WELL SERVICES

CHECK SHOT COMPUTATIONS

COMPANY : University of Svalbard
WELL   : DH4

REC. NO .	D	TVD	Z	X	T	TV	TE	TC	AV.VEL.	RMS.VEL.	INT. Z	INT. TC	INT. VEL
	M	M	M	M	S	S	S	S	M /S	M/S	M	S	M /S
											5.0	0.0014	3567
61	400.0	400.0	392.0	155.2	0.0929	0.1238	0.0024	0.1263	3104	3121			
											5.0	0.0013	3919
62	405.0	405.0	397.0	155.2	0.0940	0.1251	0.0025	0.1275	3113	3130			
											5.0	0.0013	3994
63	410.0	410.0	402.0	155.2	0.0951	0.1263	0.0025	0.1288	3121	3139			
											5.0	0.0013	3872
64	415.0	415.0	407.0	155.2	0.0963	0.1276	0.0025	0.1301	3129	3148			
											5.0	0.0015	3381
65	420.0	420.0	412.0	155.2	0.0977	0.1291	0.0025	0.1316	3131	3150			
											5.0	0.0016	3219
66	425.0	425.0	417.0	155.2	0.0991	0.1307	0.0025	0.1331	3132	3151			
											5.0	0.0017	3006
67	430.0	430.0	422.0	155.2	0.1007	0.1323	0.0025	0.1348	3131	3149			
											5.0	0.0018	2797
68	435.0	435.0	427.0	155.2	0.1024	0.1341	0.0025	0.1366	3127	3145			
											5.0	0.0017	2923
69	440.0	440.0	432.0	155.2	0.1040	0.1358	0.0025	0.1383	3124	3142			
											5.0	0.0017	2903
70	445.0	445.0	437.0	155.2	0.1056	0.1375	0.0025	0.1400	3121	3139			

CHECK SHOT COMPUTATIONS

COMPANY : University of Svalbard
WELL   : DH4

REC. NO .	D	TVD	Z	X	T	TV	TE	TC	AV.VEL.	RMS.VEL.	INT. Z	INT. TC	INT. VEL
	M	M	M	M	S	S	S	S	M/S	M/S	M	S	M /S
											5.0	0.0019	2674
71	450.0	450.0	442.0	155.2	0.1074	0.1394	0.0025	0.1419	3115	3134			
											5.0	0.0018	2780
72	455.0	455.0	447.0	155.2	0.1092	0.1412	0.0025	0.1437	3111	3130			
											5.0	0.0017	2897
73	460.0	460.0	452.0	155.2	0.1108	0.1429	0.0025	0.1454	3109	3127			
											5.0	0.0019	2698
74	465.0	465.0	457.0	155.2	0.1126	0.1448	0.0025	0.1472	3103	3122			
											5.0	0.0017	2931
75	470.0	470.0	462.0	155.2	0.1142	0.1465	0.0025	0.1489	3102	3120			
											5.0	0.0016	3034
76	475.0	475.0	467.0	155.2	0.1158	0.1481	0.0025	0.1506	3101	3119			
											5.0	0.0017	2955
77	480.0	480.0	472.0	155.2	0.1174	0.1498	0.0025	0.1523	3099	3117			
											5.0	0.0018	2806
78	485.0	485.0	477.0	155.2	0.1191	0.1516	0.0025	0.1541	3096	3114			
											5.0	0.0017	2930
79	490.0	490.0	482.0	155.2	0.1207	0.1533	0.0025	0.1558	3094	3112			
											5.0	0.0018	2723
80	495.0	495.0	487.0	155.2	0.1225	0.1552	0.0025	0.1576	3090	3108			

READ WELL SERVICES

CHECK SHOT COMPUTATIONS

COMPANY : University of Svalbard
WELL   : DH4

REC. NO .	D	TVD	Z	X	T	TV	TE	TC	AV.VEL.	RMS.VEL.	INT. Z	INT. TC	INT. VEL
	M	M	M	M	S	S	S	S	M/S	M/S	M	S	M /S
											5.0	0.0018	2809
81	500.0	500.0	492.0	155.2	0.1242	0.1569	0.0025	0.1594	3087	3104			
											5.0	0.0018	2822
82	505.0	505.0	497.0	155.2	0.1259	0.1587	0.0025	0.1612	3084	3101			
											5.0	0.0017	2955
83	510.0	510.0	502.0	155.2	0.1275	0.1604	0.0025	0.1629	3082	3100			
											5.0	0.0016	3126
84	515.0	515.0	507.0	155.2	0.1291	0.1620	0.0025	0.1645	3083	3100			
											5.0	0.0015	3258
85	520.0	520.0	512.0	155.2	0.1305	0.1635	0.0025	0.1660	3084	3102			
											5.0	0.0015	3396
86	525.0	525.0	517.0	155.2	0.1319	0.1650	0.0025	0.1675	3087	3104			
											5.0	0.0014	3611
87	530.0	530.0	522.0	155.2	0.1332	0.1664	0.0025	0.1688	3091	3109			
											5.0	0.0013	3811
88	535.0	535.0	527.0	155.2	0.1345	0.1677	0.0025	0.1702	3097	3115			
											5.0	0.0013	3760
89	540.0	540.0	532.0	155.2	0.1357	0.1690	0.0025	0.1715	3102	3120			
											5.0	0.0013	3912
90	545.0	545.0	537.0	155.2	0.1369	0.1703	0.0025	0.1728	3108	3127			

READ WELL SERVICES

CHECK SHOT COMPUTATIONS

COMPANY : University of Svalbard
WELL   : DH4

REC. NO .	D	TVD	Z	X	T	TV	TE	TC	AV.VEL.	RMS.VEL.	INT. Z	INT. TC	INT. VEL
	M	M	M	M	S	S	S	S	M/S	M/S	M	S	M /S
											5.0	0.0013	3720
91	550.0	550.0	542.0	155.2	0.1382	0.1717	0.0025	0.1741	3113	3132			
											5.0	0.0015	3354
92	555.0	555.0	547.0	155.2	0.1396	0.1731	0.0025	0.1756	3115	3134			
											5.0	0.0015	3348
93	560.0	560.0	552.0	155.2	0.1410	0.1746	0.0025	0.1771	3117	3136			
											5.0	0.0015	3325
94	565.0	565.0	557.0	155.2	0.1425	0.1761	0.0025	0.1786	3119	3137			
											5.0	0.0014	3517
95	570.0	570.0	562.0	155.2	0.1438	0.1776	0.0025	0.1800	3122	3141			
											5.0	0.0013	3901
96	575.0	575.0	567.0	155.2	0.1450	0.1788	0.0025	0.1813	3127	3147			
											5.0	0.0011	4623
97	580.0	580.0	572.0	155.2	0.1460	0.1799	0.0025	0.1824	3136	3157			
											5.0	0.0011	4714
98	585.0	585.0	577.0	155.2	0.1470	0.1810	0.0025	0.1834	3145	3169			
											5.0	0.0011	4652
99	590.0	590.0	582.0	155.2	0.1480	0.1821	0.0025	0.1845	3154	3179			
											5.0	0.0011	4536
100	595.0	595.0	587.0	155.2	0.1491	0.1832	0.0025	0.1856	3162	3189			

University of Svalbard, DH4, Check Shot Report

READ WELL SERVICES

CHECK SHOT COMPUTATIONS

COMPANY : University of Svalbard
WELL   : DH4

REC. NO .	D	TVD	Z	X	T	TV	TE	TC	AV.VEL.	RMS.VEL.	INT. Z	INT. TC	INT. VEL
	M	M	M	M	S	S	S	S	M/S	M/S	M	S	M /S
											5.0	0.0011	4542
101	600.0	600.0	592.0	155.2	0.1501	0.1843	0.0025	0.1867	3170	3199			