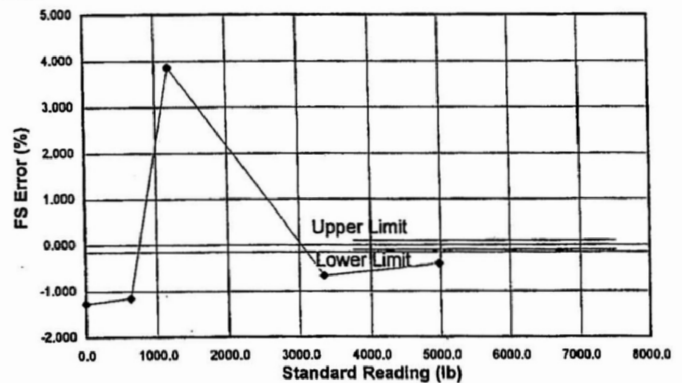
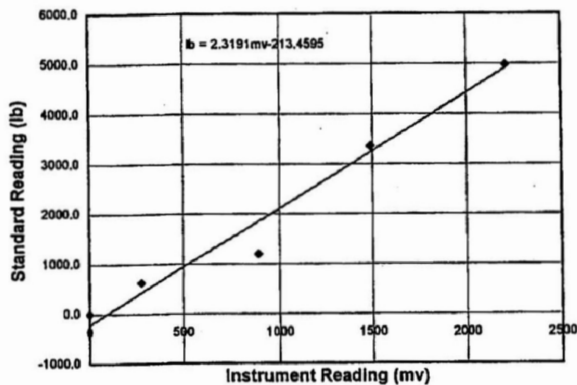


HGL Instrument Verification

DATE: 11/5/2007 Instrument No.: ft100 Location: _____ LVDT?: ☐ Yes; ☒ No
 Type Analysis: ☒ BF; ☐ NonBF; ☒ FS; ☐ Abs. Reading Resolution of Instrument: 0.000001

Instrument Identification/Data				Instrument	Standard	Prediction	Abs. Error	Full Scale
Type	Cone Penetrometer			mv	lb	lb	lb	Error (%)
Manufacturer	Fugro			0.000000	0.0	-213.5	213.5	-1.27
Model Number	F7.5CKEW2/B1			279.800000	630.0	435.4	194.6	-1.15
Serial Number	1701-1832 (Friction)			887.600000	1195.0	1845.0	650.0	3.86
HGL Instrument Number	ft100			1488.400000	3350.0	3238.4	111.6	-0.66
Excitation (V)				2210.000000	4980.0	4911.8	68.2	-0.40
Gain/Span Setting	NA			3307.800000	7520.0	7457.8	62.2	-0.37
Full Range Output (V)								
Full Range/Capacity (lb)	16858							
Date Verified	11/5/2007							
Date Due	11/4/2008							
Service Status	In Service							
Accept. Abs. or FS Error (%)	0.1	☒ FS;	☐ Abs.					
Verification/Standard Equipment								
Type	Load Cell (A2AL APPROVED)							
Manufacturer	INTERFACE							
Model Number	1211EX-10K-B							
Serial Number	113655							
HGL Instrument Number								
Date Verified								
Temperature	°C = °F							
Linear Regression, Uncertainty, & Error Summary								
Correlation Coeff. (R ²)	0.98755242							
Intercept (lb)	-213.4594712							
Slope (lb/mv)	2.319144175							
Verification (Calib.) Factor	2.31914417							
Verification Factor Units	lb/mv							
Absolute Zero (V)								
Floating Zero (V)								
Combined Uncertainty (lb)	90.41311646							
Coverage Factor	2							
Expanded Uncertainty (lb)	180.8262329							
Max. Abs. or FS Error (%)	3.86	☒ FS;	☐ Abs.					
				MTS ☐ Yes; ☒ No				



Uncertainty Budget Analysis For ft100							
Source of Uncertainty	Value in lb	Distribution	Divisor	Type	Uncertainty (u _i)	u _i ²	Comments
Standard's Uncertainty		N	2.0000	B			
Abs. Error-STDEV ¹	90.4131	N	1.0000	A	90.4131	8,174.5316	
Resolution of Instrument	0.0000	R	3.4641	B	0.0000	0.0000	
Repeatability ²		N	1.0000	A			
Resolution of Standard	#N/A	R	3.4641	B			
Combined Uncertainty	90.4131	Coverage Factor		2	for 95% confidence level.		
Expanded Uncertainty (Best Measurement Capability) ³	180.826			lb			

(1) This equation follows the approach presented by A2LA, not that typically used in uncertainty calculations; i.e., STDEV of the Mean.

(2) This value is unique for type (model) of equipment.

(3) This uncertainty represents an expanded uncertainty expressed as approximately the 95% confidence level using a coverage factor of k=2.

Verified By: [Signature]

Input By: _____

Reviewed By: _____

Checked By: [Signature]

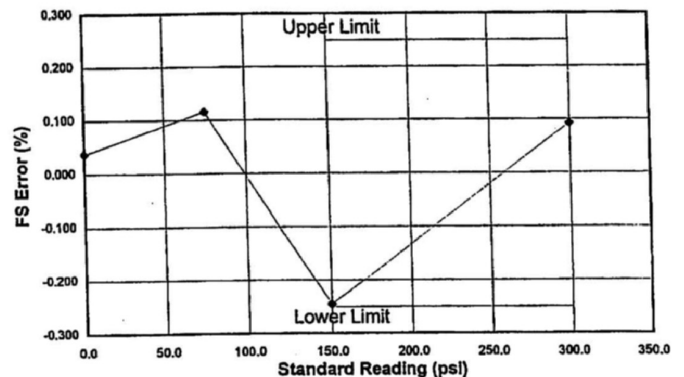
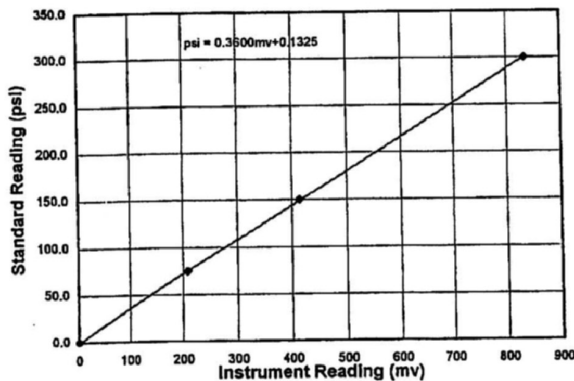
File: _____

Remarks: _____

HGL Instrument Verification

DATE: 11/5/2007 Instrument No.: pt Location: Houston LVDT?: ☐ Yes; ☒ No
 Type Analysis: ☒ BF; ☐ NonBF; ☒ FS; ☐ Abs. Reading Resolution of Instrument: 0.000001

Instrument Identification/Data		Instrument	Standard	Prediction	Abs. Error	Full Scale
Type	Cone Penetrometer	mv	psi	psi	psi	Error (%)
Manufacturer	Fugro	0.000000	0.0	0.1	0.1	0.04
Model Number	F7.5CKEV2/B1	209.100000	75.0	75.4	0.4	0.12
Serial Number	1701-1832-123312 (Piezo)	413.800000	150.0	149.1	0.9	-0.25
HGL Instrument Number	pt	833.800000	300.0	300.3	0.3	0.09
Excitation (V)						
Gain/Span Setting	NA					
Full Range Output (V)						
Full Range/Capacity (psi)	360					
Date Verified	11/5/2007					
Date Due	11/4/2008					
Service Status	In Service					
Accept. Abs. or FS Error (%)	0.25	☒ FS;	☐ Abs.			
Verification/Standard Equipment						
Type	PT(ANSI/NCSL APPROVED)					
Manufacturer	Eaton					
Model Number	UPS3000CC					
Serial Number	A0813					
HGL Instrument Number						
Date Verified						
Temperature	°C = °F					
Linear Regression, Uncertainty, & Error Summary						
Correlation Coeff. (R ²)	0.999978009					
Intercept (psi)	0.132500696					
Slope (psi/mv)	0.360039814					
Verification (Calib.) Factor	0.36003981					
Verification Factor Units	psi/mv					
Absolute Zero (V)						
Floating Zero (V)						
Combined Uncertainty (psi)	0.158811828					
Coverage Factor	2					
Expanded Uncertainty (psi)	0.317623656					
Max. Abs. or FS Error (%)	-0.25	☒ FS;	☐ Abs.			
		MTS	☐ Yes;	☒ No		



Uncertainty Budget Analysis For pt							
Source of Uncertainty	Value in psi	Distribution	Divisor	Type	Uncertainty (u)	u ²	Comments
Standard's Uncertainty		N	2.0000	B			
Abs. Error-STDEV ¹	0.1588	N	1.0000	A	0.1588	0.0252	
Resolution of Instrument	0.0000	R	3.4641	B	0.0000	0.0000	
Repeatability ²		N	1.0000	A			
Resolution of Standard	#N/A	R	3.4641	B			
Combined Uncertainty	0.1588	Coverage Factor		2	for 95% confidence level.		
Expanded Uncertainty (Best Measurement Capability) ³	0.318			psi			

(1) This equation follows the approach presented by A2LA, not that typically used in uncertainty calculations; i.e., STDEV of the Mean.

(2) This value is unique for type (model) of equipment.

(3) This uncertainty represents an expanded uncertainty expressed as approximately the 95% confidence level using a coverage factor of k=2.

Verified By: RS

Input By: _____

Reviewed By: _____

Checked By: Ry

File: _____

Remarks: _____

Calibration Verification Certificate



Device Type: Seismograph

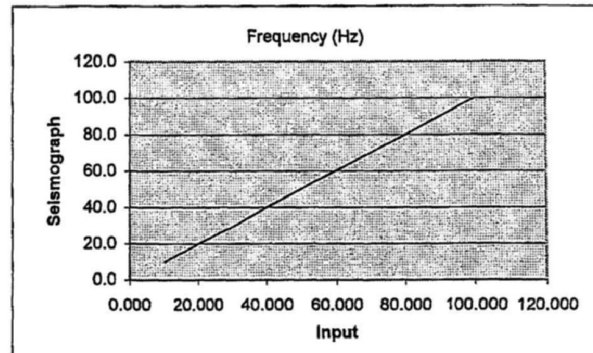
Device Manufacturer Geometrics, Inc.

Model Number: ES-3000

Serial Number: 5138

Frequency (Hz)

Input	Seismograph
10.055	9.9
20.037	19.9
30.071	29.3
40.040	40.1
50.061	50.6
60.048	60.3
70.005	70.2
80.011	79.9
90.090	90.1
100.014	99.8



FREQUENCY CALIBRATED BY INSTEK GOOD WILL INSTRUMENTS (A2LA APPROVED) FREQUENCY COUNTER :

Model: GFC-80101H, Serial No. CF871549

FREQUENCY GENERATED BY EZ DIGITAL, INC (A2LA APPROVED) OSCILLISCOPE WITH BUILT IN FUNCTION GENERATOR

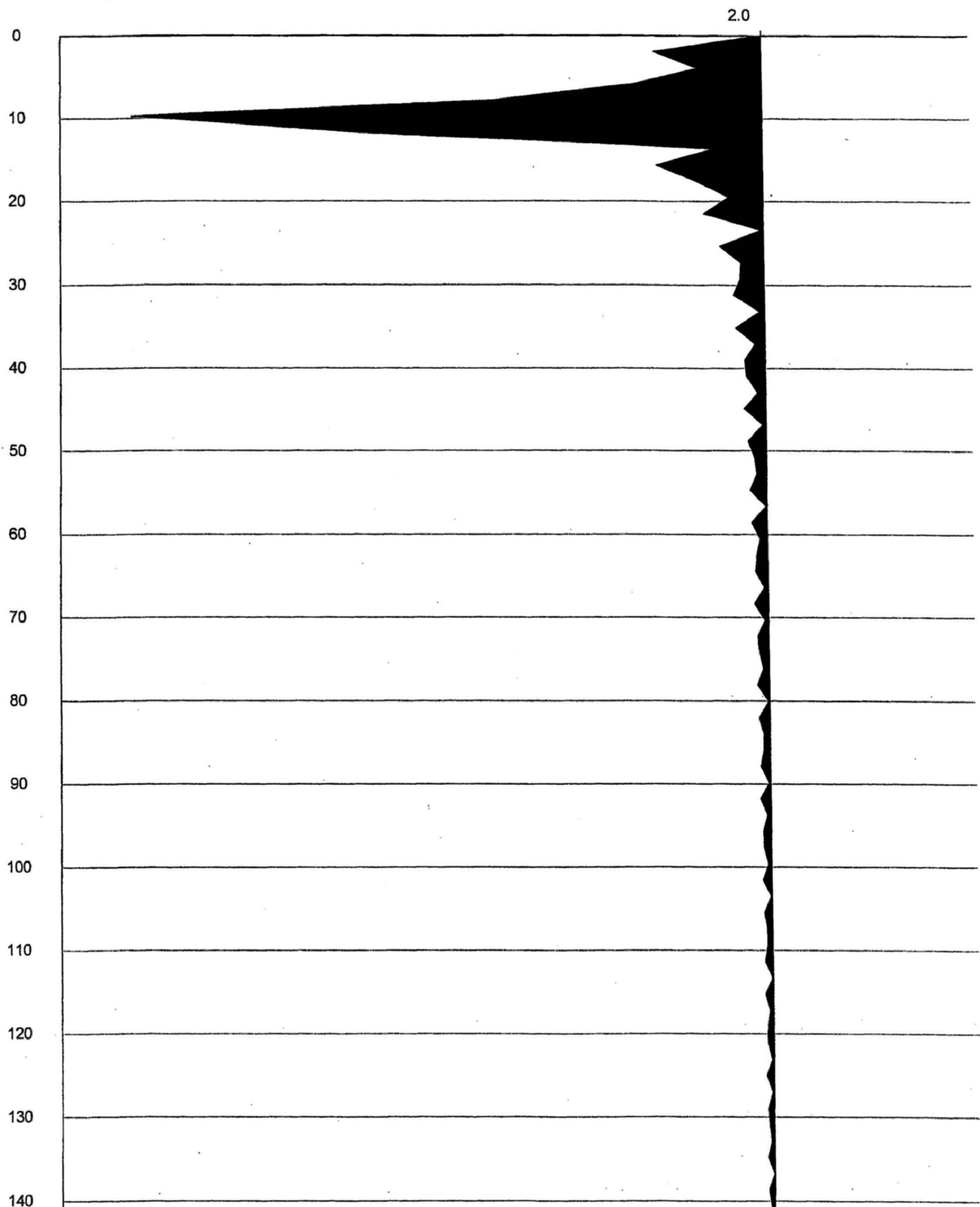
Model: OS-5020G, Serial No.: 3080209

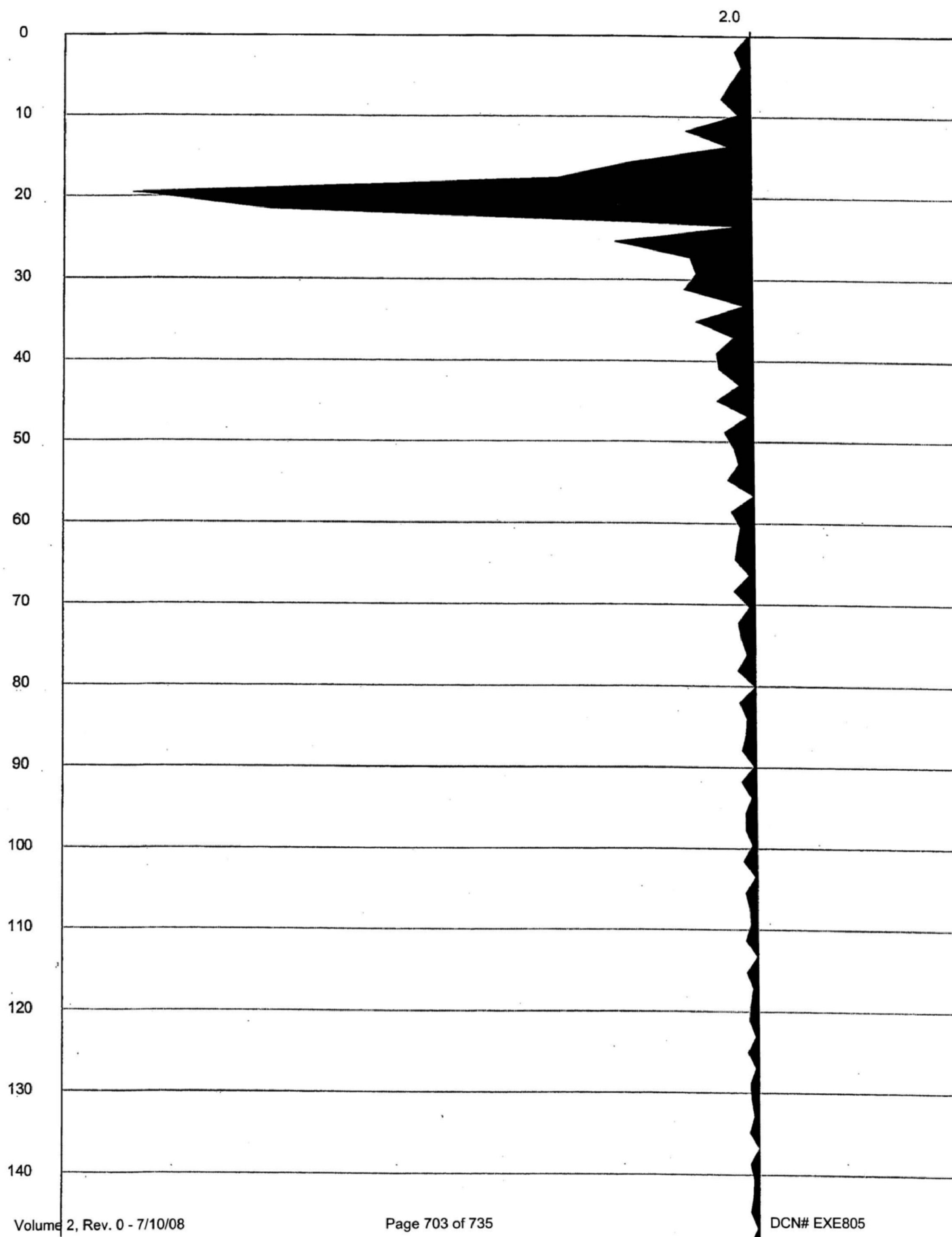
Calibration Verified by: Dennis Stauffer

Date: 1/22/2008

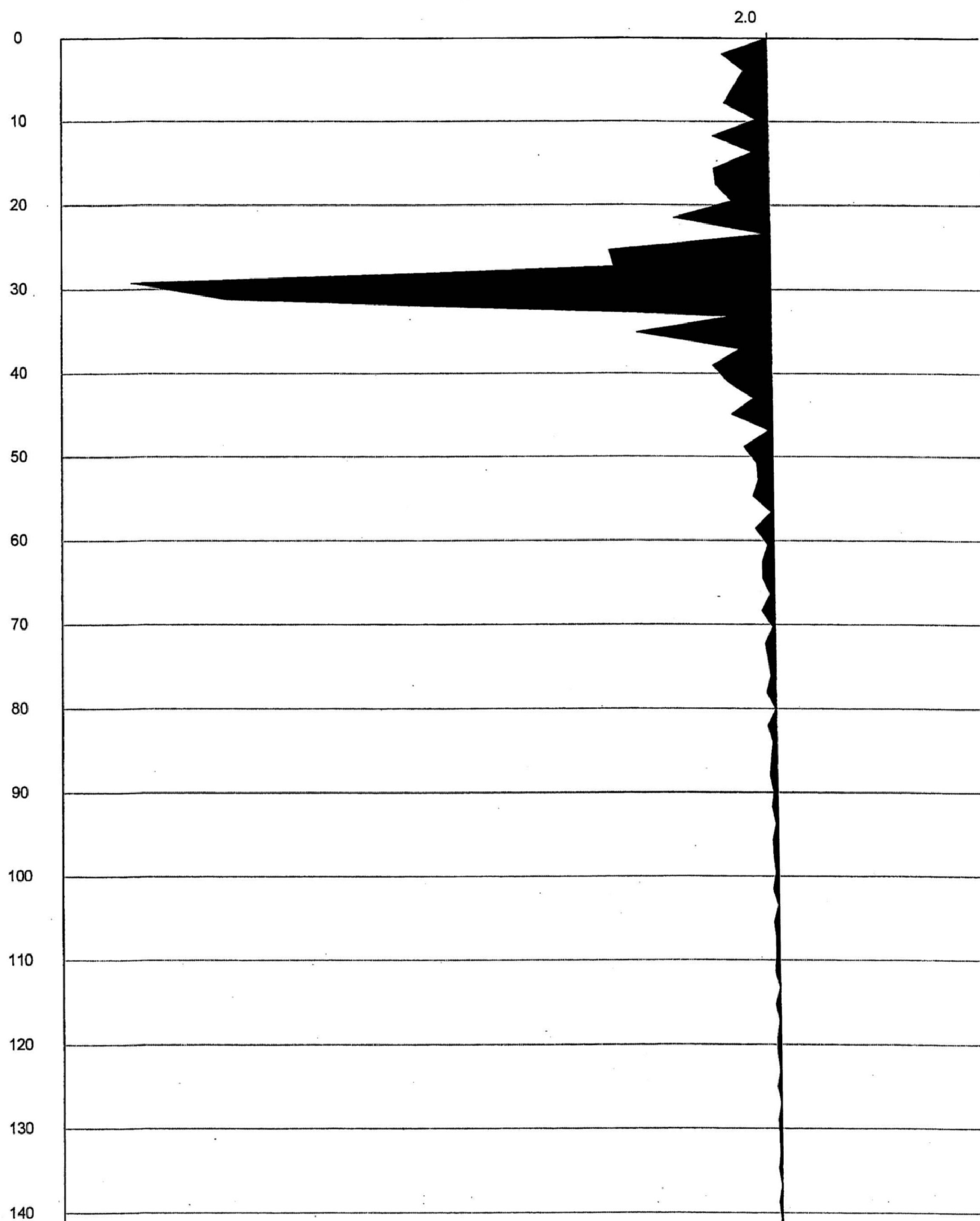
Checked By : Recep Yilmaz

Date: 1/22/2008

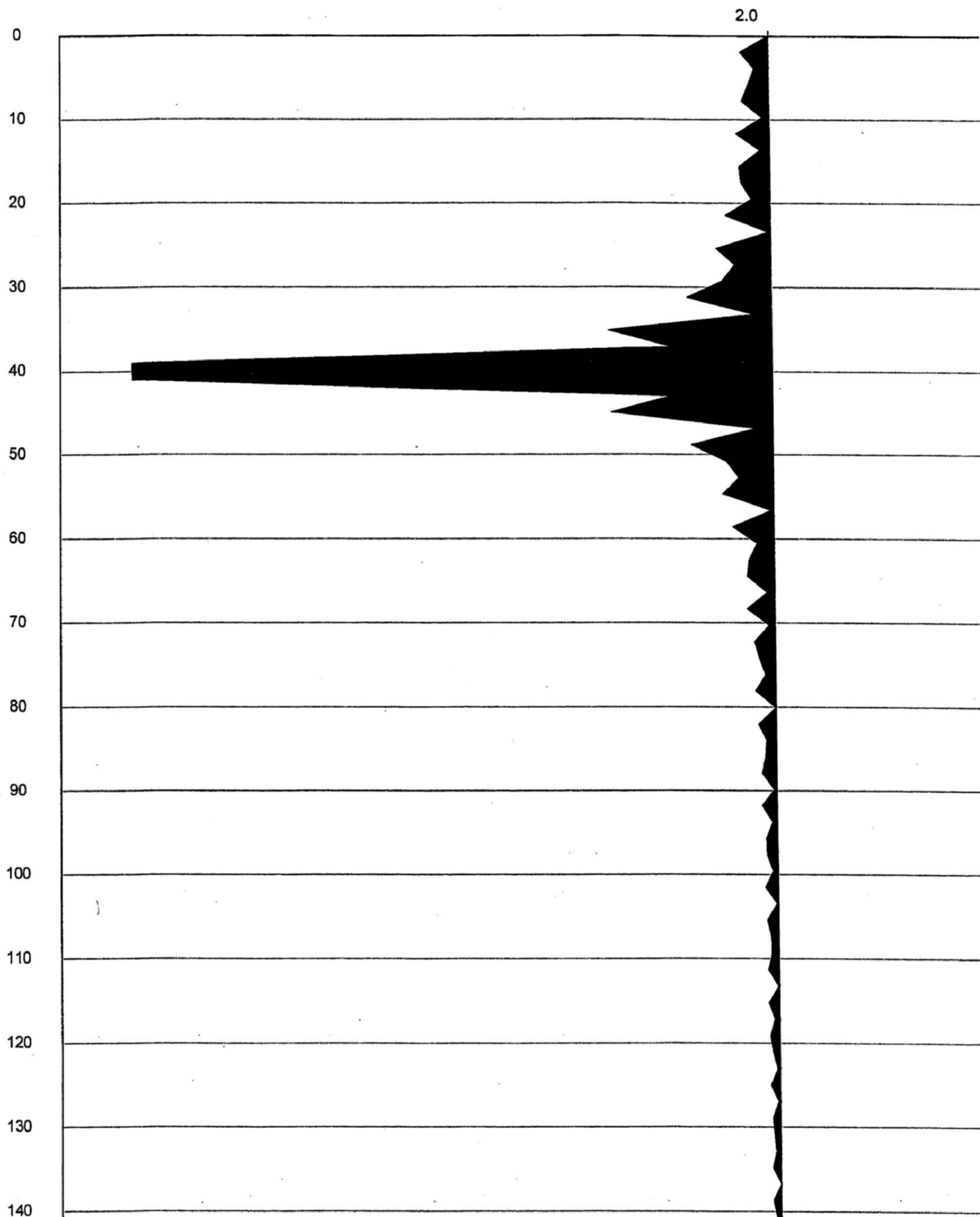


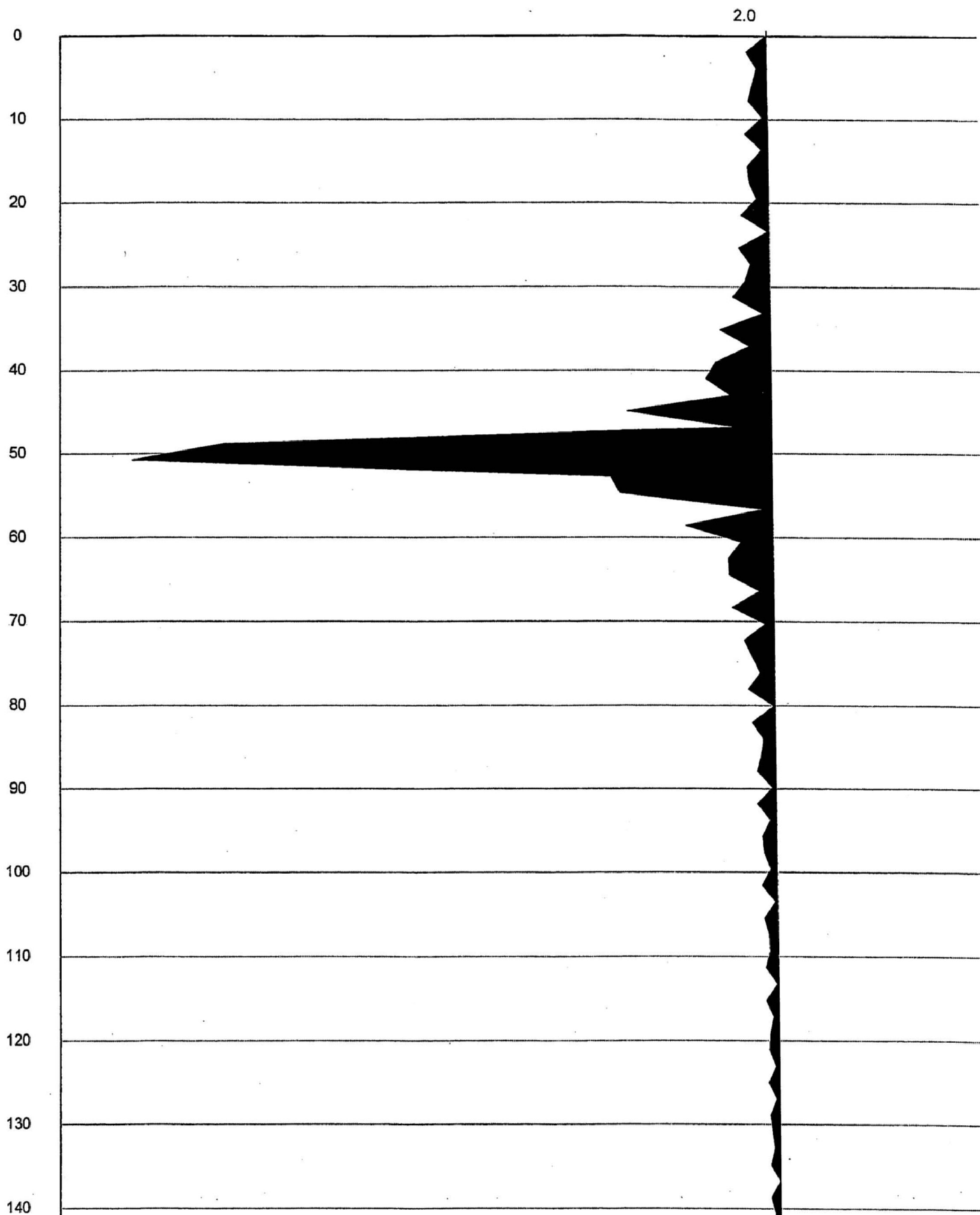


Geometrics ES-3000 S/N 5138
Frequency (Hz) IN: 30.061 Seismograph: 29.5
11/02/2007

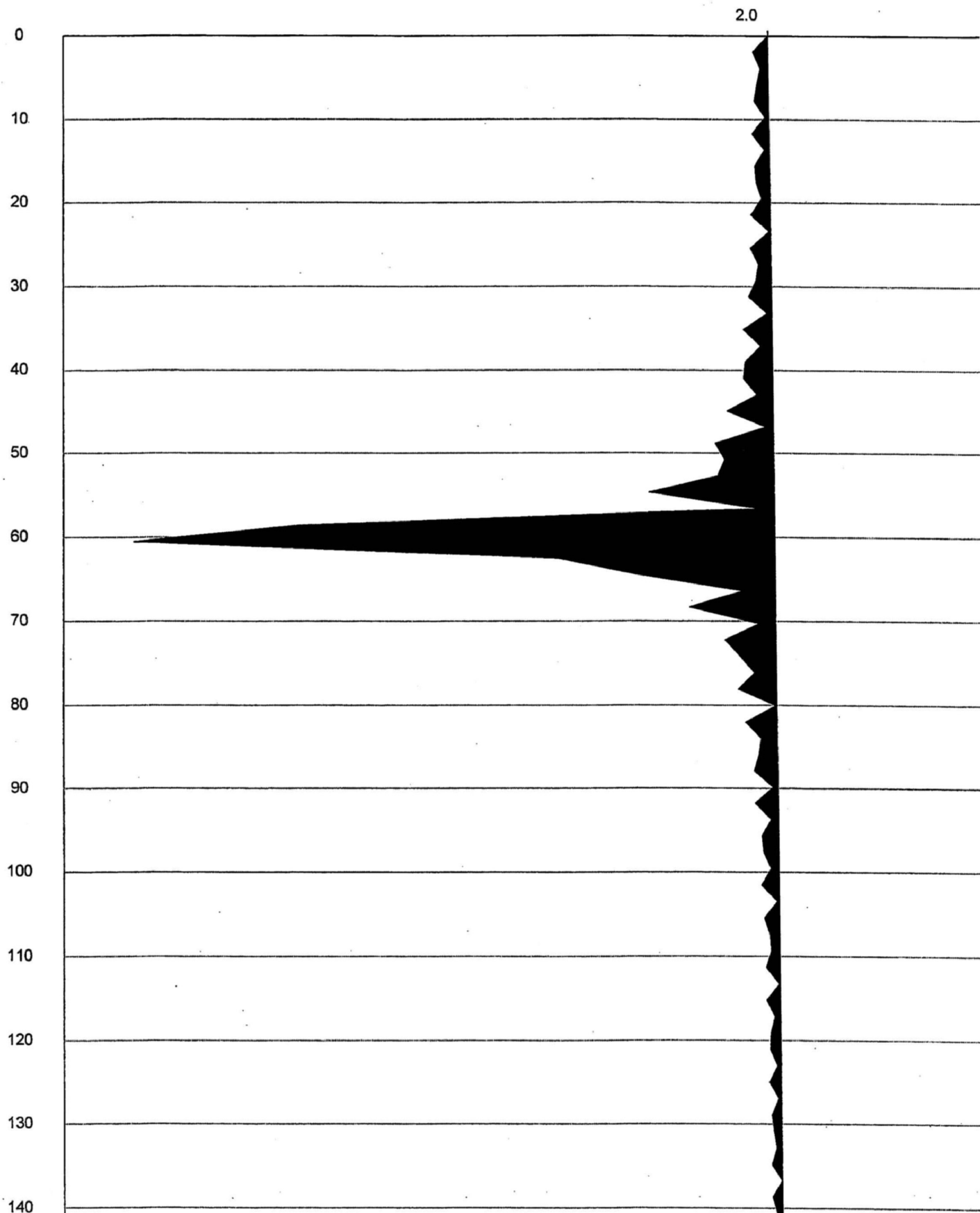


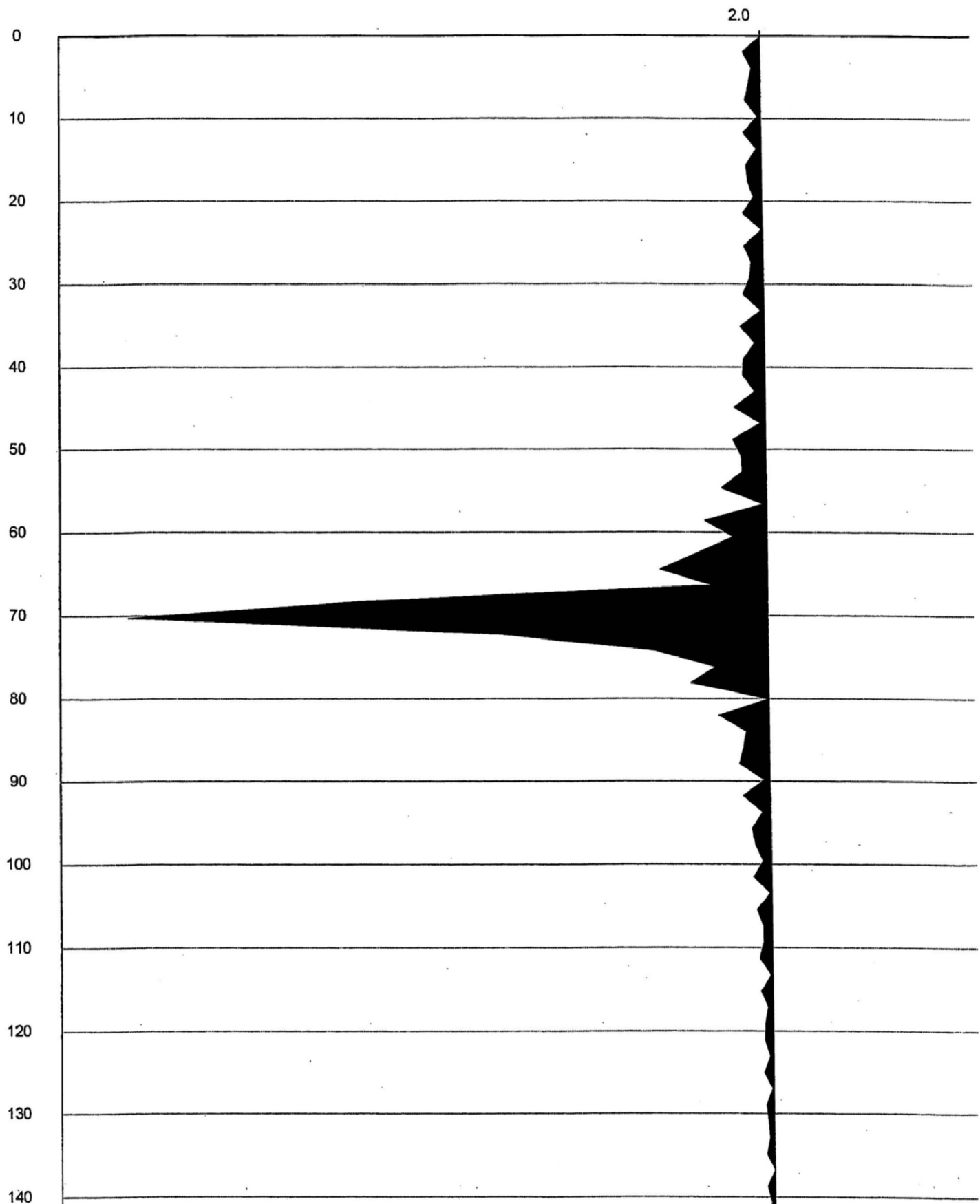
Geometrics ES-3000 S/N 5138
Frequency (Hz) IN: 40.042 Seismograph: 40.1
11/02/2007

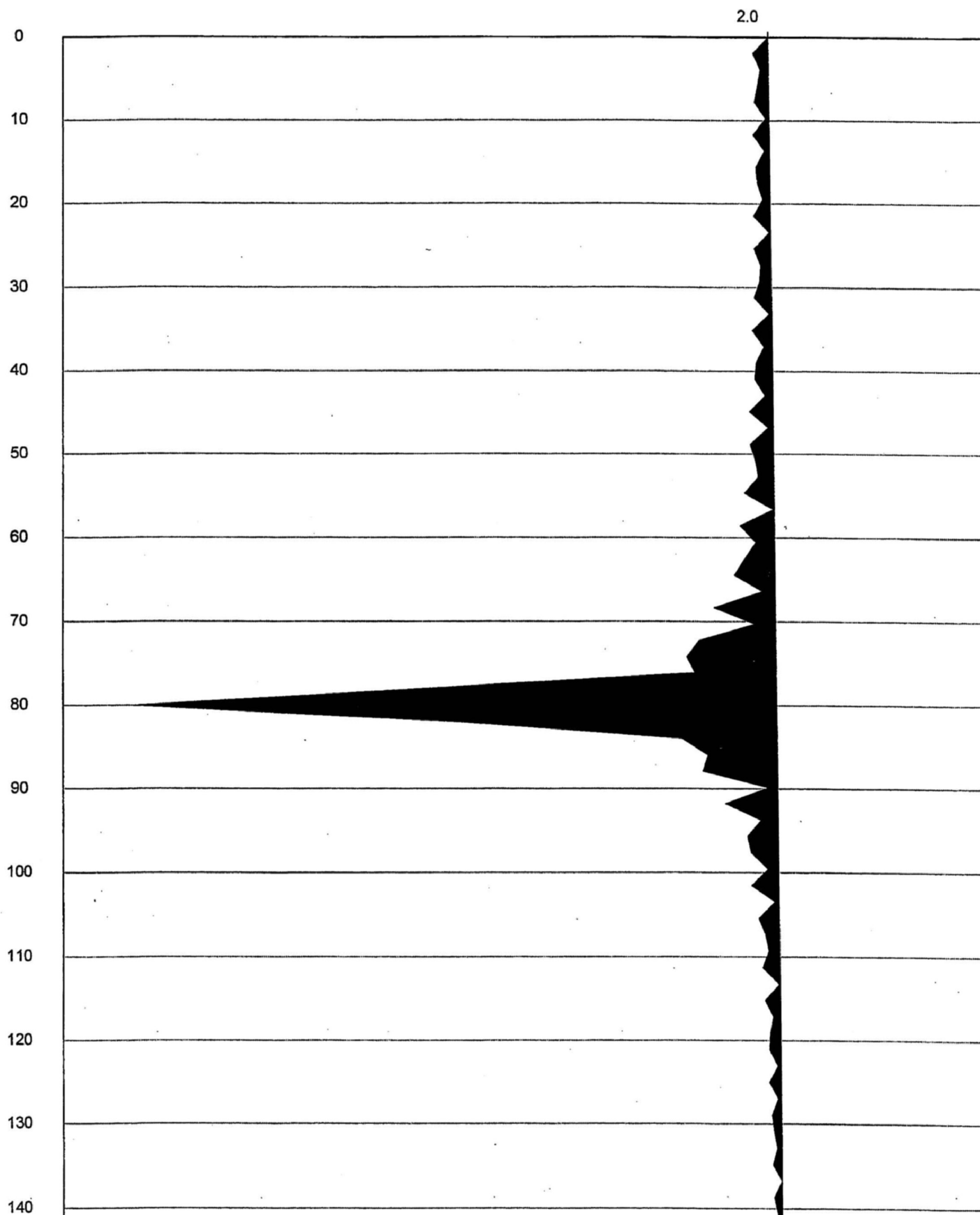




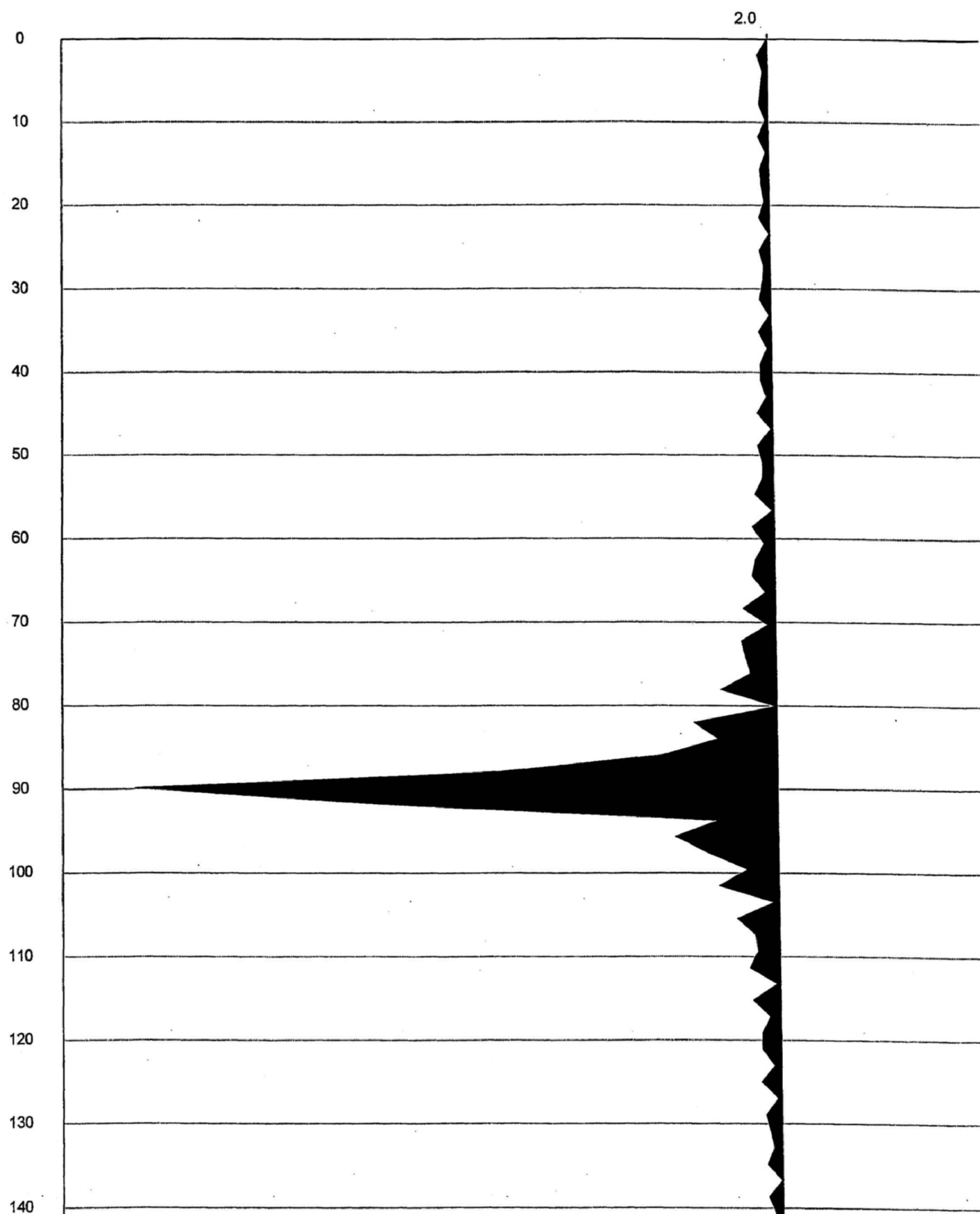
Geometrics ES-3000 S/N 5138
Frequency (Hz) IN: 60.050 Seismograph: 60.3
11/02/2007



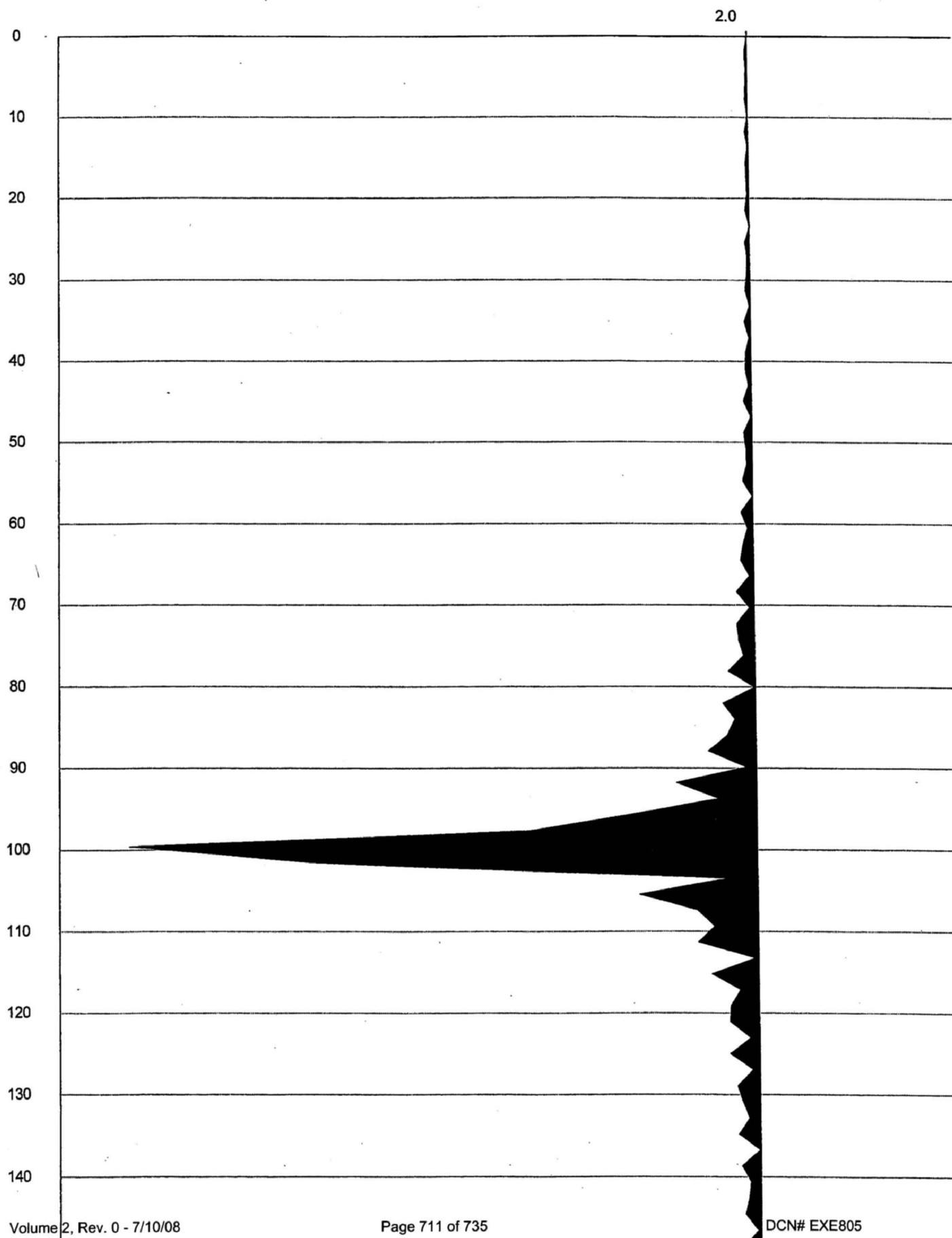




Geometrics ES-3000 S/N 5138
Frequency (Hz) IN: 90.080 Seismograph: 90.0
11/02/2007



Geometrics ES-3000 S/N 5138
Frequency (Hz) IN: 100.002 Seismograph: 99.7
11/02/2007



**POST JOB
CALIBRATION
VERIFICATION**

Calibration Verification Certificate



Device Type: Piezo Cone Penetrometer

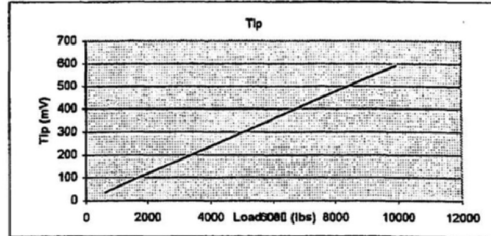
Device Number: F7.5CKEW2/B 1701-1498

TIP CALIBRATION

Tip area = 15 cm² = 0.0161 ft²

Tip readings in mV

Load lb	Load Tons	load/area tsf	Tip mV	TIP Cal Factor Mpa
0	0	0	0	0
605	0.3025	18.78882	35.7	50.3986015
5080	2.54	157.764	301.2	50.1579839
7520	3.76	233.5404	446.7	50.0648841
9960	4.98	309.3168	591.2	50.1021358
15150	7.575	470.4969	899.3	50.1001892
20040	10.02	622.3602	1190.2	50.0736325

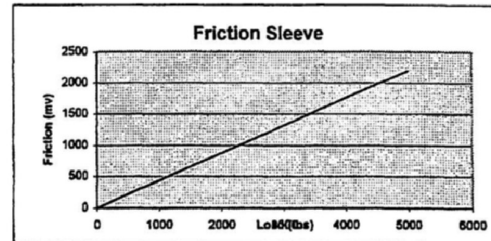


FRICTION CALIBRATION

Sleeve area = 200 cm² = 0.2153 ft²

Friction readings in mV

Load lb	Load Tons	load/area tsf	Friction mV	Friction Cal Factor Mpa
0	0	0	0	0
480	0.24	1.114724	211.7	0.50423566
2530	1.265	5.875523	1112.8	0.50561107
3610	1.805	8.383651	1586.7	0.50597092
5005	2.5025	11.62332	2197.3	0.50655651
7480	3.74	17.37111	3287.4	0.50601364

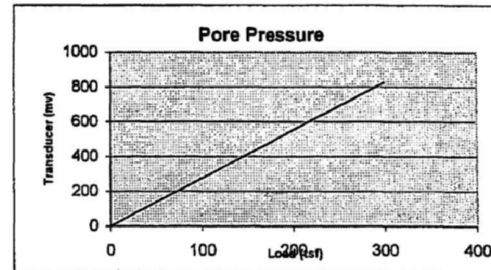


PORE PRESSURE TRANSDUCER CALIBRATION

Serial : 7056-1-133

Pore Pressure readings in mV

Pressure psi	Pressure tsf	Transducer readings mV	P.Pres. Cal Factor Mpa
0	0	0	0
75	5.4	206.9	2.49931196
150	10.8	415.2	2.49088461
300	21.6	827.5	2.49961399



Temperature Calibration (30 - 115 degrees F)

Temp (deg F)	TIP (mV)	FRIC (mV)	PIEZO (mV)	Deviation	mV	Mpa	% Full Scale
30	1.623	1.032	-0.397	Tip	0.338	0.0169	0.0338
50	1.680	1.128	-0.946	Friction	1.694	0.000847	0.1694
75	1.728	1.331	-1.147	Piezo	5.714	0.014285	0.5714
100	1.901	1.507	1.473				
115	1.943	2.174	3.319				

TIP CALIBRATED BY GEOTAC (A2LA APPROVED) LOAD CELL:

Model 560K, Serial No. 129739

FRICTION CALIBRATED BY INTERFACE (A2LA APPROVED) LOAD CELL :

Model: 1211EX-10K-B, Serial : 113655

PORE PRESSURE TRANSDUCER CALIBRATED BY GE SENSING (AANSI/NC SL APPROVED)

Pressure Indicator Model: UPS3000CC, Serial : A0813

TEMPERATURE CALIBRATED BY HOUSTON PRECISION TYPE K THERMOCOUPLE (A2LA APPROVED)

Model # 8528-40, Serial # C95005824, ID # TD-001

Calibration Verified by: Dennis Stauffer

Date: 1/22/2008

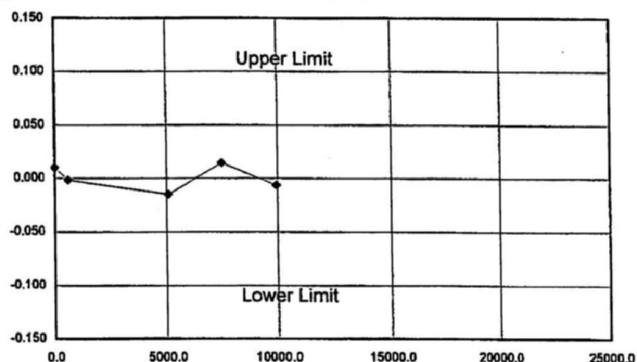
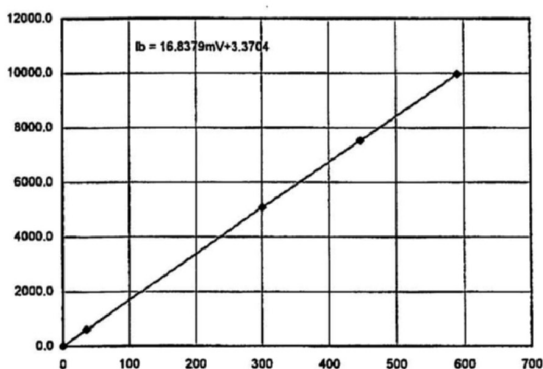
Checked By : Recep Yilmaz

Date: 1/22/2008

HGL Instrument Verification

DATE: 1/22/2008 Instrument No.: ft Location: Houston LVDT?: ☐ Yes; ☒ No
 Type Analysis: ☒ BF; ☐ NonBF; ☒ FS; ☐ Abs. Reading Resolution of Instrument: 0.000001

Instrument Identification/Data				Instrument	Standard	Prediction	Abs. Error	Full Scale
Type	Cone Penetrometer-TIP			mV	lb	lb	lb	Error (%)
Manufacturer	Fugro			0.000000	0.0	3.4	3.4	0.01
Model Number	F7.5CKE3SW2/B			35.700000	605.0	604.5	0.5	0.00
Serial Number	1701-1498(Tip)			301.200000	5080.0	5074.9	5.1	-0.02
HGL Instrument Number	ft			446.700000	7520.0	7524.8	4.8	0.01
Excitation (V)				591.200000	9960.0	9957.9	2.1	-0.01
Gain/Span Setting	NA			899.300000	15150.0	15145.7	4.3	-0.01
Full Range Output (V)				1190.200000	20040.0	20043.8	3.8	0.01
Full Range/Capacity (lb)	33716							
Date Verified	1/22/2008							
Date Due	1/21/2009							
Service Status	In Service							
Accept. Abs. or FS Error (%)	0.1 ☒ FS; ☐ Abs.							
Verification/Standard Equipment								
Type	Load Cell (A2AL APPROVED)							
Manufacturer	Geotek							
Model Number	560K							
Serial Number	129739							
HGL Instrument Number								
Date Verified								
Temperature	°C = °F							
Linear Regression, Uncertainty, & Error Summary								
Correlation Coeff. (R ²)	0.999999699							
Intercept (lb)	3.370369765							
Slope (lb/mV)	16.8378626							
Verification (Calib.) Factor	16.83786260							
Verification Factor Units	lb/mV							
Absolute Zero (V)								
Floating Zero (V)								
Combined Uncertainty (lb)	0.6157721							
Coverage Factor	2							
Expanded Uncertainty (lb)	1.2315442							
Max. Abs. or FS Error (%)	-0.02 ☒ FS; ☐ Abs.							
				MTS	☐ Yes; ☒ No			



Uncertainty Budget Analysis For ft							
Source of Uncertainty	Value in lb	Distribution	Divisor	Type	Uncertainty (u _i)	u _i ²	Comments
Standard's Uncertainty		N	2.0000	B			
Abs. Error-STDEV ¹	0.6158	N	1.0000	A	0.6158	0.3792	
Resolution of Instrument	0.0000	R	3.4641	B	0.0000	0.0000	
Repeatability ²		N	1.0000	A			
Resolution of Standard	#N/A	R	3.4641	B			
Combined Uncertainty	0.6158						
Coverage Factor					2		for 95% confidence level.
Expanded Uncertainty (Best Measurement Capability) ³			1.232	lb			

(1) This equation follows the approach presented by A2LA, not that typically used in uncertainty calculations; i.e., STDEV of the Mean.

(2) This value is unique for type (model) of equipment.

(3) This uncertainty represents an expanded uncertainty expressed as approximately the 95% confidence level using a coverage factor of k=2.

Verified By: ES

Input By: _____

Reviewed By: _____

Checked By: Ry

File: _____

Remarks: _____

HGL Instrument Verification

DATE: 1/22/2008

Instrument No.: ft100

Location:

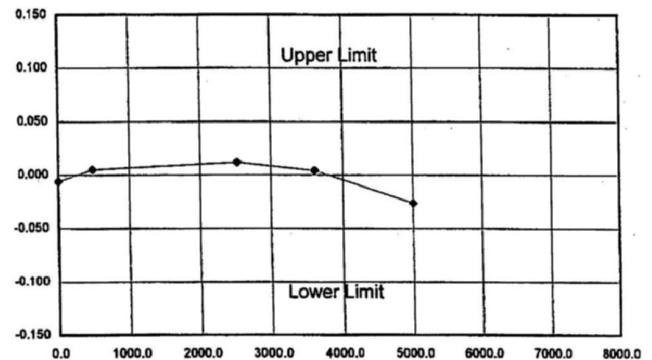
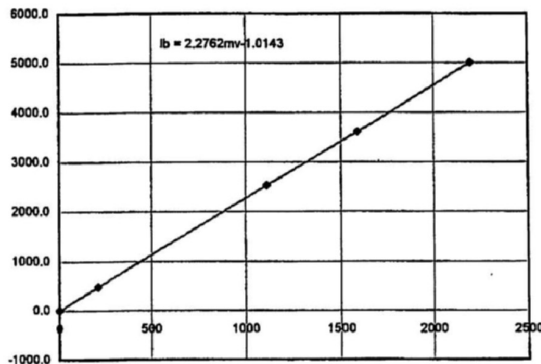
LVDT?: ☐ Yes; ☒ No

Type Analysis: ☒ BF; ☐ NonBF; ☒ FS; ☐ Abs.

Reading Resolution of Instrument: 0.000001

Instrument Identification/Data				Instrument	Standard	Prediction	Abs. Error	Full Scale
Type	Cone Penetrometer			mv	lb	lb	lb	Error (%)
Manufacturer	Fugro			0.000000	0.0	-1.0	1.0	-0.01
Model Number	F7.5CKEW2/B			211.700000	480.0	480.9	0.9	0.01
Serial Number	1701-1498 (Friction)			1112.800000	2530.0	2532.0	2.0	0.01
HGL Instrument Number	ft100			1586.700000	3610.0	3610.7	0.7	0.00
Excitation (V)				2197.300000	5005.0	5000.6	4.4	-0.03
Gain/Span Setting	NA			3287.400000	7480.0	7481.9	1.9	0.01
Full Range Output (V)								
Full Range/Capacity (lb)	16858							
Date Verified	1/22/2008							
Date Due	1/21/2009							
Service Status	In Service							
Accept. Abs. or FS Error (%)	0.1	☒ FS;	☐ Abs.					
Verification/Standard Equipment								
Type	Load Cell (A2AL APPROVED)							
Manufacturer	INTERFACE							
Model Number	1211EX-10K-B							
Serial Number	113655							
HGL Instrument Number								
Date Verified								
Temperature	°C = °F							
Linear Regression, Uncertainty, & Error Summary								
Correlation Coeff. (R ²)	0.999999261							
Intercept (lb)	-1.014317764							
Slope (lb/mv)	2.276240297							
Verification (Calib.) Factor	2.27624030							
Verification Factor Units	lb/mv							
Absolute Zero (V)								
Floating Zero (V)								
Combined Uncertainty (lb)	0.567926155							
Coverage Factor	2							
Expanded Uncertainty (lb)	1.13585231							
Max. Abs. or FS Error (%)	-0.03	☒ FS;	☐ Abs.					

MTS ☐ Yes; ☒ No



Uncertainty Budget Analysis For ft100							
Source of Uncertainty	Value in lb	Distribution	Divisor	Type	Uncertainty (u _i)	u _i ²	Comments
Standard's Uncertainty		N	2.0000	B			
Abs. Error-STDEV ¹	0.5679	N	1.0000	A	0.5679	0.3225	
Resolution of Instrument	0.0000	R	3.4641	B	0.0000	0.0000	
Repeatability ²		N	1.0000	A			
Resolution of Standard	#N/A	R	3.4641	B			
Combined Uncertainty	0.5679	Coverage Factor		2	for 95% confidence level.		
Expanded Uncertainty (Best Measurement Capability) ³	1.136			lb			

(1) This equation follows the approach presented by A2LA, not that typically used in uncertainty calculations; i.e., STDEV of the Mean.

(2) This value is unique for type (model) of equipment.

(3) This uncertainty represents an expanded uncertainty expressed as approximately the 95% confidence level using a coverage factor of k=2.

Verified By: JS

Input By: _____

Reviewed By: _____

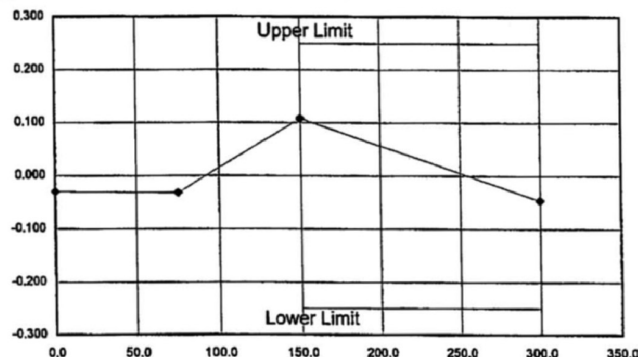
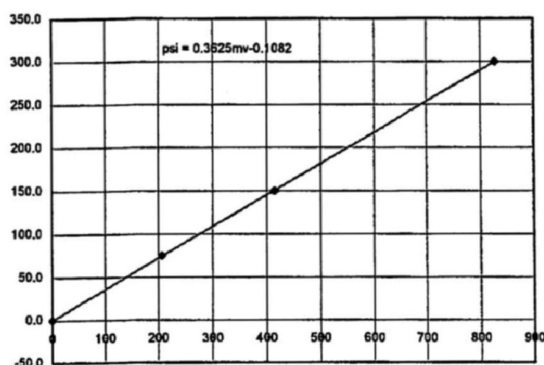
Checked By: Ry

Remarks: _____

HGL Instrument Verification

DATE: 1/22/2008 Instrument No.: pt Location: Houston LVDT?: ☐ Yes; ☒ No
 Type Analysis: ☒ BF; ☐ NonBF; ☒ FS; ☐ Abs. Reading Resolution of Instrument: 0.000001

Instrument Identification/Data				Instrument	Standard	Prediction	Abs. Error	Full Scale
Type	Cone Penetrometer			mv	psi	psi	psi	Error (%)
Manufacturer	Fugro			0.000000	0.0	-0.1	0.1	-0.03
Model Number	F7.5CKEW2/B			206.900000	75.0	74.9	0.1	-0.03
Serial Number	1701-1576-7056-1-133 (Piezo)			415.200000	150.0	150.4	0.4	0.11
HGL Instrument Number	pt			827.500000	300.0	299.8	0.2	-0.05
Excitation (V)								
Gain/Span Setting	NA							
Full Range Output (V)								
Full Range/Capacity (psi)	360							
Date Verified	1/22/2008							
Date Due	1/21/2009							
Service Status	In Service							
Accept. Abs. or FS Error (%)	0.25	☒ FS;	☐ Abs.					
Verification/Standard Equipment								
Type	PT(ANSI/NCSL APPROVED)							
Manufacturer	Eaton							
Model Number	UPS3000CC							
Serial Number	A0813							
HGL Instrument Number								
Date Verified								
Temperature	°C = °F							
Linear Regression, Uncertainty, & Error Summary								
Correlation Coeff. (R ²)	0.999995874							
Intercept (psi)	-0.108198682							
Slope (psi/mv)	0.362467436							
Verification (Calib.) Factor	0.36246744							
Verification Factor Units	psi/mv							
Absolute Zero (V)								
Floating Zero (V)								
Combined Uncertainty (psi)	0.066029689							
Coverage Factor	2							
Expanded Uncertainty (psi)	0.132059378							
Max. Abs. or FS Error (%)	0.11	☒ FS;	☐ Abs.					
				MTS ☐ Yes; ☒ No				



Uncertainty Budget Analysis For pt							
Source of Uncertainty	Value in psi	Distribution	Divisor	Type	Uncertainty (u _i)	u _i ²	Comments
Standard's Uncertainty		N	2.0000	B			
Abs. Error-STDEV ¹	0.0660	N	1.0000	A	0.0660	0.0044	
Resolution of Instrument	0.0000	R	3.4641	B	0.0000	0.0000	
Repeatability ²		N	1.0000	A			
Resolution of Standard	#N/A	R	3.4641	B			
Combined Uncertainty	0.0660						
Coverage Factor	2						for 95% confidence level.
Expanded Uncertainty (Best Measurement Capability) ³	0.132			psi			

(1) This equation follows the approach presented by A2LA, not that typically used in uncertainty calculations; i.e., STDEV of the Mean.

(2) This value is unique for type (model) of equipment.

(3) This uncertainty represents an expanded uncertainty expressed as approximately the 95% confidence level using a coverage factor of k=2.

Verified By: 12 Input By: _____ Reviewed By: _____ Checked By: Ry
 File: _____
 Remarks: _____

Calibration Verification Certificate



Device Type: Piezo Cone Penetrometer

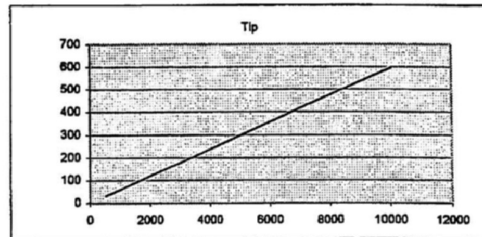
Device Number: F7.5CKESW2/V 1701-1788

TIP CALIBRATION

Tip area = 15 cm² = 0.0161 ft²

Tip readings in mV

Load lb	Load Tons	load/area tsf	Tip mV	TIP Cal Factor Mpa
0	0	0	0	0
510	0.255	15.83851	30.3	50.0563149
4980	2.49	154.6584	295.3	50.1530353
7510	3.755	233.2298	446.3	50.0431198
10040	5.02	311.8012	595.4	50.1482993
14970	7.485	464.9068	889.4	50.0559839
19960	9.98	619.8758	1184.3	50.1222011

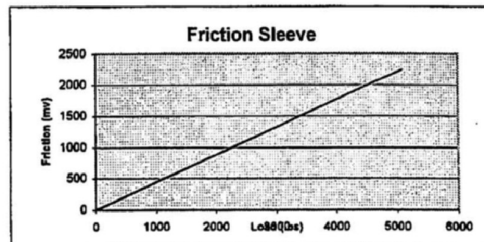


FRICTION CALIBRATION

Sleeve area = 200 cm² = 0.2153 ft²

Friction readings in mV

Load lb	Load Tons	load/area tsf	Friction mV	Friction Cal Factor Mpa
0	0	0	0	0
550	0.275	1.277288	243.8	0.50169776
2020	1.01	4.691129	890.4	0.50452117
3590	1.795	8.337204	1584.6	0.50383458
5100	2.55	11.84394	2250.7	0.50392481
7480	3.74	17.37111	3295.4	0.50478522

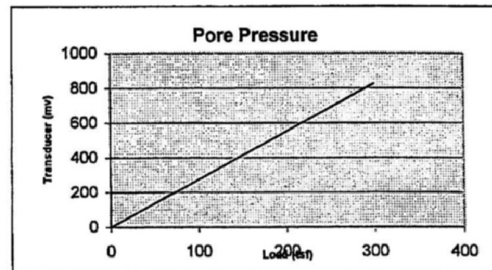


PORE PRESSURE TRANSDUCER CALIBRATION

Serial : 1233109

Pore Pressure readings in mV

Pressure psi	Pressure tsf	Transducer readings mV	P.Pres. Cal Factor Mpa
0	0	0	0
75	5.4	206.3	2.50658092
150	10.8	413.5	2.50112525
300	21.6	824.8	2.50779653



Temperature Calibration (30 - 115 degrees F)

Temp (deg TIP (mV)	FRIC (mV)	PIEZO (mV)	Deviation	mV	Mpa	% Full Scale
30	-0.010	-0.201	Tip	0.255	0.01275	0.0255
50	0.002	-0.332	Friction	2.859	0.00143	0.2859
75	0.015	-0.392	Piezo	2.490	0.006225	0.249
100	0.143	1.978				
115	0.245	2.658				

TIP CALIBRATED BY GEOTAC (A2LA APPROVED) LOAD CELL:

Model 560K, Serial No. 129739

FRICTION CALIBRATED BY INTERFACE (A2LA APPROVED) LOAD CELL :

Model: 1211EX-10K-B, Serial : 113655

PORE PRESSURE TRANSDUCER CALIBRATED BY GE SENSING (AANSI/NCSL APPROVED)

Pressure Indicator Model: UPS3000CC, Serial : A0813

TEMPERATURE CALIBRATED BY HOUSTON PRECISION TYPE K THERMOCOUPLE (A2LA APPROVED)

Model # 8528-40, Serial # C95005824, ID # TD-001

Calibration Verified by: Dennis Stauffer

Date: 1/22/2008

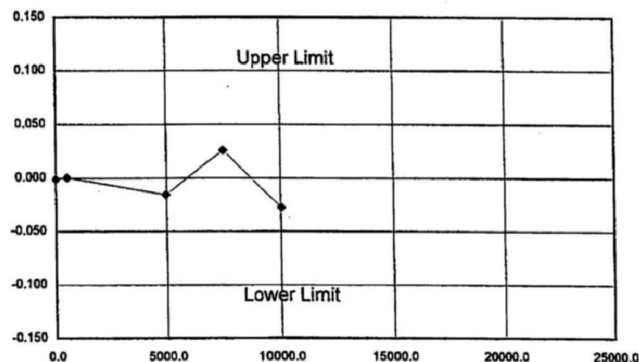
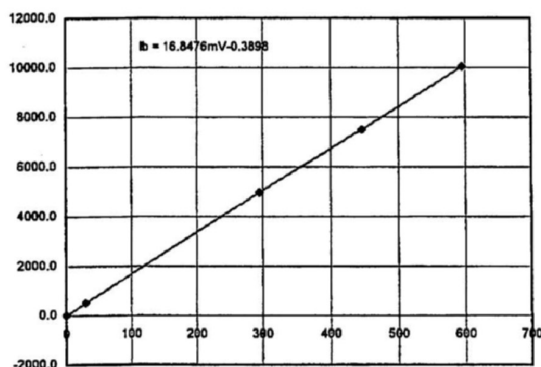
Checked By : Recep Yilmaz

Date: 1/22/2008

HGL Instrument Verification

DATE: 1/22/2008 Instrument No.: ft Location: Houston LVDT?: ☐ Yes; ☒ No
 Type Analysis: ☒ BF; ☐ NonBF; ☒ FS; ☐ Abs. Reading Resolution of Instrument: 0.000001

Instrument Identification/Data		Instrument	Standard	Prediction	Abs. Error	Full Scale
Type	Cone Penetrometer_TIP	mV	lb	lb	lb	Error (%)
Manufacturer	Fugro	0.000000	0.0	-0.4	0.4	0.00
Model Number	F7.5CKESW2/B1	30.300000	510.0	510.1	0.1	0.00
Serial Number	1701-1788 (Tip)	295.300000	4980.0	4974.7	5.3	-0.02
HGL Instrument Number	ft	446.300000	7510.0	7518.7	8.7	0.03
Excitation (V)		595.400000	10040.0	10030.7	9.3	-0.03
Gain/Span Setting	NA	889.400000	14970.0	14983.9	13.9	0.04
Full Range Output (V)		1184.300000	19960.0	19952.3	7.7	-0.02
Full Range/Capacity (lb)	33716					
Date Verified	1/22/2008					
Date Due	1/21/2009					
Service Status	In Service					
Accept. Abs. or FS Error (%)	0.1 ☒ FS; ☐ Abs.					
Verification/Standard Equipment						
Type	Load Cell (A2AL APPROVED)					
Manufacturer	Geotac					
Model Number	560K					
Serial Number	129739					
HGL Instrument Number						
Date Verified						
Temperature	°C = °F					
Linear Regression, Uncertainty, & Error Summary						
Correlation Coeff. (R ²)	0.999998634					
Intercept (lb)	-0.389801857					
Slope (lb/mV)	16.84763982					
Verification (Calib.) Factor	16.84763982					
Verification Factor Units	lb/mV					
Absolute Zero (V)						
Floating Zero (V)						
Combined Uncertainty (lb)	1.882927137					
Coverage Factor	2					
Expanded Uncertainty (lb)	3.765854274					
Max. Abs. or FS Error (%)	0.04 ☒ FS; ☐ Abs.					
		MTS ☐ Yes; ☒ No				



Uncertainty Budget Analysis For ft							
Source of Uncertainty	Value in lb	Distribution	Divisor	Type	Uncertainty (u _i)	u _i ²	Comments
Standard's Uncertainty		N	2.0000	B			
Abs. Error-STDEV ¹	1.8829	N	1.0000	A	1.8829	3.5454	
Resolution of Instrument	0.0000	R	3.4641	B	0.0000	0.0000	
Repeatability ²		N	1.0000	A			
Resolution of Standard	#N/A	R	3.4641	B			
Combined Uncertainty	1.8829						
Expanded Uncertainty (Best Measurement Capability) ³							
			Coverage Factor		2		for 95% confidence level.

(1) This equation follows the approach presented by A2LA, not that typically used in uncertainty calculations; i.e., STDEV of the Mean.

(2) This value is unique for type (model) of equipment.

(3) This uncertainty represents an expanded uncertainty expressed as approximately the 95% confidence level using a coverage factor of k=2.

Verified By: LS

Input By: _____

Reviewed By: _____

Checked By: Ry

File: _____

Remarks: _____

HGL Instrument Verification

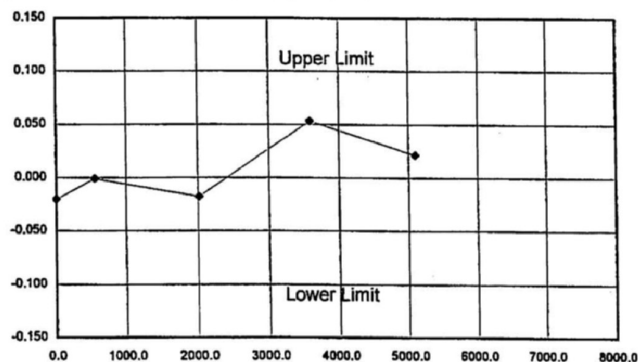
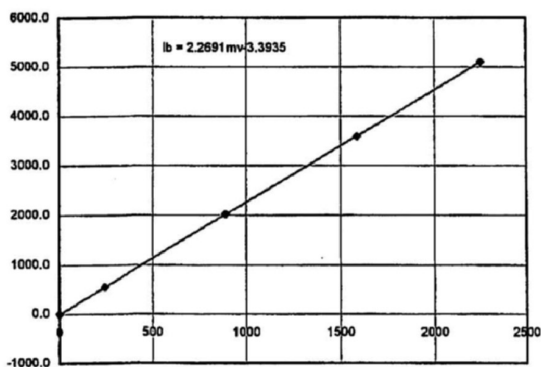
DATE: 1/22/2008 Instrument No.: ft100 Location: LVDT?: ☐ Yes; ☒ No
 Type Analysis: ☒ BF; ☐ NonBF; ☒ FS; ☐ Abs. Reading Resolution of Instrument: 0.000001

Instrument Identification/Data		Instrument	Standard	Prediction	Abs. Error	Full Scale
Type	Cone Penetrometer	mv	lb	lb	lb	Error (%)
Manufacturer	Fugro	0.000000	0.0	-3.4	3.4	-0.02
Model Number	F7.5CKESW2/B1	243.800000	550.0	549.8	0.2	0.00
Serial Number	1701-1788 (Friction)	890.400000	2020.0	2017.0	3.0	-0.02
HGL Instrument Number	ft100	1587.600000	3590.0	3599.0	9.0	0.05
Excitation (V)		2250.700000	5100.0	5103.6	3.6	0.02
Gain/Span Setting	NA	3295.400000	7480.0	7474.1	5.9	-0.04
Full Range Output (V)						
Full Range/Capacity (lb)	16858					
Date Verified	1/22/2008					
Date Due	1/21/2009					
Service Status	In Service					
Accept. Abs. or FS Error (%)	0.1	☒ FS; ☐ Abs.				

Verification/Standard Equipment	
Type	Load Cell (A2AL APPROVED)
Manufacturer	INTERFACE
Model Number	1211EX-10K-B
Serial Number	113655
HGL Instrument Number	
Date Verified	
Temperature	°C = °F

Linear Regression, Uncertainty, & Error Summary	
Correlation Coeff. (R ²)	0.999996337
Intercept (lb)	-3.393488832
Slope (lb/mv)	2.269059971
Verification (Calib.) Factor	2.26905997
Verification Factor Units	lb/mv
Absolute Zero (V)	
Floating Zero (V)	
Combined Uncertainty (lb)	1.213348951
Coverage Factor	2
Expanded Uncertainty (lb)	2.426697903
Max. Abs. or FS Error (%)	0.05

MTS ☐ Yes; ☒ No



Uncertainty Budget Analysis For ft100							
Source of Uncertainty	Value in lb	Distribution	Divisor	Type	Uncertainty (u _i)	u _i ²	Comments
Standard's Uncertainty		N	2.0000	B			
Abs. Error-STDEV ¹	1.2133	N	1.0000	A	1.2133	1.4722	
Resolution of Instrument	0.0000	R	3.4641	B	0.0000	0.0000	
Repeatability ²		N	1.0000	A			
Resolution of Standard	#N/A	R	3.4641	B			
Combined Uncertainty	1.2133	Coverage Factor		2	for 95% confidence level.		
Expanded Uncertainty (Best Measurement Capability) ³	2.427			lb			

(1) This equation follows the approach presented by A2LA, not that typically used in uncertainty calculations; i.e., STDEV of the Mean.

(2) This value is unique for type (model) of equipment.

(3) This uncertainty represents an expanded uncertainty expressed as approximately the 95% confidence level using a coverage factor of k=2.

Verified By: *DS*

Input By: _____

Reviewed By: _____

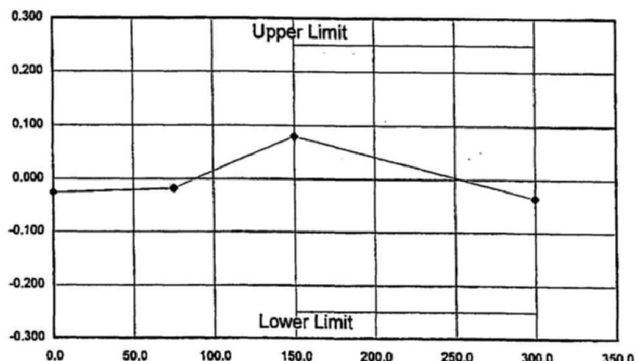
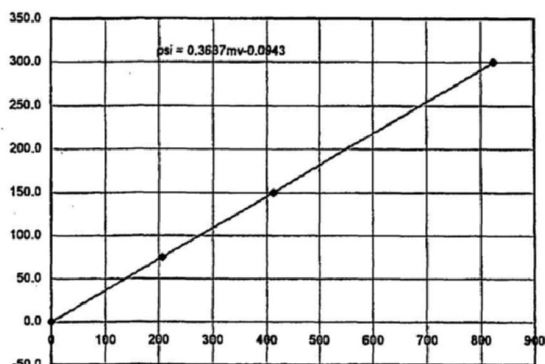
Checked By: *Ry*

File: _____
 Remarks: _____

HGL Instrument Verification

DATE: 1/22/2008 Instrument No.: pt Location: Houston LVDT?: ☐ Yes; ☒ No
 Type Analysis: ☒ BF; ☐ NonBF; ☒ FS; ☐ Abs. Reading Resolution of Instrument: 0.00001

Instrument Identification/Data				Instrument	Standard	Prediction	Abs. Error	Full Scale
Type	Cone Penetrometer			mv	psi	psi	psi	Error (%)
Manufacturer	Fugro			0.000000	0.0	-0.1	0.1	-0.03
Model Number	F7.5CKESW2/B1			206.300000	75.0	74.9	0.1	-0.02
Serial Number	1701-1788-1233109 (Piezo)			413.500000	150.0	150.3	0.3	0.08
HGL Instrument Number	pt			824.800000	300.0	299.9	0.1	-0.04
Excitation (V)								
Gain/Span Setting	NA							
Full Range Output (V)								
Full Range/Capacity (psi)	360							
Date Verified	1/22/2008							
Date Due	1/21/2009							
Service Status	In Service							
Accept. Abs. or FS Error (%)	0.25	☒ FS;	☐ Abs.					
Verification/Standard Equipment								
Type	PT(ANSI/NCSL APPROVED)							
Manufacturer	Eaton							
Model Number	UPS3000CC							
Serial Number	A0813							
HGL Instrument Number								
Date Verified								
Temperature	°C = °F							
Linear Regression, Uncertainty, & Error Summary								
Correlation Coeff. (R ²)	0.999997701							
Intercept (psi)	-0.094255964							
Slope (psi/mv)	0.363683389							
Verification (Calib.) Factor	0.36368339							
Verification Factor Units	psi/mv							
Absolute Zero (V)								
Floating Zero (V)								
Combined Uncertainty (psi)	0.0497694							
Coverage Factor	2							
Expanded Uncertainty (psi)	0.099538799							
Max. Abs. or FS Error (%)	0.08	☒ FS;	☐ Abs.					
				MTS	☐ Yes;	☒ No		



Uncertainty Budget Analysis For pt							
Source of Uncertainty	Value in psi	Distribution	Divisor	Type	Uncertainty (u _i)	u _i ²	Comments
Standard's Uncertainty		N	2.0000	B			
Abs. Error-STDEV ¹	0.0498	N	1.0000	A	0.0498	0.0025	
Resolution of Instrument	0.0000	R	3.4641	B	0.0000	0.0000	
Repeatability ²		N	1.0000	A			
Resolution of Standard	#N/A	R	3.4641	B			
Combined Uncertainty	0.0498	Coverage Factor		2	for 95% confidence level.		
Expanded Uncertainty (Best Measurement Capability) ³	0.100			psi			

(1) This equation follows the approach presented by A2LA, not that typically used in uncertainty calculations; i.e., STDEV of the Mean.

(2) This value is unique for type (model) of equipment.

(3) This uncertainty represents an expanded uncertainty expressed as approximately the 95% confidence level using a coverage factor of k=2.

Verified By: *[Signature]*

Input By: _____

Reviewed By: _____

Checked By: *[Signature]*

File: _____

Remarks: _____

Calibration Verification Certificate



Device Type: Piezo Cone Penetrometer

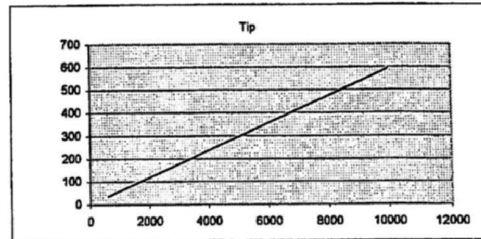
Device Number: F7.5CKEW2/V 1701-1832

TIP CALIBRATION

Tip area = 15 cm² = 0.0161 ft²

Tip readings in mV

Load lb	Load Tons	load/area tsf	Tip mV	Cal Factor Mpa
0	0	0	0	0
605	0.3025	18.78882	35.9	50.1178293
5200	2.6	161.4907	308.2	50.1766931
8120	4.06	252.1739	481.7	50.1315012
9990	4.995	310.2484	592.8	50.1174101
15100	7.55	468.9441	895.2	50.1635427
19990	9.995	620.8075	1184.6	50.1848225

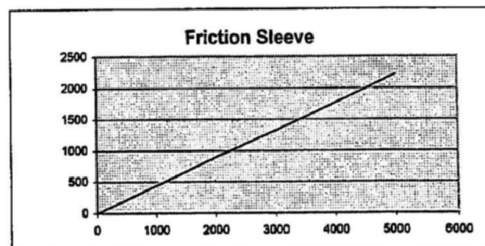


FRICITION CALIBRATION

Sleeve area = 200 cm² = 0.2153 ft²

Friction readings in mV

Load lb	Load Tons	load/area tsf	Friction mV	Cal Factor Mpa
0	0	0	0	0
550	0.275	1.277288	243.1	0.50314238
2030	1.015	4.714352	899.6	0.50183363
3540	1.77	8.221087	1552.8	0.50699177
5010	2.505	11.63493	2218.3	0.50226234
7480	3.74	17.37111	3310.2	0.50252831

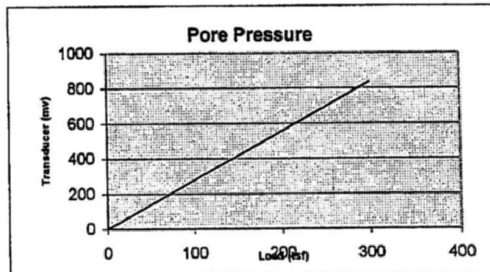


PORE PRESSURE TRANSDUCER CALIBRATION

Serial : 123312

Pore Pressure readings in mV

Pressure psi	Pressure tsf	Transducer readings mV	P.Pres. Cal Factor Mpa
0	0	0	0
75	5.4	208.9	2.47538365
150	10.8	414.1	2.4975013
300	21.6	834.2	2.47953797



Temperature Calibration (30 - 115 degrees F)

Temp (deg F)	TIP (mV)	FRIC (mV)	PIEZO (mV)	Deviation	mV	Mpa	% Full Scale
30	-0.009	0.195	-0.052	Tip	0.238	0.0119	0.0238
50	-0.041	0.207	0.135	Friction	3.180	0.00159	0.318
75	-0.046	0.284	0.148	Piezo	3.018	0.007545	0.3018
100	-0.133	2.812	-2.345				
115	-0.247	3.375	-2.883				

TIP CALIBRATED BY GEOTAC (A2LA APPROVED) LOAD CELL:

Model 560K, Serial No. 129739

FRICITION CALIBRATED BY INTERFACE (A2LA APPROVED) LOAD CELL :

Model: 1211EX-10K-B, Serial : 113655

PORE PRESSURE TRANSDUCER CALIBRATED BY GE SENSING (AANSI/NCSL APPROVED)

Pressure Indicator Model: UPS3000CC, Serial : A0813

TEMPERATURE CALIBRATED BY HOUSTON PRECISION TYPE K THERMOCOUPLE (A2LA APPROVED)

Model # 8528-40, Serial # C95005824, ID # TD-001

Calibration Verified by: Dennis Stauffer *DS*

Date: 1/22/2008

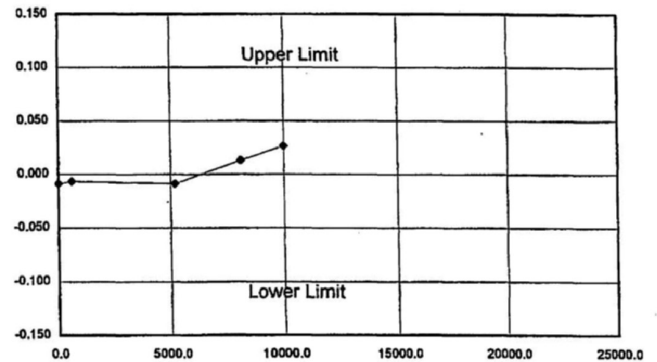
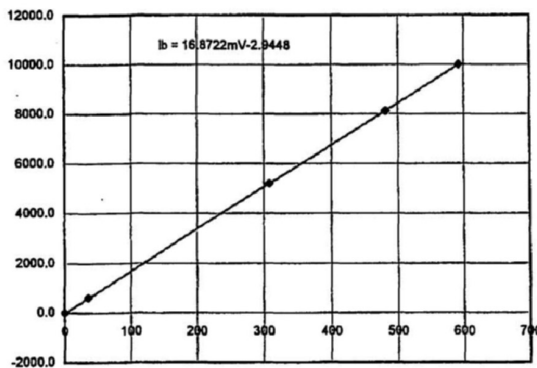
Checked By : Recep Yilmaz *RY*

Date: 1/22/2008

HGL Instrument Verification

DATE: 1/22/2008 Instrument No.: ft Location: Houston LVDT?: ☐ Yes; ☒ No
 Type Analysis: ☒ BF; ☐ NonBF; ☒ FS; ☐ Abs. Reading Resolution of Instrument: 0.000001

Instrument Identification/Data				Instrument	Standard	Prediction	Abs. Error	Full Scale
Type	Cone Penetrometer_TIP			mV	lb	lb	lb	Error (%)
Manufacturer	Fugro			0.000000	0.0	-2.9	2.9	-0.01
Model Number	F7.5CKEW2/B1			35.900000	605.0	602.8	2.2	-0.01
Serial Number	1701-1832 (Tip)			308.200000	5200.0	5197.1	2.9	-0.01
HGL Instrument Number	ft			481.700000	8120.0	8124.4	4.4	0.01
Excitation (V)				592.800000	9990.0	9998.9	8.9	0.03
Gain/Span Setting	NA			895.200000	15100.0	15101.0	1.0	0.00
Full Range Output (V)				1184.600000	19990.0	19983.8	6.2	-0.02
Full Range/Capacity (lb)	33716							
Date Verified	1/22/2008							
Date Due	1/21/2009							
Service Status	In Service							
Accept. Abs. or FS Error (%)	0.1	☒ FS;	☐ Abs.					
Verification/Standard Equipment								
Type	Load Cell (A2AL APPROVED)							
Manufacturer	Geotac							
Model Number	560K							
Serial Number	129739							
HGL Instrument Number								
Date Verified								
Temperature	°C = °F							
Linear Regression, Uncertainty, & Error Summary								
Correlation Coeff. (R ²)	0.999999507							
Intercept (lb)	-2.944801092							
Slope (lb/mV)	16.87217402							
Verification (Calib.) Factor	16.87217402							
Verification Factor Units	lb/mV							
Absolute Zero (V)								
Floating Zero (V)								
Combined Uncertainty (lb)	1.009640807							
Coverage Factor	2							
Expanded Uncertainty (lb)	2.019281615							
Max. Abs. or FS Error (%)	0.03	☒ FS;	☐ Abs.					
				MTS	☐ Yes;	☒ No		



Uncertainty Budget Analysis For ft							
Source of Uncertainty	Value in lb	Distribution	Divisor	Type	Uncertainty (u _i)	u _i ²	Comments
Standard's Uncertainty		N	2.0000	B			
Abs. Error-STDEV ¹	1.0096	N	1.0000	A	1.0096	1.0194	
Resolution of Instrument	0.0000	R	3.4641	B	0.0000	0.0000	
Repeatability ²		N	1.0000	A			
Resolution of Standard	#N/A	R	3.4641	B			
Combined Uncertainty	1.0096						
Expanded Uncertainty (Best Measurement Capability) ³	2.019						
Coverage Factor				2	for 95% confidence level.		

(1) This equation follows the approach presented by A2LA, not that typically used in uncertainty calculations; i.e., STDEV of the Mean.

(2) This value is unique for type (model) of equipment.

(3) This uncertainty represents an expanded uncertainty expressed as approximately the 95% confidence level using a coverage factor of k=2.

Verified By:

Input By: _____

Reviewed By: _____

Checked By:

File: _____

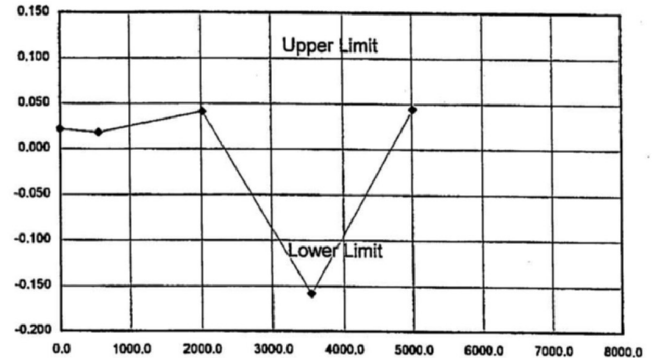
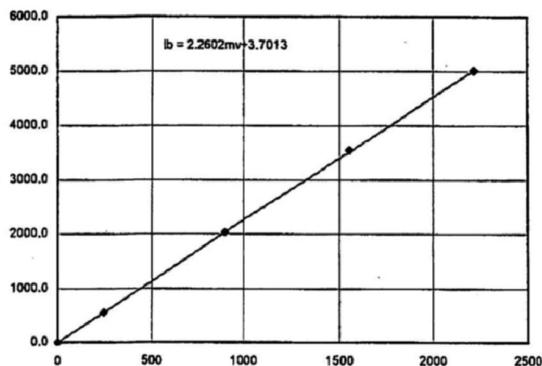
Remarks: _____

HGL Instrument Verification

DATE: 1/22/2008 Instrument No.: ft100 Location: LVDT?: ☐ Yes; ☒ No
 Type Analysis: ☒ BF; ☐ NonBF; ☒ FS; ☐ Abs. Reading Resolution of Instrument: 0.000001

Instrument Identification/Data		Instrument mv	Standard lb	Prediction lb	Abs. Error lb	Full Scale Error (%)
Type	Cone Penetrometer					
Manufacturer	Fugro	0.000000	0.0	3.7	3.7	0.02
Model Number	F7.5CKEW2/B1	243.100000	550.0	553.2	3.2	0.02
Serial Number	1701-1832 (Friction)	899.600000	2030.0	2037.0	7.0	0.04
HGL Instrument Number	ft100	1552.800000	3540.0	3513.3	26.7	-0.16
Excitation (V)		2218.300000	5010.0	5017.5	7.5	0.04
Gain/Span Setting	NA	3310.200000	7480.0	7485.4	5.4	0.03
Full Range Output (V)						
Full Range/Capacity (lb)	16858					
Date Verified	1/22/2008					
Date Due	1/21/2009					
Service Status	In Service					
Accept. Abs. or FS Error (%)	0.1 ☒ FS; ☐ Abs.					
Verification/Standard Equipment						
Type	Load Cell (A2AL APPROVED)					
Manufacturer	INTERFACE					
Model Number	1211EX-10K-B					
Serial Number	113655					
HGL Instrument Number						
Date Verified						
Temperature	°C = °F					
Linear Regression, Uncertainty, & Error Summary						
Correlation Coeff. (R ²)	0.999978435					
Intercept (lb)	3.70130146					
Slope (lb/mv)	2.260188739					
Verification (Calib.) Factor	2.26018874					
Verification Factor Units	lb/mv					
Absolute Zero (V)						
Floating Zero (V)						
Combined Uncertainty (lb)	3.62518158					
Coverage Factor	2					
Expanded Uncertainty (lb)	7.25036316					
Max. Abs. or FS Error (%)	-0.16 ☒ FS; ☐ Abs.					

MTS ☐ Yes; ☒ No



Uncertainty Budget Analysis For ft100							
Source of Uncertainty	Value in lb	Distribution	Divisor	Type	Uncertainty (u _i)	u _i ²	Comments
Standard's Uncertainty		N	2.0000	B			
Abs. Error-STDEV ¹	3.6252	N	1.0000	A	3.6252	13.1419	
Resolution of Instrument	0.0000	R	3.4641	B	0.0000	0.0000	
Repeatability ²		N	1.0000	A			
Resolution of Standard	#N/A	R	3.4641	B			
Combined Uncertainty	3.6252						
Coverage Factor	2						for 95% confidence level.
Expanded Uncertainty (Best Measurement Capability) ³	7.250			lb			

(1) This equation follows the approach presented by A2LA, not that typically used in uncertainty calculations; i.e., STDEV of the Mean.

(2) This value is unique for type (model) of equipment.

(3) This equation represents an expanded uncertainty expressed as approximately the 95% confidence level using a coverage factor of k=2.

Verified By:

Input By: _____

Reviewed By: _____

Checked By:

File: _____

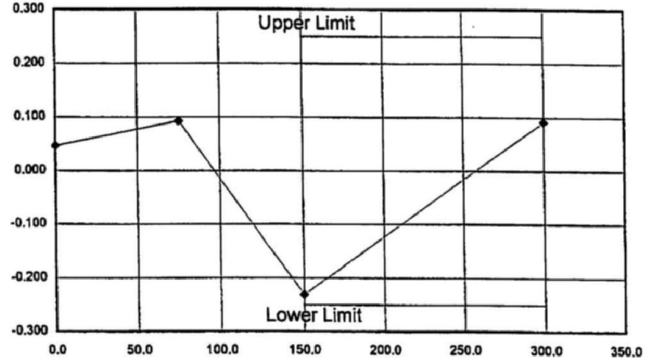
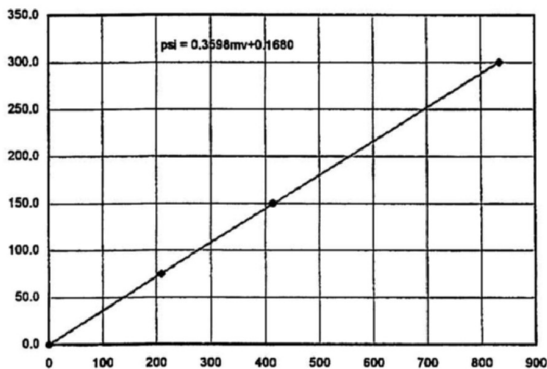
Remarks: _____

HGL Instrument Verification

DATE: 1/22/2008 Instrument No.: pt Location: Houston LVDT?: ☐ Yes; ☒ No
 Type Analysis: ☒ BF; ☐ NonBF; ☒ FS; ☐ Abs. Reading Resolution of Instrument: 0.000001

Instrument Identification/Data		Instrument	Standard	Prediction	Abs. Error	Full Scale
Type	Cone Penetrometer	mv	psi	psi	psi	Error (%)
Manufacturer	Fugro	0.000000	0.0	0.2	0.2	0.05
Model Number	F7.5CKEV2/B1	208.900000	75.0	75.3	0.3	0.09
Serial Number	1701-1832-123312 (Piezo)	414.100000	150.0	149.2	0.8	-0.23
HGL Instrument Number	pt	834.200000	300.0	300.3	0.3	0.09
Excitation (V)						
Gain/Span Setting	NA					
Full Range Output (V)						
Full Range/Capacity (psi)	360					
Date Verified	1/22/2008					
Date Due	1/21/2009					
Service Status	In Service					
Accept. Abs. or FS Error (%)	0.25 ☒ FS; ☐ Abs.					
Verification/Standard Equipment						
Type	PT(ANSI/NCSL APPROVED)					
Manufacturer	Eaton					
Model Number	UPS3000CC					
Serial Number	A0813					
HGL Instrument Number						
Date Verified						
Temperature	°C = °F					
Linear Regression, Uncertainty, & Error Summary						
Correlation Coeff. (R ²)	0.999980929					
Intercept (psi)	0.168019664					
Slope (psi/mv)	0.359818777					
Verification (Calib.) Factor	0.35981878					
Verification Factor Units	psi/mv					
Absolute Zero (V)						
Floating Zero (V)						
Combined Uncertainty (psi)	0.143768546					
Coverage Factor	2					
Expanded Uncertainty (psi)	0.287537093					
Max. Abs. or FS Error (%)	-0.23 ☒ FS; ☐ Abs.					

MTS ☐ Yes; ☒ No



Uncertainty Budget Analysis For pt							
Source of Uncertainty	Value in psi	Distribution	Divisor	Type	Uncertainty (u _i)	u _i ²	Comments
Standard's Uncertainty		N	2.0000	B			
Abs. Error-STDEV ¹	0.1438	N	1.0000	A	0.1438	0.0207	
Resolution of Instrument	0.0000	R	3.4641	B	0.0000	0.0000	
Repeatability ²		N	1.0000	A			
Resolution of Standard	#N/A	R	3.4641	B			
Combined Uncertainty	0.1438						
Expanded Uncertainty (Best Measurement Capability) ³	0.288			psi			

(1) This equation follows the approach presented by A2LA, not that typically used in uncertainty calculations; i.e., STDEV of the Mean.

(2) This value is unique for type (model) of equipment.

(3) This uncertainty represents an expanded uncertainty expressed as approximately the 95% confidence level using a coverage factor of k=2.

Verified By: *[Signature]*

Input By: _____

Reviewed By: _____

Checked By: *[Signature]*

File: _____

Remarks: _____

Calibration Verification Certificate



Device Type: Seismograph

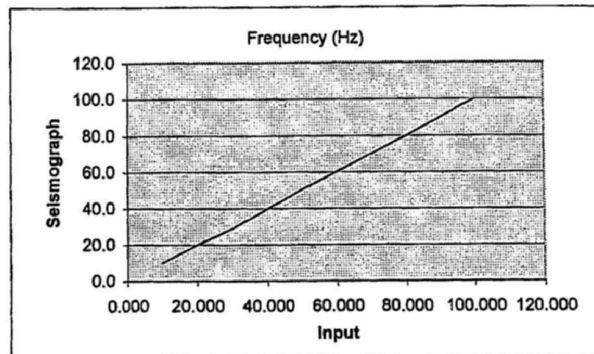
Device Manufacturer Geometrics, Inc.

Model Number: ES-3000

Serial Number: 5138

Frequency (Hz)

Input	Seismograph
10.055	9.9
20.037	19.9
30.071	29.3
40.040	40.1
50.061	50.6
60.048	60.3
70.005	70.2
80.011	79.9
90.090	90.1
100.014	99.8



FREQUENCY CALIBRATED BY INSTEK GOOD WILL INSTRUMENTS (A2LA APPROVED) FREQUENCY COUNTER :

Model: GFC-80101H, Serial No. CF871549

FREQUENCY GENERATED BY EZ DIGITAL, INC (A2LA APPROVED) OSCILLOSCOPE WITH BUILT IN FUNCTION GENERATOR

Model: OS-5020G, Serial No.: 3080209

Calibration Verified by: Dennis Stauffer

Date: 1/22/2008

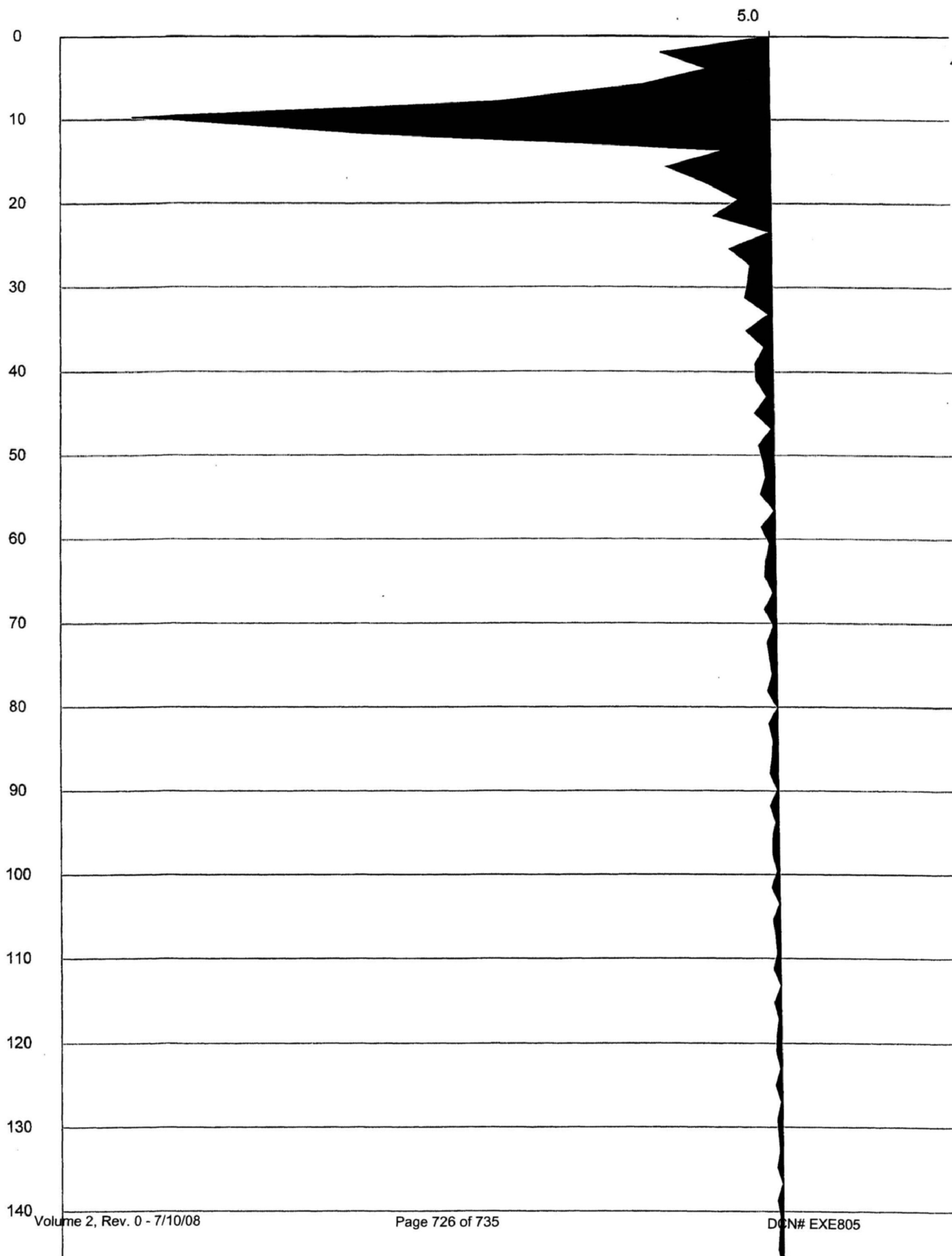
Checked By : Recep Yilmaz

Date: 1/22/2008

Geometrics ES-3000 S/N 5138

Frequency (HZ) In: 10.055 Seismograph: 9.9

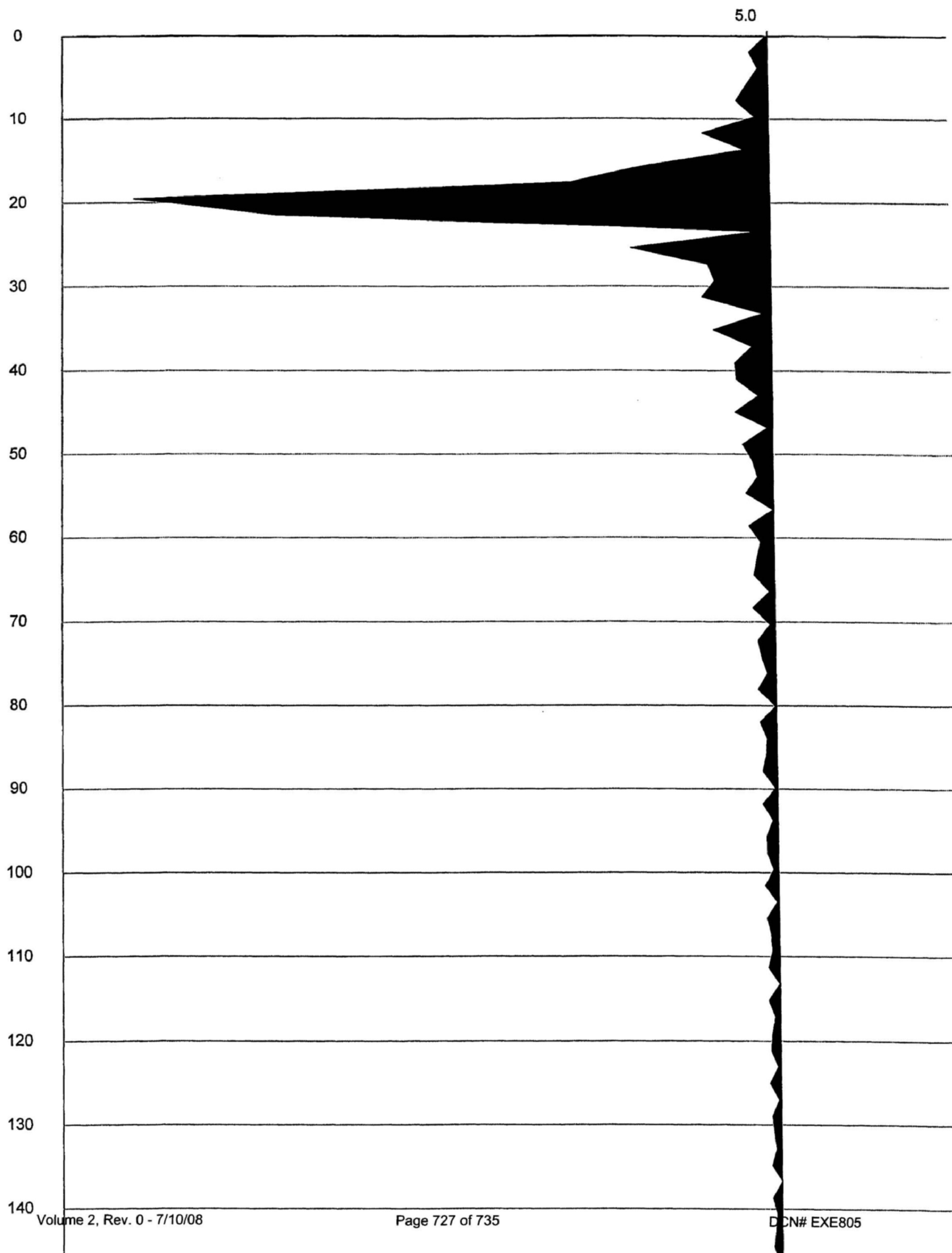
Date: 1/22/2008



Geometrics ES-3000 S/N 5138

Frequency (HZ) In: 20.037 Seismograph: 19.9

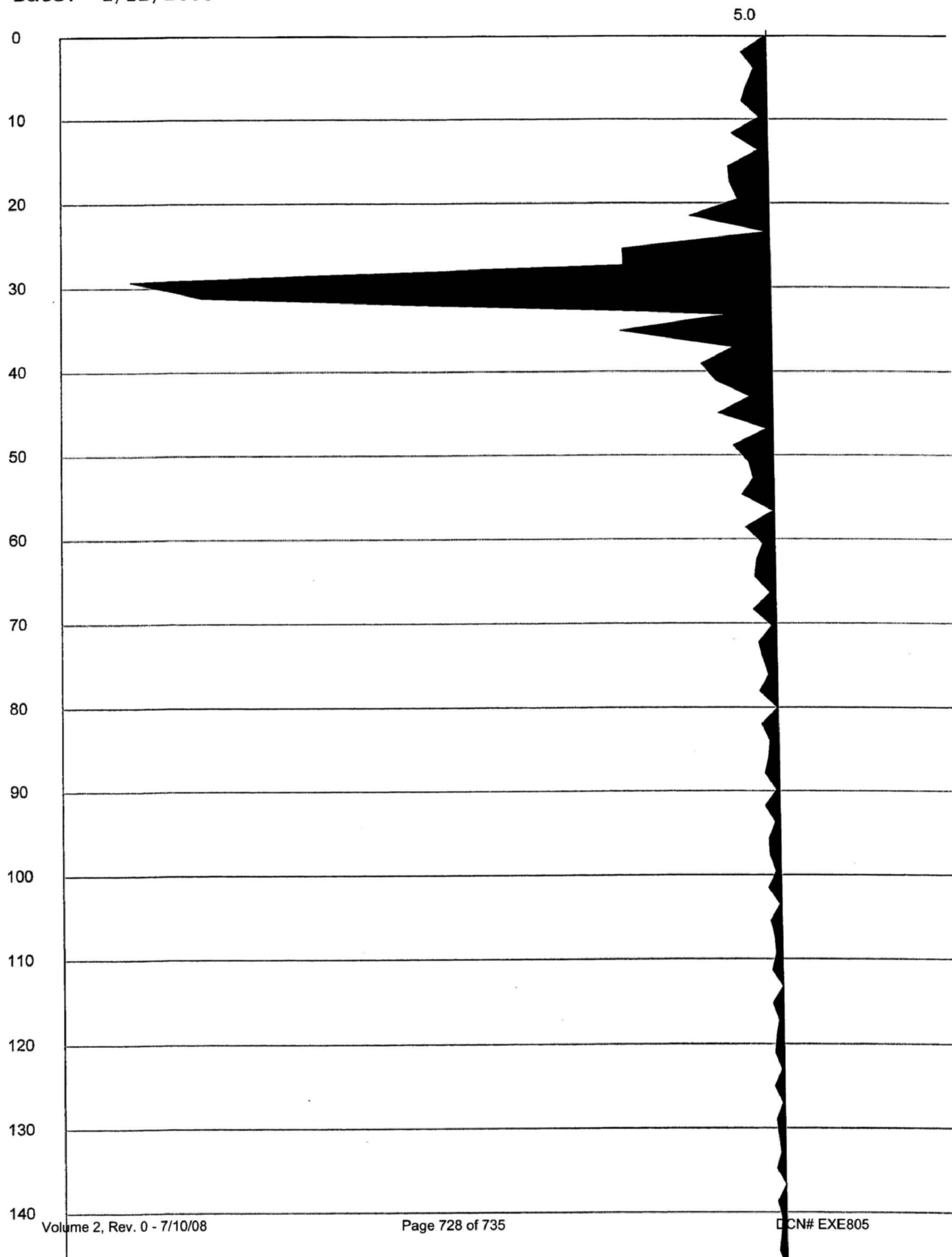
Date: 1/22/2008



Geometrics ES-3000 S/N 5138

Frequency (HZ) In: 30.071 Seismograph: 29.3

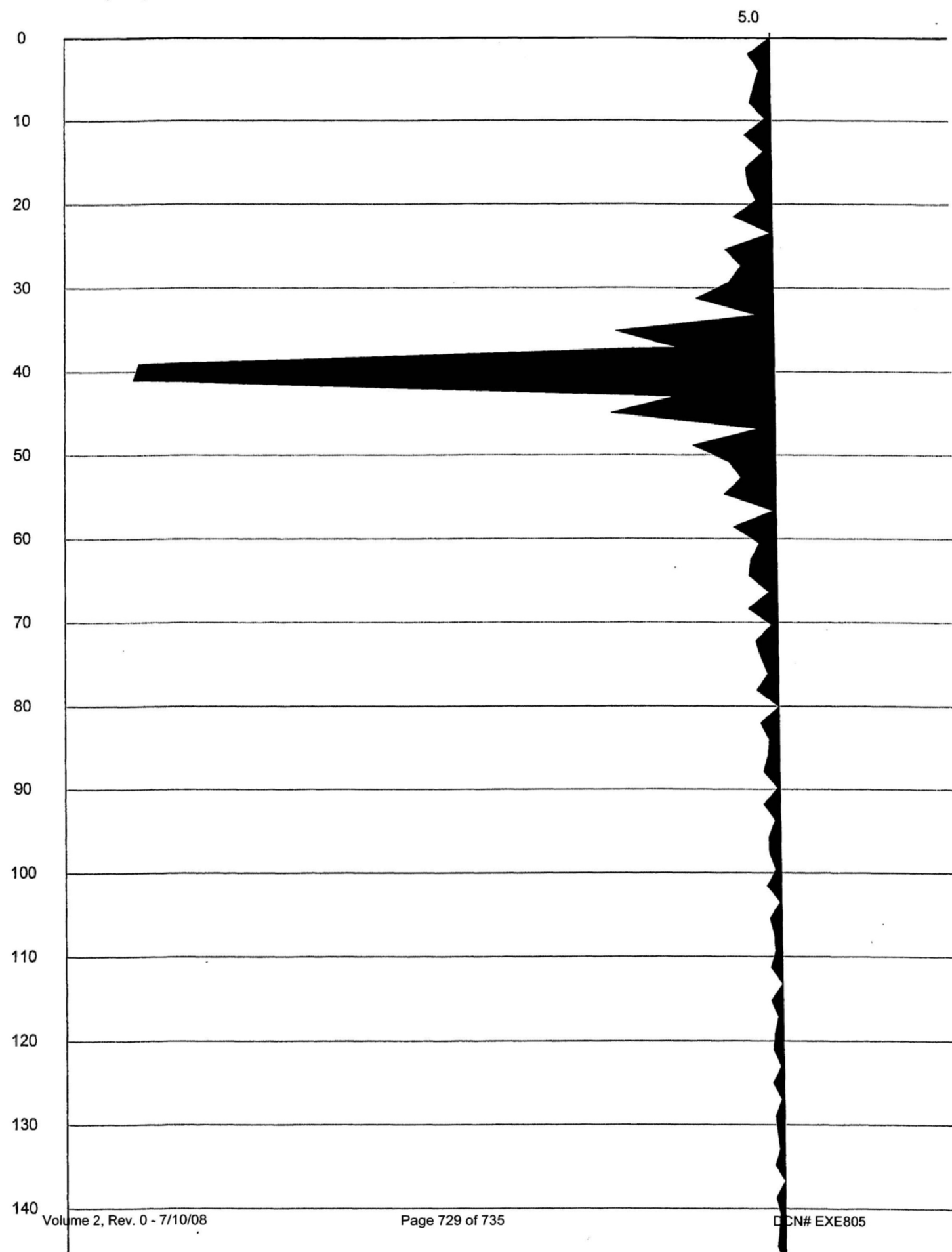
Date: 1/22/2008



Geometrics ES-3000 S/N 5138

Frequency (HZ) In: 40.040 Seismograph: 40.1

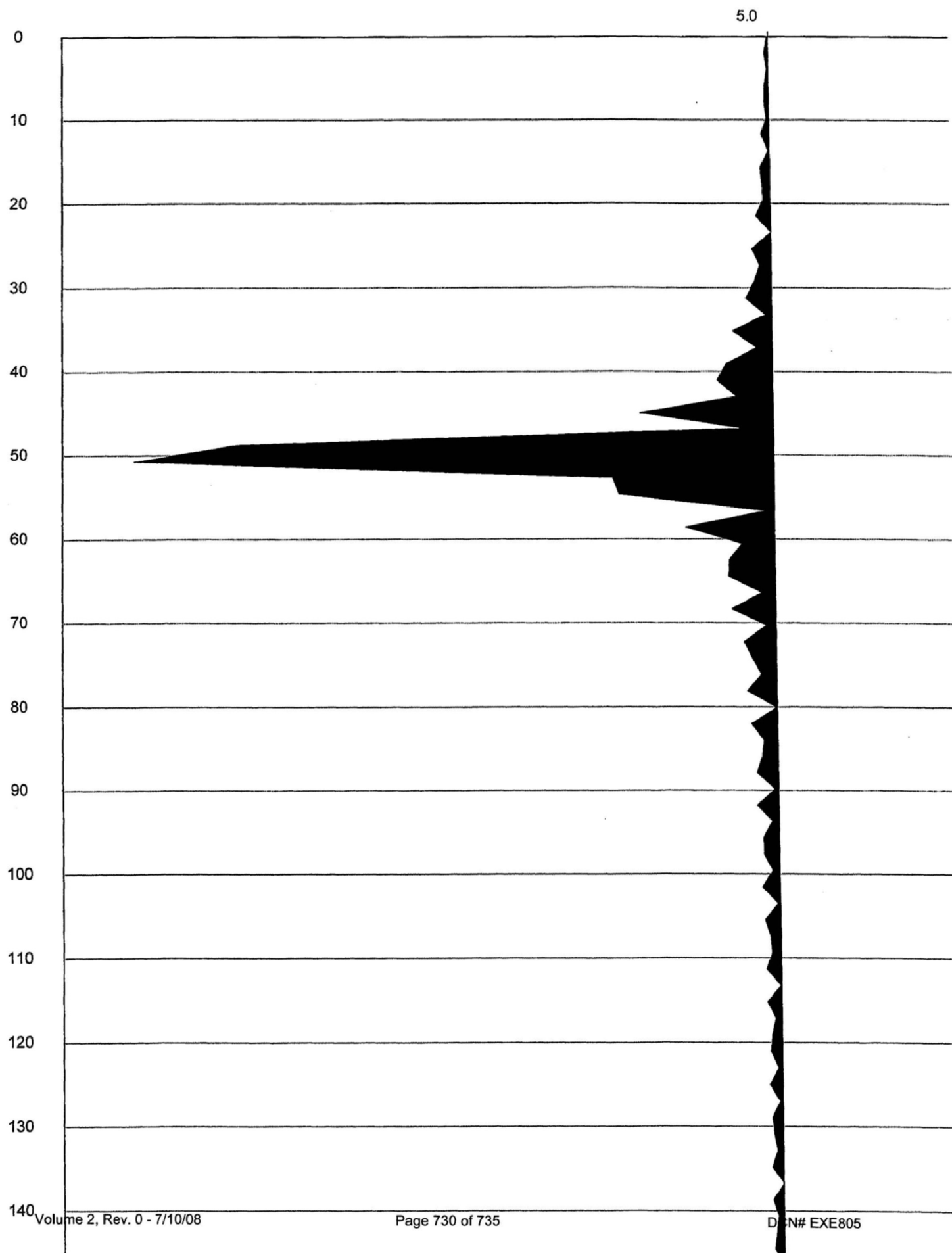
Date: 1/22/2008



Geometrics ES-3000 S/N 5138

Frequency (HZ) In: 50.061 Seismograph: 50.6

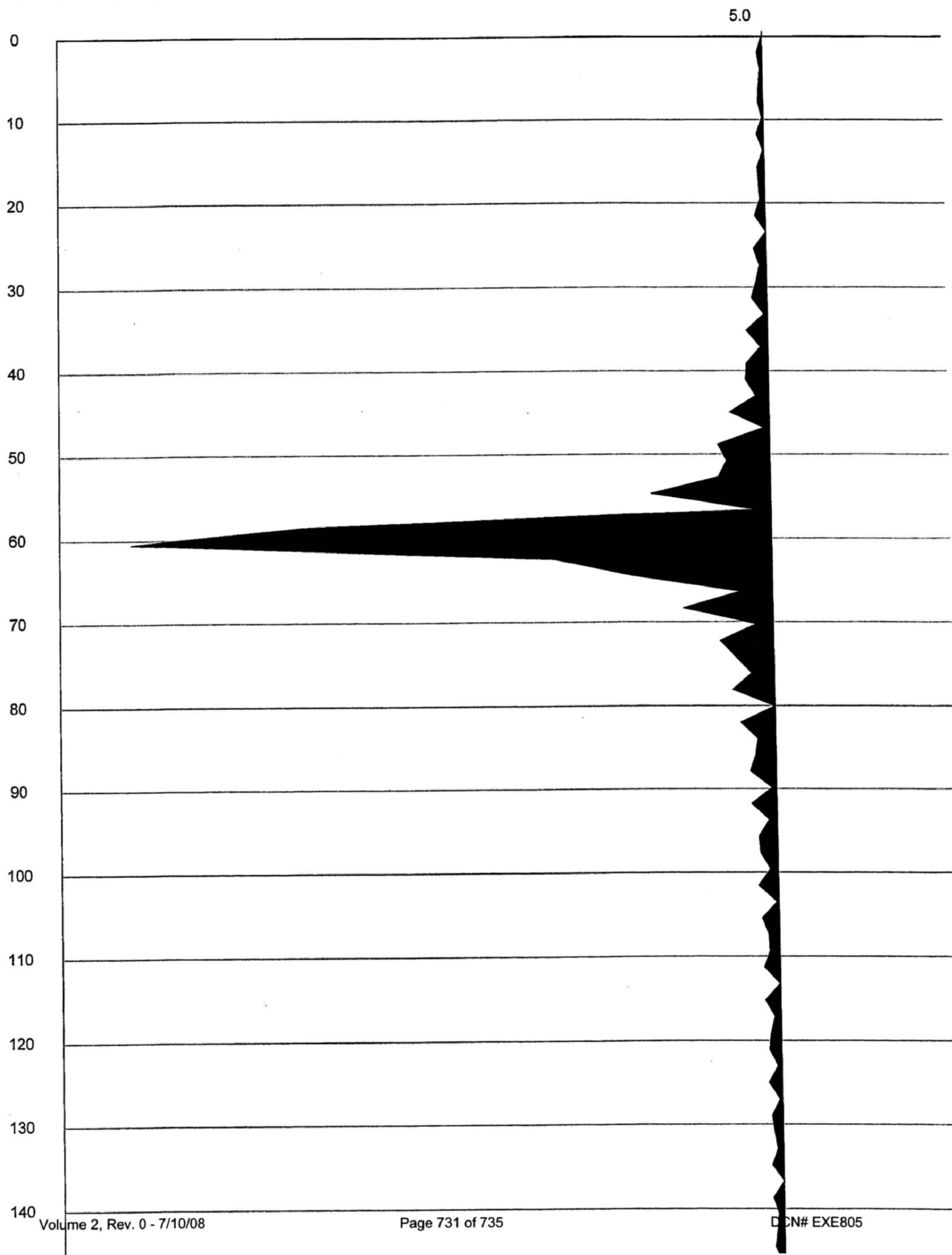
Date: 1/22/2008



Geometrics ES-3000 S/N 5138

Frequency (HZ) In: 60.048 Seismograph: 60.3

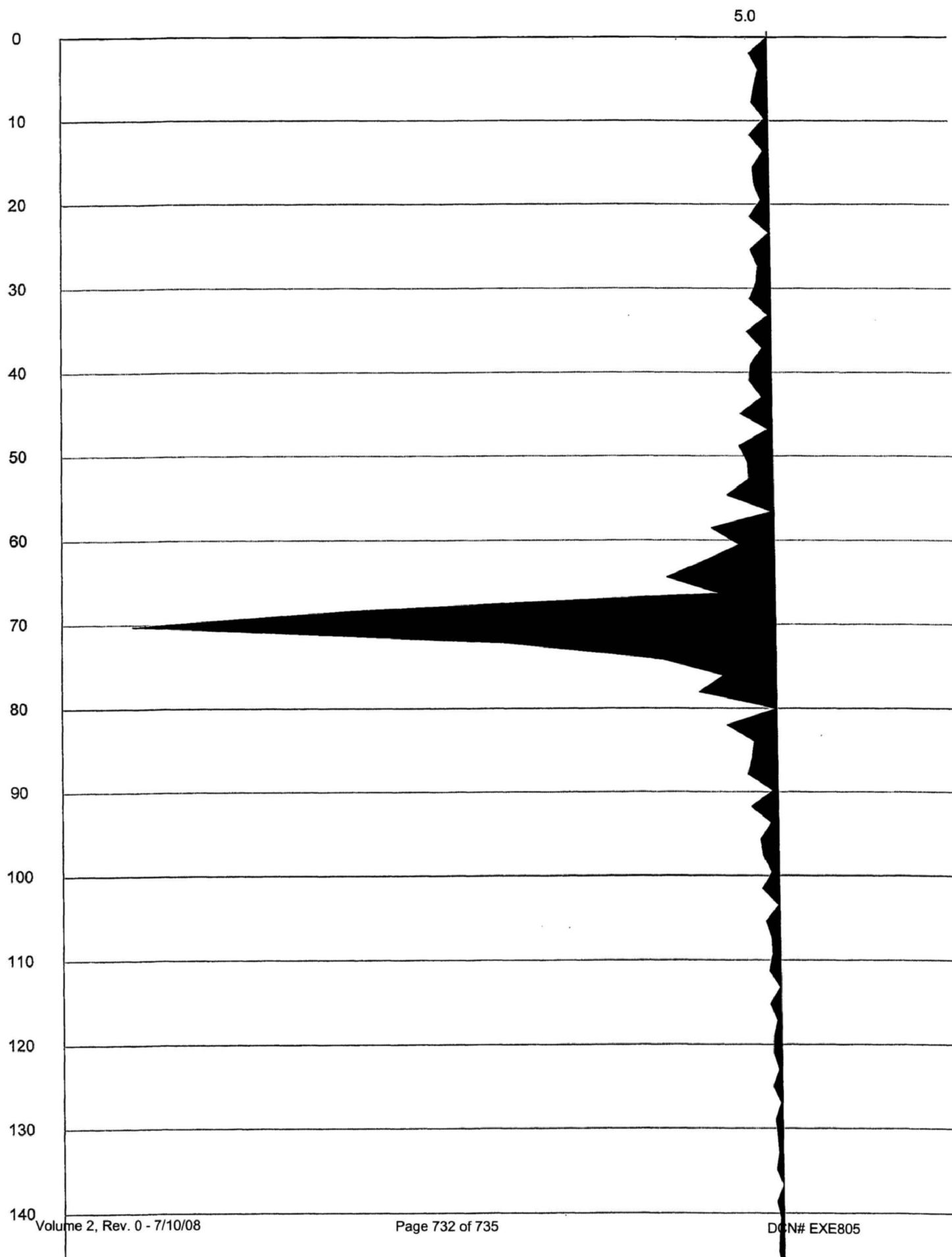
Date: 1/22/2008



Geometrics ES-3000 S/N 5138

Frequency (HZ) In: 70.005 Seismograph: 70.2

Date: 1/22/2008



Geometrics ES-3000 S/N 5138

Frequency (HZ) In: 80.011 Seismograph: 79.9

Date: 1/22/2008

5.0

0

10

20

30

40

50

60

70

80

90

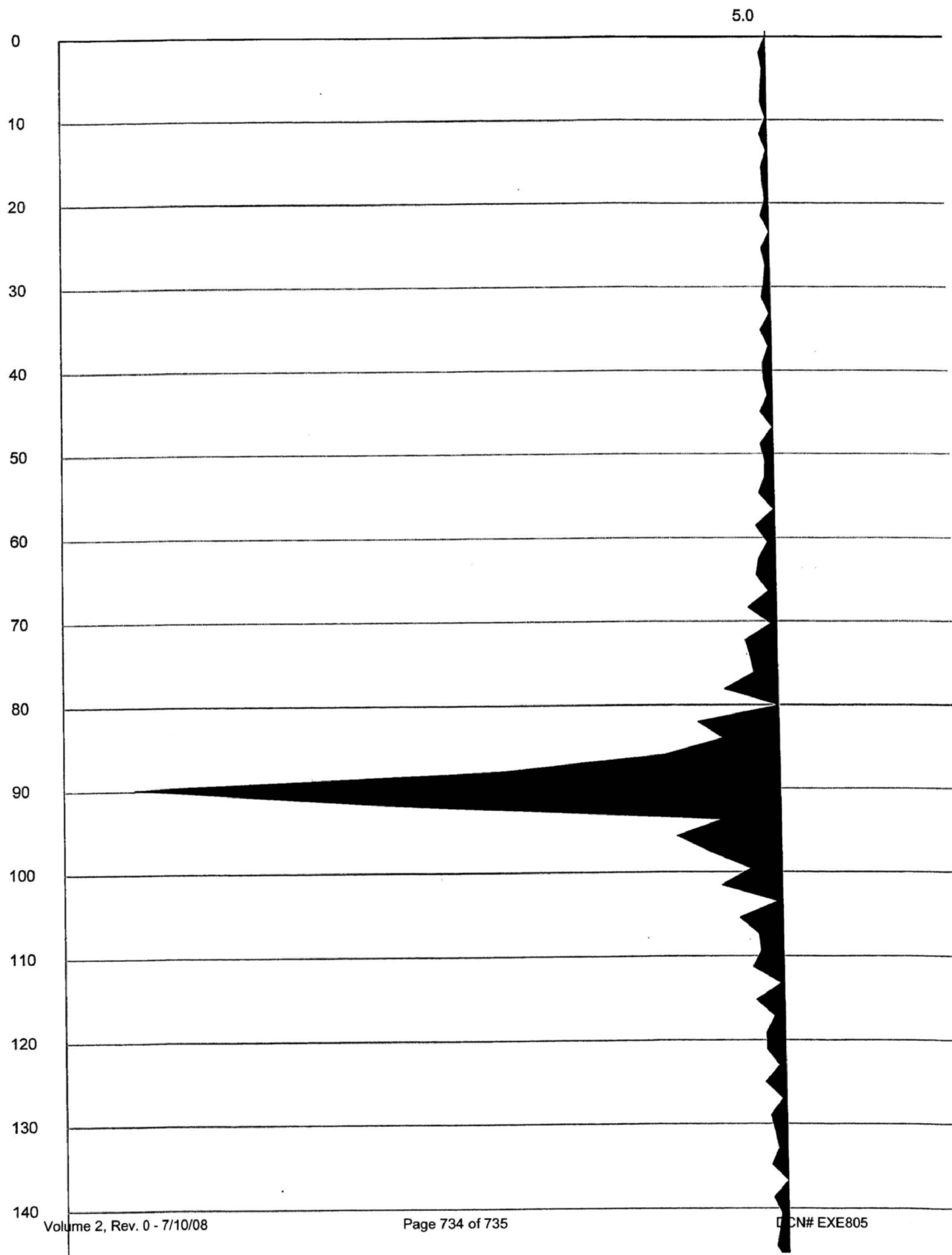
100

110

120

130

140



Geometrics ES-3000 S/N 5138

Frequency (HZ) In: 100.014 Seismograph: 99.8

Date: 1/22/2008

5.0

