welenco

5201 Woodmere Drive, Bakersfield, CA 93313-- www.welenco.com--(800) 445-9914

DUAL INDUCTION - GAMMA RAY LOG

FILING NO.

COMPANY Mactec

WELL RIPZ-16

FIELD Casmalia

STATE California COUNTY Santa Barbara

LOCATION:
Casmalia Landfill

OTHER SERVICES:
OPTV
Video

JOB NO.
39526

SEC: ____ TWP: ____ RGE: ____ LONG.: ____ LAT.: ____

Permanent Datum: Ground Level, Elev. ____ Ft.
Log Measured From: Ground Level, 00 Ft. Above Perm. Datum
Drilling Measured From: Ground Level

Elev.: K.B. ____ Ft.
D.F. ____ Ft.
G.L. ____ Ft.

Date	Dec. 07, 2004			
Type Of Log	Dual Ind			
Run No.	One	Two	Three	Four
Depth-Driller	200 Ft	Ft	Ft	Ft
Depth-Logger	200 Ft	Ft	Ft	Ft
Top Logged Interval	4 Ft	Ft	Ft	Ft
Btm. Logged Interval	196 Ft	Ft	Ft	Ft
Type Fluid In Hole	Water			
Fluid Level	Unk Ft	Ft	Ft	Ft
Max Temp	N/A °F	°F	°F	°F
Operating Rig Time	1.5 Hr	Hr	Hr	Hr
Van No. / Location	L-23 / Bfld			
Recorded By	Craig Corbell			
Witnessed By	Anna Henke			

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	TYPE	FROM	TO
1	6.5 In	68 Ft	200 Ft	8 In	Steel	0 Ft	68 Ft
2	In	Ft	Ft	In		Ft	Ft
3	In	Ft	Ft	In		Ft	Ft

Miscellaneous Information

Remarks:

Drilled By: WDC

Perforated Intervals:

Line Speed:

Borehole Volume Calculations:

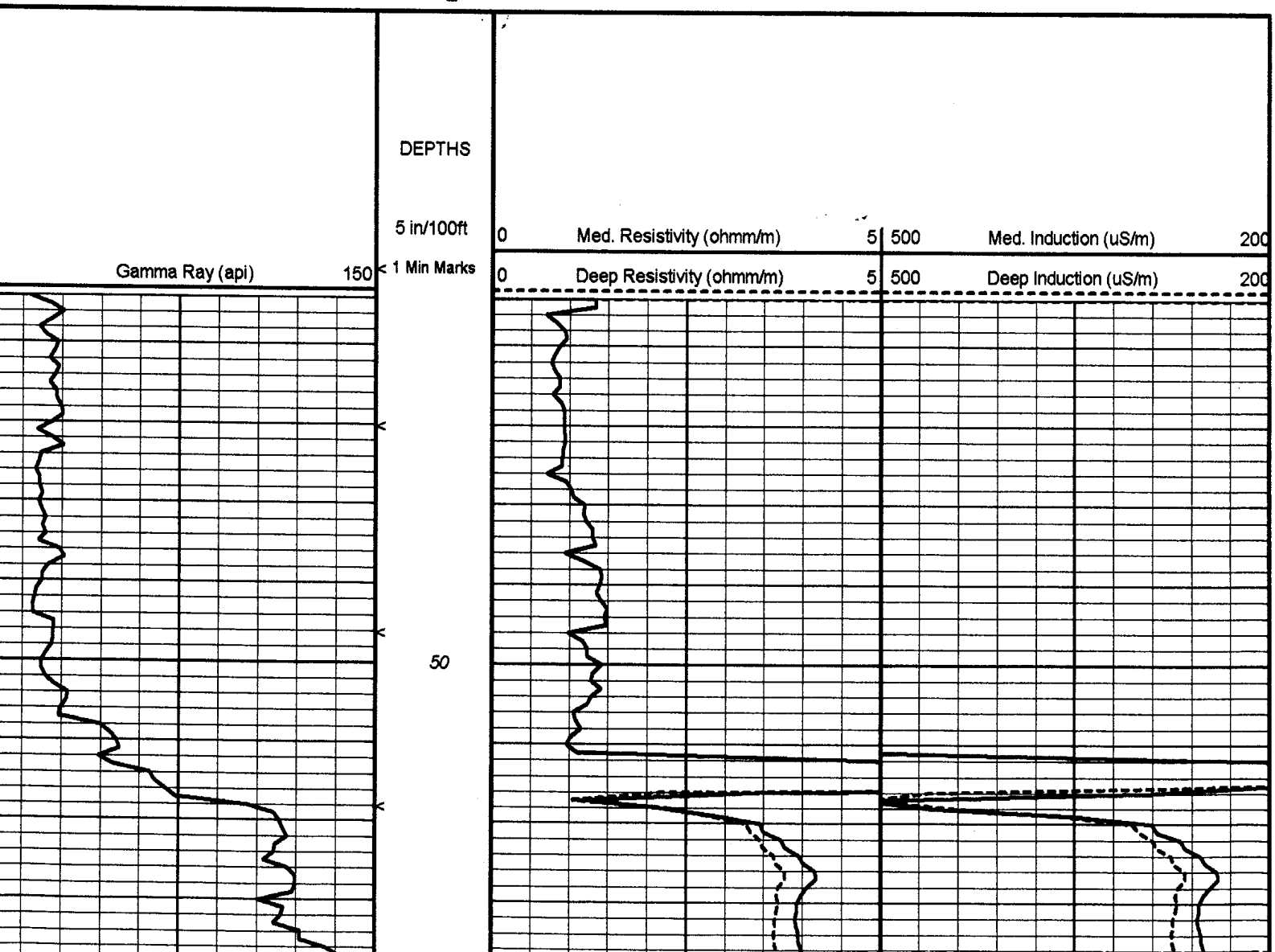
Other Information:

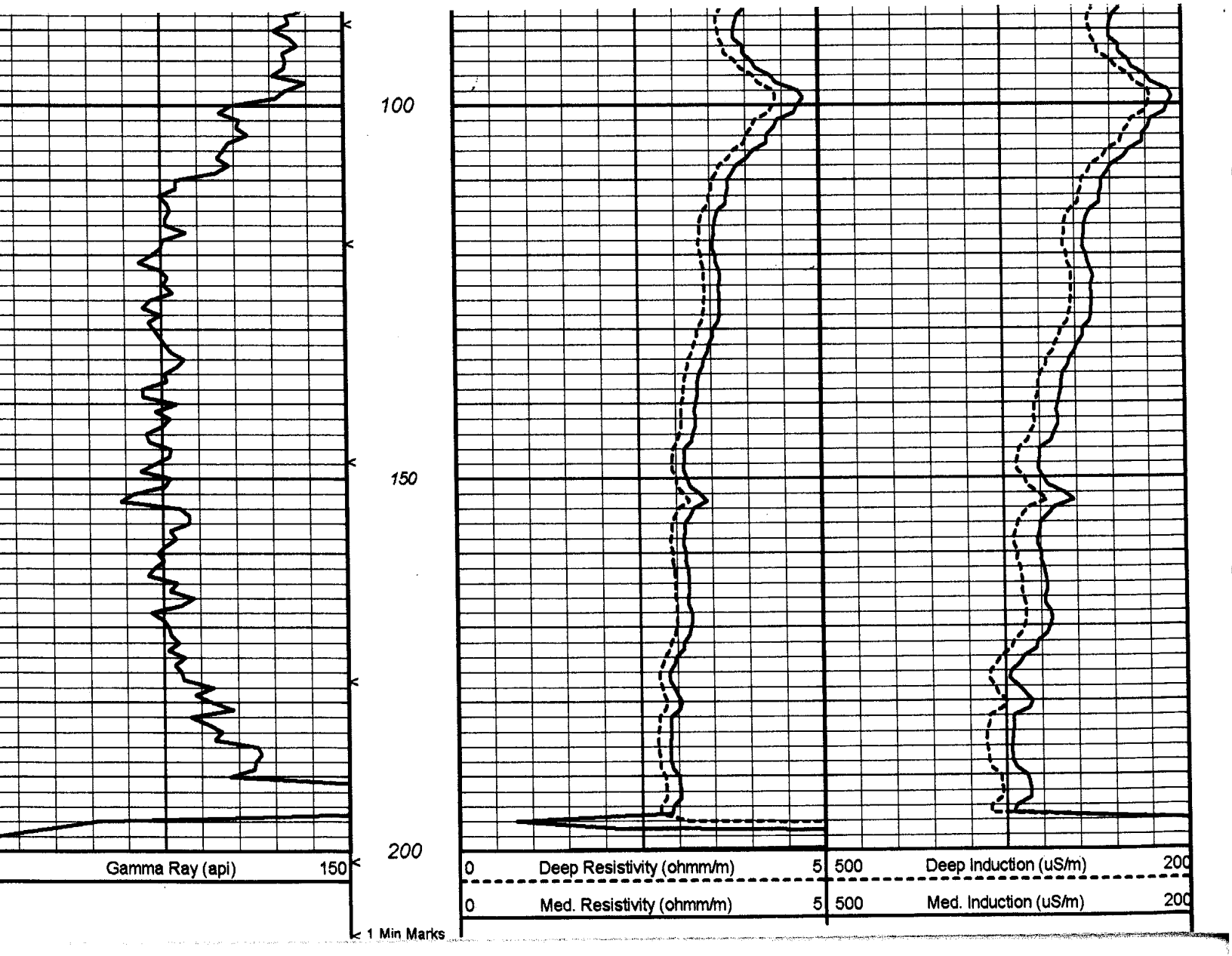
NOTICE

All Interpretations are opinions based on inferences from electrical and other measurements and we do not guarantee the accuracy or correctness of any verbal or written interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by one of our officers, agents or employees. These interpretations are also subject to our General Terms and Conditions as set out in our current Price Schedule.

welenco, inc. December 08, 2004

Mactec RIPZ-16 L:\Craig C\Logs\39526\RIPZ16_ind.lhf

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200
Gamma Ray (api)
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Deep Resistivity (ohmm/m)
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0
Med. Resistivity (ohmm/m)
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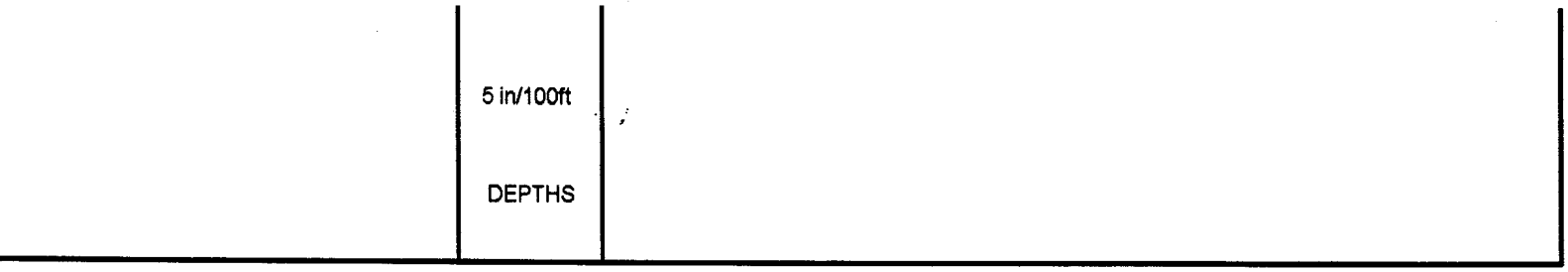
500
Deep Induction (uS/m)
200
500
Med. Induction (uS/m)
200
1 Min Marks


5 in/100ft
DEPTHS

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OPTV DATA PROCESSING
RGLDIP vsn 6.1
BOREHOLE IMAGE LOG

08 Dec 2004

Mactec

Borehole: RIPZ-16

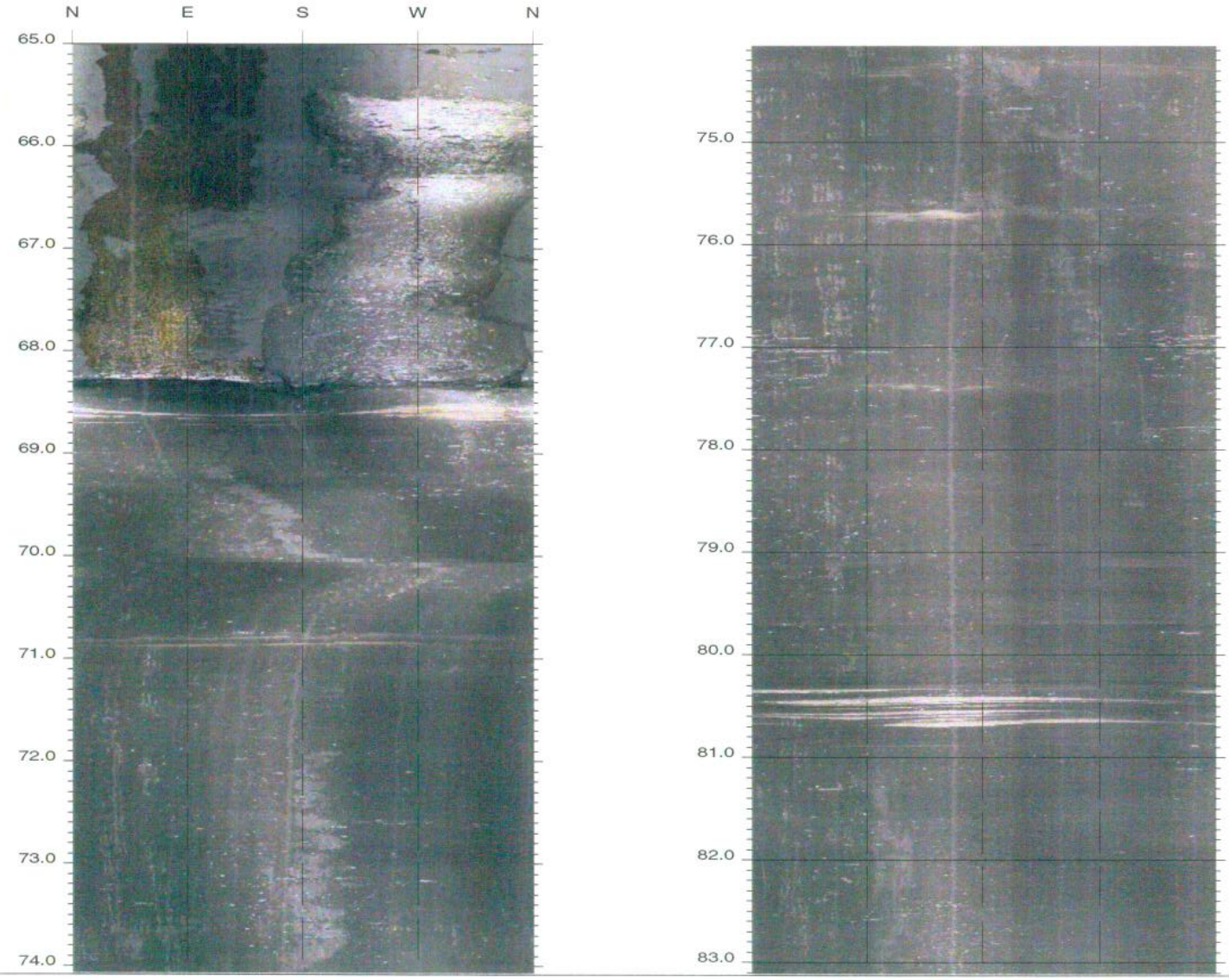
Casmalia Landfill

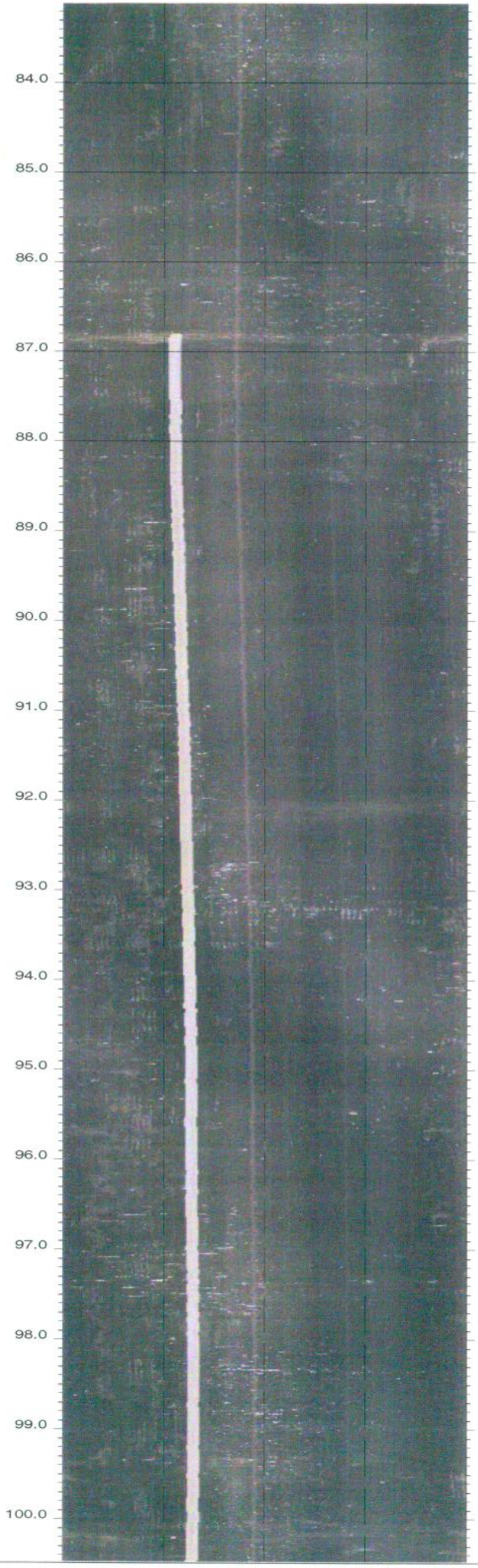
top of borehole.....
East:
North:
Elev:

North ref. is magnetic
Depth units are feet
Vertical scale: 1/20

Zone from 65.0000 to 199.0000ft
Format: BHTV NESWN

Borehole diam: 6.000inch
data intervals.....
Azimuth: 0.5000deg
Depth: 0.0080ft

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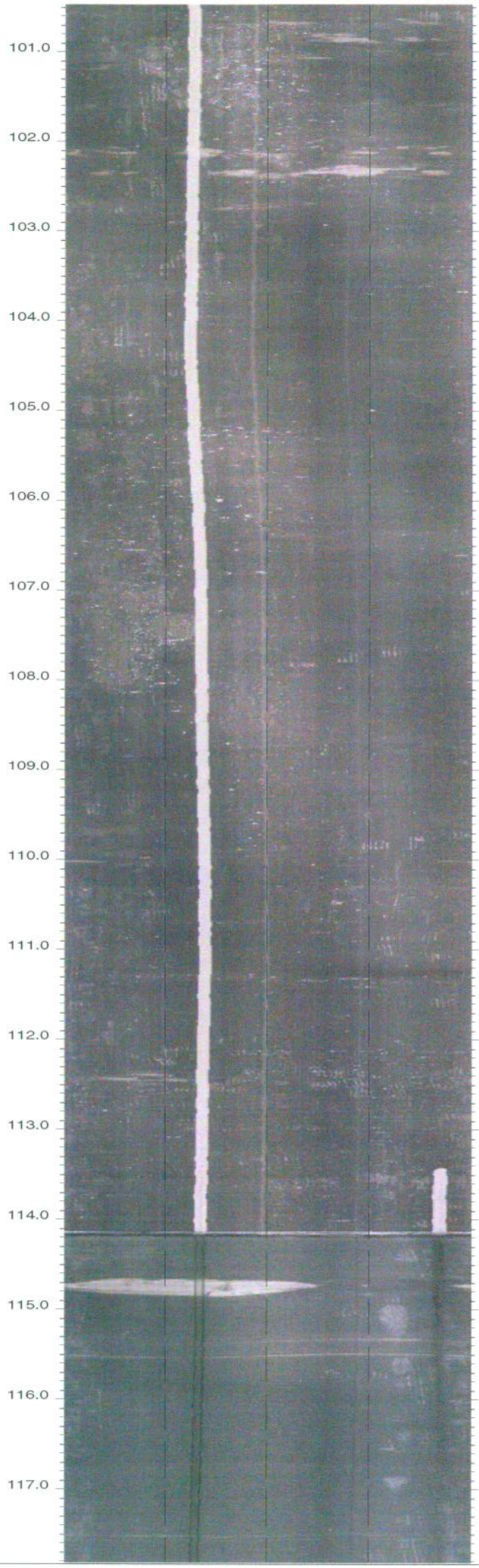
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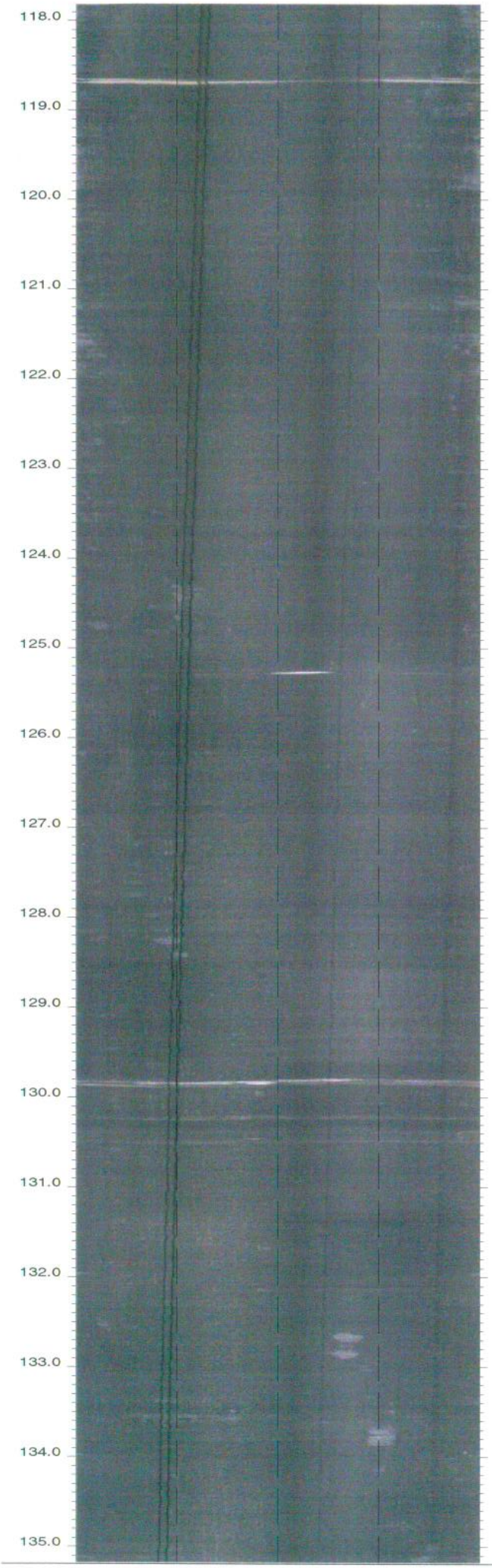
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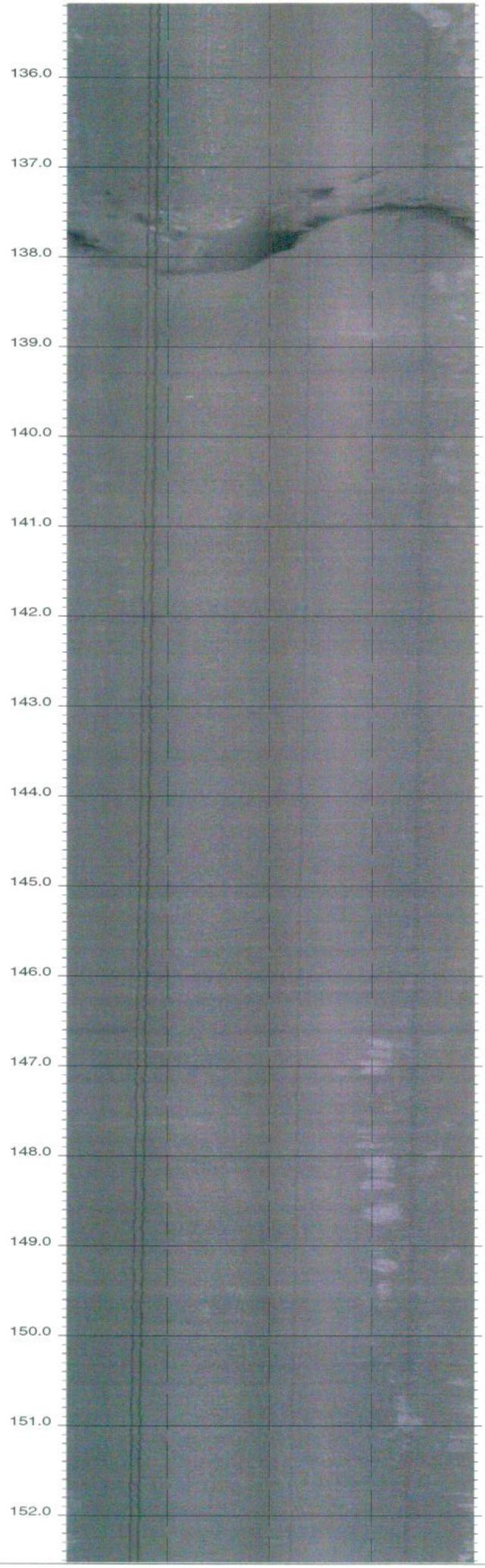
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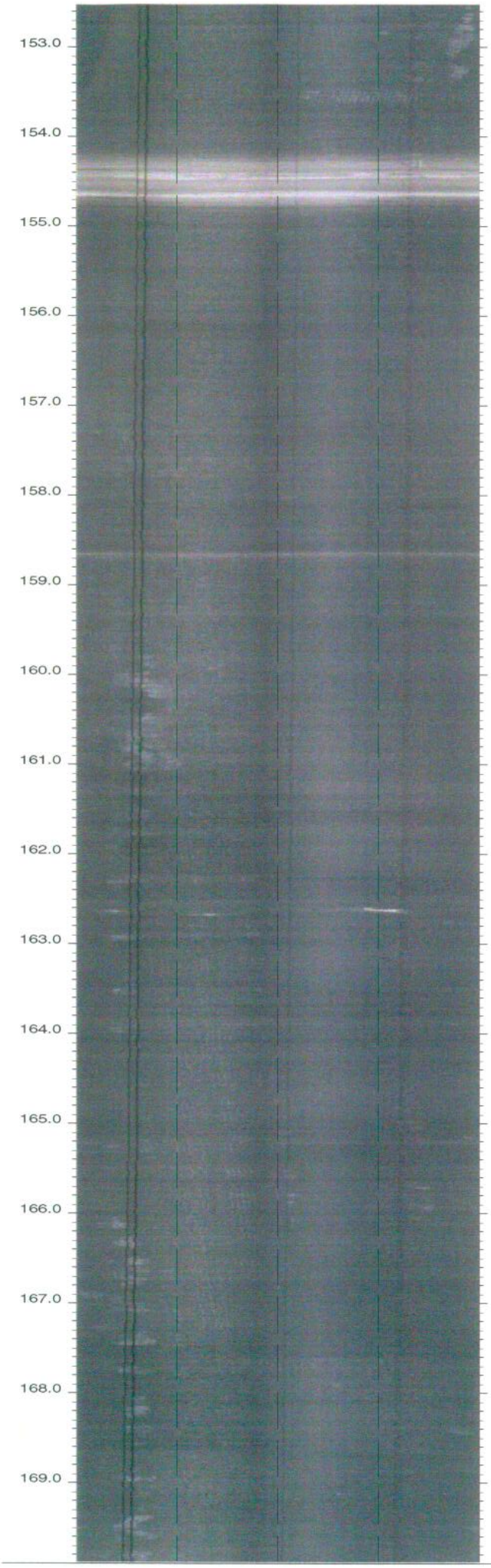
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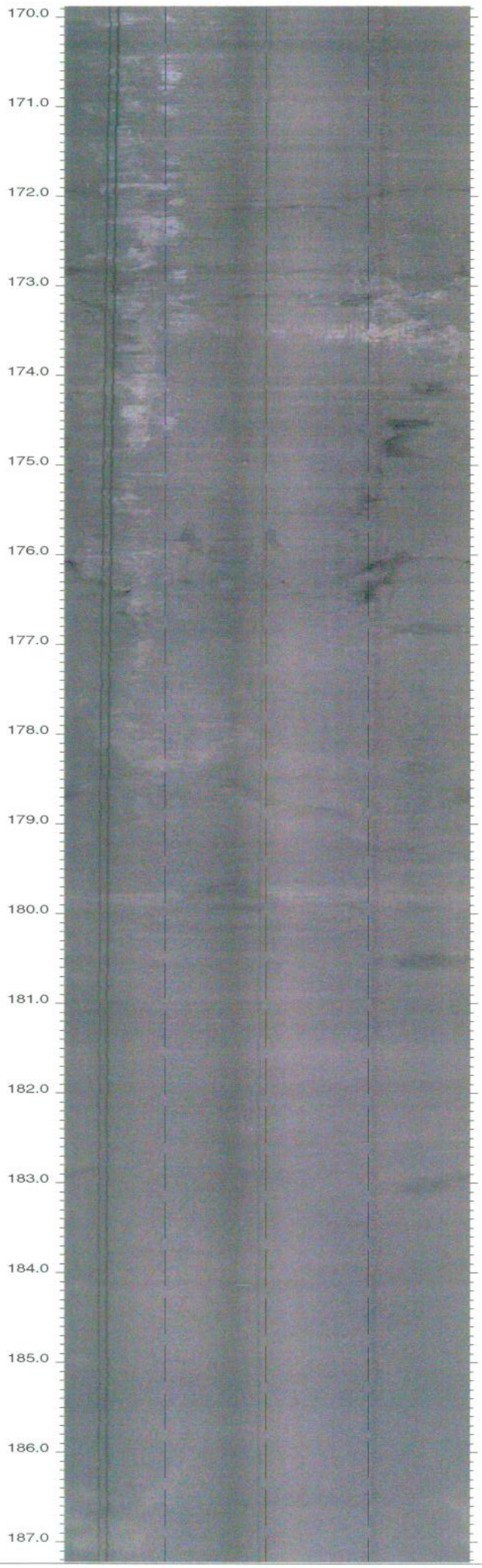
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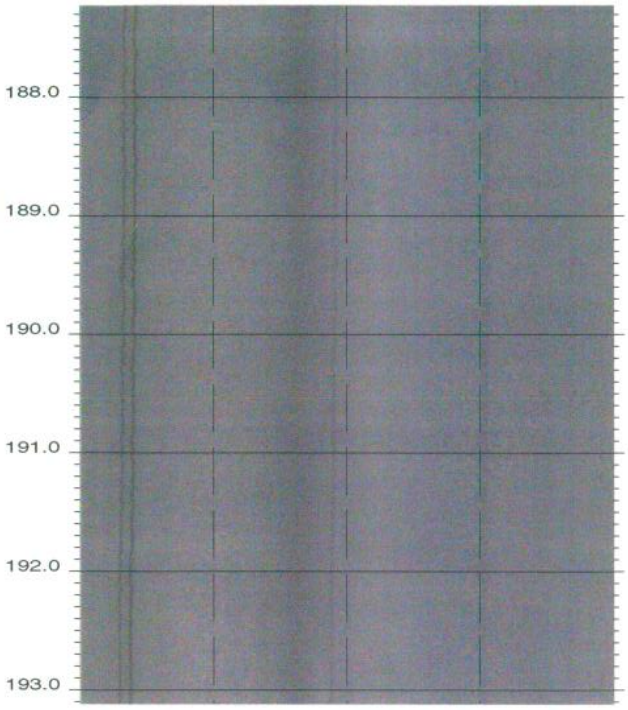
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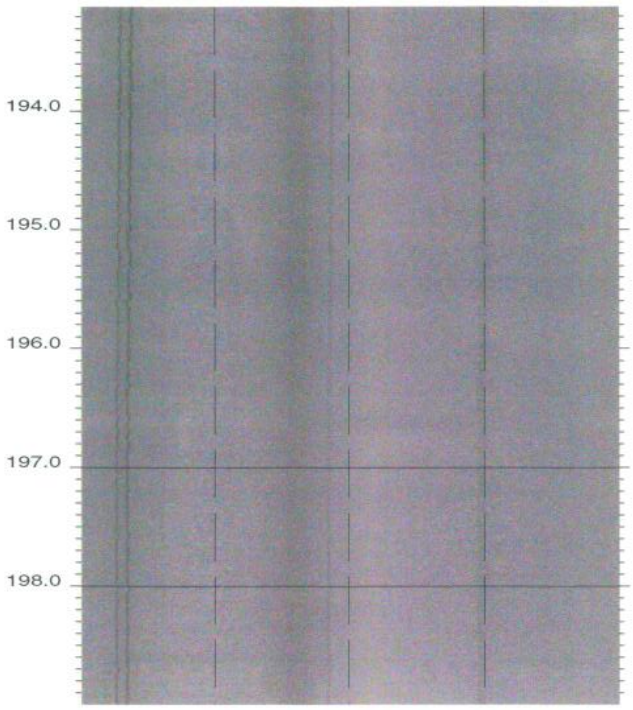
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RGLDIPv6.1 OPTV results

K = 0: BEDDING
K = 2: FRACTURE

borehole RIPZ-16
zone from 64.968 to 199.640 ft
North ref is magnetic

	Depth	Azimuth	Dip	1-P0/100	n	Q	K	Upper Depth	Lower Depth	Well Diam	Well deviation Azimuth	Dev	Thickness	
1	178.700	275	41.8	0.986	4	A	2	178.471	178.930	0.500	198.60	3.00	0.0000	Fracture
2	176.450	141	59.2	0.982	5	A	2	176.009	176.553	0.500	206.41	3.00	0.0000	Fracture
Discontinuous														
3	171.987	173	16.6	1.000	3	A	2	171.900	172.073	0.500	209.00	3.00	0.0000	Fracture
4	162.634	112	6.8	1.000	3	A	0	162.602	162.666	0.500	202.88	3.00	0.0000	Bedding
5	154.725	187	10.9	1.000	3	A	0	154.664	154.786	0.500	210.00	3.00	0.5110	Bedding
6	154.212	70	4.1	1.000	3	A	0	154.200	154.224	0.500	208.14	3.00	0.0000	Bedding
7	137.821	105	60.1	0.998	4	A	2	137.399	138.243	0.500	209.75	3.00	0.0000	Fracture
8	137.426	134	63.0	0.980	5	A	2	136.920	137.932	0.500	210.00	3.00	0.0000	Fracture
9	129.817	43	5.8	1.000	3	A	0	129.800	129.834	0.500	206.12	2.00	0.0000	Bedding
10	118.668	83	5.3	1.000	3	A	0	118.651	118.684	0.500	218.82	3.00	0.0000	Bedding
11	115.507	69	7.3	1.000	3	A	0	115.485	115.529	0.500	215.00	3.00	0.0000	Bedding
12	114.769	98	16.4	1.000	3	A	0	114.701	114.838	0.500	212.78	3.00	0.0000	Bedding
13	80.442	60	7.7	1.000	3	A	0	80.420	80.464	0.500	215.00	3.00	0.0000	Bedding
14	70.773	46	10.9	1.000	3	A	2	70.739	70.808	0.500	219.00	3.00	0.0000	Fracture

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OPTV DATA PROCESSING
RGLDIP vsn 6.1
INTERPRETED OPTV DIPS LOG

08 Dec 2004

Mactec

Borehole: RIPZ-16

Casmalia Landfill

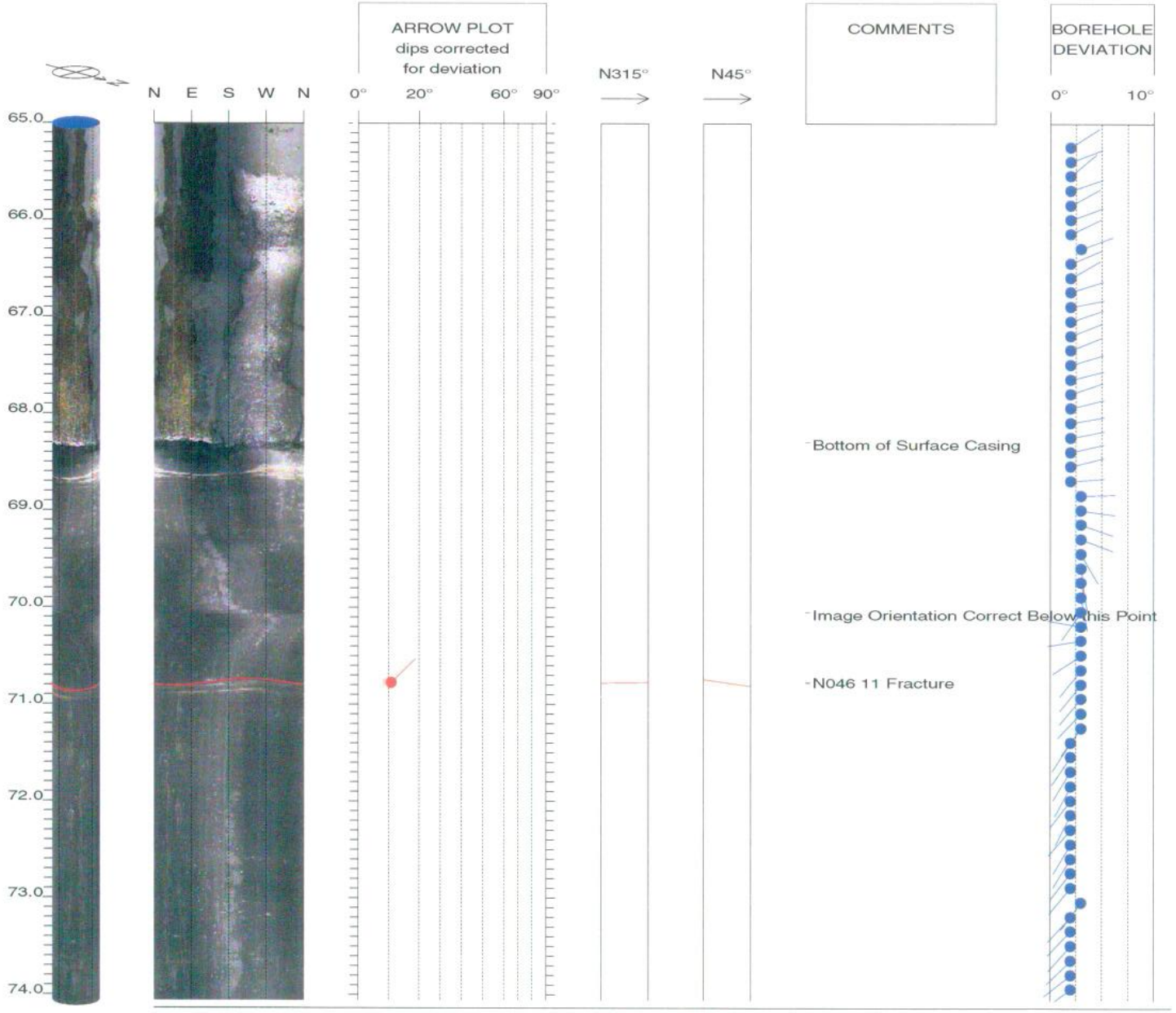
top of borehole.....
East:
North:
Elev:

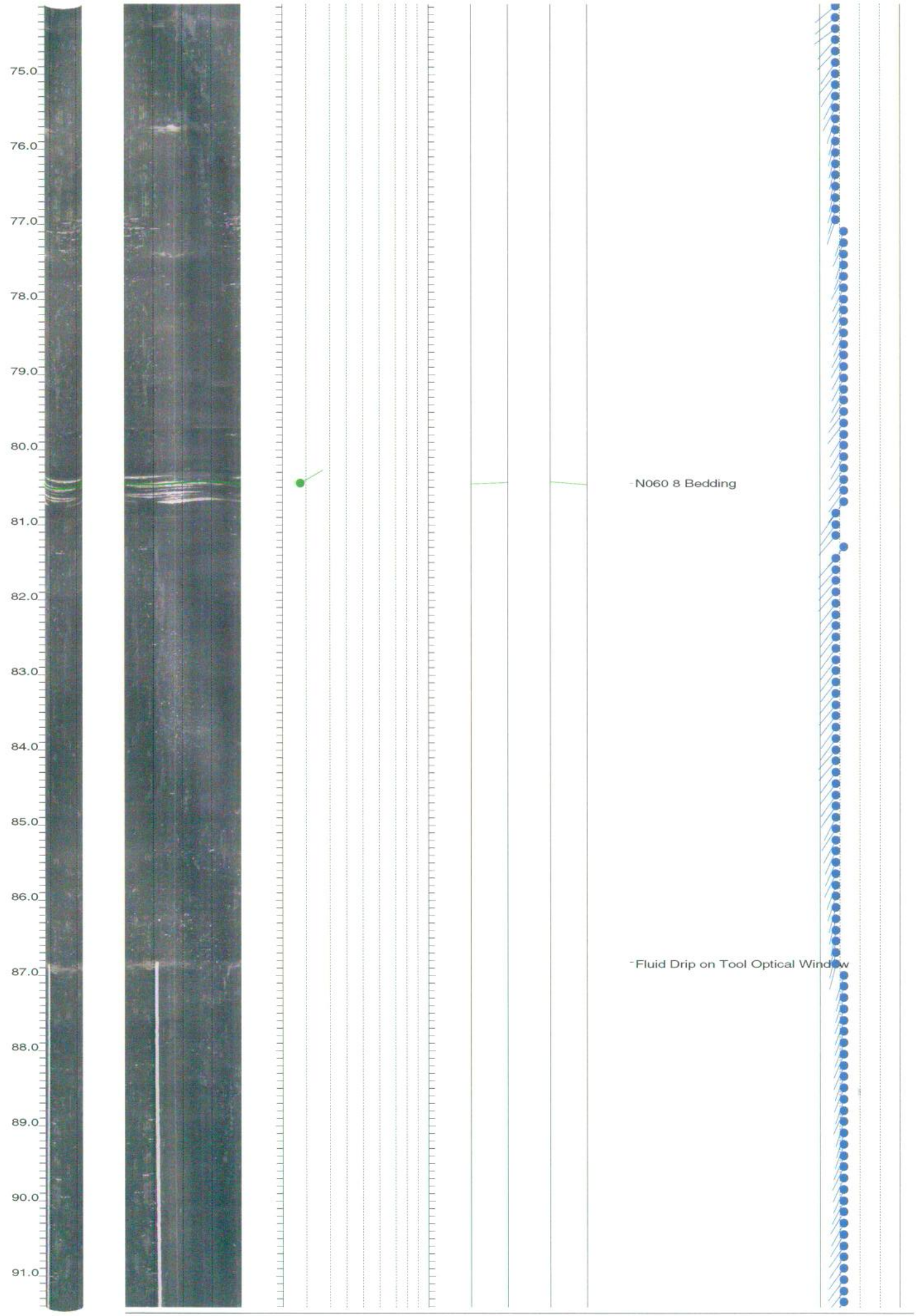
North ref. is magnetic
Depth units are feet
Vertical scale: 1/20
Horiz scale = vert scale

Zone from 199.500 to 65.000ft
Format: BHTV-NESWN

Borehole diam: 6.000inch
Vertical = borehole-axis

BEDDING
FRACTURE
Identified units

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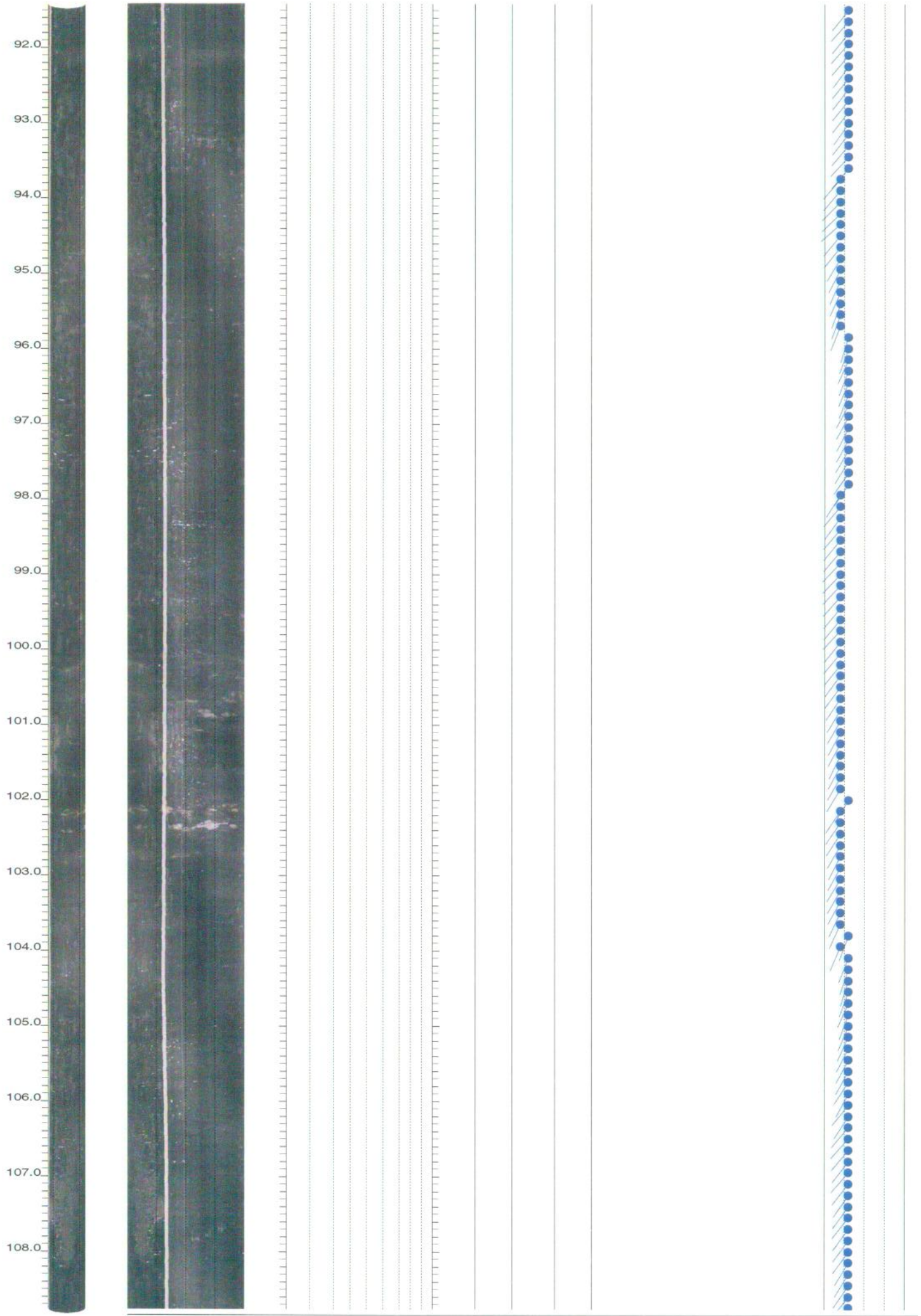
N060 8 Bedding
Fluid Drip on Tool Optical Window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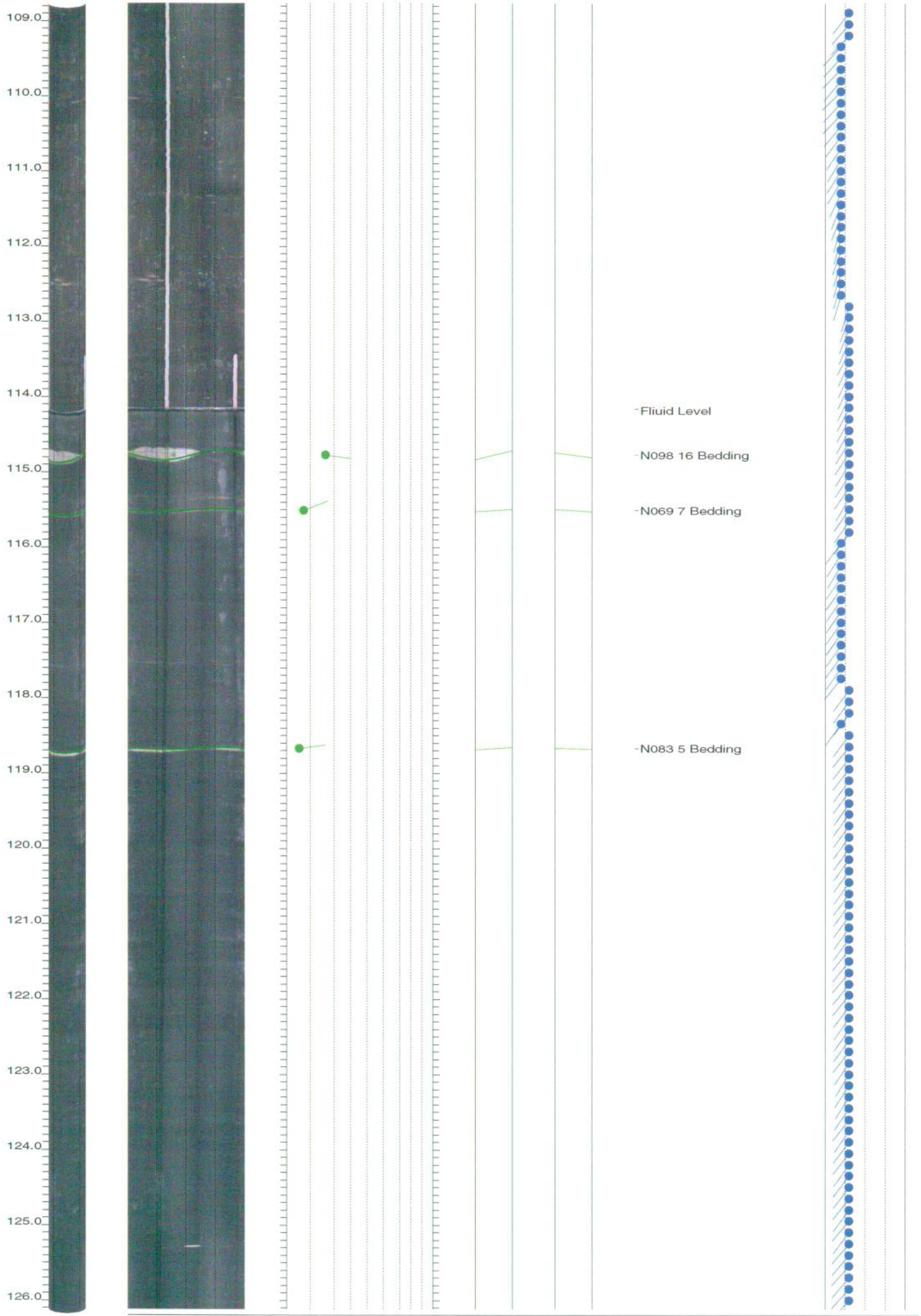
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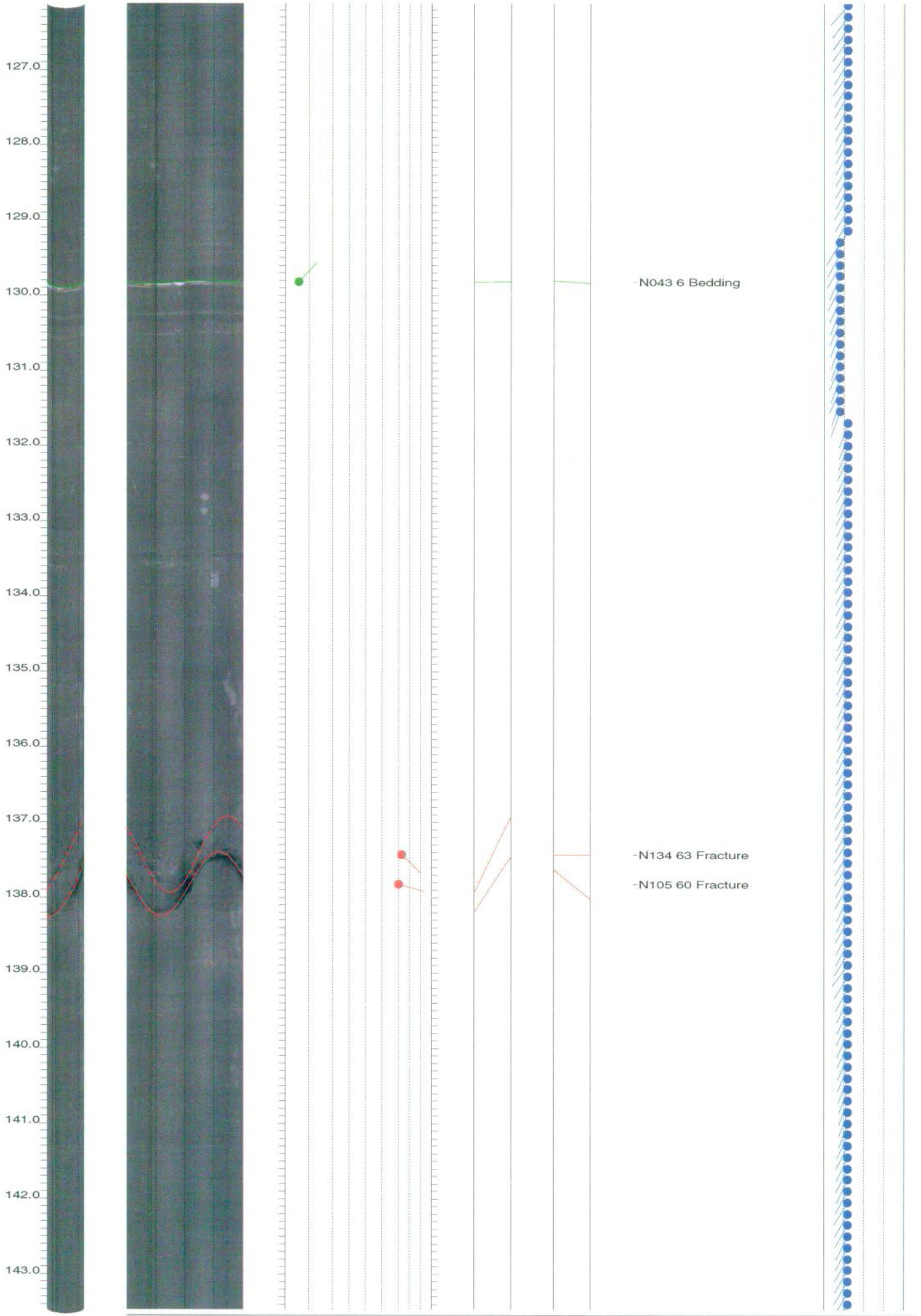
Fluid Level
N098 16 Bedding
N069 7 Bedding
N083 5 Bedding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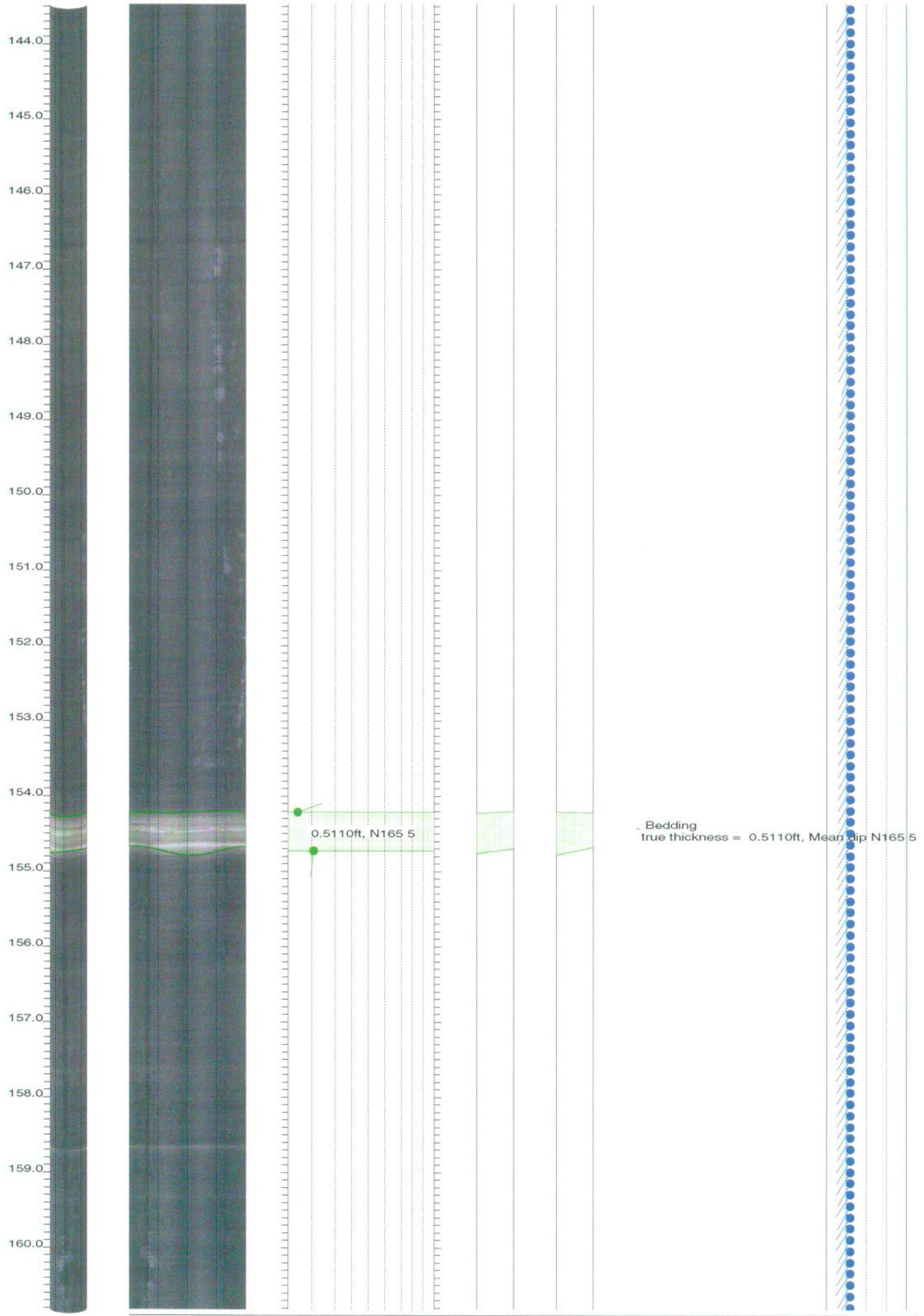
N043 6 Bedding
N134 63 Fracture
N105 60 Fracture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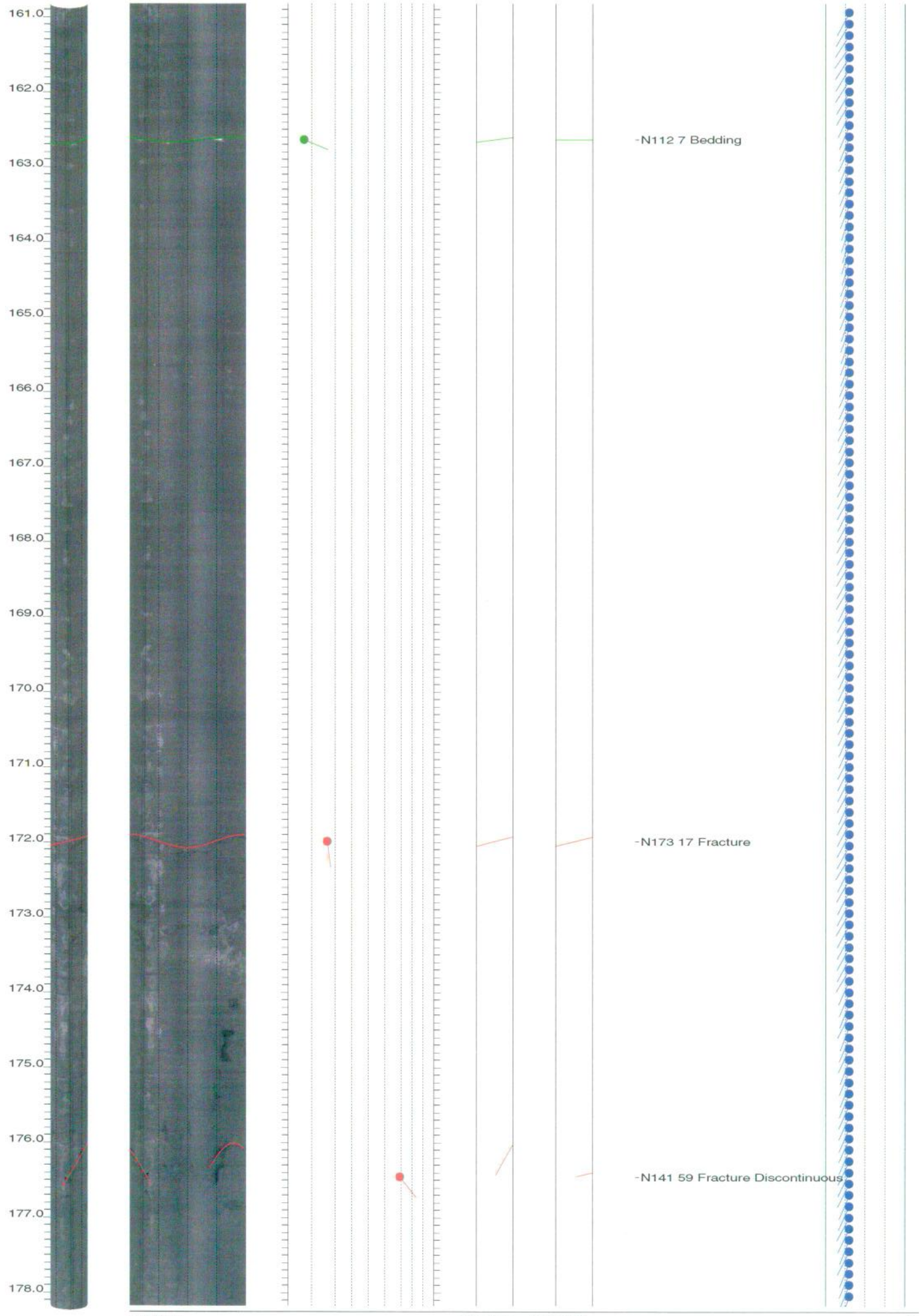
0.5110ft, N165 5
Bedding
true thickness = 0.5110ft, Mean dip N165 5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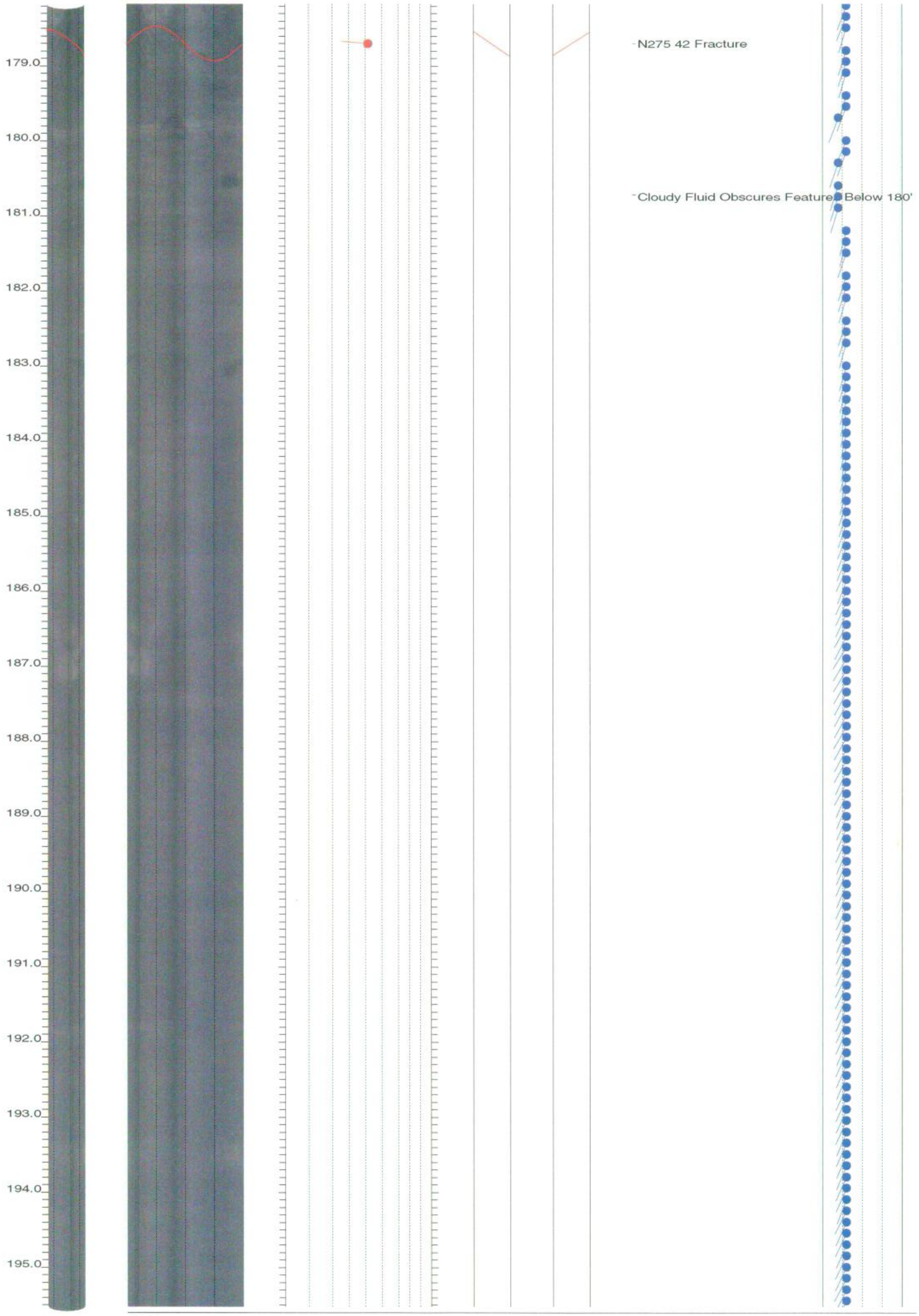
-N112 7 Bedding
-N173 17 Fracture
-N141 59 Fracture Discontinuous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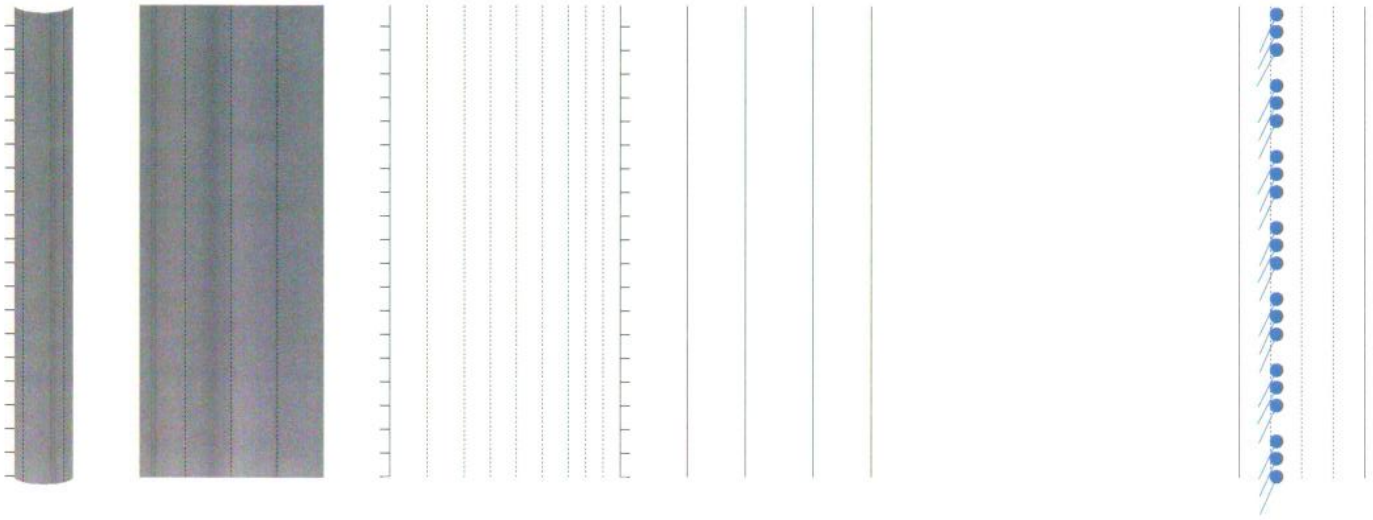
N275 42 Fracture
Cloudy Fluid Obscures Features Below 180'



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DIP DATA INTERPRETATION
RGLDIP vsn 6.1
FRACTURE ANALYSIS LOG

09 Dec 2004

Mactec

Borehole: RIPZ-16

Casmalia Landfill

top of borehole.....
East:
North:
Alt:

North ref: magnetic
Depth units are feet
Vertical scale: 1/150

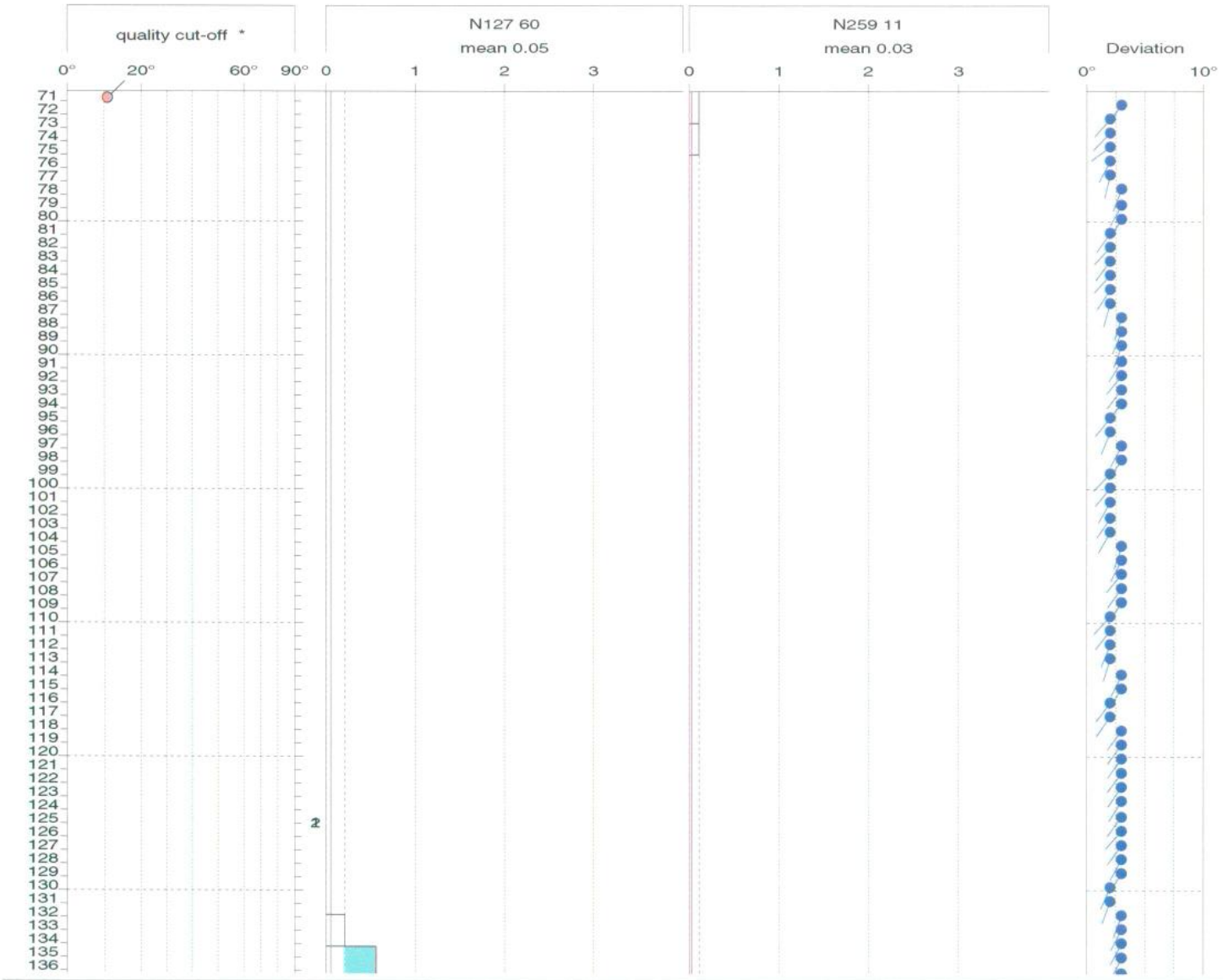
Zone from 179.200 to 70.273ft
Mean dip format: dip-azimuth and dip
Frequency histogram parameters:

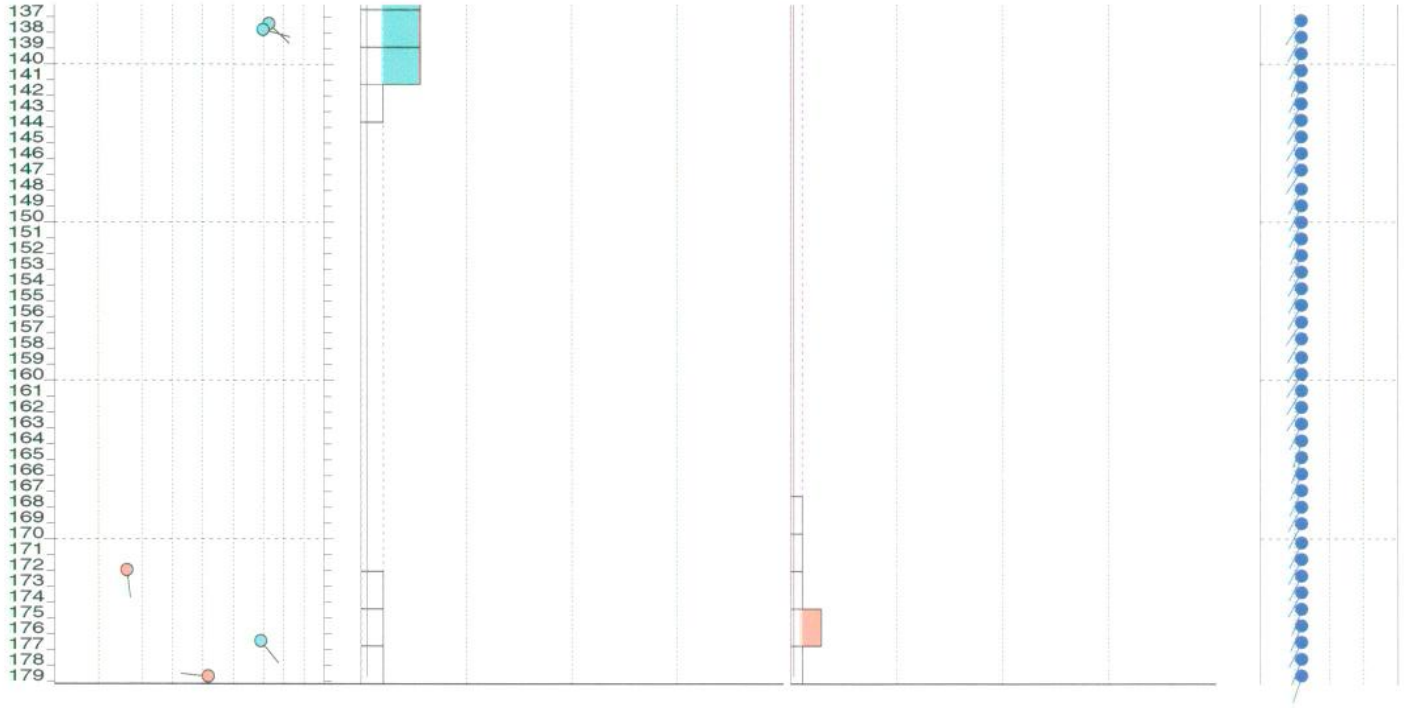
measurement distance	7.101ft
step distance	2.367ft

Interpretation 1

Dip data sets .....
OPTV dips

open symbols not used in mean-dip/zone-axis calculation

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DIP DATA INTERPRETATION
RGLDIP vsn 6.1
FRACTURE ANALYSIS STEREOGRAMS

09 Dec 2004

Mactec

Borehole: RIPZ-16

Casmalia Landfill

top of borehole.....
East:
North:
Alt:

North ref: magnetic
Depth units are feet

Zone from 179.200 to 70.273ft
Mean dip format: dip-azimuth and dip

Interpretation 1

Dip data sets .....
OPTV dips

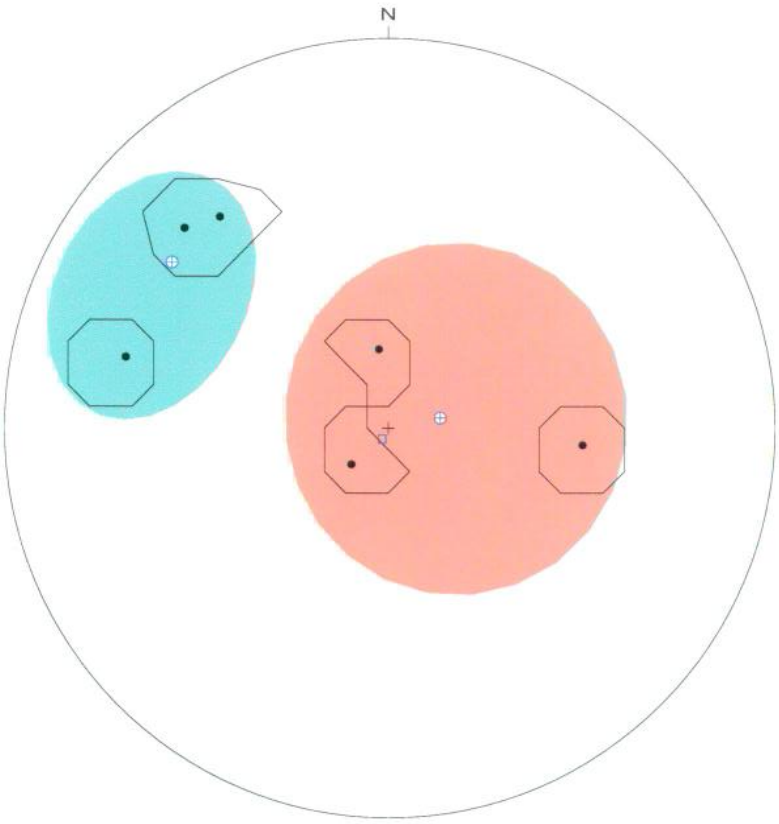
RIPZ-16
Zone 0. 70.273 - 179.200ft
Deviation 2.70 N209.70

dipdata sets.....
OPTV dips

	mean dip	n	f
N127 60	N127 60	3	0.05
N259 11	N259 11	3	0.03

intersections

	N127 60	N259 11
N127 60		08 N213
N259 11	08 N213	



⊕ mean dip
□ well axis

equal-area lower-hemisphere 0-90

contour-levels 1,

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DIP DATA INTERPRETATION
RGLDIP vsn 6.1
FRACTURE DIP-AZIMUTH ROSE-DIAGRAM

09 Dec 2004

Mactec

Borehole: RIPZ-16

Casmalia Landfill

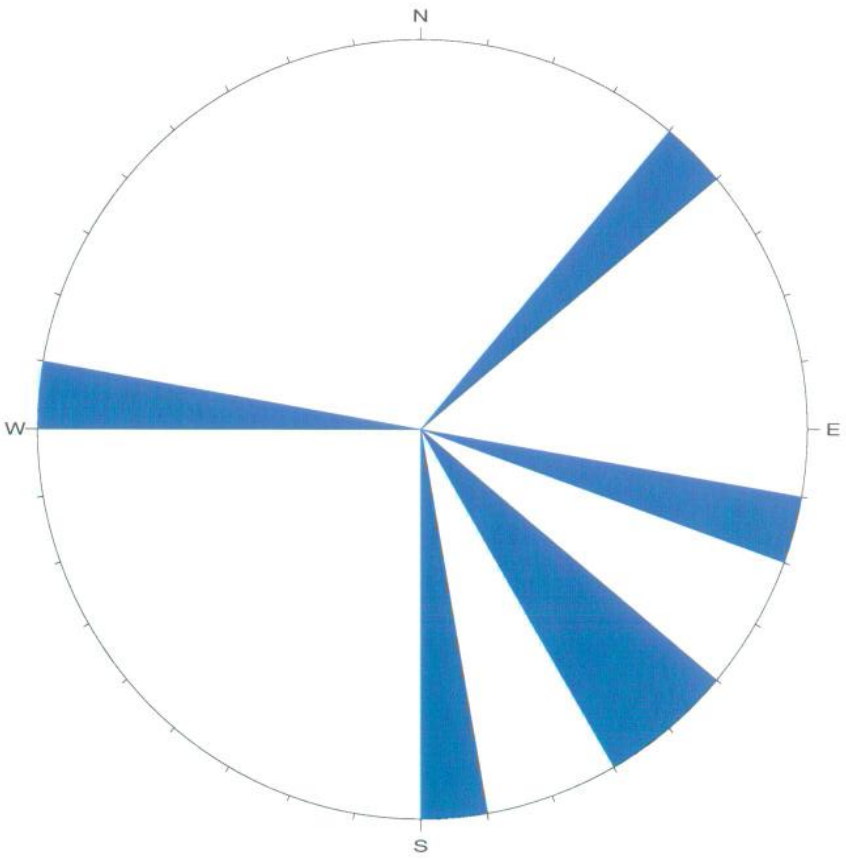
top of borehole.....
East:
North:
Alt:

North ref. is magnetic
Depth units are feet

Zone from 179.200 to 70.273ft

Dip data sets .....
OPTV dips

RIPZ-16
70.273 - 179.200ft
Dip-azimuth rose-diagram



Azimuth Incr = 10°
N = 6

RGLDIPv6.1 DIP DATA INTERPRETATION: FRACTURE ANALYSIS

borehole RIPZ-16
zone from 70.000 to 179.000 m
North ref is magnetic
09 Dec 2004

Data is classed into 1 types
5 OPTV_dips

Quality cut-off level: *

Mean well deviation: 2.7deg to N209.7

2 small-circles defined

	SEARCH AREA			MEAN DIP			
	azim	pl	cone	strike	dip	n	f
1	298.9	28.5	23.7	37	60	3	0.05
2	82.2	75.0	37.0	169	11	3	0.03

Total number of data = 6
Number of data unaccounted for = 0

ZONE No.	DEVIATION Dev	Azim	DEPTHS m TOP	BASE	No. DATA	MEAN DIPS and FREQUENCIES											
						Str	Dip	n	f	Str	Dip	n	f	Str	Dip	n	f
1	2.7	209.7	70.28	179.16	6	37	60	3	0.06	169	11	3	0.03	0	0	0	0.00
						0	0	0	0.00								
2	2.7	209.7	70.28	179.20	6	0	0	0	0.00	0	0	0	0.00	0	0	0	0.00
						0	0	0	0.00								

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DIP DATA INTERPRETATION
RGLDIP vsn 6.1
STRUCTURAL INTERPRETATION LOG

09 Dec 2004

Mactec

Borehole: RIPZ-16

Casmalia Landfill

top of borehole.....
East:
North:
Alt:

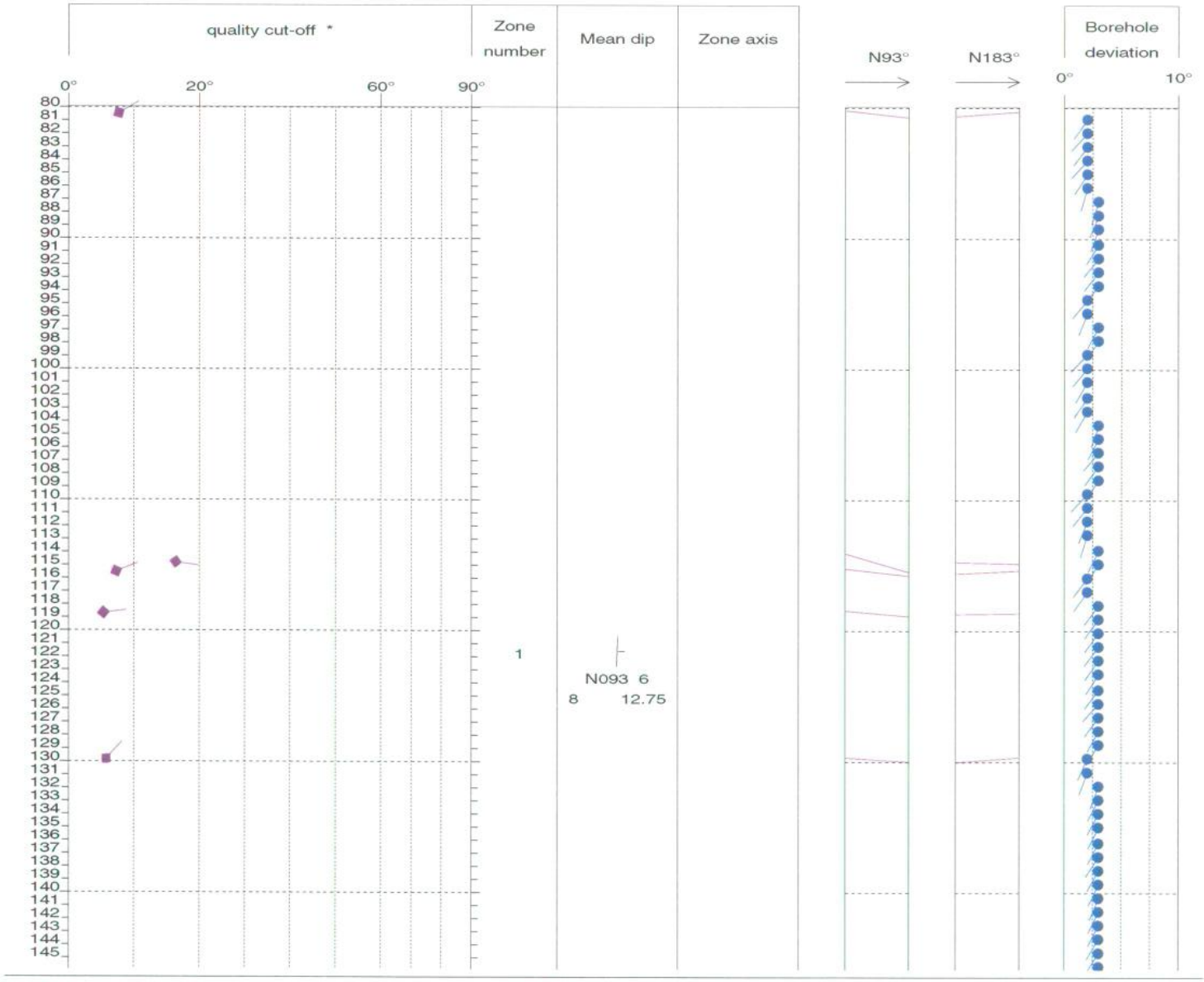
North ref: magnetic
Depth units are feet
Vertical scale: 1/150

Zone from 163.134 to 79.942ft
Mean dip format: dip-azimuth and dip

Interpretation 2

Dip data sets .....
OPTV dips

open symbols not used in mean-dip/zone-axis calculation



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DIP DATA INTERPRETATION
RGLDIP vsn 6.1
STRUCTURAL INTERPRETATION STEREOGRAMS

09 Dec 2004

Mactec

Borehole: RIPZ-16

Casmalia Landfill

top of borehole.....
East:
North:
Alt:

North ref: magnetic
Depth units are feet

Zone from 163.134 to 79.942ft
Mean dip format: dip-azimuth and dip

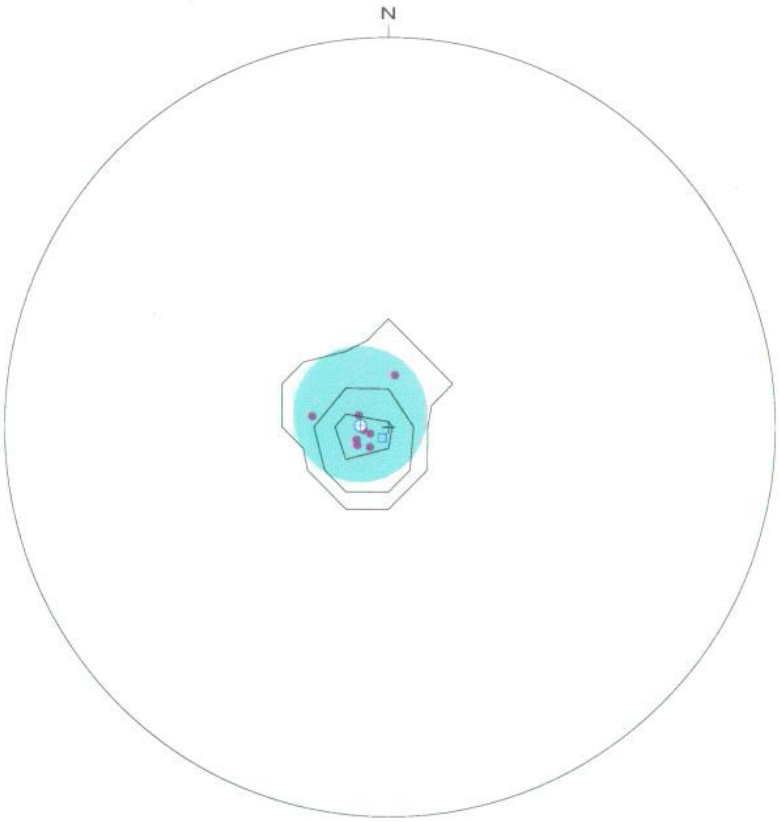
Interpretation 2

Dip data sets .....
OPTV dips

RIPZ-16
Zone 0, 79.942 - 163.134ft
Deviation 2.70 N210.50

dipdata sets.....
OPTV dips

	mean dip	n	dsp	zone axis	n	dev
N093 6	N093 6	8	12.7			



equal-area lower-hemisphere 0-90

mean dip
zone axis
well axis

contour-levels 1,3,6,

RGLDIPv6.1 DIP DATA INTERPRETATION: STRUCTURAL

borehole RIPZ-16
zone from 79.000 to 163.000 m
North ref is magnetic
09 Dec 2004

Data is classed into 1 types
5 OPTV_dips

Quality cut-off level: *

Mean well deviation: 2.7deg to N210.5

1 small-circles defined

	SEARCH AREA			MEAN DIP		
	azim	pl	cone	strike	dip	n
1	294.0	83.3	14.3	3	6	8

Total number of data = 8
Number of data unaccounted for = 0

ZONE No.	DEVIATION Dev	Azim	DEPTHS m TOP	BASE	No. DATA	MEAN DIPS and ZONE AXES											
						Str Dip	n	Disp	Str Dip	n	Disp	Str Dip	n	Disp	Str Dip	n	Disp
						Azm Pl	n	Dev	Azm Pl	n	Dev	Azm Pl	n	Dev	Azm Pl	n	Dev
1	2.7	210.5	79.94	163.13	8	3 6	8	12.75	0 0	0	0.00	0 0	0	0.00	0 0	0	0.00
						0 0	0	0.00	0 0	0	0.000	0 0	0	0.000	0 0	0	0.000