welenco

(800)445-9914

OPTV DATA PROCESSING
RGLDIP vsn 6.1
BOREHOLE IMAGE LOG

06 Dec 2004

Mactec

Borehole: RIPZ-17

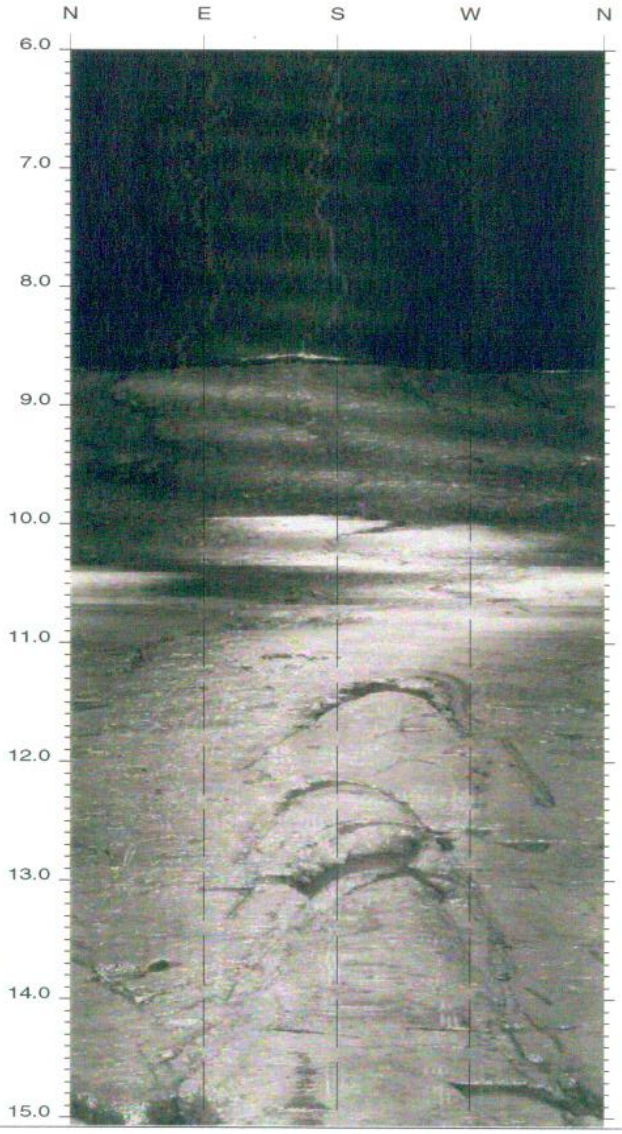
Casmalia Landfill

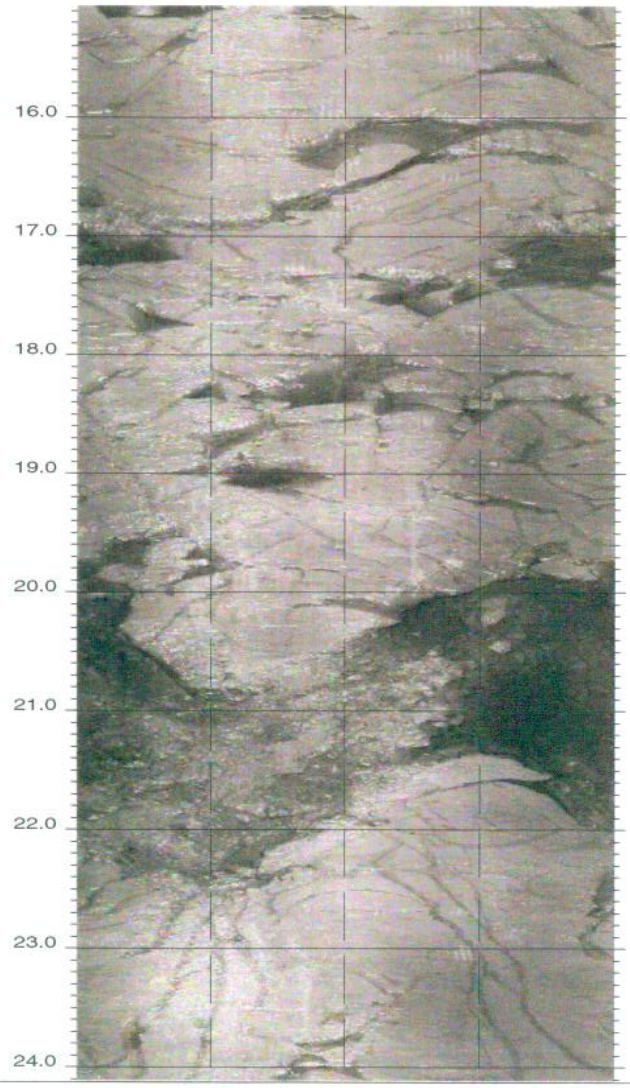
top of borehole.....
East:
North:
Elev:

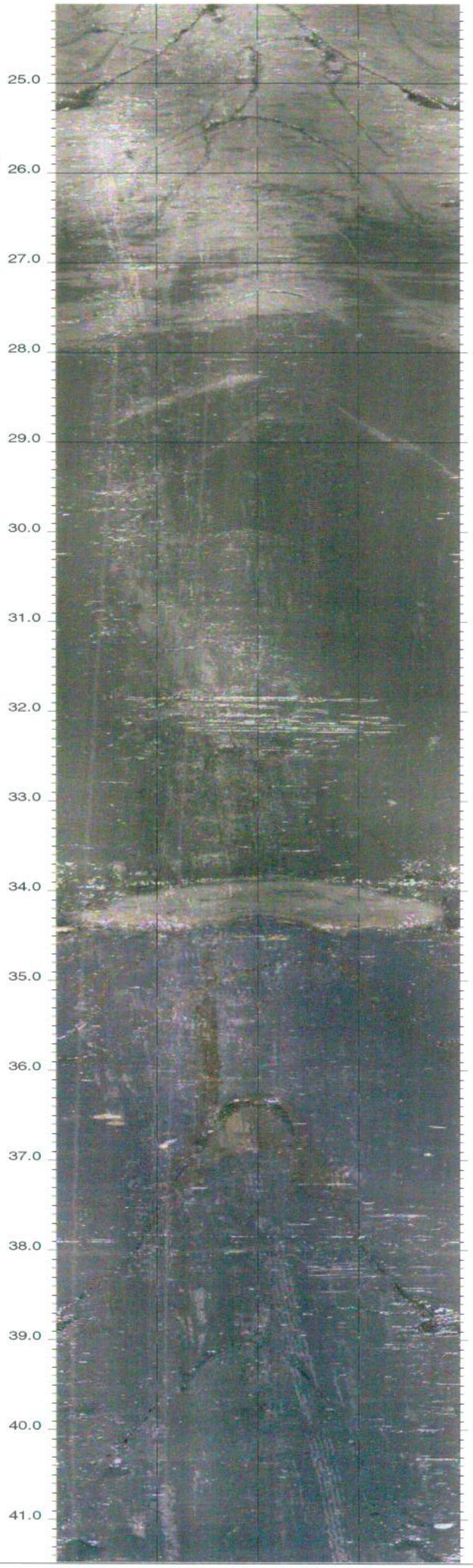
North ref. is magnetic
Depth units are feet
Vertical scale: 1/20

Zone from 6.0000 to 158.2500ft
Format: BHTV NESWN

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



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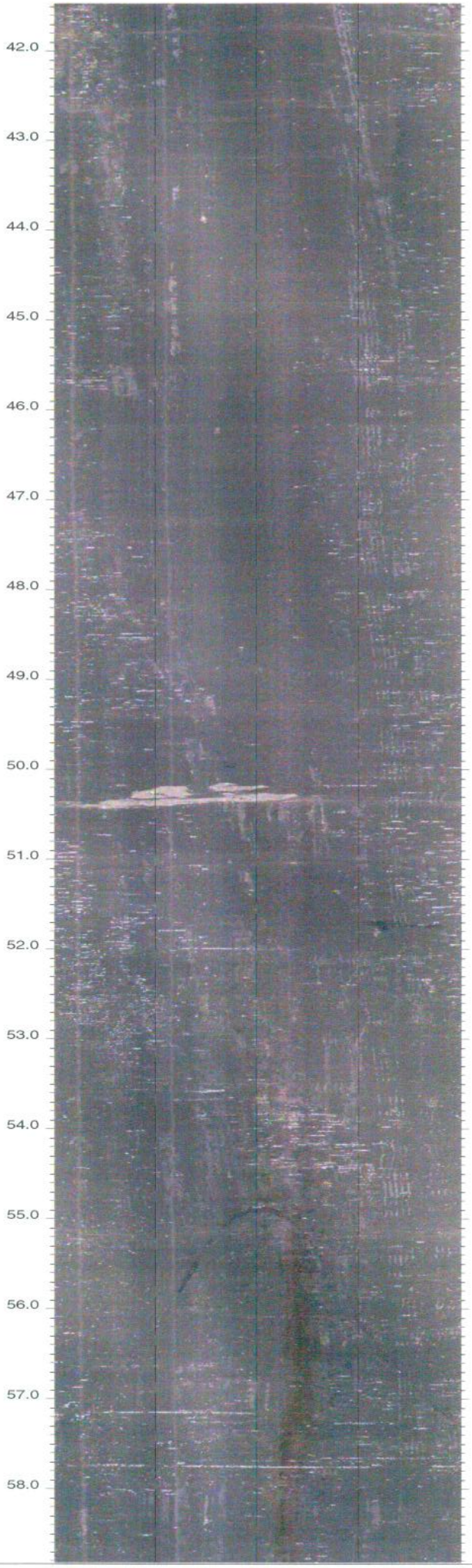
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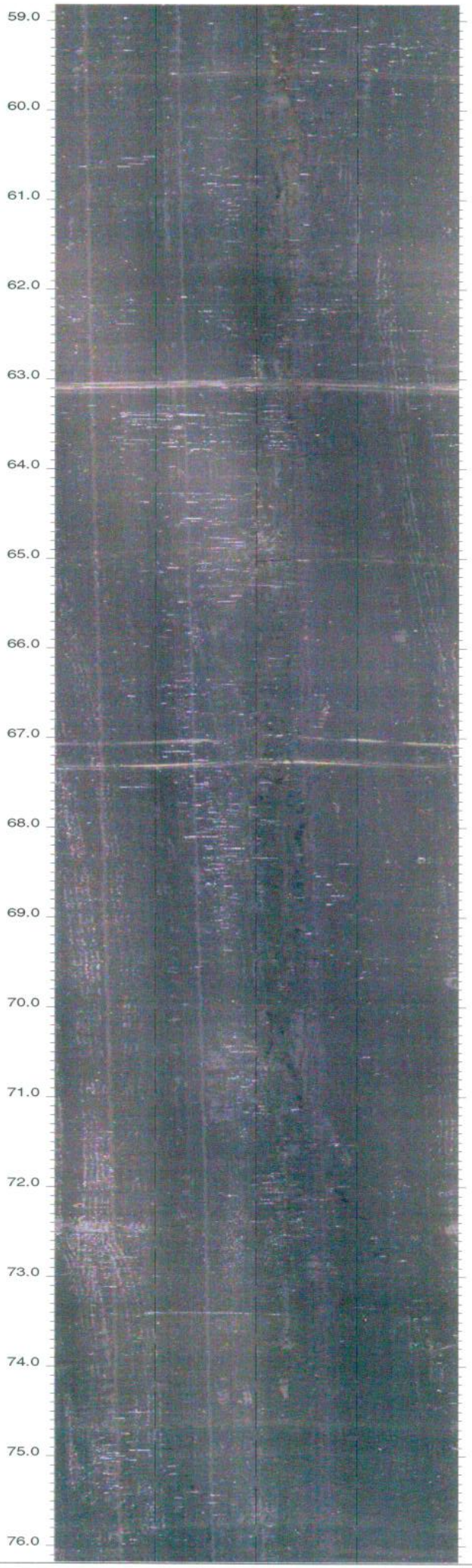
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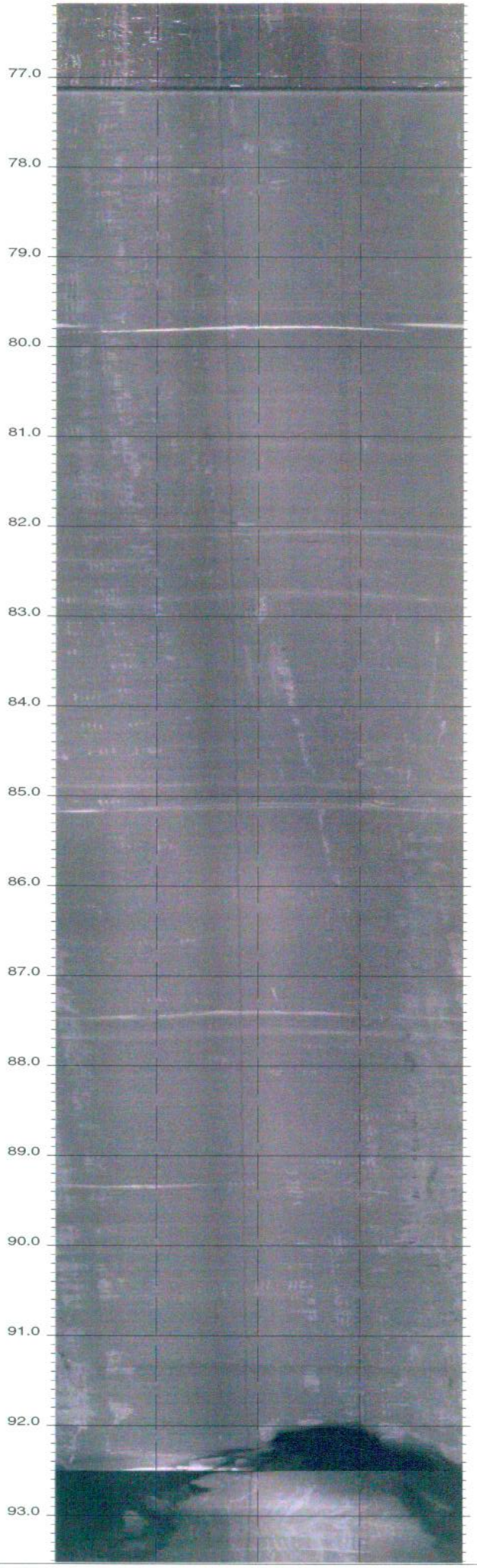
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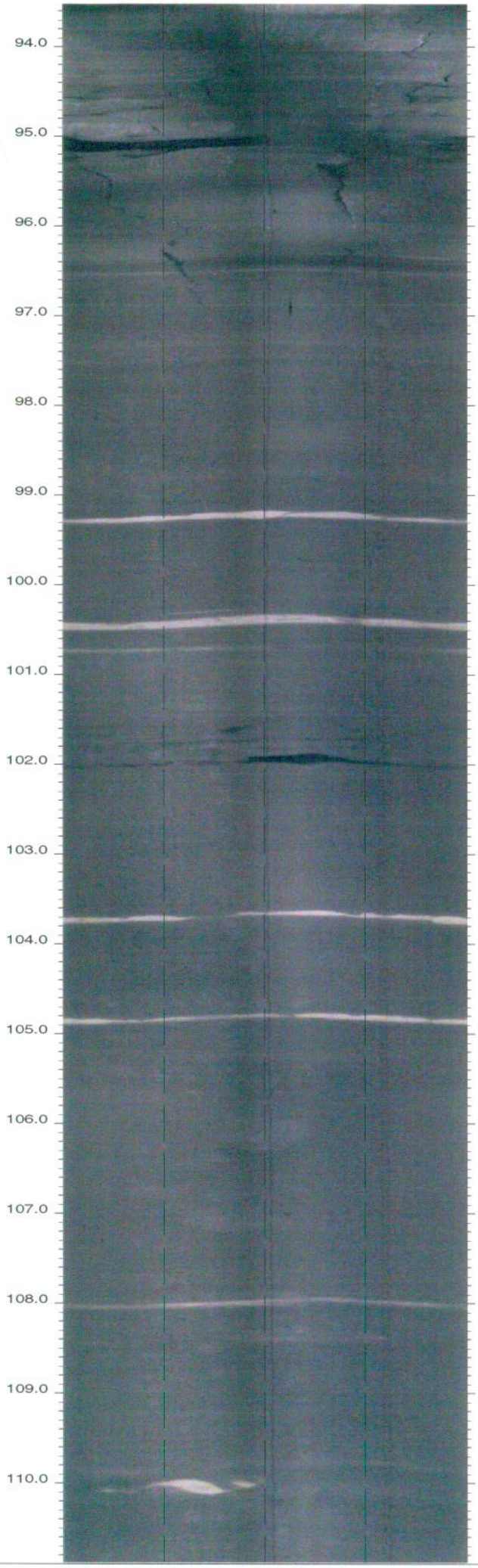
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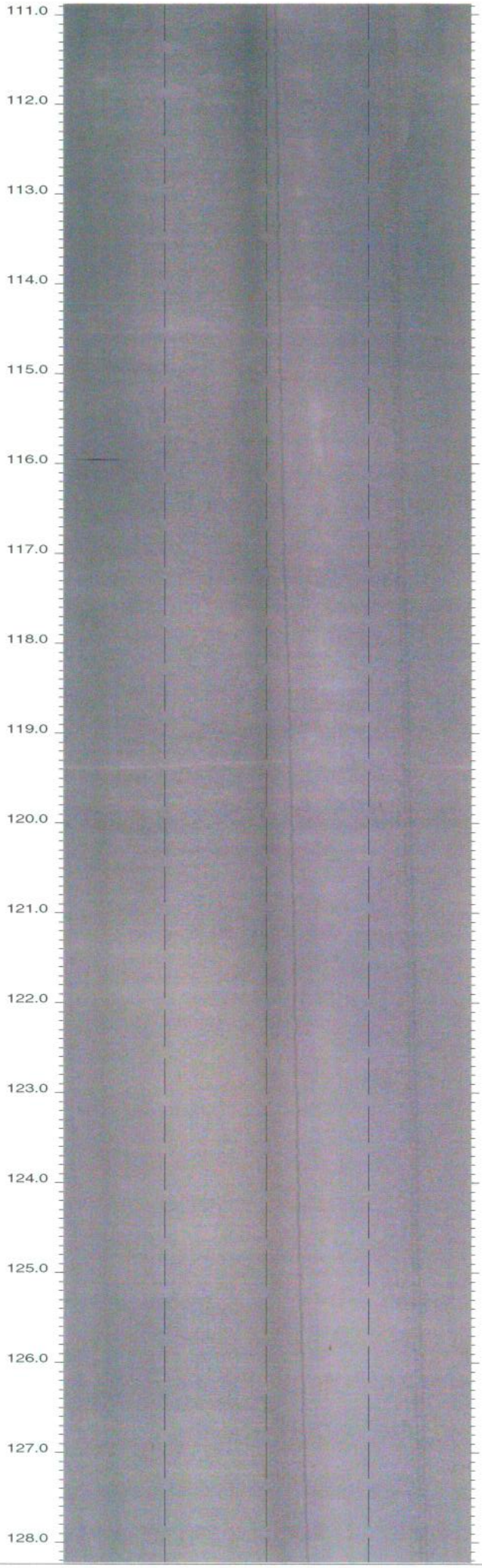
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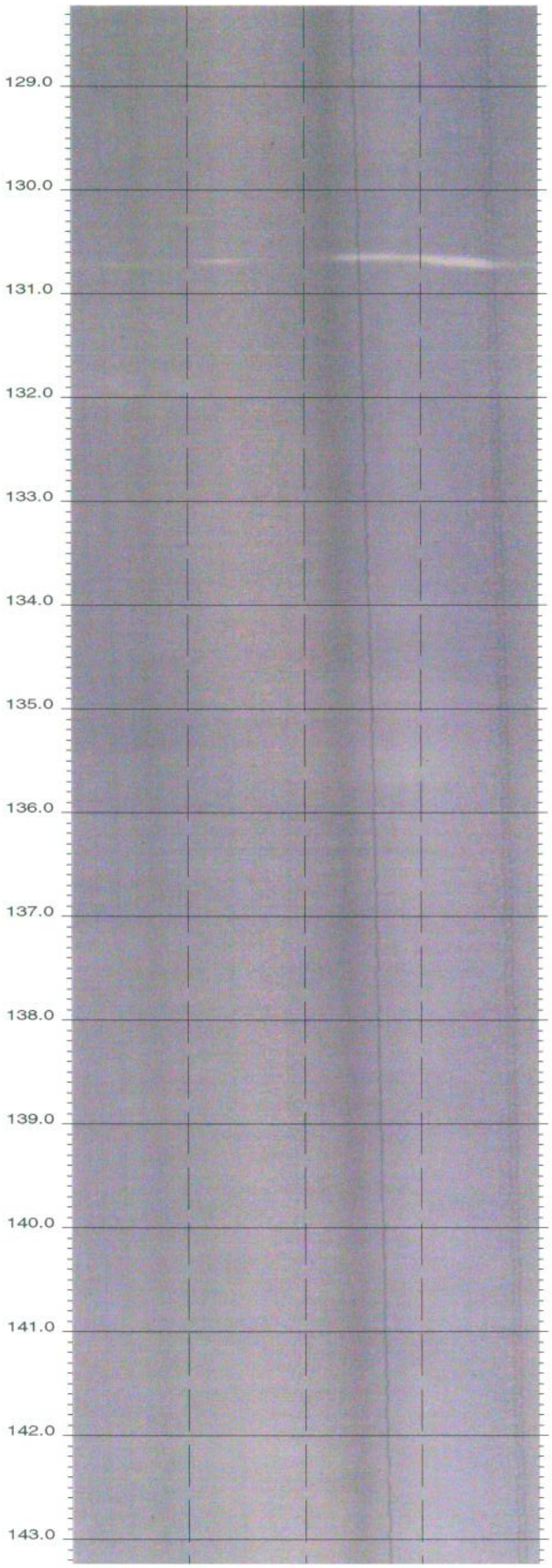
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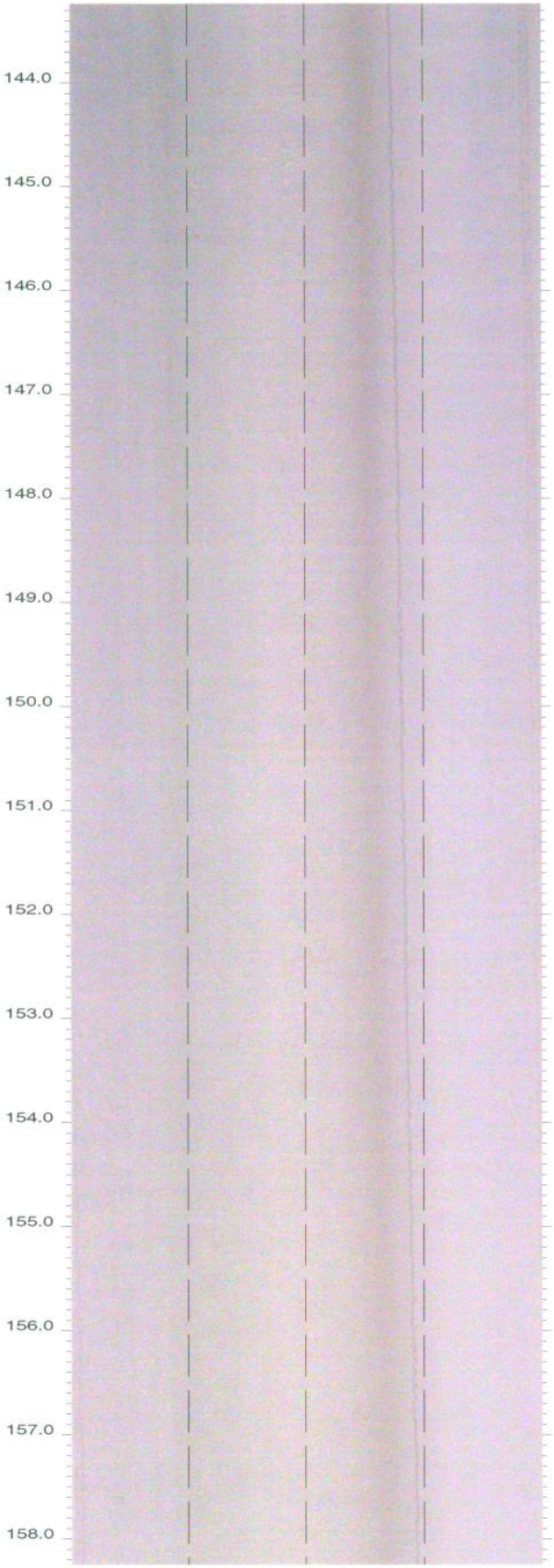
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156.0
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158.0

RGLDIPv6.1 OPTV results

K = 0: BEDDING
K = 2: FRACTURE

borehole RIPZ-17
zone from 0.008 to 158.272 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	130.689	18	6.0	0.940	4	C	0	130.664	130.714	0.500	265.71	1.00	0.0000	Bedding
2	119.324	53	10.9	1.000	3	A	0	119.279	119.368	0.500	259.10	1.00	0.0000	Bedding
3	108.005	53	11.4	0.955	4	B	0	107.958	108.051	0.500	249.00	1.00	0.0000	Bedding
4	104.811	17	8.2	0.975	4	A	0	104.772	104.850	0.500	324.24	1.00	0.0000	Bedding
5	103.703	21	11.0	0.954	4	B	0	103.655	103.752	0.500	291.42	1.00	0.0000	Bedding
6	101.988	20	12.0	0.988	4	A	2	101.936	102.040	0.500	281.03	1.00	0.0000	Fracture
7	100.390	65	17.7	1.000	3	A	0	100.315	100.466	0.500	273.36	1.00	0.0000	Bedding
8	99.245	45	6.8	0.973	4	A	0	99.218	99.272	0.500	268.55	1.00	0.0000	Bedding
9	95.112	271	3.0	1.000	3	A	2	95.103	95.122	0.500	48.40	2.84	0.0000	Fracture
10	92.449	63	58.0	0.999	4	A	2	92.064	92.835	0.500	246.46	1.00	0.0000	Fracture
11	87.453	347	14.8	0.997	4	A	0	87.392	87.515	0.500	187.07	1.00	0.0000	Bedding
12	85.114	12	8.5	0.977	4	A	0	85.076	85.152	0.500	102.46	1.00	0.0000	Bedding
13	82.067	111	9.5	1.000	3	A	0	82.028	82.106	0.500	341.35	1.00	0.0000	Bedding
14	79.802	36	7.0	0.990	4	A	0	79.774	79.830	0.500	256.53	1.00	0.0000	Bedding
15	67.289	24	5.8	0.967	4	B	0	67.259	67.318	0.500	0.32	1.00	0.0000	Bedding
16	67.027	30	11.3	0.976	4	A	0	66.973	67.080	0.500	354.21	1.00	0.0000	Bedding
17	63.050	341	10.9	0.995	4	A	0	63.001	63.099	0.500	59.60	1.00	0.0000	Bedding
18	56.087	2	76.7	0.968	5	B	2	54.932	57.243	0.500	58.97	2.00	0.0000	Fracture
19	39.947	348	74.1	0.986	5	A	2	39.050	40.843	0.500	62.48	1.39	0.0000	Fracture
20	37.666	353	76.8	0.940	4	C	2	36.416	38.917	0.500	13.70	2.00	0.0000	Fracture
21	35.291	17	59.8	1.000	3	A	2	34.833	35.749	0.500	56.69	2.00	0.0000	Fracture
22	34.847	345	66.9	0.903	4	C	2	34.249	35.445	0.500	60.09	1.62	0.0000	Fracture
23	34.371	202	22.2	1.000	3	A	0	34.278	34.463	0.500	43.75	2.00	0.0000	Bedding
24	29.064	48	64.0	1.000	3	A	2	28.534	29.594	0.500	8.16	1.00	0.0000	Fracture
25	27.805	14	61.4	0.994	4	A	2	27.337	28.272	0.500	311.90	1.00	0.0000	Fracture
26	26.717	346	75.1	1.000	3	A	2	25.798	27.637	0.500	95.84	1.00	0.0000	Fracture
27	25.853	353	59.7	0.991	4	A	2	25.410	26.295	0.500	23.69	1.00	4.9151	
Fracture-zone														
28	14.264	43	74.4	1.000	3	A	2	13.378	15.150	0.500	304.00	1.00	0.0000	
Fracture-zone														
29	13.972	31	76.5	0.985	4	A	2	12.951	14.993	0.500	283.46	1.00	0.0000	Fracture
30	13.211	6	76.8	1.000	3	A	2	12.117	14.293	0.500	294.34	1.00	0.0000	Fracture

```
Discontinuous
  31    12.126      29   70.6    1.000   3 A  2   11.382  12.113  0.500  352.73   1.00     0.0000   Fracture
Discontinuous
```

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OPTV DATA PROCESSING
RGLDIP vsn 6.1
INTERPRETED OPTV DIPS LOG

07 Dec 2004

Mactec

Borehole: RIPZ-17

Casmalia Landfill

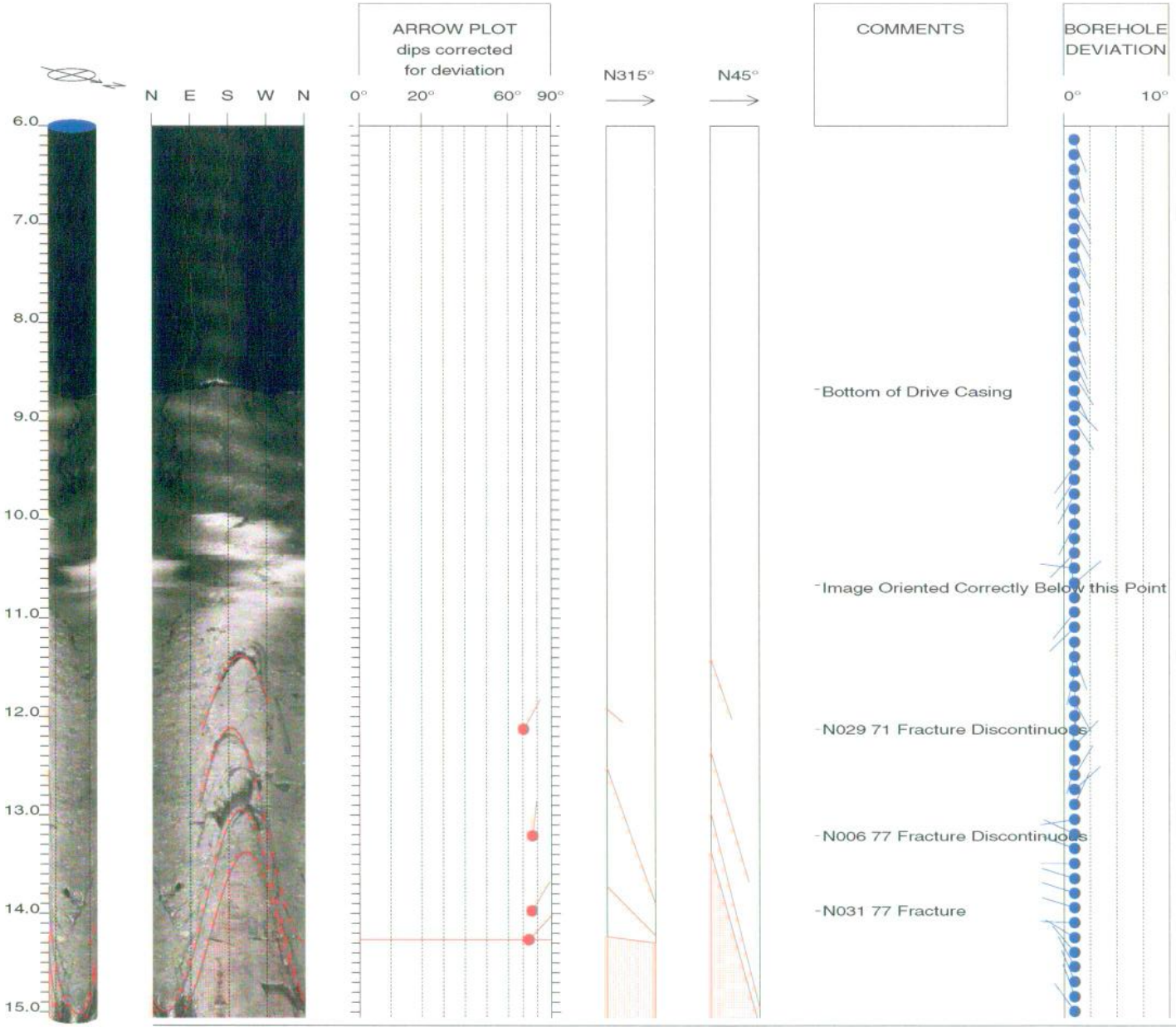
top of borehole.....
East:
North:
Elev:

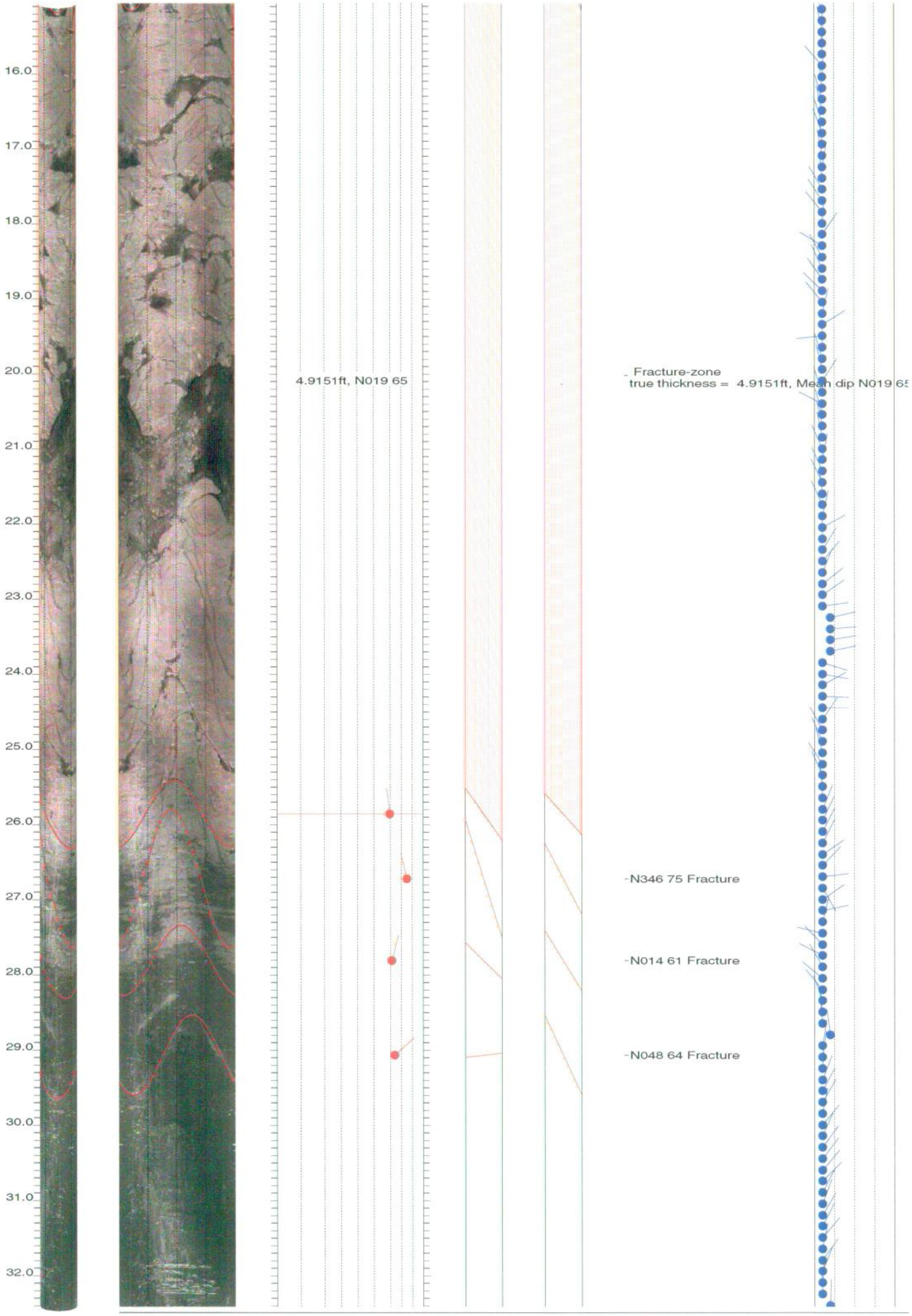
North ref. is magnetic
Depth units are feet
Vertical scale: 1/20
Horiz scale = vert scale

Zone from 158.272 to 6.000ft
Format: BHTV-NESWN

Borehole diam: 6.000inch
Vertical = borehole-axis

BEDDING
FRACTURE
Identified units

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25.0
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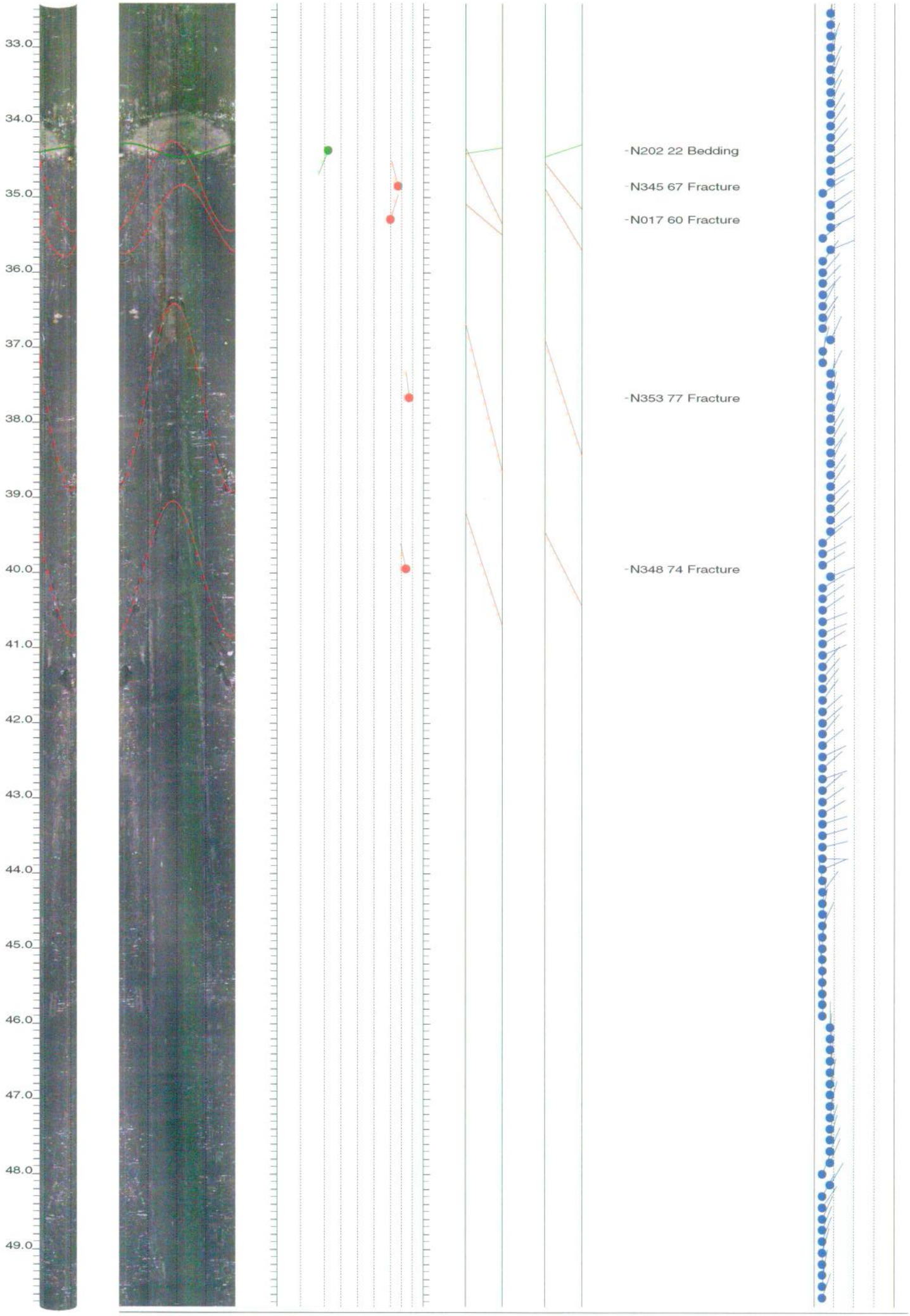
27.0
28.0
29.0
30.0
31.0
32.0
4.9151ft, N019 65
Fracture-zone
true thickness = 4.9151ft, Mean dip N019 65
N346 75 Fracture
N014 61 Fracture
N048 64 Fracture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45.0
46.0
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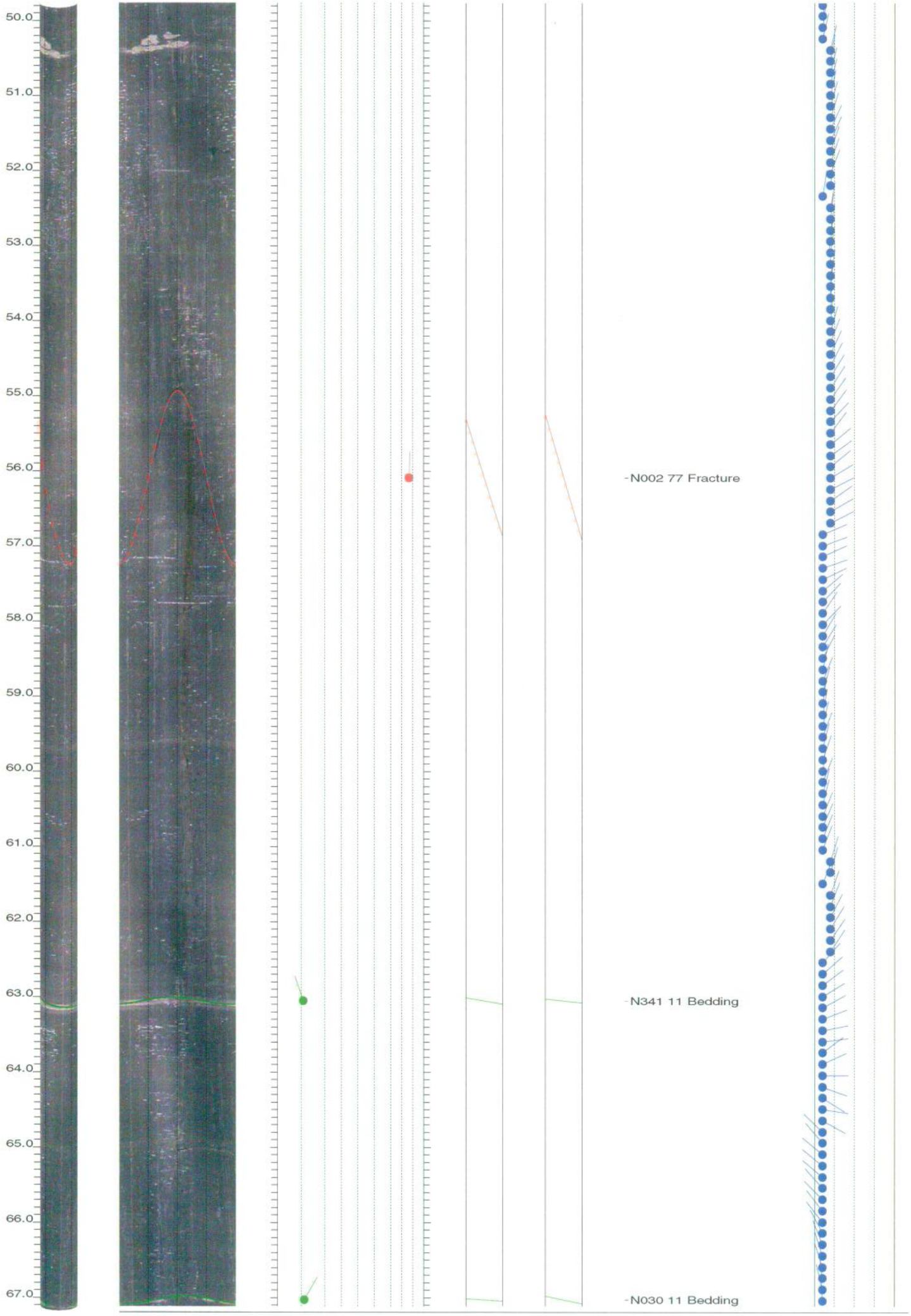
49.0
-N202 22 Bedding
-N345 67 Fracture
-N017 60 Fracture
-N353 77 Fracture
-N348 74 Fracture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58.0
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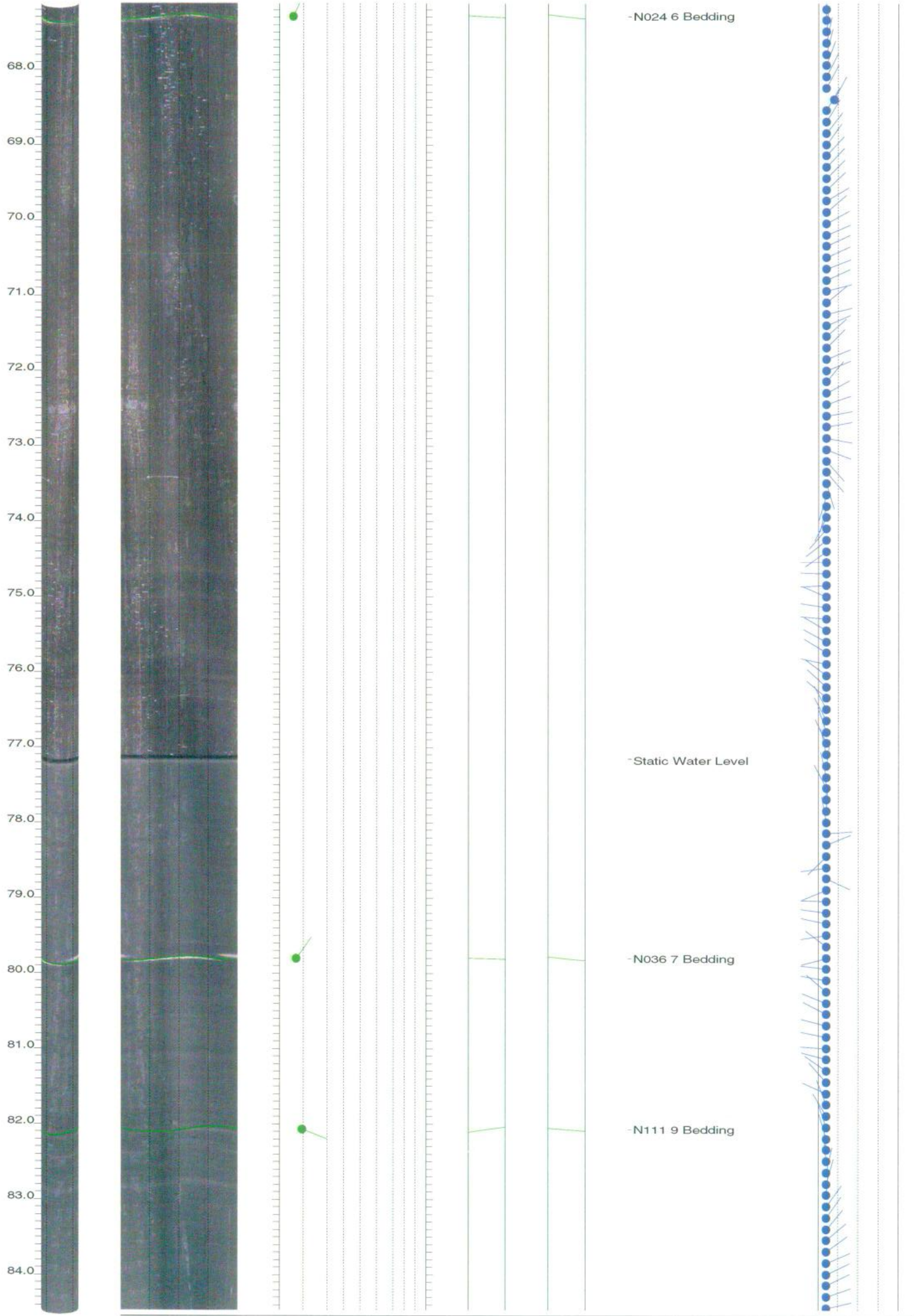
63.0
64.0
65.0
66.0
67.0
N002 77 Fracture
N341 11 Bedding
N030 11 Bedding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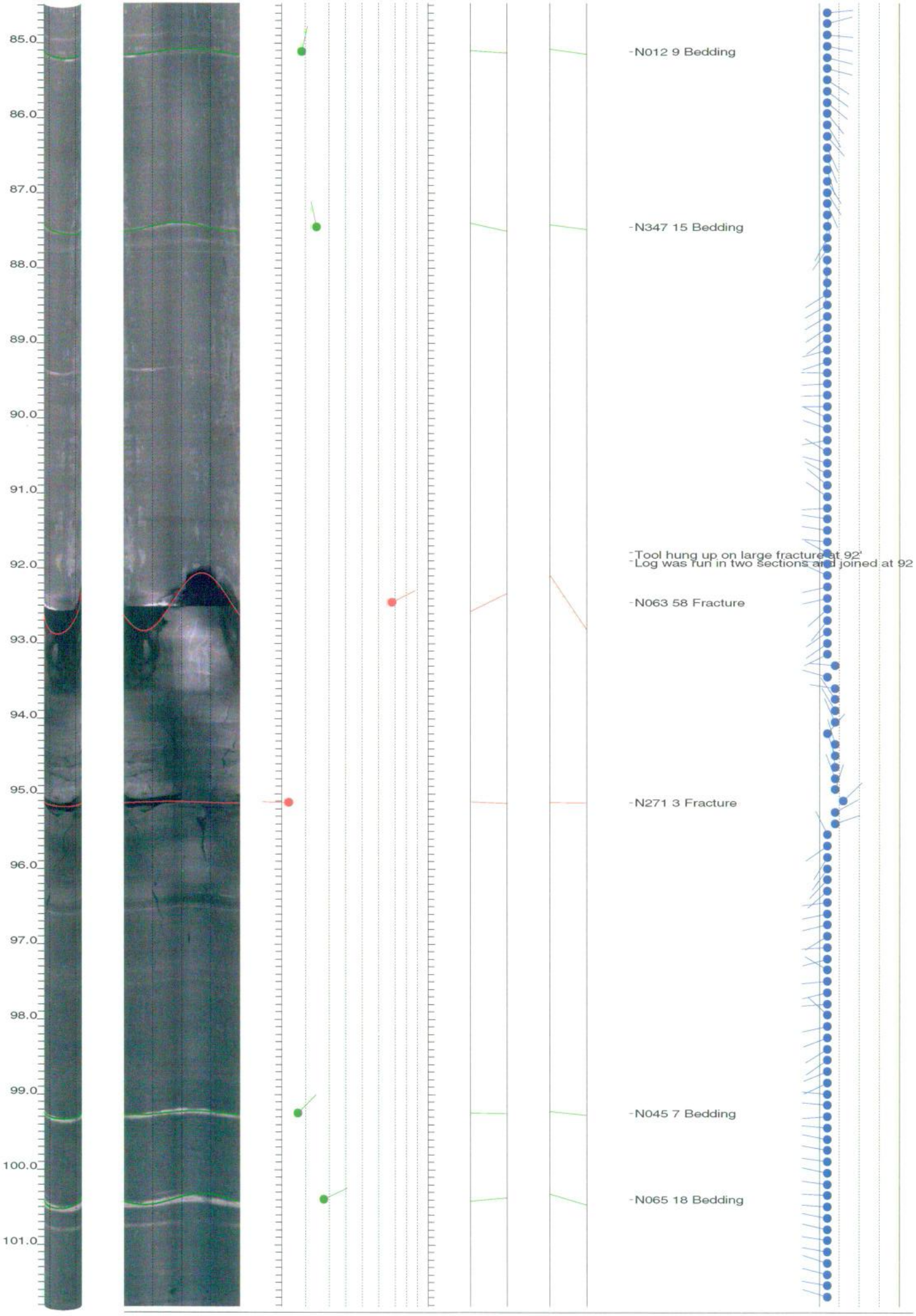
84.0
N024 6 Bedding
Static Water Level
N036 7 Bedding
N111 9 Bedding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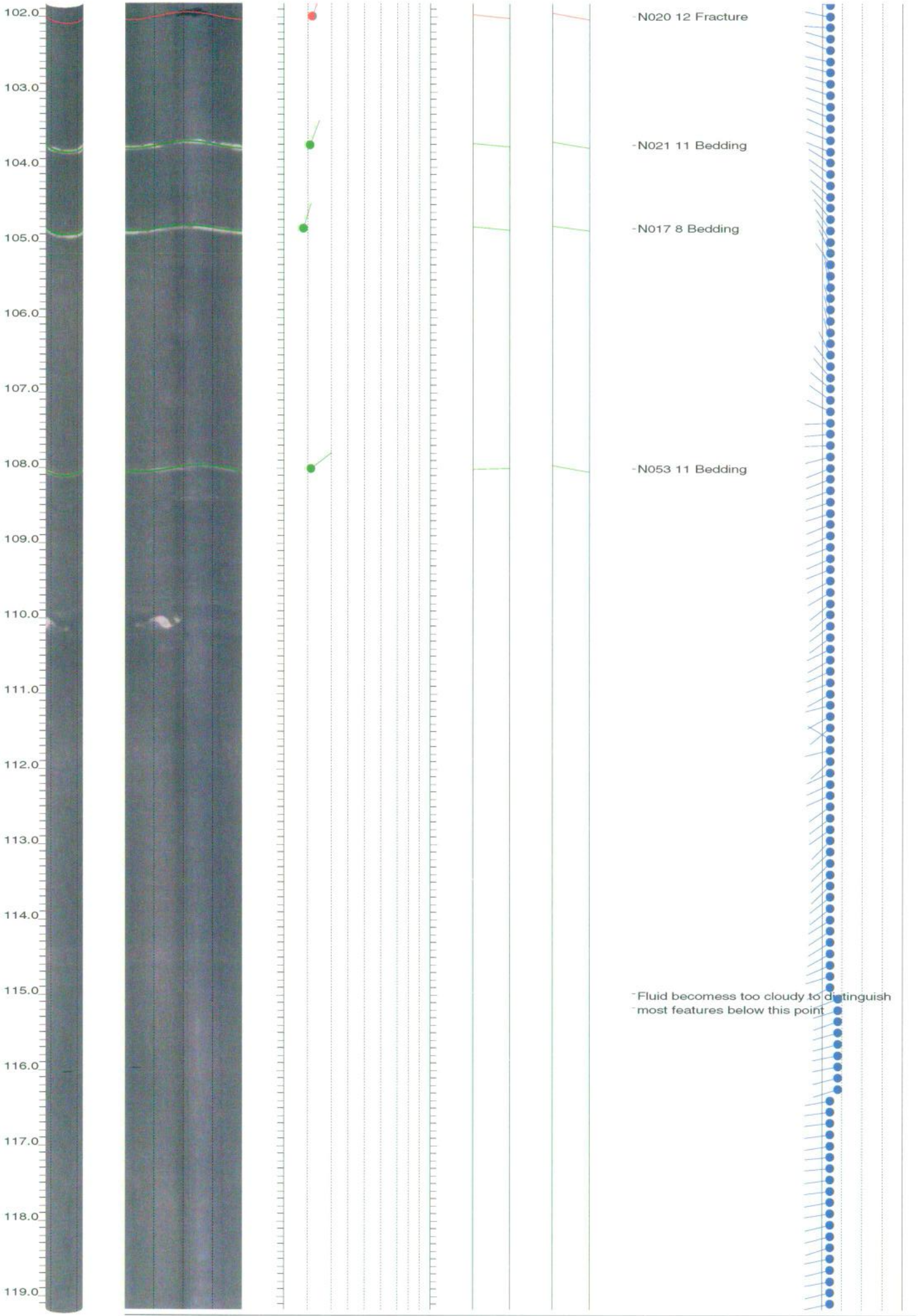
97.0
98.0
99.0
100.0
101.0
N012 9 Bedding
N347 15 Bedding
Tool hung up on large fracture at 92'
Log was run in two sections and joined at 92
N063 58 Fracture
N271 3 Fracture
N045 7 Bedding
N065 18 Bedding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114.0
115.0
116.0
117.0
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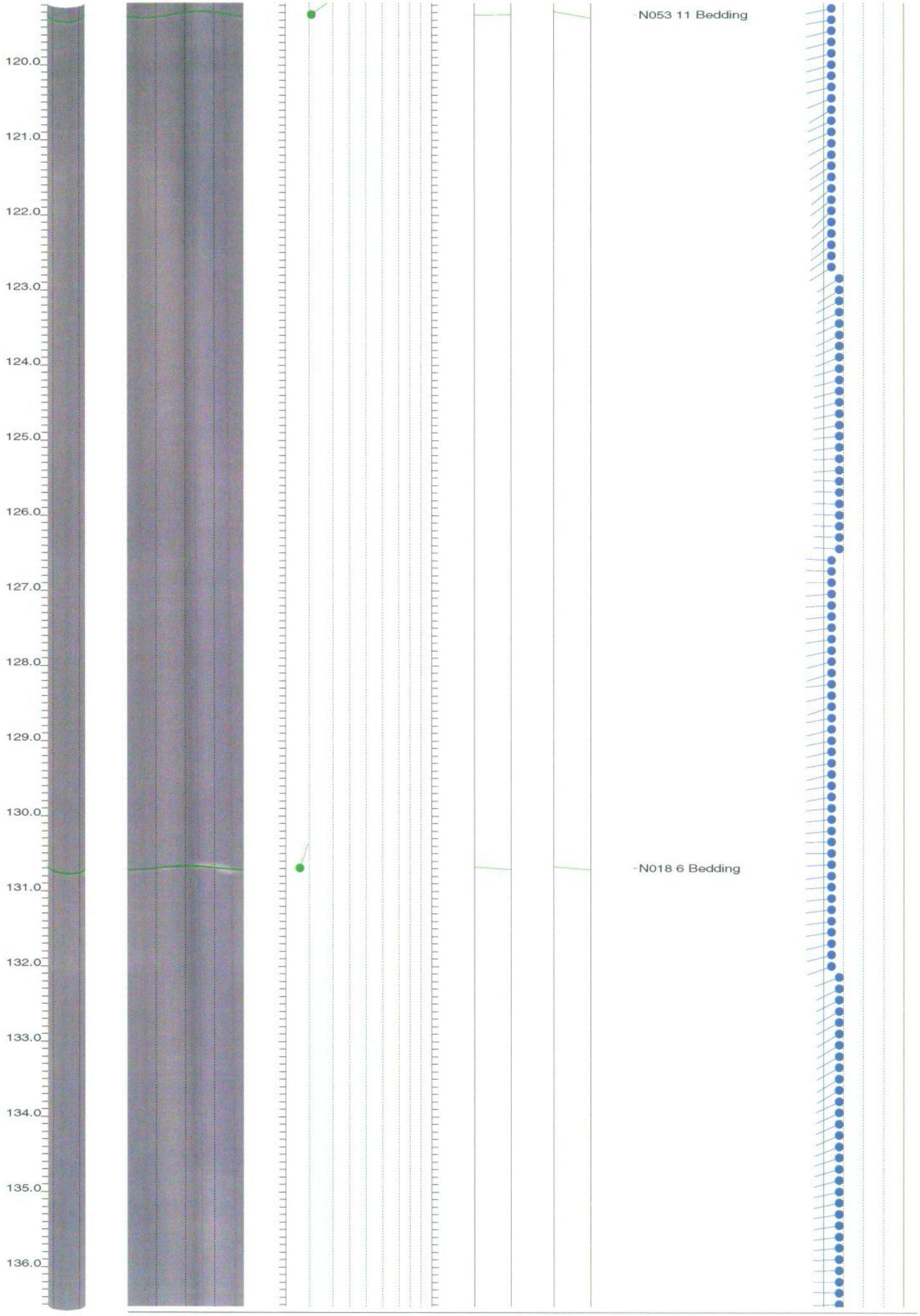
119.0
N020 12 Fracture
N021 11 Bedding
N017 8 Bedding
N053 11 Bedding
Fluid becomess too cloudy to distinguish
most features below this point


N053 11 Bedding
N018 6 Bedding
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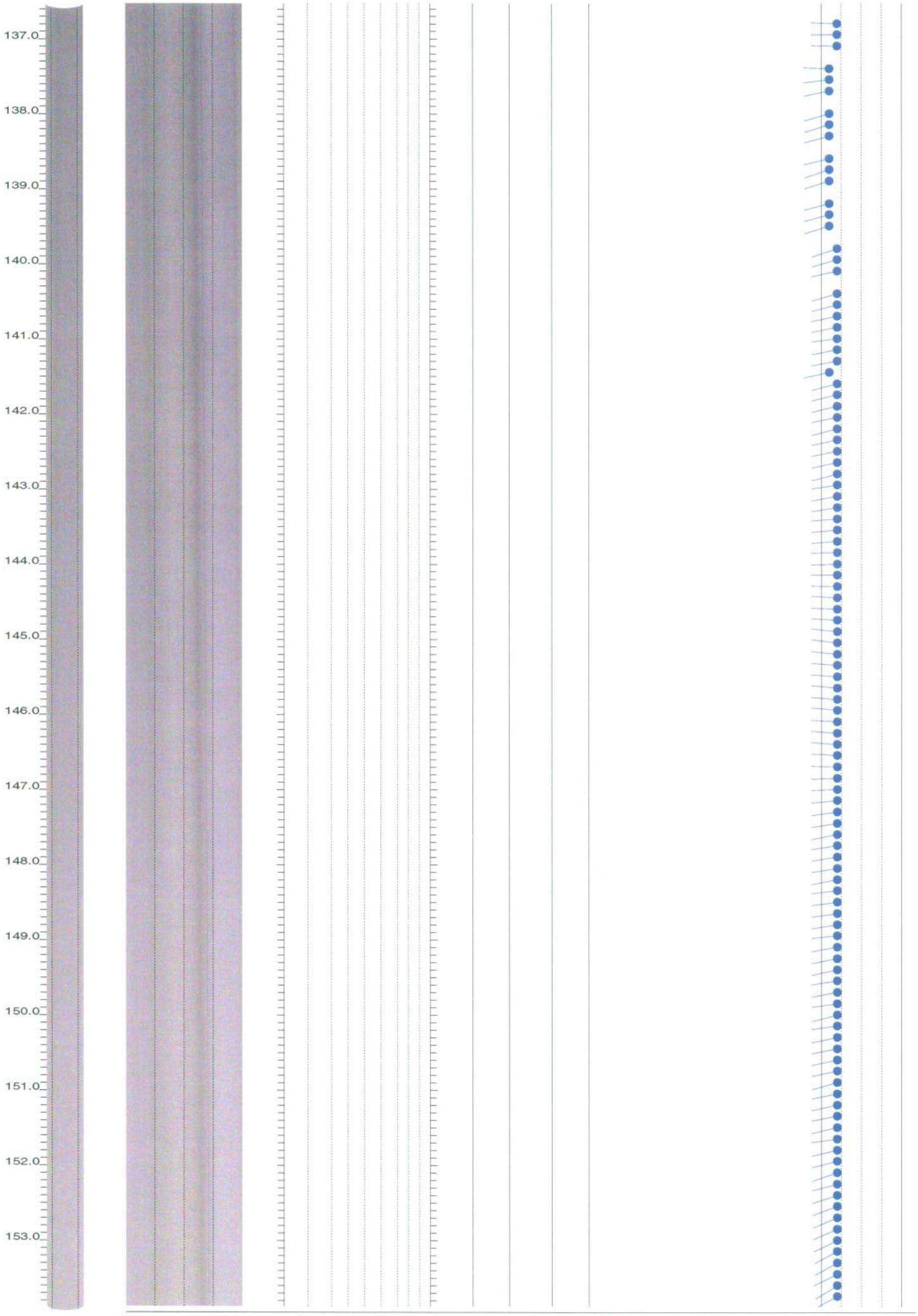
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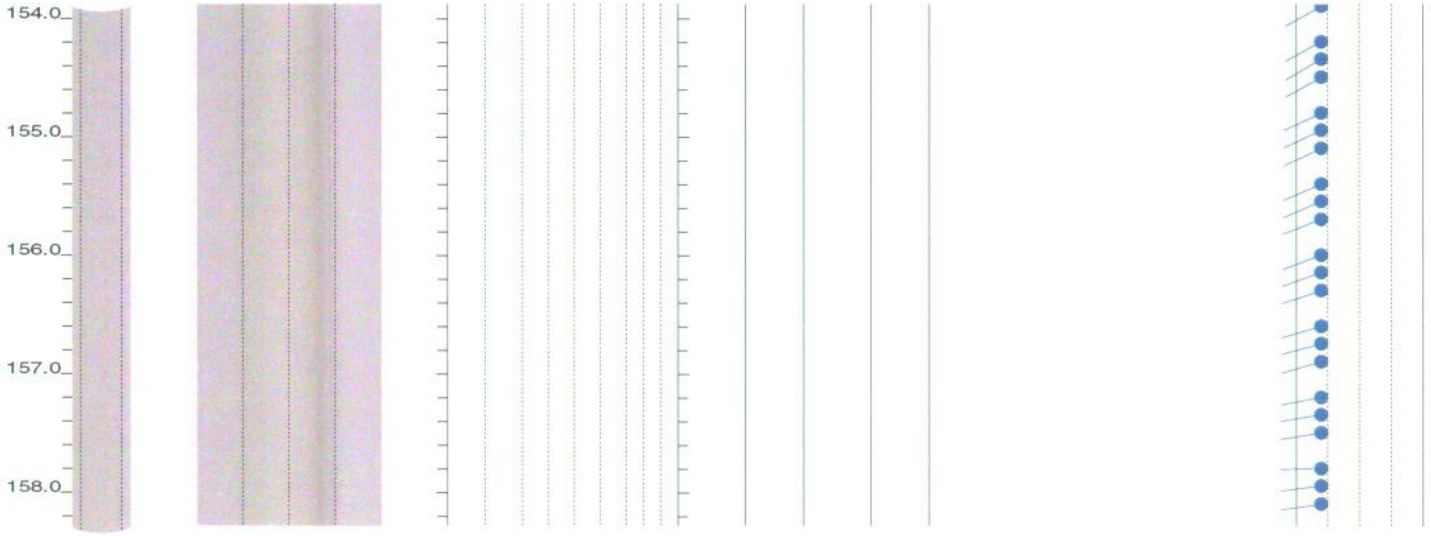
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DIP DATA INTERPRETATION
RGLDIP vsn 6.1
FRACTURE ANALYSIS LOG

06 Dec 2004

Mactec

Borehole: RIPZ-17

merged

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

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

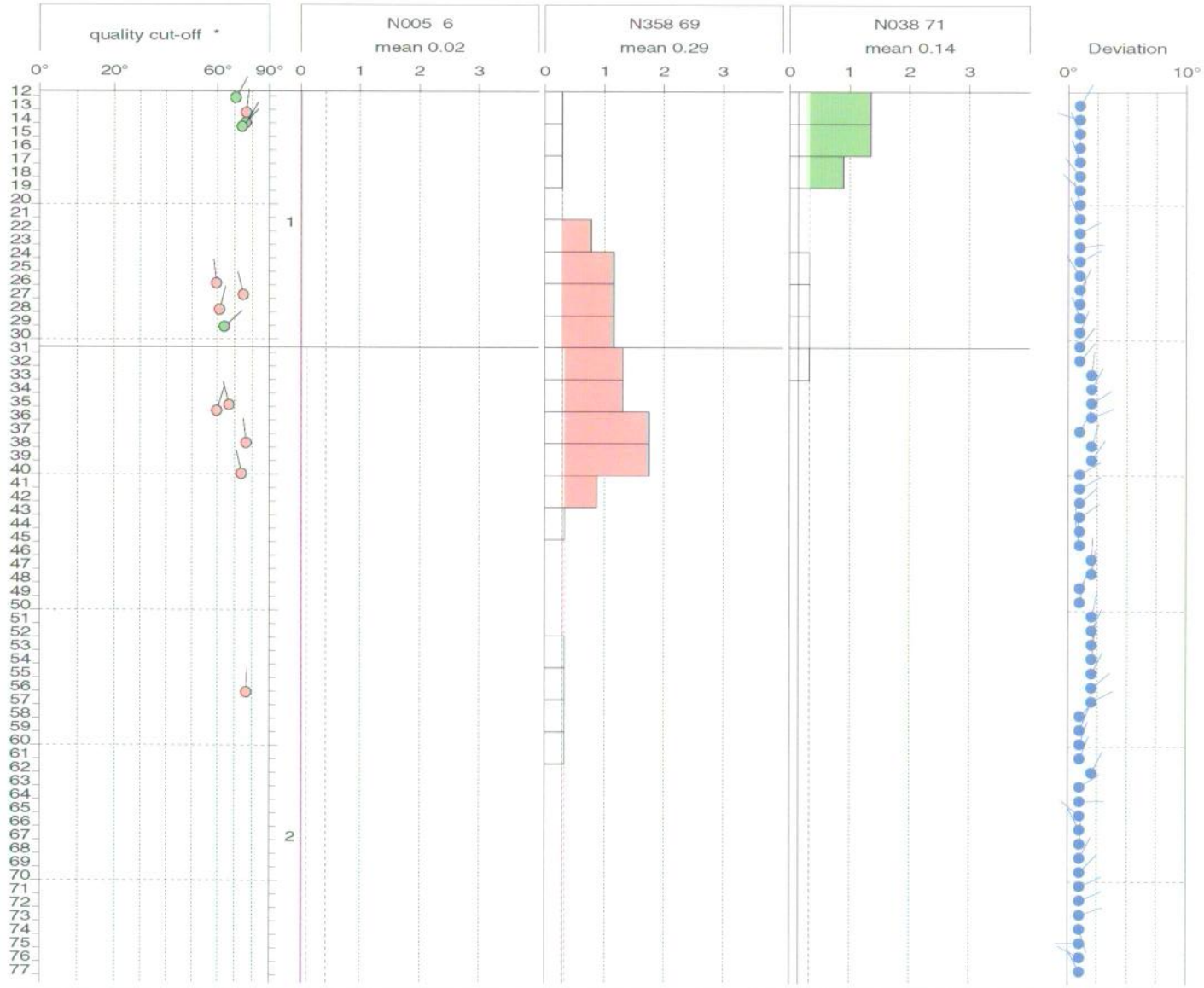
Zone from 102.488 to 11.626ft
Mean dip format: dip-azimuth and dip
Frequency histogram parameters:

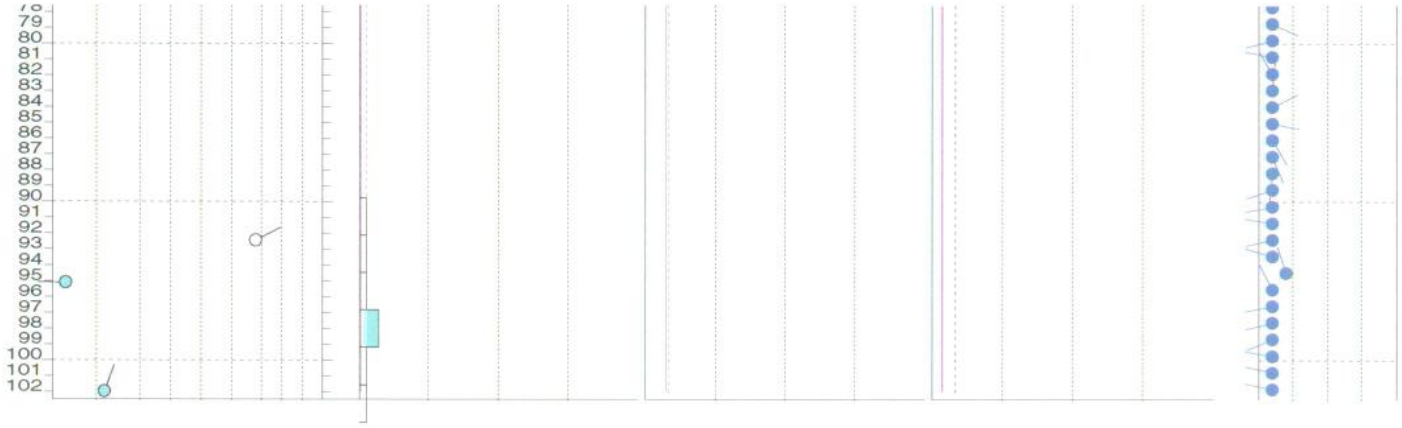
measurement distance 7.101ft
step distance 2.367ft

Interpretation 1

Dip data sets .....
OPTV dips

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

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93
94
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97
98
99
100
101
102

Mactec

Borehole: RIPZ-17

merged

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

North ref: magnetic
Depth units are feet

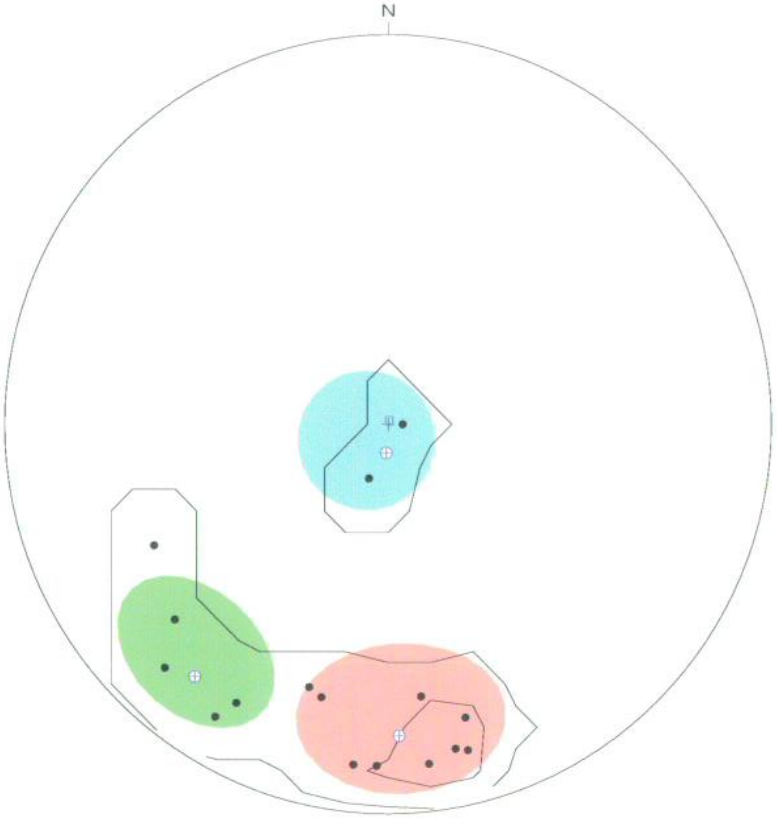
Zone from 102.488 to 11.626ft
Mean dip format: dip-azimuth and dip

Interpretation 1

Dip data sets .....
OPTV dips

RIPZ-17
Zone 0. 11.626 - 102.478ft
Deviation 0.70 N 11.70

dipdata sets.....
OPTV dips



	mean dip	n	f
N005 6	N005 6	2	(0.02)
N358 69	N358 69	9	(0.29)
N038 71	N038 71	4	(0.14)

intersections

	N005 6	N358 69	N038 71
N005 6		01 N088	03 N309
N358 69	01 N088		69 N010
N038 71	03 N309	69 N010	

equal-area lower-hemisphere 0-90

⊕ mea
□ well a

contour-levels 1,3,

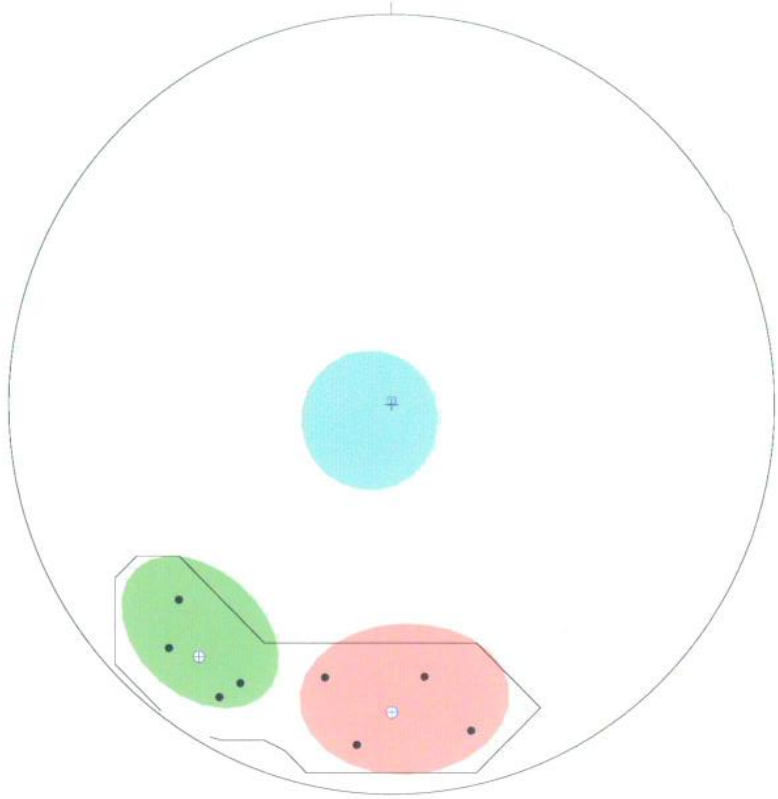
Zone 1. 11.636 - 30.571ft
Deviation 0.68 N 1.65

dipdata sets.....
OPTV dips

	mean dip	n	f
N005 6			
N358 69	N000 68	4	0.58
N038 71	N038 71	4	0.67

intersections

	N005 6	N358 69	N038 71
N005 6			
N358 69			68 N006
N038 71		68 N006	



⊕ mean dip
□ well axis

equal-area lower-hemisphere 0-90

contour-levels 1,

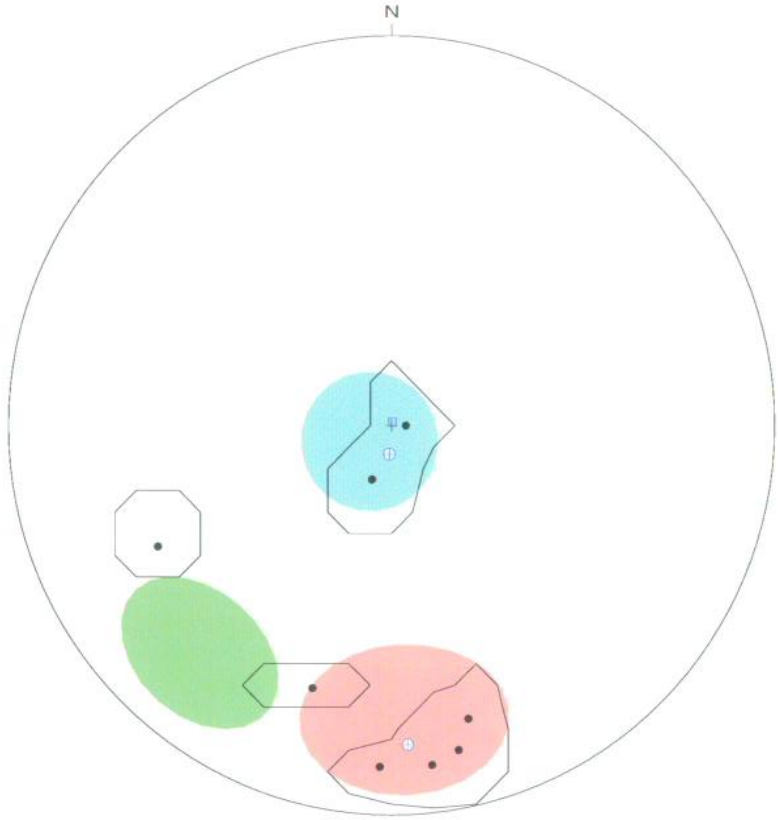
RIPZ-17
Zone 2. 30.571 - 102.478ft
Deviation 0.70 N 14.26

dipdata sets.....
OPTV dips

	mean dip	n	f
N005 6	N005 6	2	(0.03)
N358 69	N357 71	5	(0.22)
N038 71			

intersections

	N005 6	N358 69	N038 71
N005 6		01 N087	
N358 69	01 N087		
N038 71			



⊕ mea
□ well a

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

06 Dec 2004

Mactec

Borehole: RIPZ-17

merged

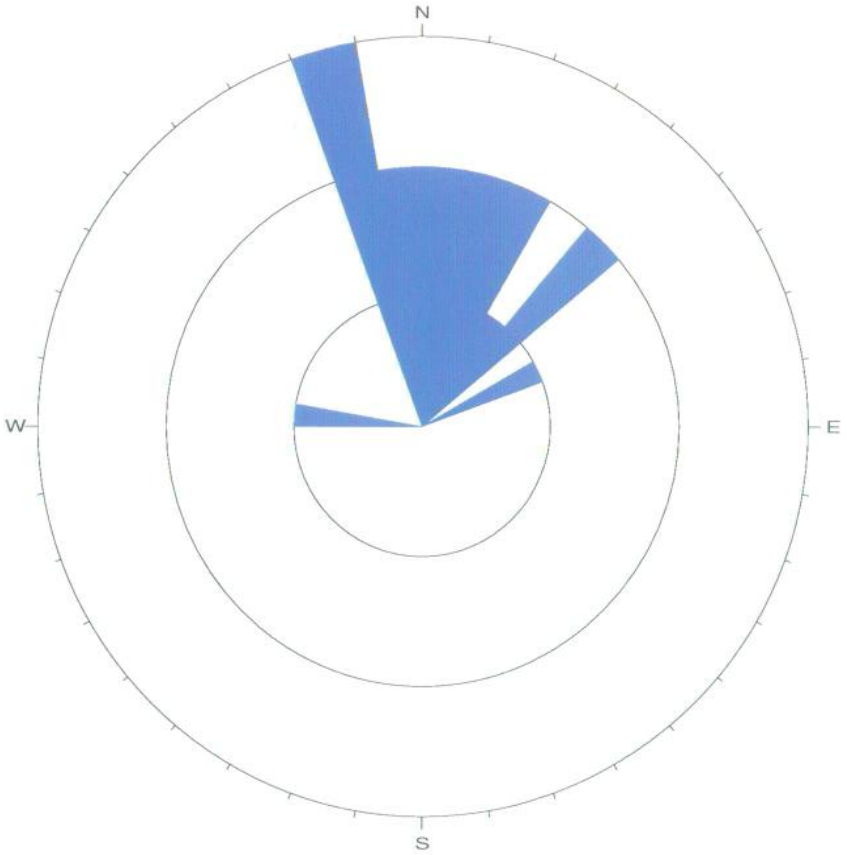
top of borehole.....
East:
North:
Alt:

North ref. is magnetic
Depth units are feet

Zone from 101.988 to 12.126ft

Dip data sets .....
OPTV dips

RIPZ-17
12.126 - 101.988ft
Dip-azimuth rose-diagram



Azimuth Incr = 10°
N = 16

0 1 2 3

RGLDIPv6.1 DIP DATA INTERPRETATION: FRACTURE ANALYSIS

borehole RIPZ-17
zone from 11.000 to 102.000 m
North ref is magnetic
06 Dec 2004

Data is classed into 1 types
5 OPTV_dips

Quality cut-off level: *

Mean well deviation: 0.7deg to N 11.7

3 small-circles defined

	SEARCH AREA azim	pl	cone	MEAN DIP strike	dip	n	f
1	234.5	84.2	14.6	275	6	2	0.02
2	177.5	24.3	18.8	268	69	9	0.29
3	220.7	23.0	15.8	308	71	4	0.14

Total number of data = 15
Number of data unaccounted for = 1

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	Str Dip	n	f	Str Dip	n	f
1	0.7	1.7	11.64	30.57	8	0	0	0.00	270	68	4	0.58	308	71	4	0.67	0	0	0.00	0	0	0.00	0	0	0.00
2	0.7	14.3	30.57	102.48	8	275	6	0.03	267	71	5	0.22	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

06 Dec 2004

Mactec

Borehole: RIPZ-17

merged

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

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

Zone from 131.179 to 33.871ft
Mean dip format: dip-azimuth and dip

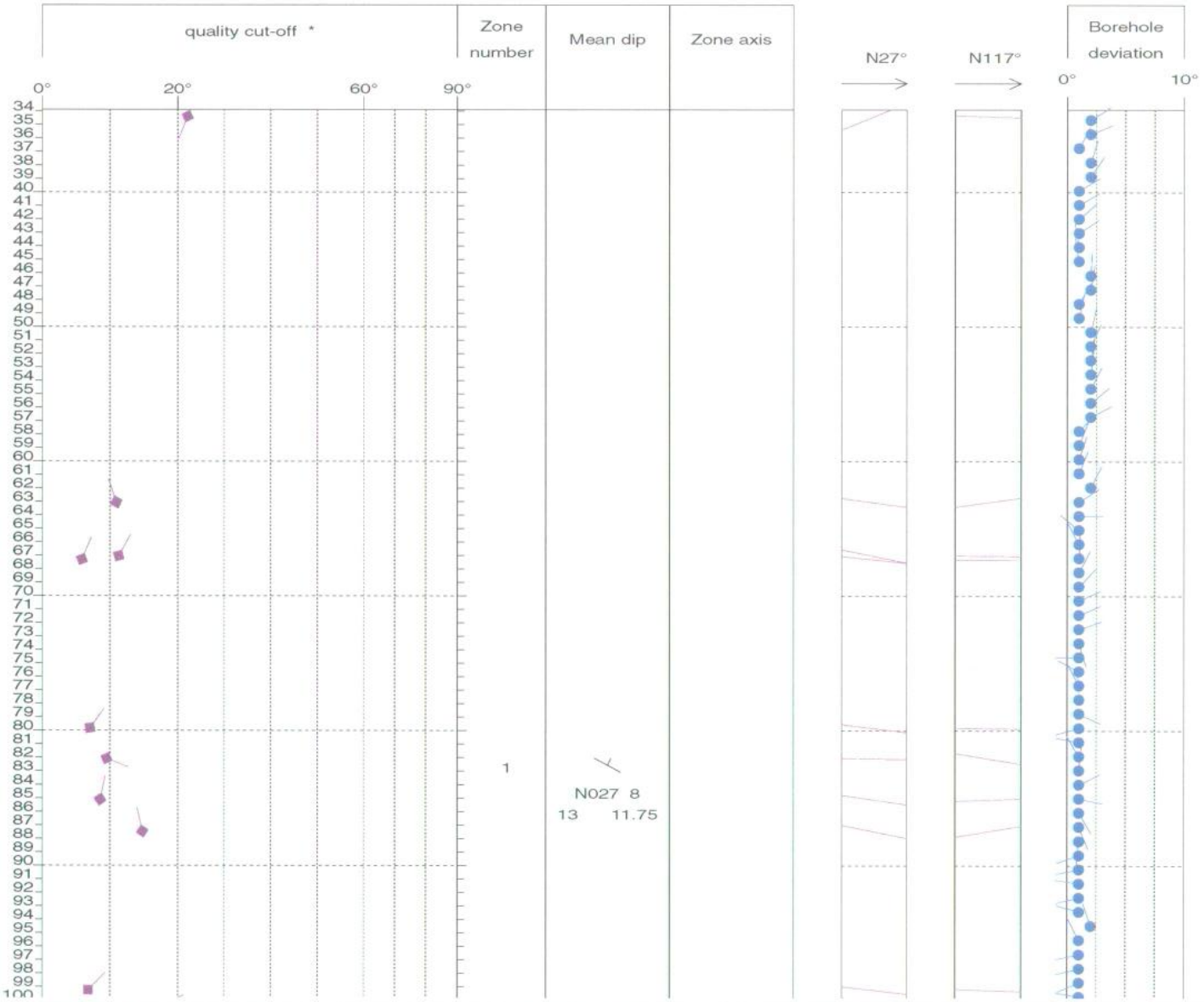
Interpretation 1

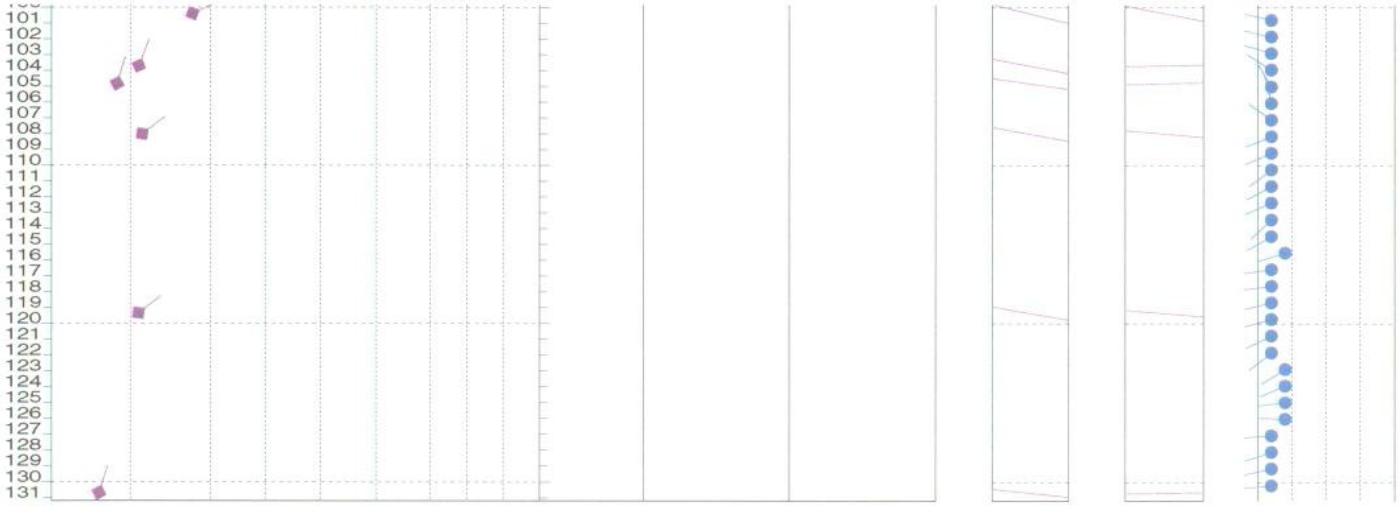
Dip data sets .....

OPTV dips

Highlighted dips: Fracture Aquifer Open of Weathered

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

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DIP DATA INTERPRETATION
RGLDIP vsn 6.1
STRUCTURAL INTERPRETATION STEREOGRAMS

06 Dec 2004

Mactec

Borehole: RIPZ-17

merged

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

North ref: magnetic
Depth units are feet

Zone from 131.179 to 33.871ft
Mean dip format: dip-azimuth and dip

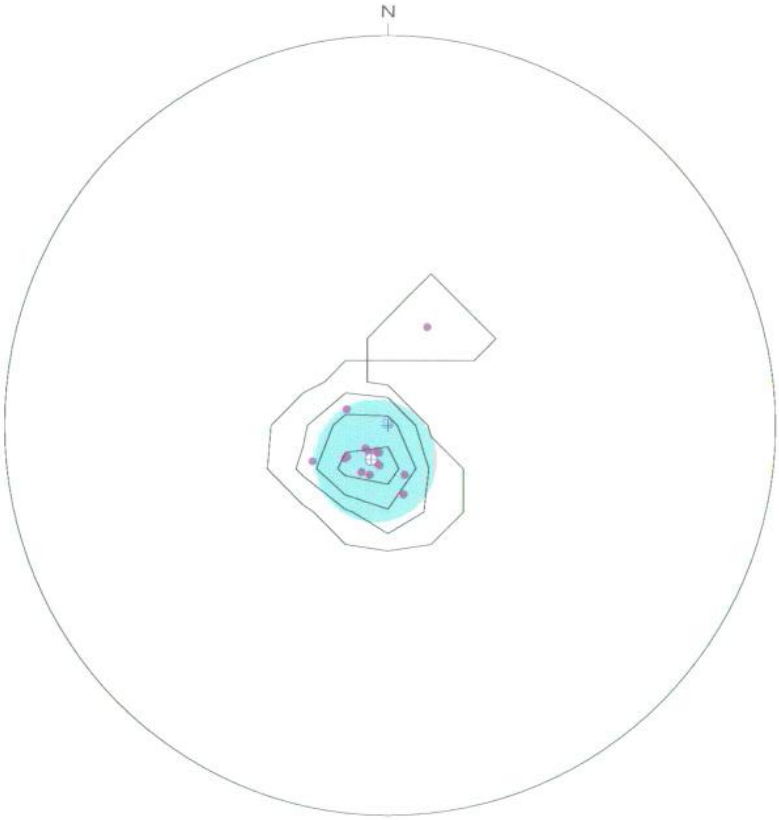
Interpretation 1

Dip data sets .....
OPTV dips

RIPZ-17
Zone 0. 33.871 - 131.179ft
Deviation 0.40 N333.90

dipdata sets.....
OPTV dips

	mean dip	n	dsp	zone axis	n	dev
N027 8	N027 8	13	11.7			



equal-area lower-hemisphere 0-90

contour-levels 1,3,6,10,

mean dip
zone axis
well axis

```
RGLDIPv6.1 DIP DATA INTERPRETATION: STRUCTURAL

borehole RIPZ-17
zone from    33.000 to   131.000 m
North ref is magnetic
06 Dec 2004

Data is classed into 1 types
5 OPTV_dips

Quality cut-off level: *

Mean well deviation:  0.4deg to N333.9

1 small-circles defined
         SEARCH AREA          MEAN DIP
      azim    pl   cone   strike dip      n
1     200.0  82.1  12.9     297    8      13

Total number of data           =   13
Number of data unaccounted for =    2

ZONE   DEVIATION     DEPTHS m     No.                                  MEAN DIPS and ZONE AXES
No.    Dev  Azim    TOP    BASE   DATA|Str Dip  n  Disp |Str Dip  n  Disp |Str Dip  n  Disp |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
|Azm Pl   n  Dev  |Azm Pl   n  Dev  |Azm Pl   n  Dev  |
_____________________________________|_________________|_________________|_________________|_________________
|_________________|_________________|_________________|
  1    0.4 333.9   33.87  131.18   15 |297  8  13  11.75|  0  0   0   0.00|  0  0   0   0.00|  0  0   0
0.00|  0  0   0   0.00|  0  0   0   0.00|  0  0   0   0.00|
                                     |  0  0   0  0.000|  0  0   0  0.000|  0  0   0  0.000|  0  0   0
0.000|  0  0   0  0.000|  0  0   0  0.000|  0  0   0  0.000|
_____________________________________|_________________|_________________|_________________|_________________
|_________________|_________________|_________________|
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