welenco

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

DUAL INDUCTION - GAMMA RAY LOG

FILING NO.

COMPANY Mactec

WELL RG-11B2

FIELD Casmalia

STATE California COUNTY Santa Barbara

LOCATION:
Casmalia Landfill

OTHER SERVICES:
OPTV
Video

JOB NO.
39952

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	Oct. 25, 2004			
Type Of Log	Dual Ind			
Run No.	One	Two	Three	Four
Depth-Driller	80 Ft	Ft	Ft	Ft
Depth-Logger	80 Ft	Ft	Ft	Ft
Top Logged Interval	5 Ft	Ft	Ft	Ft
Btm. Logged Interval	77 Ft	Ft	Ft	Ft
Type Fluid In Hole	Water			
Fluid Level	79.7 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 NO.	BOREHOLE RECORD BIT	FROM	TO	CASING RECORD SIZE	TYPE	FROM	TO
1	6.5 In	14 Ft	80 Ft	10 In	Steel	0 Ft	14 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:

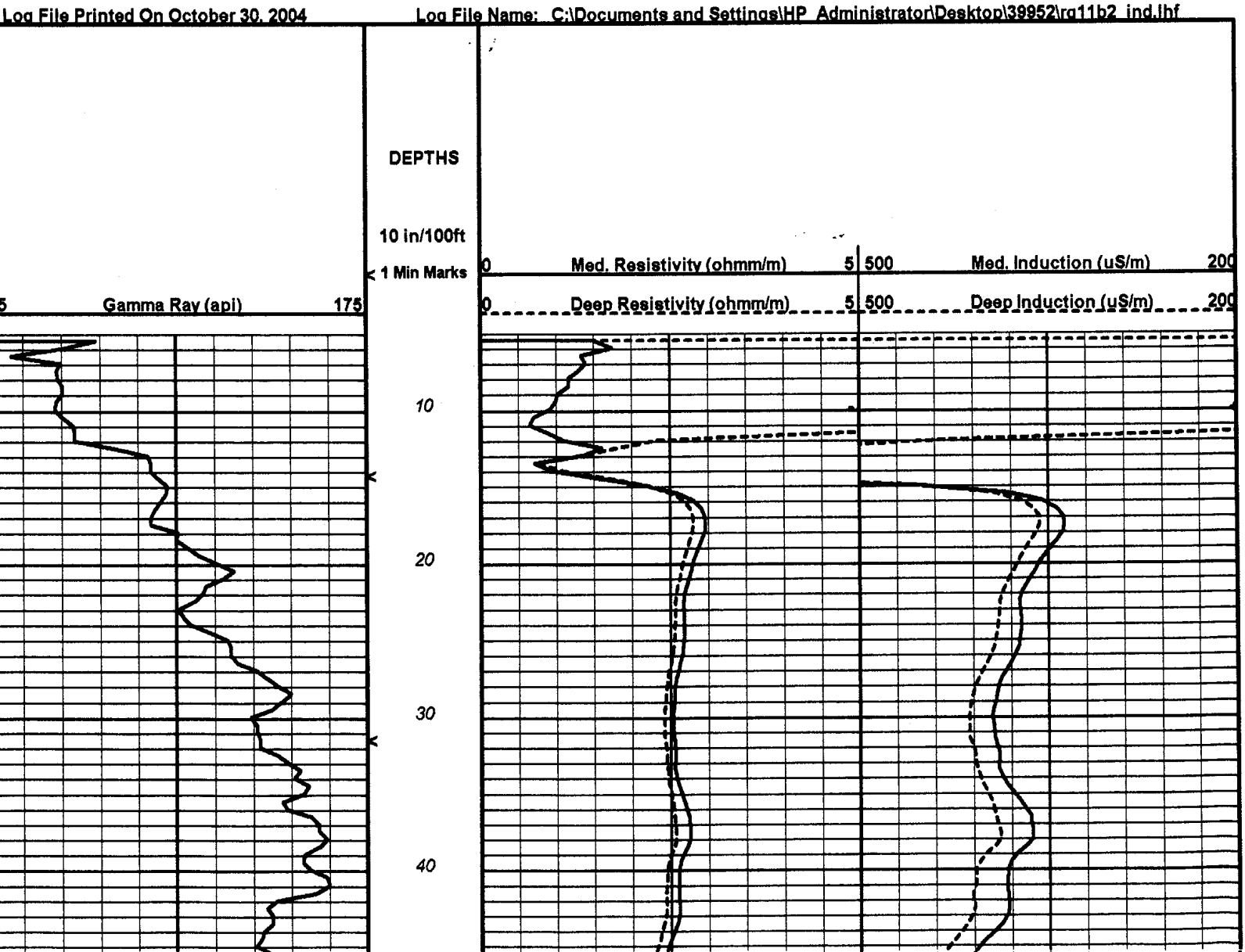
NOTICE

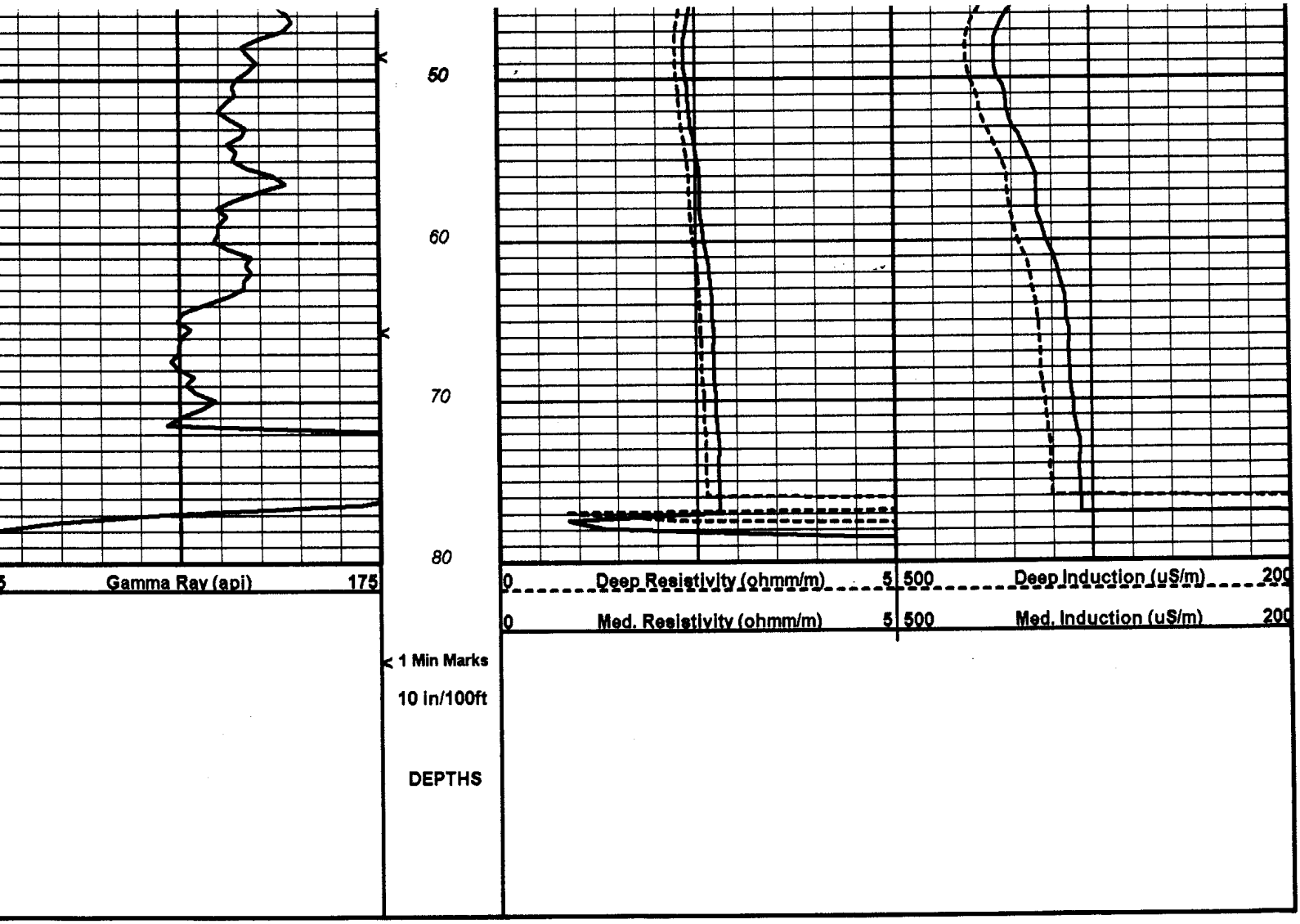
All Interpretations are opinions based on inferences from electrical and other measurements and we do not guarantee the accuracy or correctness of any verbal or written interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, 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. October 30, 2004

Log File Printed On October 30, 2004

Log File Name: C:\Documents and Settings\HP_Administrator\Desktop\39952\rg11b2_ind.lhf




50
60
70
80
5
Gamma Ray (api)
175
0
Deep Resistivity (ohmm/m)
5
500
Deep Induction (uS/m)
200
0
Med. Resistivity (ohmm/m)
5
500
Med. Induction (uS/m)
200
1 Min Marks
10 in/100ft
DEPTHS

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OPTV DATA PROCESSING
RGLDIP vsn 6.1
BOREHOLE IMAGE LOG

26 Oct 2004

Mactec

Borehole: RG-11B2

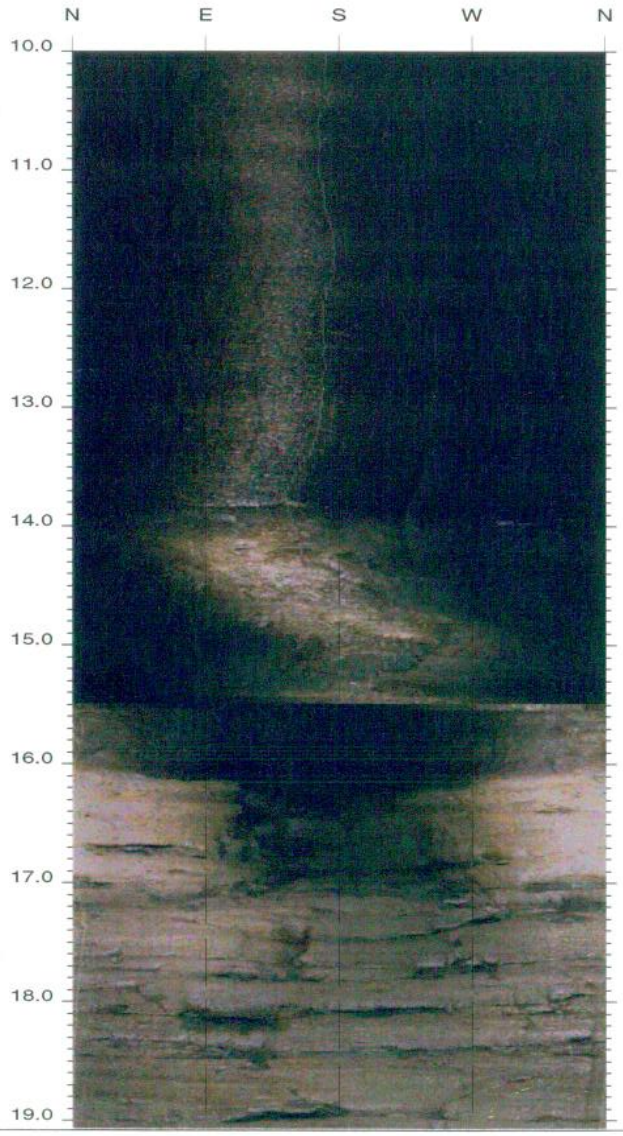
Casmalia Landfill

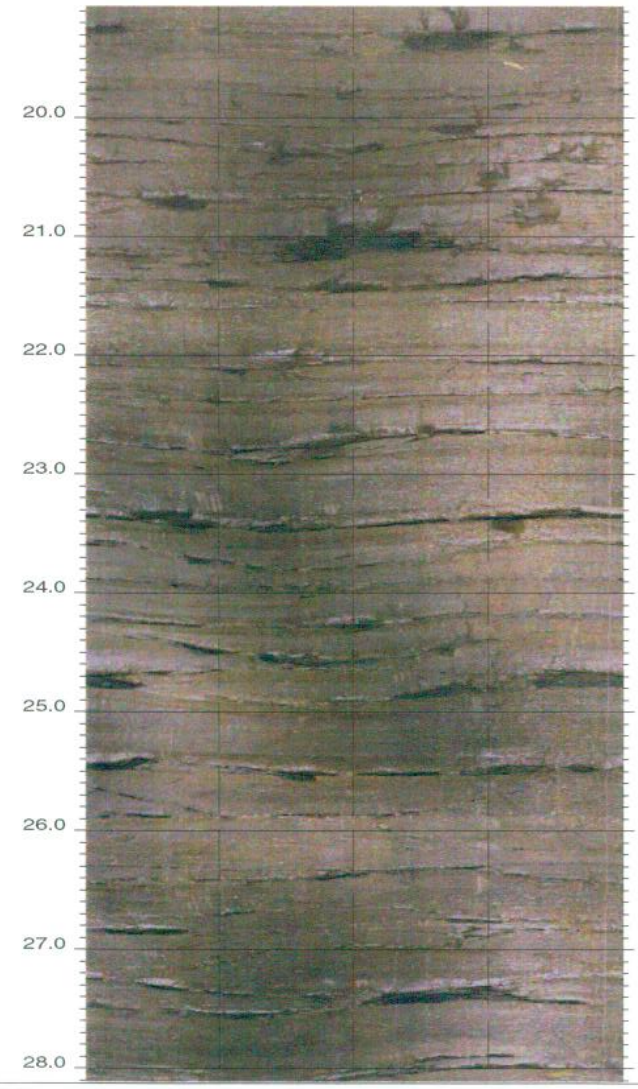
top of borehole.....
East:
North:
Elev:

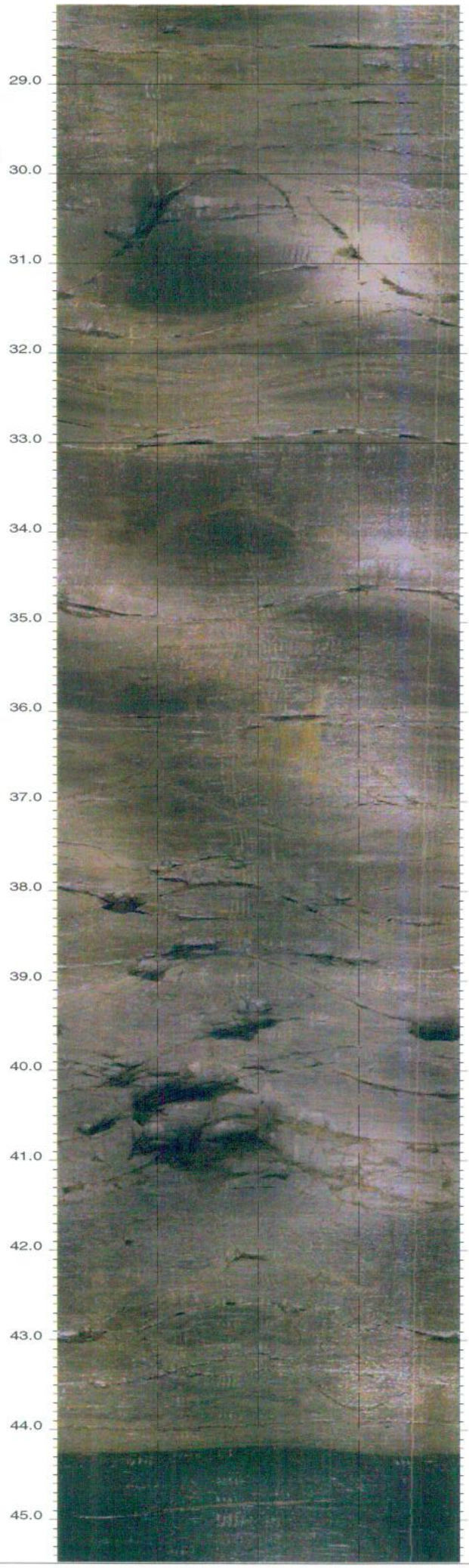
North ref. is magnetic
Depth units are feet
Vertical scale: 1/20

Zone from 10.0000 to 80.0000ft
Format: BHTV NESWN

Borehole diam: 6.480inch
data intervals.....
Azimuth: 0.5000deg
Depth: 0.0080ft



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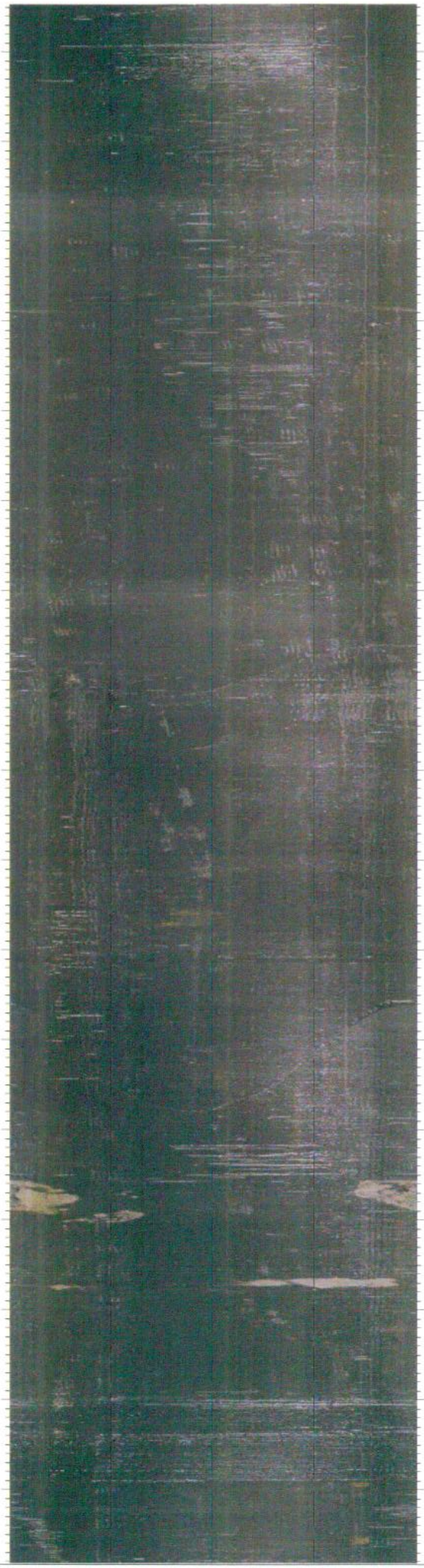
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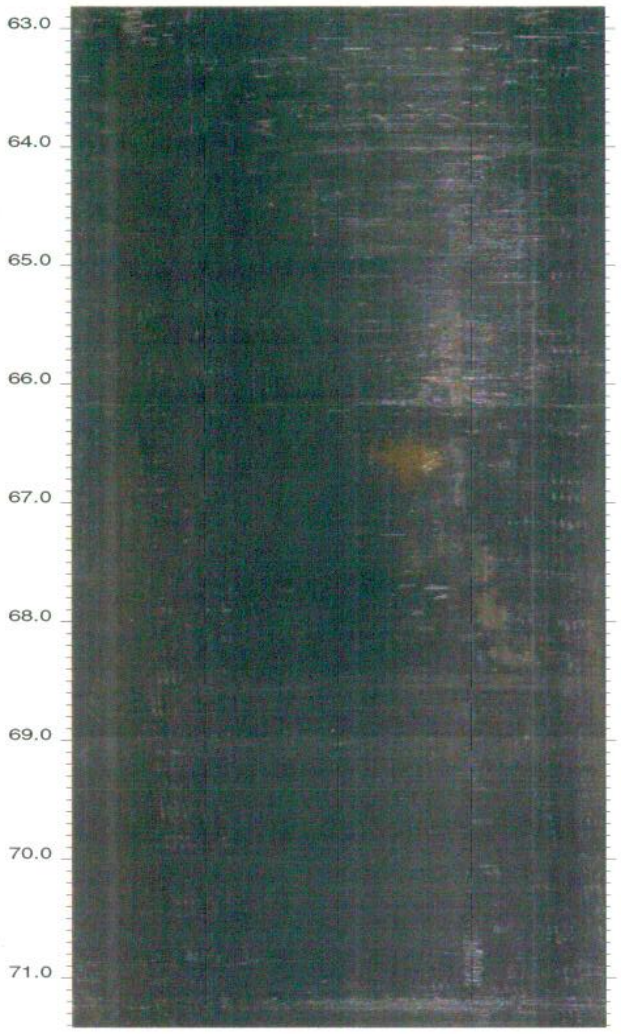
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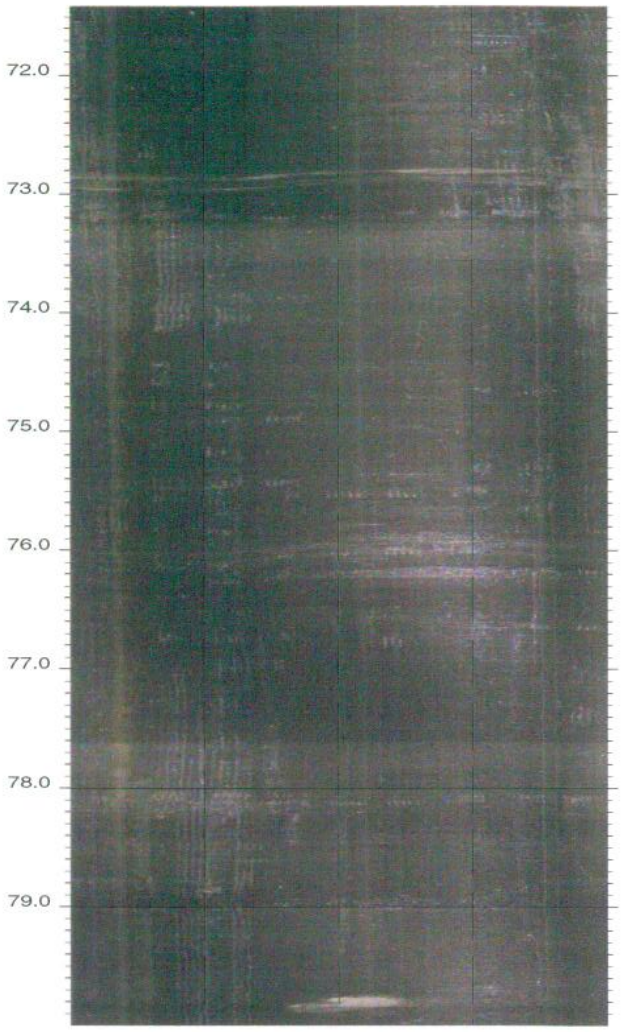
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74.0
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79.0

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OPTV DATA PROCESSING
RGLDIP vsn 6.1
INTERPRETED OPTV DIPS LOG

30 Oct 2004

Mactec

Borehole: RG-11B2

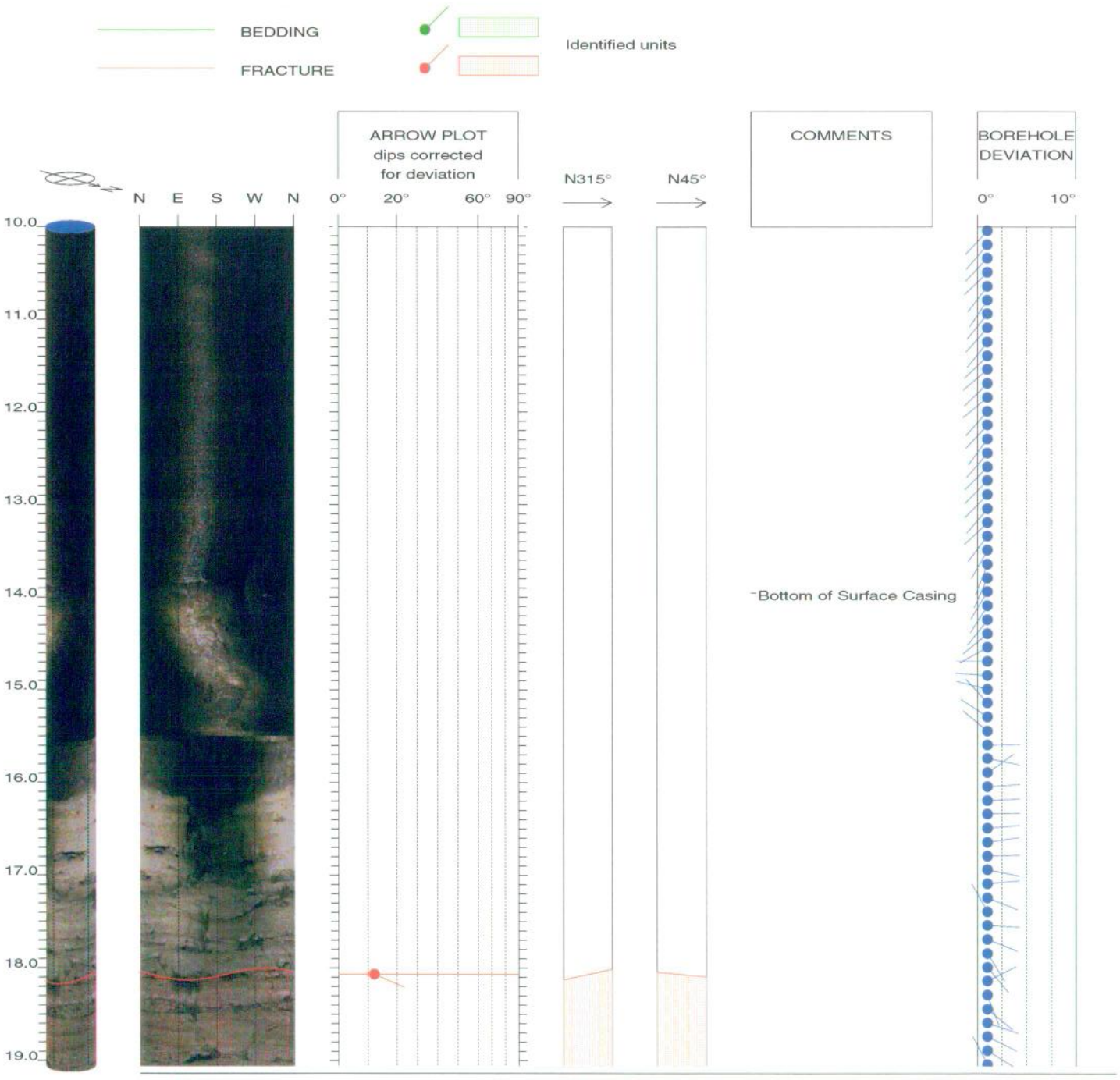
Casmalia Landfill

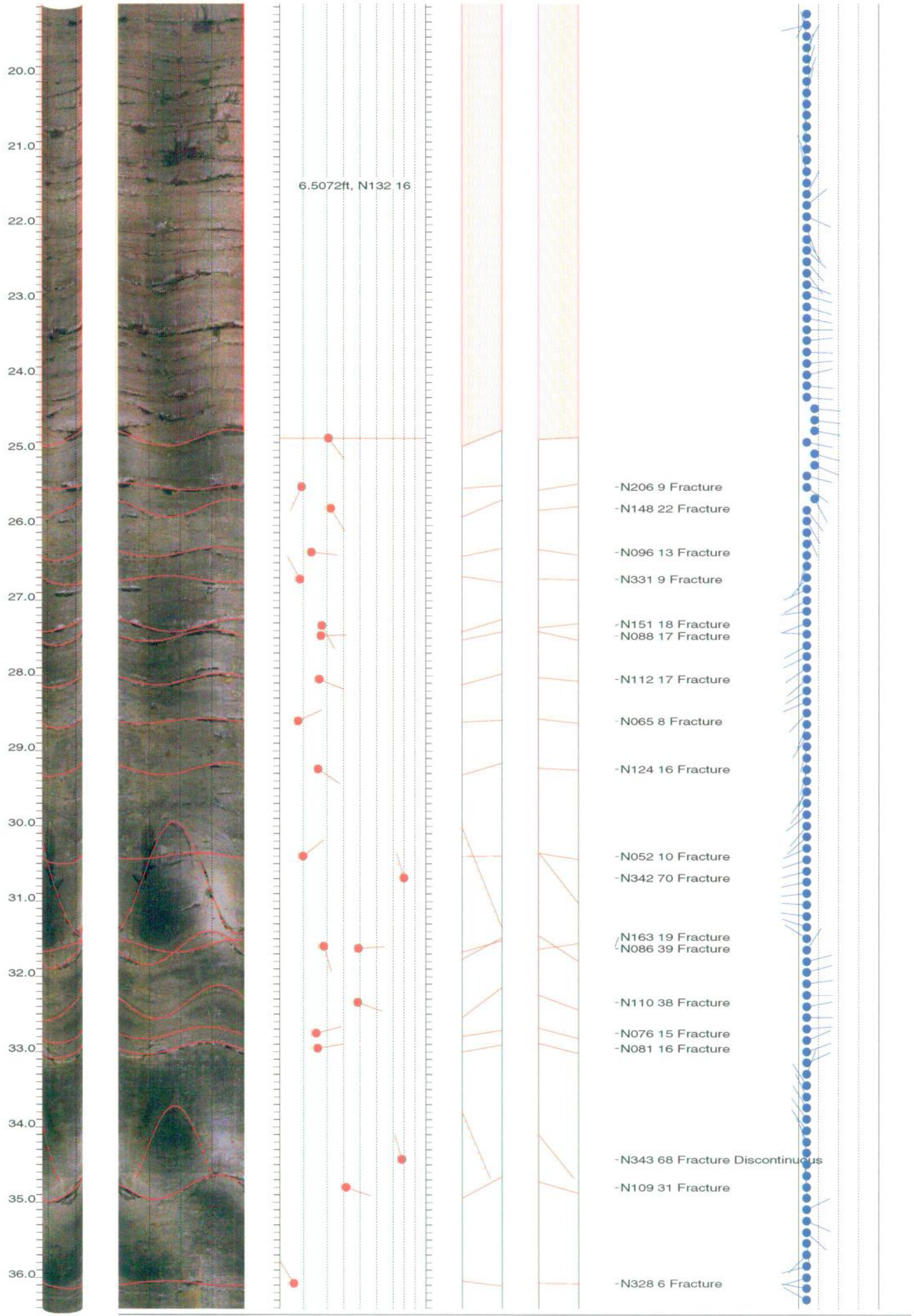
top of borehole.....
East:
North:
Elev:

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

Zone from 80.000 to 10.000ft
Format: BHTV-NESWN

Borehole diam: 6.480inch
Vertical = borehole-axis

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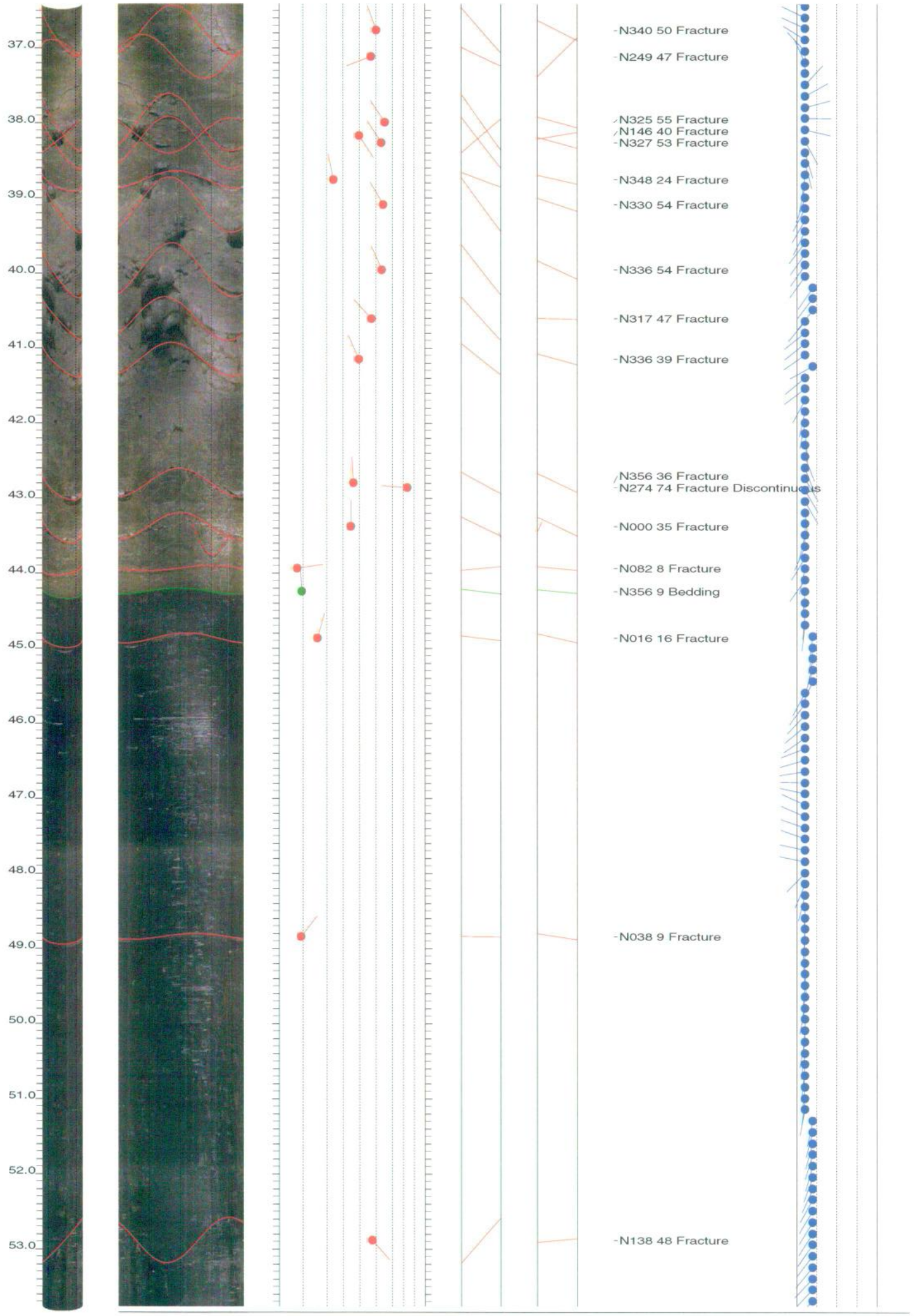
31.0
32.0
33.0
34.0
35.0
36.0
6.5072ft, N132 16
-N206 9 Fracture
-N148 22 Fracture
-N096 13 Fracture
-N331 9 Fracture
-N151 18 Fracture
-N088 17 Fracture
-N112 17 Fracture
-N065 8 Fracture
-N124 16 Fracture
-N052 10 Fracture
-N342 70 Fracture
-N163 19 Fracture
-N086 39 Fracture
-N110 38 Fracture
-N076 15 Fracture
-N081 16 Fracture
-N343 68 Fracture Discontinuous
-N109 31 Fracture
-N328 6 Fracture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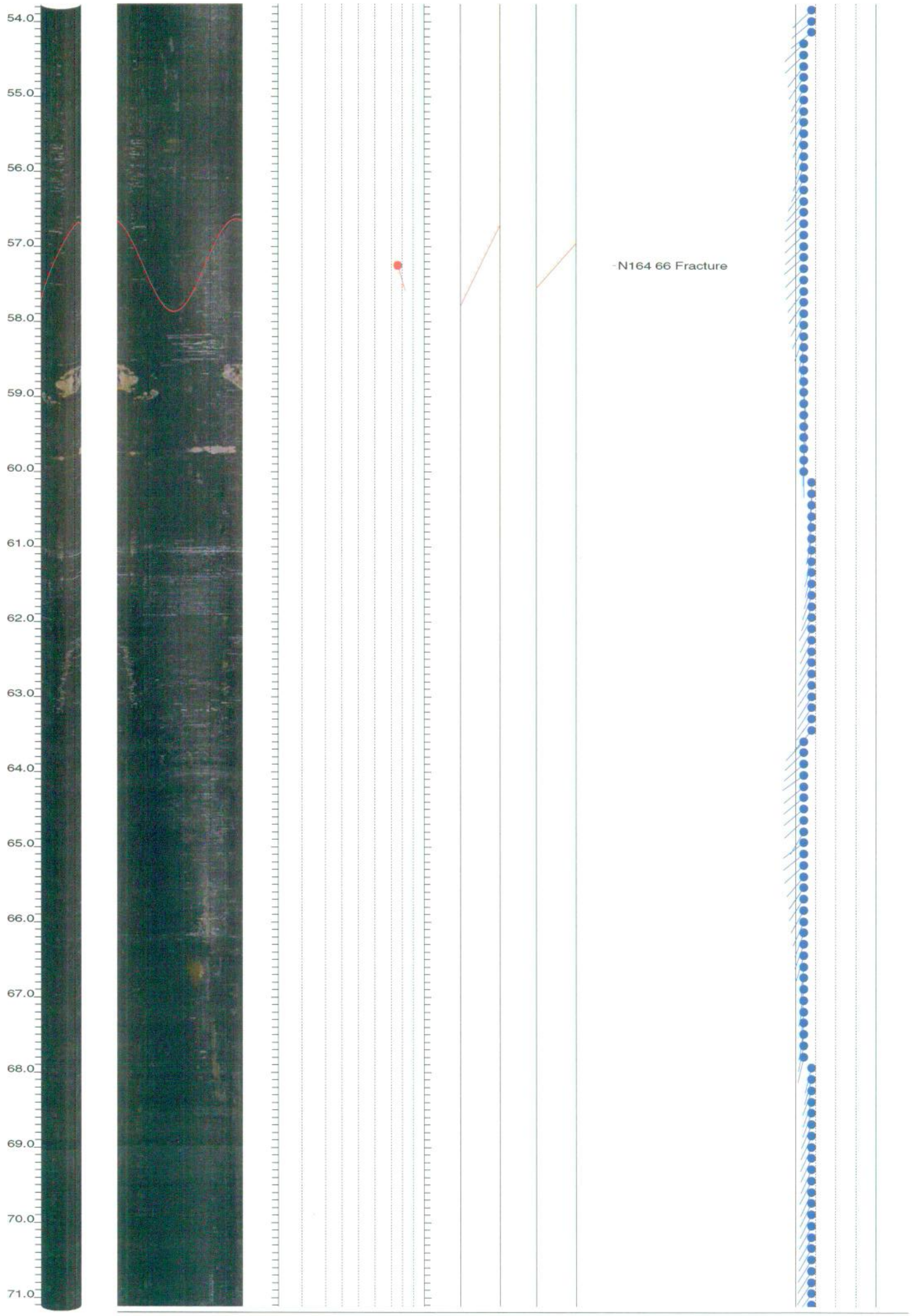
48.0
49.0
50.0
51.0
52.0
53.0
N340 50 Fracture
N249 47 Fracture
N325 55 Fracture
N146 40 Fracture
N327 53 Fracture
N348 24 Fracture
N330 54 Fracture
N336 54 Fracture
N317 47 Fracture
N336 39 Fracture
N356 36 Fracture
N274 74 Fracture Discontinuous
N000 35 Fracture
N082 8 Fracture
N356 9 Bedding
N016 16 Fracture
N038 9 Fracture
N138 48 Fracture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66.0
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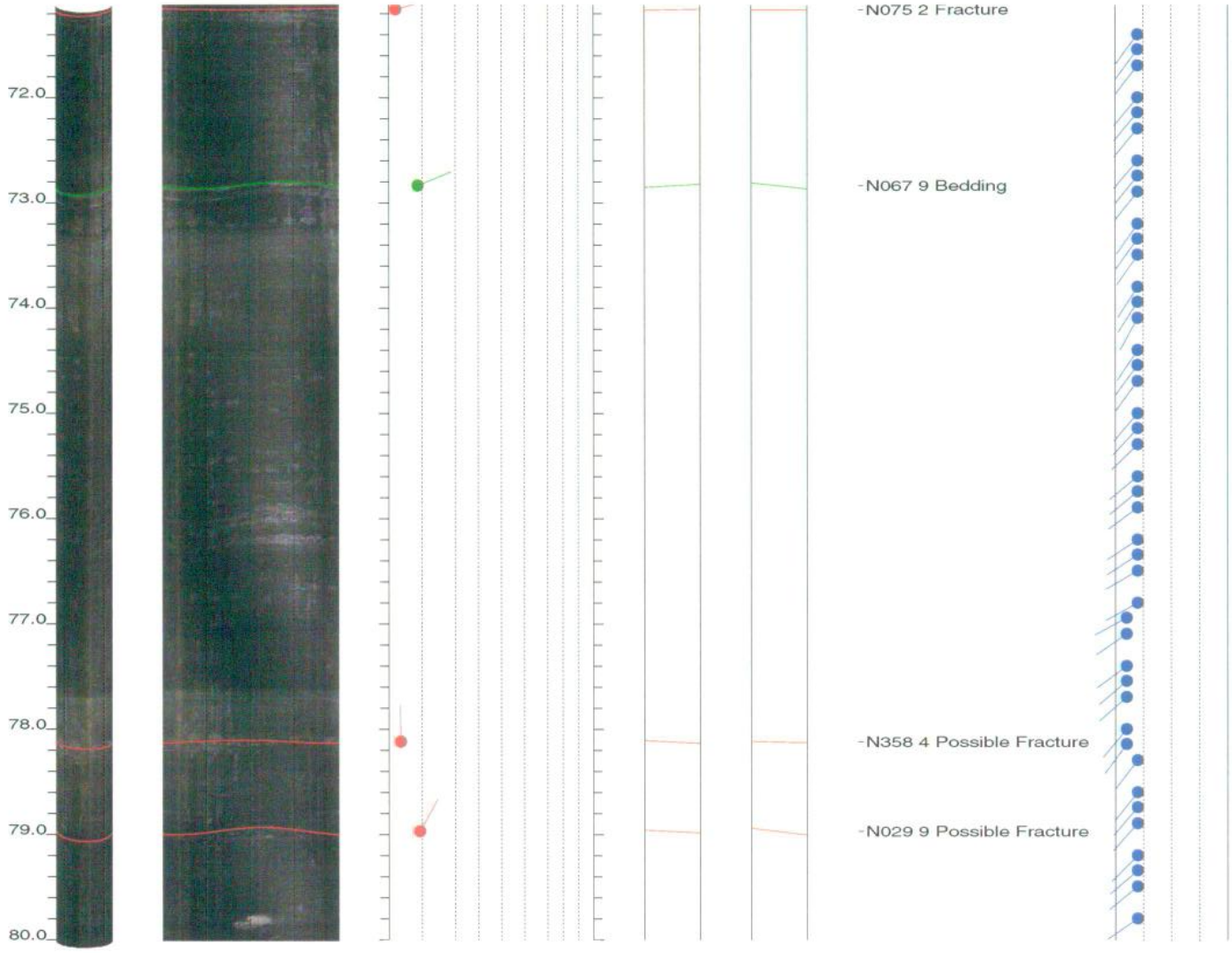
68.0
69.0
70.0
71.0
N164 66 Fracture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74.0
75.0
76.0
77.0
78.0
79.0
80.0
-N075 2 Fracture
-N067 9 Bedding
-N358 4 Possible Fracture
-N029 9 Possible Fracture

RGLDIPv6.1 OPTV results

K = 0: BEDDING
K = 2: FRACTURE

borehole RG-11B2
zone from -1.488 to 80.352 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	78.967	29	9.4	0.951	4	B	2	78.932	79.003	0.540	223.57	2.00	0.0000	Possible Fracture
2	78.117	358	3.7	1.000	3	A	2	78.102	78.131	0.540	217.41	1.00	0.0000	Possible Fracture
3	72.833	67	8.7	0.983	5	A	0	72.799	72.866	0.540	219.00	2.00	0.0000	Bedding
4	71.157	75	2.1	0.975	4	A	2	71.150	71.164	0.540	214.55	2.00	0.0000	Fracture
5	57.250	164	65.9	0.914	5	C	2	56.634	57.866	0.540	225.99	1.00	0.0000	Fracture
6	52.881	138	47.7	0.956	5	B	2	52.579	53.183	0.540	214.24	2.00	0.0000	Fracture
7	48.841	38	9.2	0.957	5	B	2	48.801	48.881	0.540	185.07	1.00	0.0000	Fracture
8	44.867	16	16.1	1.000	3	A	2	44.799	44.935	0.540	189.18	2.00	0.0000	Fracture
9	44.245	356	9.5	0.936	4	C	0	44.204	44.285	0.540	185.88	1.00	0.0000	Bedding
10	43.936	82	7.6	0.970	4	B	2	43.902	43.971	0.540	193.04	1.00	0.0000	Fracture
11	43.377	0	34.7	0.999	4	A	2	43.197	43.557	0.540	184.53	1.00	0.0000	Fracture
12	42.859	274	73.8	1.000	3	A	2	43.279	43.753	0.540	150.00	1.00	0.0000	Fracture Discontinuous
13	42.795	356	36.2	0.880	4	D	2	42.604	42.986	0.540	150.00	1.00	0.0000	Fracture
14	41.150	336	39.5	0.951	5	B	2	40.929	41.371	0.540	238.45	1.41	0.0000	Fracture
15	40.608	317	47.3	0.954	5	B	2	40.317	40.899	0.540	219.58	1.21	0.0000	Fracture
16	39.959	336	53.5	0.964	6	B	2	39.600	40.318	0.540	215.47	1.00	0.0000	Fracture
17	39.088	330	54.4	0.967	5	B	2	38.718	39.457	0.540	205.31	1.00	0.0000	Fracture
18	38.755	348	24.1	0.988	4	A	2	38.640	38.871	0.540	190.22	1.00	0.0000	Fracture
19	38.264	327	53.2	0.983	5	A	2	37.916	38.613	0.540	152.91	1.00	0.0000	Fracture
20	38.169	146	39.7	0.982	4	A	2	37.937	38.400	0.540	128.49	1.00	0.0000	Fracture
21	37.990	325	55.4	0.967	5	B	2	37.609	38.372	0.540	95.30	1.00	0.0000	Fracture
22	37.113	249	47.0	0.960	4	B	2	36.821	37.405	0.540	325.66	1.00	0.0000	Fracture
23	36.760	340	50.1	1.000	3	A	2	36.429	37.092	0.540	296.13	1.00	0.0000	Fracture
24	36.072	328	5.9	1.000	3	A	2	36.041	36.103	0.540	268.58	1.00	0.0000	Fracture
25	34.796	109	31.4	0.990	5	A	2	34.634	34.958	0.540	354.15	1.00	0.0000	Fracture
26	34.426	343	68.1	0.958	4	B	2	33.720	34.685	0.540	352.34	1.00	0.0000	Fracture Discontinuous
27	32.947	81	16.0	0.957	5	B	2	32.865	33.030	0.540	69.12	1.00	0.0000	Fracture
28	32.749	76	15.4	0.999	4	A	2	32.670	32.829	0.540	77.73	1.00	0.0000	Fracture

29	32.341	110	38.5	1.000	3	A	2	32.119	32.562	0.540	82.71	1.00	0.0000	Fracture
30	31.622	86	39.0	0.997	4	A	2	31.399	31.844	0.540	22.00	1.00	0.0000	Fracture
31	31.593	163	18.6	1.000	3	A	2	31.507	31.679	0.540	4.86	1.00	0.0000	Fracture
32	30.685	342	70.0	0.988	5	A	2	29.939	31.431	0.540	257.93	1.00	0.0000	Fracture
33	30.396	52	9.9	0.971	4	B	2	30.353	30.439	0.540	250.56	1.00	0.0000	Fracture
34	29.237	124	16.2	0.946	4	C	2	29.157	29.317	0.540	194.81	1.00	0.0000	Fracture
35	28.600	65	7.8	0.989	4	A	2	28.566	28.633	0.540	207.59	1.00	0.0000	Fracture
36	28.043	112	16.7	0.980	4	A	2	27.964	28.122	0.540	230.19	1.00	0.0000	Fracture
37	27.466	88	17.4	0.995	4	A	2	27.387	27.546	0.540	267.44	1.00	0.0000	Fracture
38	27.331	151	17.8	0.973	4	A	2	27.245	27.417	0.540	255.07	1.00	0.0000	Fracture
39	26.715	331	8.6	0.960	4	B	2	26.675	26.755	0.540	224.44	1.00	0.0000	Fracture
40	26.356	96	13.5	0.995	4	A	2	26.292	26.421	0.540	189.48	1.00	0.0000	Fracture
41	25.772	148	22.3	1.000	3	A	2	25.656	25.889	0.540	143.29	1.13	0.0000	Fracture
42	25.486	206	9.3	0.961	4	B	2	25.441	25.531	0.540	124.78	1.00	0.0000	Fracture
43	24.837	143	20.8	0.991	4	A	2	24.729	24.945	0.540	100.66	1.34	6.5072	
Fracture-zone														
44	18.067	113	12.2	0.933	4	C	2	18.003	18.130	0.540	100.11	1.00	0.0000	
Fracture-zone														

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DIP DATA INTERPRETATION
RGLDIP vsn 6.1
FRACTURE ANALYSIS LOG

30 Oct 2004

Mactec

Borehole: RG-11B2

Casmalia Landfill

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

North ref: magnetic
Depth units are feet
Vertical scale: 1/200

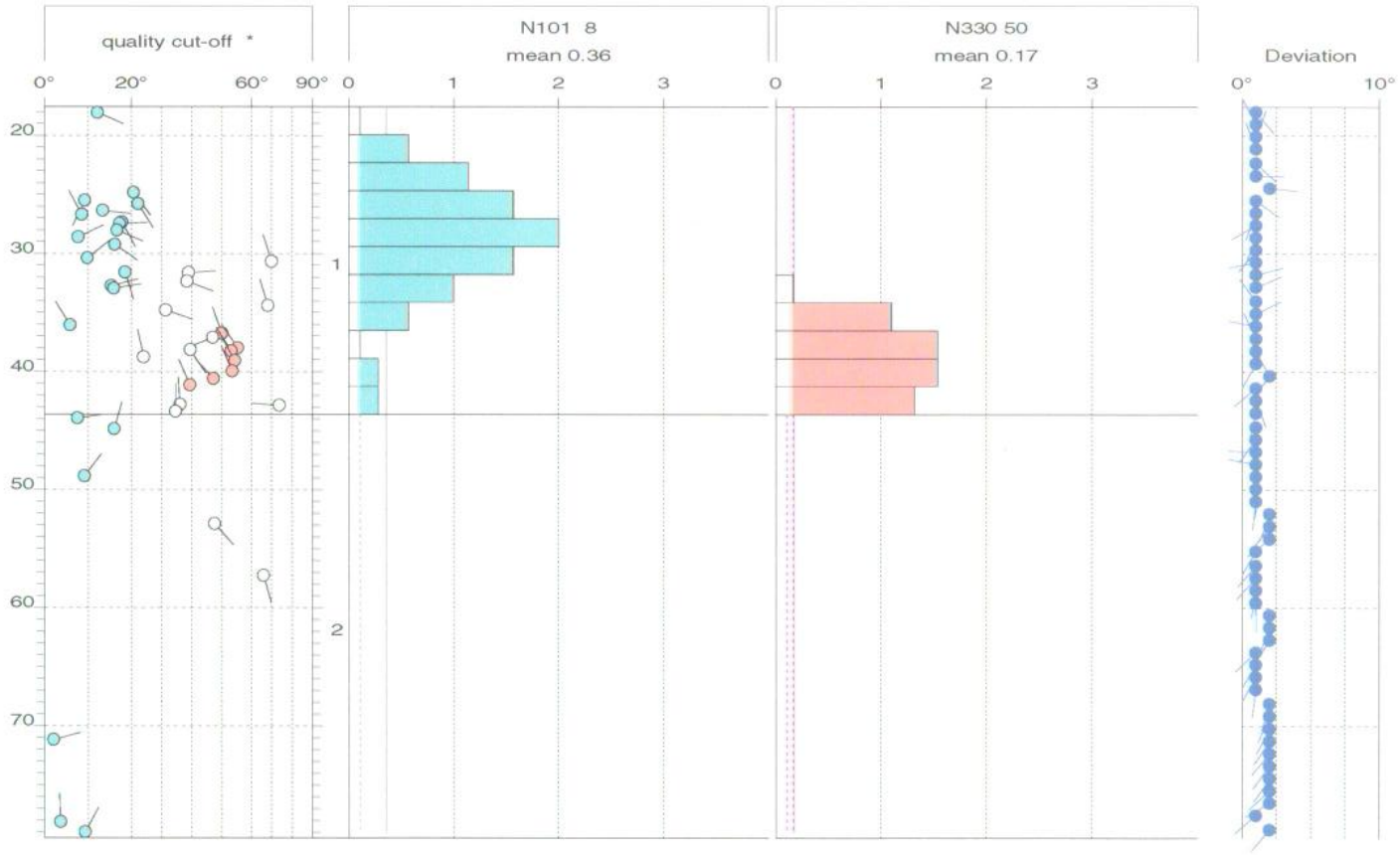
Zone from 79.467 to 17.567ft
Mean dip format: dip-azimuth and dip
Frequency histogram parameters:

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

30 Oct 2004

Mactec

Borehole: RG-11B2

Casmalia Landfill

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

North ref: magnetic
Depth units are feet

Zone from 79.467 to 17.567ft
Mean dip format: dip-azimuth and dip

Interpretation 1

Dip data sets .....
OPTV dips

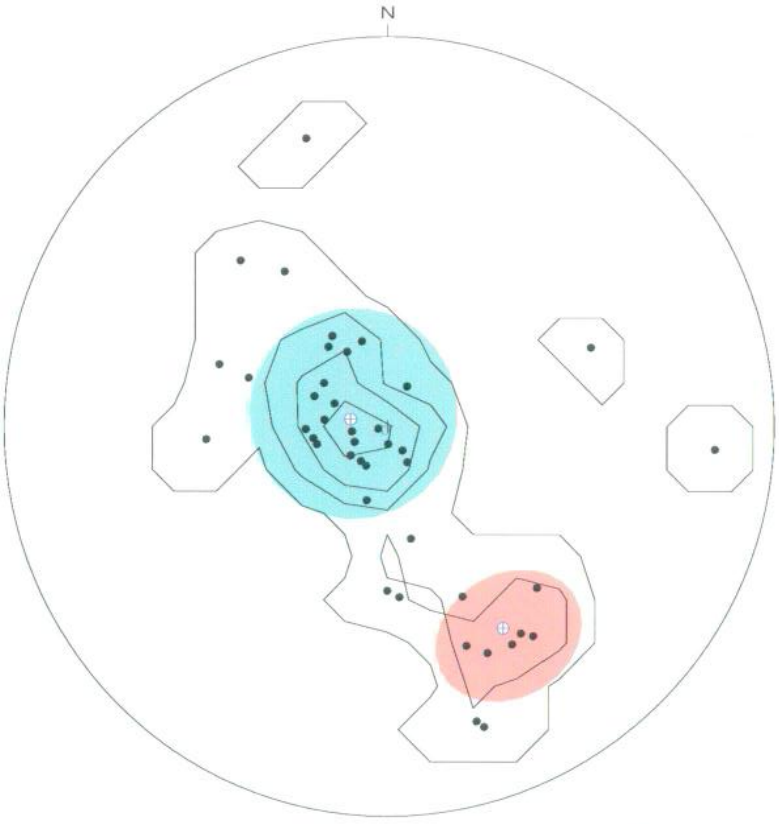
RG-11B2
Zone 0. 17.567 - 79.467ft
Deviation 0.90 N208.00

dipdata sets.....
OPTV dips

	mean dip	n	f
N101 8	N101 8	22	0.36
N330 50	N330 50	7	0.17

intersections

	N101 8	N330 50
N101 8		06 N055
N330 50	06 N055	



⊕ mean dip
□ well axis

equal-area lower-hemisphere 0-90

contour-levels 1,3,6,10,

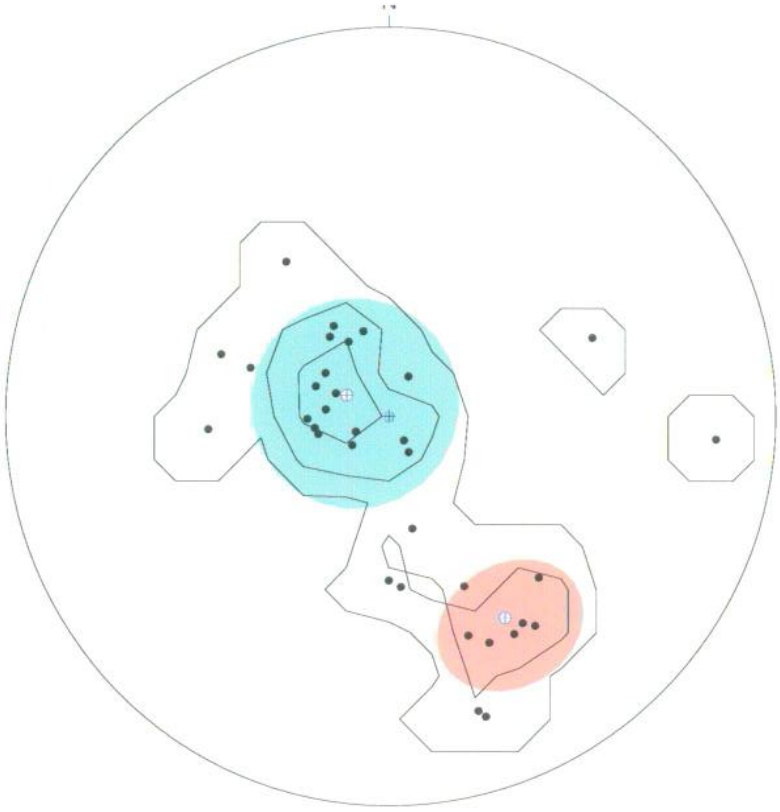
Zone 1. 17.577 - 43.612ft
Deviation 0.21 N174.76

dipdata sets.....
OPTV dips

	mean dip	n	f
N101 8	N116 10	16	0.62
N330 50	N330 50	7	0.42

intersections

	N101 8	N330 50
N101 8		05 N056
N330 50	05 N056	



⊕ mean dip
□ well axis

equal-area lower-hemisphere 0-90

contour-levels 1,3,6,

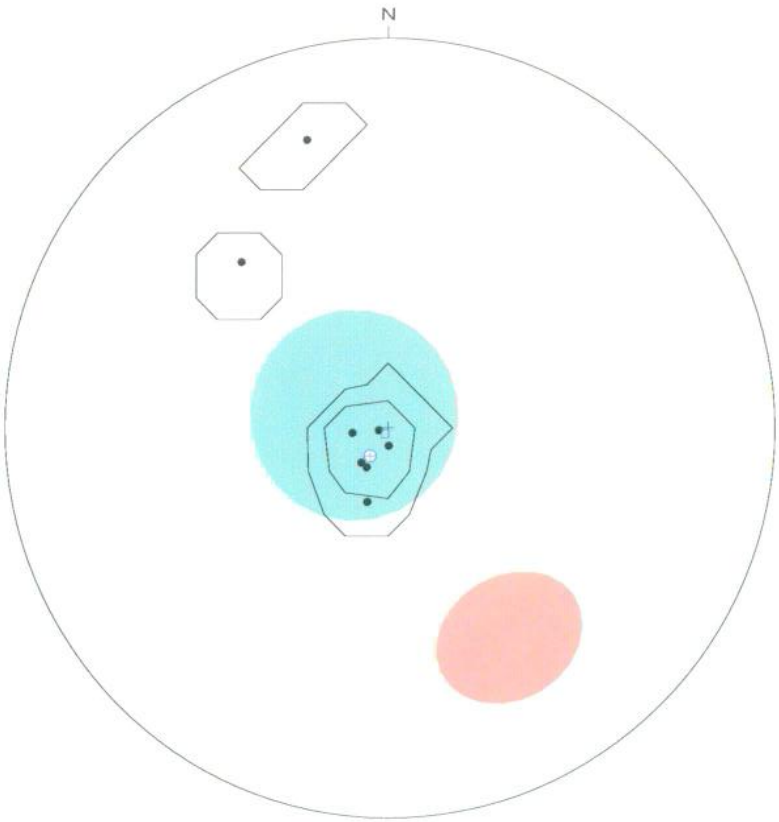
RG-11B2
Zone 2. 43.612 - 79.467ft
Deviation 1.40 N211.47

dipdata sets.....
OPTV dips

	mean dip	n	dsp
N101 8	N034 7	6	9.44
N330 50			

intersections

	N101 8	N330 50
N101 8		
N330 50		



⊕ mean dip
□ well axis

equal-area lower-hemisphere 0-90

contour-levels 1,3,

RGLDIPv6.1 DIP DATA INTERPRETATION: FRACTURE ANALYSIS

borehole RG-11B2
zone from 17.000 to 79.000 m
North ref is magnetic
30 Oct 2004

Data is classed into 1 types
5 OPTV_dips

Quality cut-off level: *

Mean well deviation: 0.9deg to N208.0

2 small-circles defined

	SEARCH AREA			MEAN DIP			
	azim	pl	cone	strike	dip	n	f
1	290.0	82.1	22.1	11	8	22	0.36
2	149.7	37.3	14.4	240	50	7	0.17

Total number of data = 29
Number of data unaccounted for = 13

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	0.2	174.8	17.58	43.61	34	26	10	16	0.62	240	50	7	0.42	0	0	0	0.00
						0	0	0	0.00								
2	1.4	211.5	43.61	79.47	8	304	7	6	9.44	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
FRACTURE DIP-AZIMUTH ROSE-DIAGRAM

30 Oct 2004

Mactec

Borehole: RG-11B2

Casmalia Landfill

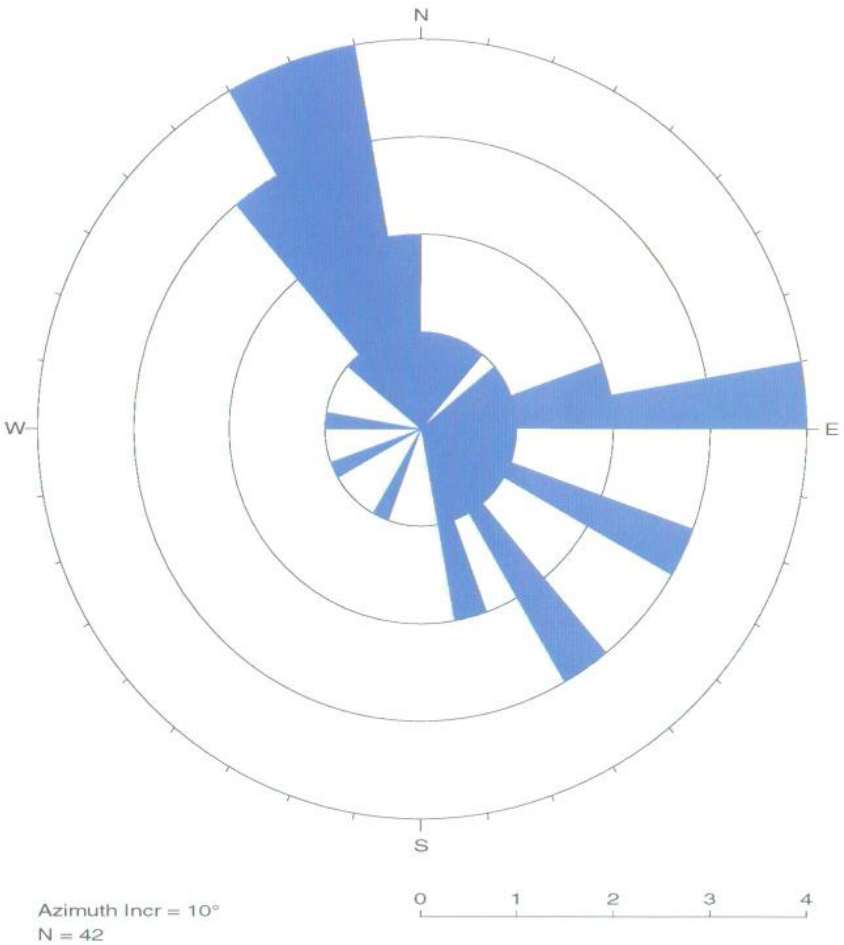
top of borehole.....
East:
North:
Alt:

North ref. is magnetic
Depth units are feet

Zone from 79.467 to 17.567ft

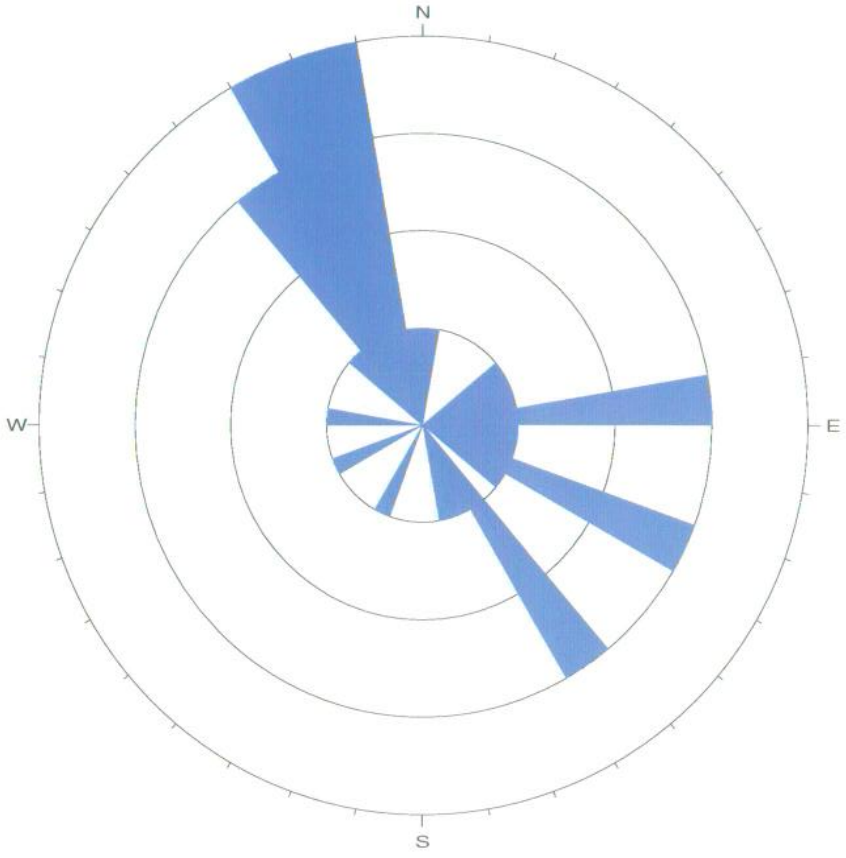
Dip data sets .....
OPTV dips

RG-11B2
17.567 - 79.467ft
Dip-azimuth rose-diagram



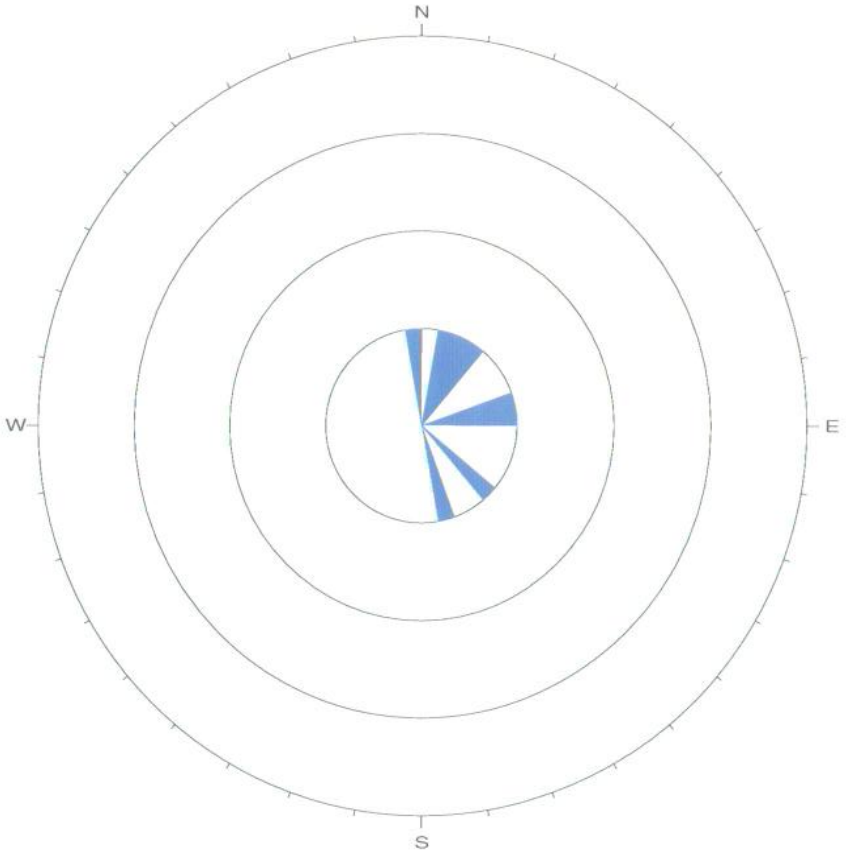
Azimuth Incr = 10°
N = 42

RG-11B2
Zone 1: 43.612 - 79.467ft
Dip-azimuth rose-diagram



Azimuth Incr = 10°
N = 34

RG-11B2
Zone 2: 43.612 - 79.467ft
Dip-azimuth rose-diagram



Azimuth Incr = 10°
N = 8

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DIP DATA INTERPRETATION
RGLDIP vsn 6.1
STRUCTURAL INTERPRETATION LOG

30 Oct 2004

Mactec

Borehole: RG-11B2

Casmalia Landfill

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

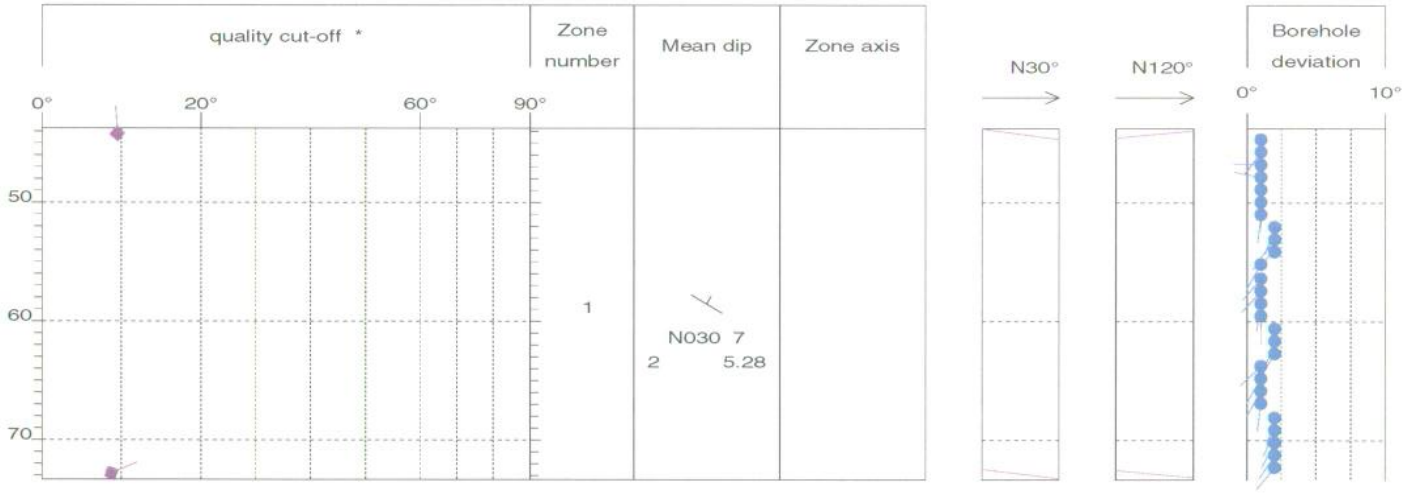
North ref: magnetic
Depth units are feet
Vertical scale: 1/200

Zone from 73.333 to 43.754ft
Mean dip format: dip-azimuth and dip

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
STRUCTURAL INTERPRETATION STEREOGRAMS

30 Oct 2004

Mactec

Borehole: RG-11B2

Casmalia Landfill

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

North ref: magnetic
Depth units are feet

Zone from 73.333 to 43.754ft
Mean dip format: dip-azimuth and dip

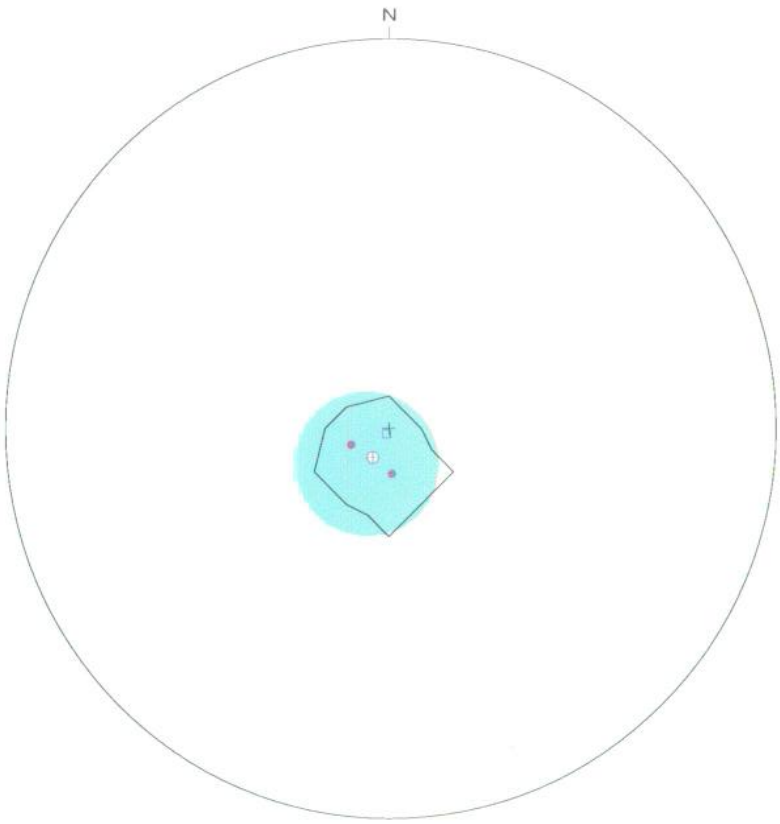
Interpretation 1

Dip data sets .....
OPTV dips

RG-11B2
Zone 0. 43.754 - 73.333ft
Deviation 1.30 N207.90

dipdata sets.....
OPTV dips

	mean dip	n	dsp	zone axis	n	dev
N030 7	N030 7	2	5.3			



equal-area lower-hemisphere 0-90

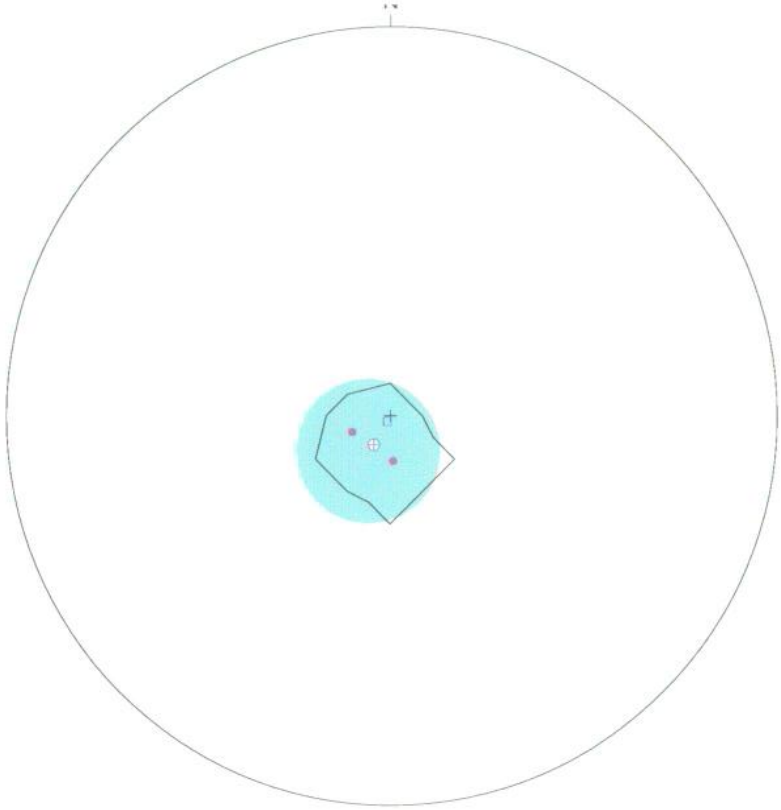
mean dip
zone axis
well axis

contour-levels 1,

Zone 1. 43.754 - 73.333ft
Deviation 1.35 N207.93

dipdata sets.....
OPTV dips

	mean dip	n	dsp	zone axis	n	dev
N030 7	N030 7	2	5.3			



⊕ mean dip
⊘ zone axis
□ well axis

equal-area lower-hemisphere 0-90

contour-levels 1,

RGLDIPv6.1 DIP DATA INTERPRETATION: STRUCTURAL

borehole RG-11B2
zone from 43.000 to 73.000 m
North ref is magnetic
30 Oct 2004

Data is classed into 1 types
5 OPTV_dips

Quality cut-off level: *

Mean well deviation: 1.3deg to N207.9

1 small-circles defined

	SEARCH AREA			MEAN DIP		
	azim	pl	cone	strike	dip	n
1	212.5	81.2	15.2	300	7	2

Total number of data = 2
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	1.3	207.9	43.75	73.33	2	300 7	2	5.28	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