WELL REPORT

Grizzly Drilling Company
Grizzly #1
NE SW Section 33, T12S-R15E
Jefferson County, Oregon

AREA: Wildcat (Hay Creek Anticline)

ELEVATION: 3450'GL (est), 3454'KB (Depth Datum)

SPUD: November, 1977

CEASE DRILLING: February, 1978

CASING: 8 5/8" 28# 8.017" I.D. @ 462'

CONTRACTOR: Grizzly Drilling Company

CORES: None

DSTS: #1 1810'-1905', #2 & 3 1230'-1325', #4 1083'-1330'
All tests inflate-straddle

GAS DETECTOR: Tooke Unmanned Unit, Surface to T.D.

SAMPLES: 10' Samples, Surface to T.D. with Grizzly Drilling Company

LOGS: Schlumberger, DIL, FDC/CNL/GR w/partial caliper

TOTAL DEPTH: ~~8549~~ 3549' Drl., 3542'Lgr.

FORMATION AT TD: Clarno Formation (Eocene)

GEOLOGICAL INTERPRETATION

System Epoch Formation	From	To	Datum Of Top	Fluid Content	How Determined
Tertiary Eocene Clarno Fm.	Surface	3550'(T.D.)	+3450'	Water w/tr hydcbn gas	Samples-logs DST

GEOLOGICAL SUMMARY

Grizzly Drilling Company's Grizzly #1 well was drilled as a rank wildcat well to test the southwestern part of the Hay Creek Anticline. This structural feature is a breached and faulted anticlinal fold trending southwest-northeast and plunging to the northeast. An inlier of slightly metamorphosed Mesozoic rocks is exposed along the eroded crest of the fold and these rocks are almost entirely surrounded by volcanic tuffs and flows of the Eocene Clamo Formation. The exposed Mesozoic rocks are described as "phyllite and sedimentary rocks" of Triassic age by D. A. Swanson (1969), and are considered by D. L. Peck (1964), to be similar lithologically to marine cretaceous rocks which outcrop some thirty miles to the east.

Several attempts have been made to test this structure in the past, but these have all been abandoned prematurely without drilling deep enough to fully evaluate the sedimentary sequence of the structure.

The Grizzly #1 well was spudded in the Eocene Clamo Formation at the southwestern end of the structure and on its southeastern flank. As drilling progressed, it became evident that the Clamo Formation was thicker than anticipated. At a depth of 3549 feet, the Mesozoic or older rocks had not been penetrated and it was decided to suspend operations and to run electric logs and to test promising zones.

The volcanic rocks of the Clamo Formation encountered while drilling the well were of three general kinds. The first and most common kind were varicolored tuffs and volcanic breccias consisting of lithic and vitric volcanic fragments in an aphanitic to fine-grained ashy matrix, all highly altered to clay. The second rock type encountered was basalt flows and possibly small intrusive bodies. These were generally fine-grained but occasionally had a glassy groundmass. Evidence of secondary porosity from fractures and vesicles was indicated by abundant crystalline calcite.

The third rock type encountered was ignimbrite, or welded tuff. This consisted of crystal laths and vitric shards tightly welded together in a largely unaltered glassy matrix and showing an alignment reminiscent of flow banding. These rocks are considered noteworthy because fracturing of similar rocks in the Trap Springs area of Nevada has produced reservoir rocks from which oil is presently being produced.

Several shows were noted while drilling the well. These were as follows:

1. 1170'-1320' Gas shows of up to 90 hot-wire units
2. 1860' At this depth, oil was reported on the pits. A small sample was collected and sent for analysis by Chemical and Geological Laboratories in Casper, Wyoming. Analysis indicated a very flat distillation graph not characteristic of most native crude oils. It should be noted, however, that the effect of nearby volcanic acitvity could result in crude oil of unusual characteristics. The results of the analysis are included with this report.

3. 2900'-3549' (T.D.) Background gas of a few hot-wire units, but not more than 20 units, was carried through most of this zone.

Four drill-stem tests were performed with results as follows:

DST #1 1810'-1905' Opened with a weak blow which increased slightly to 1/2" of water in one minute and to 3" of water in 6 minutes. The flow had decreased to 1 1/2" of water on shut-in after 12 minutes. The second flow opened with a weak blow which died after 8 minutes. Forty feet of drilling mud was recovered with no trace of oil or gas. Recorded pressures indicated low permeability of the zone. The packer failed at the final shut-in. Extremely heavy drilling mud, the consistency of chocolate pudding, caused partial plugging of perforations during the test.

DST #2 & #3 1280'-1325' Initial open flow opened with blow off bottom of bucket and decreased to 5" at end of 5 minute pre-flow. Packers failed in both tests.

DST #4 1083'-1330' Opened with a fair blow which increased to 2" of water in 2 minutes. Blow decreased and died after 3 minutes and remained dead for the rest of the test. Seventy five feet of gas cut mud were recovered, and recorded pressures indicated that the formation was tight. Recorder charts also indicated that some plugging of the test tools may have occurred during the test, again due to extremely heavy drilling mud.

Schlumberger electric logs, (Dual Induction-SFL, Formation Density-compensated neutron with gamma-ray), were run through the entire well. These presented some problems in interpretation due to the volcanic nature of the rock and to the total lack of information of the conducting properties of the undisturbed formation fluids. No obvious hydrocarbons were indicated by the logs, but they were not conclusively negative. The zone from 2850 to 3100 feet bears resemblance to known productive ignimbrite zones in the Trap Springs area of Nevada.

CONCLUSIONS

This test of the Hay Creek Anticline has demonstrated that hydrocarbons are present in limited amounts within the structure. The Mesozoic or older rocks beneath the Clarno Formation remain the best potential source rocks for hydrocarbons and the best potential reservoir rocks. These were not penetrated in the subject well and are, as yet, unevaluated. It is recommended that future wells to be drilled on the Hay Creek Anticline be located close to or within the Mesozoic outcrop in order to assure that these higher potential reservoirs are penetrated and evaluated.

Respectfully,

Patrick McConigley

Patrick McConigley
Consulting Geologist
P. O. Box 2595
Casper, WY 82602

BIT RECORD

No.	Size	Mfgr.	Type	Depth Out	Footage	Hours Run	Vertical Deviation
1	12 1/4	HTC	J-44	462' casing	462'	44	0°
2	7 7/8	HTC	J-44	790'	328'	48	4 3/4°
3	7 7/8	HTC	J-55			36	6 1/4°
4	7 7/8	HTC	J-44	1363'		48	7°
5	7 7/8	STC	F-4	1363'	0	0	
6	7 7/8	STC	F-4	2473'	1110'	143 3/4	
7	7 7/8	STC	F-4	3187'	714'	101 1/2	
8	7 7/8	STC	F-3	3549'	362'	87	

BIBLIOGRAPHY

Peck, D. L., 1964, Geologic Reconnaisance of the Antelope-Ashwood Area, North-Central Oregon, with Emphasis on the John Day Formation of Late Oligocene and Early Miocene Age: U. S. Geological Survey Bulletin 1161-D, p. D1-D26.

Swanson, D. A., (1969a), Reconnaisance Geologic Map of the East Half of the Bend Quadrangle, Crook, Wheeler, Jefferson, Wasco and Deschutes Counties, Oregon: U. S. Geological Survey Misc. Geol. Inv. Map 1-568, Scale 1:250,000.

P. O. Box 2794
Casper, Wyoming 82601

CRUDE OIL ANALYSIS REPORT

Company: Grizzly Drilling Company
Well No.: Grizzly No. 1
Field:
County: Jefferson
State: Oregon

Date: February 16, 1978 Lab. No.: 26461
Location:
Formation:
Depth:
Analyzed by: Staff

Sample skimmed from mud pits

GENERAL CHARACTERISTICS

Specific gravity @ 60/60 °F.	0.8688
A.P.I. gravity @ 60 °F.	31.4
Saybolt Universal Viscosity @ 70°F., seconds	
Saybolt Universal Viscosity @ 100°F., seconds	
B. s. and water, % by volume	
Pour point, °F.	
Total sulphur, % by weight	

"CONFIDENTIAL"

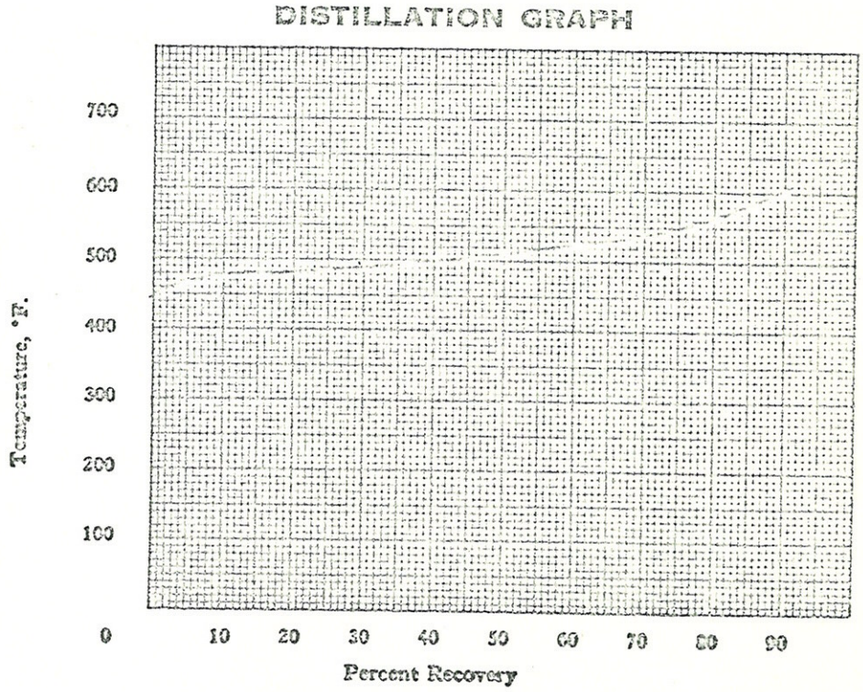
REMARKS: This appears to be a weathered diesel fuel. (Very small sample submitted for testing).

ENGLER DISTILLATION

Recovery, %	Temperature, °F.
IBP	447
5	466
10	473
15	478
20	484
25	490
30	494
35	499
40	504
45	509
50	515
55	520
60	525
65	532
70	540
75	550
80	566
85	585
90	606
95	
E.P.	

Recovery, %: 90.0
Residue, %: 10.0
Loss, %: 0

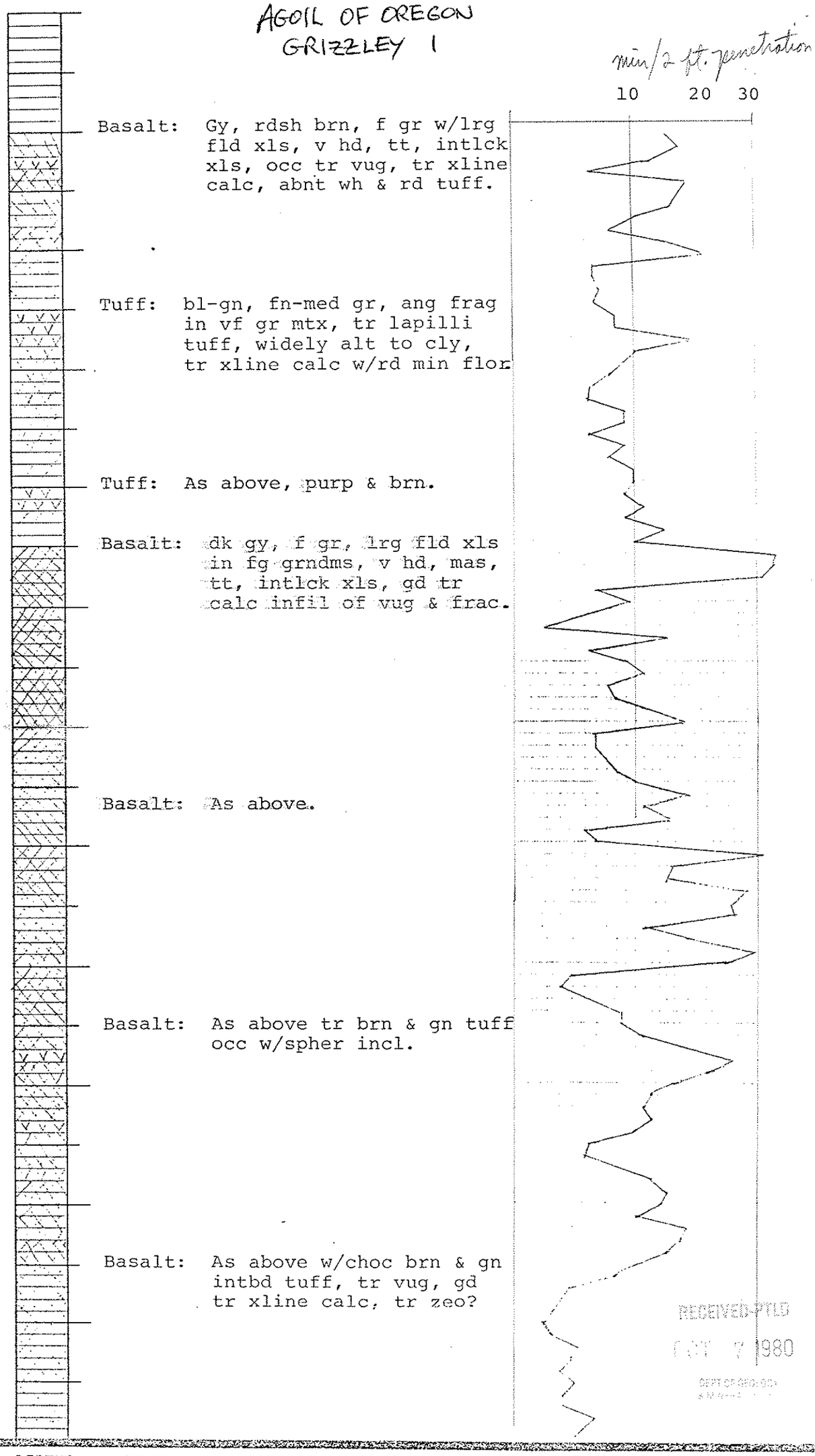
DISTILLATION GRAPH



Approximate Recovery

300 EP gasoline, %:
392 EP gasoline, %:
500 EP distillate, %:

AGOIL OF OREGON
GRIZZLEY 1



Basalt: Gy, rdsh brn, f gr w/lrg fld xls, v hd, tt, intlck xls, occ tr vug, tr xline calc, abnt wh & rd tuff.

Tuff: bl-gn, fn-med gr, ang frag in vf gr mtx, tr lapilli tuff, widely alt to cly, tr xline calc w/rd min flor

Tuff: As above, purp & brn.

Basalt: dk gy, f gr, lrg fld xls in fg grndms, v hd, mas, tt, intlck xls, gd tr calc infil of vug & frac.

Basalt: As above.

Basalt: As above tr brn & gn tuff occ w/spher incl.

Basalt: As above w/choc brn & gn intbd tuff, tr vug, gd tr xline calc, tr zeo?

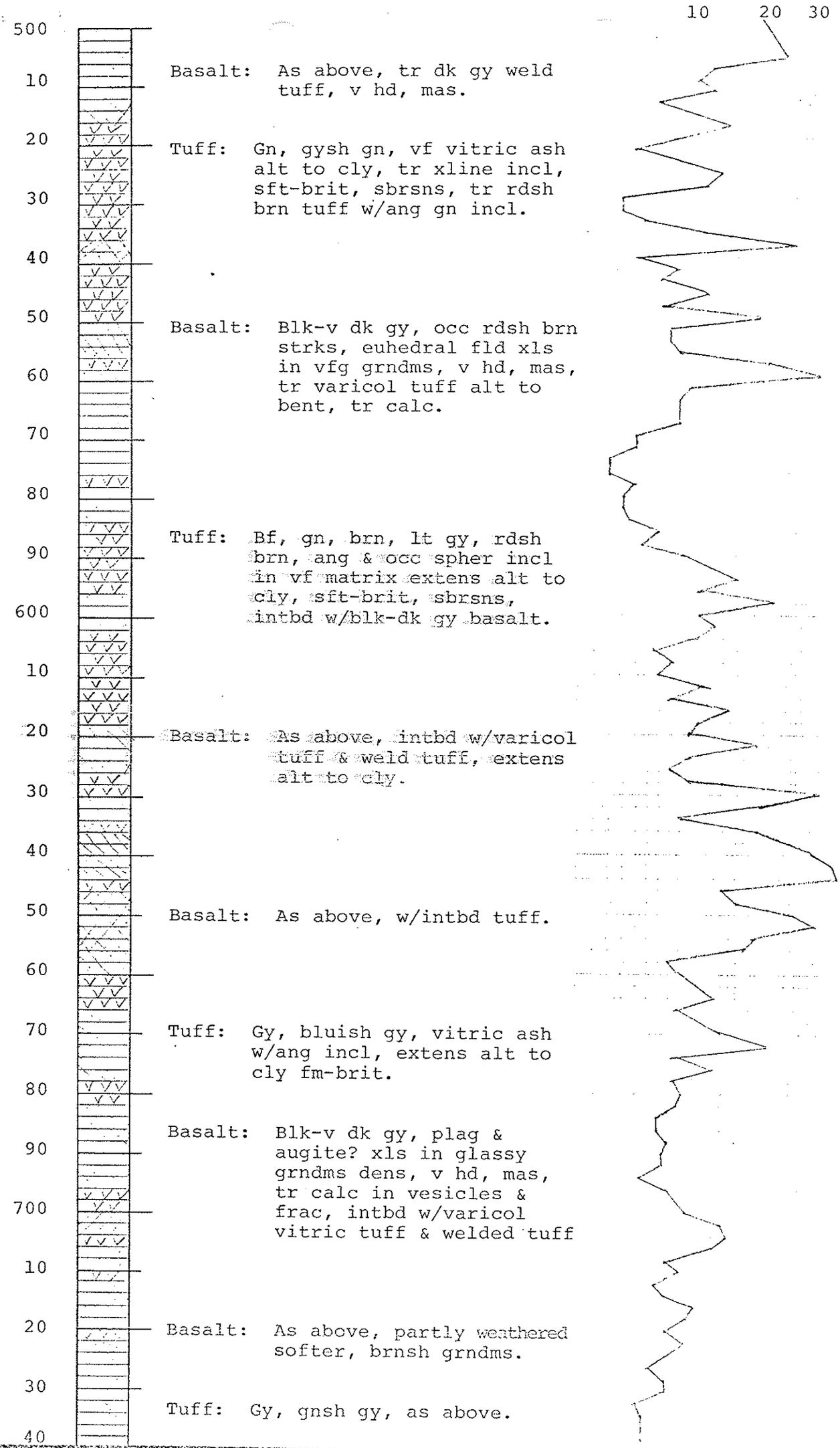
FORMATIONS By Samples | DEPTHS | LITHOLOGY | POROSITY | OIL & GAS SHOWS | PENETRATION RATE (min/2ft.) | FORMATIONS By Penetration

OPERATOR Grizzly Drilling Co. WELL Grizzly #1 LOCATION NE/SW Sec. 33-T12S-R15E ELEVATION KB 3451'

PATRICK McCONIGLEY, PETROLEUM GEOLOGIST, CASPER, WYOMING

OPERATOR Grizzly Drilling Co. WELL Grizzly #1 LOCATION NE/SW Sec. 33-T12S-R15E ELEVATION KB 3454' (est.)

PATRICK McCONIGLEY, PETROLEUM GEOLOGIST, CASPER, WYOMING



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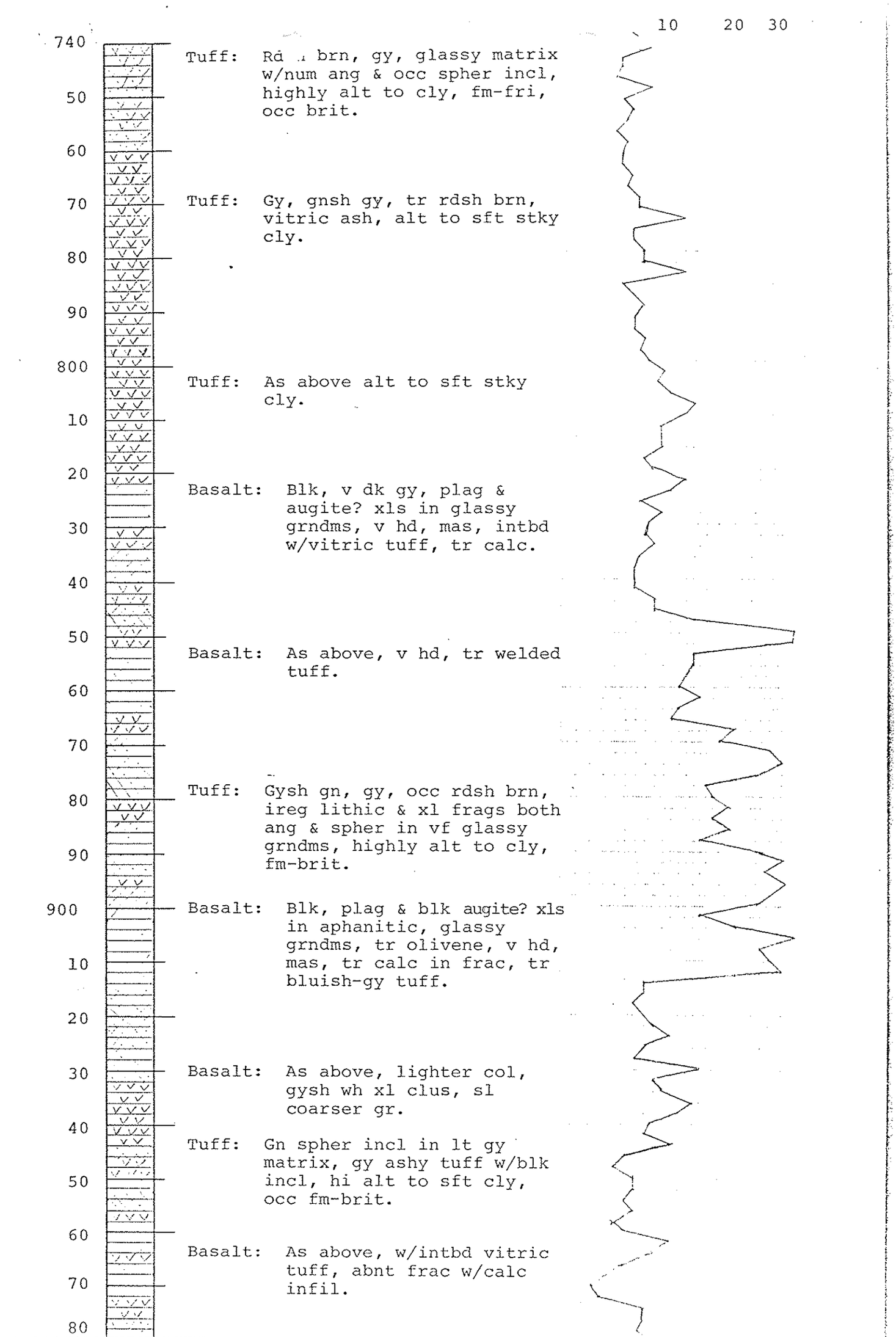

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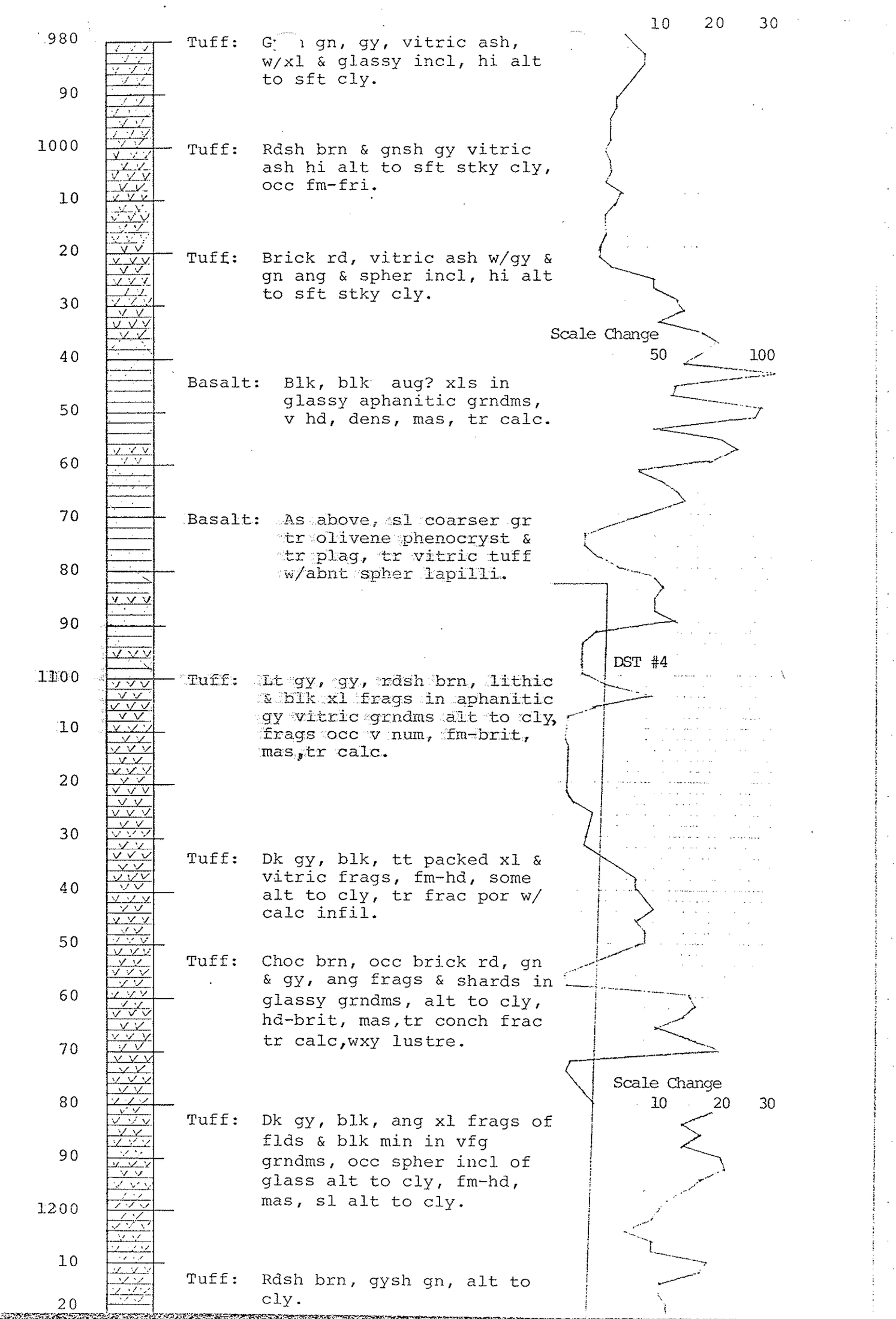

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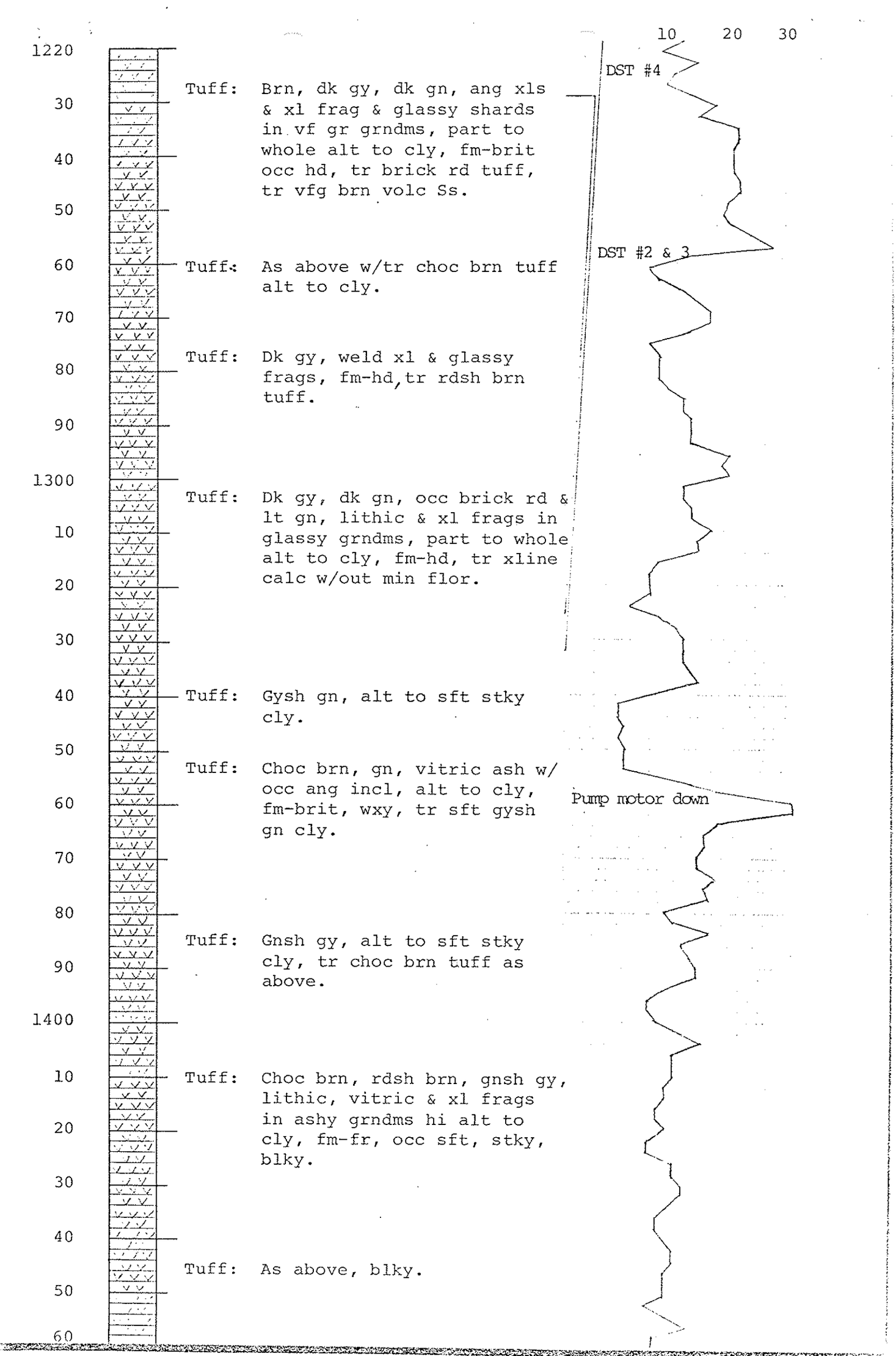

1220

Tuff: Brn, dk gy, dk gn, ang xls & xl frag & glassy shards in vf gr grndms, part to whole alt to cly, fm-brit occ hd, tr brick rd tuff, tr vfg brn volc Ss.

30

40

50

60

Tuff: As above w/tr choc brn tuff alt to cly.

70

Tuff: Dk gy, weld xl & glassy frags, fm-hd, tr rdsh brn tuff.

80

90

1300

Tuff: Dk gy, dk gn, occ brick rd & lt gn, lithic & xl frags in glassy grndms, part to whole alt to cly, fm-hd, tr xline calc w/out min flor.

10

20

30

40

Tuff: Gysh gn, alt to sft stky cly.

50

Tuff: Choc brn, gn, vitric ash w/ occ ang incl, alt to cly, fm-brit, wxy, tr sft gysh gn cly.

60

70

80

Tuff: Gnsh gy, alt to sft stky cly, tr choc brn tuff as above.

90

1400

10

Tuff: Choc brn, rdsh brn, gnsh gy, lithic, vitric & xl frags in ashy grndms hi alt to cly, fm-fr, occ sft, stky, blky.

20

30

40

Tuff: As above, blky.

50

60

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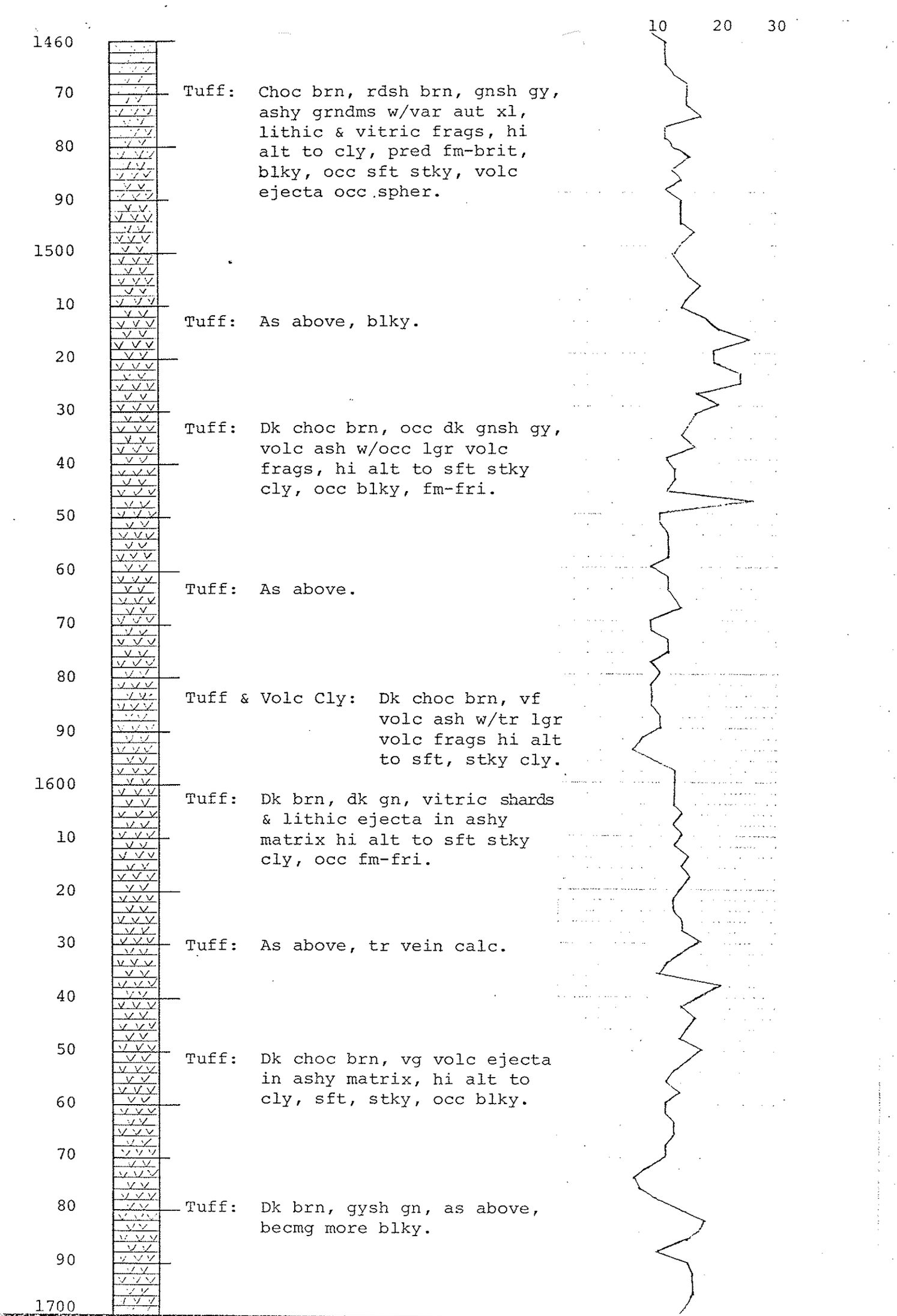

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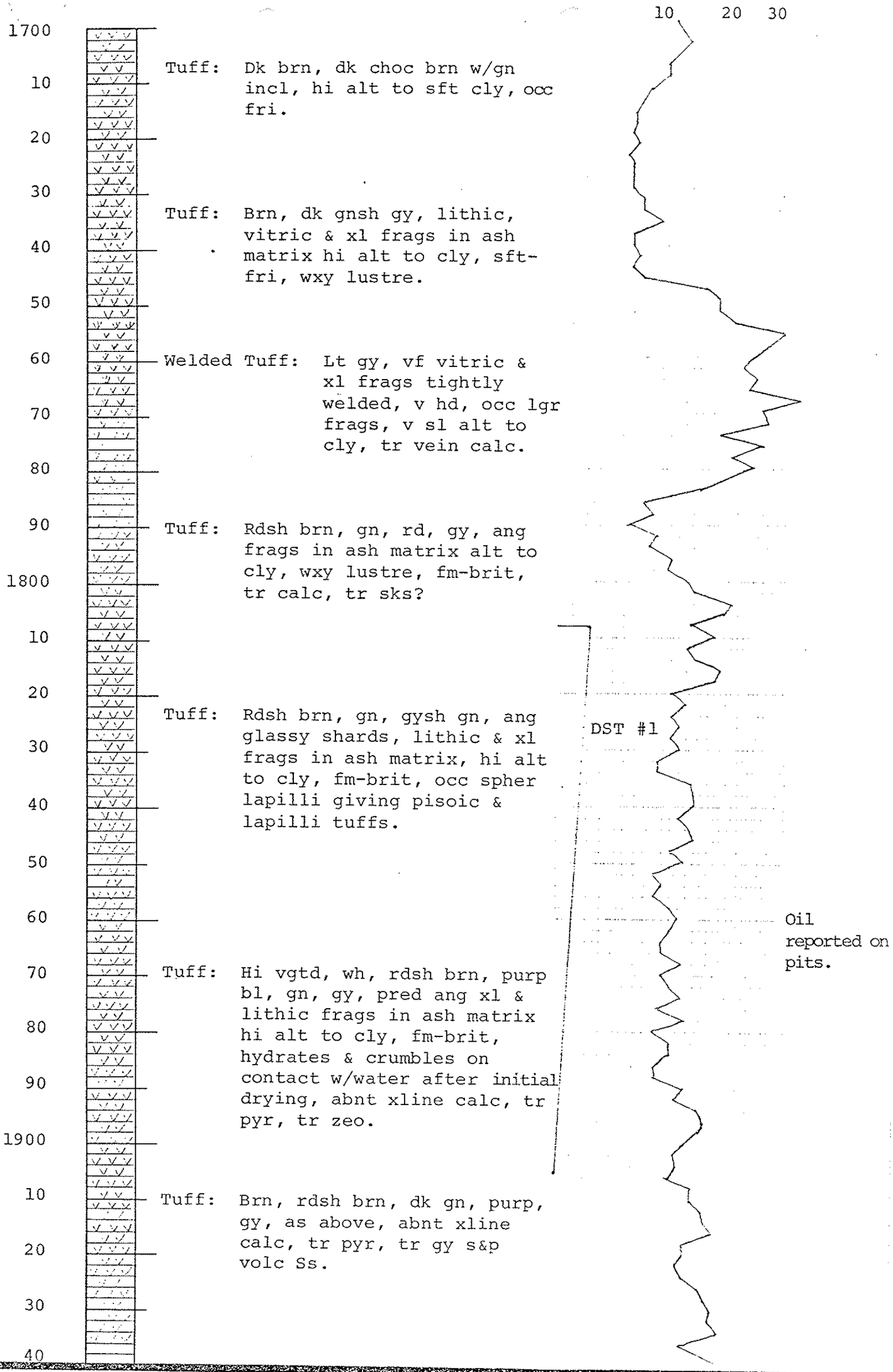

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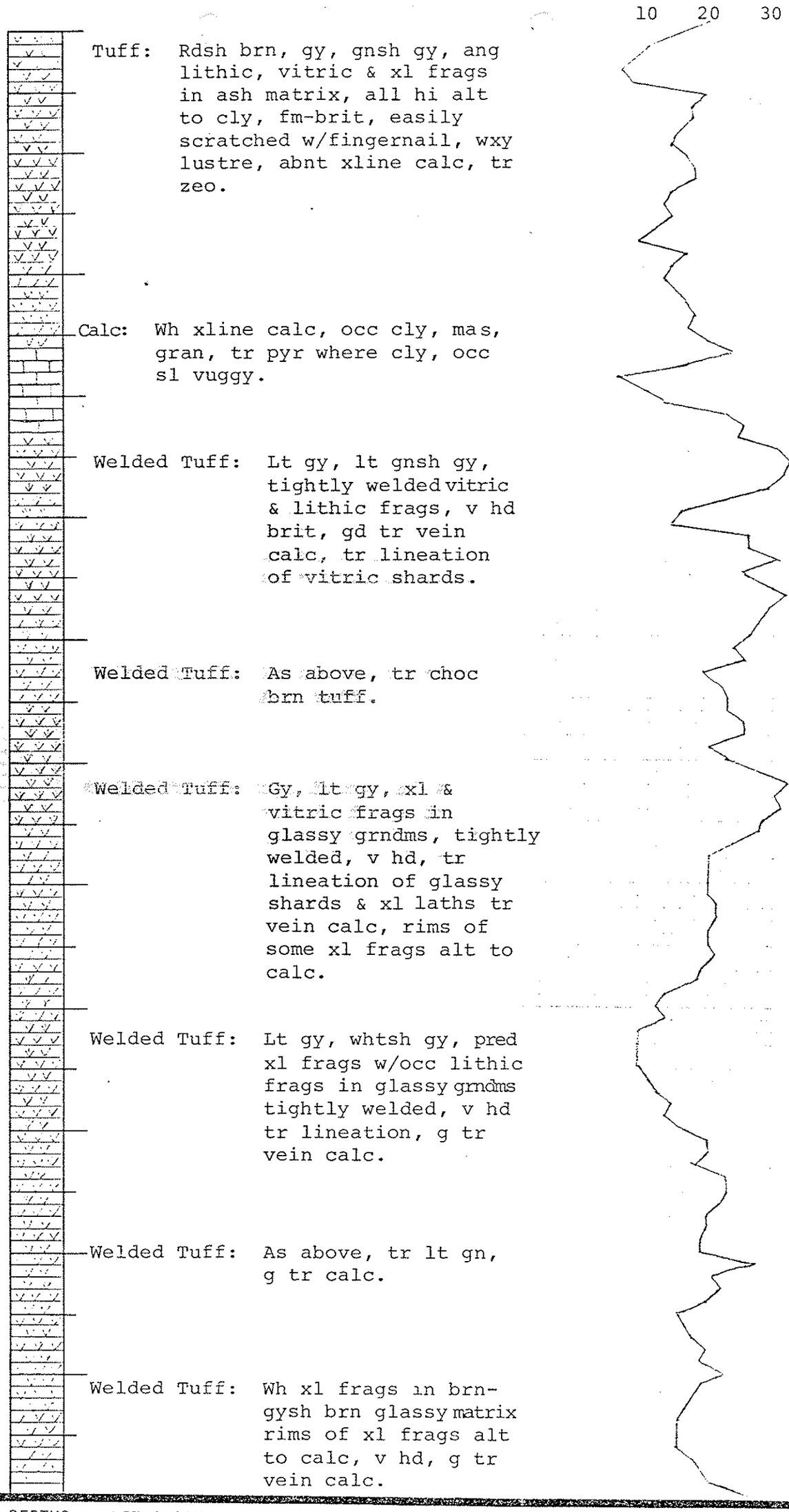

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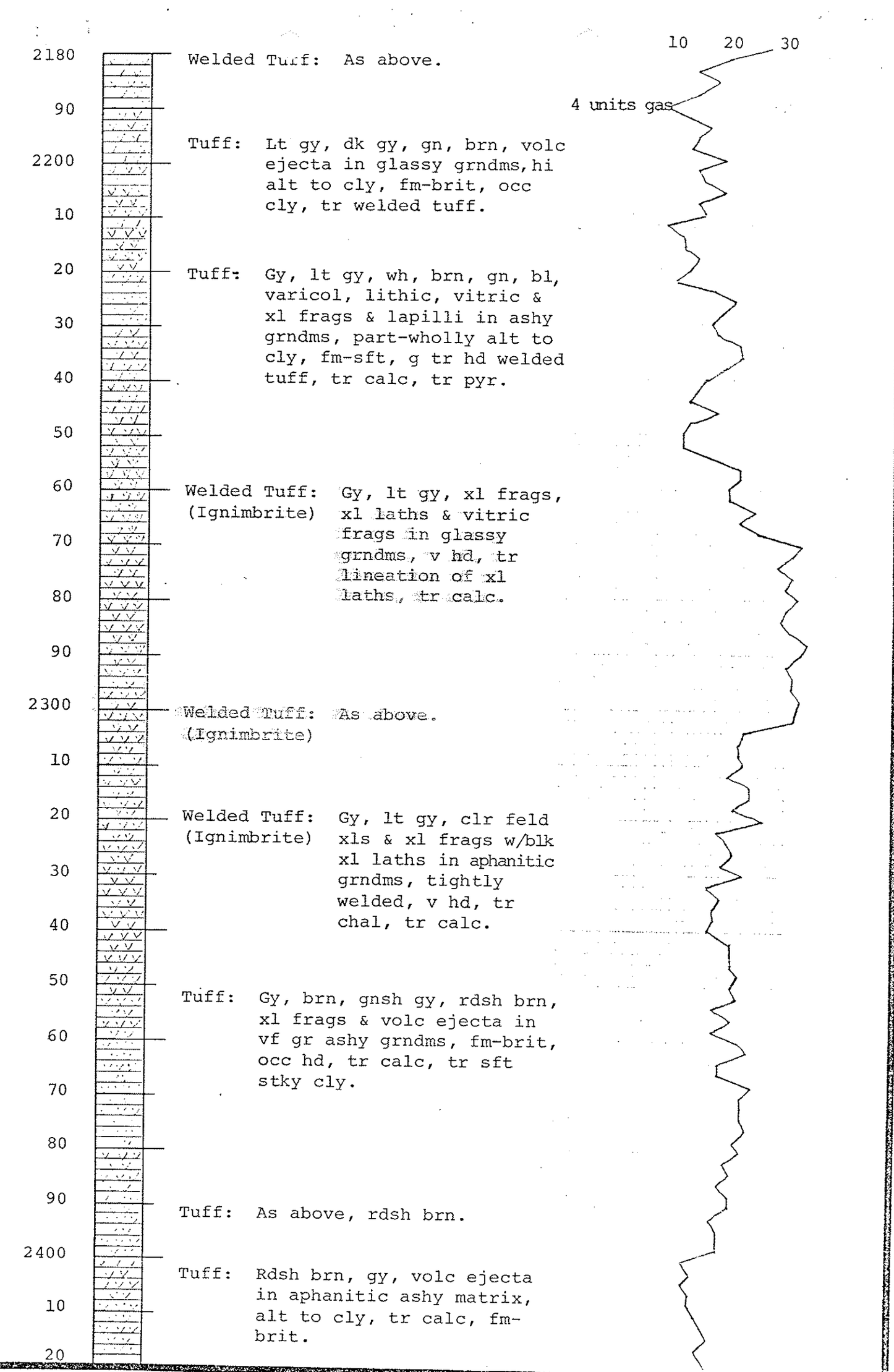

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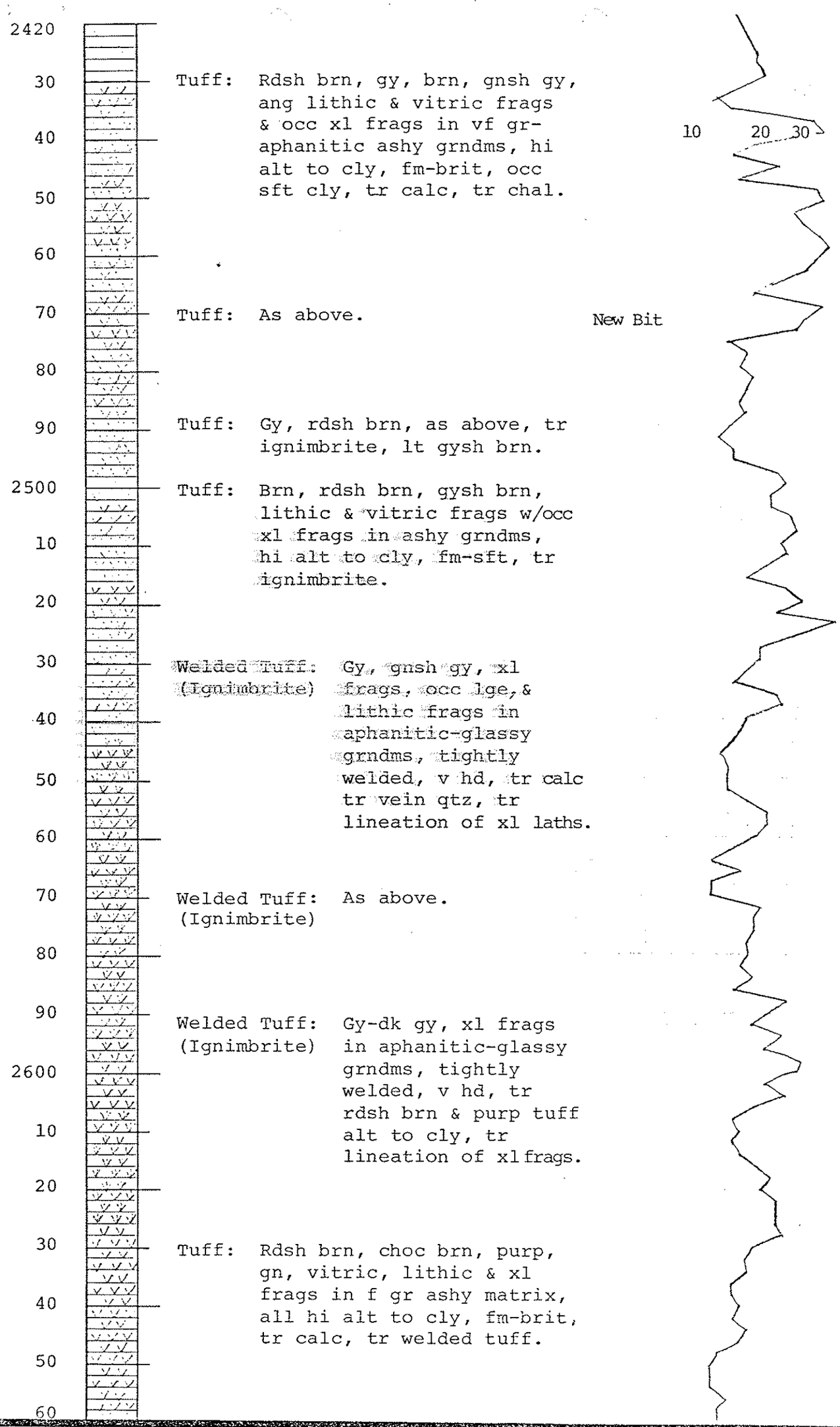

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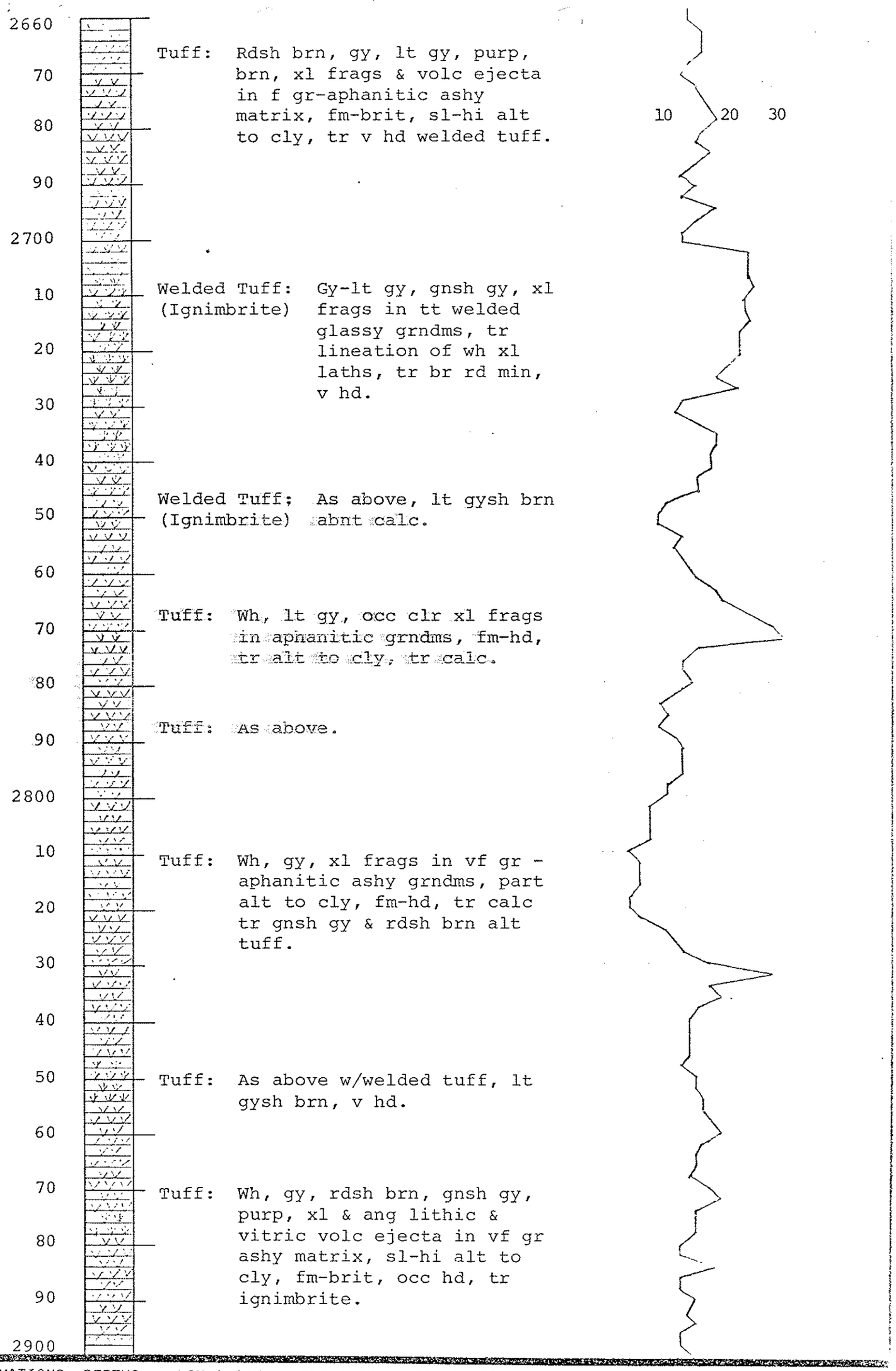

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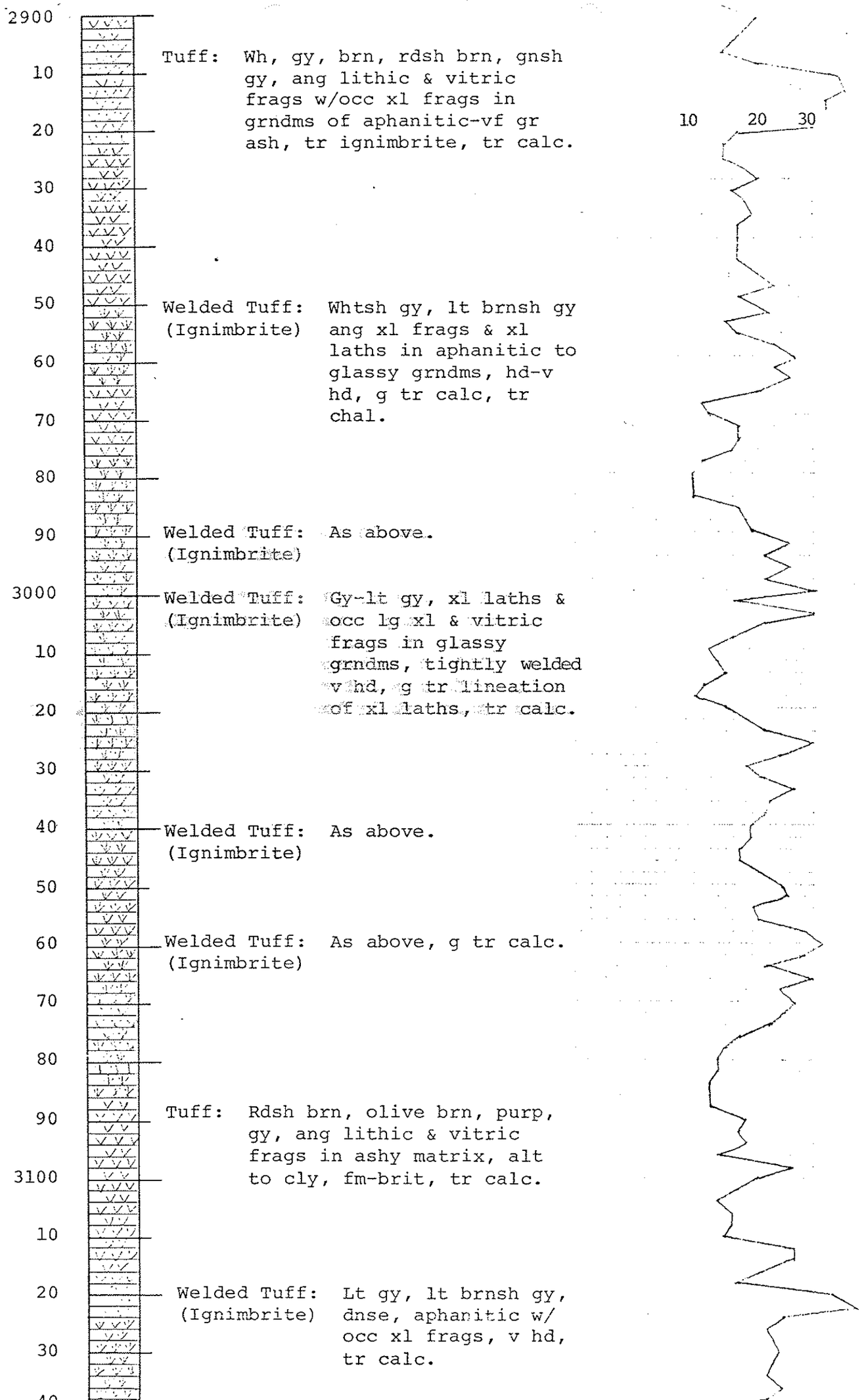

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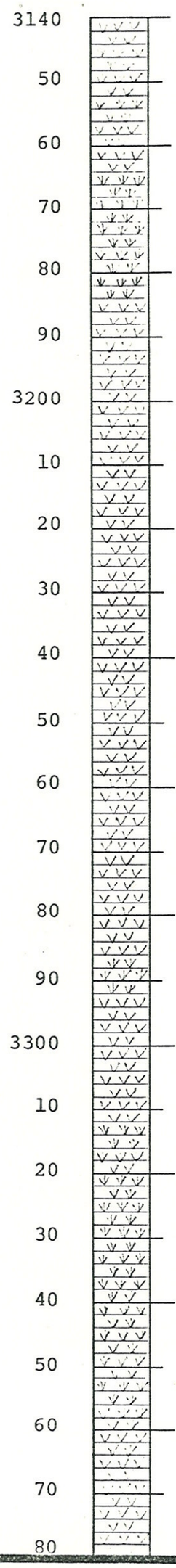

3140

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3200

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3300

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20

30

40

50

60

70

80

Welded Tuff: (Ignimbrite) Gy, lt gy, xl frags xl frags & laths & vitric frags in glassy grndms, tightly welded, v hd tr lineation.

Tuff: Brn, gn, wh, purp, volc frags in ashy matrix, hi alt to cly, g tr calc.

Tuff: Brn, gy, gn as above, tr chal.

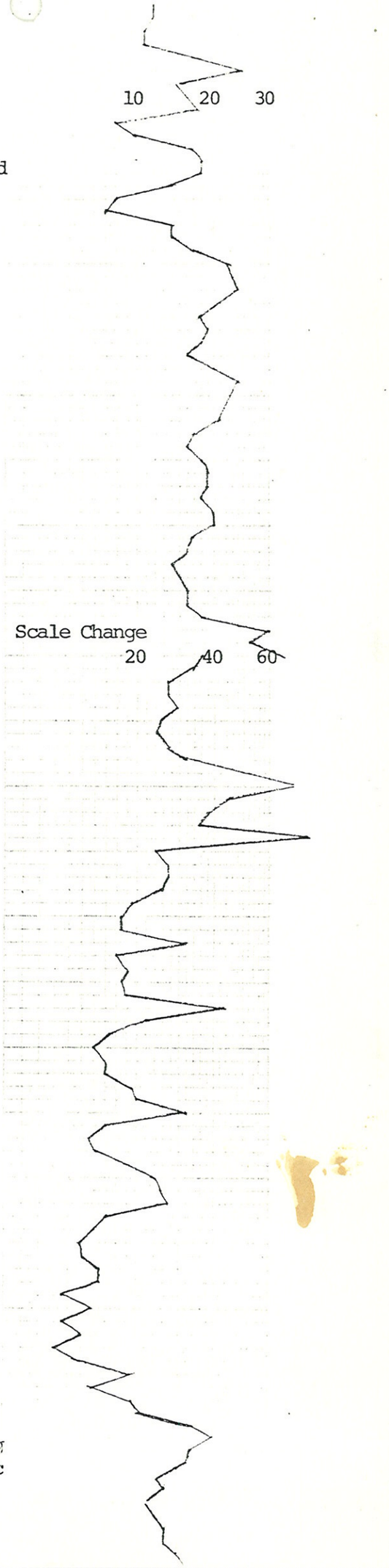
Tuff: As above.

Tuff: As above, tr sft wh cly.

Welded Tuff: (Ignimbrite) Dk gy, occ xl frags in glassy grndms, v hd, dns, tt weld, tr calc, tr chal.

Welded Tuff: (Ignimbrite) As above.

Tuff: Brn, rdsh brn, gysh gn, ang lithic & vitric frags & occ xl frags in glassy matrix, hi alt to cly, fm-brit, tr calc.



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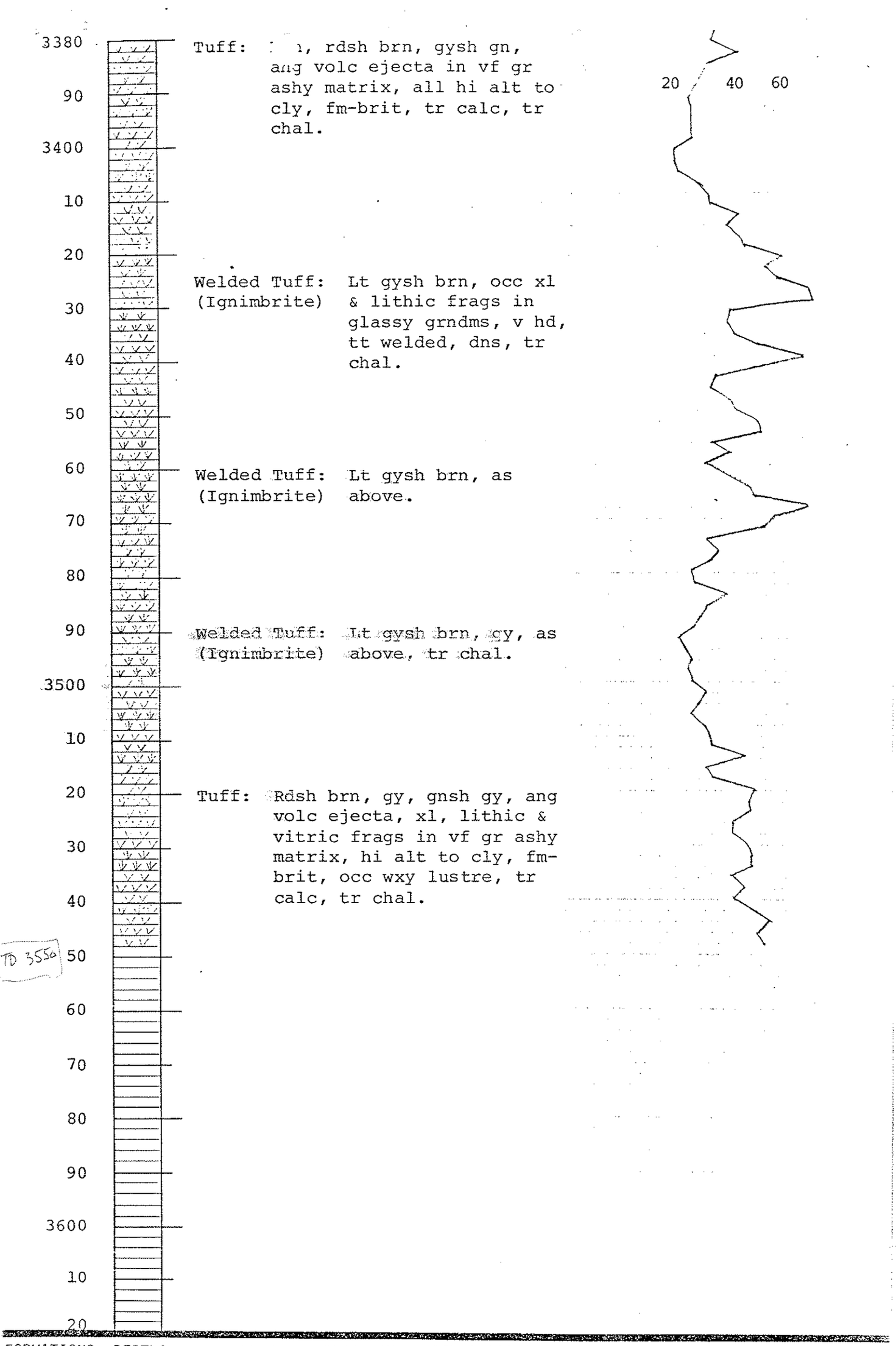

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