133

EAST AFR. PROT.

5202

5202
Rec^d 21 FEB 10

Governor Apl. Ab. …

1910

19 Feb

Previous Papers
2294
36…

Railway to Eldama Ravine Forests.

Submits [illegible] Estimate prepared by Lieut Hall R.E. - 29 miles - £170,322 = £5873 a mile

Mr Butler.

? ack. with thanks - & have the report printed to be sent out to E.A.P. as soon as possible in part reply to Ody. desp. No 8 of 6 Jan. in 2554 E.A.P. - ~~thinking second report referred to in para 2.~~ A.C.C. 23/2

Mr Read

Consider in print

Hay

Feb 23

at once

HJR 23/II

6 copies … conf 8 Apl on 8161

See now Gov 8161

T.O.

Subsequent Paper
Gov 8161/10

mention [illegible]
with refce to our desp: of 19th
Sep: re £/30464

H. J. R.
10/3/13

No harm in doing so
[illegible] 10. 10. 13

[illegible] 11. 10. 13

at once
H. J. R.
12/3/13

Dr. [illegible] Gro/35292
this can be put by
at once
H. J. R.
10/3/13

See copy of letter to Major [illegible] as
to loan of plan for use in connexion
with the restored Main room to the
[illegible] He returned the
plan in March
[illegible] 12 Nov. and I have returned
it & acknowledged receipt.
He also left with me four copies (2 sheets
each) of the enlargement (1:3000) of
part of the plan

I have disposed of them as follows:-

1 copy attached to the file
1 copy to Col. Carmichael, CA.
1 copy to ESRRA for the Ocean Eisha[?] Papers
1 copy to ESRRA for the European Harwood de
Ovedan application for a ... of ...

W.A.S. 13.11.20.

War Office
Whitehall
19th Feb 1910

URES

Sir

I have the honour to forward for the information of His Majesty's Secretary of State for the Colonies the accompanying report on a proposed railway for developing the Eldama Ravine forests in East Africa.

This report has been prepared by Lt Hall R.E. as I was unable personally to visit the country owing to my being quarantined home.

Lt Hall has considered the railway from the point of view of advantage to the concessionaires and with the exception of slightly

increasing the total mileage hauled from the Sasi to the sea the line chosen owing to the large capital cost of either the better one

The tracing from which the map that accompanies this report is not quite complete but it will when complete be forwarded to the Intelligence Dept W.O. for incorporation with the other maps of East Africa

I have the honour to be
Sir
your obedient Servant

A. G. Stevenson
Capt RE
late Y/c Uganda Rly Extension Survey

Under Secretary of State
for the Colonies
Downing Street

2 Enclosures – Print of map / Tracing of section } X

From Lieut. H. A. L. Hall R.E.

To Capt. A. G. Stevenson D.S.O. R.E.

Brompton Barracks
Chatham

14. 2. 10

Sir

I have the honour to forward herewith my report and estimates for a railway to the Eldama Forests.

I have the honour to be,

Sir,

Your obedient servant

[illegible] Hall

Lt. R.E.

X Not [illegible]

2 Enclosures — Print of map
Tracing of section

112

From Lieut. H. A. L. Hall RE

To Capt A. G. Stephenson R S O RE

Brompton Barracks
Chatham
14 2 10

Sir

I have the honour to forward herewith my report and estimates for a railway to the Eldama Forests.

I have the honour to be,

Sir

Your obedient servant

H. A. L. Hall
Lt RE

Not Printed

Reconnaissance and Report for a Railway to Eldama Ravine and the Lingham and Grogan Forest Concession.

—

The object of this reconnaissance was to find the best line ~~[illegible]~~ for working between Lingham & Grogan's forests, touching at Eldama Ravine en route. There is not much traffic, apart from timber, to be derived from this neighbourhood at present; but, if a railway is built, as there are a fair number of settlers in the vicinity and since the Masai have been induced to look on cultivation as an art not so contemptible as they by heredity consider it, a fair amount of traffic may be expected from this neighbourhood in the future.

The main watershed in so far as it affects the proposed line runs from the proposed Mau Summit Station through Loldiani Mt. from there in a N.W. direction to Timboroa and from there due North and to the East of the Uasin Gishu Plateau. The Eldama forests lie on the eastern slopes of this watershed. Two schemes have been put forward for reaching these forests:

(1) By taking off at some point near Nakuru and keeping to the east of the watershed for the whole

distance.

(2) by taking off at Londiani Station –

The advantages claimed for (1) are.

(a) a practicable route

(b) It would be in the direction of a line to
(1) the Uasin Gishu Plateau
(2) Uganda

(c) It would open up land on the Molo-R. [illegible]

(d) Shorter haulage –

Before discussing the merits of these respective [illegible] a description of them as selected is necessary –

Taking the first scheme viz from Nakuru the only question which arose was whether the [illegible] should [illegible] off at that place or at Njoro – The line from Njoro would be [illegible] miles shorter but the extra haulage [illegible] [illegible] – The length [illegible] miles of the Ruling Gradient 2% compensated for curve line [illegible] at [illegible] [illegible] of alternative – Two [illegible] ft span [illegible] [illegible] 12 ft span bridges and two [illegible] ft span steel viaducts are required –

In the case of the other scheme Mau Summit [illegible] selected as the best point to take off for the following reasons –

1) Its height is 8,320 as against that of [illegible]030 at Londiani – the height at M. 10 on proposed line being 8118.

(2) Less haulage by 7 miles

ground between Londiani and Mile 10 is not favourable for construction -

The length is 89 miles & the ruling gradient is 2% up to Mile 10 and 2.6% from there on - both compensated for at .05% per 1° of curvature.

The gradient is 2% for the first 10 miles so as to fall in with the ruling gradient of 2% on the Uasin Gishu Plateau, which for this distance would coincide -

The necessary bridges and viaducts are set forth in the estimate p. 9.

Lumbwa was selected for the termination of the line as it forms a good place for the collection of the timber - Timber could be brought here on light roughly laid lines of the Cantilever type, but this is entirely a matter for the Timber Company -

Now returning to the advantages claimed for the Nakuru route:-

a) a practicable route.

The Londiani route is also a practicable route - The cost of earth and rock work is practically identical & there are fewer smaller bridges & viaducts in the case of the Londiani route

(b) (1) It would be in the direction of a line to the Uasin Gishu -

This does not hold as the best line to the Uasin Gishu starts from Mau Summit, for it would be some 20 miles shorter and it would not have to climb the Mau Escarpment again.

(b) (2) It would be in the direction of a line to the Uganda -

The same argument holds as in the case of (b) (1) provided it is proved that this neighbourhood is the most suitable to start such a railway from.

(c) It would open up land on the Molo R.

This neighbourhood has become so unhealthy that settlers are leaving it -

(d) Shorter haulages -

The haulage is 25 miles less -

Taking the figures quoted by the Manager of the Uganda Railway in the postscript of his Memorandum dated January 11. 1905. viz

A rate of 7.5 per $\frac{5}{8}$ths ton on mile. and

An annual output of 18 000 tons.

The cost of this extra haulage works out £980 odd. This capitalised at 5% is £19

G

Note: Cost of the extra 15½ miles of permanent way material alone on the Nairobi railway line would be £28000 odd

The Londiani route is therefore recommended as it is shorter by 10½ miles and as the first 10 miles of it would form part of the line to the Mau Gisha Plateau.

Cost of Construction

Length. 29 miles

Gradient. 2% to Mile 10
2.5% Mile 10 to 29
Compensated at 05% per degree of Curvature

Minimum Curve. 8° 716 ft. Radius

Estimate

of

Mau Summit – Uasin Gishu Railway

Length 29 miles. Gauge metre

		£	£ per mile
1	Survey	2.080.	72
2	Land and Compensation	Nil	
3	Earth and Rock work	49.760.	1716.
4	Bridges and Culverts	10.786	372
5	Permanent Way	55.904	1927.
6	Telegraphs	2.171.	75
7	Station Buildings and Machinery	3.464	119.
8	Rolling Stock	5.000.	172
9	Fencing	99.	3
10	Plant	070	23
11	General Charges	40 391	1393
		~~48.391~~ 170.324	5.8[illegible]

With regard to earth & rockwork, if it be possible to obtain sufficient local labour, it would be possible to make the following reductions

	£
Passages from India	19.800.
Recruiting in India	1500
Total Saving	£ 21.300

Wages are so high in E.A.P. that Indian labour is as cheap as African.

In the event of local labour being obtainable

Capital Cost = £149.004

Cost per mile £ 5.072.

10

Rates & Conditions of Estimates.

(1) Survey

Owing to the large amount of heavy clearing the Survey is estimated to take two months.

Staff:—

1	Chief of Party	£1000	per annum
1	Assistant	500	"
2	Second Assistants	600	"
2	Foremen	400	"
	Total	£2500	per annum

	Say for 4 months to include time on voyage out and home	£ 830
150	porters @ [illegible] per month for 2 months	£ 2[illegible]
7	headmen @ [illegible] " " "	£ 21
4	1st Class passages London – E Africa & return	£ 320
2	2nd Class " "	£ 100
	Outfits	£ 100
	Camp Equipment	£ 100
	Instruments	£ 100
		£ 1981
	+ 5%	99
	Total	2080

Cost per mile £ 72

The land, exceptions for stations can be taken free of cost - Both the stations at Mau Summit and Eldama Ravine, are on Government property, so there is no cost for this item - There are no crops or huts to be damaged.

Cost Nil.

(3) Earth and Rockwork

This estimate is worked out for indentured Indian labour. The prices taken are based on figures supplied by the Uganda Railway officials.

Earthwork £- 1- 0 per 100 cub
Rockwork £5 0 0 do do

These prices include the cost of ration stocks.

Total Cost £49,160

Cost per mile £1716

These figures include clearing at £40 per mile.

Bridges & Culverts

4) Bridges and Culverts

Steel Viaducts – 3 Miles 9 · 20 ft span 40 ft £1000

3 Miles 20 ft span 30 ft. £2800

20 ft Girder Bridges are required at Miles [illegible] and 21½ for crossing the River [illegible] – [illegible] for the crossing at Th[illegible]

6 ft openings are required at [illegible] Ndondolet and Miles 19½ and 12

The following rates have been used in estimating –

Steel Viaducts	Cost erected	£23 10 0 per ton.
Concrete		£5 0 0 per 100 cub ft
Masonry		£3 0 8 do do
Girders erected		£20 7 0 per ton

Prices for Culverts

18" Culvert	£[illegible] 0 0 per ft run
24" Culvert	£1 8 0 per ft run
6 ft Concrete Culvert	£8 0 0 do do
20 ft Girder Bridge 8 ft same	£260 0 0

The cost of Bridges and Culverts amounts to £10,786 or at the rate of £372 per mile –

(5) Permanent Way

A rail weighing 50 lbs with steel sleepers is recommended [illegible] weight of [illegible] 13[illegible] tons [illegible] is 73[illegible] [illegible] mile — the [illegible] of [illegible] mile of permanent way delivered at Nairobi is 51[illegible]

The distance from Nairobi to the centre point of the line is 17[illegible] miles — at ½d a ton mile the cost of carrying 1 mile of [illegible] 17[illegible] miles is £[illegible]

Therefore the cost of 1 mile permanent way is £140[illegible]

Platelaying packing and boxing per mile [illegible]

Total per mile £[illegible]

Allowing for station & triangles

37 miles of line @ £1650 = £49,[illegible]

5 sets points & crossings @ £36 [illegible] laid

22 Miles ballast to Eldama @ £200 per m = £ 4 400
Ravine only)

Total £ 5[illegible]

+ 2½% £ [illegible] 36[illegible]

Total £ 55.904

Cost per mile [illegible] £ 192[illegible]

15

⑥ Telegraphs

Using steel poles with one wire the cost is £72 per mile –

The outfit of an office is £10.

29 Miles @ £72	£2088
3. Offices @ £10	30.
	£ 2118
+ 2½%	£ 53
Total –	£ 2171

Cost per mile – £75

⑦ Station Buildings and Machinery

Main Summit Station

Station Building + Traffic Staff Quarters	£200
Goods Shed.	£100
2 Water Tanks 1600 gallons	£1100
Piping	£30
Weighing Machine	£20
Rest House – Removing from Loudiam and reerecting –	£40
	£1490

Station Buildings & Machinery Continued

Eldama Ravine Station.

Station Building & Traffic Staff Quarters	£200
Goods Shed	£100
Loco Staff [illegible]	£100
Engine Pits	£50
Water Tank 4000 gallons	£550
Piping	£20
Weighing Machine	£20
Rest House already exists.	Nil
Quarters for Engine Drivers & [illegible]	£200
	£1240

Tengas.

1 Telegraph Office & Operators Quarters	£50

For maintenance of the line -

6 Landies @ £100	£600

Recapitulation £1490

M. Sur. it	£1490
"	1240
[illegible]	50
[illegible]	600
	3380
%	84
Total	3464

Cost per mile. £119

(8) Rolling Stock

50 bolster trucks for carrying timber @ £100 £5000

Cost per mile £172

Sufficient rolling stock exists on the present line to provide for all other wants

(9) Fencing & Gradient Boards Mile Posts.

Fencing is only allowed for round stations.

1 Mile Fencing	@ £40	£40
117 Mile Posts	@ 6/8	£39
Say 60 Gradient Boards	@ 6/8	£20
		£99

Cost per mile £3.

(h) Plant

[illegible] necessary material for the construction and equipment of the line is as follows

(a) Construction
(b) Engineering
(c) Locomotives
(d) Station furniture

(a) Construction

Winches tackle &c £100

2 Miles Mono rail with 6 sets points & crossings & 24 tip trucks £450.

£550 -

The cost of tools for earth works [illegible]

(10) Plant (continued)

(a) Construction (continued)

in the rates for that item.

(b) Engineering

6 platelayers trollies £42

(c) Locomotive

workshops exist at Nakuru, so there is no necessity for providing tools or shops.

(d) Station furniture £50

Recapitulation

(a)	Construction	£ 5[illegible]
(b)	Engineering	42
(c)	Locomotive	44
(d)	Station furniture	50
		£ 652
	+ 2½ %	18
		£ 670

Cost per mile £ 228

[illegible] detail of subheads to follow.

(11) General Charges

This item includes the salaries of the staff engaged on construction & their passage from England &c., the cost of the necessary tents, office stores &c and the cost of working the line – The latter is based on a ton-mile rate, which owing to the unfavourable conditions which always prevail during construction, is taken at 2d. Cost of carriage of permanent way material has been included under item (5) Permanent Way –

General Charges are subdivided thus:–

(a) Superintendence.
(b) Engineering
(c) Stores & Supply
(d) Accounts.
(e) Medical
(f) Police
(g) Recruiting
(h) Passages
(i) Do. indentured labour
[illegible]nacies
[illegible]sport
(m) Construction offices

Before examining these subheads in detail it is necessary to consider the organisation & the methods to be adopted in the construction. The [illegible] has been anticipated to take 2 months & on completion the construction would be taken over by the Railway staff thus effecting a saving of £5000 in passage money &c – How they are absorbed is shewn in the detail of subheads to follow –

The Rondean Ravine road crosses the proposed line at Mile 10 so that the earth work can be started here and at Man Summit simultaneously. Although this road is fit for wagons to a certain degree. This form of transport is very expensive and will be cheaper to build telescopically from Man Summit. There is plenty of timber so that there is no necessity for delay for want of bridge material, as temporary deviations can be quite simply constructed. Bridge materials if ordered immediately on completion of the survey should be available 6 months after the commencement of construction. 3000 men are to be employed while to the earth work in 9 months i.e. 233 working days. They should however be organised so that everything should complete simultaneously as near as possible as set forth in the following table.

Nature of work	Months 0	2	8
Survey	—		
Earth & Rock work		——	——
Permanent works			[illegible]

From this it will be seen that the total construction is estimated to take 12 months. In calculating the salaries of the staff an additional 2 months is added for travelling to and from England and in Africa, except in the case of those officers taken over from the Survey who have been allowed this time in Item (1) Survey, and who are here shewn with a cross thus x

(a) Superintendence.

				Total
x	1	Chief Engineer	@ £1000	£1000
x	1	Personal Assistant	@ £500	£500
	3	Clerks	@ £90	£315
	2	Draughtsmen	@ £120	£392
		Office Expenses		£ 70
			Grand Total	£2297

(b) Engineering

Section 1

	1	Executive Engineer	@ £700	£800
x	1	Assistant	@ £400	£400
x	2	Foremen	@ £250	£500
	1	Draughtsman	@ £125	£140
	1	Tracer	@ £80	£ 93
	3	Clerks	@ £90	£315
	[illegible]	Survey men	@ £72	£ 72
		Office Expenses		£100
				£2360

From this it will be seen that the total construction is estimated to take 12 months. In calculating the salaries of the staff an additional 2 months is added for travelling to and from England and in Africa, ~~with~~ except in the case of those officers taken over from the Survey who have been allowed the time in Item (1) Survey, & which are here shewn with a cross — thus ×.

(2) Superintendence

			total
× 1 Chief Engineer	@ £1000		£1000
× 1 Personal Assistant	@ £500		£500
3 Clerks	@ £90		£ ~~270~~ 315
2 Draughtsmen	@ £120		£ 392
Office Expenses			£ 100
		Grand Total	£ 2207

(b) Engineering

Section 1

1 Executive Engineer	@ £ 700	£ 820
× 1 Assistant	@ £ 400	£ [illegible]00
× 2 Foremen	@ £300	£ [illegible]00
1 Draughtsman	@ £120	£ [illegible]40
1 Tracer	@ £80	£ 93
3 Clerks	@ £90	£ 315
[illegible] Survey men	@ £12	£ 72
Office Expenses		£ 100
		£ 2356

Engineering (continued)

Section 2.

1 Executive Engineer	@ £900	£830
2 Assistant	@ £400	£400
2 Foremen	@ £200	£400
1 Draughtsman	@ £125	£1[illegible]
Tracer	@ £80	£73
3 Clerks	@ £[illegible]	£31[illegible]
[illegible] Survey men	@ £12	£[illegible]
Office Expense		£100
		£2422

A workshop is required in each section [illegible]

3 Carpenters	@ £60	£210
3 Blacksmiths	@ £60	£210
10 Labourers	@ £12	£120
		£540
for 2 Sections		£1080

Recapitulation

	£
Sections 1	2256
2	2422
Workshops	1080
Total Engineering	£9858
Orderlies @ £12	£[illegible]
Office	£[illegible]
	£[illegible]

£380
£106

(c) Stores & Supply

1 Superintendent	£200	per annum
Store keeper	£200	do
6 Clerks @ £90	£540	do
	£ 1190	
+ ⅓ for 4 months	£ 200	
	£ 1390	
Office expenses	£ 100	
50 Labourers @ £12	£ 600	
Total	£ 2090	

(f) Accounts

1 Accountant	£300	per annum
6 Clerks @ £90	£360	do
	£ 660	
+ ⅓ for 4 months	£ 143	
	£ 803	
Office expenses	£ 100	
Total	£ 1103	

(g) Medical

1 Medical officer	£300	per annum
2 Hospital Assts @ £100	£200	do
	£500	
+ ⅓ for 4 months	£ 130	
	£ 130	
	£ 72	
Orderlies @ £12	£ 50	
Office	£ 3	
		£ 380

(f) Police

Constables @ £13 each = £325
for 12 months

(g) Recruiting

Recruiting Offices in India £1500

(h) Passages

This includes railway fares in Africa

5 First Class passages from England
and return @ £80 £ 240

3 Second Class passages Do. @ £50 £ 150

27 Second Class passages from
India & return @ £30 £ 810

27 Third Class passages Do @ £10 £ 370
£ 1570

(i) Passages Indentured labour

3000 men + 10% for Contingencies

3,300 at £6 = £ 19,800

Miscellaneous 750.
2750 = £ 330
Donkeys £ 106

Materials

Medical Stores . . . . £ 70

Tents 5 @ £24 - £120
30 @ £20 - £600
750 @ £5 - £3750 £4470

Total £ 1570.

Transport.

Transport will be required to carry food beyond railhead - Porters are very expensive, and it is recommended that donkeys be used for this purpose - They possess the advantages of not requiring to be fed and if they do not die their value is recoverable - 75 donkeys should be sufficient with 3 boys to look after them.

3 donkey boys at £12 £ 36
Loss through death of donkeys say £70
£106

To Railway transport during construction for 14.6 miles: 1/2 the mean point
Rate per ton mile - 2d

Food $2\frac{1}{2}$ lbs per man per diem	1000 tons
Cement	1000 "
Miscellaneous	750 "
	2750 = £ 380
Donkeys	£106
	[illegible]

(m) Construction Offices

During construction offices will be required by the staff. These can be made of grass & their cost is negligible.

Total General Charges

		£
a	Superintendence	2207
b	Engineering	5858
c	Stores & Supply	2090
d	Accounts	1103
e	Medical	962
f	Police	325
g	Recruiting	1500
h	Passages	1570
j	Passages indentured Labour	19800
k	Materials	4570
l	Transport	406
m	Construction Offices	Nil
	Total	£40.391

Cost per mile £13.92

24 FEB 95

S/5202 Ext.

DRAFT

Capt. A. G. Stevenson, R.E.
c/o War Office

26 February.

MINUTE.

Parkinson 25/2
Fuller 26

Cox.
Lucas.
Hopwood.

Papers afterwards to P.D.

Sir,

I am directed by the Earl of Kimberley to ackn: with thanks the receipt of your letter of the 19th of Feb. transmitting for H.M.'s infn a report prepared by Lieut. H. A. L. Hall, R.E. on a proposed railway

2692-20

for developing the
forests of the Eldama
Ravine ~~in~~ in the
Rift

[illegible] · Registered Post

29 Sept. 1920

One copy [illegible]

DRAFT.

Major E. S. Grogan D.S.O.

MINUTE.

Mr. Bottomley 29.9.20

Mr.

Mr.

Mr. Grindle.

Sir H. Lambert.

Sir H. Read.

Sir G. Fiddes.

Col. Amery.

Lord Milner.

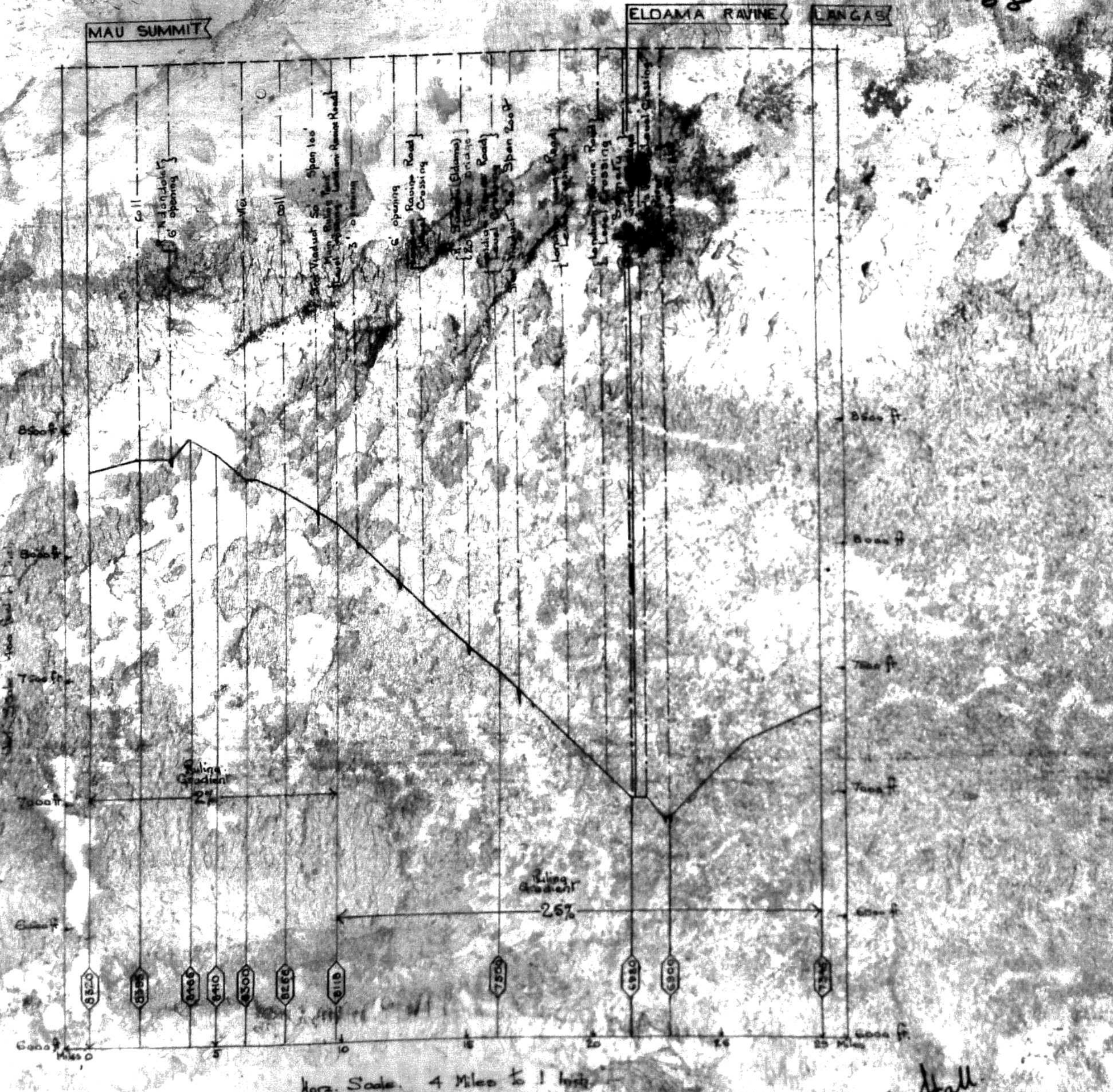
Dear Major Grogan,

I have now found the old railway survey plan and enclose it so that you can have it reproduced as you propose and let us have it back with a copy (or two copies if you can manage it).

I wonder if you could also let us have a copy of the above arrangement which you would have made with you [illegible]

SECTION
MAU SUMMIT - ELDAMA FORESTS
RAILWAY

168



Hallewell Hall
Lt. RE

CO 533/89


7730
7994
8683
7660
8135
Landi
UGANDA RAILWAY
Landiani Station
from Kisumu
10
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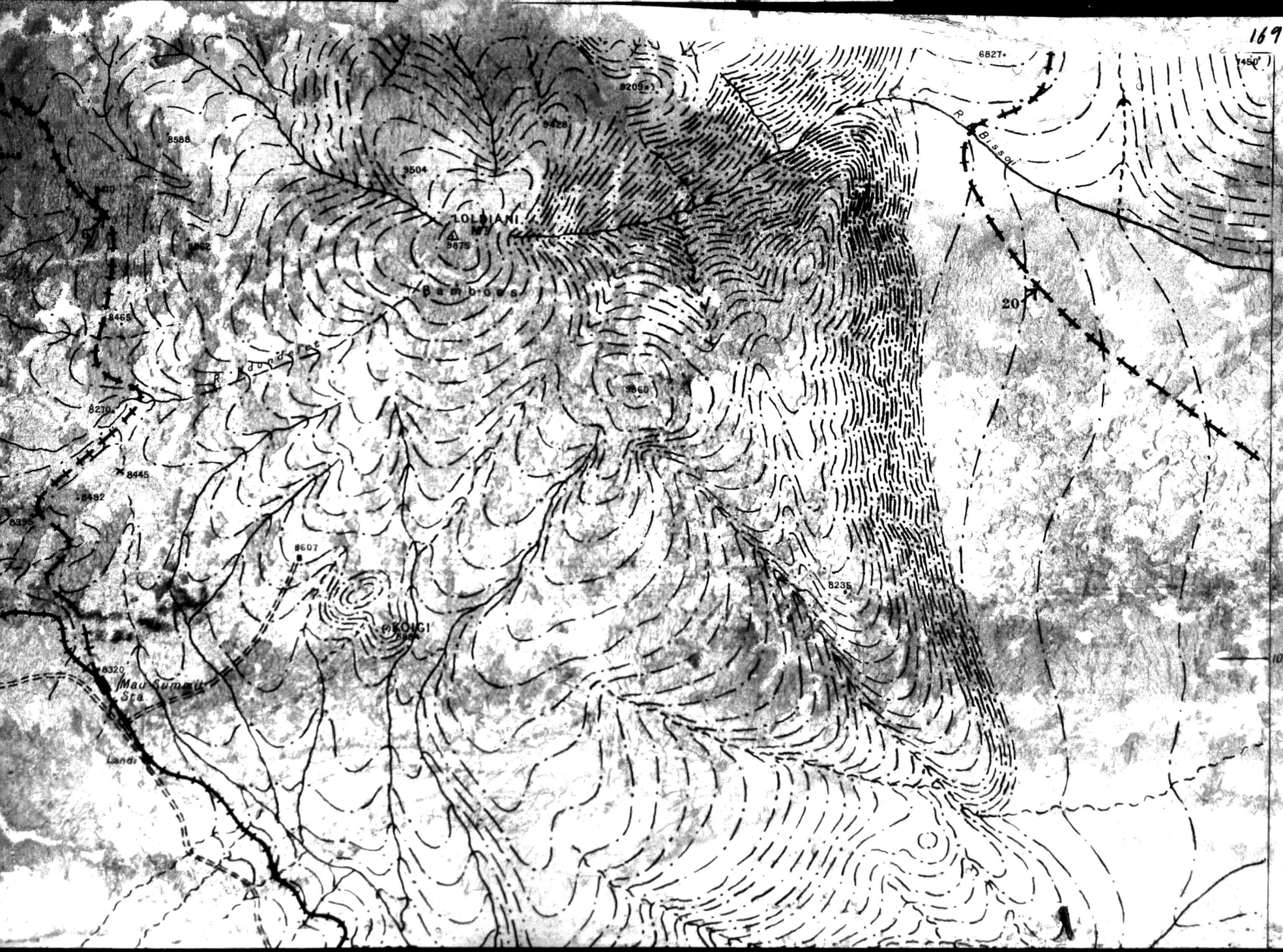
6827
9209
8588
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LOLDIANI
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Bamboos
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Mau Summit
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R. Bissoi
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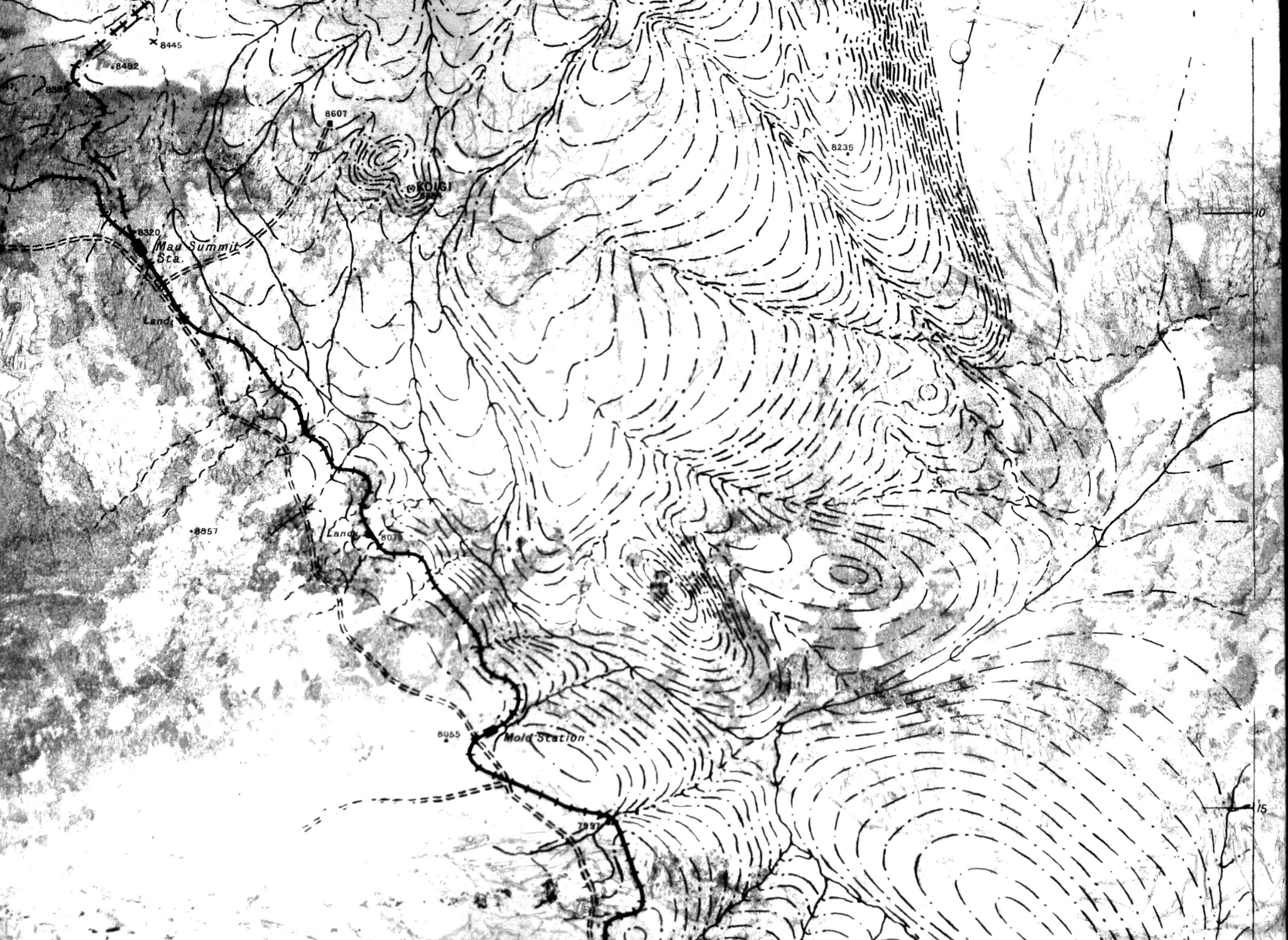
8445
8482
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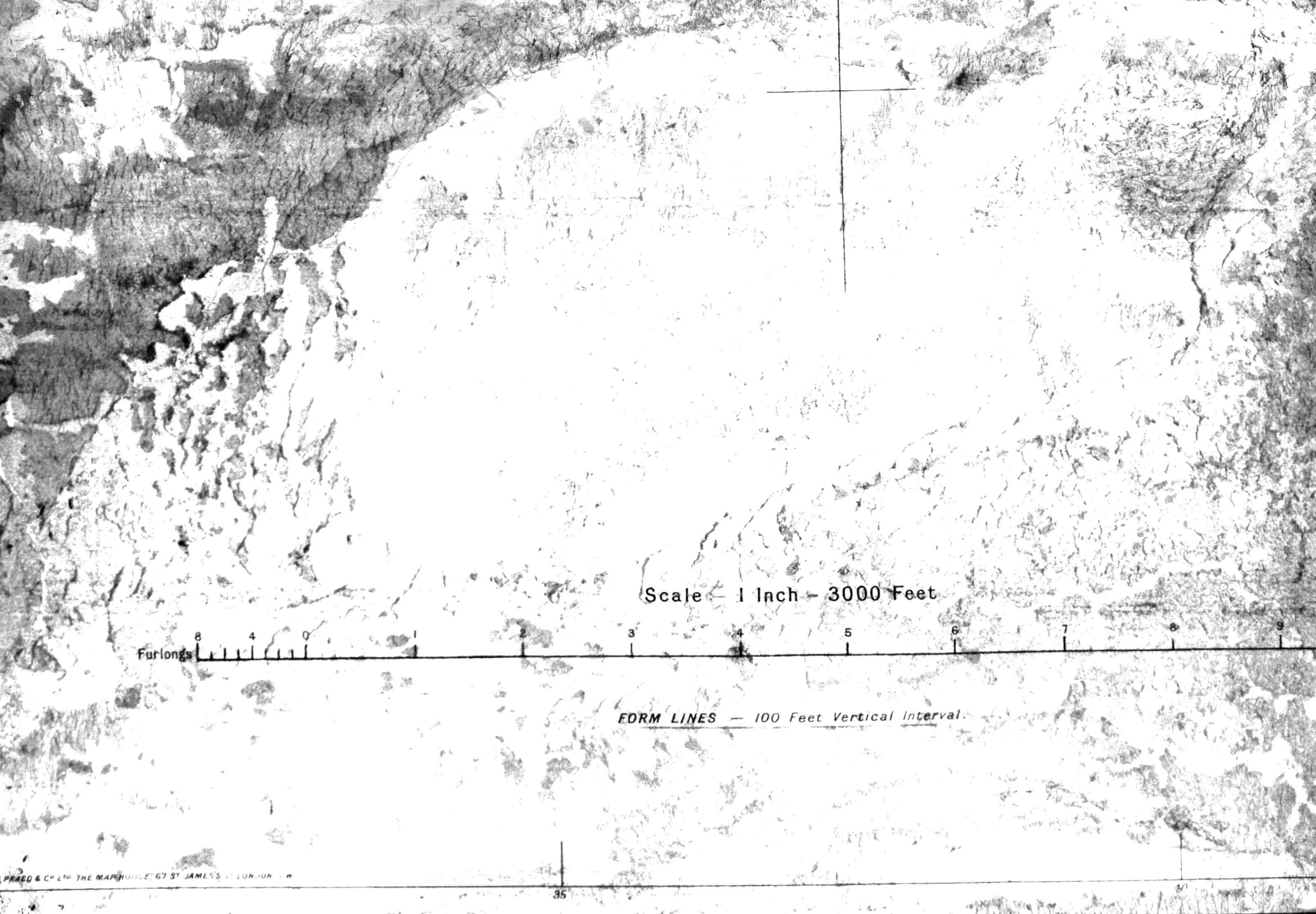
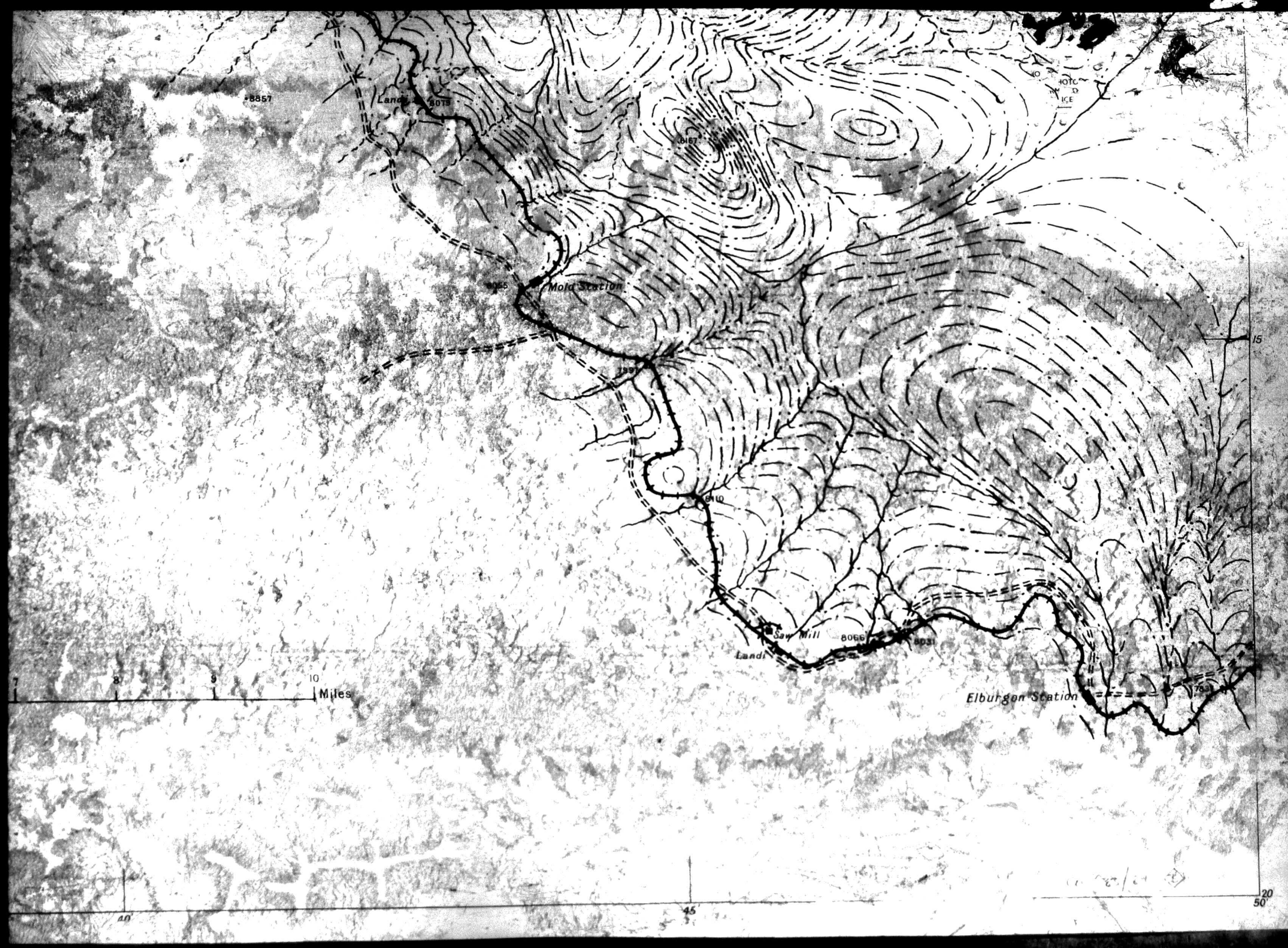
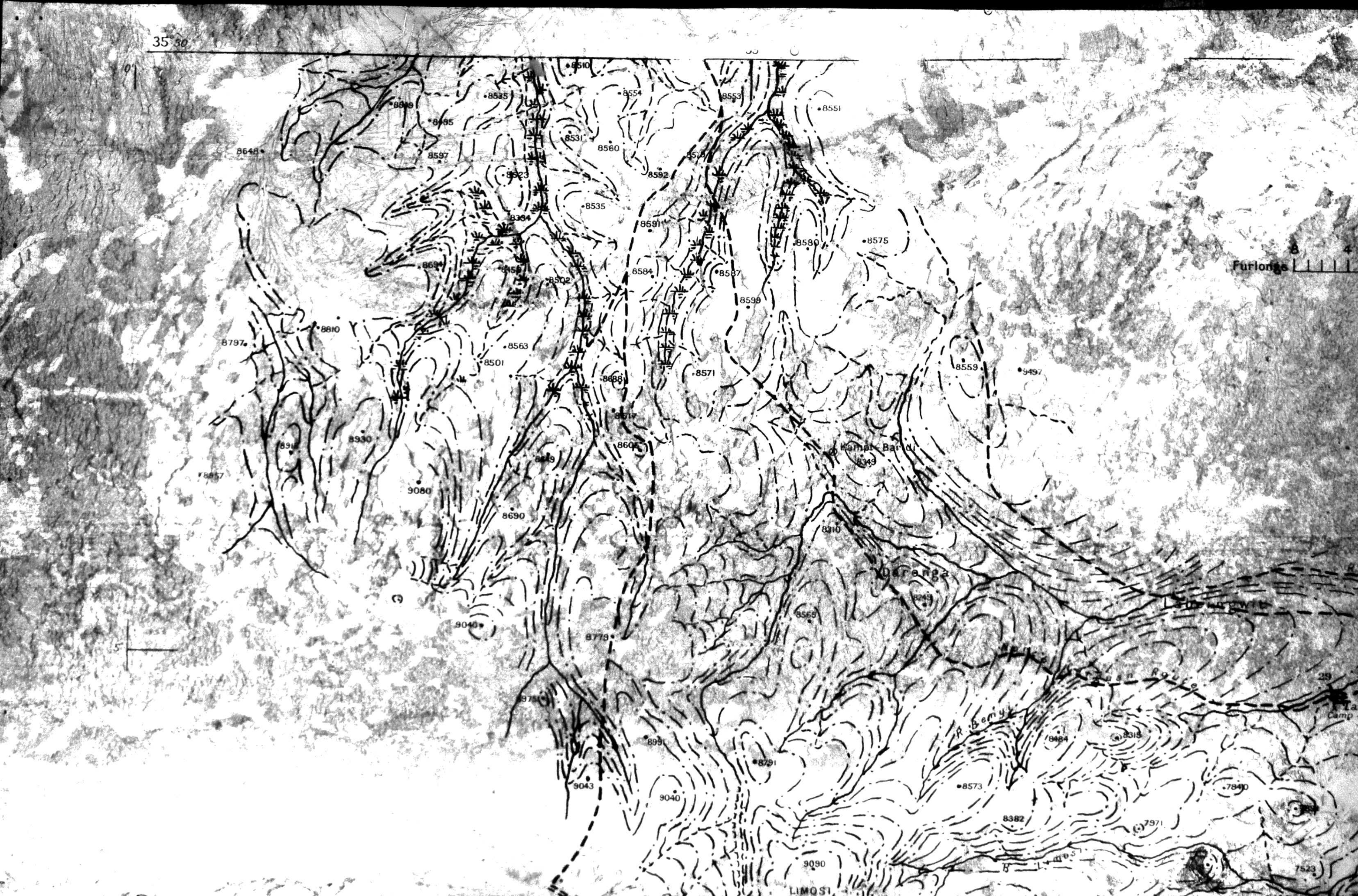
8235
KOIGI
8320
Mau Summit Sta.
Landi
8857
Landi
8055
Mold Station
7997
10'
15


Scale — 1 Inch = 3000 Feet
Furlongs
8 4 0 1 2 3 4 5 6 7 8 9
FORM LINES — 100 Feet Vertical Interval.
PRAED & Co LTD THE MAP HOUSE 67 ST JAMES'S LONDON S.W.
35


8857
Landi
8073
8167
Mold Station
8155
7997
8110
Saw Mill
8066
8031
Landi
Elburgon Station
7631
HOTC
D
ICE
7
8
9
10
Miles
15
20
40
45
50



35°30'
Furlongs
8
4
Kamai Baridi
Baranga
R. Benyi
LIMOSI
Camp
8648
8510
8535
8554
8553
8551
8531
8560
8597
8592
8523
8535
8591
8575
8580
8584
8587
8599
8810
8797
8563
8501
8559
8571
8517
8930
9080
8690
8605
8310
9040
8779
8569
8573
8382
7971
7840
7523
9043
9040
8791
9090

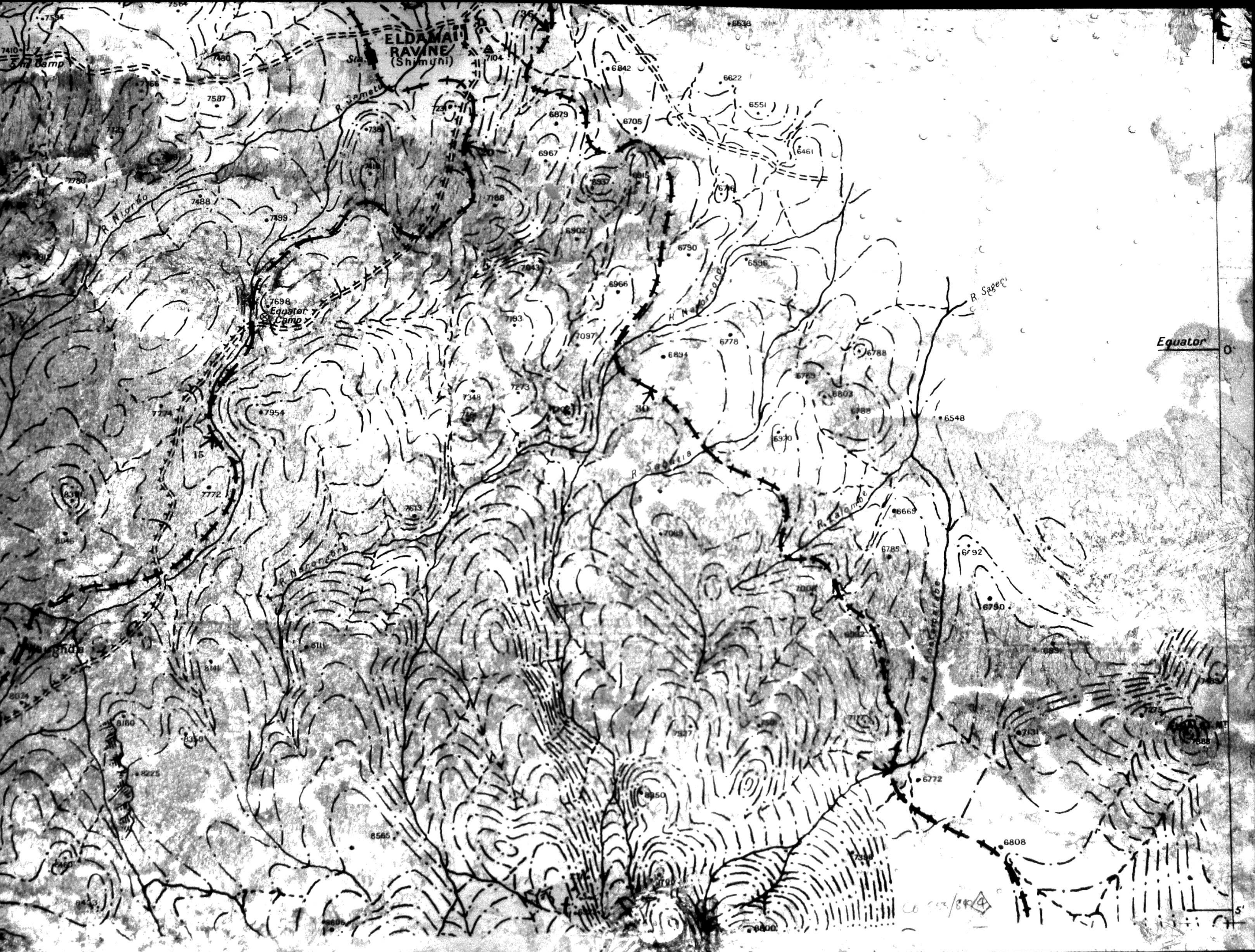

45
50
10'
Scale — 1 Inch – 3000 Feet
0
2
3
4
5
6
7
8
9
10
Miles
FORM LINES — 100 Feet Vertical Interval
6880
Falls

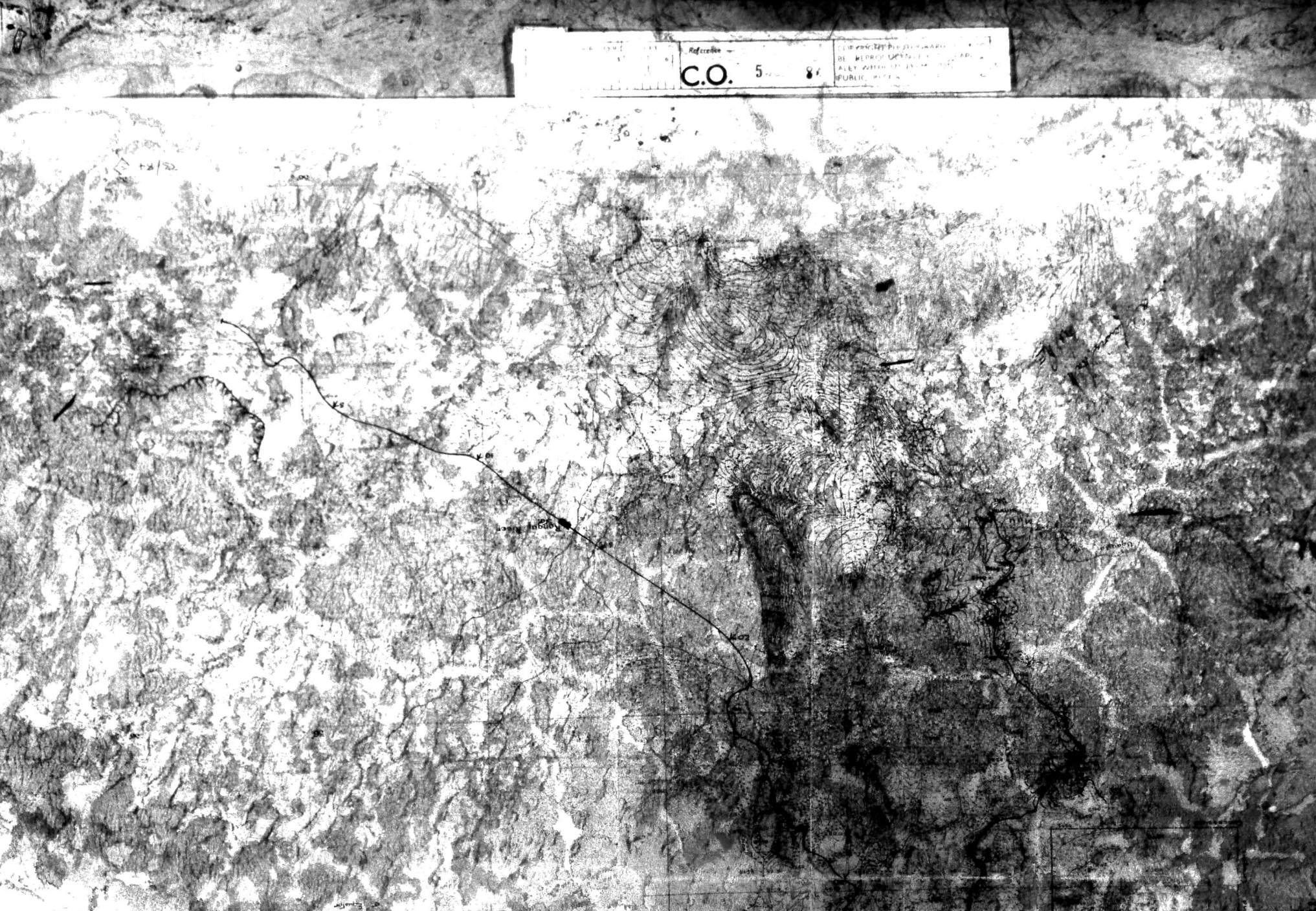
Darenga
8249
8565
8779
8991
8792
9040
8573
8484
8382
7971
9090
LIMOSI H.
8853
8940
8398
ROAD
8710
MBERIS
8430
8096
8306
8420
8368
8365
TIMBOROA
8770
8671
8831
UMURUA
8579
8370
8564
8630
8624
8575
8506
8636
7892
7780
7774


ELDAMA
RAVINE
(Shimuni)
Eldama
Sta.
Falls
Equator
Camp
Equator
0
R. Sabatia
20
30
6880
6923
6573
7104
7698
6548
6790
6891
6669
6785
7089
7954
7348
7461
7273
7188
7043
6967
6937
6842
7471
7167
7480
7587
7399
7774
7772
7813


TIMBOROA
9436
MBERIS
8430
SCLATERS
Mberis R.
R. Nioro
UMURUA
8579
8710
7892
7780
7488
8448
8096
8770
8671
8831
8420
8368
8306
8365
8370
8564
8527
8630
8624
7774
8575
8636
8046
8345
8342
8455
8635
8355
8267
8202
8225
8460
8433
8481


ELDAMA RAVINE
(Shimuhi)
Sta.
7104
7480
7587
6842
6879
6705
6967
6622
6551
6461
7698
Equator Camp
7954
7772
7613
7348
7273
6894
6778
6790
6596
6966
7097
R. Sageri
6548
6970
6665
6785
6792
6790
6772
6808
8225
8565
8111
8141
R. Niorao
15
30


ELDAMA RAVINE
(Shimuni)
Equator Camp
Equator
0'
5'
6548
6808
6772
7954
7772
7613
6778
6788
6790


Reference
C.O. 5 8

172

PUBLIC RECORD OFFICE.

Four ~~One~~ Documents being 2) a section of Mail Summit - Eldama Forests Railway

3) a sketch map of the railway from Landiani to Elburgon Stations.

4) a sketch map of the railway through the Eldama Forests

5) sketch map of a reconnaissance for a railway to Eldama Ravine

~~has~~ been removed to MR 750

14.vii.70

H Anderson