C. S. O.

0 3 2 1

MIN/PEA/2#4

0 3 2 1.

2#4

(Formerly)

SUBJECT:

PEAT DRYING IN THE FALKLANDS.

CONNECTED FILES.

NUMBER AND YEAR.	
0035.	Utilisation of Milled Peat for Briquetting and Power Generation - Report Requested.
316/22	Utilization of Peat Deposits in the Falkland Islands.
194/33	Establishment of a Peat Industry in the Falkland Islands.
446/22	Utilization of Peat.

DESPATCHES AND TELEGRAMS.

To S. of S.			From S. of S.		
No.	Date.	Page.	No.	Date.	Page.
			Confd Des. 40	27.10.47	14

EX. CO. MINUTES.

Date.	Page.	

Date. Name.

HCS

I want to test out (for purposes of record) the drying factor of the climate here in relation to peat-harvesting. The formula is as follows :-

$Td - Tw + \sqrt{V}$ where

Td = dry bulb thermometer

Tw = wet do do and

V = wind velocity

7 readings a day should be taken to provide mean and the product multiplied by H = number of hours between sunrise and sunset which will give the drying factor for a single day.

Could Met. Office oblige ?

MC. 25/1

Replied at 3
Rec 4-8

25/1

OK

1A

Address.

2.

Asst. Office

I spoke to HE. No
allowance is made for radiation.
Formula is from - Book
for Black or Low temperatures.
No duty here.

27.

6

2

C.S.

Some time ago I

asked Mr. Hawkins to work

out for me the local

"drying factor" with special

reference to peat. Can you

ascertain as to whether he

has done so? I gave

him the formula.

MC. 23/V

Lieut. Price

23/5.

0321

Reply at 3

see 4-8

FLK 1/47/7.

Meteorological Office,
Stanley, Falkland Islands.

28th. May, 1947.

Peat Drying Factor.

H.C.S.,

With reference to His Excellency's minutes dated 25th. January and 23rd. May on the drying factor of peat; all past records of observations taken in Stanley, were sent to the United Kingdom by Naval Met. Branch and the factors can, therefore, only be based on the current season.

This data is now complete and the information can be supplied early in June if His Excellency requires it urgently. The original minute states that the information is required for record purposes only and it would be appreciated if the work could be delayed for a further four weeks in view of the shortage of trained staff at the Met. Office.

G. A. Hawkins

Meteorological Officer.

The Honourable,
The Colonial Secretary,

Stanley.

Asst. Secy. Inc. 29/V

29.5

ME.

Mr H. has kept his promise this earlier but, as ME. knows, has been extremely pressed. Will ME. agree to x?

28.5

4

Hon. Col. Sec.

5-8
1.2

1. The attached paper is an attempt to answer His Excellency's request for data on the Drying Factor of Peat in Stanley.

2. You will note that the answer is entirely dependent on the units chosen for the various elements and, since it is based on monthly averages, the result can only be approximate .

3. If His Excellency is interested in collecting more reliable data, then I suggest that we commence a detailed analysis from November 1946, as soon as the book giving the basis for the formula arrives out from U.K.

pp ARL 26/6

Replied

G. H.
Meteorological Officer.
24.6.47

FLK 1/47/9

Peat Drying Factor for Stanley.

This analysis must be treated with caution since it involves a number of assumptions which are difficult to justify. It is based on the formula $F = [(Td - Tw) + \sqrt{V}]\ S$, used by the Irish Peat Board, and the results can only be used for comparison with the Irish statistics, even if the assumptions given below are justifiable.

2. It is assumed that the units are as follows:-

Td, Tw (Dry Bulb and Wet Bulb Temperatures)	--	Degrees Fahrenheit
V (Wind Velocity)	--	mph or knots
S (Hours of Bright Sunshine)	--	Hours

The formula is obviously an empirical one since it is dimensionally unsound and hence any change of units must falsify the results.

3. Detailed observations are only available for one season (1946-7) and this is acknowledged to have been an exceptionally bad one - a fact which is supported by the following rough figures:-

1946-7	Rain Fall (% deviation from previous season)
November	+ 100%
December	- 50%
January	+ 30%
February	+ 30%
March	+ 90%

Thus the total rainfall, which must bear some relation to the wet bulb depression (Td - Tw), was 50% above the previous seasons total. Hence, since (Td - Tw) probably contributes at least as much as V to the factor F, an answer based on the 1946-7 season is likely to be 25% lower than the average.

4. An alternative method is to use the average monthly values of Td, Tw, V and S for as many seasons as possible. This makes the assumption that:-

$$[(\overline{Td} - \overline{Tw}) + \sqrt{\overline{V}}]\ \overline{S} = \overline{[(Td - Tw) + \sqrt{V}]\ S} \quad - (a)$$

which would only be true of Td , Tw, V and S bore very special relationship to each other.

In practice the values of Td, Tw, V and S are so distributed that high values of one function are normally associated with high values of the others; low values of one function are associated with low values of the others. This distribution obviously renders the assumption (a), above, invalid.

Two extreme examples will indicate the maximum error likely to be introduced

When $(Td - Tw) = 10$, $V = 25$, $S = 12$

$$F_1 = 10 + 25\ 12 = 170$$

and when $(Td - Tw) = 0$, $V = 0$, $S = 0$

$$F_2 = 0$$

$$\overline{F_1 + F_2} = 85$$

and $$\left[(\overline{Td} - \overline{Tw}) + \sqrt{\overline{V}}\right] \overline{S} = \left[\frac{10 + 0}{2} + \sqrt{\frac{25}{2}}\right] \frac{12}{2} = 50$$

Hence the maximum possible error resulting from the assumption would be of the order of 40%. In practice there is every reason to believe that the error will be considerably less than 40% and the method will give a value of F which is more accurate than that derived from the individual values of Td, Tw, V and S for one season.

The errors involved in the method are minimised to some extent, by working out factors based on the monthly averages; this should take account of the seasonal changes of sunshine, wind and himidity.

	$\overline{(Td - Tw)}$	$\overline{v}$	$\overline{s}$	Monthly Factor	Seasonal Factor
1932-3					
November	3.3	20	7.3	58	
December	3.9	14	6.8	52	
January	3.5	13	5.1	36	
February	3.5	13	5.5	39	43
March	2.8	14	4.7	31	
1933-4					
November	3.1	20	4.7	35	
December	2.4	15	6.1	44	
January	2.4	18	6.7	45	
February	5.6	17	4.5	44	43
March	1.3	22	4.4	26	
1934-5					
November	6.1	16	4.6	46	
December	3.5	22	5.7	52	
January	3.3	16	3.6	26	
February	2.9	18	4.9	35	40
March	2.3	22	6.0	42	
1935-6					
November	3.2	15	6.5	52	
December	3.4	15	4.2	30	
January	1.5	10	6.5	30	
February	3.6	16	6.9	52	39
March	2.3	20	3.9	26	
1936-7					
November	4.1	18	5.8	49	
December	1.5	19	7.3	43	
January	2.7	14	6.0	39	
February	4.6	14	5.5	46	43
March	3.0	15	5.7	40	
1937-8					
November	4.0	8	6.1	48	
December	3.1	4	4.6	28	
January	4.2	8	5.5	38	
February	7.0	14	5.4	58	39
March	2.4	14	3.6	23	
1938-9					
November	4.4	14	6.3	51	
December	3.7	8	5.2	34	
January	2.7	10	4.4	25	
February	3.5	12	6.1	43	37
March	2.6	11	5.1	31	

Hence Mean value = 41 and seasonal deviation from mean is 10%.

This value is probably low because

i The wind speeds were estimated from a sheltered position in Stanley and the average value may be as much as 5 mph low.

ii Sixty hours of potential sunshine was lost annually due to the position of the recorder.

iii The fundamental assumption made in deducing the factors, will produce a low answer.

The mean value of the Drying Factor, therefore, probably lies closer to 45.

G.A Hawkins

Meteorological Officer.

Meteorological Office,

Stanley.

24th. June, 1947.

ME.

4-8 is the report to
M. ME about it.

1.7

~~Hawkins~~ Please convey my thanks to Mr. Hawkins; the book can be borrowed (9 Vols) from Mr. Jack Barnes

MEC 3/VII

No. 321

(It is requested that, in any reference to this minute the above Number and the date may be quoted.)

MINUTE.

9

3rd July, 19 47.

From The Colonial Secretary,

Stanley, Falkland Islands.

To Meteorological Officer,

Stanley.

Peat Drying in the Falklands.

4 I am directed by the Governor to acknowledge the receipt of your minute of the 24th of June, 1947, and to convey to you the thanks of His Excellency for the paper submitted therewith.

2. With regard to your third paragraph I am to say that it is understood that Mr. Jack Barnes has a copy of the book, which he would doubtless be prepared to lend you on his return to Stanley.

Colonial Secretary.

VP.

B.W. 3.4.48 3.4.48 WBC 3.7.47

7/10

Hon. P. S.

P. 208 of Handbook noted, thank you.

It is observed that :-

1. Mr. Martin does not state under what conditions or in what units his measurements were made.

2. His results apply to one season only, which might presumably have been an exceptional one.

3. The formula given to me earlier does not agree with that in the Handbook.

5 4. My assumption (in FLK 1/47/9, dated 24th June) that S = hours of bright sunshine is invalid.

5. 5. The corrections to the factors in FLK 1/47/9 11 are attached.

G. H.

28.7.

11

FLK 1/47/16

Drying Factors for Stanley Based on Formula D= F. = $S(T_d-T_w)$ V

S = Hours of daylight T_d= Dry bulb temperature in degrees fahrenheit.

T_w= Wet Bulb temperature V= Wind velocity in miles per hour

1932 -3	Factor.		1936-7	Factor	
Nov.	3.3x4.5x15.5 = 231		Nov,	4.1x4.3x15.5 = 273	
Dec.	3.9x3.8x16.5 = 244		Dec.	1.5x4.4x16.5 = 109	
Jan.	3.5x3.6x16.0 = 202	199	Jan.	2.7x3.8x16.0 = 165	190
Feb.	3.5x3.6x14.5 = 183		Feb.	4.6x3.8x14.5 = 254	
Mch.	2.8x3.8x12.5 = 133		Mch.	3.0x3.9x12.5 = 146	
1933-4			1937-8		
Nov.	3.1x4.5x15.5 = 217		Nov.	4.0x2.9x15.5 = 180	
Dec.	2.4x3.9x16.5 = 155		Dec.	3.1x2.0x16.5 = 102	
Jan.	2.4x4.3x16.0 = 165	126	Jan.	4.2x2.8x16.0 = 189	194
Feb.	5.6x4.1x14.5 = 234		Feb.	7.0x3.8x14.5 = 386	
Mch.	1.3x4.7x12.5 = 76		Mch.	2.4x3.8x12.5 = 114	
1934-5	[illegible]		1938-9	[illegible]	
Nov.	6.1x4.0x15.5 = 378		Nov.	4.4x3.8x15.5 = 243	
Dec.	3.5x4.6x16.5 = 266		Dec.	3.7x2.9x16.5 = 177	
Jan.	3.3x4.0x16.0 = 211	234	Jan.	2.7x3.1x16.0 = 134	168
Feb.	2.9x4.3x14.5 = 181		Feb.	3.5x3.5x14.5 = 178	
Mch.	2.3x4.7x12.5 = 135		Mch.	2.6x3.4x12.5 = 110	
1935-6			1939-40		
Nov.	3.2x3.9x15.5 = 194		Nov.	6.8x3.8x15.5 = 400	430
Dec.	3.4x3.9x16.5 = 219		Dec.	6.8x4.0x16.5 = 459	
Jan.	1.5x3.1x16.0 = 74	165	Jan.		
Feb.	3.6x4.0x14.5 = 209		Feb.		
Mch.	2.3x4.5x12.5 = 130		Mch.		

Therefore the Mean Drying Factor = 182, with a deviation of ± 30, from season to season.

5 For reasons 1 and 3 given in FLK 1/47/9, this value is probably low and the mean value probably lies closer to 200.

Hence Mean Drying Factor = 200

Meteorological Office, Stanley
28th July 1947

G. M. Howkins
Meteorological Officer.

NE

10–11 f. with p. 208 of Institute of C.E.'s of Ireland Bulletin for March 1946 which has now arrived. ABC 25.7

No.

(It is requested that, in any reference to this minute, the above Number and the date may be quoted).

MINUTE.

12

19

To

From

Stanley, Falkland Islands.

C.S.

Having now digested all the available literature on this subject I am fully persuaded that the briquetting of peat on a commercial basis here is not worth pursuing unless as a bye-product from power generation — even so it would be a doubtful proposition.

2. The only conceivable market is Uruguaya and as to this it must be born in mind

(a) Thermal efficiency of peat is inferior to that of bituminous coal and price factor f.o.b. would have to be in order of 1:2,

(b) Handling qualities of briquettes are poor and there would be considerable wastage

(c) Price delivered including F.I.C. freight and handling charges would not accord or would be unlikely to accord with (a) above

(d) For domestic use it would not be regarded as an efficient substitute for electricity, gas, coal or mineral oil and could not compete on price with charcoal

(e) For commercial use the fire-bars etc of existing coal consuming plant would require adaptation and no firm undertaking would contemplate this unless assured of a substantial saving in operating cost

13

3. A possibility is production of alcohol but this would involve considerable capital outlay and the product would have to compete with petroleum.

4 Finally, it is well to bear in mind the conclusions reached by the Canadian Government after long experimentation and the expenditure of hundreds of thousands of dollars:—

"No manufacturing plants are producing peat fuel on a commercial basis (this was written before recent and costly developments at Lullymore MC) ..... numerous attempts have been made to do so but failure has attended every one. Most have failed because the finished product could not be produced cheaply enough to compete with other high-grade fuels." (Official Bulletin of the Canadian Govt.).

5. I think this file can now be discontinued unless you think it well to bring these conclusions to the notice of the C.O. who (in Mr Lutkin's time) started this hare again? Despatch on any predecessor's Development Plan refers.

MC. 13/X

Yr

Draft for consideration.

22.x

MC 23/X

14

FALKLAND ISLANDS.

No. 40.

CONFIDENTIAL.

GOVERNMENT HOUSE,

STANLEY.

27th October, 1947.

Sir,

105 in 8/42 "Policy - General & Comprehensive"

I have the honour to refer to your Confidential Despatch No. 39 of the 24th of October, 1946, on the subject of my predecessor's proposals for development in the Colony, and to inform you, with regard to paragraph 12 (d) of the enclosure therein, that I have now studied all the available literature on the subject of the "briquetting" of peat and from this and from other enquiries am fully persuaded that it is not worth pursuing here unless as a bye-product from power generation. Even so, I consider that it would be a doubtful proposition.

2. The only conceivable market is Uruguay and as to this it must be borne in mind that:-

(a) the thermal efficiency of peat is inferior to that of bituminous coal and price factor f.o.b. would have to be in order of 1 : 2;

(b) the handling qualities of briquettes are poor and there would be considerable wastage;

(c) the price delivered including Falkland Islands Company's freight and handling charges would not accord or would be unlikely to accord with (a) above;

(d) for domestic use it would not be regarded as an efficient substitute for electricity, gas, coal or mineral oil and could not compete in price with charcoal;

(e) for commercial use the fire-bars etc. of existing coal-consuming plant would require adaptation and no undertaking would contemplate this unless assured of a substantial saving in operating cost.

3. A possibility is production of alcohol but this would involve considerable capital outlay and the product would have to compete with petroleum.

4. Finally, it is well to bear in mind the conclusions reached by the Canadian Government after long experimentation and the expenditure of hundreds of thousands of dollars:-

"No manufacturing plants are producing peat fuel on a commercial basis (this was written before recent and costly developments at Lullymore - M.C.) ..... numerous attempts have been made to do so but failure has attended every one. Most have failed because the finished product could not be produced cheaply enough to compete with other high-grade fuels." (Official Bulletin of the Canadian Government).

5. In all the circumstances, therefore, you may feel disposed

to/

THE RIGHT HONOURABLE
ARTHUR CREECH JONES, P.C., M.P.,
SECRETARY OF STATE FOR THE COLONIES.

WL

15

to agree that the project of peat-briquetting, which has arisen Phoenix-like from time to time over a period of many years, may now rest decently interred in its own ashes.

6. I take this opportunity to invite your attention to my confidential despatch of 22nd January, 1947, of which I have as yet received no official acknowledgement.

I have the honour to be,
Sir,
Your most obedient,
humble servant,

(Sgd.) MILES CLIFFORD.

1 in 0040 "Dev. Policy"

Para extracted to 0040.

PA (Intld) ABM 28.X