(1) பக்கங்களின் எண்ணிக்கை 64

(2) புதுக்கித் திருப்பிய நாள் 18-2-88

(3) ஆதாரங்குறிப்பவர் சுருக்கொப்பம்

தமிழ்நாடு ஆவணக் காப்பகம்.

தமிழ்நாடு அரசு

P.W.D துறை

அரசாணை எண்.
மு. கோப்புத் தாள் எண். 2507W அச்சகம் பலவகை

நாள் : 16-8-1988 ~~198~~.

கவோ கண்டபடி கையாளவோ கூடாது

ஸ:1—18,006—15-8-87.

2507
1

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

READ—the following papers :—

From Surgeon-Major J. A. LAING, Officiating Sanitary Commissioner, to the Chief Secretary to Government, Public Department, dated Madras, 13th March 1888, No. 507.

In forwarding the accompanying letter from the Collector of Nilgiris, I have the honor to state that I quite concur in the remarks made by Dr. VanGezzel, Chemical Examiner to Government, in connection with the analyses of the water from the Marlimund reservoir.

From L. R. BURROWS, Esq., Collector of the Nilgiris, to the Chief Secretary to Government, Public Department, (through the Officiating Sanitary Commissioner, Madras), dated Ootacamund, 9th March 1888, No. 13.

With reference to G.O., dated 11th January 1888, No. 30, Public Department, I have the honor to forward, for the information and orders of Government—

(1) a copy of a letter from the Acting Chemical Examiner, to the Executive Engineer, Nilgiri Division, forwarding analysis of eight samples of water taken from the Marlimund reservoir and its affluents, and dated 23rd February 1888, No. 132 ;

(2) analysis of water taken from the Marlimund reservoir by the Collector under the order above quoted.

2. The analyses are said to indicate contamination by vegetable organic matter.

From W. B. DE WINTON, Esq., Executive Engineer, Nilgiri Division, to the Superintending Engineer, IV Circle, Coimbatore, dated Pandalur, 8th June 1888, No. 1054.

With reference to your endorsement No. 164 N.I., of 21st April 1888, I have the honor to report as follows :—

1. In the report which accompanied the estimate for the Ootacamund northern water-supply, it was stated that 188·65 acres of the catchment area of Marlimund reservoir would be cut off, because they were planted with tea, and therefore presumably contaminated with manure, and would be supplemented by 200 acres on Snowdon, whose rainfall would be conveyed to Marlimund in a masonry duct. Rs. 1,000 were provided in the estimate for excluding the contaminated area, and Rs. 30,750 for bringing in the new supply from Snowdon.

2. This latter part of the scheme has been carried out with the result that up to date, instead of the 15 cubic feet per second which was the anticipated discharge, we have only obtained 5 cubic feet per second ; and I am of opinion that we shall never get anything approaching the anticipated discharge from this area, and that it will never compensate for the area which it is proposed to exclude at Marlimund.

3. I may mention here that I accompanied the Chief Engineer last month on an inspection of the available catchment area on the northern slopes of Snowdon, when it was decided that no further supply could be obtained from that quarter, and that I have since inspected the southern slopes with a similar result.

4. No expenditure has as yet been incurred on the sub-head "excluding contaminated area of Marlimund reservoir, Rs. 1,000," and I propose that none should take place for the following reasons:—

(*a*) The Chemical Examiner's analysis goes far to prove that the amount of animal organic matter in the Marlimund water is infinitesimal.

(*b*) It also proves that the Snowdon water is very little superior in quality to the Marlimund water.

(*c*) The cost of excluding the area will be Rs. 6,825 instead of Rs. 1,000 made up as follows:—

	Rs.
55,200 cubic feet earth-work, at Rs. 10	552
955 running feet of Vengay wood trough on blue gum piles, at Rs. 2½	2,388
890 running feet of masonry duct, at Rs. 4	3,560
Petty supervision and contingencies	325
Total ...	6,825

The plan and longitudinal sections herewith sent will explain this estimate. The red-dotted line on the plan from A to B, B to C, C to D, E to F, F to G, shows the lowest margin of the tea all round the lake. The portions from C to F and G to H are swamps which will have to be crossed by troughs, because they are the principal affluents of the reservoir, while the length from H to K crosses area which is to be retained, through which the catch-drain must be tunnelled.

The longitudinal section A to K shows the line a catch-drain would have to take, if it excluded all the tea, and only the tea; while the sections D, C and E, F show branch channels which would join the main channel at D and F, respectively.

It would, I think, be impossible to go down to the point B, which is a foot lower than the swamp C, F, and some area of tea would here have to be purchased and uprooted.

I have provided channel, trough, and duct 3 feet wide, and for the former an average depth of excavation of 3 feet.

(*d*) The plan and section above referred to show how difficult and expensive it would be to cut off the tea, and I do not believe the desired object would be attained. I have been frequently over the ground, and have never seen manure being laid; and I understand that, when it is laid on tea estates, it is always buried 2 feet under ground, so that no mere surface catch-drain would be of any use in arresting percolation from it.

(*e*) The water-supply from Snowdon will never compensate for the area excluded at Marlimund, and there will always be danger of a water famine.

5. My objection to the exclusion of the tea may therefore be summed up as follows:—

(1) It probably does no harm;
(2) Snowdon water no better than Marlimund;
(3) Difficulty and expense of exclusion;
(4) Doubt as to effectiveness of any possible attempt at exclusion;
(5) Resulting scarcity of water.

6. I will now state what I propose to do instead—

(*a*) I believe the injurious elements in the water, which the analysis has brought to light, to be due chiefly to vegetable matters brought in from the peat bogs, through which every affluent of the reservoir flows, and that the relatively large quantity of this matter is due partly to the subsidence in November last of Mr. Wapshare's peat bog into the reservoir, and partly to the custom of cutting peat all round the reservoir for the Ootacamund market. Wherever this peat cutting is in progress the water flowing therefrom to the reservoir is always very turbid.

2507/2

The subsidence was unavoidable, and may not occur again; but I propose that all peat cutting on the margin of the reservoir should be prohibited. (The sheds on the margin are not cattle sheds but sheds for stacking peat). This would involve the purchase of the peat bogs which might be effected, I believe, at a moderate cost.

(*b*) I would fence in the whole catchment area and prohibit all grazing of cattle therein. This would involve some compensation to owners of land on the margin who have now the right of grazing.

(*c*) I would prohibit the construction of dwelling houses or buildings of any kind within the catchment area.

(*d*) If the medical advisers of Government consider it necessary, I would construct filter beds at Snowdon service reservoir, the cost of which would amount to something like Rs. 40,000.

7. I therefore beg that you will be good enough to lay the matter before Government, and obtain orders thereon. Until then I will delay the submission of the revised estimate, which, unless filter beds are adopted, will not exceed the sanctioned estimate.

ENCLOSURE.

From J. L. VANGEZZEL, Esq., M.B., Acting Chemical Examiner, to the Executive Engineer, Nilgiri Division, dated Madras, 23rd February 1888, No. 132.

I have the honor to forward analysis of eight samples of water received with your letter, dated 12th February 1888, No. 3197, and to inform you that all the waters contain Albumenoid Ammonia in such amount as would place them in the class of "suspicious waters." The small amount of Chlorine and relatively small free Ammonia tends to negative the probability of the pollution being other than of vegetable origin; but chemical analysis alone cannot decide the *nature* of the pollution, and it is this consideration, which is all important, in condemning a water or passing it as fit for consumption. If the affluents of the reservoir are open to pollution from animal organic matter, such as manure and town sweepings, &c., obviously the water must be condemned. In the positive absence of such sources of pollution, the results of the chemical analysis, as furnished in the table appended hereto, would indicate that the waters are rain-water tainted by vegetable matters, for, in other respects, they are wholesome enough.

I would, however, point out that waters polluted by vegetable matter, though they are considered less dangerous than those polluted by animal matter, are not considered harmless.

Waters Nos. 3, 5, 7 and 8 are more suspicious than the rest.

No. 242 E.W.

Submitted to the Chief Engineer for favor of orders with reference to G.O., dated 16th April 1888, No. 1150 W.

(Signed) J. W. MARTIN,
Ex. Engr., in charge IV Circle.

OOTACAMUND,
14th June 1888.

No. 403 D.

Referred to the Surgeon-General with the Government for favor of remarks.

(Signed) J. O. HASTED, Colonel, R.E.,
Chief Engineer, P.W.D.

OOTACAMUND,
12th July 1888.

From G. BIDIE, Esq., M.B., C.I.E., Surgeon-General with the Government of Madras, to the Secretary to Government, Public Works Department, dated Ootacamund, 2nd August 1888, No. 0/388.

I have the honor to return, with remarks, the papers regarding the Ootacamund northern water-supply, referred to me under your No. 403 D of 12th July 1888.

2. As regards the quality of the water feeding and stored in the Marlimund reservoir, I quite agree with the Chemical Examiner that if the organic impurities which exist in it were due to pollution from animal excreta, it would be unsafe.

3. The actual amount of solid matter which it contains is very small, and it is a soft water. The neighbouring cultivated land is, of course, objectionable, as the washings of the soil may possibly carry down both organic matter and salts; but, as noted by the Chemical Examiner, the small quantities of Chlorine and free Ammonia found in the water are against the probability of contamination from manure.

4. So far as I can learn, the amount of manure applied to the tea land is small, and is almost exclusively cattle manure from the estate, and no town poudrette and sweepings have been used. When put out the dung is dug in and incorporated with the soil, and for a time there would be the risk, during heavy rain, of some of it reaching the lake, where it would remain active for a considerable period owing to the slow process of oxidation in stagnant water. This risk, however, is merely stated as a possibility, as hitherto, so far as I know, there have been no signs of such contamination; and the manurings, according to my own observation, have been few and far between. For many years the water has been liable not only to this but to more serious pollution during delivery in an open channel, but apparently without inducing in the people who use it any of those ailments which are caused by drinking impure water. This is a practical test, which, taken in conjunction with the chemical analysis, is so far assuring.

5. With regard to the proposal to have a catch-drain to carry off the surface wash of the tea garden, it seems to me undesirable to spend so much money on what would after all be a very doubtful expedient for the protection of the reservoir. The most perfect safeguard would be to buy up the whole of the tea garden that drains into the lake, and to put the land under strict conservancy. But before advising such an expensive measure, it seems desirable to watch carefully the chemical condition of the water for a further period, and to take measures to remedy other sources of pollution.

6. In my opinion the organic matter now found in the water is mostly, if not entirely, of vegetable origin, and derived from the neighbouring peat deposits and swamps which drain into the lake. Both of those sources of pollution might be rendered less obnoxious by deep drainage, the bogs being purchased so as to render their better conservancy practicable. It need hardly be said that vegetable matter in water is not always innocuous, but if the expedients proposed did not reduce it to a harmless amount in the Marlimund water, it might be further disposed of by filtration.

7. With regard to the expected supply to the reservoir from the northern side of Snowden, it appears to me that the channel might be greatly improved, for although a considerable body of water enters it at its eastern extremity, from the hill stream which it taps, nearly the whole of this is lost by leakage in transit.

ORDER—dated 16th August 1888, No. 2507 W., Public Works.

The letter from the Surgeon-General will be communicated to the Executive Engineer, whose special attention will be called to the last paragraph.

2. The Government are of opinion that no provision need be made in the revised estimate either for catch-drains below the tea plantation or for filtering beds. To drain the peat bogs by deep cutting, as proposed, or to prohibit peat cutting, would involve the purchase of the peat bogs, and the Government are not prepared to sanction this at present.

(True Extract.)

Captain, R.E.,
Under-Secy. to Govt., P.W.D.

To the Superintending Engineer, IV Circle.
" Public Department.
Exd. F. R. Bantleman.
Spare Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1888} Madras.

PUBLIC WORKS.

Dated August, 16th.

Read. *Encl.*

G.O., 16th Aug. 1888, No. 2507 W.

AUGUST.

Ootacamund Water-Supply Scheme

Communicating to the Executive Engineer, Nilgiri Division, letter from the Surgeon-General on the subject of the — with instructions for the preparation of a revised estimate.

NILGIRI COLLECTOR'S OFFICE,
RECEIVED, 2nd March 1888.
No. 13
2507

FROM
L. P. Kennedy Esqr.
COLLECTOR OF
NILGIRIS.

TO
THE CHIEF SECRETARY
TO GOVERNMENT
Public Department
Through the Officiating
Sanitary Commissioner, Madras.

SIR,

I have the honor to forward for the information and orders of Government,

(1) a copy of a letter from the Ag. Chemical Examiner to the Executive Engineer Nilgiri Division forwarding analysis of

of 8 samples of water taken from the Manlimmed Reservoir and its affluents and dated 28th February 1888 No. 132.

(2) Analysis of water taken from the Manlimmed Reservoir by the Collector under the order above quoted.

2. The analysis are said to indicate contamination by vegetable organic matter.

I have the honour to be,

Sir,

Your most obedient servant,

Collector.

Ref:

J. Collector & Co's Ltr

SUPG. ENGINEER'S OFFICE
19 APR 88
P. W. D.
FOURTH CIRCLE

SUPG. ENGINEER'S OFFICE
13 JUN 88
P. W. D.
FOURTH CIRCLE

EXECUTIVE ENGINEER'S OFFICE
7 JUN 1888
P. W. D.
PALGHAT

Receive Letter No. 12 9-6-88.
from the Collector of Palghat

No. 132.

Chemical Examiner's Office
Madras 28th February 1888

2507/5 2 Sh

From,

J. L. Van Geyzel Esqr. B. A.
Ag. Chemical Examiner
Madras.

To,

The Executive Engineer
Palghat Division.

Sir,

I have the honor to forward analysis of 8 samples of water received with your letter dated 13 February 1888 No. 3197 and to inform you that all the waters contain albumenoid Ammonia in such amount as would place them in the class of "suspicious waters". The small amount of Chlorine and relatively small free Ammonia tends to negative the probability of the pollution being other than of vegetable origin but Chemical analysis alone

alone cannot decide the nature of the pollution and it is this consideration which is all important in condemning a water or passing it as fit for consumption. If the affluents of the Reservoir are open to pollution from animal organic matter such as manure and town sewerings &c. obviously the water must be condemned. In the positive absence of such sources of pollution the results of the chemical analysis as furnished in the table appended hereto, would indicate that the waters are Rain waters tainted by vegetable matter, for in other respects they are, wholesome enough.

I would however point out that waters polluted by vegetable matter, though they are considered less dangerous than those polluted by animal matter, are not considered

considered however 250/6 3 p/s

waters Nos. 3, 5, 7 and 8 are more suspicious than the rest.

I have &c.

(Signed) J. L. Van Dezzel M.D.
Ag Chemical Examiner

(True Copy)

(Initialled) W. S. de W.
Executive Engineer N. D.

(True Copy)

Collector

No

SUPG: ENGINEER'S OFFICE
NO. 1
13 JUN.88
P. W. D.
FOURTH CIRCLE

EXECUTIVE ENGINEER'S OFFICE
GEN'L NO. 1
7 JUN 1888
P. W. D.
NILGIRIS.

2807

No 507

Office of Sanitary Commissioner
Madras 13th March 1888
1060.

From

Surgeon Major J.A. Laing
Offg Sanitary Commissioner

To

The Chief Secretary to Government
Public Department

Sir,

4 Enclosures

In forwarding the accompanying letter from the Collector of Nilgiris, I have the honor to state that I quite concur in the remarks made by Dr. Van Geyzel, Chemical Examiner to Government, in connection with the analyses of the water from the Marlimund Reservoir.

I have the honor to be, Sir,
Your most obedt Servant
Jas. Anderson Laing.
Offg Sanitary Commissioner
for Madras

SUPG: ENGINEER'S OFFICE
NO.
13 JUN.88
P.W.D.
FOURTH CIRCLE

SUPG: ENGINEER'S OFFICE
NO.
19 APR.88
P.W.D.
FOURTH CIRCLE

SUPG: ENGINEER'S OFFICE
JUN 1888
P.W.D.
NILGIRIS.

2807
8 5:P

No. 1054, P. W. D.

N.B.—*Please quote the number and date of this letter in future communication on this subject.*

NILGIRI DIVISION OFFICE.

STATION Camp Sandalwood 18th June 1888.

Enclosures. 27 From W. B. de Winton Esqr.

EXECUTIVE ENGINEER, NILGIRI DIVISION,

OOTACAMUND,

5 Orgl Enclosures (with folios)

To

THE SUPERINTENDING ENGINEER,

FOURTH CIRCLE,

COIMBATORE.

SIR,

With reference to your endorsement No 164/W.I of 21st April 1888, I have the honor to report as follows:—

(1). In the report which accompanied the Estimate for the Ootacamund Northern Water Supply, it was stated that 1885 Acres of the Catchment area of Marlimund Reservoir would be cut off, because they were planted with tea, and therefore presumably contaminated with manure, and would be supplemented by 200 acres on Snowdon, whose rainfall would be conveyed to Marlimund in a masonry duct— & Rs 1000/ were provided in the Estimate for

Excluding

excluding the contaminated area, and Rs. 30750 for bringing in the new supply from Snowdon.

2. This latter part of the scheme has been carried out, with the result that, up to date, instead of the 15 Cft. per second which was the anticipated discharge, we have only obtained 5 Cft. per second, and I am of opinion that we shall never get anything approaching the anticipated discharge from this area, and that it will never compensate for the area which it is proposed to exclude at Ellarimund.

3. I may mention here that I accompanied the Chief Engineer, last month on an inspection of the available Catchment area on the Northern slopes of Snowdon, when it was decided that no further supply could be obtained from that quarter, and that I have since inspected the Southern slopes with a similar result.

4. No expenditure has as yet been incurred for the published "Tender Notice" inviting Contractors to tender for the contaminated area of Marimund Reservoir. Rs 1000/- and I propose that none should take place, for the following reasons.

(a) The Chemical Examiner's Analysis goes far to prove that the amount of Animal Organic matter in the Ellarimund water is infinitesimal

(b) Also proves that the Snowdon water is very little superior in quality to the Ellarimund water.

(c) The cost of excluding the area will be Rs 6825 instead of Rs 1000/- made up as follows:

55200 Cft. Earthwork @ Rs 10/-		Rs 552-
955 Rft of Verandy wood trough on Blue gum piles @ Rs 2½		" 2388-
890 Rft of Masonry duct @ Rs 4/-		" 3560-
Petty expenditure & Contingencies		" 325-
	Total Rs	6825-

The plan and longitudinal sections herewith put up explain these estimates. The red dotted line on the plan from A to B, B to C, C to D, E to F, F to G, shows the lowest margin of the tea pot round the Lake. The portions from

from C to F. and G to H are swamps which will have to be crossed by troughs because they are the principal affluents of the Reservoir while the length from H to K crosses peat which is to be retained, through which the Catch drain must be tunnelled.

The longitudinal section A to K shews the line a Catch drain would have to take, if it included all the tea, and only the tea, while the sections D. C. and E. F. shew branch channels or which would join the main channel at D and F. respectively.

It would I think be impossible to go down to the point B, which is a foot lower than the swamp C. F. and some part of the land have to be purchased and reported.

I have provided Channel troughs and duct 3 feet wide, and for the former an average depth of excavations of 3 feet.

(d) The plan and section above referred to, shew how difficult and expensive it would be to cut off the tea, and I do not believe the desired

2507/10 7

object would be attained. I have been frequently over the ground and have on never seen manure being laid, and I understand that, when it is laid on tea estates, it is always buried 2 feet under ground, so that no Catch surface drain would be of any use in preventing percolation from it.

(e) The water supply from Snowdon will never compensate for the area excluded at Marlimead and there will always be danger of a water famine

5. My objections to the exclusion of the tea, may therefore be summed up as follows: —

(1) It probably does no harm.

(2) Snowdon water no better than Marlimead.

(3) Difficulty and expense of exclusion.

(4) Doubtful effectiveness of any possible attempt at exclusion.

(5) Resulting scarcity of water.

6. I will now state what I propose should be instead:

(a) I believe the injurious elements in

in which the waters, which the Analysis has brought to light, to be due chiefly to vegetable matters brought in from the peat bogs, through which every affluent of the Reservoir flows, and that the relatively large quantity of this matter is due partly to the subsidence in November last of Mr Wapshare's peat bog into the Reservoir, and partly to the custom of cutting peat all round the Reservoir for the Derby market. Wherever this peat cutting is in progress the waters flowing therefrom to the Reservoir is polluted to a very serious extent.

The subsidence was unavoidable and may not occur again, but I propose that all peat cutting on the margin of the Reservoir should be prohibited. (The sheds on the margin are not Cattle sheds but sheds for stacking peat).

This would involve the purchase of the peat bog, which might be effected, I believe, at a moderate cost.

(b) I would fence in the whole catchment area and prohibit all grazing of Cattle therein.

This would involve some compensation for loss of land on the margin which [illegible]

of grazing.

(c) I would prohibit the construction of dwelling houses or buildings of any kind within the Catchment area.

(d) If the medical advisers of Government consider it necessary, I would construct filter beds at Snowden Service Reservoir, the cost of which would amount to something like £40,000.

7. I therefore beg that you will be good enough to lay the matter before Government and obtain orders thereon. Until then I do not delay the submission of the Revised Estimate, which, unless filter beds are adopted, will not exceed the sanctioned Estimate.

I have the honour to be
Sir
Your most obedient Servant
J Bateman
Executive Engineer N. R.

WDC 26.

2507 8P
11

SUPT. ENGINEER'S OFFICE
No. 2737
12 JUN. 88
P. W. D.
FOURTH CIRCLE

2507
12

No. 242
Ex.

Submitted to the Chief Engineer for favor of orders with reference to G.O. dated 16th April 1888 No. 1150 W.

E. W. Martin
Ex. Engineer in charge
IV Circle

Camp Ootacamund
14th June 1888

From
THE EXECUTIVE ENGINEER,
NILGIRI DIVISION,
To
THE SUPERINTENDING ENGINEER,
4TH CIRCLE.

Dated 8
Despatched 11 June 188 8
Received

Enclosures 7.

No. 1054

Enclosures. 7.

Subject.

Ootacamund Water Supply Scheme—
Reports regarding the question of Cutting off the objectionable area which is owned Contaminate the

161

No. 07/87.

Rec 403 D.

P.W. Department.

Ootacamund. 12th July 1888.

Referred to the Surgeon General with the Government for favor of remarks

Dft. Colonel RB.
Chief Engineer P.W. Dept.

From, (3)

The Supg. Engineer,
Fourth Circle.

Dated 14th } June 1888.
Despd 16th }

No. 242
E.W.

Enclosures 7.

Subject

Ootacamund Water Supply Scheme.

Submits report from the Executive Engineer, Nilgiri Division, regarding cutting off the objectionable area which would contaminate the —

Referred

To the Surgeon General with the Government to be returned —

6.3.7.88 — No 18.7

OFFICE OF SURGEON-GENERAL
WITH THE GOVERNMENT OF MADRAS,
Ootacamund, ~~Fort St. George~~, 2nd August 1888.

No. 07358
From G. Bidie Esq. M.B., C.S.E.
THE SURGEON-GENERAL WITH THE
GOVERNMENT OF MADRAS,
~~FORT ST. GEORGE~~,
Ootacamund

2507
13

To
THE Secretary to Government
Public Works Department
Ootacamund

SIR,

I have the honor to return with remarks, the papers regarding the Ootacamund northern water supply, referred to me under your No. 403 D of 12 July 1888.

2. As regards the quality of the water feeding, and stored in the Marlimund reservoir, I quite agree with the Chemical Examiner, that if the organic impurities which exist in it were due to pollution from animal excreta it would be unsafe.

3. The actual amount of solid matter which it contains is very small and it is a soft water. The neighbouring cultivated land is of course objectionable, as the washings of the soil may possibly carry down both organic matter and salts, but as noted by the Chemical Examiner the small quantities of chlorine and free ammonia found in the water are against the probability of contamination from manure.

4. So far as I can learn the amount of manure applied to the tea land is small and is almost exclusively cattle manure from the estate, and no town poudrette and sweepings have been used.

When put out the dung is dug in and incorporated with the soil, and for a time there would be the risk during heavy rain of some of it reaching the lake, where it would remain active for a considerable period owing to the slow process of oxidation in stagnant water. This risk, however, is merely stated as a possibility, as hitherto, so far as I know, there have been no signs of such contamination; and the manurings, according to my own observation, have been few and far between.

For many years the water has been liable not only to this but to more serious pollution during delivery in an open channel, but apparently without inducing in the people who use it any of those ailments which are caused by drinking impure water. This is a practical test, which taken in conjunction with the Chemical Analyses, is so far assuring.

5. With regard to the proposal to have a catch drain to carry off the surface wash of the tea-garden, it seems to me undesirable to spend so much money on what would after all be a very doubtful expedient for the protection of the reservoir. The most perfect safe-guard would be to buy up the whole of the tea-garden that drains into the lake, and to put the land under strict conservancy. But before advising such an expensive measure it seems desirable to watch carefully the Chemical condition of the water for a further period, and to take measures to remedy other sources of pollution.

6. In my opinion the organic matter now found in the water is mostly if not entirely of vegetable

origin, and derived from the neighbouring peat deposits and swamps which drain into the lake. Both of those sources of pollution might be rendered less obnoxious by deep drainage, the bogs being purchased so as to render their better conservancy practicable. It need hardly be said that vegetable matter in water is not always innocuous, but if the expedients proposed did not reduce it to a harmless amount in the Marlimund water it might be further disposed of by filtration.

7. With regard to the expected supply to the reservoir from the northern side of Snowdon it appears to me that the channel might be greatly improved, for although a considerable body of water enters it at its Eastern extremity, from the hill stream which it taps, nearly the whole of this is lost by leakage in transit.

I have the honor to be
Sir,
Your most Obt. Servant.
Lidie M.B., C.I.E.
Surgeon-General
Govt. of Madras
C

(188) DEPARTMENT.

No. 1921 of 17. 1. 88
" 1502 of 16. 4. 88

From H. Bidie Esq. M.B., C.I.E.
THE SURGEON-GENERAL WITH THE
GOVERNMENT OF MADRAS,
~~Fort St. George.~~
Ootacamund.

No. 0/388

Dated 2.° August 1888.
Recd. 4.°

Encls. 8
No.
× 2 plans

SUBJECT.

Returns with remarks correspondence regarding the Ootacamund northern water supply.

B & R
Elworky

PUBLIC WORKS DEPARTMENT.

2507 15 131

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the

READ the following

Letter from the Collector, Nilgiris, No. 13 dated 9th March 1888 to the Chief Secretary to Government		
Letter from the Sanitary Commissioner to the Chief Secretary to Government	507	13th March 1888.
From the Executive Engineer Nilgiris to the Suptg. Engr. IV Circle.	1054	8th June 1888
Endorsement from the Superintending Engineer IV Circle.	242 / 2. W.	14th June 1888.
Letter from the Surgeon General with the Govt. of Madras.	0/388	2nd August 1888.

The letter from the Surgeon General will be communicated to the Executive Engineer whose special attention will be called to the last paragraph.

The Government are of opinion that no provision need be

be made in the revised estimate
either for catch drains below
the Tea plantation or for filling
beds. To drain the peat bogs
by deep cutting, as proposed, or
to prohibit peat cutting, would
involve the purchase of the peat
bogs, and the Government are
not prepared to sanction this
at present.

J

Jell
14/4/98

D
14/4/98

R C

The Supt. Engr. To have
Public Depts.

TRACING FROM OOTY SETTLEMENT MAP

EXECUTIVE ENGINEER N. DIVISION.

Marlimund Bridle Path

Marlimund Road

North Reservoir

Tudor Hall

Tea

Llangollen

A 95

A 96

A 133

C 120

C 121

C 122

C 123

C 124

C 125

C 126

C 127

C 128

C 129

C 130

C 131

C 132

C 133

C 134

C 135

C 136

C 137

C 138

C 139

C 140

C 141

C 142

C 143

C 144

C 145

C 146

C 147

C 148

C 178

C 84

C 86

C 88

C 92

C 93

C 94

C 95

C 101

C 102

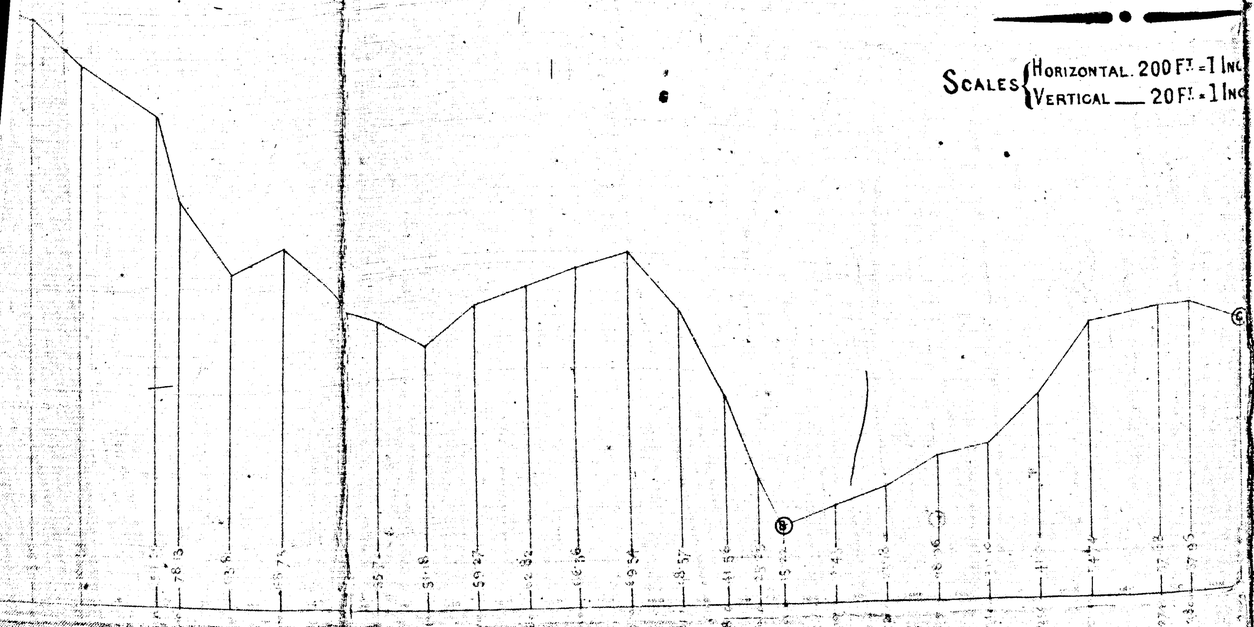
Head Office

Asst. Engineers Office N Division
Ootacamund 11th June 1886

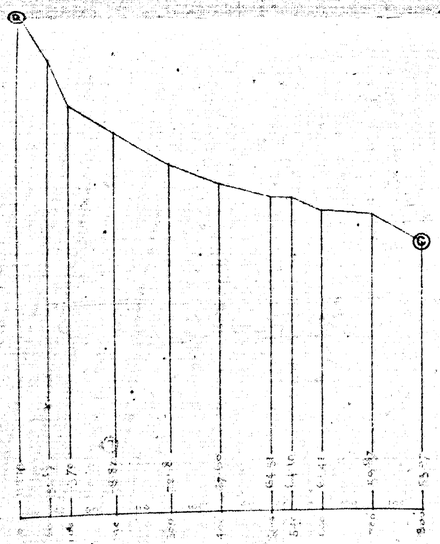
Traced by C.R.V.

Levels along lower edge of Tea Plantation on Marlimund Catchment

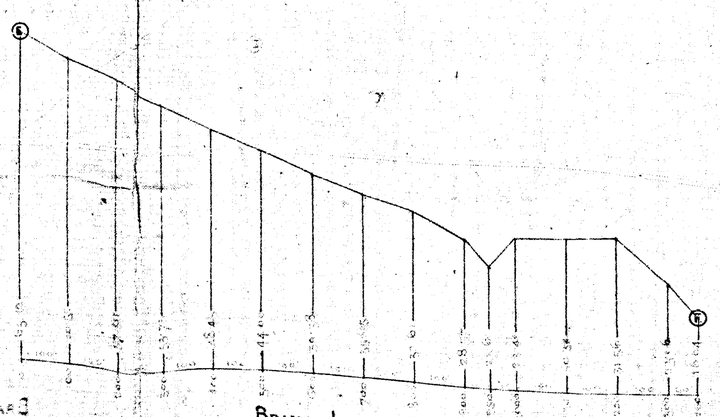
Scales { Horizontal. 200 Ft. = 1 Inch
Vertical ___ 20 Ft. = 1 Inch



Longitudinal Section on A.B.C.F.G.H.K.



Branch Line on D.C.



Branch Line on E.F.

SUPG: ENGINEER'S
NO. 1/3
12 JUN.88
P. W. D.
FOURTH CIRCLE

Encl. 2. Circ. No. 132 of 23/2/88

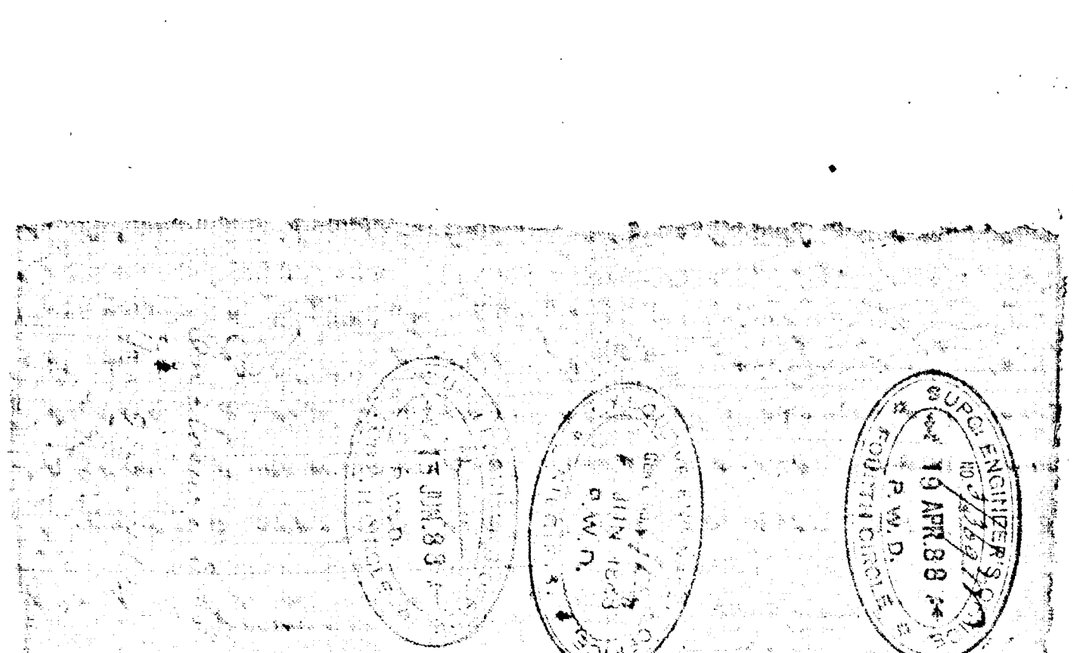
Analysis of water (8 samples) taken from the Marlinmund Reservoir and its affluents by the Ex. Engineer Wilfire Division —

	Snowdon North supply	Snowdon South supply	Marlinmund near sluice	Brackenbrook No 1 North affluent	Marlinmund No 2 & 3 North affluents at head of lake		Marlinmund Wapshare's Peat bog	
	No 1.	No 2.	No 3.	No 4.	No 5	No 6.	No 7.	No 8.
Total Solids .. Grms. per litre	0·040	0·050	0·060	0·070	0·040	0·040	0·060	0·120
Volatile —— do —— do	0·010	0·030	0·020	0·040	0·030	0·030	0·030	0·040
Chlorine —— do —— do	0·007	0·007	0·005	0·005	0·005	0·005	0·005	0·005
Total hardness — clark's scale	0°·875	0°·525	0°·700	0°·700	0°·350	0°·700	1°·050	0°·525
Permanent do — do — do	0°·700	0°·350	0°·525	0°·525	0°·250	0°·525	0°·700	0°·350
Free ammonia .. Dr grms. per litre	trace	trace	0·040	trace	0·040	trace	0·040	trace
Albuminoid do —— do —— do	0·120	0·160	0·240	0·200	0·160	0·240	0·160	0·230
Nitric acid — do — Dr (as Ammonia)	0·600	0·150	0·150	0·150	0·150	0·300	0·150	0·150
Apparent quality of the water as inferred from the result obtained on examination	Vide letter attached No. 132 dated 23rd February 1888							
Remarks.	slight deposit of vegetable debris	slight deposit of vegetable debris & diatomaceous pollen grains	water cloudy deposit fine vegetable debris & many infusoria pollen grains & diatomaceous debris	Brackenbrook — water cloudy deposit of vegetable debris & diatomaceous debris	water cloudy slight deposit of vegetable debris & diatomaceous debris	deposit of vegetable debris	water cloudy deposit (Vegetable)	water cloudy & brownish deposit of masses of vegetable debris granular (Vegetable matter)

/ Press Copy /

/ signed / W. R. de Wilton
Executive Engineer

/ signed / J. L. Dare Esqre
Collector



Analysis of water taken from the Marlimund Reservoir by the Collector.

			Water of the Marlimund Reservoir	
Total Solids	Grms. per litre		0·070	The amount of free Ammonia and Albuminoid
Volatile solids	—do—	do	0·040	Ammonia are high and point to Contamination
Chlorine	—do—	do	0·005	by organic matter. The small amount of chlorine
Total Hardness	Clark's scale		0°·875	present tends to negative the source of contamination
Albuminoid hardness	—do—	do	0°·700	being animal organic matter. A careful inspection
Free ammonia	Milligrms. per litre		0·320	should be made of the catchment
Albuminoid Ammonia	—do—	do	0·240	area drained by this water source, otherwise
Nitric acid	—do—	do (as Ammonia)	0·300	it is a good soft water.

†Apparent quality of the water as inferred from the results obtained on examination —

Remarks. Sediment contains vegetable debris and few particles of sand.

(Signed) J. L. Dan Lazzel B.Sc.
Ag. Chemical Examiner

(Denis Coby)
Collector.

L.C.

2807/27

SUPDT. ENGINEER'S OFFICE
13 APR.88
P.W.D.
FOURTH CIRCLE

EXECUTIVE ENGINEER'S OFFICE
GEN'L NO.
7 JUN 1888
P.W.D.
NILGIRIS.

SUPDT. ENGINEER'S OFFICE
13 JUN.88
P.W.D.
FOURTH CIRCLE

No 614

12-3-88.

From

The Collector of Nilgiris

SUPDG. ENGINEER'S OFFICE NO. 13 JUN.88 P.W.D. FOURTH CIRCLE

SUPDG. ENGINEER'S OFFICE NO. 2369 19 APR.88 P.W.D. FOURTH CIRCLE

EXECUTIVE ENGINEER'S OFFICE GEN'L NO. 7 JUN 1888 P.W.D. NILGIRIS.

To The Chief Secretary to Government Public Department

Through the Sanitary Commr

Madras

Dated 9 March/88
Recd

No 13

Enc: 3

Subject

Nonlemend Water

Forwarding for information & orders of Government Copies of Analyses of — received from the Chemical Examiner Madras

PUBLIC WORKS DEPARTMENT.

2507/31

READ the following :—

Letter from the Supdg Engr IV Circle No 242/Ex dy June 14, 1888.

" " " Surgeon General with the Govt of Madras } - 9/388 dy Augt 2, "

FOR ORDERS.

The Surgeon Generals letter leads me to think there is no occasion either to preclude the tea plantation from the gathering ground, or to buy up the peat bogs. and for the present at all events I think this part of the scheme may be left in abeyance.

Filtering also may be left for future consideration and I think a revised estimate may be prepared with these omissions

J.H. 11/6/88

501
32

25074

OSS 5.VIII
Mu 12.VIII.88

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PUBLIC WORKS

1574

Dated

Dated

16th Sept 1850W.

Enclosing Estimate
Specification
Copy of Letter from the Surveyor General on the subject of the — with instructions for the preparation of Contract Estimate.

95/6

9/1918