C.S.

PUBLIC WORKS
(Stanley Improvement Scheme)
(Water Supply)

No. 388/24

1924.

Mr. A. A. P. Neave

SUBJECT.

192 4

30th April

Previous Paper.

STANLEY IMPROVEMENT SCHEME

Proposed Water Supply
ex Mile Pond.

MINUTES.

Report from Mr A A P Neave of 30th April 1924 — Encl ①

C/S.
Submitted
C/S. has had the plans and has discussed the matter with Mr. Neave

5 June 1924

H.C.S.
Will you please have this circulated in connection with C/S: to us in connection with 254/1923 & 465/1924.

12 July 1924

Subsequent Paper.

Hon Ag Treasurer
Hon Colonial Surgeon }

Circulated

G K L Brown
Clerk Executive Council
14th July 1924

(1)

Port Stanley,

FALKLAND ISLANDS.

30th April, 1924.

PORT STANLEY - IMPROVEMENT SCHEME.

Proposed Water Supply ex. the Mile Pond.

Sir,

I beg to forward herewith 3 No: drawings showing the proposed scheme of water supply ex. the Mile Pond for the town, together with estimate, copy of analysis of the water, and correspondence with the Colonial Surgeon.

2. The question of water supply is one to which I have devoted a large amount of time as I consider that of all the improvements so necessary to bring the town into a satisfactory sanitary condition the provision of a water supply is undoubtedly the most urgently required.

3. It will be remembered that the original proposal contained in my Preliminary report dated February, 1923., was for a comprehensive gravitational scheme fed from a catchment area sited at the apex of Sapper's Hill, the total cost of which was estimated at £34,000; and that this was subsequently ruled out on financial grounds as being beyond the means of the Colony.

4. Since submitting my Preliminary report above mentioned I have taken considerable pains to evolve a less comprehensive scheme based on a smaller allowance of water per head of population per diem, and at a much lower estimated expenditure. Whilst under other circumstances I would have wished to avoid a scheme involving the installation of pumping plant the one I now put forward has been prepared after somewhat protracted reconsideration of the whole of the circumstances and possibilities, and I recommend it as the scheme best suited to meet local requirements.

5. The estimated cost of this scheme is £15,000 and I do not advise that anything less comprehensive should be undertaken; in fact it would be advisable if funds could be rendered available to somewhat increase the extent of the reticulation of mains in the town in the first instance instead of leaving these extensions to future years.

6. It will

6. It will be seen from the attached copy of the analysis of the Mile Pond water that it is relatively high in dissolved and suspended solids but deficient in lime. The quantity of suspended solids is particularly noticeable during boisterous winds when the surface of the pond becomes agitated and the peaty silt covering the bottom becomes stirred up. The water will accordingly require special treatment for the removal of suspended solids, and the right proportioning of lime before it can be regarded as satisfactory.

7. The pond in question, which presumably takes its name from the fact that it is roughly a mile in perimeter, is situated approximately 2 miles from the South side of the town and lies near the South shore, the intervening ground rising more or less uniformly to the ridge known as the Murray Heights and then again falling slowly to the Southern edge of the town and then more sharply to Stanley Harbour, the whole forming a 'Hog back'.

8. The scheme provides for the construction, on a site to the West of the Mile Pond, of a pair of concrete sedimentation tanks, each to hold 12,000 gallons gross with an effective capacity of 9,000 gallons for delivery to the town each day. In these tanks after the introduction of lime and alumina in suitable proportions the bulk of the suspended matter in the Mile Pond water will be deposited; the clear water being then drawn off to the concrete lined pump well inside the pump house.

The interiors of the sedimentation tanks are to be divided by a series of walls as indicated, causing the water to slowly traverse a considerable distance between inlets and outlets (the more usual circular form of sedimentation tank being avoided on account of the lack of suitable labour locally for this type of construction), during which process the suspended solids will be deposited on the floor which slopes as indicated to the deep end of the tanks where overflows and wash-outs are provided. The top surfaces of these tanks are to be covered with wire netting fixed on timber framing to prevent agitation of the water surface by wind.

9. The pump house, which will be situated to the North of the sedimentation tanks, is to be provided with two sets of crude oil driven pumps and two sets of high pressure sand filtering plant each with independent cleansing apparatus complete;

each

each pumping set being capable of working with either filter set; the whole of the plant being in duplicate and arranged so that one set can be worked whilst the other is under cleansing or repair, or so that both complete sets of pumps and filters can be run simultaneously if required.
Each pumping and filtering set is to be capable of delivering 1,000 gallons of purified water per hour under normal working conditions, i.e. each dealing with the contents of one sedimentation tank in a working day of nine hours whether worked singly or both sets simultaneously, and each capable of simultaneously delivering at least 25% in excess of this under test.

10. The purified water from the filters will be forced through a pumping main to the service tanks, situated at an elevation of approximately 200 feet on the ridge between the South shore and Stanley Harbour, which will act as a storage reservoir feeding the town mains.
I attach two drawings (Nos: 2 & 3) showing alternative arrangements of supply from the service tanks to the town:-

(a). Drawing No: 2.

This lay out provides for the construction of service tanks having a total storage capacity of 40,000 gallons (i.e. two tanks each 20,000 gallons capacity as shown on drawing No: 1), and utilising the existing Spring Paddock Reservoir (at present connected to Government House) as a supplementary reservoir supplying the low level area at the West end of the town, as indicated in green on plan.

The existing Spring Paddock reservoir, which is situated approximately 180 feet above sea level, has a capacity of some 14,000 gallons. In this lay-out the walls are to be lifted slightly, increasing this amount to 16,000 gallons, and the reservoir is to be roofed with a boarded roof covered with "Ruberoid". The total storage capacity will thus be 56,000 gallons, of which 20,000 gallons (i.e. the contents of one division of the new service tanks alternately) will be maintained in reserve for fire or other emergency, leaving 36,000 gallons (i.e. 4 days supply at 10 gallons per head per day) open to mains.
The high pressure main and low pressure main (fed from the new service tanks and Spring Paddock reservoir respectively) will be connected at the junction of Villiers Street and John Street with a sealed valve only to be opened in case of fire in the low pressure area to enable extra pressure of water to be obtained.

(b). Drawing No: 3.

This lay-out provides for the construction of somewhat larger service tanks having a total capacity of 54,000 gallons (i.e. two tanks each 27,000 gallons capacity) to supply the whole of the town, the existing Spring Paddock reservoir being left outside the scheme and a new main being laid to Government House (and to be ultimately extended to Sullivan house if and when funds are available).

The contents of one division of these tanks (i.e. 27,000 gallons) will be maintained in reserve alternately for fire or other emergency, leaving 27,000 gallons (i.e. 3 days supply at 10 gallons per head per day) open to the mains.

11. In designing a new scheme on strictly economical lines the embodiment of any existing works which may be reasonably situated naturally requires consideration.

In the present instance however there is comparatively little difference in the costs of the alternative lay-outs (plans Nos: 2 & 3), and it is very open to question as to whether the advantage of utilising a work already constructed and having water coming into the town via a second route, which might prove of considerable benefit in case of unforseen interruption of the main route, are not more than outweighed by the disadvantage of the scheme being more complicated in working when put into operation and a certain amount of uncertainty as regards the life of the small existing main, which at present supplies Government House with non-potable water.

Taking all these points into consideration I recommend that the Spring Paddock Reservoir be not utilised, and that the lay-out shown on plan No: 3 be adopted.

The old reservoir, situated in the North East corner of Government House Paddock, is sited at too low a level to be of practical service in connection with either scheme, and I see no reason for maintaining it.

12. The area

12. The area surrounding the Mile Pond will require fencing to keep out animals. This fence should be at least 300 yards from the edge of the pond on the uphill side (i.e. North side), and sufficiently far from East end that no animal comes within the same distance where the ground falls towards pond; at the West end it will be a convenient distance clear of the pump house, and along the South side it will run just South of the ridge, which is situated close to the Pond.

A residence will also be required convenient to the pump house for the resident engineman, whose duty will include running the plant and cleaning out sedimentation tanks, etc:. This residence is to be sited so that all drainage flows away from the source of water supply, and it will be convenient that the overflow discharge from sedimentation tanks be readily visible from his house. This can be arranged by causing the overflow to discharge through projecting pipe orifice or over weir.

13. It will be noticed that the system of tanks, pumping plant, etc:, has been duplicated throughout to allow for cleansing or repairs, etc:.
The capacity of each sedimentation tank and pumping set (i.e. 9,000 gallons per 9 hour pumping day) has been based on an allowance of 10 gallons per head of population per day, taking the population of Port Stanley as 900 at which figure it has been practically stationary during 20 years and there being small grounds for anticipating any appreciable increase on this figure in future years.

By working both sets of plant simultaneously or running longer hours it will be possible to double this output, but allowing for cleansing tanks and filters and Sundays and possible repairs it should not be expected to normally obtain more than 14,500 gallons per day (i.e. 15 gallons per head per diem), although this figure could be considerably increased for short periods of emergency.

14. There is ample storage capacity in the Mile Pond, and the scheme lends itself to extension at any future date by installing another pumping and filter set with accompanying sedimentation tanks etc:, all suitably proportioned for the extra duty should the town of Stanley ever develop.

15. I have made provision for a system of fire hydrants throughout the town so placed that, with few exceptions (e.g. Sullivan House), there is a fire hydrant within reasonable distance of practically

every

every building. On the ground of fire protection alone, apart from the pressing need of a proper domestic supply from a public health point of view, I submit that the scheme is worthy of very serious consideration.

16. I have provided for six public fountains conveniently distributed over the town. I do not recommend that this number be exceeded, but that property owners be encouraged to instal house connections wherever houses are within reasonable distance of mains. Economy will be effected if requisitions for house connections can be obtained from property owners before the street mains are laid so that the necessary stop cocks, branch pipes, etc:, can be arranged rather than having to open up excavations again at a later date.

The income to be derived from a water rate based on a sliding scale of ratable values from house occupants should materially help the annual working expenses of the system.

Provided funds are available to lay all the necessary mains and maintain a sufficient supply of water the ultimate aim should be the enactment of a bye-law requiring a water tap in every dwelling and an ample supply to such businesses as slaughterhouses and bakeries.

17. I have allowed for connecting the Dockyard Jetty and Public Jetty to the water system, and I suggest that provided proper facilities and organization be arranged a very appreciable income might be obtained from the delivery of water to ships (particularly whalers) visiting the port. If the water can be delivered to vessels at an economic figure it is reasonable to expect that ship-owners will avail themselves of the supply.

18. The above report explains the salient features of the scheme and the extent of work involved, and, in the event of it meeting with His Excellency's approval and it being decided to carry it out, I shall be glad to prepare a memorandum dealing with the method of construction and plant and materials required in greater detail.

I am,
Sir,
Your obedient Servant,

The Honourable
The Colonial Secretary,
STANLEY.

PORT STANLEY - IMPROVEMENT SCHEME.

Proposed Water Supply ex. the Mile Pond.

BASIS OF ESTIMATE.

Lay-out as Plan No: 2.

	£.
Allow for transport of plant and materials to Mile Pond and temporary sheds, etc:, on site.	500.
Quarters for Resident engineman.	700.
Sedimentation tanks.	595.
Draw off from Mile Pond including cast iron pipes to sedimentation tanks and pump house, drains, sumps, valves & covers etc:.	300.
Pump House.	
Building & foundations. ..... 750.	
Pumping and filtering plant including freight & erection etc:.....1,400.	2,150.
Fencing Mile Pond enclosure.	225.
Service tanks.	740.
Lap-welded steel water mains coated lagged and coated :-	
4,000 yds: 1in: 3½" diam: at 15/6..... 3,100.	
3320 " " 3" " at 15/-.... 2,715.	
250 " " 2½" " at 14/6. 181½. (say)	6,000.
28 No: Fire hydrants at £7/10/-... 210.	
6 No: Public Fountains. at £25. ..... 150.	
10 No: Stop valves at £6. 60.	420.
Allow for connections to jetties and Government buildings and plugs for future extensions to street mains (provisional).	350.
Roofing Spring Paddock Reservoir and 2" connecting main from mains supply (550 yds: 1in:)...	450.
	£12,430.
Add. Contingencies. 10%.	1,243.
	£13,673.
Add. Engineering, Administration etc: 10%..	1,367.
	£15,040.

SAY £15,000.

PORT STANLEY - IMPROVEMENT SCHEME.

Proposed Water Supply ex. the Mile Pond.

BASIS OF ESTIMATE.

ALTERNATIVE.

Lay-out as Plan No: 3.

	£		£
ADD.			
Additional supply main 3" diam: (200 yds: 1in: at 5/- yd:) to Government House, etc:.	150.		
Increase total capacity of new storage tanks by 14,000 gallons (i.e. 7,000 gallons each half).	200.		
		ADD.	350.
DEDUCT.			
Raising walls and roofing in Spring Paddock Reservoir and supply pipe 2" diam: from service main to Spring Paddock Reservoir.		DEDUCT.	450.
		NETT DEDUCTION ON TOTAL ESTIMATE.	£100.

EXTRACT FROM REPORT (DATED 20th SEPTEMBER, 1922) BY THE DIRECTOR OF THE IMPERIAL INSTITUTE, SOUTH KENSINGTON, W.C. 7., ON SAMPLES OF WATER FORWARDED FROM PORT STANLEY.

MILL POND SAMPLE.

Results of Chemical Analysis.

	Parts per 100,000 parts of water.
Total dissolved solids.	24.9
Organic matter.	12.1
Mineral matter.	12.8
Potassium chloride.	0.1
Sodium chloride.	9.1
Sodium sulphate.	-
Iron carbonate.	-
Calcium carbonate.	1.1
Magnesium carbonate.	1.4
Magnesium chloride.	1.4.
Magnesium sulphate.	0.5

Hardness expressed as equivalent of calcium carbonate ($CaCO_3$) per 100,000 parts of water.	9.7

Nature.	Medium.

COPY

Port Stanley,

FALKLAND ISLANDS.

1st May, 1924.

STANLEY IMPROVEMENT SCHEME.

Water Supply.

Sir,

With reference to the scheme I have prepared for the supply of water to the town ex. the Mile Pond, which water you have been good enough to inform me can be regarded after sand filtration as a satisfactory potable water, I have allowed for treatment with lime and alumina in conjunction with sedimentation tanks and high pressure sand filters connected by a rising main to storage reservoirs, and I shall be glad to know whether this will meet medical requirements.

Chlorinating plant can be arranged if really necessary, but it is naturally not desirable to incur the expense and complication of any non-essentials.

I am,

Sir,

Your obedient Servant,

(Sgd) A. A. P. Neave.

The Honourable

The Colonial Surgeon,

STANLEY.

COPY

Port Stanley,

FALKLAND ISLANDS.

2nd May, 1924.

Sir,

In reply to your letter of yesterday's date, I beg to state that I have always considered the Mile Pond the best source of water supply for Stanley, and after being treated as you intend it to be treated the water will meet all medical requirements.

I would suggest that an earth dam be placed across the West end of the Pond, which would increase the depth and add greatly to the quality of the water.

Yours sincerely,

(Sgd). F.G.W. Deane.
Colonial Surgeon.

A.A.P. Neave, Esq:,

Consulting Engineer to the
Colonial Government,

STANLEY.