

RE: DEER LAKE WATER QUALITY

The costs for this project have not yet been "firmed up" nor has the source of funding been determined. When firm costs become available, they will be reported to Council together with the recommended source of funding.

ACTING MUNICIPAL MANAGER'S RECOMMENDATIONS:

1. THAT the recommendations as contained in the report from the Director Recreation & Cultural Services be adopted.
2. THAT a copy of this report be sent to Mr. L.C. Davis, 4190 Watling Street, Burnaby, B.C., V5J 1V2 (who previously corresponded with Council on this matter).

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1986 MAY 08

TO : MUNICIPAL MANAGER
FROM: DIRECTOR RECREATION & CULTURAL SERVICES
RE : DEER LAKE WATER QUALITY

RECOMMENDATIONS:

1. THAT Council approve a program of weed control in Deer Lake as outlined in this report at an estimated cost of \$15,000.
2. THAT Council approve the preparation of a preliminary design for a nutrient sink pond system at an estimated cost of \$17,000.
3. THAT Council appropriate \$32,000 from the Operating Contingency to finance the above two projects in 1986.
4. THAT Council be advised that the Parks & Recreation Commission considered that the responsibility of the capital costs of providing the design and construction of nutrient sink ponds should fall within the responsibility of the appropriate Municipal departments dealing with the water quality and such costs should be included in those departments, and the Commission wishes to further advise that the ongoing maintenance of said facilities and further cutting of weeds will be accounted for in future Parks & Recreation Department budgets.

REPORT

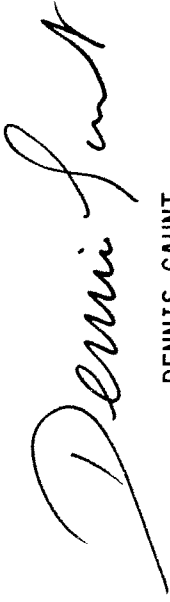
At its meeting of 1986 May 07, the Parks & Recreation Commission received the attached staff report on the above subject and adopted the three recommendations contained therein.

In discussing the report the Commission approved the following additional recommendation:

ITEM 3
MANAGER'S REPORT NO. 33
COUNCIL MEETING 86/05/20

ITEM 3
MANAGER'S REPORT NO. 33
COUNCIL MEETING 9/6/05/20

4. THAT Council be advised that the Parks & Recreation Commission considered that the responsibility of the capital costs of providing the design of nutrient sink ponds should fall within the responsibility of the appropriate Municipal departments dealing with the water quality and such costs should be included in those departments, and the Commission wishes to further advise that the ongoing maintenance of said facilities and further cutting of weeds will be accounted for in future Parks & Recreation Department budgets.



DENNIS GAUNT
DIRECTOR RECREATION &
CULTURAL SERVICES

PL/se
Attach.

cc - Director Administrative & Community Services
Director Planning & Building Inspection
Director Engineering
Director Finance
Medical Health Officer
Chief Public Health Inspector

RE: DEER LAKE WATER QUALITY

ITEM	3	PORT NO.	10
MANAGER'S REPORT NO.	33	STING	86 05 07
COUNCIL MEETING	8 6/05/20		

RECOMMENDATIONS:

1. THAT the Commission approve a program of weed control in Deer Lake as outlined in this report at an estimated cost of \$15,000.
2. THAT the Commission approve the preparation of a preliminary design for a nutrient sink pond system at an estimated cost of \$17,000.
3. THAT Municipal Council be asked to appropriate \$32,000 from the Operating Contingency to finance the above two projects in 1986.

REPORT

Attached is a copy of a report from the Chief Public Health Inspector regarding Deer Lake Water Quality.

The report sets out the background of the problem and what has transpired in the past several years. The work of the Health Department has been lengthy and has come to a conclusion earlier in 1985 coincident with receipt of reports which have helped to formulate a conclusion but too late to be included as a budget item in the 1986 regular capital budget.

It is strongly recommended that we do not wait one more year to carry out this work through the normal budgeting process but that we consider a request for the expenditure of contingency funds for this purpose.

The reason for this recommendation is that the Health Department have advised that due to a slow worsening of water quality over several years, the closure of Deer Lake for swimming purposes was seriously considered in 1985. It is the Chief Public Health Inspector's opinion that if the water quality continues to worsen, that it is almost certain that the swimming activity would have to be closed down at some time during 1986.

The cost of these works, namely, the machine cutting and disposal of weeds and the laying of a weed barrier is estimated at \$15,000.

ENGINEERING DESIGN STUDY

As the attached report explains, the next step should be a design study for a nutrient sink pond treatment. The study is estimated at \$17,000. It is anticipated that the engineering works to be undertaken following the study will be at a much lesser cost than those called for by the first water quality report of 1982.

Staff would recommend that now that the information has been received which allows us to proceed with water quality improvement, that Municipal Council be asked to approve expenditures from the 1986 Contingency to carry out this work immediately.

FUTURE WORKS

Discussions with the engineering firms involved in the design of nutrient sink ponds would indicate that the approximate cost of this proposal will be in the area of \$750,000.

It is proposed that this item be brought forward for consideration as part of the 1987 Provisional Capital Budget. The proposed study will provide firm cost estimates for construction at that time.

DG:hh
Attach.

C.C.
Director Adm. & Community Services
Director Planning & Bldg. Inspection
Director Engineering
Director Finance
Medical Health Officer
Chief Public Health Inspector

A65.3(2)

ITEM 3
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COUNCIL MEETING 8 6/05/20

ITEM 2
DIRECTOR'S REPORT NO. 10
COMMISSION MEETING 86 05 07

TO: DIRECTOR RECREATION & CULTURAL SERVICES 1986 MAY 01
FROM: CHIEF PUBLIC HEALTH INSPECTOR
RE: DEER LAKE WATER QUALITY

RECOMMENDATION:

- 1. THAT the Parks and Recreation Department implement programs to remove weed growth in Deer Lake and conduct preliminary design work for a nutrient sink pond system.

SUMMARY

Following is a report concerning the current state of Deer Lake water quality. The lake continues to be subjected to high levels of nutrients, which is causing continued poor water quality. Two programs are being recommended to enhance the water quality of Deer Lake. These are a nutrient sink pond system and mechanical harvesting of the weed growth within the lake. Without programs aimed at improving the incoming water quality to Deer Lake, it is questionable as to how much longer the lake will comply with the recreational water quality requirements of the Provincial Health Act.

A. BACKGROUND

Municipal Council on 1979 July 03 authorized the preparation of terms of reference and call for proposals for a consultant to conduct water quality studies of Deer Lake to determine the impact of the proposed park development and surrounding residential areas on the Lake and to establish methods of maintaining and enhancing the Lake's water quality. This action was consistent with one of the conditions of the Provincial Government transferring 158.34 acres of the Oakalla lands to Burnaby. This condition of transfer agreed to by Municipal Council states "that Burnaby undertake immediately a program with respect to water quality in Deer Lake, which will include the establishment of suitable ground water improvement from the present residential areas and designated park areas to bring water quality to levels acceptable to recreational purposes before major park development is authorized".

The recommendations of the Deer Lake Water Quality Study were presented to Council on 1982 November 29. Council at that time acted on staff's recommendation to continue assessing the water quality of Deer Lake in order to make further recommendations on methods of improving lake water quality. Since 1983, the Environmental Health Division has been conducting an extensive program of bacteriological and nutrient analysis of Deer Lake, establishing a data base using its microcomputers and using as a consultant the original limnologist assigned to the Deer Lake Water Quality Study.

In 1986 February, the consulting limnologist submitted a report that detailed the continuing poor water quality of Deer Lake. The Deer Lake Water Quality Committee discussed the report and concluded that steps should be immediately taken to begin removal of weed growth, as well as commencement of engineering design work for a nutrient sink pond system.

The information pertaining to the engineering feasibility design work for a nutrient sink pond system and the means to remove weed growth in Deer Lake was not received until 1986 April. For this reason, we were unable to proceed with recommendations until this date.

B. CURRENT LAKE WATER QUALITY

Deer Lake continues to suffer poor water quality and demonstrates this through:

- abundant weed growth
- summer algae blooms
- poor water clarity
- high summer temperatures
- high summer coliform counts

It is questionable as to how much longer Deer Lake will meet the requirements of the Provincial Health Act for permitting primary recreational water contact (swimming). This is due to continued high coliform counts, poor water clarity and weed growth in the shallows of the lake and close to the swimming area.

C. NUTRIENT SINK POND TREATMENT

The 1981 I.E.C. Beak Consultant Report on Deer Lake Water Quality recommended the expenditure of over \$3,000,000 for a storm water diversion of creeks on the south side of the lake and their treatment through means of settling ponds.

Since 1983, the Engineering Department has made considerable improvements to the incoming creek banks on the south side of Deer Lake. These improvements have resulted in a notable reduction of nutrients entering Deer Lake at this location. The consultant limnologist has reviewed the sampling data and is now recommending against the proposed storm water diversion and treatment through a nutrient sink pond system.

The continued assessment of Deer Lake Water Quality has identified Creek 3, located on the west side of Deer Lake, which is contributing over 50% of phosphorous and nutrient loading. Staff and the consultant limnologist are recommending the establishment of a nutrient sink pond system to reduce this major contributor of nutrients to Deer Lake.

The concept of using a nutrient sink pond system for improving incoming creek water quality by removal of sediment, phosphorous, suspended solids, hydrocarbons, lead, zinc and coliforms is a proven lake restoration system.

As it is not required to divert the incoming creeks on the south side of Deer Lake, the size and cost for the establishment of a nutrient sink pond system for Creek 3 will be greatly reduced from the \$3,000,000 projection contained in the 1981 I.E.C. Beak Consultant Report.

We are recommending at this time the expenditure of \$17,000.00 for a consultant to undertake preliminary design study of a nutrient sink pond system for Deer Lake, Creek 3 drainage.

The engineering design study is required to determine a variety of aspects of the project including:

- (a) Size and site location
- (b) Projected cost estimates
- (c) Inlet and outlet fixtures
- (d) Method of water level control
- (e) Frequency of inspection and maintenance
- (f) Soil stability and erosion projection
- (g) Mechanisms for intermittent dredging
- (h) Specifications & tender documents for the proposed works

The Director Engineering concurs with this report's recommendation.

D. MECHANICAL HARVESTING OF DEER LAKE WEED GROWTH

Appearing on the 1986 April 07 Council Agenda, was correspondence from Mr. L.C. Davis, 4190 Watling Street, pertaining to the subject of weed growth on Deer Lake.

In February of this year, the Ministry of Environment, Waste Management Branch, was requested to survey the lake and report on possible means of removal of a nuisance weed, identified as "Najas". This particular weed is of concern as it serves as a substantial source of phosphorous to the lake, interfering with activities such as canoeing and fishing along the lake shore, encroaching on the recognized swimming area of the lake and becoming a potential hazard to swimmers.

On 1986 April 14, the Ministry of Environment surveyed the lake with staff from the Environmental Health Division and Parks Department. The Ministry of Environment is recommending harvesting of the rooted "Najas" plants. The Ministry of Environment is prepared to conduct the harvest of the entire lake in the month of June 1986 with the cost to the Municipality of \$9,000.00 for the machine and \$2,000.00 for weed disposal.

In conjunction with harvesting of the weeds in Deer Lake, the Ministry of Environment is recommending the installation of bottom barriers within the swimming area of the lake, at a cost of \$4,000.00, to ensure against future weed growth.

A further assessment will be required in one year's time from the date of harvesting to determine if a second weed growth removal is required. It is the Ministry of Environment's experience that a second harvesting is necessary.

We are recommending at this time the expenditure of \$15,000.00 for the mechanical harvesting of weed growth in Deer Lake and the placement of sand barriers within the recognized swimming area.

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E. CONCLUSION

The ongoing Deer Lake Water Quality Monitoring Program has provided sufficient information to recommend the first stages of a program to improve the water quality of Deer Lake.

Without addressing the current weed growth problem and treatment of the major source of nutrients to Deer Lake, it is questionable as to how much longer the lake will be suitable for primary contact recreational use (swimming).

The removal of weed growth and the treatment of the major source of incoming nutrients to Deer Lake may only be a first step in improving the lake water quality. Assessment of Deer Lake Water Quality will be continued in order to determine what further restoration programs may be required.

George V. Harvie

G.V. Harvie, C.P.H.I. (C)
CHIEF PUBLIC HEALTH INSPECTOR

GVH/1a

cc: Medical Health Officer
Director Planning & Building Inspection
Director Administrative & Community Services
Director Engineering
Director Finance

