

TO : CITY MANAGER DATE: 1999 APRIL 22

FROM : DIRECTOR PARKS, RECREATION AND CULTURAL SERVICES

SUBJECT : **BURNABY MOUNTAIN CONSERVATION AREA - ENVIRONMENTAL ASSESSMENT AND REMEDIATION OF THE OLD GUN CLUB SITES**


PURPOSE : To request Council to bring down a Capital Reserves Expenditure Bylaw in the amount of \$1,870,000 (inclusive of 7% GST) to undertake the 1999 work plan for the remediation of the old gun club sites.

RECOMMENDATION:

1. THAT a Capital Reserves Expenditure Bylaw in the amount of \$1,870,000 (inclusive of 7% GST) be brought down to undertake the 1999 work plan for the remediation of the old gun club sites .

REPORT

At its meeting of 1999 April 21, the Parks and Recreation Commission received the attached staff report on the above subject and adopted the three recommendations contained therein.



KATE FRIARS
DIRECTOR PARKS, RECREATION
AND CULTURAL SERVICES

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cc: Director Engineering
Director Planning
Director Finance

**SUBJECT: BURNABY MOUNTAIN CONSERVATION AREA - ENVIRONMENTAL
ASSESSMENT AND REMEDIATION OF THE OLD GUN CLUB SITES**

RECOMMENDATIONS:

1. THAT the Commission approve the expenditure of \$1.8 million from the 1999 Annual Capital Budget to undertake the 1999 work plan for the remediation of the old gun club sites.
2. THAT the Commission approve in principle including \$200,000 in the 2000 Capital Budget for subsequent remediation work outlined in this report.
3. THAT Council be requested to bring down a Capital Reserves Expenditure Bylaw in the amount of \$1,870,000 (inclusive of 7% GST) to undertake the 1999 work plan for the remediation of the old gun club sites.

REPORT

INTRODUCTION

The Burnaby Mountain properties are owned by the City of Burnaby and were leased to three private gun clubs, the Barnet Rifle Club, Coast Marksmen Inc. and the Burnaby Fish and Game Club. The leased lands are located within a dedicated conservation area and are zoned P3, for parkland use. The City of Burnaby, terminated the leases to the gun clubs in order to free the land for uses that are consistent with the Conservation Area designation and the parkland zoning. The lease to the gun clubs expired on October 31, 1998 and the premises were vacated on March 10, 1999.

In preparation for the planned closure, the City retained environmental consultants to undertake an Environmental, Geotechnical and Hydrogeological Assessment of the Burnaby Mountain Outdoor Target Range Sites. As a result of the findings, an environmental remediation plan for clean-up of the sites was undertaken. The results of these studies and proposed remediation plan are discussed below.

Phase 1 Assessment - Contaminant Summary

Environmental site assessments at the outdoor target range properties were conducted by Envirochem (Preliminary Environmental Investigation, December, 1997) and Gartner Lee Limited (Environmental, Geotechnical and Hydrogeological Assessment, October 1998). The primary metal of concern was found to be lead, with copper, antimony, arsenic and zinc occurring as secondary contaminants.

Soil Quality

The target range soils are contaminated with total lead concentrations in excess of the BC Contaminated Sites Regulation (CSR) standards for parkland use and leachable lead concentrations in excess of the leachate quality standards stipulated in the Special Waste Regulation. Generally, this contamination occurs within the surface to 0.3 meter depth at the Barnet Rifle Club property and within the first 0.1 meters at the Coast Marksmen Inc. and Burnaby Fish and Game Club sites. Localized areas of the target range sites such as soil backstops, exposed cutbanks behind targets, sideberms and disturbed areas are contaminated with elevated total and leachable lead levels to an average of 1 meter, with contamination in some areas extending to depths of up to 4 meters.

As determined during a metal detector survey and surface soil sampling program, the areas upslope of the target ranges are also contaminated with lead shot to varying degrees. However, the terrain is very steep and heavily vegetated in the upper slope areas precluding any mitigation options involving excavation.

The environmental assessment report estimated a total of approximately 11,000 cubic meters of contaminated soil to be treated or removed.

Surface Water and Stream Sediment Quality

Surface water quality on and off the Burnaby Mountain properties has been adversely affected by activities on the rifle ranges. The concentrations of lead and/or copper in surface water and stream sediments in Simon Creek exceed the government guidelines established to protect aquatic life. The concentration of copper and lead were highest in the east branch of Simon Creek that drains the Barnet Rifle Club range. A portion of the Coast Marksman range also discharges to this branch of the creek. Copper and lead concentrations were also found to slightly exceed the aquatic life criteria at the creek discharge to Burrard Inlet.

Background water and sediment quality, as represented by samples collected upstream of the rifle ranges, had significantly lower concentrations of copper and lead.

Groundwater Quality

Dissolved lead concentrations in groundwater were generally found to be less than the CSR standard for aquatic life use. Groundwater samples collected from one monitor installed at the Coast Marksman site and one monitor installed at the Burnaby Fish and Game site contained concentrations of dissolved lead which were only slightly elevated higher than the aquatic life water numerical standard.

Based on the available information it is concluded that groundwater contamination from rifle range activities is minimal and does not constitute a major pathway for off-site migration.

Overview of Remediation Work Plan for 1999

The concentrations of lead and copper in soils and surface water at the site pose a risk to human health and the environment. Lead can accumulate in human, animal and plant tissue and can cause chronic health effects. The receptors are exposed to metal contaminants originating on the former outdoor target range sites through various pathways including: air (blowing particles), soils, surface water and groundwater. The overall objective of the proposed remediation strategies will be to remove the source of contamination and block the exposure pathways.

A staged remediation is proposed to manage and minimize the potential environmental risk in a cost-effective and timely manner. The remediation will involve the following components:

- Surface Water / Sediment Control
- Excavation of Metal Contaminated Soils Classified as Special Waste and Commercial/Industrial
- Treatment and Off-site Disposal of Special Waste
- Preliminary Risk Assessment
- Regulatory Approvals

Environmentally sensitive features in the Simon Creek watershed relate to terrain hazards such as steep unstable slopes and to important fish and wildlife habitats. The most sensitive areas are:

- riparian zones where fish and wildlife values are greatest.
- very steep sloped lands where slope instabilities could result in landslides or soil erosion problems.

In consideration of the environmentally sensitive ecological and terrain features identified at the Burnaby Mountain outdoor target range properties, remediation of contaminated soils and sediments in riparian corridors must be conducted using all practical protective measures. Mature riparian vegetation should be retained, where possible, and all excavation, soil handling stockpiling and disposal should be conducted in accordance with the Land Use Development Guidelines specified by the Department of Fisheries and Oceans.

On the basis of site specific contaminant information identified in the environmental assessment reports and the requirements of the federal and provincial regulatory agencies, the first stage of remediation proposed for completion in 1999 will involve the control of off-site contaminant migration and removal of soils classified as Special Waste and in excess of the clean-up standard on the basis of lead and copper content. The proposed excavation areas are located within the cleared portions of the former target range properties.

While the technical information and regulatory positions on the issues of control of contamination migration and removal of Special Waste are well established, other site specific issues of environmental concern require further clarification prior to regulatory acceptance of the remediation plan. These issues include:

- the acceptability of a risk assessment/risk management approach for contaminated soil classified as Special Waste located in the steep forested areas of the properties, where excavation could lead to slope instability and habitat destruction;
- the acceptability of a site-specific risk based clean-up standard for lead; i.e., soil containing lead concentrations that exceed the CSR parkland use standard, but would not be classified as commercial contaminated levels; or,
- regulatory approval for on-site treatment or isolation (either in-place or under parking lots) of residual soil contamination that exceeds the site-specific risk based clean-up standard, but less than commercial contaminated levels.

In order to address the issues identified above, a screening level risk assessment has been initiated for the properties during the first stage of remediation to be conducted in 1999. The risk assessment activities to be conducted in 1999 will include the development of site-specific risk based clean-up standards for lead in soils and problem formulation for the cleared areas of the former target range properties as well as the forested upper slopes. The results of the risk assessment activities to be conducted in the first stage of the remediation strategy would provide the regulatory agencies with adequate information to determine the feasibility of managing the lead contamination at the site using a risk management approach.

The major tasks to be conducted during the spring, summer and fall of 1999 are as follows:

1. Retain prequalified contractors to conduct the surface water control works and the subsequent excavation of contaminated soil.
2. Prepare specification documents and award a contract for the construction of surface water control works
3. Issue a Request for Proposal to establish a short list of 3 or 4 qualified hazardous waste contractors to conduct the treatment, shipping and off-site disposal
4. Obtain necessary permits and approvals
5. Tender Call and Award for treatment and disposal contract.
6. Construct surface water control works
7. Conduct excavation / treatment / disposal of contaminated soil
8. Basic site revegetation

These works are estimated to cost \$1.8 million. Sufficient Capital reserves are available and the project is included under the 1999 Major Parks Component of the 1999 - 2003 Annual Capital Program. Work is scheduled to occur between May and October.

Proposed Work Plan for Subsequent Remediation Phases

Work to be conducted during subsequent phases of the remediation program will include:

- a detailed risk assessment for in-situ management of contaminated soil and Special Waste located in the steep forested areas of the properties, where excavation could lead to slope instability and habitat destruction
- ongoing surface-water monitoring
- detailed design for on-site encapsulation of contaminated soils beneath the proposed parking lots.

These works are estimated to cost an additional \$200,000. It is recommended that the Commission consider allocating this amount in the 2000 Capital Budget to undertake the final remediation program for the old gun club sites.

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cc: Director Engineering
Director Planning
Director Finance

