ITEM 16
MANAGER'S REPORT NO. 37
COUNCIL MEETING May 13/74

Re: Trans Mountain Oil Pipeline Company
(Item 21, Report No. 35, May 6, 1974)

At the meeting of Council on April 22, 1974, it was mentioned that a notice had appeared in a recent edition of the Vancouver Sun that the subject Company would be discharging effluent from a ballast water treatment plant to Burrard Inlet, and that this would produce a greater volume and strength of pollutants than was being allowed to be discharged to Burrard Inlet as a part of the Chevron Refinery Expansion Program. Council subsequently requested a report to include comments on the following two matters:

1. The difference between the volume and strength of pollutants which will be discharged by Chevron as compared to the Trans Mountain proposal.

2. Whether the Trans Mountain proposal will adversely affect the intended recreational use of the land abutting Burrard Inlet.

Council on May 6, 1974 was advised that the Planning Department was engaged in discussions with the Municipal Health Department and various pollution control agencies in an effort to acquire necessary information.

Following is a detailed report from the Director of Planning on this matter.

RECOMMENDATION:

THAT the Municipal Health Department be authorized to register an objection to the current proposal in writing as required under the Pollution Control Act, and to recommend that an increased discharge volume of 2,000,000 Imperial gallons per day be permitted subject to a maximum discharge characteristic of 5 mg/l oil and grease, to meet the water quality objective for ballast water discharge as set out in the Pollution Control Objectives for the Chemical and Petroleum Industries of British Columbia, issued March 1974; and

THAT the Department be authorized to request that the Municipality be furnished with the results of the regular sampling and analysis of effluent quality.

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PLANNING DEPARTMENT
MAY 10, 1974

SUBJECT: TRANS MOUNTAIN PIPE LINE CO. LTD.
WESTRIDGE TERMINAL BALLAST WATER TREATING PLANT
POLLUTION CONTROL BRANCH PERMIT APPLICATION

Background:

During a recent Council meeting, it was reported that an advertisement had appeared in the daily newspapers, advising of a current application by the above mentioned Company for a permit under the Pollution Control Act, 1967 for the discharge of effluent to the waters of Burrard Inlet. The staff were asked to report on the nature of the permit request, to compare the quantities proposed for discharge with the effluent discharge approved for the Chevron Refinery, and to comment on the expected impact of the discharge with respect to proposed marine recreational facilities in the area.

Current Westridge Terminal Installations and Control Permit

The Westridge Terminal installation of the Trans Mountain Pipe Line Co. Ltd. is situated on the foreshore of Burrard Inlet immediately east of the Shell Oil refinery, immediately to the north of and below the Westridge residential subdivision and west of existing zoned parkland (see attached location sketch). The facility's principal functions are the storage and shipping of liquified petroleum gas (LPG), stored in two prominent, large white spherical vessels near the foot of the bluff, and presently the marine shipment of crude oil from the Company's Pipe Line via tankers. Trans Mountain also operates a tank farm on the south western slopes of Burnaby Mountain and an installation in the Sumas area, from which a branch of the pipe line delivers crude oil to customers in the U.S., and is the principal supplier of crude oil for the petroleum refineries in the Lower Mainland area.

During the recent energy shortage in eastern Canada, the Federal government arranged for the shipment of Western Canadian crude via ocean-going tanker routed through the Panama Canal to supplement the supplies of crude available to eastern refineries served only by tank car beyond the area serviced by the Inter Provincial pipe

line. As a result the deep sea shipping facilities of the Westridge terminal were put into regular service for major deliveries to tankers using the Company's 24" pipe line connection.

Deep sea tankers arriving without cargo to take on oil must of necessity travel under ballast to provide seaworthiness and control, particularly under heavy weather conditions. This ballast, in the form of sea water carried in the oil cargo holds, must of course be pumped out prior to loading operations, and the ballast water must be appropriately treated prior to discharge under the control of Provincial and Federal regulations. Under normal conditions, an effort is made to have tanker crews limit ballast water quantities to under 40,000 barrels, but under some circumstances, vessels arrive with up to 100,000 barrels for treatment prior to discharge.

At the time the current shipping program was started, the Westridge Terminal was without ballast water treating facilities, and discharged ballast water had to be pumped to existing de-oiling facilities at the neighbouring Shell refinery for treatment, prior to discharge to the Inlet.

In December, 1973, an application for PPA for new floatation separation unit ballast water treating facilities and related holding tanks at the Westridge Terminal was filed on behalf of Trans Mountain. At that time, documentation proving acceptance by the Pollution Control Branch and setting out conditions of approval was requested, and received on January 8, 1974 in the form of a Letter of Approval from the Pollution Control Branch authorizing discharge of ballast water effluent from a floatation separation unit up to a maximum daily discharge of 750,000 gallons per day with a pH range of 6.5 to 9.0, and a maximum oil and grease content of 10 mg/l, (10 ppm) for a period ending June 20, 1974. Preliminary Plan Approval was granted specifically subject to the terms and conditions set out in the Pollution Control Branch's approval. The equipment has been installed, and according to local P.C.B. authorities, is operating extremely well.

Current Application:

The current application before the Pollution Control Branch requests an increase in the daily discharge rate to 2,000,000 imperial gallons from the 750,000 gallons previously approved. According to Company sources, this volume can be handled by the present equipment within the performance characteristics presently required, and provision is being made for the addition of two "cells" to the floatation separation unit if approved, to increase efficiency.

For information, the equipment operates as follows: as ballast water is being pumped from the tanks of a vessel at the dock, a polyelectrolyte chemical is introduced to the ballast water stream before being discharged into a multi-chambered separator unit. In this unit, an air induction system causes aeration and floatation of suspended foreign materials. In combination with the action of the chemical, which reduces the surface tension of the water and promotes floccing of suspended solids and oil, these materials are floated to the surface on a foam which is mechanically skimmed off and collected, being eventually stored in two 420 barrel tanks for recycling. The treated sea water is discharged to the Inlet via a 10" submerged outfall below low water level at a point roughly 150 feet west of the causeway to the dock, and periodic sampling of the discharged effluent is undertaken at weekly intervals. pH and oil and grease levels are determined weekly based on a composite sample of the effluent collected over a three-hour discharge period, and results are submitted to the District Manager of the P.C.B. monthly. Compliance with the terms and conditions of the permit is determined through periodic inspections by P.C.B. staff.

We are informed by Company sources that the laboratory that is engaged to conduct the testing and analysis of effluent quality consistently reports performance well in excess of the minimum standard required under the present permit approval. Specifically, values of 3 to 5 ppm are commonly recorded, using the APHA testing method prescribed by the P.C.B. This claim is corroborated by the local

branch of the P.C.B., which reports that the equipment is operating exceptionally well, and that performance on the order of 2 to 3 ppm is being achieved. It will be of interest to note that normal storm run-off water from streets and parking lots in urban areas contains in excess of 10 to 15 ppm of oil and grease, and that a slight sheen of oil is ordinarily visible in these run-off waters. The District Manager of the P.C.B. has requested a bioassay of the chemical additive being used, to provide assurance that toxicity is not a problem, and this testing is presently being carried out by the B.C. Research Council and satisfactory results will be prerequisite to P.C.B. approval.

Representatives of the Terminal indicate that the increased flow rate being requested will not increase the total quantity of ballast water treated and discharged over a period of, for example, 30 days, but will rather permit to a greater extent the direct processing of ballast as it is pumped from vessels, rather than depending so heavily as at present on storage tankage to hold ballast water for treatment over a more extended period of time. (At present, ballast may be pumped to a single 45,000 barrel holding tank prior to treating, so as to provide for a quick turn-around of the tanker in port; if the volume of water on board exceeds the 45,000 barrel capacity of the tank, the procedure is more time-consuming as pumping is slowed to match the processing rate of the separator unit.) The alternative to increasing the discharge rate limitation, in the Company's view, is to increase tankage capacity, and the cost and lack of a suitable site for further tankage make this unfeasible.

Local Conditions and Environmental Concerns:

Council is well aware of the existing and proposed recreational development of the foreshore area immediately to the east of the Westridge Terminal. Barnet Beach is situated approximately 900 yards east of the outfall of the subject equipment, and implementation of the Development Concept for the Eastern Segment of the Municipal Burrard Inlet Foreshore Study as adopted by Council on October 22, 1973 is underway to provide for expansion and further development of this recreational potential in the immediate area. The condition of the Inlet waters in this vicinity is therefore of utmost concern, and the impact of the present application on local water quality is receiving the careful attention of the Department of Environmental Health. Members of that Department together with Planning Department staff have inspected the present operation while in process, and report that there are no evident signs of contamination from this source beyond the immediate point of discharge. In this connection, it should be noted that the outfall is always below low water level, and within the area contained by a surface containment boom, which encircles the loading dock from the shoreline east to shoreline west of the facility. A small, faint slick approximately 20 feet across has been detected directly above the outfall with the equipment in full operation, but this is prevented from drifting to adjacent waters by the containment boom. Moreover, a "slick licker" device is maintained within the operations area to remove any surface contamination that may be necessary.

In general terms, it should be understood that the total quantity of effluent discharged on a daily basis is a function of both discharge volume and concentration of contaminants in the effluent flow, and that potential environmental impact involves other factors such as time rate of discharge, wind, tide, and current conditions, etc. Despite the Company's indication that total volumes of pollutant discharged are not expected to increase on an averaging basis (30-day period), it is considered significant that larger absolute quantities of oil and grease may be deposited in the Inlet in a shorter time period. This condition, in combination with unfavorable current, incoming tide, and wind conditions, might conceivably result in impaired dispersion and dillution of contaminants, with apparent consequences.

However, in the case of ballast water, the only common materials expected are oil residue and particulates. Because the petroleum residue is considerably lighter than sea water, and consequently surfaces quickly, the dispersion problem is not significant so long as the containment boom and slick clearing facilities are effectively used. Contaminants which go into solution or are suspended in the sea water are not a factor in this case, hence dispersion properties are not of great concern.

ITEM 16
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COUNCIL MEETING May 13/74

Discharge Comparison:

In response to the direct question of comparison with permitted discharge rates for the Chevron Refinery, the current Provisional Permit issued to Chevron Canada Limited on December 6, 1971 permits an average discharge of 600,000 Imperial gallons per day. It must be noted, however, that refinery process waters contain a variety of possible pollutants, including aldehydes, phenols, sulphides, and metals, each of which is restricted in concentration by the Permit, and that therefore no valid direct numerical comparison of simple discharge volumes can be made between a refinery and a ballast water treating plant, in terms of overall environmental impact.

Anticipated Effect of Proposal:

Concerning the possible adverse effect of the current proposal on the intended recreational use of the land abutting Burrard Inlet, your staff conclude that if the concentration of oil, grease, and particulates in the effluent stream can be maintained at currently achieved levels, then the volume rate of discharge may be safely increased to the 2,000,000 Imperial gallon per day level without impairing water quality or recreational potential. Accordingly, the Department of Environmental Health proposes to register an objection to the current proposal in writing as required under the Pollution Control Act, but to recommend that an increased discharge volume of 2,000,000 Imperial gallons per day be permitted subject to a maximum discharge characteristic of 5 mg/l oil and grease, to meet the water quality objective for ballast water discharge as set out in the Pollution Control Objectives for the Chemical and Petroleum Industries of British Columbia, issued March 1974. Further, the Department will be requesting that the Municipality be furnished with the results of the regular sampling and analysis of effluent quality.

RECOMMENDATION:

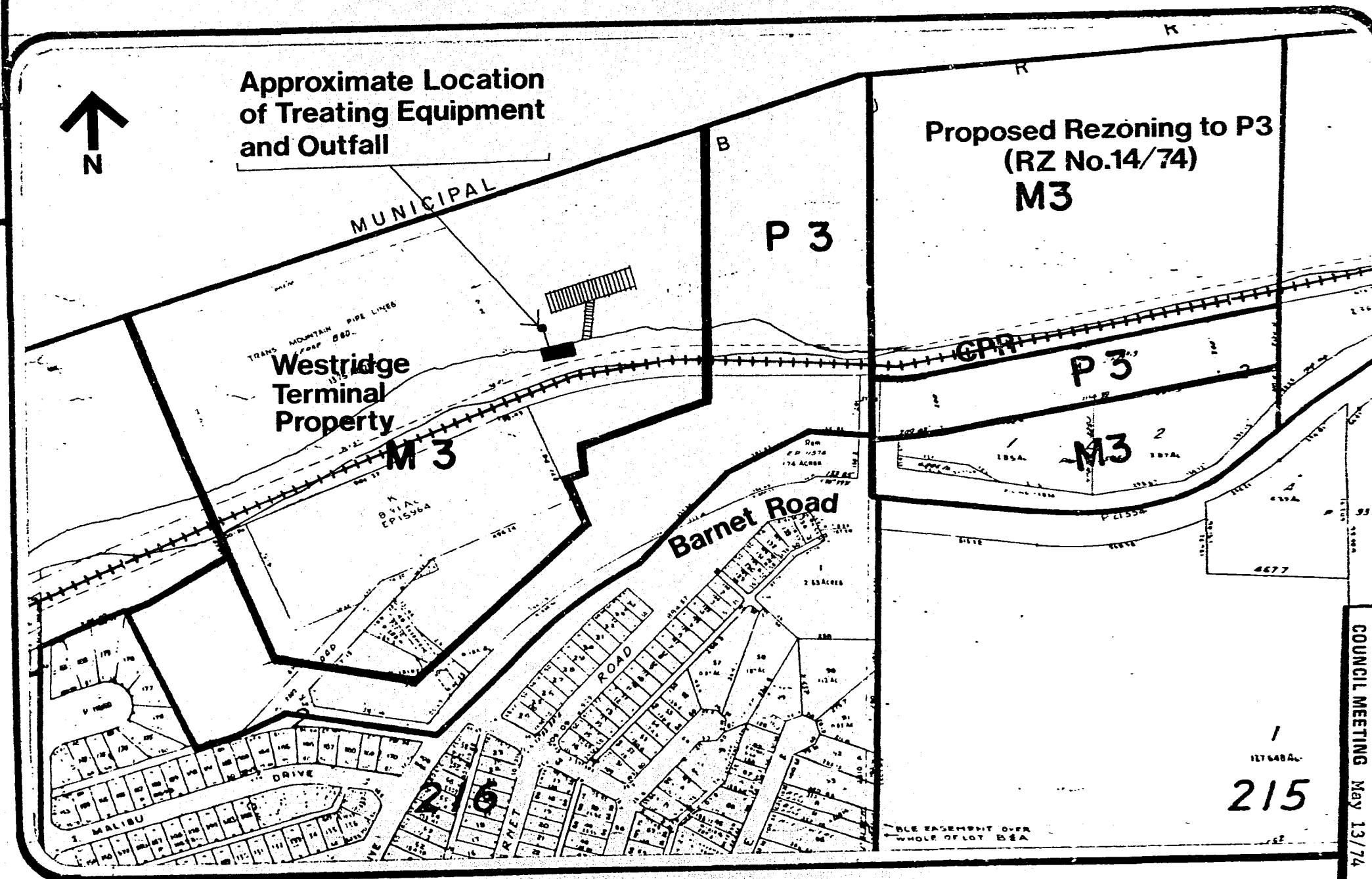
THAT this report be received for the information of Council, and

THAT Council endorse the course of action as outlined above concerning the response by the Department of Environmental Health to the present application.

A. L. Parr,
DIRECTOR OF PLANNING.

DGS:cm

Attach.



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BALLAST WATER TREATING FACILITIES
Westridge Terminal, Burrard Inlet

BURNABY PLANNING DEPARTMENT

ITEM 16
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