

ITEM	10
MANAGER'S REPORT NO.	43
COUNCIL MEETING	June 13/77

Re: APPLICATION FOR POLLUTION CONTROL PERMIT
B. C. HYDRO AND POWER AUTHORITY
BURRARD THERMAL GENERATING PLANT

Further to a recommendation by Mayor T. W. Constable, adopted by Council at its meeting of May 2, 1977, the following report from the Director of Planning dated June 8, 1977 provides further information on the effects of B. C. Hydro's proposal to change fuels at the Burrard Thermal Generating Plant.

RECOMMENDATION:

1. THAT Council direct the filing of an official objection under the Pollution Control Act.

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PLANNING DEPARTMENT
JUNE 8, 1977

TO: MUNICIPAL MANAGER
FROM: DIRECTOR OF PLANNING
SUBJECT: APPLICATION FOR POLLUTION CONTROL PERMIT
B.C. HYDRO AND POWER AUTHORITY
BURRARD THERMAL GENERATING PLANT

At the May 2 meeting of Council, the following recommendation, contained in a report presented by Mayor T.W. Constable on the referenced subject, was adopted:

"That the Municipality of Burnaby send a letter to the Provincial Pollution Control Branch informing them that we support the recommendations of the Director of Pollution Control, Mr. Bunnell, and further that we ask staff to bring forward a report with any further information that may be available."

Subsequently, on May 18, 1977, a letter was received from K.K. Bhattacharyya, P. Eng., of the General Section, Industrial Division, Department of the Environment, acknowledging receipt of the Municipality's letter, and indicating that the letter and the material supplied with it would be considered during the assessment of the application under the Pollution Control Act, but that if the Municipality wished in addition to register an official objection, it might do so in writing within 30 days of the date of publication in the B.C. Gazette or in the Vancouver Sun or the Vancouver Province. At that time, the Hydro and Power Authority had not published notice of its application, but staff was instructed by Council to proceed with a formal objection.

Moreover, during the enquiry session at the May 9 meeting of Council, staff was requested to indicate in its forthcoming report the harmful effect to humans by Sulphur Oxides, Nitrogen Oxides, and suspended particles, and also to indicate whether or not the Port Authority has any controls over tanker traffic or the use of crude bunker "C" oil in Burrard Inlet.

ITEM	10
MANAGER'S REPORT NO.	43
COUNCIL MEETING	June 13/77

Notice has since been published in the B.C. Gazette, and the Municipality has the opportunity until June 21, 1977 to register its formal objection under the provisions of the Pollution Control Act.

126

The purpose of this report, prepared with the assistance of the Chief Public Health Inspector, is to provide Council with the further information requested as well as a copy of the letter of formal objection to be filed with the Director of Pollution Control in Victoria.

PROPERTIES OF CONTAMINANTS LISTED IN B.C. HYDRO'S PERMIT APPLICATION

The application filed by the B.C. Hydro and Power Authority for its Burrard Thermal Generating Plant lists three air contaminants to be discharged, and indicates the proposed rate of discharge and average and maximum concentrations for the contaminants.

A brief discussion of the characteristics and effects of these contaminants follows:

1. Particulate Matter

Dust, ash, smoke, and pollen particles are some examples of airborne particles that are to be found in any body of air. While some of these contaminants may originate from natural sources, in an industrialized area it is common for particulates from man-made sources and activities to predominate.

Man-made particulate matter is generally created in one of three ways: by burning or applying heat to materials, by chemical and photochemical reactions, or by grinding or pulverizing operations.

Smoke is the most obvious particulate pollutant associated with human activity. It is composed of carbon and other substances given off during the incomplete burning of material. Some fuels used in domestic or industrial heating produce more smoke and ash than others (example: coal or bunker oil versus natural gas). Burning fuel in automobiles, diesel trucks and buses, aircraft, incinerators, and industrial plants, as well as heat application processes such as metal smelting or refinery distillation all produce particulate matter.

Some solid particulate materials produced by man-made sources are more toxic than others. The presence of particulates in the air supply has been linked to many types of respiratory disorder, and some types of specific chemical solid contaminants have been proven to be lethal in high concentrations or inhaled over long periods.

The visual effect of particulate-laden air is well known, and is a factor that impairs the quality of life and recreational enjoyment of the environment where effective controls are not in use.

2. Oxides of Nitrogen

When fuel is burned, a certain amount of the nitrogen present in the air burns as well. This burning is also known as oxidizing, and the oxidation of nitrogen results in such products as nitric oxide (NO) and nitrogen dioxide (NO₂). Mixtures of these compounds are known as oxides of nitrogen and are involved, under certain conditions, in photochemical reactions that produce oxidant, directly attributable to NO₂ as a result of a chemical reaction that takes place in the atmosphere between NO₂ and organic compounds under the influence of sunshine.

Photochemical smog was first identified in California but today is found in the major cities of the world, wherever there are large concentrations of people and automobiles. Fortunately, conditions that lead to photochemical smog occur infrequently in the Vancouver area, but from time to time during prolonged windless

periods or during 'inversions', this phenomenon does occur, principally in areas with high concentrations of automobile traffic.

Nitrogen dioxide is a brownish colored gas that may be seen as a 'whiskey brown' haze at high concentrations. As such, it contributes to an impairment of visibility, damage to vegetation, and eye irritation. In experimental situations and studies, pulmonary disorders, impairment of breathing experienced by sufferers from asthma and emphysema, and reduced resistance to respiratory diseases have been linked to adverse concentrations of ozone and oxidants resulting from the presence of oxides of nitrogen.

3. Sulphur Oxides

Heating or burning fossil fuels like coal and oil release the small amounts of sulphur present in these materials. In large cities where great quantities of fossil fuels are burned, such as London and New York, sulphur oxides are a major air pollutant.

The largest fraction of sulphur oxides is sulphur dioxide (SO₂). This substance often further oxidizes to form sulphur trioxide (SO₃) which combines with moisture in the air to form sulphuric acid mist (H₂SO₄). Both sulphur dioxide and sulphur trioxide can damage vegetation and affect the health of humans and animals.

The so-called "killer smogs" of the Meuse Valley in Belgium in 1930, in Donora, Pennsylvania in 1948, and in London in 1952 and 1962 resulted in extreme increases in deaths and illnesses as a result of damage to the cardio-respiratory system, and the primary ingredients in these episodes were sulphur oxides.

The emission of sulphur oxides from oil refinery operations is a major concern, and the Pollution Control Objectives for the Chemical and Petroleum Industries of British Columbia has set high standards for the limiting of such emissions. The use of only low sulphur content fuels is an important factor in controlling such emissions, although treatment of the flue gases with sulphur recovery plants is possible as a means of 'cleaning up' sulphur-rich combustion discharges.

Sulphur dioxide is a colorless gas with a pungent odor. Its toxic hazard rating ranges from moderate ("may involve both irreversible and reversible changes not severe enough to cause death or permanent injury") to high ("may cause death or permanent injury after very short exposure to small quantities").

We are informed that concentrations of SO₂ of less than 1 part per million (ppm) is found to be injurious to plant foliage; at 6 to 12 ppm causes irritation to the nose and throat, and at 20 ppm causes irritation to the eyes. The maximum permissible concentration for exposures of 30 to 60 minutes is estimated to be on the order of 50 to 100 ppm, and concentrations of 400 to 500 ppm are judged to be immediately dangerous to life. The proposed concentration upon discharge at the stacks of the six boiler stacks at the Burrard Thermal plant is 1050 ppm.

PROPOSED DISCHARGES - BURRARD THERMAL PLANT

The discharges of atmospheric contaminants indicated in B.C. Hydro's current application for a Permit under the Pollution Control Act are based on a maximum discharge rate of 1.8 million standard cubic feet per minute from the stacks on a continuous basis. The contaminant concentrations are listed as follows:

Total Particulates: 0.07 grains/dry standard cubic foot at 12% CO₂
Oxides of Nitrogen as NO₂: 160 parts per million
Sulphur Dioxide: 1050 parts per million

Extended, according to the figures supplied by F.R. Bunnell, Director of Operations to the G.V.R.D. Regional Board, these concentrations would translate to the following quantities:

Particulates:	25,956 lbs./day	
NOx	: 49,440 lbs./day	128
SO2	: 453,600 lbs./day	

These figures are based on B.C. Hydro's submission which contemplates burning Bunker C fuel, at a sulphur content of 2%.

Mr. Bunnell has pointed out that it is estimated that as a gas-fired operation, the Thermal Plant is now emitting only 3,240 lbs. of particulates and 142 lbs. of SO₂ daily.

In order to give perspective to the magnitude of B.C. Hydro's proposed emissions, Mr. Bunnell further supplied an estimate of the total of emissions covered by permits and registrations in the entire Eastern Burrard Inlet Air Basin, including all four oil refineries and the Thermal Plant using gas-fired operation:

Particulates:	13,284 lbs./day
NOx	: 81,944 lbs./day
SO2	: 38,407 lbs./day

Clearly, the quantities being proposed by B.C. Hydro for particulates and SO₂ emissions completely eclipse the present "background" levels, by factors of 1.25 and 11.8 respectively.

Council will well recall the efforts of this Municipality to secure the highest possible level of environmental control on air emissions from the Chevron Oil Refinery in conjunction with its recent expansion. The levels imposed by the GVRD in granting its Pollution Permit met our objectives, and reflected compliance with Level 'A' objectives for the petroleum industry in British Columbia with supplementary control limits to further improve air quality in line with Bay Area Standards (San Francisco).

The limits on these three contaminants in the case of the Chevron Refinery, for comparison purposes, were as follows:

Particulates:	696 lbs./day
NOx	: 3,982 lbs./day
SO2	: 4,437 lbs./day

Among other measures, Chevron was obliged to install a sophisticated Sulphur Recovery Unit to recover 99%+ of the sulphur content in its flue gases, and to utilize desulphurized fuel oil or natural gas in all combustion sources, to replace the use of ordinary residual fuel oil.

The Municipal Council has supported the recommendation of Mr. Bunnell that only desulphurized fuel oil or natural gas be utilized in all combustion sources at the Thermal Plant, or that equivalent control at the source be required.

CONTROL ON TANKER TRAFFIC IN BURRARD INLET

Council has requested that staff report on whether or not the Port Authority has any control on tanker traffic in the harbour or the use of bunker "C" oil in the Inlet.

Captain Ross, Harbour Master for the Port of Vancouver advises that the Authority has complete control over the movement of any ship in the harbour. More particularly, they exercise strong controls over both the size and operation of tankers within the harbour, due to the extreme hazard involved.

ITEM	10
MANAGER'S REPORT NO.	43
COUNCIL MEETING	June 13/77

With regard to tanker access to the upper reaches of the Inlet, the depth of channel and speed of the current at Second Narrows limit the size of tankers for regular use to not greater than Panama Canal size (i.e. - not over 60,000 - 70,000 tons deadweight). Further, it is noted that dredging to substantially deepen the channel at this point cannot be reasonably done, due to the location of the pier supports for the Canadian National RR bridge. With respect to operations, tanker movements are restricted to 'daylight only' passage, whether loaded or unloaded, due to the hazards of grounding or explosion, respectively.

It was observed that the oil companies in their discussions with the Port Authority seem to feel that they would require the use of larger vessels, on the order of 100,000 tons deadweight. As noted above, it is not felt this could be reasonably accommodated. It was further mentioned that provision of a facility for berthing Panama-size tankers at the Burrard Thermal site would require dredging at that site, which would necessitate specific approval under the Ocean Dumping Control Act and various Environmental approvals.

Under the Navigable Waters Protection Act, the Port Authority through the Coast Guard again would have control, but it is the Harbour Master's position that they could not obstruct the issuing of permits to allow tanker operations if this were the method of delivery of bunker oil, provided the size and operations of the ships met their requirements.

It was noted that there have been several rather tentative approaches to the Port Authority by the oil companies and B.C. Hydro in this connection, but nothing has been formally proposed. Further, it should be mentioned that bunker fuel, if it were to be used at the Thermal Plant site, could conceivably be delivered by pipeline, either via land or submarine pipeline from a refinery such that tanker traffic to the Thermal Plant site might not necessarily be involved.

IMPACT OF PROPOSED EMISSIONS ON BURNABY

This Municipality has consistently taken the position that it would object to the issuance of pollution permits that provided for anything less than the highest standards of control for industries whose emissions influence the quality of the air in Burnaby. In the case of the four refineries on Burrard Inlet, this Municipality gave formal notice of objection under the Act to the issuance of any permit for refinery discharges that did not meet the standards known as Level "A" in the Objectives relating to that industry. To date, we have been successful in achieving Level "A" and better standards on one refinery located on Burrard Inlet.

The magnitude and the nature of the contaminant discharges indicated in the application for the Burrard Thermal Plant are grossly in excess of the standards considered acceptable in this area. The site is located in an urban regional area, and in a topographically-defined basin that is known to suffer from stagnation and lack of ventilation effects, where the cumulative effects of high emission levels of such harmful pollutants as SO₂ are sure to have serious effects. The location of this facility is such that its emissions will detrimentally affect the quality of air in the north part of Burnaby, as well as in neighbouring municipalities such as Port Moody (see attached report dated May 8, 1977 from the City Engineer of Port Moody to R.H. Blackwood, Municipal Administrator).

Moreover, the site is situated in close proximity to Burnaby's Burrard Inlet Foreshore Park, now under development, where the quality of the air, both visually and in terms of odor or harmful gases, must be preserved for the good of the public who will use the park. The imposition of high levels of contamination from a source across the Inlet, whether privately-or publicly-owned, cannot be tolerated in view of the public investment in and public need for, this valuable major recreational resource.

In conclusion, your staff would advise that the application by B.C. Hydro and Power Authority for a Pollution Control Permit as described is totally unacceptable and contrary to the interests of citizens of this Municipality. Consequently, it is appropriate that the Municipality register the strongest possible objection under Section 13(3) (a) of the Pollution Control Act, 1967, and ask that the Burrard Thermal Plant be required to adhere to emission standards equivalent to those described as Level "A" in the report entitled "Pollution Control Objectives for the Chemical and Petroleum Industries of British Columbia", and that only desulphurized fuel oil or natural gas be utilized in all combustion sources or that equivalent controls at the source be required.

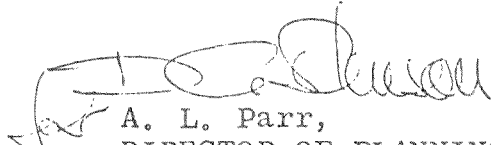
Attached is a copy of the letter of objection proposed to be sent to the Director of Pollution Control, Victoria, B.C. in this regard.

RECOMMENDATION:

It is recommended THAT Council endorse the filing of an official objection under the Pollution Control Act.

AW

DGS:cm
Attach.


A. L. Parr,
DIRECTOR OF PLANNING.

c.c. Chief Public Health Inspector
Municipal Clerk

D R A F T

ITEM	10
MANAGER'S REPORT NO.	43
COUNCIL MEETING	June 13/77

Director, Pollution Control,
Parliament Buildings,
Victoria, B.C.

Dear Sir:

Re: Application for Discharge of Emissions Under
the Pollution Control Act -
British Columbia Hydro and Power Authority
Source - Burrard Thermal Generating Plant, Ioco, B.C.

At the direction of Council, I am writing on behalf of the Corporation of the District of Burnaby to register this Municipality's objection to the referenced application for a permit under the Pollution Control Act 1967 (Emissions) dated April 4, 1977 requesting approval to discharge contaminants to the atmosphere.

The Corporation of the District of Burnaby is an objector under Section 13(3)(a) of the Pollution Control Act 1967. The Corporation, in this regard, is representing the interests of this Municipality with respect to emissions proposed to be discharged from the Burrard Thermal Plant which is located in close proximity to the northerly area of our Municipality. The quality of the air is a subject of great concern to the residents of this Municipality, and the level of emissions proposed under the Hydro and Power Authority's application would, we believe, seriously impair air quality in the eastern portion of the Burrard Inlet basin and would detrimentally effect the use and enjoyment of lands within this Municipality, including residential areas and the Burrard Inlet Marine Park, currently under development by the Municipality on the south shore of Burrard Inlet.

For reasons expressed above the Corporation is and will remain an objector to the issuance of any permit for the discharge of contaminants to the atmosphere by the Burrard Thermal Plant which do not adhere to emission standards at least equivalent to those described as Level "A" in the report entitled "Pollution Control Objectives for the Chemical and Petroleum Industries of British Columbia", and further request that only desulphurized fuel oil

ITEM	10
MANAGER'S REPORT NO.	43
COUNCIL MEETING	June 13/77

132

or natural gas be utilized in all combustion sources or that equivalent controls at the source be required.

We would therefore request that you as Director of Pollution Control, require that these standards be established as the minimum for any permit to be issued for this Thermal Plant, in order to avoid any deterioration in air quality in this Municipality as a result of increased emissions from the Burrard Thermal Plant.

Yours truly,

Melvin J. Shelley,
MUNICIPAL MANAGER.

c.c. Chief Public Health Inspector
Director of Planning
Municipal Clerk