

ITEM	1
MANAGER'S REPORT NO.	20
COUNCIL MEETING	79 03 12

Re: CHEVRON CANADA LIMITED
REFINERY EXPANSION PROGRAM
UPDATED STATUS REPORT

Following is a report from the Director of Planning regarding the modernization and expansion program at the subject facility.

RECOMMENDATION:

1. THAT the report of the Director of Planning be received for information purposes.

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TO: MUNICIPAL MANAGER 1979 FEBRUARY 28
FROM: DIRECTOR OF PLANNING
SUBJECT: CHEVRON CANADA LIMITED
REFINERY EXPANSION PROGRAM — UPDATED STATUS REPORT

RECOMMENDATION

1. THAT this report be received for the information of Council.

REPORT

At the 1978 October 30 meeting of Council, staff was requested to provide an updated status report on the refinery modernization and expansion program undertaken by Chevron Canada Limited.

In accordance with this direction, Planning Department staff met with representatives of the Environmental Health Department, Fire Prevention Office, and representatives of the oil refinery on 1978 November 15 to obtain updated information on the various elements of the expansion program, which had been last reported to Council in detail on 1977 July 18 (Item 24, Manager's Report Number 51). In order to provide Council with specific comments on the refinery's performance with respect to air, emissions, effluent water quality, and the noise control program, it was found necessary to obtain specific information from the various authorities that inspect and monitor these environmental aspects.

The necessary information has now been obtained from the Greater Vancouver Regional District, the Provincial Ministry of Environment - Pollution Control Branch, and the Environmental Health Department's Noise Monitoring Service inspections, and office records, and we are now able to provide Council with the requested report, as follows.

SUMMARY OF PRESENT STATUS

The modernization and expansion project which was approved in principle by Burnaby Municipal Council on 1974 January 14, has proceeded basically according to the originally stated plan, and the majority of the elements of that plan have been completed and are operating satisfactorily. Significant improvements have been made in the control of emissions and effluent from the refinery, and the construction of facilities needed to accomplish these environmental goals is largely complete. The oil company has not yet expanded to the maximum through-put capacity that was contemplated in the expansion program due to a lack of sufficient market demand to justify construction of a new crude unit together with the attendant additional support facilities. The major objectives related to site boundary definition and landscaping improvements have been accomplished, and the Company has proceeded with acquisitions and transfer of properties related to the approved greenbelt/buffer concept.

Monitoring results, according to the G.V.R.D. and the Provincial Ministry of Environment - Pollution Control Branch, demonstrate that the pollution control objectives that were established as a condition of Council's approval are being achieved and surpassed in actual operation, and monitoring/inspection will be continued in order to assure that these improved operating standards are maintained.

STATUS OF ASPECTS OF
THE MODERNIZATION AND EXPANSION PROGRAM

1. Process Area (Area II) -- Facilities

<u>ITEM</u>	<u>STATUS</u>	<u>COMMENTS</u>
CO Boiler	Complete; has been in continuous operation for over two years, except for the required annual shut down for inspection and maintenance purposes.	By converting CO to CO ₂ (which is not considered a pollutant) the output of carbon monoxide from the fluid catalytic cracking unit has been virtually eliminated. The plume formerly evident at the 300' stack has been eliminated due to operating temperature reduction and the consumption of sulphur trioxide.
Sour Water Stripper	Complete; has been in continuous operation for over two years; operating satisfactorily.	As will be noted below, Chevron Canada has entered into an agreement with the G.V.S. & D.D. concerning the standards of process water discharged to the sanitary sewer system; the G.V.R.D. advises that the quality of effluent is in compliance with the agreement. This unit is instrumental in removing hydrogen sulphide and ammonia from effluent waters; overhead gas from this unit is routed to the sulphur plant. Sulphides have been further reduced by Chevron to a trace level in order to offset possible sewer odors.

ITEM	1
MANAGER'S REPORT NO.	20
COUNCIL MEETING	79 03 12

ITEM	STATUS	COMMENTS
H ₂ S Sulphur Plant	Complete; in operation since 1977 June 23; the G.V.R.D. advises that the unit is achieving the required sulphur recovery objective (Level "A") of greater than 99% recovery.	Operation meets and exceeds Level "A" requirements. Quarterly testing is undertaken by an independent laboratory at Chevron's expense to verify satisfaction of permit standards; the emission of SO ₂ and particulates by every analysis meets or exceeds Level "A" requirements.
Catalytic Reformer (Rheniformer)	Complete and in operation.	Process component required for low-lead/no-lead gasoline products, and reduces sulphur content in the product.
Effluent Water Treatment	All Area II effluent process water, by agreement with the G.V.S. & D.D., is discharged to the sanitary sewer system.	Quality of effluent is in compliance with the agreement. Sulphides have been further reduced by Chevron to a trace level in order to offset possible sewer odors.
Crude Unit/Light Product Treating	One of the four major components (splitter) complete and in operation with sufficient production to permit refinery to meet its short term product demands. Remaining components of crude unit deferred at present--not required at this time due to continued low market demand.	Splitter uses specialty feed stocks which are low in sulphur content (desulphurized light oil and treated condensate (Kaybob) from Alberta). Results in reduction in air pollution products as compared to the refining of crude.
Diesel Hydrodesulphurization Plant	Deferred for the present time; to date the Federal Government has not promulgated any new regulations governing maximum sulphur content in diesel fuel. However, we are advised that a requirement was adopted 1977 August 10 which requires importers and producers of petroleum products to report to Environment Canada on the content of additives (lead, phosphorus and other elements) and sulphur content in their petroleum products.	Decision to not proceed at this time is related to the low level of sulphur content of available plant feed stock and the fact that diesel and furnace oil products now meet pertinent standards. This item to be developed if future government standards for such products are changed and so require.
Flare Relocation; Low Level Flare	Low level flare complete and in operation for almost one year. Relocation of the existing low level flare, for emergency operation only, would be undertaken in conjunction with construction of an expanded crude unit.	In normal operation only, the low level flare will customarily be used; the high level flare is an emergency backup only (has been required to be used only once within the past year).
Noise Reduction Program	The Chief Public Health Inspector advises as follows:	

ITEM	1
MANAGER'S REPORT NO.	20
COUNCIL MEETING	79 03 12

ITEM	STATUS	COMMENTS
Noise Reduction Program Continued.	"The Chevron Noise Control Program has been active towards reaching their objective of a property line noise emission level in compliance with the 60 dBA night-time (22:00 to 07:00 h) Burnaby Noise or Sound Abatement By-law standard. Currently, the Company is installing an acoustical enclosure around the atmospheric furnace No.5101 and also eliminating, where possible, steam venting. Chevron officials are of the opinion that completion of this work should result in a property line noise emission level in compliance with the night-time (22:00 to 07:00 h) 60 dBA Burnaby Noise or Sound Abatement By-law requirements.	
	Upon completion of the acoustical enclosure, the Environmental Health Department will commence monitoring, during permissible weather conditions, to determine Noise By-law Compliance."	
Vapour Recovery System on Steam Traps, Seals, Vents, and Drains	Program to provide for collection and utilization of escaped vapours is complete.	Vapours formerly discharged to the atmosphere are now recovered and piped for use as furnace fuels following desulphurization.
Pipeline Protection System	Collection system is complete and in operation: interceptor drain system through Confederation Park north of product pipelines, discharges to sump and closed pipeline to foreshore basin.	This system, to protect against soil pollution in the event of a break or leak in the product pipelines is in place and operational; no breaks or leaks have occurred to date.
Spent Caustic Collection	Tank installed and in operation.	Caustic materials stored and re-used, eliminating their discharge to effluent water system.
Perco Unit Drains	Installed and in use.	Copper solution collected and recycled, eliminating discharge to effluent water system.
Painting Program	All newly complete process facilities have been painted in aesthetic pastel colours; repainting program continues at the rate of approximately four tanks per year.	Visual improvement due to appropriate treatment of new facilities and repainting of older elements.
LPG Storage Spheres	Not yet constructed -- no plans at this time for additional major LPG storage. New construction would be contingent on development of the new crude plant; existing LPG storage in the existing tank field conforms to NFPA standards and is acceptable to the Fire Prevention Office.	The specialty feed stocks for the new plant are essentially debutanized. The production of LPG for sale has decreased with the operation of new facilities allowing deferment of the new storage facility. If production increases, refinery would

ITEM	1
MANAGER'S REPORT NO.	20
COUNCIL MEETING	79 03 12

<u>ITEM</u>	<u>STATUS</u>	<u>COMMENTS</u>
LPG Storage Spheres continued....		install low profile cylinders in Area II at a screened location as per Master Plan to replace existing containers in Area I.
Other Buildings in Process Area	Additional support buildings constructed and completed in Area II.	Consistent with approved modernization program.
Hydro Sub-Station	New 60 Kv sub-station installed and in operation.	New sub-station adjacent Penzance Drive, 60 Kv capacity, supplied from two independent B.C. Hydro feeder systems -- improves reliability of electric service, minimizing chances for a complete shut down due to electrical service reasons.
Landscaping	Landscaping requirements program to date have been completed.	Additional broom planting along the Penzance Drive fence line is continuing; landscape maintenance program continues.
<u>Process Area (Area II) -- Operations</u>		
Sulphur Reduction by 99%	Achieved by new sulphur plant; G.V.R.D. advises that unit is achieving the required sulphur recovery.	Complies with G.V.R.D.'s Level "A" permit requirement.
Air Emissions	Level "A" objectives of particulates, carbon monoxide, hydro carbons, sulphur dioxide on fluid catalytic cracker unit (FCCU). The G.V.R.D. advises that current emission levels are less than one-half of the Level "A" objectives for all contaminants. The requirements of Level "A" are as follows: --particulates 0.05 grains/SCF --carbon monoxide - 2000 ppm --hydro carbons - 25 ppm --sulphur dioxide - 300 ppm	Meets and exceeds air quality objectives with respect to these emissions.
Monitoring of SO ₂ Ground Level Concentration	Permit criterion is the Federal Government's desirable limit for ambient air quality; the G.V.R.D. advises that ambient measurements of contaminants are provided at the Regional District's continuous air quality monitoring station. In the vicinity of the Chevron Refinery, the ambient levels for sulphur dioxide in 1978 do not exceed the Federal Government's desirable limits for air quality.	Chevron is a participant along with other refineries, in the financing of the G.V.R.D.'s air quality monitoring program.

ITEM	1
MANAGER'S REPORT NO.	20
COUNCIL MEETING	79 03 12

ITEM	STATUS	COMMENTS	106
Curtailment of Operations to Maintain Operation Within Maximum Desirable Limits in Event of "Upset"	Curtailment procedures are part of the Refinery's standard operating procedure, in order to meet this requirement.	Standard operating procedures designed to maintain compliance.	
Shutdown Procedures	Plant operating procedures dictate that units installed for environmental protection (such as CO boiler and sulphur recovery plant) are permitted to be shut down <u>only</u> when production facilities such as furnaces, FCCU, etc. which would produce substantial quantities of contaminants have been previously shut down.	This sequence of steps in the shutdown procedure is designed to ensure that sources of contaminants are taken out of operation prior to the shutting down of the respective pollution-reduction units, in order to meet the ground level concentration criteria of the refinery's permit.	
Flare Operations	The standard operating procedure provides that scheduled shut downs are to be done using the new low-level flare only, and will not exceed its capacity.	The refinery is designed to be able to shut down completely without use of the elevated flare, except in extreme emergency situations.	
Oily Ballast Water	No ballast water treating facilities required as marine transport utilize barges only -- no tankers.	No ballast water involved in barge operations.	
Steam Plant and Process Heaters Air Emissions	The G.V.R.D. advises that current levels being achieved are less than one-third of the Level "A" objectives for all contaminants. The requirements of Level "A" are as follows: --particulates 0.65 grains/SCF --sulphur dioxide - 300 ppm --sulphur trioxide - 0.011grains/SCF	Meets and exceeds air quality objectives with respect to these emissions.	
Sulphur Content IU Feed Stock	The criteria under the expansion approval required the use of low sulphur content crude (Peace River stock) for 80% of the post-expansion refinery crude run. The use of de-sulphurized light oil has allowed a further reduction in the total sulphur content of the feed stock.	Sulphur content of Peace River crude is 0.4%, by weight, while the content of Great Canadian Oil Sands desulphurized light oil is 0.17%.	
Fire Protection	The Company advises that its facilities and operations conform to all the pertinent NFPA and API standards, and that they meet the requirements of the Fire Prevention Officer in all respects.	The Fire Prevention Officer confirms his satisfaction with operations as of his last inspection relevant to fire prevention and protection measures.	

ITEM	STATUS	COMMENTS
Fire Truck	A new fire truck has been purchased and is located on the site and an ongoing training program is continuing. Expenditures by the oil company on fire protection items to May 1975 were reported to \$213,000. Since the expansion, a further \$690,000 has been expended on new capital items to improve the standards of protection.	New capital items have included the following: Area I — new fire vehicle, high expansion foam monitors around LPG tanks and loading rack fire training ground, tank truck loading rack drainage line protection, and automatic shutoff systems. Area II— provision of looped water systems around each plant, and provision of strategically located monitors, foam containers on all new tanks, and a water fog system for hot oil pumps. Further work to be completed during 1979 includes an automatic overhead sprinkler system under the roof at the tank truck loading racks in Area I.
Steam Turbine Spares or Standby Equipment on Sulphur Plant	The sulphur plant has been constructed in such a way that electric power is supplied from either of the two major power sources serving the refinery. In this way, continued operation is assured except in the highly unlikely circumstances that both electric power sources (Horne-Payne sub-station and Barnard sub-station) were to fail simultaneously.	This provision ensures continuing operation of the sulphur plant under upset conditions short of absolute failure of all power from both sources. Even if this unlikely situation were to arise, the emissions from flue gases would not exceed current SO ₂ emission levels, and of course the refinery would immediately undergo a controlled systematic shutdown. Provision is made for process furnaces to shut off automatically, immediately, in the event of a major emergency, such that production of sulphur-laden flue gases would cease.
<u>Tank Farm (Area I) — Facilities</u>		
Vapour Recovery System - Tank Truck Loading Rack	This item is dealt with in greater detail below, following this table.	The majority of the bottom loading conversion program has been implemented; see notes below.
Tank Modification to Reduce Hydrocarbon Emissions	Reallocation of products within the tanks has been completed and floating roofs with improved seals are in place on all gasoline storage tanks; all emission requirements of the air pollution permit are met. The G.V.R.D. advises that installation of two new storage tanks at the refinery site and modifications to several existing tanks were specified in the Pollution Control Board permits; all related work has been completed.	Reallocation, floating roofs, and improved seals were required to reduce the emissions and free hydrocarbons from high vapour pressure products under the air pollution permit.

ITEM	1
MANAGER'S REPORT NO.	20
COUNCIL MEETING	79 03 12

<u>ITEM</u>	<u>STATUS</u>	<u>COMMENTS</u>
New Tank Construction	The major new tank in Area I (north of the foot of Carlton Avenue) has been completed satisfactorily.	The tank siting, grading, and screening were designed to minimize the view of this tank from the residential area. We know of no complaints concerning this new tank and believe that the care exercised in siting and screening was warranted.
In-line Blending	This item has been deferred for the present time, again in response to reduced product demand. An understanding exists that no additional new gasoline tanks will be approved prior to installation of the blending system.	The function of the gasoline blender is to allow combination of products without relying on large amounts of intermediate storage tankage. No new gasoline tanks should be approved until the blending system is in place.
Foreshore Basin	Completed and operating satisfactorily; a permit for discharge of storm run off water from Area I has been issued by the Pollution Control Board, providing for de-oiling, air flotation, and ponding/skimming in the foreshore basin.	This foreshore basin forms a last stage holding pond for run off and discharge from the pipeline protection system prior to discharge to the Inlet. Skimming and pumping equipment has been installed to remove any colours of oil that might appear in this final trim stage.
Tank Car Loading and Foreshore Landscaping	The loading rack is complete and in operation and foreshore landscaping adjacent the facility has been provided.	Installed as per program.
Removal of LPG Cylinders	As noted above, the LPG cylinders have not to date been removed from the tank farm area.	Deferred due to lack of requirement for additional LPG storage; present situation is acceptable to the Fire Prevention Office.
LPG Loading Rack	Not yet constructed, the refinery has no plans to advance this at the present time.	Due to small market demand for LPG products delivered by truck, an expanded LPG loading rack is not presently justified (most LPG now goes out by tank car).

2. BOUNDARY DEFINITION AND TREATMENT

Land Exchange Program	Initial land exchange complete, including cancellation of redundant roads and lanes, vesting of title, securing of easements in return for Chevron-owned properties.	Initial land exchange completed as per proposal.
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CHEVRON REFINERY EXPANSION PROGRAM
UPDATED STATUS REPORT
1979 FEBRUARY 28.....PAGE TEN

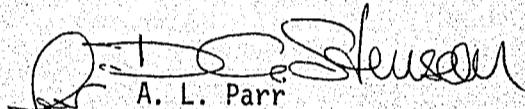
ITEM	1
MANAGER'S REPORT NO.	20
COUNCIL MEETING	79 03 12

110

In summary, it is felt that a realistic schedule for upgrading the private carriers has been submitted, particularly in view of the number of carriers involved".

Chevron refinery representatives have confirmed this timetable, and indicate that the program is proceeding according to schedule.

The foregoing is for the information of Council.


A. L. Parr
DIRECTOR OF PLANNING

AP.
DGS/ds

- cc Chief Public Health
Inspector
- Chief Fire Prevention
Officer