

ALASKA LEGISLATURE SPECIAL COMMITTEE / SUBJECT FILES 8672

1071 SCOMM 28: JOINT GAS PIPELINE COMMITTEE, 1981-82 / 071

The April 1981 survey found one efficiency and two one-bedroom furnished apartments available. During March 1981, when nine of the 20 complexes surveyed announced rent increases effective April 1, a total of 43 apartment units became available for rent, a 4 percent total vacancy rate. Landlords surveyed said they had little difficulty filling the vacancies. More than half the vacancies occurring in March were in one-bedroom units. Managers reported only minimal turnover for two-bedroom units and none in three-bedroom apartments. In some instances landlords filled their one-bedroom units with tenants who immediately went on the waiting list for a two- or three-bedroom unit, thus assuring themselves of first consideration once an opening occurred for a larger unit within the complex.

Landlords indicated that despite the recent rent increases, tenants were remaining in their apartment complexes, possibly due to the lessening availability of similar type apartment units at lower rents. Most of their tenant turnover in March was due to people purchasing their own homes or transferring jobs, unlike the turnover earlier in the year, when some tenants vacated their units to find cheaper housing.

About nine months ago nearly all of these complexes ran regular ads in the Fairbanks Daily News-Miner, but now only four are running ads and one of these is just advertising for names for future openings. Waiting lists are now kept for half the complexes surveyed. In April 1981, the number of names on each list averaged one-fourth of the total number of units in the complex. Most landlords surveyed, including those who do not maintain waiting lists, indicated that they receive daily inquiries from prospective tenants who need an apartment immediately. One manager of a medium-sized complex commented, "I have had to turn away at least 30 people a week who need housing right away." Another indicated, "If we had another 533 units out there, we could fill them."

It is apparent that by this summer the vacancy rates for newer apartment complexes and perhaps all rental units will be negligible, and tenants will no longer have the flexibility to move when the rents in their complexes are raised. As one owner put it, "For the first time since 1976, the owners can call the shots."

Average Rents

The survey found that between February 1981 and April 1981, nine complexes had rent increases of between \$15 and \$75 per unit, and average rents increased three to six percent during that two-month period. Table 9, which compares rents from the February and April surveys, shows that the largest average rent increases were for one-bedroom unfurnished apartments which rose from \$364 to \$385 (+6 percent) and one-bedroom furnished units which rose from \$410 to \$431 (+5 percent). Average rents for two- and three-bedroom apartments

Table 9

AVERAGE MONTHLY RENTS FOR MAJOR* APARTMENT COMPLEXES

Fairbanks Area
February 1981 and April 1981 Comparisons

<u>Apartment Sizes</u>	-----Average Rents----- (Units shown in parentheses)		Rent % Change <u>February 1981</u> <u>to April 1981</u>
	<u>February</u> <u>1981</u>	<u>April</u> <u>1981</u>	
Efficiencies	\$259 (32)	\$259 (32)	0%
One-Bedroom Unfurnished	\$364 (140)	\$385 (140)	6%
One-Bedroom Furnished	\$410 (497)	\$431 (497)	5%
Two-Bedroom Unfurnished	\$414 (127)	\$428 (127)	3%
Two-Bedroom Furnished	\$492 (237)	\$505 (237)	3%
Three-Bedroom	\$466 (145)	\$482 (145)	3%

* 1976 data is based on a survey of 29 apartment complexes representing 1,500 units. The 1978 and 1981 data is based on 1,178 units in 20 apartment complexes which have 12 or more units and were built since 1960. See Table 7 for a list of complexes.

Sources: February 1981 and April 1981 data was based on a survey of major apartment complexes made by Marilyn Forrest for Northwest Alaskan Pipeline Company, Manpower and Impact Planning Department.

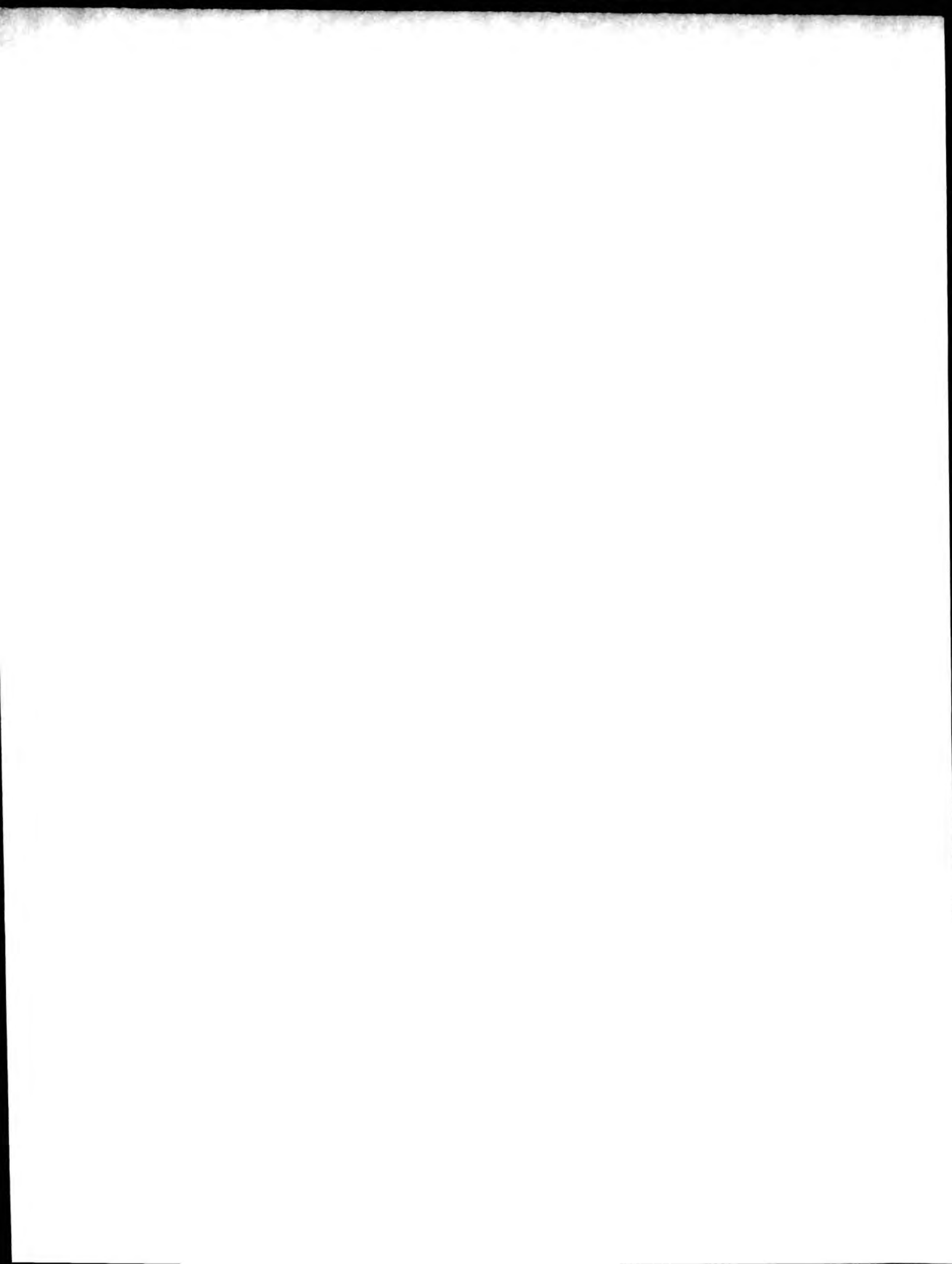
increased 3 percent during that period. The average rent for a three-bedroom apartment increased from \$466 to \$482. There was no change in the average \$259 per month rent for an efficiency unit.

Apartment complex managers had expressed concern in February about the effect of planned rent increases on their occupancy rates; yet in April these managers were able to conclude that the increases had little or no effect on tenant turnover. "We didn't lose a single tenant", noted the manager of one complex which had raised rents in March. Complex managers indicated recent rent increases were vital toward meeting basic costs of running the complexes; however, several managers indicated that in view of the tightening rental market situation, additional increases are likely as early as this summer.

Other Trends

Problems and delays in getting phone service were mentioned by several landlords surveyed. They said private lines are virtually impossible to obtain and new tenants at one complex must wait a minimum of two months for phone service on a four party line.

Recent rent increases were necessary to meet the basic costs of running the complexes. Therefore, one complex, in an effort to keep down heating costs and rental rates, plans to build its own small coal-fired heating plant.



****PLEASE NOTE****

THE ORIGINAL FILE CONTAINS AN OVERSIZED DOCUMENT THAT
IS UNSUITABLE FOR FILMING. PLEASE REFER TO THE ALASKA
STATE ARCHIVES TO VIEW THE ORIGINAL.



Alaska Natural Gas Transportation System

Northwest Alaskan
PIPELINE COMPANY

SCOMM

28:27

9/5/80

COMMISSIONER'S FINDINGS

Under the authority invested through AS 38.05.020(b)(2), the Commissioner of Natural Resources may enter into agreements he considers necessary to carry out the purposes of the Public Lands chapter. In September , 1980, and after an extensive public process to be described hereinafter, the State of Alaska, acting through its Commissioner of Natural Resources, and Dow Chemical U.S.A. and/or Shell Chemical Company, together with "Participants" Alaska Interstate Company, Asahi-Dow, Ltd., Doyon, Ltd., E.I. duPont de Nemours, Earth Resources Company of Alaska, Mitsubishi Chemical Industries, Ltd. and Mitsubishi Corporation, and "Affiliate" Alaska Interior Resources Company will enter a Memorandum of Understanding and Intent. All the companies together, operating as the Dow-Shell Group (DSG), agreed to take certain actions toward the ultimate goal of establishing, if feasible, an in-state industry using natural gas liquids from Prudhoe Bay. A copy of the agreement is attached.

The State has demonstrated a long term interest in maintaining options and improving opportunities for future petrochemical manufacturing in Alaska. The State's Prudhoe Bay oil and gas leases require that one-eighth of all oil and gas produced under lease be granted to the State as royalty. As a matter of both law and policy, the State's foremost priority is

that its royalty hydrocarbons be processed inside the State and that the products be distributed first within the State before product or raw material export takes place. Prudhoe Bay gas production is scheduled to commence within the next decade, probably by 1986. Approximately 2 billion cubic feet per day of sales gas will be produced for the 2-to-25 year life of the field, with the State's royalty share averaging 250 million cubic feet per day. On this date, no disposition of the State's royalty gas (methane) or royalty gas liquids, including ethane, from the Prudhoe Bay field unit, remains in effect.

The State has long supported making natural gas liquids available as feedstock for petrochemical manufacturing in Alaska. The State's attorneys, for example, have attempted to keep petrochemical development options open during the ongoing Federal Energy Regulatory Commission (FERC) hearings on gas pipeline issues. The State has consistently argued, in addition, that piecemeal disposition of the issues affecting availability of natural gas liquids is counterproductive and that the pipeline pressure issue should have been considered simultaneously with the issues of CO2 level and butane disposal.

On August 6, 1979, FERC issued its Order Approving Alaska Segment Design Specifications and Initial System Capacity.

In response to widespread concern about the implications of FERC's action, the Governor appointed a Working Group on Natural Gas Conditioning, with membership from the Administration, the Legislature and the municipalities. After a series of meetings in August and September at which the group identified issues surrounding instate use of royalty gas and royalty gas liquids, and development of an instate petrochemical industry, the Governor's Working Group resolved the following at its September 21 meeting: (1) the subcommittee's reports, as approved by the full Working Group, be transmitted to the Governor as the preliminary report; (2) the Governor be requested to determine the present day feasibility of an instate petrochemical industry, particularly by actively contacting and soliciting the interest of major petrochemical companies with regard to the feasibility of such development; and (3) the Governor be requested to preserve the State's options by requesting the FERC to re-open for hearing the project's size and pressure issue and, failing that, filing an appeal of the FERC size and pressure order in federal court no later than October 5, 1979. The Working Group's September 21 resolution was accompanied by another asking the Governor to continue the Working Group by allowing its members to serve as ex officio members of the Legislature's Joint Gas Pipeline Committee.

The Administration responded to the recommendations of the Governor's Working Group by authorizing the State's attorneys to file suit in U. S. District Court to overturn the FERC

size and pressure order issued August 6. In addition, in late October and early November, 1979, Administration representatives and members of the Legislature met with North Slope gas producers, petrochemical firms, Northwest's investment advisors, congressional members and federal agency representatives to discuss the gas pipeline project and potential petrochemical development.

FERC public hearings on the Draft Environmental Impact Statement for the Prudhoe Bay project gave Alaska citizens and officials the opportunity to comment publicly on September 4 and 5, 1979, on the petrochemical development issues, such as location of the gas conditioning plant and availability of natural gas liquids. At issue were the conclusions and much of the content of FERC's Draft Environmental Impact Statement released July 27, 1979.

At the November 21, 1979 meeting of the Legislature's Joint Gas Pipeline Committee, Attorney General Avrum Gross announced the State's intention to seek formal proposals for petrochemical development. The Committee, with the Governor's Working Group, endorsed a resolution concerning Alaska's securing gas liquids for use in an Alaska petrochemical industry, and also endorsed a proposed schedule for further administrative action for acquisition and delivery of gas liquids and development of a related industry. Copies are attached.

The four Alaska mayors also reiterated their position on potential petrochemical development and State participation in the gas pipeline project. First, they supported maximum instate use of gas liquids. Second, they believed acquisition of liquids is the only basis for state financing of the gas pipeline. And, third, they urged the State to take the lead in purchasing negotiations of the producers' liquids.

In response, the Administration continued its conversations with producers concerning the possibility of an option to purchase, or an outright purchase, of all or a part of the producers' processing rights to Prudhoe Bay gas. By June of 1980, the State had received formal replies from the three major Prudhoe Bay gas producers (Exxon, Atlantic Richfield, and Sohio-BP), which indicated their willingness, under certain conditions, to enter into good faith negotiations with a financially responsible major petrochemical concern sponsored by the State of Alaska (copies attached). Exxon Chemical Company later indicated its intention of completing a major feasibility study to determine the economics of a gas based petrochemical industry in Alaska.

In January, 1980, Governor Hammond reconstituted the working group as the Alaska Natural Gas Task Force. Lt. Governor Terry Miller was named to chair the Task Force whose membership included the Commissioners of Revenue, Natural Resources,

and Commerce, the Attorney General, four legislators and five mayors. At that time the State anticipated that the Phase I Letter of Intent for the Northwest Gas Pipeline Project would be signed by the Northwest partnership and the producers by February 1.

The role of the Task Force was to evaluate and monitor the developing plans for the Phase I design of the gas pipeline, particularly with respect to its impact on potential development of instate petrochemical facilities. Negotiations for the Phase I Letter of Intent, however, were slower than originally anticipated, with the parties signing the document on June 20, 1980. Accordingly, the role of the Governor's Task Force became focused on the State's solicitations for gas liquids development and selection of a company or companies to receive the State's backing for a feasibility study of petrochemical development.

On February 4, 1980, the Governor issued a "Solicitation of Interest" to more than seven hundred firms potentially interested in development projects using Prudhoe Bay gas liquids. Firms were to respond to the initial solicitation by February 15; the deadline was later extended to March 30 at the request of several companies.

Spring, 1980, activities included the approval by the Joint Gas Pipeline Committee of a proposed FY 81 budget for studies

and continued activities relating to the gas pipeline and petrochemical development. Administrative and legislative support was given to inclusion to the proposed funding in the State budget.

The Governor's Natural Gas Task Force continued its meetings, receiving updates on the Washington, D. C. gas pipeline project negotiations, firms' responses to the solicitation of interest, and proposed budget. In March, 1980 I issued a "Further Solicitation" to the firms that responded affirmatively to the initial solicitation.

In June, 1980, the State received several formal proposals in response to its "Solicitation" and "Further Solicitation." The firms and individual responding included Alaska Arctic Resources Group; Dow/Asahi-Dow, with Shell Petroleum; Earth Resources/Mitsubishi; Nissho-Iwai Group; Phillips Petroleum; Alaska Interior Resources; and Jerry McCutcheon. Exxon Chemical Company also indicated its intention of conducting its own independent examination of the feasibility of an Alaska petrochemical industry.

On July 18 and 19, 1980, the petrochemical firms made public presentations to the Governor's Task Force on their formal proposals. The public presentations were followed on August 7 by public hearings on the proposals in Fairbanks and Anchorage. Following the public hearings, a subcommittee of

the Task Force (Lt. Governor Terry Miller, Commissioner LeResche, and Mayor Carlson) entered into initial negotiations with the petrochemical groups. At an August 15, 1980 meeting of the Task Force, the group moved to continue negotiations with three of the proposers: Dow/Shell; Alaska Arctic Resources Group; and Phillips Petroleum. Further negotiations the week of August 18-25 led to Phillips Petroleum withdrawing from the selection process and negotiated "Letters of Understanding and Intent" drawn up between the State and the Dow/Shell Group, and the State and Alaska Arctic Resources. The Governor's Task Force met again on August 28 to review the proposed Letters of Intent and to again consider the basic proposals, and at that time, decided to recommend Dow/Shell to the Governor as the group the Task Force recommends to complete a feasibility study of an instate gas-based petrochemical industry.

PURPOSE AND FINDINGS

The purpose of the memorandum of understanding and intent is to facilitate the wise development of Alaska's royalty gas liquids by providing means and procedures calculated to promote private economic growth consistent with applicable environmental standards and public fiscal stability. Alaska statutes provide that, at an appropriate time, the State will take, if possible, its royalty gas liquids in kind rather than in value. Alaska statute further provides that the sale of royalty hydrocarbons be by competitive bid except when the Commissioner determines that the best interest of the State does not require it.

Certain unknowns make it impossible to prudently dispose of the State's Prudhoe Bay royalty gas and royalty gas liquids at this time. These unknowns include: the yet undetermined value of the gas liquids; the uncertain economic feasibility of a gas-based petrochemical industry in Alaska, the financial and operational impacts, if any, of gas-based petrochemical development on the gas pipeline project; the impacts, such as field fuel requirements and line routing requirements, of gas-based petrochemical development on the TAPS line; timing of gas sales and delivery through the gas pipeline; and ownership and operation/management of the Prudhoe Bay gas conditioning plant.

At the same time, however, that many unknowns make final disposition of the State's Prudhoe Bay royalty liquids unwise at this time, other factors make it vital that the State take decisive actions to maintain the possibility and maximizing the probability of future gas-based petrochemical development. The Phase I agreement between the producers and the Northwest Pipeline sponsors has provided the gas pipeline project with a significant step toward a speedier completion of pipeline engineering and design. A bid package for a contractor to prepare the Phase I design work has been prepared and distributed to bidders. The signing of the contract and initiation of design work for the gas pipeline, including the gas conditioning plant, is scheduled for October 1, 1980. Selection of a gas conditioning process is set for February 1, 1981, with bids prepared for major equipment purchases by June 1, 1981. In other words, the timeline for the natural gas pipeline project has been set; the decisions made within the next few months will have a determinative effect on the options of a gas-based petrochemical industry.

Industry representatives and others examining the potential for petrochemical development in Alaska have often stated that project economics may demand that the entire volume of Prudhoe Bay natural gas liquids be available for use in the project. Securing a sufficient quantity of natural gas

liquids, obtaining needed design changes on the gas conditioning plant to maximize liquids recovery, and obtaining design changes, if needed, on the gas pipeline itself will all require cooperative efforts by the producers, the Northwest partnership, the petrochemical firms and the State. Coordination of potential petrochemical development with gas pipeline and gas conditioning plant design, construction and operation is vital to resolving satisfactorily the issues of field fuel options, conditioning plant location, conditioning plant design, pipeline pressure and pipeline CO2 level. Linking the petrochemical feasibility studies with the on-going gas pipeline design work thus becomes a crucial factor in protecting the opportunities for instate petrochemical development.

A second major crucial factor is the ability of the petrochemical firms to negotiate with the producers to acquire producers' liquids, as there is common agreement that the State's royalty gas liquids alone are not sufficient feedstock for an economically sound petrochemical venture. The short critical timetable and the need for close cooperation and/or negotiations with the gas producers led the Task Force and myself to making a decision to recommend only one company to continue with a petrochemical feasibility study. The DSG has agreed to immediately negotiate contracts(s) with North Slope producers for the purchase of natural gas liquids. It

has also agreed to provide appropriate engineering expertise to the State during the conditioning plant and gas pipeline design process, and to the State's contractor for the liquids pipeline design/cost study. In addition, DSG has specifically committed to providing an analysis of the Selextsol gas conditioning process and the Sulfinol gas conditioning process during conditioning process during conditioning plant design.

Another factor in the decision to select only one company rather than to continue working with two or more companies was the position taken by the firms. The Alaska Arctic Resources Group stated that it would not be willing to continue its work in this area if more than one company were selected; the DSG maintained that it would continue, but on a reduced basis, its efforts at examining instate petrochemical feasibility, were more than are group chosen. The selection of only one group to continue with a petrochemical feasibility study, however, does not bind the State in any way to ultimately negotiate a royalty liquids sales agreement with that group. As is explicitly stated in the Memorandum of Understanding and Intent, the State reserves the right to determine after the submittal of the feasibility study if the DSG project is in the State's best interest and if the State's royalty gas liquids should be sold to DSG. The Memorandum also cites provisions which would be included in any sales agreement

for the State's royalty gas liquids, including pricing and instate use provisions. The memorandum also emphasizes that the State reserves the right to act in its best interests, require due diligence from DSG and prohibit DSG from assigning the memorandum without first obtaining the written consent of the State.

In making a final determination as to whether to negotiate a royalty gas liquids sales agreement between the State and DSG, I must consider the criteria cited in AS 38.06.070: the basic economic feasibility of the project; the revenue needs and projected fiscal condition of the State; the existence and extent of present and projected local and regional needs for gas products and by-products; the desirability of localized capital investment; increased payroll, secondary development and other possible effects of the sale, exchange or other disposition of royalty gas liquids; the projected social impacts; the projected additional costs and responsibilities which could be imposed upon the State and affected political subdivisions by the project; the projected positive and negative environmental effects; the projected effects of the project upon existing private commercial enterprise and patterns of investments; and the potential processing and sale of products instate. This consideration cannot be competently made without facts that will become available during the next 12-18 months, as a result of the feasibility

study, state studies, and work done by and decisions made by the Design and Engineering (Phase I) Board, the pipeline partnership, and the producers.

A large, stylized handwritten signature in dark ink, appearing to read 'Robert E. LeResche', written over a horizontal line.

Robert E. LeResche

Commissioner

A handwritten date '5 September 1980' in dark ink, written over a horizontal line.

Date



Alaska State Legislature

Gas Pipeline Committee
1024 W. 6th Avenue
Anchorage, Alaska 99501
(907) 279-1243

September 30, 1980

Dear Member of the natural gas or pipeline industry:

Attached is a request for proposals to study the design and costs of the extraction and transportation of Prudhoe Bay gas liquids to an instate petrochemical facility. The study is sponsored by the Gas Pipeline Committee of the Alaska State Legislature. Its results will be used by state policy-makers, and the cost estimates will be used to aid private industry in making investment decisions.

We would appreciate your consideration of the research project, and look forward to the receipt of your proposal. Please contact me at the above address, if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Mark Wittow".

Mark Wittow
Study Manager

Senator Mike Colletta
Representative Bill Miles
Co-Chairmen

REQUEST FOR PROPOSALS - ALASKA STATE LEGISLATURE

GAS LIQUIDS LINE STUDY

This is a request for proposals of study of the engineering, design, construction and operation, and respective cost estimates, for a natural gas liquids (NGL) pipeline (and related extraction facilities) for transportation of Prudhoe Bay liquids to an instate petrochemical facility. The construction and operation cost estimates are to be used to establish realistic cost-of-service or tariff figures which shippers, producers, gas transmission firms, and others can use to make an investment decision.

I. BACKGROUND

Gas production from Alaska's Prudhoe Bay will commence within the next decade, probably by 1986 or 1987. Approximately two billion cubic feet per day of sales gas will be produced for the 20 to 25 year life of the field. The volume of ngl's, including ethane, will be approximately 150,000+ b/d. The State and private industry have demonstrated a longterm interest in examining opportunities for future gas-based petrochemical manufacturing in Alaska. The State recently entered into a Memorandum of Understanding and Intent with a petrochemical consortium headed by Dow Chemical U.S.A. and Shell Chemical Company. The Dow-Shell Group has agreed to undertake an indepth feasibility study of an instate petrochemical industry.

The study to be conducted through this Request for Proposals focuses, however, on one segment of the proposed instate industry, the transportation of the gas liquids to the facility site.

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II. STUDY SPONSOR

The research will be conducted in consultation with the Joint Gas Pipeline Committee of the Alaska State Legislature. Mark Wittow will be the day-to-day study manager for the committee.

III. STUDY SCOPE

The goal of the study is to establish reasonable cost estimates for construction and operation of a gas liquids pipeline to transport Prudhoe Bay liquids to an instate petrochemical facility site. In addition, the study should identify costs of liquids extraction at Prudhoe Bay or other extraction points on the Alaska Natural Gas pipeline. The study should indicate realistic cost-of-service or tariff figures for the various transportation scenarios.

A. assumptions

The study should be based on the assumption that construction of the petrochemical system will be completed no earlier than 1986. The life of the liquids line should be calculated at 20 to 25 years, concurrent with the life of the Prudhoe Bay field. Phased-in construction of one to three world-scale (1 billion pounds/year) ethylene plants built to come on line four years apart should be assumed. The study should be based on the ultimate maximum economic utilization of recoverable ethane for ethylene production. Cost estimates should be in nominal dollars. For the purposes of this study, natural gas liquids is defined so

as to include ethane. To the extent technically feasible, it should be assumed that the liquids line will follow the routing of the Trans-Alaska Pipeline System.

B. cases/scenarios

The following cases should be examined:

1. Modified conditioning plant at Prudhoe Bay, additional low temperature refrigeration added to current Parsons design for the conditioning plant, with no liquid fractionation. A separate NGL line would be constructed from Prudhoe Bay to a tidewater location, with ethane then delivered to ethylene plant(s). The tidewater locations include the following: Kenai, North Cook Inlet, Point Gravina, and Valdez. The cost estimate should include the costs of liquids extraction equipment designed to take out 30,000 b/d of ethane at Prudhoe Bay for each ethylene plant, with either one, two or three ethylene plants ultimately being phased into production.
2. Modified conditioning plant at Prudhoe Bay, with additional low temperature refrigeration added to current Parsons design for conditioning plant and no liquid fractionation. A separate NGL line from Prudhoe Bay to Fairbanks, with ethylene complex at Fairbanks, and the rest of the liquids delivered in another liquids line to tidewater for export. Tidewater sites are the same as in Case No. 1 above.

LIQUIDS LINE STUDY - 4

3. Conditioning plant at Prudhoe Bay remains the same as designed by Parsons, with approximately two billion cubic feet per day of conditioned gas delivered to the Alaska Natural Gas Pipeline. At Fairbanks, the ethane and propane-plus are extracted and placed in a liquids pipeline and transported to a tidewater petrochemical facility site. The tidewater sites are the same as in Case No. 1 above.

C. cost considerations

The Contractor will want to examine the following possible construction and operating cost consideration:

1. Cost of delivery of construction materials, including size and weight limitations of transportation by Alaska Railroad for equipment shipments to Fairbanks and elsewhere, and barge transportation constraints.
2. Labor costs.
3. Construction cost adjustment factors for different locations in Alaska (Prudhoe, Fairbanks/the Interior, and tidewater sites) as compared to a U.S. Gulf Coast facility.
4. Adverse effect, if any, of major construction demands of the Alaska Natural Gas Pipeline system and related facilities which could require most readily available resources and thus impact construction costs for other facilities during the same time period.
5. Costs of special environmental requirements, if any, for potential routing and siting.
6. Penalties for reduction of BTU's in the Alaska Natural Pipeline stream (NGL shrinkage charges).
7. Wellhead values, state severance taxes and Alaska Natural Gas Pipeline BTU/mile tariff for those liquids recovered at Fairbanks.

LIQUIDS LINE STUDY - 5

8. Conditioning plant tariff.
9. Extraction plant cost, probably allocated to the recovered NGL on a liquid volume basis.

The study results should indicate the varying costs associated with only one ethylene plant in operation, with two ethylene plants in operation, and with three ethylene plants in operation. If the phased-in construction would appear to indicate a phased-in cost-of-service or tariff rather than a steady tariff over the life of the liquids line, that too should be clearly indicated.

D. additional work

In a separate section, the Contractor shall also examine the construction and operation costs of an all-methanol line from (a) Prudhoe Bay to Fairbanks and (b) Prudhoe Bay to tidewater.

IV. OTHER RESEARCH WORK

The Contractor will be furnished with other applicable research work done to date. Prior work has delineated the rate of gas production at Prudhoe Bay, and the various possible compositions and volumes of the gas stream. Other work has delineated probable pipeline sizes.

V. OTHER CONTRACT PROVISIONS

- (A) At least two on-site consultations will be required. The first will take place at the study's outset for research design, and the second before the submission of the final report for a review of the draft report. Each consultation

LIQUIDS LINE STUDY - 6

may require two days. Contract proposals should also discuss the ability of the contractor to provide continuing technical advice and assistance to the State after completion of the final report.

- (B) The study will become the property of the State of Alaska.
- (C) The study must be written in language and style readily understood by persons who are not economists or gas transmission experts.
- (D) Ten copies of a final report and one original that can be readily duplicated must be submitted. Ten copies of the draft report must also be submitted.

VI STUDY TIMEFRAME

Proposals must be received no later than October 31, 1980. A bid will be awarded no later than November 14, 1980. Preferably by December 1, 1980 a research work program will be finalized, and by February 20, 1980 the draft report will be submitted for review. An on-site consultation with the study manager would occur the ensuing week, and a final report prepared and submitted no later than March 20, 1980. The deadlines cited above may be treated as approximate ones.

VII COSTS

A maximum of \$200,000 has been allocated for this study. Bids exceeding this amount will not be considered on the same basis as bids within the cost limit.

LIQUIDS LINE STUDY - 7

VIII CONTENTS OF PROPOSALS

For full consideration, the proposal should contain the following:

- A. a general description of proposed methodology
- B. vitae of principals who would be assigned to the project, with proposed allocations of responsibility and time
- C. summary of comparable work performed by the firm with references and samples, if available for public release
- D. timeframes as closely corresponding with those cited above as can be feasibly met by the firm
- E. a cost quotation
- F. general informational material on the firm
- G. A description of contacts with the following companies that may pose a conflict of interest:

- Northwest Energy Co.
- American Natural Resources Co.
- Northern Natural Gas Co.
- Panhandle Eastern Pipe Line Co.
- United Gas Pipeline Co.
- Pacific Lighting Corp.
- Pacific Gas & Electric Co.
- Columbia Gas System
- Texas Eastern Corp.
- Texas Gas Transmission Corp.
- TransCanada Pipelines Ltd.
- Foothills Pipe Lines, Ltd.
- Alberta Gas Trunk Line Co. Ltd.
- West Transmission Co. Ltd.
- Atlantic Richfield Corp.
- Sohio Corp.
- Exxon Corp.
- Mobil Corp.
- Chevron Corp.
- Phillips Corp.
- Dow Chemical Co.
- Shell Oil Corp.

LIQUID LINES STUDY - 8

IX. EVALUATION

The proposals will be judged on the basis of the quality of the proposed methodology, the experience and involvement of the principal investigators, cost and timeframe.

If you have any questions, please contact Mark Wittow, Study Manager, Joint Gas Pipeline Committee, 1024 West Sixth, Anchorage, Alaska 99501, phone (907) 279-1243. Proposals should be submitted to Mr. Wittow at this address.

We appreciate your consideration of the research project, and look forward to receipt of your proposal.

**PLEASE NOTE: THE FOLLOWING PAGES WERE TREATED
AS A UNIT IN THE ORIGINAL DOCUMENT**

MEMORANDUM

TO: Interested Parties

FROM: Mark Wittow, Staff 
Joint Gas Pipeline Committee

DATE: March 17, 1981

RE: Why Alaska needs an in-state natural gas and gas liquids use study.

Last year's Joint Gas Pipeline Committee made a commitment to sponsor a study of in-state gas uses, and obtained an appropriation of \$150,000 for that purpose (March 1980 meeting). A detailed request for proposals was issued and distributed statewide and nationally; five proposals were received and evaluated by legislative and executive branch staff. For a variety of reasons, no contract has been let to perform the study. Since a good deal of time has passed since the study was originally conceived, I thought an updated statement of the reasons for conducting an in-state use study would be useful. Specific reasons include:

1) Assessment of Dow-Shell Group Petrochemical Feasibility Study Results

The Dow-Shell Group will report on the results of their work in September 1980. Alaska policymakers should have an independent analysis of the range of uses for State royalty gas and gas liquids (see attachment) before making a decision on disposition of the State's royalty interest. Such an analysis is vital if a petrochemical venture is to take shape in a form that confers as many benefits as possible on Alaskans. The Prudhoe Bay producers, who control seven-eighths of the available gas and gas liquids, will also play a major role in determining the nature of any proposed petrochemical development. Again, some independent analysis of possible in-state uses is required for the State to adequately present its interests. Many of the in-state uses for gas liquids would also greatly enhance the economic viability of petrochemical development.

2) Natural Gas Pipeline Corridor Use

Additional analysis of the potential for natural gas use in corridor communities (North Slope to Fairbanks to Tok) is necessary for determination of offtake points, taps, city gate station, and required volumes of gas. This portion of the study is fairly straightforward and could be handled by the executive branch.

3) Alternatives to the Natural Gas Pipeline

In the event that the gas pipeline project does not move forward within the next year or two, the State may want to investigate alternative methods for using North Slope gas. An in-state use study would help determine which of the possibilities offers the greatest benefits to the State.

4) Alaska Energy Needs

An analysis of in-state uses would greatly improve the planning necessary for meeting energy needs in the State during the next two to twenty years. Natural gas and gas liquids are a clean, efficient source of fuel that can be used in a variety of ways. Their use would be especially compatible with the construction of hydroelectric projects for long-term needs. The Citizen's Advisory Committee on Petrochemicals has also made a strong written recommendation in favor of a legislative in-state use study.

In closing I offer an excerpt from a recent memorandum by Arlong Tussing concerning the legislature's in-state natural gas use study proposal:

"My main concern, however, is that 13 years after the Prudhoe Bay discovery and 4 years after the completion of TAPS, neither Alaska's Executive Branch nor its Legislature has ever contemplated the big picture with respect to ANS natural gas and NGLS --- to consider the relations between the design and timing of ANGTS; potential in-state residential, commercial, and utility uses; instate processing for export; and the State's fiscal in the gas and NGL...

The need will not go away. Over the next few years, the State will be faced with a stream of decision points --- about proposals from the Dow-Shell group, new demands that it commit its ANS royalty gas, and very likely with the choice of taking the entrepreneurial and financial initiative in getting ANGTS built, letting it die without a viable successor, or actively promoting an alternative strategy for use of the gas. I don't believe that anyone has even a workable conceptual framework yet in which to consider these issues rationally, and no agency of the State (or anyone else, for that matter) has even expressed an intention of trying to relate them coherently."

Attached is a list of some of the possible uses for State royalty gas and gas liquids. Please let me know if you desire any further information.

Attachments

IV. INSTATE GAS USE STUDY

A. The Investigation of Potential Instate Gas Uses of Prudhoe Bay Natural Gas

The following list includes the most readily apparent potential instate uses for Prudhoe Bay natural gas, and some that may not be so readily apparent. In the course of the study, the investigators are likely to reject some of these alternatives as patently unfeasible, while they may uncover other, more promising potential uses.

1. Gas-utility distribution of Prudhoe Bay natural gas for residential, commercial, industrial, and agricultural use in the Fairbanks area and possibly elsewhere along the ANGTS corridor.
2. Gas-utility distribution of Prudhoe Bay natural gas for residential, commercial, industrial, and agricultural use at a distance from ANGTS requiring one or more spur pipelines. (E.G., the Anchorage area, the Railbelt, Copper Valley, Haines, and Skagway.)
3. Electric-utility use of Prudhoe Bay natural gas in the Fairbanks area, along the ANGTS pipeline, or on one or more spur pipelines.
4. Exchange of Prudhoe Bay royalty gas for Cook Inlet gas (or, possibly, yet-undiscovered gas from the Gulf of Alaska or elsewhere), to be used for residential, commercial, industrial, or electric utility consumption in Southcentral Alaska.
5. Liquefaction of Prudhoe Bay natural gas at a tidewater location (Nikiski, Pac-Alaska, Haines, or Skagway) for shipment to Southeast and Southwest Alaska.
6. Conversion of methane and (CO_2) to methanol fuel at Prudhoe Bay for distribution on the North Slope or through an NGLs

line to other parts of Alaska as a substitute for petroleum products for home heating, transportation, and electric utility fuel.

7. Production of methanol fuel for instate consumption from methane and (CO_2) as a byproduct of the North Slope production of MTBE (methyl tertiary butyl ether), an octane-enhancing gasoline additive which might be exported either through TAPS or through an NGLs pipeline. (The Arctic Slope Regional Corporation [ASRC], together with DMI, ARTA, and others, is investigating the feasibility of a Prudhoe Bay methanol-MTBE facility.) (See Appendix C.)
8. North Slope production of methanol fuel plus methanol-based synthetic gasoline for export and/or instate distribution. (Mobil has a methan-to-methanol-to-gasoline process that is currently being investigated in Canada.)
9. Extraction and instate distribution of LPG "bottle gas" from Prudhoe Bay NGLs for residential, commercial, agricultural, and transportation use.
10. Distribution of compressed natural gas as a transportation fuel. (This scheme and the necessary automotive retrofitting are currently being investigated by the Province of British Columbia and by private enterprise in Alberta.)
11. Use of Prudhoe Bay NGLs as electric-utility fuel in the Fairbanks area, the Railbelt, the Anchorage area, or elsewhere in Southcentral Alaska.
12. Use of Prudhoe Bay ethane and/or propane, diluted with air, nitrogen, CO_2 , or low-BTU synthetic gas from coal, waste or biomass, as gas-utility fuel in the Fairbanks area, the Railbelt, or Southcentral Alaska.

**PLEASE NOTE: THE PRECEDING PAGES WERE TREATED
AS A UNIT IN THE ORIGINAL DOCUMENT.**

**PLEASE NOTE: THE FOLLOWING PAGES WERE TREATED
AS A UNIT IN THE ORIGINAL DOCUMENT**

F

FORMAL STATE REVIEW OF THE
DOW/SHELL GROUP FEASIBILITY STUDY REPORT

At the request of Governor Jay Hammond and with coordination provided by the Department of Natural Resources, the State of Alaska undertook a review of the Dow/Shell Group Feasibility Study Report submitted to the State on September 9, 1981. The review was structured around the Governor's stated policies on petrochemical development, the Department of Natural Resources' legal requirements, Dow/Shell's obligations under the Memorandum of Understanding with the State, and a modified "Major Project Review" process adapted for use on this project.

Review responsibilities were undertaken by the following agencies: Alaska Power Authority; Budget and Management, Office of the Governor; Department of Community and Regional Affairs; Department of Environmental Conservation; Department of Fish and Game; Department of Health and Social Services; Department of Labor; Department of Natural Resources; Department of Public Safety; Department of Revenue; and Department of Transportation/Public Facilities. Work was also undertaken by one consultant, Keown & Associates.

State personnel assigned to the review group were often the same staff who worked on the initial general assessment of petrochemicals under the direction of the Department of Environmental Conservation.

The attached memorandums are the result of this formal review work. It should be noted that the memorandums are in response to specific legal and policy parameters. State agencies were not asked to prepare an environmental impact statement, or were they asked to balance the "positive" and "negative" factors affecting this project. In general, the State also found that a detailed cost-benefit analysis is not possible at this time; that analysis must await additional information such as site selection and market value of the natural gas liquids.

As many of the memorandums refer back to the recommendations and general conclusions reached by the agencies in the earlier September 14, 1981, report to Governor Hammond, a summary of those recommendations is included as an appendix to this document.

ALASKA POWER AUTHORITY

334 WEST 5th AVENUE - ANCHORAGE, ALASKA 99501

Phone: (907) 277-7641
(907) 276-0001

October 13, 1981

Ms. Mary Halloran
Special Assistant to the Commissioner
Department of Natural Resources
Pouch M
Juneau, Alaska 99811

Dear Ms. Halloran:

According to the Memorandum of Understanding and Intent between the State and the Dow/Shell Goup, Dow/Shell is required to describe the project's electrical power requirements and alternative means of meeting those requirements. The feasibility study is also to include the projected energy requirements of communities directly affected by the project and is to address the merits of interconnecting with local power utilities and power grids to facilitate more economical power for Interior and Southcentral Alaskan consumers. The power supply systems to be evaluated include onsite generation, cogeneration, mine-mouth wheeled power, expansion of existing utility systems, and hydroelectric power.

Specific comments on Volume 8, Energy Study:

1. Page 5. In a recent study for the Power Authority, Commonwealth Associates advised that the North Star Borough should maintain installed reserve generation at least equal to the capacity of the two largest units in service. For Fairbanks, this amounts to 130 MW. Subtracting this reserve margin from the 292 MW installed leaves an upper limit on peak demand of 162 MW. If this conservative approach is adopted, we estimate that Fairbanks, as an isolated load center, has sufficient capacity until about 1985-86. If the Anchorage and Fairbanks systems were to be interconnected, existing generation capacity is probably sufficient until the late 1980's. Dow/Shell, on the other hand, assumes fewer reserve requirements and forecasts that existing power-producing capability would be sufficient to supply the borough until the mid-1990's or later.

Since reserve requirements must be taken account of in power system planning, we question the suggestion on page 5 that available capacity in Fairbanks might be available to provide estimated power needs for the Phase I Complex until the mid - 1990's or longer. For the same reason, we also question the similar suggestion on Page 8 that the existing capacity of an intertied Railbelt system might be sufficient to power the Phase I Complex until 1993.

TO: Mary Halloran
Special Assistant to the Commissioner
Department of Natural Resources

DATE: September 25, 1981

FILE NO.

TELEPHONE NO.

Thru: Ronald D. Lehr, Director
Division of Budget & Management
Office of the Governor

FROM: SUBJECT: Dow-Shell Feasibility Study

Ronald D. Rippel, Economist
Division of Budget & Management
Office of the Governor

The purpose of this memo is to identify deficiencies in the method of ethane valuation at Alaska tidewater as presented in the Dow-Shell Group (D-S) study. The impact of the deficiencies on the wellhead value (and thus state royalties) is also noted.

The process whereby the D-S study determines the natural gas liquids (NGL) - and therefore the liquid petroleum gas (LPG) and ethane - value at tidewater Alaska is acceptable only for determining the feasibility of a NGL project if no Alaska petrochemical project is pursued. The tidewater-Alaska, NGL value that would make an Alaskan NGL project profitable is stated to equal the U.S. Gulf Coast (USGC) NGL value minus the cost of transporting the NGL from Alaska to the USGC. This is because if no petrochemical industry exists in Alaska and NGL's are not exported they would most likely be shipped to existing facilities at the USGC. Thus, the NGL value would be determined by the NGL value at the USGC less the cost of getting them there. This valuation process does not hold once we turn to development of a petrochemical industry in Alaska. In the case of a tidewater petrochemical complex, the ethane will not be shipped to the USGC, so the Alaska-USGC transportation costs are irrelevant with respect to ethane value. If an LPG export license were to be obtained the Alaska-USGC transportation costs would not be meaningful at all in determining the NGL value at tidewater.

Setting aside the issue of LPG exports, what is the appropriate method for determining the value of ethane at a tidewater petrochemical facility? Ethane is used as an input to the production of ethylene. Ethylene can be sold as a final product (with respect to an Alaska operation) or it can be used as a building block for other petrochemicals produced in Alaska. An Alaska petrochemical facility is envisioned to compete in the Pacific Rim marketplace. Hence, the value of ethane at tidewater is dependent on and determined by the market price for petrochemicals in the Pacific Rim markets and the transportation costs between an Alaska facility and the final markets. Alaska's proximity to the Pacific Rim markets is one reason for considering a petrochemical industry in Alaska.

TO: Mary Halloran
Special Assistant to the Commissioner
Department of Natural Resources

DATE: October 8, 1981

FILE NO:

Thru: Ronald D. Lehr, Director
Division of Budget & Management
Office of the Governor

TELEPHONE NO:

FROM: Ronald D. Ripple, Economist
Division of Budget & Management
Office of the Governor

SUBJECT: Dow/Shell Feasibility Study

The purpose of this report is to summarize my review of The Dow/Shell Group study on Alaska Petrochemical Industry Feasibility. To this end, I will respond to the issues and questions set out in "Dow/Shell Feasibility Study Review - Economics" which I received from you.

Policy and Legal Parameters

Although the state can have an impact on the profitability of this project, the determination of the economic soundness of the project is a private sector matter. The impact of the state could be felt through the price charged for royalty natural gas liquid (NGL), the amount of infrastructure provided at state expense, state regulation and/or the state's role as tax collector. The most appropriate way for the state to determine that the project is economically sound is to price the royalty NGL at the world market price, provide only "traditional" levels of infrastructure that meet the criterion of public purpose, and/or tax this project the same as existing corporate entities. Should the state follow this plan and Dow/Shell proceeds with the project, the project is economically sound. If Dow/Shell chooses not to pursue the project it would then be necessary to determine if the reason for secession of interest is current state policy. If an element of state policy diminishes project feasibility, the State should decide if it is in its best interest to alleviate the situation. Alleviation of any "problem" presented by a given, "equitably" applied state policy implies providing a subsidy to a specific project. The state should provide no subsidy unless it is determined that one is needed and in the best interest of the state.

In general, determination of the best interest of the State (as prescribed by AS 38.05.182 and AS 38.05.183) for the disposition of royalty NGL requires a comparison of the thoroughly analyzed alternative uses of the state's royalty share of NGL. The State's best interest involves more than simply obtaining the highest dollar value per unit of royalty NGL. Best interest includes all elements of social and economic impacts, fiscal concerns, resource utilization and environmental quality, as well as the effect of the proposed project(s) on the stability of the state's economy.

CORRECTION

CORRECTION

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334 WEST 5th AVENUE - ANCHORAGE, ALASKA 99501

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October 13, 1981

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Since reserve requirements must be taken account of in power system planning, we question the suggestion on page 5 that available capacity in Fairbanks might be available to provide estimated power needs for the Phase I Complex until the mid - 1990's or longer. For the same reason, we also question the similar suggestion on Page 8 that the existing capacity of an intertied Railbelt system might be sufficient to power the Phase I Complex until 1993.

2. Page 9. Recent capital cost estimates for coal-fired power plants developed by our consulting engineers differ somewhat from those used by Dow/Shell. Specifically, we would estimate about 50 percent higher for the coal-fired power plant at tidewater. Taking account of this difference, of course, would serve to strengthen Dow/Shell's preference for combined cycle combustion turbines over coal-fired generation.

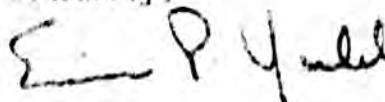
Page 10. While the Dow/Shell report identifies the base year for capital costs (1981), there is no similar identification for fuel costs. It is not clear from the information provided whether the fuel costs used in the analysis are meant to be indicative of present day costs or whether they incorporate some expectation of future price increases. The Power Authority, in similar analyses, has found it imperative to consider more than just the first year cost of power. We find that comparative energy costs are very sensitive to forecasted differential fuel price/value trends. Despite this caveat, Dow/Shell's preferred generation option of combined cycle gas turbine cogeneration seems well suited to the nature of the Dow/Shell enterprise and its requirement for both electrical energy and process steam.

Page 10. Dow/Shell mentions the possibility of exporting excess power to the Railbelt grid prior to operation of the Phase 2 Complex. This temporary source of power could be very valuable to Anchorage and Fairbanks as the Railbelt proceeds to develop long term power supplies such as the Susitna Hydroelectric Project or Beluga coal-fired generation. It is doubtful that either alternative could be operational until about 1993. Temporary use of excess Dow/Shell power until that time would very much compliment Railbelt power system planning.

In general, the report fully responds to the requirements of the Memorandum of Understanding and Intent.

It was a pleasure to offer our comments.

Sincerely,



Eric P. Yould
Executive Director

TO: Mary Halloran
Special Assistant to the Commissioner
Department of Natural Resources

DATE: September 25, 1981

FILE NO:

THRU: Ronald D. Lehr, Director
Division of Budget & Management
Office of the Governor

TELEPHONE NO:

FROM: SUBJECT: Dow-Shell Feasibility Study

Ronald D. Rippel, Economist
Division of Budget & Management
Office of the Governor

The purpose of this memo is to identify deficiencies in the method of ethane valuation at Alaska tidewater as presented in the Dow-Shell Group (D-S) study. The impact of the deficiencies on the wellhead value (and thus state royalties) is also noted.

The process whereby the D-S study determines the natural gas liquids (NGL) - and therefore the liquid petroleum gas (LPG) and ethane - value at tidewater Alaska is acceptable only for determining the feasibility of a NGL project if no Alaska petrochemical project is pursued. The tidewater-Alaska, NGL value that would make an Alaskan NGL project profitable is stated to equal the U.S. Gulf Coast (USGC) NGL value minus the cost of transporting the NGL from Alaska to the USGC. This is because if no petrochemical industry exists in Alaska and NGL's are not exported they would most likely be shipped to existing facilities at the USGC. Thus, the NGL value would be determined by the NGL value at the USGC less the cost of getting them there. This valuation process does not hold once we turn to development of a petrochemical industry in Alaska. In the case of a tidewater petrochemical complex, the ethane will not be shipped to the USGC, so the Alaska-USGC transportation costs are irrelevant with respect to ethane value. If an LPG export license were to be obtained the Alaska-USGC transportation costs would not be meaningful at all in determining the NGL value at tidewater.

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The effect of the above stated valuation procedure is that the projected ten cent per pound differential in capital and operating costs - Alaska relative to USGC - does not have to be made up completely by reduced ethane values at tidewater Alaska. The tidewater value of ethane will be determined by subtracting the transportation savings from the ten cent differential - transportation costs from Alaska to Japan, for example, would be less than transportation costs from USGC to Japan.

The effect of this method of ethane valuation is to increase the tidewater value. Given a tariff structure which is providing adequate revenues to the pipeline owners, the increased tidewater value implies an increased wellhead value, hence increased state royalties.

Note that if LPG exports are undertaken, the above analysis is also the relevant method for tidewater LPG valuation.

TO: Mary Halloran
Special Assistant to the Commissioner
Department of Natural Resources

DATE: October 8, 1981

FILE NO:

TELEPHONE NO:

FROM: Thru: Ronald D. Lehr, Director
Division of Budget & Management
Office of the Governor

SUBJECT: Dow/Shell Feasibility Study

From: Ronald D. Ripple, Economist
Division of Budget & Management
Office of the Governor

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Although the state can have an impact on the profitability of this project, the determination of the economic soundness of the project is a private sector matter. The impact of the state could be felt through the price charged for royalty natural gas liquid (NGL), the amount of infrastructure provided at state expense, state regulation and/or the state's role as tax collector. The most appropriate way for the state to determine that the project is economically sound is to price the royalty NGL at the world market price, provide only "traditional" levels of infrastructure that meet the criterion of public purpose, and/or tax this project the same as existing corporate entities. Should the state follow this plan and Dow/Shell proceeds with the project, the project is economically sound. If Dow/Shell chooses not to pursue the project it would then be necessary to determine if the reason for secession of interest is current state policy. If an element of state policy diminishes project feasibility, the State should decide if it is in its best interest to alleviate the situation. Alleviation of any "problem" presented by a given, "equitably" applied state policy implies providing a subsidy to a specific project. The state should provide no subsidy unless it is determined that one is needed and in the best interest of the state.

In general, determination of the best interest of the State (as prescribed by AS 38.05.182 and AS 38.05.183) for the disposition of royalty NGL requires a comparison of the thoroughly analyzed alternative uses of the state's royalty share of NGL. The State's best interest involves more than simply obtaining the highest dollar value per unit of royalty NGL. Best interest includes all elements of social and economic impacts, fiscal concerns, resource utilization and environmental quality, as well as the effect of the proposed project(s) on the stability of the state's economy.

Pursuant to the Memorandum of Understanding and Intent, the Dow/Shell study is not of such quality as to justify an irrevocable investment decision. Although considerable information and detail have been provided, significant elements of costs and the responsibility for these costs have not been determined. For example, neither the costs of the dock facilities nor the ownership and operation of the dock facilities have been determined. Moreover, there has not been a decision on the site. Infrastructure costs will vary across the potential sites and will therefore have an impact on economic feasibility.

The test of public purpose for elements of infrastructure has not been conducted, and hence, the method of apportioning infrastructure costs cannot yet be negotiated. Furthermore, an "irrevocable investment decision" cannot be made until the availability and price of the NGL's has been determined.

The importance of the state's royalty share of the NGL's to the success of the proposed petrochemical industry has not been established. It has been determined that the state's share alone would not be sufficient to establish a feasible petrochemical industry. From a negotiating point of view it is important to know if the state's share is necessary. Furthermore, if the producers sell their NGL's to Dow/Shell and a NGL pipeline is built, what options remain for the state?

Modified Major Project Review

Economics

1. Real per capita personal income: Nominal income will certainly increase. Dow/Shell estimates the statewide, wage and salary income of the permanent, direct workforce to be \$125 million per year (in 1981 dollars). Dow/Shell also estimates that 80 to 85 percent of the permanent workforce "could be" Alaskan residents. This would imply that \$100 - \$106 million per year could come to current residents.

Given the present population of approximately 400,000, the \$100 - \$106 million per year coming to current residents implies an average increase in per capita personal income of approximately \$250 - \$265 per year. This increase equates to approximately \$4.80 - \$5.10 per week. These figures are in 1981 dollars. Real per capita income, however, depends on changes in the price level as well as the changes in nominal income. The question then is whether or not the increase in the statewide price index will be enough to offset the statewide per capita income increase.

On a regional basis, Dow/Shell estimates that \$93 million of the \$125 million will accrue to the permanent labor force located at tidewater. In most cases, the tidewater-site, community per capita personal income would increase substantially. The 1980 U.S. Census showed the City of Seward to have a population of 1842. Dow/Shell estimates that the population increase for Seward would be 6588, at the operational stage of Phase 2. If 80 percent of this population increase came from migration of resident Alaskans, the current resident Alaska population in Seward would grow to 7112 (a migration of 5270).

If 80 percent of the \$93 million accrues to current residents, their gross personal income would increase by \$74 million. Hence, on a regional basis, the \$74 million would be "split" among 7112 current resident Alaskans to provide an increase of \$10,000 per year, or \$190 per week, in per capita personal income. Again, real per capita income is also dependent on the change in the price level. It is true that the regional price level will be pushed up by a greater amount than the statewide price level because of the heavier concentration of the nominal income increase. For example, there would be considerable real estate demand with the attendant price level increase. However, it is not clear that the price level will increase enough to offset the income increase. Hence, we might expect an increase in real per capita personal income.

During the construction phase we would expect the price level and nominal income to rise. However, since the personal income and resident Alaska employment proportion estimates from Dow/Shell are for permanent, i.e., operational, employment and population changes, we cannot say anything substantive about short-run, construction-phase real per capita personal income.

Over the life of the project we might expect real per capita personal income to increase. The post-TAPS construction period has seen inflation in Alaska moderate and decline. Given this experience and the fact that the Alaska economy is larger and stronger, we could expect the economy to be even more resilient at the time of construction for a petrochemical industry than it was at the time of TAPS.

2. Long-run economic stability - the broadening of the economic base of the state which would occur due to the establishment of a petrochemical industry would, in general, increase the stability of the Alaska economy. However, the petrochemical industry is closely tied to world market conditions. As noted throughout the Dow/Shell study, the feasibility of the project depends upon the world price of crude oil and the world -- in particular the Pacific Rim -- markets for petrochemicals. Therefore, given the uncertainty surrounding these economic factors, we would have to view the impact of this project on long-run economic stability as uncertain.

3. Administrative roadblocks - the potential for administrative impediments exists. However, since most of these would be tied to infrastructure questions, and socioeconomic and monitoring cost mitigation, the degree of significance of these potential roadblocks cannot be assessed at this time.

Fiscal

1. Net balance of state and local government - the determination of the net balance of either state or local government is unclear at this time because no site selection has been made. Although the revenues derived from a petrochemical industry -- and the attendant service community -- will not vary widely over the potential sites, the costs to governments will. The major costs will arise from state and local expenditures on infrastructure. Although the infrastructure needs for the project have been laid out in a general manner for each site, the actual costs and the burden of those costs

have not been determined. The impact on community services -- schools, medical, etc. -- would be quite different depending on the site selected. For example, the projected population increase of 5576 in Anchorage, relating to the Fire Island site, implies a 3 percent growth. However, the projected population increase of 6588 for Seward implies a 358 percent growth. The impact on Anchorage would be minimal given its already broad range of community services and the belief, by Dow/Shell, that the population increase would be spread widely over the city and not significantly affect "any one neighborhood or specific service." On the other hand, Seward would require major expansion to accommodate the population growth. For example, Dow/Shell estimates -- as set out in the Appendix on employment and population effects -- that 25 percent of the population change for the operation phase will be school age children. For Seward, this amounts to an increase in school age children of 1647. This is nearly the size of the present city population and would require extensive expansion of the school district. Furthermore, considerable differences exist in the difficulty -- and thus cost -- of providing some elements of the infrastructure. For example, the Complex would require 25 million gallons of fresh water per day and the ability of each community to provide this amount of water varies. Hence, the impact on government expenditures is uncertain at this time.

2. State subsidies -- although masked requests for subsidies are in the Dow/Shell study -- below market ethane values, potential of "non-traditional" infrastructure -- the exact nature of the subsidies will not be known until negotiations begin between the State and Dow/Shell.

Risk

1. Uncertainty about technological, environmental, financial, and/or economic factors. The greatest uncertainty is likely to evolve from the economic factors surrounding the viability of the petrochemical project. As noted above, the project will be influenced by the world price of crude oil and the world supply and demand for petrochemical products. The first-half 1981 U.S. Gulf Coast price for crude oil was \$37.50 per barrel. Dow/Shell suggests that to make a natural gas liquids line attractive as an investment the real price of crude at the U.S. Gulf Coast should be over \$50 per barrel. A natural gas liquids line is required to make a petrochemical industry possible. Furthermore, the present world demand for petrochemicals is depressed and the present projected demands make it questionable as to the need for -- and hence the feasibility of -- a petrochemical industry in Alaska. World demand has to increase more rapidly than presently projected, while world supply from more competitive sources does not increase such as to make an Alaska industry superfluous. Hence, some of the uncertainty about the feasibility of this project derives from international markets and conditions. Furthermore, the Alaska Natural Gas Transportation System (ANGTS) will have an impact on the feasibility of the project. Shipping ethane and some of the propanes and butanes down the ANGTS will increase the Btu value of the natural gas. This constitutes an alternative use for the NGU's. In that ANGTS is dependent upon national markets -- both for sale of natural gas and financing -- uncertainty surrounding the petrochemical industry also comes from the national level.

2. Adequate information - as noted in numerous places throughout this report, the information provided by the Dow/Shell study is insufficient for purposes of determining the best interest of the state for the disposition of royalty NGL's. For example, the opportunity cost of not including the NGL's in the natural gas being sent down the ANGTS has not been adequately examined. Furthermore, the impacts on communities and government expenditures cannot be adequately determined because no site has been selected. Moreover, the information, as presented, is not sufficient for the Dow/Shell Group to make an "irrevocable investment decision."

3. External factors - it has been noted elsewhere in this report that external factors may well be the actual driving force with respect to project feasibility. These factors include the world price of crude oil, world markets for petrochemicals and U.S. markets for natural gas.

Conclusion

The Dow/Shell Study has not provided sufficient information to allow for adequate determination of the benefits and costs to the state of petrochemical development. The two most important missing pieces are the evaluation of alternative uses of NGL's and a specific site selection.

MEMORANDUM

State of Alaska

DEPARTMENT OF COMMUNITY AND REGIONAL AFFAIRS

TO: John Katz
Commissioner
Department of Natural Resources

DATE: October 9, 1981

FILE NO:

TELEPHONE NO: 465-4750

FROM: Lee McMerney
Commissioner
Department of Community
and Regional Affairs

SUBJECT: Comments on the Alaska
Petrochemical Industry
Feasibility Study

Introduction

In the Petrochemical Industry Assessment prepared by the Interagency Technical Team, the Department of Community and Regional Affairs presented three questions that should be addressed in the Dow-Shell petrochemical feasibility report:

1. What are the current and anticipated public service and facility shortfalls?;
2. Is there a need to strengthen local planning, fiscal, and management capabilities?; and,
3. What local, state, and industry investments are necessary in light of these shortfalls?

To determine social costs and benefits, the Governor's Community Well-Being concerns also should be addressed in this report including estimations of consumer goods and services shortages and price inflation; housing availability, price inflation and quality; rate of population growth; expected changes in lifestyle and social patterns; and the level of local growth management capabilities including land use plans, ordinances, and revenue generating mechanisms.

It was believed that a detailed analysis covering these questions and concerns would address the key socioeconomic issue of petrochemical development, i.e., the local government's ability to respond to the increased public service and facility demands generated by petrochemical development and the related rapid population growth.

The Department presented this as a central issue because it is local government which has primary responsibility to anticipate public facility and service demands and to make planning and fiscal decisions that will result in a managed development benefiting both local residents and industry alike.

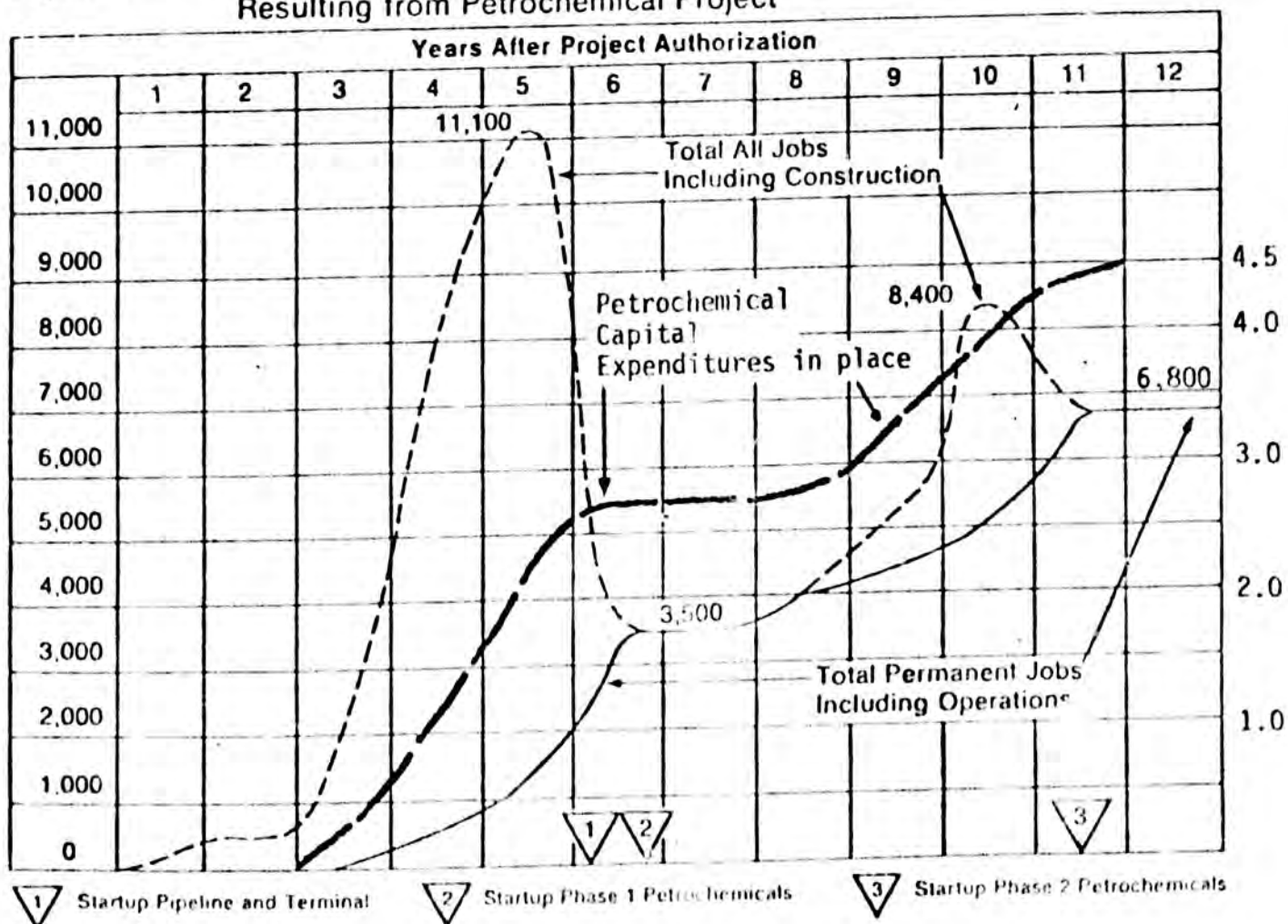
Comments on the Petrochemical Feasibility Study

The Department has reviewed the Alaska Petrochemical Industry Feasibility Study released by the Dow-Shell Group on September 9, 1981, and finds that while the study does give merit to the concerns expressed above by readily admitting that the project would create significant demands on most communities' facilities, services, land use, and lifestyle, it did not provide the detailed analysis necessary to assess the local governments' ability to respond to these petrochemical development demands. In fact, in the report Dow-Shell places much of the burden on the selected community to solve these problems by stating that they do not intend to pay for those facility and service costs not directly related to plant development and operation. Instead, they propose that the increased tax base of approximately \$4.5 billion due to petrochemical development would be sufficient pay for many of the community needs.

An example of a shortcoming in their analysis with respect to socioeconomic concerns is indeed this idea that the petrochemical industry tax base would generate the necessary community revenues. While in the long run this may true, this study did not relate the dollar amount and timing of such tax revenues to the timing of needed capital improvements and service delivery. Figure 1 illustrates that if taxable, petrochemical capital value in place is overlaid onto the total employment figures over time, a discrepancy in timing and possibly dollar amount exists between peak employment periods (signifying the greatest demands on public services and facilities) and the amount of taxable capital in place (the supposed source of revenue to meet increased public costs). If an initial tax holiday is granted, a suggestion mentioned in the report to achieve economic feasibility, this discrepancy could be substantially increased. To give proper consideration to fiscal matters the study should have made detailed approximations of community costs and timing of such costs and compared them to the revenues expected during this period.

Even if a community was to have ample revenues or their bond rating increased substantially with the prospect of a major development in the community, it still must have sufficient lead time (at least two years) before project construction start up to adequately upgrade and coordinate its fiscal management and planning responsibilities. The study did not provide a detailed explanation of what Dow-Shell anticipates each community must accomplish during the preparatory period to ensure a controlled growth, e.g., the need for capital improvements programs, upgrading municipal staff, and the development of land use plans or zoning ordinances.

Figure 1 — Projected Total Alaska In-State Direct and Indirect Employment Resulting from Petrochemical Project



BILLIONS OF DOLLARS INSTALLED (1981 dollars)

Recommendations

To allow for adequate consideration of Department concerns and to benefit the affected communities, it is recommended that over the next two or three years the following actions be undertaken or financially supported by The Dow-Shell Group.

1. For each site under consideration, Dow-Shell should conduct a detailed analysis of the local government's ability to respond to increase public services and facility demands generated by petrochemical development and the related rapid population growth during both construction and operation. Analysis should cover current and anticipated public service and facility shortfalls; the need to strengthen local planning, fiscal and management capability; and identification of local, state and industry investments necessary in light of the identified shortfalls.
2. Dow-Shell should fund independent research into how other petrochemical facilities in the lower 48 and Canada have been able to work compatibly with communities under similar conditions in terms of cooperation between industry and government and identification of mechanisms for sharing the cost of providing public services and facilities.
3. The final site for the development should be selected as soon as practicable after obtaining the information requested above. Timely selection of a community would allow for optimal use of state and local staff and would permit a more focused approach to community analysis.
4. A task force should be designated which would be responsible for making recommendations to the selected community for producing a "Master Plan for Petrochemical Development" or a comprehensive plan as appropriate. This task force would be comprised of state and local officials, industry representatives and local residents. The charge would be to establish goals and objectives to ensure controlled growth and would include implementation measures such as capital improvement programs, a land use plan, and subdivision, building, zoning and housing ordinances. This effort should begin at least two years before anticipated project construction start-up.
5. The Dow-Shell Group should provide timely information to local governments and the state regarding changes in construction schedules, anticipated manpower needs, and facility and service requirements.

John Katz
October 9, 1981
Page 5

6. The Dow-Shell Group should fund an impact coordination center within the selected community which would facilitate project data dissemination and exchange of information to handle socioeconomic concerns between the community and Dow-Shell.

The Department would like the opportunity to provide further explanation and justification for each of these recommendations when deemed appropriate.

cc: Richard Aks
Deputy Commissioner
Department of Community and
Regional Affairs

Lawrence H. Kimball, Jr.
Director
Division of Community Planning
Department of Community and
Regional Affairs

Richard Spitler
Planning Supervisor
Division of Community Planning
Department of Community and
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Mary Halloran
Assistant to the Commissioner
Department of Natural Resources

Debra Kirk
Project Coordinator
Department of Environmental Conservation

Mary Jo Waits
Project Analyst
Lieutenant Governor's Office

Bob Dale
Planner IV
Division of Community Planning
Department of Community and
Regional Affairs

MEMORANDUM

State of Alaska

TO: John Katz, Commissioner
Department of Natural Resources

DATE: October 9, 1981

FILE NO:

TELEPHONE NO:

FROM: Ernst W. Mueller, Commissioner
Department of Environmental Conservation

SUBJECT: ADEC Review of the Dow-Shell Feasibility Study

The Department of Environmental Conservation has been involved with the Dow-Shell Group project for the past year as a result of its responsibilities in assessing public attitudes, providing information to the public and in coordinating the Interagency Technical Team. As a result of these efforts, we have reached conclusions on various aspects of the project and questions facing the state. The following is a response to your specific concerns. Attached is our review of the Dow-Shell feasibility study.

It is in the state's best interests to ensure that any petrochemical development is environmentally compatible with Alaska's other resources. Any agreement concerning the sale of the gas liquids affords the state an opportunity to influence new development and hence direct it toward the state's best interests. We must recognize, however, that an industry could develop regardless of the state's decision on the royalty gas liquids.

We have concluded that there are no environmental factors which would absolutely preclude development of the industry at any of the sites discussed. Phase I and II development could be controlled with appropriate technology and a commitment by the state and local governments to adequate planning, zoning and other regulatory activities necessary to protect the state from adverse impacts of the industry. This is based on very preliminary information supplied by Dow-Shell and the state's independent analysis of the industry. We do not rule out the possibility that further studies will preclude development at one site or another. Also, we remain extremely concerned about related or dependent industrial developments which may occur at some future time. Those industries have greater potential for environmental problems and have historically been more difficult to control. Methods of managing these problems will need to be developed.

The Dow-Shell Group has not, in our opinion, supplied sufficient information to justify an irrevocable investment decision by the state. Nor is the environmental impact analysis in sufficient detail to allow the state to determine precise environmental costs and benefits. These

two conditions of the Memorandum of Understanding were, perhaps, overly optimistic with regard to environmental concerns. Such decisions imply for this department that permits could be issued. That level of detail cannot and should not be expected in a feasibility study.

The uncertainties expressed by the Dow-Shell Group on economic issues argue against any irrevocable commitments at this time. These economic issues will be very closely tied to the state's concern over environmental issues. The uncertainties surrounding potential processes and products, the lack of site selection, and the lack of detail in the analyses prevent any definitive determinations on environmental costs and benefits. These determinations are best made in conjunction with actual site selection, design criteria development, permit applications and/or EIS preparation.

We do not find that such development would be precluded; there does need to be substantial additional work done to determine the conditions of any development. If the state's overall interests are best served by further agreements with Dow-Shell, then we request that the recommendations of the state's technical team be considered for inclusion as a part of that agreement. I will provide, under separate memo, DEC's recommendations for the state and for Dow-Shell.

Attachment

Department of Environmental Conservation
Summary Review of
The Dow-Shell Feasibility Study

The Department of Environmental Conservation has reviewed the Dow-Shell feasibility report, as well as some additional information supplied by Dow-Shell. It is understood that the development of a feasibility study does not address environmental issues in sufficient detail to determine compliance with possible permit requirements. The Dow-Shell study did not identify any environmental factors which would preclude its proposed project in Alaska. At this time, we would have to agree, however, the level of detail was so general that further studies may identify factors which alone, or in conjunction with other factors, would preclude use of one or more of the currently proposed sites.

The feasibility study is so nonspecific that a detailed review of individual issues is not generally possible. The additional information supplied by Dow-Shell did not rectify this situation. At a minimum, Dow-Shell could have identified the most critical issues at each site or phase of development. Means of addressing these issues could have been suggested as well. This would have provided all parties with a better understanding of the project and its impacts. The State, in fact, did provide much of this type of information in its own reports.

There are many questions regarding some of the general statements on design issues, such as tank storage, runoff treatment needs, etc. Since Dow-Shell has limited current evaluations to general considerations, there is little point in addressing these issues at this time. When design criteria are being selected, when definitive site evaluations are undertaken, and/or when product slates and design processes are determined, we will be happy to work with Dow-Shell on these matters. Some of the types of design concerns will be included in our recommendations for further action. The real concern is that sufficient lead time for resolving such concerns be built into any state/Dow-Shell agreements.

The Dow-Shell report supported the State's contention that downstream development of other industries should be anticipated. Should a petrochemical industry develop in Alaska, the sponsors should be aware that specific evaluation of the proposals would, of necessity, include evaluation of downstream related industries. This would include identification of the most likely industries to develop, who the sponsors might be, potential markets and associated environmental risks. This type of analysis is common should an EIS be required.

The landlord concept of wastewater management would require careful analysis and information beyond that contained in the feasibility study. Examples will be needed of other similar systems, how treatment upsets can be traced, how liability is determined in the event of permit violations, and the landlord's powers of enforcement. The operation of a facility of this type would be closely tied to the DEC permits and their conditions.

The discussion on regulatory requirements is occasionally misleading. This may be due to oversimplifying the regulatory framework, however, there are certain errors which should be noted. In Table 6-4-A, the standards should be in micrograms rather than milligrams. Also, Table 6-4-C is misleading; the statements concerning percentages of industrial growth are essentially meaningless and will cause confusion. One other statement which will likely cause confusion is on Page 24, under Effluent Standards. A discussion of EPA's effluent technologies is mixed with statements on Alaska's receiving water standards and again milligrams was a typographical error. These are all explainable, if unfortunate.

Dow-Shell supplied us with the Oceanographic Institute of Washington's marine risk assessment. The assumptions used in this study are general, over simplified and potentially misleading. While this analysis may be suitable for a feasibility study, it would be insufficient as the only marine risk assessment. Limited data, lack of inclusion of other types of marine traffic (such as fishing vessels, other cargo vessels, etc), the apparent use of two years of spill data averaged over a four year period, size of spills, etc., limit the usefulness of this study to a preliminary effort to determine the gross likelihood of a spill. Future work would have to consider a more realistic set of circumstances in assessing both the probability and consequences of spills. Individual sites will also present problems requiring more detailed analysis--such as ice and shoaling in upper Cook Inlet and delays of ships in Prince William Sound due to weather.

Nothing in the analyses reviewed to date adequately address the issues surrounding rail transport of petrochemicals in Alaska. The condition of the railroad, type of tank cars, applicable regulations and liability issues should be clearly defined. DEC would be very concerned about the safe transport of any of the currently proposed materials. It is our understanding that the Department of Transportation is evaluating these issues.

MEMORANDUM

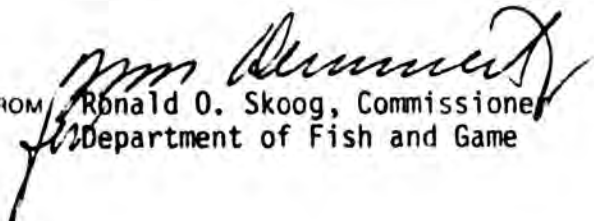
State of Alaska

TO John W. Katz, Commissioner
Department of Natural Resources

DATE: October 16, 1981

FILE NO.

TELEPHONE NO 465-4100

FROM  Ronald O. Skoog, Commissioner
Department of Fish and Game

SUBJECT: Review of Dow-Shell
Petrochemical Feasibility
Study

The Department of Fish and Game has completed its review of the "Alaska Petrochemical Industry Feasibility Study" prepared by the Dow-Shell Group. Our comments are confined to the general effects that the project may have on the fish and wildlife resources of the State including the human use of fish and wildlife resources.

In general, the report was well organized and packaged, but lacked specificity in the areas of fish and wildlife resources portrayal and the environmental protection measures necessary to prevent adverse impacts on fish and wildlife resources. While we laud Dow-Shell's claim that "there would be no need to seek variations from Federal and State regulations with regard to air emissions or effluents and solid wastes," the report contains scant information on how this can be accomplished. The Department has detailed its concerns in the report titled, "Potential Impacts of the Proposed Dow-Shell Petrochemical Complex on Fish and Wildlife Resources in Alaska" which was submitted to the Interagency Petrochemical Technical Team for inclusion in "Petrochemical Industry Assessment for the State of Alaska." Based on our analysis a world class ethylene plant and gas liquids pipeline of the size and scope proposed by the Dow-Shell Group will potentially have significant effects on fish and wildlife resources and human use of fish and wildlife resources.

The Department has analyzed the potential impacts of the project based upon the limited information provided to us by the Dow-Shell Group and the existing fish and wildlife data for the proposed sites. The Dow-Shell Group report does not address many of the potential problems identified in our report. For example, if the plant is located at the Wildwood site, up to 25 million gallons of water per day may be appropriated from the Kenai River. An out-of-stream diversion of this magnitude will have an undetermined effect on the habitat quality of the Kenai River and potentially cause damage to a highly important sport and commercial fish resource. The Dow-Shell report made no mention of the fish entrainment and impingement problems attendant with massive appropriation of water from the Kenai River.

The influx of employees to construct and operate a petrochemical facility will have a significant effect upon the local utilization of fish and wildlife resources. Past history has taught us that the disturbance and influx of people associated with major construction projects will lead to the type of fish and wildlife allocation conflicts which are now occurring in the Cook Inlet region. Moreover, it can be assumed that most of the

skilled employees needed to construct and operate the facility will come from outside of Alaska and will result in an increased local competition for the relatively finite fish and wildlife resources. The Dow-Shell Group estimates a peak in-State workforce of 11,100 with a permanent employment base of 6,800 after ten years. The results of this population increase on fish and wildlife resources will likely be reflected in shorter seasons, smaller catch size, smaller bag limits, lower success/effort ratios, and more resource user conflicts as well as additional fish and wildlife habitat being lost to urbanization and associated developments. It is unfortunate that few Environmental Impact Statements or Socio-economic studies ever adequately address the subject of increased population demand on fish and wildlife resources and habitats. This subject was not addressed at all in the Dow-Shell report.

While the Department recognizes that the Dow-Shell report was only intended to be a "feasibility study," we are concerned about the brevity with which fish and wildlife impacts were addressed. Insufficient information was provided on pipeline routing, effluent composition, water appropriation, and toxic materials transportation to enable the Department to determine whether the project is environmentally safe. Part 1(c) of the Memorandum of Understanding and Intent between the State and the Dow-Shell Group requires Dow-Shell to provide an "environmental and social impact analysis in sufficient detail to allow the State to determine environmental and social costs and benefits." In the Department's opinion, the State cannot make this determination based upon the Dow-Shell report. In lieu of additional project details the Department will report to the Governor that the proposal at this time involves many technological, environmental, financial and economic factors that have a high degree of uncertainty and risk.

Recommendations

The Department recommends that the following be made conditions of the State's future involvement with the Dow-Shell Group:

1. Dow-Shell shall furnish the State with a detailed product slate including a description of each industrial process sufficient in detail to determine the composition and volume of the waste stream and the volume and nature of chemical materials used in the manufacture of products that must be stored or transported in-State.
2. Dow-Shell shall furnish the State with the corporate structure, scope of concern, and authority for industrial management for environmental protection. In particular, specific commitments will be required for fish and wildlife protection in both the construction and operation phases of all proposed facilities.
3. Dow-Shell will make the final site(s) selection for the manufacture, storage and transportation of petrochemical products and will coordinate with the Department of Fish and Game and other State resource agencies prior to beginning environmental baseline studies to insure that the studies are adequate to address State concerns.

4. Dow-Shell shall furnish to the State detailed water appropriation specifications at the primary manufacturing site and any planned subsidiary manufacturing sites. Included will be peak demand, average demand, expected seasonal or daily variations in demand, source(s) of water to be appropriated, and the location and type of intake facility required.
5. Dow-Shell shall furnish to the State a detailed description of the gas liquids pipeline. Included are: (a) the pipeline route and associated facilities delineated on photo-mosaic sheets (scale one inch = 1,000 feet) supplemented with color aerial photographs covering the entire pipeline system; (b) the basic criteria for pipeline design and associated facilities including substantiation of arctic engineering concepts employed for construction and operation; (c) requirements for the use of fill materials by geographic location in terms of type, quality, and quantity; (d) the location and size of all major temporary facilities, including work camps and staging areas; (e) the projected workforce requirements and distribution along segments of the pipeline; and (f) the overall project schedule including the proposed seasons of activities for all major components of pipeline construction.

The Department of Fish and Game will continue to actively participate in studies for an in-State petrochemical industry. At present, our level of participation is supported by a Coastal Energy Impact Program (CEIP (c)(1)) grant from the Department of Commerce. Funds for this grant are scheduled to terminate on September 30, 1982. If the State chooses to pursue continued involvement with the Dow-Shell project or others, we would support the establishment of a stable interagency petrochemical team with an assured source of funding and agency commitment.

Thank you for the opportunity to comment.

cc: Deborah Kirk, ADEC

MEMORANDUM

State of Alaska

TO John Katz, Commissioner
Department of Natural Resources

DATE October 7, 1981

FILE NO.

TELEPHONE NO. 3030

FROM *Helen D. Beirne*
Helen D. Beirne, Commissioner
Department of Health & Social Services

SUBJECT Petrochemical Industry
Assessment

Having reviewed reports submitted to the state regarding the feasibility and socio-economic impacts of petrochemical industry development in Alaska, we in the Department of Health and Social Services believe that our initial concerns, which were included in the Petrochemical Industry Assessment for the State of Alaska by the Interagency Technical Team, should be addressed if a decision is made to proceed with development of this industry. While Dr. John Middaugh, State Epidemiologist, will be sending you a separate report on his assessment of health risks, this memo summarizes the general concerns of all in this Department who have worked on this project.

Additional analysis of health and social services related issues should be undertaken if or when a particular site is selected. This should be done in cooperation with the individual community selected for site development.

It appears from the Dow-Shell Feasibility Study that industry planning for health and safety issues addresses only petrochemical workers, but does not involve planning for the surrounding community. Since hazardous chemicals must be transported into and out of the plant site, health, safety, and fire service planning should include all communities within the vicinity of petrochemical transport routes.

For example, the September, 1981, issue of the American Journal of Public Health notes that "Firefighters, particularly in rural areas, are seldom prepared to deal safely with such (chemicals) fires, and serious episodes of toxic inhalation have occurred among firefighters exposed to burning chemical wastes."

Furthermore, as our initial report recommended, the Alaska Division of Emergency Services, Department of Military Affairs, should be consulted regarding contingency plans for possible disasters which may involve petrochemical facilities. This recommendation is based in part on our review of a book titled The Peel Regional Police Force and the Mississauga Evacuation by Joseph Scanlon (1980), which describes a Canadian train derailment involving hazardous chemicals including caustic soda, propane, toluene, styrene, and chlorine (the most dangerous in terms of public health). As a result of this accident, 213,000 people were evacuated from the surrounding area.

Although we believe that such serious accidents are rare, we also believe that contingency planning for any possible disaster is in the best interests of our population. These issues should be addressed whether or not the Dow-Shell Petrochemical Industry is deemed feasible.

Such planning should include representatives from appropriate state agencies, industry experts, and local communities. We do not have any specific recommendations at this time on how to budget for these activities.

We appreciate the opportunity to have participated in the Petrochemical Industry Assessment, and we will be happy to offer additional assistance in the future.

TO: [The Honorable John W. Katz
Commissioner
Department of Natural Resources

DATE: October 8, 1981

FILE NO:

TELEPHONE NO:

FROM: *Helen D. Beirne*
Helen D. Beirne
Commissioner
Department of Health and
Social Services

SUBJECT: Formal State Review
of Dow/Shell Feasibility
Study

This memorandum transmits the report developed by the State Epidemiologist of the Division of Public Health assessing the Dow/Shell Feasibility Study as it relates to health hazards and risk assessment of the proposed petrochemical development in Alaska. We appreciate the opportunity to serve on the Petrochemical Technical Group and would be pleased to provide any additional information that you or the group would like.

Attachment: As Indicated Above

**HEALTH HAZARD AND RISK ASSESSMENT
OF THE DOW-SHELL GROUP PROPOSED PETROCHEMICAL INDUSTRY
REVIEW OF THE DOW-SHELL ECONOMIC FEASIBILITY STUDY**

John Middaugh
State Epidemiologist
Division of Public Health

October 9, 1981

My initial report of September 9, 1981 was the product of extensive literature research and numerous discussions with leading national experts on petrochemicals and health, including many Dow Chemical physicians, epidemiologists, and toxicologists. (See Appendix A, 9/9/81 Report) My review of the economic feasibility study since its release on September 9, 1981 has provided no new information that had not already been covered in much greater depth during prior research. Information in the feasibility study does not provide answers to the concerns and issues discussed in my earlier report.

In order to provide to the State information of the highest reliability, I sent copies of my September 9, 1981 report, "Health Hazard and Risk Assessment of the Dow-Shell Group Proposed Petrochemical Industry", to nine leading experts for critical review. (See Appendix B, 9/9/81 Report) To date, five of the nine reviewers have responded in writing and their comments are attached. (Attachment 1) The remaining four reviewers have indicated that they will soon provide their written comments which also will be made available upon receipt.

Other epidemiologic responsibilities required that I devote a great deal of my time during the past month to activities not related to petrochemicals. I have had only limited time to continue my evaluation of health impacts of the proposed petrochemical development in Alaska. Nevertheless, continued study has identified new concerns and recommendations.

1. The State should review carefully the possibility of prohibiting production of chlorinated petrochemicals altogether due to the serious environmental and health effects associated with many of the chlorinated hydrocarbons.
2. Fugitive emissions need to be examined in greater depth as does "state-of-the-art" technology which may be inadequate to control emissions in Alaska.
3. The State should review its ability to control what petrochemical products may be produced in the event that the petrochemical industry proceeds. Dow-Shell has clearly indicated that Phase I and Phase II projected product slates are by no means inclusive. Many other potential "downstream" products are known to be even more hazardous than those proposed to date and should possibly be prohibited from manufacture in Alaska.

4. The State needs to obtain information on catalysts. This information has not been provided to date and adequate assessment of health risks and hazards is not possible without this information.
5. Standards significantly lower than those currently in effect have been proposed recently for Benzene, Ethylene Oxide, and Ethylene Dichloride. The State should insist that these lower standards be in effect if petrochemicals are produced in Alaska.
6. A thorough review of state and federal statutes and regulations by the Department of Law should be performed to identify gaps in authority and areas in which state standards may be preempted by federal standards. In view of potentially significant alterations in federal statutes under the current administration, State legislation may be essential simply to maintain present standards.
7. Recent study has brought forth new concerns related to explosion and fires. A particular hazard of chemical fires is the formation of toxic combustion products. Unprepared fire fighters have experienced serious episodes of toxic inhalation and chemical burns. Protective suits may be dissolved by corrosive chemical toxins. Protective suits have also led to heat exhaustion. Run-off of water needed to fight chemical fires has caused contamination of surface and ground water with toxic chemicals. Considerable study, education, and equipment will be required to assure adequate fire-fighting capability.
8. Considerable expertise is available to assist the state in thoroughly evaluating the proposed petrochemical industry. The State should consider developing carefully a formal comprehensive request for proposals (RFP) from national independent scientific consulting firms to obtain detailed information on the many areas of concern identified in the technical committee report.
9. The evaluation of health impacts of petrochemicals has clearly shown that severe staffing limitations exist for medical epidemiology within the State. Regardless of whether or not a petrochemical industry is ever pursued, the State could profit immensely from increasing epidemiology staff whose expertise will be increasingly required in the future. Specific recommendations include the addition of:
 - 1) One full-time medical epidemiology position, with extensive experience in chronic disease, environmental health, and occupational epidemiology.
 - 2) One full-time nurse epidemiology position.
 - 3) Appropriate clerical support staff.
10. Studies conducted since May, 1981 have been very productive. Expertise is being developed which will profit the State in the future. Valuable professional contacts have been made and should be maintained. Continued support for continued study is essential.



Centers for Disease Control
National Institute for
Occupational Safety & Health
Robert A. Taft Laboratories
4676 Columbia Parkway
Cincinnati, OH 45226

September 30, 1981

John Middaugh, M.D.
State Epidemiologist
Alaska Division of Public Health
338 Denali Street
Room 313, MacKay Building
Anchorage, Alaska 99501

Dear John:

Thank you again for having invited me to Alaska. I very much enjoyed the visit, and I was pleased by the course and tone of the discussions which we had with your Director, with Commissioners Ratz and Muller, and with the Lieutenant Governor. You are to be congratulated for having so successfully introduced considerations of public health into the public policy debate surrounding the proposed Dow-Shell petrochemicals facility.

I have re-read your assessment of the health hazards which may be associated with the Dow-Shell plant. Although the document is brief and rather general, it does a good job of cataloging and assessing the major health hazards that have been shown in previous studies to be associated with the production of petrochemicals.

The principal potential hazards of such plants are as follows:

1. fire and explosion;
2. occupational exposure to toxic chemicals which may result either rapidly or after many years in:
 - a. cancer;
 - b. male sterility;
 - c. other reproductive problems, e.g. miscarriages in workers' wives or genetic damage;
 - d. other occupational disease, e.g. toxic hepatitis, chronic kidney disease, or neurological damage;
3. pollution of air and water;
4. accumulation of toxic wastes;
5. production of disease in children and adults in surrounding communities either as the result of their exposure to fugitive emissions or in consequence of parental occupational exposures to chemical toxins with subsequent transport home of those materials.

I was very pleased to see that each of those categories of hazard had already received active consideration in Alaska either by your Division or by other State agencies. As we discussed in our meetings, there are several points to be kept in mind in minimizing the risks associated with these potential hazards:

- exposures to all suspect carcinogens and reproductive toxins should be controlled to the lowest possible level. The existence of safe thresholds cannot be assumed. Achievement of control by application of state-of-the-art engineering technology is relatively easy in the design and construction of a new plant, but becomes much more difficult and expensive when it involves retrofitting an already existing facility. Hence there is an economic incentive to prevention.

- measures for the control of carcinogens and reproductive toxins should be designed not merely to meet present-day standards, but should additionally take cognizance of the fact that recommended exposure limits for such compounds as benzene, ethylene oxide, and ethylene dichloride (among others) will probably be made more stringent in the not too distant future. Accordingly, and to avoid the need for expensive retrofitting, initial plant design should be sufficiently tight so as to meet anticipated future levels of control. Specific recommendations on this point will require that one-at-a-time review be conducted of each chemical compound and of each process that is planned for the new facility.

- scheduled maintenance of the proposed facility should be required from the very beginning of the plant's operation. Preplanned maintenance which is conducted on an unvarying schedule and with State oversight is an excellent safeguard against the unanticipated spills and leaks from supposedly closed systems which constitute one of the major sources of human exposure at petrochemical plants.

- careful monitoring of in-plant and environmental exposures to toxic compounds should be undertaken on a regular and thorough schedule, and the results of that monitoring should be carefully scrutinized by the appropriate State agencies.

- careful personnel and medical records of all employees at the facility must be kept. Those records must include a listing of all jobs held by each worker and must be readily linked to exposure monitoring records and also to records of any spills or accidental releases to which a worker may have been exposed. The State must have immediate, open access to those records.

- consideration should be given to establishing statewide cancer and birth defects registries. Such registries will serve as an additional monitoring system for detection of any diseases which may be associated with the proposed facility and will also provide useful information to the Division of Public Health on time trends and geographic variation in the incidence of cancer and birth defects in Alaska. All records in both such registries should take careful note of occupational histories.

- the importance of safe disposal of toxic wastes generated by the facility cannot be overemphasized. The hazards of improper waste disposal are manifold and are outlined in our recent editorial in the Journal of the American Public Health Association. Those hazards are, however, entirely preventable through adherence to EPA regulations and state law.

Perhaps the most important aspect of our meetings in Juneau was that at a very early stage of plant planning we were discussing the prevention of disease and genetic damage in Alaskans one or two or more generations hence. Such anticipatory discussion has been rare in our nation's industrial history and can only yield beneficial results. Virtually all of the diseases and public health problems which have previously been associated with petrochemical production elsewhere can be prevented in Alaska with appropriate planning and careful foresight. I commend you and your colleagues on having begun such planning.

The Centers for Disease Control and the National Institute for Occupational Safety and Health will be pleased to assist you and the State of Alaska in any way that we can in the continuing evaluation of the hazards which may be associated with petrochemicals development in Alaska. I enclose the materials on ethylene oxide and ethylene dichloride which you had requested. Please do not hesitate to call further upon us.

Sincerely yours,



Philip K. Landrigan, M.D.
Director

Division of Surveillance, Hazard
Evaluations and Field Studies



DOW CHEMICAL U.S.A.

1803 Building
16 September 1981

MIDLAND, MICHIGAN 48640

John Middaugh, M.D.
State Epidemiologist
State of Alaska
Dept. of Health and
Social Services
Room 222 Mackay Building
338 Denali Street
Anchorage, Alaska 99501

Dear Dr. Middaugh:

Thank you for providing us the opportunity of reviewing your 9 September 1981 report, "Health Hazard and Risk Assessment of the Dow-Shell Group Proposed Petrochemical Industry." We recognize you had to assimilate a lot of information in a short period of time and, in turn, are trying to provide a distillation of your research to Governor Hammond so that he can factor health issues into his administrative decisions; however, our overall impression is that your writeup is too generic.

For example, in your first paragraph under the heading, "Health Effects", you make the comment, "These chemicals have caused human cancers, sterility, infertility, miscarriages, and congenital malformations. This is too broad a statement. To our knowledge, none of the chemicals proposed for production in either Phase I or Phase II (your Appendix D) have been related meaningfully to human sterility, infertility, miscarriages or congenital malformations.

Benzene has been associated with human leukemia, but only at high levels of exposure; levels considerable above those to be expected in the proposed plant, and much above those for the surrounding community. Ethylene dichloride has been hypothesized to be a possible human carcinogen based on a 1978 National Cancer Institute report of carcinogenicity in rats and mice after gavage. On the other hand, Maltoni (1979) has reported essentially negative results from a lifetime inhalation study of rodents exposed to 150 and 250 ppm of EDC; and Goldschmidt (quoted by NIOSH, 1978) was unable to show increased incidence of tumors in experimental animals after skin applications of EDC. The point that we're trying to make is, having obtained a broad overview of the topic, you probably should focus your research on a smaller subset of specific chemicals, those found in your Appendix D.

11 September 1981

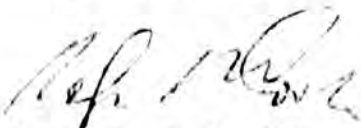
In paragraph two you mention a variety of human cancers that "have been caused by petrochemicals," but fail to mention which chemicals and that none of these chemicals (benzene being the exception) will be part of the project. Angiosarcoma of the liver, for example, is thought to be caused by excessive exposures to arsenicals, vinyl chloride and Thorotrast. The latter is a product formerly used primarily by radiologists. Further, recent studies by NIOSH (unpublished) are finding that previously reported two- to three-fold increased risks of brain cancer among petrochemical workers at Dow are not holding up after additional more rigorous research.

The concept of no threshold for a carcinogen is an administrative convenience, not a scientific fact. Medically, the concept of thresholds makes more sense to me. We use it in therapy, even for allergies. To rigorously prove a threshold is not feasible for essentially all toxicological responses. Indeed, even the simple LD₅₀ is determined by using log probability models which inherently recognize no threshold. Moreover, not assuming a threshold for carcinogenesis is tantamount to accepting essentially all chemicals as carcinogens.

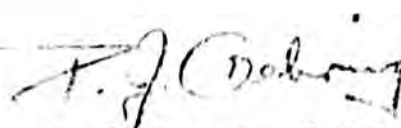
We support your argument that further research is needed and, if the project proceeds, would like to explore with you the most efficient and rigorous methods by which our respective organizations could perform this research.

In the meantime, we would suggest you attend either the epidemiology short courses at the University of Minnesota or Amherst. We realize funding may preclude this, but both are excellent and would be a great help to you. Members of our group have gone to both and found them up-to-date and quite thorough. Enclosed find recent information on each.

Sincerely yours,



Ralph R. Cook, M.D., M.P.H.
Director of Epidemiology
Health & Environmental Sciences



F. J. Gehring, D.V.M., Ph.D.
Vice-President, Agricultural Chemicals R&D
and Director, Life Sciences R&D

cc: Dr. R. Middaugh

FJM:1

THOMAS D. BATH, CONSULTANT

GOVERNMENT RELATIONS • ENGINEERING • ENVIRONMENT

2555 M STREET, N.W. SUITE 404
WASHINGTON, D.C. 20037 (202) 293-6190

September 21, 1981

John Middaugh, M.D.
State Epidemiologist
State of Alaska
Dept. of Health and Social Services
Room 222 Mackay Building
338 Denali Street
Anchorage, Alaska 99501

Dear Dr. Middaugh:

I regret my tardy reply to your letter of September 2. I hope it does not inconvenience you. In general, I feel that your report on health hazards represents an excellent summary of current knowledge regarding health concerns related to increased exposures to organic chemicals. As you are aware, my technical background is in chemical engineering rather than toxicology or epidemiology and therefore my comments will be from a somewhat different perspective than many you may receive. I do, however, have in mind that your own responsibility is to advise the Governor from the public health point of view and so I have tried to direct my comments in a way which will be relevant to your needs. Here are my suggestions:

Product Mix - As I look at the product mix outlined on page fourteen of your report, it appears to me that the manufacture of chlorinated hydrocarbons may not be essential to the viability of the project. The environmental contamination associated with chlorine plants and the special toxicological concerns related to many of the chlorinated hydrocarbons are such that I would recommend making a special point of the implications of introducing any chlorinated compounds into the product mix. Usually, the capacity to carry out chlorinations leads to the consideration of the production of a variety of substances (vinyl chloride, pentachloro phenol, etc.) depending on their current economic desirability. Hence, either we should suggest that the consortium deliberately exclude chlorinated compounds, or, failing that, your report should review much more broadly the health concerns associated with chlorinated organics. I realize that you touch on this elliptically in your report (p.6), but I think it needs more emphasis.

Dr. Middaugh
Page Two
September 21, 1981

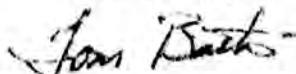
Source Control - I was pleased to see you give explicit attention to the likelihood that "fugitive" organic emissions would likely be a major mechanism of exposure. I would suggest that your statement: "Even state-of-the-art technology cannot eliminate...Canada.", is not strong enough. "SOA technology" for control of these emissions is really a phantom. The industry may be able to do well (with the expenditure of enough effort) in controlling emissions in Texas and West Virginia, where they have extensive operating experience, but control here is mainly a matter of the long-term behavior of seals and packing glands, etc. and I am concerned about the lack of experience that the industry has operating such delicate systems in the Alaskan climate. Has anyone reviewed the performance of pumps/seals on the pipeline?

Facility Heat Rejection - Your paper does not mention any possible environmental or microclimatologic effects which can be expected from the heat rejection systems employed by such a large facility. Perhaps this is beyond the scope of your responsibility; however, let me suggest that "ice fog" and other such phenomena may provide a secondary mechanism for exacerbating the health impacts of other pollutants.

I hope you find these comments helpful. Certainly, isolated points of view such as mine, are not substitute for the consensus views of a committee or review board, and you might want to suggest that the Governor consider setting up such a group. However, I think you have done an excellent job, so far, and I wish you well in your future efforts.

I did manage to escape from Colorado without any new parasites, having greatly enjoyed my trek along the Continental Divide (Zirkel Mountain Wilderness). I do hope that we have a chance to get together on your next visit East.

Sincerely,



Thomas D. Bath

TDB:eac



DAVID S. SAXON
President of the University

University House
Davis, California 95616

EMIL M. MRAK
Chancellor Emeritus

September 17, 1981

Dr. John Middaugh
State Epidemiologist
Dept. of Health and Social Services
Room 222 Mackay Building
338 Denali Street
Anchorage, Alaska 99501

Dear Dr. Middaugh:

I have read your report with great interest. Before making any comments, however, I would like to suggest that you give serious consideration to the possibility of attending a conference to be held in Washington on Dioxins October 4-7.

I am enclosing a copy of the program for this conference. You will note it is an International meeting and you will note that it does cover chemical spills and especially the one that occurred in Italy that caused so much comment. You will note, too, that there are people from other places in the world discussing this important area.

I would recommend very strongly that if you can attend the meeting, that you do so. If you wish further details, I would suggest you get in touch with Dr. Fred Coulston, 17 Woodlawn Avenue, RDZ, Rensselaer, New York 12144, phone (518) 489-8346 who is one of the leading organizers of the meeting and either write to him or phone him.

I think your attending this meeting might very well modify your report. Now about your report--

In the second paragraph you refer to chemicals that cause human cancers, sterility, and so forth. It should be pointed out that most of this work, and in fact almost all of it, has been done with animals, and an animal is not 'always' a human. I would also like to point out that the dosages may have been extreme, not just one short or very mild.

With respect to your third paragraph, I can't refrain from pointing out that skin cancer is very common, but it is mostly caused by exposure to the sun. Some have raised the question of whether or not we should ban the sun.

With respect to the last part of the third paragraph, I would again urge that you attend the meeting in Washington.

With respect to the last paragraph on page two, the line that says "and, once an acute exposure occurs, continued progression of clinical manifestations of the adverse process can occur in the absence of continued exposure," I would precede this sentence by saying "it is believed." I am not sure that there is evidence to prove this. I think, too, that one needs to talk about the type of exposure and whether it is a one shot deal or continuous.

This same comment refers to the top paragraph on page three. With respect to the last two lines on the first paragraph on page three, it seems to me it would be better if it stated finally, the largest group might consist of the general population and so forth. I say this because of the reports that some of us are getting back from Italy. This will be reported on in the meeting in Washington in October.

Under the sub-heading Cancer - background. When some of the people talk about environmental effects, they have in mind not only air, water, and so forth, but also food. In this connection you may wish to contact Dr. Albert C. Kolbye, Associate Director for Sciences, Bureau of Foods, Food and Drug Administration, 200 C Street, S.W., Washington, D.C. 20204. He is an M.D. and also a lawyer. He is now trying to bring rational thinking into carcinogenesis.

With respect to the last paragraph, I think one needs again to consider types of exposure and age. When Dr. Schneiderman of the Cancer Institute talks about cancer, he indicates that if one corrects for age, cancer is really going down.

I would say on page four that the three topics you listed are good statements.

September 17, 1981

I would certainly agree with you under the statement number six on page eight, that OSHA is the key agency to monitor compliance. The thing that bothers me about some of the people that are doing this, however, is that they are at times bureaucrats rather than good scientists. I am sure you are well aware of this.

I must say you certainly contacted a lot of people and have certainly had a broad exposure to views on this matter.

Finally, I would call your attention to an organization in the San Francisco bay area known as Environmental Management Services to Government. This organization is led by Dr. Stan Greenfield who was the first administrator for research in EPA.

I have had an opportunity to see their brochure and it seems to me that they have a good organization and can do good work. Most certainly I am not recommending this or selling him. It just occurred to me that you might be interested in writing to Dr. Stanley Greenfield, President, Systems Applications, Inc. 101 Lucas Valley Road, San Rafael, California 94903 to get their brochures and material. It is quite possible that the companies going in to Alaska should be asked to have some outside organizations such as this one to review their operation. I want to repeat, however, that I am not selling this organization, I am just aware of it.

Kindest personal regards,



Emil M. Mink

MEMORANDUM

State of Alaska

TO: John Katz
Commissioner
Department of Natural Resources FILE NO:

DATE: October 12, 1981

FROM: *Ed Orbeck*
Edmund N. Orbeck
Commissioner
Department of Labor

TELEPHONE NO: 465-2700

SUBJECT: Review of Dow/Shell Group
Alaska Petrochemical
Industry Feasibility Study

The review on the Occupational Safety and Health issues has been completed. The basic findings and recommendations made in Raymond Jorgensen's initial response contained in the Petrochemical Industrial assessment for the State of Alaska by the interagency technical team remains the same. The basic issues of concern are adequately identified in that report.

Thank you for the opportunity to participate on the technical team.

MEMORANDUM

State of Alaska

TO John W. Katz, Commissioner
Department of Natural Resources

DATE October 8, 1981

FILE NO

TELEPHONE NO

FROM Edmund N. Orbeck, Commissioner
Department of Labor

SUBJECT: Dow-Shell Petrochemical
Assessment Update

The Alaska Department of Labor would like to reaffirm the general conclusions contained in our labor market impact report to the Petrochemical Technical Group. After a careful review of the Alaska Petrochemical Feasibility study prepared by the Dow-Shell Group and after discussions with Dow-Shell officials we can find no errors in our report or conflicts with data available from all sources. There are, however, some points that should be emphasized and one additional recommendation which would provide the necessary data for a detailed analysis of the employment impacts of petrochemical development.

Our report found that the construction phase of the project would require workers with skills available in Alaska but in greater numbers than are currently unemployed. The long term operations phase would require fewer workers but workers with many skills currently in short supply. Long term operations employment provides the opportunity for many jobs to be filled in state if appropriate training programs are established. The construction phase of the project, as described by the Dow-Shell group, would employ an average of 9,750 workers in the peak year. Based upon historical seasonal construction employment factors for Alaska the seasonal peak for the year would likely be 20 to 30 percent higher for direct construction labor placing a greater demand on the Alaska labor force than initially estimated.

The overall findings of the Dow-Shell Group report relating to community employment and population impacts cannot be disputed based upon currently available data. However, the estimates of nonlocal hiring and resulting population increases expected seem conservative in light of the estimated number of unemployed workers in the studied communities. A recommendation that should be considered, along with those already contained in our report, would be that the area that is chosen for the site should be surveyed to determine the actual labor force participation characteristics, skills of the currently unemployed workers and interest in employment of those not currently working. This would provide a relevant basis for determining, with a greater degree of accuracy, the employment, population and immigration effects likely to occur. A localized survey might be sufficient but a broader survey to include the total labor market affected by the facility may be appropriate. The benefits associated with a larger number of job choices and the opportunities for skill upgrading could also be determined from such a survey.

October 8, 1981

In general, the Petrochemical Industry Assessment prepared by the Interagency Technical Team addresses most of the major concerns relating to petrochemical development. Further research will be required as the project comes closer to initiation. The Alaska Department of Labor will continue to monitor the progress of the project and provide support as necessary in review of issues relating to impacts on the Alaska labor force.

cc: John Post

CC/JH:bb



PHILIP E. KEOWN & ASSOCIATES, INC.
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MEADOWS BUILDING, DALLAS, TEXAS 75206 (214) 361-1556

October 29, 1981

Honorable John W. Katz
Commissioner, Department of Natural Resources
State of Alaska
Pouch M
Juneau, Alaska 99811

Dear Mr. Katz:

The attached presents our evaluation of The Dow-Shell Group's "Report to the State of Alaska--Easibility of a Petrochemical Industry".

In summary, our analyses indicate that based upon the investment and operating costs given by The Dow-Shell Group, their report does present a reasonable assessment of the economic feasibility of a petrochemical industry in Alaska.

Very truly yours,

Philip E. Keown
Philip E. Keown

PEK: kw
Attachments