

ALASKA LEGISLATURE SPECIAL COMMITTEE / SUBJECT FILES 86 / 2

467 SCOMM13: JOINT COMM. ON GAS PIPELINE IMPACT 1974-76

to the electrical people about the Healy plant, but understand there has been considerable trouble. (This subject needs further study).

6. Health. Solid waster powers are under the Borough. Outside the City this is handled by private collection firms. The Borough operates the disposal area. There was no concern evidenced as to adequacy of the disposal areas.

7. Schools. The school system needs expansion. The fate of the needed construction is again up to the Borough voters in October. There are three bond issues-one to build a Junior High, one to build a Junior-Senior High and the third for maintenance. Carlson thinks there is a 50/50 chance of approval. (I'm not so sure. There is sentiment that since Alyeska is causing this problem, let them build the schools, or else the State should do so).

Mr. Carlson says if the bond issues don't pass, it will mean double shifting or portable school buildings.

In connection with schools, the Borough has what appears to be an excellent program for adult education and careers.

8. Inflationary Pressures. In addition to the \$10 million dollar flood control project, there is the \$15 million dollar Federal Building and if the bond issues pass, \$11 million dollars of school construction in the mill. Mr. Carlson expects there will be a crunch for skilled labor and the added impact. He is suggesting that the Federal Building construction be deferred. (The problems here again may be fear of loss of the appropriation).

Mr. Carlson also believes some of the OSHA regulations will have the effect of increasing the costs of construction.

9. Financing. Mr. Carlson is fearful that there will be a lack of financing for private industry needs and housing at any rate of interest.

VALDEZ - Interview Herbert W. Lehfeldt
City Manager
September 5, 1973

1. Mr. Lehfeldt state that there was considerable conflict among the several impact studies in respect to projections of employment and population in Valdez. He says the Powder Company will have 50 families living in Valdez which were not specifically mentioned in the Alyeska report.

He says that Alyeska plans 12 hour shifts and that men will be too tired to play. Mr. Lehfeldt believes there will be a 500 man construction camp at the terminal site across the Bay and one at mile 11 or 12 out of Valdez.

Population of Valdez now about 1000. Mr. Lehfeldt predicts 6500 people during (MSNW shows only about 3000 at the peak) the peak of construction and 300% permanent resident increase after construction.

Valdez is worried about the influx of people not directly associated with construction and people looking for jobs or just looking.

Mr. Lehfeldt thinks that if Alyeska hires most of their construction people outside there will be less serious adjustment problems after construction, especially among the natives. He says they will be unable to adjust to such radical changes.

Mr. Lehfeldt had no opinion as to the validity of the MSNW report that pipeline construction workers would require only 40% of the government services as permanent residents, and that other pipeline workers temporarily located in Alaska would need only 80% of government services offered.

2. Public Safety. Valdez now has ³city policemen and should have 4 for the present population. Mr. Lehfeldt says they will need to increase their force beyond that, if they can get the men. (Based on Mr. Lehfeldt's Impact Statement he would require 6 more policemen). Mr. Lehfeldt says they expect two additional State troopers to be stationed at Valdez. The City also has 12 men police volunteers for back-up with some training for emergencies and back-up only.

Valdez has 2 Fish & Game Protection Officers stationed at Valdez and possible 2 additional promised.

Valdez uses sideband radio for inter-city police communications. Weather conditions makes it undependable at times. They have commercial telephone for back-up. The City of Valdez furnishes the State Trooper side band equipment so that he can monitor the City frequency.

The Trooper has poor communication with his own headquarters at Glennallen. Commercial telephone is the normal communications channel. The Trooper also is equipped with radio using the Highway Department frequencies, but this is HF gear and is quite limited as to range and can only be used from 8-5 when the Highway offices are manned.

Lehfeldt thinks union jurisdictional problems unresolved in Anchorage might have to be handled or controlled by the State Troopers along the pipeline route.

Valdez has 28 volunteer fire fighters and good equipment. They are expecting Alyeska to provide their own fire protection at the pipeline terminal, tank farm and docks, although they have not been advised of this. If this is not the case, the City would

have very limited capability in the pipeline terminal area without expansion. If they will be required to provide such service, the property tax millage rate on the Terminal property would reflect the service.

3. Transportation. Mr. Lehfeltdt expects Alyeska materials will be received over both the City dock and an Alyeska dock to be built.

The Valdez airport is soon to be improved. There is available 2.3 million dollars for this work from a State bond issue. Engineering is complete and work should start soon. A delay has been caused by changes that were made and they are waiting approval of the F.A.A. There will be a 5000 foot, paved runway. There will be no runway lighting at this time nor the required navigational aids needed for all-weather operation. This will probably not be done until such equipment becomes more sophisticated. Alaska Airlines has talked of improved services for Valdez, however, at this time they have no service of their own. The contract with a bush pilot who offers service between Cordova and Valdez with single-engine equipment. Polar Airways offers 5 day per week service from Anchorage. This is with twin-engine aircraft, but requires VFR weather at Valdez.

Lehfeltdt says the Highway Department does an excellent job of keeping Thompson Pass open. He says that since he has been there (2 years) the pass was closed only once for about a day but this was the first time in years.

4. Housing. Mr. Lehfeltdt says the present population of Valdez is just over 1000. He anticipates 6500 at the peak of construction and about 3000 after construction is completed. There is unused land within the City which could be served with sewer and water, however, most is in private hands. He thinks it may not become available because of speculation. I think most of this land is in the business district, and if not used, may slow business development.

There is a definite problem as to the location of mobile homes, trailers or temporary housing.

There is not much land available which can be served with City services. There is some held by B.L.M. and the University of Alaska. The University land probably could be leased for temporary housing.

Lehfeltdt believes that zoning could be a problem despite adequate laws.

Lehfeltdt knows of no Federal housing programs that are available, except loans. Most federal programs are for low income groups. Farmers Home has a loan program, but funds have historically been very limited.

There are few federal programs that would aid community in building community facilities. The Better Community Act might have small amounts available but the community to qualify must have received federal assistance in the past. (Valdez qualifies) He thinks that perhaps as much as 50,000 to 60,000 dollars might be available to Valdez, although no application has been made. It is questionable if the receipt of such funds could be timely. Within the Valdez city area there is presently little vacant housing available. There are about three small motels in town and some small over-night tourist quarters which presumably could and would be made available for single or married workers, especially during the off-season. There are two trailer parks in town, but they

appeared to be almost fully occupied. Trailer parks out of town would need to be served by wells and cesspools.

5. Government. Mr. Lehfeltdt believes most laws presently exist that will be needed during the construction period. There is one concern in Valdez. Presently only 30 day residency is necessary to run for city government office. With such a high percentage of new residents there is the feeling that all new Council members could be elected, thereby affecting stability and continuity of city government. Worse, undesirables could control the government and perhaps allowing lawlessness in a community that until now is a peaceful, family community. There is thought being given to law changes which would provide lesser numbers of council members to be elected at one time and maintain better continuity of government.

Valdez is concerned with what will happen after the construction period. All previous plans were for reasonable growth. They do not desire to become a depressed area afterward, but hope the City can meet the temporary needs without indebting themselves (at least not beyond the ability of safely meeting the obligations following the construction).

The city must exist afterwards and the hope is that it can return to a family type community.

Mr. Lehfeltdt believes the State revenue-sharing formula is equitable. He says there are inequities but that he knows of no better way to allocate.

6. Utilities. Mr. Lehfeltdt says he knows of no plans to increase the electrical generating capacity for Valdez. (See interview with Jim Palin of Copper Valley Electric Coop.)

There is no TV in Valdez and no AM or FM radio signals can be normally received from Anchorage or elsewhere. The City operates the Armed Forces Radio Station in Valdez and broadcasts programs coming in by overland telephone circuits from Anchorage. This station can be received only in the Valdez Bay region.

7. Health. There is only one doctor living in Valdez. There are no dentists in residence, but a couple of times a year one or more dentists visit Valdez and set up shop for local residents. Emergency dental work must be done in Anchorage (or elsewhere). It is Mr. Lehfeltdt's understanding that Alyeska has contracted with Fairbanks physicians for emergencies along the pipeline.

The hospital and medical facilities in Valdez are very limited as to the severity of cases that can be handled. They must be transported to Anchorage or Fairbanks. Often this is not possible by air. Mr. Lehfeltdt believes better facilities are needed there, particularly for emergencies and severe injuries.

Valdez does have a new ambulance. They also have 7 emergency medical trainees in residence who have passed the Sitka training program(I understand these people are not as highly trained as paramedics)

8. Community Facilities. Valdez has a sewage collection and trunk system which Mr. Lehfeltdt describes as being adequate for the construction impact. They have a primary sewage treatment plant which will need to be expanded. The effluent from the treatment plant empties into the Bay in the neighborhood of the Old Town site. Although the Bay is deep and there is a 13' tide at least one person has said there is a pollution hazard. Lehfeltdt says the flushing action is good.

Mr. Lehfeltdt says they do not have sufficient road equipment.

9. Courts. There is a magistrate at Valdez. Mr. Lehfeltdt says the court cannot handle their load now and that conditions will get worse. He expects the majority of violations will be misdemeanors and therefore can be handled by a magistrate.

10. Inflationary Pressures. Mr. Lehfeltdt is much concerned with the problem of the City government (and local business & industry) competing with the construction industry for workers. He expects to lose some male workers (even possibly policemen, who now make 1900 per mo). Even if they don't lose people, the expected high wage settlements will almost certainly force all wages up. Valdez locked in on budgets will have difficulty keeping or recruiting help. He expects insurance rates to rise, also. He wondered about wage ceilings.

He believes the State needs to take a hard position on excessive Alyeska costs and that audits be made and maybe penalties be assessed or threatened in cases of excessive costs. He believes the only way is to control or set the maximum price per barrel that the oil can be sold for (would probably require Federal legislation).

An increase in cost of living will remain high after the boom period.

11. Planning. The Capital Improvements part of the comprehensive Valdez Plan is completed. (will attempt to get copy)

12. Banking. At lease one more bank (maybe 2) will open a branch in Valdez.

13. Postal Services. Postal services believed to be adequate. Mail is brought daily by truck from Anchorage. Airmail service is also available. If the service is cancelled, out-going airmail goes by truck. However, incoming airmail to Valdez awaits the airplane departure, even if delayed or cancelled. Service could be improved if airmail were trucked on days when flights are cancelled or delayed.

The incoming mail is not delivered but placed in post office boxes. An additional tier of boxes could be installed, if needed. Also, a second floor could be added to the building.

14. Schools. Mr. Lehfeltdt believes the school system can handle the expected need with double shifting and more teachers, providing Alyeska does not permit pipeline workers to bring their families.

VALDEZ - Interview John Kelsey
Valdez Dock Co.
September 5, 1973

Bill Johnson (Homer) has 8 pilots qualified to work in Valdez and Prince William Sound waters. He plans to station pilots in Valdez. Kelsey believes there will be sufficient pilots.

He says Coast Guard will bring in a 90' vessel and expand as required.

B. & B. Fisheries (Bix Bonney) are constructing a large freezer plant (Ready Nov. 1, 1973, for Tanner Crab season) 50% Japanese ownership. They will also meet Alaskan market demands directly (won't ship first to the State).

The Copper Valley Coop also provides telephone service in Valdez and to Glennallen. They need to expand but haven't found way to do it. (See RCA pipeline communications in Delta Junction interviews)

Sea Land transportation is planning some form of scheduled transportation into Valdez and have talked to John Kelsey.

Mr. Kelsey believes the legislature has passed legislation since the installation of the Valdez sewer system that could cut down the planned capacity (5000-6000 persons).

The Valdez State trooper believes if legislation were passed requiring restitution after conviction of stealing or destroying property, it would be a deterrent to committing such acts.

NOTE: Reference is made to the Impact Statement submitted by the Valdez City Manager, which I understand was sent to Committee members.

ALYESKA MSNW REPORT

1. Is forecast made on employment still valid?
2. Which alternative forecast now looks likely?
3. Is the construction camp policy for Valdez assumed in the study valid, or will some workers, or all, be based in town? How about other areas?
4. What will be the logistics plan for support of the construction camps?
5. Native training programs - what are they and which other agencies should, or could, supplement this program.
6. Are any problems anticipated because of conflicting union jurisdictions?
7. Consistency of ALYESKA wage policy with Alaska construction wages.
8. Are there any future construction plans which have not been mentioned in the MSNW report?
9. Was the drilling of production wells and the construction of the gathering system employment considered in the MSNW report?
10. Are there community or government services which may be used by ALYESKA along the pipeline route or elsewhere?
11. What transportation services will be used by ALYESKA during construction and after?
12. Will ALYESKA use any public utilities of communities along the pipeline route or, conversely, will ALYESKA be able to offer services to the public at any point?
13. Comments on potential inflationary pressures due to:
 - a. Lack of skilled labor.
 - b. Inadequate transportation.
 - c. Lack of warehousing.
 - d. Lack of competition.
 - e. Shortage of housing.
 - f. Labor piracy.
 - g. Other.
14. Adequacy of banking facilities.
15. Adequacy of postal services.
16. Availability of ALYESKA's report "Recruitment and Training Task Force Report".

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17. The MSNW report doesn't anticipate any Federal increases in employment because of pipeline construction, nor decreases which may be caused by base cut-backs or closures. Was this because of lack of information?

18. What will be the specific location of the construction camps?

19. Have there been any changes in the assumptions listed on pages 19 to 25 in Vol. II of the MSNW report?

ADDITIONAL QUESTIONS FOR ALYESKA

1. Pipeline construction work-hours and time-off policy.
2. Specific routes of pipeline through communities and whether buried or above ground.
3. What are the plans for fire-fighting at the terminal and at pumping stations, if near communities?
4. Will the medical services provided at the camps be confined to first aid? What transportation will be provided for serious injuries or illness?
5. What are the plans for sewage and solid waste disposal at the camps?

Bob Sharp - Anchorage City Manager
September 10 - 10-11:20 A.M.
Manager's Office

1. Water problems. Water supply is expected to be adequate for the pipeline construction period for the area. Ship Creek was considered the main source for the water supply for the next several years. However, foundation problems for the required new dam necessitated a new study. A joint City-Central Alaska Utilities study led to the plan to determine if wells in the Eagle River valley could provide the needs of the next ten years. This will proceed.
2. Government capacity. The City, Borough, and Military bases now depend to a great extent on natural gas, both for heating fuel but for the generation of electric power. Although the well-head supply of gas is considered adequate, the transmission by way of the 12 inch pipeline of sufficient gas to meet the growing needs is questioned. It is believed serious consideration needs to be given to running another 12 inch line. (Two 12 inch lines already span Turnagain Arm). (This will be checked with the Gas Company).
3. Used State & Dept. of Interior employment and population figures. Same on employment/dependent ratio. (Based on judgment of employment expected).
4. Not yet sure what, or if, public works requires state aid. Further study needed.
5. If surface transportation exists, would be between Seward/Whittier and Anchorage. Dock improvements planned.
6. Can't see REA-group, proposal helping Anchorage at this time - could long-range.
7. City will make revenue projection created by pipeline impact. Believes City revenues would lag considerably behind both impacted city operational costs and increased needs of public works.
8. Doesn't believe there will be any substantial delay in other construction projects and there won't be much competition between pipeline construction skills and those needed in other construction, however, didn't deny all additional workers would add to impact. Some public works projects cannot wait, Anchorage Federal Building delay could jeopardize the appropriation.
9. Courts are now jammed. Only solution to add judges.
10. No postal service problems he knows.

11. Mr. Sharp believed surface transportation capacity probably adequate. The City lost their court action regarding certain tidelands south of the present City Port. Part of this land was to be used for additional POL docking and discharging facilities. Phase three of Dock additions is now being planned. The first construction project will be built in 1974. This will be used for general cargo and will almost double the capacity for general cargo. Sea Land will be moved to terminal 2 (which was completed in 1970) and Terminal 1 may be then used for additional POL facilities. Mr. Sharp felt if there were to be any surface transportation problem it might be between here and Seward and Whittier.

Mr. Sharp is yet to be questioned regarding land needs at Merrill Field and Campbell Field use.

12. Mr. Sharp believed there are definite dangers of another regional inflationary trend.

13. Mr. Sharps statement on police problems are in his impact statement. The City contracts with the Spenard Service Area for police protection in that area.

GREATER ANCHORAGE AREA BOROUGH

Mayor John Roderick

Paul Carr - Planning

Wm. Beaty-Planning Director

Harry Donahue-Mayors Staff Director

September 12 - 2 - 4 P.M. at Borough offices

1. They have studied MSNW report pretty thoroughly and believe it to be quite thorough. They agree there are unanswered questions.

2. The police problem really is an area wide problem. Either people need to approve area-wide powers or Legislature needs to do so. State troopers don't feel they can provide necessary control, they don't have sufficient people to do so and their men are not trained for patrolman duties. The belief is that adequate law enforcement will not be made under present set-up. With area-wide powers, they could contract with the City for police protection.

3. The Borough now has fire-protection powers for specific areas and foresee no real problems with the exception of the provisions of new equipment on a timely basis, if it is needed. It may be difficult to anticipate the need of additional equipment. There is the belief that the fire protection services of the Borough should be integrated, however, no problems are anticipated because of the present separation.

4. Housing is expected to be a problem for the lower income group. It is believed housing will be available for those with higher incomes. There may be reluctance, as always, of private investors to build housing, especially rental property, for low income families. Emphasis will need to be made on trailer and mobile-home parks. The Borough will need to develop plans for providing water and especially sewer for expanded mobile-home and trailer parks. Funding such expansion on an accelerated basis may be a problem. Building codes are in effect in the Borough. Emphasis will be upon health potential problems which might be created by any temporary housing projects or expanded trailer parks.

The Borough government will review the trunk road situation relative to expanded housing projects.

An attempt will be made to get further information on the present population, the housing vacancies now existing with a break-down of availability for lower income families.

It was suggested that if financing becomes difficult, that the State consider some financing or mortgage guarantee program, particularly for low income rentals or purchases. The Borough has a problem of insufficient inspectors.

5. It was believed that it would be difficult to anticipate additional school requirements but it was believed that projections made by the MSNW report could be accommodated. Further contact will be made with school authorities.

6. The Borough has area-wide health responsibilities. They plan close monitoring of new housing construction, especially in areas where sewers are not yet available. Some problems are anticipated with solid waste disposal.

7. Bob Smith of Central Alaska Utilities says he believes pipeline construction period water needs can be met, both from standpoint of capital investments and water source supply. Long run picture is not so good. Original plan was to further dam Ship Creek to provide a larger impoundment, however, because of the depth of bed rock (some 170' below the surface at some points) foundation problems developed. This plan was dropped. They are now exploring feasibility of drilling wells in the Eagle River Valley for additional supply to meet the needs of the next ten years.

8. The Borough Government is concerned with rising wages caused by pipeline construction (and other unrelated construction) making it difficult to hire government workers who are qualified at wages within the budget limitations. It is the belief that as a very interested party, the State should sit in all pipeline contractors/workers wage negotiations in an attempt to avoid another regional inflationary spiral that would establish a new plateau of living costs in Alaska.

9. The Borough believes some State aid will be required. Further study is now being undertaken to attempt to quantify their impact needs, along with anticipated increased revenues and the expected lag of revenue increases behind money needs. I will hold a second meeting with the Borough staff about Oct 10. At this meeting items not covered in today's meeting, such as Transportation and Government Services will be covered. It is expected that a hearing will be held sometime late in October or early November at which local government agencies and community leaders can present their impact needs and statement.

ALASKA RAILROAD
Walter Johnson - General Manager
Sept. 12 - 9 A.M.

1. A.R.R. can double tonnage with present equipment. Plan is to replace a number of pieces of power equipment with larger powered units. Effect will be to have a lesser number but each higher powered.
2. Equipment can be leased from railroads in the States and brought up on Seatrain or Hydro-train.
3. If there is a need for special equipment they have not been advised. However, any such traffic will probably be put aboard needed special cars and sent to Alaska via sea-train and left on the special equipment.
4. Alyeska has not advised the A.R.R. as to their transportation needs.
5. A.R.R. is operated under an industrial fund basis. Therefore, expansion needs would be expected to be met from reserve funds generated by revenues.
6. Many of SeaLand vans are transported to Fairbanks by rail. More could be handled, however, Sea Land unions apparently will not permit increases but insist on moving them via highway.
7. Mr. Johnson believes the majority of A.R.R. employees will stay with them, particularly those that have 5 years or more employment (because of retirement benefits). It may be difficult to meet recruitment needs during the pipeline construction period. The A.R.R. would probably need to hire less qualified people and be faced with lower quality performance. Despite the desire to employ more natives, experience has been that many are not too dependable, however, efforts will be made to employ more.
8. Mr. Johnson doesn't believe there will be much success in postponing construction projects, although he agrees that the impact will be aggravated by additional employment and population.
9. The A.R.R. doesn't have much of their own warehousing. They are making small areas available which will be used for warehousing. He foresees a shortage of warehousing here as well as in Fairbanks. He believes at least two individuals will construct warehouses at Anchorage.
10. The recent court action decided in favor of the A.R.R. in the tideland ownership south of the City port area. The City apparently intended to provide more POL docking facilities, evidently needed. The A.R.R. will have no immediate use, but is considering partnership in an ocean van service that would come in here instead of Seward or Whittier. However, A.R.R. would prefer such service to operate into Seward or Whittier, because of the longer A.R.R. haul.

It would be expected, under these circumstances, that no immediate use would be made of the tidelands mentioned. Of course, there is no assurance that the City would make use of the land during the pipeline construction period, although a POL facility could probably be built quicker than a dock capable of receiving vans.

11. The A.R.R. will make further projections when and if Alyeska makes its needs known.

Capt. H. G. Lyons
U. S. Coast Guard
Sept. 11 10 A.M. his office

1. His area of jurisdiction:

- a. Merchant Marine Safety-all area west of 134th(7) meridian (Alaska-Yukon border)
- b. Oil spills-Port Safety-more limited area which includes Cook Inlet and Prince William Sound.

2. Coast Guard plans:

- a. Coast Guard station at Valdez-two men to start to monitor shipping and unloading of explosives and hazardous substances.
- b. Two boats to be stationed at Valdez with approximately 35 men and officers. \$3,000,000 plus to be expended for facilities.
- c. New navigational aids and communications facilities to be installed between Hinchinbrook entrance and Valdez to aid tanker operations. Method used will be monitoring movement of all vessels (except fishing boats), communications between Coast Guard and ships and bridge-to-bridge between ships; radar; traffic separation, with an IN route and an OUT route from Hinchinbrook entrance to area outside of Valdez Bay. From this point into and out of Valdez Bay, only one ship at a time will be allowed.
- d. Explosives and hazardous substance will be unloaded at locations away from other docks (possibly at Alyeska dock on south side of Bay). Explosives may also come to Whittier, Seward, Anchorage or Kodiak for trans-shipment. Also, methods will need be worked out for land transportation via highway or railroad (for explosives).

3. Pilots are required by State law on foreign vessels operating in Alaskan waters. Federal regulations require federal pilots on coastwise vessels (over 150 tons) operating in coastal waters. Thus, pilots will be on all ships entering Valdez Bay.

The Coast Guard believes many domestic ships will carry their own pilots and require only a docking pilot after entering Valdez Bay.

Otherwise, a pilot station at a convenient location, or a pilot boat, will be necessary. The location of the pilot station (or boat) should be as near as possible to Hinchinbrook Entrance (compromises on the location may be necessary). The costs of maintaining pilots at the right location will need to be born by the operating ships as a necessary cost of doing business.

4. Capt. Lyons believes the Traffic Separation method of controlling tankers (and other vessels) will be satisfactory and safe. This method gives the control at both ends of a trip, when approaching land, but allows the captain freedom to take his own course when at sea to avoid storms or inclement weather.

5. Capt. Lyons does not believe there is need for change in the State pilotage laws, since the combination State/Federal laws are now adequate.

Capt. Lyons.....Coast Guard.....cont'd.

6. Capt. Lyons says the Coast and Geodetic Survey has recently charted the waters in Valdez Bay and in Prince William Sound (?). New charts are expected to be available by next year.

September 17, 1973

SPECIAL PETROLEUM IMPACT COMMITTEE MEMBERS:

Enclosed are the following papers:

1. A summary of the potential problems which you may want to consider. These are taken from interviews made during my trip from Valdez to Fairbanks and in Anchorage. These subjects will require further study.
2. A study outline I prepared before arriving in Anchorage but after I learned I would be working on this project. It was completely subjective and covers only those impact factors I arbitrarily classed as Element I priority on the front sheet marked "Scope".
3. The highlights of the interviews conducted on the trip and so far in Anchorage. These interviews were not meant to be in-depth or very searching, but in the limited time to get only a perspective.
4. A list of questions that I submitted to Alyeska in August. I have others now to add to the list when I meet with them. They have called me to advise I will be contacted September 17 in regard to a meeting. At the same time they advised me they were considering seminar-type meetings at various locations to answer these and other questions.
5. Presentation by T. F. Bradshaw, President Atlantic Richfield Company before the Vancouver Rotary Club.
6. Partial budget.

In regard to my future activities, I have some 30 people on my list for interviews here in Anchorage to develop further information about the pipeline construction and the post-construction period.

It is my aim to further delineate problems and, with your approval, develop more specific information or research needed for you to determine what your course of action should be.

You will be holding hearings and meetings with others to learn first-hand what people are thinking and planning. I will arrange for such meetings and provide a record of them. Since recording such meetings completely can be very expensive, I will appreciate your advice on how fully you will want such meetings recorded and transcribed.

It is my belief that you will want legislative programs or budget proposals which you believe are necessary or desirable,

Special Petroleum Impact Committee Members

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prior to the convening of the Legislature. Further, I would assume you may want your information in time to have draft legislation prepared.

I shall look for further guidance on this work-plan and more detail regarding your own ideas on the specific objectives of the Committee.

George Sharrock

POTENTIAL PROBLEMS OF PIPELINE CONSTRUCTION

1. Occupational safety and health programs and budgets.
2. Question of opening the Yukon-Prudhoe road prior to completion of the pipeline.
3. Question of asking local governments for estimates of revenue increases generated by the pipeline impact, in addition to costs.
4. Question of encouraging government (all levels) to delay construction projects not urgently needed during the pipeline construction period.
5. Question of auditing pipeline construction cost by the State.
6. Borough-wide police powers (Anchorage and Fairbanks).
7. Borough-wide fire protection.
8. Availability of State, BLM or U. of A. land in urban areas for housing or mobile home use.
9. Financial aid, State loan programs or mortgage guarantee, for low income family housing or mobile home parks.
10. Aid for impacted area public services largely needed to serve transient workers or pipeline workers.
11. Aid for public works programs needed either on a crash basis or on an accelerated basis due to pipeline construction. Grant programs, loan programs, or if the community indebts itself, aid in early interest payments or debt service payments.
12. Aid for communities to provide recreational facilities needed during the pipeline construction period especially.
13. Legislative actions required in the unorganized borough area for expanded schools, extra police and other services needed to meet the pipeline construction problems.
14. Legislation that might be required for general health problems caused in impacted communities.
15. Consideration of ways to maximize long range benefits to the State by encouraging Alyeska to purchase their electric power requirements.

16. The funding of special road projects necessary (because of the pipeline project) in and around communities.
17. Should the State make an attempt to be a party to wage negotiations between pipeline contractors and the unions?
18. Problem of inadequacy of courts, jails and detention areas.
19. State Trooper strength requirements in impacted areas.
20. State Trooper communication needs which now appear to be inadequate.
21. Possible legislative action regarding the point at which pilots should board incoming ships and leave out-going ships.
22. Will the Legislature wish to protect our road system by a requirement to use the railroad more.
23. There have been recommendations for rent controls and wage ceilings, however, there are many problems associated with such programs.
24. Legislative review of the local-hire law.
25. Review of organized community taxing ability in communities not now taxing themselves.
26. The question of residency requirements for voting in local elections.
27. Emergency equipment for State Troopers.
28. Para-medical program funding.
29. Aid for school operation or construction costs caused by pipeline construction impact.
30. Committee position on Alyeska allowing families of pipeline workers to come to Alaska.
31. Restitution legislation to deter property crimes.
32. Liquor license issuance along pipeline.
33. Problem of electric power capacity in Valdez.
34. Consideration of more scattered State offices and services along the pipeline.

35. Forty-Five to fifteen school attendance program -- year around school.
36. OSHA regulations that may increase costs substantially.
37. Resolutions asking for Federal aid in areas and functions for which the Federal Government should accept some responsibility. For example, in areas where native populations are high.

ARCO Tankers-
A Commitment to Safety

T. F. Bradshaw
President
Atlantic Richfield Company

Presented to
The Vancouver Rotary Club

Vancouver, B.C.
July 24, 1973

Thank you for permitting me to be in your very beautiful city. As I flew in yesterday afternoon, I saw the beautiful mountains, and the city set against those mountains, and I saw lots and lots of very clean water. I am here really as a sailor. In a few minutes I will have to talk as an oil company president, but basically I am here to look over sailing opportunities. I have had the good fortune to be able to play around with small boats, as they say, and my hobby and my love is sailing. Until our company moved its headquarters from New York to Los Angeles about a year ago, I did all my sailing on the East Coast. Now I plan to do it on the West Coast. So I am really up here to just sort of "case the joint," to see if the waters are as pristine and as clean as they say they are.

I should say, having been driven out of Long Island Sound by garbage flotsam, jetson and oil, that I do not expect to be driven out by the same from Puget Sound. But now I have to talk as the president of an oil company, though I would love to go on talking as a sailor.

Some of you are familiar with Atlantic Richfield; others may not be. Atlantic Richfield is a rather large company with about four billion dollars in sales and about four billion dollars in assets. It operates in some 22 countries but is principally what we consider a domestic company operating in the United States. In the recent Federal Trade Commission blast at the major oil companies which attempts to prove

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once more that we are engaged in monopolistic practices, Atlantic Richfield made the list, but only as the last one of the eight.

Once again we are going to have to defend ourselves against being a so called monopoly. This has gone on for a long time, gentlemen, as you perhaps know. I have often said that if the petroleum industry is a monopoly it is the worst run monopoly I have ever seen. It has for years reminded me of a cartoon which showed a herd of elephants breaking through the jungle on a stampede. One old elephant turns to another and says, "Worst run stampede I've ever been on." Worst run monopoly I have ever been on.

I had hoped to be able to see your Premier, Mr. (David) Barrett, but I understand that he is at the Calgary Rodeo. But I do hope to see him when I come up here again.

Our company, in addition to finding oil and gas, refining it into products, marketing it, and transporting it in ships and pipelines, also has rather large interests in Canada.

We have been here for a long time searching for oil and gas and have found it. We are heavily involved in the tar sands situation in Alberta. We are very hopeful that our group will build the next tar sands plant. We hope we have been good citizens of Canada.

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Now, I wasn't really invited here. I sought this opportunity to come to talk to you because of the impending decision on the Alaskan pipeline. Being of an optimistic turn of mind, I thought that the Alaskan pipeline was inevitably going to go through and, therefore, this would then mean some tanker passage along your coast. I have heard that there is some opposition to that. So I did seek out this opportunity to talk to you, and I am very glad that you have permitted me to.

I did not realize the timing would be quite so apropos. As you know, the Senate of the United States passed a bill last week which not only corrects a technical deficiency in the building of the pipeline, but permits the pipeline to go ahead without any further litigation. A companion bill to this will shortly be taken up by the House of Representatives. So we are almost there, I would say, and my timing is somewhat more apropos than I had thought.

I would like to talk to you about this matter of the trans-Alaska pipeline and with quite specific attention being given to the implications of the tanker traffic which would arise from it. By way of background I would like to contrast very briefly the energy situation in the United States with the energy situation in Canada.

The United States is now a have-not nation in energy after many years of being a surplus nation with more energy than it could

use; with enough surplus so it could take care of Europe, for instance, in times of difficulty. All of a sudden it appears that the United States is a have-not nation.

As recently as 1967 the United States had surplus oil producing capacity. Alaska was opened up by the discovery of the North Slope in 1968; offshore California came through in 1968. Everything looked as though it was coming up very well in terms of providing the energy needs of the United States.

And now here it is three or four years later and we are really a have-not nation. For instance, in 1972 the United States used 17 million barrels of oil a day and produced 11 million barrels of oil, giving rise to the necessity for importing about one-third of its needs. That is a tremendous contrast to 1967.

This oil was imported at a cost of some four to five billion dollars, and you may recall that our balance of payments deficit in 1972 was about 4.5 billion dollars. That led to the first devaluation of the dollar and then a second devaluation of the dollar. Looking forward to 1985, we anticipate that the needs of the United States for energy will be some 27 million barrels a day and we will be producing about 12 million barrels a day meaning that more than half of our oil requirements will have to come from foreign nations, principally from the Middle East. The cost by 1985 will be something like 25 billion dollars a

year. That faces the United States with some very severe problems, problems to which we do not have the answers now.

The first problem is can we pay for it? What will we pay for it with? It must be paid for with increased trade. Certainly the Arab nations are not going to take pieces of paper, particularly when we devalue those pieces of paper quite regularly.

The second question is, will the Arab nations let us have the oil? After all, they will have their own problems as to what to do with all the money that will be pouring into those nations at that time. They will not only be getting 25 billion a year from the United States; they will be getting about the same amount from Europe and they will be getting some 15 billion a year from Japan.

So the total may be something like 50 to 60 billions of dollars pouring into a very few Middle Eastern nations which are largely undeveloped at this time. What will they do with that? Can you conceive of a monetary system that would endure that kind of a capital buildup in such a concentrated area? Can you conceive of a trade system that would support that? What would they do with it? They could build up balances, but that would certainly ruin any monetary system. They cannot spend it at home. They cannot spend that kind of money in a country like Saudi Arabia, for instance, which has a population of six million people and is largely underdeveloped.

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This dilemma poses very real questions. One of the things that they might do is not supply the oil because oil is a very finite resource. They might want to spread that resource over a 50 year period instead of a 25 year period and this might possibly be in the best interests of Saudi Arabia and Iraq and the other nations which have the oil.

If they do indeed cut back on the oil, what then will happen to the developed nations of the world? What will happen to the United States if it cannot get the energy which it needs? So we face some very real problems. I do not know the answers to them.

How did we get into this mess in the United States? I will very briefly mention some of the things that I think caused us to get into this mess, only because it might help Canada avoid some of our mistakes. Basically what happened was that our government did not recognize what was going on until far too late and we did not have the appropriate kinds of energy policies in the United States which would have staved off this kind of a situation.

We now have the realization of this kind of a crisis, but it is far too late. It is too late to bring new sources of supply on stream; it is too late to build refineries in time. The United States is going to have to do with less energy and this is going to be a very difficult thing.

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Now how it happened: Demand increased beyond all expectation both because of our affluent society and our high per capita use of oil, and because of our profligate use of energy.

We have always had it, and we spent it. A friend of mine went to a hotel in Houston, Texas. Of course the hotel was air conditioned. When he went to bed he found that he had a heating blanket on his bed to keep him warm. This is all right if you have got it and can flaunt it. But we do not have it.

About 1969 or 1970 the environmental age dawned in the United States and none too soon as far as we are concerned. We hope it is not too late, as a matter of fact. We have an energy crisis in the United States but we also have an environmental crisis in the United States.

Ironically, legislation passed in early 1970 which required control of auto emissions, and the emission control devices already on our cars in the United States, increased the consumption of gasoline by some 15 per cent. By 1975 emission control devices will add another 10 per cent.

Supply has been decreased by some of the same environmental legislation. We can no longer use coal under our boilers to generate electricity because of the sulfur emission standards set by law. We have the North Slope frozen in because of

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environmental differences of opinion. We have offshore California locked in. We have slowed down on our offshore drillings.

So demand has increased enormously while supply has gone down and we find ourselves facing a large and widening energy gap. Against this background the North Slope find of 1968 is an extremely important factor. It is the largest single find ever in the history of North America -- about 10 billion barrels.

It is very essential to get this oil to market. Even more important, basically, than getting this oil to market is for the United States to find out how much more oil there is in Alaska. We do not know because oil exploratory efforts stopped when the pipeline was blocked.

We do not know if we have 30 billion barrels there, 15 billion barrels, or just 10 billion barrels. Our whole attitude towards the future, our relationships with other nations, could undergo a significant change if we knew that we had enough oil in Alaska to help take care of our needs.

What does all this mean to Canada? I would only quote a Canadian Minister who spoke to me a few months ago and said it is one thing for Canada to have a giant south of the border; Canadians have learned to live with that. But, he said, it would be quite another thing to have a sick giant south of the border. If the

United States cannot get the energy it needs it will be the sick giant, indeed, and I think that may give Canada some thought.

By contrast, Canada is in an enviable position. I believe I am right if I say that Canada is the only industrialized, developed nation in the world which is self sufficient in energy. A very enviable position. It does not mean you do not use very much. The United States, for instance, uses the energy equivalent of 60 barrels of oil for each person each year. Canada uses 50. And the next nation I think is Great Britian with something like 25, or West Germany, perhaps.

And your reserve situation is not doing all that well. You have about eight billion barrels of conventional crude in reserve, but the reserves have been declining since 1966. Right here in British Columbia, for instance, your natural gas reserve life index has slipped to 26 years from 40 or 50 years which was the case in the early 60's. If you would continue to use gas at the rate of increase which you have been using it in British Columbia, and if you found no reserves in British Columbia, you would run out in six years.

So, I think you have a most enviable position at the moment but I think you have a very large need to look at your own reserve situation and your own possibility for finding oil and gas.

You have very large needs for far-sighted government policies in order to protect Canada to retain its reserve situation and its self-sufficiency. I think my basic conclusion would be that Canada does have the opportunity for continuing self-sufficiency, but there is very little opportunity for Canada to come to the help of the United States.

Against this very broad background, why do we find the trans-Alaska pipeline to be the preferable route? You might assume that we find it to be the preferable route because we bought a lot of pipe and have about four hundred million dollars invested in the Alaskan pipeline. Those of you who are in business know the time value of money, know that this is a very large incentive, and might well say that the pipeline has got to go through Alaska because we have that kind of money invested in Alaska.

We may have felt that way for awhile. But there is one factor that in my opinion is the lead factor, the important factor, in the comparison of the Canadian line and the trans-Alaskan line. That is the matter of time. We have run out of time in the United States. We have got to get the oil in as fast as we possibly can. We have got to get back to exploring in Alaska to find out how much more oil there is and whether there is enough to help alleviate our energy problem.

We can complete the trans-Alaska line in three years from the time of approval, and we would hope that approval would be sometime

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this summer. We do not know how long it would take to complete a Canadian line.

We know the actual building would take about five years; in other words, two years longer than the actual construction work of an Alaskan line. But we do not know how long it would take before we could start in Canada. We have not done the engineering work in Canada; we have not done the environmental studies - the millions and millions of dollars of environmental studies which we have done in Alaska. Those would still have to be done. We do not know the extent of the opposition of Canadian environmentalists and we do not know the kind of problems we would have with provincial government and with the Canadian government.

We think that this whole process might take two to three years, although that is anybody's guess. When you add that to the five-year building time, you come up with something like seven to nine years and we cannot wait that long.

I am not speaking for a company now; I am speaking for the United States. We cannot wait that long.

The other thing that this delay would do is, in turn, delay the delivery of gas from Northern Alaska. As you know, with the oil was found one of the largest gas pools in the United

States - some 26 trillion cubic feet. The obvious route for that gas is a pipeline through Canada merging with the Delta Gas Line and picking up Canadian gas and distributing it either in Canada or the United States in whatever proportions might be required at that time.

There is no possibility of building an oil line and a gas line at the same time in Canada. There just is not the available capital nor the available manpower -- the construction crews. It just could not be done.

But we can build a line through Alaska and then when we are partially through with that line we could start a line through Canada, if that is Canada's desire at that time. We then could have gas coming down through Canada two years after the completion of the oil line in Alaska.

There have been many other difficulties with thinking about building this first oil line through Canada. I did visit a number of years ago with various Canadian ministers at their request. We discussed this matter and at that time the kinds of conditions they discussed with me -- and this was not a government to government contact by any means -- would have made it impossible for a private company or a group of private companies in the United States to finance the line through Canada.

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This may have changed since then, but I have not had further conversations. In any event, it begins to look as though the line through Alaska is rapidly becoming a reality. Therefore, I think the thing to do is to turn to the problems of what we call the "tanker-leg."

As you all know, the oil will come down to a port in Southern Alaska, Valdez, and there it will be picked up by tankers and delivered some 1200 miles to various ports along the West Coast of the United States.

I should spend a few minutes talking about what I am sure is your concern about the possibilities of oil spills. I would suggest that you remember, and I am sure you do, that oil has been coming down the coast from the Cook Inlet for about ten years and we have had no oil spills in that particular traffic.

I would point out that the addition of the Prudhoe Bay Field production of two million barrels a day will not really result in very much increase in Puget Sound traffic, by almost any measure, because, after all, this oil will be coming to several ports in the United States, not just to Puget Sound.

We estimate that there will be some six tankers a month coming into Puget Sound with this North Alaskan oil, or about 80 a year. Our own refinery at Cherry Point, Washington, will take one tanker every nine days. In order to put this in perspective,

you might compare this with the total of 2,460 ship departures from Puget Sound in 1971. So it is basically 80 tankers in addition to the normal traffic of 2,460 ships of all kinds. I would say this is a rather insignificant addition.

I will not say Puget Sound is an under-utilized port because perhaps you do not want it utilized very much more. But by comparison with the major ports in the United States, which are vastly inferior to Puget Sound as a port, the figures are rather startling. For instance, Portland, Maine - and this is tanker traffic only - has 1,635 tankers a year. New Orleans - 1,270. Boston - 1,511 tankers. Puget Sound - 460.

But then you begin to look at the kind of a port that you have here in Puget Sound. I think you will find it to be a sailor's delight. It is a remarkable port. The width of the entrance, for instance, is very important as is the depth. My own sailing boat has a 6-foot draft so depth does not mean all that much. But some of these rather large tankers like to have a lot of water under them.

Boston, for instance, has a 900-foot channel coming into the harbor with a 40-foot depth. Portland has a 700-foot width for the channel coming in with a 45-foot depth. New Orleans is 600 feet wide with a 36-foot depth. Puget Sound - the Rosario Channel - is one mile in width - 108 feet in depth.

The Juan de Fuca Strait is 12 to 15 miles in width and 600 feet in depth. Furthermore, a very remarkable thing for any channel in the world, I am told, is that the sides of this channel are absolutely straight so you have got the entire width of the 12 to 15 miles at 600 feet. And, of course, these are very sheltered waters. So this port, I say, is a sailor's delight.

How will the tankers come; what is the route they will follow for the 1200 miles from Valdez to Puget Sound? Most of that time they will be far outside of Canadian waters - several hundred miles off the coast. They will come south about 35 miles off Vancouver Island to a point off Cape Flattery, so they will avoid the lee shore of the Island. From that point on they will be coming up to the Juan de Fuca Strait.

How safe are tankers? Well, someone, I am told, in some responsible organization has estimated that two per cent of the oil found in the oceans is a result of tanker collisions, tanker mishaps. I do not have the faintest idea how you would get a statistic like that and I cannot really believe it.

In any event, whether two per cent is right or not, we did analyze the 730 oil spill complaints in Puget Sound in 1970. Of those, 520 were less than five gallons. Another 133 were traceable to freighters and tugs and barges which were not carrying oil and had nothing to do with oil traffic. When we finally come down to

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the spills directly attributable to oil tankers and barges we find then 28 out of the 730 and they were all small.

For this run from Valdez to Puget Sound, our company is building five new ships -- three 120,000 - deadweight - ton tankers, two 70,000 - deadweight - ton tankers. The other companies are also building new ships and these are American flag ships. They have to be built in American yards and they have to be operated by American seamen and they come under the control of the United States Coast Guard.

Let me talk a few minutes about the specifications -- safety, and so forth -- which are under our control when they are American built ships, but not under our control when they are foreign ships.

We know that the larger the ship the less chance for oil spillage because there is less traffic. The ships are all compartmentalized so if a ship is stove in, it is just a compartment that leaks out, not the whole ship. So the total size is not all that important. However, we are not building super tankers for this run; we are building 120,000 ton tankers. A super tanker is 200,000 tons up to 500,000 tons. Ours are not super tankers. They are larger than the normal ships that come into the United States because you have got a better port here. But they are not super tankers.

They are equipped with all the kinds of navigation and anti-collision equipment that would make any sailor's heart beat a little faster. Each ship has two completely separate radar systems, where most ships have only one. Each ship has a long range navigational system, the LORAN system, for navigation at night and bad weather. They have radio direction finders. My boat has that too, for short range homing in. They have fathometers, echo sounders, for determining the depth. They have radio telegraph systems, medium and high frequency transmitters, plus total emergency receivers. They have bridge to bridge radio telephones, something that our company pioneered about 15 years ago. The Captain can pick up the phone and talk from his bridge over to the bridge of another ship.

These ships have the most modern ballast equipment that we know about. There are two kinds of ballast handling; one is if your ship gets in trouble if you are in a storm. You may have to take on water in order to stabilize your ship. For this purpose there are special tanks provided which never contain oil so sea water is then put into clean tanks. When the storm has abated that sea water is pumped out again. The second kind of ballast handling concerns empty ships. When the ship returns empty she has to have water in her tanks in order to maintain her stability and, of course, that means putting sea water into tanks which have contained oil. One of the largest causes

for spillage of oil in the oceans has been the flushing out of these tanks underway.

This is not permitted in any of our ships. At Valdez we plan to build a receiving tank, at a cost of over 10 million dollars, which will receive the dirty water that is impregnated with oil. We will have a skimming device which will skim that oil off the water. Then, after the water reaches a certain degree of purity, it will be pumped back into the sea.

I think I will at this point quote David Anderson, member of your legislature here. He is not often quotable by me, but he did say, "ARCO tankers are probably the best ships that any one could put in water. In fact I'd say, if we have to have oil tankers, I'd say thank God they'll be American-built, American-owned and American-manned. I have no doubt they will be the safest ships available."

We certainly thank David Anderson very much for that. I am sure that was in return for a favor we did him. And the favor was the timing of our oil spill at our Cherry Point refinery. One or two days after the oil spill at Cherry Point, Mr. Anderson was scheduled to appear before a Senate committee and he strolled into the committee room with an armful of your newspapers with very large headlines and he had something to talk about.

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Now that I mentioned that spill I should say it was caused by a faulty fitting on a foreign ship over which we had no control. It was a cast iron fitting that broke under pressure on a Liberian flag ship that was delivering Persian Gulf oil. Had it been one of our ships, had it been a U. S. flag ship, the fitting would have been steel and it would not have broken.

We also have a large number of safety devices at the dock itself at Cherry Point, which is close enough I know for you to be interested in. The dock is concrete on steel pilings, with shock absorbing fenders. It has loading arms on swivel joints which go up and down with the motion of the ship. The arms have quick closing valves that can be shut off in a moment's time.

There is a heavy floating boom which is laid around each ship as it comes in and in case there is a spill it will be contained within that boom. You might ask what happened in the Cherry Point oil spill of last year. The boom was too low, it was too small, and we had not had experience with it. We have since replaced that boom with a very heavy, high boom that we think can handle any spill that might occur at the dock.

On the dock we have work boats and skimmers and we can get them into the water right away if there is a spill.

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I would say just in passing, not relating perhaps to the tanker passage, that the Cherry Point oil refinery cost about 200 million dollars and it has 17 million dollars of equipment relating to pollution control on it.

It was visited by a delegation from the United States Congress a few months ago. In the official report which was delivered to the Congress, Congressman Silvio O. Conte of Massachusetts said, "I had to ask whether the refinery was operating," and we are very glad that he was in the position where he had to ask.

We have put every safety feature into our ships that we know about. In addition we are, of course, cooperating with Clean Sound, the clean-up group in Puget Sound, in case there is a spill. And we are, of course, bound to obey the U. S. Coast Guard's Oil and Hazardous Substances Control Plan.

We support very much an international organization for the control of ships comparable to our Federal Aviation Agency.

Safety is paramount, first and foremost, but there will be human error. There is no way we can go through this life without human error. There is no way we can go through this life without accident. And part of the price of our industrial society is that we do have to make compromises. I am not standing up before

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you and saying there will be no spills. All I am saying is that we have made every possible plan to insure that there will not be spills. And - if there are spills, we stand ready to clean up.

Now what are the alternatives? One has been suggested, and peculiarly enough by Canadians, that no Alaskan oil come into Puget Sound. Mr. Donald S. MacDonald has suggested, as you know, that Canada might be prepared to insure that the Puget Sound refineries are supplied with Canadian oil.

As of today, I understand a deputation from your Parliament has gone down to Washington to talk to some representatives from our Congress about this kind of a possible deal.

I think that all I can say on that score is that the appropriate place for such discussions is at a government to government level. I do not think it is appropriate for this kind of discussion to take place between the Canadian government and Atlantic Richfield Company, for instance. We operate an enterprise in a profit making environment and our job as managers, within the rules of our society, is to direct our investments in those directions which return the most to our shareholders. The Cherry Point refinery was built for Alaskan oil; we cannot bring it up to capacity with Canadian oil. It cannot operate at its

optimum economic output with Canadian oil. It is most appropriate, then, that this become a government to government matter. I can see that certainly on the minds of the Canadian delegation must be this matter which I began with: How much oil does Canada have and can Canada afford to set aside enough oil to supply four refineries in the Puget Sound area for 25 years in view of its own depleting reserves?

This is something the Canadian delegation, I am sure, had to face up to in the Canadian government. And our government, I am sure, will have to face up to the fact that if Canada cannot supply this oil without decreasing exports to the United States, what part of the United States will those exports be drained from. Presumably, of course, from the Mid-Western states. Our government will have to look at it from the point of view of can we afford to take this oil that comes from Canada out of the Mid-Western states and have it go to the Western states.

Those are, thankfully, matters for governmental deliberation, outside of my scope.

Another alternative which we have looked at is the matter of unloading outside the Juan de Fuca Strait. We found this is utterly impossible; the weather conditions are impossible; we just couldn't possibly unload tankers at sea and pipe oil to shore. There is no way to hold the tankers.

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In conclusion, then, I know you are very apprehensive about this movement of oil along your coast, even though it is a very small matter as compared with the total traffic in Puget Sound. I think that part of your apprehension arises from the fact you cannot quite see what the quid pro quo is.

What is in it for Canada? What do you in British Columbia get from this transmitting of oil from Alaska to feed the voracious appetite of the United States? Well, I cannot answer that because I do not think there is anything particularly in it for British Columbia.

But I do think there is something in it for Canada because on the other side of Canada, as you well know, there are tankers moving along the East Coast of the United States, foreign flag tankers, carrying foreign oil to Portland, Maine, where the oil is then piped to Montreal. In 1970 this accounted for 150 million barrels of oil and about 800 tankers were used. This compares with the 80 tankers which we anticipate will supply oil to the Puget Sound refineries.

This, of course, is not quid pro quo; it is something which is already there. It is part of our normal relationship with Canada and I hope will continue to be a normal relationship with Canada.

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We do think that the early building of a pipeline will benefit Canada because we are quite sure that you will want to get together with us on the building of a gas line in order to utilize your own gas.

And we do feel that the building of the Alaskan pipeline at this time does insure that the ships which carry the oil are American flag ships and subject to all of the controls and safety devices which I have mentioned. And, finally, I will come back to what I said at the start: Energy to the United States is very, very vital, and if you are not to have a sick giant to the south, the United States must get its energy supply.

Thank you.

SCOMM

#13:9

March 26, 1976

The Honorable John L. Rader
Chairman, Gas Pipeline
Impact Committee
Alaska State Legislature
Juneau, Alaska 99811

Dear Senator Rader:

Support for a trans-Alaska gas pipeline has been a top priority of this Administration for some time, and the recent activities of the Legislature's Gas Pipeline Impact Committee and the Legislature as a whole indicate that the priority of this issue is a shared judgment. Stated conclusions and findings recently issued from your Joint Committee and apparently well accepted in the Legislature indicate that additional activities and governmental actions in support of an Alaska gas line should be considered at the earliest possible time. To this end, I would like to indicate to you some existing and contemplated actions of the Administration in this regard.

First, I should point out to you that the Administration has recently made a decision to participate in the hearings of the National Energy Board in Canada as it takes up the issue of gas pipeline routing. Although a schedule for this has not yet been set, the intention of the State to participate is firm, and our participation will be supported under existing funding provided to the Department of Law. In addition, Lieutenant Governor Thomas will be making a major appearance in Canada in May in support of an Alaskan line.

Second, within the very near future, a supplemental appropriation request will be forwarded for the purpose of supporting professional legislative and administrative assistance for the State in Washington, D. C., on this issue. This request in the amount of \$50,000 will be used to further represent the State's position on the gas line issue at the Federal level and insure that lines of communication between the State and Washington are as good as possible on this issue.

Third, the stated conclusions and findings recently issued from your joint committee and well accepted in the Legislature indicate that, as an exception to the stated

objectives of the royalty oil and gas statute to foster in-State use, the sale of royalty gas now for the purpose of assisting the promotion of a trans-Alaska pipeline may be appropriate.

Consideration of a sale for this purpose has been an ongoing aspect of the Administration's work respecting both the gas line and royalty gas issues. To date, in spite of substantial efforts on our part, it is my judgment that no offer to purchase gas has been put forward that presents benefits of a sale to promote the gas line which outweigh the disadvantages of losing options relating to in-State use which occurs if State royalty gas is sold for export from the State.

Nonetheless, our efforts to investigate this possibility have continued, and pursuant to the recent actions of the Joint Committee, a substantial renewed effort is now being made to stimulate new and better offers from all of those previously interested in State gas, as well as some new potential buyers. As you know, the Administration has supported the supplemental appropriation for this purpose submitted at the request of the Gas Line Impact Committee.

To be acceptable, any new offer will have to be predicated on important new support for an Alaskan route, be valid only if this route is selected, and offer to purchase only Alaska surplus gas so as to leave an unquestionably adequate supply for Alaska's future use. Some future needs within Alaska are known. Others are not, nor will they be known in the short-term future. Any sale, to be satisfactory, must protect the State's future both for the known and the hoped for but presently unknown, uses of its royalty gas.

I hope and intend that this process will be successful in determining if a gas sale can be made which makes a difference in the gas line decision, or if such a sale is not in the Alaska interest at this time. Substantial difficulties exist regarding the limited time available for the processes of the royalty sale statute to be carried out. Such time constraints are undesirable, but in an effort to explore all avenues on this matter, my efforts will continue and be emphasized during the short time period available.

Since no acceptable offer has been made yet, in my view, the entire royalty process must take place, including the submittal of new offers, negotiations, administration decision, Royalty Board and Legislative approval. For this process to take place within the confines of the present Session will be difficult, yet the effort is important, and it is already actively under way. The length of the Session is the limiting factor which must be recognized, and I solicit your cooperation in informing me at appropriate times regarding

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your expectation for adjournment. Although I will make every effort to expedite Administration consideration of this matter, I think it extremely unwise that we subvert the overall State interests to a pressured decision on this matter if it is avoidable, and I know you agree.

I hope this brief outline, in addition to the material already supplied by members of the Administration to your recent hearings, details the continued intent of this Administration to aggressively pursue its policy favoring the trans-Alaska gas line. Our efforts will continue in this spirit, and we look forward to cooperation with the Legislature.

Very truly yours,

Jay S. Hammond
Governor

cc: The Hon. Chancy Croft, President of the Senate
The Hon. Mike Bradner, Speaker of the House

bcc: The Hon. Lowell Thomas, Lieutenant Governor
Commissioner Martin

GRM:lb

-TO: Rep. Steve Cowper, Chairman
Subcommittee on Revenue Sources

FROM: Jim Rhode
AA to Rep. Malone, Chairman
House Finance Committee

SUBJECT: The Rothschild Memorandum

At your request, we have reviewed "The Trans-Alaska Pipeline and Prudhoe Bay Crude Oil Production . . . Profit Potential", prepared by Rothschild and Co., New York, dated 2 December 1975 ("Corrected Version").

Rothschild concludes that the pipeline and the Prudhoe Bay fields will have a ". . . return of 18% on the estimated \$10 billion initial investment . . ." (page 3) as follows:

\$.6 billion annual net profits of pipeline	\$1.2 billion annual net profits of field production	=	\$ 1.8	=	18% return
<u>\$10 billion initial investment</u>			<u>\$10.0</u>		

This "simple accounting profit" is not the proper basis of tax policy for the oil industry, lumps pipeline and oil field numbers that should be kept separate, is computed in an incorrect manner, and rests on a bad estimate.

Unlike the calculations of Tanzer Economic Associates and of the oil companies themselves, these "returns" are not based on "discounted cash flow". That is, they do not allow for the fact that profits are impacted not only by the relative amounts of revenue and cost that are involved, but also, by how long this money can or cannot be put to use.

If simple accounting profits were a sound measure of profitability, the returns for the pipeline would not be averaged with those for the oil fields. Pipelines, as regulated public utilities, are limited by law to seven percent on total investment. Lumping the returns for the pipeline with those for the field is to claim that investors and companies should have their smaller returns on the pipeline made up by far larger returns on the field. (Actually, the best measure here would be returns to equity which, under ICC practice, are 15% of total investment. In this instance, the net annual income of \$.6 billion is a 46% return on the equity of \$1.3 billion - including a return on the interest charges for borrowed capital.)

Once the field is separated, the simple accounting profits should be annual net profits over total investment (exploration, leases, and development, but not operating costs). Instead, we are given annual net profits in a peak year (not the average) and "initial" (not total) investment. Presumably, \$8.65 billion of the \$10 billion is the final cost of the pipeline (including funded interest) with 1.5 million bbls per day capacity, for

this is the case used to compute the net profits on the field (page 6). This leaves \$1.35 billion for the "initial" field investment alone, a figure that is unaccounted for by any text or table and several billions under the figure used by Tanzer. Indeed, were this our measure of the profitability of the field, \$1.2 billion on \$1.35 investment would bring the stunning return of 89%.

There are many other errors and questionable numbers in the memorandum. No mention is made of the reserves tax and its credit against severance. They do not realize that our severance tax is graduated nor do they cite the provisions or collection history of the Interstate Tax Compact on income taxation. They do not accord separate tax treatment for intangible (drilling) and tangible expenses. The 20 mill property tax on pipeline and field equipment is miscalculated. Their estimate of the major reserve positions in Prudhoe Bay are mistaken. No data in the paper is documented. In addition, no attempt was made to obtain the production buildup or pipeline tariff estimates of the State Treasury Division and the Oil and Gas Division.

Remarkably, after reviewing three of their estimates of net profit per barrel, we find they are not significantly different from comparable Tanzer estimates.

Given the faults of this memorandum, we are not surprised at reports that, until recently, oil industry officials criticized Rothschild for concluding that an ". . . 18% . . . (is) . . . not a terribly attractive return . . .", fearing this would affect their latest efforts to obtain financing.

SPECIAL REPORT

Alaskan Tax Proposals

January 22, 1976

NORTH SLOPE OIL AND GAS

State Senator John Huber, Chairman of the Special Committee on Revenue and Taxation, has announced his intention to introduce three bills to further tax the oil and gas industry in Alaska. These measures call for: (1) an increase in the effective severance tax to 12½%* (estimated statewide weighted average) from the current approximate 8% rate; (2) the introduction of a "properties net proceeds tax," which would revamp the state corporate income tax for oil companies and assure that, at a minimum, income taxes would amount to about 9.4% of pretax income; and (3) the establishment of an "excess value surtax" mechanism, whereby the state's share of the "net proceeds" (after all costs) from the sale of Alaskan oil — at prices above a state-determined crude oil value — would escalate significantly.

In essence, neither of the first two proposals are particularly new or surprising. Our October 16, 1975 *Industry Review* discussed in some detail the State of Alaska as a source of investment uncertainty in evaluating the North Slope project and specifically pointed to the likelihood of a resurrected proposal to revise the severance tax upward. Similarly, our previous calculations have also assumed accrual of a full 9.4% state corporate income tax rate. However, a restructuring of the tax in the form of a net proceeds levy, with provisions for a larger take above a certain crude price level, is without question a new and disturbing twist in the Alaskan petro-political situation.

At the start, it should be stated that this proposal, which is still in committee, is very preliminary in nature. Notwithstanding this important caveat, it is useful to review the

*The revised severance tax schedule is as follows:

<u>Well Output</u>	<u>Rate</u>
0 — 300 b/d	5.0% (unchanged)
300 — 1,000 b/d	6.0 (unchanged)
1,000 — 2,000 b/d	11.0
2,000 b/d +	14.5

Thus, for a 10,000 b/d Prudhoe Bay well, the weighted average severance would amount to 13.3%. Also, it appears that the state will retain its alternative minimum cents-per-barrel computation.

mechanism contemplated here to clarify some of the initial confusion about how such a tax would work and to assess the potential impact on production earnings for the three principal Prudhoe Bay leaseholders.

There has been some confusion about the proposal as to whether this new tax would be based on landed West Coast values, a wellhead price, or some intermediate standard; however, our contacts with this committee clearly indicate that the starting point for computation is currently intended to be a West Coast market value. In essence, the proposed "excess value surtax" would determine a "long-term price" for Alaskan oil and would levy a tax higher than the 9.4% current rate on the difference between the market price of the oil and this "long-term price" less full allowances for existing burdens on the gross proceeds of production (i.e., royalty and severance taxes). In describing his scheme, Senator Huber has emphasized that he intends the "long-term price" to be high enough to ensure that capital continues to be attracted to the Alaskan petroleum industry. Toward this end, his bill incorporates certain safeguards for setting and revising this state-determined value (discussed below). He has further stated that the tax is designed only to capture for Alaska a portion of any windfall resulting from a rise in prices above the threshold price required for new investment.*

The following calculations are offered only as two specific examples. However, they are based on a methodology that has been confirmed by a staff aide of the Special Committee on Revenue and Taxation and on indications of what might constitute reasonable ranges for both the state-determined "value" of oil (above which an "excess value surtax" would be imposed) and the rate of incremental taxation.

(See tables on following pages)

**These apparently comforting remarks are far less reassuring when coupled with Senator Huber's stated belief that there will clearly be a windfall for Prudhoe Bay producers, in contrast to our October 1975 calculations, which showed -- based on a \$12 West Coast price and a 1.5 million b/d production rate -- a total current return (including pipeline earnings of \$586 million) that would approximate 17%. However, it should be noted that this calculation does not take into account the time weighting of several billion dollars of expenditures that will have been nonproductive for many years.*

Case A

Pipeline throughput 1.5 million b/d

\$12.00

West coast price				
"Long term price"	\$7.00		"Excess value"	\$5.00
Less: Pipeline tariff & tankers	4.51			-
Wellhead	\$2.49			-
Less: Royalty @ 12 1/4%	0.31			0.63
Severance @ 13.3% (12.42)	0.33 (1.275)			0.66 (0.55)
Lifting, depreciation & amortization	0.44			-
Pretax profit	\$1.41 (1.46)		3.82	\$3.71
Less: State income tax (a)	0.13 (9.36% rate) (1.13)		1.91	1.86 (9.4% + 40.6%)
Federal income tax @ 48%	0.61 (1.2)		.92	0.89
Net income per barrel	\$0.67 (1.71)			\$0.96
Combined profit per barrel			\$ 1.63 (1.70)	
Previous estimate (HCW Industry Review 10/16/75)			2.54	
Downward adjustment			\$ 0.91	

(a) Assumes deductibility of state income tax for Federal tax purposes.

Production earnings effect:

Atlantic Richfield									
315,000 b/d	x	365	x	\$2.54/bbl	=	\$292 million	or	\$ 5.06/sh.	
			x	1.63/bbl	=	187 million	or	3.24/sh.	
				(1.70)		\$105 million		\$ 1.82/sh.	
						(201)			
Standard Oil of Ohio									
714,000 b/d	x	365	x	\$2.54/bbl	=	\$662 million	or	\$10.17/sh.	
			x	1.63/bbl	=	425 million	or	6.53/sh.	
				(179)		\$237 million		\$ 3.64/sh.	
						(443)			
Exxon									
315,000 b/d	x	365	x	\$2.54/bbl	=	\$292 million	or	\$ 1.31/sh.	
			x	1.63/bbl	=	187 million	or	0.84/sh.	
						\$105 million		\$ 0.47/sh.	

State of Alaska Revenues (In millions):	Previous (10/16/75)	Revised	Net Increase
Royalty	\$ 514.7	\$ 514.7	-
Severance taxes	388.7	542.0	\$153.3
State income taxes	279.2	1,089.5	810.3
Total revenues	\$1,182.6	\$2,146.2	\$963.6

Case A: State-determined "long-term price" \$7.00 per barrel; 50% combined state income tax.

Case B: State-determined "long-term price" \$9.00 per barrel; 25% combined state income tax.

Case B

Pipeline throughput 1.5 million b/d

\$12.00

West coast price			
"Long term price"	\$9.00	"Excess value"	\$3.00
Less: Pipeline tariff & tankers	4.51		—
Wellhead	\$4.49		—
Less: Royalty @ 12½%	0.56		0.38
Severance @ 13.3% (12.62)	0.60 (1.50)		0.40 (33)
Lifting, depreciation & amortization	0.44		—
Pretax profit	\$2.89 (2.99)		\$2.22 (2.29)
Less: State income tax (a)	0.27 (9.36% rate) .25		0.56 (9.4% + 15.6%) (5)
Federal income tax @ 48%	1.26 1.30		0.80 (1.82)
Net income per barrel	\$1.36 1.41		\$0.86 (1.90)
Combined profit per barrel		\$ 2.22 (2.31)	
Previous estimate (HCW Industry Review 10/16/75)		2.54	
Downward adjustment		\$ 0.32 (20)	

(a) Assumes deductibility of state income tax for Federal tax purposes.

Production earnings effect:

Atlantic Richfield

315,000 b/d	x	365	x	\$2.54/bbl	=	\$292 million	or	\$ 5.06/sh.
			x	<u>2.22/bbl</u>	=	<u>255 million</u>	or	<u>4.42/sh.</u>
						\$ 37 million	or	\$ 0.64/sh.

Standard Oil of Ohio

714,000 b/d	x	365	x	\$2.54/bbl	=	\$662 million	or	\$10.17/sh.
			x	<u>2.22/bbl</u>	=	<u>579 million</u>	or	<u>8.89/sh.</u>
						\$ 83 million	or	\$ 1.28/sh.

Exxon

315,000 b/d	x	365	x	\$2.54/bbl	=	\$292 million	or	\$ 1.31/sh.
			x	<u>2.22/bbl</u>	=	<u>255 million</u>	or	<u>1.14/sh.</u>
						\$ 37 million	or	\$ 0.17/sh.

State of Alaska Revenues (In millions):	Previous (10/16/75)	Revised	Net Increase
Royalty	\$ 514.7	\$ 514.7	—
Severance taxes	388.7	547.5	\$158.8
State income taxes	279.2	454.4	175.2
Total revenues	\$1,182.6	\$1,516.6	\$334.0

Case A: State determined "long-term price" \$7.00 per barrel; 50% combined state income tax.

Case B: State determined "long-term price" \$9.00 per barrel; 25% combined state income tax.

Based on our understanding of the mechanics of the various tax proposals, the \$2.54 per barrel estimate for Prudhoe Bay field (Sadlerochit, Sag River, and Shublik formations) unit profitability at a pipeline throughput rate of 1.5 million b/d and a \$12 per barrel West Coast landed price, as contained in our October report, would be reduced to a range of \$1.63-\$2.22 per barrel, as illustrated by Case A ("worst case") and Case B ("best case"), respectively. Conversely, the State of Alaska's revenue take would be significantly boosted — by \$334 to \$964 million — by the combination of an increased severance tax and the "excess value surtax."

It should be emphasized, however, that several items under consideration for inclusion in Senator Huber's proposed windfall profits tax could moderate its eventual impact on the Alaskan oil industry. These possible provisions include:

- (1) An automatic inflation adjustment (tied to the Wholesale Price Index) to be applied annually to the state determined "long term price";
- (2) The formation of a State body or board to periodically review (and presumably propose modifications to) the "long term price"; and
- (3) A \$1 per barrel supplemental allowance to the "long term price" for a given field in which the sum of all pretax expenses (including state royalty and severance tax) would fall within \$1 of the "long term price" set by the State of Alaska.*

At this point, a few comments about legislative procedure and scheduling are appropriate. It is now contemplated that the three bills on oil taxation will be formally introduced within the next week or so. To become law, they must undergo consideration by four other committees (the Finance and Resource committees of both Houses), have all differences resolved in joint committee sessions, be voted out in final form by both Houses, and be signed by Governor Hammond. Clearly, a great deal of coordination will be necessary if all of this is to be successfully accomplished during the current 90-day session, which is expected to run until mid-April. Moreover, the possible reintroduction of one other piece of oil-related legislation — revival of an earlier concept for additional taxation of pipeline earnings — may further complicate the 1976 legislative calendar.

**This provision appears designed to aid the economics of high cost fields. Given the relatively low costs of the Prudhoe Bay field, however, the \$1 per barrel profit safeguard will not be generally applicable. For example, under Case A, the sum of all expenses — \$5.59 per barrel — would be 42¢ below the level required to qualify for the \$1 per barrel increment.*

January 22, 1976

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NORTH SLOPE OIL AND GAS

A more definitive assessment of Prudhoe Bay field economics, as well as the future environment for oil company exploration and development activity in Alaska, will be possible as further details on these proposed tax changes emerge following introduction of the bills into the Legislature — when it will become clear what inevitable compromises must accompany broad legislative support of parts or all of the package.

H. C. WAINWRIGHT & CO.

Thomas A. Petrie

Paul R. Leibman

AGO 531843

INDUSTRY REVIEW

This Report Replaces Our Report of October 7, 1975

October 16, 1975

NORTH SLOPE OIL AND GAS
Atlantic Richfield (ARC)
Standard Oil (Ohio) (SOH)

Commentary

During the past five months, there have been further developments affecting a number of key elements of the North Slope development project that, of necessity, were addressed in a provisional manner in our May, 1975 North Slope Oil and Gas *Industry Review* and the accompanying *Basic Reports* on Atlantic Richfield and Standard Oil of Ohio. In particular (1) the 1975 construction season is well along, providing an additional basis for assessing the pipeline completion schedule; (2) the State of Alaska has enacted a tax on hydrocarbon reserves to finance its anticipated budget deficits prior to the start of production; (3) Alyeska has announced another upward revision in its estimate of the total cost of the pipeline system — to \$6,375 million — for the 1.2 million b/d configuration; (4) Sohio has formally announced its plan for transporting Alaskan crude to the Midwest via a southern pipeline system utilizing idled natural gas transmission facilities; and (5) BP/Sohio have essentially concluded a mammoth \$1.75 billion private placement of long-term pipeline debt.

In view of the substantial additional information that has become available in connection with these various developments, a detailed review of the economics of both the pipeline and wellhead production is in order. This report will again utilize the tariff and production profitability models developed in our earlier *Industry Review*. However, the analysis here has been carried a step beyond our "representative" case to show the positions of Arco and Sohio, and their individual recognition of investment tax credit benefits along with the likely effects of reconciling differences in their respective tariff positions. Our approach to the key question of crude prices has also undergone some modification; the \$6.00 per barrel case has been eliminated as both unlikely and too pessimistic in terms of real prices to provide an adequate incentive for new exploration projects. Also, a \$12.00 case has been included to allow for continued OPEC control of world price levels and/or domestic energy policy considerations, although the base price for our longer term company earnings projections continues to be \$10.00 per barrel. This position is predicated on our earlier documented belief that, notwithstanding the historical tendency of oil to underperform inflation following price runups analogous to that of 1973-1974, domestic oil will at least maintain its 1975 average real value in an environment of 5% inflation assumed for the balance of the decade.

As shown in the following table of contents, this report concludes with updates of longer-term earning power and reviews of the financial positions of two of the principal North Slope participants.

(See Table of Contents on following page)

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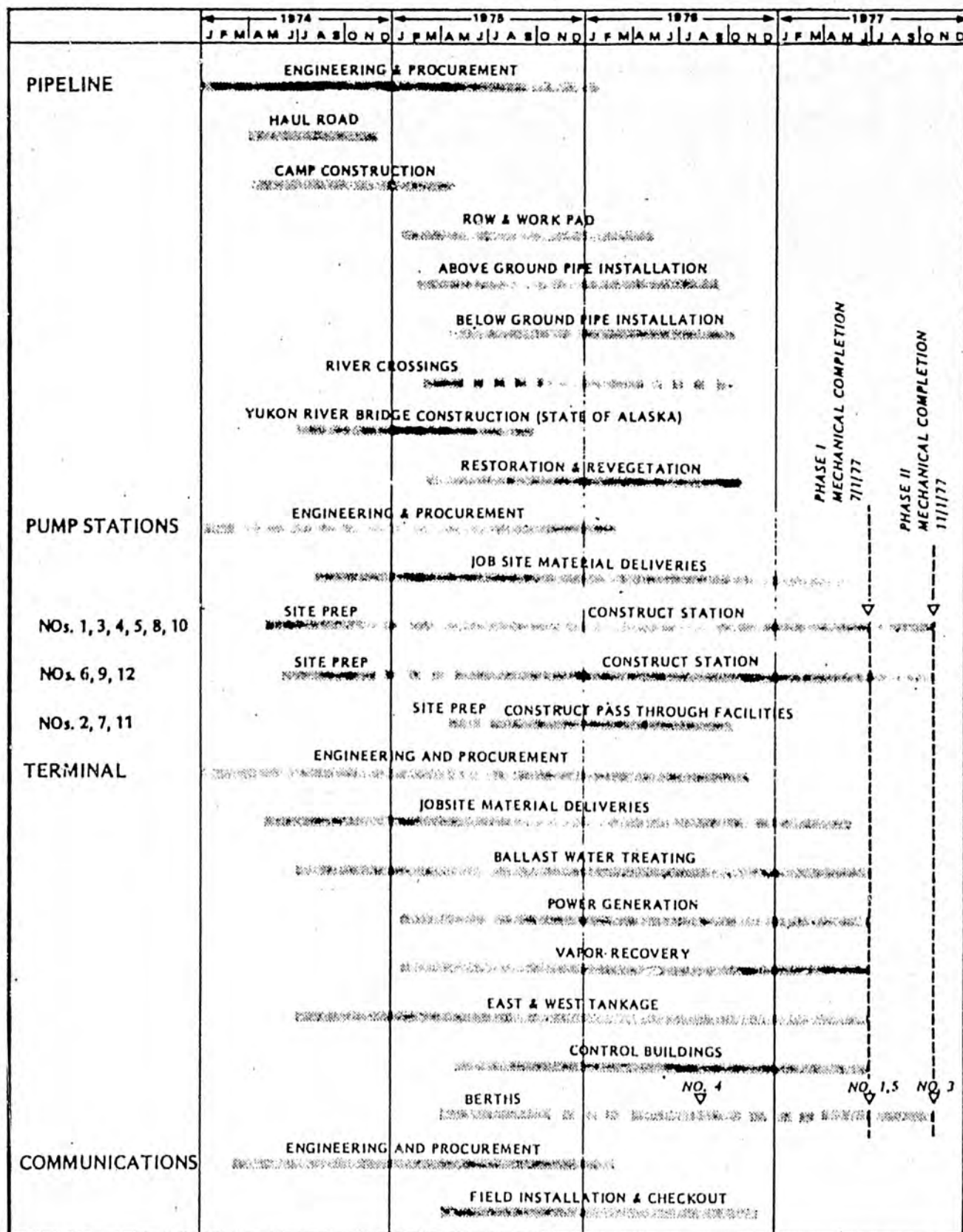
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TAPS Construction and Field Development Progress

The following chart shows revisions in the timetable for the principal TAPS construction tasks since our last *Industry Review*.

(See chart on following page)

Pipeline project schedule



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The main differences between this schedule and that presented earlier are (1) stretchouts in the time required for engineering and procurement at the pump stations and the terminal and (2) jobsite delivery of materials to the pump stations. Even though the Valdez terminal is still the pacing item for an on-time completion of the initial system, none of the revisions to date for individual activities have been sufficient to necessitate a postponement of the mid-1977 target for startup. In fact, the experience so far reemphasizes the point that equal delays in different construction activities are not of equal significance. In the year to date, Alyeska has already shown noteworthy ability to reschedule work and to shift manpower and equipment as requirements change. This flexibility (albeit often obtained at higher costs) should be borne in mind throughout the following review of particular aspects of the project.

Project Management. In June, Alyeska announced a redefinition of the scope of the Bechtel Corporation's duties as the prime contract manager for TAPS construction. Under the new organizational structure, Alyeska assumed full direct supervision of all subcontractors, relegating Bechtel to a project advisory status. Confusion, unnecessarily slow responsiveness to Governmental requirements, and communications difficulties which arose under the prior organizational arrangements were cited by the Alaska State Pipeline Coordinator in a March, 1975 report detailing potential sources of delay in pipeline construction. In assessing the reorganization, it should be recognized that awkwardness incorporated into the basic structure of Alyeska opened the door to top-level organizational difficulties, as evident from the following description by one of the participating companies:

Eight companies which own Alyeska, operating through the Construction Committee in which each has a representative, must approve major projects, audit performance and agree to furnish funds. This is in contrast to usual joint venture pipeline construction projects where one company is normally the managing partner and where contract responsibility can be given a contractor.

Accordingly, Alyeska's move to streamline the contract management function appears well-conceived, though perhaps somewhat belated. In the view of one Government monitor, it has already improved Alyeska's ability to respond to problems with more timely system design and scheduling modifications.

Valdez Terminal. Good progress is continuing to be made in this critical area. At last report, construction was well underway on 10 out of the 14 crude oil tanks in the eastern tank farm; thus, the goal of completing nine of these tanks by year-end appears easily attainable. The finished tanks will provide 50% of the required crude storage capacity for the phase II configuration (1.2 million b/d) and serve as a positive sign toward completion of the terminal, despite its still-tight schedule. The three ballast tanks needed for phase II are also well along (*ranging from 80% to 92% complete*). The primary current concern regarding the terminals' completion date of mid-1977 is the need for further disposal facilities to handle an extra 5-6 million cubic yards of overburden from excavation. It is both ironic and indicative of the fast changing nature of the situation that, at an earlier stage, the excavation questions at Valdez centered on whether or not there would be *sufficient* overburden material to accommodate landfill requirements for 18 acres of lowland and thus expand the usable land area at the cramped terminal site. Now there is more than enough material, but it is of such low grade that it must be hauled away and better quality fill is being imported to meet the terminal needs. In any case, at recent Congressional oversight hearings on TAPS, Alyeska

officials indicated that this disposal of extra overburden might become a pacing item affecting completion of the terminal. However, with significant tankage already well under way, it appears that, at most, this problem would somewhat restrict the volume of initial shipments.

Pipeline Construction. Actual pipelaying activities still seem to have the greatest slack in any critical path analysis of the project. Moreover, while there remain several identifiable problems that could cause sufficient stretchouts to make pipelaying the determining factor in the timing of system completion, the responsiveness of Alyeska's contractors to difficulties has been particularly impressive in this area.

For example, as of last spring there had been only limited progress (perhaps 5% of the total effort) in drilling the 75,000 boreholes which will be used to hold the vertical support members (VSM) for approximately 50% of the line that will be elevated. This was primarily due to late delivery of sufficient specially designed augers and spare parts. The delay caused Alyeska to miss its first winter season, which is the ideal time for working on most of the permafrost regions where VSM's will be used.

To regain time, Alyeska quickly obtained additional conventional boring equipment and rescheduled a portion of the work to the summer, even though more complicated drilling procedures were required in some cases. As a result, as of late September, 34,426 VSM's (over 45% of the total) had been installed. Clearly, progress during the past two months has been especially encouraging, suggesting that a learning curve is indeed present. Thus, at present, VSM installation is advancing extremely well, with the availability of spare parts the only continuing concern of Governmental monitors of the project.

In all, the VSM situation provides a good illustration of Alyeska's ability and dedication to make up lost time on certain paths by reallocating manpower and equipment and incurring added costs. River crossings are another area where this approach will be necessary. Through 1975, Alyeska had initially planned to complete a total of 10 crossings. However, slippages during the winter of 1974-1975 delayed commencement of this activity until last April; since that time only three crossings have been completed. The bulk of the remainder have been reprogrammed for the coming winter season. Theoretically, such rescheduling should not seriously affect either costs or overall project timing, since it only shifts project manhours from 1975 to 1976. Importantly, however, if such a change also necessitates the performance of work planned for 1976 in 1977, there is an implicit added cost, since the present union wage scales of most Alyeska contracts only apply until mid-1976.*

A factor that could affect construction progress is the pipeline design modifications necessitated by new information gained in the field. For example, in section three where H.C. Price is the contractor, the terrain has proved highly unpredictable so that early borehole data on soil conditions is not always proving correct. Accordingly, there has been rather extensive redesign, including changes from elevated to buried configurations (and the reverse). In this case, although such work lapsed beyond the slippage allowances in the schedule, time gained in completing the gravel workpad has enabled Price to stay within 2% of its completion target. Nevertheless, the lesson from section three has been that field redesign of pipeline segments can require major adjustments for which allowances will need to be made on occasion.

*Alyeska's latest cost estimate assumes that a 12% increase in wage rates will be negotiated effective in mid-1976.

Worker productivity remains a key imponderable for an on-time completion. The experience this summer in selected areas appears to have been encouraging. Though there is undoubtedly a risk in drawing general conclusions, the following is a summary of observations about a few specific activities. In addition to its excellent progress in installing VSM's and terminal tankage, Alyeska has completed its double-jointing program. This involves welding 40-ft. pipe sections in shops at Valdez and Fairbanks to cut in half the amount of welding to be done under much more difficult conditions in the field. More than 625 miles of pipe have been welded at Fairbanks and Valdez. Considering the smoothness with which double jointing operations proceeded, there is little question that the overall efficiency of the welding task has been significantly improved. A second factor that may further assist welding productivity during field installation is the recent authorization by Federal and state monitors that permits welders to produce the first two passes of mainline welding at 10-20 inches per minute versus the 5-8 inches per minute previously allowed.

A less encouraging aspect of worker productivity to date involves attitudes of some of the laborers. Although the Teamsters are the only union to have actually violated a no-strike provision, there have been reports of work slowdowns and the use of numerous "safety meetings," reflecting the inevitable grievances associated with the performance of arduous and sometimes dangerous labor under the added pressure of time. It is all but impossible to gauge the significance of this factor from the available information, but its potential consequences are self-evident and the situation bears close scrutiny in the period ahead.

Of necessity, the foregoing discussion is based on only partial analysis of a highly complex and dynamic project. In fact, the ability of an outside observer to *comprehensively* review the status of TAPS construction will probably remain impossible until actual completion of the system, by which time an examination will be largely of academic interest. Nevertheless, the limited information available does provide a basis for a tentative judgment about the progress of TAPS construction. Our May 1975 report accepted Alyeska's contention that a construction delay beyond mid-1977 was not a foregone conclusion, but also pointed out some of the numerous possibilities for delay and cost escalation as the project unfolded. The validity of this view remains intact; however, one cannot help but be impressed by Alyeska's responsiveness to various difficulties as they arose this past summer — especially its flexibility in work rescheduling in an attempt to attain an on-time completion, notwithstanding the cost trade-off involved. Regarding the trade-off, it should also be noted that the combination of carrying charges in 1977 on about \$7.0 billion of pipeline debt and the now established precedent of an Alaskan ad valorem tax on nonproducing reserves provides a powerful incentive to spend currently in order to stay on schedule. With tangible evidence that this is indeed Alyeska's strategy, our inclination is to increase the probability of an on-time completion of the initial *pipeline* configuration but, concurrently, to allow for higher costs than contained in Alyeska's latest control estimates. Based on this expectation along with the companies' last-minute success in getting most of the barges loaded with critical modules for field development to Prudhoe Bay, our production volume assumptions are that throughput will average 600,000 b/d during the second half of 1977, reaching twice that level in early 1978.

Alaskan Reserves Tax

To help alleviate an anticipated fiscal crunch prior to the flow of North Slope oil to market, the State of Alaska has enacted an ad valorem tax (House Bill 297) on hydrocarbon reserves

for a two-year period beginning January 1, 1976. Since provision has been made in the bill for a credit of the tax against future severance tax obligations once production begins, the reserves tax can be alternatively viewed as an interest-free advance by the oil companies to the state.

The circumstances surrounding passage of the reserves tax can be traced to the long delay in TAPS completion, along with unrelenting growth of state budgetary expenditures. Under an initial expectation that TAPS would be operational by the fiscal year (FY) ending June 30, 1974, Alaska has been drawing down its \$900 million lease bonus fund (garnered at the 1969 sale of Prudhoe Bay leases) to cover its budget shortfalls, on the belief that the receipt of oil royalty revenues starting in 1974 would be sufficient to restore the lease sale fund to its original size. At the same time, the existence of the \$900 million fund provided impetus for an expansion of Government spending. Thus, Alaska's general fund budget rose from \$168 million in FY 1970 to \$364 million in FY 1974. Accordingly, by January 1975, the lease sale fund had shrunk to \$504 million. However, of that latter amount, only \$311 million was held as liquid investments (the balance was in relatively illiquid Alaskan loans and mortgages as well as deposits in Alaskan banks).

In FY 1975, general fund expenditures of about \$540 million exceeded approximate revenue receipts of \$340 million, necessitating a bonus fund drawdown of \$200 million for the entire year, or to about \$370 million by June 30. Based on an estimated general fund budget of \$620 million for FY 1976, the state anticipates that the resulting budget deficit and already mandated loan programs will require an additional \$350 million, against which, the sale of remaining lease bonus monies — both investments and deposits — should net only \$300 million. Hence, beginning in FY 1976, a significant cash crunch is foreseen. Latest projections indicate that the state will need \$400 million in total additional revenue for the years 1976-1978 if the pipeline is completed on schedule (July 1, 1977). A six-month delay would boost the amount needed to \$600 million and a full-year delay to \$850 million.

In attempting to meet the anticipated cash flow shortfall, Alaska's legislators had to choose from among the following mix of revenue-producing measures: (1) budget cuts; (2) sale of loans and mortgages from the general fund; (3) oil and gas lease sales; (4) advance sales of royalty oil and gas; (5) general tax increases; (6) ad valorem taxation of oil and gas reserves; and (7) short-term borrowing. Some of these alternatives involve limitations with respect to either the amount of revenue generated or the time frame for receipt of additional revenue. For example, given Alaska's limited economic base, it would be difficult to raise much of the required \$400 million and still retain an equitable tax system. By eliminating some of the loopholes in the Alaskan corporate tax that exist because of "piggybacking" the Federal income tax and increasing the natural gas severance tax from 4% to 10%, an additional \$20 million in revenue is expected. The final alternative, short-term borrowing, would require an amendment to the state constitution to permit borrowing for operational purposes beyond a one-year period. Unfortunately, an enabling constitutional amendment could not be voted upon until the next general election in November, 1976 — too late to meet the initial fiscal crunch.

Among the other available alternatives, an ad valorem tax on oil and gas reserves was selected as the principal ameliorative for maintaining fiscal solvency prior to pipeline startup. It is

interesting to note that Alaska opted for a reserves tax (HB 297) over the opposition of one of its key consultants, Lipton, Levy & Associates, who favored a Beaufort Sea lease sale. As enacted, the reserves tax is similar in structure to existing statutes in California and Texas, except for the provision of a tax credit against severance tax payments once oil production starts. In fact, the provision has led a legal consultant of the state to conclude that HB297 may violate the due process and equal protection clauses of the 14th amendment to the U.S. Constitution. In effect, Alaska is seen as coercing the lending to it of monies on an interest-free basis by lessees of state oil and gas leases. The legal consultant believes that to convert HB 297 from a mandatory lending statute into a genuine tax law, it will be necessary to modify its tax credit provisions so as to produce a substantial amount of new and independent tax revenue. While a potential legal challenge cannot be ruled out, it is difficult to see how the oil companies could benefit by challenging the reserves tax since it can be easily converted into an independent revenue raising device by simply eliminating the severance tax credit.

As far as the actual mechanics of the reserves tax are concerned, it relies on the income appraisal method of oil and gas property valuation to determine the fair market value of the property using discounted present value techniques. A number of difficult estimation problems arise in any attempt to arrive at the value of the leasehold or other mineral interest involved, including: (1) reserves in-place; (2) production rates; (3) out-of-pocket operating expenses; (4) prices; and (5) discount rate. As such, an ad valorem tax on oil and gas properties can be highly-arbitrary in nature.

In early 1975, a study commissioned to assess, as of January 1, 1976, the value of oil and gas contained in the Sadlerochit formation of the Prudhoe Bay field arrived at a figure of \$11.5 billion. This analysis assumed that oil production would begin at 1.2 million b/d in 1978, and rise to a peak rate of 1.8 million b/d in 1981. A wellhead price of \$4.93 per barrel was used initially, which subsequently rises to \$7.50 per barrel by 1980 based on a \$10 per barrel refinery price. For natural gas, production was assumed to begin in 1982 at a rate of 1 billion cubic feet per day, with an eventual peak of 3 billion cubic feet per day in 1997. A wellhead price of 50¢ per Mcf was used. After deducting out-of-pocket expenses — capital expenditures, lifting costs, property taxes — from gross revenue, the resulting pretax income figure was discounted at an 18% annual, mid-year rate. Of the resulting \$11.5 billion appraised value, \$10.8 billion was attributable to oil alone.

The rate of levy for the tax year beginning January 1, 1976 is 20 mills (2¢) per dollar of assessed valuation, payable by June 30, 1976. The Alaskan legislature will annually set the rate of levy, but it cannot exceed 20 mills. A reading of the exemption and credit provisions of the tax would appear to limit its impact primarily to the Sadlerochit formation and several small gas fields in the Kenai area.* Using the above-derived valuation for the Sadlerochit, the first year tax would amount to \$230.3 million.** The legislation also provides for a system of development incentive credits by which the affected oil companies will receive, beginning in

*To the extent that severance taxes paid on a producing property for a 12-month period prior to the tax payment date equal or exceed the reserve tax assessment, no payment is required. Also, a property wholly or partially underlying a discovery well is exempted from the tax for a period of five years beginning on the date of the completion, suspension, or abandonment, whichever occurs first.

**Until a permit or license is issued for construction of a natural gas transmission line, natural gas reserves at Prudhoe Bay are exempted from the tax. The natural gas exemption reduces tax revenues by \$14 million, or to \$216 million.

1978, a reduction in severance taxes equal in amount to total reserves tax payments. However, the development incentive credit cannot exceed 50% of severance taxes computed on a monthly basis — a limitation which effectively increases the payback period to some 4½ years.

Coming as it does when the major Prudhoe Bay leaseholders face already significant TAPS and field development expenditures, the reserves tax has imposed yet another financing burden on the oil industry, especially Sohio. As such the tax joins the minimum cents-per-barrel severance tax as a seemingly inequitable revenue-producing measure and a source of anxiety to the companies in terms of possible follow-on tax measures. Regarding the latter point, the legislature's refusal to adopt the so-called "Sohio amendment," which would have allowed a reserves tax credit against royalty rather than severance tax, is indicative of Alaska's strategy of taking a portion of its royalty oil entitlement in kind to establish the regulatory functions of the Alaska Pipeline Commission.*

The preceding discussion is not meant to alarm the reader, but only to reiterate the risk of viewing tax terms at any Governmental level as fixed. In fact, a bill introduced during the past session of the Alaskan Senate, (Senate Bill 295), sought to raise the oil severance tax from a maximum of 8% of wellhead value to 12%. *Moreover, it should be noted that this latter measure is likely to be resurrected again during the next legislative session starting in January*, and thus bears close monitoring. Nevertheless, given Alaska's future cash flow stream from the North Slope, as well as the need to allow adequate economic incentive in order to maximize long-term oil development opportunities, an overly cautious attitude regarding the future relationship between Alaska and the oil companies does not appear warranted at this time. To illustrate the financial benefits that will accrue to Alaska once North Slope oil production begins, the following table depicts our derivation of potential sources of revenue under a variety of the throughput rates using a \$10 per barrel West Coast price. For comparison purposes, general fund budget expenditures are projected to reach about \$1.2 billion in 1980.

(See table on following page)

**By taking a portion of its royalty oil in kind, either at some intermediate point or at Valdez, Alaska will have established an intrastate movement of North Slope crude, thus enabling its Pipeline Commission to assert regulatory control, including tariff rates, over the intrastate movements. Also, the state is presently a party to an ICC determination, ex parte 238, which involves questions relating to what items shall go into the rate base and the allowed rate base return.*

State of Alaska Revenues
(In millions)

	Pipeline Throughput		
	1.2 mil. b/d	1.5 mil. b/d	2.0 mil. b/d
Ad valorem taxes (a)	\$178	\$183	\$177
Severance taxes (b)	201	252	375
Royalty	261	376	586
Income tax:			
Pipeline	69	73	74
Wellhead	131	196	303
Total income tax	<u>200</u>	<u>269</u>	<u>377</u>
Total revenues	\$840	\$1,080	\$1,515

(a) Includes ad valorem taxes on field development facilities. Assessed valuation is assumed to be based on the gross cost of the main Prudhoe Bay field facilities (\$2.375 billion) less amortization of investment at the rate of 24 ¢ per barrel on a unit-of-production basis. Because of the unavailability of data related to the cost of facilities required to ultimately develop the Lisburne and Kuparuk formations, an ad valorem tax estimate has not been made for this potential component of field development spending.

(b) Before deduction of severance tax credits, over a 4½ year period, amounting to a maximum of \$474 million based on a preliminary appraisal of the oil reserves contained in the Sadlerochit formation.

Economics of Prudhoe Bay Production

Pipeline Economics

On June 19, 1975, Alyeska Pipeline Service Company announced a revised control estimate of \$6.375 billion for the construction of TAPS to an initial design capacity of 1.2 million b/d. Although the revised figure includes provision for escalation of the costs of labor,* material, equipment, and consumables, a contingency allowance is not specifically included in the new control estimate.** However, Alyeska did suggest to the TAPS owners that a contingency allowance of 5% might be added to the control estimate to provide for unforeseen cost changes during the remainder of the construction period. Alyeska has also estimated that the cost to expand TAPS from 1.2 million to 2 million b/d would approximate \$850 million, of which \$490 million would be required to expand system capacity to an intermediate level of 1.6 million b/d.***

In full cognizance of the TAPS construction cost progression to date and the aforementioned tradeoff between on-time project completion and final system cost, our projections allow for a final cost of 10% above Alyeska's latest estimate of total project cost.

*A Project Labor Agreement entered into with the major international and local unions involved in the project has established wage rates only for the period through June 30, 1976.

**It might be recalled that Alyeska's previous control estimate of \$5.98 billion last October incorporated a \$424 million contingency allowance.

***Expansion of TAPS to an intermediate capacity level between 1.2 and 2.0 million b/d would require an amendment to the TAPS Agreement.

The following analysis of pipeline earnings and tariffs includes a "representative" case applicable to all the TAPS participants -- similar to the approach used in our May *Industry Review* -- and individual computations for ARCO Pipeline Company and Sohio Pipe Line Company. The latter analysis illustrates the variable tariffs that arise under the undivided interest form of ownership due to cost of capital differences among the TAPS owners and individual company preferences regarding usage of debt and equity in financing the project.

Working assumptions for our "representative" case include the following:

- (1) Construction of TAPS to an initial design capacity of 1.2 million barrels per day will cost \$7,012.5 billion. Expansion of the system to 2 million b/d will cost an additional \$935 million.
- (2) TAPS will be financed (including capitalized interest) utilizing 85% borrowed funds at an average borrowing rate of 9.5%.
- (3) Capitalized interest charges during construction are estimated at \$1.52 billion, of which \$1.47 billion is applicable to the 1.2 million b/d system configuration.
- (4) Capitalized interest will be amortized over a 25-year period. Amortization of debt used to finance TAPS (exclusive of refinancings) will not begin in a time frame relevant to the scope of the analysis included herein.
- (5) The main pipeline system assets placed in service in mid-1977 will be depreciated over a 35-year period for ICC purposes. For IRS filings, a 22-year sum-of-the-years'-digits method will be employed, with a possible requirement that any resulting tax deferrals be flowed through as a reduction in pipeline tariff. As additional pipeline capacity is added beyond mid-1977, a shorter depreciable life is used for assets associated with the expanded capacity (mainly pump stations) to conform with the remaining depreciable life of the main pipeline system assets.
- (6) Ad valorem taxes of 20 mills (2¢) per dollar of assessed valuation will be collected by the State of Alaska on qualifying pipeline system assets.
- (7) Current ICC procedures will govern rate base determination. A return of up to 7% of net pipeline valuation* is allowable in posting ICC tariffs under the terms of the 1941 Consent Decree.

On the basis of the foregoing assumptions, the following table depicts, both for book and tax purposes, pipeline earnings and required tariffs for various throughput levels.

(See table on following page)

* Assumed to be \$7.72 billion upon initial completion of TAPS.

Pipeline Earnings and Tariffs — Ex ITC
(In millions)

	1.2 million b/d		1.5 million b/d		2.0 million b/d (a)	
	Book	Tax	Book	Tax	Book	Tax
Revenues	\$2,267	\$2,267	\$2,388	\$2,388	\$2,413	\$2,413
Operating costs	50	50	60	60	70	70
Ad valorem taxes(b)(c)	130	130	137	137	136	136
Amortization of capitalized interest	59	59	60	60	61	61
Interest expense	682	682	724	724	748	748
Depreciation	200	610	216	631	228	611
Total expenses	<u>1,121</u>	<u>1,531</u>	<u>1,197</u>	<u>1,612</u>	<u>1,243</u>	<u>1,626</u>
Pretax earnings	1,146	736	1,191	776	1,170	787
Income taxes (d):						
Cash	389	389	411	411	416	416
Deferred	<u>217</u>	<u>—</u>	<u>217</u>	<u>—</u>	<u>203</u>	<u>—</u>
ICC allowable return	<u>\$ 540</u>	<u>\$ 347</u>	<u>\$ 561</u>	<u>\$ 365</u>	<u>\$ 551</u>	<u>\$ 371</u>
	Case A	Case B	Case A	Case B	Case A	Case B
Gross revenues required	\$2,050	\$2,267	\$2,169	\$2,388	\$2,210	\$2,413
Oil shipments (million barrels)	438	438	548	548	730	730
Required tariff per barrel	\$4.68	\$5.18	\$3.96	\$4.36	\$3.03	\$3.31

- (a) Capacity of 1.5 million and 2 million b/d is assumed to be reached one and three years, respectively, after completion of the first stage.
- (b) 2% of the remaining net tangible investment in pipeline facilities after approximately \$500 million of properties transferred to the State of Alaska (Yukon River bridge, certain airfields, and the Alaskan highway) are deducted.
- (c) Not including amortization of capitalized ad valorem taxes of \$138.6 million incurred through mid-1977.
- (d) Includes statutory Alaskan income tax of 9.36%.

Case A: With flow-through.

Case B: Without flow-through.

(See table on following page)

Pipeline Earnings and Tariffs — Including ITC
(In millions)

	1.2 million b/d		1.5 million b/d(a)		2.0 million b/d(a)	
	Book	Tax	Book	Tax	Book	Tax
Revenues	\$2,267	\$2,267	\$2,388	\$2,388	\$2,413	\$2,413
Operating costs	30	50	60	60	70	70
Ad valorem taxes (b)(c)	130	130	137	137	136	136
Amortization of capitalized interest	59	59	60	60	61	61
Interest expense	682	682	724	724	748	748
Depreciation	200	610	216	631	228	611
Total expenses	1,121	1,531	1,197	1,612	1,243	1,626
Pretax earnings	1,146	736	1,191	776	1,170	787
Income taxes:						
Federal - cash						
Pre-ITC	320	320	338	338	342	342
ITC	(406)(d)	(406)(d)	(25)	(25)	—	—
Federal-deferred	217		219		203	
State @ 9.36%	69	69	73	73	74	74
Total income taxes	606	389	630	411	619	416
ICC allowable return	540	\$ 347	\$ 561	\$ 365	\$ 551	\$ 371
ICC allowable return plus ITC	\$ 946	—	\$ 586	—	—	—
	Case A	Case B	Case A	Case B	Case A	Case B
Gross revenues required	\$2,050	\$2,267	\$2,169	\$2,388	\$2,210	\$2,413
Oil shipments (million barrels)	438	438	548	548	730	730
Required tariff per barrel	\$4.68	\$5.18	\$3.96	\$4.36	\$3.03	\$3.31

- (a) Capacity of 1.5 million and 2 million b/d is assumed to be reached one and three years, respectively, after completion of the first stage.
- (2) 2% of the remaining net tangible investment in pipeline facilities after approximately \$500 million of properties transferred of the State of Alaska (Yukon River bridge, certain airfields, and the Alaskan highway) are deducted.
- (c) Not including amortization of capitalized ad valorem taxes of \$138.6 million incurred through mid-1977.
- (d) While the indicated level of ITC benefit exceeds the statutory limit (\$25,000 plus 50% of taxes payable) on a project stand-alone basis, the assumed availability of sufficient income from other sources should allow each of the TAPS participants, except for BP and Sohio, to fully recognize this benefit on a current basis.

Case A: With flow-through.

Case B: Without flow-through.

Given that the State of Alaska will undoubtedly opt to receive a portion of its 12½% royalty oil entitlement in kind, with an attendant need for common carrier transportation services, a strong likelihood exists that the state will elect to file a contested rate application with the ICC opposing the indicated maximum tariffs shown above.* To illustrate the impact of

*Since Alaska's major sources of revenue are directly tied to the Prudhoe Bay field wellhead price, a strong bias exists in favor of minimizing transportation charges.

a lower allowed ICC return, pipeline earnings under the 1.2 million b/d throughput level would fall to \$386 million and result in a revised flow-through tariff of \$3.94 per barrel under the assumption of a 5% allowable return. *For companies whose interests in production roughly approximate their interest in TAPS, the overall impact on earnings is negligible, since lower pipeline earnings are largely offset by the benefits of a higher wellhead price.*

Allowable Tariff Positions of Individual Companies

In addition to the possibility of a contested rate application, there are other circumstances under which actual pipeline tariffs could vary from the "representative" 7% return case developed above. Under the individual interest form of pipeline ownership, each company with a stake in TAPS will individually arrange and reflect its portion of the pipeline debt financing on its own balance sheet and will file separate tariff schedules with the Interstate Commerce Commission based on a proportionate share of TAPS' overall operations. As mentioned previously, this approach results in differences in the maximum allowable tariffs for individual companies due to variations in (1) the cost of capital, (2) the debt/equity mix, and (3) the rate at which debt is taken down for pipeline financing. To illustrate these differences, the following calculations have been developed for the specific cases of ARCO Pipeline Company and Sohio Pipe Line Company, using the approach already outlined for the "representative" example above, along with the additional working assumptions outlined below:

- (1) Operating costs, an valorem taxes, and depreciation are each based on the company's ownership percentage applied to the appropriate totals for these items in the "representative" case.
- (2) ARCO Pipeline's TAPS financing is assumed to consist of 90% debt and 10% equity, with all of the remaining requirements for the latter* contributed during 1977. Sohio Pipe Line's capitalization mix will be 85% debt and 15% equity, with the balance of the equity contributed after mid-1976.**
- (3) Average pipeline borrowing rates of 9% and 10% are anticipated for ARCO and Sohio, respectively.
- (4) Capitalized interest and commitment fees during construction will be \$275 million for ARCO Pipeline, of which \$268 million is attributable to the 1.2 million b/d configuration. For Sohio Pipeline, the corresponding amounts will be \$465 million and \$445 million.

*On March 31, 1975, ARCO Pipeline's long term capitalization totaled \$695.4 million, of which \$155.4 million was stockholders' equity. Of the latter amount, \$75 million is assumed to be creditable as an equity contribution toward TAPS, leaving a 1977 requirement for an additional \$105 million.

**At year-end 1974, Sohio Pipe Line's equity was \$42 million. To achieve an 85%/15% debt equity mix in 1977, another \$308.7 million will be required during 1976-1977. A portion of this requirement can be met by converting existing parent company advances of \$110 million to equity contributions.

ARCO Pipeline Earnings and Tariffs — Ex ITC

	1.2 million b/d		1.5 million b/d		2.0 million b/d (a)	
	Book	Tax	Book	Tax	Book	Tax
Revenues	\$468	\$468	\$492	\$492	\$571	\$571
Operating costs	11	11	13	13	17	17
Ad valorem taxes	27	27	29	29	33	33
Amortization of capitalized interest	11	11	11	11	12	12
Interest expenses	141	141	150	150	178	178
Depreciation	42	128	45	133	55	146
Total expenses	232	318	248	336	295	386
Pretax earnings	236	150	244	156	276	185
Income taxes						
Cash	79	79	83	83	98	98
Deferred	46	—	46	—	48	—
ICC allowable return	\$111	\$ 71	\$115	\$ 73	\$130	\$ 87
	Case A	Case B	Case A	Case B	Case A	Case B
Gross revenues required	\$422	\$468	\$446	\$492	\$523	\$571
Oil shipments (mil. barrels)	92	92	115	115	175	175
Required tariff per barrel	\$4.59	\$5.09	\$3.88	\$4.28	\$2.99	\$3.26

Case A: With flow-through.

Case B: Without flow-through.

- (a) Assumes that ARCO Pipeline's interest in TAPS increases to 24% following implementation of a nomination to expand system throughput to 2 million b/d to accommodate incremental North Slope production. The additional cost to ARCO Pipeline involved in the reallocation of ownership interests is estimated by the writer to amount to \$236 million exclusive of unamortized capitalized interest.

(See table on following page)

Sohio Pipe Line Earnings and Tariffs -- Ex ITC

	1.2 million b/d		1.5 million b/d		2.0 million b/d	
	Book	Tax	Book	Tax	Book	Tax
Revenues	\$756.5	\$756.5	\$798.2	\$798.2	\$795.6	\$795.6
Operating costs	16.7	16.7	20.0	20.0	23.3	23.3
Ad valorem taxes	43.3	43.3	45.7	45.7	45.3	45.3
Amortization of capitalized interest	17.8	17.8	18.3	18.3	18.6	18.6
Interest expense	235.7	235.7	250.7	250.7	247.5	247.5
Depreciation	66.7	203.4	72.0	210.4	76.0	203.4
Total expenses	380.2	516.9	406.7	545.1	410.7	538.1
Pretax earnings	376.3	239.6	391.5	253.1	384.9	257.5
Income taxes						
Cash	126.7	126.7	133.9	133.9	136.2	136.2
Deferred	72.4	—	73.2	—	67.4	—
ICC allowable return	\$177.2	\$112.9	\$184.4	\$119.2	\$181.3	\$121.3
	Case A	Case B	Case A	Case B	Case A	Case B
Gross revenues required	\$684.1	\$756.5	\$725.0	\$798.2	\$728.2	\$795.6
Oil shipments (mil. barrels)	146	146	182.7	182.7	243.4	243.4
Required tariff per barrel	\$4.69	\$5.18	\$3.97	\$4.37	\$2.99	\$3.27

Case A: With flow-through.

Case B: Without flow-through.

From this analysis, it is evident that at intermediate throughput levels, ARCO Pipeline's maximum allowable tariff would be 8¢-9¢ per barrel less than the "representative" case, largely due to the company's advantageous cost of capital. In Sohio's case, the higher relative capital costs obviously result in a greater allowable tariff than for ARCO, but the interesting point is that the company's intended use of proportionally more equity* in the pipeline should partially offset this effect so that Sohio's calculated per barrel transportation postings should closely approximate the "representative" case.

There are circumstances under which the foregoing differences could become significant. In particular, during a period of less than full pipeline utilization,** actual tariffs would be likely to gravitate toward the maximum levels of the lower cost suppliers of transportation services as producers exercise nominating preferences for such capacity. This tendency would thus preclude the full realization of the maximum allowable ICC return on pipeline investments of companies with the highest rate bases.

*For comparison, it appears that Exxon's and Mobil's TAPS pipeline capitalizations will consist of 10% or less equity.

**It is possible to see this occurring as capacity is expanded to 2.0 million b/d and depending on the degree of future exploratory success and the timing of the development of the Lisburne and Kuparuk formations.

To better demonstrate the tariff-setting mechanism here, it should also be noted that the *potential* for variation in per barrel tariff is actually wider than indicated by our calculations for ARCO and Sohio. For example, not long ago one owner of a fairly small interest in TAPS was reportedly contemplating funding its entire share of pipeline costs with equity, thus foregoing any rate base credits for interest expense and capitalized interest during construction. Holding all other assumptions constant, the effect of using this financing mix for TAPS would be to reduce the maximum ICC allowed tariff to \$2.75 per barrel for Case A at 1.2 million b/d of throughput, fully \$1.94 below that of Sohio. This is clearly an extreme example with at least some chance that this company will ultimately more closely conform its financing strategy to that of other TAPS owners. Since only a few percentage points of transportation capacity are involved, the downward pulling effect from this one participant would still be limited. However, the comparison helps to illustrate the likely mechanism for tariff determination, and is one more factor dictating caution in simply using a tariff based on an ICC allowed 7% return for a given company.

The investment tax credit is another factor that could give rise to differences in individual company tariffs if such benefits are flowed-through in a manner similar to ICC treatment of deferred taxes. As indicated in both the "representative" tariff analysis and the Financial Position Review sections for Arco and Sohio, ITC benefits will be quite significant for leading TAPS participants. However, due to the differing abilities of Sohio and Arco to utilize portions of their TAPS and field development ITC prior to pipeline startup under the "qualified progress payment" option,* it is clear that a company's ITC benefits available at commencement of operations will not simply be a function of TAPS and field ownership percentages. Because of the inherently greater difficulty in predicting what Sohio will be able to realize in ITC benefits at given throughput levels, we have excluded this factor from the analysis in the preceding table.

Prudhoe Bay Field Profitability

In estimating unit producing profitability, the following assumptions have been made:

- (1) The landed crude oil price on the West Coast will fall within a broad range of \$8-\$12 per barrel toward the end of the decade.
- (2) With additional exploratory activity on the North Slope, delineation of the Lisburne and Kuparuk oil pools and any new pools could contribute sufficient additional reserves to enable pipeline throughput to reach 2 million b/d by mid-1980.

**Under the Tax Reduction Act of 1975, a participant in a project which has a leadtime of more than two years may elect to recognize its ITC associated with qualified expenditures in a given year on a ratable basis over a period of up to five years from 1975. Both ARCO and Sohio have adopted this treatment of ITC, but it appears that while ARCO should be able to fully realize such benefits currently, Sohio may be unable to fully utilize these credits in 1975 and 1976, resulting in its having proportionally greater ITC carryforwards available in 1977.*

- (3) Production operating costs (lifting, depreciation, and amortization) will approximate 44¢ per barrel for the Sadlerochit formation* and 97¢ for possible incremental production from the Lisburne, Kuparuk, and any other as yet undefined pools. The latter figure involves an admittedly arbitrary assumption that the unit profitability of oil pools other than the Sadlerochit will, at a *minimum*, fall 25¢ per barrel below the comparable figure for the Sadlerochit; this reflects significantly lower per well producibility and higher drilling and completion costs on a unit-of-production amortization basis.
- (4) Royalty payments (12.5%), severance taxes (8%), and ad valorem taxes will approximate 22% of wellhead value, except that severance taxes, as currently indicated by the Bureau of Labor Statistics' index of wholesale crude prices, would be a minimum of 46¢ per barrel for a 10,000 b/d well (34¢ per barrel for a 1,000 b/d well) before provision for credit against the ad valorem tax on in-place reserves.
- (5) Wellhead profits will be taxed at a full 48% Federal rate (before investment tax credits related to field development expenditures) and a 9.36% Alaskan rate. Because of differing individual company treatment of ITC under the terms of the Tax Reduction Act of 1975, the unit profitability figures shown below do not include provision for this credit. (See Financial Position Review section for a discussion of the individual treatment by Arco and Sohio).

Incorporating the foregoing assumptions into projections for unit producing profits, the next table shows their impact under the three throughput configuration cases.

(See table on following page)

**Field development costs are presently estimated at \$2.375 billion to reach producibility of 1.5 million b/d versus \$1.9 billion in our earlier assessment. Field development expenditures include \$100 million for a power station and \$350 million for a gas compression plant. A portion of the cost of these facilities is thus applicable to natural gas production — on a Btu equivalent basis, total field development costs work out to 24¢ per barrel for oil and 1¢ per Mcf for natural gas.*

Unit Profits

Pipeline Throughput: 1.2 million b/d

	\$8.00	\$10.00	\$12.00
West Coast price			
Pipeline tariff	\$4.68	\$4.68	\$4.68
Tanker costs (a)	<u>0.55</u>	<u>0.55</u>	<u>0.55</u>
Total transportation costs	5.23	5.23	5.23
Wellhead price	2.77	4.77	6.77
Royalty, severance and misc.	0.85	1.13	1.49
Lifting, depreciation & amortization	<u>0.44</u>	<u>0.44</u>	<u>0.44</u>
Total producing costs	1.29	1.57	1.93
Pretax profit	1.48	3.20	4.84
Income taxes at 52.9%	<u>0.78</u>	<u>1.69</u>	<u>2.56</u>
Net income per barrel	\$0.70	\$ 1.51	\$ 2.28

Pipeline Throughput: 1.5 million b/d

	\$8.00	\$10.00	\$12.00
West Coast price			
Pipeline tariff	\$3.96	\$3.96	\$3.96
Tanker costs (a)	<u>0.55</u>	<u>0.55</u>	<u>0.55</u>
Total transportation costs	4.51	4.51	4.51
Wellhead price	3.49	5.49	7.49
Royalty, severance and misc.	0.95	\$1.23	\$1.65
Lifting, depreciation and amortization	<u>0.44</u>	<u>0.44</u>	<u>0.44</u>
Total producing costs	1.39	1.67	2.09
Pretax profit	2.10	3.82	5.40
Income taxes at 52.9%	<u>1.11</u>	<u>2.02</u>	<u>2.86</u>
Net income per barrel	\$0.99	\$ 1.80	\$ 2.54

Pipeline Throughput: 2.0 million b/d

	\$8.00	\$10.00	\$12.00
West Coast price			
Pipeline tariff	\$3.03	\$3.03	\$3.03
Tanker costs (a)	<u>0.55</u>	<u>0.55</u>	<u>0.55</u>
Total transportation costs	3.58	3.58	3.58
Wellhead price	4.42	6.42	8.42
Royalty, severance and misc. (b)	1.05	1.41	1.85
Lifting, depreciation & amortization(c)	<u>0.57</u>	<u>0.57</u>	<u>0.57</u>
Total producing costs	1.62	1.98	2.42
Pretax profit	2.80	4.44	6.00
Income taxes at 52.9%	<u>1.48</u>	<u>2.35</u>	<u>3.17</u>
Net income per barrel	\$1.32	\$ 2.09	\$ 2.83

(a) Includes 5 ¢ per barrel for the TAPS Liability Fund.

(b) For the \$8 per barrel case, severance tax is a weighted average of 46¢ per barrel for 1,500,000 b/d and 34¢ per barrel for 500,000 b/d. The cents-per-barrel minimum severance tax is superseded by the 8% of wellhead maximum under the \$10 and \$12 per barrel cases.

(c) 1,500,000 b/d at 44¢ per barrel and 500,000 b/d at 97¢ per barrel.

*Financial Position Review***Financial Position Review — The Standard Oil Company (Ohio)**

In our May, 1975 *Basic Report* on this company, five contingencies were identified, which could result in significant additional financing requirements. These included (1) construction delays, (2) system cost revisions, (3) early commitment to expansion of throughput beyond 1.2 million barrels daily (4) enactment of an Alaskan reserves tax, and (5) a decision to proceed with a trans-U.S. pipeline to move North Slope oil to the Midwest. With three of these factors now realities, a review of Sohio's financing needs for the critical 1975-1977 period is in order.

The next table summarizes Sohio's past and projected North Slope expenditures for each increment of pipeline capacity and for development of the main field based on our revisions of estimates for system costs.

Estimated North Slope Pipeline & Development Costs
(In millions)

	Expended Through Mid-1975	Approximate Remaining Obligation	Total
TAPS:			
To 1.2 million b/d	\$ 816	\$1,522	\$2,338(a)
To 2.0 million b/d	—	312	312(b)
Capitalized pipeline interest	84	381	465
TAPS total	\$ 900	\$2,215	\$3,115
Field development	517	749	1,266(c)
Tankers	—	720	720(d)
Total North Slope (c)	\$1,417	\$3,684	\$5,101

- (a) 33.34% of Alyeska's latest cost estimate (\$6,375 million) escalated an additional 10% to \$7,012.5 million.
- (b) Not including additional costs associated with possible realignment of TAPS ownership interests. Thus, 33.34% of Alyeska's latest cost estimate (\$850 million) increased by 10% to \$935 million.
- (c) 53.3% of an estimated \$2,375 million for field development costs necessary to reach 1.5 million b/d.
- (d) Covers construction contracts for eight tankers which the company is in the process of assigning to others in return for charter or lease arrangements.

In all, Sohio's expenditures through mid-1975 amount to just over 32% of the above estimated total expenditures for the North Slope project (excluding chartered tankers). The field development costs shown are directly proportional to our estimate of Sohio's ultimate share of the main unit's reserves. While it is normal that unitized field development costs are equalized, there is no such agreement in this instance. Accordingly, during unitization negotiations, Sohio will be seeking some adjustment against its share of additional costs for development of the eastern half of the field to reflect the company's early development expenditures at lower costs due to lower prices for labor and materials. Since the difference in development costs for the field's two halves could well exceed \$200 million, even partial compensation for Sohio's share of this excess may be a meaningful adjustment in the field development funding requirements shown here.

The financial requirements picture has been further complicated by several other contingencies identified in our May *Basic Report*. These include the company's Alaskan reserves tax obligations for 1976 and 1977 and its preliminary planned expenditures toward a trans-U.S. pipeline to move Alaskan crude into Texas. These considerations have been included in the following revised projections which show the timing and magnitude of Sohio's remaining balance sheet financing requirements through 1977.

Standard Oil (Ohio) Financing 1975-1977 (In millions)					
Sources:	1975		1976	1977	Cumulative Tot. mid-1975-1977
	Actual First Half	Estimated Second Half			
Net income plus deferred taxes (a)	\$ 85.0	\$ 95.0	\$ 190.0	\$448.6	\$ 733.6
Depreciation, depletion, and amort.	39.6	38.4	85.0	130.4	253.8
Funds from operations	\$124.6	\$133.4	\$ 275.0	\$579.0	\$ 987.4
Less:					
Debt maturities	3.4	0.6	11.0	18.0	29.6
Dividends	24.9	25.1	51.0	51.0	127.1
Available from operations	\$ 96.3	\$107.7	\$ 213.0	\$510.0	\$ 830.7
Uses:					
TAPS outlays	\$364.0	\$465.0	\$ 863.7	\$300.3	\$1,629.0
Capitalized pipeline interest	28.0	54.0	196.3	120.5	370.8
Field development	145.0	190.0	367.0(b)	192.0	749.0
Total North Slope expenditures	\$537.0	\$709.0	\$1,427.0	\$612.8	\$2,748.8
Other expenditures (c)					
Existing activities	81.0	141.0	115.0	75.0	331.0
Alaskan reserves tax	—	—	115.0	140.0	255.0
Trans-U.S. pipeline	—	—	75.0	50.0(d)	125.0
Total	\$618.0	\$850.0	\$1,732.0	\$877.8	\$3,459.8
Indicated financing needs	\$521.7	\$742.3	\$1,519.0	\$367.8	\$2,629.1

(a) 1977 figure includes \$88.9 million of producing profit (58.8 million barrels) @ \$1.51/bbl, \$44.5 million of pipeline profit (36.8 million barrels @ \$1.21/bbl) based on pipeline throughput of 600,000 b/d from July 1 through December 31, and 1.2 million b/d thereafter. Also included are estimated TAPS and field development ITC benefits of \$117.5 million.

(b) Assumes realignment of expenditures with unit interests by year-end 1976.

(c) Excludes capital projects to be financed off-balance sheet including \$720 million for tankers and \$200 million for the estimated capitalized value of lease obligations in connection with El Paso natural gas pipeline facilities to be used for TRUSS.

(d) Assumes that 50% of TRUSS pipeline system will be sold to other companies at year-end 1977.

Clearly, 1975-1976 is the period of peak outside funding needs for the company. In 1977 initial cash flow from startup of the pipeline at 600,000 b/d along with a drop off in TAPS expenditures should result in sharply reduced external financing needs. The importance of the \$117.5 million of investment tax credit as a source of earnings in the 1977 projection is particularly noteworthy. Because of these benefits, actual North Slope earnings of 600,000 b/d will be significantly higher than might be suggested by simply applying an estimate for fully taxed margins on the oil at that level of throughput. Non-cash charges including pipeline depreciation (\$16.8 million), capitalized interest amortization (\$4.5 million), and deferred taxes (\$42.6 million) are also quite meaningful factors assisting the 1977 funding picture. Based on all of these considerations, and *assuming that similar ice problems do not develop in 1976*, permitting an on-time startup at the *phase one* volume, it appears that the financial consequences of this year's barge difficulties can be handled within Sohio's current funding plan.

As discussed in some detail in our May report, Sohio's financing of the pipeline should be viewed separately from Prudhoe Bay development and other expenditure needs. To meet its mammoth pipeline requirements of the next few years, Sohio management has already lined up several substantial sources of funds including (1) a \$600 million line of bank credit (of which \$125 million was drawn down as of September 5, 1975), (2) two public debt issues totaling about \$339 million (8 5/8% Notes due 1983 and 9 3/4% Debentures due 1999), and (3) a \$1.75 billion private placement of BP/Sohio pipeline debt of which \$1,186.5 million is net to Sohio. In all, slightly more than \$2.0 billion of pipeline debt has been arranged if it is assumed that bank lines will be completely drawn down and converted to an intermediate term loan, as is Sohio's option. At an assumed 85% debt ratio for total pipeline expenditures, including capitalized interest, additional pipeline debt funding requirements would be on the order of \$325 million if the system cost assumption used here (i.e. 10% further cost escalation) remains intact.

Beyond TAPS debt needs, the remaining capital obligations of the parent company consist of (1) the unfunded portion of the 15% equity in the pipeline, (estimated at \$280 million through 1977*), (2) the \$749 million of field development work, (3) other capital expenditures of \$331 million, (4) \$255 million of Alaskan reserves tax obligations, and (5) \$125 million toward a trans-U.S. pipeline system. Available to partly meet these \$1,740 million of other requirements, Sohio has \$275 million of unused bank lines (parent's \$300 million facility) and an estimated \$852 million of available cash flow. This leaves an unfunded balance of approximately \$888 million.

Viewed in the foregoing context, management's decision to proceed with an equity offering is hardly surprising, and it seems fair to conclude that the current two million share sale may not be the last. In fact, this analyst's working assumption continues to be the ultimate sale of up to six million new shares prior to commencement of North Slope production. At an average price of \$75 per share, this would cover slightly more than 50% of the remaining external funding needs already outlined, with the balance currently expected to be met by (1) additional parent company debt, (2) inter-company adjustments in field development

*This assumes that the parent company's advances to Sohio Pipe Line which total approximately \$110 million, are fully converted to equity.

costs, (3) advance crude sales, and (4) disposition of other corporate assets. The latter two options were both discussed in our earlier report and are available to management under the soon-to-be finalized covenants of the private placement. The next table recapitulates these details of Sohio's financing needs and arrangements to date.

Standard Oil (Ohio)			
Financing Requirements & Arrangements			
(In millions)			
TAPS expenditures	\$2,428	Arranged but unused credit (a)	\$1,355
Capitalized interest	455		
Total TAPS	\$2,883	Remaining TAPS debt to be arranged	
Less expenditures through mid-1975	900	(\$1,680 less \$1,355)	325
Remaining expenditures	\$1,983		
TAPS debt financing to 6/30/75	923	Total additional debt	\$1,680
Remaining expenditures to be financed			
(\$2,883 less \$923)	1,960		
Equity needed (\$2,883 x 15% less		Remaining parent pipeline equity	
\$152) (b)	280	requirement	280
Debt capacity (\$2,883 x 85%, less	1,680		
\$771)(c)	<u>1,680</u>		
Total to be financed	\$1,960	Total	\$1,960

Other Activities

Total uses (ex TAPS) less total sources	
(\$1,460 less \$831)	\$ 629
Non-debt sources (d)	170
Debt requirements	459
Combined Financing Needs:	
Debt	\$2,139
Non debt	450
Total	\$2,598

(a) \$1,186.5 million private placement plus \$168.5 million of Sohio Pipe Line's bank credit not backing up \$431.5 million of commercial paper.

(b) Includes \$42 million of existing equity and assumed conversion of \$110 million of parent company advances.

(c) TAPS debt financing through mid-1975 is \$771 million.

(d) \$450 million of assumed proceeds from equity sale less \$280 million contributed to pipeline equity.

Based on the financing expectations just outlined, it appears that Sohio's long-term debt will nearly triple from the mid-1975 level as shown in the following projection of the company's balance sheet position for year-end 1977.

(See table on following page)

Standard Oil (Ohio)

Partial Balance Sheet Data
(In millions)

	June 30, 1975 (Unaudited)	December 31, 1977 (Estimated)
Long-term debt	\$1,180	\$3,319(a)
% of total capitalization	48.0%	64.9%
Preferred stock	11	11
% of total capitalization	0.4%	0.2%
Special stock (BP)	25	25
% of total capitalization	1.0%	0.5%
Common shareholders' equity	1,247	1,758
% of total capitalization	50.6%	34.4%
Total capitalization	\$2,463	\$5,113

Totals may not add due to rounding.

(a) Does not include \$720 million of tanker construction/charter obligations and lease commitments of \$200 million for the use of the El Paso natural gas facilities.

If our projections prove reasonably accurate, footnote (a) above could become significant since Sohio management has agreed to a covenant in the TAPS private placement which establishes a \$3,750 million limitation on permitted indebtedness for financing its share of TAPS construction costs, production facilities, and tankers. If the company's non-North Slope related debt is backed out of the estimated 1977 figure, it appears that Sohio could be approaching this ceiling by late 1977. However, one must also note that management has considerable flexibility here in that it is possible to reduce its tanker obligations by arranging to sell oil at Valdez, which in effect shifts tanker commitments to other offtakers. The explicit provision allowing for this possibility suggests that it is an option that will receive active management consideration if further cost escalation or an earnings shortfall from these projections causes Sohio to more closely approach the debt ceiling. In all, further cost escalation for TAPS and field development, along with the Alaskan reserves tax, have certainly made Sohio's financing task no less formidable than at the time of our last *Basic Report*; however, Sohio's arrangements to date — including an all but concluded private placement financing — provide good evidence of the continuing manageability of the financial situation.

Financial Position Review — Atlantic Richfield Company

Based on our revised cost parameters for pipeline construction and Prudhoe Bay field development, the following table summarizes Arco's past and projected cost position.

(See table on following page)

Atlantic Richfield

Estimated North Slope Pipeline and Development Costs
(In millions)

	Expended Through 1974	Approximate Remaining Obligation	Total
TAPS:			
To 1.2 million b/d	\$285	\$1,188 (a)	\$1,473(b)
To 2.0 million b/d (c)	—	196	196(d)
Capitalized pipeline interest through mid-1977 (c)	25	250	275
TAPS total	\$310	\$1,634	\$1,944
Field development	79	341	420(f)
Total North Slope	\$389	\$1,975	\$2,364

(a) Includes \$215 million spent through May 31, 1975.

(b) 21% of Alyeska's latest cost estimate (\$6,375 million) escalated by 10% to \$7,012.5 million.

(c) Not including additional costs associated with a future realignment of TAPS ownership interests.

(d) 21% of Alyeska's latest cost estimate (\$850 million) escalated by 10% to \$935 million.

(f) 21% of an estimated \$2,375 million of total field development costs necessary to reach productivity of 1.5 million b/d.

Out of total North Slope expenditures of \$2,364 million outlined above, \$389 million, or 16%, had been expended through 1974. Based on a number of unspecified assumptions, Arco management's own estimate of the cost to develop its share of the proven oil and gas reserves in the main Prudhoe Bay field through 1990 approximates \$2.5 billion. As discussed in the Sohio Financial Position section, field development expenditures do not take into account the possibility that the time value of early expenditures made by Sohio for the western operating area will be recognized under field unitization.

Including an incremental financing requirement necessitated by the passage of the Alaskan reserves tax and other appropriate modifications to the writer's earlier assumptions, the next table updates Arco's sources and uses of funds and indicated financing needs over the 1975-1977 period.

(See table on following page)