ALASKA STATE LEGISLATURE
JOINT MEETING
SENATE SPECIAL COMMITTEE ON ENERGY
HOUSE RULES STANDING COMMITTEE
June 7, 2008
10:10 a.m.

MEMBERS PRESENT

SENATE SPECIAL COMMITTEE ON ENERGY

Senator Charlie Huggins, Chair
Senator Bert Stedman, Vice Chair
Senator Kim Elton
Senator Lyda Green
Senator Lyman Hoffman
Senator Gary Stevens
Senator Joe Thomas
Senator Bill Wielechowski

HOUSE RULES

Representative John Coghill, Chair
Representative Anna Fairclough
Representative Craig Johnson
Representative Ralph Samuels

MEMBERS ABSENT

SENATE SPECIAL COMMITTEE ON ENERGY

Senator Lesil McGuire
Senator Donald Olson
Senator Fred Dyson
Senator Thomas Wagoner

HOUSE RULES

Representative John Harris
Representative Beth Kerttula
Representative David Guttenberg

OTHER LEGISLATORS PRESENT

Senator Con Bunde
Senator Fred Dyson
Senator Johnny Ellis

Senator Hollis French
Senator Gene Therriault
Senator Joe Thomas
Senator Gary Wilken

Representative Bob Buch
Representative Mike Chenault
Representative Harry Crawford
Representative Nancy Dahlstrom
Representative Andrea Doll
Representative Mike Doogan
Representative Bryce Edgmon
Representative Les Gara
Representative Mike Hawker
Representative Lindsey Holmes
Representative Craig Johnson
Representative Reggie Joule
Representative Scott Kawasaki
Representative Wes Keller
Representative Mike Kelly
Representative Bob Lynn
Representative Kevin Meyer
Representative Mark Neuman
Representative Jay Ramras
Representative Bob Roses
Representative Woodie Salmon
Representative Paul Seaton
Representative Mike Stoltze
Representative Peggy Wilson

COMMITTEE CALENDAR

SENATE BILL NO. 3001
"An Act approving issuance of a license by the commissioner of revenue and the commissioner of natural resources to TransCanada Alaska Company, LLC and Foothills Pipe Lines Ltd., jointly as licensee, under the Alaska Gasline Inducement Act; and providing for an effective date."
HEARD AND HELD

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HEARD AND HELD

PREVIOUS COMMITTEE ACTION

BILL: SB3001
SHORT TITLE: APPROVING AGIA LICENSE
SPONSOR(s): RULES BY REQUEST OF THE GOVERNOR

06/03/08	(S)	READ THE FIRST TIME - REFERRALS
06/03/08	(S)	ENR
06/03/08	(S)	REPORT ON FINDINGS AND DETERMINATION
06/04/08	(S)	ENR AT 10:00 AM TERRY MILLER GYM
06/04/08	(S)	Heard & Held
06/04/08	(S)	MINUTE(ENR)
06/05/08	(S)	ENR AT 9:00 AM TERRY MILLER GYM
06/05/08	(S)	Heard & Held
06/05/08	(S)	MINUTE(ENR)
06/06/08	(S)	ENR AT 10:00 AM TERRY MILLER GYM
06/06/08	(S)	Heard & Held
06/06/08	(S)	MINUTE(ENR)
06/07/08	(S)	ENR AT 10:00 AM TERRY MILLER GYM

BILL: HB3001
SHORT TITLE: APPROVING AGIA LICENSE
SPONSOR(s): RULES BY REQUEST OF THE GOVERNOR

06/03/08	(H)	READ THE FIRST TIME - REFERRALS
06/03/08	(H)	RLS
06/03/08	(H)	WRITTEN FINDINGS & DETERMINATION
06/04/08	(H)	RLS AT 9:00 AM CAPITOL 120
06/04/08	(H)	Heard & Held; Subcommittee Assigned
06/04/08	(H)	MINUTE(RLS)
06/04/08	(H)	RLS AT 10:00 AM TERRY MILLER GYM
06/04/08	(H)	Heard & Held
06/04/08	(H)	MINUTE(RLS)
06/05/08	(H)	RLS AT 9:00 AM TERRY MILLER GYM
06/05/08	(H)	Heard & Held
06/05/08	(H)	MINUTE(RLS)
06/06/08	(H)	RLS AT 10:00 AM TERRY MILLER GYM
06/06/08	(H)	Heard & Held
06/06/08	(H)	MINUTE(RLS)
06/07/08	(H)	RLS AT 10:00 AM TERRY MILLER GYM

WITNESS REGISTER

TONY PALMER, Vice President
Alaska Business Development
TransCanada Alaska LLC

POSITION STATEMENT: Answered questions and continued his PowerPoint presentation during hearing on SB 3001 and HB 3001.

PATRICK GALVIN, Commissioner
Department of Revenue
Juneau, AK
POSITION STATEMENT: Answered questions during hearing on SB 3001 and HB 3001.

TOM IRWIN, Commissioner
Department of Natural Resources
Juneau, AK
POSITION STATEMENT: Answered questions during hearing on SB 3001 and HB 3001.

BOB SWENSON, Director
Division of Geological & Geophysical Surveys
Department of Natural Resources
Fairbanks, AK
POSITION STATEMENT: Gave a PowerPoint presentation on undiscovered resources and answered questions during hearing on SB 3001 and HB 3001.

DAVE HOUSEKNECHT, Geologist
U.S. Geological Survey
U.S. Department of the Interior
POSITION STATEMENT: Assisted with PowerPoint presentation and answered questions during hearing on SB 3001 and HB 3001.

ACTION NARRATIVE

CHAIR CHARLIE HUGGINS called the joint meeting of the Senate Special Committee on Energy and the House Rules Standing Committee to order at 10:10:16 AM.

SB3001-APPROVING AGIA LICENSE
HB3001-APPROVING AGIA LICENSE

10:10:16 AM
CHAIR HUGGINS brought SB 3001 and HB 3001 before the committees. He noted that there would be follow-up questions for TransCanada and additional information from Mr. Palmer; Commissioners Galvin and Irwin were available for questions. Also on the agenda was a presentation from Bob Swenson of the Department of Natural Resources (DNR) and Dave Houseknecht of the U.S. Geological Survey (USGS).

10:12:48 AM
TONY PALMER, Vice President, Alaska Business Development, TransCanada Alaska LLC, indicated he would share information

sent since yesterday's meeting. Referring to discussion of whether Keystone contracts were made available publicly in regulatory forums, he reported that in a Canadian National Energy Board (NEB) hearing, Keystone did provide redacted pro forma copies of the transportation service agreements for its base system; those are available online at:

https://www.neb-one.gc.ca/ll-eng/livelink.exe?
func=ll&objid=444693&objaction=browse

MR. PALMER noted that the second issue relates to whether TransCanada could prevent a party that had built a pipeline to TransCanada's Alberta system from entering it. He said provisions in the NEB Act and the provincial regulator require TransCanada to interconnect. Section 71(3) of that Act governs construction of new facilities for federally regulated pipelines.

MR. PALMER said even if TransCanada didn't want it, NEB has had the power for decades to require expansion or interconnection. Reading from Section 71(3)(c), he said NEB can require the junction of a pipeline with other facilities for the transmission of hydrocarbons or other commodities if the board finds it places no undue burden on the company.

10:15:53 AM
SENATOR THOMAS asked: What is considered a competing pipeline with respect to size? Is 0.5 billion cubic feet a day (Bcf/day) the capacity absent any expansion? Does it matter whether it comes from the Foothills or the North Slope? Would financial incentives such as tax provisions make a difference? And when it comes to an independent builder without state participation, how does that play in?

10:17:16 AM
PATRICK GALVIN, Commissioner, Department of Revenue (DOR), responded that 0.5 Bcf/day is the initial capacity. Any pipeline can be expanded. The idea was to make the assurance, recognizing that any applicant will assess its opportunity to acquire sufficient firm transportation (FT) commitments. If the state sponsored another pipeline in some financial way and it took away some existing gas that could be committed to this Alaska Gasline Inducement Act (AGIA) line, it would diminish the likelihood of success for this pipeline. So the administration would focus on the initial amount to hit that threshold.

COMMISSIONER GALVIN discussed what assistance the state might provide that would trigger this mechanism. He said the statute was carefully crafted to focus on financial assistance, including tax breaks, targeted to that particular project. An overall tax change wouldn't target a particular project. Also, as he'd responded yesterday, the state clearly would still provide and even coordinate all the regulatory processes for these other

projects. But because the state is a sovereign, and to have a clean decision-making process, none of that activity would trigger this provision.

COMMISSIONER GALVIN addressed the question of whether the gas comes from the Foothills or the North Slope. He said those could be considered competing for the same gas supply. It wouldn't be gas in Nenana, for instance, because the target of AGIA is from the North Slope to market. As to whether this would hinder a private company trying to pursue the line without any state financial assistance, he said no. While it clearly allows for competing projects to advance, it doesn't allow the state to provide financial assistance to those competing projects.

MR. PALMER concurred.

10:21:09 AM

TOM IRWIN, Commissioner, Department of Natural Resources, added that 0.5 Bcf/day might sound small, but he'd put it in context. Under AGIA, 0.5 Bcf/day or less doesn't compete. For example, 10.0 Bcf/day goes from Canada to the U.S. The 0.5 to be used within Alaska is 5 percent of that. If there is a 4.0 to 4.5 Bcf/day line, 0.5 Bcf/day would be all the state's royalty gas, significant quantities for in-state use.

COMMISSIONER IRWIN referred to Cook Inlet and indicated 0.19 Bcf/day is used for liquefied natural gas (LNG) today. That would leave 0.31 for in-state use including Agrium. In 1998, with Agrium running, it was 0.142. Predicting by 2020 it will be up to 0.18 of the 0.19, he concluded that 0.5 Bcf/day allows for all the in-state use that can feasibly be foreseen, all Alaska's royalty gas if it chooses.

COMMISSIONER IRWIN emphasized that gas will be available in Alaska. He said it doesn't compete and is a separate issue. This isn't either/or. In fact, if it rose to 1.0-1.5, some would have to be exported, fitting with the "Y-line" concept. There is plenty at 0.5 Bcf/day.

REPRESENTATIVE RAMRAS questioned the math, citing calculations of 100 Bcf a year with a build-out in Fairbanks and the presumption of being able to nominate adequate gas once there is infrastructure. He mentioned adding Flint Hills and the build-out of Fairbanks, Anchorage, and Agrium.

REPRESENTATIVE RAMRAS also recalled a trip that he, the Speaker, and the commissioner took to China to see what markets exist; he said if trade with China isn't likely in the near future, it doesn't preclude it with Korea or Japan. He emphasized getting gas right now to energy-isolated communities including Fairbanks, expressing concern that it may require a larger pipeline to be viable, which AGIA precludes.

10:26:13 AM
COMMISSIONER IRWIN clarified that he was talking per day, whereas Representative Ramras was talking per year. He said if those numbers are divided by 365 days, then 0.5 Bcf/day satisfies it. Economical energy is needed today for Alaskan businesses as well as for Alaska's future, which doesn't compete with what Representative Ramras was talking about.

COMMISSIONER IRWIN indicated the Chinese opportunities have been looked at with experts. The economics appear best if there is a line to Canada that then sets up the gas treatment plant (GTP) and the pipeline to Delta; the administration concludes that a Y-line to Valdez would make terrific economic sense. Noting that the two tie together, he reminded members that he'd testified when AGIA was proposed as a bill that he wouldn't be satisfied until Alaska has both. This is a route to both, he said, a clear path forward.

10:28:02 AM
COMMISSIONER GALVIN reminded members of yesterday's discussion of false choices, the idea that there must be a choice between Alaskan gas now versus AGIA. He agreed with Representative Ramras that if the goal is to meet Alaska's needs now with a pipeline which pays for itself, ultimately that must connect to a much larger market, with LNG for export and a larger-capacity line. The question becomes at what point a balance is reached so there is a quick LNG project that is economically viable. He asked, however, whether this is really the goal.

COMMISSIONER GALVIN explained that if the goal is to maximize value to Alaskans, there are two interests: 1) revenue, monetizing North Slope gas to the maximum possible, encompassed in AGIA; and 2) getting gas to Alaskans. He said the administration's analysis of a large-capacity line, the TransCanada project, versus an LNG project showed that tens of billions of value in today's dollars would be lost by switching from the TransCanada project to an LNG project.

COMMISSIONER GALVIN therefore opined that the State of Alaska could build a small-capacity line to serve Alaska's needs entirely with state money and not worry about economies of scale. That would be a tremendously better economic decision for the state and would get gas to Alaskans more quickly than hooking it up to an LNG project.

COMMISSIONER GALVIN pointed out that even small-capacity LNG projects have timeline considerations, as analyzed in the finding. The entire supply-route chain must be lined up. This includes having the gas committed, along with the question of who will commit gas to an LNG project for an Asian market. It also includes getting the export license, lining up contracts, and so on. That won't be quick.

COMMISSIONER GALVIN emphasized the opportunity to choose. He said if Alaskans believe gas truly is the fuel of the future - better than going for a hydroelectric project or other alternatives - then the state can build the line, which will be cheaper than forgoing TransCanada's Alaska project.

10:31:34 AM
REPRESENTATIVE RAMRAS remarked, "Only if we make it so." He said 1) he doesn't hear a "can do" attitude from the two commissioners about providing gas for Alaskans; 2) he stands on his math for annual usage for Anchorage, Fairbanks, and potentially others along the Railbelt and down to Valdez, as well as Agrium and Flint Hills; and 3) he hears $500 million going to a Canadian multinational conglomerate and an interest in getting gas to Alaskans after a large line is built because that provides value to the state treasury, not the household incomes of Alaskans.

COMMISSIONER IRWIN responded by indicating he cares equally about in-state usage. He again highlighted the per-year versus per-day calculations, reiterating his belief that 0.5 Bcf/day clearly covers it all, and more. He emphasized that he absolutely believes, as does the administration, in the energy needs of today. This AGIA project doesn't compete with in-state use, he said. It's two different issues.

10:33:53 AM
SENATOR THERRIAULT reported that he'd met with ENSTAR Natural Gas Company ("ENSTAR") representatives when they were in town; they have a $6 million budget to start working on the economics of a bullet line and indicated they're being approached by companies with products around the world, pitching composite versus steel pipe, for instance. When asked, they'd indicated they need nothing from the state government right now, other than perhaps assistance with permitting and gathering information.

SENATOR THERRIAULT highlighted two ways to ensure that in-state gas is affordable and that the tariff doesn't price it out of the market. First, capacity can be ramped up, since any molecule riding a bigger line gets a cheaper ride and the farther it goes, the better. Or, second, the debt can be paid down. He asked: Has the administration considered helping to pay down the debt so a bigger line isn't needed to deliver an affordable product to Alaskans?

10:35:43 AM
COMMISSIONER GALVIN responded that economical energy is an issue this administration has taken head-on. The Alaska Energy Authority is undertaking long-term planning, and this legislature will talk soon about short-term energy relief and how that builds into a mid-term and long-term energy plan.

COMMISSIONER GALVIN addressed whether the administration would consider paying down the cost of a bullet line to lower the

tariff to provide affordable energy. He said that's been discussed publicly as an option. However, to simply rush in and say the answer to the energy future is a bullet line doesn't recognize alternative energy choices that state dollars could go towards instead.

COMMISSIONER GALVIN said that public dialogue needs to occur, and AGIA was set up to allow that discussion. The administration has a "can do" attitude and wants to find solutions, but it requires a joint effort, based on facts and true choices for long-term energy needs.

COMMISSIONER GALVIN reminded members that many bumper-sticker solutions have impacts. For instance, if a bullet line takes all the state royalty gas and provides it to Alaskans at a cheaper price, it will affect tax revenue, royalty revenue, and Alaskans' permanent fund dividends. That trade-off needs to be recognized. Is it the most cost-effective way of solving this problem? That choice needs to be made with the best information available.

COMMISSIONER GALVIN noted that 0.5 Bcf/day is 500 million cubic feet a day. Within the Southcentral area, which uses natural gas to generate electricity, the entire market including homes and commercial operations uses 252 million cubic feet a day. That's currently served by the Cook Inlet gas supply.

COMMISSIONER GALVIN also noted that export of LNG is about 190 million cubic feet a day. Agrium at its peak almost a decade ago used about 150 million a day. All that will continue to be served by Cook Inlet for years; if the desired exploration is successful, it should be served for decades.

COMMISSIONER GALVIN concluded by saying there are two issues: 1) an immediate need to get gas to Alaskans, which doesn't conflict with AGIA, and 2) the long-term need, for which spur lines off the main line are the solution; those aren't in competition, either, and won't be implicated by this provision. Noting a big question is whether approval of the AGIA license somehow precludes the state from solving this problem of low-cost gas for Alaskans, he said the answer is no.

10:41:34 AM
REPRESENTATIVE DOOGAN asked: When does the state's commitment to TransCanada to not financially support a competing pipeline end?

COMMISSIONER GALVIN referred to the statute and replied it ends upon commencement of commercial operations of the pipeline.

MR. PALMER agreed.

10:42:16 AM
SENATOR STEDMAN pointed out that many parts of Alaska such as Kodiak or Southeast won't see a gas line, and there are serious

issues in Western Alaska related to fuel costs. He emphasized the need for solutions statewide, not just for the Railbelt.

COMMISSIONER IRWIN replied he couldn't agree more. Indicating this significant issue could have different answers in various parts of the state, he cautioned against focusing so hard on one area that others are missed.

10:43:29 AM
REPRESENTATIVE NEUMAN mentioned high fuel prices around the state including the Yukon River. He asked if the soonest natural gas can get to Alaskans is when the pipeline is built and gas flows.

COMMISSIONER GALVIN replied no. He clarified that he'd said the state can satisfy the needs of Alaskans separately.

REPRESENTATIVE NEUMAN surmised that would entail a spur line off of the main line.

COMMISSIONER GALVIN answered no. He said the state could build a separate line if there's a collective decision that it's the best choice among the energy options.

REPRESENTATIVE NEUMAN gave his understanding that if it's over 0.5 Bcf/day or 500 million cubic feet, there couldn't be financial incentives from the state.

COMMISSIONER GALVIN agreed if it's bigger than 500 million. However, he said it is unlikely to get anywhere close to that size to meet the needs of folks on the Yukon.

REPRESENTATIVE NEUMAN indicated he'd received information that peak capacity without Agrium was 480 million cubic feet a day. Alluding to a presentation by Econ One, he said in the event of an unsuccessful open season, TransCanada expects the state to use its sovereign status to encourage, induce, and persuade Alaska North Slope (ANS) producers to commit gas. He asked how the state would likely do that, in light of the Denali project.

COMMISSIONER GALVIN requested that he wait until tomorrow, when an entire day was scheduled to address that.

10:48:10 AM
CHAIR HUGGINS said AGIA reduces flexibility by limiting the volumes, but volume doesn't matter if it isn't economically feasible. Noting new projects will create demand, he said this body passed a resolution on in-state gas, a subject many of his constituents feel strongly about. He stressed the need to separate false choices from good ones to retain the flexibility to feasibly get in-state gas to Alaskans, wherever they live.

COMMISSIONER GALVIN replied he agrees 100 percent with the need to focus on ensuring all options are kept available to satisfy

in-state needs. While the assurances in the AGIA license do limit the state's flexibility, this doesn't preclude a solution to Alaska's in-state energy needs, given the demand expected within Alaska, current supplies in Cook Inlet, and the timeframe before getting to the main line.

10:51:18 AM
REPRESENTATIVE JOHNSON asked: Does it trigger the treble damages if we decide it's best to build a bullet line and it doesn't reach the expected threshold, but is capable of delivering more than 0.5 Bcf/day through compression or looping?

COMMISSIONER GALVIN replied no. It would happen if there were an open season seeking more than the 0.5 Bcf/day. Any line could be expanded, so that capability wouldn't be the threshold.

10:52:26 AM
REPRESENTATIVE WILSON asked: If prices continue to climb, might there be a point where the price is as high as or higher than what is paid now, even if there is a line for Alaska?

COMMISSIONER GALVIN answered yes. Clearly, it could rise beyond what people pay now, even if the state subsidized every transportation aspect. That's why, when looking at a long-term choice, policymakers must consider the options. These include whether to lock the state into a nonrenewable resource such as natural gas for the long-term supply or go with a renewable source or something like hydroelectric power as an alternative.

COMMISSIONER GALVIN cautioned against seeing natural gas as a panacea because at this moment the price is lower than other choices. He emphasized that this decision needs to be made conscientiously. Particularly in Southcentral Alaska, folks are looking at the next generation of energy supply, and the state will be locked into that for 30 years or more. This is a critical juncture, with a great opportunity to decide.

10:54:40 AM
COMMISSIONER IRWIN recalled hearing someone in Nome say he wants the big line, but wants it treated as a drug dealer would treat his drugs - as a seller, not a user. That person had asked for renewable, clean energy for the future of the state. Commissioner Irwin suggested that parallels this discussion.

REPRESENTATIVE WILSON told members she believes the state should look at renewable energy because people will need to be wise about how they spend their money to convert their furnaces and so on. She suggested communities especially need to look at that.

REPRESENTATIVE ROSES said he agrees with the math. If a line impacts the volume in the big line, financially it's better to generate revenue and then subsidize the other line by having the state pay transportation costs. He expressed concern, though,

that a precedent has been set by discussing a $1.2 billion subsidy to citizens to offset high energy costs. He suggested the calculation should anticipate that folks will want that subsidy until the line exists; thus the savings account for paying that down may dwindle.

10:56:56 AM
CHAIR HUGGINS asked Mr. Palmer to elaborate on TransCanada's involvement in a change in AGIA during the course of the debate on that legislation, from 50 percent reimbursement up to the current 90 percent.

MR. PALMER replied last year, as AGIA was being established, he'd testified six times before the Senate and House regarding TransCanada's position on proceeding beyond an open season. He recalled being asked whether there was some incentive the state could provide to potential applicants under AGIA if it required that parties continue beyond a failed open season; he'd answered that the state could increase its contribution. That's the extent of TransCanada's involvement in that process, he said.

MR. PALMER noted the state came back with a proposal which did that and maintained the requirement that a successful applicant must continue beyond a failed open season and go through Federal Energy Regulatory Commission (FERC) certification. It also increased the state's percentage of contribution post-open season, but it maintained the $500 million cap.

MR. PALMER, as to whether TransCanada had considered that in evaluating whether to apply under AGIA, said definitely yes. He surmised it was a consideration for other parties as well, who likely also examined whether the $500 million is sufficient.

10:59:53 AM
CHAIR HUGGINS recalled those discussions in committee. Indicating the amendment was proposed by the administration, he surmised there were communications in that respect and noted Commissioner Galvin was to give a follow-up answer.

COMMISSIONER GALVIN replied he hadn't had time to go back through the legislative record last night, but his recollection was similar to Mr. Palmer's, that there was ample testimony during the initial hearings from potential applicants who expressed concern about the risk/reward trade-off. This was one of many amendments generated by the administration during the process. As to whether the matching-contribution distribution was responsive to TransCanada's request, he said it was.

CHAIR HUGGINS asked whether it was based on negotiations or discussions with TransCanada.

COMMISSIONER GALVIN specified that it was based on the input from TransCanada that came through the committee process.

CHAIR HUGGINS asked whether that included raising the reimbursement to 90 percent.

COMMISSIONER GALVIN replied yes. What he didn't recall, though, was what the other potential applicants said during their testimony and if they specifically discussed the post-open season matching contribution. He indicated the administration was addressing a number of concerns raised by potential applicants at the time; this was one. As Mr. Palmer said, TransCanada was on record as saying it needed a change there.

SENATOR STEDMAN clarified for the public that while the administration may work up recommended amendments, those need to have a committee member's sponsorship. Committee members make the amendments.

11:03:11 AM

MR. PALMER returned to the PowerPoint presentation he'd begun yesterday, "TransCanada's AGIA Application Presentation to the Legislature"; a handout duplicated the slides. He began with slide 26, "Canada - Advantages of the NPA - Timing," which had the following points relating to the Alaska Pipeline Project (APP) and Canada's Northern Pipeline Act (NPA):

Certificate of public convenience and necessity has been issued by statute (section 21 of the NPA)

- Public interest determination has been made
- Process for meeting current environmental standards and approving design plans will include input by appropriate stakeholders and First Nations but will not revisit the go/no go decision

Single window, expeditious regime

- Cabinet is authorized to transfer the powers of any department or agency of the Gov't of Canada to the Minister responsible for the NP Agency
- Minister is entitled to second employees from any dept or agency (including the NEB) to the NP Agency

MR. PALMER noted he'd testified a number of times on Canadian regulatory issues. TransCanada has held the certificate of public convenience and necessity for this project in Canada for some 30 years. He emphasized that while environmental issues will be reviewed, there will be no revisiting of the go/no go decision.

MR. PALMER told members the single-window, expeditious regime is very different from what has occurred on the Mackenzie project. While the Northern Pipeline (NP) Agency has been modestly staffed, appropriately so, it has authority to second employees, as it has in the past for the pre-build and every expansion of Foothills Pipe Lines, obtaining staff from across the government of Canada, including the NEB, to review the project.

MR. PALMER, in response to a query, explained that to second is to transfer employees on a temporary basis from their regular department under the aegis or authority of the NP Agency.

11:04:30 AM
MR. PALMER addressed slide 27, "Canada - Advantages of the NPA - History of Implementation," which said:

> The NPA has a history of implementation that will provide the precedents required to move forward on the APP.
>
> The NPA was used as the regulatory vehicle for the following:
>
> - Construction of the Pre-Build (approximately 25% of the Canadian portion of the APP)
> - Construction of 5 Expansions of the Pre-Build
> - Other - acquisition of Duke's Interest in Foothills (as recently as 2003-2004)

MR. PALMER emphasized that the NPA has been used many times, including for pre-build facilities put in place in 1981-1982 and further construction through 1998, as well as acquisition of Duke's interest in Foothills five years ago.

MR. PALMER discussed slides 28-29, "Canada - Advantages of the NPA - Flexibility," which had the following points:

> NPA is not prescriptive as to volume or design
>
> - Sec. 3 (Treaty): "The initial capacity of the Pipeline will be sufficient to meet, when required, the contractual requirements of the United States shippers and of Canadian shippers."
> - Sec. 1 (Treaty) indicates that the line size may be 48-54 inches in diameter "or any other combination of pressure and diameter which would achieve safety, reliability and economic efficiency ... the decision relating to pipeline specifications remains the responsibility of the appropriate regulatory authorities."

- NPA is not prescriptive as to timing

- No sunset date in legislation

NPA is uniquely designed to meet current standards by requiring:

- Approval by the Designated Officer of plans submitted by Foothills to implement the approved project

- Foothills to comply with all undertakings it provided during the NEB hearing and to provide to DO, for approval:

  - Final detailed design and detailed construction procedures and specifications

  - A schedule for project control, including schedules for regulatory reviews and approvals

  - Results of further studies (environmental, social and economic matters) as may be ordered or directed by the DO

  - Business and opportunity plans, environmental plans and procedures, plans for meeting Terms & Conditions

MR. PALMER noted he'd heard parties ask whether the project has changed somehow because the capacity is different now. He emphasized that the treaty language isn't specific to a particular capacity. On the first point, Section 3 (Treaty), he said Canadian shippers at the time contemplated moving Mackenzie Valley gas down this pipeline; this is a separate project. The language is permissive as to volumes, not restrictive.

MR. PALMER explained that an NEB certificate generally has a two-year sunset date. There was no such provision on this certificate because the parties didn't know the construction date at the time. Also, there is a particular named individual called the designated officer (DO), usually a member of the NEB who, under the NPA, is given specific duties and responsibilities; those would be provided for members' review.

11:08:01 AM
MR. PALMER addressed slide 30, "Canada - Advantages of the NPA - Land Rights," which had the following points:

Foothill holds a right-of-way (ROW) in the Yukon

- Provides access through Yukon along the route of the APP

- Acknowledged in the Umbrella Final Agreement by Yukon First Nations, Canada and Yukon
  - Final agreements have been entered into by the Kluane, Champagne Aishihik and T'an Kwach'an First Nations, Kwanlin Dun, Carcross/Tagish and the Teslin [Tlingit] Council

- ROW has since been approved by Cabinet pursuant to Sec. 37 of the NPA and remains in full force and effect

MR. PALMER said TransCanada has held the right-of-way (ROW) through the entire Yukon Territory for this project since 1983. Ten years after it was granted, an umbrella agreement recognizing the ROW was reached among all Yukon First Nations, represented by the Council for Yukon Indians at the time; the Canadian government; and the Yukon Territory government.

MR. PALMER, noting six of the eight subsequent final land claims established in the Yukon Territory specifically recognized that ROW, gave his understanding that the same would happen with the other two when their land claims are resolved. That ROW remains in full force and effect.

11:08:59 AM
MR. PALMER discussed slide 31, "Canada - Other Land - BC and Alberta," which had the following points:

- In BC, Foothills holds Map Reserves under the Land Act and Mining Reserves under the Mining (Placer) Act for all lands required for pipeline purposes

- In Alberta, Foothills holds a Consultative Notation with respect to Provincial Crown Lands

- The effect of the above is to give notice of intended use of land to all others and provides Foothills with the opportunity to review and comment upon any conflicting proposed development

- The normal process for acquiring Crown land rights will occur as the project progresses; including a License of Occupation (Land Act) in BC and a Pipeline Agreement (Public Lands Act) in Alberta

- Negotiations with landowners for privately held lands

MR. PALMER explained that whereas the Yukon Territory is relatively virgin territory for gas pipelines, British Columbia (BC) and Alberta have had pipelines some 50 years. TransCanada has 15,000 miles of pipe in Alberta and knows how to get these

things done there, he assured members, noting competitors have thousands of miles of pipe in BC. There is an established process with an established group of officials as well as legislation to do this.

11:09:50 AM
CHAIR HUGGINS clarified that the Foothills Mr. Palmer had referenced is unrelated to Alaska's foothills geography.

SENATOR FRENCH asked why TransCanada has a right-of-way through the Yukon Territory but not BC, going all the way to Alberta, since it seems that would have been part of the process over the last many years. He also asked what resistance might exist to getting that through BC.

MR. PALMER replied the rationale some 25 years ago was that it was potentially difficult to get a ROW through the Yukon, so it was sought earlier than normal. Alberta and BC were expected to have a straightforward process, which usually is done after the open season; that is how TransCanada has contemplated it.

MR. PALMER added that it isn't unusual for certain parties to try to extract value from a pipeline company or other infrastructure developer, to prosecute either political or legal angles in that attempt. This happens all the time on infrastructure projects, and TransCanada faces it daily. However, that process - both legislative and regulatory - is well handled in Alberta and BC, and TransCanada deals with 100 First Nations on its existing system across Canada every day.

11:12:04 AM
REPRESENTATIVE SAMUELS alluded to issues in Canada. Mentioning the NPA process versus the NEB process, he asked whether TransCanada would go to court to stand up for its rights.

MR. PALMER answered that he believes both the State of Alaska and the government of Canada have a letter on record from TransCanada's chief executive officer to that effect.

REPRESENTATIVE SAMUELS mentioned the money at stake in the project and asked: Do you see a problem with respect to timing if the Canadian court system determines this issue, if Enbridge goes through with an NEB process or TransCanada goes through with an NPA process?

MR. PALMER replied that Enbridge, along with any other party, had every opportunity to participate in the AGIA process but hadn't done so; nor did Enbridge submit a final bid under the Stranded Gas Development Act (SGDA) process and complete that by agreeing to reimbursement with the former administration. He added that if TransCanada is granted this AGIA license and is proceeding, it is in effect not addressing the exclusivity issue. TransCanada

would be prosecuting the project under NPA, and he wasn't aware of Enbridge having a competing project.

COMMISSIONER GALVIN reported that the state did hire an analysis of that issue, comparing the two and also looking at Canadian permitting issues in general. Indicating that's in the finding and appendix, he specified that Bennett Jones was the Canadian counsel hired to do an analysis of all legal issues associated with the Canadian permitting; their conclusions on timing and potential impacts to the schedule are incorporated into the administration's analysis of the project economics. Someone from Bennett Jones would be available Monday and Tuesday.

11:15:37 AM
CHAIR HUGGINS asked about the First Nations structure, including whether this entails privately held land and whether the parties are tribes or corporations such as exist in Alaska.

MR. PALMER explained that TransCanada will be negotiating with individual First Nations groups, which generally don't have Native corporations. Eight First Nations in the Yukon Territory are along the ROW; TransCanada holds the ROW through the entire Yukon and already has access to the lands, but must negotiate benefits with those parties.

MR. PALMER said specific benefits laid out in the terms and conditions to NPA some 30 years ago along the ROW are the law of Canada. TransCanada will meet those and has done preliminary negotiations with a number of First Nations about improving on the law of the land in this regard. It's a very different circumstance than exists for the Mackenzie Valley project.

REPRESENTATIVE DAHLSTROM asked: If TransCanada couldn't successfully negotiate with one of the First Nations, would that group be able to sue and stop the project? And in that case, who would be liable for the costs incurred?

MR. PALMER responded that TransCanada cannot prevent a party from going to court on any issue. However, TransCanada has terms and conditions established in the Act after significant hearings on this some 30 years ago and is offering to enhance those. If negotiations are unsuccessful and parties don't want benefits superior to what was offered 30 years ago, TransCanada would rely on the rights and obligations under the law. That doesn't preclude parties from taking a political angle, as described earlier to Senator French, or going to court.

MR. PALMER said if a party chose to do that, it could delay the process, although there are some limitations on that. It could also increase the cost of the project, since delay costs money. TransCanada would bear some of that risk, as described in its capital cost risk assessment, and the shippers would bear some. He surmised in that case, a number of parties would be highly

motivated to resolve this issue, but he reiterated that some who see a major infrastructure development might seek to extract value in whatever fashion they could.

11:19:51 AM
REPRESENTATIVE DAHLSTROM asked: Could the State of Alaska potentially incur some cost also, an unknown amount?

MR. PALMER answered that the state wouldn't have a direct payment. But since the state is a royalty and tax collector, its net value could go down if the cost of the pipeline goes up. While acknowledging that there could be some impact, he offered assurance that TransCanada has the law on its side, 30 years of dealing with parties on this project, and 50 years' experience dealing with 100 First Nations.

CHAIR HUGGINS asked about the Mackenzie project delays.

MR. PALMER replied he isn't an expert on that, although he has observed it from afar. A number of issues have delayed that project in the regulatory arena, including the regulatory process established as a result of land-claims resolutions in the Northwest Territories; the process under the NEB Act, which doesn't have an expedited or single-window regime; and negotiations with First Nations on both benefits and access.

CHAIR HUGGINS asked how long that delay is.

MR. PALMER recalled there was a commercial agreement among the owners and shippers in 2003 or early 2004, and the hope is for an NEB decision by 2009. Subsequent to that, additional land and water use approvals must be obtained. After that, the project will proceed.

SENATOR FRENCH observed that Mr. Palmer had emphasized access in distinguishing the Alaska project from the Mackenzie project delays. He asked about that distinction.

11:23:25 AM
MR. PALMER answered that there are two distinguishing factors: 1) access and 2) that there is law on terms and conditions that establishes base benefits. As for access, TransCanada holds the right-of-way through the Yukon Territory. By contrast, the Mackenzie Valley project will be obtaining a ROW after getting regulatory approval.

MR. PALMER paraphrased slide 32, "Canada - Environment," noting he'd spoken about some of these already. Slide 32 said:

Fundamental Decisions

In passing the NPA, Parliament clearly:
- Decided that the APP is in the public interest

- Determined there is a need for the APP
- Recognized a general route for the APP
- Recognized that environmental and social impacts, while expected, would be acceptable with mitigation
- Created NP Agency to be the exclusive regulatory agency to determine environmental and socio-economic issues related to the completion of the APP, i.e. what was appropriate and what required mitigation

11:24:19 AM
MR. PALMER turned to slide 33, "AGIA 'Must-haves' Promote Basin Development," which said:

- Rolled-in tolls up to 115% of initial rates in Alaska
- Open Season every 2 years
- In-State deliveries
- Distance-sensitive tolls
- Minimum 5 delivery points
- Low equity ratio requirement for pipeline sponsors
- State fiscal incentives (if any) targeted to AGIA pipeline shippers

MR. PALMER added he believes these are important for long-term basin development. Highlighting recent significant discussion of rolled-in tolls, he indicated other slides would address this. With respect to the open season every two years, he mentioned expansions with engineering increments.

MR. PALMER said in-state deliveries off this pipeline couldn't occur until 2018. The schedule provided yesterday indicates that if TransCanada is granted a license in August - assuming all necessary approvals and customer requirements are in place - project completion will be in September 2018. If the legislature approves it more quickly and TransCanada knows that in advance, it could significantly improve the schedule by providing additional time in the summer.

11:26:16 AM
REPRESENTATIVE FAIRCLOUGH asked how inflation will affect the tariff and rolled-in rates, the 115 percent, and access and equity in the pipeline.

MR. PALMER gave his understanding that no inflation factor is added in to the 115 percent. If TransCanada's numbers were perfectly correct, and including fuel the pipeline were completed for $2.76, that number in nominal dollars would be in effect; 15 percent would be added to the Alaskan section of the pipe, not the Canadian section, which is governed by NEB rules.

MR. PALMER, saying inflation could "take that issue away," added that generally pipelines don't have straight-line depreciation. Often a relatively balanced approach over time is seen with

expansions and depreciation of the pipe. But there certainly are occasions when inflation causes costs to go up.

REPRESENTATIVE FAIRCLOUGH mentioned the Trans-Alaska Pipeline System (TAPS) for oil and her understanding that no additional producers can transport their commodity to market on TAPS. With respect to the Alaskan portion of this gas line, she asked: What happens in the three big producers buy up all the capacity during the open season?

11:28:45 AM
MR. PALMER noted he isn't an expert on TAPS, but replied that for this gas project, if the three large North Slope producers today decide to take 4.5 Bcf/day capacity, that's good and the pipeline will be put into service. If other parties also want capacity in the initial open season, say, an additional 0.5 or 1.0 Bcf/day to serve in-state or out-of-state markets, TransCanada will design the pipeline for 5.0 or 5.5 Bcf/day. That's one circumstance.

MR. PALMER said if, however, only those three big producers bid in the open season for 4.5 Bcf/day and TransCanada wants to expand, he has shown some economics both in TransCanada's application and in responses to the Legislative Budget & Audit Committee (LB&A or BUD). Other slides show results for a particular case LB&A requested, and he has shown circumstances where expansions went through 7.2 Bcf/day early in the game.

MR. PALMER concluded by saying there is significant flexibility, but he cannot predict inflation. Looking at today's circumstances, however, he doesn't see that inflation in the short term, after "in service," will deny access based on that provision. That provision doesn't deal with just 115 percent in Alaska in the short run. If costs exceed 115 percent, there is a significant benefit because 115 percent will be rolled in and only the number above that will be incremental.

REPRESENTATIVE FAIRCLOUGH expressed concern that if the three big producers own more than 51 percent of the line, there could be access issues for other producers to open the basin.

MR. PALMER replied that TransCanada believes if it brought in other parties under the AGIA license as shareholders, they would be obliged to take on the same obligations that TransCanada will have under that license. He indicated he'd heard from a number of parties over the past few days about their expectations of TransCanada as a good partner with regard to this issue.

11:31:22 AM
SENATOR GREEN asked: Is it common in contracts to have a mandatory open season schedule prior to construction of a pipeline? She requested examples of pipeline projects for which there has been a mandatory open season directed in advance.

MR. PALMER answered it's common to have open seasons for a pipeline before proceeding with certification. That's the normal process. And if it hadn't been mandated, TransCanada or any other commercial party would pursue it in that fashion. What is different here, to his belief, is the mandate to go to the market every two years for an expansion. However, this isn't an issue for TransCanada, which seeks expansions on an economic basis continually, as a normal course of business, on all its pipelines. It has done so for 50 years.

MR. PALMER explained that, as a pipeline company, TransCanada is highly incentivized to go to the market continually to ensure it's serving future customers as well as current ones. Expressing hope that he'd showed how it has assisted TransCanada's business in the long run, he added that it was an easy "must have" for TransCanada to agree to.

11:33:46 AM
SENATOR THERRIAULT alluded to the AGIA amendment discussed earlier that raised the percentage to 90 percent. Reinforcing Senator Stedman's comments that the legislature is in charge of the amendment process, Senator Therriault reported that he'd just called his own staff and found on the Senate side that language was included in the committee substitute (CS) from the Senate Finance Committee. Indicating the rolled-in rate and 115 percent came from FERC for the U.S. portion of the line, he asked whether NEB generally uses a rolled-in-rate methodology.

MR. PALMER affirmed it's the norm in Canada and has been for decades. Rolled-in tolls occur whether costs go up or down, he said, and there isn't a limit such as the 115 percent. That has worked well to expand Western Canadian systems for 50 years, and it remains the norm. He expects it to apply to this project.

11:35:10 AM
MR. PALMER followed up on a question from Representative Kelly to another witness a couple of days ago. He recalled that it involved potential delivery to Fairbanks of an additional 50 million to 100 million cubic feet of gas a day from the pipeline.

MR. PALMER reported that he'd spoken carefully with TransCanada's engineering group, who'd indicated if the pipeline is constructed for 4.5 Bcf/day to Alberta as the initial nominated volume, then the way TransCanada can operate the pipeline would allow some spare capacity as far south as Fairbanks, up to 100 million a day. That's in addition to what would go to Alberta if Fairbanks grew over time.

MR. PALMER continued with slide 33, noting he'd talked before about the low equity ratio that has lowered the tolls. If the state decided to change its fiscal incentives, those would be targeted to this pipeline.

11:36:33 AM
MR. PALMER read from slide 34, "Long-run Basin Development - Pipeline Expansions," which posed these questions:

- Value to Producers / Governments?
- Does Alaska have enough gas?
- Drilling impacts?
- Impact of rolled-in tolls?

He said the second question relates to gas beyond Alaska's proven reserves.

MR. PALMER discussed slide 35, "Value of Potential Expansions ($Billions)." Assuming an annual average netback of $6.89/MMBtu, it listed: the base project at 25 years (4.5 Bcf/day), with combined producer/government revenue of $350 billion; expansion Case I, base volumes for 10 years and 30 percent expansion for 25 years (5.9 Bcf/day), with combined revenue of $600 billion and expansion value of $250 billion; and expansion Case II, base volumes for 10 years and 60 percent expansion for 25 years (7.2 Bcf/day), with combined revenue of $700 billion and expansion value of $350 billion.

MR. PALMER specified that these are based on economics in TransCanada's application, not the administration's assessment shown in Anchorage last week. Noting the company had to make assumptions in its application about producers' production costs and what production taxes would be, he said TransCanada doesn't profess to be expert in either area and thus he'd pooled those to try to avoid that issue.

MR. PALMER indicated this takes the netback after the gas is sold in Alberta, using U.S. Energy Information Administration (EIA) forecasts that TransCanada was provided for 2006; that gas price was just under $10 per Mcf in nominal terms, on average, over 25 years. Since prices in Alberta are now at $10, that assumes no increase for the next 34 years. The $350 billion is the value to be shared among the producers and governments. Of course, the producers would have to pay production costs, take their profits, and pay taxes to the governments.

MR. PALMER explained that for expansion Case I, TransCanada's look at this basin says this is relatively conservative, with no expansions in the first 10 years of service. For a base volume of 4.5 Bcf/day for 10 years and then 30 percent expansion for an additional 25 years, as he recalled, proven reserves would have to increase from 45 Bcf to some 78 Bcf. This gives $250 billion in value to the producers and governments.

MR. PALMER said expansion Case II, with 60 percent expansion at year 10 up to 7.2 Bcf/day, doubles the value of the base project. These are direct revenues only, not benefits Alaska would see

through all the indirect drilling and development to achieve this or multiplier effects.

11:40:19 AM
MR. PALMER turned to slide 36, "Basin Development - Western Canada Example," which had two graphs and the following points:

Pipeline expansion can create "virtuous circle"
- More exploration and drilling
- If successful, leads to more pipeline expansion

Exploration and drilling drives service industry and employment over long term

MR. PALMER noted this relates to his opening statements. The left graph shows completed Western Canadian Sedimentary Basin (WCSB) gas wells since 1955. In 1955, folks knew TransCanada's pipeline was in the works and were drilling and completing 180 wells a year; there were 200 by the time it went into service in 1958. That has grown massively over time. He emphasized that it is the expansions and induced drilling that provide the employment, not operation of the existing pipeline.

MR. PALMER explained that the right-hand graph shows what has happened with Western Canadian potential and proven reserves as well as cumulative production. In 1955, it was expected that there'd be 75 trillion cubic feet (Tcf); now it's above 250 Tcf. Some 150 Tcf has been produced over the last 50 years. Proven reserves 10 years after the pipeline went into service had almost quadrupled, from 15 Tcf in 1955 up to 55 Tcf in 1968. At that point, they leveled off.

MR. PALMER explained that proven reserves level off because producers and other parties don't tend to prove up reserves to store them in case of a strong market. Keeping enough for 8-10 years is the norm in Canada and the Lower 48. So as there has been an increase in production, proven reserves have been relatively steady.

11:43:09 AM
REPRESENTATIVE SAMUELS returned to the expansion cases on slide 35, asking about the amount of gas at Prudhoe Bay.

COMMISSIONER GALVIN indicated he'd been using 24 Tcf and said there'd be rock experts later.

REPRESENTATIVE SAMUELS surmised that if there were 24 Tcf at Prudhoe Bay and no more exploration, nobody could win if at least 45 Tcf total would be needed over time.

MR. PALMER clarified that TransCanada's analysis looked at the economics from the Prudhoe Bay owners' perspective if they accepted capacity and didn't find additional gas and thus ended

up with spare capacity for that 25 years. The conclusion was still that it would be a positive investment for them.

MR. PALMER said it can be looked at in terms of whether the desire is to keep the line filled throughout that and maximize that. If so, new gas must be found. But as to whether they have to find the gas to make money, TransCanada has found that isn't the case.

REPRESENTATIVE SAMUELS asked whether, from TransCanada's perspective, the line could be built and operated and would pay with 24 Tcf total.

MR. PALMER answered that this analysis assumes 4.5 Bcf/day into the pipeline and 5.0 into the gas treatment plant (GTP), which is how the 45 Tcf is arrived at that he'd described. If there is less than 4.5 Bcf/day contracted over 25 years, TransCanada believes it needs 3.5 Bcf/day to make the pipeline through Canada work, as described previously. TransCanada believes the economics still work.

MR. PALMER added he hadn't looked at the specific case that the administration looked at, taking a contract and being responsible for the tolls over this timeframe with a lower volume. While he'd sat through some of the administration's presentations and didn't disagree fundamentally, he hadn't done his own analysis.

COMMISSIONER IRWIN commented that there is another 9 Tcf at Point Thomson, so there is plenty.

REPRESENTATIVE SAMUELS said his question didn't revolve around Point Thomson. It was philosophical, the fear being that expansions won't happen if the ConocoPhillips-BP Denali project beats this project to FERC, cuts a tax deal, and so on. He asked: Does it behoove the Prudhoe Bay owners to just monetize their own gas, or does it enhance their project to go to 45 Tcf over time? And would TransCanada take the risk to monetize 24 Tcf if there were no other gas besides Prudhoe Bay gas?

11:47:30 AM
MR. PALMER replied that TransCanada hadn't done that analysis, but believes there is sufficient gas in this basin to go beyond the volumes shown. Referring to a graph, he said the top line indicates 45 Tcf over the course of 25 years; the second, 78 Tcf over 35 years; and the third, 90 Tcf over 35 years.

MR. PALMER, noting he isn't a geologist, cited TransCanada's experience in other basins, not just in Canada. He opined that if TransCanada puts an expandable pipeline in place and can succeed with it, proven reserves will grow in order to serve this market. It assumes this gas will be economic in the market, that there'll be a decent gas price and so on. But he hasn't looked at this basin contemplating only 24 Tcf.

MR. PALMER contrasted that with Mackenzie Valley, where the pipeline initially will have one-quarter this capacity and proven reserves are 6 Tcf, significantly less on a ratio basis, with less potential as well. Returning to Alaska, he said TransCanada believes, if it is granted a license and is successful, that this will be a highly prolific basin that can draw expansions to the project over time. So, no, he hadn't looked at in terms of only moving 24 Tcf forever.

11:49:20 AM
REPRESENTATIVE SAMUELS thanked Mr. Palmer and announced he would draft a letter. He said the point of the question was when the economics would flip so it wasn't desirable from the standpoint of an original shipper with 24 Tcf of gas. Acknowledging there are many factors, he opined that intuitively someone would want to get to 45 Tcf in order to mitigate the risk that tariffs would go through the ceiling, and thus would want to explore for gas.

MR. PALMER noted he hadn't understood the first question that way and would try to respond. He surmised that customers who execute contracts obliging them to pay for 4.5 Bcf/day for 25 years, if that's what is decided, will seek to mitigate risk by producing 45 [Tcf] over the course of that 25 years; that should give them the highest possible value. He added he wouldn't speak for those parties, who clearly are well qualified to speak for themselves.

COMMISSIONER GALVIN suggested that before drafting his letter, Representative Samuels should look at the report done by Black & Veatch in the modeling. He said when looking at the reserve risk, the administration was surprised by the amount of actual risk in making those commitments. One question was whether the project will only be economic if new discoveries are made. He said the answer, surprisingly, was that it still will be economic even if those future discoveries aren't made and they end up with an oversized line.

COMMISSIONER GALVIN interpreted Representative Samuels' question to have changed at the end, initially asking whether a producer-owned pipeline would have similar motivations to have exploration taking place on the North Slope.

REPRESENTATIVE SAMUELS explained that he believes the fear is a bit unfounded until it gets to where the tariff starts to go back up. After that point, he agrees with the general perspective of AGIA that the state's interests need to be protected. Until it gets to the 45, though, the risk allocation among shippers - including the state as a shipper - will always mean having a little more gas in there to ensure that the tariffs don't go through the roof on the remaining gas as it dwindles.

COMMISSIONER GALVIN suggested the question is whether to have a pipeline that encourages the three big producers to explore or

that encourages an entire market of new entrants to explore and take on the associated risk. He said he believes, from the administration's perspective, the answer is clear: The administration wants one that encourages a whole suite of new explorers to come up to Alaska.

REPRESENTATIVE SAMUELS conveyed his thanks, saying he looked forward to the Black & Veatch presentation again.

11:53:27 AM
MR. PALMER prefaced slide 37 by turning to the protections FERC provides under the legislation put in place for this project almost four years ago, as well as FERC regulations. He said he would read specific citations and comment on how that could affect whether rolled-in tolls would occur on a pipeline that isn't proceeding under AGIA.

MR. PALMER reminded members that the Alaska Natural Gas Pipeline Act (ANGPA) was passed in October 2004. The FERC regulations governing conduct of open seasons for Alaska gas transportation projects were issued in February 2005; he and other parties gave presentations in Anchorage when a hearing was held in December 2004 on those, and TransCanada argued vigorously for a rebuttable presumption of rolled-in tolls, as did other parties including the State of Alaska.

MR. PALMER explained that those FERC regulations govern voluntary expansions - he emphasized voluntary - by the pipeline company. There is a rebuttable presumption of rolled-in tolls for voluntary expansions proposed by a pipeline company. This presumption applies except where an expansion is mandated pursuant to Section 105 of ANGPA, which authorizes FERC to order an expansion of an Alaska pipe under certain criteria. That is unusual in the U.S., although NEB has held that power in Canada for decades. He said it is some protection under ANGPA.

MR. PALMER again paraphrased Section 105. He said if FERC orders an expansion, it can establish rates on an incremental or rolled-in basis, but it must ensure that the rates don't require existing shippers to subsidize expansion shippers. He pointed out that "subsidize" isn't defined in this context.

MR. PALMER also said obtaining a FERC order to expand the pipeline would be time-consuming and costly, as opposed to having a pipeline company voluntarily agree under AGIA to go forward and apply for an expansion. Shippers would be in a very different circumstance if they must request that FERC mandate an expansion when they haven't found gas yet and are considering whether to explore. Also, they no longer would have the absolute protection of a rebuttable presumption of rolled-in tolls.

MR. PALMER noted that AGIA requires a pipeline sponsor to file for rolled-in tolls up to 115 percent of the initial tolls; it

has been well explained that this doesn't guarantee how FERC will rule. Saying the positions that initial shippers and expansion shippers will take are known, he surmised the position of the pipeline company may well be the tipping point as to whether there will be rolled-in tolls.

MR. PALMER further noted that AGIA requires the pipeline company to test the market every two years and commit to expand voluntarily. As discussed, for TransCanada this isn't a burden because the company does this in its normal course of business. Of course, TransCanada in its AGIA application made those commitments, as required by AGIA.

11:58:33 AM
SENATOR WIELECHOWSKI asked: If TransCanada makes 14 percent regardless of how much is in the line, what is the incentive to expand the line? Does the company make more money when it goes from 4.5 to 7.2 Bcf/day?

MR. PALMER answered it isn't volume-specific. However, the company then has an opportunity to continue to invest its money at a profitable rate in its base business. In effect, it's highly attractive to have brownfield expansions on an existing facility. This also allows diversifying the supply and markets over time, which TransCanada believes is good for its business and is inherently aligned with what any government would wish.

SENATOR WIELECHOWSKI surmised that with a producer-owned line, there would be more incentive to expand because it would put more of the producer's product in the line.

MR. PALMER, noting he wanted to be very careful in responding as to what TransCanada's potential shippers may wish to do, replied that his experience over a long time has been that existing customers are always keen to expand for their own volumes and not necessarily for other producers' volumes.

CHAIR HUGGINS reminded members that FERC will be in Anchorage to respond to questions during this session.

The meeting was recessed from 12:01:08 PM until 1:33:49 PM.

MR. PALMER discussed slide 37, the first of two labeled "Impact of Rolled-in Tolls?" It had a bar graph with the heading "Incremental Costs." A note said it was for Alaska and Yukon-BC sections only, and it listed these assumed volumes:

4.5 Bcf/day years 1 & 2
5.9 Bcf/day years 3 & 4
6.5 Bcf/day years 5 & 6
7.2 Bcf/day years 7 & beyond

MR. PALMER explained that this specific example was requested of TransCanada by LB&A, which had provided a scenario for an expansion case commencing at 4.5 Bcf/day for the first two years and so on, as shown. TransCanada ran that case, and the graph shows incremental costs if the project were tolled incrementally. It was run for the pipeline only, not the GTP, which is why the numbers are lower than seen before.

MR. PALMER noted for the pipeline only, the cost for 4.5 Bcf/day would be about $1.76. Going up to 5.9 Bcf/day with compression, incremental costs would actually be lower than that, as described previously. Once it moves up to 6.5 and 7.2 Bcf/day on an incremental basis, however, it increases dramatically. At 7.2 Bcf/day, that number is about $4.28 on an incremental basis.

1:36:08 PM
MR. PALMER discussed slide 38, which had one graph on the left labeled "Rolled-in Tolls (Initial and Expansion Customers)" and another labeled "FERC Lower 48 'Standard'" that showed separate bars for initial and expansion customers. The slide also said:

> Rolled-in tolls increase chance of expansions above 5.9 Bcf/d
> - 35% lower tolls for expansion customers to 6.5 Bcf/d
> - 50% lower to 7.2 Bcf/d

MR. PALMER explained that this shows the impact under AGIA and the "115 percent test" on rolled-in tolls. He noted that the horizontal line labeled "AGIA Standard (115% of initial)" on the left-hand graph was just above $2.00.

MR. PALMER pointed out that if incremental costs are rolled in, this graph shows a decline from 4.5 to 5.9 Bcf/day, a modest decrease just under 10 cents. Going up to 6.5 Bcf/day, it coincidentally increases by approximately 10 cents. And moving up to 7.2 Bcf/day, the toll increases to about $2.00. While still under the 115 percent test in AGIA, the price on a rolled-in-toll basis would have increased for the base customers.

MR. PALMER noted that the graph on the right shows what would happen if FERC's Lower 48 standard were applied to this project. That standard is to roll in the tolls, averaging them, when tolls go down. When moving from 4.5 to 5.9 Bcf/day, the tolls decline, as also seen in the left-hand chart. But whenever the tolls go up, base customers stay at that lower toll. So if this were a Lower 48 pipeline, new explorers would pay incremental tolls. At 6.5 Bcf/day, it would be $1.00 higher; at 7.2 Bcf/day, it would be $2.50 higher.

MR. PALMER surmised that this permanent increase relative to base customers would be a significant factor for a potential explorer in deciding whether to explore in this basin and commit gas. He noted the state wrestled with this policy issue last year in

establishing AGIA and deciding whether to ask the pipeline sponsor to propose rolled-in tolls up to 115 percent of the initial toll. He said rolled-in tolls are important, as are the FERC rules as to which rates shown on the graph the pipeline sponsor will propose.

1:39:21 PM
CHAIR HUGGINS asked whether FERC's Lower 48 standard applies to the Alaska gas pipeline.

MR. PALMER said FERC's Lower 48 standard doesn't apply for a voluntary expansion. However, for a mandatory expansion there is the provision he'd described, the subsidy question. If that is interpreted to imply an increase, which some parties have argued, then it would apply for a mandatory expansion, an expansion that the pipeline sponsor did not support.

CHAIR HUGGINS asked whether the left-hand graph that describes rolled-in rates relates to the request, not the FERC decision.

MR. PALMER replied that is what the pipeline sponsor is required to request of FERC. As described today, the positions of the existing customers and future customers are known. What the pipeline requests can often be the tipping point.

1:41:16 PM
MR. PALMER turned to climate change, slides 39-42, noting Representative Seaton had asked some related questions over the last several months. Slide 39, "Climate Change Challenge - Overview," had the following points:

- Global concerns continue to grow.
- Intergovernmental Panel on Climate Change (IPCC) strengthens argument to limit manmade greenhouse gases (GHGs).
- Most common mandate GHG is carbon dioxide (CO2).
- Bulk of CO2 emissions generated by combustion of fossil fuel.
- Meeting the growing demand for energy while lowering GHGs is challenging as fossil fuels are abundant and inexpensive compared to low carbon alternatives.

MR. PALMER highlighted the final point as the key message. He then relayed information from slide 40, "Alaska's Greenhouse Gas Emissions," which had two pie graphs and the following text:

> The United States emits approximately 14% of global manmade GHG emissions.
>
> Alaska emits less than 1% of US domestic GHG emissions: 52 million of 7076 million tonnes CO2e.

1:41:44 PM

MR. PALMER summarized slide 41, "Alaska and Climate Change," which said:

Alaska faces a unique challenge:
- Alaska and other regions at high northern latitudes will experience greater warming trends resulting from climate change. ("Warming is expected to be greatest over land and at most high northern latitudes...." Section 3.2.2, Page 46, Climate Change 2007: Synthesis Report, IPCC)

- Supplying natural gas to markets will increase Alaska's emissions levels, however it will also help address the challenge of climate change by potentially displacing higher carbon fuels

- Natural gas is cleanest burning fossil fuel, emitting approximately 50% less CO2 than coal at the burner tip and roughly 25% less CO2 than oil when combusted

MR. PALMER discussed slide 42, "TransCanada's Climate Change Activities," which had the following information:

Emissions Reduction Programs
- Leak Detection and Repair Program
- Blowdown Management
- High Efficiency Engines

Technology Development
- Supersonic Ejector Patent
- Incineration
- Field test RB211-6761

Sharing Knowledge
- Methane to Markets (Washington, China, Russia)
- USEPA Natural Gas Star - since 1990s

MR. PALMER elaborated, saying TransCanada has had a long-term leak detection and repair program on its existing pipeline systems and inspects all pipelines, valves, fittings, and so on. Blowdown management is when maintenance is done on a piece of pipe and gas must be dealt with between the valves being addressed. TransCanada has a new piece of equipment and now combusts that fuel, rather than venting it into the atmosphere.

MR. PALMER told members this is to try to address climate change issues and be a cleaner, more environmentally friendly company. Noting he would discuss the Supersonic Ejector patent shortly, he said TransCanada has been an active participant in both Canadian and U.S. conferences and workshops around the world.

1:43:38 PM

MR. PALMER turned to slide 43, "Technology Excellence," which had two photographs and the following text:

> TransCanada is currently operating the world's first Rolls-Royce RB211-6761.
>
> Unit demonstrates high efficiency (40%), low NOx and CO2 emissions.
>
> Features include: remote stand-alone operation, modular design (ease of maintenance, reduced downtime).

MR. PALMER noted he'd described a highly efficient and low-fuel-consumption pipeline that TransCanada has proposed, 2.15 percent fuel on this pipeline from Prudhoe Bay to Boundary Lake. TransCanada proposes to use highly efficient compressors. The company put this Rolls-Royce RB211-6761, the largest compressor available, into service on its Alberta pipeline system to test it five years ago. Proven technology that has operated for five years, it is the type of compressor likely to be used on this Alaska pipeline.

MR. PALMER briefly discussed slide 44, "TransCanada Invents New Gas Technology," which had a photograph and this text:

> Supersonic Ejector reinjects very low pressure methane into high pressure gas stream
>
> Benefits include:
> - GHG reduction of 1,700 tCO2e (per unit per year),
> - Savings of $28,000 (per unit per year),
> - Zero operating cost.

MR. PALMER explained that there are dry seals on the pipelines and a modest emission of gas at those seals. TransCanada is patenting a technology that removes those methane emissions from the environment.

1:44:59 PM
MR. PALMER addressed slide 45, "GHG Emissions from Long Haul Natural Gas Pipelines," which had the following information:

> TransCanada's Alberta System - 2.5 million tonnes CO2e (typically 900 PSI, 11 bcfd, 300 miles average distance of haul)
>
> TransCanada's Mainline - 3.8 million tonnes CO2e (typically 900 PSI, 7 bcfd, 1400 miles average distance of haul)
>
> Proposed GTP - 4.1 million tonnes CO2e

Proposed pipeline/facilities - 2.0 million tonnes CO2e (2500 PSIG, 4.5 bcfd, 1715 miles)

MR. PALMER indicated the carbon dioxide equivalent (CO2e) is in metric tonnes; he wasn't certain of the conversion to U.S. tons. As for the Alberta system, he said TransCanada has 15,000 miles of pipe and moves gas on average 300 miles, with 1,100 receipt and delivery points. The mainline refers to TransCanada's system from Alberta to eastern North America.

MR. PALMER noted the final point shows the proposed project. The GTP is where the bulk of the emissions will come from, since that's where the bulk of the fuel is consumed. It has a high fuel ratio at that facility. He told members there is no technology yet developed to efficiently capture greenhouse gas emissions from compressor-fuel gas combustion. The 2.0 million tonnes is for the entire pipeline moving south.

MR. PALMER paraphrased slide 46, "Climate Change - Alaska Pipeline Project," which had the following points:

TransCanada will responsibly manage GHG emissions associated with the pipeline.

TransCanada's efforts to control emissions from this project will include the use of Best Management Practices in pipeline design and operation including:
- Installation of the highest efficiency engines that are suitable for this application
- Use of high strength steel, which will lower fuel usage by allowing higher pressure operation
- Implementation of industry leading methane management programs

MR. PALMER noted he'd described how TransCanada has controlled emissions. He added that the company is the leader in high-strength steel, welding technology, and operation of pipelines.

1:46:59 PM
MR. PALMER discussed slide 47, "Summary," which said:

Last year, the Administration and Legislature established AGIA as Alaska's transparent and competitive process to advance a gas pipeline project
- AGIA was structured to encourage:
  - Construction of base project
  - Long-run basin development
  - Open access terms for:
    - Initial and future shippers
    - In-State, Lower 48, and LNG markets

TransCanada has the credentials and capacity to build, own, operate and expand the project

TransCanada's objectives are aligned with AGIA
- Early in-service
- Long-run basin development
- Open access - equitable treatment for all customers

MR. PALMER thanked the legislators for their attention and questions. He said TransCanada is highly motivated to advance the project, succeed with it, and obtain the license.

1:48:20 PM
REPRESENTATIVE SEATON expressed appreciation that Mr. Palmer had addressed emissions. He asked: If carbon credits are issued for this project in excess of what is later needed, how will those be handled? Will those credits or any income from them help to lower the tolls?

MR. PALMER answered that there is no mechanism in place to deal with carbon credits at this time, either on the state or federal level that he's aware of. As those come forward, there will have to be an examination and response at that time.

1:49:34 PM
REPRESENTATIVE FAIRCLOUGH asked about access and a correlation involving proven reserves as a way to fill the pipeline. She explained that Alaska reportedly has a closed-access pipeline under TAPS. A constituent's e-mail had just cited a Texas Railroad Commission model that allows access or capacity allocations based proportionately on proven reserves. That allows for exploration. If more reserves are brought onto their books, they reallocate the transportation ability; this increases profitability and allows new producers to find space even on larger pipes if they prove up reserves.

COMMISSIONER GALVIN deferred to FERC representatives who would speak tomorrow, saying he believes it's more a regulation matter. He opined that the response may relate to the difference between how an oil pipeline is regulated versus a gas pipeline - common carriage versus contract carriage.

MR. PALMER noted he isn't an expert in oil transportation systems, but agreed it sounds like an oil mechanism, where generally there are common carriers. For a large Alberta oil pipeline to the U.S., for instance, parties are prorated based on either nominations or proven reserves.

MR. PALMER compared that with contract carriers, which natural gas pipelines normally are. If someone contracts for 300 million a day, he explained, the pipeline must reserve that amount on a firm basis each and every day and isn't allowed to prorate it. He added that while he wasn't aware of any common carriage in the gas pipeline business, he hadn't researched the Texas Railroad Commission on this issue.

1:54:05 PM
REPRESENTATIVE RAMRAS asked about TransCanada's market capitalization relative to that of the producers; whether TransCanada intends to execute this project on its own; TransCanada's capacity to handle this project; the lack of FT commitments; the notion that for a 4.5 Bcf/day pipeline over 25 years, the capacity could be off by 20 Tcf; and how TransCanada will handle cost overruns if it cannot get the $18 billion in federal loan guarantees.

MR. PALMER answered that TransCanada's market capitalization today is just above $20 billion; he doesn't dispute the numbers others have stipulated on the record for ConocoPhillips and BP. They are large corporations, as is TransCanada. But no company will build this pipeline on the basis of its market capitalization only.

MR. PALMER said he doesn't believe any company has committed, now or in the past, to build this pipeline on speculation, including those proposing alternatives to the AGIA project; as he recalled, their public statements to date have been that they'll hold an open season, and he wasn't aware that they'd committed to build any pipeline - nor has TransCanada or anyone else. He'd described in the last two days why that is so. Even with the financial capacity to commit $30 billion to build on speculation, without a loan guarantee or money from anyone else, no party is capable of achieving that.

MR. PALMER explained that gas pipelines are developed in a certain fashion. TransCanada proposes to do this in a fashion that's traditional and takes advantage of the U.S. government loan guarantee; as indicated previously, TransCanada believes there's an innovative way to use that for cost overruns. If that isn't available, however, TransCanada still intends to proceed with the project and use the loan guarantee for base capital as it's currently structured.

MR. PALMER further replied that while there've been only preliminary discussions with U.S. officials, TransCanada doesn't believe a change in legislation is required, since regulations haven't been promulgated, but he'd had no assurance about that. If TransCanada is unsuccessful in obtaining U.S. government approval for using the loan guarantee for overruns, it will prosecute the project as described, taking a portion of the capital-costs risk and having the customers take the remainder.

MR. PALMER assured Representative Ramras that TransCanada is large enough to do this project. The company built a longer facility when first incorporated, for instance, when its market capitalization approached zero. It continues to build large projects. TransCanada has a $5 billion oil pipeline underway and hopes to soon have a second component that will bring it up to some $13 billion, approximately half the capital cost of this

Alaska project; TransCanada has a partner, having sought one, and is pleased to be working with ConocoPhillips on that.

MR. PALMER opined that TransCanada has the capacity to do this project alone, as described before. In addition, TransCanada believes strongly from the statements of the current North Slope leaseholders that if they become shippers - which they haven't committed to - they are highly interested in becoming an owner of this pipeline. If that doesn't happen, TransCanada has other partners available, if it so desires.

MR. PALMER pointed out that if this is a successful project, TransCanada also has available the public markets to raise equity if so required. For projects developed in the last two years, it has done so successfully, as described earlier. Referring to cash-flow numbers shown over the past couple of days, he said if TransCanada doesn't succeed with any new projects beyond the current ones on its books, it has a history of developing new projects and expanding its cash flows beyond those.

2:01:40 PM
MR. PALMER noted there'd been questions about Ravenswood and the debt-rating agencies. He said TransCanada was put on a ratings watch, which is normal on a large transaction; a month later Standard & Poor's confirmed its rating at A- and Canada's DBRS did the same, while Moody's has it at a higher notch but might lower it to A- after review. He opined that the fact that TransCanada has been able to finance in the public markets for a difficult circumstance, when the markets are unstable, proves it has access to the market for equity or debt, if so required.

MR. PALMER added that the U.S. loan guarantee will assist the project whether it's available for overruns or not. TransCanada has raised $3 billion in the public markets in the last 15 months and $2 billion in the debt markets. But while TransCanada has the capacity to do this project as proposed, it won't advance it through construction without customers or credit. Mr. Palmer said he has been clear on that issue for 12-16 months and doesn't believe any party will advance without contracts. Nobody to date that he's aware of has promised to do so, either large companies - TransCanada being one - or small ones.

2:03:25 PM
REPRESENTATIVE RAMRAS voiced appreciation for the response, but characterized this as a fool's errand. He opined that the leaseholders have been explicit that there'll be no gas for this project. And the state's seed money won't change the behavior of these large corporations. He also suggested that if this were a boardroom in the private sector, it wouldn't withstand scrutiny because the empirical data before the legislature isn't sufficient to presume this will move toward a transaction. He said he would carry this message across the state.

COMMISSIONER GALVIN took exception to the assertion about gas commitments. He specified that the producers have never said they won't commit gas to this project. Rather, they've expressed concern about aspects of AGIA they believe will cause them to consider that issue, and they've clearly expressed a desire for additional changes to the state fiscal system, based on their desire for profitability of this project.

COMMISSIONER GALVIN indicated the issue of how to get gas committed to this project will be discussed over the next couple of days. It is a challenge to get that gas to the TransCanada project, he said, but not one that has been precluded. In addition, experts who've looked at this project closely have said there is a high likelihood the gas will ultimately be committed once the interests have lined up.

COMMISSIONER GALVIN also took exception to the suggestion that if this were a boardroom, somehow the decision would be different. He said he didn't know how many legislators at the forum last week had talked to the Goldman Sachs folks in particular or others who advise the boards of these energy companies about opportunities such as this one.

COMMISSIONER GALVIN surmised that those experts would have advised - looking at this opportunity from the state's position as a resource owner - that advancing this TransCanada project would be appropriate and would be done if this were strictly a commercial venture.

2:08:26 PM

REPRESENTATIVE RAMRAS objected, characterizing the earlier meetings as propaganda and saying he didn't want to accept hearsay. He asked that Goldman Sachs be brought before the legislature to be questioned on the record.

COMMISSIONER GALVIN replied that Goldman Sachs would be in Juneau Monday and Tuesday and in Anchorage later. Some of their top energy folks would be advising the state on questions put before them about the finance markets and TransCanada's ability to undertake the responsibilities. Discounting any idea that they'd take a position just because it was favorable to the administration's, he said these are companies that have a high degree of integrity, putting that integrity on the line.

MR. PALMER added that TransCanada does operate in the private sector. Its board made a commercial decision to participate in the process established by this legislature. It did so because of the belief that TransCanada can attract the customers. TransCanada isn't in the business of pursuing a project where it might spend over $100 million of shareholders' money with the expectation of failure. If that were so, the decision would have been different and TransCanada wouldn't have filed under AGIA.

2:11:10 PM
SENATOR DYSON told members the administration had responded better than he could, indicating he considered the remarks of Representative Ramras out of line. Agreeing with Commissioner Galvin that the companies have never said they wouldn't ship at the wellhead or the GTP, Senator Dyson said he believes there is a letter on his own desk this week from Exxon in response to an inquiry from several legislators.

SENATOR DYSON reported that the last two times he visited with FERC commissioners, they reminded him that this project is unique in that Congress has decided it is in the national interest and that this continent needs Alaska's gas, with the clear implication that they would follow through.

SENATOR DYSON gave his understanding that the day that this project is declared valid, the companies get to book the equivalent of 8.6 billion barrels of oil, more than a thousand billion dollars that they get to add to their books. He discounted the notion that shareholders would allow those companies to refuse to ship under such circumstances.

SENATOR DYSON said almost no projects in North America have been built by the producers. Almost all are independent pipelines. The kinds of partnerships that will come together here are typical. He reported that FERC officials have assured him that the best of all circumstances for the state is to have competing proposals show up at their desk; a marriage most likely will come out of that, even if forced, and the stakeholders will come together for a successful project.

REPRESENTATIVE DOOGAN asked the chair what proportion of questioning versus political posturing there would be during these proceedings.

CHAIR HUGGINS replied that since all the legislators are politicians, it's probably 100 percent politics, with variations among those present. They all deserve a chance to ask questions and state opinions, so long as they display respect and decorum. He offered to address any further concerns after the meeting.

2:16:19 PM
REPRESENTATIVE NEUMAN mentioned the open season, saying he believes TransCanada's proposal wants to get to a class 4 engineering report, which is 15-20 percent "project definition complete," with expenditures of approximately $80 million split 50/50 between the state and TransCanada, $40 million each. This is so an application can go to FERC to ensure there are FT commitments in order to produce the gas.

REPRESENTATIVE NEUMAN contrasted that with the Denali project, for which ConocoPhillips and BP propose to spend over $600 million to have a class 1 or 2 engineering report, 50-100

percent project definition complete. He said that's critical to ensure that all producers wanting to ship gas down that pipeline have the necessary information to apply for capacity within that pipe and get a FT commitment; in that way, whoever builds this pipeline can get the money to build it.

REPRESENTATIVE NEUMAN recalled hearing Mr. Palmer say that TransCanada already has a lot of information, but said he didn't know what it was worth or how much was spent getting there. He said he'd rather have ten proposals go to FERC; it seems there'll be at least two. He mentioned trying to ensure that there is a pipeline eventually, with FT commitments.

REPRESENTATIVE NEUMAN also surmised that it will delay the pipeline if TransCanada's proposal goes forward and at the open season there aren't sufficient FT commitments to get $30 billion to build it. Expressing concern about the timeline to get low-cost energy to Alaskans, he recalled hearing that the least expensive way would be a spur line off a mainline. He suggested that if TransCanada is willing to spend over $100 million and the state will put in another $500 million, TransCanada essentially will be doing the contract work out of that.

MR. PALMER replied that he wasn't in a position to comment on what others would spend on a different project, having no knowledge of it except for a 12-page PowerPoint presentation he'd seen. But TransCanada's professional opinion, based on 50 years of experience and information available today within the corporation, is that TransCanada can come up with a very credible capital-cost estimate to hold an open season for $84 million, as shown on the estimate provided to legislators.

MR. PALMER also said he wouldn't speak to why others would pay more to get to an open season. When purchasing something, he looks at who is credible and has the capability, rather than simply getting a party that will charge him more for an estimate. He expressed hope that over the last few months he has conveyed TransCanada's credibility and capability to the legislature and the people of Alaska - that TransCanada knows how to do this business, having been involved in this business and this project for a very long time.

MR. PALMER, with regard to TransCanada's risk exposure, noted there'd been testimony from a number of parties over the last several days that TransCanada will incur the costs first and then be reimbursed up to $500 million, with different ratios both before and after the open season. Giving his assurance that TransCanada hasn't lowballed the number before the open season in order to get to the 90 percent factor, he said whether it's committed in advance of or after the open season doesn't matter because the entire $500 million will be used.

MR. PALMER indicated over several years TransCanada will have exposure to more than $100 million of its own money and will make

nothing off the state's money. Also, if the estimate to get to the FERC certificate is wrong and the state is already at its cap, TransCanada's exposure increases. If it can be done successfully for less, the state and TransCanada both save money. He expressed hope that the cost estimates had been adequately addressed in the binders and testimony provided over time.

2:24:16 PM
REPRESENTATIVE NEUMAN explained that his question centered on the type of engineering report, the blueprint for the project, and whether there is sufficient information available to make the decisions for TransCanada to attract FT commitments worth $30 billion. Since TransCanada's application says it believes this can be done with a class 4 report, there seems to be a discrepancy with trying to get a different proposal, and he doesn't have anything else to gauge this proposal against.

MR. PALMER replied that he hopes TransCanada has shown itself to be a respectable, respectful, and professional organization that deals with these potential customers daily as it moves gas throughout North America. TransCanada believes it can provide a credible and standard cost estimate, as it would for other projects when going to an open season. Whether large or small, in Alberta or the Lower 48, this is the standard the company applies. He said he couldn't comment on other parties.

REPRESENTATIVE NEUMAN relayed his belief that TransCanada is a highly respectable company, which he'd heard from other companies as well. However, for a successful open season he believes the more information companies have that may want to sign up for a FT commitment, the better off the state is. He suggested that's critical to ensuring there is gas to Alaskans.

MR. PALMER offered that merely spending a lot of money doesn't necessarily get a better cost estimate. For example, the parties pursuing the Mackenzie Valley project have spent a great deal; he noted TransCanada had only a tiny participation in that and didn't drive that project in any way. He said last year those capital costs ended up doubling after hundreds of millions of dollars had been spent.

2:27:10 PM
COMMISSIONER GALVIN told members Representative Neuman's question was a good one; the administration has heard the same thing about comparisons between what the Denali project claims it will have as cost estimates pre-open season and what TransCanada says. Thus the administration's economic analysis separates the risks associated with the cost estimate being off, referred to as "project scope risk." If it were missed because of not having gotten further at the time of the open season, the issue is how much risk there'd be in terms of its impact on the tariff and ultimately on profitability to the producers.

COMMISSIONER GALVIN reported that the impact was found to be small - the range of possible variation from doing the additional engineering has a relatively small impact compared with other risk factors. He opined that's why, from the industry perspective, the norm is to go the level TransCanada is proposing; the additional clarity of having the engineering get down to such a further level doesn't help tremendously.

2:28:49 PM
REPRESENTATIVE GARA expressed concern that Mr. Palmer will hear "fire" and voice concern to the shareholders that the State of Alaska might not be a good partner.

MR. PALMER gave his assurance that he takes no offense, understands this is a difficult decision for this body and for Alaskans, and believes the comments have been heartfelt.

REPRESENTATIVE GARA concurred with the earlier comments of Senator Dyson. Noting many folks are interested in a bullet line, he recalled there'd be a much lower, if not zero, tax for in-state gas use. He asked: What are the fiscal ramifications for the State of Alaska if choosing a bullet line for in-state gas use somehow precludes building a larger-diameter gas line?

REPRESENTATIVE GARA also noted that in-state gas use is to be addressed in the scheduled out-of-Juneau hearings. He said he'd never heard of a proposal that would provide low-cost gas without some massive state subsidy; this includes the tentative proposal from ENSTAR Natural Gas Company and others, as well as any spur line from this project or an in-state bullet line. He asked: Is it correct that there won't be low-cost gas without a subsidy from the state? What are the expectations for in-state gas prices under any of these scenarios? And what are the tax ramifications for primarily an in-state-use gas line?

2:31:05 PM
COMMISSIONER GALVIN responded first to the tax questions. Referring to the 2007 legislation known as Alaska's Clear and Equitable Share (ACES), he said it included a global change to the state production tax - it takes the tax rate currently used within the Cook Inlet market for gas produced there and applies that to any North Slope gas consumed within Alaska. Thus gas consumed within Alaska has a lower tax rate, which means lower revenue, but that's not the driver of the issue.

COMMISSIONER GALVIN turned to providing affordable gas to Alaskans. Mentioning high expectations, he clarified that the state potentially would provide low-cost transportation of the gas if the state were to build a bullet line and subsidize the cost. He highlighted Senator Therriault's point that in order to make transportation economic, one either can increase the throughput by adding LNG or other things or else can just

subsidize the cost that ultimately may be recovered in the tariffs. So the transportation costs could be brought down.

COMMISSIONER GALVIN said ultimately it will be a matter of what the actual price is for the gas. Within Cook Inlet, that's controversial in terms of whether it's the cost of production or is somehow tied to a Henry Hub price or if there is a need to jack up the actual commodity price of gas to spur exploration. A similar question would be faced when getting to possibly bringing North Slope gas down to Fairbanks or bringing gas up from Cook Inlet to Fairbanks to satisfy demand.

COMMISSIONER GALVIN added that the price for the gas will be determined down the line, probably by a regulatory agency like the Regulatory Commission of Alaska (RCA) or by the market itself. At this point, there is a risk of setting an exceedingly high expectation that the state could unilaterally create low-cost gas, absent a tremendous amount of state resources being brought to bear.

COMMISSIONER GALVIN also mentioned the idea of the state's providing royalty gas as the source of low-cost gas, providing it at a dramatically reduced, below-market price within Alaska. He said that has been discussed on the oil side for a number of years, but it creates constitutional issues associated with the expectations of what the state will get for its resources. While it is open for discussion, it has those ramifications.

COMMISSIONER GALVIN recalled that Senator Stedman had expressed concern about giving away the state's one source of revenue at an incredibly low rate to Alaskans, since not all Alaskans would be in a position to consume that low-cost energy. Noting the state gets its value through the sale of it, Commissioner Galvin cautioned that there is no panacea, including a bullet line. In some ways, the fact that the state is enjoying tremendous revenues right now opens up opportunities to explore different possibilities. But this needs to be approached with eyes wide open and based on facts that can be gathered.

2:35:55 PM
SENATOR STEDMAN noted that recent presentations and analyses have been based on $10 gas, with much larger numbers than the previous administration's proposal, the gross dollar value if this gas gets to market. With respect to risk exposure, he wondered why the state would have a 90/10 split if this project is nearly risk-free, roughly 80-90 percent at the end, depending on how it is counted, and whether the legislature would be here if that were reversed, with 10-20 percent state money. He asked about TransCanada's monetary comfort level in pursuing this project versus relying on other people's funds.

MR. PALMER answered that TransCanada looked carefully at the proposal under AGIA, viewing it as an overall business deal

including the rights such as the $500 million and the responsibilities. Last year when testifying, he was asked whether TransCanada would commit to apply at 90 percent; he'd demurred because last spring TransCanada hadn't decided whether to file at any percentage.

MR. PALMER recalled that there were variations on how the state would share risk, including monetary amounts and percentages. TransCanada was asked many times whether it was prepared to commit to apply. While some parties said they would bid and then didn't necessarily end up at the finish line, TransCanada never stated it would bid at 90, 80, or 50 percent. But once AGIA passed and the request for applications (RFA) was issued, TransCanada closely examined the overall opportunity and risks. As to whether the $500 million was an important factor, he affirmed that it was.

2:40:00 PM
SENATOR STEDMAN asked: Is there any relationship between the probability of success and the ratio for state money versus TransCanada shareholder money?

MR. PALMER reiterated his remarks about examining the situation, adding that part of it was looking at TransCanada's financial exposure if it never successfully completed the project. TransCanada figures to use the state's $500 million before hitting the final cost estimate to get to FERC; the $500 million cap and not the 80-90 percent is the limiting factor.

MR. PALMER added that if the state had offered 50 percent as its entire exposure before and after, then TransCanada's exposure would have been about $300 million. However, he wasn't in a position to say whether that would have changed TransCanada's decision to submit a bid.

SENATOR STEDMAN clarified that he was struggling with the probability of success versus the split of 50/50, 75/25, and so forth.

MR. PALMER said perhaps he hadn't understood the question. If TransCanada had bid and taken on $300 million in risk rather than $100 million, for example, at that point he didn't think it would have changed the probability of the project's success. If there'd been exposure to a much higher financial commitment in order to bid, however, TransCanada might not have come to the table. Nobody might have. That might have changed the state's probability of success in attracting an AGIA licensee.

SENATOR STEDMAN suggested that correlates with the last days of the AGIA legislative process, when amendments were made including one changing the reimbursement from 80 to 90 percent.

2:44:17 PM

REPRESENTATIVE GATTO told members what's important to him is keeping the eye on the prize, the future of the state for the next generations. He said he doesn't believe TransCanada is a charity, but came here for the money; people are watching and wanting to ensure that it succeeds. He surmised that TransCanada had done an immense amount of investigation before making the commitment to submit the application that agreed with all the requirements. He expressed confidence that TransCanada can do this project and that everyone will be better off for it.

2:47:24 PM
REPRESENTATIVE SAMUELS noted he hadn't been a big fan of the AGIA process. While respecting TransCanada, he said there wasn't the competition promised. He'd rather see the administration negotiating TransCanada down as far as possible to get a better deal, lowering the rate of return from 14 percent, for instance.

2:51:49 PM
COMMISSIONER IRWIN explained that when this process was set out, looking at the state's history at that time, the administration made a conscious decision to have a fair, open, competitive process. The administration could have asked for bidders without asking for best and final offers. But that may have resulted in negotiations behind closed doors with various companies. That is a route often chosen by businesses.

COMMISSIONER IRWIN said the administration instead chose another route that businesses also use: clearly defining what the state wants and then using the "best and final offer by date certain" concept. He reminded members that in meetings with large groups, he'd frequently said only one good bidder is needed. While some were pushed out for unknown reasons, those companies made their own decisions. In this case, this high-quality company played, participated, and honored the state's rules for a best and final offer by a date certain.

COMMISSIONER IRWIN said the administration gave a promise. The administration got AGIA passed, was tasked with proceeding, and put out an RFA. To go back now and ask for more out of TransCanada wouldn't be honoring the state's word. The administration chose the "best and final offer" route, and he doesn't regret it. There could always be a little more on the table somewhere, but the state got a high-quality company.

COMMISSIONER IRWIN added that when he looks at what TransCanada offered such as debt equity, he believes that was from competition. It might not have been obtained through negotiation. He concluded by saying he can't speak for Mr. Palmer and his company, but can clearly say how much he thinks of them. They also have negotiations to do to bring this gas pipeline to a hugely successful completion for everyone.

2:55:30 PM

COMMISSIONER GALVIN followed up, saying the bottom line is that TransCanada will be negotiating with the producers on shipping rates. The producers can negotiate to bring those down, probably with a better negotiating position than the state would have in trying to do the same.

COMMISSIONER GALVIN also cautioned against thinking AGIA didn't create competition. He said it clearly did in the minds of the applicants, the only place it could affect the outcome. As Mr. Palmer has testified, TransCanada didn't know who would apply and therefore put in an application based upon the expectation that others would compete, the best offer it could give. This is what's before the legislature today.

2:57:52 PM
SENATOR STEDMAN asked: What will the state do if this proposal ends up before FERC and FERC decides 600 basis points above the 10-year Treasury bond rate is appropriate, for example, rather than 900-some basis points?

COMMISSIONER GALVIN answered that he wouldn't speculate now, since it will be based on a future decision and a variety of considerations. As noted yesterday, the state isn't obligated to defend every aspect of the TransCanada proposal, including rate-of-equity expectations and the point Senator Stedman just made. However, there'll be an assessment of the level at which the state wants to advocate for something that affects the value to TransCanada, given that the state brought TransCanada into this process with the expectation of being partners going forward.

COMMISSIONER GALVIN added that the administration wants to make sure the state's partner gets the value it would like and reasonably expects out of this project, just as anybody would want a partner to succeed. So that will be part of the administration's analysis. But the state isn't bound to having to defend it, which he indicated is the most important piece that the administration wanted to retain.

2:59:26 PM
REPRESENTATIVE KELLY asked Mr. Palmer how many real players TransCanada had thought would bid on this project.

MR. PALMER replied that TransCanada had market intelligence in the late fall about certain parties that TransCanada expected weren't going to bid, but didn't know the accuracy of that. However, TransCanada had believed one major competitor would be making a strong bid and was surprised that didn't happen; that competitor had stipulated it would bid, and TransCanada had received no contrary market intelligence.

REPRESENTATIVE KELLY asked: If the state had come to TransCanada as the only party that the state was interested in talking to,

would TransCanada's best and final offer have been higher or lower than it is now?

MR. PALMER answered that TransCanada feels it stretched to get to this point, looking at the risk; the opportunity; the value to the company; the requirements under AGIA, both moral and legal; and the rights that would be obtained. Rather than being pushed by the board to be more aggressive, he had pushed the board to get to this level.

REPRESENTATIVE KELLY called himself an "options guy" and voiced appreciation for the fact that the legislature is pushing hard for questions. He surmised as a player TransCanada will take the state's "must haves" all the way to FERC, and the others with a project in the works will have to deal with the fact that somebody will arrive at FERC with the Alaska story and a way to meet it, which is healthy for everyone involved. He opined that the state is right where it ought to be, with a good return predicted and so forth.

CHAIR HUGGINS asked Mr. Palmer whether he and others from TransCanada would be available over the next 50 days or so.

MR. PALMER affirmed that.

The committees took an at-ease from 3:03:26 PM to 3:18:37 PM.

CHAIR HUGGINS invited Bob Swenson and Dave Houseknecht to give their presentation.

BOB SWENSON, Director, Division of Geological & Geophysical Surveys, Department of Natural Resources, explained that they would discuss the advancement in the understanding of the North Slope region, how that is used to do resource assessments, and what undiscovered resource assessments USGS has performed. He would provide an overview of the geology, and Mr. Houseknecht would explain resource assessments done in 2004 and 2006.

MR. SWENSON began a PowerPoint presentation titled "Natural Gas Exploration Potential in the Alaskan Arctic"; a handout duplicated the slides. He noted the opening slide shows the test well in Prudhoe Bay State No. 1, the first test of gas on the North Slope from the Prudhoe Bay gas cap in the late 1960s. Since then, knowledge about the North Slope has increased dramatically.

MR. SWENSON showed the next slide, a map labeled "Arctic Alaska - Key Geologic Features." Pointing out that the area of discussion extends from the Canadian-U.S. boundary to the Russian-U.S. boundary, he highlighted the Chukchi Sea platform; the Beaufort Sea arctic slope; and the onshore sequence including the National Petroleum Reserve-Alaska (NPRA), state lands, and the Arctic National Wildlife Refuge (ANWR).

MR. SWENSON said the geologic portions become important in any resource assessment. This relates to the tectonic regime in these areas. Seen is the underlying geology that makes up the depositional sequences, where sediment is being deposited. To the north is the Barrow Arch, a rift shoulder sequence, meaning when North America rifted away from Northern Canada it created a breakup of this part of the crust.

MR. SWENSON highlighted its importance, saying it is similar to North Sea regions where the coast of the Atlantic rifted away from Europe. To the south is another major tectonic province, the Brooks Range, a major source for sediment deposited in the Colville and Hanna troughs.

3:22:03 PM
MR. SWENSON turned to the next slide, "Stratigraphy - Known & Potential Source Rocks," which had a depiction labeled "Central North Slope Stratigraphy" going from the Cenozoic down to the Pre-Mississippian, as well as these notations on the right-hand side, from top to bottom: Paleogene Canning, Seabee, GRZ (HRZ), Lower Kingak, Shublik, Lisburne (Kuna), and Kekiktuk.

MR. SWENSON explained that since the late 1960s an incredible amount of work has been done on the North Slope by state geologists and by industry and federal representatives. From that work, a comprehensive story has been put together of what the rocks look like and their depositional setting. If a well were drilled all the way down into the basement rock, the depth would vary tremendously, depending on the location. This slide shows the package of rocks that would be seen, with the age of the rocks.

MR. SWENSON told members there are a number of important points on this slide. Though he wouldn't go into detail, those include the reservoir rocks shown in yellow and the source rock facies, the highly organic facies that if put through the correct temperature and pressure regimes by burial will generate hydrocarbons.

MR. SWENSON noted that on the right-hand side is a sequence of these highly organic facies on the North Slope. This shows that the North Slope is a supercharged basin, with a number of these different facies that have gone through various tectonic and geologic histories to generate hydrocarbons.

MR. SWENSON explained that the next slides show the lateral continuity of these different source facies, from the earlier Triassic and Permian facies to the Beaufortian and Brookian sequences. One important aspect is the ability to correlate between samples of hydrocarbons and the original source facies using modern geochemical techniques, making models of where different facies may or may not have generated.

3:24:19 PM
MR. SWENSON discussed a slide labeled "Arctic Alaska Source Rock Systems," noting these regional maps depict where the source facies are located; important colors are light greens and yellows. The lower part of the sequence shows this highly organic facies was deposited over pretty much the entire area in the Triassic and the Jurassic sequence; this includes into the Chukchi Sea region, offshore state waters, and the Beaufort Sea.

MR. SWENSON said for the Cretaceous and Paleogene sequences, these deposits occurred over much of the area. In the southern part of this region, the Terrigenous - meaning it came from land sources - and Mixed Kerogen areas are highly gas-prone.

MR. SWENSON noted that the next slide, "Overview of Regional Geology," depicts a cross-section showing what this depositional sequence has gone through over time. This is from the Brooks Range heading north to the Beaufort Sea. The rift sequence mentioned earlier, similar to what is found in the North Sea, can be seen. To the south is a classic foreland basin, similar to the Canadian thrust belt. He emphasized that the North Slope deposits including Prudhoe Bay, Kuparuk, and Alpine are here on the Barrow Arch; this area has oil and associated gas.

3:26:12 PM
MR. SWENSON explained that in the deeper parts of the basin, those same source rocks have generated both oil and gas in the shallow section. In the deeper section, those source rocks have gone through a crack to gas, meaning it's primarily a gas province, both to the south because of the deep burial and to the north. Also important is that because of the thrusting - the deformation as the Brooks Range was built - there was uplift and release of that gas along with a flushing of any earlier oil charge that may or may not have been there.

MR. SWENSON discussed the next slide, "Reservoir quality studies," which had what appeared to be a photograph labeled "Skimo Anticline - Overturned Forelimb"; another labeled "Porosity"; and a graph labeled "Porosity (%) vs. Permeability (mD), North Slope Foothills."

MR. SWENSON advised members that the reservoir rock has porosity and permeability, as shown on the thin section on the upper part of the slide; blue areas are the spaces between the rock that give the porosity, while the interconnectivity, how well fluid flows in that, is the permeability. Thus the graph relates to how much oil or gas can be fit into those pore spaces and also how well those are connected and hence how fast the fluid will flow. That's an important aspect for any resource development.

3:27:26 PM
MR. SWENSON turned to results from the exploration phases, showing a slide labeled "Foothills Drilling and Gas Occurrences."

He explained that this map shows discovered gas accumulations in the Foothills region, where he would be focusing; wells with numerous strong or fair gas shows; and wells with few or minor gas shows. The large circles represent that most of the wells drilled in the Foothills regions - few for the size of this area - had very, very strong gas shows.

MR. SWENSON noted that the next two slides, "Foothills Cross Section - Oil and Gas Shows" and "Foothills Structural Plays, Seismic Interpretation," depict each of these wells in context with the geology and also the seismic line from the Kavik field area, which gives an idea of what the subsurface looks like.

MR. SWENSON said for the first, each well is represented by a vertical line; in between is an interpretation of the basin field geometry of that whole Colville trough, revealing the complexities that also bring up opportunity because what is going on isn't known for every portion of the basin. Important to note is that the red and green tick marks on the vertical lines represent gas shows, in red, and oil shows. For each well, there were numerous shows of both oil and gas.

3:29:19 PM
MR. SWENSON turned to the seismic line for the Kavik area seen on the earlier map. Highlighting the gas shows throughout that sequence, he noted there's a tremendous amount of deformation seen in the Foothills region; this sets up numerous different types of plays that could be explored for with respect to gas.

MR. SWENSON addressed a slide labeled "Conventional Exploration Play Types" that relates to oil and gas trapping mechanisms. He told members that to understand the geology in any of these basins, especially a supercharged basin like the North Slope, it's important to have a fair understanding of the reservoir rock distributions, the geometries of all the different traps, and the generation and migration of hydrocarbons to fill those traps. All this geology is fit into the resource evaluation to come up with estimates for undiscovered resources. He turned the presentation over to Mr. Houseknecht.

3:30:13 PM
CHAIR HUGGINS mentioned legislation passed in a special session that allowed access to data from different organizations including the producers and other companies. He asked what the status is and whether that has aided this work.

MR. SWENSON replied a lot of additional information has been gained. The charter agreement for all the data made publicly available is in-house. Also, DNR's Division of Oil & Gas has a complete set of onshore data. The data that can be used is publicly available or else agreements have been made for it.

MR. SWENSON said this data has dramatically increased the ability with respect to subsurface interpretation, both with detailed well information and seismic data. Noting he'd just showed one seismic line, he said there is a whole suite of seismic lines across the North Slope, and USGS has an even more comprehensive data set.

3:31:27 PM
DAVE HOUSEKNECHT, Geologist, U.S. Geological Survey, U.S. Department of the Interior, began by saying he would address the role of the USGS and its sister agency, the Minerals Management Service (MMS), with respect to how the information they generate relates to these deliberations. One mandate of USGS is to do systematic evaluations of energy and mineral resources nationwide and worldwide.

MR. HOUSEKNECHT explained that they collaborate with state organizations such as DNR divisions and take opportunities to interact with industry where possible; it's important to share ideas and exchange data where appropriate. They then go behind closed doors and make estimates of how much oil and gas remains to be discovered; it's essential that this process be independent of any influence because that's the basis of their credibility in Washington, D.C.

MR. HOUSEKNECHT said the information he would share today is from work over the last decade. He opined that it's significant that all this work was published before the AGIA proceedings began. He noted summaries of the information can be made available to the legislature or by e-mailing him; his e-mail address was shown as dhouse@usgs.gov.

3:33:21 PM
MR. HOUSEKNECHT highlighted a paper he and colleague Ken Bird published in 2006, a broad summary of what they know about those reserves and undiscovered oil and gas resources in northern Alaska. In addition, he said, short factsheets provide an executive summary for specific areas where they've worked. This represents the work of both USGS and MMS, and it predates the AGIA proceedings.

MR. HOUSEKNECHT discussed a slide labeled "Known Gas Accumulations in Arctic Alaska," which listed known unit and gas reserves (Bcf) as follows: Prudhoe Bay 24,526; Pt. Thomson 8,000; Pt. McIntyre 1,526; Kuparuk River 1,150; Duck Island 843; North Star 450; Colville River 400; Barrow-Walakpa 34; Milne Point 14; and a total of 35,417. It also listed other known accumulations, possible gas reserves onshore and offshore (Bcf). Onshore it showed: Gubik 600, Kavik 115, Square Lake 58, Meade 20, Umiat 5, East Umiat 4, and "?" for East Kurupa, Kemik, and Wolf Creek. For the offshore Outer Continental Shelf (OCS) it showed Burger at 14,000 and "?" for Sandpiper.

3:35:01 PM
MR. HOUSEKNECHT explained that two fundamental types of gas resources are shown: known accumulations of associated gas, meaning gas associated with oil, with Prudhoe Bay as the best example; and non-associated gas, meaning gas that occurs in an accumulation in the absence of oil or significant liquids. Most of the associated gas resources are clustered in the north near the Barrow Arch, whereas most of the non-associated gas resources are clustered in the Foothills, where there has been relatively little exploration; he would return to this point.

MR. HOUSEKNECHT highlighted proved reserves in arctic Alaska, mentioning a summary published by DNR's Division of Oil & Gas. He said other accumulations have been discovered, but not much is known about the size. As shown here, the biggest is the Burger prospect, a discovery drilled about 1990 in the Chukchi Sea that was the focus of a big lease sale recently by MMS.

MR. HOUSEKNECHT emphasized that until now there've been about 500 exploration wells drilled in northern Alaska. One was drilled intentionally looking for natural gas this past season. Thus what is known about gas reserves and gas resources in northern Alaska is the result of looking for oil. In fact, most accumulations discovered in the Foothills represent exploration failures that have one well in them and in many cases tested a lot of gas; because it was gas and there was no commercial market for it, the company never delineated that accumulation and so it isn't really known how big it is.

MR. HOUSEKNECHT showed a slide labeled "Alpine Play in NPRA - More Gas than Oil?" He said as resource assessments are performed in northern Alaska to estimate oil and gas that remains to be discovered, this area of North America is difficult to deal with as a geologist because there is so little exploration information. A good example is northeastern NPRA, where in 2004 USGS completed such an assessment and six months later ConocoPhillips leased some of the results of that exploration drilling.

MR. HOUSEKNECHT explained that at the time of the assessment, all that was known of the Alpine play was the Alpine field, which has a gas-to-oil ratio of 840, quite low. Shortly after the estimates were released saying there was a lot of oil and condensate with some gas in NPRA, the results from new discoveries were released. Within about 20 miles, moving westward from Alpine, there is a gas accumulation in the westernmost discovery, with a lot of condensate.

MR. HOUSEKNECHT said this suggests the oil numbers may be a bit high and gas estimates a bit conservative. Highlighting the need for continuing study of these frontier areas, he said every well drilled represents a significant amount of new information that the agencies then have to work with.

3:39:50 PM
MR. HOUSEKNECHT showed a slide labeled "Assessment Methodology - Geologic Basis." He emphasized that although the mean estimate typically is reported in the literature and media, these estimates of undiscovered oil and gas resources capture a range of probabilities.

MR. HOUSEKNECHT explained the process. When they go behind closed doors, they start by measuring and filling out on a probabilistic scale how thick the reservoir is; how big the closures are, seen in the seismic data; and what they think the porosity and water saturation of the reservoir are. They do a simulation, and the result is a distribution of oil and gas accumulation sizes that capture the range of uncertainty.

MR. HOUSEKNECHT said they then apply risk, which relates to whether those source rocks have generated oil and gas, whether that has made it into the reservoir, as well as the presence of good reservoir rocks and traps; this provides a distribution of in-place resources. After that, they apply a recovery factor to get an estimate of "technically recoverable resources"; this is the volume of oil and gas they believe is recoverable using current technology, regardless of price.

MR. HOUSEKNECHT showed a slide that had a map of Alaska and parts of Canada, labeled "Undiscovered Conventional Gas Potential." He said one can see why so much emphasis is placed on the arctic part of Alaska, where the largest of the bubbles represented 119 Tcf of gas. He noted the bubbles represent mean estimates made by USGS onshore, MMS offshore, and the Geological Survey of Canada in the Mackenzie delta. The large bubbles represent that those agencies believe there are large gas resources in arctic North America.

MR. HOUSEKNECHT discussed a slide labeled "Potential for Undiscovered Petroleum in Arctic Alaska," which listed mean estimates of undiscovered conventional gas in Tcf. For onshore and state offshore areas, USGS estimates were: NPRA, 61.35 for non-associated gas, 11.68 for associated gas, and 73.03 total gas; Central North Slope, 33.32 non-associated, 4.20 associated, and 37.52 total; ANWR, 1002 Area, 3.84 non-associated, 4.76 associated, and 8.60 total; and a subtotal of 98.51 non-associated, 20.64 associated, and 119.15 total. For federal offshore areas, MMS estimates had total gas only: Chukchi Shelf, 76.77; Beaufort Shelf, 27.65; Hope Basin, 3.77; and a subtotal of 108.19. The total for all was 227.34 Tcf.

3:42:51 PM
MR. HOUSEKNECHT told members this summarizes both the means and the uncertainty associated with the estimates. The numbers in the yellow boxes are from USGS for the onshore North Slope and state waters. The ANWR numbers had been estimated in 1998; the

NPRA numbers in 2002; and the central North Slope, mostly state land, in 2005. The blue boxes have MMS numbers for the Beaufort and Chukchi areas.

MR. HOUSEKNECHT emphasized that this shows the range of uncertainty. When he briefs Alaska's congressional delegation about the amount of gas, he gives the low and high numbers. The lower number represents a 95 percent probability. For instance, he'll say there's a 95 percent chance that there is 24 Tcf of technically recoverable natural gas in the central North Slope area and a 5 percent chance of 45 Tcf. However, the mean of that distribution, 33.3 Tcf, is typically used in congressional hearings, by the media, and so on.

3:44:11 PM
MR. HOUSEKNECHT added that one awkward thing about probabilistic distributions is that statistically it's not legal to add up what are called the fractals and to provide a summation of that range of uncertainty. He indicated USGS is in the process of doing that statistically; it will be released soon. Until then, however, the means of those distributions can be added, which he said is a legal and rigorous statistical methodology. Those are shown on the slide, with a subtotal for onshore and state offshore areas of 119.15 Tcf.

MR. HOUSEKNECHT explained that MMS does its assessments a little differently, which is why there aren't independent estimates of non-associated and associated gas. The subtotal for the offshore arctic is 108.19 Tcf. He said this is the U.S. Department of the Interior's perspective on undiscovered gas resources in arctic Alaska and the adjacent OCS. Even though economic analysis isn't the main goal, they attempt to include an economic filter.

3:46:30 PM
MR. HOUSEKNECHT showed a slide labeled "Estimates of Gas Accumulation Sizes" that plots numbers of gas accumulations against the gas accumulation size class in Bcf. He said the economics of undiscovered oil and gas are driven by how big the accumulations are. This graph shows mean estimates and the 95 percent and 5 percent probability estimates, to give some idea of the uncertainty. The largest accumulations of non-associated gas in state lands are probably in the range of 1.5 to 3.0 Tcf; at the mean, there may be 5 or 6 in the 768 Bcf to 1.5 Tcf range, and there may be more than 15 in the 400-750 Bcf range.

3:48:10 PM
MR. HOUSEKNECHT addressed a slide labeled "Economic Analysis Simulates Exploration and Development," indicating he'd used this with respect to ANWR in Washington, D.C.; although he hadn't prepared a gas example, it works the same. Explaining the process for an economic analysis, he said the first thing they do for state lands, for instance, is to divide the area into

subareas based on where they think accumulations are and whether those will be mostly oil, mostly gas, or some mixture.

MR. HOUSEKNECHT said next they ask the assessment geologists to determine what size of accumulations can be expected in each area. Then the economist will "build" pipelines based on the assumption that the largest accumulations closest to existing infrastructure are discovered first. That supports construction of a regional transportation system and development of that accumulation, if large enough.

MR. HOUSEKNECHT concluded with the slide, saying that in turn supports the development of satellites. An example for gas is the larger Alpine field and newer discoveries in NPRA. As infrastructure extends into an area, that can be used as a jumping-off point to develop similar areas in the same fashion.

3:49:38 PM
MR. HOUSEKNECHT showed a slide labeled "Central North Slope Economically Recoverable Gas," relating to undiscovered non-associated natural gas resources. He noted it plots market price and gas volume in Tcf. The vertical lines represent the estimate of the 95 percent probability value, the mean value, and the 5 percent value.

MR. HOUSEKNECHT explained that when the economist does the analysis, the result is a set of curves like this. The curve for the mean suggests at about $3 per thousand cubic feet (Mcf), no gas in this example is economically viable. Noting that this price includes transportation to a Chicago market, he said as the price increases, an increasing volume of gas is economically recoverable. At $10 per Mcf, this shows 27-28 Tcf would be economically available.

MR. HOUSEKNECHT emphasized that this simple modeling suggests about 83 percent of the mean estimate of technically recoverable resources close to existing infrastructure is actually economically recoverable at $10 per Mcf. While these numbers change as one goes farther from the infrastructure, it gives some idea in context. Noting all the economic parameters have been published, he offered to provide links to the online publications.

3:51:40 PM
MR. HOUSEKNECHT turned to the next slide, "Arctic Alaska Exploration Maturity. He said this shows a low-angle perspective, with the most prospective area for oil and gas being north of the Brooks Range, extending at least to the shelf edge of the Beaufort and across all the Chukchi Sea to the Russian maritime boundary. In this area, marked by red dots, there have been fewer than 500 exploration wells drilled since the 1940s, when the U.S. Navy started exploring in NPRA.

MR. HOUSEKNECHT put this into perspective using Wyoming as an example; he noted Wyoming was shown at the same scale. He said in arctic Alaska about 150,000 square miles are believed to be prospective, including onshore, state waters, and OCS. In Wyoming, where more than 19,000 exploration wells have been drilled, about one-quarter isn't prospective because it is core uplifts, and 75,000 square miles are prospective. As shown, the entire state of Wyoming would fit between Prudhoe Bay and Burger, two of the largest gas accumulations known in arctic Alaska to date.

MR. HOUSEKNECHT said Wyoming has produced over 21 Tcf so far and has proved reserves of at least 24 Tcf; its exploration-well density is about 250 wells per square mile. By comparison, the exploration-well density in arctic Alaska is about 3 per 1,000 square miles, mostly concentrated along the coast and straddling Prudhoe Bay. Thus arctic Alaska is said to be an underexplored frontier gas province about which there is lots to learn.

3:54:06 PM
MR. HOUSEKNECHT showed a slide labeled "Wyoming Gas Reserves & Production History," a graph that plots Wyoming known gas resources from 1977-2006, with cumulative production and proved reserves. Noting a similar curve was shown earlier for the Western Canadian sedimentary basin, he said this is public domain data from the EIA.

MR. HOUSEKNECHT reported that in 1977 there'd been about 7.5 Tcf produced, with about the same in reserves. Today, almost 30 Tcf has been produced, with about 24 Tcf in reserves. In 1981, the USGS said about 25 Tcf remained to be discovered; in 1995, after a lot was discovered, USGS said it was 16-17 Tcf; and about two years ago, USGS said it's about 95 Tcf. He would explain why.

3:55:20 PM
MR. HOUSEKNECHT discussed a slide labeled "'Unconventional' Gas Resources (continuous resources)," that had USGS maps for coalbed gas; overpressured, basin-centered gas; and gas hydrates. He explained that before 1990-1995, Lower 48 natural gas exploration focused on conventional resources, those occurring in straight accumulations with water contact under the gas. However, folks realized a lot of gas is in unconventional formations, including shale gas, coalbed gas, and so on.

MR. HOUSEKNECHT said the industry responded by developing technology. In concert with that, rising costs made it economically viable to develop those unconventional resources. Thus they've been added to the resource base, resulting in a significant ramping up since the mid-1990s. However, Alaska is at the low end of the curve. For arctic Alaska, it is known that there are unconventional resources, but the first steps are just being taken to estimate how much may be recoverable.

MR. HOUSEKNECHT indicated USGS is working with an interagency team to try to estimate how much gas hydrate may be recoverable in arctic Alaska. With respect to overpressured, basin-centered gas, he noted there is good evidence that this lies behind the foothills of the Brooks Range, where a number of wells tested high-pressure gas, though the volume isn't known. While USGS is just now starting to build the database to estimate unconventional resources, it remains to be seen whether those will be added to the reserves base.

3:58:11 PM
MR. HOUSEKNECHT paraphrased the final slide, "Summary," which had the following points that he noted Mr. Swenson had demonstrated:

Arctic Alaska Natural Gas Resources

Arctic Alaska supercharged hydrocarbon basin grossly under explored with respect to gas

More than 35 TFC proved reserves

Federal mean estimates of undiscovered, conventional gas resources: 119 TCF onshore & state waters plus 108 TCF federal offshore

Huge upside potential in "unconventional" gas resources not included in estimates
- gas hydrates
- overpressured basin-centered gas
- coalbed gas

MR. HOUSEKNECHT added that the hydrocarbon basin includes both oil and natural gas that's grossly underexplored. The "federal offshore" is the OCS; those are mean estimates of technically recoverable resources. He concluded the presentation by saying the unconventional gas resources not yet included in the estimates remain the focus of a lot of USGS research and the research of other federal and state agencies.

3:59:12 PM
SENATOR WIELECHOWSKI highlighted concern that there might be an attempt to put OCS gas into the pipeline and that the state would get no royalty or tax from it. He asked: At what point will it be technically possible for gas from the Chukchi and Beaufort Seas to be put into the pipeline?

MR. HOUSEKNECHT replied that is a major question, one MMS has attempted to address. He gave his perspective that some offshore activity would be seen now that the Chukchi lease sale has brought in such big dollars; however, there is no clear indication as to whether the bidders there are looking for liquids or gases at this point.

MR. HOUSEKNECHT opined that development of natural gas resources will occur onshore first and then migrate outward, away from existing infrastructure, and that OCS gas is further on the horizon than onshore and state-waters gas. He declined to speculate on the timeframe, saying it largely depends on whether there is a viable commercial market and whether that market and areas to do exploration are available.

4:01:21 PM
MR. SWENSON referred to the slide shown by Mr. Houseknecht labeled "Economic Analysis Simulates Exploration and Development," saying it is key to this question. For any given potential accumulation, there'll be the "risk of success," the economics of actually getting the resource to the market and the ability to access that.

MR. SWENSON explained that if relatively low-risk plays are close to infrastructure so the upfront capital expenditures early on are low, those will likely be the first to be developed, even if they're not the largest. If there is drilling offshore in the Beaufort or Chukchi Sea, it's hard to understand exactly how that production would happen, especially in the Chukchi Sea, even if were something like an LNG facility on a platform offshore that would never actually make it to shore. He said that's something he can't predict. But if something is economic and somebody is doing the exploration, those will be the first plays pursued.

4:02:55 PM
SENATOR WIELECHOWSKI referred to the graph that plots market price and gas volume. He asked whether the presenters had done any cost analysis of the Chukchi or Beaufort areas.

MR. HOUSEKNECHT replied no, although MMS has done some work; he offered to provide links to publications MMS had released on that. He indicated the economic analysis he'd shown for the state lands was USGS's first attempt ever to put an economic filter on these undiscovered gas resources in arctic Alaska. When they did the ANWR and NPRA assessments, they felt there weren't enough constraints on timing of a gas line or the costs for getting discoveries in those areas to market.

MR. HOUSEKNECHT explained that when they finished the central North Slope assessment, however, the gas line issue was clearly ramping up in Alaska and the Lower 48, and FERC was already holding informational hearings; he'd testified at one. So despite the uncertainty about access to market and other costs, they'd felt compelled to attempt the estimate described. He added that those graphs use 2003 dollars and costs, but after listening to Mr. Palmer this morning, he believes the costs probably aren't too far off.

4:05:07 PM

REPRESENTATIVE GARA noted there has been discussion about possibly having two pipelines, a large-diameter line and a bullet line, and so the question of how much gas the North Slope has is increasingly important. He gave his understanding that ENSTAR will be looking in the Foothills region over the next two summers to assess the viability of a bullet line.

REPRESENTATIVE GARA asked Mr. Houseknecht what he believes might be in the Foothills area in comparison with what is known at Prudhoe Bay. Saying he has heard generally from DNR folks that it might be more difficult to retrieve gas if it's there, he also asked why that is.

MR. HOUSEKNECHT referred to the slide labeled "Known Gas Accumulations in Arctic Alaska" and replied that for the onshore area, the associated gas is generally in the northern part, the coastal plain and state waters where it occurs in association with liquid oil and condensate. The non-associated gas is primarily in the Foothills. As USGS sees it, an area in the intermediate part of the Slope will have a mixture of both. Probably the best example is the gas trend that includes the Gubik gas field and the Umiat oil field.

MR. HOUSEKNECHT added that, as seen from Prudhoe Bay, Point Thomson, and so on, the associated gas accumulations on the Barrow Arch perhaps have the potential to be larger because the reservoirs are of better quality. The structures have more integrity in terms of not being broken up. As one moves to the Foothills to the south, there is a greater likelihood that accumulations are smaller, but there are likely to be more of them. He surmised that if this geology were in the Lower 48, it would have been thoroughly explored and producing gas for many decades.

4:08:21 PM
MR. SWENSON discussed why it would be harder to produce gas from Foothills-type accumulations. He noted that an earlier slide showed the depth of burial of the rocks for a gas province, saying it was much deeper and hotter. That also affects the reservoir quality, which in the Foothills is a challenge because of the size of the pore spaces and how well those fit together. The permeability and ability to produce that into a well bore can be challenging. An example is the Kavik field. He surmised that this is likely where the comment had come from.

4:09:05 PM
SENATOR STEDMAN requested comment on the Yukon-Kuskokwim delta potential and whether that has been reviewed. He also asked whether any exploratory work has been done in Southeast Alaska, where some areas look similar to Cook Inlet on a surface map.

MR. SWENSON addressed the Yukon-Kuskokwim delta. He agreed with Mr. Houseknecht's suggestion that if Alaska's numerous

sedimentary basins were in the Lower 48, there would have been significantly more exploration. He said there are wells in most of the basins, with more information from some than others.

MR. SWENSON explained that the primary difference between here and the other basins is that most of the others are Tertiary in age and don't have the same supercharged nature. Often, the gas in interior basins is related specifically to coals; an example is Cook Inlet, where 90 percent of the gas produced has been biogenic, having migrated from the coal. He emphasized that it's not coalbed methane, but is biogenic.

MR. SWENSON said for other basins like the Yukon-Kuskokwim or any of the Bering Sea basins, a number of wells were drilled in the 1980s when the industry got together. There are snippets of information, but many don't have the same source rock potential. As economies change, though, there could be additional exploration. When there is infrastructure in the interior parts like the Nenana or Susitna basin along the Railbelt, there'll be exploration. He added that with the Division of Oil & Gas exploration license program, a fair amount of exploration has been ongoing in those other basins.

4:11:24 PM
REPRESENTATIVE SAMUELS told members he'd recently spoken with folks who said methane hydrate research is further along than some might think. He requested comment on the monetization or recovery of gas hydrates.

MR. HOUSEKNECHT indicated USGS is participating in a collaborative research effort and had an integral part in both the Mallik well drilled on the Mackenzie delta a few years ago and the Mount Elbert well drilled on the North Slope a year ago. His group is in the process of making its first estimate of how much gas may be technically recoverable, and he expects that to be released within three months or so. The next step will be to determine how much is economically viable, which is still an area of active research.

MR. HOUSEKNECHT said there is no question that hydrates have a very large potential to add to a reserves base, as do basin-centered gases. The coalbed gases probably would come in third among those three unconventional types, but one estimate has already been made from coalbed gases in northern Alaska, with a mean estimate of as much as 18 Tcf; this data is available in a published factsheet. He said more is being learned by the day, week, and month. Probably within relatively few years there'll be a much better estimate of what's economically recoverable.

4:13:52 PM
SENATOR DYSON told members he's uncomfortable about talk of a bullet line while so much of the Cook Inlet basin is unexplored

for gas. He asked what the broad understanding is of what recoverable reserves may be there.

MR. HOUSEKNECHT answered that the last published USGS estimate was in 1995 and thus is badly out of date. To his recollection, it was 2 Tcf for undiscovered resources, which he believes is conservative. They're working on a new estimate that may be completed in about 18 months. Based on information they currently see, he opined that the number will rise significantly; he declined to quantify that.

MR. SWENSON added that the National Energy Technology Laboratory did a study on that and used 17 Tcf as the resource for all of Cook Inlet and the Shelikof Strait areas. He noted the ability to do that is based on the knowledge and data available; in some areas of Cook Inlet, it's relatively limited, but that's increasing in a number of cases.

SENATOR DYSON remarked that some folks who work for the Division of Oil & Gas and some companies that have been out there think 17 Tcf may be in the ballpark. He commended the efforts.

4:16:04 PM
REPRESENTATIVE KELLY observed that the presenters and TransCanada had given easy-to-understand comparisons with Wyoming and parts of Canada. He asked what similar comparisons would look like for oil, both on land and in state waters.

MR. HOUSEKNECHT answered that the paper he'd referred to that is available on the Web is a summary for arctic Alaska of both oil and gas resources that are undiscovered. Indicating he was reading from it, he said the estimated total for liquids onshore and beneath state waters for arctic Alaska, including crude oil and natural gas liquids (NGLs), is 27 billion barrels at the mean. That is almost equally divided between NPRA and the ANWR coastal plain, with a relatively smaller number for the central North Slope because it has been much more intensely explored already, having been open for business several decades.

MR. HOUSEKNECHT further reported that MMS estimates about 24 billion barrels recoverable offshore - about 15 billion in the Chukchi area and 8 billion in the Beaufort area. If the USGS estimates he'd just cited for onshore and state waters are added to the MMS estimates for the OCS, the sum that remains to be discovered is a little more than 50 billion barrels.

MR. HOUSEKNECHT proposed looking at an example from the North Slope, where the Alpine discovery was the largest onshore discovery in North America in the last 25 years. This serendipitous discovery occurred when the company that drilled the well had a different primary objective. He said the lesson learned in both oil and gas basins is that the more exploration one does, the more one tends to find.

4:19:21 PM
SENATOR THOMAS asked whether the information on the 500 exploratory wells drilled since the 1940s is available through USGS or requires some process to obtain.

MR. HOUSEKNECHT replied that most of the information is in the public domain and is mostly available through the Alaska Oil and Gas Conservation Commission (AOGCC); for some, especially for NPRA, USGS maintains an active archive. Some proprietary wells have had that status as long as 30 years, and even USGS doesn't have access to those. Among the 500 or so exploration wells, he estimated information is available for probably 95-97 percent.

SENATOR THOMAS asked what determines whether a well is proprietary.

MR. HOUSEKNECHT deferred to Kevin Banks of the Division of Oil & Gas, but noted that the answer depends on whether the wells are drilled on state leases, Native lands, or federal leases. All three have different regulations controlling the release of results. Also, companies can petition those lease owners to hold the wells proprietary. So there isn't a universal rule for northern Alaska.

4:21:21 PM
REPRESENTATIVE CHENAULT thanked the presenters for the information, but said he'd be more interested in hearing from AOGCC about gas takeoff at Prudhoe Bay, since he'd heard Point Thomson isn't needed now to build a gas pipeline. He asked that AOGCC members be made available as well.

CHAIR HUGGINS concurred, indicating he would work on that. He thanked the presenters. Both SB 3001 and HB 3001 were held over.

The joint meeting of the Senate Special Committee on Energy and the House Rules Standing Committee was adjourned at 4:23:49 PM.