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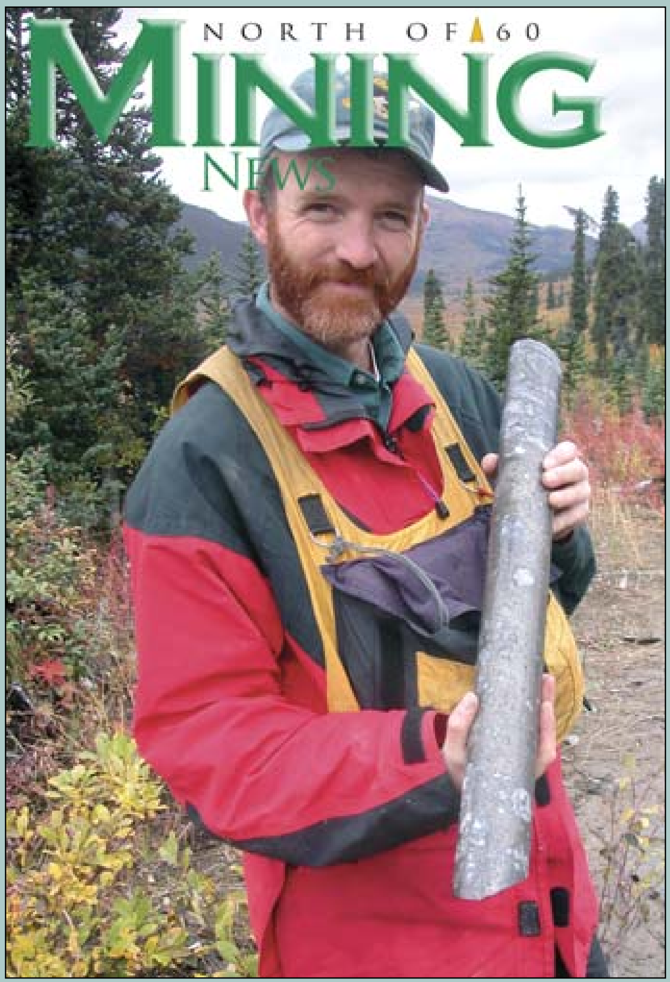
Week of November 28, 2004 • $1.50

page 4 Federal assessment of B.C. drilling moratorium complete

North of 60 Mining News inside



This month's North of 60 Mining News features several stories, including Curt Freeman's Alaska mining news update; Sarah Hurst's article about encouraging trends in Canada's Yukon Territory; and Hurst's "Ivanhoe riding to riches in Mongolia," about a new copper-gold discovery that could rival Alaska's Pebble deposit. Ivanhoe's controversial chairman, flamboyant mining promoter Robert Friedland, guided the sale of Fairbanks Gold Mining's Fort Knox deposit to Amax Gold in 1992.

ANWR not a slam dunk; moderate House Republicans not on board

JUDY PATRICK

ROGER HERRERA

Roger Herrera, a former BP geologist who has been working for a number of years to open the coastal plain of the Arctic National Wildlife Refuge for exploration, told the Resource Development Council conference Nov. 18 that even with a larger number of Republican senators following the general election, opening the coastal plain of ANWR is not a done deal.

"There is no such thing as a slam dunk," Herrera said, encouraging continued support for Arctic Power, which works to open the coastal plain for exploration, and inviting conference attendees to a Dec. 1 fundraiser at 5:30 p.m. at the Petroleum Club in Anchorage, "to help fund Arctic

see **HERRERA** *page 19*

BREAKING NEWS

ANCHORAGE

In high gear

Bowles: Alaska holds multiple investment opportunities for Conoco

By KRISTEN NELSON

Petroleum News Editor-in-Chief

JUDY PATRICK

Jim Bowles, ConocoPhillips Alaska

Jim Bowles, who took over as president of ConocoPhillips Alaska in October, told the Resource Development Council conference Nov. 18 in Anchorage that ConocoPhillips sees new investment opportunities in Alaska in several areas: increased recovery in existing fields; continued development of satellite fields; aggressive development of heavy oil; continuous exploration; and successful Alaska North Slope natural gas commercialization.

Alpine is an example of an existing field where new investment has increased recovery, Bowles said. ConocoPhillips and its partner Anadarko Petroleum are investing some $60 million in each of the two facility expansion programs at the Alpine field. From its initial flow rate of about 80,000 barrels per day in November 2004, Bowles said, Alpine production has been increased to more than 100,000 bpd, with a current flow rate of about 113,000 bpd. By the time work on the second facility expansion is completed next year, capacity will be increased to 130,000 bpd, he said.

Satellite fields have been developed recently at Prudhoe Bay and Kuparuk, and Alpine satellites are in the planning stage in both NPR-A and on state and Native lands east of NPR-A. "In total

see **CONOCOPHILLIPS** *page 18*

GULF OF MEXICO

Enbridge surfaces as U.S. Gulf deepwater giant

Canadian pipeline firm buys Shell's GOM pipeline assets for $613M

By RAY TYSON

Petroleum News Houston Correspondent

PAT DANIEL

Canadian pipeline company Enbridge, with its pending US$613 million acquisition of Shell's Gulf of Mexico natural gas transmission assets, would instantly become a major midstream player in the U.S. Gulf, particularly in the expanding deepwater frontier.

Enbridge, which already operates the world's longest crude oil and liquids transportation system in Canada and the United States and is negotiating with the state of Alaska to build a gas pipeline from the North Slope, stands to gain substantial interests in 11 pipelines and gathering systems in five major transmission corridors offshore Texas and Louisiana. However, U.S. regulators must first approve the deal.

"Our vision has long been to be the leader in North American energy delivery, and this modest size acquisition advances us another step towards that end," Pat Daniel, Enbridge's chief executive officer, said in a Nov. 17 conference call explaining the Shell acquisition.

see **ENBRIDGE** *page 18*

ANCHORAGE

BP: $10 billion could be $15B

Walker: Heavy oil could be half of Alaska North Slope production by 2030

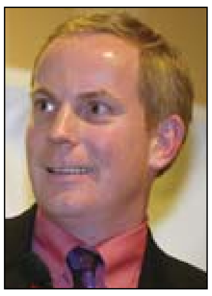
By KRISTEN NELSON

Petroleum News Editor-in-Chief

BP is eyeing a very long-term future in Alaska, looking at building for the next 50 years, Angus Walker, commercial vice president for BP Exploration (Alaska), told the Resource Development Council's annual conference in Anchorage Nov. 18.

BP "wants to use in excess of $10 billion of our capital to create a long-term business in Alaska," and that $10 billion could be $15 billion, "depending on how things work out," Walker said.

The $10 billion, he said, "is how much we need to invest in our Alaskan business over the next 10 years in order to build the foundations for a business that will remain strong and sustainable for the next 50 years."



JUDY PATRICK

Angus Walker, BP Exploration (Alaska)

The company's capital budget for Alaska for 2005 is $700 million, split evenly between the North Slope and investments in infrastructure. The company also continues to spend about $800 million to maintain and operate existing facilities.

"BP is, and will continue to be, the largest private-sector investor in the state of Alaska," he said.

see **HEAVY OIL** *page 16*

Alaska - Mackenzie Rig Report

The Alaska - Mackenzie Rig Report as of November 4, 2004.
Active drilling companies only listed.

TD = rigs equipped with top drive units WO = workover operations
CT = coiled tubing operation SCR = electric rig

This rig report was prepared by Wadeen Hepworth

Alaska Rig Status

North Slope - Onshore

Rig Owner/Rig Type	Rig No.	Rig Location/Activity	Operator or Status
Doyon Drilling			
Dreco 1250 UE	14 (SCR/TD)	Milne Point, drilling MPG-03a	BP
Sky Top Brewster NE-12	15 (SCR/TD)	Deadhorse yard, expected start 2005	ConocoPhillips
Dreco 1000 UE	16 (SCR)	J-pad. J-2 sidetrack	BP
Dreco D2000 UEBD	19 (SCR/TD)	Alpine, drilling CD1-11	ConocoPhillips
OIME 2000	141 (SCR/TD)	Infield Kuparuk, drilling 1E-168 multilateral	ConocoPhillips
Nabors Alaska Drilling			
Trans-ocean rig	CDR-1 (CT)	Stacked, Prudhoe Bay	Available
Dreco 1000 UE	2-ES (SCR)	Prudhoe Bay, 5-24A	BP
Mid-Continent U36A	3-S	Stacked, Deadhorse	Available
Oilwell 700 E	4-ES (SCR)	Milne Point, MPF-38	BP
Dreco 1000 UE	7-ES (SCR/TD)	Prudhoe Bay, Z-13A	BP
Dreco 1000 UE	9-ES (SCR/TD)	Prudhoe Bay, V-211i	BP
Oilwell 2000 Hercules	14-E (SCR)	Stacked, Deadhorse	Available
Oilwell 2000 Hercules	16-E (SCR/TD)	Stacked, Prudhoe Bay	Available
Oilwell 2000	17-E (SCR/TD)	Stacked, Point McIntyre	Available
Emsco Electro-hoist -2	18-E (SCR)	Stacked, Deadhorse	Available
OIME 1000	19-E (SCR)	Stacked, Deadhorse	Available
Emsco Electro-hoist Varco TDS3	22-E (SCR/TD)	Stacked, Milne Point	Available
Emsco Electro-hoist	28-E (SCR)	Stacked, Deadhorse	Available
OIME 2000	245-E	Stacked, Kuparuk	Available
Nordic Calista Services			
Superior 700 UE	1 (SCR/CTD)	Kuparuk, C-41	BP
Superior 700 UE	2 (SCR/CTD)	Kuparuk, 1H-11	BP
Ideco 900	3 (SCR/TD)	Kuparuk, stacked at 1-Q	ConocoPhillips

North Slope - Offshore

Rig Owner/Rig Type	Rig No.	Rig Location/Activity	Operator or Status
Nabors Alaska Drilling			
Oilwell 2000	33-E (SCR/TD)	Stacked, NorthStar	BP
Emsco Electro-hoist Canrig 1050E	27-E (SCR/TD)	Stacked at 12-acre pad	Kerr-McGee

Cook Inlet Basin – Onshore

Rig Owner/Rig Type	Rig No.	Rig Location/Activity	Operator or Status
Aurora Well Service			
Franks 300 Srs. Explorer III	AWS 1	Stacked in Nikiski	Available
Pioneer (Evergreen)			
Wilson Super 38	96-19	Stacked in Wasilla yard	Pioneer (Evergreen)
Inlet Drilling Alaska/Cooper Construction			
Kremco 750	CC-1	Stacked, Kenai	Available
Kuukpik	5	West Forelands, drilling #2	Forest Oil
Marathon Oil Co. (Inlet Drilling Alaska labor contractor)			
Taylor	Glacier 1	Working on KBU 42-6	Marathon
Nabors Alaska Drilling			
Rigmasters 850	129	Released from Unocal	Aurora
National 110 UE	160 (SCR)	Stacked, Kenai	Available
Continental Emsco E3000	273	Stacked, Kenai	Available
	51	Steelhead platform, done 12-1-03	Unocal
Franks	26	Winterization	Unocal
IDECO 2100 E	429E (SCR)	Stacked, removed from Osprey platform	Available
Water Resources International			
Ideco H-35 KD		Continuing to rig up and prep to spud the N, Beluga 1 well	Pelican Hill

Cook Inlet Basin – Offshore

Rig Owner/Rig Type	Rig No.	Rig Location/Activity	Operator or Status
Cudd Pressure Control	340K	Stacked	Available
Unocal (Nabors Alaska Drilling labor contractor)			
Not Available			
XTO Energy (Inlet Drilling Alaska labor contract)			
National 1320	A	Idle	XTO
National 110	C (TD)	Drilling well C22A-26LN at 12,057'	XTO

Mackenzie Rig Status

Mackenzie Delta-Onshore

Rig Owner/Rig Type	Rig No.	Rig Location/Activity	Operator or Status
AKITA Equtak			
Dreco 1250 UE	62 (SCR/TD)	Barges at staging site	EnCana
Dreco 1250 UE	63 (SCR/TD)	Barges at staging site	Chevron Canada
National 370	64	Stacked, Inuvik, NT	EnCana

Central Mackenzie Valley

Rig Owner/Rig Type	Rig No.	Rig Location/Activity	Operator or Status
AKITA/SAHTU			
Oilwell 500	51	Stacked, Fort Good Hope, NT	Apache Canada
Nabors Canada			
	62	Racked	Available

Yukon Territories Rig Status

Yukon

Rig Owner/Rig Type	Rig No.	Rig Location/Activity	Operator or Status
AKITA/Kaska			
National 80UE	58	Kotaneelee, drilling L-38	Devon Canada

JUDY PATRICK

Nabors 9-ES

Baker Hughes North America rotary rig counts*

	November 19	November 12	Year Ago
US	1,268	1,259	1,107
Canada	444	448	414
Gulf	99	93	97

Highest/Lowest

US/Highest	4530	December 1981
US/Lowest	488	April 1999
Canada/Highest	558	January 2000
Canada/Lowest	29	April 1992

*Issued by Baker Hughes since 1944

Rig start-ups expected in next 6 months

Rig Owner/No.	Rig Location/Activity	Operator
Akita Equtak 62	Umiak No. 5 camp and construction equipment are on barges at staging site at Mason Bay.	EnCana
Akita Equtak 63	West Ellice rig camp and construction equipment are on barges at staging site at Ellice Island.	Chevron Canada
Akita/Sahtu Drilling 51	Will be drilling in the Colville Lake area	Apache Canada
Akita/Sahtu Drilling 40	Will be drilling in the Summit Creek area, west of Tulita NT.	Northrock Resources
Doyon Drilling 15	Will start drilling in January 2005	ConocoPhillips

CANADIAN ARCTIC ISLANDS

Call for nominations in Arctic Islands

The Canadian Minister of Indian Affairs and Northern Development has issued a call for oil and gas nominations for Crown reserve lands north of 60 degrees in the Arctic Islands of Nunavut. The ministry said January is the tentative date for calls for bids as a result of this call for nominations.

Nominations will be accepted through Dec. 23. Details are available online at: http://www.ainc-inac.gc.ca/oil/act/Cal/nvt2005/nom/index_e.html

The ministry said individuals or companies nominating parcels are expected to submit a bid in response to the call for bids. "The Minister reserves the right to refuse future postings requests by that individual or company if a bid is not submitted."

In a bid round, selection of the successful bid will be based on the total amount of money the bidder proposes to spend doing exploratory work on each parcel. The minimum work bid for each parcel is C$1 million.

—PETROLEUM NEWS

FAIRBANKS, ALASKA

100 pipeline workers graduate

The Alaska Department of Labor and Workforce Development, the North Slope Contractors Association and the Alaska Petroleum Joint Crafts Council are graduating about 100 pipeline construction workers, workers qualified for jobs this winter at West Sak and other construction sites on Alaska's North Slope.

Construction of a demonstration section of pipeline was part of the graduation.

The state said Nov. 19 that the Fairbanks training project was prompted in part by the August decision of ConocoPhillips Alaska and BP Exploration (Alaska) to initiate West Sak production in what will be the largest heavy oil development program in

see **GRADUATION** page 18

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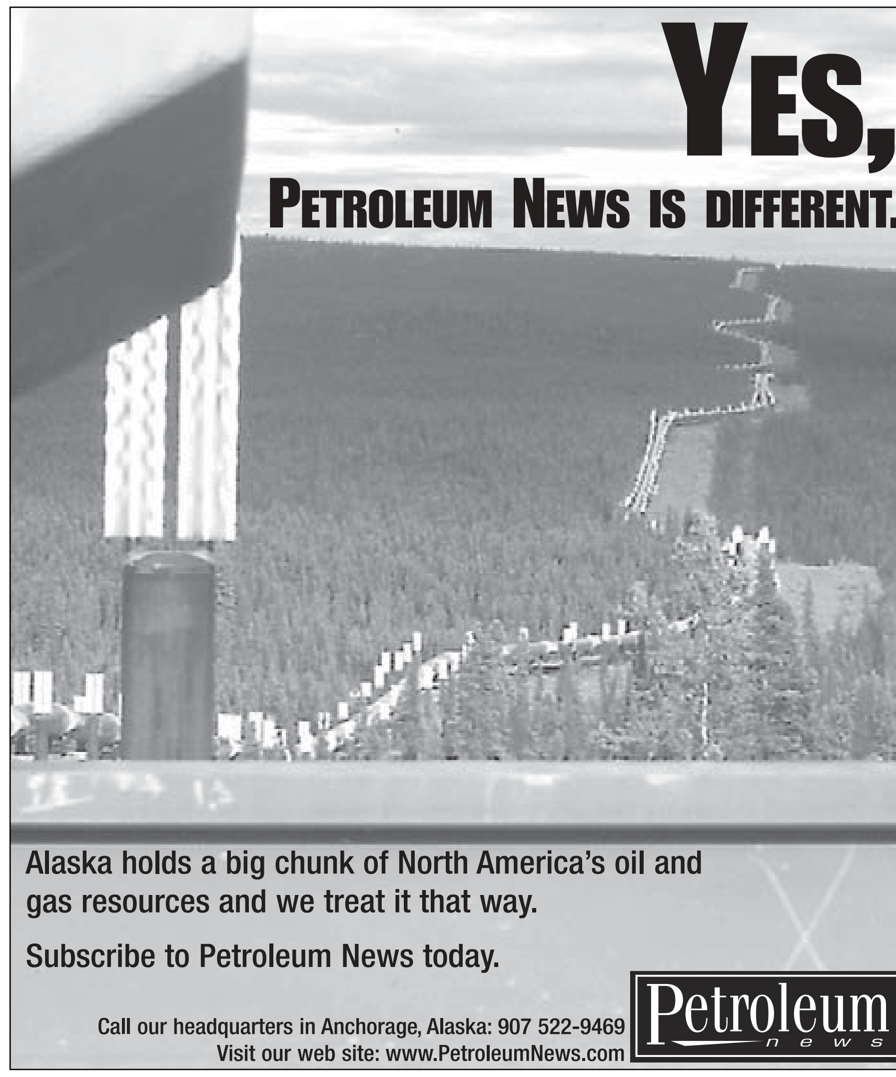
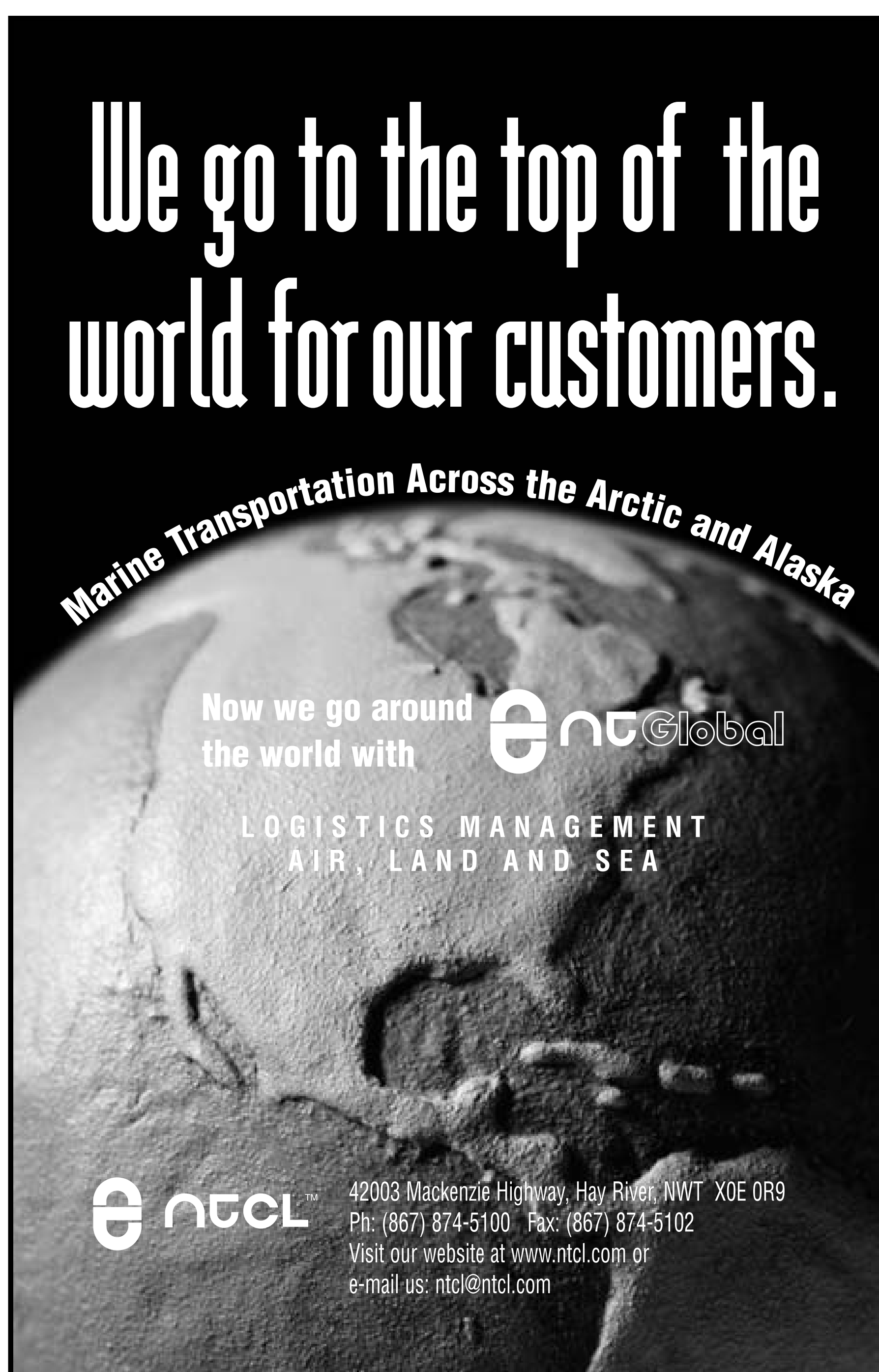




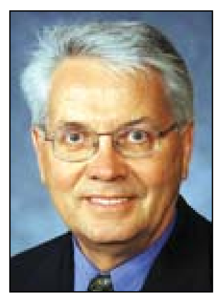
● BRITISH COLUMBIA

Federal assessment of B.C. drilling moratorium complete

PETROLEUM NEWS

The federal government of Canada has completed a federal review process addressing the federal moratorium on oil and gas exploration and development off the coast of British Columbia, R. John Efford, Minister of Natural Resources Canada, said Nov. 19.

Initiated in 2003, the arms-length review was to provide both a scientific analysis and an assessment of the position of British Columbians and coastal First Nations on the subject of oil and gas activities offshore the western province.


"As far as I'm concerned, it's not a very good report. It doesn't tell us anything that we didn't already know. If I was the federal government, I'd be pretty disappointed about taking almost a year to come up with nothing." —B.C.'s Energy Minister Richard Neufeld

"This has been a broad and open process. We have now heard a wide range of views from British Columbians and appreciate their contribution. This is an important decision for B.C. and for Canada," Efford said in a press release.

The three reports that were part of the process, initiated in 2003, "will help the government assess the next steps regarding the moratorium, and my colleagues and I will be looking at them in the coming months," he said.

"The three-part federal process is not a decision-making process, but rather a way to explore the issues and views of British Columbians regarding the federal moratorium. The three reports provide valuable input to help the government of Canada assess whether or not, or under what conditions, to lift the federal moratorium on offshore B.C. oil and gas activities in the Queen Charlotte region," Efford said.

The first report concerned the state of the science, and was released in February 2004. A panel of four scientists said there was no scientific reason to maintain a joint federal-provincial moratorium on offshore drilling, and that work could begin as soon as the necessary environmental assessments have been completed.

> *"The three reports provide valuable input to help the government of Canada assess whether or not, or under what conditions, to lift the federal moratorium on offshore B.C. oil and gas activities in the Queen Charlotte region."*
> **—R. John Efford, Minister of Natural Resources Canada**

But the panel, working under the auspices of the Royal Society of Canada, said that drilling must be governed by strict regulations, First Nations claims must be settled, and a wide range of environmental and technical studies must be completed. But a green light for preliminary work "would enhance the opportunity for filling many of the science gaps through shared-cost partnerships involving industry participation."

Seventy-five percent opposed

The next two panels, which completed their reports in mid-November, were the Public Review Panel and the First Nations Engagement Process. They were to provide the views of British Columbians, including coastal First Nations, on the federal moratorium. The public review panel said 75 percent of the people who participated in hearings in British Columbia earlier this year were opposed to lifting the exploration moratorium.

But unlike the scientific panel, the public review panel decided not to make a recommendation on lifting the moratorium.

"As far as I'm concerned, it's not a very good report. It doesn't tell us anything that we didn't already know. If I was the federal government, I'd be pretty disappointed about taking almost a year to come up with nothing," B.C.'s Energy Minister Richard Neufeld told The Canadian Press Nov. 19.

First Nations say no

The First Nations' report, titled Rights, Risks and Respect, concluded that the "moratorium should not be lifted at this time," stressing that there was a "need for greater understanding" of the risks associated with oil and gas activities.

The report also pointed to "unresolved title, rights and jurisdictional issues and, in particular, foreshore rights" that must be addressed before the moratorium is lifted.

The executive summary of the report said that there were "two perspectives contributing" to the First Nations' conclusion. "One view is that an informed decision cannot be made on the basis of currently available information. The second view is that there is enough information available now to definitively conclude that the moratorium should absolutely not be lifted."

Chevron, Shell, Exxon, Forest hold leases

Resource estimates prepared by the Geological Survey of Canada some years ago put the petroleum resource potential in Hecate Strait offshore British Columbia at 9.8 trillion cubic feet of gas and 1.3 billion barrels of oil.

Oil companies still holding exploration leases for offshore British Columbia (they were put in abeyance when the moratorium was imposed) include Petro-Canada, ChevronTexaco, Shell Canada, ExxonMobil and Canadian Forest Oil.

While all the attention has been focused on the waters between the Queen Charlotte Islands and the mainland, there are three other offshore basins that have been identified as having oil and gas potential.

The Winona and Tofino Basins, off the west coast of Vancouver Island, have an estimated resource potential of 9.4 trillion cubic feet of gas, while the Georgia Basin near Vancouver has an estimated resource potential of 6.5 tcf. ●

Editor's note: Watch for a full story on the B.C. assessment in the Dec. 5 edition of Petroleum News.

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BROOKLYN, N.Y.

KeySpan to sell Houston Exploration shares for $369M

Northeast U.S. natural gas distributor KeySpan said Nov. 19 that it agreed to sell the company's remaining 6.6 million shares of The Houston Exploration Co. for about $369 million, or $56.25 per share.

Following the transaction, KeySpan would no longer have any ownership interest in Houston Exploration, KeySpan said, adding that investment bank Morgan Stanley will be the sole underwriter for the transaction.

KeySpan is the largest distributor of natural gas in the Northeast with 2.5 million customers, operating regulated natural gas utilities in New York, Massachusetts and New Hampshire which do business as KeySpan Energy Delivery.

Houston Exploration is an exploration and production independent based in Houston, Texas.

—RAY TYSON

JUNEAU

State of Alaska's bond credit rating outlook improves

Moody's Investors Service has changed its outlook on the state of Alaska's general obligation bond credit rating from negative to stable, citing the state's low debt burden, expanding economy and conservative financial planning.

Favorable bond ratings help state and local governments borrow at lower interest rates, reducing the cost of new schools, roads, ports and other capital investments. Credit rating changes are usually preceded by an indicative outlook, making today's announcement good news for Alaska issuers of public debt and holders of Alaska bonds, a Nov. 19 press release from Alaska Gov. Frank H. Murkowski said.

"I am pleased with this increased confidence in the future of our great state, and I share that confidence," Murkowski said. "I think it is clear that our outlook has improved significantly since 2002."

In removing the negative outlook it placed on the state in 2002, Moody's cited the state's low debt burden, the expanding but still narrow economic base, sizeable reserve fund balances, and conservative financial planning efforts to accommodate the eventual limitation of oil revenues.

Moody's also acknowledged efforts to bring North Slope natural gas to market.

In October the Alaska Department of Revenue, along with the state's financial advisors, briefed Moody's on progress made in Alaska and in the U.S. Congress aimed at construction of a pipeline to bring Alaska's stranded North Slope natural gas to market.

Moody's tempered its improved outlook for the state by cautioning that, "Our rating of Aa2 with a stable outlook is predicated on the assumption that the state will ultimately make the hard decisions necessary to address its structural budget problems."

● HOUSTON

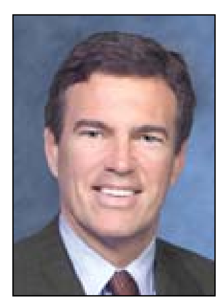
Kerr-McGee, Anadarko to focus on development in '05

Anadarko's 2005 capital budget will range between $2.9 billion and $3.1 billion, roughly the same level as this year; Kerr-McGee budgets $1.7B

By RAY TYSON

Petroleum News Houston Correspondent

Big exploration and production independents Anadarko Petroleum and Kerr-McGee, taking advantage of the strong commodity price environment, will be focusing substantial chunks of next year's capital spending on development projects designed to generate quick returns in the way of increased production.



James Hackett, Anadarko's chief executive officer

Kerr-McGee, adjusting for its acquisition of Westport Resources, is planning to spend about $1.7 billion on oil and gas operations in 2005, a 20 percent increase over 2004 capital spending. That effort should yield a 15 to 19 percent increase in production, company officials said.

Luke Corbett, Kerr-McGee's chief executive officer

Anadarko's 2005 capital budget will range between $2.9 billion and $3.1 billion, roughly the same level as this year. However, 64 percent of spending is earmarked for development — an effort the company said would increase production 7 to 11 percent over 2004 volumes.

James Hackett, Anadarko's chief executive officer, said in a Nov. 19 conference call that Anadarko chose "to exercise the strategic option" of accelerating low-risk drilling on some of its unconventional "tight gas plays" in the Vernon field in North Louisiana and Wild River in Alberta, Canada, and on delineating new plays in Texas and Louisiana.

He said production also will continue to ramp up at the company's enhanced oil recovery operations at the Salt Creek and Monell fields in Wyoming.

In the Gulf of Mexico, he said, Anadarko will concentrate on delineation drilling and facilities installation in the deepwater at K2, K2 North and Eastern Gulf, "which are expected to be significant contributors to the company's volume growth through 2008."

Alaska investment in Alpine, NPR-A

In Alaska, Anadarko plans to invest about $80 million, largely to pay its share of expanding the Alpine oil facility to increase capacity.

Although Anadarko spent $746,362 in the Oct. 27 state oil and gas lease sale for acreage near its Jacobs Ladder prospect on the eastern North Slope, Hackett did not mention any long terms exploration plans for Alaska. Anadarko has said it will not operate any exploration wells in the state this winter, but it is a partner in the two wildcats ConocoPhillips plans to drill in the National Petroleum Reserve-Alaska and in the Iapetus appraisal well being drilled this winter as part of a Colville River unit expansion. (See related story on page 11 of this issue.)

"Anadarko expects to achieve sustainable, profitable growth by leveraging our skill assets on the things we do well," Hackett said.

Anadarko's capital program is expected to deliver 160 million to 165 million barrels of oil equivalent production in 2005, up from 148 million to 151 million barrels expected by the end of this year.

About 25 percent of Anadarko's 2005 capital budget will go to exploration and the remaining 11 percent to capitalized interest, overhead and other items, the company said.

Exploration will focus on key areas in deepwater Gulf of Mexico, including prospects such as Genghis Khan, Knotty Head and Mondo Northwest, Anadarko said. In addition, the company plans to explore for deep gas in Canada and onshore United States.

International exploration will focus on Algeria, Tunisia and Indonesia, as well as on activities in unspecified new venture areas, the company said.

Kerr-McGee to capitalize on Westport

Luke Corbett, Kerr-McGee's chief executive officer, said his company's 2005 capital budget was designed "to capitalize on the potential" of its Westport acquisition earlier this year, including "thousands of identified exploitation opportunities."

"We plan to continue to ramp up exploitation drilling on these properties, while continuing our successful development and exploration programs," he added.

In fact, Kerr-McGee plans to drill about 800 exploitation and development wells next year,

see FOCUS page 7

● CALGARY

Shell Canada boosts capital spending 60%

C$1.8 billion capex budget includes C$335 million for Foothills region of western Canada, C$150 million for Sable gas

PETROLEUM NEWS

Shell Canada says it will reinvest a portion of this year's profits in order to boost capital and exploration spending in 2005 to C$1.8 billion, a 60 percent increase over 2004.

In the Nov. 18 press release, Shell Canada CEO Clive Mather said, "While profitability of our existing businesses remains a priority, we will be putting more emphasis on our strong and diverse portfolio of growth opportunities over the next several years."

The 2005 capex budget includes C$780 million for exploration and development of Canadian natural gas, which Shell hopes to maintain at current production levels, despite declining reserves in its producing fields.

The Foothills region of western Canada will get a C$335 million slice of the exploration and development funds and a C$150 million chunk will go to the Sable gas project off the coast of Nova Scotia, where Shell has a 31 percent operating stake.

Other E&D funds will go to the Peace River oil sands in western Canada and the Mackenzie Gas Project in the Northwest Territories, where Shell is a partner in a C$7 billion effort to build a natural gas pipeline from the Mackenzie Delta to markets in Alberta and the United States.

The Peace River program includes additional wells to increase bitumen production to the current license capacity of 12,000 barrels per day and engineering and technical work for a potential 30,000 barrels per day expansion project. Depending on the outcomes of this work and obtaining necessary approvals, construction on the Peace River expansion project could start in 2007, Shell said.

Unconventional gas opportunities, such as tight gas and coalbed methane in Alberta and British Columbia, will also get a slice.

The 2005 program for oil sands includes C$135 million for the Athabasca Oil Sands Project "operations and profitability initiatives" and $215 million for "growth."

Shell said planned profitability initiatives are largely focused on reducing unit costs.

The growth related piece includes Athabasca oil sands debottlenecking projects and front-end engineering for a 90,000 barrel-per-day expansion.

The program also includes funding to capitalize a lease arrangement for large mobile equipment — trucks and shovels — at the Muskeg River Mine. This arrangement is currently accounted for as an operating lease, Shell said.

The oil products spending program includes a C$110 million slice for marketing and C$370 million for manufacturing and distribution projects. ●

continued from page 6

FOCUS

"achieving very attractive returns," Corbett said.

More than half of the exploitation wells would be drilled in the Rocky Mountains, the company said.

Kerr-McGee plans specifically to expand activity by more than 40 percent in the Greater Natural Buttes area of Utah's Uinta basin, by drilling more than 200 wells. That effort, along with facility and pipeline improvements, should increase average daily production in the area by near 50 percent above 2004 levels, the company said.

The company also has earmarked an unspecified amount of cash for appraisal drilling on Alaska North Slope discoveries.

Kerr-McGee is on track with its Alaska drilling plans, having announced in July it would drill as many as six North Slope wells in the winter of 2004-2005 to evaluate its Nikaitchuq discovery, including one well into the Tuvaaq unit to the east.

"We either make a decision to move forward (with development) after this year's drilling season or not," Kerr-McGee Alaska Operations Manager Todd Durkee told Petroleum News July 14. "We intend to fully evaluate the Sag River formation discovery the company made last winter season."

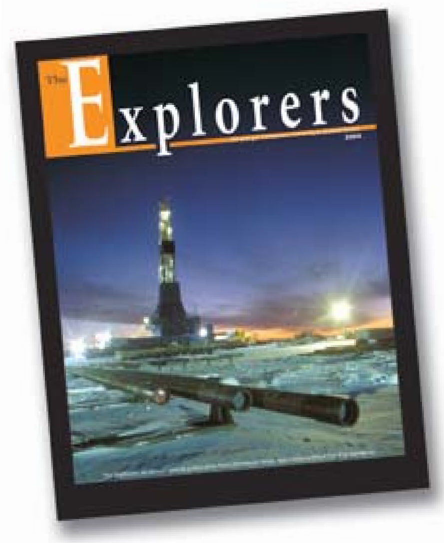
In the Gulf of Mexico, capital expenditures will finance continued development of Kerr-McGee's deepwater Constitution and Ticonderoga fields, as well as new developments at the Merganser, Vortex and San Jacinto fields in the Eastern Gulf.

Of next year's $1.7 billion capital budget, $660 million will go to the U.S. onshore, $645 million to the Gulf of Mexico, $270 million to the North Sea, and $160 million to new ventures and other international projects, the company said.

Kerr-McGee's average daily production for 2005 is projected in the range of 155,500 to 165,500 barrels of liquids and 1.167 million to 1.257 million cubic feet of gas. About 48 percent of liquids production and about 95 percent of gas volumes are expected to come from the United States. ●

● COOK INLET

Prodigy still looking for Cook Inlet partners



This article is an abbreviated version of an article that appears in The Explorers, an annual magazine published by Petroleum News. Formerly called The Independents, The Explorers magazine was released at the annual Resource Development Council of Alaska conference in Anchorage.

By KAY CASHMAN

Petroleum News Publisher & Managing Editor

Prodigy Alaska is seeking partners to participate in the drilling of two test wells to a depth of around 16,700 feet true vertical depth and, if successful, the development of its Northern Lights project in the upper Cook Inlet basin of Southcentral Alaska.

The Irving, Texas-based independent's new president, Paul Fenemore, is spearheading the firm's effort to bring in partners for its Northern Lights project which he says has "estimated gross recoverable oil reserves and resource potential in the range of 111-358 million barrels of oil equivalent."

Prodigy Alaska LLC was formed in 2001 for the purpose of exploring for and developing oil and gas reserves in the Cook Inlet basin. Prodigy has acquired a 100 percent working interest in 15 leases on 36,205 gross acres in the upper Cook Inlet basin. All of the leases are located in water depths of 100 feet or less and are close to pipelines and oil and gas infrastructure, Fenemore told Petroleum News late last month.

Dave Doherty, Prodigy Alaska's exploration manager, spent 14 years in Alaska with ARCO, during which time he was responsible for taking a new look at the geology of the Cook Inlet basin.

Fenemore, who is also president of Prodigy Oil and Gas, has spent much of his 27 years in the oil business involved in both domestic U.S. and international projects, including a significant amount of time on North Sea projects.

Want to know more?

If you'd like to read more about Prodigy go to Petroleum News' web site and search the archives: www.PetroleumNews.com/ The following stories, publishing since 2001 in Petroleum News, either feature or mention Prodigy.

2004
- **Aug. 29** Escopeta Oil's search for Cook Inlet's 'missing giants'

2003
- **Oct. 12** State issues Cook Inlet leases; three not taken
- **May 18** CORRECTION: Changes in Alaska's preliminary lease sale results
- **May 11** Prodigy looking for Cook Inlet partners
- **May 11** Picking up pieces

2001
- **Aug. 28** Texas independent looks to drill new Cook Inlet leases

Cook Inlet similar to North Sea

"In many ways the Cook Inlet is very similar to the North Sea, with regard to operations and the related costs involved, but is very much less explored," Fenemore said.

"The Cook Inlet has a lot in common with the East Irish Sea in the UK. They're both relatively remote basins; if you bring a rig in, it is likely that it will remain active there for several years," he said, referring to Cook Inlet's need for a jack-up rig.

"It's been difficult getting people interested in Alaska. Everyone thinks of the North Slope and its extreme climate and the costs involved in doing business there. … They don't quite seem to grasp that the Cook Inlet is not in the Arctic, not of the same mold," Fenemore said. "There's a lot of room in Cook Inlet for medium-sized independent oil companies to cut their teeth.

Northern Lights is on the central part of the North Cook Inlet structure. Fenemore said this anticline is approximately 23 miles long, 3 to 6 miles wide, and is characterized by pronounced, steep-sided domes at both ends. "Notably, the northern dome of the North Cook Inlet structure contains the Tyonek Deep oil field and in the opinion of Prodigy there is strong technical support for a significant extension of this undeveloped field into the Northern Lights project area." Of the 17 wells drilled into the Tyonek Deep on the structure, 15 were deemed productive, and eight tested at initial rates of up to 3,600 barrels of oil per day, per zone, Fenemore said. ●

NORTH AMERICA

U.S. picks up nine rigs, Canada down by four rigs

The number of rotary drilling rigs operating in North America during the week ending Nov. 19 stood at 1,712, a net increase of five rigs from the previous week and a net gain of 191 rigs compared to the same period last year, according to rig monitor Baker Hughes.

The Canadian rig count actually decreased by four vs. the prior week to 444, but was up by 30 compared to the year-ago period.

The number of rigs operating in the United States compared to the previous week increased by nine rigs to 1,268 and was up by 161 vs. the same time last year. Compared to the prior week only, offshore rigs jumped by seven to 105, while land rigs increased by two to 1,141. The number of inland water rigs was unchanged at 22.

Of the total number of rigs operating in the United States during the recent week, 1,080 were drilling for natural gas and 186 for oil, while two were being used for miscellaneous purposes. Of the total, 795 were vertical wells, 346 directional wells, and 127 horizontal wells.

Among the leading producing U.S. states, New Mexico alone picked up six rigs for a total of 77, while Texas gained six rigs for a total of 545 and Louisiana picked up one rig for a total of 173. Wyoming's rig count declined by four to 69, while Oklahoma's decreased by two to 156. Alaska was unchanged with 11 rigs, as well as California with 26 rigs.

—RAY TYSON

OKLAHOMA CITY

Gulfport Energy's drilling program dubbed a success

Independent producer Gulfport Energy has significantly increased both oil and gas production in Louisiana's West Cote Blanche Bay field since launching a drilling and well recompletion program at the field in July, the company said Nov. 19.

The eight wells that have been drilled and completed had combined initial gross production rates of 607 barrels of oil per day and 901,000 cubic feet of natural gas per day, Gulfport said, adding that logs from the wells showed a total of 678 feet of net pay in 38 productive zones.

The four existing wells that were recently recompleted had combined initial gross production rates of 459 barrels of oil per day and 111,000 cubic feet of gas per day.

Prior to July, the daily gross sales for the West Cote Blanche Bay field were 1,428 barrels of oil and 237,000 cubic feet of gas. The field had daily gross sales of 2,494 barrels of oil and 1.249 million cubic feet of gas at the completion of the drilling program.

Gulfport owns a 100 percent working interest in the field and an average net revenue interest of 81.11 percent.

—RAY TYSON

● COOK INLET

Devon says no deal yet on Cosmopolitan unit

ConocoPhillips to shoot seismic in the summer of 2005; 'if that turns out' a well in 2006 contingent on getting a jack-up rig into Cook Inlet

By **KAY CASHMAN**

Petroleum News Publisher & Managing Editor

When ConocoPhillips Alaska told regulators that it would begin shooting 3-D seismic at the Cosmopolitan unit in Southcentral Alaska within a year, Petroleum News reported it on the front page of the Nov. 14 edition.

Since ConocoPhillips had been looking for another working interest partner to help fund seismic and a delineation well in the 24,600 acre exploration unit, Petroleum News asked the company if its plans to shoot seismic were the result of having found another partner.

Official channels at ConocoPhillips said there was "nothing new" to report regarding the unit off the lower Kenai Peninsula.

A likely investor was Devon Energy, which picked up half of Forest Oil's working interest in the unit, effective Aug. 1. Devon had held a 5 percent interest in the seven state of Alaska leases and the two federal leases in the unit and in the August deal added half of Forest's 25 percent working interest, giving Devon a 17.5 percent interest, Forest a 12.5 percent interest and operator ConocoPhillips a 70 percent working interest.

Devon was not able to provide a comment in time for the Nov. 14 edition, but an industry source told Petroleum News that Devon was farming in for another chunk of working interest in Cosmopolitan "in order to get another well drilled" in the unit.

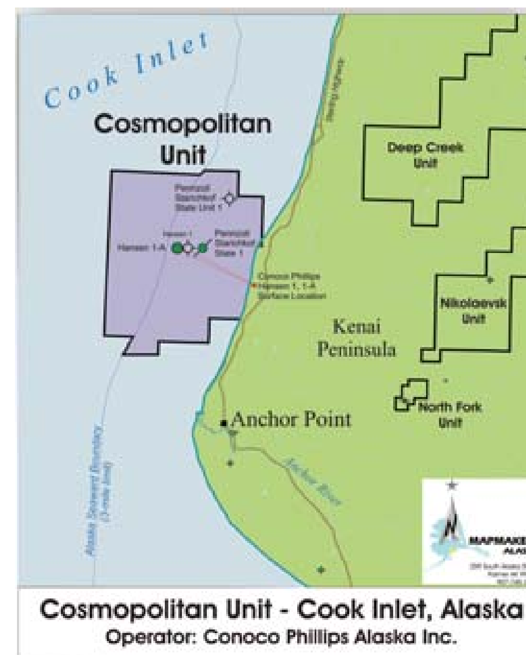
Deal, jack-up being discussed

On Nov. 18, Devon spokesman Chip Minty told Petroleum News that a farm-in for additional working interest by his company was "possible," but "not imminent."

Minty said Devon and ConocoPhillips were talking and "while there is an interest, there hasn't been a decision by Devon."

He also said ConocoPhillips was looking at shooting seismic in the summer of 2005 and "if that turns out" there "is a possibility of another well in 2006" contingent on getting a jack-up rig into Cook Inlet.

"As I understand it, it's pretty shallow water" where ConocoPhillips "would want to drill and subject to tidal influences," Minty said.



A former executive with Forest Oil, which has several other offshore Cook Inlet prospects that require a jack-up to explore, told Petroleum News it would take a jack-up rig to really test Cosmopolitan.

Pennzoil found oil and gas in the area in 1967, drilling offshore with a jack-up. But ConocoPhillips' first well at the prospect, the Hansen 1, spud in October 2001, was drilled from onshore to a bottom-hole under Cook Inlet. The measured depth of the well was almost four miles. The true vertical depth was 7,102 feet.

A sidetrack, Hansen 1A, followed in 2003. It was also drilled from shore.

Since that time ConocoPhillips has been evaluating the prospect for possible development.

Got one year from the feds

As reported in the Nov. 14 issue of Petroleum News, a new, two-year plan for the Cosmopolitan unit was approved by state and federal regulators in early November.

see **COSMOPOLITAN** page 10

ALBERTA

Suncor approves C$3.6 billion in funding for next phase of oil sands growth

Oil sands powerhouse Suncor Energy gave its final stamp of approval Nov. 16 to a C$3.6 billion expansion designed to help boost its Alberta oil sands production to 350,000 barrels per day by 2008. The company also set its capital budget for 2005 at C$2.5 billion, a 47 percent increase over 2004.

The C$3.6 billion figure — $600 million more than Suncor's initial estimate — includes C$2.1 billion for upgrader expansion and new coking facilities, and C$1.5 billion to boost bitumen production at the company's in-situ and mining and extraction facilities. Bitumen from third parties is also expected to supply the expanded upgrader.

Final Board approval "for some components of the bitumen production plan are still pending," Suncor said in a Nov. 17 press release.

Engineering for the project is approximately 50 percent complete, Suncor said. Preliminary fieldwork, foundation construction and the manufacture of major vessels and equipment are in progress.

"Increased oil sands production is central to our long-term strategy," said Rick George, Suncor president and chief executive officer. "With our staged approach to growth, we expect to expand production steadily, reliably and at a competitive cost."

This project, as well as other expansion projects currently being undertaken by Suncor, are key components of the company's Voyageur growth strategy — a multiphase plan to increase production to more than a half million barrels per day in the 2010 to 2012 time frame.

Included in Suncor's C$1.5 billion capital spending budget for 2005 are C$1.5 billion to support oil sands development and C$400 million for Canadian downstream operations, with the majority directed toward meeting federal regulations for diesel desulphurization at the company's Sarnia refinery, the company said.

Funds will also be spent to expand the refinery's throughput capacity and enable it to process approximately 40,000 barrels per day of oil sands sour crude blends.

Also included in the capital budget is C$535 for Suncor's U.S. operations.

—PETROLEUM NEWS

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COSMOPOLITAN

The new plan and its work commitment prompted the U.S. Minerals Management Service to extend its suspension of operations on the two federal leases in the unit from November 2004 to Nov. 15, 2005, albeit one year short of the termination of the unit plan.

But the deadlines for work commitments in the unit plan are one day earlier than when the suspension expires — an expiration that MMS said would effectively terminate Cosmopolitan's federal leases.

The new plan calls for ConocoPhillips to shoot a minimum of 40 square miles of 3-D seismic, beginning no later than Nov. 14, 2005, with acquisition to be complete by Nov. 14, 2006. Or, the company can drill another well in the unit.The well alternative requires ConocoPhillips to commit to drill by Nov. 14, 2005, and drill before the plan expires in November 2006.

The new well has "to penetrate the Lower Tyonek sand-prone interval" found in the Starichkof State No. 1 well, or a true vertical depth of 6,500 feet subsea, by Nov. 14, 2006. The well could be a sidetrack or a new well, but the bottomhole would have to be more than 500 feet from the bottomhole location of the Hansen 1 and Hansen 1A wells. ●

● ALASKA

Hanley: Alaska a growth area for Anadarko

By RAY TYSON

Petroleum News Houston Correspondent

Anadarko Petroleum says Alaska is a growth area for the big exploration and production independent, despite a companywide realignment of E&P activities that spawned rumors of a pull back on the North Slope.

The fact Anadarko Alaska was not included in a $2.5 billion property divestiture program in North America alone should demonstrate that the Houston-based company is not in an asset-cutting mode in Alaska, Anadarko Alaska spokesman Mark Hanley said in an October 2004 interview with Petroleum News. (See latest Alaska update in the Anadarko/Kerr-McGee story on page A6.)

"We're not divesting of anything in Alaska and that should indicate to you that there is an interest in staying here," Hanley asserted. "In fact, since that decision was made we participated in at least one lease sale, and I suspect you'll see us participating in more lease sales."

Fueling the rumor was an 80 percent reduction in Anadarko's Anchorage staff, followed by a strong indication from the company that it would not be drilling a well of its own on the slope this winter.

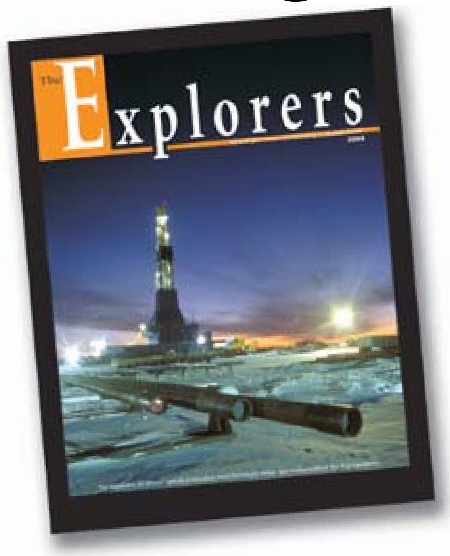
"Because we were not drilling a well this winter, they weren't going to let these guys just sit up here and not have anything to do," Hanley explained. "I fully expect that if we get a program going that we will see some people up here again."

However, as winter approached, Anadarko was still in the process of devising a multi-year drilling program and specifically looking for a partner to help shoulder the cost of exploring its Jacob's Ladder oil prospect. Hanley said it was just too late in the year to plan for any well this winter.

Partnership with ConocoPhillips changes

"We're working right now on partners and strategies," he added, "and I would say the hope is to be able to start the program the following winter, but we'll see where that goes."

Both Hanley and Jim Hackett, Anadarko's chief executive officer, made it clear that the company intends to fulfill its drilling and operational obligations on acreage shared and operated by ConocoPhillips, Anadarko's partner for more than a decade on the North Slope. However, the commitment comes with a slightly new twist.



This article is an abbreviated version of an article that appears in The Explorers, an annual magazine published by Petroleum News. Formerly called The Independents, The Explorers magazine was released at the annual Resource Development Council of Alaska conference in Anchorage.

"We decided not to double up on G&A (general and administrative) costs to help them," Hackett told analysts at the Lehman Brothers energy conference in September 2004. "We've decided to let them do that. In Alaska, ConocoPhillips … has looked out for our interests. We've proved it over the years." That means Anadarko is doing "a little less double checking" or "looking over their shoulder," particularly on drilling operations, Hanley explained.

"But we still have our technical people doing work alongside them (in Houston) on the exploration side, looking at prospects and evaluating them," he added.

Waiting for gasline

On the natural gas side, Anadarko's decision to wait for regulatory and construction approvals for a major pipeline to carry North Slope gas to the U.S. Lower 48 before launching a drilling program on its North Slope Foothills acreage also has fueled speculation over the company's future in Alaska.

"It's more of a strategic hold and see position," Hanley said. "We think we have some good potential. But obviously, until we see a gas line, it's pretty hard to invest much more money in going out there and drilling prospects."

Selling off unwanted assets

By the middle of September, Anadarko also had signed agreements to sell roughly $2.3 billion worth of unwanted oil and gas properties in the Gulf of Mexico, onshore Lower 48 and Canada, bringing the company close to its $2.5 billion divestiture goal.

Anadarko's new strategy largely entails using profits from proven "foundation assets" onshore U.S. and Canada to fuel "growth platforms" in deepwater Gulf of Mexico, Algeria and Qatar, the company said.

"The divestiture of non-strategic properties allows Anadarko to focus on areas that have consistently produced the best results for us, as well as new growth areas," Hackett added.

Although Alaska was not included in Anadarko's divestiture package, Hackett made no mention of the North Slope being a growth area for the company.

"Frankly, if we weren't interested in Alaska we would have divested as part of the whole divestiture," Hanley said. "So I think (this) should give you a signal that after having gone through a full review of all the company's assets, we are considered a growth asset within the company. That alone should suggest to you that it's something we want to develop." ●

natural gas

GULF COAST

Cheniere gets draft EIS for Corpus Christi LNG plant

Cheniere Energy Inc. has received another piece of good news in its attempt to become a player in the LNG terminal business along the Gulf Coast.

The Houston-based company said Nov. 18 that the Federal Energy Regulatory Commission had issued a favorable draft environmental impact statement for its proposed Corpus Christi terminal. The draft EIS says the terminal would have limited adverse impact on the environment, with proper mitigating measures.

Earlier in November, Cheniere announced agreements with both ChevronTexaco and Total for capacity at its Sabine Pass terminal in Louisiana. The draft EIS for that terminal was completed Aug. 12, with the same conclusion as that for Corpus Christi.

Cheniere expects a permit from FERC for Sabine Pass by the end of the year.

For the Corpus Christi facility, FERC set a public comment period that ends Jan. 4, with a public scooping meeting Dec. 15. The terminal will have an initial processing capacity of 2.6 billion cubic feet daily, the same as the Sabine Pass plant.

The Corpus Christi terminal will have three tanks with storage for LNG equivalent to 10.1 billion cubic feet of gas, and two docks in a new marine basin. It is sited on 600 acres of land along the La Quinta Ship Channel in San Patricio County, Texas. The project is expected to cost about $740 million and open in 2008.

Cheniere has a 66.7 percent interest in the Corpus Christi terminal, with an unnamed party holding the rest. It has 100 percent of the Sabine Pass facility, along with 30 percent of a terminal under development at Freeport, Texas.

Cheniere reported a net loss of $5.6 million for the third quarter, essentially representing development expenses for the terminals, partly offset by payments from the minority owner of the Corpus Christi terminal. Working capital was $6.4 million at the end of the quarter.

—ALLEN BAKER

CALGARY

Shell Canada exec not proposing over-the-top line for Alaska gas

A recent news story out of Canada said Shell Canada's new chief executive was in favor of shipping Alaska natural gas east, offshore "over-the-top" of the North Slope to Canada's Mackenzie River delta and then south through the proposed Mackenzie gas pipeline vs. building a separate Alaska line to take North Slope gas south and then southeast along the Alaska Highway to Canada and Lower 48 markets.

But Shell Canada spokeswoman Jan Rowley told Petroleum News Nov. 22 that Clive Mather, chief executive of Calgary-based Shell since August, was not proposing Alaska's stranded gas be shipped through the Mackenzie line; rather he was saying the Mackenzie pipeline would be the foundation for development of the natural gas

see GASLINE page 13

● COOK INLET

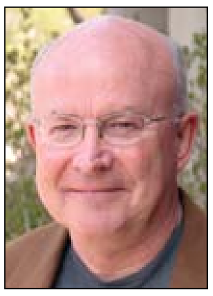
Is natural gas storage viable in Cook Inlet?

By KRISTEN NELSON

Petroleum News Editor-in-Chief

Why spend money putting natural gas back into the ground? That was the question Kent Hampton of Marathon Oil addressed in a Nov. 16 presentation to the International Association of Energy Economists in Anchorage.

Storage allows you to meet winter needs, Hampton said, and still allow fields to produce at "their natural, most efficient and most economic rate." If Southcentral Alaska gets a spur natural gas pipeline from the North Slope, storage would allow that spur line to be used year around, "avoid over sizing the pipeline" to meet peak needs for the coldest days of the year and ensure deliverability.



FORREST CRANE

"Storage is not cheap," Hampton said: you pay to reserve space in a storage facility, whether you use that space or not, and annual costs range from 40 cents to $3.50 per mcf.

Hampton is Marathon's marketing manager for North American natural gas, and is on special assignment to the company's Alaska gas operations. An economist by training, Hampton has been marketing natural gas for 22 years, and he shared his insights — which he said did not necessarily represent the views of Marathon — about whether natural gas storage is feasible in Cook Inlet.

Winter prices have to be higher

Storage does add to the cost of natural gas.

In the Lower 48, Hampton said, the natural gas futures markets "deliberately price winter gas above summer gas" to cover the cost of storage with a differential of about $1 per thousand cubic feet.

Before deregulation, local distribution companies and pipeline companies used to hold most storage capacity, he said, "and producers didn't have any access to storage whatsoever." After deregulation storage was unbundled and merchant storage evolved, so customers are no longer forced to take a whole package but can buy storage if they need it.

"Storage is not cheap," Hampton said: you pay to reserve space in a storage facility, whether you use that space or not, and annual costs range from 40 cents to $3.50 per mcf. There is also a relatively small charge for the compression, with 3-4 percent of the natural gas used for compression fuel.

Because the reservation cost is so high, that makes storage very expensive if you use it only once a year, to meet needs on that cold day in January. If you can use the storage multiple times, however, that capacity payment gets spread out.

Customers for storage are the utilities, the local distribution companies, "but in many instances producers use storage." For instance, he said, a producer with offshore production in the Gulf of Mexico and a firm commitment to sell natural gas can fill any shortage in deliveries by buying from the spot market, or can keep some gas in storage. "So it's an insurance policy," he said, "to guarantee that if you promise firm service to a customer, that you can deliver it."

Merchant storage is regulated by the Federal Energy Regulatory Commission, and there are open seasons for new projects.

Cook Inlet: a growing storage need

In the past, Hampton said, "Cook Inlet producers had lots of excess of deliverability" for natural gas. It wasn't a problem to keep some wells shut in against a need for extra gas on cold winter days, with some wells shut in entirely in the summer.

But when wells are shut in, "ultimate recovery from the reservoir suffers and efficiency is often compromised: there's some hidden costs there."

When markets are scarce and there is plenty of natural gas, that isn't a problem, "but when markets get tight and prices get high, then that becomes important."

Enstar, the local distribution company in Southcentral Alaska, "requires its suppliers to meet its full requirements, that includes not just the base load, but it includes meeting those peaks on a cold day. It's bundled," he said.Unocal provides a small amount of storage in the Swanson River field to help with peak winter needs and industrial users on the Kenai Peninsula have to curtain operations on cold winter days so that Enstar has all of the gas it needs. "It comes at a cost: it's not free," Hampton said.

What would make a good storage project?

Natural gas storage facilities are common in the Lower 48. Depleted gas reservoirs with high permeability and porosity are good candidates for storage facilities, Hampton said, as long as they don't have a

see STORAGE page 13

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STORAGE

lot of wells — and you need to know where those wells are. Some storage projects in the Pittsburg area, he said, have old wells, not well documented, and when they started putting gas in, it started coming out in places it wasn't expected to come out.

In addition to knowing where the wells are, he said, you also need to know the performance characteristics of the reservoir.

And, like real estate, he said: location is everything: storage needs to be close to markets, connected to pipelines and in a place that's accessible.

Hampton said he's been asked about refurbishing a liquefied natural gas plant. The Nikiski LNG plant is in good shape, still producing LNG, he said, but even if it were available for gas storage, the volume of LNG the plant produces is "way oversized for what we would need" for Cook Inlet.

And it lacks regasification facilities. LNG will return to normal temperature — and a gaseous state — by itself, he said, "but probably not fast enough to do what you want to do, which is peak shave," to meet peaks of need on very cold days, Hampton said, although it does have location: it's on the pipeline system and close to the peninsula's industrial hub.

Complications in establishing storage

There are complications in setting up storage facilities, Hampton said. Gas migrates, so there are losses from the reservoir. And gas follows pressure differentials and doesn't honor ownership, so gas that you put in the ground can end up in places you didn't expect.

There are also ownership issues. You frequently have multiple working interest owners in a gas field, and to change from production to gas storage you have to get all of the working interest owners to sign off.

Then there is the issue of base gas: how do leaseholders get value for remaining base gas if a producing reservoir is converted to storage? And in addition to any remaining gas, some gas will probably have to be put into the reservoir to provide the base, or cushion. "It never comes out," Hampton said. It provides needed pressure so that storage gas can be produced when needed.

Then there is a royalty issue: royalty is normally paid when gas is severed from the lease, he said. If you put more gas into the reservoir, when you take gas out, he asked, "does the state get a second tranche of royalty payments?"

Reliability is a huge issue for Cook Inlet, Hampton said, because Alaska isn't on the national gas grid, "so we have to have some redundancy and we have to have backups."

He said he thinks a spur line will be built from the North Slope. "I think the storage, whatever it is, needs to be integrated in with the design of the spur line." The spur line could fill storage in summer and run the base load in the winter, he said. "If you oversize that line" for winter peak needs, and only use a 30 or 40 percent of the capacity most of the year, the tariff will be much higher.

And, with storage, you also have backup during pipeline outages.

Role of coal?

Coal has been discussed as a source of alternative energy for Southcentral, Hampton said, but the problem is that coal-powered plants work best when delivering a baseline flat output with no variation in output. Wind power is useful, but you can't store it. Gas turbines, on the other hand, can come up to speed quickly to meet swing requirements, he said, making gas storage a good complement to other forms of energy.

So if coal power is the base of your energy, wind power is added in when available, and gas "can very nicely serve a swing market by going up and down," Hampton said. "… You can very quickly get a gas turbine up to speed and online" when extra power is needed. That means that the gas producer has to have the ability to provide that additional gas to the power generator when it is needed, "so again we come back to the need for gas storage."

Hampton said he thinks gas storage for Cook Inlet needs to be studied in more detail, but first, he said there has to be an incentive for the producer and perhaps a merchant operator, but also an incentive for the consumer not to burn gas on a cold day, so that some consumers can switch their load. ●

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GASLINE

resources in the Far North. And, in itself, prompt interest in exploiting other gas deposits to the west in Alaska, and north, south and east in northwestern Canada.

"Shell Canada is not involved in Alaska gas," Rowley said. A U.S. subsidiary of Royal Dutch/Shell handles the company's growing interest in Alaska oil and gas properties. "But once the Mackenzie pipeline is in place then clearly you're up north looking in all direction for natural gas opportunities. … Once you have the Mackenzie line in place there will be renewed interest in exploring in the North."

Shell Canada is a partner in the Mackenzie Gas Project, the consortium planning to build a $7 billion natural gas pipeline from Inuvik along the east side of the Mackenzie River valley to Norman Wells. The pipeline will continue south to connect to an extension of the NOVA Gas Transmission system just south of the Northwest Territories-Alberta boundary.

Other partners in the Mackenzie project include Imperial Oil and its parent company ExxonMobil, ConocoPhillips, and affected aboriginal groups. Subject to regulatory approval "with satisfactory conditions being received by mid-2006, construction of the required facilities is expected to be completed in time to enable gas to be delivered to Alberta through the pipeline in 2009," the Mackenzie Gas Project said in its regulatory application to the National Energy Board.

Estimates for delivery of Alaska gas through a separate line from the North Slope are later — 2012 to 2017.

Alaska has legally banned the construction of any northern "over-the-top" gas pipeline routes and recent U.S. federal legislation did the same.

Alaskans generally oppose the northern route because of the loss of construction jobs from building less pipe in Alaska and the loss of potential gas delivery to Fairbanks and other Alaska communities. Of the three North Slope gas owners looking to build an Alaska Highway gasline — BP, ConocoPhillips and ExxonMobil — only ExxonMobil has insisted a northern route still be considered an option.

—KAY CASHMAN

ALASKA

Tentatively scheduled Alaska lease sales

Agency	Sale and Area	Proposed Date
MMS	Sale 195 Beaufort Sea	March 30, 2005
DNR	Cook Inlet Areawide	May 2005
DNR	Foothills Areawide	May 2005
BLM	NE NPR-A	June 2005
DNR	North Slope Areawide	October 2005
DNR	Beaufort Sea Areawide	October 2005
DNR	Alaska Peninsula Areawide	October 2005
MMS	Sale 199 Cook Inlet	2006
MMS	Sale 202 Beaufort Sea	2007
MMS	Chukchi Sea/Hope Basin	interest based
MMS	Norton Basin	interest based

Agency key: BLM, U.S. Department of the Interior's Bureau of Land Management, manages leasing in the National Petroleum Reserve-Alaska; DNR, Alaska Department of Natural Resources, Division of Oil and Gas, manages state oil and gas lease sales onshore and in state waters; MHT, Alaska Mental Health Trust Land Office, manages sales on trust lands; MMS, U.S. Department of the Interior's Minerals Management Service, Alaska region outer continental shelf office, manages sales in federal waters offshore Alaska.

● NPR-A

Mapping the details in eastern NPR-A

A USGS team is preparing much-improved surface maps and helping find gravel for development in the oil reserve

By ALAN BAILEY

Petroleum News Staff Writer

U.S. Geological Survey geologist Dave Houseknecht unveiled some stunning new surface maps of eastern NPR-A at the Alaska Geological Society meeting on Nov. 18. The maps use a kaleidoscope of colors to depict in great detail the topography of the area and surface characteristics, such as sand, sandy mud, vegetation and water. And these maps form the first tangible products of a project to study and document the Quaternary geology and surface features of the eastern NPR-A area, Houseknecht said.

Houseknecht expects the wealth of detail in the new maps to help land managers and others in doing environmental assessments and other planning work. And because the USGS is publishing the maps in digital format, people will be able to load the maps into geographic information computer systems.

"This project started about a year and a half ago with funding primarily from BLM and a little bit of USGS money," Houseknecht told the geological society audience. Houseknecht sees the project as an excellent opportunity for the USGS and BLM to collaborate on some important work.

Detailed digital maps

Houseknecht expects the wealth of detail in the new maps to help land managers and others in doing environmental assessments and other planning work. And because the USGS is publishing the maps in digital format, people will be able to load the maps into geographic information computer systems.

As a first pass at preparing the maps, the USGS team digitized existing paper-based maps that USGS geologist Dave Carter completed about 20 years ago.

The USGS team has also produced maps from satellite and aircraft remote sensing data.

"The second (project) task was to evaluate whether or not we could use remote sensing to do a better job resolution-wise in the eastern NPR-A," Houseknecht said.

The team is focusing on the Harrison Bay quadrangle in eastern NPR-A, where the current surface map has a scale of 1:250,000. That scale translates roughly into a 125-meter resolution, Houseknecht said. The team has been able to use data from the satellite based ASTER and Landsat remote sensing systems to map land surface characteristics at resolutions from 15 to 30 meters in one part of the quadrangle.

The resolution on these maps still looks a little coarse, he said. So the team has tried combining the ASTER and Landsat data with high-resolution elevation data from an IFSAR aircraft-based remote sensing survey.

"It (IFSAR) provides surface elevation data in digital format with resolutions ranging between one and five meters," Houseknecht said.

The resulting map overlays surface characteristics on finely detailed topographic features such as narrow ridges and lake-filled depressions.

Geological insights

Geological investigations by the USGS team are providing new insights into how the current terrain of the NPR-A area formed. The team has built on previous work in the area by doing detailed surveys at locations where riverbanks or thaw lake blowouts expose sediments up to 2 million years old. The surveys delineated a widespread area of desert sands above river borne sediments and below more recent soils.

The desert sands formed during a cold period when ancient glaciers tumbled down from the Brooks Range. The team found that the sands lie as flat sheets, rather than in the long sand dunes that everyone expected.

"This was probably the biggest surprise that arose from our visit to the field this summer because when you look at the satellite and digital images what strikes you are the long linear sand dune (like) features," Houseknecht said.

The USGS team now speculates that these linear features may be relics of rivers that once cut down into the sands.

The hunt for gravel

Houseknecht hopes that the geological investigation will shed light on where to find gravel for pads and other infrastructure in NPR-A. Of particular significance is an ancient shoreline which seems to have run well south of the current shoreline of the Beaufort Sea. The river-borne sediments to the south of that ancient shoreline present the best bet for finding gravel.

"So we are all starting to focus … on hunting for gravel south of that (shore) line," Houseknecht said.

Gravel should also be more common in the older sediments, where evidence indicates that rivers flowing out of the ancient Brooks Range glaciers carried coarse sediments across the coastal plain.

The team has plotted the distribution of some gravel in northeast NPR-A by examining log data from old seismic shot holes — it's possible to use the shot hole data to piece together shallow cross-sections of the subsurface sediments. In one interesting example, the team traced a deposit of sand and gravel close to the surface near the location of a proposed pad.

Work by the USGS team continues. The focus now is to clarify whether the elongated features seen on satellite images do represent ancient rivers and whether the distribution of river sediments can point to the location of gravels, Houseknecht said.

Meanwhile Houseknecht anticipates early publication of the digital maps and remote sensing data.

"They will be published by the USGS, hopefully early in 2005, in both hard copy and digital formats," Houseknecht said.●

● CANADA

The answer is blowin' in the wind

Wind energy industry certain it can meet 20 percent of Canada's power needs by 2010; oil, gas companies getting involved as technology improves reliability, cuts costs; 32 turbines already installed in six provinces, one territory

By GARY PARK

Petroleum News Calgary Correspondent

Canada has produced an atlas that's full of wind — which is just fine with an industry looking for government backing to boost wind-generated power by 20-fold over the next five years.

The field is also starting to attract participation by fossil fuel-based companies in Canada as they look to spruce up their image and position themselves for a role in renewable energy.

1 2 SERIES

GOING GREEN: Part 2 of a look at Canada's efforts to tackle greenhouse gas emissions and develop alternative energy sources

The Canadian Wind Energy Atlas is a comprehensive database of high-resolution wind statistics, making Canada the first large-area country in the world to aid in identifying potentially productive wind-farm sites by reducing the need for extensive, costly field studies.

"It's nice to have wind turbines, but you need to know where to put them," said federal Environment Minister Stéphane Dion.

He described the atlas as a "way to see the wind."

For Robert Hornung, president of the Canadian Wind Energy Association — CanWEA for short — the information will conclusively show that "the magnitude of Canada's wind resource potential is superior" to that of European countries that are far ahead of Canada in exploiting a renewable, clean energy source.

"Wind is becoming a major economic force," he said.

Currently, Canada has 440 megawatts of installed capacity, concentrated in Alberta and Quebec, supplying about 0.4 percent of the country's electricity, or the equivalent of 100,000 average homes, compared with Denmark at 15 percent and Germany and Spain, each at 5 percent.

Association believes wind could provide 20% of Canada's electricity

Hornung's association believes Canada could easily turn the wind into 10,000 megawatts of power by 2010, meeting 20 percent of its needs.

Further bolstering the initiative, Natural Resources Minister John Efford allocated almost C$25 million to the newly commissioned Summerview Wind Farm near Pincher Creek, in the windswept Crowsnest Pass region of southwestern Alberta.

That is part of the government's Wind Power Production Initiative, which will distribute C$260 million over 15 years to promote the sector's development — a figure Horning wants to see quadrupled.

Summerview is operated by Vision Quest Windelectric, a unit of Calgary-based energy utility TransAlta. When it bought Vision Quest two years ago for C$37 million, TransAlta said it planned to spend as much as C$2 billion over 10 years to develop wind energy, marking the largest entry into the field by a private sector power generator.

The purchase, said President and Chief Executive Officer Steve Snyder, would be a "cornerstone for our renewable energy strategy," with Vision Quest having pinpointed about 1,000 megawatts of growth opportunities.

"We think that as this business grows in scale and as the capital costs come down per unit, that it will be a viable, economic source of generation," said Snyder.

"There are limits to what we can do, but this is certainly one way to move that agenda forward."

Canada has 32 installed turbines

According to CanWEA, Canada has 32 installed turbines in six of the 10 provinces and one of the three territories.

Alberta is the clear front-runner, with more than a decade of experience and now operating 13 projects with combined output of 269 megawatts, followed by Quebec with five projects and 113 megawatts.

CanWEA said that wind power has increased by more than 30 percent a year this century and now likely exceeds 40,000 megawatts worldwide, on its way to 95,000 megawatts by 2008 and 194,000 megawatts by 2013.

The association claims the fast-evolving wind energy technology has achieved 98 percent reliability with turbines, lowering generation costs to 6 cents-12 cents per kilowatt/hour from 30 cents less than a decade ago.

Natural Resources Canada reported on Oct. 19 that the price of wind energy dropped to 5 cents-10 cents per kilowatt hour from 20 cents in 1983.

Major reviews by the U.S. Department of Energy and the British government project that the cost of wind energy will range from 3.4 cents-5.5 cents (US) by 2020.

Investment may come under Kyoto Protocol

Further lifting the hopes of wind power advocates is the possibility they will receive investment from energy companies under the Kyoto Protocol, which Canada is still committed to implementing.

The accord will force utilities to lower their output of greenhouse gases from conventional power plants, while allowing them to turn an investment in wind power into a green credit to reduce their Kyoto obligations.

Dion has given a strong hint of his leanings, arguing that Canada does not rank well with other rich, Western countries on pollution reduction, although independent research organizations suggest one of the obstacles is very cheap power available compared with Europe.

Wind meets 5 percent of needs on Prince Edward Island

Wayne MacQuarrie, manager of PEI Energy on Prince Edward Island, said that if it costs C$2 million to retrofit a conventional plant compared with spending C$10,000 for the same result on a wind project "then it's worthwhile" examining.

On Prince Edward Island, by far Canada's smallest province with a population of just 140,000, wind power now meets 5 percent of needs and could cover 100 percent at an estimated cost of C$300 million by harnessing the gales that pound the Gulf of St. Lawrence.

Provincially owned Nova Scotia Power approved 17 renewable energy projects in late October — 15 of them wind-driven —

CANWEA

According to CanWEA, Canada has 32 installed turbines in six of the 10 provinces and one of the three territories.

that will add 28 megawatts to the province's grid and put out a call for large-scale ventures that will add another 30 megawatts.

The Nova Scotia government has just passed legislation that requires a minimum portion of all new electricity generation to come from renewable sources.

However, J.D. Irving Ltd., the New Brunswick industrial conglomerate, was forced to scale down a proposed wind farm for the island because of concerns about noise and the appearance of wind towers.

In British Columbia, the first wind energy development got environmental approval in early November.

The C$100 million Holberg Wind Energy proposed for the northern tip of Vancouver Island could be providing enough power to provincially owned B.C. Hydro to serve 17,000 households over 20 years, starting in 2006. Partners in the venture are Stothert, a Vancouver-based company, and Global Renewable Energy Partners, a Danish-U.S. company.

Sea Breeze Energy has previously received approval for a wind farm in the same area, but has not been able to line up customers or access to transmission lines.

Pace quickening

On a grander scale, the pace has quickened elsewhere in Canada this year.

In early October, the Quebec government approved construction of eight wind farms capable of supplying 1,000 megawatts of power to 1 million homes — by far the biggest leap the industry has made — and plans another 1,000 megawatts before 2010.

Provincially owned Hydro-Quebec, by far Canada's biggest utility with annual revenue of C$11.5 billion, which plans to spend C$50 billion on new generating capacity between 2005 and 2020, is also starting to pay more than lip service to wind power and energy conservation.

It has just announced C$2 billion in wind power projects to be built and operated by the private sector — a small, but significant step away from Hydro-Quebec's strategy of relying on hydroelectricity for 95 percent of its production, posing a serious challenge for the utility, which faced record low levels in its reservoirs last year before it was rescued by a rainy summer this year.

Ontario has also paid heed to the shifting winds by putting out a call for 300 megawatts of wind-generated power and that could multiply five-fold within a few years.

Among the proposals submitted to Ontario is one from Suncor Energy, Enbridge (two of Canada's largest energy firms) and Spanish-owned EHN Wind Power Canada, which plan a 75-megawatt project.

The same partners own and operate a 30-megawatt plant in southwestern Alberta, while Suncor and Enbridge operate an 11.2 megawatt facility in Saskatchewan.

"It will be a race between Ontario and Quebec as to who overtakes Alberta first," predicted John Keating, chief executive officer of Canadian Hydro Developers, which generate 50 megawatts from three Alberta farms.

Some companies taking negative view

Many companies, such as Suncor and Enbridge that have largely made their money from conventional oil and natural

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HEAVY OIL

Move away from exploration

In 2003, Walker said, BP decided to "focus on the known resource base … near to our existing infrastructure." That decision, he said, was based on the company's track record: "we were finding six times as much oil and gas in and around our existing fields and infrastructure as we were through exploration."

The company's goals in Alaska, he said, are to maximize recovery of light oil, increase production of heavy or viscous oil reduce costs so the company can compete for capital and commercialize North Slope gas.

"The prize we are chasing is enormous: close to 6 billion barrels equivalent of already discovered oil and gas in BP's Alaska portfolio. Next to Russia, Alaska is the single largest source of known oil and gas resources in BP's portfolio."

But, Walker said, the challenges to develop that resource are "enormous." Less than one-third of the 6 billion barrels "is currently proven and economic to produce," he said.

> *"Unprecedented collaboration between North Slope producers and quantum leaps in drilling technology have breathed new life into our efforts to commercialize viscous."* **—Angus Walker, commercial vice president, BP Exploration (Alaska)**

Light oil largest component, viscous oil a different challenge

Light oil is the largest component of BP's Alaska portfolio, and has accounted for most of the 14 billion barrels produced from the North Slope over 27 years. Among light oil reserves added by the industry over the last three decades are some 4 billion barrels at Prudhoe Bay alone, Walker said.

Challenges to commercialize remaining light oil are "daunting," he said: with smaller targets farther away.

Viscous or heavy oil is "another multi-billion-barrel resource," Walker said, but "we're only just beginning to unlock its potential."

Currently less than one out of every five barrels of viscous oil in BP's portfolio is "proven and capable of being produced today." This oil is shallow, cold, thick and it doesn't flow readily to the surface.

"Unprecedented collaboration between North Slope producers and quantum leaps in drilling technology have breathed new life into our efforts to commercialize viscous." A few years ago, he said, it was a challenge to make a viscous well produce a thousand barrels a day. "Today we have more than 20 wells that each have produced more than a thousand barrels for more than a year."

BP drilled the first quadrilateral well on the North Slope earlier this year, "with five miles of reservoir penetration," and the next well, he said, will have five laterals, individual reservoir penetrations.

Viscous challenge moving to the surface

"So now the challenge of producing viscous is moving to the surface," Walker said, with sand flowing to the surface with the oil and filling separation vessels. That sand, he said, "must be removed, ground up and re-injected." In addition, viscous fluids are "more difficult to process and our facilities were designed for light oil and are struggling with viscous."

BP is looking at "adding heat and chemicals to lower viscosity, and help blend viscous oil with light oil. And we're currently evaluating whether we need to build a completely new processing facility designed specifically for viscous oil."

Viscous oil will be more expensive to develop than light oil, he said, and there are challenges, but if the industry is successful, "we predict that by 2030, almost half of the oil flowing down Taps could be viscous."

Costs, natural gas

BP is "making great progress" in transforming its costs in Alaska, Walker said, "but it is truly a formidable task, considering that the industry (on the North Slope) was developed on 2 million barrels a day, rather than the current reality of 1 million barrels a day."

Part of this cost reduction is the $250 million electrification of the trans-Alaska pipeline by Alyeska Pipeline Service Co. that "will help position the pipeline to meet the operational challenges" of the future. BP's $1 billion investment in four double-hulled tankers "will significantly reduce our shipping costs."

"And every dollar that we save, without compromising safety, the environment or operational integrity, enhances our ability to compete for investment and on the state's side, increases state tax and royalty revenues by creating higher wellhead value."

Commercialization of North Slope gas, which accounts for roughly one-third of BP's Alaska portfolio, is "one of the largest undeveloped resources in our global portfolio," Walker said.

Bringing that gas to market will be one of "the most expensive projects undertaken in history" and the project is not without risks. Federal legislation was "a very important milestone," he said. Still needed are a "clear, efficient regulatory process in Canada" and a fiscal contract with the state of Alaska.

Oil and gas interdependent

And, he said, "the long-term health of our oil industry is dependent on the development of North Slope gas, as similarly, the gas project is dependent on the health of the oil business. Gas sales and a healthy oil business are inseparable. They will both use much of the same infrastructure and facilities."

BP hopes that, if all of the issues can be resolved, "North Slope gas could be flowing to market in 10 years."

BP "has an ambitious strategy and vision for Alaska, and the resources and determination to make it a reality," Walker said.

But BP "can't do it alone," he said, "and we will continue to require the help, and to work closely with, the state, the borough, our partners, the contracting industry and many of the agencies," both state and federal. "Investments are our lifeline to the future and Alaskan investments must be able to generate returns that are competitive with investment opportunities around the world, or the capital will simply go elsewhere."

And, he added, that is true whether oil is "$50 a barrel, $20 a barrel or $10 a barrel."

And costs, based on operating in the Arctic, shipping through an 800-mile pipeline, and a 2,000-mile ocean voyage to market, "all make Alaska one of the most expensive places in the world to produce oil."

BP is working to reduce its costs, "but business climate in Alaska plays a crucial role in our ability to compete for investments," and tax increases will not attract needed capital. ●

Companies involved in North America's oil and gas industry

All of the companies listed above advertise on a regular basis with Petroleum News

Petroleum news

Business Spotlight

By **PAULA EASLEY**

FORREST CRANE

Michael Davenport, program manager

Alaska Anvil Inc.

Alaska Anvil is a wholly-owned subsidiary of the employee-owned Anvil Corporation based in Bellingham, Washington. Alaska Anvil offers quality multi-discipline engineering, project management, and technical services for oil & gas production, refining, chemical, power, and other industrial and commercial clients. The company has operated in Alaska since 1984 and has offices located in Anchorage and Kenai.

Mike put his BS in electrical engineering to work as a registered control systems engineer in oil and gas, refining and chemical operations in Alabama and Texas. He joined Alaska Anvil about four years ago. He and wife Melody have three daughters – Kelsey, 16, and twins Taylor and Katie, age 9. Participating in kids' activities along with fishing and golf are special pastimes.

FORREST CRANE

Mark G. Huber, vice president

Doyon Universal Services LLC

Doyon Universal Services LLC began operations in Alaska in 1946. DUS specializes in providing catering, housekeeping, facility management and maintenance in remote locations. DUS Security provides physical security, medical and fire response services for Alaska's critical infrastructure. DUS has Anchorage-based operations with Horizons Cafe and Catering and Anchorage Animal Care and Control Center.

Mark Huber moved to Anchorage to begin his professional career with KPMG Peat Marwick in 1987. After several years in public accounting, he joined DUS in 1995. He and wife Cindy Mittlestadt have two children, Tricia and Lyndon. Mark is president of The Alliance and supports the UAA Culinary Arts Program, Resource Development Council, United Way and organizations addressing the needs of individuals with disabilities.

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GRADUATION

Alaska history. The state supported the Fairbanks training with a $334,000 grant from the State Training and Employment Program. Oil companies and unions committed more than $170,000 to the project.

Alaska Works administered the program grant for the state on behalf of the Alaska Petroleum Joint Crafts Council and members of the North Slope Contractors Association. Alaska Works is a non-profit corporation representing building and construction trade unions and federally registered union apprenticeship and training programs. Labor Commissioner Greg O'Clary said the goal of the training was intensive under the guidance of instructors experienced in pipeline construction, with a goal to upgrade skills of workers from Interior and North Slope Alaska and introduce the crews to Arctic pipeline construction.

Pipeline contractors ASRC Energy Services, H.C. Price, Norcon, Flowline Alaska, Alyeska Pipeline Service Co., Great Northwest, NC Machinery and Airport Rental contributed equipment, a construction yard, materials and training supervision.

Apprentice training instructors, tools, supplies, equipment and safety personnel were provided by four trade unions: Operating Engineers Local 302, Plumbers and Pipefitters 375, Laborers Local 942 and Teamsters Local 959.

—PETROLEUM NEWS

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CONOCOPHILLIPS

right now we're seeing about 100,000 barrels a day of production on the slope is generated from these satellite-type fields," Bowles said. With the slope's large fields on decline, he said, satellite development is what will keep "volumes flat."

Most recently ConocoPhillips has been working on satellite development in the Colville River unit (where the Alpine field is in production) at Fiord and Nanuq, CD-3 and CD-4. "We've been in the permit stage" and earlier in the month, ConocoPhillips received environmental impact statement approval from the Bureau of Land Management for the five satellites planned at Alpine, both in NPR-A and to the east.

Bowles said the company still needs one permit; "we're working on it. We're very hopeful that we can get this project started this winter."

Heavy oil production headed up

West Sak, where heavy crude overlies Kuparuk, is now being successfully developed with horizontal wells, he said. Most recently multi-lateral wells have been drilled, with separate horizontal penetrations into different sands from the main well bore, and an undulating horizontal, which "actually goes up and down and comes in between two different sands."

Original wells in the West Sak produced just a few hundred barrels a day. With horizontal multi-laterals, Bowles said, wells "come on at production rates far in excess of what we've ever seen before. We've seen initial rates up into the 7,000 barrels a day rate — that may taper off to 1,500 or 2,000 barrels — but it makes them a very economical way to develop the field."

The horizontal multi-lateral wells "may cost three times as much as what we were normally drilling," but pad locations are minimized.

By 2007, he said, West Sak production could be 40,000 to 50,000 bpd, and up to 100,000 bpd of heavy oil with production from the Orion satellite in Prudhoe. The West Sak portion of this program, he said, is about $500 million.

On the exploration front, "ConocoPhillips has been very active," Bowles said, and, in addition to acreage on state lands, with its partners holds up to 1.9 million gross acres in NPR-A. "It is the focus of a lot of attention in our company as far as future drilling activity."

In the 2004 winter drilling season, ConocoPhillips drilled five exploration wells, with a sixth that should be drilled before year end.

Good year ahead

Bowles said the company did not yet have its final budgets approved for 2005, "I can tell you that we can expect to see a very active year going forward exploring through this next winter season."

Plans appear to include four exploration wells, as ConocoPhillips said in a Nov. 17 presentation to analysts that its 2005 Alaska exploration program was expected to include two wildcat and two appraisal wells.

As for North Slope gas commercialization, this is the "Big Kahuna" of all investments, Bowles said, adding that the company is very encouraged by Congressional passage of legislation to enable and ensure economics, and that "the governor has seized the initiative as far as where we stand now and is coming forward with a proposal to see if the state can have some type of equity ownership in the line."

As for concerns, Bowles said what concerns us "the most, as an industry, is the tax picture." Some 87 percent of revenues going into the state's general fund come from the oil and gas industry, and with high oil prices, there is pressure to increase that percentage.

"We as a company, and the energy industry, just do not see that's the best way forward to encourage investment," Bowles said. ●

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ENBRIDGE

In North America, Enbridge already is "ideally" positioned in Western Canada for both oil and gas and maintains strong market positions in key U.S. Mid-continent regions, Daniel said.

"Now we're adding a very strong market position in the offshore Gulf of Mexico as well, particularly in the deepwater Gulf, and that is important to us," he said, adding that the U.S. Gulf was among several industry "hot spots" that had interested the company.

Lines near unexplored or undeveloped prospects

In fact, several of the Shell pipeline interests being acquired by Enbridge extend seaward as far or farther than any other natural gas pipeline in the U.S. Gulf. They also are situated near unexplored or undeveloped prospects — business that Enbridge said it hopes to capture in the future.

Shell Gas Transmission, to be renamed Enbridge Gulf System when the deal closes, transports about 3 billion cubic feet of gas per day, roughly 75 percent of which comes from deepwater fields. The system also delivers about half of all currently produced gas from the deepwater.

The systems included in the transaction have a combined daily capacity of 4.7 billion cubic feet and comprise about 1,482 miles of pipeline.

"It immediately gives us geographic reach and competitive strength in yet another growing North American gas supply region," Daniel said.

He said Enbridge also likes the deal because the pipeline systems are fee-based and carry dedicated reserves and long-term contracts "with commercial terms which fit well with our low risk tolerance and business model at Enbridge."

Sale part of ongoing Shell program

The sale, which represents the majority of Shell's natural gas pipeline business in the U.S. Gulf, is part of Shell's ongoing program to grow its upstream business and to focus on core downstream activities, Shell said.

However, Shell said its U.S. exploration and production unit would continue as a customer of Enbridge, retaining existing contracted long-term access to the pipelines. Shell and BP are currently the largest shippers on the Shell Gas Transmission pipeline systems.

Enbridge plans to hire members of the current Shell Gas Transmission management team and staff, the company said, adding that Enbridge would assume Shell Gas Transmission's role as commercial manager and field operator for most the pipeline systems: Stingray, Triton, Garden Banks, Magnolia, Nautilus, Manta Ray, Cleopatra, Mississippi Canyon, Destin, Okeanos and Spirit. The Magnolia, Cleopatra and Okeanos systems have not been completed.

"The system is large and dominant in the region, which is attractive to us in terms of economies of scale," Daniel said.

Enbridge expects deepwater Gulf of Mexico to yield more than 100 tcf

Enbridge expects the deepwater Gulf to yield ultimate recoverable natural gas reserves of more than 100 trillion cubic feet, with overall production peaking sometime between 2010 and 2020.

"We have a high level of confidence that the basin will develop further and will make additional connections, thanks to strong commodity prices, which is the big driver on development going forward," Daniel said.

Steve Wuori, Enbridge's chief financial officer, said the Shell acquisition would increase the company's pipeline earnings by C$30 million to C$40 million in 2005, with earnings to increase "modestly" in 2006 and 2007, "as we complete the expansions and add contracted volumes on three of the five corridors."

"We should be very competitive since our assets already are among the farthest out and well positioned," he added.

Dan Tutcher, an Enbridge vice president, said the company also would be well positioned to transport potential volumes from LNG re-gasification facilities proposed in the U.S. Gulf.

"Overall, with their broad geographic footprint and proximity to recent discoveries and new exploratory plays, we anticipate these pipelines will continue to deliver solid performance and offer tremendous opportunities for organic growth," he said. ●

EMPLOYMENT LISTING

FAIRBANKS ALASKA AREA PLUMBERS AND PIPEFITTERS JOINT APPRENTICESHIP TRAINING COMMITTEE WILL BE ACCEPTING APPLICATIONS FOR APPRENTICE PLUMBERS AND PIPEFITTERS FROM NOV. 22, 2004 TO DEC. 6, 2004. APPLICANTS MUST APPLY IN PERSON AT: 1978 BURGESS AVENUE, FAIRBANKS, ALASKA. OFFICE HOURS: 8 AM TO 12 PM, 1 PM TO 5 PM, MON-FRI, TELEPHONE: (907) 456-5989.

REQUIREMENTS UPON MAKING APPLICATION:

A. YEARS OF AGE: A MINIMUM OF 18

B. PROVIDE THE FOLLOWING DOCUMENTS:
1. BIRTH CERTIFICATE
2. HIGH SCHOOL DIPLOMA & TRANSCRIPT OR G.E.D. CERTIFICATE AND REPORT OF TEST RESULTS.
3. MILITARY TRANSFER OR DISCHARGE FORM DD-214, IF APPLICABLE.

C. DRUG FREE

APPLICANTS WILL BE REQUIRED TO APPEAR FOR INTERVIEW WHEN SCHEDULED.

FAIRBANKS ALASKA AREA JOINT APPRENTICESHIP TRAINING COMMITTEE IS AN EQUAL OPPORTUNITY EMPLOYER PROVIDING EQUAL EMPLOYMENT OPPORTUNITY WITHOUT REGARD TO RACE, CREED, COLOR, SEX, OR NATIONAL ORIGIN.

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HERRERA

Power's effort in Washington, D.C."

Those opposed to opening the coastal plain "are not going to play dead just because they see their backs are against the wall as a result of the recent election," he said.

The count in the U.S. Senate is now 54 or 55 in favor, "on a good day," but 60 votes are needed to overcome a filibuster, he said.

ANWR a revenue-generating issue

Because opening the coastal plain of ANWR is a revenue-generating issue, it "can be put into budget bills, and probably will be, come February-March next year," Herrera said. "As such it cannot be filibustered in the United States Senate — it requires only a majority vote."

But, he said, "there is no such thing as a political slam dunk in our nation's capital."

There are roadblocks, even in the House of Representatives which has passed ANWR provisions three times.

For example, he said, some 30 moderate Republicans in the House have signed a letter objecting to inclusion of ANWR in a budget bill.

Typically more than 30 House Democrats have supported opening ANWR, but, Herrera said, the objection could force a vote along party lines, and prevent ANWR from being put in a budget bill, which brings the lack of 60 votes in the Senate into play again.

"I think all of us should be losing sleep until the day President Bush signs his signature on the bottom line of an open-ANWR bill," hence the invitation to the Dec. 1 fundraiser.

—PETROLEUM NEWS

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WIND

gas, are now covering their bets by taking a foothold in the wind sector. But it's not a headlong rush.

Calgary-based utility ATCO pulled out of plans for one of Canada's largest wind farms in September, by withdrawing from a joint-venture with government-owned SaskPower to build a C$250 million farm in Saskatchewan.

ATCO Chief Executive Officer Nancy Southern said the company would put its priority instead on extending gas and power line infrastructure to keep pace with Alberta's explosive growth, although it would keep a commitment to wind and green power.

SaskPower hopes to keep the project alive, but did not express hope that it could find a new partner.

One of Europe's largest power companies, E.ON AG, the continent's second-largest electricity generator, added to a negative view by issuing a report in October that concluded wind power is a costly, unreliable source of power.

E.ON, a substantial investor in wind power and the owner of half of Germany's wind farms, urged governments and the industry to keep a tight hold on their expectations.

"Due to their limited availability, wind power plants can not replace the usual power station capacities to a significant degree, but can basically only save on fuel," E.ON said.

Canadian Hydro says concerns not new

But Canadian Hydro's Keating said the concerns are not new and don't trouble him, calling on the government to extend its financial incentives for wind farms — about 1 cent per kilowatt/hour — to the full range of renewable and clean-power sources.

The report said Ontario, with a population approaching 10 million, could install 8,000 megawatts of wind power by 2012, generating C$14 billion in economic benefits and 5,000 direct jobs.

"If it comes with zero emissions, do you really care it came from wind or hydro, biomass or the sun? You shouldn't care, you should just let the market choose," he said.

Suncor Chief Executive Officer Rick George said in an October speech that the Canadian government's Wind Power Production Incentive — which offers as much as 1.2 cents per kilowatt hour for new wind energy developments — is one example of the kind of support the renewables sector needs to get on its feet.

But the David Suzuki Foundation, in a report released Oct. 23, said the Ontario government is losing out on a chance to create thousands of new jobs and pump billions of dollars into the economy because it is slow to support renewable energy.

The report said Ontario, with a population approaching 10 million, could install 8,000 megawatts of wind power by 2012, generating C$14 billion in economic benefits and 5,000 direct jobs.

"If you think in terms of growth sectors, wind and solar are huge growth areas comparable to the growth of the electronics industry," said scientist David Suzuki.

Governments should also recognize the bigger picture and accept that policies promoting renewable energy can improve overall health and the environment as well as give a lift to the economy, he said. ●

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MINING NEWS

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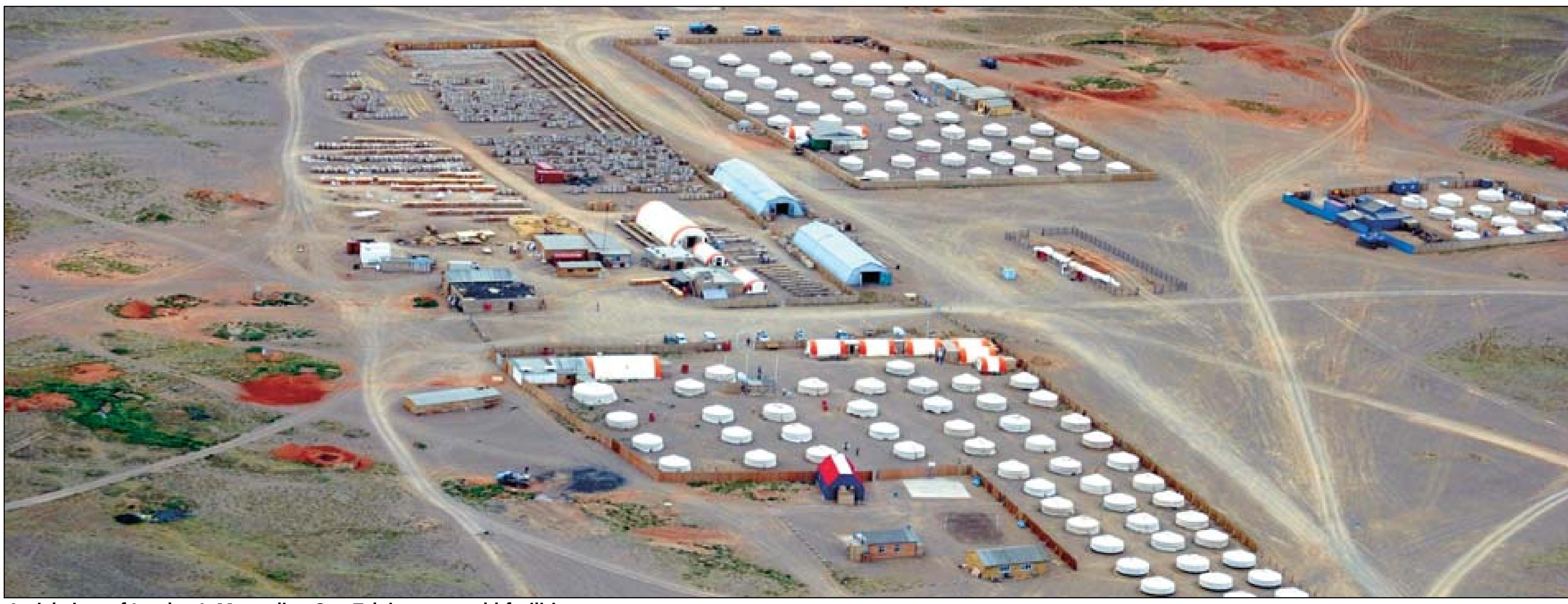
YUKON GEOLOGICAL SURVEY GEOLOGIST, JEFF BOND, HOLDING SECTION OF A GOLD BEARING QUARTZ-SULPHIDE VEIN INTERSECTED IN DRILLING ON THE TAY-LP PROPERTY OF ROSS RIVER MINERALS.

PHOTO COURTESY OF YUKON GEOLOGICAL SURVEY

A special supplement to Petroleum News

WEEK OF
November 28, 2004

Petroleum news



COURTESY IVANHOE MINES

Aerial view of Ivanhoe's Mongolian Oyu Tolgi copper-gold facilities

● MONGOLIA

Ivanhoe riding to riches in Mongolia?

Flamboyant mining promoter Robert Friedland announces world-class copper discovery that could rival Alaska's Pebble

BY SARAH HURST

Mining News Contributing Writer

A new copper discovery in Mongolia's South Gobi region could rival Alaska's Pebble deposit as one of the most valuable in the world. Drilling on the Hugo North deposit at the Oyu Tolgoi copper-gold project has produced impressive results, according to a Nov. 18 release from Ivanhoe Mines. Ivanhoe's controversial chairman, Robert Friedland, denies media accusations that he has been over-hyping the company's Mongolia finds.

"Based on my 30 years of experience in the exploration business, I believe the Hugo North deposit is the highest-grade copper-porphyry system that has ever been found anywhere," said Douglas Kirwin, Ivanhoe's executive vice president of exploration. The recent drilling has also extended the length of the Hugo North high-grade copper-gold core to more than 1.6 kilometers — a further 300 meters beyond the discovery's northern limit that was established six months ago.

Hugo North is part of the 2.8 kilometer-long Hugo Dummett deposit, named after a distinguished geologist who joined Ivanhoe in 2001 and was killed in a highway accident in August 2002. The Hugo North deposit, as defined by an independent resource estimate prepared by AMEC of Canada in May 2004, increases in tonnes and grade from south to north. It was estimated to have inferred resources of 666 million tonnes, grading 1.46 percent copper and 0.34 grams per tonne of gold (1.68 percent copper equivalent), at a 0.60 percent copper equivalent cut-off. The average grade of four more recent drill holes at the northern end of Hugo North is 3.16 percent copper and 1.25 grams per tonne of gold.

Friedland guided sale of Fort Knox

Ivanhoe's Friedland has an Alaska connection: he guided the sale of Fairbanks Gold Mining's Fort Knox deposit to Amax Gold for $152 million in 1992. Fort Knox, now owned by Kinross Gold, has produced more than 3 million ounces of gold since 1996.

Friedland's other major success in North America was the sale of Diamond Fields Resources' nickel deposit at Voisey's Bay in eastern Canada to INCO Ltd. for C$4.3 billion in 1996.

Rather less spectacularly, he acquired the nickname "Toxic Bob" for the cyanide heap-leaching mess his bankrupt company Galactic Resources left near Summitville, Colo., in 1994.

In the past few years Friedland has turned his attention to projects in Asia, including Burma, Indonesia and Kazakhstan.

STEVE BORELL

The Mongolia find underscores the necessity for miners associated with the Pebble project to strike while copper is hot, according to Steve Borell, executive director of the Alaska Miners' Association: "Existing copper mines are expanding as fast as they can to take advantage of new prices, so there is less need for new copper. But if this continues for many years, these projects will be not able to go forward. If you putter around and goof off, the window of opportunity may close."

Trust and Lies on web site

In defense of his reputation Friedland devotes a section of Ivanhoe's web site to "Truth and Lies: Setting Straight the Media and Public Records."

Last year he called a Forbes magazine article that questioned the significance of the Mongolia discovery "a contrived, one-sided account" and a "shameful deception". Respected journalists and

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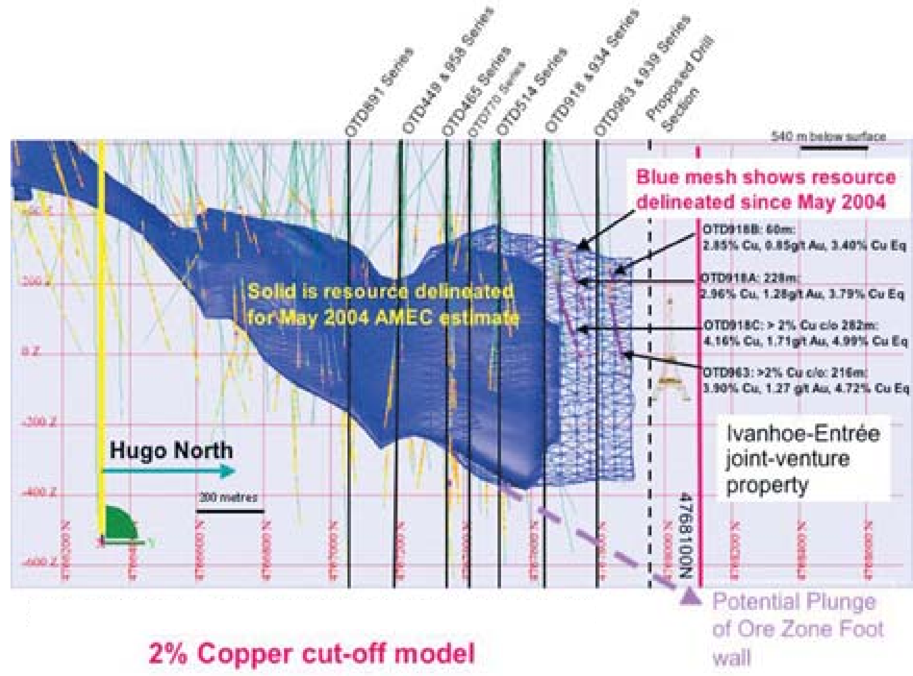


Hugo North longitudinal section, view to west

● ALASKA

Governor gives Alaska miners the good news

After the November election, the state's support for miners is solid as a rock; additional $700,000 in 2005 for surveys

BY SARAH HURST

Mining News Contributing Writer

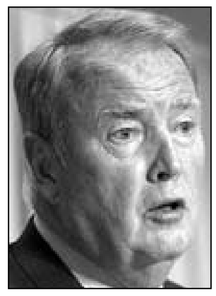
After seeing his daughter Lisa elected to the U.S. Senate, the first place Alaska Gov. Frank Murkowski headed to on Nov. 3 was the Alaska Miners Association convention in Anchorage. Perhaps because of his good mood, Gov. Murkowski promised to request a $700,000 addition to next year's budget for enhanced airborne geophysical surveys. In a speech to the convention two days later, Alaska Department of Natural Resources Commissioner Tom Irwin confirmed the state's enthusiasm for the mining industry.

"Men and women of the Alaska mining industry have again for the eighth straight year in a row added something in the area of over a billion dollars to the economy of this state," said Murkowski. "It remains irrefutable that the future of mining in Alaska is probably as bright, if not brighter than those gold nuggets that some of you folks at the Fortymile are still digging up once in a while."

Mining claims, infrastructure

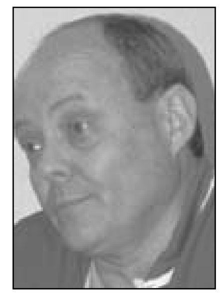
A total of 4,323 new state mining claims were filed in fiscal year 2004, covering more than 580,000 acres. Since July 1, 2004 there have already been an additional 2,500 claims, covering more than 300,000 acres. This upsurge was mainly due to Pogo, near Delta Junction in Interior Alaska, and Pebble, near Lake Iliamna, southwest of Anchorage. "The big challenge, of course, is energy, and the cost of energy, and the development of potential energy sources nearby, whether it be natural gas or other forms of energy, coal, whatever," said Murkowski. "Those are going to be the things that are going to make the determination of whether or not the economics will support some of these major developments in very isolated areas."

There are other infrastructure requirements, too, and the state of Alaska has been working to identify port, road and rail projects that could expedite resource development, with its "Roads to Resources" program. Murkowski described a recent visit to Nome, where he saw that a four-mile access road to the Rock Creek mine was already being built, in snowy conditions. One of the more ambitious long-term plans is to build a rail connection to the Lower 48.



"Men and women of the Alaska mining industry have again for the eighth straight year in a row added something in the area of over a billion dollars to the economy of this state." —Alaska Gov. Frank Murkowski

JUDY PATRICK



"… resource development is the economic future and it is the engine for Alaska. There are no other options, it's the resource development. Each mine creates real wealth. It creates real career opportunities, not just jobs." — Commissioner of Natural Resources Tom Irwin

"When I became governor of this state 22 months ago, I promised you that mining would remain one of the major economic pillars of my administration, and I've kept my word," Murkowski said. "We've enhanced the large mine permit team within the Department of Natural Resources. … We moved the Alaska coastal zone management planning to the Department of Natural Resources in order to streamline the process, by making it more objective and more accountable. That's a responsibility of government. We've got to be able to give you an answer — yes, no, or here's what you have to do to comply."

Administration will defend projects

The Murkowski administration is establishing what the governor calls "best permitting practices" which will reconcile conflicting state laws affecting resource development, so that permitting is less of a target for litigation by environmental groups; and eliminate unnecessary processes that add time and cost without benefiting the environment. The functions of the Habitat Division have been transferred to DNR to facilitate permitting processes. An Alaska statute has also been amended to enable mineral property holders to pay a penalty to have their mineral locations reactivated if they have been deemed abandoned under law.

"Miners take their livelihood from the land. You know that. You, better than most people, understand the value of a clean environment and responsible development practices," Murkowski said. "I'm going to make a pledge to you. If you follow — which of course you will, because it's good business — all the permitting and production regulations and take your environmental protection responsibilities to an even higher level, my administration will step in and aggressively defend you against those who attack your projects."

The governor complimented miners on their commitment to Alaska hire. "Under my administration we're not going to be hiring people from South America," he said. "Somebody asked me what I meant by that, it means any place south of Ketchikan."

Several other influential Alaskan politicians spoke briefly at the AMA convention. Lisa Murkowski's spokeswoman expressed the U.S. senator's regret that she couldn't be there in person. U.S. House Rep. Don Young told miners that in some cases they left the land better than it was before. "Nature isn't always the best steward," he said. Lt. Gov. Loren Leman was introduced as the grandson and son of miners. State House Majority

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Petroleum news

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Ivanhoe's Mongolian Oyu Tolgoi camp entrance

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MONGOLIA

investment analysts have examined the discovery and confirmed its significance, Friedland said.

On Oct. 13 of this year Friedland responded to a similar doubting Bloomberg news agency story by saying: "Approximately 20 companies (including Anglo American) have signed strict confidentiality agreements with Ivanhoe to obtain access to the company's data and to the Oyu Tolgoi discovery site… It also is a matter of public record that a number of companies have expressed interest in being involved with the development of Oyu Tolgoi."

Window for copper

The Mongolia find underscores the necessity for miners associated with the Pebble project to strike while copper is hot, according to Steve Borell, executive director of the Alaska Miners' Association.

"Let's recognize that there is a window of opportunity with copper right now," he told Mining News. "Existing copper mines are expanding as fast as they can to take advantage of new prices, so there is less need for new copper. But if this continues for many years, these projects will be able to go forward. If you putter around and goof off, the window of opportunity may close."

Robert Friedland, Ivanhoe's controversial chairman

Pebble and Hugo North face similar challenges with the lack of infrastructure in their respective regions. However, Hugo North is close to the Chinese border and the Chinese government quickly built a 200-kilometer road for the project without going through the kind of lengthy permitting process required in Alaska. The state's environmental regulations are excessive, Borell believes, but at least such issues are taken into consideration, unlike in China and Mongolia.

"One of the advantages of this country is public input," Borell said. "People can say, here's a better way to do what you're trying to do." ●

● BRITISH COLUMBIA

Serengeti gives upbeat assessment of B.C. prospects

BY SARAH HURST

Mining News Contributing Writer

Exploration at five porphyry-copper gold properties in the Quesnel trough of northern British Columbia is proving its worth, Vancouver-based Serengeti Resources announced in a Nov. 18 release. All the properties lie within 10 kilometers of the Omenica mining access road, with the Choo and Darby prospects directly accessible off logging and mining roads. The Choo property is 25 kilometers west of Placer Dome's Mount Milligan Deposit.

"Serengeti's recently completed fall program on these five highly prospective properties, Bloom, Choo, Fleet, Darby and Shadow indicates that these systems are stronger and potentially more extensive than originally expected," said David W. Moore, president and CEO of Serengeti. "Due to these highly encouraging results, we have increased our land position by staking and it is clear that additional detailed follow-up and in some cases drilling will be required to further assess their potential."

"Due to these highly encouraging results, we have increased our land position by staking and it is clear that additional detailed follow-up and in some cases drilling will be required to further assess their potential." —David W. Moore, president and CEO of Serengeti

Highlights of the exploration include 800 ppm (parts per million or milligrams per kilogram) to 4,500 ppm copper and 30 ppb (parts per billion or micrograms per kilogram) to 2,080 ppb gold in a 1,500-meter by 1,000-meter soil anomaly at Bloom; 142 ppb gold at 40 meters, 190 ppb gold at 26 meters and 95 ppb gold at 20 meters in drill holes at Choo; an additional 500-hectare claim staked at Fleet to double its size; an average of 890 ppm copper and 102 ppb gold in a 2,500-meter by 500-meter soil anomaly at Darby; and 155 ppm to 333 ppm copper and less than 10 ppb to 2,200 ppb gold in a 1,500-meter by 300-meter soil anomaly at Shadow.

Osatenko has worked in B.C., Alaska, Chile

Serengeti also announced the appointment of Myron Osatenko as chief geologist. Osatenko has 35 years' exploration experience with Teck Cominco and related companies, where he specialized in the identification and discovery of large tonnage porphyry copper and copper-gold deposits. He has worked with these deposits over a geographical range from Chile to the Highland Valley of British Columbia and Pebble, Alaska. ●

COURTESY SERENGETI RESOURCES

Chief geologist Myron Osatenko on a property examination, northern British Columbia

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GOVERNOR

Leader John Coghill reminisced about growing up near Usibelli coal mine. Although all these politicians are Republicans, Alaska's Democratic legislators have also voted consistently in favor of the mining industry.

Convention timed to coincide with election

"Politicians in Alaska have got their heads on straight," Steve Borell, AMA's executive director, told Mining News. "They know what resource development means." The convention was deliberately timed to coincide with the November election, but not only to take advantage of the political excitement. "It used to be the last week of October, but the dredges at Nome wouldn't be frozen up yet and some of the managers and engineers didn't come," Borell said.

DNR Commissioner Tom Irwin a mineral engineer

The appointment of Tom Irwin as DNR commissioner in January 2003 signaled more good news for Alaska miners. A mineral engineer, Irwin oversaw operations for two large hard-rock gold mines during his career: the Sleeper gold mine in Nevada and Fort Knox in Alaska. Irwin celebrated his birthday at the AMA convention, and his speech could only begin after the presentation of a giant toy fish, in honor of all his fish stories, a cake with candles, and the audience's rendition of "Happy Birthday."

"Politicians in Alaska have got their heads on straight. They know what resource development means." —Steve Borell, Alaska Miners Association executive director

"As you know, I clearly support this organization and the important role it has in Alaska," Irwin said. "Our future's in here, based on our decisions. Think about it for a moment. We have Red Dog, Greens Creek, Usibelli, Fort Knox and True North. They're mining the way we expect mining to be done, and this is a tremendous foundation to build on. … Their track record speaks for itself and that has to be our future. If anyone fouls up, we all pay the penalty. But we've got the foundation. Now we have Pogo under construction, as well as major development projects on the horizon, such as Kensington, Donlin, Rock Creek, Pebble gold and copper, Nixon Fork."

It isn't the scenery that attracts businesses to Alaska, Irwin said. "The fact is, they evaluate their business plans and they invest where they get the best return on their investment, the best cash flow and the best security for that cash flow. Alaska competes with the world. … Look, resource development is the economic future and it is the engine for Alaska. There are no other options, it's the resource development. Each mine creates real wealth. It creates real career opportunities, not just jobs. There's a big difference when you're talking about careers. And it has significant positive impacts on the communities and the boroughs that are around."

Large mine project team working on permitting

The large mine project team has been cooperating with a number of mines on permitting and reclamation, including Red Dog, Greens Creek, Illinois Creek and Kensington. Fairbanks Gold Mining has undertaken the first heap leach closure in Alaska at the Ryan Lode mine, and was praised by the Department of Environmental Conservation for its reclamation efforts. The state backed the developers of the Pogo project when they faced an appeal by a Fairbanks-based environmental group against a federal water discharge permit. The appeal was withdrawn in May of this year.

"The whole team at DNR supported the permitting of this mine, we jumped through hoops to have it come out earlier," Irwin said. "Underground activities are now scheduled to start 30 days ahead of schedule." The large mine project team can also help at the pre-application stage. "We've been meeting with Donlin, Rock Creek, Pebble gold and copper and other projects," Irwin said. "The idea is to help them as much as possible on application submissions, give them information about permitting, information about baseline studies that just facilitates their work."

DNR has also been asked to work on mines adjacent to the U.S.-Canada border in southeast Alaska. "It's for a twofold purpose," Irwin said. "Yes, they're above very critical fish streams. And yes, it has to be done right, but we don't want the state of Alaska to improperly restrict. It just ought to be good business, environmental sense, and so we're involved."

Taiga Mining honored for reclamation

Following Irwin's speech, Bob Loeffler from DNR's Division of Mining, Land and Water presented the 2004 Reclamation Award for exceptional stewardship to Taiga Mining. The company was nominated by the Bureau of Land Management. Taiga has been mining in the Bear Creek Watershed for more than a decade. Bear Creek is located within the BLM's Hogatza River Area of Critical Environmental Concern. Salmon from the Hogatza River provide angling and subsistence fishing opportunities along 800 miles of the Yukon River for residents of over 25 villages.

According to the award citation, "Taiga's mining and reclamation of approximately 200 acres has created stream valleys with adequate floodplain widths and channel locations such that streams were re-established with uniform slopes and appropriate widths and depths. These efforts have reduced stream headcutting, lateral migration and subsequent sedimentation of new channels. The establishment of riparian vegetation within the active floodplain of Ida Creek is indicative of this channel stability." ●

● SOUTHWEST ALASKA

Northern Dynasty meets 2004 Pebble timeline

BY STEVE SUTHERLIN

Mining News Associate Editor

After a busy summer, Northern Dynasty Minerals Ltd. is on schedule and optimistic it can meet its timeline for a 2009 commencement of mining operations at its Pebble deposit, a proposed open pit, gold-copper-molybdenum-silver mine near Iliamna in southwestern Alaska, according to Bruce Jenkins, Northern Dynasty director of corporate affairs.

The company completed intensive infill drilling in 2004, sufficient to move the project to the bankable feasibility study level, Jenkins told an audience Nov. 4 at the Alaska Miners Association 2004 annual convention at the Sheraton Anchorage Hotel.

The current timeline calls for mine construction to start in 2007 and for mine operation to begin in 2009. The company plans to deliver the bankable feasibility study, and to begin permit applications in mid-2005.

In addition to drilling, the company moved aggressively in 2004 to fulfill its commitments to the state, affected communities and to its investors, Jenkins said. During the year, Northern Dynasty added a new Anchorage office and staff, made significant mine planning and engineering progress, initiated comprehensive environmental studies, and received formal approval to list its common shares on the American Stock Exchange. Effective Nov. 4, the company's shares were to be listed for trading on AMEX under the symbol NAK. Another high point for the company in 2004 was the completion of a preliminary assessment, which demonstrates robust economics for the Pebble project, Jenkins said.

Due to the difficult superlative challenges, helicopters play a vital role in moving materials and manpower

Superlative characteristics

Jenkins presented tables that underscore the superlative characteristics of the Pebble deposit. According to a Metal Economics Group, December 2003 ranking, Pebble is the fifth largest accumulation of copper-gold porphyries worldwide, and it is the largest in the United States. With 26.5 million ounces, Pebble is one of North America's largest gold deposits when ranked by contained gold in resources. Pebble is the number two copper deposit in North America when ranked by contained copper in resources. It is Alaska's largest copper deposit.

The company continues to weigh three different mine development concepts, all of which include a three-stage mining pit that will reach 1,800 meters in length, 1,200 meters in width, and 250 meters in depth. The first stage of mining is expected to recover 5.1 million ounces of gold and 3.3 million pounds of copper.

Superlative challenges

The Pebble project faces superlative challenges as well. There is no road into the project area, 65 miles from ice-free tidewater in Cook Inlet. The Alaska Department of Transportation and Public Facilities has commissioned pre-feasibility level engineering studies for a transportation corridor and a proposed port on the southwest corner of Iniskin Bay, according to Northern Dynasty. Results of the study are expected in early 2005.

Perhaps the most interesting challenge facing Northern Dynasty is where to find

The current timeline calls for mine construction to start in 2007 and for mine operation to begin in 2009. The company plans to deliver the bankable feasibility study, and to begin permit applications in mid-2005.

the estimated 150 megawatts to 200 megawatts of electricity it will take to power the mill that processes ore. The best way to deliver that kind of power to the remote Iliamna area is still under study. Northern Dynasty put out a request for proposals for power earlier in the year and it is expecting to receive responses soon — responses the company hopes will contain a viable solution to its power needs.

Power source undetermined

The company isn't fixated on any specific power delivery proposal at this point.

"Power requirements are likely to be met via a connection to the Alaska transmission grid or an independent power producer's generator located near to the project area," the company said in a Nov. 16 statement.

Preliminary studies completed by the project's previous owner proposed that power requirements could be met by natural gas from currently producing offshore wells in Cook Inlet or from thermal coal resources located within the state.

On the other hand, hooking up to the existing Railbelt power grid would require a submarine cable crossing Cook Inlet, or an overland transmission line following the west shore of Cook Inlet to the Chugach Electric Beluga power station.

The ultimate solution will require no less than a comprehensive power plan for the entire region. The company said earlier this year that a working group was convened by Gov. Frank Murkowski to evaluate the demand for, and the benefits of, a regional energy system — including the need for and location of fuel supplies, power stations and transmission lines. ●

● YUKON TERRITORY

Encouraging trends lift Yukon projects

Drilling in new directions, closer relations with First Nations and devolution benefit explorers

BY SARAH HURST
Mining News Contributing Writer

Placer mining in Canada's Yukon Territory has increased significantly this year, and although there are no operating hard-rock mines in the territory yet, that may change soon. Mike Burke of the Yukon Geological Survey outlined the varied projects of the past season at the Alaska Miners Association Convention in Anchorage on Nov. 4. In particular, he drew attention to Expatriate Resources' exploration in the Finlayson Lake District at Wolverine, for which the company has raised C$16.6 million.

Wolverine is one of several important volcanogenic massive sulfide deposits in the district. It is rich in selenium, which is used in glass making, pigments and manganese production. "The price of selenium has skyrocketed," Burke said. "Smelters are now interested in this concentrate and are offering to pay for the selenium instead of charging a penalty." Results from nine drill holes in the deposit showed an inferred resource aggregating 6,237,000 tonnes grading 12.66 percent zinc, 1.55 percent lead, 1.33 percent copper, 371 grams per tonne silver and 1.76 grams per tonne gold, according to a release dated Nov. 8.

"A bankable feasibility study is scheduled to be completed in early 2006, at which time we will make a production decision," Brian Soregaroli, Expatriate's manager of investor communications, told Mining News. "If the decision is made to go ahead, the mine would be operational as early as late 2007, if all goes according to plan." Expatriate is set to split into two companies, if a motion is ratified at an extraordinary shareholders' meeting on Dec. 14, in which case all its Finlayson District assets will go to a company renamed Yukon Zinc Corporation.

Expatriate also drilled three holes at the nearby Thunderstruck target, a new discovery.

"This is a really juvenile mineral district, so I've always said, all you've got to do is spend a little more money and you're going to have another discovery, and sure enough these guys proved me right again," Burke said. "Just going out and putting your boots on the rocks, you're going to find more stuff here."

In addition to Wolverine, another potential underground mine could be completed at the Minto Deposit, about 150 miles northwest of Whitehorse, where Minto Explorations is already halfway to building the mine, Burke told Mining News. Asarco has an agreement to fund the project to production, but it has never funded it completely and is selling its portion of the deposit. "That could be a real jump start, depending on who gets their hands on it," Burke said.

Grew Creek: new interpretation

More exciting news came from Freegold Ventures' Grew Creek Project, where drilling by previous operators was based on an interpretation that the gold mineralization trended in an east-southeasterly direction. A new interpretation suggested that most of the previous drilling may have been oriented sub-parallel to the vein orientation. This is Freegold's first project in Yukon Territory: the company has been operating mainly in Alaska up to now. Infrastructure-wise, the Grew Creek Project couldn't be better placed — it is 22 miles west of the town of Ross River and just over half a mile from the Robert Campbell Highway and the Whitehorse power grid.

Freegold announced assay results for the first drill hole in a release Nov. 1. The stockwork zone averages 2.25 grams per tonne gold over the 90.5 meters (297 feet) interval from 37.5 meters to 128 meters. A continuous quartz-adularia vein stockwork was intersected through the interval. The most intense stockwork interval of 17.5 meters (57.4 feet) from 91.5 meters to 109 meters has an average grade of 6.79 grams/tonne gold. Within the interval strongly veined sections assayed 14.38 grams/tonne gold over 2.0 meters (6.6 feet) and 17.77 grams/tonne over 2.3 meters (7.6 feet).

Information released in a Nov. 11 news release indicated the third hole at Grew Creek intersected 22.12 grams/tonne gold (0.65 opt) over 6.25 meters (20.5 feet).

Cooperating with First Nations

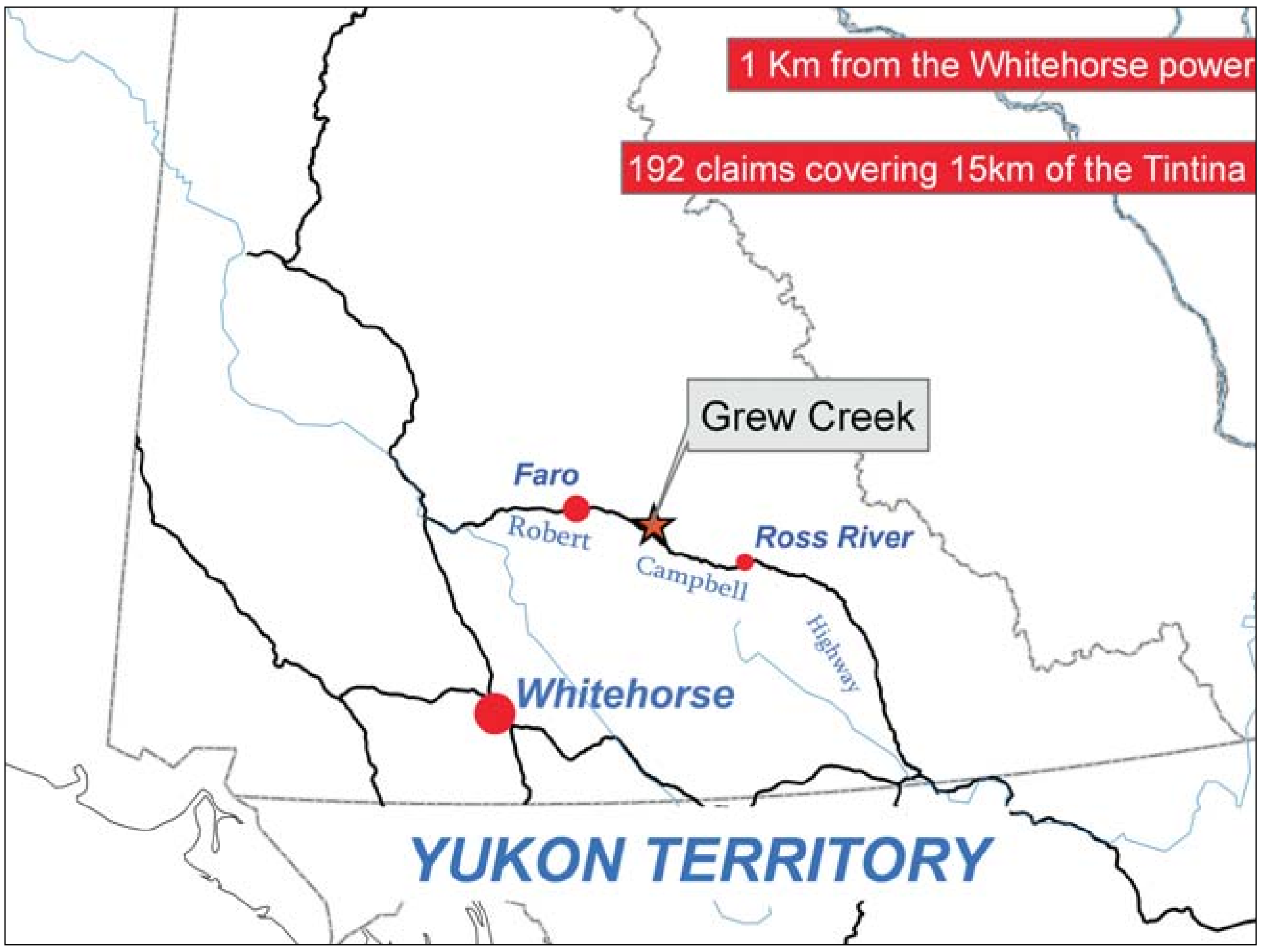
Mining companies in Yukon Territory are cooperating with First Nations for mutual benefit. Teck Cominco signed an agreement with Kaska Nation-owned Kaska Minerals Corp. in November 2003 to explore on a parcel of land known as R-15, about 87 miles southeast of Ross River. Kaska Minerals is leasing the 17 square miles of land from the Yukon government for five years with the permission of the Ross River Dena Council. So far eight holes have been drilled, but no results are available yet.

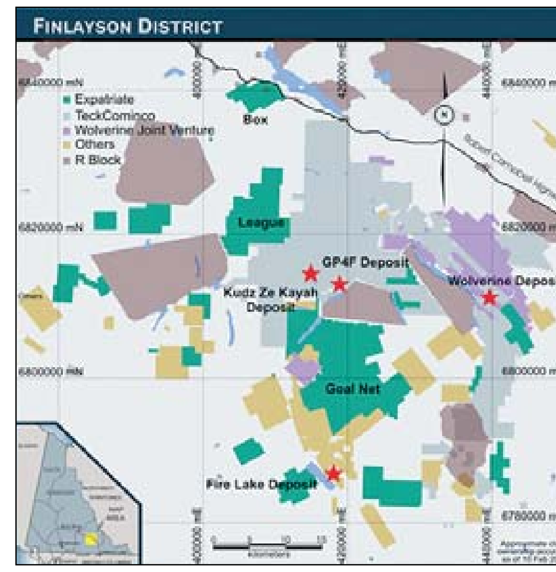
The Ross River First Nation also has a social-economic agreement with True North Gems. In recognition of the agreement, the company renamed its Regal Ridge Project Tsa da Glisza, which means "green stone" in the Kaska language. This year True North drilled about 58 shallow diamond drill holes and mined about 1,500 tonnes of emerald-bearing material here. The company was able to process about 600 tonnes of that, from which it recovered 21 kilograms of emer-

see **YUKON** page 8

COURTESY EXPATRIATE RESOURCES

Jason Dunning with core from the Wolverine Project





COURTESY EXPATRIATE RESOURCES

Above: A map of Finlayson District provided by Expatriate Resources Ltd., showing the Wolverine deposit. The Thunderstruck discovery is in the southern part of the Goal Net property.

Left: NovaGold's Grew Creek site

COURTESY EXPATRIATE RESOURCES

An Otter delivering people and supplies to Expatriate Resources Wolverine project

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YUKON

alds. A total of 4,100 carats was gem quality, 37,000 carats near gem and 65,000 carats non-gem material.

At True North Gems' True Blue property, which is 62 miles northwest of Tsa da Glisza, diamond-impregnated chainsaws were used to go into the boulder field, Burke said. In August 2003 a team of field geologists discovered 50 showings of a True Blue aquamarine gemstone here, the first of its kind in the world.

Yukon government got more responsibility in 2003

Devolution gave a boost to miners on April 1, 2003, when the federal government gave more responsibility for land and mineral resources to the Yukon government, including local control over permitting issues. "We always tend to have supportive governments, as mining is the mainstay of the Yukon economy," Burke said. Forest fires were the main setback last summer, forcing the cancellation of a few projects, including NovaGold's drilling at Brewery Creek, near Dawson. Yale Resources also had to take a month off drilling at its Golden Revenue property in the Carmacks District because of fires.

Valuable lessons about mining in Yukon Territory can be learned by looking at Australia, and Copper Ridge Explorations is doing just that, as its Yukon Olympic property resembles the giant Olympic Dam copper-gold mine in Australia. The existence of the distinctive rocks known as Wernecke breccias has fueled the theory that Yukon and Australia were joined at the hip in the Late Proterozoic era, around 600 million years ago. Copper Ridge is in a joint venture with Canadian Empire Exploration Corp. (funded by Teck Cominco) at Yukon Olympic. The Yukon Olympic property consists of 377 claims located along the Dempster Highway, north of Dawson City.

Stratagold's Hyland property, 43 miles northeast of Watson Lake, is also similar to the Telfer-type deposits in Australia and has the potential to host a large sediment-hosted gold deposit. Other notable exploration projects in Yukon Territory include Kobex Resources and Almaden Minerals at Morley Lake, Strategic Metals at Antimony Mountain, ASC Industries at Red Mountain, Logan Resources at Shell Creek, Ross River Minerals at Tay-LP and Madalena Ventures at White River. ●

● ALASKA

Movers and shakers break ground in Alaska

From Nome to Juneau and almost everywhere in between, the heat is on in the race for the state's mineral wealth

BY SARAH HURST

Mining News Contributing Writer

Neither the heat and smoke from wildfires, nor excruciatingly low winter temperatures could deter miners from expanding their operations in Alaska this past season. Representatives of several companies described their achievements in the "Development and Mine Operations" session at the Alaska Miners Association convention on Nov. 5.

COURTESY NOVAGOLD

Drilling site at NovaGold's Rock Creek

NovaGold Resources' Rock Creek

John Odden from NovaGold Resources began with a presentation on Rock Creek, which is located on the Seward Peninsula, seven miles north of Nome. Part of it is on land owned by the Bering Straits Native Corp., which will receive a royalty on gold production. The Rock Creek and nearby Saddle deposits contain a resource of greater than 1 million ounces of gold.

Production at Rock Creek is targeted to begin by 2006, with an anticipated average of 100,000 ounces of gold per year at a total cash cost of $200 per ounce.

"There is good road access from Glacier Creek, and Nome Utilities power is within five kilometers — it's an easy shot to power up the mine," Odden said.

The final feasibility study for Rock Creek is well under way and the company has initiated the permitting process. Approximately 5,400 feet of HQ triple tube diamond drilling in 20 holes has been completed, along with a 3,300-foot trench program across the main mineralized zone. A twin drill hole program of duplicate best method reverse circulation drilling has also been completed as part of the reserve definition program developed by engineering firm AMEC E&C Ltd.

A further 8,900 feet of infill drilling, to convert the remaining areas of inferred resources to indicated resources, has also been completed with 38 drill holes of both reverse circulation and core. A detailed metallurgical program is under way to determine final design parameters for the milling circuit. One of NovaGold's objectives has been to reduce gold loss from the core, and to this end they have been using new equipment: a face-discharge bit instead of a conventional bit. The ports on the face-discharge bit direct the flow of mud away from the core.

NovaGold Resources' Big Hurrah

NovaGold also owns the Big Hurrah property, 45 miles east of Nome. Initial exploration started there in 2004 and the results are pending. Historic work on the property has identified multiple shallow mineralized zones grading as much as 10 grams/tonne gold with similar characteristics to Rock Creek. Among its other Alaskan properties, NovaGold owns 70 percent of the Donlin Creek deposit in the southwest of the state, in a joint venture with Placer Dome, which owns the remaining 30 percent. The companies hope to begin construction of a hard-rock mine here in November 2007 or earlier. Placer Dome announced the appointment of a new president and CEO last September, Peter Tomsett, who took over from Jay Taylor.

Commercial production at Pogo in early 2006

Teck Cominco will also soon have a new president,

see **ALASKA** *page 10*

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ALASKA

Donald R. Lindsay, the company announced in November, and he will likely take over as CEO next April.

Teck Cominco is the operator of the Pogo gold project and holds 40 percent interest in it, with Sumitomo Metal Mining holding 51 percent and Sumitomo Corp. the remaining 9 percent. Pogo has a probable resource of 7 million tonnes grading 16.12 grams/tonne, and the underground mine is expected to produce an average of 400,000 ounces of gold annually over a 10-year life.

The company aims to start commercial production early in 2006. Major progress on construction has been made at Pogo, which is 38 miles northeast of Delta Junction, Teck-Pogo's Karl Hanneman told the convention.

Capital costs for the Pogo project total $284 million, including $30 million for a 50-mile access road and site roads. Teck-Pogo began construction of a winter road in December 2003, with nine large bridges and up to 20 smaller bridges across the Goodpaster River.

"Some local guys from Delta, very hardy, wood-savvy folks, really make this kind of stuff happen, we couldn't do it without them," Hanneman said. "They get out there at 30 or 40 below (zero) and pump and blow water onto the river to make the ice-bridge crossings." Temporary wood and steel bridges were also brought in. In 1997-98 the round-trip travel time on this winter road was 14 hours; last year it was between six and eight hours.

"We ended up moving about 600 loads of fuel and supplies into the mine," Hanneman said, "most of which came in the very latter parts of the February-March period, so when all the freight did arrive it was fortunate that we had a road where we could transfer it rapidly into the site before break-up."

At the same time as building the winter road, Teck-Pogo worked on the pilot access road up to Shaw Creek Valley. The road traverses three major terrain types: sand dunes, very high alpine terrain above the tree line and heavily wooded terrain.

Video game-style GPS consoles were installed in bulldozers so their operators could see themselves without needing a survey team ahead of them in the deep snow and forest.

The access road was completed in April, but it was difficult to use during the two-month break-up period, so fuel and supplies were brought in by air, to a new 3,000-foot airstrip.

At the end of June the Camp Creek forest fire came dangerously close to the project.

"I want to acknowledge the response of DNR (the Department of Natural Resources). They quickly mobilized to help us protect the camp," Hanneman said. The company also had several water trucks keeping the woods wet.

Despite haze from fires throughout the summer, Teck-Pogo managed to build its water treatment plant and start on the mill by September.

Fort Knox: 1/3 of gold in 1 percent of rock

The Boundary wildfire forced the evacuation of the Fort Knox open pit mine, near Fairbanks, at the end of June, but it was back to normal production levels within a few days. Gold production and restoration work continues apace there, according to Paul Jensen of Fairbanks Gold Mining, a subsidiary of Kinross Gold.

"Eighty-eight percent of our wetlands have been restored," he said. "There is some very good habitat for moose, fish and ducks."

Fairbanks Gold Mining expects the mine to produce around 340,000 ounces of gold at total cash costs of $220 per ounce in 2004.

For the future the company plans Fort Knox pit expansion, near mine exploration, district exploration and to look at outside acquisition and discovery opportunities.

"One-third of our gold is in 1 percent of our rock," said Jensen.

For the future the company plans Fort Knox pit expansion, near mine exploration, district exploration and to look at outside acquisition and discovery opportunities.

Mystery Creek Resources working Nixon Fork area

The first 400 tons of gold were shipped from the Nixon Fork area, 35 miles northeast of McGrath, in 1919, but Mystery Creek Resources only acquired a lease on the mine here in February 2003. The company is a subsidiary of St. Andrew Goldfields, Mystery Creek's president, Paul Jones, told the convention. This particular underground mine started production in 1995, under the ownership of Consolidated Nevada Gold Co., but stopped when that company went into receivership in mid-1999 due to "some happenings in Mexico," Jones said. Mystery Creek took the mine over from Mespelt & Almasy Mining Co.

Indicated resources at the property are estimated to be 69,000 tonnes at 32.4 grams/tonne gold, and inferred resources total 76,000 tonnes at 26.4 grams/tonne gold. The company plans to revise the estimate in January to upgrade most of the indicated to reserve status and most of the inferred to indicated, and add what has been found in this year's drilling. "You get some spectacular grades — you also get some that are not so spectacular, but they all work out," said Jones.

An underground drilling program started in 2004 and Mystery Creek has drilled 13,000 meters (42,650 feet) to date. It has also conducted environmental permitting studies, hydrological studies and metallurgical studies for the redesign of the milling process, and designed a new metallurgical circuit. In 2005 it hopes to complete the permitting process, renovate and modify the milling facility, treat the existing tailings material from the previous operation in the summer, and begin the mining of new ore in the late fall.


CHRIS AREND

A Usibelli coal dragline at work

Mystery Creek's predecessor, Consolidated Nevada Gold, shipped a bulk sulfide concentrate to Japan via Seattle for smelting. To avoid this expense, Mystery Creek will do flotation and make a high-grade copper concentrate. "We may actually do some scrubbing of that flotation product before we clean it," Jones said. The tailings from the flotation process will then be leached with cyanide to make a doré. The company expects to get about 25 percent of the total gold out with the gravity circuit. About 35 or 40 percent of the gold will come out in the cyanide leach process, and the rest of it will be with the copper material.

Kensington Gold moving ahead

In southeast Alaska, Coeur Alaska is moving forward with its Kensington Gold Project.

"You guys might think Juneau is the hardest place in the world to mine, but it's not, it's been a very welcoming community," said Tim Arnold, vice president and general manager of Coeur, who came to Alaska in April. Coeur has been involved with Kensington for more than 15 years and is currently in the last stages of permitting the current mine plan. The company has spent around $150 million on Kensington, $25 million in environmental studies alone. It hopes to begin production in summer 2006.

Kensington is about 45 miles north of Juneau. Coeur plans to build a two-mile road extension and a port facility to shuttle its workers back and forth from Alaska's capital, a five-mile ferry trip.

"All the workers will do a daily commute to Juneau in the new plan, which has not been a part of the previous plan," Arnold said. The Jualin camp is another five miles away, on the other side of a mountain. At present it is "not much more than a very coarse exploration camp," Arnold said, but most facilities will be based there once the mine is in operation.

During pre-production, the majority of the development will take place on the Kensington side.

The tailings management facility will be at Lower Slate Lake, a 20-acre lake that is 51 feet deep in the middle. Coeur will expand it to about 50 acres and reduce the average depth to 20 feet, so it will be shallow enough for about 800 Dolly Varden from Upper Slate Lake to live in.

"Our tailings are very clean, as a matter of fact they're cleaner than what's at the bottom of Slate Lake right now," Arnold said. "We have a high quality of reclamation standards," he added. "We feel as though there's going to be a very small impact. It's a nice underground mine."

Usibelli: state's only coal mine

Usibelli Coal Mine could be called the black sheep of Alaska's mining industry, as it is the state's only coal mine, but it has proved there is nothing wrong with standing out from the crowd. Usibelli has been exporting coal to South Korea since 1985, and this year sent its first test shipment to Chile, Fred Wallis told the convention.

The company has been mining near Healy for 60 years and opened its Two Bull Ridge mine in July 2003. This is now its main mining area — it has five altogether. "We have some pretty good coal that's not too far down under the ground," Wallis said. A total of 2,500 acres are permitted there.

Like other mining companies, Usibelli is having difficulty recruiting younger employees. It currently has 90 full-time employees, almost one-third of whom have been with the company for more than 20 years. The average age of Usibelli employees is 47.

It is considerably easier to obtain new equipment. A CAT 992C 1988 model with more than 49,000 hours of service was retired this year and replaced with a CAT 992G. Usibelli also owns a 2,100-ton BE 1300W Walking Dragline, the only one in Alaska, purchased in 1977. "It attracts a lot of attention in the area," Wallis said. Usibelli recently bought a Gamma-Metrics Elemental Crossbelt Analyzer, which will "make a better blended product for our customers," according to Wallis.

Usibelli's customers include Aurora Energy, Fort Wainwright, Eielson Air Force Base, the University of Alaska Fairbanks and Golden Valley Electric Association. The Alaska Railroad hauls all the coal off-site that is not delivered to the mine-mouth power plant: 750,000 tons of coal north to Fairbanks and 400,000 tons south to Seward annually. Reclamation has been taking place at the closed Poker Flats mine and Usibelli estimates that it planted more than 20,000 trees last summer. ●

● NEWS ROUND-UP

Mining exploration spending in Alaska approaches $50M in 2004, says Freeman

Alaska Miners Association convention forum for results from Alaska's exploration, development and production properties

BY CURT FREEMAN

For North of 60 Mining News

The month of November started off with a bang with favorable results for the mining industry from both the state and federal elections standpoint. As it closes the price of gold is flirting with $450 per ounce, the highest price for this metal since mid-1988.

The Alaska Miners Association convention was very well attended in early November and results were revealed there from many of Alaska's exploration, development and production properties.

A quick tally of spending across the state suggests exploration spending will be up almost $50 million in 2004.

Development spending is likely to be dramatically higher in 2004, primarily due to the Pogo mine construction but also significantly impacted by activities at Nixon Fork, Donlin Creek, Rock Creek and Kensington.

Production revenue is undoubtedly going to top $1 billion all by itself thanks to strong gold, silver, copper, lead and zinc prices. Not bad for Seward's Icebox!

WESTERN ALASKA

Northern Dynasty Minerals reported a summary of a recently completed preliminary economic analysis on their Pebble copper-gold prospect near Iliamna. The estimates were based on inferred mineral resources of 2.74 billion tonnes grading 0.55 percent copper-equivalent (0.30 grams gold per tonne, 0.27 percent copper and 0.015 percent molybdenum above a cut-off grade of 0.30 percent copper-equivalent).

Processing of mill feed from an open pit will produce a copper sulfide flotation concentrate with gold and silver values as well as a separate molybdenum sulfide concentrate. Estimated metal recoveries were 88 percent for copper, 76 percent for gold and silver, and 60 percent for molybdenum. Copper concentrates would be transported to a storage and dewatering port facility on tidewater on Cook Inlet via a concentrate pipeline. Molybdenum sulfide concentrate would be packaged and shipped to market separately.

The preliminary assessment examined three production rate scenarios: 100,000 tonnes per day, 200,000 tonnes per day and a phased expansion from 100,000 tonnes per day to 200,000 tonnes per day in year six. These analyses show that at the lowest production rate considered (100,000 tonnes per day), the project has the scope to produce an annual average of 256 million pounds of copper, 365,000 ounces of gold, 8 million pounds of molybdenum, and 1.4 million ounces of silver during the first 10 years of a 62-year mine life. At the largest scale studied (200,000 tonnes per day), the project would produce an annual average of 470 million pounds of copper, 674,000 ounces of gold, 15 million pounds of molybdenum, and 2.5 million ounces of silver during the first ten years of a 31 year mine life.

Waste-to-ore stripping ratio for all three scenarios was 0.23 to 1. Average cash costs net of other metal credits ranged from 24 cents per pound of copper for the smallest production rate to 19 cents per pound of copper for the largest production rate. Capital cost estimates range from $1.0 billion for a 100,000 tonnes per day facility to $1.5 billion for a 200,000 tonnes per day facility. Life-of-mine sustaining capital estimates range from a total of $276 million for a 100,000 tonnes per day project to a total of $197 million for a 200,000 tonnes per day project. Operating cost estimates range from $5.06 per tonne milled for a 100,000 tonnes per day production rate to $4.36 per tonne milled for a 200,000 tonnes per day production rate.

The results of financial analyses for the three production rates under consideration indicate that the project could generate an internal rate of return on capital invested of between 15.3 percent and 20.3 percent, and a net present value, discounted at 5 percent, of between $1.047 billion and $2.091 billion. At metal prices of $1.25 per pound copper, $415 per ounce gold, $7.00 per ounce silver and $15 per pound molybdenum, the internal rate of return would increase to between 33.0 percent and 40.8 percent and the net present value to between $3.511 billion and $5.972 billion.

A capital cost of $103 million was estimated for construction of the seaport and access road for the Pebble project although these numbers were not included in the preliminary economic assessment since talks are on-going with state and federal agencies regarding funding of this part of the project. Development of a mine at Pebble will require the construction of an 86-mile road to connect the project to tidewater at Cook Inlet and a deep sea port facility. Options for electrical power generation include connection to the state's existing power transmission grid, either through a 41-mile submarine connection to the Kenai Peninsula or an overland route on the west side of Cook Inlet. An alternative to a transmission grid connection would involve construction of new generation facilities close to the mine or port area.

Not to be outdone by the engineers and metallurgists, Northern Dynasty Minerals also reported a summary of drilling results on their Pebble copper-gold prospect near Iliamna. The project's $25 million exploration budget included infill resource definition drilling, exploration drilling, geotechnical and engineering drilling and process design drilling. The work also included extensive environmental and socio-economic planning, data collecting and field studies. Drilling totals include 122 holes (101,539 feet) of in-fill drilling, 26 holes (21,335 feet) of metallurgical drilling from which 85 tons of metallurgical samples have been shipped, 70 holes (32,502 feet) of geotechnical drilling and nine holes (13,815 feet) of exploration drilling.

Highlights of the 2004 in-fill and exploration drilling results include hole 4137 which returned 143.3 meters grading 0.54 grams gold per tonne, 0.52 percent copper and 0.028 percent molybdenum; hole 4142 which returned 103.6 meters grading 1.11 grams gold per tonne, 0.52 percent copper and 0.018 percent molybdenum; hole 4145 which returned 259.1 meters grading 0.68 grams gold per tonne, 0.55 percent copper and 0.037 percent molybdenum; hole 4147 which returned 100.6 meters grading 0.99 grams gold per tonne, 0.42 percent copper and 0.011 percent molybdenum; hole 4187 which returned 76.2 meters grading 0.47 grams gold per tonne, 0.86 percent copper and 0.063 percent molybdenum; hole 4189 which returned 64.3 meters grading 0.73 grams gold per tonne, 0.81 percent copper and 0.081 percent molybdenum; and hole 4199 which returned 52.3 meters grading 0.65 grams gold per tonne, 0.65 percent copper and 0.013 percent molybdenum. Additional assays from exploration and in-fill drilling are pending.

Liberty Star Gold announced preliminary results from a four-hole, 1,329-foot, core drilling program on its Big Chunk copper-gold project near Iliamna. Drilling was conducted on the White Sox prospect where altered and mineralized sedimentary rocks cut by porphyry dikes and quartz veins were intersected. Copper and molybdenum sulfides were visible in some intervals of the core.

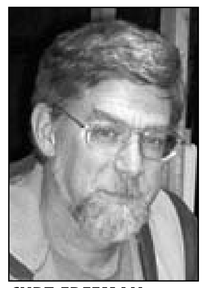
Induced polarization geophysical anomalies and geochemical anomalies coupled with this drilling suggest the system is more than one mile wide, three miles long and open to the northeast, east and south. Airborne magnetic highs suggest the White Sox prospect is adjacent to a large intrusive system which may be the source of porphyry dikes encountered in the drilling. The company indicated that it believes that White Sox represents a covered, previously unrecognized porphyry copper-gold system.

NovaGold Resources announced additional results from its Rock Creek project near Nome.

The 2004 work program included 5,921 meters of in-fill drilling and 1,000 meters of trenching to provide additional geologic data for an updated three-dimensional block model. The company has signed a memorandum of understanding with the state of Alaska formally initiating the permitting process at Rock Creek. This agreement outlines the requirements for permitting of the project and is antic-

see ROUND-UP page 12

The author



CURT FREEMAN

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ROUND-UP

ipated to be completed by the second half of 2005.

Baseline environmental monitoring and permitting activities have been budgeted at more than US$700,000 in 2004. The company also announced that a feasibility study on the project has been initiated under the direction of Norwest Corp. Over US$1.1 million has been budgeted for engineering programs in support of the feasibility study. Other studies under way include metallurgical testing, waste rock characterization and disposal, water management and mine facilities design.

NovaGold Resources also announced exploration efforts at its Big Hurrah gold project east of Nome. The company completed 2,900 meters of both reverse circulation and core drilling to test the potential to develop a near surface gold resource. Historic work on the property has identified multiple near surface gold mineralized zones with similar characteristics to Rock Creek.

The company is targeting the potential to define an initial mineralized zone that could contain 100,000 to 200,000 ounces of gold grading between 5 to 10 grams gold per tonne beginning at surface. Assay results from the current drill program are still pending but drilling on the property did encounter mineralization which included zones of veining with coarse visible gold. The zone remains open at depth and along strike.

Full Metal Minerals Ltd. announced results from their Ganes Creek property west of McGrath. Field work during 2004 included collection of 1,316 soil samples on a 50 by 100 meter spaced soil grid centered over three placer gold-producing streams east of the main Ganes Creek channel. This work, in conjunction with prior data, has identified several northeast trending zones of anomalous (greater than 95th percentile) gold values, highlighted by a 5,500 meter long anomaly located proximal to a major fault zone.

Prospecting work, which included collection of 387 rock samples, revealed new gold occurrences located proximal to old workings at the Independence prospect. A grab sample of highly altered and veined mafic intrusive rock assayed up to 49 grams of gold per tonne, with samples nearby of narrow quartz breccias exposed in trenching returning values up to 8.3 grams of gold per tonne. At the Katz showing, 14 grab samples collected over 5 meters averaged 3.9 grams of gold per tonne from the end of a historic exploration drift while grab samples from an old dump returned up to 22.0 grams of gold per tonne. Additionally, several subcrop and float occurrences of quartz from areas with extensive vegetation cover, assayed between 5.7 and 8.5 grams of gold per tonne, proximal to gold in soil anomalies. The company indicated drilling was planned on the property for 2005.

EASTERN INTERIOR

Kinross Gold announced third quarter results from its Fort Knox operations.

The mine produced 84,738 ounces of gold at a total cash cost of $229 per ounce compared to 98,518 ounces of gold at a total cash cost of $249 per ounce during the third quarter of 2003. Mill throughput for the quarter averaged 37,213 tonnes per day at an average grade of 0.79 grams of gold per tonne. Recovery was steady at 89 percent and total operating costs were $317 per ounce. Production was slightly ahead of forecast levels due to better grades and mill recoveries. The year-on-year decrease in production was a result of the temporary suspension of mining from the True North pit which did not contribute to production in the third quarter of 2004. Rising fuel and energy costs both adversely affected operating costs in the third quarter.

Teryl Resources Corp. announced results from limited soil auger sampling on its West Ridge gold prospect in the Fairbanks district. A total of 161 power auger soil samples were collected on a small grid over the southern part of the claim block and within lands the company has leased from the State Mental Health Land Trust. In addition to the 161 auger samples, 14 shovel soil samples were collected in the same area as previous rock sampling which returned gold values ranging up to 4.3 grams of gold per tonne. Anomalous gold and pathfinder elements in the 2004 soil grid occur in four discrete areas of the grid and all four areas are open to expansion into lands owned or leased by the company.

Of the 175 soil samples collected, 29 returned values greater than 100 parts per billion gold with the maximum value being 981 parts per billion. An additional 32 returned anomalous gold values ranging between 50 and 100 parts per billion. Anomalous gold was associated with elevated arsenic, antimony, lead, bismuth and tungsten. The presence of anomalous bismuth (to 15 parts per million) and tungsten (to 370 parts per million) in soils suggests that gold mineralization within the sample grid may be intrusive related. Additional work is planned for 2005.

Teryl Resources Corp. also announced that two reverse circulation drill holes (587 feet) had been completed on its Fox Creek gold prospect in the Fairbanks district. The holes were angled to the southeast and northwest from a drill pad placed adjacent to the rock sample site that returned 1.36 gold grams of gold per tonne during initial due diligence sampling. The holes were placed approximately 150 meters east of a 1995 hole drilled by AMAX Gold that returned 30 feet grading 0.03 ounces per ton of gold. Both holes intercepted sulfide-bearing granite along with altered quartzite and quartz mica schist. Sulfides observed include pyrite and molybdenite. Hornfelsing was observed in both holes. Assays are pending.

Teck Cominco and partner **Sumitomo Metal Mining** announced that construction activities on their Pogo gold mine are ahead of schedule and the partners now estimate the first gold pour for December 2005 rather than the originally estimated March 2006 pour date.

The electrical power line along the 49-mile road access corridor is due to electrification in mid-December which will allow an estimated 2 megawatts of power to be drawn for construction purposes by January 2005. The twin portals used to access the ore body are due to be collared in December. Capital costs are still pegged at $284 million for the mine-mill complex. The mine's revenue generating capacity has drawn the notice of the Fairbanks North Star Borough's mayor who recently indicated his administration is looking at an option to annex the land around Pogo into the North Star Borough to allow it to tax the facility. Funny, nobody thought this land was worth much a few years ago….

Tri-Valley Corp. announced the formation of a new mining subsidiary, Select Resources Corp., as the first step toward creating a new mining company to house its 42 square mile Richardson gold project southeast of Fairbanks. The new company would provide a standalone vehicle for Richardson and other gold exploration projects the company may acquire in the future. Tri-Valley has discovered gold at 60 locations along a 20-mile strike on the project. Several drill targets have been identified and Select expects to drill one or more in 2005.

NORTHERN ALASKA

Little Squaw Mining Co. announced additional results from 2004 fieldwork on its Little Squaw gold project in the southern Brooks Range. Fieldwork involved prospecting of some of the 59 favorable targets identified from a photo geologic lineament study conducted earlier in the year. Subsequent fieldwork identified a number of high priority gold-quartz vein prospects for future exploration. Results from the Little Squaw vein include a grab sample from a quartz vein exposed in one of the trenches which assayed 5.24 ounces of gold per ton. Channel sampling in a tunnel below that trench yielded 19.98 ounces of gold per ton over 3.54 feet of true width. This sample run includes a 0.84 foot interval of ribbon quartz that assays 89.12 ounces of gold per ton with 15.85 ounces of silver per ton. Another channel sample of this ribbon quartz taken 10 feet farther along in the tunnel assayed 5.16 ounces of gold per ton over 0.85 feet.

At the Crystal vein, rediscovered this season, the old shaft and associated trenches are completely caved however a set of veins can be traced over a strike length of at least 400 feet. The main quartz vein is at least 5 to 6 feet thick and has a 0.67-foot-thick footwall of ribbon quartz that assayed 3.64 ounces of gold per ton. Additional promising results were received from the McLellan, Pioneer, Uranus, Mikado, Rock Glacier, Prospector East and Big Tobin prospects. Additional work is planned for 2005.

SOUTHEAST ALASKA

Kennecott (70.3 percent) and **Hecla** (29.7 percent) announced third quarter 2004 production from the Greens Creek mine on Admiralty Island. The total cash cost per ounce of silver at Greens Creek for the quarter was $1.55, a significant increase over third quarter of 2003 costs of $1.14 per ounce. The average grade of ore mined during the quarter was 18.05 ounces of silver per ton. During the third quarter the mine produced 2,579,774 ounces of silver, 20,699 ounces of gold, 6,014 tons of lead and 18,668 tons of zinc. Total production costs for the quarter were $3.58 per ounce of silver produced versus $3.35 per ounce for the third quarter of 2003. Exploration drilling continued to advance targets west of any previous mining. Underground access to this area should be ready for exploration drilling in early 2005.

Bravo Venture Group Inc. announced the completion of Phase II drilling at its Woewodski Island project in southwest Alaska. Five drill holes (550 meters) were completed at two of the 13 volcanogenic massive sulfide and gold prospects on the island. Three drill holes (349 meters) targeted interlayered sulfides, argillite and andesitic tuffs at the Mad Dog prospect where previous drilling returned values of up to 3.8 meters of 16.4 ounces of silver per ton, 2.8 percent lead and 22.4 percent zinc within a 17 meter intercept of 6.5 ounces of sil-

see **ROUND-UP** *page 13*

● ALASKA

State working on half dozen mining road, port projects

Port and road combinations planned to provide market access to minerals near Alaska's West Coast

BY KRISTEN NELSON

Mining News Editor-in-Chief

The first of two-seasons of construction is under way on the Nome Glacier Creek Road realignment in western Alaska. This is just one of a number of mining road and port projects the Alaska Department of Transportation and Public Facilities has carried into Phase II, Mike McKinnon, the project's manager, told the Alaska Miners Association annual conference in Anchorage Nov. 4.

For five years, he said, the department has "been looking at the issue of industrial development roads with the idea that there are situations where the state of Alaska could make surface transportation investments in ports and roads" that would give a push to "projects that are feasible and economic at the site" but need access, thus speeding up getting minerals to the market. Both mining and oil and gas projects are included (see story on oil and gas access projects in Nov. 21 issue of Petroleum News).

Phase I of the department's resource transportation analysis, in 2000-2002, looked at traditional long-distance, overland routes for mineral resources, but found that in today's conditions they are "too expensive to build and operate," McKinnon said.

But with a combination of a port and a short road, you had something — like the Red Dog mine transportation system — that works on Alaska's western coast he said.

Mine road and port projects carried into Phase II include: the Delong Mountain terminal port expansion at Red Dog; the Point Lay deadfall syncline coal mine access; the Noatak Airport and Red Dog Mine access road; the Nome Glacier Creek Road to Rock Creek Mine; Yukon-Kuskokwim rivers ports and roads; and the Pebble gold-copper port and road.

A port on the Kuskokwim and a 24-mile road linking the port to the Donlin Creek mine would likely be the first project, with the second phase a mainline barge port on the Yukon River and a 65-mile road to Donlin.

Improving Red Dog access

At the Red Dog zinc mine, the department is working with the NANA Regional Corp., Teck Cominco and the Alaska Industrial Development and Export Authority on a proposed expansion of the existing port facility. Currently, barges deliver to ships offshore, but with the proposed port expansion ships would come directly into port through a dredged channel and turning basin.

Phase I of the department's resource transportation analysis, in 2000-2002, looked at traditional long-distance, overland routes for mineral resources, but found that in today's conditions they are "too expensive to build and operate." —Mike McKinnon, resource transportation analysis manager, Alaska Department of Transportation and Public Facilities

The U.S. Army Corps of Engineers is working on a draft environmental impact statement and McKinnon said the EIS should be out for review in early 2005.

The department is working with Arctic Slope Regional Corp., NANA and Teck Cominco on finding a route between the Deadfall Syncline coal mine near Point Lay and the Delong Mountain Terminal, with a goal of moving 1 million to 2 million tons a year of high-quality coal to Asian markets for manufacturing use in coal-blend formulas.

A 90-mile road to Delong Mountain Terminal appears most practical, as grades and terrain breaks appear to preclude rail. McKinnon said reconnaissance engineering is expected to be complete by mid-May, and the project will then go into standby mode until ASRC and others move the coal project forward.

A third project is also Red Dog-related. The airport at Red Dog is closed or at marginal operations about 40 percent of the time, McKinnon said, and the department is looking at Noatak for a jet airport with a 20 to 35 mile road to the Red Dog mine.

Having a 5,000-foot jet-capable runway at Noatak would improve air carrier operations, and the road would benefit Noatak, which could get fuel deliveries by truck from the port. A reconnaissance engineering report on this project is due in March.

The Nome Glacier Creek Road realignment will improve access to the Rock Creek Gold Mine, remove traffic from the Nome watershed and improve state maintenance and operations costs. This project is funded through the Federal-Aid Highway program and the

see **PROJECTS** page 15

CALGARY

Industry research concludes clean coal within reach, can be cleaner than natural gas, says Canadian group

The Canadian Clean Power Coalition said Nov. 16 that phase one of its research program indicated electricity from coal can be cleaner than natural gas, but cost remains an issue.

CCPC, a coalition of Canadian coal and coal-fired electricity producers, was trying to determine the viability of clean coal technology for use in Canada. The group, formed in 2000 to research, develop and demonstrate commercially viable clean coal technology by 2012, said technology would be required to reduce or eliminate all air emissions, including greenhouse gas, from a new coal fired power plant.

"The key message here is that clean coal is within reach — we're talking years now, not decades," said Jim Dinning, CCPC chairman. "The challenge is to adapt the technology to be cost competitive while controlling or eliminating all air emissions."

Next phase, Stobbs exec director

In the next phase of its research, CCPC said it will take the preliminary designs from phase one and "attempt to close technological gaps to achieve optimized and cost effective designs."

Those designs will then be developed into detailed business plans for a demonstration plant to be in place by 2012.

CCPC said it has hired Jacobs Engineering of the United Kingdom to complete this work.

The coalition has also retained Robert Stobbs, P. Eng., as executive director.

Research showed that there was large scale capacity in Western Canada for captured carbon dioxide to be used in enhanced oil recovery or to be permanently stored in depleted reservoirs.

Stobbs, who has 29 years experience in the power industry, has been the chair of CCPC's technical committee since 2001and an employee of SaskPower since 1979.

Most recently, Stobbs held the position of project leader at SaskPower.

He will be seconded to CCPC for a minimum one-year term.

Coal gasification most appropriate technology

Phase one of CCPC's research focused on evaluating technological options to reduce or eliminate air and carbon dioxide emissions from coal-fired power generation. It concluded that coal gasification was the most appropriate technology for new power plants.

The coalition also investigated opportunities for disposal of captured carbon dioxide. Research showed that there was large scale capacity in Western Canada for captured carbon dioxide to be used in enhanced oil recovery or to be permanently stored in depleted reservoirs.

Coal is Canada's largest fossil fuel reserve. Approximately 25 per cent of the country's total electricity supply comes from coal.

In Alberta, Saskatchewan and Nova Scotia, the majority of electricity comes from coal.

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ROUND-UP

ver per ton and 11.27 percent zinc.

The other two drill holes tested induced polarization, gravity and ground magnetic geophysical anomalies on the Brushy Creek prospect. The first hole intercepted a thick mineralized horizon of sulfide-rich tuffs and sediments about 250 meters along strike from historical drilling which returned 2.3 meters of 1.25 percent zinc and 1.1 ounces of silver per ton. The second hole tested a previously untested geophysical target approximately 300 meters to the southwest of the first drill hole. Assay results are pending.

OTHER

Freegold Ventures announced initial drill results at its Grew Creek gold project near Ross River, Yukon. Two of the first three holes drilled on this epithermal gold target returned high grades over significant widths. The first drill hole returned 90.5 meters grading 2.25 grams gold per tonne including a 17.5 meter interval which returned 6.79 grams gold per tonne. The third hole returned 6.25 meters grading 22.12 grams gold per tonne. Gold is associated with distinctive pink quartz-adularia veins that are now believed to trend north-south across the property. Additional drilling is in progress. ●

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PROJECTS

two-season construction project is under way and will be completed by the fall of 2005.

Roads and ports: the big projects

The big mining road and port projects include a Yukon-Kuskokwim transportation corridor and road and port access to the Pebble gold-copper prospect near Lake Iliamna in southwest Alaska.

Work on an environmental impact statement began in September for the Yukon-Kuskokwim transportation corridor, with a draft EIS expected in December 2005, a final EIS in December 2006 and construction in the summer of 2007.

A 90-mile road to Delong Mountain Terminal appears most practical, as grades and terrain breaks appear to preclude rail. McKinnon said reconnaissance engineering is expected to be complete by mid-May, and the project will then go into standby mode until ASRC and others move the coal project forward.

There are navigation constraints for this project, McKinnon said: the Yukon allows larger barges but the Kuskokwim operates longer in the year. A May 2004 phase II analysis shows ports on the rivers, and a road network linking the ports to the region's mineralized area, are practical construction projects with positive economic values to the region.

A port on the Kuskokwim and a 24-mile road linking the port to the Donlin Creek mine would likely be the first project, with the second phase a mainline barge port on the Yukon River and a 65-mile road to Donlin. Over time, a road could be built north from Donlin to the McGrath/Ruby area, providing access to other known deposits.

The department is working with Arctic Slope Regional Corp., NANA and Teck Cominco on finding a route between the Deadfall Syncline coal mine near Point Lay and the Delong Mountain Terminal, with a goal of moving 1 million to 2 million tons a year of high-quality coal to Asian markets for manufacturing use in coal-blend formulas.

The department said in an October report: "The EIS process is committed to ongoing work with Yukon and Kuskokwim river villages to ensure the project incorporates safeguards to protect the region's subsistence resources.

Work on access to the Pebble gold-copper prospect has already incorporated local knowledge, McKinnon said. The draft reconnaissance engineering review the department began working on in November has already pulled the road back away from the lake shore in response to village concerns and because snow drift conditions are worse near the lake.

The Pebble gold-copper transportation corridor includes a west Cook Inlet port and an 80-mile road for freight, fuel and concentrate transport. Work on a benefit/cost analysis is scheduled to begin this February, and final reconnaissance engineering will be complete in May. ●