

# ALASKA

Envisioning a Bright New Era



*Alaska is on the path to a new petroleum boom aided by a state government determined to make it, once again, a giant in the world's oil and gas industry. Explorers of all sizes are rediscovering the massive potential of the U.S.'s only arctic state.*

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# The sleeping giant awakens

## Ambitious targets, industry revival driven by reforms

Before the Gulf of Mexico and the shale gas revolution, Alaska rode high as a giant of the North American oil and gas industry.

In the late 1980s, more than 2 million barrels of oil flowed south every day through the Trans Alaska Pipeline System (TAPS), supplying the US with 25% of its oil needs.

The Alaska oil boom began to fade in the 1990s, and today the flow of oil through TAPS has ebbed to less than 600,000 barrels of oil per day.

But the sleeping giant is stirring thanks to a combination of forces that have put the United State's only arctic state on the path to a new energy boom.

Alaska's state taxes on onshore oil production - the highest in North America - are undergoing a reform effort to remove what many petroleum companies regard as the biggest barrier to new investment and production.

These moves have coincided with the recognition that Alaska's oil and gas potential is still greater than most other places around the world.

The re-rating of Alaska is highlighted by Shell's determination to drill in arctic waters off the north coast. Shell has already invested \$5 billion before sinking the first exploration well.

Alaska's place within an OECD country has also elevated it in global assessments. Unlike many of the big-oil destinations to emerge over the past 20 years, Alaska has a predictable fiscal and legal regime.

The shift towards a more positive investment climate has already led to a breakthrough in a potential new LNG

project based on multi-TcF reserves at Point Thomson and the legacy oil fields on the North Slope.

The project partners hope to capitalise on Alaska's proximity to Asia and build on the state's impeccable record as a



**"We're going out of our way to let the world know that Alaska is interested in doing business with them and growing our economy in the process."**

SEAN PARNELL, Governor

supplier of cargoes from the Kenai LNG plant since 1969.

Signs of the coming boom in Alaska's energy industry can be seen in a revival already underway in the state's traditional petroleum hotspots - the Cook Inlet in the south and the North Slope in the arctic.

A new wave of companies has entered the Cook Inlet over the past two years, reflected in high levels of bidding in recent annual oil and gas lease sales.

On the North Slope, explorers are racing to establish positions onshore and offshore. Prudhoe Bay, North America's largest oil field with almost 17 billion barrels already produced, is now being seen as just the beginning. The United States Geological Survey (USGS) and the U.S. Bureau of Ocean Energy Management collectively place a mean estimate of 40 billion barrels of oil still technically recoverable from the North Slope and in waters off Alaska's northern coast, along with 207 TcF of gas, not including shale gas and other unconventional sources such as viscous oil, heavy oil and gas hydrates.

These are big numbers that befit what is still one of the biggest and most exciting frontiers for the world's petroleum industry.



Offshore oil and gas production in the Cook Inlet

© Paul Andrew Lawrence

### Alaska facing up to critical need for change

The declining flow of oil through TAPS is much more than a symbol of Alaska's economic health.

With no state income tax, sales tax or property taxes, the Alaskan administration relies almost exclusively on taxes charged to the oil and gas industry. In the year to 30 June 2011, taxes on the petroleum industry generated \$7 billion, or 92% of the state budget.

Alaska's public finances are in enviable health today, with a triple A rating, a budget reserve of \$20 billion and another \$40 billion parked in the Alaska Permanent Fund Corporation, a sovereign wealth fund established in 1980.

High oil prices of recent years have helped to insulate the state from the full effects of a long-term decline in production that has averaged about 5 percent per annum.

But with no short or medium term prospects of a reversal in the downward trend, the long-term outlook for Alaska's public finances is ringing alarm bells for the state's administrators.

The declining flow of oil through TAPS is also creating technical and potential environmental safety issues for the operator, Alyeska Pipeline Service Company.

These critical financial and technical issues led Alaska's Governor, Sean Parnell, to announce in March 2011 a goal to

rebuild the flow through TAPS to one million barrels of oil per day over the next 10 years.

Parnell says it will take a broad range of stakeholders to achieve the target, but government can take a leading role by

**"We have to make it more attractive for the billions of dollars of investment we will require to get to that target of one million barrels per day."**

DAN SULLIVAN, Commissioner DNR



© Shane Lasley

doing business with them and growing our economy in the process."

Parnell is also actively encouraging the Obama Administration to follow the state's lead in creating a better investment climate for energy companies on Federal

lands, which occupy around half of Alaska's land area, and in Federal waters on the outer continental shelf.

He argues that Alaska still has a key role to play

improving the tax and regulatory regime.

Tax cuts for oil and gas producers were passed last year by Alaska's House of Representatives, but were subsequently blocked by the state Senate.

Parnell says changing the tax regime is still his top priority, despite the barriers put up by the Senate.

"We have the public much better educated than they were a year and a half ago, and they see the connection between taxing and revenue for the state. Taxing more means less production and less revenue for the state of Alaska. It means less money for schools and everything else."

He says Alaska is actively working to develop its vast resources for the benefit of its people. "To do that, we recognise that we need to be more competitive. And we're going out of our way to let the world know that Alaska is interested in

in creating energy security for the United States. The state continues to produce about 11% of the nation's oil needs, and has the potential to increase this dramatically.

Obama has supported Alaska's energy revival by establishing an inter-agency working group to improve coordination between the federal agencies that are responsible for authorizing onshore and offshore work by Shell, Statoil and others companies planning to drill in the Arctic.

### Tax reform

Alaska's Commissioner of the Department of Natural Resources, Dan Sullivan, leads the administration's efforts to achieve the target of one million barrels per day.

He says the administration is "very focused" on achieving its ambitious target.

“We believe it is achievable given the sheer size of the resources in the North Slope region. We are also benefiting from a shift in investment back to OECD countries. If you look around at countries with that combination of resource potential and stable political/legal systems, Alaska is probably the best place in the world right now.”

Sullivan, who served in federal government from 2006 to 2009 as Assistant Secretary of State for Economic, Energy and Business Affairs, is leading his department's work on a multi-pronged strategy that begins with enhancing Alaska's global competitiveness and investment climate.

He says it is imperative that Alaska creates the right investment climate and cost structure. “We have to make it more attractive for the billions of dollars of investment we will require to get to that target of one million barrels per day.”

“That will be principally through tax reform, but it's also through infrastructure development. We have invested significant amounts on improving our transport infrastructure, including maintaining the road to Prudhoe Bay.”

Sullivan says Alaska already has very favorable and competitive tax rules that applied to the front end of projects, such as generous tax credits for exploration costs.

“Where we need to be more competitive is at the production end, particularly at times of higher oil prices.”

The tax reforms so far envisioned include replacing a single marginal tax rate on oil production, which is currently one of the highest in the world, with a progressive tax similar to bracketed tax rates on personal income.

The reforms are also targeted at promoting infield drilling by existing producers, which is seen as the best way to get more oil into TAPS in the short term.

Sullivan says the state administration is focused on getting a tax reform package through the legislature as soon as possible.

“We have to succeed with this. It's critical for the investment climate and the future of the state.”

Alaska's Commissioner of the Department of Revenue, Bryan Butcher, says the high cost of working in Alaska's remote areas, combined with the state's high taxes, has made other destinations more attractive for petroleum companies.

“Our resources are far greater than North Dakota and Texas. We have larger resources than a lot of the areas that are booming right now, but we're not getting the development they are getting. We can't



Petro Star refinery at the North Pole



Aiviq towing Shell's Kulluk



Oooguruk Drill Site in the Beaufort Sea



Prudhoe Bay Oil Fields

do anything about the remoteness, but we can do something to bring taxes down to a reasonable level.”

Butcher says the state had become complacent in the past about attracting investment because of the huge size of the Prudhoe Bay and Kuparuk fields.

We have to compare ourselves to every other state and country and ask ‘how do we stack up?’

“That's what this administration is doing, and looking at what we need to do to still get Alaska's fair share but also allow private industry to function at a profit that is competitive with elsewhere.”

In addition to the ongoing effort on tax reform, he and Commissioner Sullivan have embarked on a comprehensive campaign – in the Lower 48 and around the world – to pitch Alaska and encourage new investment.

## Permitting

The second key strategy for attracting energy investment is an overhaul of the petroleum permitting system in Alaska, which Sullivan says had changed little since the birth of Alaska's energy industry in the 1960s.

“We are reforming our state-wide permitting system, which is a really important issue. My agency has hired 35 new people and trained them as part of our larger effort to make our permitting much more efficient, timely and certain.”

“We have passed through the legislature reforms that get rid of duplication and we have also invested in new technology so that permits can move more quickly.”

Sullivan says the state is also working closely with the Federal Government on improving the handling of permits on Federal lands, which includes some of Alaska's most prospective areas.

## Next phase

A third key strategy is clearing a path for the next phase of oil and gas development on the North Slope. The first phase was the discovery and development of Prudhoe Bay and neighbouring Kuparuk field, which are the largest and second largest oil fields in North America respectively.

These have dominated the North Slope for decades, but attention is now turning to dozens of nearby fields that are small by Alaska's standards, but would be moderate to large discoveries anywhere else.

Sullivan points out that the US Geological Survey in its last assessment of

the North Slope said there were dozens of smaller conventional pools.

“They define smaller as anywhere between 30 million and 300 million barrels. Now a lot of people would think 300 million barrels is not so small, but for Alaska that's small, and there are dozens of them.”

The state is also encouraging development of unconventional plays, including shale oil, viscous oil and heavy oil. A new



“Our resources are far greater than North Dakota and Texas. We have larger resources than a lot of the areas that are booming right now”

BRYAN BUTCHER, Commissioner DOR

shale oil play in Alaska is beginning to emerge with investors like Riverstone and service companies like Halliburton focusing on the huge potential of shale oil in Alaska. To prepare for the different regulatory challenges of unconventional energy, Sullivan's department has set up a shale gas taskforce. In addition, Sullivan and his

staff has held a series of meetings with their counterparts in North Dakota.

The next phase of North Slope development is expected to rely heavily on smaller, more nimble companies outside the ranks of the supermajors. As experience in the North Sea has shown, independents can generate new waves of development activity in mature regions by exploiting the opportunities considered too small by the oil majors.

Texas-based Pioneer Natural Resources has led the charge with the discovery and rapid development of its near-shore Oooguruk oil field, about 250 km south-east of Barrow. The field represented the first production by an independent operator on the North Slope.

Brooks Range Petroleum is another independent securing a long-term presence on the North Slope with the recent discovery of the Mustang oil field on the southwestern boundary of the Kuparuk River. The Anchorage-based explorer has recently announced plans to bring the 40 million barrels field into production as early as 2014 at a rate of up to 14,000 barrels per day.

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# Big frontier, even bigger opportunities

## Onshore, offshore, diverse resource mix spur demand for acreage

Alaska has a reputation as a big frontier for mineral and energy resources, but the size and richness of its natural endowment is still hard to grasp.

The US Geological Survey (USGS) estimated in 2008 that Alaska's North Slope has more oil than any other Arctic nation, with a mean estimated resource of 36 billion barrels of oil and natural gas liquids.

North Slope gas resources are also among the largest in the Arctic circle, with an estimated resource of 221 trillion cubic feet.

More recently, the USGS has increased the estimate of undiscovered, technically recoverable oil on the North Slope to 40 billion barrels.

These figures do not include potentially tens of billions of barrels in unconventional resources, including heavy and viscous oil, shale oil and tight gas.

The USGS has also made big estimates for untapped resources in the Cook Inlet area, where Alaska's oil and gas industry began with the discovery of oil at Swanston River in the late 1950s.

Mean recoverable oil resources are estimated at 600 million barrels, with 13.7 TcF of conventional gas and 5.3 TcF of unconventional gas.

While these figures are dwarfed by the North Slope estimates, the Cook Inlet on the south coast of Alaska is easily accessible and is well south of the Arctic circle.

The Cook Inlet also offers a much more attractive tax regime than the North Slope, with no production tax on oil and tax credits of up to \$25 million on the first three exploration wells.

### North Slope activity

The USGS studies suggest that explorers have still only scratched the surface of Alaska's petroleum potential, despite the production of almost 17 billion barrels of oil already from the North Slope. The high likelihood of undiscovered resources

### TAPS Operating excellence



Proposals to construct the Trans-Alaska Pipeline System (TAPS) were fiercely opposed by environmental groups in the early 1970s. Approval was finally granted in 1973 by a special act of the US Congress.

Opponents predicted many adverse consequences, including the decimation of caribou herds.

In fact, caribou have thrived over the past 35 years. The Central Arctic caribou herd, which occupies summer ranges surrounding Prudhoe Bay, has grown from 5,000 in 1975 to over 70,000 today.

The growth of the caribou herd is one of many environmental success stories for TAPS, which is operated by Alyeska Pipeline Service Company.

Alyeska's chief executive officer, Thomas Barrett, says the company's two major accomplishments are the safe movement of 17 billion barrels of oil and the validation of the environmental protection built into TAPS.

"It's a fabulous piece of infrastructure that withstood a major earthquake in 2002 and has withstood wildfires. We're constantly making it safer and even more efficient."

Alyeska last year received an award from the Association of Environmental and Engineering Geologists for engineering and operating excellence.

is also borne out by the light amount of exploration activity. Only 500 wells have been drilled in the history of exploration on the North Slope. By comparison, the much smaller area of Wyoming has been subject to 19,000 wells.

The biggest news on the North Slope was the start this year of Shell's drilling program on the outer continental shelf, almost five years after it was awarded acreage in the Beaufort and Chukchi Seas.

The campaign did not make as much progress as Shell had hoped for because of delays with certification of a purpose-built spill containment vessel, but the supermajor was able to complete a number of top holes ahead of its return next season.

Shell's campaign has attracted global interest and is being closely watched by its major competitors on the outer continental shelf, Statoil and ConocoPhillips. Statoil - an Arctic specialist - was next in the queue to drill, but recently deferred plans for exploration wells until at least 2014. ConocoPhillips continues to work towards drilling in 2014.

Onshore, activity on the North Slope is surging ahead, as reflected in the success of recent lease sales.

ConocoPhillips, which is already Alaska's largest oil producer through its interests in Prudhoe Bay, Kuparuk and Alpine fields, has staked out new positions onshore as it heads west into the National Petroleum Reserve - Alaska (NPR-A).

ConocoPhillips was the first company to explore in the NPR-A in 2008. It is set to become the first producer when it develops the CD5 satellite of the Alpine field. Production is expected to reach up to 18,000 barrels of oil per day when output begins in 2015.

The onshore lease sale also attracted new players such as Royale Energy, which is targeting conventional oil and a potential shale oil play.

Spanish energy giant Repsol is another new arrival. The company bid aggressively



Colville River on the North Slope, separating NPR-A from the Alpine oil field

in the 2010 onshore lease sale for 500,000 acres and followed up quickly with plans for a campaign of up to 15 exploration wells. Only three wells were drilled before a blowout at its Qugruk 2 cost it the rest of the drilling season. Smaller companies are playing a major role in the revival of the onshore North Slope, including Pioneer Natural Resources and home-grown independent Brooks Range Petroleum.

Other independents are looking closely at new ways to commercialize the region's many undeveloped discoveries, including the Umiat heavy oil field. Discovered in 1946, the Umiat has an estimated 70 million barrels of oil, but the high gravity of the crude has defeated previous production efforts.

### Cook Inlet renaissance

Two years ago, the Cook Inlet was near dormant in terms of exploration activity. Since then, the entry of Apache Corporation and other newcomers has revitalized the region, with up to 15 exploration wells expected over the next year.

Hilcorp Energy, Linc Energy, NordAq, Cook Inlet Energy and Armstrong Oil & Gas are other newcomers boosting investment in exploration and development.

Apache's acquisition of about 800,000 acres is seen as highly positive for the Cook Inlet, given the company's enviable exploration record and its keen eye for opportunities around the globe.

The company's exploration leaders believe there is still as much oil to be found in the Cook Inlet as has been produced in the 55 years since the first discovery.

The company has begun a large campaign of 3D seismic surveys both onshore and offshore, featuring the use of new wireless technology that avoids the need to clear seismic lines through forest and other vegetation.

Hilcorp is major new entrant to the Cook Inlet. The privately owned company specializes in working over existing assets and applying new engineering to boost production.

Earlier this year, Hilcorp bought 165,000 acres from Chevron and is set to become

the largest producer in the Cook Inlet region with a buy out of Marathon Oil.

Hilcorp President Greg Lalicker reportedly told the Anchorage Chamber of Commerce the company would invest more than \$500 million in the Cook Inlet by the end of 2014, when it plans to achieve production of 25,000 barrels of oil per day.

### Alaska's own shale gale on the way

Alaska's potential shale resources rival those driving the "shale gale" in the Lower 48 states.

The USGS has assessed mean potential shale resources on the North Slope of 940 million barrels of oil, 262 million barrels of natural gas liquids and 42 Tcf of gas.

The good news in the USGS assessment for Governor Sean Parnell is the best shale potential sits within Cretaceous and Triassic rocks beneath state lands.

Development of unconventional resources is already moving ahead, with Alaska-based independent Great Bear Petroleum drilling the first shale oil well in August on leases immediately south of Prudhoe Bay. The program is designed to tap directly into the oil-rich shales that have sourced the giant 20+ billion barrel Prudhoe Bay field.

North Slope exploration wells are usually drilled in winter on ice pads but Great Bear worked in summer by using previously built gravel pads adjacent to the Dalton Highway.

The company has formed a partnership with Halliburton and is working towards first production as early as next year.

## LOOKING FORWARD

Arctic Slope Regional Corporation relies on the teachings of our ancestors, using our Iñupiaq values as our guide, to impart a prosperous heritage to future generations.

Our values are the cornerstone of our success as a community partner and as a company.



# Native corporations part of Alaska's energy revival

## Vision, diversification and resources create shareholder value

Alaska's native corporations play a major role in the business of petroleum exploration and production. The state's 13 native corporations were created in 1971 by an Act of US Congress to settle the claims of Alaska's traditional landowners. Today, native corporations own about 11% of Alaska's land area.

This includes some of the most petroleum prospective land in the state, which makes native corporations frequent partners with petroleum companies in exploration and development.

Native corporations were set up as for-profit companies with a mandate to develop businesses that could generate ongoing dividends to their native shareholders.

Native corporations have become spectacular success stories. A number of them operate engineering, drilling and petroleum service companies that provide essential support to the upstream industry, including the world's largest oil companies.

The Arctic Slope Regional Corporation (ASRC), which represents the business interests of its 11,000 Inupiat Eskimo shareholders, has been the largest locally owned and operated business in Alaska for almost two decades. It has 10,000 employees worldwide and revenues of more than \$2.5 billion in 2011.



Doyon Drilling Rig 16 in Prudhoe Bay

ASRC has four main divisions in energy services, petroleum refining and marketing, government services and construction industries.

ASRC Energy Services has emerged as one of Alaska's largest oilfield service providers. The skills developed in serving the oil and gas industry on the North Slope are now being exported to projects in the Gulf of Mexico, Russia and Canada.

ASRC Energy Services was also selected recently as the lead engineer on a new refinery on the Fort Berthold Indian Reservation in western North Dakota.

Native corporations are also moving increasingly into the exploration business in their own right.

Doyon, Limited, a Fairbanks-based native corporation with 18,600 shareholders, recently approved plans to spend \$37 million on oil and gas exploration within Doyon's lands and nearby State lands.

Doyon is the largest private landholder in the state with 12.5 million acres in Interior Alaska, spread across an area the size of France.

Doyon President and CEO, Aaron Schutt, says recent government incentives and changes in oil production taxes in frontier basins had encouraged Doyon to step up its petroleum exploration activity.

"In the next five to ten years I would really like to see us make an oil and gas discovery in Interior Alaska. That would be a game changer for us and why we are aggressively pursuing that goal."

"But because oil and gas exploration is very risky, we have aggressive growth plans as well for our service companies and government contracting. These will see us grow outside of Alaska, as well as in the Cook Inlet and the North Slope where we have operated for 30 years."

Schutt says Interior Alaska has been overlooked by petroleum explorers, with industry attention focused on the north and south coastal areas.

"There are multiple basins with potential for large, giant-sized oil fields that have never had wells drilled. That includes the Yukon Flats and the Nenana Basin, where the US Geological Survey has confirmed the existence of excellent oil source rock and deep basins."

"That would be an enormous shot in the arm for the state economy to have

**"In the next five to ten years I would really like to see us make an oil and gas discovery in Interior Alaska. That would be a game changer for us and why we are aggressively pursuing that goal."**

**AARON SCHUTT, President & CEO, DOYON**

production on that scale happen off the North Slope or the Cook Inlet."

Doyon's exploration plans focus on the Nenana Basin and the Yukon Flats.

The Nenana Basin was explored by Arco, Unocal and others in the 1960s and 1970s, with seismic surveys and two shallow wildcat wells.

Doyon conducted seismic surveys of its own in 2005 and drilled one well in 2009, with more seismic following in 2012, the first deep test of an Interior basin. It failed to make a commercial discovery, but yielded valuable data about the geology of the basin.

Schutt says Doyon is now seeking partners to explore over 400,000 acres in the basin. The corporation will submit permits for drilling at one location in summer 2013 and is looking to permit two other locations.

In the Yukon Flats, Doyon conducted a seismic survey in 2010. Geochemical surveys over the last two years have demonstrated a widespread surface expression of



CIRI's Fire Island Wind turbines

oil. Doyon plans a 3D seismic survey for 2013. Prior to Doyon's recent efforts, exploration has not occurred in the area since the 1980s, when Exxon conducted large 2D seismic surveys.

"They were very excited about the results but literally finished the program the day the Exxon Valdez ran aground. That distracted them for many, many years and no-one has been back in the Yukon Flats since then," Schutt says.

CIRI is another native corporation exploring for petroleum resources. The Anchorage-based company is owned by 7,600 Alaska Native shareholders who have ties to the Cook Inlet region.

CIRI President and Chief Executive Officer, Margaret Brown, says "we see energy becoming a core business segment, rather than just a passive royalty interest."

In the Cook Inlet we have just announced a large exploration agreement with Apache and we also have a relationship with Hilcorp. Additionally, we have what looks like a commercial discovery on our property on the Kenai Peninsula with a company called NordAq. And so we have every hope that we will have additional production coming off our land."

"We have royalty interest in those lands, but we are also looking for ways to become a more active participant, either by taking working interest in some of our leases or other mechanisms to support the industry here."



**"We see energy becoming a core business segment, rather than just a passive royalty interest."**

**MARGARET BROWN, President & CEO, CIRI**

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# Frontiers no barrier for Alaska's transport operators

## Investment, inter-modal logistics and infrastructure connect to resources

Alaska is a vast frontier more than twice the area of Texas, but size and remoteness have never been hurdles for the state's infrastructure operators.

The \$8 billion Trans Alaska Pipeline System (TAPS) is one of the world's largest pieces of infrastructure and indicative of what Alaskans can achieve when necessity calls.

The state's transport network is another innovative response to the geographic and climatic demands of the state.

Inter-modal connections of water, road and rail make it possible to transport heavy goods, construction equipment, chemicals and drilling supplies at any time of year from the lower 48 states to the North Slope.

Equipment and supplies can also be shipped direct to Prudhoe Bay in the openwater season from about July to October.

The state-owned Alaska Railroad Corporation (ARRC) is the backbone of the state's freight and passenger network.

The corporation operates a 470-mile railroad running from the southern ports of Seward and Whittier through Anchorage to Fairbanks, the largest city in the state's interior.

Alaska's rail network is connected to the Lower 48 states by sea barges. Rail cars roll onto the sea barges at Seattle and roll off at Whittier. The multi-level barges also carry shipping containers and road trucks.

ARRC's Vice President, Business Development, Dale Wade, says the sea and rail arrangement "is a very cost effective way of moving traffic. We have rail from the Lower 48 to Alaska, we just float part of the way."

When rail cars reach the end of the line at Fairbanks, goods are loaded onto surface carriers to complete the journey by road to Prudhoe Bay.

The ease of switching between transport modes and the cost efficiency of Alaska's rail network creates some interesting customer behaviours.

For example, road trucks have a clear run up the Alaska Highway to Fairbanks, but between 50 and 60 trucks each night roll onto ARRC flat cars and are freighted by rail instead.

"The cost per ton favors rail, especially in the summer season when the road is heavy with tourist traffic. Truck drivers can get there faster by road, but they can't get there more economically than going by railroad," Wade says.

ARRC plays a key role in moving goods and materials for the oil and gas industry, as well as taking its products to market. One of the railroads' biggest customers is Flint Hills Resources, which produces jet fuel at its North Pole refinery (near Fairbanks) from crude oil travelling down



Train transporting gravel

TAPS to Valdez. Flint Hills' jet fuel is freighted by ARRC to Anchorage airport.

Wade says one of ARRC's key mandates is to support state-wide economic development. This means it is involved in a number of projects to expand the rail network, particularly where these support the development of Alaska's resource industry.

ARRC recently received approvals to develop a 30 to 45 mile extension of the rail network to Port MacKenzie, which is located opposite Anchorage on the western bank of the Cook Inlet's Knik Arm.

The extension will connect the small existing facilities of Port MacKenzie with minerals projects in the Alaskan interior and pave the way for bulk commodity exports. This could include a major increase in coal exports to Russia and Asia from the Usibelli coal mine near Healy in the mountains of the Alaska Range.

ARRC is also extending the northern limits of its network by building a bridge across Tanana River. The project is funded by the Department of Defence, which has military installations in the area. The project is also seen as a possible first step in a longer-term vision to connect Alaska's rail network to western Canada.

Development of transport infrastructure is one of the top priorities of the Parnell administration.

The FY 2013 budget allocated more than \$1.6 billion in funding for transportation infrastructure projects across the state.

This spending includes \$1.4 billion for state-wide highway and aviation projects and \$550 million for state-funded marine transportation projects such as ferries, docks and harbors.

Infrastructure spending includes the Roads to Resources initiative, which was recently allocated \$28.5 million to improve access for communities and resource explorers to fish, timber, minerals and petroleum resources.



Trans Alaska Oil Pipeline through the Brooks Range of Alaska

The largest component of Roads to Resources is a further \$10 million for environmental assessment work and evaluation of routes from the Dalton Highway to Umiat. The project has already received \$25 million in previous years.

The road would provide access to oil and gas resources along the northwestern foothills of the Brooks Range.

Public funds have also been allocated for development of all-season access roads to the Ambler district on the southern margin of the Brooks Range, which is highly prospective for copper deposits. Funding is also being provided for a road to Tanana in concert with the development work by ARRC.

The development of Alaska's transport infrastructure is also taking place at the Ted Stevens Anchorage International Airport. The airport is vital to the oil and gas industry, with most of the North Slope's fly-in, fly-out workers commuting through Ted Stevens every two weeks from their homes in Anchorage or the lower 48 states.

The airport this year began developing a new master plan that will look at how its services and facilities will need to grow over the next 10 years to meet the needs of users.

Anchorage airport is much more than a transport centre for Alaska's communities and local industry. It has become one of the busiest airports in the world in terms of cargo throughput because of its

"We have rail from the Lower 48 to Alaska, we just float part of the way."

DALE WADE, VP Business Development, ARRC



proximity to North America, Asia and Europe. The airport claims to be within 9.5 hours flying time of 90% of the developed world.

On the North Slope, air transport services were boosted recently with the opening of the Deadhorse Aviation Centre (DAC), owned by Offshore Support Services, Fairweather and the Kaktovik Inupiat Corporation. DAC is designed to provide oil companies and their suppliers with a safe and efficient aviation command center for onshore and offshore operations.

The centre is located at the Federal Aviation Authority-approved Deadhorse Airport, with access to the Dalton Highway and the ocean. Facilities include terminal and hangar facilities, logistics support, staging and storage, office space and accommodations for sleeping and dining. The 21,000-square-foot aircraft hangar can accommodate two to three large helicopters or smaller fixed-wing aircraft.

## CENTRAL ALASKA Continental Rift Basins

**1.8 million acres** (730,000 hectares) in large contiguous blocks

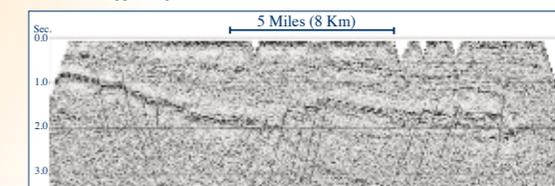
- Majority working interest and operator positions available
- Multiple giant field possibilities; two basins, multiple sub-basins
- Conventional oil and gas
- Nearby roads, rail and other infrastructure, including Trans Alaska Pipeline System
- Data room with recent and heritage seismic, drilling, other geophysics, and surface geochem
- Ongoing exploration programs, including seismic and drilling
- New State exploration rebates up to 80% of drill costs and 75% for seismic
- New lower State production tax rates for these basins

For more information and data displays, go to [doyonoil.com](http://doyonoil.com)

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# Environmental protection, a condition “sine qua non”

## “No impact” standards, new technology and collaboration safeguard the environment

Alaska’s state administration is leaving no stone unturned on its bid to attract new investment in oil and gas exploration, but one area it will not compromise is protection of the environment.

Commissioner of the Department of Natural Resources, Dan Sullivan, says he makes no apology for the costs of meeting Alaska’s world-class environmental standards.

“For projects in Alaska, there are inherent costs of doing business because of the remoteness of the location, the arctic climate, and the fact that we have probably the highest environmental standards of any hydrocarbon basin in the world.”

“We’re very proud of that, and we tell businesses if you don’t want to abide by those standards, if your company does not have a commitment internally, we don’t want you up here.”

Sullivan says this hard-line approach is a deterrent to some companies, but he believes the size and abundance of Alaska’s exploration opportunities is more than adequate compensation.

The environmental debate has raged in Alaska since the discovery of the Prudhoe Bay oil field on the North Slope in 1968.

“Our efforts to develop resources on the North Slope while also protecting the environment and wildlife have been successful. We have a great record, with the one horrible exception of the Exxon Valdez, which was due to human error.”

The Cook Inlet on the south central coast is further proof the success of Alaska’s environmental standards. Oil and gas producers have successfully co-existed with world-class fisheries in the Cook Inlet for almost 50 years.

Alaska’s environmental standards are based on a philosophy of “no impact” exploration. No activity is allowed within one mile of polar bear dens, and leases are not

### Port of Adak reopens to serve oil industry



Drilling in the Arctic means much more than one or two drillships. Large flotillas of support vessels are required to comply with unprecedented safety and environmental safeguards.

To meet growing demand from the oil industry for port services and logistics, Aleut Corporation has teamed up with Offshore Systems, Inc. (OSI) to re-open Port of Adak, the westernmost port in the Aleutian Island chain.

The local native corporation bought the Adak settlement and its impressive transport infrastructure from the US government in 1997. Adak was a former Navy and Coastguard base that closed after the Cold War.

Anchorage-based OSI is an experienced operator of port services and logistics for the oil industry and is confident Port of Adak can attract new business.

The port has 2,750 lineal feet of deep-draft berthing space and is ice-free year-round. Services include a modern, high capacity fueling system, electrical power, crane support and fresh water.

Port Adak’s airport is one of its competitive biggest advantages, with two paved runways that can accommodate 737 aircraft.

granted in environmentally sensitive areas.

The “no impact” approach means onshore exploration drilling is allowed only in winter. Heavy equipment is brought out to remote sites on ice roads and drilling rigs are assembled on ice pads.

When the ice melts, there is no trace of the pad remains. The only visible sign of drilling activity is an eight-by-eight foot well house that will remain on location because the well is part of a field under development and will one day produce oil.

In short, it is possible to explore for oil on the North Slope and leave no visible footprint.

Development and production also have stringent standards, with the state mandating the use of the best available technology for oil discharge containment, storage, transfer, and cleanup. Even rainwater is not permitted to run off gravel drill pads on the surrounding tundra.

Onshore pipelines must be buried where possible to minimize impacts on wildlife, and if pipelines are built above ground, they must be elevated so caribou can migrate.

Commissioner Sullivan says Alaska’s stringent environmental standards have forced innovation on the oil and gas industry and led to new technologies that have had enormous environmental and financial benefits.

“Many of the horizontal drilling techniques that are now used all over the world were developed by operators in Alaska to meet our environmental standards.”

Advances in horizontal and multi-lateral drilling technology over the past 30 years have led to a dramatic reduction in the surface footprint of drilling.

For example, 54 wells have been drilled at the Alpine field from a single pad of only 13-acres.

Technology also allows much greater reach below ground. In the 1970s, wells



Central Arctic caribou herd is thriving

from one pad could span only three square miles. By 1999, this had increased to 50 square miles, while up to 100 square miles is now possible.

Sullivan says the development debate has not kept up with these advances and the benefits they have created for the environment.

He says new drilling technology also allows a more a cost-effective way to develop remaining oil.

“Extended-reach horizontal drilling means that today, the same level of production can be achieved with fewer wells. It also means that more complicated stratigraphic plays can be developed.”

The use of extended, directional drilling to minimize environmental impact is a feature of Pioneer Natural Resources’ Oooguruk near-shore field.

The project consists of three main components – an offshore drill site, an onshore production support facility, and a system of flowlines, power cables, and

communications cables connecting the onshore and offshore facilities.

The offshore drill site is a four-metre high artificial gravel island about five miles from the shoreline that covers an area of only six acres. The drill rig has been specially modified to allow close spaced drilling of a large number of production and injection wells from the small pad.

State and federal governments are not the only guardians of Alaska’s environment. Native corporations, which represent the traditional owners of Alaskan land, arguably have a greater interest in its protection than any other stakeholder.

Rex Rock is the President and Chief Executive Officer of the Arctic Slope Regional Corporation (ARSC), Alaska’s largest native corporation.

He says ASRC is a partner to the energy industry, but also understands its own communities on the North Slope are on the front line of development and carry some of the highest risks with respect to food security.

“We recognize that Arctic resource development has a global impact. With that in mind, we do not want to become sideline observers to development that occurs in our region. We need to be a part of it.”

He said native corporations can work successfully with petroleum companies to achieve development that benefits all parties.

“An example of a successful collaboration and the building of trust is spelled out in the story of CD-5. This satellite field will be the first commercial production from National Petroleum Reserve in Alaska, on lands owned by Kuukpik and ASRC.”

“It took time, but Kuukpik, the Native Village of Nuiqsut, the City of Nuiqsut, ASRC, the North Slope Borough and ConocoPhillips finally came to an agreement on how best to mitigate impacts to the community and environment of the CD-5 development.”

He said it was encouraging to have such a diverse stakeholder group come together and reach an agreement.

“The project was originally denied (federal approval). However, due to the alignment of all the parties on the

“We do not want to become sideline observers to development that occurs in our region. We need to be a part of it”

ROCK A. REX SR., President & CEO, ASRC



proposed development, we were all able to work together for the reversal of the Army Corps of Engineers’ decision to deny the project and finally win approval for the CD-5 development,” Rock says.

ASRC is one of many stakeholders that will ensure Alaska’s environment remains protected, despite the growing interest in the region from petroleum companies around the world and increased pressure for exploration and development.

- 40 years of leasing its **1.3 million acres** of subsurface estate for responsible oil, gas and mineral development
- **Active investor** in oil and gas, energy and utility assets
- Traditional and alternative energy **project development**
- Energy **infrastructure** and **services**

## Energy for Alaska

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# Alaska's new era on the way

## Determination, development, LNG potential's pledge for the future

The future potential of Alaska's petroleum industry looks brighter than at any time since the discovery of the Prudhoe Bay field in 1968.

While the declining flow of oil through the Trans Alaska Pipeline System (TAPS) is causing headaches and a worrying decline in state revenue, all the signs suggest a turnaround is inevitable in the medium to long term.

Exploration activity onshore on the North Slope is surging ahead, with new fields already being discovered. Exploration for shale gas and other unconventional resources is moving ahead rapidly. The economics of bringing old fields into production are also being re-examined under the promise of a more favourable tax regime.

Lower production taxes on the North Slope are still not law, but the Parnell Administration is working hard to convince skeptics in the state's Senate that Alaska cannot afford to not be more tax competitive.

Even without a new tax regime, TAPS is guaranteed new volumes from the Point Thomson field following a breakthrough in the stand-off between the state and the field's partners — ExxonMobil, ConocoPhillips and BP.

Point Thomson, 60 miles east of Prudhoe Bay, is Alaska's largest undeveloped petroleum field, with 8 Tcf of gas and hundreds of millions of barrels of oil and condensate.

The field is equivalent to 25% of all the gas reserves on the North Slope and development of the project is key to realizing the gas potential of the entire region.

The settlement of the dispute announced in April by Governor Parnell includes a commitment from the Point Thomson partners to begin initial liquids production of 10,000 barrels a day by 2016.

While this is small scale, the settlement also includes a commitment to build a new common carrier pipeline from Point Thomson to Prudhoe Bay with a capacity of 70,000 barrels per day.



*A prosperous future must hold a positive outlook for all*

That sort of production would make a meaningful contribution to refilling TAPS, and is indicative of the potential the Point Thomson partners see for the eastern end of the North Slope.

In the central and western areas of the North Slope, exploration programs by ConocoPhillips, Repsol and a growing number of independents hold promise of additional volumes in the short to medium term.

Looking further ahead, the huge exploration investments by Shell, ConocoPhillips, Statoil and others in the Chukchi and Beaufort Seas point to a new golden age for Alaskan oil production.

There are no certainties in the exploration game, but assessments by the USGS suggest huge potential rewards on the outer continental shelf and minimal risks. A number of supermajors are backing that view with multi-billion dollar exploration budgets.

Another bright spot in Alaska's petroleum future is this year's real progress in monetising the vast gas reserves of the North Slope.

The construction of TAPS in the 1970s created a vital linkage between the North Slope's giant oil fields and global markets.

The region's gas reserves are still stranded 35 years later, but the Point Thomson partners and TransCanada have aligned for the

first time to develop plans to export their gas as LNG to Asia. The dimensions of the proposed LNG project are staggering. In a project update released in October, the partners estimated a development cost as high as \$65+ billion.

This would cover the cost of constructing a gas pipeline alongside TAPS to bring up to three billion cubic feet of gas every day from the North Slope to a LNG plant somewhere on the southcentral coast.

The three-train LNG plant would produce between 15 million and 18 million tonnes of LNG per annum, ranking it as one of the largest projects of its kind in the world.

According to the partners in a 1 October letter to Governor Parnell, the proposal represents "a megaproject of unprecedented scale and challenge; up to 1.7 million tons of steel, a peak construction workforce of up to 15,000 and a permanent workforce of over 1,000 in Alaska."

These figures are adding to the buzz that has developed in 2012 around Alaska and its petroleum industry. There are still many hurdles to clear, but the industry has momentum as well as the support of the vast majority of Alaska's communities, including Alaskan natives. A bright new era looks inevitable.

### Alaska General Data

**Official name:** State of Alaska, USA

**Nick name:** The Last Frontier

**Statehood:** 49th State, 3 Jan. 1959

**Capital:** Juneau (-1 CST)

**Largest city:** Anchorage (-2 CST)

**Governor:** Sean Parnell ( R ), 2009

**Native Corporations:** 13

**ANCSA:** Established 1971

**Population:** 722,718 (July 2011 est.)

**Total Area:** 1,717,853 km<sup>2</sup> / 663,267 mi<sup>2</sup>

**Land area:** 1,481,346 km<sup>2</sup> / 571,951 mi<sup>2</sup>

**Water Area:** 236,507 km<sup>2</sup> / 91,316 mi<sup>2</sup>

**Coastline:** 10,686 km / 6,640 mi

**Languages:** English (*official*), Native (22), mostly belonging to Eskimo-Aleut and Na-Dene language families

**Climate:** Arctic in the north; subarctic in the interior; continental subarctic in the northwest; subarctic oceanic in the southwest; subarctic oceanic in the south central; mid-latitude oceanic in the southeast

**Location and Geography:** Northwest extremity of the North American continent, bordering Canada to the east, Arctic Ocean to the North, Pacific Ocean to the west and south, Russia further west across the Bering Strait

**Land Ownership:** 60% Federal, 28% State, 11% Native, 1% Private

### Economy

**GDP:** \$49 billion (2010)

**GDP per capita:** \$63,424 (2010)

**Real growth rate:** 1.9% (2010)

**Inflation rate:** 1.8% (2010)

**Alaska Permanent Fund:** \$40 billion

**Rating:** Triple A

**Main industries:** Oil, gas, mining, fishing, forestry, tourism, government services, military, food processing

**Natural resources:** Oil, gas, coal, precious and base metals, timber, water

**Exports:** \$5.2 billion (2011 est.)

**Export commodities:** Seafood, petroleum, primary/precious metal, forestry products

**Imports\*:** \$18.26 billion (January 2011 est.)

**Import commodities:** Capital equipment, petroleum, foodstuffs

\* includes imports to the US

### Energy Overview

ALASKA RESOURCE ASSESSMENTS\* (*undiscovered, technically recoverable*)

	Mean Oil Est.	Mean Gas Est.
Onshore Arctic:	15.9 billion bbl	99 tcf
Offshore Arctic:	23.8 billion bbl	108 tcf
Interior basins:	234 million bbl	5.5 tcf
Upper Cook Inlet:	599 million bbl	19 tcf
Other Southern Alaska:	2.9 billion bbl	23.5 tcf
<b>TOTAL:</b>	<b>43 billion bbl</b>	<b>255 tcf</b>

\* excludes shale oil, shale gas, methane hydrates and CBM

#### PRODUCTION

<b>Total crude oil production:</b>	209 million bbl (2011)
<b>North Slope:</b>	562,000 bpd (2011) 591,000 bpd (2010)
<b>Cook Inlet:</b>	10,000 bpd (2011) 10,000 bpd (2010)
<b>Share of US total production:</b>	11%
<b>North Slope exploratory wells to date:</b>	500 (2012)
<b>North Slope Shale Potential - OIL:</b>	Up to 2 billion bbl (2011 est.)
<b>North Slope Shale Potential - GAS:</b>	Up to 80 trillion cf (2011 est.)
<b>North Slope Coal Potential:</b>	3.5 trillion metric tons (2011 est.)

#### TAPS

<b>Throughput to date:</b> 16.3 billion bbl	<b>Length:</b> 800 mi / 1,287 km
<b>Construction time:</b> 3 years, 2 months	<b>Diameter:</b> 48 inches / 1.2 m

Sources: DNR, US Census Bureau, US Department of Commerce, Northrim Bank, Office of Trade and Industry Information, Statista, USGS, Institute for Energy Research, US Energy Information Administration (EIA), TAPS

### Website References

State of Alaska  
www.alaska.gov

Department of Natural Resources  
www.dnr.alaska.gov

Department of Revenue  
www.revenue.state.ak.us

Department of Transportation  
www.dot.alaska.gov

Department of Environmental Conservation  
www.dec.alaska.gov

Department of Commerce, Community and Economic Development  
www.commerce.state.ak.us

US Geological Survey  
www.usgs.gov

Alaska Oil & Gas Association  
www.aoga.org

Alaska Railroad Corporation  
www.akrr.com

Arctic Slope Regional Corporation  
www.asrc.com

CIRI  
www.ciri.com

Doyon  
www.doyon.com

Alaska Resource Development Council  
www.akrdc.org

Deadhorse Aviation Center  
www.deadhorseaviationcenter.com

Alyeska Pipeline Service Company  
www.alyeska-pipeline.com

Anchorage Economic Development Corporation  
www.aedcweb.com

Offshore Systems Inc.  
www.offshoresystemsinc.com

Alaska Gasline Development Corporation (AGDC)  
www.agdc.us



StarCommunications

[www.star-communications.us](http://www.star-communications.us)



Northstar is the first Arctic offshore field connected to shore by pipeline only. Northstar oil flows to the Trans-Alaska Pipeline System through a subsea pipeline. Northstar was developed by BP when it acquired a major interest in 1995. Production started in 2001. (Photo ©BP)