

Petrotechnical Resources of Alaska, LLC

Alaska's Oil and Gas Consultants

Statement of Qualifications



PRA
3000 A Street, Suite 410
Anchorage, AK 99503
907-272-1232
www.petroak.com
info@petroak.com

INTRODUCTION

Petrotechnical Resources of Alaska, LLC (PRA) provides professional consulting services to the oil and gas industry. Our multidisciplinary staff of qualified and experienced professionals possess a diverse array of technical capabilities to provide our clients with a full spectrum of geoscience, engineering, HSE and project management consulting services.

Founded in 1997 and currently managed by three petrotechnical consultants who have worked in various capacities within international oil and gas companies over the past forty years, we have now grown into Alaska's premier oil and gas professional consulting group. We offer petrotechnical services in geophysics, geology, engineering, HSE, and project management. Our staff has a wide range of technical experience in Alaska. Professionals on our staff can be contracted out as individuals for specific, well-defined jobs, or as members of a team tailored to manage larger projects.

MISSION STATEMENT

Petrotechnical Resources of Alaska ("PRA") is committed to providing high quality professional oil and gas consultants to the Alaskan energy community. Our employees have extensive Alaskan experience on the North Slope, the interior basins, Alaska Peninsula, and Cook Inlet. We provide our clients with experienced individuals to fill specific needs or with integrated teams to manage exploration and development projects or provide due diligence support. We are committed to maintaining the highest level of professional and ethical standards in delivering valuable services to our clients.

KEY PROJECTS

PRA has provided strategic, commercial, technical and operations services for numerous clients throughout Alaska, and we are experts on exploration, development, production, regulatory, and drilling operations. PRA has managed oil and gas drilling projects for the North Slope Borough; Cook Inlet Natural Gas Storage; Lync Energy; AHTNA Regional Corporation; Doyon Limited; Furie; Brooks Range Petroleum, and the U.S. Department of Energy. PRA has become the go-to consulting group for Cook Inlet gas field operations, complementing our long-standing position as the leading oil and gas consulting firm throughout Alaska.

PROFILE OF SERVICES

REPRESENTATIVE SERVICES WE OFFER OUR CLIENTS
INCLUDE:

GEOSCIENCE

- ◆ TECTONICS / STRUCTURE
- ◆ STRATIGRAPHY / SEDIMENTATION
- ◆ RESERVOIR MODELING
- ◆ WELLSITE GEOLOGY
- ◆ BASIN ANALYSIS
- ◆ PROSPECT / FIELD EVALUATION

GEOPHYSICS

- ◆ 2D AND 3D SEISMIC INTERPRETATION
- ◆ SEISMIC ACQUISITION PLANNING
- ◆ SEISMIC PROCESSING OVERSIGHT
- ◆ SEISMIC ATTRIBUTE ANALYSIS
- ◆ SEISMIC SEQUENCE STRATIGRAPHY

GEOLOGY

- ◆ WELL PLANNING
- ◆ OPERATIONS
- ◆ WELL LOG CORRELATIONS
- ◆ PETROPHYSICS
- ◆ PROSPECT AND FIELD ECONOMICS
- ◆ CORE DESCRIPTIONS

ENGINEERING

- ◆ DRILLING PLANNING, DESIGN AND OPERATIONS
- ◆ SURVEILLANCE AND WELLWORK
- ◆ DEVELOPMENT PLANNING
- ◆ RISK AND RESERVE ANALYSIS
- ◆ ECONOMIC / COMMERCIAL EVALUATIONS
- ◆ FACILITIES DESIGN, OPERATIONS, AND MAINTENANCE

OTHER

- ◆ EXPERT WITNESS
- ◆ GIS MAPPING AND ANALYSIS
- ◆ HSE AND PROJECT PERMITTING
- ◆ PROJECT MANAGEMENT
- ◆ TAX CONSULTATION
- ◆ DUE DILIGENCE
- ◆ ASSET MANAGEMENT

PRA CLIENT LIST

- ◆ AHTNA
- ◆ ANADARKO
- ◆ ALASKA DIVISION OF GEOLOGICAL AND GEOPHYSICAL SURVEYS
- ◆ ALASKA DIVISION OF OIL AND GAS
- ◆ ALASKA OIL AND GAS CONSERVATION COMMISSION (AOGCC)
- ◆ ASRC
- ◆ AURORA GAS, LLC.
- ◆ BP EXPLORATION ALASKA, INC.
- ◆ CHEVRON
- ◆ CHUGACH ELECTRIC ASSOCIATION
- ◆ CIRI
- ◆ CONOCOPHILLIPS ALASKA
- ◆ COOK INLET ENERGY
- ◆ DOYON, LIMITED
- ◆ ENI PETROLEUM
- ◆ FURIE OPERATING ALASKA, LLC
- ◆ GLACIER OIL AND GAS
- ◆ GREAT BEAR/PANTHEON
- ◆ HILCORP
- ◆ KUUKPIK
- ◆ NORTH SLOPE BOROUGH
- ◆ OIL SEARCH (ALASKA), LLC, A SUBSIDIARY OF SANTOS LIMITED
- ◆ PETROCANADA
- ◆ SAVANT ALASKA
- ◆ SHELL
- ◆ TRUST LAND OFFICE/ STATE OF ALASKA
- ◆ ULTRASTAR EXPLORATION, LLC
- ◆ U.S. DEPARTMENT OF ENERGY
- ◆ U.S. GEOLOGICAL SURVEY
- ◆ 88ENERGY

PRA PROJECT SUMMARIES

Carbon Sequestration and Storage Screening Study

Petrotechnical Resources of Alaska (PRA) partnered with Petrotek Corporation to complete a screening study of Carbon Sequestration and Storage opportunities on the North Slope of Alaska. The objective of the study was to identify potential storage zones in the subsurface of the Kuparuk River Unit (KRU), Colville River Unit (CRU), and Bear Tooth Unit (BTU) suitable for sequestering the CO₂ from production operations at the three producing units.

Relevance:

This feasibility screening study was successful in meeting all objectives set-out in the RFP, finding a high-quality storage zone identified in the Ivishak reflecting: ample CO₂ storage volume, promising plume and pressure containment characteristics, and minimal legacy and future well potential penetrations. No fatal flaws were encountered in the screening study, and modeling indicates local Ivishak storage injectivity sufficient to handle all 3 Units' target injection volumes and rates with minimal well count.

List of tasks performed:

PRA used a merged 3-D seismic data volume to interpret and map the Ivishak Fm. across the study area, from eastern Kuparuk River Unit (KRU), Colville River Unit (CRU) and Bear Tooth Unit (BTU).

A seismic horizon near Top Ivishak was interpreted and mapped by PRA over the merged seismic volume, and seismic amplitude analysis was undertaken to inform reservoir characterization trend modeling in the geo-model.

A Petrel geo-model was constructed using the seismic interpretation results and well log analysis from 37 legacy exploration wells penetrating the Ivishak across the study area.

Petrophysical analysis integrating well log and core data was used to establish the reservoir poro-perm and saturation characteristics, and stratigraphic zonation

Sensitivity modeling at a location central to the KRU's three CPFs was also completed to test potential impacts to CO₂ injectivity resulting from: the vertical to horizontal permeability ratio (k_v / k_h); the allowable maximum bottomhole pressure.;

Value Engineering & Cost Control Highlights:

As the primary firm on this project, PRA maintained the PRA budget as well as the budget for Petrotek Corporation. PRA provided monthly updates on the progression of deliverables and the spend against budget

for both companies. The project was achieved under budget and successfully achieved all objectives set out in the RFP.

Kuukpik Consulting and Royalty Model Development

Petrotechnical Resources of Alaska (PRA) has consulted with Kuukpik Corporation for several years. PRA has evaluated North Slope projects that impact this native corporation as well as recently developing a reservoir model to ascertain the impact to Kuukpik of its royalties, especially considering redeterminations. PRA makes available a team of petroleum engineers, reservoir engineers, geologists, geophysicists, and project managers who evaluate and study the potential impact of future and pass development over Kuukpik lands.

Relevance:

Kuukpik management has a responsibility to its shareholders to evaluate and guide the oil and gas development of their lands. PRA is their Oil and Gas Consulting firm that assists them in discussions about land selections and technical interactions with North Slope operators. Additionally, PRA has designed and implemented a royalty assessment model to guide Kuukpik in understanding future royalty payments in legacy oil fields as well as future developments.

List of tasks performed:

PRA performs ad-hoc technical consulting services to Kuukpik on many North Slope fields.

PRA has presented to the Kuukpik Board of Directors on the impact of changes in North Slope unit developments.

The development of a reservoir model to track the barrels of hydrocarbon owed to the Kuukpik Corporation was developed over the last 6 months. This tool assists the Kuukpik management staff to recognize the upcoming royalties for the new Pikka development, as well as comprehend the ramifications of drilling changes by the operators on future redeterminations.

PRA has represented North Slope oil development project impacts to Kuukpik shareholders in the village of Nuiqsut. This often-difficult task shows the sensitive requests associated with the impact of oil development for native corporations and PRAs ability to navigate sensitive consulting situations.

Value Engineering & Cost Control Highlights:

PRA has a diverse team of geologists, geophysicists, engineers, modeling specialists, and project managers that bill only for the work they perform for Kuukpik. Kuukpik's wide range of technical projects are met with by a group of seasoned professionals that work, and bill only as needed. PRA's partnership with Kuukpik has been for many years and continues to add value to this corporation.

Cook Inlet Natural Gas Storage Alaska Development

PRA was contracted by Enstar Natural Gas in 2011 to advise in selecting a suitable depleted gas field in Cook Inlet for natural gas storage, to design, plan, and drill five natural gas storage wells, and to oversee the construction of the gas storage facility, followed by ongoing strategic and operations support for field management.

Relevance:

PRA technical professionals have extensive experience working on the CINGSA Project, a natural gas storage facility constructed to provide peaking capacity for the energy utilities in Southcentral Alaska. After assisting Enstar (Parent company of CINGSA) to select and procure an optimal depleted gas pool for conversion to storage, PRA was engaged to design and manage drilling and completion of the five horizontal gas wells used for injection and offtake of natural gas from the reservoir. After successful drilling and completion of the wells and construction of the facility, PRA has supported surveillance and modeling of the reservoir, constructed and maintained detailed reservoir characterization and simulation models for the field, and designed and managed operations for well work programs. PRA has supported design, construction, and operation of the facility since 2012, as well as providing strategic planning for expansion and wellwork options to optimize injection/offtake capacity, and serving as expert witnesses before DNR, AOGCC, and RCA.

List of tasks performed:

PRA confirmed the Cannery Loop Sterling C Pool gas reservoir as a gas storage candidate and characterized the reservoir to confirm suitability. PRA supported ENSTAR in negotiations with Marathon to define the pool boundaries, reservoir size and commercial value.

PRA was responsible for technical details used in permit applications for gas storage lease, Unit and pool definition, and drilling of wells.

PRA led the solicitation for the Request for Proposals (RFP) to establish the companies to provide the Engineering, Procurement, and Construction services for drilling and completion of the five original storage wells.

PRA optimized the design of horizontal wells for gas storage injection and deliverability.

PRA supported the PHMSA certification for the CINGSA facility.

Value Engineering & Cost Control Highlights:

In the initial negotiations for the segregation of the Sterling C gas pool from the Cannery Loop Production Unit, PRA proposed reservoir extent be defined from the top of the sealing shale at the base of the Sterling B to the bottom of the Sterling C interval overlying the Beluga Fm. This amendment in the definition of the Sterling C interval ensured that no well could produce from the topmost zones in the Sterling C, which would

compromise the integrity of the storage pool. This simple alteration of the pool definition negotiated with Marathon proved to be a very important operational consideration. The gas storage drilling project was completed within the \$35MM budget, with perfect HSE performance, and on schedule. PRA's involvement in the project began in 2011, prior to Enstar's taking over the project, and continued through 1Q24.

Efficiencies in management and operations led to the successful project execution under budget and on time.

North Slope Borough Gas Fields Upgrade

PRA managed a major gas field upgrade project for the North Slope Borough (NSB) including the design, permitting, procurement, and construction management for 5 new horizontal gas production wells, and facility upgrades for the East Barrow Gas Field, and Walakpa Gas Field in Barrow Alaska. This work involved extensive reservoir modeling prior to designing the upgrades to increase gas field production capacity. PRA gathered all available seismic data covering the fields and interpreted and integrated the seismic data with well log data from the two fields to create a detailed reservoir characterization model. PRA gathered all available seismic data covering the fields and interpreted and integrated the seismic data with well log data from the two fields to create a detailed reservoir history match, and predictive modeling to demonstrate the benefit of additional wellbore capacity.

Material balance and decline curve analysis were also incorporated in the study to understand the influence of in-situ methane hydrate saturation and dissociation in the two fields. Ongoing studies include regular pressure monitoring and associated decline curve analysis to estimate remaining reserves in the two fields.

The most significant component of this project, for the Alaska Gas Hydrate Production Test Well Design and Test Plan, was the research program funded jointly by the U.S. Department of Energy- NETL and the NSB

(Federal Project #DE-FC26-06NT42962). The objective was to prepare a research management plan; establish a context for the study based on prior and ongoing research; model the hydrate stability zone associated with the three Barrow Gas fields; characterize the reservoir properties; model production characteristics of the fields; and select an optimum hydrate test well location in Barrow. Modeling work was completed supporting the existence of methane hydrates in association with the gas fields. The project included sampling and analysis of produced gas; determination of temperature and pressure gradient; and modeling of hydrate stability. Although the DOE, due to the financial crisis, had to pull the funding prior to the execution phase, a detailed reservoir characterization was completed: supporting the simulation of hydrate production methodologies; quantifying the hydrate resource; and facilitating the selection of an optimum location for a methane hydrate test well.

Project final cost: \$105,000,000.

Relevance:

Multi-agency permits for this project included: Federal, State and Local Agencies. Negotiations for land use were also extensive encompassing

native corporations, State agencies, ConocoPhillips and private landowners. Integration of drilling results with facility upgrades was imperative. The remote location of the Barrow Gas fields provides understanding of the challenges and logistics necessary for project work anywhere in remote Alaska. PRA's role in executing the RFP solicitation and the reservoir understanding of a methane driven reservoir gave a unique comprehension of different production driven fields and the integration of proper surface and down hole drivers.

List of tasks performed:

PRA identified location and wellbore design to optimize the new wells' deliverability.

PRA developed a comprehensive Project Management Plan, including project objectives, work breakdown structure, project schedule and network diagram, deliverables, and risk register.

PRA prepared and distributed a comprehensive Request for Proposals (RFP) to select the companies to provide the Engineering, Procurement, and Construction services.

PRA was responsible for permits for ice road construction, drilling, facility upgrades and construction, and land use.

PRA identified and implemented logistics for this very complex project. Identifying risks, evaluating alternative options and open communication with all project stakeholders was key to the overall success of the project. PRA worked closely with NSB Capital Projects and Public Utilities Departments and presented project status updates to NSB Assembly.

Value Engineering & Cost Control Highlights:

In the investment of preplanning, PRA identified alternate staging areas for equipment and supplies. PRA worked closely with the normal production operations/ maintenance staff to ensure minimum impact to ongoing production during the project. Early consultation with State and Federal agencies resulted in efficient operations at the time of the project execution. Establishing and integrating the necessary equipment and, where applicable, equipment sharing for the project execution resulted in significant cost reductions. PRA managed and executed the North Slope Borough Gas Field project within a budget of \$105MM. The project was extremely well received by clients and stakeholders and met all expectations. Every phase of the project schedule was delivered as planned.

Beluga River Gas Storage and Reservoir Support

Petrotechnical Resources of Alaska (PRA) has consulted Chugach Electric Association (CEA) on reservoir management, drilling oversight, and petrophysical analysis of the Beluga River Gas field since 2021. PRA has a team of petroleum engineers, reservoir engineers, geologists, geophysicists, and petrophysicists who evaluate and study the potential of the Beluga River Unit (BRU). Additionally, over the last three years PRA has led a special project for CEA with the identification and early development of Gas Storage on the west side of Cook Inlet.

Relevance:

Chugach has the majority ownership of the Beluga River Unit. The gas produced from this field is of critical importance to the utility and its customers. PRA has the role of overseeing the work done by the operator and influencing technical decisions. In the last five years the production from BRU has grown. The newly developed gas in the field is strongly leveraged by the technical knowledge that PRA can advise CEA about. As well as the day to day oversight objectives, CEA has PRA involved in a gas storage identification and development project. This special project is being progressed now by both the operator and CEA. The value derived from this special project has important ramifications for the future needs of this electric utility.

List of tasks performed:

PRA performs ad-hoc technical consulting services to CEA on the Beluga River field.

PRA has regularly presented to the CEA Board of Directors on the oversight roll and progress as well as the advancement of the gas storage play in the Beluga River Unit.

CEA has a unique responsibility to keep the RCA informed about the development of the Beluga River and its impact on the rate payers. PRA has represented CEA on multiple occasions on technical petroleum issues about the Beluga River Unit.

In the special project capacity of identifying and developing a gas storage reservoir in BRU, PRA has written two reports and is now in the active process of informing CEA management, on a bi-weekly basis, about the current progress of the project.

Value Engineering & Cost Control Highlights:

The BRU field production since PRA's involvement in 2021 has grown more than 10% per year, from an annual production of 8.6BCF in 2021 to over 17.4BCF in 2025. PRA has been a technical contributor to this very significant reversal of a decline trend in a brown field that has been on

production since the late 1960's. This is an extremely significant production change in a timeframe where gas production out of the Cook Inlet Basin is of critical importance to the Southcentral Alaska energy grid. PRA has been actively working this project for over 5 years and has been under budget throughout.

Ahtna Regional Corp

Petrotechnical Resources of Alaska, as consultants to Ahtna Regional Native Corporation, designed, drilled, and completed a well in the Copper River Basin in Southcentral Alaska near Glennallen. This exploration project was motivated by the desire to find gas for local energy consumption. The drilling location was remote and involved significant logistical challenges. The drilling, testing and completion/abandonment design included management of very challenging high-pressure intervals. This project highlighted PRA's diverse multi-discipline team approach to solving challenging drilling projects. PRA's key engineering managers are registered, licensed engineers with the State of Alaska, and PRA is a licensed Petroleum Engineering firm.
Project final cost: \$20,000,000.

Kitchen Lights

PRA was contracted to support Furie Operating Alaska, LLC in designing and implementing a \$32MM capital improvement project for the Kitchen Lights Unit (KLU) in Cook Inlet, Alaska. The objective of the project was to increase wellbore delivery of natural gas to meet gas sales contract commitments. This project consisted of the planning and execution associated with completing a previously suspended gas well, and drilling of one new gas production well from the Julius R offshore production platform. The program also included completing workovers on two wells, and involved engineering, geoscience, permitting, procurement, contracting, compliance, safety, and field operations. PRA developed service contracts to carry out all aspects of the well drilling and workover operations up to and including well tie-in and production startup. PRA managed the planning, procurement, permitting, operations, safety, and regulatory compliance aspects of the project, as well as vetting invoices for Furie approval and payment.

PRA integrated the available well and seismic data for Kitchen Lights Unit to identify the optimal location for the KLU-A4 well, with the goal of maximizing stacked pay in the Beluga and Sterling Formations, while targeting sweet spots in the fluvial channel geometry to improve access to reserves and increase drainage area.

The Kitchen Lights Unit is located offshore of Nikiski in Cook Inlet. Drilling and workover operations utilized a mobile offshore drilling unit (jack-up rig). The Cook Inlet regularly experiences high current during both flood and ebb tides. Logistics management included contracting bathymetric surveying, work boats, shore based management, and helicopter scheduling and management. The project achieved all objectives with exemplary safety and environmental performance. Project final cost: \$32,000,000.

Placer

The drilling of the Placer well on the North Slope of Alaska is another example of PRA's ability to design and execute an exploration program in a remote location. On behalf of our client, Arctic Slope Regional Corporation, PRA's multi-discipline team of oil and gas professionals designed and implemented the successful program over a very limited drilling window and did so under budget. Additionally, the project required the construction of a 12-mile ice road. At the completion of the drilling component, the PRA team designed and implemented a field production testing plan to accomplish a well test that led to the certification of the exploration well with the State of Alaska.

A key design challenge faced by this project was a high-pressure shallow interval. The wells targeted the Kuparuk River Formation within the Placer Unit, and in order to reach the reservoir interval, the wellbores had to pass through the over-pressured Miluveal Shale. The seismic analysis of the extent and thickness of this shallow drilling hazard was a key component leading to the success of the drilling program.

The Placer project was completed within the \$10MM budget, and achieved all well objectives on schedule and with excellent safety and environmental performance.

Project final cost: \$10,000,000.

Gas Hydrates

Petrotechnical Resources of Alaska (PRA) was selected by the Japan Oil, Gas and Metals National Corporation (JOGMEC), and the U.S. Department of Energy National Energy Technology Laboratory (NETL) to conduct studies and plan and manage a stratigraphic well drilling program to research Methane Hydrate Long-Term Production Testing on the Alaska North Slope (Federal Project #DE-FE0025387). Collaboratively with the NETL, JOGMEC, and the United States Geological Survey (USGS), PRA successfully planned and executed the drilling of the Stratigraphic Test Well (Hydrate-01) at the Prudhoe Bay Unit (PBU) 7-11-12 gravel pad site. Hydrate-01 was completed with downhole sensors (Distributed Temperature Sensors and Distributed Acoustic Sensors) and continues to serve as the first of two monitor wells for the Project. Significant geologic, seismic and reservoir studies supported by PRA led to the completion of Hydrate-01, which established the 7-11-12 site as “world-class” for a gas hydrate-bearing reservoir. This project’s total cost was \$18.9MM and was executed in an exemplary safe and environmentally sound manner.

PRA acquired the data license for proprietary seismic in the area, and secured land use permits to continue the project into the final phase of conducting a long-term (12 month) gas hydrate production test at the site. PRA, on behalf of the DOE, engaged BPXA in a Drilling Services Agreement, whereby BPXA executed the drilling and completion operations of the Hydrate-01 well. The PRA team has combined experience of over 40 years in the study and drilling of hydrate wells on the North Slope of Alaska. PRA team members have also worked on several of the hydrate studies conducted in the State of Alaska over the last 20 years. Project final cost: \$18,900,000.

Umiat

PRA designed and drilled two exploration wells for Linc Energy Ltd in the winter season of 2013 and 2014. The remoteness of the Umiat oil field, combined with the reservoir's complex geology and the shallow reservoir target made this project a technical challenge. The interval of interest, the Grandstand Fm. is present in the base of and below the permafrost in this area. PRA successfully drilled the first horizontal well ever drilled in the remote field. The unique design of the well completion, in combination with the horizontal penetration of the reservoir helped to inch this extremely challenged discovery closer to commercial viability.

The challenges posed by drilling a reservoir within and slightly below the permafrost were overcome, with the support of PRA's prior experience drilling other shallow formations on Alaska's North Slope. The knowledge gained through this shallow horizontal drilling program will benefit other PRA drilling projects, like the methane hydrate test well project.

PRA's seismic interpretation and petrophysical analysis of this unique partially-frozen reservoir aided the client in developing a reservoir characterization supportive of a preliminary plan of development for the field.

The Umiat project was delivered for the projected cost of \$58MM. There were no recorded HSE incidents and the project was on schedule and within budget.

Project final cost: \$58,000,000.