

Gaffney
Cline

Experts in Unconventional in Argentina



What makes GaffneyCline Different?

GaffneyCline is a global consultancy that has been offering technical, commercial, and strategic advice to the oil and gas sector since 1962. GaffneyCline is well known as one of the leading suppliers of Reserves and Resources assessments, which are required for many purposes including statutory reporting, stock exchange listing, development planning, project finance, and asset valuation.

In addition, GaffneyCline offers a full range of upstream, midstream and downstream consultancy services. These include seismic interpretation, static and dynamic reservoir modelling, field development planning, facilities and pipeline engineering, gas monetization, LNG/GTL, mergers and acquisitions, economics and project finance, unitization and redetermination, carbon management and expert witness work. GaffneyCline operates worldwide from three main offices in London, Houston and Singapore, supported by regional offices in Buenos Aires, Sydney and Dubai.

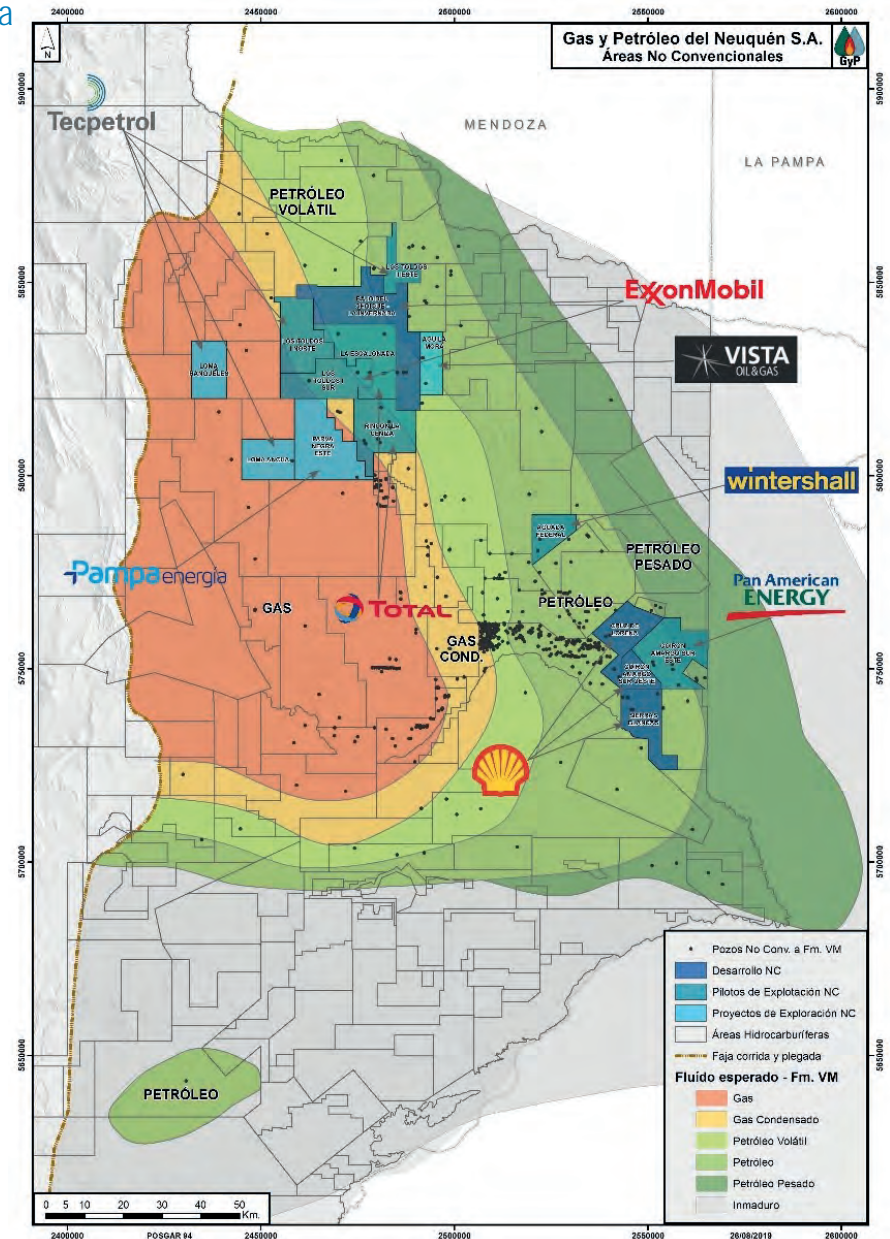
Vaca Muerta Shale

GaffneyCline has performed numerous projects in Argentina including several in the Vaca Muerta shale region, some of which are outlined in the following brief descriptions of assignments conducted by GaffneyCline in the past five years.

Our North American teams' experience and expertise have been leveraged by our clients to evaluate the Vaca Muerta shale play in Argentina as well as other shale plays globally.

GaffneyCline has Evaluated 31 Vaca Muerta Unconventional Fields:

Exxon	Los Toldos 1A / 2C
Exxon	Pampa de las Yeguas
Exxon	Parva Negra
Exxon	Sierra Chata
IEASA	Aguada del Chanar
Pampa	Parva Negra Este
Phoenix	Puesto Rojas
Phoenix	Mata Mora
Phoenix	Corralera
Pluspetrol	Meseta Buena Esperanza
Pluspetrol	La Calera
Tecpetrol	Fortin de Piedra
Tecpetrol	Los Toldos Sur
Vista	Bajada del Palo
YPF	Lindero Atravesado
YPF	Aguada Pichana Este
YPF	Aguada Pichana Oeste
YPF	Aguada Villanueva
YPF	San Roque
YPF	Bajo del Toro
YPF	Bandurria Norte
YPF	Bandurria Centro
YPF	Bandurria Sur
YPF	Canadon Amarillo
YPF	El Orejano
YPF	La Amarga Chica
YPF	Loma Campana
YPF	Loma La Lata Central
YPF	Loma La Lata Norte
YPF	Rincon del Mangrullo



Source: G&P Neuquén

Illustrative GaffneyCline Projects across Argentina

Independent Technical Evaluation

GaffneyCline has conducted an independent technical evaluation of reserves and resources of a Vaca Muerta block located in the Neuquén province in Argentina where an NOC has a participating interest.

This NOC is seeking potential investors willing to participate in the development of this block and GaffneyCline has prepared an independent report that will be used as technical support for the negotiation process.

Independent Argentinean Company's Audit of Reserves and Resources

An independent Argentinean company requested GaffneyCline to conduct a reserves and resources audit of one of the largest gas fields in Argentina.

This field is producing over 500 MMscfd of gas and the operator has drilled more than 60 horizontal wells and is planning to drill 330 additional wells to complete the development of the reserves. As a future development, the operator is planning to drill 200 additional wells to develop the resources.

Resource Evaluation – Austral Basin

As requested by an Argentinean operator, GaffneyCline conducted a resources evaluation of several blocks in the Austral basin, Santa Cruz province in Argentina, which included the evaluation of unconventional resources in some of these blocks. With time, this play has demonstrated to be a good unconventional producer and is presently being pilot tested.

Independent Evaluation, Exploration and Development Blocks

A large international NOC requested GaffneyCline to undertake an independent evaluation of the most important development and exploration blocks in the Vaca Muerta basin operated by the six largest national and international operators in Argentina.

This project included reviewing all the seismic, geological, petrophysical, reservoir engineering, facilities, drilling and completion information, including a site visit to identify the best opportunities for our client.

The outcome of this evaluation was a contract agreement between the NOC and the large independent operator.

Audited the Vaca Muerta Reserves of an Argentinean Operator

GaffneyCline has audited the reserves of most of the Vaca Muerta producing blocks for an Argentinean operator. This company has drilled more than 700 wells into the Vaca Muerta, of which more than 250 wells are horizontal.

The operator has fields that are producing in the oil window and fields that are producing in the gas window. This company is the largest Vaca Muerta producer in Argentina.

Independent Evaluation, Vaca Muerta, Neuquén Province

Following the request of several independent operators in Argentina, GaffneyCline conducted independent evaluations of the Vaca Muerta reserves and resources for blocks located in the Neuquén province in Argentina.

For this project, GaffneyCline:

- Reviewed the existing seismic information
- Identified analog wells that were used as a reference
- Reviewed all existing petrophysical and geochemical information
- Estimated type wells for the different Vaca Muerta intervals
- Estimated resources for the blocks
- Proposed an exploration well and future development of a pilot project to book reserves in these blocks

Independent Report Conducted for a Major Financial Institution

At the request of a major financial institution, GaffneyCline conducted a review of the Argentinean hydrocarbon industry.

This project included the main producing oil and gas fields, the companies operating in Argentina, the development of unconventional oil and gas fields, the economics of a Vaca Muerta development, the environmental impact, and made a comparison with a similar type of development in the US.

The main objective of this project was to make an accurate description of the hydrocarbon industry to validate project financing to companies operating in Argentina.

Based on public domain information and the experience of different professionals that have worked in the Argentinean hydrocarbon industry, a detailed report was prepared that supported project financing activities in Argentina.

Conceptual Design of an Oil Treatment Plant for a Vaca Muerta Project

GaffneyCline undertook a study for an independent company in Argentina to review the surface design and environmental risks associated with the construction of a crude oil processing facility designed to treat the light hydrocarbons produced from the Vaca Muerta.

Independent Evaluation of a Vaca Muerta Development Opportunity for an International Operator Seeking Investment in Argentina

For a European operator, GaffneyCline was contracted to provide a good understanding of the specific above-ground and subsurface issues, risks of the unconventional plays in the Neuquén basin, and a related macro-economic qualitative overview of the E&P market in Argentina.

GaffneyCline conducted an oil and gas monetization study that included the preparation of different oil and gas production and demand scenarios, review of the existing oil and gas transportation system, refineries capacity and demand, gas distribution system, power generation, and identification of alternatives for the commercialization of the future gas production. Among other alternatives, GaffneyCline has been evaluating exporting gas to Chile and Brazil, and to export LNG to Asia, using the advantage of the opposite climate cycle.

Lanín Volcano, Neuquén, Argentina



Additional Information

For more information about GaffneyCline's integrated services, please contact your local GaffneyCline office.

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