

UPSTREAM OPPORTUNITIES:
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Bolivia

P·P·O

• LEGAL & TAX •

OVERVIEW

Bolivia Oil & Gas Upstream - Exploration and Development Opportunities

Bolivia is one of the most important natural gas producers in South America, and it plays a strategic role in the regional energy integration.

The Bolivian State has decided to promote new opportunities on exploration and development (E&D) in the upstream sector, providing relevant information on mature blocks and fields with hydrocarbon potential. In addition, it has implemented a new regulatory framework for this sector.



The Hydrocarbon Development Plan seeks a significant investment in exploration, storage and logistics, production, refining and industrialization, as well as in the improvement of the current structure and gas transportation.

The information provided in this report is an executive summary of publications made by the Bolivian government on currently available E&D opportunities, showing their hydrocarbon potential and investment attractiveness.



BOLIVIAN HYDROCARBONS POTENTIAL

**50 MMm3/d
Average
Natural Gas
Production**

**8.95 TCF
Natural Gas
Reserves 1P**

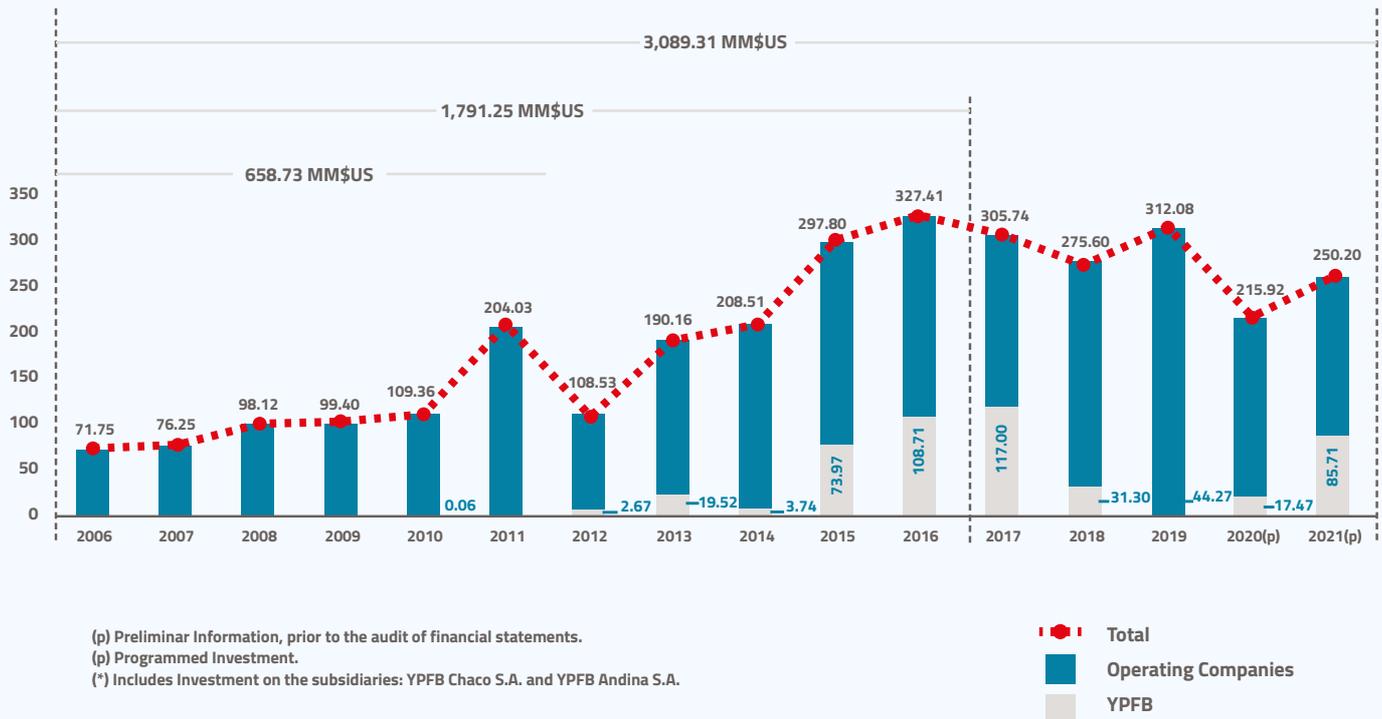
**Bra/Arg/Bol
Natural Gas
Markets**

**9,838 MMUSD
Investments on
Exploration
and
Development
in the last
15 years**

**TRANSPORT
CAPACITY**
Natural Gas Exportation
64.86 MMmcd
Internal Market
14.00 MMmcd

**100 MMm3/d
Natural Gas
Plant Capacity**

Investments in Exploration



Regulatory Framework

The Political Constitution of Bolivia authorizes the O&G state company YPFB to:

- Sign service contracts with public, mixed or private companies, Bolivian or foreign, for O&G production activities. The State pays a fee that has two components, recoverable costs and a retribution for the profits from block production.
- Establish associations or mixed economy companies for the execution of exploration, develop-

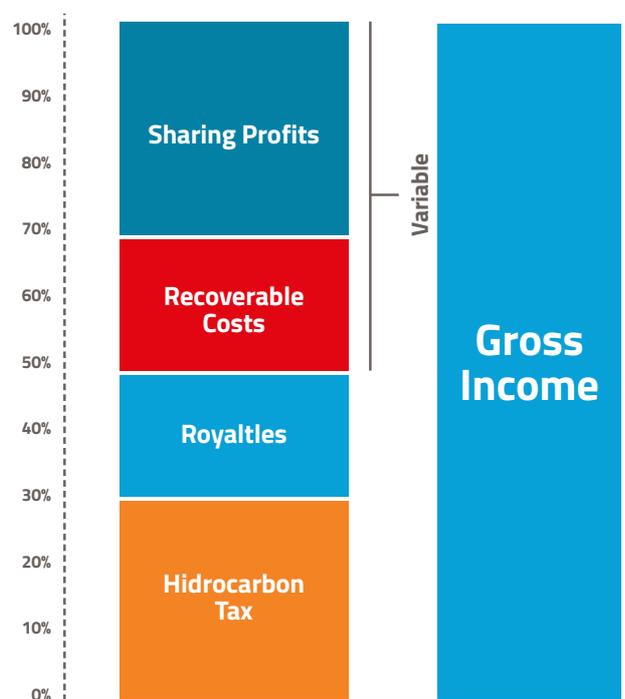
ment, refining and industrialization activities. Furthermore, the Constitution establishes that YPFB must have a participation of at least 51% of the capital stock in these associations or companies.

- The Legislative Assembly must explicitly authorize the signing of any O&G service contract.



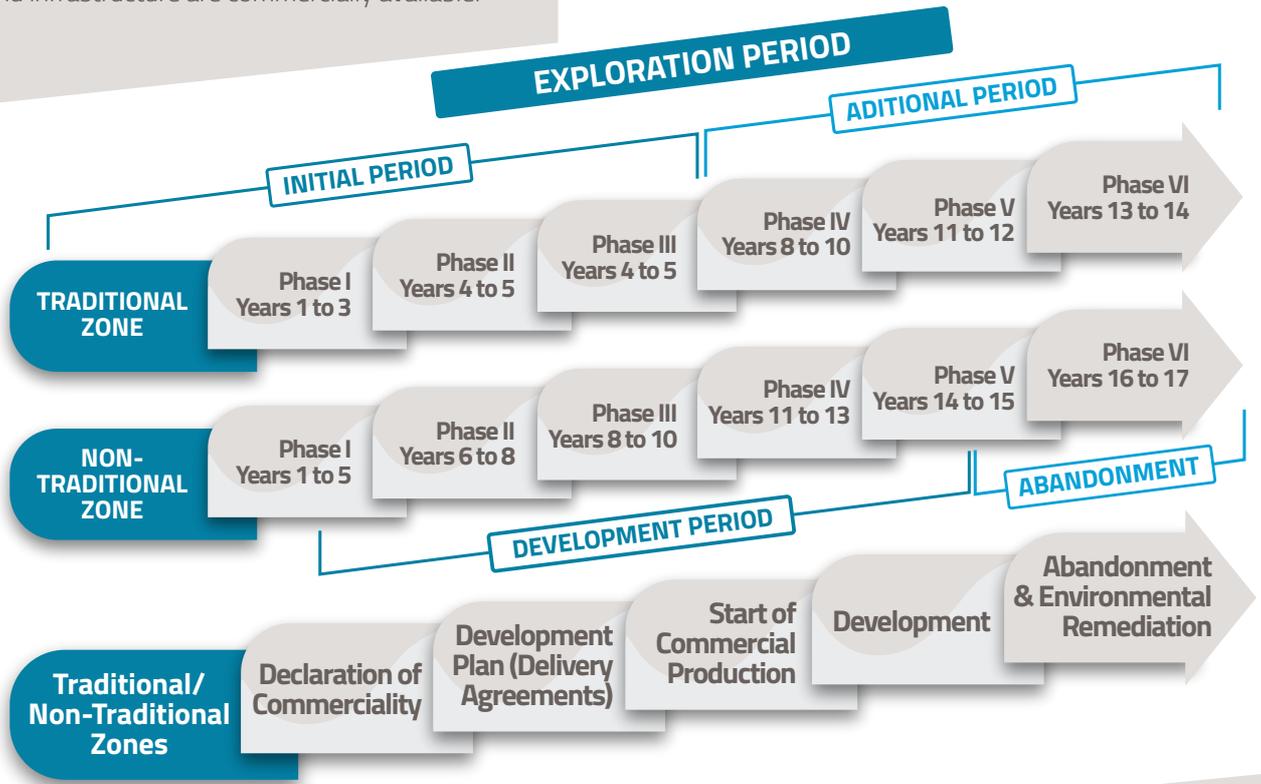
Regulatory Framework

- ▶ **Sharing Profits:** Profits are split between YPFB and the holder on every Service Contracts.
- ▶ **Recoverable costs:** These are the capital and operating expenses (CAPEX & OPEX) that the holders normally invest during the E&D periods. YPFB repays these costs as the asset is produced.
- ▶ **Profit:** YPFB will pay the operator the corresponding profit as agreed in the oil services contract according to the gas produced in the block.
- ▶ **Royalty Payment:** This includes a payment to the Department (area of the country) where the E&D activities are carried out (12%) and a direct deposit to the National Treasury (6%).
- ▶ **Hydrocarbon Tax:** A production tax payment of 32%.



Law No. 3058

Is the most important legal framework for the regulation on the hydrocarbon sector. For exploration and exploitation purpose, this law sets out that the Bolivian territory is divided into two zones declared as Traditional and Non-Traditional. Traditional Zones are those where hydrocarbon production and infrastructure are commercially available.



Exploration Opportunities

The exploration opportunities described in this section are subdivided into "development blocks", considering technical aspects, geological environments, economic evaluation, proximity and production facilities.

With these opportunities the Bolivian State seeks to reduce E&D costs using existing facilities and reducing risks by progressively acquiring Geological & Geophysical (G&G) data.



RELEVANT INFORMATION YARARA BLOCK

WELLS NAME	TECHNICAL INFORMATION	SURFACE AREA/UTE	AVIABLE INFORMATION	LOCATION	ECONOMIC EVALUATION
YARA: YRA-X1, YRA-X2	<ul style="list-style-type: none"> Block: Yarara Objetive: Petaca/Yantata Fm. Probability of geological success (Pg): 45% Recoverable resources (BCF): 12 Recoverable resources (MMBO): 3,49 	20 HAS/900	<ul style="list-style-type: none"> 2D seismic: 210 km Classification: Prospect 	Northern Foothills Department of Santa Cruz	<ul style="list-style-type: none"> IRR: 15,2% EMV: 14,7 MMUSD Probably of EMV>0: 62,3% Costs (MMUSD): Lifting Cost 5,6
YOPE: YOP-X1	<ul style="list-style-type: none"> Block: Yarara Objetive: Petaca/Yantata Fm. Probability of geological success (Pg): 26% Recoverable resources (BCF): - Recoverable resources (MMBO): 2,93 	20 HAS/900	<ul style="list-style-type: none"> 2D seismic: 90 km Classification: Lead 	Northern Foothills Department of Santa Cruz	<ul style="list-style-type: none"> IRR: 57,2% EMV: 1,3 MMUSD Probably of EMV>0: 71,9% Costs (MMUSD): Lifting Cost 25,4
LAS DELICIAS: LDC-X1	<ul style="list-style-type: none"> Block: Yarara Objetive: Petaca/Yantata Fm. Probability of geological success (Pg): 23% Recoverable resources (BCF): - Recoverable resources (MMBO): 2,75 	20 HAS/900	<ul style="list-style-type: none"> Wells: PTJ-X1, BNQ-X1 2D seismic: 80 km Classification: Lead Others SFD (Stress Field Detection) 	Northern Foothills Department of Santa Cruz	<ul style="list-style-type: none"> IRR: 55,8% EMV: 0,3 MMUSD Probably of EMV>0: 36,4% Costs (MMUSD): Lifting Cost 10,36
Chane, Yapa and Chorro	Under Evaluation				

RELEVANT INFORMATION INGRE AND HUACARETA BLOCKS

WELLS NAME	TECHNICAL INFORMATION	SURFACE AREA/UTE	AVIABLE INFORMATION	LOCATION	ECONOMIC EVALUATION
INGRE: IGE-X3	<ul style="list-style-type: none"> Block: Ingre Objetive: Hmp + Icla, Santa Rosa Probability of geological success (Pg): 21-24% Recoverable resources (BCF): 611 (Santa Rosa) Recoverable resources (MMBO): - 	31,250 HAS	<ul style="list-style-type: none"> Well: 2 2d seismic: 448 km Magnetotellurics: Yes Gravimetry/Magnetometry: Yes Classification: Prospect Others: SFD (Stress Field Detection) 	Southern Sub Andean Department of Chuquisaca	<ul style="list-style-type: none"> IRR: 20,3% EMV: 1,8 MMUSD Probably of EMV>0: 74,2% Costs (MMUSD): Lifting Cost 8,52
YAPUCATI: YAP-X1	<ul style="list-style-type: none"> Block: Huacareta Objetive: Hmp + Icla, Santa Rosa Probability of geological success (Pg): 23-25% Recoverable resources (BCF): 717 (Santa Rosa) Recoverable resources (MMBO): - 	453,750 HAS	<ul style="list-style-type: none"> Wells: 2 2D seismic: 4 lines Magnetotellurics: Yes Gravimetry/Magnetometry: Yes Classification: Lead 	Southern Sub Andean Department of Chuquisaca	<ul style="list-style-type: none"> IRR: 20,5% EMV: 1,2 MMUSD Probably of EMV>0: 44,3% Costs (MMUSD): Lifting Cost 5,2

RELEVANT INFORMATION SAUCE MAYU, IÑAU AND ASERO BLOCKS

WELLS NAME	TECHNICAL INFORMATION	SURFACE AREA/UTE	AVIABLE INFORMATION	LOCATION	ECONOMIC EVALUATION
SAUCE MAYU: SMY-X1	<ul style="list-style-type: none"> Block: Sauce Mayu Objective: Hmp + Icla, Santa Rosa Probability of geological success (Pg): 21-24% Recoverable resources (BCF): 790 (Santa Rosa) Recoverable resources (MMBO): - 	45,750 HAS	<ul style="list-style-type: none"> Wells 62: (Monteagudo Field) 2D seismic: 149.5 km 3D seismic: 280 km2 Magnetotellurics - Gravimetry/Magnetometry: - Classification: Prosect Others SFD: (Stress Field Detection) 	Southern Sub Andean Department of Chuquisaca	<ul style="list-style-type: none"> IRR: 28,2% EMV: 2,8 MMUSD Probably of EMV>0: 54,4% Costs (MMUSD): Lifting Cost 5,8
IÑAU-IÑA-X3	<ul style="list-style-type: none"> Block: Iñau Objective: Hmp + Icla, Santa Rosa Probability of geological success (Pg): 21-24% Recoverable resources (BCF): 1,292 (Santa Rosa) Recoverable resources (MMBO): - 	100,000 HAS	<ul style="list-style-type: none"> Wells: 8 2D seismic: 1,290 km Magnetotellurics: Yes Gravimetry/Magnetometry: Yes Classification: Prosect Others SFD: (Stress Field Detection) 	Southern Sub Andean Department of Chuquisaca	<ul style="list-style-type: none"> IRR: 19,1% EMV: 5,6 MMUSD Probably of EMV>0: 68,4% Costs (MMUSD): Lifting Cost 7,63
ILLINCHUPA-ICP-X1	<ul style="list-style-type: none"> Block: Asero Objective: Hmp + Icla, Santa Rosa Probability of geological success (Pg): 18% Recoverable resources (BCF): 702 (Santa Rosa) Recoverable resources (MMBO): - 	285,000 HAS	<ul style="list-style-type: none"> Wells: - 2D seismic: 225 km (Asero Block) Magnetotellurics: - Gravimetry/Magnetometry: - Classification: Lead 	Southern Sub Andean Department of Chuquisaca	No information available

RELEVANT INFORMATION VITACUA, RIO SALADO, SAN TELMO AND ASTILLERO BLOCKS

WELLS NAME	TECHNICAL INFORMATION	SURFACE AREA/UTE	AVIABLE INFORMATION	LOCATION	ECONOMIC EVALUATION
VITACUA	<ul style="list-style-type: none"> Block: Vitacua Objective: Hmp + Icla, Santa Rosa Probability of geological success (Pg): 34% Recoverable resources (BCF): 2,178 (Santa Rosa) Recoverable resources (MMBO): - 	73,875 HAS	<ul style="list-style-type: none"> 2D seismic: 805,12 km Classification: Lead 	Southern Sub Andean Department of Chuquisaca	<ul style="list-style-type: none"> IRR: 27,7% EMV: 176.3 MMUSD Probably of EMV> 97% Costs (MMUSD): Lifting Cost 3,6
RIO SALADO	<ul style="list-style-type: none"> Block: Rio Salado Objective: Hmp + Icla, Santa Rosa Probability of geological success (Pg): 22% Recoverable resources (BCF): 1,540 (Santa Rosa) Recoverable resources (MMBO): - 	50,000/900 UTE's	<ul style="list-style-type: none"> Wells: 6 2D seismic: 453 km 3D seismic: 270 km2 Magnetotellurics: - Gravimetry/Magnetometry: Yes Classification: Prospect 	Southern Sub Andean Department of Tarija	<ul style="list-style-type: none"> IRR: 25,8% EMV: 0,1 MMUSD Probably of EMV>0: 45,5% Costs (MMUSD): Lifting Cost 5,6
DOMO OSO	<ul style="list-style-type: none"> Block: San Telmo North Objective: Hmp + Icla, Santa Rosa Probability of geological success (Pg): 22% Recoverable resources (BCF): 2,100 (Petrobras) Recoverable resources (MMBO): - 	95,250 HAS	<ul style="list-style-type: none"> Wells: 1 2D seismic: 111 km Classification: Prospect Others: Surface geology-thermochronology 	Southern Sub Andean Department of Tarija	<ul style="list-style-type: none"> IRR: 21,9% EMV: 54,5 MMUSD Probably of EMV>0: 83,5% Costs (MMUSD): Lifting Cost 2,4
ASTILLERO	<ul style="list-style-type: none"> Block: Astillero Objective: Hmp + Icla, Santa Rosa Probability of geological success (Pg): 19% Recoverable resources (BCF): 823 (Santa Rosa) 	21,093 HAS	<ul style="list-style-type: none"> Wells: 1 2D seismic: 222 km Magnetotellurics: 6 lines Gravimetry/Magnetometry: 872 km Aeromagnetometry: 3,640 km Classification: Prospect 	Southern Sub Andean Department of Tarija	<ul style="list-style-type: none"> IRR: 16,5% EMV: 4,4 MMUSD Probably of EMV>0: 74,5% Costs (MMUSD): Lifting Cost 5,1

RELEVANT INFORMATION CAROHUAICHO AND IRENDIA BLOCKS

WELLS NAME	TECHNICAL INFORMATION	SURFACE AREA/UTE	AVIABLE INFORMATION	LOCATION	ECONOMIC EVALUATION
Escondida - EDA-X1	<ul style="list-style-type: none"> Block: Carohuaicho 8B Objective: Huamampampa Probability of geological success (Pg): 22% Recoverable resources (BCF): 426 Recoverable resources (MMBO): 35 	98,750 HAS	<ul style="list-style-type: none"> Wells: - 2D seismic: 807,5 km Magnetotellurics: 549 points Gravimetry/Magnetometry: 423 points Classification: Lead Others: 545 km, surface geology 	Southern Sub Andean Department of Santa Cruz	No information available
Opabusu - OPB-X1	<ul style="list-style-type: none"> Block: Carohuaicho 8B Objective: Huamampampa Probability of geological success (Pg): 23,5% Recoverable resources (BCF): 405 (YPFB Chaco) Recoverable resources (MMBO): - 	100,000 HAS	<ul style="list-style-type: none"> Wells: 5 (TTR field) 2D seismic: 1,353 km (Car 8A Block) Magnetotellurics: 19 lines Gravimetry/Magnetometry: - Classification: Lead 	Southern Sub Andean Department of Chuquisaca	No information available
IRENDIA	<ul style="list-style-type: none"> Block: Irendia Objective: Carboniferous sst Probability of geological success (Pg): 21% Recoverable resources (BCF): - Recoverable resources (MMBO): 175 	25,000 /700 UTE's	<ul style="list-style-type: none"> Wells: 1 2D seismic: 198 km Magnetotellurics: - Gravimetry/Magnetometry: - 	Southern Sub Andean Department of Santa Cruz	No information available

RELEVANT INFORMATION VILLA MONTES AND AGUARAGÜE BLOCKS

WELLS NAME	TECHNICAL INFORMATION	SURFACE AREA/UTE	AVIABLE INFORMATION	LOCATION	ECONOMIC EVALUATION
Villa Montes-VMT-X7	<ul style="list-style-type: none"> Block: Villa Montes Objective: Huamampampa Probability of geological success (Pg): 21% Recoverable resources (BCF): 611 Recoverable resources (MMBO): - 	12,500 HAS	<ul style="list-style-type: none"> Wells: 8 (VMT field) 2D seismic: 2,121 km Magnetotellurics: - Gravimetry/Magnetometry: - Classification: Prospect 	Foothills Department of Tarija	<ul style="list-style-type: none"> IRR: 41,3% EMV: 0,8 MMUSD Probably of EMV>0: 41,7% Costs (MMUSD): Lifting Cost 3,1
San Antonio Oeste-SON-X2	<ul style="list-style-type: none"> Block: Aguaraüe Centro Objective: Tertiary and Carboniferous sst Probability of geological success (Pg): Under evaluation Recoverable resources (BCFE): Under Evaluation 	44,125 HAS	<ul style="list-style-type: none"> Wells: 4 2D seismic: 800 km (Aguaraüe centro Block) Magnetotellurics: - Gravimetry/Magnetometry: - Classification: Lead Other SFD (Stress Field Detection) 	Foothills Department of Tarija	No information available
*Sayurenda, Yurenda and Carandaiti	These three blocks are in the same area and under evaluation. Sayurenda has a potential of 35.5 BCF, Yurenda 171.2 BCF and Carandaiti 163.1 BCF.				

Development Opportunities: Mature/Brown Fields

The objective of the Reactivation Plan for Mature/Brown Fields is to carry out field operations to produce remaining resources and reduce liquid hydrocarbon imports.

YPFB will conduct the reactivation operations itself or through national or international oil companies.

This section will describe the most relevant information on investment opportunities in mature fields.



RELEVANT INFORMATION MATURE/BROWN FIELDS

FIELD NAME	ACTIVITIES TO BE DEVELOPED	LOCATION/AREA/ZONE	AVIABLE INFORMATION	FACILITIES
Escondido	<ul style="list-style-type: none"> ▪ Capillary injection of surfactants ▪ Evaluation of Shooting Perforations in the Yecua Fm. ▪ Cleaning of Accumulated sand ▪ Sand control implementation ▪ Shooting Perforations in Wells (EDD-8, EDD-5, EDD-10) 	<ul style="list-style-type: none"> ▪ Foothills Department of Tarija ▪ 4.999 HAS ▪ Tradicional 	<ul style="list-style-type: none"> ▪ Wells: 6 ▪ Lines 2D: 8 ▪ Seismic 2D: 227.88 km ▪ Seismic 3D: ESCONDIDO 3D done by BG Group ▪ This field was operated by Shell until May 2019, when its operating contract with YPFB ended 	<ul style="list-style-type: none"> ▪ Wells ▪ Gas pipeline ▪ Oil pipeline ▪ Process plant ▪ Separation facilities ▪ Gathering network
Los Suris	<ul style="list-style-type: none"> ▪ LSR-X1 ▪ Workover to reduce water hydrostatic pressure ▪ Downhole surfactant injection ▪ Shooting Perforations in the Escarpment Fm. LSR-X3 ▪ Workover to reduce water hydrostatic pressure ▪ Downhole surfactant injection 	<ul style="list-style-type: none"> ▪ Foothills Department of Tarija ▪ 4.999 HAS ▪ Tradicional 	<ul style="list-style-type: none"> ▪ Wells: 6 ▪ Lines 2D: 8 ▪ Seismic 2D: 227.88 km ▪ Seismic 3D: LOS SURIS3D-8G ▪ This field was operated by Shell until May 2019, when its operating contract with YPFB ended 	<ul style="list-style-type: none"> ▪ Wells ▪ Gas pipeline ▪ Oil pipeline ▪ Process plant ▪ Separation facilities ▪ Gathering network
Algarobilla	<ul style="list-style-type: none"> ▪ Stratigraphic analysis to reduce uncertainty ▪ Repayment of surface equipment for well AGR-X1 ▪ Data acquisition to update numerical models 	<ul style="list-style-type: none"> ▪ Chaco, Department of Tarija ▪ 43.125 HAS ▪ Tradicional 	<ul style="list-style-type: none"> ▪ Wells: 4 ▪ Lines 2D: 10 ▪ Seismic 2D: 760.19 km ▪ Seismic 3D: Palo Marcado ▪ Gravimetry/Magnetometry: Aquio Beretimag-Total-2003 	<ul style="list-style-type: none"> ▪ Wells ▪ Gas pipeline ▪ Oil pipeline ▪ Process plant ▪ Separation facilities ▪ Gathering network ▪ Pump station
Villamontes	<ul style="list-style-type: none"> ▪ Workover on wells that reached Cangapi, San Telmo, Yecua and Vitiaca Fms. ▪ Data adquisition to update numerical models. 	<ul style="list-style-type: none"> ▪ Pie de Monte Department of Tarija ▪ 12.500 HAS ▪ Tradicional 	<ul style="list-style-type: none"> ▪ Wells: 6 ▪ Lines 2D: 10 ▪ Seismic 2D: 565.75 km 	<ul style="list-style-type: none"> ▪ Wells ▪ Gas pipeline ▪ Oil pipeline ▪ Process plant ▪ Separation facilities ▪ Gathering network ▪ Pump station
Tita-Techi	<ul style="list-style-type: none"> ▪ Well Intervention of TIT-X1 to test levels of interest in the Iquiri Fm. ▪ Integrate Surface Geochemistry information ▪ Identify higher structural area for Iquiri Fm. in the southeast 	<ul style="list-style-type: none"> ▪ Chaco Plain Department of Santa Cruz ▪ 81.250 HAS ▪ Tradicional 	<ul style="list-style-type: none"> ▪ Wells: 22 ▪ Lines 2D: 22 ▪ Seismic 2D: 1,664.22 km ▪ Seismic 3D: BAÑADOS ▪ Gravimetry/Magnetometry: ROBORE MAG GRAV YPFB - 2017 	<ul style="list-style-type: none"> ▪ Wells ▪ Gas pipeline ▪ Process plant ▪ Pump station ▪ Village

ABOUT US

PPO Abogados is the largest law firm in Bolivia, with more than 100 professionals working from their offices in La Paz, Santa Cruz, Sucre, Cochabamba and Cobija. PPO is recognized for being the leader in the Bolivian legal market and has highly specialized teams in Energy and Natural Resources matters.

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