Onshore Natural Gas Facilities & Pipelines
Equinox Engineering Ltd.

Equinox Engineering Ltd. is a world class provider of EPCM services to the global oil and gas marketplace.

Founded in 1997, Equinox has successfully executed over 3,000 significant projects around the world including Australasia, the Middle East and North America.

Equinox has industry leading expertise in gas processing and treating for shale gas, tight gas and coal seam gas. We have designed and installed over 40 gas processing trains, 100s of field facilities, and 1000s of kilometers of pipelines.

**Australia and Papua New Guinea**

Equinox has been working with Australian clients since 2010. We are currently executing numerous FEED and Detailed Design projects including gas processing, condensate handling, transportation and storage, loading facilities and pipelines.

**Gas Processing and Liquids Recovery**

Equinox Engineering provides world class expertise in gas processing, gas treating and liquids recovery facilities design. We provide complete EPCM services including conceptual design, Front End Engineering Design, Detailed Design through to Start-up and Commissioning.

Our experience includes a wide range of processing and treating facilities including refrigeration plants, amine facilities, sulphur recovery, mercury removal, acid gas transportation and disposal, glycol dehydration and mole sieve dehydration, cryogenic processing plants, turbo-expander plants, NGL recovery and fractionation.
Equinox provides a complete range of engineering services for Coal Seam Gas (CSG) facilities.

We have executed hundreds of unconventional gas projects including coal seam gas, shale gas, and tight gas.

Our CSG expertise includes Central Processing and Field Facility projects such as compression, dehydration, refrigeration, custody transfer and metering, scraper (pigging) launcher and receivers, storage, etc.

Our extensive gas compression experience includes centrifugal, reciprocating, rotary screw and vane type compressors covering all onshore applications, as well as gas turbine, natural gas engine, steam turbine and electric drivers.

Dehydration experience includes Triethylene Glycol (TEG), Diethylene Glycol (DEG), Mole Sieve and silica gel facilities.

Equinox has completed well over 1000 wellsite tie-ins and 1000’s of kilometers of gathering systems, trunk and group lines.

Equinox has world class experience with tight gas applications utilizing multi-zone, multi-well facilities expandable up to 18 wells per pad. These expandable sites accommodate the high initial production rates from shale gas and tight gas wells and the subsequent decline rates, bringing on additional wells and zones appropriately.

Equinox provides the expertise required to specify, size and utilize the appropriate equipment including oil/water/gas/separation, sand separators, wet and dry meter skids, RTU/TEG skids, in-line heaters, condensate pump skids, methanol injection pumps and storage tanks, corrosion inhibition, PSVs, flare knock out drums and flare stacks as needed. Equinox also manages all SCADA requirements as well as RTUs to handle wellhead ESDVs, skid control and pump control.

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**Montney Gas Plant** (420 TJ) & Infrastructure - FEED

FEED phase for unconventional gas program including Central Processing Facility (420 TJ); two Compression/Dehydration Field Facilities (2 x 210 TJ); Websites and Gathering Lines (1000 wells situated at 72 multiwell well pads); sales pipelines and trunklines (12" and 24" pipelines); water handling; power generation.

**Dawson Gas Plant** (115 TJ)

FEED and Detail Design for 115 TJ gas plant with process trains (2 x 57.5 TJ) containing inlet separation, inlet/sales compression (4 reciprocating compressors totaling 10,000 hp), amine sweetening (CO₂ and H₂S removal), refrigeration, liquid fractionation and stabilization, acid gas compression, vapour recovery, recycle system, power generation (2 x 4.6 MW gensets), storage for produced water, condensate (275 bpd) and NGL (171 bpd) with truck-out facility.

**West Doe Gas Plant** (95 TJ)

FEED and Detail Design for 95 TJ gas plant with three process trains containing inlet separation, inlet/sales compression (3 reciprocating compressors totaling 6,500 hp), amine sweetening (CO₂ and H₂S removal), refrigeration, acid gas compression, vapour recovery, recycle system, power generation (5 MW), storage for produced water, condensate and NGL with truck-out facility.

**Pouce South Gas Plant** (58 TJ)

FEED and Detail Design for 58 TJ gas plant; process trains (2 x 29 TJ) contain inlet separation/ slug catcher, inlet/sales compression (4 reciprocating compressors totaling 7600 hp), amine sweetening (CO₂ and H₂S removal), refrigeration, condensate stabilization, acid gas compression, vapour recovery, recycle system, storage for produced water and condensate (590 bpd) and truck-out facility.

**Pouce Coupe Gas Plant** (58 TJ)

FEED and Detail Design for 58 TJ gas plant including inlet separation, inlet/sales compression, amine sweetening (CO₂ and H₂S removal), refrigeration, liquid fractionation and stabilization, acid gas compression, acid gas blending, vapour recovery, recycle system, storage for produced water, condensate and NGL with truck-out facility.

**Musreau Phase 1 Gas Plant** (43 TJ)

FEED and Detail Design for 43 TJ gas plant; including contain inlet separation, condensate stabilization, inlet/sales compression (5 reciprocating compressors totaling 10,000 hp), amine sweetening (CO₂ and H₂S removal), refrigeration, de-ethanizer, vapour recovery, recycle system, storage for produced water, condensate (800 bpd) and NGL (912 bpd) with truck-out facility.
Musreau Turbo Expander
(190 TJ + 23,600 bbl)
FEED and Detail Design for 190 TJ gas plant containing inlet separation, inlet compression (3 reciprocating compressors totaling 14,205 hp), mole sieve dehydration, turbo expander liquid recovery package (17,697 bbl C2+), sales compression (2 centrifugal compressors totaling 26,440 hp), C2+ storage, condensate stabilization (6,866 bbl), LACT and power generation (11.2 MW). A sour gas processing train is included with amine sweetening (CO2 and H2S removal), and vapour recovery unit.

Wascada Liquids Recovery
(7 TJ + 1400 bbl)
FEED and Detail Design for 7 TJ gas plant and liquids recovery facility including inlet separation, inlet compression (reciprocating compressor totaling 1,445 hp), amine sweetening (CO2 and H2S removal), refrigeration (1,400 bpd) and NGL storage.

Stanley Liquids Recovery
(133 TJ + 5169 bbl)
FEED and Detail Design for 133 TJ gas plant located in tropical rainforest designed with unique seismic design conditions. Process trains (2 x 66.5 TJ) contain inlet separation, injection compression (5 reciprocating compressors totaling 19,490 hp), mercury removal, refrigeration, condensate stabilization, (5,169 bpd), condensate transfer pumps, power generation, condensate storage (25,000 bbl) and produced water storage.

Kiunga Condensate Terminal
(75,000 bbl)
FEED and Detail Design for Condensate Terminal including floating roof Condensate Storage Tank (75,000 bbl), two (2) centrifugal condensate loading pumps, diesel storage (750 bbl), lube oil storage, and power generation.

Equinox experience with refrigeration, hydrocarbon dewpoint control and liquid recovery plants includes propane refrigeration, mixed refrigerant plants, Joule Thompson (J-T) refrigeration, turbo-expanders, de-ethanizers, de-propanizers and de-butanizer facilities.
Equinox has extensive knowledge and expertise in all phases of pipeline system design, material selection and construction. Equinox provides consultation services from front end engineering design, site and route selection, stress analysis, fluid hydraulics, detailed engineering, procurement and construction management for pipeline projects.

Our experience includes pipelines for natural gas, acid gas, water, conventional oil, heavy oil, steam, fuel gas, annulus gas, NGL, condensate, etc. Our background includes gathering lines (4” to 12”), trunk lines (8” to 24”), sales lines and transmission lines (24” to 36”).

We are experts in design considerations for both buried and above ground pipelines. Our pipeline team including our mechanical design and stress engineers are experts in material selection requirements for pipeline, expansion loops, transitions, valve stations as well as crossings (river, road, rail, and pipeline). Our civil and earthworks team are also experts in design and construction considerations for pipeline support and anchor design in the swamp, muskeg and jungle conditions.

Equinox provides water treatment expertise for natural gas and conventional oil applications, including produced water treatment and hydraulic fracturing water treatment.

Our experience with water treatment issues (produced, fresh, brackish, saline, brine, disposal) and solutions include lime softening, ion exchange softening, evaporation, reverse osmosis, advanced oxidation, thermal vapour recompression, thermal distillation.

**Debolt Water Treatment Facility—Project Profile**

The Debolt Water Treatment Facility (in remote northern Canada) utilizes an unconventional source of saline subsurface water by tapping into the Debolt Aquifer approximately 800 meters below surface. Water extracted from the aquifer that contains H₂S is first treated then placed in the storage facility to be used for hydraulic fracturing purposes throughout the region. Water pipelines transport water from extraction wells back into the Debolt aquifer.

The scope of the project was to design and install a grassroots, sour water treatment plant with design capacity of the facility is 16,000 m³/d of inlet sour produced water.

The facility includes three phase inlet separation, sour gas compression, sour gas stripping tower, degassing tank, reactor towers, pump packages, HCl Storage and injection, H₂S analyzers and power generation.

The facility design utilizes a leading edge processing technology which is a proprietary, confidential process to reduce H₂S content of the water facility to 0 ppm.
**Projects**

**Australia and Papua New Guinea**
1. Gas Plant (133 TJ) and Condensate Recovery (5,100 bpd)
2. Condensate Terminal and Storage Facility (60,000 bbl)
3. River Mooring and Load Out Facility
4. Condensate Pipeline (12" x 2 km)
5. Condensate Pipeline (6" x 43 km)
6. PreFEED Gas Plant (240 TJ) and Liquids Recovery Facility

**North America**
7. Musreau Gas Plant (190 TJ) with Liquids Recovery (17,500 bpd)
8. Dawson Gas Plant (115 TJ)
9. West Doe Sour Gas Plant (95 TJ)
10. Birchcliff Sour Gas Plant (57 TJ)
11. Pouce Coupe Sour Gas Plant (57 TJ)
12. Tooga Sour Gas Plant (52 TJ)
13. South Peace Gas Pipeline (100 km x 20")

**Other International**
14. Oudeh Oil Processing (90,000 bpd) FEED
15. Tishrine Oil Processing (135,000 bpd) FEED
16. Haditha Pump Station (500,000 bpd)
17. Lower Fars (9,000 bpd) Heavy Oil Pilot
18. Mina Abdullah Refinery De-Hazing
19. Fateh Offshore Platform Upgrades
20. Kub-Gas Plant Expansion (43 TJ)
21. Kumsai Oil Processing (1,000 bpd) Pilot