



PIPELINE PROJECT HIGHLIGHTS

Over the past decade, Acero has been responsible for numerous pipeline projects of varying sizes (3" to 22" nominal), complexities (1km – 30km), and design pressures (1,000 kPag - 15,200 kPag). A few of these projects are highlighted below.



GAS PIPELINE REPLACEMENTS ◀ **PENGROWTH ENERGY CORP.** ◀ *Swan Hills, AB*

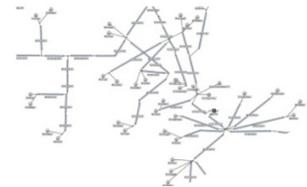
Acero's scope of work included the detailed design and procurement of multiple 4" to 12" LP & HP gas pipeline replacements (externally coated steel as well as free standing liner composite pipelines). Projects featured a new pipeline separator (96" OD x 20' S/S), surface piping, instrumentation and controls, pig launching and receiving facilities, major road and water crossings.

3" & 4" FRP HP PRODUCED WATER INJECTION PIPELINE **ACCEL ENERGY CANADA LTD/ PENGROWTH ENERGY CORP.** *Judy Creek, AB*

Acero was responsible for the engineering, procurement and construction support for multiple 3" & 4" FRP high pressure (14,900 kPag) pipelines, and multiple 6" to 12", high pressure (15,200 kPag) water injection steel, thermoplastic-lined pipelines. Projects featured new underground anchors, new stainless steel risers, as well as design considerations for road, water and underground service crossings.

PIPELINE NETWORK MODELING **PENGROWTH ENERGY CORP.** ◀ *Irricana, AB*

Project featured a Pipe-Flo model for the existing wells and pipelines in the Irricana area to evaluate the existing network, simulate options for the re-routing of production, and to bring low producing shut-in wells back online. Network contained 20 wells, 42 pipeline segments, and 1 booster compressor.



PIPELINE PROJECT ◀ **POLAR STAR OIL AND GAS INC.** ◀ *Laprise Creek, BC*

Acero's scope of work included the engineering and design, procurement, and regulatory support for a 10", 12km main trunk line with 6" parallel common ditch fuel gas pipeline, as part of a new gathering system. Crossing considerations included 7 open-cut road allowances, 18 stream crossings (3 of which were bored), and 4 archaeological no-work zones, which were bored.

PIPELINE INTEGRITY - REPAIRS, SECTIONAL REPLACEMENTS, AND REROUTING

PEMBINA PIPELINE CORP. ◀ Various

- ▶ Scope of work included the engineering and assessment of several temporary & permanent sleeve repairs between 8" – 22" designed to fit directly on pipe or with an elevated collar (dependent on severity of wrinkle). Typical deliverables have included, repair drawings, Finite Element Analysis, fatigue analysis, and final report.
- ▶ Acero provided several design packages for partial pipeline replacements including rail, road and water body crossings. Typical scope has included stress analysis, pipeline & riser details, bends specification & schedule and alignment sheets.



DOSEO PIPELINE PROJECT

GLENCORE ◀ Chad, Africa

Scope of work consisted of cost estimating to support alternative configurations and options, development of temperature gradient monitoring, feasibility assessment of on-shore barge equipment, and development of estimating TIC template.

3" & 4" FRP FLOWLINE REPLACEMENTS

ACCEL ENERGY CANADA LTD/ PENGROWTH ENERGY CORP.

Judy Creek, AB

Acero was responsible for the engineering, procurement and construction support of multiple 3" & 4" FRP high pressure/ temperature pipelines (6,900 kPag at 93°C). Projects featured new underground anchors, new stainless steel risers at well sites and satellites, as well as design considerations for road and water crossings.

DUAL 12" PIPELINES

◀ PAINTED PONY ◀ Montney Field, BC

Responsible for the engineering, procurement, construction management, regulatory, and project management for dual NPS 12" pipelines. Project featured 13 crossing considerations including the HDD of 1 major river.



PIPELINE PROJECTS

CNRL ◀ Dawson Creek, BC

Scope of work consisted of the evaluation and technical recommendations for various pieces of process equipment, single and multi- well tie-ins for sweet and sour oil emulsion wells, installing free standing composite liners through existing pipelines to restore production, as well as a 4 km acid gas pipeline and tie-in.

8" FRP GROUPLINE REPLACEMENT

ACCEL ENERGY CANADA LTD/ PENGROWTH ENERGY CORP.

Judy Creek, AB

Scope of work included the engineering, procurement and construction support for a 4 km, 8" FRP pipeline replacement which featured underground anchor blocks & supports, required to counter the stress imposed on the pipeline due to poor soil conditions and elevated operating temperature. In addition to the civil / structural work associated with the riser supports, Acero designed stainless steel risers, multiple road crossings and one creek crossing.

GARRINGTON PIPELINE INSTALLATION

PENGROWTH ENERGY CORP. ◀ Southern AB

Acero was responsible for the engineering, design, procurement, and construction support of a new pipeline to an existing facility in order to re-route field production to a third party. Scope of work also included analysis of stress caused by elevated operating temperatures and flow reversal of an existing pipeline; required to accommodate the re-routing of production.

