PIPELINE ENGINEERING & DESIGN

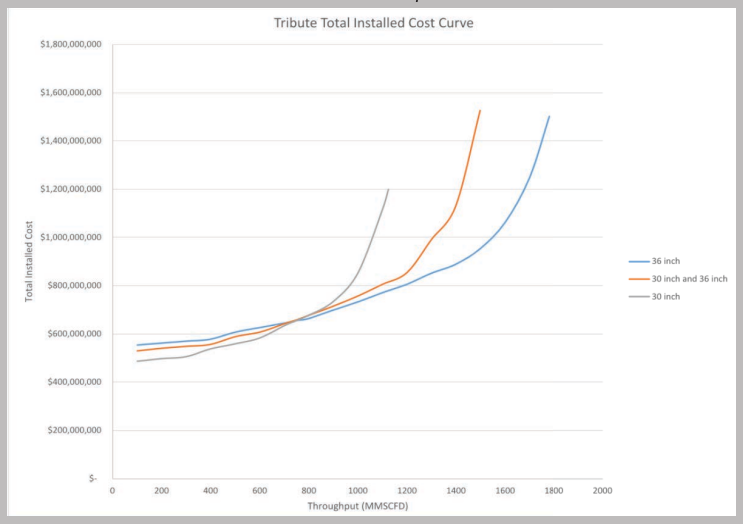
ZAP's pipeline specialties include route analysis, engineering, design, and hydraulic modeling. Our team provides process expertise with design and construction follow-through, to provide our clients with all resources necessary to execute quality, on-schedule projects.

ZAP
ENGINEERING & CONSTRUCTION SERVICES, INC.

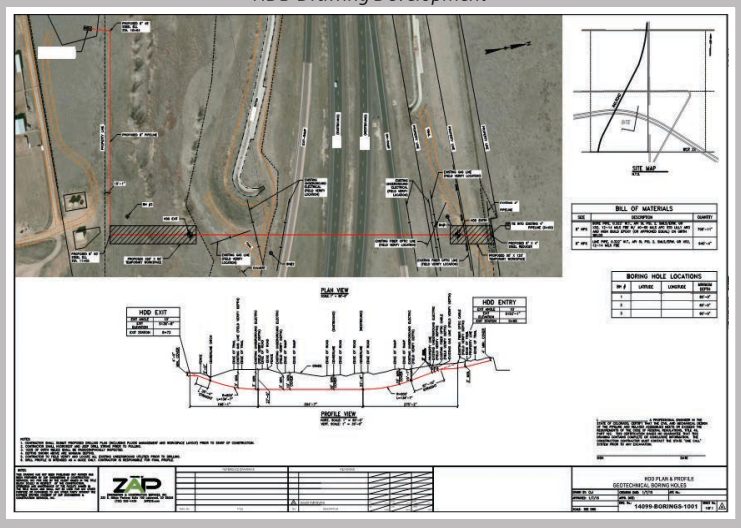
ROUTE ANALYSIS

ZAP generates elevation profiles and pipe segment lengths using information from simple platforms such as Google Earth, or more complex shape files developed using survey data. Using this information, we then evaluate crossings, terrain impacts on construction, as well as identify areas that may require additional permitting.

J Curve Graph



HDD Drawing Development



ENGINEERING AND DESIGN

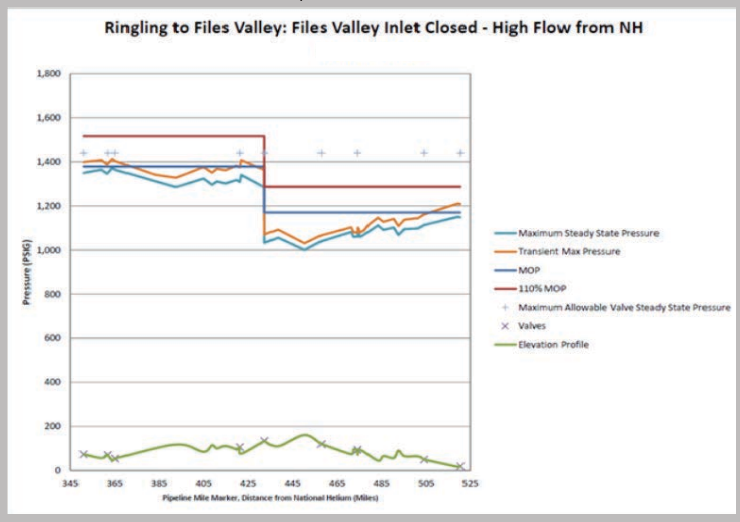
Engineering calculations include pipe sizing, wall thickness, horsepower requirements, and crossing stresses. These calculations can be shown on construction documentation tailored to the needs of the construction team. Typical pipeline drawings include route maps, alignment sheets, crossing details, construction typicals, and engineered drawings for pipeline facilities (pig traps, main line valves, tie-ins).

The list of deliverables can be tailored to meet the needs of the client and construction team. ZAP project management controls the scope, schedule, budget, and quality of the project to ensure the best package is produced on time and on budget.

HYDRAULIC MODELING

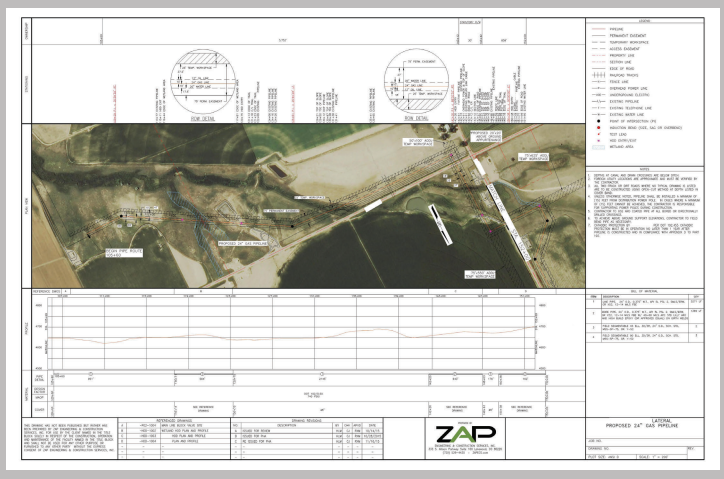
ZAP leverages hydraulic simulators to create pipeline models to solve steady state and transient calculations. The steady state simulations help determine the throughput solutions, pressure profiles and line sizing are developed. Transient simulations show liquid drop out, pig volumes, pressure surges, and potential over-pressure scenarios. Identifying the over-pressure scenarios and cases helps create mitigation plans that protect the pipeline while maintaining the required conditions of service.

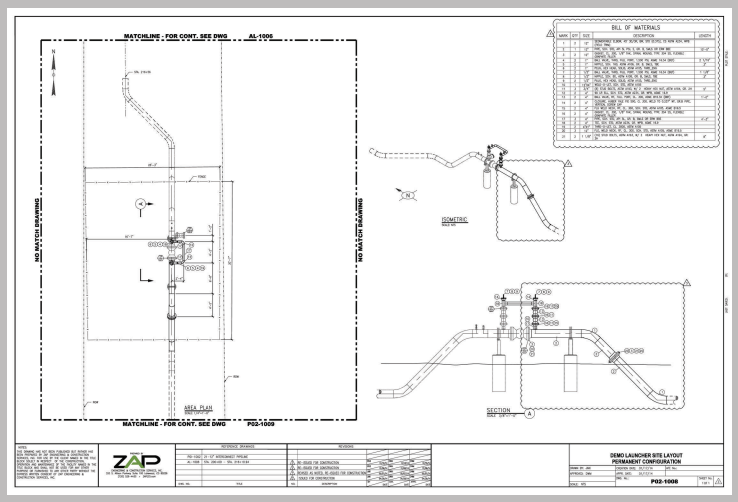
Pipeline Simulations

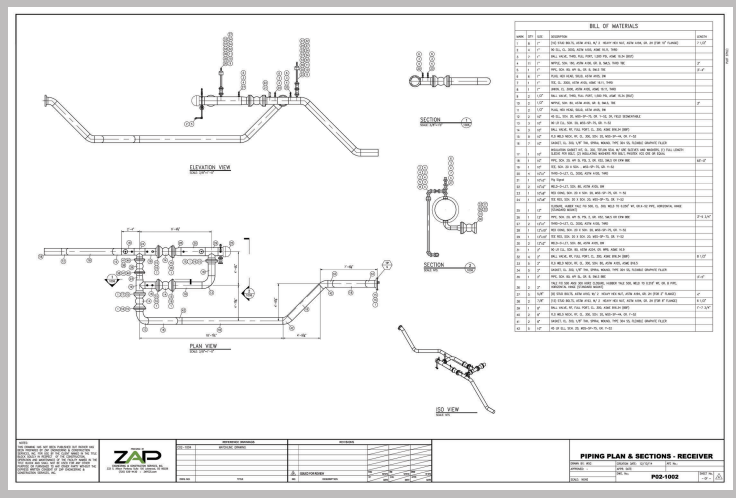


PREVIOUS EXPERIENCE

- Gas, oil, and produced water, fresh water, NGL system pipelines
    - Ranging from 6" to 24" pipe size
- Oil, produced water, and fresh water laterals from well pads to main trunk lines
    - Ranging from 6" to 12" pipe size
- Launcher / Receiver design development
- Oil gathering, gas gathering, and water distribution steady state and transient hydraulics
    - Utilizing VMG Symmetry, HYSYS, and Synergy Pipeline Simulator







PIPELINE DELIVERABLES

- TIC Estimates
- Desktop Routing / Analysis
- Operational Schematics
- Crossing Drawings for Permitting
- P&ID's
- Plot Plan / GA's
- Piping Interconnect Details, Sections, BOM's
- MLV, Launcher / Receivers, Details, Sections, BOM's
- HDD's Plan & Profiles
- Alignment Sheets
- Hydrotest Procedures
- Hydrotest Segmenting
- Material Expediting & Tracking Report
- Contractor SOW Bid Documents

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