



## WIM M. VELDMAN *M.Sc., FEIC, P.Eng.* Arctic Pipeline Experience

- River Surveys
- Alignment
- EIA
- Design
- River Training Structures
- Construction
- Monitoring
- Maintenance

### 1. ALYESKA PIPELINE SERVICE COMPANY (1973 - Present)

Full time senior hydrologic consultant (1973-1976) for the \$8 billion, 800 mile, 48 inch trans-Alaska oil pipeline, responsible for final design review and field design changes of 80 river crossings and 30 miles of floodplain construction. Work involved 15 pipeline bridges, access roads, culverts, dykes, spurs and revetments containing 2,000,000 yards of fill and 300,000 yards of rock. Testified before the Federal Energy Review Commission in Washington, D.C. as an expert witness regarding the construction cost. Project manager for the hydrologic input (1989-1991) to Alyeska and Williams Brothers for the planning, permitting, detailed design and construction of a 9 mile, \$100 million pipe replacement in the Atigun River. This involved a unique 40,000 foot long river training structure utilizing gabions and articulated concrete mats to reduce the required burial depth of the pipeline. Prepared an Action Plan and detailed design of river training structures to protect a 40 mile long section along the Sag River following the 1992 flood of record (1991-1994). Design of a revetment for the Middle Fork Koyukuk River (1994). Reviewed design of Fibre Optic Cable at all major river crossings (1997). Conceptual and detailed design of bank protection for the Tazlina River Bridge (1997-1998). Assessment of measures required in the Dietrich/Koyukuk Rivers and the Pump Station 4 area following high flows in 1998 and 1999 respectively. Provided input to the EIA to support an application for the renewal of the ROW (1999 - 2002). Line-wide recon, preparation of conceptual designs and field engineering support (2001 - 2004).

### 2. IMPERIAL OIL RESOURCES LTD. / COLT KBR (2002 - Present)

The proposed Mackenzie Gas Project pipeline, from the Arctic Ocean roughly parallelling the Mackenzie River valley to the Alberta border in the south, will involve numerous river crossings. Wim participated in a multi-discipline field and office evaluation of the location and construction mode of the significant crossings. At the present, he is Project Manager for a Conceptual Engineering report which addresses Design Criteria, Construction and Operational Methodologies and presents conceptual designs and considerations for the major and representative river crossings.

### 3. BP EXPLORATION ALASKA - BADAMI PROJECT (1994 - 2001)

Hydrologic consultant to the Project Alliance team. Responsible for the development of design approaches and criteria for the river crossings (width from 3500' to 500') and overland flow for the R.O.W. application. Made presentations to stakeholders and regulatory agencies. Responded to regulatory questions. Undertook pre-breakup and breakup field assessments on the North Slope. Providing detailed design input during operations for erosion control measures at the Sag River.

### 4. CONOCOPHILLIPS ALASKA, ALPINE AND NPRA PROJECTS, ALASKA (2000 - Present)

Providing hydrologic design input to Michael Baker Jr. and Phillips Alaska for the Alpine project located in the Colville River delta. Reviewing the design flood for the Colville River which included a regional hydrologic analysis. Presented findings to government regulators. Assessing impact of major floods on roads, bridges (and required openings) and well pads (2000 - 2004). Field assessment of spring breakup conditions in the Colville River and adjacent streams (2001, 2003, 2004). Presented hydraulic assessments and design considerations for major bridges (2003).



**5. FOOTHILLS PIPELINES, ALASKA HIGHWAY GAS PIPELINE (1979 - 1983, 2000)**

Reviewed, on behalf of TAPS, the potential impact of the gas line on the adjacent oil line. Provided input to updated cost estimate. Reviewed original Northwest Alaska design.

**6. IMPERIAL OIL - NORMAN WELLS (1999 - 2000)**

Review of condition of multiple pipeline crossings of the Mackenzie River. Prioritized future maintenance and monitoring needs and prepared detailed designs for immediate repair measures.

**7. YUKON PACIFIC CORPORATION (1990 - 1991)**

Project manager for the preparation of a river crossing design manual and representative designs for a proposed 800 mile, 36 inch gas pipeline in Alaska. Design flows using the HEC-1 model were computed for all crossings.

**8. ENBRIDGE (IPL) - NORMAN WELLS TO ZAMA LAKE PIPELINE (1988)**

Hydrologic consultant to evaluate and prepare detailed drawings for the Ochre River (exposed) and Hodgson Creek (failed river training structure) crossings following the 1988 floods.

**9. SOHIO CONSTRUCTION COMPANY, ENDICOTT (1983-1987)**

Project manager for the hydrologic input for the Endicott oil development offshore from Prudhoe Bay and responsible for:

- evaluating alternative pipeline alignments to cross the one mile wide Sag River,
- detailed hydraulic design of the river crossings (culverts, and road overflow sections) and review of as-built conditions,
- reviewing scour predictions for the 500 and 200 foot long bridges in the 6 mile long causeway and preparing detailed designs and specifications for a \$2 million rock armouring scheme to limit scour at the 500 foot bridge.

**10. CONOCO, MILNE POINT (1984)**

Project manager for breakup monitoring and hydrologic design of elevated river crossings for the Milne Point oil field west of Prudhoe Bay.

**11. EXXON COMPANY, USA, POINT THOMPSON (1982)**

Project manager for the hydrologic input to the Point Thompson Development, Alaska. Responsible for:

- breakup, summer monitoring and surveys of the major river crossings,
- selecting optimum river and road crossing locations,
- developing hydrologic and hydraulic design criteria and conceptual designs for the Sag River crossing and other major rivers.

**12. ARCO ALASKA, PRUDHOE BAY (1979 - 1983)**

Project manager for:

- design and construction of river training structures for road and pipeline bridges at the West Channel, Sagavanirktok River
- follow-up breakup monitoring/flow measurements/riverengineering assessment.

**13. FOOTHILLS PIPELINES, DEMPSTER LATERAL PIPELINE (1978 - 1979)**

River engineering specialist to evaluate route from Dawson City area Yukon, to Inuvik, NWT. Participated in a one week routing evaluation.

**14. FOOTHILLS PIPELINES, ALASKA HIGHWAY GAS PIPELINE (1978))**

Evaluated optional route from Whitehorse to Dawson City and thence into Alaska. Participated in field assessment with geotechnical and construction personnel.

