CONSTRUCTION OF THE NORTHERN BORDER PIPELINE IN MONTANA

Report to File

by

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ACKNOWLEDGEMENTS

PHOTOGRAPH AND FIGURE CREDITS

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Figures	
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INTRODUCTION

The Northern Border Pipeline, a 42-inch natural gas pipeline, was built in Phillips, Valley, and Roosevelt counties in 1981. It is part of the Alaskan Natural Gas Transportation System (ANGTS) which is being built by a consortium of pipeline companies to carry gas from the North Slope of Alaska to California via the Western Leg, and to Illinois via the Eastern Leg. The Northern Border Pipeline is that part of the Eastern Leg from the U.S. - Canada border in Montana to Iowa. The Northern Plains Natural Gas Company of Omaha, Nebraska, one of the consortium members, is the builder and operator of the pipeline. Completion is expected by the end of 1982.

Because of the large size of the ANGTS, legislation was passed by Congress setting up special procedures for building it. Some of these included establishing the Office of Federal Inspector to monitor and expedite permitting and construction, and the imposition of environmental requirements on the builders of the pipeline. There was little recognition of the role of states in the legislation, except for Alaska. In addition, Montana has little authority over gas pipelines, which are largely under the jurisdiction of the Federal Energy Regulatory Administration.

Regulatory actions that were taken by Montana state government were: 1) preparation of a draft and final environmental impact statement by the Department of Natural Resources and Conservation, published in 1980, 2) issuance of numerous state and local permits, and 3) establishment of the Interagency Pipeline Task Force Force (IPTF).

The IPTF was first established by executive order by Governor Judge for the Northern Tier oil pipeline. Governor Schwinden modified it to include any large-diameter pipeline, which allowed the IPTF to negotiate a limited

funding and policy agreement with the Northern Border Pipeline Company (NBPC). The IPTF operated from April 1, 1981 to December 31, 1981 on Northern Border, assisted NBPC with obtaining permits, and assisted state agencies with monitoring construction activities.

Northern Border is one of the first large-diameter pipeline built in Montana. As such, there are lessons to be learned from it. What follows is a description of pipeline construction, right-of-way requirements, special concerns of Montana state lands crossings, a short statement about federal-state relations on the project, and a few suggestions concerning state actions on future large pipeline projects. The project and natural environment of northeast Montana is described in detail in the EIS. Most photographs were selected from IPTF files. The report is not intended to be a complete description of all the issues that occurred, but rather was formulated as a guide to assist agency personnel working on future pipeline projects. Additional interpretations can be drawn from the data, tables, and photographs that may be useful in planning and regulating other large-diameter pipelines, but I have not presented detailed interpretations here.

GENERAL ASPECTS OF NORTHERN BORDER CONSTRUCTION

Construction of the approximately 181 miles of pipeline in Montana began on May 4, 1981. The photographs in this section depict the main features of construction, which are right-of-way (r-o-w) clearing, pipe-stringing, pipe bendings, ditching, welding, taping, lowering-in, back-filling (covering the pipe and trench), tie-ins (welding, lowering, and covering openings in the pipeline that were bypassed by the other operations), contouring and clean-up, river crossings, hydrostatic testing, and initial reclamation practices. These operations were largely completed by October 15, 1981. Work on valves, compressor station site, and reclamation operations continued after this date. Photographs frequently are of state-owned land (a total of about 13 miles of the 181 miles in Montana) crossed by the pipeline. If so, they are identified by the parcel number used by MBPC, such as PH012. Letters refer to counties: PH is Phillips county, VA is Valley county, and RO is Roosevelt County. A list of the state parcels, the legal description of locations and photographs of them is given in Table 1 on page 4.

A detailed description of the sequence of pipeline construction, and the differential rate at which separate construction operations proceeded, is given in Table 2. These operations are described in photos #1 through #49.

Table 1.

MONTANA STATE LANDS CROSSED BY THE
NORTHERN BORDER PIPELINE

"As-Built" Survey Stations*

Tract#	Enter	Leave	Legal Description	Photograph#
SPREAD NO. 1				
PH012.0	328+67.8	392+47.4	Sec. 36-T37N-R32E	15, 17, 19, 61, 62, 72, 73
PH018.0	516+03.8	572+84.7	Sec. 16-T36N-R33E	11
PH019.0	572+84.7	599+07.4	Sec. 21 T36N-R33E	11
PH021.0	648+36.7	651+46.2	Sec. 22-T36N-R33E	56, 57
PH022.0	651+46.2	667+37.3	Sec. 27-T36N-R33E	-
PH023.0	667+37.3	687+94.4	Sec. 26-T36N-R33E	-
PH026.0	741+59.1	809+47.1	Sec. 36-T36N-R33E	58, 63-66
PH033.0	992+62.8	1016+40.5	Sec. 16-T35N-R34E	81
VA001.0**	1326+02	1339+26.9	Sec. 7-T34N-R35E	20, 28, 29, 30, 45
VA006.0	1448+06.9	1502+51.2	Sec. 16-T34N-R35E	59
VA027.5	1994+02.5	2026+28.6	Sec. 36-T34N-R36E	68, 77
VA051.0	2804+01.2	2858+36.4	Sec. 17-T33N-R39E	69-71
VA052.0	2858+36.4	2913+76.7	Sec. 16-T33N-R39E	8, 74
VA053.5	2913+76.7	2922+92	Sec. 15-733N-R39E	-
VA055.0	2941+52	2968+29	Sec. 15-T33N-R39E	-
VA056.0	2968+29	2969+10.4	Sec. 22-T33N-R39E	76
VA057.0	2969+10.4	3023+11.9	Sec. 23-T33N-R39E	5, 50, 51, 75
VA058.0	3023+11.9	3046+56.4	Sec. 24-T33N-R39E	-
SPREAD NO. 2				
RO142	262+54.8	266+15.0	Sec. 16-T29N-R55E	79, 80
RO195***	1341+38	1407+72	Sec. 36-T28N-R58E	53, 54

* Submitted to DNRC August 10, 1981. "As-Built" refers to the survey made after the pipeline is buried. On Spread One, this is the distance in feet from the United States - Canadian Border; i.e. read 328+67.8 as 32,876.8 ft. On Spread Two, the survey began at Big Muddy Creek.

** This is a DNRC parcel; the rest are DSL.

*** As-Built surveying had not reached this point yet; this is a preliminary survey.

Table 2. Weekly progress of pipeline construction operations, given in miles, on Spread One, the 148.6 miles between the United States-Canada Border and Big Muddy Creek.

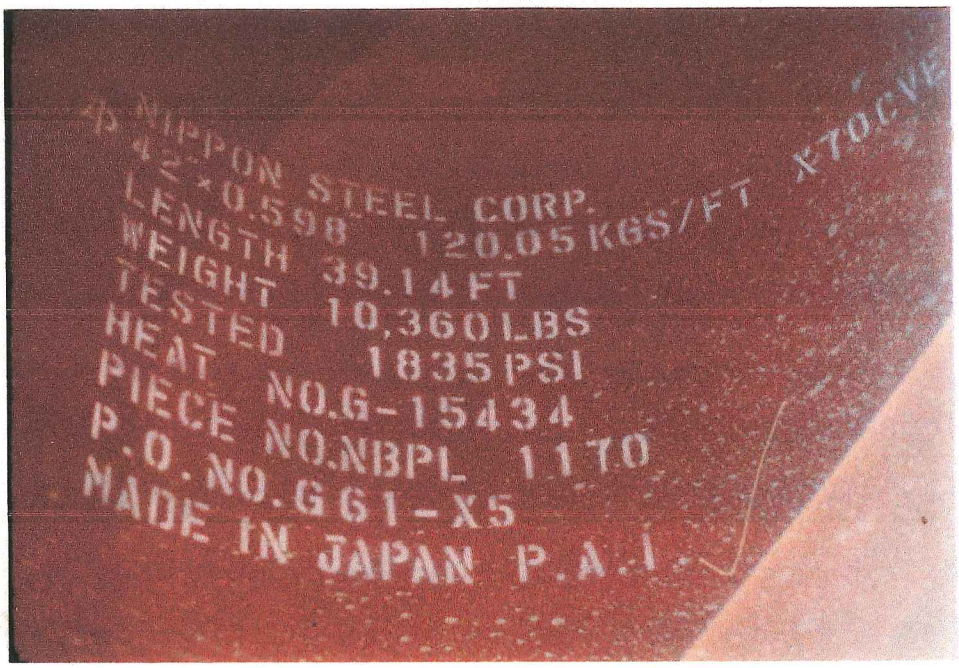
	May*	June		July				August		
		4-10	11-17	18-23	24-1	2-8	9-15	16-22	23-29	30-5	6-12
Temporary fencing	87.4	0	17.8	14.8	9.6	14.7	4.3	complete	--	--	--
Clear/grade right-of-way	80.4	6.6	16.0	15.0	10.2	13.8	5.8	complete	--	--	--
Pipe-stringing	10.0	5.3	5.9	12.1	13.6	8.1	6.6	9.1	10.0	11.9	13.2
Ditching	6.5	7.4	5.0	9.6	8.1	8.6	8.1	12.2	12.0	14.1	14.5
Bending	1.5	8.3	3.5	10.7	10.3	6.7	7.3	10.3	12.5	14.2	14.6
Welding	0	0.3	1.2	6.8	9.2	8.5	9.8	11.9	12.2	16.3	13.1
Tape/lower-in/ back-fill	0	0	0.3	5.2	9.7	7.2	9.7	8.5	12.8	16.5	9.5
Right-of-way clean-up	0	0	0	0	8.2	4.5	2.4	3.6	9.3	6.8	16.9
Tie-ins	0	0	0	0	14.8	7.2	8.2	4.5	9.6	15.0	13.9
Hydrostatic testing	0	0	0	0	0	0	0	0	0	0	0

Table 2. Continued

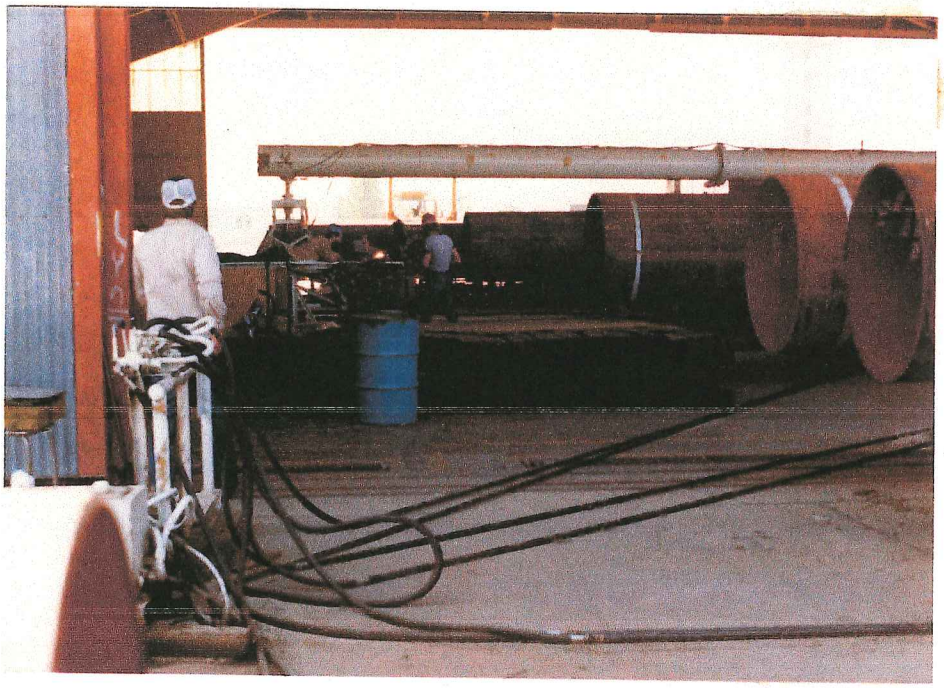
	August			September				October	
	13-19	20-26	27-2	3-9	10-16	17-23	24-30	1-7	8-14
Temporary fencing	--	--	--	--	--	--	--	--	--
Clear/grade right-of-way	--	--	--	--	--	--	--	--	--
Pipe-stringing	14.7	13.3	12.2	2.1	complete	--	--	--	--
Ditching	12.8	11.9	10.0	7.3	complete	--	--	--	--
Bending	14.5	9.3	10.4	14.0	complete	--	--	--	--
Welding	10.9	12.2	5.3	9.1	9.2	4.8	7.0	0.6	complete
Tape/lower-in/ back-fill	14.8	11.3	10.6	7.3	10.4	2.5	1.8	3.6	complete
Right-of-way clean-up	28.0	19.1	12.2	9.4	6.4	12.2	5.2	2.2	0.6 (complete)
Tie-ins	15.4	12.2	9.9	10.8	6.3	14.6	0	4.2	1.6 (complete)
Hydrostatic testing	0	0	0	51.3	6.0	76.6	9.4	0	5.3 (complete)

* A weekly breakdown for May was not reported to the IPTF

SOURCE: Reported to the Montana IPTF by the Office of the Federal Inspector, as reported by NBPC's inspectors. There may be discrepencies. Daily averages should be computed on the basis of a seven-day work week.



#1 Label inside a pipe section showing origin, strength, weight, thickness, and grade (X70). American-made pipe was used in other states along the Northern Border route. Forty-foot sections were transported by rail to the Valley Industrial Park near Glasgow.



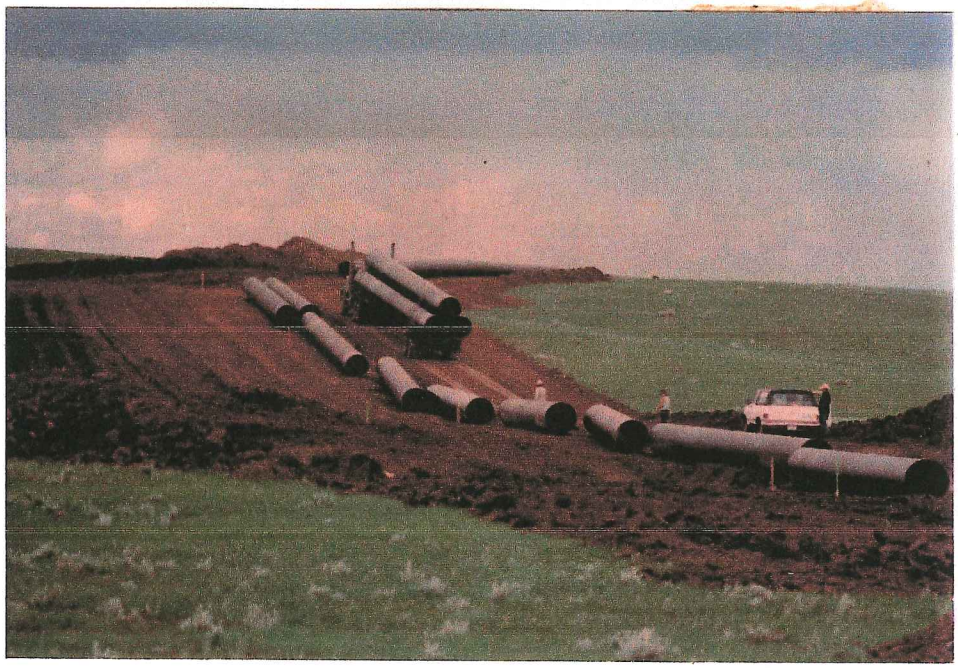
#2 Two forty-foot sections were machine welded together at Valley Industrial Park ("double-jointing").

#3 Storage of 80-foot sections ("joints) at VIP.

#4 Right-of-way clearing June 26. Soil and spoil is usually moved perpendicular to the centerline to simplify recontouring. All clearing was completed in Montana by July 15.

#5 Dozer blading 3-4 inches of topsoil from over trench area prior to ditching. This operation was combined with r-o-w clearing when the terrain was not as flat as shown in the photo, taken on July 16 on state land parcel VA057 west of the West Fork Procupine Creek.

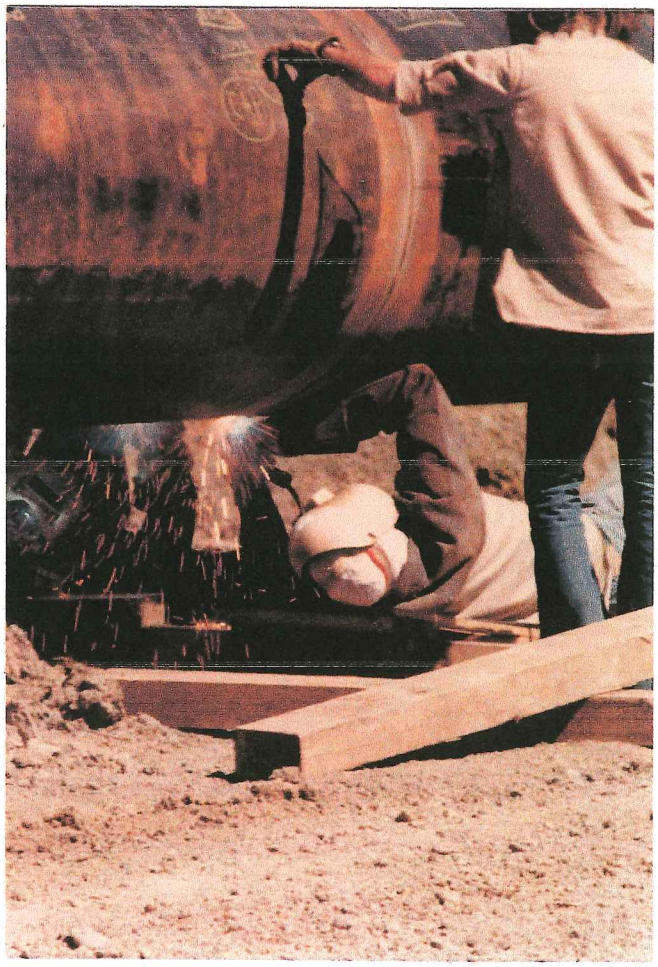
#6 Pipe truck hauling three 80-foot joints on U.S. Highway 2. Load is approximately 63,000 pounds.



#7 Stringing pipe on r-o-w, which was used as road in many locations, after clearing was completed. Photo taken June 23.

#8 Trenching on state parcel VA052 on July 16. Note the grass remaining on the work area. Terrain was flat and little side-hill cutting was required.

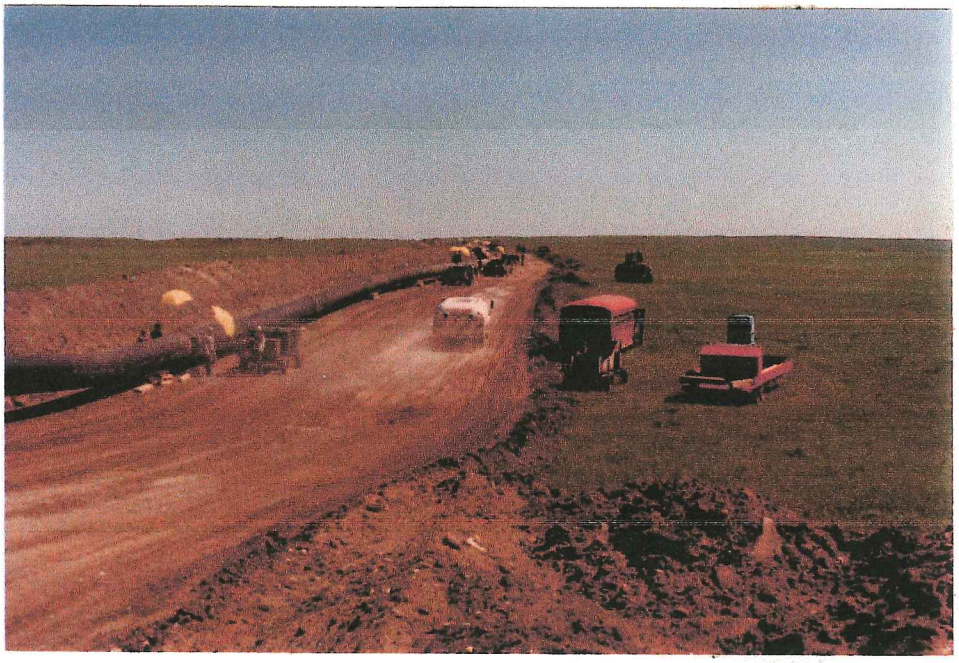
#11 Welding spread in Phillips County on state land parcel PH018 near Turkey Track Road. Photo taken June 25. Note the welding trailers at each weld. The farm tractor on the right side of the r-o-w was used to pull the trailer. The bus was used to bring pipeliners to work. It was about a 1.5 hour one-way trip to this work site from Glasgow.



#12 Two welders joining 80-foot joints. Eleven welding passes were needed to join the .598 inch thickness pipe. Each weld was x-rayed for damage or faulty welds.

#9 Pipe joint in bending machine in Idaho on the Western Leg of the ANGTS. Similar machines were used in Montana. Pipe was coated with teflon, rather than tape, on the Western Leg. Pipe is bent to closely conform to terrain after it is strung out on the r-o-w.

#10 Bending machine again in Idaho. Note the "pig" which is run into the pipe joint to prevent kinking during bending by applying hydraulic pressure against the inside of the pipe. Photo taken June 24, 1981.



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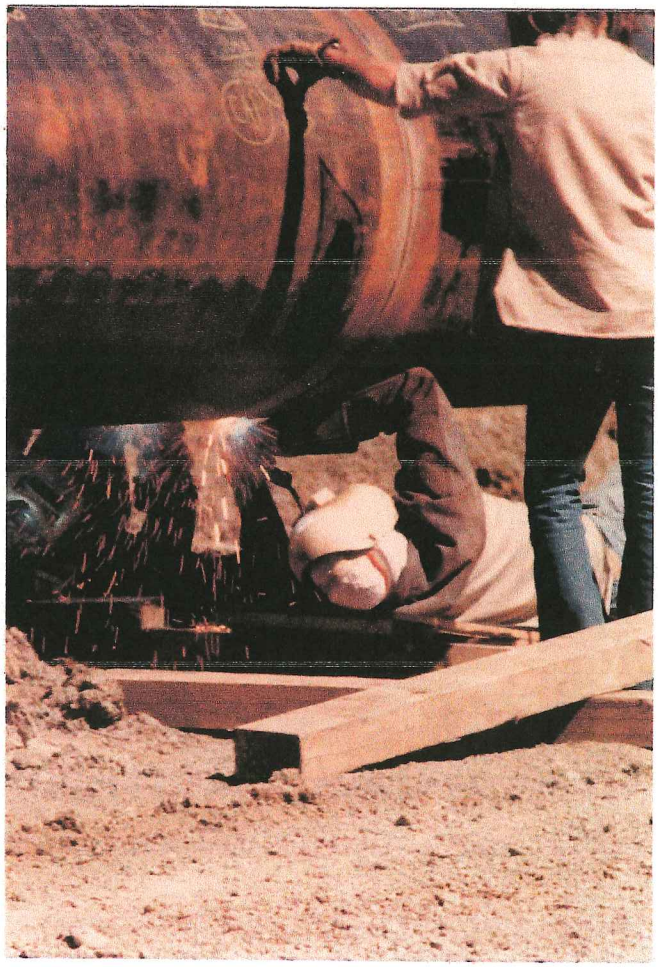

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#13 Welding completed, and pipe ready for wrapping and lowering-in in Phillips County.

#14 Taping machine. In operation, it is suspended by a side-boom tractor. Pipe was coated with Teflon on the Western Leg of ANGTS rather than being wrapped with tape (see photo #9).

#15 Side-boom tractors lifting pipe and feeding it into the tape machine behind them. The tractors move slowly forward and the pipe is suspended on rollers. After wrapping, the pipe is lowered into the trench. The tractor in the foreground pulls a cart which carries hardwood blocks that prop up the welded pipe. This is state parcel PH012 on June 26.

#16 Taping machine wrapping pipe with plastic tape to prevent corrosion. It was stalled at the time of the photograph.