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TITLE	<b>DCR Application for a Type A Water Licence</b>
SECTION	6: Water Use for Pipeline Pressure Testing
SUBJECT	1: Pressure Testing Water Requirements

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## INTRODUCTION

This section describes the activities that could be used to pressure test the pipelines within the Deh Cho Region. Pressure test water is expected to be obtained from both outside and within the region. Options for disposing of any subsequent wastewater are also described.

## LOCATION OF UNDERTAKING (PART 3)

The pipeline route extends for about 521.9 km through the DCR, as shown in the following figures located in [Section 5](#):

- [Figure 5-1: DCR Map 1 of 52 \(KP-686 to KP-695\)](#)
- [Figure 5-2: DCR Map 2 of 52 \(KP-694 to KP-708\)](#)
- [Figure 5-3: DCR Map 3 of 52 \(KP-708 to KP-720\)](#)
- [Figure 5-4: DCR Map 4 of 52 \(KP-720 to KP-734\)](#)
- [Figure 5-5: DCR Map 5 of 52 \(KP-734 to KP-744\)](#)
- [Figure 5-6: DCR Map 6 of 52 \(KP-742 to KP-752\)](#)
- [Figure 5-7: DCR Map 7 of 52 \(KP-752 to KP-763\)](#)
- [Figure 5-8: DCR Map 8 of 52 \(KP-763 to KP-775\)](#)
- [Figure 5-9: DCR Map 9 of 52 \(KP-775 to KP-785\)](#)
- [Figure 5-10: DCR Map 10 of 52 \(KP-783 to KP-790\)](#)
- [Figure 5-11: DCR Map 11 of 52 \(KP-790 to KP-802\)](#)
- [Figure 5-12: DCR Map 12 of 52 \(KP-803 to KP-814\)](#)
- [Figure 5-13: DCR Map 13 of 52 \(KP-814 to KP-824\)](#)
- [Figure 5-14: DCR Map 14 of 52 \(KP-824 to KP-834\)](#)
- [Figure 5-15: DCR Map 15 of 52 \(KP-834 to KP-844\)](#)
- [Figure 5-16: DCR Map 16 of 52 \(KP-844 to KP-855\)](#)
- [Figure 5-17: DCR Map 17 of 52 \(KP-855 to KP-866\)](#)
- [Figure 5-18: DCR Map 18 of 52 \(KP-864 to KP-876\)](#)
- [Figure 5-19: DCR Map 19 of 52 \(KP-876 to KP-885\)](#)
- [Figure 5-20: DCR Map 20 of 52 \(KP-885 to KP-901\)](#)
- [Figure 5-21: DCR Map 21 of 52 \(KP-901 to KP-909\)](#)
- [Figure 5-22: DCR Map 22 of 52 \(KP-909 to KP-918\)](#)
- [Figure 5-23: DCR Map 23 of 52 \(KP-918 to KP-927\)](#)
- [Figure 5-24: DCR Map 24 of 52 \(KP-927 to KP-936\)](#)
- [Figure 5-25: DCR Map 25 of 52 \(KP-936 to KP-944\)](#)
- [Figure 5-26: DCR Map 26 of 52 \(KP-943 to KP-951\)](#)
- [Figure 5-27: DCR Map 27 of 52 \(KP-951 to KP-965\)](#)
- [Figure 5-28: DCR Map 28 of 52 \(KP-964 to KP-974\)](#)

- Figure 5-29: DCR Map 29 of 52 (KP-974 to KP-986)
- Figure 5-30: DCR Map 30 of 52 (KP-985 to KP-993)
- Figure 5-31: DCR Map 31 of 52 (KP-993 to KP-1007)
- Figure 5-32: DCR Map 32 of 52 (KP-1007 to KP-1017)
- Figure 5-33: DCR Map 33 of 52 (KP-1017 to KP-1027)
- Figure 5-34: DCR Map 34 of 52 (KP-1027 to KP-1038)
- Figure 5-35: DCR Map 35 of 52 (KP-1038 to KP-1049)
- Figure 5-36: DCR Map 36 of 52 (KP-1049 to KP-1060)
- Figure 5-37: DCR Map 37 of 52 (KP-1060 to KP-1071)
- Figure 5-38: DCR Map 38 of 52 (KP-1070 to KP-1081)
- Figure 5-39: DCR Map 39 of 52 (KP-1081 to KP-1092)
- Figure 5-40: DCR Map 40 of 52 (KP-1092 to KP-1102)
- Figure 5-41: DCR Map 41 of 52 (KP-1102 to KP-1112)
- Figure 5-42: DCR Map 42 of 52 (KP-1112 to KP-1122)
- Figure 5-43: DCR Map 43 of 52 (KP-1122 to KP-1132)
- Figure 5-44: DCR Map 44 of 52 (KP-1132 to KP-1143)
- Figure 5-45: DCR Map 45 of 52 (KP-1143 to KP-1154)
- Figure 5-46: DCR Map 46 of 52 (KP-1154 to KP-1165)
- Figure 5-47: DCR Map 47 of 52 (KP-1165 to KP-1175)
- Figure 5-48: DCR Map 48 of 52 (KP-1175 to KP-1186)
- Figure 5-49: DCR Map 49 of 52 (KP-1187 to KP-1197)
- Figure 5-50: DCR Map 50 of 52 (KP-1197 to KP-1207)
- Figure 5-51: DCR Map 51 of 52 (KP-1207 to KP-1217)
- Figure 5-52: DCR Map 52 of 52 (KP-1216 to KP-1220.1)

The pipeline will undergo a pressure test prior to being placed into service. The design described in this application is to test the pipeline in the DCR with a mixture of water and methanol. Pressure testing will be performed on segments that are about 15 km long. Exact locations and test section lengths will vary with the terrain and topography. [Table 6-1](#) is a list of proposed construction spreads and pressure test water sources.

**Table 6-1: Pressure Test Construction Spreads and Proposed Water Sources**

Spread	Starting KP	Ending KP	Length Estimated (km)	Proposed Primary Water Source
B1	620	757	137	Mackenzie River
B2	757	907	150	Mackenzie River
A1	907	1064	157	Mackenzie River
A2	1064	1221	157	Mackenzie River

## DESCRIPTION OF UNDERTAKING (PART 4)

### Pressure Testing Procedure Using Water

Before testing begins, a detailed test plan will be developed. This plan will provide the test medium, testing schedule, water sources, water withdrawal and disposal methodologies, schematic drawings and test pressures. It will be completed when the final, detailed design and selection of the contractor(s) have been determined.

Pipeline testing is planned for winter, immediately following the construction process. Due to the low winter ground temperatures in the DCR, a water-freeze depressant mixture will be required as the test medium. A mixture consisting of about 50% freeze depressant and 50% water is currently assumed to be used. The water will be obtained from a source near the start of the pipeline section.

After a section of pipeline is installed, the pipe trench will be backfilled leaving the ends of the test section exposed for about 10 m. Test heads, comprised of a simple piping header with nozzles to allow the section to be filled with testing medium and pressurized, will be welded onto the ends of the test section. The required volumes of water will be withdrawn from the selected sources using a combination of pumps, trucks and temporary insulated surface water lines.

There will be one NPS 30 gas pipeline constructed in the DCR. The test mixture is calculated for the NPS 30 gas pipe.

The minimum volume of water required to make up the water-freeze depressant mixture is about 50% of the volume of a 15 km NPS 30 pipeline section, or about 3,500 m<sup>3</sup> of water. However, a larger volume of water-freeze depressant mixture will be prepared to allow for variability in test section lengths and handling activities. This volume of water, estimated at about 4,500 m<sup>3</sup>, will be blended with freeze depressant from temporary storage tanks and pumped into the first pipeline test section. As each subsequent section is tested, the water-freeze depressant mixture will be pushed along the pipeline, using compressed-air-driven displacement pigs.

Once a test section undergoes an acceptable pressure test, the water-freeze depressant mix might be pumped ahead to the next test section or, alternatively, transported by water truck to the next test section. A pipeline pig will then be sent through the line to ensure that the tested section of the pipeline is clean and dry.

At the end of the first construction season, the water-freeze depressant mixture will be stored in the last test section for use in the next construction season. For this reason the water-freeze depressant mixture might be treated with a biocide and oxygen scavenger to inhibit corrosion while the mixture is stored in the last test section until the following construction season.

## QUANTITY OF WATER INVOLVED (PART 7)

The quantity of water currently estimated to be required for pressure testing in the DCR will be about 4,500 m<sup>3</sup> and will depend on the length of the test section, the water-freeze depressant mixture strength, and contingency volumes. This same volume is used repeatedly from section to section through the region in both the first and second pipeline construction seasons. The freeze depressant testing fluid for the northern pipeline spreads in the DCR is expected to be obtained from outside the region. The freeze depressant testing fluid for the southern pipeline spreads in the DCR is expected to be obtained from within the region.

The volumes listed in [Table 6-2](#) indicate the estimated water requirements. The same mixture will be used in the second test year, with minor volumes required as make-up.

Any spills or leaks of the freeze depressant mixture will be handled in accordance with the emergency response plan (see [Section 11](#)).

**Table 6-2: Pipeline Pressure Testing Water Requirements – DCR**

Description	Water Requirements	
	Total Volume	Average Daily Volume <sup>a</sup>
521.9 km of 762 mm OD (NPS 30) gas pipe	4,500 m <sup>3</sup>	Not applicable
Total water requirements for pressure testing	4,500 m <sup>3</sup>	
NOTE: <sup>a</sup> Average daily volume is not meaningful in this context.		

The estimated water requirements will be refined when a final pressure testing plan has been completed during the final project design and prior to the commencement of construction.

## WASTE DEPOSITS (PART 8)

After pressure testing is completed in the final construction season, the water-freeze depressant mixture will be removed from the pipeline. Test water containing freeze depressant will not be discharged into the natural environment. The freeze depressant will either be separated from the water, or the complete mixture will be salvaged or disposed of in an environmentally appropriate manner.

A number of options are being investigated, both singly and in combination, for the disposal or salvage of the test mixture. These include:

- using mobile chemical recycling facilities to extract the freeze depressant on site

- pumping the mixture to Norman Wells through the pipeline system for deep well injection
- temporarily storing the freeze depressant in tanks for salvage
- using a centralized process to recover or flare the depressant

If the freeze depressant is extracted by flaring, filtering, or evaporation, the treated water will be tested to ensure standards of water quality have been met prior to its release into the natural drainage system. Recovered freeze depressant will be reused or disposed of through an approved facility or to a qualified salvage contractor. Arrangements will be made for extraction and disposal of the freeze depressant prior to the start of pressure testing.

### **SCHEDULE (PART 13)**

In the DCR, testing is planned to take place when pipeline construction has been completed. These dates are currently estimated to be the late winters of 2007-2008 and 2008-2009 (see [Section 3](#) for additional information).

