INTRODUCTION

This section supports an application for the land use activities and operations associated with the two pipeline segments on Gwich'in private lands (see Figure 6-1). It includes:

- an estimate of personnel requirements
- a summary of the operations
- a description of potential environmental and resource effects
- construction equipment estimates
- detailed information about the pipeline segments, including:
    - pipeline rights-of-way
    - watercourse crossings
    - access roads
    - appurtenances

The pipeline segments in this section are numbered from north to south and are determined by the boundaries between the settlement regions and between private settlement land, Crown land and Commissioner's land. This results in six pipeline segments in the GSA, four on Crown land and two on Gwich'in private land. The site boundaries for the Inuvik area facility separate the pipeline through the most northerly section of Crown land into two segments (C1 and C2). There are no pipeline segments through Commissioner's land in the GSA.

Site-specific maps showing the location of individual pipeline segments are provided in the subjects included in this section.

PERSONNEL (PART 3)

Parts of two pipeline construction spreads will be built across private lands during the winters of 2006-2007 through 2009-2010. About 110.1 km of the proposed pipelines will be constructed on private lands.

Beginning at the Inuvik area facility (KP-0.0), there will be two parallel pipelines sharing the same 50 m right-of-way – an NPS 10 NGL pipeline and an NPS 30 gas pipeline. The construction spread configuration for the entire pipeline is shown in the foldout maps in Appendix C.

The northern crew will operate out of the Campbell Lake infrastructure site and the southern crew from the Little Chicago infrastructure site. The personnel in

these spreads will consist of up to 1,350 people to manage, support and execute all elements of the construction process.

SUMMARY OF OPERATIONS (PART 5)

The land use activities and operations described in this section include:

- developing and maintaining about 110 km of 50 m wide pipeline right-of-way that will contain:
  - about 110 km of NPS 30 gas pipeline
  - about 110 km of NPS 10 NGL pipeline
  - pipeline appurtenances such as valves, cathodic protection devices, signs and markers
  - watercourse crossings, where required, along the pipeline right-of-way
- developing and maintaining about 23 access roads with a total length of 20 km (for cross-sections, see Section 3) connecting the pipeline right-of-way, existing transportation routes, water sources, infrastructure sites and roads near watercourse crossings
- using additional temporary workspace in support of construction activities

Figure 6-1 is an overview map of the pipeline segments. The following subjects describe the proposed alignment of these pipeline segments:

- Subject 6.2 Pipeline Segment P1
- Subject 6.3 Pipeline Segment P2

Preconstruction Activities

Before construction activities begin on the right-of-way:

- a preconstruction survey will be conducted to finalize the alignment
- detailed planning will be conducted to locate temporary construction access from the pipeline right-of-way to existing transportation routes, water sources, borrow sites and near watercourse crossings
- geotechnical evaluations will be conducted, as required

Development Activities

Pipeline Right-of-Way

The segments of the pipelines on private lands within the GSA are included in Table 6-1.

Table 6-1: Pipeline Segments within Gwich'in Private Lands

Segment	Starting Kilometre Post (KP)	Ending Kilometre Post (KP)	Length (km)
P1	11.8	15.2	3.4
P2	48.1	154.7	106.6

On either side of these segments, the pipeline traverses GSA Crown lands. These right-of-way segments are the subject of the GSA Crown land use permit application.

The right-of-way width provides for most pipeline construction activities, including storage of snow, spoil and slash, workspace for trenching, welding and stringing activities, and a travel lane for moving personnel and equipment. Section 3 contains typical schematics of the pipeline right-of-way configurations.

Additional temporary workspace will be required in certain areas such as watercourse crossings, pipeline appurtenances, cross slopes and truck turnarounds during the construction period, as shown in Section 3. The temporary workspace requirement for watercourse crossings and pipeline appurtenances is listed in the pipeline subjects that follow. Temporary workspace requirements for pipeline construction activities are shown in Table 6-2.

This space is necessary for construction activities and is incremental to the right-of-way itself. The need, exact location and size of any additional temporary workspaces will be determined in the field and will be based on, among other things, geographic conditions encountered during construction (see Section 3).

Table 6-2: Estimated Temporary Workspace Requirements

Use of Temporary Workspace	Description of Use	Approximate Site Size	Number of Locations	Total Area (ha)
Truck turnarounds	Area for trucks and buses to turn around	20 m x 50 m	1	0.1
Cross slopes	Area required for working on right-of-way where cross slopes are excessive	8 m x length of cross slope	186	22.2

Table 6-2: Estimated Temporary Workspace Requirements (cont'd)

Use of Temporary Workspace	Description of Use	Approximate Site Size	Number of Locations	Total Area (ha)
Laydown areas	Extra space required at the beginning and end of each construction spread	200 m x 150 m	1	3.0
Watercourse crossings	Area required for crossing activities and to lay down pipe	6,000 m^2	19	11.4
Block valves/ CP sites	Extra space required for construction of a valve/CP site on the right-of-way	3,500 m^2	6	2.1
Total				38.8

Access Roads

About 23 temporary access roads will be required on private lands in the GSA. These roads will provide access to the pipeline right-of-way, existing transportation routes, water sources, borrow sites and watercourse crossings (see Table 6-3). The alignment of these roads will be finalized as engineering design progresses.

Table 6-3: Access Roads for Water Sources and Pipeline Construction

Segment	Number of Access Roads	Land Use			Estimated Length (km)
		Municipal Length (km)	Private Length (km)	Crown Length (km)	
P1	2	-	4.3	7.0	11.3
P2	21	-	15.7	-	15.7
Totals	23	0.0	20.0	7.0	27.0

Watercourse Crossings

Access Roads and Right-of-Way Travel Lanes

Watercourses and ravines encountered during the construction of access roads and right-of-way travel lanes, both between sites and at crossing locations, will be crossed using one of six main techniques – permanent bridges, temporary bridges, culvert crossings, timber fill crossings, ice bridges and snow fill crossings. Descriptions of each crossing type are provided in Section 3.

Crossing locations are listed in Subject 6.2 (P1) and Subject 6.3 (P2).

Figure 6.1 has been moved to reduce file size. To view it, click on the link to the figure in the web page List of Figures for this document.

Pipelines

Watercourses encountered along the right-of-way will be crossed using one of three main techniques – trenchless horizontal directional drilling, isolated crossings or open cut crossings. Descriptions of these techniques are contained in Section 3. No trenchless or aerial crossings are presently planned for watercourse crossings on private lands within the GSA.

A summary of the crossings for each pipeline segment is shown in Table 6-4.

Table 6-4: Watercourse Crossings Along the Pipeline Right-of-Way

Segment	Horizontal Directional Drills (HDD)	Isolated	Large Open Cut	Open Cut	Number of Crossings
P1	-	-	1	-	1
P2	-	1	17	46	64
Totals	0	1	18	46	65

Pipeline Appurtenances

Various appurtenances will be installed on the right-of-way for pipeline operations and maintenance. These include cathodic protection devices, block valves, pigging facilities, signs and markers (see Section 3).

A summary of the pipeline appurtenances is provided in Table 6-5. Most appurtenances will be located in shared sites to reduce disturbance and to facilitate operations and maintenance activities. For appurtenance locations, see Section 3 and the individual pipeline segment descriptions in this section.

Table 6-5: Pipeline Appurtenances Summary

Segment	Block Valve Sites	Gas Block Valve Sites	NGL Block Valve Sites	Cathodic Protection Sites
P1	-	-	-	-
P2	-	1	4	1

SUMMARY OF POTENTIAL ENVIRONMENTAL AND RESOURCE EFFECTS (PART 6)

Individual pipeline segments in the GSA might cover different ecological regions with significant variations in the terrestrial environment including vegetation types, soils and landforms, and wildlife habitat. This makes the prediction of specific effects and mitigation on a segment-specific basis difficult to quantify at

this stage of the project. Therefore, information addressing potential environmental and resource effects has been presented for the region in Section 8.

EQUIPMENT (PART 10)

Table 6-6 shows an estimate of the equipment that might be required for a typical pipeline construction spread. An exact list and numbers will not be known until immediately before construction.

Table 6-6: Estimate of Typical Pipeline Construction Equipment

Type and Approximate Number per Site	Size, Model or Equivalent	Proposed Use
Trucks – 32	Tandem tractor	Hauling
Trucks – 7	Tandem crane	Lifting
Trucks – 164	4x4 Pick–up and crew cab	Personnel transport
Trucks – 110	Mechanic rig	Field mechanic
Ambulances – 14	4x4	First aid, med-evac
Trucks – 7	Tandem fuel	Equipment fuelling
Trucks – 7	Tandem service	Equipment servicing
Trucks – 37	1 and 3 ton flat bed	Hauling
Trucks – 2	SA picker	Loading and hauling
Trucks – 8	Tandem water	Water hauling
Trailers – 10	Low-boy	Hauling
Jeeps – 3	4x4	Personnel transport
Trailers – 19	Pole, tri-axle	Hauling
Trailers – 32	High-boy	Hauling
Trailers – 23	Warehouse van	Parts and supplies
Trailers – 11	Office skid	Administration
Buses – 55	36, 24, 12 passenger 4x2	Personnel transport
Athey tracks – 13	As required	Hauling
Sidebooms – 63	Standard medium to large sized sidebooms	Pipe work
Sidebooms – 18	Auto-weld	Carry welding shelters
Bulldozers – 64	Medium and large sized dozers (310-400 hp)	Earth moving
Tractors – 5	Medium sized tractor	Pipe crews, early work
Mechanical welding equipment – 1	As required	Weld pipe

Table 6-6: Estimate of Typical Pipeline Construction Equipment (cont'd)

Type and Approximate Number per Site	Size, Model or Equivalent	Proposed Use
Quad welders – 8	As required	Weld pipe
Mechanical welding shelters – 18	As required	Shelter welders
Welding sleds – 8	As required	Transport welders
Ditchers – 3	Bucket	Trenching
Ditchers – 4	Chain	Trenching
Clamshell mechanical ditchers – 4	Medium sized excavator	Excavation
Tracked mechanical ditchers – 45	Large sized excavator	Excavation
Dump trucks – 48	Articulated	Hauling earth
Snowmobiles – 13	As required	Transport
Nodwells – 4	As required	Hauling
Graders – 6	Large sized grader (4.3 m blade)	Road grading
Loaders – 8	Large sized loader (3.0m3 bucket loader)	Loading granular dump trucks
Cranes – 5	100 tonne tracked	Lifting and loading
Bending machines (comes with dies and mandrels) – 2	As required	Pipe bending
Internal clamps – 4	As required	Pipe work
Skid sleds – 64	As required	Pipe work
External clamps – 10 to 20	As required	Pipe work
Bevelling machines – 5 to 10	As required	Pipe work
Sand blasting units – 13	As required	Cleaning pipe
Lower-in belts – 10	As required	Pipe work
Pumps – 72	Assorted sizes	Ditch dewatering and testing
Testing trailers – 2	As required	Monitoring and pressure testing
Compressors – 21	150 through 1,600 cfm	Pipe work, dewatering and testing
Generators – 4	Assorted sizes	Power for hand tools and pumps
Radios – 54	Base (4) and mobile (50)	Communications
Propane tanks – 5	1,890 L	Propane storage

Table 6-6: Estimate of Typical Pipeline Construction Equipment (cont'd)

Type and Approximate Number per Site	Size, Model or Equivalent	Proposed Use
Holiday detectors – 15	As required	Testing pipe coating
Light towers – 92	Assorted sizes	Work area lighting
Pipe cradles – 13	Assorted sizes	Pipe work
Hydraulic rock drills – 5	Assorted sizes	Drilling rock
Trench boxes – 8	Assorted sizes	Store safety equipment
Skid stackers – 4	As required	Collecting and bundling skids
Fuel tanks – 15	Assorted sizes	Fuel storage

PERIOD OF OPERATION (PART 14)

The right-of-way and pipeline through private lands within the GSA are scheduled for development during the winters of 2006-2007 through 2009-2010 (see Section 3).

LOCATION OF ACTIVITIES BY MAP COORDINATES (PART 16)

Map coordinates of pipeline segments are listed in Table 6-7.

Kilometre post markers are approximate and shown for relative placement purposes only. Final KP markers will depend on the final pipeline route.

Table 6-7: Map Coordinates of Pipeline Segments

Segment	Kilometre Post (KP)	Latitude (DD)	Longitude (DD)	UTM Easting (m)	UTM Northing (m)	UTM Zone
P1 Begin	11.8	68.3249	-133.1661	575579	7580219	8
P1 End	15.2	68.2963	-133.1441	576584	7577061	8
P2 Begin	48.1	68.0498	-132.7363	594413	7550151	8
P2 End	154.7	67.5353	-130.8565	420843	7492245	9

FEES (PART 18)

The total land area required for activities contained in this section is 590.0 ha.

The land requirements are shown in Appendix A.

DESCRIPTION

The first segment of pipeline right-of-way on private lands in the GSA starts at KP-11.8. This segment is about 3.4 km long and ends at KP-15.2 (see Figure 6-2 for KP-5 to KP-18). Table 6-8 lists map coordinates of this pipeline segment.

Table 6-8: Pipeline Segment P1 (Map Coordinates)

Segment	Kilometre Post (KP)	Latitude (DD)	Longitude (DD)	UTM Easting (m)	UTM Northing (m)	UTM Zone
P1 Begin	11.8	68.3249	-133.1661	575579	7580219	8
P1 End	15.2	68.2963	-133.1441	576584	7577061	8

One watercourse crossing occurs in this pipeline segment. This segment contains no facilities, valve sites or cathodic protection facilities.

PIPELINE RIGHT-OF-WAY

The pipeline route through this segment of private land runs in a southeast direction. The crew involved in construction of the spread (E2), in which this segment is located, will be working between the ISR boundary and Crossing Creek Lake. Construction of this segment is currently planned primarily for the winters of 2006-2007 through 2009-2010.

The right-of-way will be 50 m wide. In some areas, construction activities might require temporary workspace during the construction period (see Summary of Operations in Subject 6.1 and Section 3).

ACCESS

About 4.3 km of access roads will be required on this segment. Table 6-9 contains access road details. Figure 6-3 and Figure 6-4 show the alignment of these roads.

Table 6-9: Access Roads within Pipeline Segment P1

Access Road	Kilometre Post (KP)	Land Use			Estimated Length (km)
		Municipal Length (km)	Private Length (km)	Crown Length (km)	
G-WS-W-53	12.6	-	1.7	2.6	4.3
G-PL-W-18.0	18.0	-	2.6	4.4	7.0

Currently, the defined temporary route to the right-of-way uses three different access roads. They enter the right-of-way at about KP-0.0 (G-F-A-0.0), KP-8.1 (G-PL-W-8.1) and KP-18.0 (G-PL-W-18.0). Of these, G-PL-W-8.1, is the only one that does not cross Gwich'in private land.

Appropriate portable bridges and ice bridges will be built along the right-of-way travel lane and winter access roads to accommodate the construction traffic. Section 3 contains descriptions of bridges that might be installed.

WATERCOURSE CROSSINGS

There is one watercourse crossing along the right-of-way in this segment of private land. This crossing will be completed by an open cut watercourse crossing method. Designs for this crossing will be done as part of the detailed pipeline design before construction begins.

Temporary workspace for larger crossings is required for crossing activities and to lay down pipe before trenching. About 0.6 ha of temporary workspace will be required. Table 6-10 identifies the watercourse crossing in this segment.

Table 6-10: Watercourse Crossings within Pipeline Segment P1

Crossing Class	Crossing ID	Crossing Name	Kilometre Post (KP)	Proposed Crossing Method	Proposed Temporary Workspace (ha)
Vegetated	RPR-065	Unnamed	12.1	Open Cut	0.6

OTHER CROSSINGS

There are no third party pipeline or road crossings along the right-of-way in this segment of private land.

APPURTENANCES

There are no valves or cathodic protection facilities in this pipeline segment.

PUBLIC INVOLVEMENT

No concerns regarding this pipeline segment have been expressed by the local GSA communities in meetings or discussions with Imperial. The public involvement activities are documented in Section 10 of this application.

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DESCRIPTION

The second segment of pipeline right-of-way on GSA private lands starts at KP-48.1, near North Caribou Lake. This segment ends at KP-154.7, at Thunder River. See the following figures:

- Figure 6-3: GSA Private Lands Pipeline Segment P2 Map 1 (KP-37 to KP-48)
- Figure 6-4: GSA Private Lands Pipeline Segment P2 Map 2 (KP-48 to KP-57)
- Figure 6-5: GSA Private Lands Pipeline Segment P2 Map 3 (KP-57 to KP-65)
- Figure 6-6: GSA Private Lands Pipeline Segment P2 Map 4 (KP-65 to KP-74)
- Figure 6-7: GSA Private Lands Pipeline Segment P2 Map 5 (KP-73 to KP-83)
- Figure 6-8: GSA Private Lands Pipeline Segment P2 Map 6 (KP-82 to KP-91)
- Figure 6-9: GSA Private Lands Pipeline Segment P2 Map 7 (KP-91 to KP-99)
- Figure 6-10: GSA Private Lands Pipeline Segment P2 Map 8 (KP-99 to KP-112)
- Figure 6-11: GSA Private Lands Pipeline Segment P2 Map 9 (KP-110 to KP-121)
- Figure 6-12: GSA Private Lands Pipeline Segment P2 Map 10 (KP-120 to KP-130)
- Figure 6-13: GSA Private Lands Pipeline Segment P2 Map 11 (KP-131 to KP-139)
- Figure 6-14: GSA Private Lands Pipeline Segment P2 Map 12 (KP-140 to KP-148)

- Figure 6-15: GSA Private Lands Pipeline Segment P2 Map 13 (KP-148 to KP-158)

Table 6-11 lists map coordinates of this pipeline segment.

Table 6-11: Pipeline Segment P2 (Map Coordinates)

Segment	Kilometre Post (KP)	Latitude (DD)	Longitude (DD)	UTM Easting (m)	UTM Northing (m)	UTM Zone
P2 Begin	48.1	68.0498	-132.7363	594413	7550151	8
P2 End	154.7	67.5353	-130.8565	420843	7492245	9

Several watercourse crossings occur in this pipeline segment. Some watercourses will have detailed crossing plans. This segment also contains valve and cathodic protection facilities.

PIPELINE RIGHT-OF-WAY

The pipeline route through this segment of private land runs in a southeast direction. The crews involved in the construction of the two spreads (E2 and D1) in which this segment is located, will be working from the ISR boundary and Crossing Creek Lake. Construction of this segment is currently planned primarily for the winters of 2006-2007 through 2009-2010.

The right-of-way will be 50 m wide. In some areas, construction activities will require temporary workspace during the construction period (see Summary of Operations in Subject 6.1 and Section 3).

ACCESS

About 15.7 km of access roads will be required on this segment. Table 6-12 contains access road details. Figure 6-3 and Figure 6-4 show the alignment of these roads.

Table 6-12: Access Roads within Pipeline Segment P2

Access Road Name	Kilometre Post (KP)	Land Use			Estimated Length (km)
		Municipal Length (km)	Private Length (km)	Crown Length (km)	
G-WS-W-60	49.2	-	1.2	-	1.2
G-WS-W-62a	57.9	-	0.7	-	0.7
G-WS-W-62b	61.4	-	1.5	-	1.5
G-WS-W-63	64.2	-	1.1	-	1.1

Table 6-12: Access Roads within Pipeline Segment P2 (cont'd)

Access Road Name	Kilometre Post (KP)	Land Use			Estimated Length (km)
		Municipal Length (km)	Private Length (km)	Crown Length (km)	
G-WS-W-74	73.8	-	1.8	-	1.8
G-WS-W-75	79.5	-	0.3	-	0.3
G-WS-W-76	84.3	-	0.3	-	0.3
G-WS-W-80	94.7	-	0.3	-	0.3
G-WS-W-83a	103.3	-	0.3	-	0.3
G-WS-W-83b	106.1	-	0.3	-	0.3
G-WS-W-86	111.9	-	0.7	-	0.7
G-WS-W-85	112.9	-	1.1	-	1.1
G-WS-W-87	116.7	-	0.1	-	0.1
G-WS-W-GSA11	123.2	-	1.6	-	1.6
G-WS-W-88	126.8	-	0.8	-	0.8
G-WS-W-89	137.9	-	1.2	-	1.2
G-WS-W-92	146.6	-	0.3	-	0.3
G-WS-W-93	148.9	-	0.3	-	0.3
G-WS-W-95a	151.5	-	1.4	-	1.4
G-WS-W-95b	151.5	-	0.2	-	0.2
G-WS-W-94	152.0	-	0.2	-	0.2

Temporary access to the right-of-way for the northern crew will be through a winter road starting at the Dempster Highway about 4.0 km southeast of the all-weather access road (see Section 4) to the Inuvik area facility. This access road enters the right-of-way at about KP-18.0 and is identified in Table 6-12 as G-PL-W-18.0.

Currently, the defined temporary access to the right-of-way for the southern crew is along the travel lane from the Sahtu Settlement Area.

Appropriate portable bridges and ice bridges will be built along the right-of-way travel lane and winter access roads to accommodate the construction traffic. Section 3 contains descriptions of bridges that might be installed.

WATERCOURSE CROSSINGS

There are 64 watercourse crossings along the right-of-way in this segment of private land. These crossings will be completed by one of two different watercourse crossing methods – open cut or isolated. Designs for these crossings will be done as part of the detailed pipeline design before construction begins.

Temporary workspace for larger crossings is required for crossing activities and to lay down pipe before trenching. About 10.8 ha of temporary workspace will be required. Table 6-13 identifies watercourse crossings in this segment.

Table 6-13: Watercourse Crossings within Pipeline Segment P2

Crossing Class	Crossing ID	Crossing Name	Kilometre Post (KP)	Proposed Crossing Method	Proposed Temporary Workspace (ha)
Vegetated	RPR-084	Unnamed	49.0	Open Cut	-
Vegetated	RPR-085	Unnamed	50.4	Open Cut	-
Vegetated	RPR-086	Unnamed	51.8	Open Cut	-
Vegetated	RPR-087	Unnamed	52.4	Open Cut	-
Vegetated	RPR-088	Unnamed	53.0	Open Cut	-
Vegetated	RPR-089	Unnamed	53.2	Open Cut	-
Vegetated	RPR-090	Unnamed	54.4	Open Cut	-
Vegetated	RPR-090.1	Unnamed	57.5	Open Cut	-
Vegetated	RPR-090.2	Unnamed	60.1	Open Cut	0.6
Vegetated	RPR-091	Unnamed	62.1	Open Cut	-
Vegetated	RPR-092	Unnamed	64.0	Open Cut	0.6
Vegetated	RPR-093	Unnamed	67.0	Open Cut	-
Vegetated	RPR-093.1	Unnamed	67.1	Open Cut	-
Vegetated	RPR-093.1.1	Unnamed	68.8	Open Cut	-
Vegetated	RPR-093.2	Unnamed	70.6	Open Cut	-
Vegetated	RPR-094-A	Unnamed	71.3	Open Cut	0.6
Vegetated	RPR-095	Unnamed	74.3	Open Cut	-
Vegetated	RPR-096	Unnamed	75.9	Open Cut	-
Active I	RPR-097	Travaillant River	76.8	Isolate	0.6
Vegetated	RPR-098	Unnamed	78.6	Open Cut	-
Active I	RPR-099	Unnamed	84.2	Open Cut	0.6

Table 6-13: Watercourse Crossings within Pipeline Segment P2 (cont'd)

Crossing Class	Crossing ID	Crossing Name	Kilometre Post (KP)	Proposed Crossing Method	Proposed Temporary Workspace (ha)
Vegetated	RPR-100	Unnamed	87.9	Open Cut	-
Vegetated	RPR-100.1	Unnamed	91.9	Open Cut	-
Vegetated	RPR-101	Unnamed	93.5	Open Cut	-
Vegetated	RPR-102	Unnamed	95.4	Open Cut	-
Vegetated	RPR-103	Unnamed	97.7	Open Cut	-
Vegetated	RPR-104	Unnamed	100.0	Open Cut	-
Vegetated	RPR-105	Unnamed	100.2	Open Cut	0.6
Active II	RPR-106	Unnamed	100.9	Open Cut	-
Active II	RPR-107	Unnamed	102.3	Open Cut	0.6
Active II	RPR-108	Unnamed	103.2	Open Cut	0.6
Vegetated	RPR-109	Unnamed	106.0	Open Cut	0.6
Vegetated	RPR-110	Unnamed	107.8	Open Cut	-
Vegetated	RPR-111	Unnamed	112.8	Open Cut	-
Vegetated	RPR-111.1	Unnamed	114.4	Open Cut	-
Vegetated	RPR-112	Unnamed	114.9	Open Cut	-
Vegetated	RPR-113	Unnamed	116.7	Open Cut	-
Vegetated	RPR-114	Unnamed	120.3	Open Cut	-
Vegetated	RPR-115	Unnamed	120.8	Open Cut	-
Active II	RPR-116	Unnamed	121.3	Open Cut	0.6
Active II	RPR-117	Unnamed	123.1	Open Cut	0.6
Vegetated	RPR-118	Unnamed	131.8	Open Cut	0.6
Vegetated	RPR-119	Unnamed	132.0	Open Cut	0.6
Vegetated	RPR-120	Unnamed	134.3	Open Cut	0.6
Vegetated	RPR-121	Unnamed	134.8	Open Cut	-
Vegetated	RPR-122	Unnamed	135.8	Open Cut	-
Vegetated	RPR-123	Unnamed	136.3	Open Cut	-
Vegetated	RPR-124	Unnamed	137.1	Open Cut	-
Vegetated	RPR-125	Unnamed	137.9	Open Cut	0.6
Vegetated	RPR-126	Unnamed	138.7	Open Cut	-

Table 6-13: Watercourse Crossings within Pipeline Segment P2 (cont'd)

Crossing Class	Crossing ID	Crossing Name	Kilometre Post (KP)	Proposed Crossing Method	Proposed Temporary Workspace (ha)
Vegetated	RPR-127	Unnamed	139.5	Open Cut	-
Vegetated	RPR-128	Unnamed	140.3	Open Cut	0.6
Vegetated	RPR-129	Unnamed	141.4	Open Cut	-
Vegetated	RPR-130	Unnamed	141.7	Open Cut	-
Active II	RPR-131	Unnamed	142.7	Open Cut	0.6
Active II	RPR-132	Unnamed	145.3	Open Cut	-
Vegetated	RPR-133	Unnamed	146.1	Open Cut	-
Active II	RPR-134	Unnamed	146.4	Open Cut	0.6
Vegetated	RPR-135	Unnamed	147.4	Open Cut	-
Vegetated	RPR-136	Unnamed	148.9	Open Cut	-
Vegetated	RPR-137	Unnamed	149.8	Open Cut	-
Vegetated	RPR-138	Unnamed	150.5	Open Cut	-
Vegetated	RPR-139	Unnamed	151.5	Open Cut	-
Vegetated	RPR-140	Unnamed	153.8	Open Cut	-

OTHER CROSSINGS

There are no third party pipeline or road crossings along the right-of-way in this segment of private land.

APPURTENANCES

Along the right-of-way within the GSA, there are gathering, gas and NGL valve sites and cathodic protection sites. All of these sites will be accessed through the pipeline right-of-way. Temporary workspace is required for valve locations along the right-of-way.

Table 6-14 shows the appurtenances and temporary workspace in this segment of private lands (see also Figure 6-7, Figure 6-10 and Figure 6-15).

NGL Valve Sites

Four NGL block valve sites occur in this segment of right-of-way (see Table 6-14 and Figure 6-7, Figure 6-10 and Figure 6-15). These NGL valve sites are located within the pipeline right-of-way and will not require any additional permanent lands.

Gas Valve Site

One gas valve site occurs within this segment of the right-of-way. It is located at KP-69.7 and will not require any additional permanent lands (see Table 6-14 and Figure 6-6).

Cathodic Protection Site

There is one cathodic protection site within this segment. The site is located at KP-069.7 and is labelled CP-05. It is located within a valve site (see Figure 6-6) and will not require any additional permanent lands.

Table 6-14: Appurtenances within Pipeline Segment P2

Appurtenance/ Facility ID	Name and Location	Kilometre Post (KP)	Temporary Workspace (ha)
GAS BV-002	Fish Trap Lake future compressor station (Automated Block Valve No. 2)	69.7	0.35
CP-05	Cathodic Protection Site No. 5 (within block valve footprint)	69.7	-
NGL BV-004	Block Valve No. 4 (Automated)	76.5	0.35
NGL BV-005/ NGL CV-003	Block Valve No. 5 and Check Valve No. 3 (Manual)	79.3	0.35
NGL BV-006/ NGL CV-004	Block Valve No. 6 and Check Valve No. 4 (Manual)	108.7	0.35
NGL BV-007	Block Valve No. 7 (Automated)	152.9	0.35

PUBLIC INVOLVEMENT

Public concerns were raised regarding several proposed pipeline routes through the Travaillant Lake, Mackenzie/Tree Conservation Zone. The Tsiigehtchic community felt that the original route was too close to Travaillant Lake. It was also understood that burial sites were close to an adjusted preliminary route. Imperial worked with the communities to establish the Tsiigehtchic alternative route, which addressed the main concerns expressed by the communities and shortened the route through the Travaillant Lake, Mackenzie/Tree River Conservation Zone by about two kilometres.

The public involvement activities are documented in Section 10 of this application.

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Figure 6.4 has been moved to reduce file size. To view it, click on the link to the figure in the web page List of Figures for this document.

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Figure 6.15 has been moved to reduce file size. To view it, click on the link to the figure in the web page List of Figures for this document.

There are no facilities associated with this application.