INTRODUCTION

This section supports an application for the land use activities and operations associated with the five gathering pipeline segments on ISR Crown lands (see Figure 6-1). The five segments exist on four gathering pipeline laterals in the ISR. The Taglu lateral consists of two Crown segments that are divided by a 23.6 km private land segment. The text includes:

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

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

PERSONNEL (PART 3)

Parts of two pipeline construction spreads will be built across Crown lands in the ISR during the winters of 2006-2007 through 2008-2009. About 151.6 km of gathering pipelines will be constructed on Crown lands.

The gathering pipelines originate at the three gas conditioning facilities at Niglintgak, Taglu, and Parsons Lake. The Taglu and Parsons Lake laterals will come together at the Storm Hills pigging facility (KP-S0.0) and flow south to the Inuvik area facility (KP-0.0) along the Storm Hills lateral. The gathering pipeline laterals will be built as follows:

- Niglintgak lateral – NPS 16 pipeline in a 30 m right-of-way
- Taglu lateral – NPS 26 pipeline in a 40 m right-of-way
- Parsons Lake lateral – NPS 18 pipeline in a 30 m right-of-way
- Storm Hills lateral – NPS 30 pipeline in a 40 m right-of-way

The construction spread configuration for the Mackenzie Gas Project is shown in the foldout maps in Appendix C.

The northern crew will operate out of the Swimming Point infrastructure site and the southern crew from the Campbell Lake infrastructure site in the GSA. 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 15.7 km of 30 m wide gathering pipeline right-of-way for the NPS 16 raw gas gathering pipeline – Niglintgak lateral
- developing and maintaining about 57.8 km of 40 m wide gathering pipeline right-of-way for the NPS 26 raw gas gathering pipeline – Taglu lateral
- developing and maintaining about 26.5 km of 30 m wide gathering pipeline right-of-way for the NPS 18 raw gas gathering pipeline – Parsons Lake lateral
- developing and operating about 51.6 km of 40 m wide gathering pipeline right-of-way for the NPS 30 raw gas gathering pipeline – Storm Hills lateral
- each of the four laterals will contain:
    - pipeline appurtenances such as valves, cathodic protection devices, signs and markers
    - watercourse crossings, where required, along the associated right-of-way
- developing and maintaining about 27 winter access roads with a total length of 30.2 km (for cross-sections, see Section 3) connecting the gathering pipeline rights-of-way, existing transportation routes, water sources, infrastructure sites, borrow sites and GNWT winter roads near watercourse crossings
- using additional temporary workspace in support of construction activities

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

- Subject 6.2 Gathering Pipeline Segment C1
- Subject 6.3 Gathering Pipeline Segment C2
- Subject 6.4 Gathering Pipeline Segment C3
- Subject 6.5 Gathering Pipeline Segment C4
- Subject 6.6 Gathering Pipeline Segment C5

Preconstruction Activities

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

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

Planned Development Activities

Gathering Pipeline Rights-of-Way

The segments of the gathering pipelines on Crown lands in the ISR are included in Table 6-1.

Table 6-1: Gathering Pipeline Segments within Inuvialuit Crown Lands

Segment	Starting Kilometre Post (KP)	Ending Kilometre Post (KP)	Length (km)
C1	N0.0	N15.7	15.7
C2	T0.0	T33.7	33.7
C3	T57.3	T81.4	24.1
C4	P0.0	P26.5	26.5
C5	S0.0	S51.6	51.6

On either side of these segments, the related gathering pipeline traverses either GSA Crown lands or ISR private lands. The right-of-way segments are the subject of the ISR private land ILA Application Report and Gwich'in Crown land use permit applications for the project.

The right-of-way width provides for most gathering 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 gathering pipeline rights-of-way configurations.

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.

Additional temporary workspace will be required in certain areas such as water 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 gathering pipeline construction activities are shown in Table 6-2.

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	18	1.8
Laydown areas	Extra space required at the beginning and end of each construction spread	~ 200 m x 150 m	4	11.6
Side bends	Extra space required when a large side bend is encountered in the routing	20 m x 100 m on workside	2	0.4
Cross slopes	Area required for working on right-of-way where cross slopes are excessive	8 m x length of cross slope	197	23.8
Watercourse crossings	Area required for crossing activities and to lay down pipe	6,000 m^2	48	33.5
Total				71.1

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).

Access Roads

About 27 temporary winter access roads will be required on ISR Crown lands. These roads will provide access to the gathering pipeline rights-of-way, existing transportation routes, water sources, infrastructure sites, borrow sites and watercourse crossings (see Table 6-3). Detailed planning will be required to finalize the alignment of these roads.

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

Segment	Number of Access Roads	Estimated Crown Length (km)
C1	3	5.7
C2	8	7.3
C3	3	3.1

Table 6-3: Access Roads for Water Sources and Pipeline Construction (cont'd)

Segment	Number of Access Roads	Estimated Crown Length (km)
C4	5	2.4
C5	8	11.7
Totals	27	30.2

Watercourse Crossings

Access Roads and Right-of-Way Travel Lanes

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

Crossing locations are listed in Subject 6.2 (C1), Subject 6.3 (C2), Subject 6.4 (C3), Subject 6.5 (C4) and Subject 6.6 (C5).

Gathering Pipelines

Watercourses encountered along the gathering pipeline rights-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.

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

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

Segment	Horizontal Directional Drill (HDD)	Isolated	Open Cut	Number of Crossings
C1	3	-	5	8
C2	3	1	10	14
C3	-	-	26	26
C4	-	1	18	19
C5	-	2	36	38
Totals	6	4	95	105

Gathering Pipeline Appurtenances

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

A summary of the gathering 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 gathering pipeline segment descriptions in this section.

Table 6-5: Gathering Pipeline Appurtenances Summary

Segment	Block Valve Sites	Cathodic Protection Sites
C1	2	-
C2	1	1
C3	1	-
C4	2	-
C5	1	1

SUMMARY OF POTENTIAL ENVIRONMENTAL AND RESOURCE EFFECTS (PART 6)

Individual gathering pipeline segments in the ISR 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 is presented for the region as a whole 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 Gathering 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 – 11	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 bulldozers (310-400 HP)	Earth moving
Tractors – 5	Medium sized tractor	Pipe crews, early work
Mechanical welding equipment – 1	As required	Weld pipe
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

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

Type and Approximate Number per Site	Size, Model or Equivalent	Proposed Use
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 (3.0 m^3 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
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

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

Type and Approximate Number per Site	Size, Model or Equivalent	Proposed Use
Skid stackers – 4	As required	Collecting and bundling skids
Fuel tanks – 15	Assorted sizes	Fuel storage

PERIOD OF OPERATION (PART 14)

The rights-of-way and gathering pipelines through Crown lands within the ISR are scheduled for development during the winters of 2006-2007 through 2008-2009 (see Section 3), with cleanup and restoration continuing into 2009-2010.

LOCATION OF ACTIVITIES BY MAP COORDINATES (PART 16)

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

Kilometre post markers are approximate and shown for relative placement purposes only. Their locations depend on the route version and should not be interpreted as absolute positions along the gathering pipeline corridors.

Table 6-7: Map Coordinates – Gathering Pipeline Segments

Segment	Kilometre Post (KP)	Latitude (DD)	Longitude (DD)	UTM Easting (m)	UTM Northing (m)	UTM Zone
C1 Begin	N0.0	69.3037	-135.2656	489526	7688252	8
C1 End	N15.7	69.3745	-134.9651	501374	7696121	8
C2 Begin	T0.0	69.3745	-134.9651	501374	7696121	8
C2 End	T33.7	69.1732	-134.4053	523592	7673791	8
C3 Begin	T57.3	68.9989	-134.1266	534918	7654501	8
C3 End	T81.4	68.8124	-133.8418	546711	7633878	8
C4 Begin	P0.0	68.9865	-133.5718	557150	7653525	8
C4 End	P26.5	68.8124	-133.8418	546711	7633878	8
C5 Begin	S0.0	68.8124	-133.8418	546711	7633878	8
C5 End	S51.6	68.4166	-133.3118	569298	7950284	8

FEES (PART 18)

The total land area required for activities described in this section is 695.7 ha, consisting of 564.2 ha of gathering pipeline right-of-way, 60.4 ha of winter access roads and 71.1 ha of temporary workspace.

The land requirements are shown in Appendix A.

INTRODUCTION

The first segment of gathering pipeline right-of-way on ISR Crown lands starts at KP-N0.0, at the Niglintgak gas conditioning facility. This segment is about 15.7 km long and ends at KP-N15.7 at the Taglu gas conditioning facility (see Figure 6-2 for KP-N0.0 to KP-N7.0 and Figure 6-3 for KP-N7.0 to KP-N15.7). Table 6-8 lists map coordinates of this gathering pipeline segment. This segment is also referred to as the Niglintgak lateral.

Table 6-8: Map Coordinates – Gathering Pipeline Segment C1

Segment	Kilometre Post (KP)	Latitude (DD)	Longitude (DD)	UTM Easting (m)	UTM Northing (m)	UTM Zone
C1 Begin	N0.0	69.3037	-135.2656	489526	7688252	8
C1 End	N15.7	69.3745	-134.9651	501374	7696121	8

Several watercourse crossings occur in this pipeline segment. Some watercourses will have detailed crossing plans. This segment also contains valve sites within the Niglintgak and the Taglu gas conditioning facilities.

GATHERING PIPELINE RIGHT-OF-WAY

The gathering pipeline route through this segment of Crown land runs in a northeast direction. The crew involved in construction of the spread (E1), in which this segment is located, will be working between Storm Hills pigging facility and the gas conditioning facilities. Construction of this segment is currently planned for the winters of 2006-2007 through 2007-2008 with cleanup and restoration to follow.

The right-of-way will be 30 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 5.7 km of winter access roads will be required for 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 Gathering Pipeline Segment C1

Access Road Name	Kilometre Post (KP)	Crown Length (km)	Estimated Length (km)
I-PL-W-0.6	N0.6	3.6	3.6
I-WS-W-46B	N4.8	1.9	1.9
I-WS-W-46C	N7.0	0.2	0.2

Currently, the defined temporary route to the right-of-way uses the Middle Channel and access road I-PL-W-0.6. This road enters the right-of-way at about KP-N0.6 and is identified in Table 6-9.

Appropriate snow or ice bridges will be built along the right-of-way travel lane and winter access roads to accommodate the construction traffic (see Section 3 for a description of bridges that might be installed).

WATERCOURSE CROSSINGS

There are eight watercourse crossings along the right-of-way in this gathering pipeline segment on ISR Crown land. These crossings will be completed by one of two different watercourse crossing methods – open cut or horizontal directional drilling (HDD). Designs for the crossings will be done as part of the detailed gathering pipeline design before construction begins.

Temporary workspace is required for crossing activities and to lay down pipe. About 6.2 ha of temporary workspace will be required. Table 6-10 identifies watercourse crossings in this gathering pipeline segment.

Table 6-10: Watercourse Crossings within Gathering Pipeline Segment C1

Crossing Class	Crossing ID	Crossing Name	Kilometre Post (KP)	Proposed Crossing Method	Proposed Temporary Workspace (ha)
Active I	RNT-02	Aklak Channel	N2.2	HDD	1.5
Vegetated	RNT-03	Unnamed	N3.5	Open Cut	0.6
Vegetated	RNT-03.1	Unnamed	N7.6	Open Cut	-
Lake	RNT-03.2	Unnamed	N9.9	Open Cut	-
Vegetated	RNT-03.3	Unnamed	N10.9	Open Cut	-
Large	RNT-04	Kanguk Channel	N13.2	HDD	1.6
Active II	RNT-05	Unnamed	N13.7	Open Cut	0.6
Large	RNT-06	Kuluarpak Channel	N14.5	HDD	1.9

OTHER CROSSINGS

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

APPURTENANCES

Along this right-of-way segment within ISR Crown lands, there are two block valve sites. Both of these sites will be accessed through the right-of-way. Temporary workspace will not be required for valve locations.

A list of the appurtenances and temporary workspace in this gathering pipeline segment on Crown lands is presented in Table 6-11.

Block Valve Sites

Block valve BV-001 is located at KP-N0.0 and block valve BV-002 is located at KP-N15.7 (see Figure 6-2 and Figure 6-3). These block valve sites are located completely within facility footprints and will not require any additional permanent lands.

Cathodic Protection Sites

There are no cathodic protection sites associated with this gathering pipeline segment.

Table 6-11: Appurtenances within Gathering Pipeline Segment C1

Appurtenance/ Facility ID	Name and Location	Kilometre Post (KP)	Temporary Workspace (ha)
BV-001	Niglintgak gas conditioning facility – Start of Niglintgak lateral (Gathering Pipeline Block Valve No. 1)	N0.0	-
BV-002	Taglu gas conditioning facility – End of Niglintgak lateral (Gathering Pipeline Block Valve No. 2)	N15.7	-

PUBLIC INVOLVEMENT

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

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Figure 6.3 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.

INTRODUCTION

The second segment of gathering pipeline right-of-way on Crown lands within the ISR starts at KP-T0.0, at the Taglu gas conditioning facility. This segment is about 33.7 km long and ends at KP-T33.7. See the following figures:

- Figure 6-4 for KP-T0.0 to KP-T1.0
- Figure 6-5 for KP-T1.0 to KP-T10.0
- Figure 6-6 for KP-T10.0 to KP-T21.0
- Figure 6-7 for KP-T21.0 to KP-T32.0
- Figure 6-8 for KP-T32.0 to KP-T33.7

Table 6-12 lists map coordinates of this gathering pipeline segment. This segment is also referred to as a part of the Taglu lateral.

Table 6-12: Map Coordinates – Gathering Pipeline Segment C2

Segment	Kilometre Post (KP)	Latitude (DD)	Longitude (DD)	UTM Easting (m)	UTM Northing (m)	UTM Zone
C2 Begin	T0.0	69.3745	-134.9651	501374	7696121	8
C2 End	T33.7	69.1732	-134.4053	523592	7673791	8

Several watercourse crossings occur in this gathering pipeline segment. This segment also contains valve and cathodic protection facilities within the Taglu gas conditioning facility site.

GATHERING PIPELINE RIGHT-OF-WAY

The gathering pipeline route through this segment of Crown land runs in a southeast direction. The crew involved in construction of the spread (E1) in which this segment is located, will be working between Storm Hills pigging facility and the gas conditioning facilities. Construction of this segment is currently planned for the winters of 2006-2007 through 2007-2008 with cleanup and restoration to follow.

The right-of-way will be 40 m wide. In some areas, construction activities will require a temporary workspace during the construction period (see Summary of Operations in Section 6.1 and Section 3).

ACCESS

About 7.3 km of winter access roads will be required for this segment. Table 6-13 contains access road details. Figure 6-4 through Figure 6-8 show the alignment of these roads.

Table 6-13: Access Roads within Gathering Pipeline Segment C2

Access Road Name	Kilometre Post (KP)	Crown Length (km)	Estimated Length (km)
I-WS-W-46F	T0.6	1.5	1.5
I-WS-W-2	T5.5	0.4	0.4
I-WS-W-3	T7.7	0.1	0.1
I-WS-W-4	T11.1	0.8	0.8
I-WS-W-7	T16.8	0.8	0.8
I-WS-W-9	T21.7	1.7	1.7
I-WS-W-10a	T23.4	1.1	1.1
I-WS-W-10b	T23.7	0.9	0.9

Currently, the defined temporary access to the right-of-way is along the Harry Channel and the East Channel of the Mackenzie River. These winter roads enter the right-of-way at KP-T1.7 and KP-T39.1, respectively.

Appropriate 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 14 watercourse crossings along the right-of-way in this gathering pipeline segment on ISR Crown land. These crossings will be completed by one of three different watercourse crossing methods – open cut, isolated or horizontal directional drilling (HDD). Designs for the crossings will be done as part of the detailed gathering pipeline design before construction begins.

About 8.7 ha of temporary workspace will be required for crossing activities and to lay down pipe before trenching. Table 6-14 identifies watercourse crossings in this gathering pipeline segment on ISR Crown land.

Table 6-14: Watercourse Crossings within Gathering Pipeline Segment C2

Crossing Class	Crossing ID	Crossing Name	Kilometre Post (KP)	Proposed Crossing Method	Proposed Temporary Workspace (ha)
Active I	RPR-001	Unnamed Delta Channel	T1.5	HDD	0.9
Large	RPR-002	Harry Channel	T1.7	HDD	0.9
Active I	RPR-003	Unnamed Delta Channel	T2.5	Open Cut	0.6
Vegetated	RPR-004	Unnamed Delta Channel	T4.4	Open Cut	0.6
Active I	RPR-005	Unnamed Delta Channel	T5.1	HDD	1.5
Lake	RPR-006	Lake	T10.8	Isolated	0.6
Active II	RPR-006.1	Unnamed	T13.4	Open Cut	0.6
Vegetated	RPR-006.2	Unnamed	T19.5	Open Cut	-
Active II	RPR-007	Yaya River	T23.7	Open Cut	0.6
Active II	RPR-008	Unnamed	T26.2	Open Cut	0.6
Vegetated	RPR-009	Unnamed	T30.0	Open Cut	0.6
Vegetated	RPR-009.1	Unnamed	T31.6	Open Cut	0.6
Vegetated	RPR-010	Unnamed	T32.2	Open Cut	-
Vegetated	RPR-010.1	Unnamed	T32.7	Open Cut	0.6

OTHER CROSSINGS

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

APPURTENANCES

Along this right-of-way segment within ISR Crown lands, there is a gathering pipeline block valve site and a cathodic protection site. Both of these sites will be accessed through the right-of-way. Temporary workspace will not be required for these two locations.

A list of the appurtenances in this gathering pipeline segment on Crown lands is presented in Table 6-15.

Block Valve Sites

The block valve site that occurs within this segment of right-of-way is located at KP-T0.0 and is labelled block valve BV-003 in Figure 6-4. This block valve site is located within the Taglu gas conditioning facility footprint and will not require any additional permanent lands.

Cathodic Protection Sites

The cathodic protection (CP) site within this segment is located at KP-T0.0 and is labelled CP-01. It is located within the Taglu gas conditioning facility footprint (see Figure 6-4). This CP site will not require any additional permanent lands.

Table 6-15: Appurtenances within Gathering Pipeline Segment C2

Appurtenance/ Facility ID	Name and Location	Kilometre Post (KP)	Temporary Workspace (ha)
CP-01	Cathodic Protection Site No. 1 (within Taglu Gas conditioning facility footprint)	T0.0	-
BV-003	Gathering Pipeline Block Valve No. 3 (within Taglu gas conditioning facility - Start of Taglu lateral)	T0.0	-

PUBLIC INVOLVEMENT

The local ISR communities, in meetings or discussions with Imperial, have not expressed concerns regarding this pipeline segment specifically. However, they have requested that the gathering system be moved from the proposed location west to the Ikhil route. Imperial has conducted route comparisons and concluded that the proposed gathering pipeline route is preferred because it is shorter and uses a smaller footprint than the proposed Ikhil alternatives, and as a result, will be less costly. The public involvement activities are documented in Section 10 of this application.

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Figure 6.8 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.

INTRODUCTION

The third segment of gathering pipeline right-of-way on ISR Crown lands starts at KP-T57.3. This segment is about 24.1 km long and ends at KP- T81.4, at the Storm Hills pigging facility. See the following figures:

- Figure 6-9 for KP-T57.3 to KP-T69.0
- Figure 6-10 for KP-T67.0 to KP-T79.0
- Figure 6-11 for KP-T76.0 to KP-T81.4

Table 6-16 lists map coordinates of this gathering pipeline segment. This segment is also referred to as part of the Taglu lateral.

Table 6-16: Map Coordinates – Gathering Pipeline Segment C3

Segment	Kilometre Post (KP)	Latitude (DD)	Longitude (DD)	UTM Easting (m)	UTM Northing (m)	UTM Zone
C3 Begin	T57.3	68.9989	-134.1266	534918	7654501	8
C3 End	T81.4	68.8124	-133.8418	546711	7633878	8

Several watercourse crossings occur in this gathering pipeline segment. This segment also contains a block valve site within the Storm Hill pigging facility.

GATHERING PIPELINE RIGHT-OF-WAY

The gathering pipeline route through this segment of Crown land runs in a southeast direction. The crew involved in construction of the spread (E1), in which this segment is located, will be working between Storm Hills pigging facility and the gas conditioning facilities. Construction of this segment is currently planned for the winters of 2006-2007 through 2007-2008 with cleanup and restoration to follow.

The right-of-way will be 40 m wide. In some areas, construction activities will require a temporary workspace during the construction period (see Summary of Operations in Section 6.1 and Section 3).

ACCESS

About 3.1 km of winter access roads will be required for this segment. See Table 6-17 for access road details. Figure 6-9 through Figure 6-11 show the alignment of these roads.

Table 6-17: Access Roads within Gathering Pipeline Segment C3

Access Road Name	Kilometre Post (KP)	Crown Length (km)	Estimated Length (km)
I-WS-W-22	T59.2	1.4	1.4
I-WS-W-24	T65.6	0.6	0.6
I-WS-W-25	T74.0	1.1	1.1

Currently, the defined temporary access to the right-of-way is along the East Channel of the Mackenzie River. This winter road enters the right-of-way at about KP-T39.1.

Appropriate snow or 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 26 watercourse crossings along the right-of-way in this segment on ISR Crown land. These crossings will be completed by using the open cut watercourse crossing method. Designs for these crossings will be done as part of the detailed gathering pipeline design before construction begins.

About 4.8 ha of temporary workspace will be required for crossing activities and to lay down pipe before trenching. Table 6-18 identifies the watercourse crossings in this gathering pipeline segment on ISR Crown land.

Table 6-18: Watercourse Crossings within Gathering Pipeline Segment C3

Crossing Class	Crossing ID	Crossing Name	Kilometre Post (KP)	Proposed Crossing Method	Proposed Temporary Workspace (ha)
Vegetated	RPR-015.4	Unnamed	T58.1	Open Cut	0.6
Vegetated	RPR-015.5	Unnamed	T58.9	Open Cut	-
Vegetated	RPR-015.6	Unnamed	T59.6	Open Cut	0.6
Vegetated	RPR-016	Unnamed	T60.0	Open Cut	-

Table 6-18: Watercourse Crossings within Gathering Pipeline Segment C3 (cont'd)

Crossing Class	Crossing ID	Crossing Name	Kilometre Post (KP)	Proposed Crossing Method	Proposed Temporary Workspace (ha)
Vegetated	RPR-017	Unnamed	T60.4	Open Cut	-
Vegetated	RPR-018	Unnamed	T61.1	Open Cut	-
Vegetated	RPR-019	Unnamed	T61.6	Open Cut	0.6
Vegetated	RPR-019.1	Unnamed	T62.2	Open Cut	-
Vegetated	RPR-020	Unnamed	T62.8	Open Cut	-
Vegetated	RPR-020.1	Unnamed	T63.2	Open Cut	-
Vegetated	RPR-021	Unnamed	T64.1	Open Cut	-
Vegetated	RPR-021.1	Unnamed	T65.7	Open Cut	-
Vegetated	RPR-022	Unnamed	T65.8	Open Cut	-
Vegetated	RPR-023	Unnamed	T69.3	Open Cut	-
Vegetated	RPR-024	Unnamed	T70.4	Open Cut	-
Vegetated	RPR-025	Unnamed	T71.1	Open Cut	-
Vegetated	RPR-026	Unnamed	T76.3	Open Cut	0.6
Vegetated	RPR-027	Unnamed	T76.9	Open Cut	0.6
Vegetated	RPR-028	Unnamed	T77.2	Open Cut	-
Vegetated	RPR-028.1	Unnamed	T77.3	Open Cut	-
Vegetated	RPR-029	Unnamed	T78.3	Open Cut	-
Vegetated	RPR-030	Unnamed	T78.9	Open Cut	0.6
Vegetated	RPR-030.1	Unnamed	T79.2	Open Cut	-
Vegetated	RPR-031	Unnamed	T79.9	Open Cut	0.6
Active II	RPR-032	Unnamed	T80.3	Open Cut	0.6
Vegetated	RPR-032.1	Unnamed	T80.9	Open Cut	-

OTHER CROSSINGS

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

APPURTENANCES

Along this right-of-way segment within ISR Crown lands, there is a block valve site. This site will be accessed through the right-of-way. Temporary workspace is not required for this valve location.

A list of the appurtenances and temporary workspace in this gathering pipeline segment on Crown lands is presented in Table 6-19.

Block Valve Sites

The block valve site that occurs within this segment of right-of-way located at KP-T81.4 and is labelled block valve BV-006 in Figure 6-11. This block valve site is located within the Storm Hills pigging facility footprint and will not require any additional permanent lands.

Cathodic Protection Sites

There are no cathodic protection sites associated with this gathering pipeline segment.

Table 6-19: Appurtenances within Gathering Pipeline Segment C3

Appurtenance/ Facility ID	Name and Location	Kilometre Post (KP)	Temporary Workspace (ha)
BV-006	Gathering Pipeline Block Valve No. 6 (within Storm Hills pigging facility – End of Taglu lateral)	T81.4	-

PUBLIC INVOLVEMENT

The local ISR communities, in meetings or discussions with Imperial, have not expressed concerns regarding this pipeline segment specifically. However, they have requested that the gathering system be moved from the proposed location west to the Ikhil route. Imperial has conducted route comparisons and concluded that the proposed gathering pipeline route is preferred because it is shorter and uses a smaller footprint than the proposed Ikhil alternatives, and as a result, will be less costly. The public involvement activities are documented in Section 10 of this application.

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Figure 6.11 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.

INTRODUCTION

The fourth segment of gathering pipeline right-of-way on ISR Crown lands starts at KP-P0.0, at the Parsons Lake gas conditioning facility. This segment is about 26.5 km long and ends at KP-P26.5, at the Storm Hills pigging facility. See the following figures:

- Figure 6-12 for KP-P0.0 to KP-P9.0
- Figure 6-13 for KP-P6.0 to KP-P19.0
- Figure 6-14 for KP-P19.0 to KP-P26.5

Table 6-20 lists map coordinates of this gathering pipeline segment. This segment is also referred to as the Parsons Lake lateral.

Table 6-20: Map Coordinates – Gathering Pipeline Segment C4

Segment	Kilometre Post (KP)	Latitude (DD)	Longitude (DD)	UTM Easting (m)	UTM Northing (m)	UTM Zone
C4 Begin	P0.0	68.9865	-133.5718	557150	7653525	8
C4 End	P26.5	68.8124	-133.8418	546711	7633878	8

Several watercourse crossings occur in this gathering pipeline segment. This segment also contains block valve sites within the Parsons Lake gas conditioning facility and the Storm Hills pigging facility.

GATHERING PIPELINE RIGHT-OF-WAY

The gathering pipeline route through this segment of Crown land runs in a southwest direction. The crew involved in construction of the spread (E1, in which this segment is located, will be working between the Parsons Lake gas conditioning facility and the Storm Hills pigging facility. Construction of this segment is currently planned for the winters of 2006-2007 through 2007-2008 with cleanup and restoration to follow.

The right-of-way will be 30 m wide. In some areas, construction activities will require a temporary workspace during the construction period (see Summary of Operations in Section 6.1 and Section 3).

ACCESS

About 2.4 km of winter access roads will be required for this segment. See Table 6-21 for access road details. Figure 6-12, Figure 6-13 and Figure 6-14 show the alignment of these roads.

Table 6-21: Access Roads within Gathering Pipeline Segment C4

Access Road Name	Kilometre Post (KP)	Crown Length (km)	Estimated Length (km)
I-WS-W-31a	P0.0	0.6	0.6
I-WS-W-31b	P11.4	0.4	0.4
I-WS-W-30	P22.2	0.6	0.6
I-WS-W-29	P23.9	0.7	0.7
I-WS-W-28	P24.4	0.1	0.1

Currently, the defined temporary access to the right-of-way is along the East Channel of the Mackenzie River entering the right-of-way at KP-T39.1. The other option is from the Dempster Highway to the Campbell Lake infrastructure site, then north along the all-weather access road (G-F-A-0.0) to the Inuvik area facility which connects with the right-of-way at KP-0.0.

Appropriate snow or ice bridges will be built along the right-of-way travel lane and winter access roads to accommodate the construction traffic (see Section 3 for a generic description of bridges that might be installed).

WATERCOURSE CROSSINGS

There are 19 watercourse crossings along the right-of-way in this gathering pipeline segment on ISR Crown land. These crossings will be completed by one of two different watercourse crossing methods – open cut or isolated. Crossing designs will be part of the detailed gathering pipeline design before construction begins.

The gathering pipeline crossing of Zed Creek is listed using an isolated technique. The creek might be crossed using an aerial technique depending on additional detailed crossing designs.

About 6.0 ha of temporary workspace will be required for crossing activities at these 19 locations and to lay down pipe before trenching. Table 6-22 identifies watercourse crossings in this gathering pipeline segment on ISR Crown land.

Table 6-22: Watercourse Crossings within Gathering Pipeline Segment C4

Crossing Class	Crossing ID	Crossing Name	Kilometre Post (KP)	Proposed Crossing Method	Proposed Temporary Workspace (ha)
Vegetated	RPL-00.1	Unnamed	P0.4	Open Cut	0.6
Active I	RPL-01	Zed Creek	P5.2	Isolated	0.6
Vegetated	RPL-01.1	Unnamed	P6.3	Open Cut	0.6
Vegetated	RPL-02	Unnamed	P7.6	Open Cut	0.6
Vegetated	RPL-03	Unnamed	P8.8	Open Cut	0.6
Vegetated	RPL-03.1	Unnamed	P9.5	Open Cut	0.6
Vegetated	RPL-03.2	Unnamed	P10.0	Open Cut	-
Vegetated	RPL-04	Unnamed	P10.6	Open Cut	0.6
Vegetated	RPL-04.1	Unnamed	P12.1	Open Cut	-
Vegetated	RPL-04.2	Unnamed	P12.3	Open Cut	-
Vegetated	RPL-04.3	Unnamed	P15.1	Open Cut	-
Vegetated	RPL-04.4	Unnamed	P15.3	Open Cut	-
Vegetated	RPL-04.5	Unnamed	P17.8	Open Cut	0.6
Vegetated	RPL-05	Unnamed	P18.7	Open Cut	-
Vegetated	RPL-05.1	Unnamed	P18.9	Open Cut	0.6
Vegetated	RPL-06	Unnamed	P21.4	Open Cut	0.6
Vegetated	RPL-06.1	Unnamed	P23.0	Open Cut	-
Vegetated	RPL-07	Unnamed	P23.6	Open Cut	-
Vegetated	RPL-07.1	Unnamed	P26.0	Open Cut	-

OTHER CROSSINGS

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

APPURTENANCES

Along this right-of-way segment within ISR Crown land, there are two gathering pipeline block valve sites. Both of these sites will be accessed through the right-of-way. Temporary workspace will not be required for these valve locations.

A list of the appurtenances and temporary workspace in this gathering pipeline segment on Crown lands is presented in Table 6-23.

Block Valve Sites

Block valve BV-007 is located at KP-P0.0 and block valve BV-008 is located at KP-P26.5 (see Figure 6-12 and Figure 6-14). These block valve sites are located

completely within facility footprints and will not require any additional permanent lands.

Cathodic Protection Sites

There are no cathodic protection sites associated with this gathering pipeline segment.

Table 6-23: Appurtenances within Gathering Pipeline Segment C4

Appurtenance/ Facility ID	Name and Location	Kilometre Post (KP)	Temporary Workspace (ha)
BV-007	Gathering Pipeline Block Valve No. 7 (within Parsons Lake gas conditioning facility - Start of Parsons Lake lateral)	P0.0	-
BV-008	Gathering Pipeline Block Valve No. 8 (within Storm Hills pigging facility - End of Parsons Lake lateral)	P26.5	-

PUBLIC INVOLVEMENT

The local ISR communities, in meetings or discussions with Imperial, have not expressed concerns regarding this pipeline segment specifically. However, they have requested that the gathering system be moved from the proposed location west to the Ikhil route. Imperial has conducted route comparisons and concluded that the proposed gathering pipeline route is preferred because it is shorter and uses a smaller footprint than the proposed Ikhil alternatives, and as a result, will be less costly. The public involvement activities are documented in Section 10 of this application.

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Figure 6.14 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.

INTRODUCTION

The fifth segment of gathering pipeline right-of-way on ISR Crown lands starts at KP-S0.0, at the Storm Hills pigging facility. This segment is about 51.6 km long and ends at KP-S51.6, at the Gwich'in Settlement Area boundary. See the following figures:

- Figure 6-15 for KP-S0.0 to KP-S6.0
- Figure 6-16 for KP-S6.0 to KP-S17.0
- Figure 6-17 for KP-S17.0 to KP-S29.0
- Figure 6-18 for KP-S29.0 to KP-S42.0
- Figure 6-19 for KP-S42.0 to KP-S51.6

Table 6-24 lists map coordinates of this gathering pipeline segment. This segment is also referred to as the Storm Hills lateral.

Table 6-24: Map Coordinates – Gathering Pipeline Segment C5

Segment	Kilometre Post (KP)	Latitude (DD)	Longitude (DD)	UTM Easting (m)	UTM Northing (m)	UTM Zone
C5 Begin	S0.0	68.8124	-133.8418	546711	7633878	8
C5 End	S51.6	68.4166	-133.3118	569298	7950284	8

Several watercourse crossings occur in this gathering pipeline segment. This segment also contains valve and cathodic protection facilities within the Storm Hills pigging facility site.

PIPELINE RIGHT-OF-WAY

The gathering pipeline route through this segment of Crown 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 Storm Hills pigging facility and the ISR/GSA boundary. Construction of this segment is currently planned for the winters of 2007-2008 through 2008-2009 with cleanup and restoration to follow.

The right-of-way will be 40 m wide. In some areas, construction activities will require a temporary workspace during the construction period (see Summary of Operations in Section 6.1 and Section 3).

ACCESS

About 11.7 km of winter access roads will be required for this segment. Table 6-25 contains access road details. Figure 6-15 through Figure 6-19 show the alignment of these roads.

Table 6-25: Access Roads within Gathering Pipeline Segment C5

Access Road Name	Kilometre Post (KP)	Crown Length (km)	Estimated Length (km)
I-WS-W-33	S5.7	0.5	0.5
I-WS-W-35	S17.8	3.6	3.6
I-WS-W-38a	S22.4	1.1	1.1
I-WS-W-38b	S24.2	0.5	0.5
I-WS-W-38c	S27.7	0.2	0.2
I-WS-W-41	S34.4	3.0	3.0
I-WS-W-43	S40.7	0.8	0.8
I-WS-W-45	S42.8	2.0	2.0

Currently, the defined temporary access to the right-of-way is along the Dempster Highway to the Campbell Lake infrastructure site, then north along the all-weather access road (G-F-A-0.0) to the Inuvik area facility which connects with the right-of-way at KP-0.0.

Appropriate snow or 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 38 watercourse crossings along the right-of-way in this gathering pipeline segment on ISR Crown land. These crossings will be completed by one of two different watercourse crossing methods – open cut and isolated. Designs for the crossings will be done as part of the detailed pipeline design before construction begins.

About 7.8 ha of temporary workspace will be required for crossing activities and to lay down pipe before trenching. Table 6-26 identifies the watercourse crossings in this gathering pipeline segment on ISR Crown land.

Table 6-26: Watercourse Crossings within Gathering Pipeline Segment C5

Crossing Class	Crossing ID	Crossing Name	Kilometre Post (KP)	Proposed Crossing Method	Proposed Temporary Workspace (ha)
Vegetated	RPR-033	Unnamed	S0.8	Open Cut	0.6
Vegetated	RPR-034	Unnamed	S1.1	Open Cut	-
Active I	RPR-036-A	Hans Creek	S5.2	Isolated	0.6
Vegetated	RPR-037	Unnamed	S7.0	Open Cut	-
Vegetated	RPR-038	Unnamed	S8.6	Open Cut	0.6
Vegetated	RPR-039	Unnamed	S12.6	Open Cut	0.6
Vegetated	RPR-040	Unnamed	S13.4	Open Cut	-
Vegetated	RPR-041	Unnamed	S13.7	Open Cut	0.6
Vegetated	RPR-042	Unnamed	S14.6	Open Cut	-
Vegetated	RPR-043	Trail Valley Ck.	S16.5	Open Cut	0.6
Vegetated	RPR-043.1	Unnamed	S19.8	Open Cut	-
Vegetated	RPR-044	Unnamed	S21.3	Open Cut	-
Vegetated	RPR-044.1	Unnamed	S21.7	Open Cut	-
Vegetated	RPR-045	Unnamed	S22.5	Open Cut	0.6
Active I	RPR-046	Unnamed	S23.5	Isolated	0.6
Vegetated	RPR-047	Unnamed	S24.1	Open Cut	-
Active I	RPR-048	Unnamed	S25.6	Open Cut	0.6
Vegetated	RPR-049	Unnamed	S26.3	Open Cut	-
Vegetated	RPR-050	Unnamed	S27.8	Open Cut	-
Vegetated	RPR-051	Unnamed	S28.1	Open Cut	-
Vegetated	RPR-051.1	Unnamed	S30.0	Open Cut	-
Vegetated	RPR-052	Unnamed	S32.4	Open Cut	0.6
Vegetated	RPR-052.1	Unnamed	S33.1	Open Cut	-
Vegetated	RPR-053	Unnamed	S33.3	Open Cut	-
Vegetated	RPR-053.1	Unnamed	S34.9	Open Cut	-
Vegetated	RPR-053.2	Unnamed	S37.0	Open Cut	-

Table 6-26: Watercourse Crossings within Gathering Pipeline Segment C5 (cont'd)

Crossing Class	Crossing ID	Crossing Name	Kilometre Post (KP)	Proposed Crossing Method	Proposed Temporary Workspace (ha)
Vegetated	RPR-054	Unnamed	S37.9	Open Cut	0.6
Vegetated	RPR-054.1	Unnamed	S39.2	Open Cut	-
Vegetated	RPR-055	Unnamed	S39.8	Open Cut	0.6
Vegetated	RPR-056	Unnamed	S41.7	Open Cut	-
Vegetated	RPR-057	Unnamed	S42.1	Open Cut	-
Vegetated	RPR-057.1	Unnamed	S44.1	Open Cut	-
Vegetated	RPR-058A	Unnamed	S46.0	Open Cut	-
Vegetated	RPR-058.1 (REV3-AA)	Unnamed	S48.2	Open Cut	
Vegetated	RPR-058.2 (REV3-AB)	Unnamed	S48.8	Open Cut	
Vegetated	RPR-058.3 (REV3-AC)	Unnamed	S50.2	Open Cut	0.6
Vegetated	RPR-058.4 (REV3-AD)	Unnamed	S50.9	Open Cut	
Vegetated	RPR-058.5	Unnamed	S51.2	Open Cut	

OTHER CROSSINGS

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

APPURTENANCES

Along this right-of-way segment within ISR Crown lands, there is a lock valve site and a cathodic protection site. Both of these sites will be accessed through the right-of-way. Temporary workspace will not be required for these valve locations.

A list of the appurtenances in this gathering pipeline segment on Crown lands is presented in Table 6-27.

Block Valve Site

The block valve site that occurs within this segment of right-of-way is located at KP-S0.0 and is labelled block valve BV-009 in Figure 6-15. This block valve site

is located within the Storm Hills pigging facility footprint and will not require any additional permanent lands.

Cathodic Protection Sites

The cathodic protection (CP) site within this segment is located at KP-S0.0 and is labelled CP-02. It is located within the Storm Hills pigging facility footprint (see Figure 6-15). This CP site will not require any additional permanent lands.

Table 6-27: Appurtenances within Gathering Pipeline Segment C5

Appurtenance/ Facility ID	Name and Location	Kilometre Post (KP)	Temporary Workspace (ha)
BV-009	Gathering Pipeline Block Valve No. 9 (within Storm Hills pigging facility – Start of Storm Hills lateral)	S0.0	-
CP-02	Cathodic Protection Site No. 2 (within facility footprint)	S0.0	-

PUBLIC INVOLVEMENT

The local ISR communities, in meetings or discussions with Imperial, have not expressed concerns regarding this pipeline segment specifically. However, they have requested that the gathering system be moved from the proposed location west to the Ikhil route. This could potentially affect the southern portion of this pipeline segment. The public involvement activities are documented in Section 10 of this application.

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