

2.0 PROJECT DESCRIPTION

2.1 PROJECT OVERVIEW

The proposed Project consists of the following:

- Construction of 46.5 km of 115 kV alternating current (AC) transmission line, in a 60 m ROW, terminating at the Whiteshell and Pointe du Bois Stations.
- Installation of equipment at the Pointe du Bois and Whiteshell Stations to terminate the new line, including:
 - Two 115 kV breakers at each station;
 - Various 115 kV switches at each station; and
 - Other associated components.

2.2 PROJECT COMPONENTS

2.2.1 Pointe du Bois to Whiteshell Stations 115 kV Transmission Line (PW75)

The engineering details for the PW75 transmission line are based on preliminary design, current technical requirements, and established construction policies and practices. The final transmission line design will vary based on the final approved route, more detailed investigation of site conditions, contract requirements, and evolving standards and regulations. The final transmission line design and construction will meet or exceed the requirements as set out in applicable standards (i.e., Canadian Standards Association [CSA]), as well as the North American Electric Reliability Corporation [NERC]).

Final engineering design will be completed subsequent to receipt of the Environment Act Licence and will take into account conditions of that licence. Specific structure placements will be finalized after the ROW has been procured and surveyed.

The Final Preferred Route (FPR) is shown on Map 2-1. The FPR was determined using Multi-Criteria Evaluation (MCE) and Least Cost Path Analysis (LCPA) in Geographic Information Systems (GIS) to determine the preferred route (Chapter 4).

The objectives of the site selection process were to minimize adverse biophysical and socio-economic impacts, and to satisfy technical and cost requirements for the project. The process to select a route for the transmission line considered a broad range of environmental, socio-

economic, technical, stakeholder, and public information to determine a route that attempts to balance all perspectives.

2.2.1.1 Structures

A guyed lattice steel structure is the current design for the transmission line. The height of the structure is engineered to be between 30 to 40 m with the footprint dimensions (guy wire base to guy wire base) between 35 to 50 m. The spans between the structures will be approximately 420 to 480 m. This structure type, complete with relative dimensions, is illustrated in Figure 2-1.

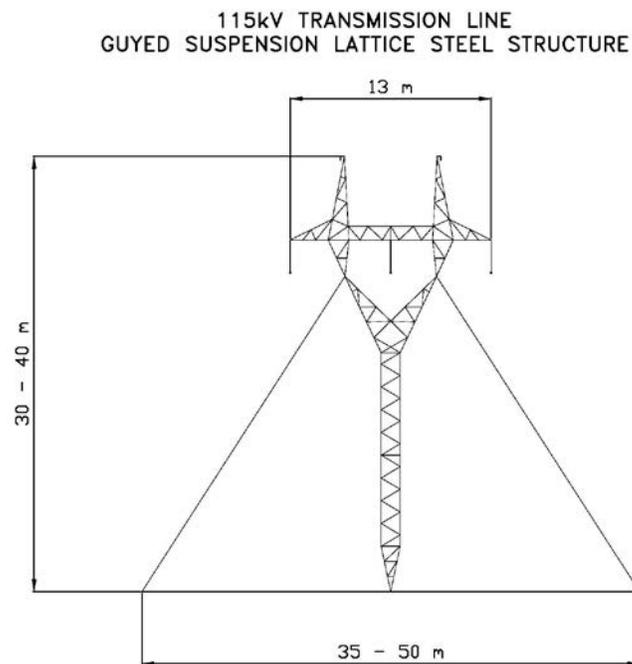


Figure 2-1: Guyed Lattice Steel Structure – Preliminary Design

Heavy angle and dead end structures will be required at specific locations to accommodate line redirection and to terminate the transmission line into the stations. Typical dead end and heavy angle structures will be a single circuit self-supporting steel lattice tower design. The heavy angle structure heights will be approximately 30 m and the bases will be approximately 14 x 14 m. The distance between the tower's centerline and outer arm edge will be between 8.5 and 9 m. This structure type is illustrated in Figure 2-2.

Other structure designs might be considered to mitigate site specific issues along the final route alignment

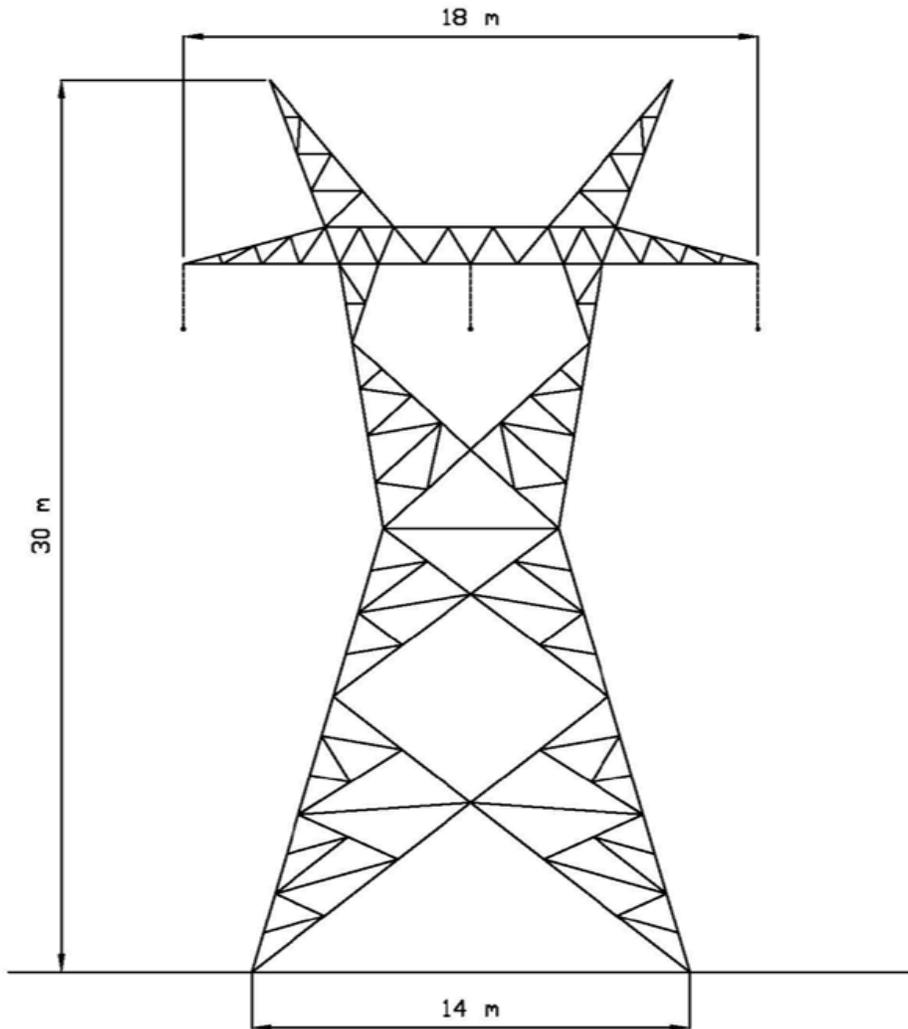


Figure 2-2: Heavy Angle Structure – Preliminary Design

2.2.1.2 Conductors

Line PW75 is designed for three 795 MCM 26/7 ACSR “Drake” type conductors, 28 millimetres (mm) in diameter, to be carried by the structures. Each conductor, consisting of aluminum strands with a center core of steel strands, will be supported from the structures by insulators. The ground-to-conductor heights will meet or exceed the C22.3 No. 1 “Overhead Systems” regulations. The minimum ground-to-conductor height under heavy loading conditions at 100 degrees Celsius (°C), as outlined by the CSA is provided in Table 2-1.

Table 2-1: Minimum Conductor to Ground Clearances

Condition	115 kV Alternating Current (AC) Line
Farmland	5.5 m
Roads, Highways, and Street Crossings	5.7 m
Underground Pipeline Crossings	5.5 m
Above top of railway	8.7 m

2.2.1.3 Insulators

Overhead transmission conductors will be insulated from the structures by sets of insulators. The insulators for this type of conductor are typically manufactured from ceramic and contain seven to nine bells per insulator. The insulators are suspended from the structures and support the conductors. The insulators have flexibility in movement to allow for blow-out and galloping of the conductor during various weather and electrical loading conditions.

2.2.1.4 Ground Wires

Two ground wires will be strung at the tops of the structures. These wires are designed to provide grounding and lightning protection. The ground wires are typically galvanized steel strands of conductors approximately 7 mm in diameter. One of these wires will be an Optical Ground Wire (OPGW). This OPGW cable will serve for communications purposes during the line’s operation.

2.2.1.5 Transmission Line Right-of-Way Requirements

Manitoba Hydro obtains the legal right to construct, operate and maintain their transmission lines within a ROW. This right is generally obtained through easement of privately owned lands, or initially by a Crown Land Reservation, pending easement, for right of use on provincial Crown land.

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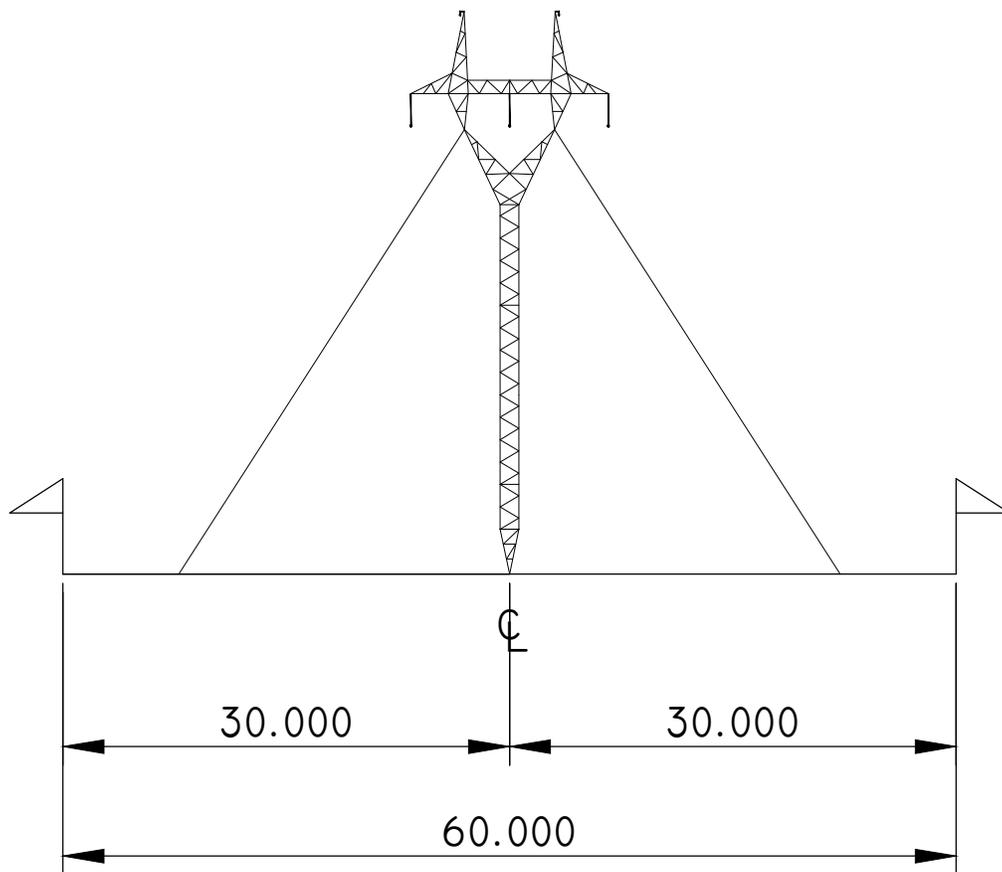
Once the Environment Act Licence is obtained, property easements for the required ROW will be secured. For private lands, this process is typically completed by direct negotiation with the affected landowners.

The ROW widths are determined to allow safe conductor swing or blow-out. The ROW width also provides adequate lateral distance under wind conditions to limit flashovers onto objects located near the edge of the ROW. The typical ROW requirements for a 115 kV guyed lattice steel structure are illustrated in Figure 2-3.

From the Pointe du Bois Station, PW75 uses an existing Manitoba Hydro ROW for approximately 21 km. The existing 66 kV sub-transmission lines which occupy the ROW (P1 to P4 lines) are being decommissioned. The existing ROW needs to be widened by 15 m on both sides to accommodate the new line (Figure 2.4).

North of the Whiteshell Station, PW75 also uses an existing Manitoba Hydro ROW to cross the Whitemouth River. Immediately south of the river, new ROW is required on the southeast side of the ROW for the line to terminate at the Whiteshell Station. A portion of one private property will need to be acquired through easement to accommodate the new line. Approximately 37 m of ROW will need to be acquired from the landowner. Immediately north of the Whitemouth River, the existing ROW will need to be widened by 32 m to accommodate PW75 (Figure 2-5; Figure 2-6).

115kV TRANSMISSION LINE
TYPICAL GUYED LATTICE SUSP. STR.



TYPICAL RIGHT OF WAY
115kV TRANSMISSION LINE

Figure 2 3: Guyed Structure Showing Typical ROW Requirements

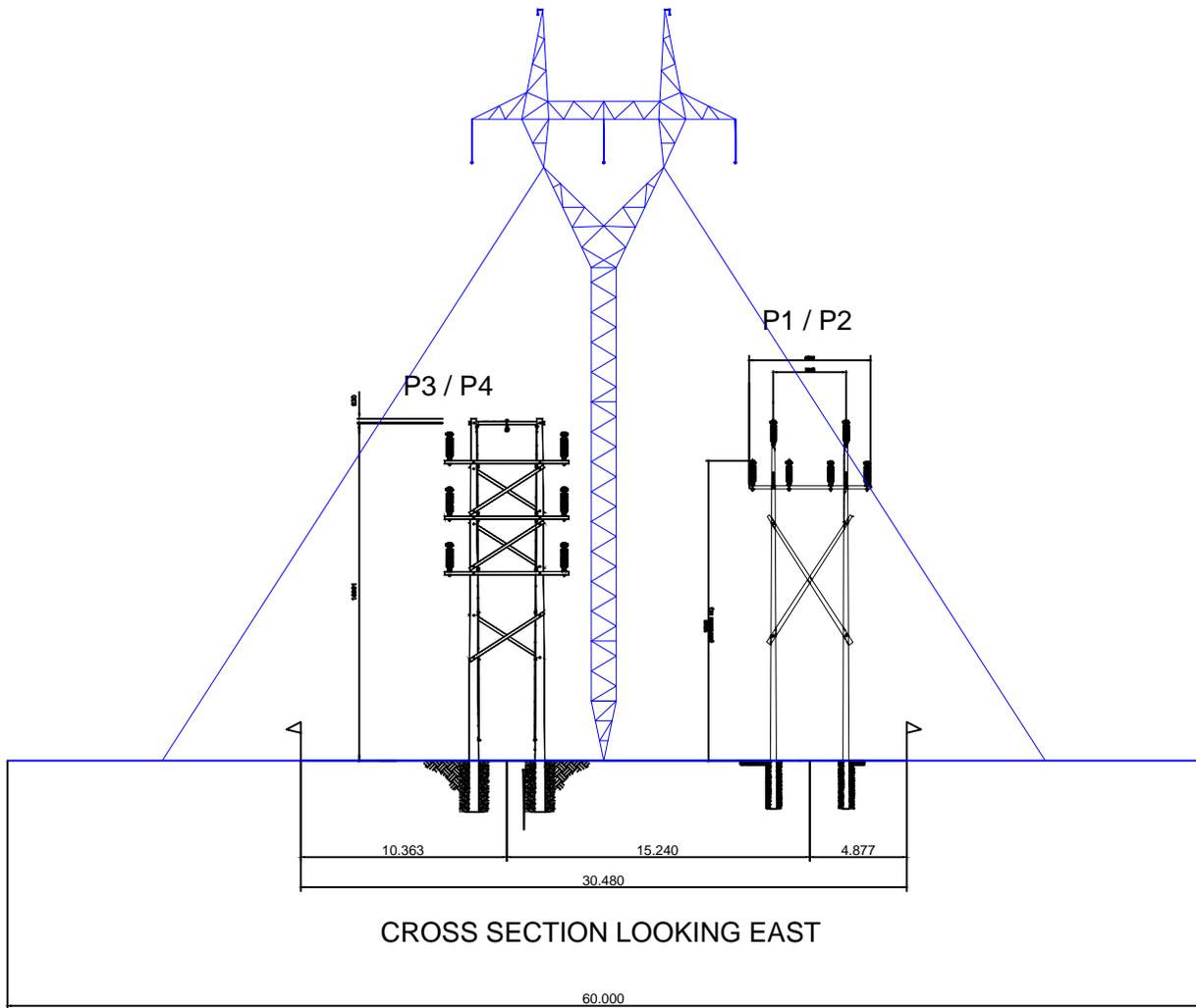
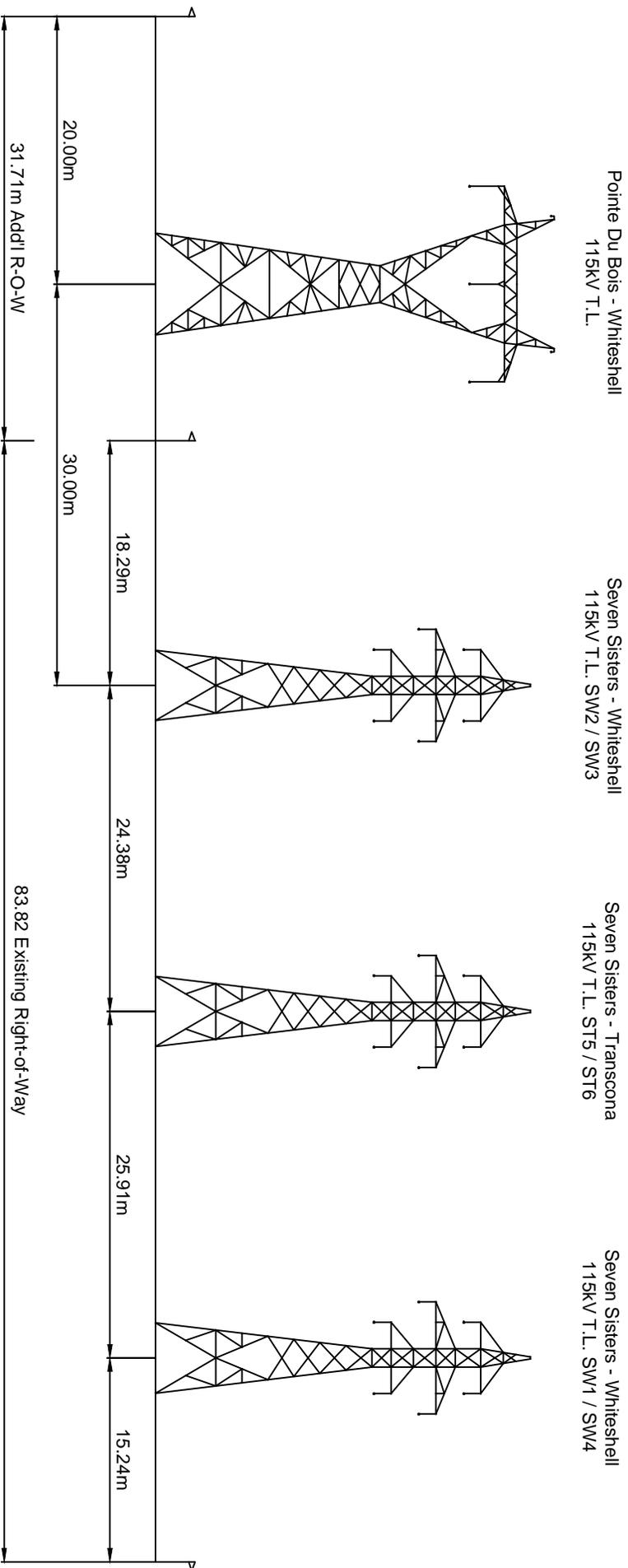


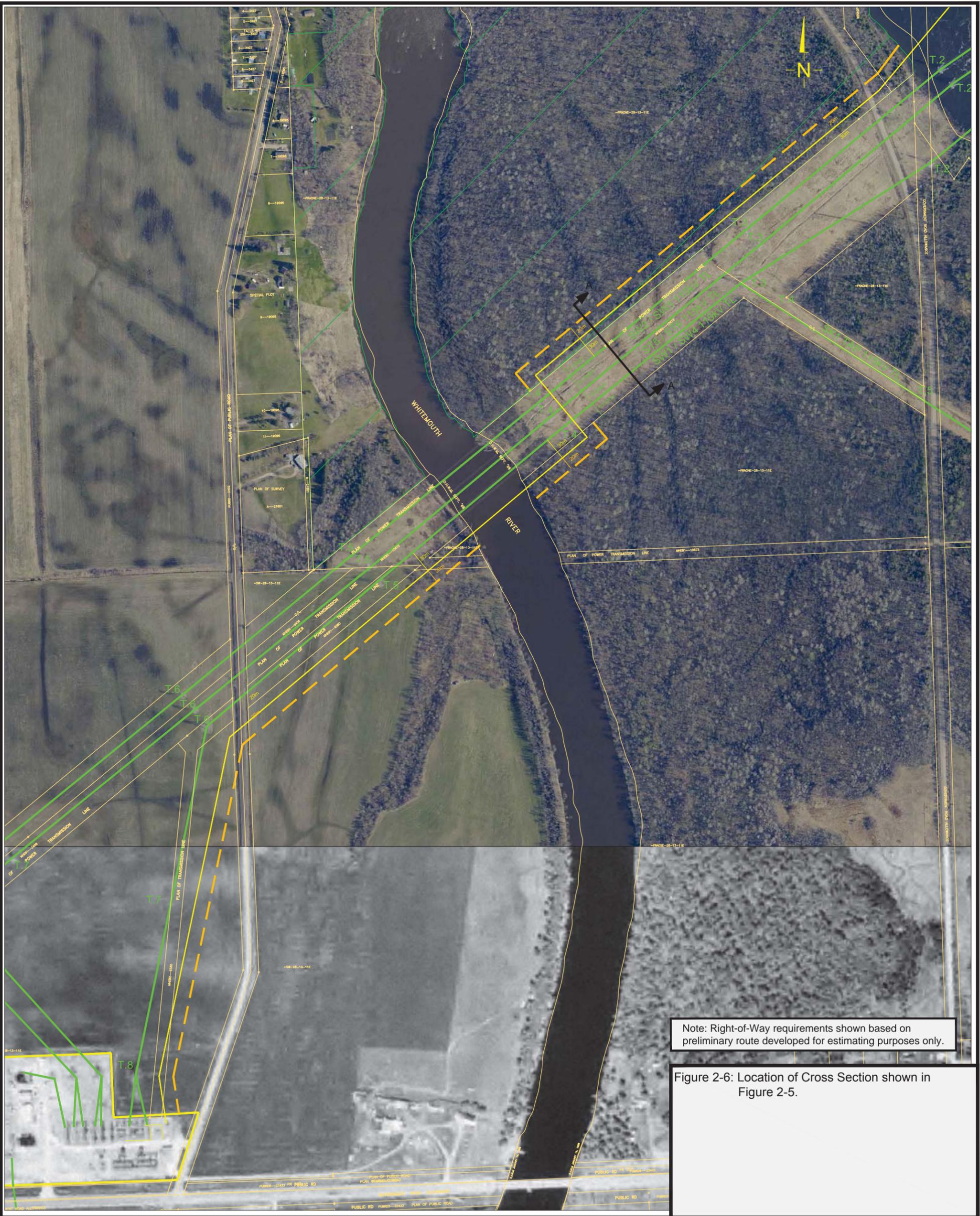
Figure 2-4: P1 to P4 Existing ROW

Section A - A



Cross Section Looking North East - Towards Seven Sisters G.S.

Figure 2-5: ROW Looking Northeast towards Seven Sisters Generating Station



Note: Right-of-Way requirements shown based on preliminary route developed for estimating purposes only.

Figure 2-6: Location of Cross Section shown in Figure 2-5.

2.2.2 Station Components

2.2.2.1 Whiteshell Station

Station Location and Size

PW75 will be terminated at the Whiteshell Station. Four new 115kV bays will be constructed back to back in the previously reserved space of the switchyard. The new bays have space to install two breakers, mount four switches and terminate the new line.

Station Equipment

Specific equipment for the Whiteshell Station will be needed to accommodate the termination of PW75. The major equipment components will include:

- 1 – 115 kV dead tank breaker for R8. (assume 2000 amp).
- 1 – 115 kV dead tank breaker to replace R10. (assume 2000 amp).
- 3 – 1 ph 115 kV CVT's for new line to Pointe du Bois.
- 1 – 3 ph 115 kV center break switch, steel mounted c/w motor and ground switch for new line from Pointe du Bois.
- 4 – 3 ph 115 kV center break switches, steel mounted.

Station Structures

Associated with the required station equipment installations will be foundations needed to support the equipment and to allow the equipment to be connected to the existing 115 kV transmission line sections. The associated structures will be steel lattice in design and will be supported on concrete foundations located inside the station site. A dead end lattice steel structure will be the last terminal point of the transmission line prior to connection to the station. This structure is typically located outside the fenced area of the station.

Site Security

The station site is enclosed within a continuous perimeter chain link fence. The height of the fence is approximately 2.1 m, with a top guard of at least three strands of barbed wire extending the fence to an overall height of approximately 2.4 m.

Station Grounding

Stations include a subsurface ground grid needed for personal and equipment safety, which conforms to Manitoba Hydro specifications for station design. The ground grid will be adjusted

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to ensure safety criteria are met with the new fault levels while ensuring a bond to all the new equipment. The ground grid will be expanded to accommodate the new equipment in the station.

Oil

Oils and gases are typically required to provide an insulating medium for equipment within substations. These are required for the safe operation of the station's equipment. The modifications to the Whiteshell Station will include:

- 145 kV Capacitive Voltage Transformer PB81 & PB82
 - Mineral Oil - 90 litres (3 x 30 litres)
 - Dielectrol Fluid PXE - 23.1 litres (3 x 7.7 litres) – used as an electric insulator

The existing station oil containment pits and traps have been designed to accommodate this increase of oil.

Site Access

The station is presently accessible by permanent all-weather road access from Provincial Trunk Highway (PTH) 11 and PR 307. Existing access will be used for construction and maintenance at the station site.

2.2.2.2 Pointe du Bois Station

PW75 is planned to egress from the west side of the Pointe du Bois Station. All new station equipment additions will be contained within the existing fenced area of the station.

Station Structures

Associated with the required station equipment installations will be foundations needed to support the equipment. Foundations are anticipated to consist of either drilled piles to rock or soil supported reinforced concrete pads.

Additional Equipment

Additional equipment requirements needed to complete the connection of PW75 to the station include:

- 1 - Bank 8 power transformer 115/66 kV, 36/48/60 MVA,. Oil 25,560 kg or 30,000 liters, core and coils assy 37,780 kg, tank & fittings 25,680 kg. Total weight 89,020 kgs.
 - 2 – 115 kV dead tank breaker for R4 and R5. (assume 2000 amp)
-

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- 3 – 1 ph 115 kV CVT's for new line to Whiteshell.
- 3 – 1 ph 115 kV CVT's for R1 protection.
- 1 – 1 ph 115 kV CVT's Sync Pot for Bank 8.
- 1 – 3 ph 115 kV center break switch, steel mounted c/w motor and ground switch for PW67 new line to Whiteshell.
- 1 – 3 ph 115 kV steel mounted side break switch for D4B.
- 1 – 115 kV selector switch dual-st c/w aux switches for D5A and B8.
- 3 – 115 kV Station Class MOVs.

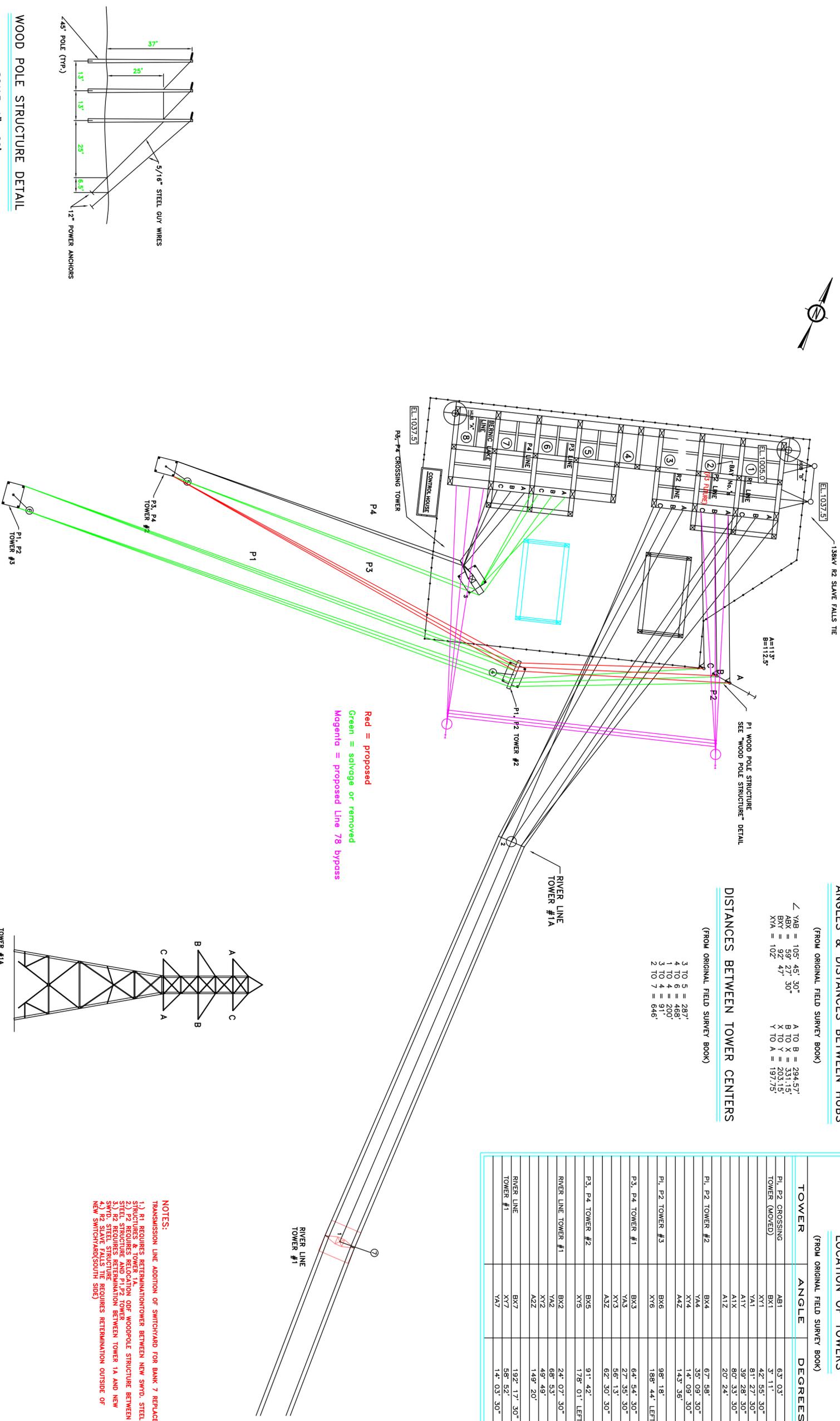
Associated with the station equipment additions will be foundation installations needed to support the equipment and to allow the equipment to be connected to the existing station apparatus. Figure 2-6 illustrates the area for equipment additions in the Switchyard.

Site Security

The station is currently contained within a continuous, chain link fence enclosure. The fence has several barbed wire strands at the top of the fence for additional security. All new equipment additions will be located within the existing fenced area. All gates and other access points to the station will be locked.

Grounding

The existing grounding system which is currently used for this station will be used for grounding the new equipment additions. The ground grid will be adjusted to ensure safety criteria are met with the new fault levels while ensuring a bond to all the new equipment. The ground grid will be expanded to accommodate new equipment additions to the station.



ANGLES & DISTANCES BETWEEN HUBS

(FROM ORIGINAL FIELD SURVEY BOOK)

\angle YAB = 105° 45' 30"
 ABX = 59° 27' 30"
 BXY = 92° 47'
 X/A = 102
 A TO B = 294.57'
 B TO X = 331.15'
 X TO Y = 205.15'
 Y TO A = 197.75'

DISTANCES BETWEEN TOWER CENTERS

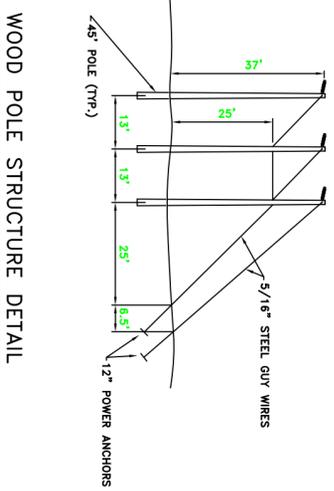
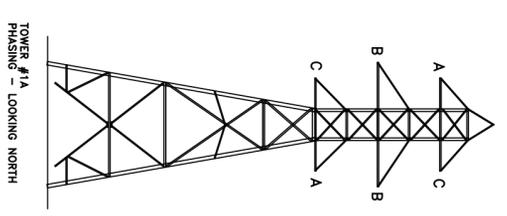
(FROM ORIGINAL FIELD SURVEY BOOK)

3 TO 5 = 287'
 4 TO 6 = 468'
 1 TO 4 = 200'
 3 TO 4 = 91'
 2 TO 7 = 646'

LOCATION OF TOWERS

TOWER	ANGLE	DEGREES
P1, P2 CROSSING TOWER (MOVED)	AB1	63° 03'
	BX1	3° 11'
	XY1	42° 55' 30"
	AY1	81° 27' 30"
	ATX	39° 28' 30"
	ATZ	80° 33' 30"
		20° 24'
P1, P2 TOWER #2	BX4	67° 58'
	YA4	35° 09' 30"
	XY4	14° 09' 30"
	A4Z	143° 36'
P1, P2 TOWER #3	BX6	98° 18'
	XY6	188° 44' LEFT
P3, P4 TOWER #1	BX3	64° 54' 30"
	YA3	27° 35' 30"
	XY3	56° 13'
	A3Z	62° 30' 30"
P3, P4 TOWER #2	BX5	91° 42'
	XY5	178° 01' LEFT
RIVER LINE TOWER #1	BX2	24° 07' 30"
	YA2	68° 53'
	XY2	49° 49'
	A2Z	149° 20'
RIVER LINE TOWER #1	BX7	192° 17' 30" L
	XY7	58° 52'
	YA7	14° 03' 30"

Red = proposed
 Green = salvage or removed
 Magenta = proposed Line 78 bypass



WOOD POLE STRUCTURE DETAIL
SCALE: 1" = 20'

LINES ACROSS TALLRACE		P7DRH1		1		99 02 03		CONVERTED TO CAD, TERMINATED R1 LINE TO BAY No.1		BY: BAW	
POINTE SWITCHING STRUCTURE SITE/FENCE PLAN		60-D-16		No.		DATE		TERMINATED R2 TO BAY No.3		REVISION	
REFERENCE DRAWINGS		DRWG. NO.		No.		DATE		REVISION		BY: APP'D	

PRELIMINARY ONLY

PLT. CONTROL NO. 2002-12-04
BY: BAW

WINNIPEG HYDRO

POINTE DU BOIS-1958

LOCATION OF SW. STRUCTURE & TRANS. TOWERS LAYOUT

SCALE	DRAWING NO.	REV.
1" = 40'	P9D034	01

Figure 2-7: Pointe du Bois Switchyard Layout

Oil

The equipment additions for the Pointe du Bois Station will require a modest amount of mineral oils and insulating gases to ensure the proper operation of the power transformers and circuit breakers. The alterations to the station will include:

- 115 kV Power Transformer B8
 - Mineral Oil - 40,000 litres (1 x 40,000 litres)
- 145 kV Capacitive Voltage Transformer
 - Mineral Oil - 180 litres (6 x 30 litres)

The stations existing oil containment berm and oil/water separators have been designed to handle the equipment additions.

Site Access

The station is presently accessible by permanent all-weather road access from PR313. Existing access will be used for construction and maintenance at the station site.

2.2.3 Project Construction

2.2.3.1 PW75 115 kV Transmission Line

Transmission line construction will begin subsequent to receipt of the Environment Act Licence, General Permits, Work Permits and other work permits and/or authorizations as required. It's expected that construction activities will be carried out by contractors, under the supervision of Manitoba Hydro. Both Manitoba Hydro field staff and the contractors will be provided with the Environmental Act Licence for the Project, which will outline conditions to be implemented during construction phases of the project. In addition, Manitoba Hydro will adopt the standard procedures for protecting the environment by adhering to a Construction Phase Environmental Protection Plan (EnvPP). The Construction Phase EnvPP will outline general and site-specific mitigation, and on-ground activity for preventing or minimizing environmental effects as a result of construction activities.

Overhead transmission line construction is preceded by a survey to establish the centerline of the ROW. The edges of the ROW will be flagged to ensure that tree clearing is completed according to CSA and NERC standards. The survey will also establish the specific locations of each transmission structure.

Right-of-Way Clearing

Clearing of trees and other vegetation within the ROW is required for transmission line operating safety and reliability. Herbicides will not be used for clearing the ROW. The extent and type of clearing method will be influenced by the transmission line route and the amount of vegetation to be cleared. Clearing methods can include machine clearing by “V” and KG shear blades, mulching by rotary drums, selective clearing by feller-bunchers and hand clearing particularly in environmentally sensitive areas. Trees will be cut close to ground level, typically within 10 centimetres (cm) above the ground surface. Ground vegetation will not be grubbed except at structure sites where foundations are required, where access of equipment necessitates it, or for worker safety reasons. In circumstances where danger trees beyond the ROW are identified, they will be targeted for removal.

The disposal of trees and other vegetation will conform to the recommendations as outlined in the EnvPP, or to satisfy conditions of the Project’s Environmental Act Licence or General Permits. Where practical, Manitoba Hydro may set aside a limited quantity of firewood for use by local communities and salvage merchantable timber where facilities exist to accept it. The remaining debris/timber is expected to be disposed of by burning.

Once the ROW is cleared, construction of the transmission line will begin. Construction is generally as follows:

- installation of anchors and foundations (types may include rock sets, cast-in-place concrete piles, or pre-cast concrete screw piles);
- assembly and erection of structures;
- stringing of conductors and ground wires (including OPGW); and
- clean-up and commissioning.

Foundation Installation

Mat foundations are typically 3 m x 3 m and 3 m deep. Where soil conditions permit, pile foundations are augured cast-in-place piles, generally about 0.9 m in diameter extending about 10 m deep. Heavy angle or dead end structures can also require mat or pile foundations, with mat foundations being about 4 m x 4 m mats constructed 3 m deep. Pile foundations for heavy or dead end structures consist of four 1.2 m diameter concrete piles extending about 12 m deep. Dimensions are subject to detailed design and will vary according to specific ground conditions.

Structure and Conductor Installation

Structures are generally assembled on-site, or assembled in designated marshalling yards and transported to the construction site by truck. Insulators will be attached to the cross-arms of each structure prior to structure erection. Structures are erected by cranes. Anchors will be placed to secure the structures. Reels of conductor will typically be transported by truck to the construction site. The conductors will be suspended from the insulators which are attached to the structures. Conductor tensioning will be completed by machine to provide the pre-determined ground-to-conductor clearances. Either implosive sleeves or hydraulic crimping will be used to splice conductor ends together.

Equipment Requirements

Clearing and construction equipment can include:

- feller-bunchers;
- skidders;
- bulldozers with shear blades, dozer blades and rakes;
- bulldozers with stringing equipment such as tensioners and pullers;
- drill rigs;
- backhoes with attachments;
- excavators and cranes;
- materials delivery trucks and trailers;
- concrete trucks; and
- various smaller equipment, as required.

Access for Transmission Line Construction

Access for transmission line construction will generally be within the ROW. Access to the ROW will typically be from adjacent or intersecting roadways or existing trails. Permission will be requested from landowners for use of roads or trails on private property. Permits will be secured from MCWS for access to the ROW from provincial crown lands. Manitoba Infrastructure and Transportation (MIT) will be contacted for access from highways (i.e., PR 307, PR 313).

Marshalling Yards

Marshalling yards are used for storage of construction materials and equipment, and possibly the assembly of towers. These yards will be established near the transmission line route and, where practical, will take advantage of previously cleared sites such as borrow pits, aggregate stockpile site and wood yards. The number and location of the marshalling yards will be determined once the Project has received the required regulatory approvals. Contractor specifications and agreements will also influence the number and location of marshalling yards to be used.

Granular Materials

A limited amount of granular materials will be required during the construction of the transmission line for concrete batching and/or for granular backfill. Granular materials required for construction will generally be purchased from local suppliers. Locations and sites will be determined based on availability, quality of product, and location of the final licensed route. It is expected that the use of local granular materials will minimize the introduction of non-native and/or invasive plant species.

Waste Disposal and Clean-up

Disposal of waste materials will rely on the use of locally available services and will also be determined by conditions of the Environment Act Licence. Temporary waste disposal will be undertaken in accordance with provincial and municipal regulations, and by-laws. Once the transmission line is constructed, all excess materials and equipment including debris, and unused supplies will be dismantled, if required, removed from the site and disposed of according to provincial and municipal regulations. Rehabilitation of sites such as marshalling yards will be undertaken as required.

Workforce Schedule and Accommodation Requirements

The transmission line construction workforce will range in number from about 45 on a monthly basis, during mobilize and de-mobilize phases, to a maximum of 112 personnel per month during peak construction periods (Table 2-2). Transmission line construction will be conducted during winter months only, extending from December, 2015, to the end of April, 2017. ROW clearing will commence in December 2015 and be completed by April 2016. A total of 154 person months of activity is expected in this first winter season of clearing and construction. The second winter season from December 2016 to April 2017 will focus on line construction and will involve an estimated 365 person months of activity to complete construction. It is expected that local existing local accommodations will be used for the most part for housing the transmission construction workforce.

Table 2-2: Estimated Construction Workforce for PW75

Month and Year	Estimated Workforce
December 2015	49
January and February 2016	112
March 2016	102
April 2016	46
December 2016	69
January and February 2017	112
March 2017	82
April 2017	46

2.2.3.2 Whiteshell Station

All modifications and equipment additions will be conducted within Manitoba Hydro's existing property and the fenced area of the station. Construction activities will be carried out by skilled and certified trade's people.

Access to the Station Site

As public and worker safety, as well as station security, are of utmost importance, only authorized personnel will be allowed in the construction area. The station is located immediately north of PR307. Access to the station by construction vehicles will be from PTH11 and PR307. It's anticipated that no new access will be required for the equipment additions at this station.

Workforce and Accommodations Requirements

The expected construction workforce for the Whiteshell Station equipment additions is shown in Table 2-3.

Table 2-3: Whiteshell Station Termination PW75 Workforce Requirements

Workforce Requirements	2016					2017		
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Civil Construction	6	6						
Overhead Line Construction		12	12				12	
Electrical Construction			8	8	8	8	8	
Commissioning and Energize								8
TOTAL	6	18	20	8	8	8	20	8

2.2.3.3 Pointe du Bois Station

All modifications and equipment additions will be conducted within Manitoba Hydro’s existing property and the fenced area of the station. Construction activities will be carried out by skilled and certified trade’s people.

Access to the Station Site

As public and worker safety, as well as station security, are of utmost importance, only authorized personnel will be allowed in the construction area. The station is located off of permanent all weather roads in Pointe du Bois. It’s anticipated that no new access will be required for the equipment additions at the station.

Workforce and Accommodations Requirements

The expected construction workforce for the Pointe du Bois Station equipment additions is shown in Table 2-4.

Table 2-4: Pointe du Bois Station PW75 Termination Workforce Requirements

Workforce Requirements	2015	2016						2017		
	Oct	Jun	Jul	Aug	Sep	Oct	Nov	Feb	Mar	Jun
Civil Construction		6	6							6
Overhead Line Construction	12		10			10		10	12	
Electrical Construction	4		12	12	12	12				4
Commissioning and Energize	4					8	8		8	
TOTAL	20	6	38	12	12	40	8	10	20	10

2.2.4 Project Operations and Maintenance

2.2.4.1 PW75 115 kV Transmission Line

PW75 will be designed to operate continuously, though the actual flow of electricity will vary with electrical load requirements. In order to maintain PW75 in a safe and reliable operating condition, regular inspection and maintenance must occur. This will include inspections of the ROW as well as structures, conductors and related hardware.

The inspections of the transmission line will include air patrols, ground patrols and non-scheduled maintenance by air or ground in the event that unexpected repairs are required. Ground travel can include snowmobile, flex-track type or road vehicles. Regular inspections will typically occur once per year by ground and can occur up to three times per year by air.

Maintenance procedures are the subject of a corporate manual for transmission line maintenance and construction activities which is continuously updated.

Vegetation Management

Vegetation management within the ROW is required for public and employee safety, as well as the reliable operation of the line. The ROW will be maintained on an ongoing basis throughout the life cycle of operation.

An integrated vegetation management approach will be undertaken to address undesirable and non-compatible vegetation issues within the ROW. Vegetation control methods on Manitoba

Hydro's ROWs are achieved primarily through mechanical control (wheeled or tracked prime movers with drum or rotary cutters, mulcher, feller-bunchers, bulldozers with modified brush blades, etc.), herbicides, and manual control (chain saws, brush saws, and brush axes).

The method and timing of vegetation maintenance depends on a number of factors such as; the species, growing conditions and density of the non-compatible species. It may also depend on the existing plant community, terrain, economic feasibility environmental sensitivity and the ownership for the ROW and adjacent property.

Options for vegetation management in the ROW include:

- **Hand cutting:** Hand cutting is labour intensive and typically occurs in small and environmentally sensitive areas like river bank buffers and park areas. It is also used to control individual trees within the ROW that are close to interfering with the reliability of the transmission line.
- **Mechanical Cutting:** Where dense tree growth reoccurs on the ROW, mechanical cutting is generally undertaken. This type of ROW maintenance typically requires follow-up maintenance within two to three years to control suckering.
- **Winter Shearing:** This type of ROW maintenance is used in frozen ground conditions where a tracked vehicle equipped with "V" or "KG" blade is used to clear tree growth within the ROW. Trees are sheared just above ground level to minimize environmental damage and disturbance to the organic soil layer.
- **Selective Herbicide Treatment:** Manitoba Hydro uses selective treatments to control undesirable vegetation growth that may impact the reliability of the transmission. Over the long term, mechanical cutting in combination with herbicide application is expected to increase more desirable vegetation within the ROW such as; low lying shrubs, grasses, forbs etc., and gradually reduce the need for herbicide use.

Foliar Application Methods:

- Broadcast foliar application equipment such as machine applicators, and hose and handgun applicators are used for controlled droplet applicators for tree heights of 2.5m or less. It is used when densities are high but variable. Complete coverage of foliage is essential for control. Additionally, basal treatment is not effective on older trees with thick bark.

Stem Treatment Methods:

- Basal application combines the herbicide with a penetrant oil and applies the mixture directly to the lower 12 to 18 inches of the stem. Adequate coverage is essential, since treating only one side of the stem will result in controlling only half of the tree. Basal applications can be
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made any time of the year, but are most effective during the dormant season when leaves are not present.

- Stump treatment is used following hand cutting, where practical, in order to provide selective control of resprouts from the cut surface. It may be applied at any time of the year on all diameter trees.
- Tree injection methods may also be used on trees over 2.5 m in height, however, it is dependent upon the location of the tree(s) within the ROW and the potential to impact the transmission line if left in place.
- All herbicide applications will be completed and supervised by licensed applicators and in accordance with a Pesticide Use Permit. Herbicide application rates will be determined by Manitoba Hydro's Chief Forester in accordance with product label instructions. Only herbicides which have been identified in the Herbicide Use Permit will be used.

On private lands, weed control in cultivated and uncultivated areas of the ROW involves the input of the landowner, as well as Manitoba Hydro personnel. Prior to any vegetation management work on private property, the landowner or authority will be contacted. On provincial Crown Lands, a work permit will be obtained under *The Forest Act* (Manitoba). In cases where private property is adjacent to provincial Crown Lands, adjacent landowners will also be contacted in advance of the work. The Project Manager or delegate is responsible for obtaining the work permit and necessary approvals. The Chief Forester is responsible for obtaining the necessary Pesticide Use Permits and submitting Post Season Control Reports as required by the Manitoba Regulation 94-88R under *The Environment Act* (Manitoba).

2.2.4.2 Station Maintenance

The sub-stations are not manned on a continual basis. However, routine inspections and maintenance operations will be required to ensure safe and reliable operation. Weed control within the station sites is necessary for operating reliability of equipment, as well as safety of personnel working within the stations. The Operations and Maintenance phase of the Project will be compliant with Manitoba Hydro's Operations and Maintenance EnvPP.

2.2.5 Project Decommissioning

It's expected that all project components will remain in service for decades. If and when decommissioning of the transmission line or stations is required, a Decommissioning EnvPP will be developed to ensure compliance with the federal, provincial and municipal regulations of that time.

2.2.6 Project Schedule

Receipt of an Environment Act Licence for the Project is targeted for December 2014. Upon receipt of the Environment Act Licence, property acquisition for the PW75 ROW will be completed. The Project's construction schedule will occur through a period of 1.5 years from fall 2015 to spring 2017 inclusive.

2.2.6.1 PW75 Transmission Line

The transmission line ROW clearing and line construction activities will be undertaken during the winter months under frozen ground conditions. Clearing of the ROW for the line will begin in December 2015, and is expected to be complete by the end of April 2016. This period will also include some construction activity. The construction of the line will resume in December 2016 and be complete by the end of April 2017. Transmission line construction as well as demobilization, is expected to be complete, by the end of April 2017. The transmission line is scheduled for commissioning and in-service in April 2017.

2.2.6.2 Whiteshell Station

August - September 2016

- Demolish old switchyard building, switchyard site improvements and install switchyard equipment foundations and grounding.

September - October 2016

- Install switchyard steel structure bays and equipment and salvage switchyard equipment.

October 2016 - February 2017

- Install switchyard apparatus and cabling and salvage and install Control Building equipment.

February 2017

- Finish remaining switchyard work and terminate new line from new tower outside of switchyard into new switchyard bay.

March – April 2017

- Switchyard operational testing and energization.

2.2.6.3 Pointe du Bois Station

October 2015

- Re-terminate overhead line from existing switchyard bay to existing switchyard bay.
- Move Switchyard Control House equipment from existing panel to existing panel.
- Re-energization (commissioning).

June – July 2016

- Switchyard site improvements and install switchyard equipment foundation.
- Salvage and install switchyard steel structures and equipment.

July to October 2016

- Salvage and install switchyard apparatus and cabling.
- Salvage and install Switchyard Control House equipment and cabling.
- Salvage Powerhouse equipment and cabling.

October –November 2016

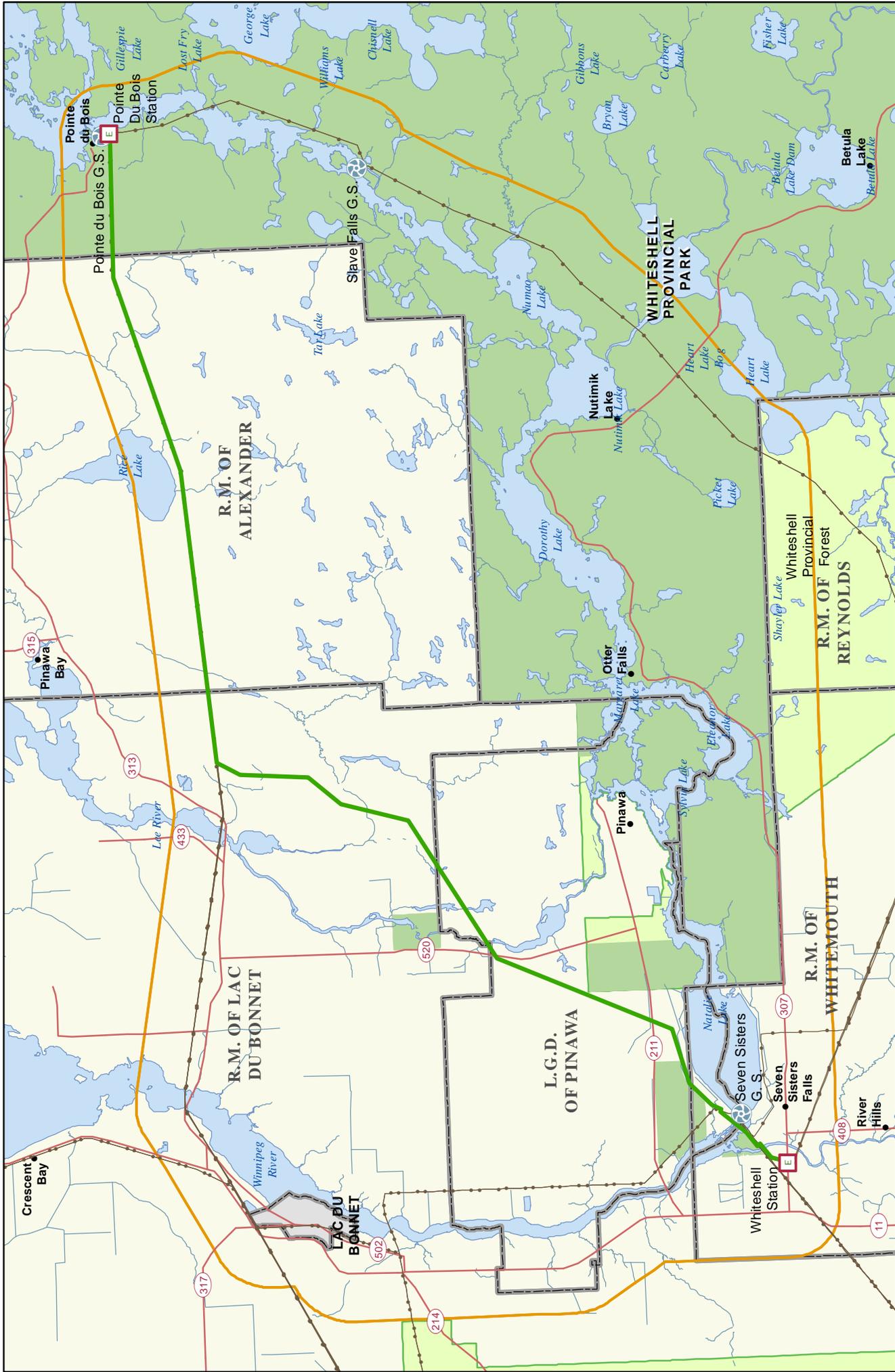
- Switchyard operational testing and energization.

February – April 2017

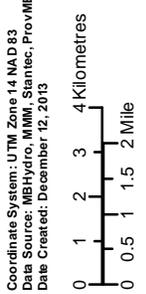
- Salvage switchyard equipment.
- Finish remaining switchyard work and terminate new line from new tower outside of switchyard into existing switchyard bay.
- Energize new line.

June 2017

- Salvage switchyard equipment and remove switchyard equipment foundations.



Coordinate System: UTM Zone 14 NAD 83
 Data Source: MBHydro, MIM, Stantec, ProvMB, NRCan
 Date Created: December 12, 2013



- Final Preferred Route
- Community
- Provincial Park
- Generating Station
- Transmission Line
- Provincial Forest
- Provincial Road/Highway
- City / Town
- Transmission Station
- Rural Municipality
- Project Study Area

Pointe du Bois Transmission Project

Final Preferred Route