Stantec

Memo

To:	Ricardo Moreno and Dan Brocklebank Westcoast Energy Inc. (Westcoast) Suite 2500, 425 1st Street SW Calgary, AB T2P 3L8	From:	Michelle Meier and Bob Fuller Stantec Consulting Ltd. 500 – 4730 Kingsway Burnaby, BC V5H 0C6
File:	123220406	Date:	October 21, 2016

Reference: Wyndwood Expansion Project—Vegetation and Wetlands Technical Memorandum

1 INTRODUCTION

Westcoast Energy Inc., carrying on business as Spectra Energy Transmission (Westcoast), contracted Stantec Consulting Ltd. (Stantec) to prepare the environmental and socio-economic assessment (ESA) for the proposed Wyndwood Expansion Project (the Project) under Section 58 (s. 58) of the *National Energy Board Act (NEB Act)*. Westcoast is proposing to construct and operate a natural gas pipeline loop segment in the Peace River Regional District 15 km west of Chetwynd, British Columbia (BC). The Project alignment is primarily contiguous with the existing Fort St. John Mainline (Transmission (T) North System) and runs parallel to John Hart Highway (Highway 97), industrial developments and various settlements.

The Project consists of construction and operation of an approximately 28 km pipeline loop segment consisting of 914 mm (Nominal Pipe Size (NPS) 36) natural gas buried pipeline, tie-ins to the existing pipeline system, associated crossover valves and piping, and pigging facilities at each end of the loop. The proposed pipeline loop is an approximately 20 to 35 m wide pipeline right-of-way (ROW) with intermittent adjacent temporary workspace (TWS) averaging 20 to 60 m wide.

This memorandum reports on the methods and the results of baseline vegetation and wetland field programs conducted in September and October 2015, September 2016, and the results of a rare plant survey conducted in June and July 2016. The field surveys were conducted to identify and characterize provincially listed plant species and ecosystems at risk, wetlands, and old forest, and to gather preliminary information on the presence of invasive and noxious plant species.

The objectives of the vegetation field program were to:

- Gather data to be used for ecosystem mapping
- Determine the locations of ecological communities of interest
- Identify stands of old forest
- Identify and classify wetland ecosystems
- Locate occurrences of provincially and federally-listed plants
- Identify occurrences of provincially- and regionally-listed noxious weed species

2 STUDY AREA

The Project location and overview is shown in Figure 2-1 (Appendix A). The study area overlaps cultivated land, industrial developments, various settlements, and forested, riparian, and wetland habitat within both Crown and privately held lands. The terrain is largely in the lowlands of the Rocky Mountain Foothills and within the incised valleys near the Pine River. Of the total 28 km long proposed pipeline route, 12.0 km falls within the Agricultural Land Reserve (ALR), of which, 10.2 km is privately owned.

The vegetation study area is shown in Figure 2-2 (Appendix A). Vegetation and wetland surveys were conducted within a 200 m wide corridor referred to as the local study area (LSA). The LSA was selected to capture potential interactions of the Project with vegetation and wetlands, species at risk and to identify locations of invasive plant species.

The Project lies within the Moist Warm Boreal White and Black Spruce (BWBSmw) biogeoclimatic subzone. Forests in the BWBSmw are often dominated by trembling aspen (*Populus tremuloides*) and lodgepole pine (*Pinus contorta*), with white spruce (*Picea glauca*) as the dominant climax species. Wetter upland sites with rich soils are generally dominated by balsam poplar (*Populus balsamifera*) or white spruce, with black spruce (*Picea mariana*) the dominant tree species at lowland sites on poorer soils with a thick organic layer (DeLong et al. 2011).

Vegetation and/or soils in the study area have been altered in locations of existing roads, trails, pipeline ROW, and where forest harvesting and agriculture has occurred.

3 METHODS

The vegetation and wetland surveys were conducted September 22 to October 3, October 16 to 19, 2015, and September 13, 2016. An ecosystem characterization approach was used to identify ecological communities of interest and inform ecosystem mapping. The survey focused on provincially listed ecosystems at risk, wetlands, and old forest that may be affected by Project activities. Occurrences of non-native invasive plant species were also recorded incidentally in survey plots and along the existing ROW and on property within the ALR during soil surveys. A rare plant survey was conducted June 14 to 15 and July 2 to 4, 2016 to identify occurrences of plant species at risk that may be affected by Project activities.

3.1 VEGETATION AND WETLAND SURVEY

The vegetation and wetland survey followed methods described in *Field Manual for Describing Terrestrial Ecosystems 2nd Edition* (BC MOFR and BC MOE 2010) for describing site and vegetation characteristics during site visit inspections. Upland ecosystems were classified using *A Field Guide to Ecosystem Identification for the Boreal White and Black Spruce (BWBS) Zone of British Columbia* (DeLong et al. 2011). Wetlands were classified using *Wetlands of British Columbia: A Guide to Classification* (MacKenzie and Moran 2004). The British Columbia Conservation Data Centre (BC CDC) website was queried prior to fieldwork to identify red- and blue-listed ecosystems that had the potential to occur in the LSA (BC CDC 2015a).

Ecosystem survey plots were completed in 77 locations, consisting of 20 ground site inspections and 57 visual site inspections. Survey plots were established in pre-selected areas, based on imagery, where wetlands, old forest or provincially listed ecosystems at risk were suspected. At each ground inspection site, vegetation data, site information, and soil moisture and soil nutrient regimes were recorded. Dominant vascular and non-vascular plants were recorded, including percent cover along with general site characteristics such as aspect, elevation, slope position, and geographic location. Soil, terrain, vegetation, and topographic information were considered together to classify the ecosystem or wetland unit at each inspection. At visual site inspections, only general site characteristics, ecosystem or wetland unit, and structural stage were recorded. Ecological communities of interest were identified from the plot data. While the majority of the vegetation inspections are within the LSA, a small number of the plots are located just outside of the LSA, where habitats with potential to support the targeted species and ecological communities extended beyond the LSA.

3.2 INVASIVE PLANT SURVEY

While completing the vegetation and wetland survey, invasive plant or noxious weed species listed by the *BC Weed Control Act* and the Peace River Regional District Invasive Plant Committee (PRRD IPC , 2016) were identified and recorded. For the identified species, the distribution and density of the infestation was recorded according to a rating system developed by the BC Ministry of Forests, Lands, and Natural Resource Operations (MFLNRO) Invasive Alien Plant Program (IAPP) (BC MOFR 2010).

3.3 RARE PLANTS SURVEY

To identify potential effects to plant species at risk, rare plant surveys were completed following methods similar to those described by Penny and Klinkenberg (2012). Rare plant species include red- and blue-listed vascular and non-vascular plant species listed by the BC CDC or listed on Schedule 1 of the federal *Species at Risk Act* (SARA). Prior to field surveys, a list of red- and blue-listed plant species with the potential to occur in the LSA was generated and used to target potential rare plant habitats. Habitats that are known to support rare plants such as wetlands, riparian areas, mature forests, and rocky outcrops, were targeted. At each location, a meandering walk was completed and each plant species observed was identified.

4 RESULTS

A summary of the vegetation and wetland survey results is provided in the following section. The locations of vegetation plots are shown in Figure 4-1. A list of plant species recorded during the field surveys is provided in Appendix B.

4.1 VEGETATION AND WETLAND SURVEY

Upland and wetland ecosystems identified during the field survey are summarized in Table 4-1 and Table 4-2 respectively. Survey plots were primarily located where ecological communities of interest (i.e., wetlands, old forest, and ecosystems at risk) had the potential to occur and, secondarily, every 1 to 2 km to support mapping of communities of interest.

4.1.1 Ecosystems at Risk

Within the 77 ecosystem survey plots completed, one red-listed ecosystem, and four blue-listed ecosystems were identified (Table 4-1).

The red-listed ecosystem was identified along the Pine River near KP14. This red-listed ecosystem is the Sandbar willow (00/Fl06) community, which typically occurs on sandbars along very large river systems in southern, central and northeastern interior of BC (BC CDC 2015b).

Four blue-listed ecosystems were identified at several locations in the LSA:

- Two occurrences of Balsam poplar – White spruce – Mountain alder – Dogwood (112/CD)
- Four occurrences of White spruce – Currant – Horsetail (111/SH)
- Nine occurrences of Bebb's willow – Bluejoint swamp (Ws03/BJ)
- Five occurrences of Swamp horsetail – Beaked sedge (Wm02/BM)

Field surveys did not confirm old forest (>140 years) in the LSA, however several mature forest communities were identified ranging in age from 80 to 124 years (Table 4-1).

4.1.2 Wetlands

Four wetland communities were identified at 19 locations in the LSA. A summary of these communities is presented in Table 4-2 along with the potential functions these wetlands may perform. Wetlands identified were:

- Two occurrences of Beaked sedge – Water sedge marsh (Wm01/MA)
- Five occurrences of Swamp horsetail – Beaked sedge marsh (Wm02/BM)
- Nine occurrences of Bebb's willow – Bluejoint swamp (Ws03/BJ)
- Three occurrences of an uncorrelated swamp wetland (Ws00/Ws); an uncorrelated site does not correlate well with published field guides for site classification.

Table 4-1 Ecosystems Field Identified in the LSA

Plot Number	Plot Detail[1]	Site Series	Ecosystem Name	Structural Stage	BC CDC Status
DY15001	G	112	Balsam poplar - White spruce - Mountain alder - Dogwood	6 - mature forest	blue-list
DY15002	V	101$6B.1	Trembling aspen - Rose - Creamy peavine	6 - mature forest	-
DY15003	V	111$6B.1	Balsam poplar - Dogwood - Highbush cranberry	6 - mature forest	-
DY15004	G	101$6B.1	Trembling aspen - Rose - Creamy peavine	4 - pole/sapling	-
DY15005	G	101	White spruce - Trailing raspberry - Step moss	6 - mature forest	-
DY15006	V	101$6B.1	Trembling aspen - Rose - Creamy peavine	4 - pole/sapling	-
DY15007	V	Fl01	Mountain alder - Common horsetail	2a - forb-dominated	-
DY15008	G	111$6B.1	Balsam poplar - Dogwood - Highbush cranberry	3 - shrub	-
DY15009	V	111$6B.1	Balsam poplar - Dogwood - Highbush cranberry	6 - mature forest	-
DY15010	V	101$6B.1	Trembling aspen - Rose - Creamy peavine	5 - young forest	-
DY15011	V	101$6B.1	Trembling aspen - Rose - Creamy peavine	5 - young forest	-
DY15012	V	101$6B.1	Trembling aspen - Rose - Creamy peavine	5 - young forest	-
DY15013	V	101$6B.1	Trembling aspen - Rose - Creamy peavine	6 - mature forest	-
DY15014	V	111$6B.1	Balsam poplar - Dogwood - Highbush cranberry	5 - young forest	-
DY15015	V	111$6B.1	Balsam poplar - Dogwood - Highbush cranberry	6 - mature forest	-
DY15016	V	00	Rock outcrop	1a - sparse	-
DY15017	G	111	White spruce - Currant - Horsetail	4 - pole/sapling	-
DY15018	V	101$6B.1	Trembling aspen - Rose - Creamy peavine	5 - young forest	-
DY15019	V	101$6B.1	Trembling aspen - Rose - Creamy peavine	5 - young forest	-
DY15020	V	103$6B.1	Aspen - Rose - Fuzzy spiked wildrye	5 - young forest	-

Reference: Wyndwood Expansion Project—Vegetation and Wetlands Technical Memorandum

Table 4-1 Ecosystems Field Identified in the LSA

Plot Number	Plot Detail[1]	Site Series	Ecosystem Name	Structural Stage	BC CDC Status
DY15021	G	111$6B.1	Balsam poplar - Dogwood - Highbush cranberry	6 - mature forest	-
DY15022	V	111$6B.1	Balsam poplar - Dogwood - Highbush cranberry	4 - pole/sapling	-
DY15023	G	111$6B.1	Balsam poplar - Dogwood - Highbush cranberry	5 - young forest	-
DY15024	V	101$6B.1	Trembling aspen - Rose - Creamy peavine	6 - mature forest	-
DY15025	V	101$6B.1	Trembling aspen - Rose - Creamy peavine	5 - young forest	-
DY15026	G	Wm02	Swamp horsetail - Beaked sedge	2b - graminoid-dominated	blue-list
DY15027	G	Ws03	Bebb's willow - Bluejoint	3b - tall shrub	blue-list
DY15028	V	Wm01	Beaked sedge - Water sedge	2b - graminoid-dominated	-
DY15029	V	111	White spruce - Currant - Horsetail	6 - mature forest	blue-list
DY15030	G	111	White spruce - Currant - Horsetail	6 - mature forest	blue-list
DY15032	V	Wm02	Swamp horsetail - Beaked sedge	2b - graminoid-dominated	blue-list
DY15033	V	101$6B.1	Trembling aspen - Rose - Creamy peavine	4 - pole/sapling	-
DY15034	V	111$6B.1	Balsam poplar - Dogwood - Highbush cranberry	6 - mature forest	-
DY15037	V	Ws00[2]	uncorrelated swamp wetland	3b - tall shrub	-
DY15038	V	Ws03	Bebb's willow - Bluejoint	3b - tall shrub	blue-list
DY15039	V	Ws03	Bebb's willow - Bluejoint	3b - tall shrub	blue-list
DY15040	V	Ws03	Bebb's willow - Bluejoint	3b - tall shrub	blue-list
DY15041	G	112	Balsam poplar - White spruce - Mountain alder - Dogwood	6 - mature forest	blue-list
DY15042	V	101$6B.1	Trembling aspen - Rose - Creamy peavine	5 - young forest	-
DY15044	V	Gb51	Saskatoon - Blue wildrye	3a - low shrub	-

Table 4-1 Ecosystems Field Identified in the LSA

Plot Number	Plot Detail[1]	Site Series	Ecosystem Name	Structural Stage	BC CDC Status
DY15045	V	103$6B.1	Aspen - Rose - Fuzzy spiked wildrye	5 - young forest	-
DY15046	V	111$6B.1	Balsam poplar - Dogwood - Highbush cranberry	5 - young forest	-
DY15047	G	111$6B.1	Balsam poplar - Dogwood - Highbush cranberry	3 - shrub	-
DY15048	V	Ws03	Bebb's willow - Bluejoint	3b - tall shrub	blue-list
DY15049	G	00	Gravel bar	2a - forb-dominated	-
DY15050	V	Wm02	Swamp horsetail - Beaked sedge	2b - graminoid-dominated	blue-list
DY15051	V	Ws03	Bebb's willow - Bluejoint	3b - tall shrub	blue-list
DY15052	V	111	White spruce - Currant - Horsetail	6 - mature forest	blue-list
DY15053	G	111	White spruce - Currant - Horsetail	6 - mature forest	blue-list
DY15054	V	111$6B.1	Balsam poplar - Dogwood - Highbush cranberry	5 - young forest	-
DY15055	G	Wm02	Swamp horsetail - Beaked sedge	2b - graminoid-dominated	blue-list
DY15056	V	Wm02	Swamp horsetail - Beaked sedge	2b - graminoid-dominated	blue-list
DY15057	V	Fl06	Sandbar willow	3b - tall shrub	red-list
DY15058	V	102	Lodgepole pine - Kinnikinnick - Lingonberry	4 - pole/sapling	-
DY15059	V	Ws00[2]	uncorrelated swamp wetland	3b - tall shrub	-
DY15060	V	111$6B.1	Balsam poplar - Dogwood - Highbush cranberry	3b - tall shrub	-
DY15061	V	Ws03	Bebb's willow - Bluejoint	3b - tall shrub	blue-list
DY15062	V	Ws03	Bebb's willow - Bluejoint	3b - tall shrub	blue-list
DY15063	V	111$6B.1	Balsam poplar - Dogwood - Highbush cranberry	4 - pole/sapling	-
DY15064	V	Wm01	Beaked sedge - Water sedge	2b - graminoid-dominated	-

Table 4-1 Ecosystems Field Identified in the LSA

Plot Number	Plot Detail[1]	Site Series	Ecosystem Name	Structural Stage	BC CDC Status
SHC15001	V	101	White spruce - Trailing raspberry - Step moss	4 - pole/sapling	-
SHC15002	V	Ws00[2]	uncorrelated swamp wetland	3b - tall shrub	-
SHC15003	V	101$6B.1	Trembling aspen - Rose - Creamy peavine	4 - pole/sapling	-
SHC15004	V	112	Balsam poplar - White spruce - Mountain alder - Dogwood	3a - low shrub	-
SHC15005	V	Ws03	Bebb's willow - Bluejoint	3b - tall shrub	blue-list
SHC15006	V	111$6B.1	Balsam poplar - Dogwood - Highbush cranberry	4 - pole/sapling	-
SHC15007	V	112	Balsam poplar - White spruce - Mountain alder - Dogwood	3b - tall shrub	-
SHC15008	V	101$6B.1	Trembling aspen - Rose - Creamy peavine	5 - young forest	-
SHC15009	V	103	White spruce - Lodgepole pine - Soopolallie - Fuzzy spiked wildrye	4 - pole/sapling	-
MM16053	G	111$6B.1	Balsam poplar - Dogwood - Highbush cranberry	5 - young forest	-
MM16054	G	Gb51	Saskatoon - Blue wildrye	3a - low shrub	-
		102$6B.1	Trembling aspen - Soopolallie - Kinnikinnick	5 - young forest	-
MM16055	V	103$6B.1	Aspen - Rose - Fuzzy spiked wildrye	5 - young forest	-
MM16056	V	111$6B.1	Balsam poplar - Dogwood - Highbush cranberry	5 - young forest	-
MM16057	G	111$6B.1	Balsam poplar - Dogwood - Highbush cranberry	5 - young forest	-
MM16058	G	111$6B.1	Balsam poplar - Dogwood - Highbush cranberry	5 - young forest	-
MM16059	G	101$6B.1	Trembling aspen - Rose - Creamy peavine	5 - young forest	-
MM16060	V	Gb51	Saskatoon - Blue wildrye	3a - low shrub	-

NOTE:

[1] G = ground site inspection, V = visual site inspection

[2] uncorrelated = site does not correlate with published field guides for site classification

Table 4-2 Wetlands Field Identified in the LSA

Plot Number	Plot Detail[1]	Site Series	Wetland Class	Ecosystem Name	Structural Stage	BC CDC Status	Potential Wetland Function
DY15026	G	Wm02	marsh	Swamp horsetail - Beaked sedge	2b - graminoid-dominated	blue-list	water flow moderation; water quality treatment; biological productivity; wildlife habitat
DY15032	V						
DY15050	V						
DY15055	G						
DY15056	V						
DY15028	V	Wm01		Beaked sedge - Water sedge	2b - graminoid-dominated	-	
DY15064	V						
DY15027	G	Ws03	swamp	Bebb's willow - Bluejoint	3b - tall shrub	blue-list	water flow moderation; water quality treatment; wildlife habitat
DY15038	V						
DY15039	V						
DY15040	V						
DY15048	V						
DY15051	V						
DY15061	V						
DY15062	V						
SHC15005	V						
DY15059	V	Ws00[2]		uncorrelated swamp wetland	3b - tall shrub	-	
DY15037	V						
SHC15002	V						

NOTE:
[1] G = ground site inspection, V = visual site inspection
[2] uncorrelated = site does not correlate with published field guides for accurate site classification

4.2 INVASIVE PLANT SURVEYS

Invasive plants and noxious weeds listed in the *BC Weed Control Act* and by the PRRD IPC (PRRD IPC 2016) were compared to plot plant species lists to determine the occurrence of listed invasive plant and noxious weed species. Table 4-3 summarizes the locations of invasive plant occurrences observed in the study area and defines whether the species are listed by the *BC Weed Control Act* as well as the invasiveness category assigned to the species by the PRRD IPC. The *BC Weed Control Act* lists invasive plants that are considered noxious in all areas of the province on Schedule A Part 1 and those considered to be noxious in a particular region of the province on Schedule A Part 2. The PRRD IPC (2015) defines invasiveness categories as follows:

- Regional Early Detection Rapid Response – species that are a significant threat and are new to the area and have a management objective of eradication. This category includes new incursions and high risk invasive plant species that are extremely limited in extent. Some of these species may not be present within the PRRD but are found in adjacent areas and are at risk of being introduced.
- Category A – High priority for eradication and containment: highly competitive invasive plants with an ability to spread rapidly and pose a significant threat.
- Category B – Medium priority for eradication and containment: primary invasive plants that have an ability to spread rapidly but are not as aggressive as Category A plants, or have become naturalized, are still considered a threat to the fine seed industry.
- Education and Awareness List – these invasive plants can spread easily but requirements to contain are site-specific. The priority is to educate, raise awareness and maintain an up to date inventory. This list includes native plants that are weedy in nature and cause damage to environmental, social, and economic values and invasive plants under successful biological control.

Table 4-3 Field Identified Invasive Plant and Noxious Weed Species

Common Name	Scientific Name	BC Weed Control Act Noxious Weed List	PRRD NEIPC Invasiveness Category	Plot Number	Location
annual hawksbeard	*Crepis tectorum*	-	Education / Awareness	SS41W31	KP22
bull thistle	*Cirsium vulgare*	-	Education / Awareness	DY15008	KP8.3
				SS1W1	KP12.5
				SS3W3	KP13.1
				SS48W16A	KP26.4
				SS48W16	KP23.6
				SS47W17	KP23.3
				SS42W32	KP22.2
				DY15049	KP22.1
				SS40W30	KP21.8
Canada thistle	*Cirsium arvense*	Schedule A Part 1	B	SHC15018W	KP0.5
				DY15001	KP2.1
				NR16007	KP2.2
				DY15007	KP2.5
				NR16008	KP2.5
				SS1W1A	KP12.7
				SS2W2	KP12.9
				SS4W4	KP13.4
				SS4W4A	KP13.4
				DY15057	13.8

Table 4-3 Field Identified Invasive Plant and Noxious Weed Species

Common Name	Scientific Name	BC Weed Control Act Noxious Weed List	PRRD NEIPC Invasiveness Category	Plot Number	Location
Canada thistle (cont'd)				NR16011	KP14.1
				SS6W7	KP14.2
				SS6W6	KP14.1
				DY15030W	KP14.2
				SS7W8	KP14.4
				SS7W10	KP14.4
				SS7W9	KP14.6
				SHC15008W	KP18.5
				SS24W18	KP18.9
				SS26W22	KP19.3
				SS27W19	KP19.4
				SS28W20	KP19.6
				DY15038	KP19.9
				SS29W21	KP19.9
				SHC15010W	north of KP19.2
				SS47W17	KP23.6
				SHC15017W	KP23.4
				SS48W16	KP23.8
common tansy	*Tanacetum vulgare*	Schedule A Part 2	A	SS36W	KP21.3
curled dock	*Rumex crispus*	-	Education / Awareness	SS9W11	KP15
dog mustard	*Erucastrum gallicum*	-	Education / Awareness	SS6W6	KP14.1

Table 4-3 Field Identified Invasive Plant and Noxious Weed Species

Common Name	Scientific Name	BC Weed Control Act Noxious Weed List	PRRD NEIPC Invasiveness Category	Plot Number	Location
flixweed	*Descurainia sophia*	-	Education / Awareness	SS9W11	KP15
				SS17W13	KP16.8
				SS41W31	KP22
foxtail barley	*Hordeum jubatum*	-	Education / Awareness	SHC15019W	KP0.5
meadow buttercup	*Ranunculus acris*	-	B	NR16004	KP8.9
				DY15021	KP9.7
oxeye daisy	*Leucanthemum vulgare*	Schedule A Part 2	B	SHC15006W	KP12.5
				SHC15009W	KP18.2
perennial sow-thistle	*Sonchus arvensis*	Schedule A Part 1	Education / Awareness	NR16001	KP8.3
				SS1W1	KP12.6
				DY15027	KP13.1
				SS3W3	KP13.1
				SS6W6	KP14.1
				SS18W14	KP17.1
				SS24W18	KP18.9
				SS28W20	KP19.6
				SS30W23	KP20.1
				SS47W17	KP23.6
				SS39W15	KP21.6

Table 4-3 Field Identified Invasive Plant and Noxious Weed Species

Common Name	Scientific Name	BC Weed Control Act Noxious Weed List	PRRD NEIPC Invasiveness Category	Plot Number	Location
quackgrass	*Elymus repens*	Schedule A Part 2	Education / Awareness	SHC15006W	KP12.5
				SHC15008W	KP18.4
				SHC15009W	KP18.1
				SHC15010W	north of KP19.3
				SHC15016W	KP27.6
stinkweed	*Thalapsi arvense*	-	Education / Awareness	SS41W31	KP22
wild oat	*Avena fatua*	Schedule A Part 1	Education / Awareness	SHC15006W	KP12.6
				SHC15008W	KP18.5
				SHC15009W	KP18.1
				SHC15010W	north of KP19.3
				SHC15016W	KP27.6
yellow starthistle	*Centaurea solstitialis*	Schedule A Part 1	-	SS17W13	KP16.9
				SS41W31	KP22.2

In total, 15 species of invasive plants were identified at 50 locations in the study area. Seven of these plants, Canada thistle (*Cirsium arvense*), common tansy (*Tanacetum vulgare*), oxeye daisy (*Leucanthemum vulgare*), perennial sow-thistle (*Sonchus arvense*), quackgrass (*Elymus repens*), wild oats (*Avena fatua*), and yellow star-thistle (*Centaurea solstitialis*), are listed on Schedule A of the *BC Weed Control Act*. Canada thistle, perennial sow-thistle, wild oats, and yellow star-thistle are listed as noxious in all areas of the province, while common tansy, oxeye daisy, and quackgrass are listed as noxious within the PRRD. Common tansy is the only species encountered in the study area that is ranked as a Category A invasive plant by the PRRD IPC and oxeye daisy, Canada thistle, and meadow buttercup (*Ranunculus acris*) are the only species encountered in the LSA that are ranked as Category B invasive plants by the PRRD IPC. All other invasive plants encountered are listed under the Education and Awareness category of the regional invasive plant list. Invasive plants were encountered along the existing ROW within the LSA or in disturbed habitats adjacent to the ROW such as in agricultural areas, in cut blocks, and along access roads and trails.

4.3 RARE PLANT SURVEY

Rare plant survey plots were established in areas where potential rare plant habitat existed (i.e., wetlands, rock outcrops, riparian sites). In total 22 rare plant survey plots were completed in the LSA (Table 4-4). A population of shinleaf wintergreen (*Pyrola elliptica* Nutt.), a blue-listed plant species, was identified in a riparian community on the east bank of the Pine River near plot NR16005 (KP17.5). The population consisted of 95 individual plants in an area of approximately 30 m^2. A copy of the BC CDC Species Summary for shinleaf wintergreen is provided in Appendix C. No other provincially or federally listed rare plant species were identified in survey plots.

Table 4-4 Rare Plant Survey Plots

Plot Number	Habitat	KP Range	Approximate KP
DP16001	upland forest	21 – 22	21.62
DP16002	marsh wetland	13-14	13.38
DP16003	marsh wetland	13-14	13.51
DP16004	riparian	13-14	13.36
DP16005	swamp wetland	13-14	13.28
DP16006	upland forest	3-4	3.46
DP16007	upland forest	8-9	8.36
NR16001	riparian	8-9	8.38
NR16002	riparian	9-10	9.4
NR16003	dry bluff	9-10	9.32
NR16004	riparian	8-9	8.97
NR16005	riparian -	17-18	17.55
NR16006	riparian	17-18	17.45
NR16007	riparian	2-3	2.16

Table 4-4 Rare Plant Survey Plots

Plot Number	Habitat	KP Range	Approximate KP
NR16008	riparian	2-3	2.45
NR16009	riparian	1-2	1.42
NR16010	open upland forest	11-12	11.88
NR16011	riparian	14-15	14.13
NR16012	wetland on cultivated field	14-15	14.43
NR16013	forest edge on cultivated field	20-21	20.07
NR16014	drainage on cultivated field	20-21	20.69
NR16016	grass field	26-27	27.58

5 DISCUSSION

The vegetation and wetland surveys provide baseline information on the type and location of ecological communities of interest within the vegetation and wetlands LSA. In particular, field surveys identified the locations of wetlands, and ecosystems and plant species at risk. In addition, the invasive plant survey provided information on the location and extent of species-specific infestations that can inform invasive plant management.

The LSA lies within the BWBSmw biogeoclimatic subzone and intersects private and Crown land, including some land within the ALR. Forests consist of a mixture of coniferous and deciduous species with seral forests dominated by trembling aspen, balsam poplar and lodgepole pine, while white spruce is the dominant climax species in mature forest. Along larger streams and the Pine River, riparian flood units are common, while wetlands in the LSA are typically sedge marshes or willow swamps.

Field surveys in the LSA identified one red-listed and four blue-listed communities. Old forest communities were not observed in the LSA. Four wetland communities were identified in the field, two graminoid marsh wetlands and two shrub swamp wetlands. Seven invasive species listed on Schedule A of the *BC Weed Control Act* were encountered in the LSA, four of which, common tansy, Canada thistle, meadow buttercup and oxeye daisy, are also listed by PRRD IPC as Category A or B invasive plant species. One population of shinleaf wintergreen, a blue-listed plant species, was identified in the LSA on the east side of the Pine River approximately 55 m south of the pipeline loop segment near KP17.5.

The results of the vegetation and wetland field survey has been used to inform desktop mapping of ecological communities of interest in the LSA. The occurrence of ecosystems at risk, rare plants, wetlands, old forest and invasive plant species within the LSA have been considered and assessed for residual project effects in the ESA of the Project. Mitigation measures for these communities, rare plants and invasive plant management will be described in the vegetation chapter of the ESA.

6 CONCLUSION

Key findings of the vegetation and wetland and invasive plant field surveys were:

- One red-listed ecosystem was identified at one location within the LSA
- Four blue-listed ecosystems were encountered at 21 locations within the LSA
- Four wetland communities were encountered at 19 locations in the LSA
- Fifteen invasive plant species were encountered at 50 locations in the LSA
- One population of a blue-listed plant species was encountered at one location in the LSA.

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Michelle Meier, B.Sc., R.P. Bio
Vegetation Ecologist
Phone: (250) 655-2294
Fax: (250) 656-4789
Michelle.Meier@stantec.com

Bob Fuller, B.Sc., P. Ag.
Senior Vegetation Ecologist
Phone: (250) 655-5372
Fax: (250) 656-4789
Bob.Fuller@stantec.com

Attachment: Appendix A Figures
Appendix B Plant Species List |
Appendix C BC Conservation Data Centre Species Summary: Shinleaf wintergreen (*Pyrola elliptica*)

MM/BF/tt

7 REFERENCES

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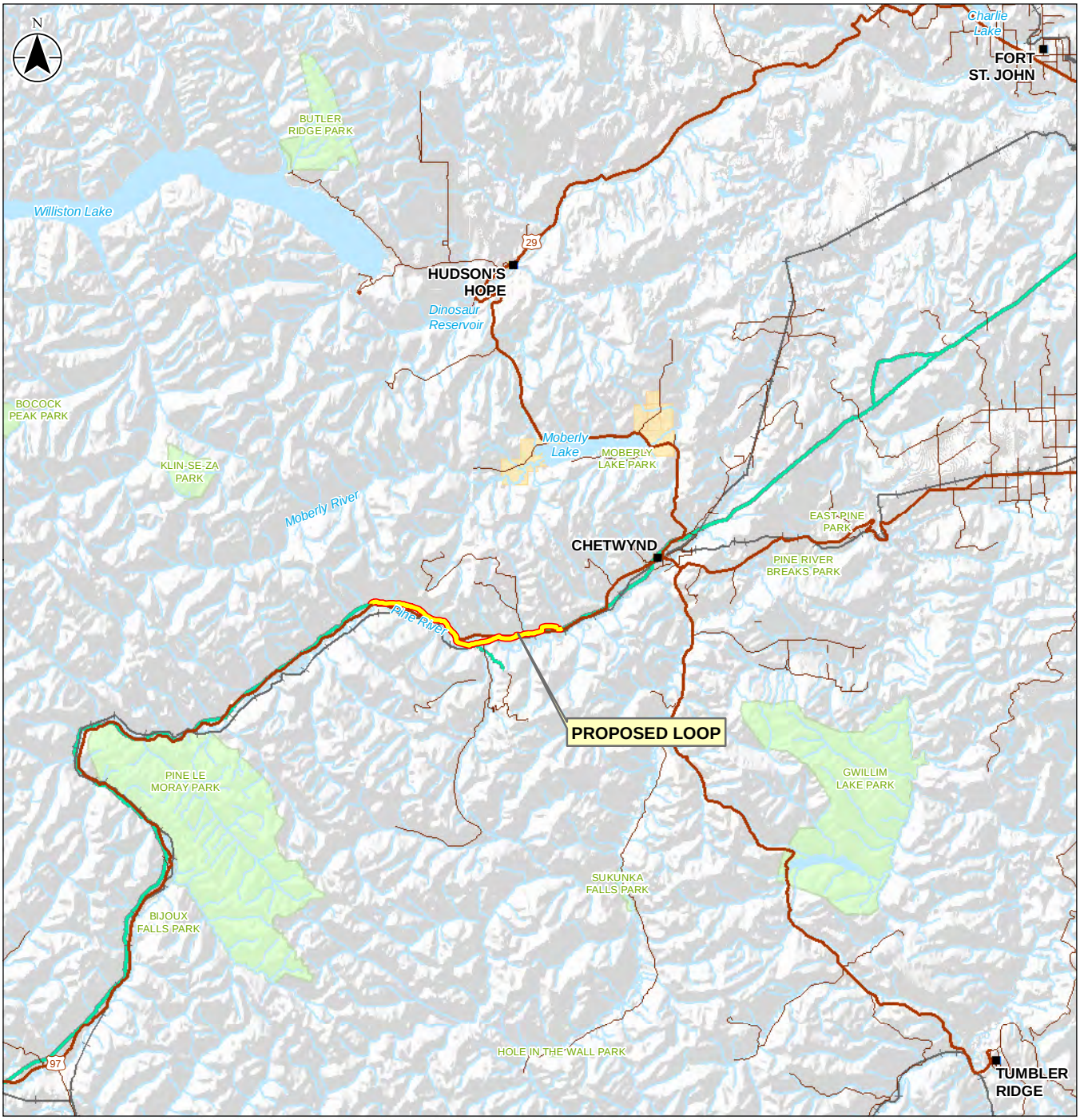
APPENDIX A
FIGURES



- City or Town
- Highway
- Road
- Railway
- Watercourse
- Existing Right of Way
- Waterbody
- Indian Reserve
- Parks, Protected Area, Ecological Reserve and Conservancy
- Proposed Loop

0 10 20 30 km

1:750,000 (at original document size of 8.5x11)

Notes
1. Coordinate System: NAD 1983 UTM Zone 10N
2. Data Sources: DataBC, Government of British Columbia (GovBC); Terrain Resource Information Management, GovBC; National Topographic System, GovBC; BC Stats, GovBC; BC Oil & Gas Commission, GovBC; CanVec v12, Government of Canada (GC); National Hydrology Network, GC; Atlas of Canada National Framework, GC; Fisheries and Oceans Canada, GC; Environment Canada, GC; Natural Resources Canada, GC;

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Independent Review by K.Hewgill

Client/Project
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Wyndwood Expansion Project
Vegetation and Wetlands Technical Memorandum

Figure No.
2-1

Title
WYNDWOOD EXPANSION PROJECT
OVERVIEW MAP

Road
Railway
Watercourse
Existing Right of Way
Waterbody

Kilometre Post (KP)
Wyndwood Proposed Loop
Local Study Area

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3. Orthophotography: Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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British Columbia

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Figure No.
2-2

Title
Wyndwood Expansion Project
Study Area for Vegetation

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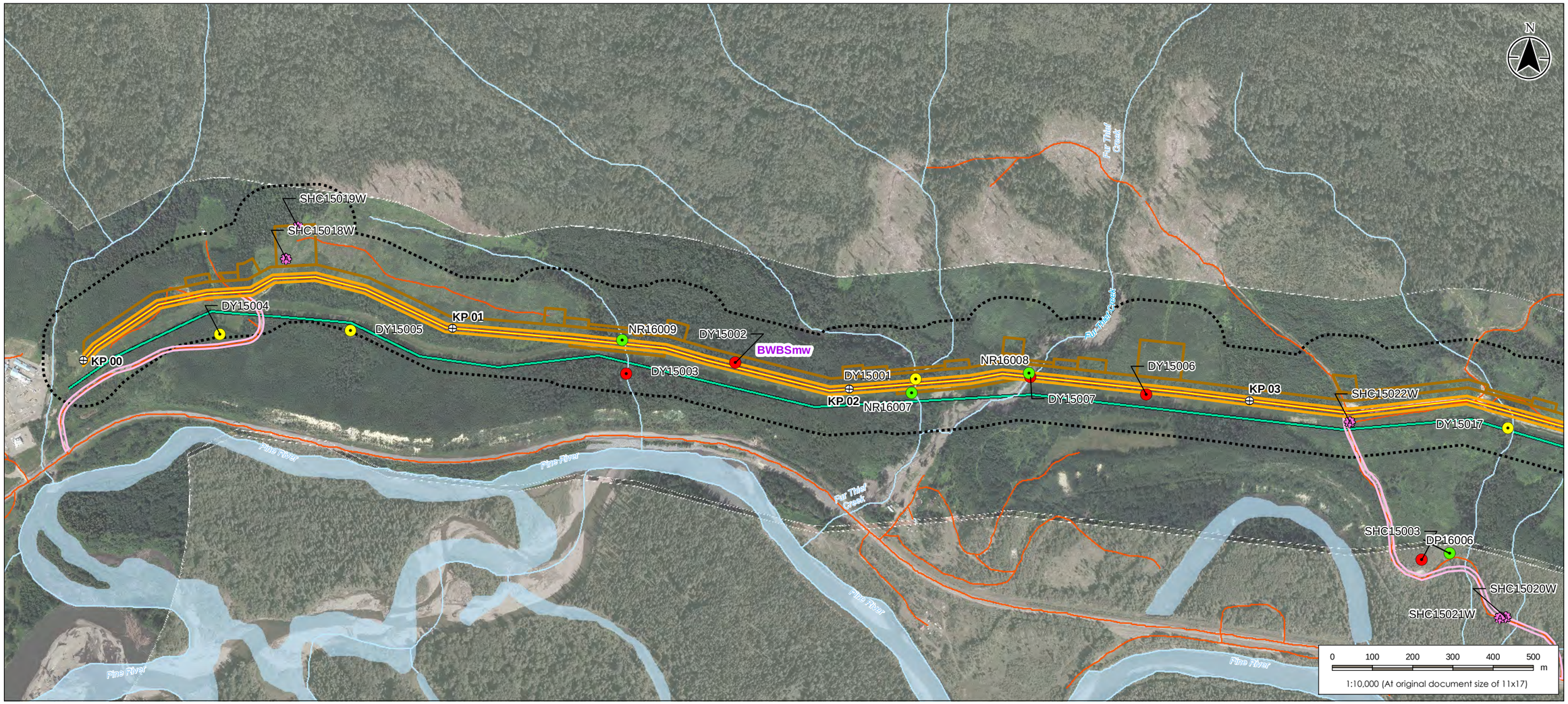

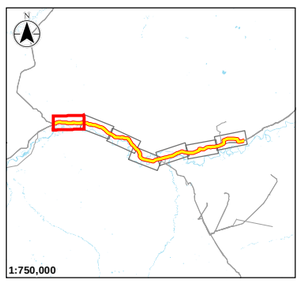

- Road
- Railway
- Watercourse
- Existing Right of Way
- Freshwater Atlas Wetland
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Biogeoclimatic Zone Unit
BWBSmw –Moist Warm Boreal White and Black Spruce
SBSwk2 - Finlay-Peace Wet Cool Sub-Boreal Spruce

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Figure No.
4-1

Title
Wyndwood Expansion Project
Vegetation Survey
Sheet 1 of 7

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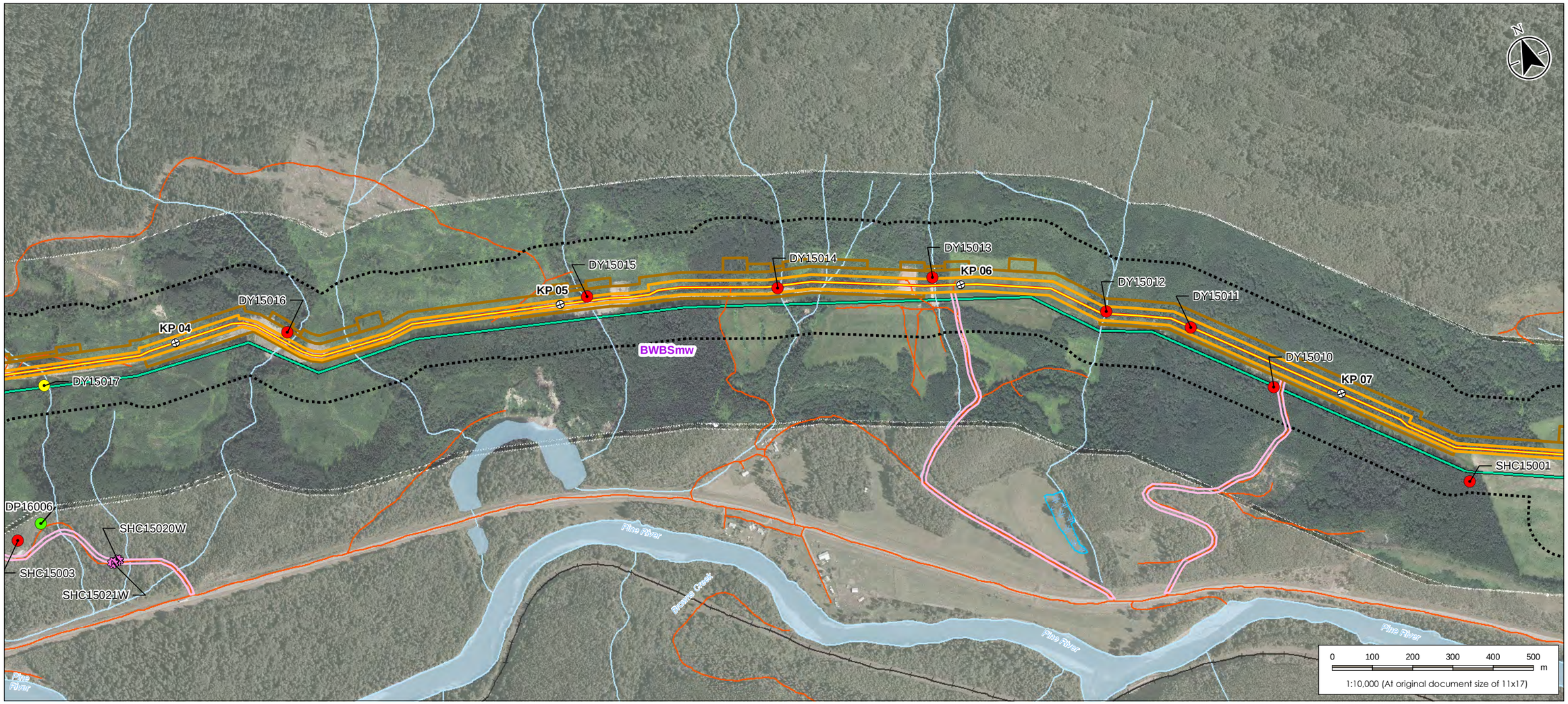

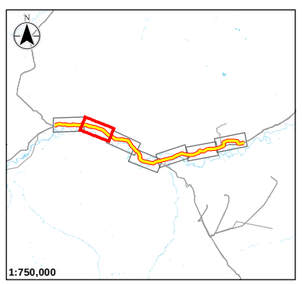

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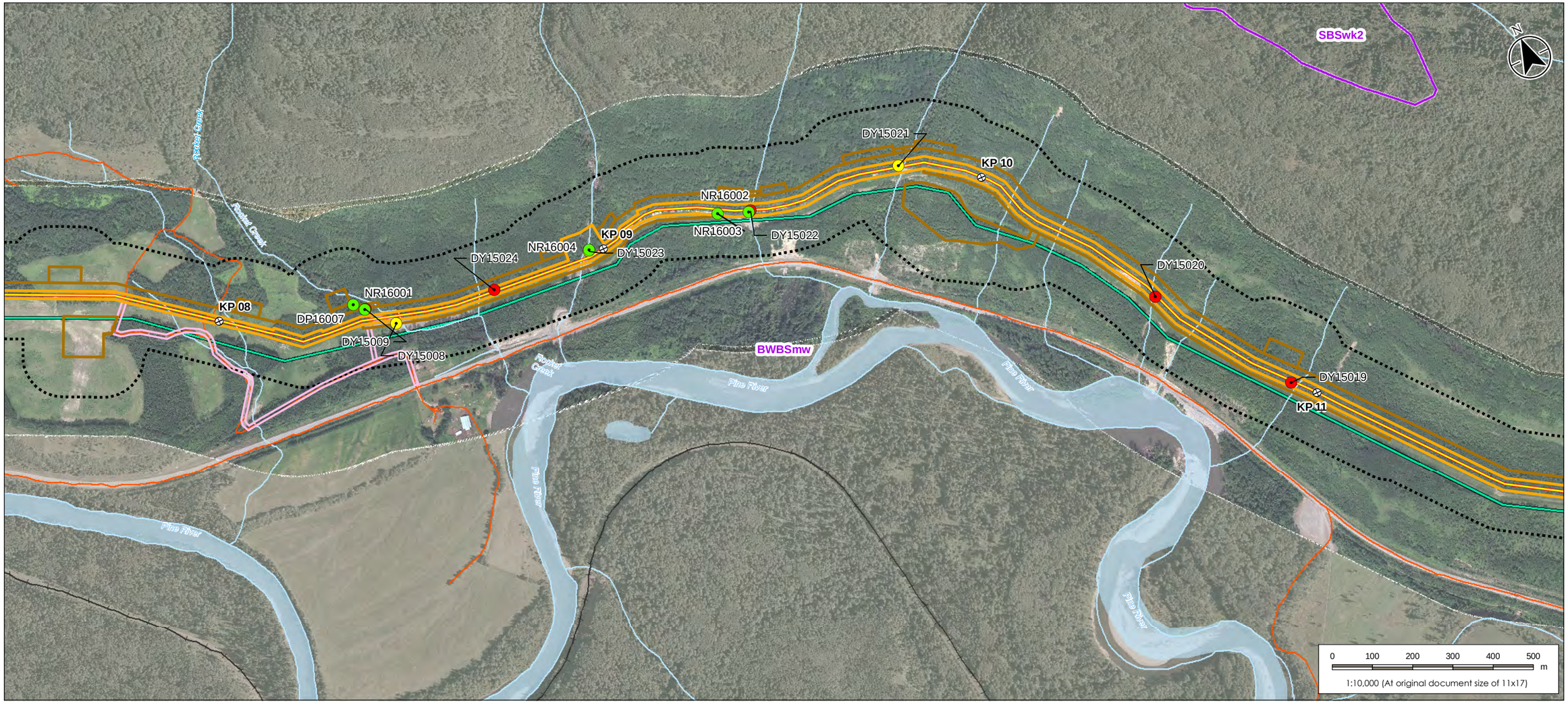
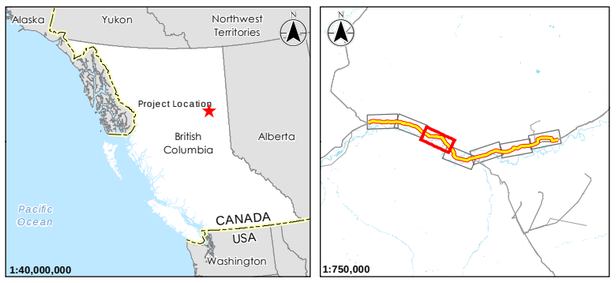
Figure No.
4-1

Title
Wyndwood Expansion Project
Vegetation Survey
Sheet 2 of 7





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Sheet 3 of 7

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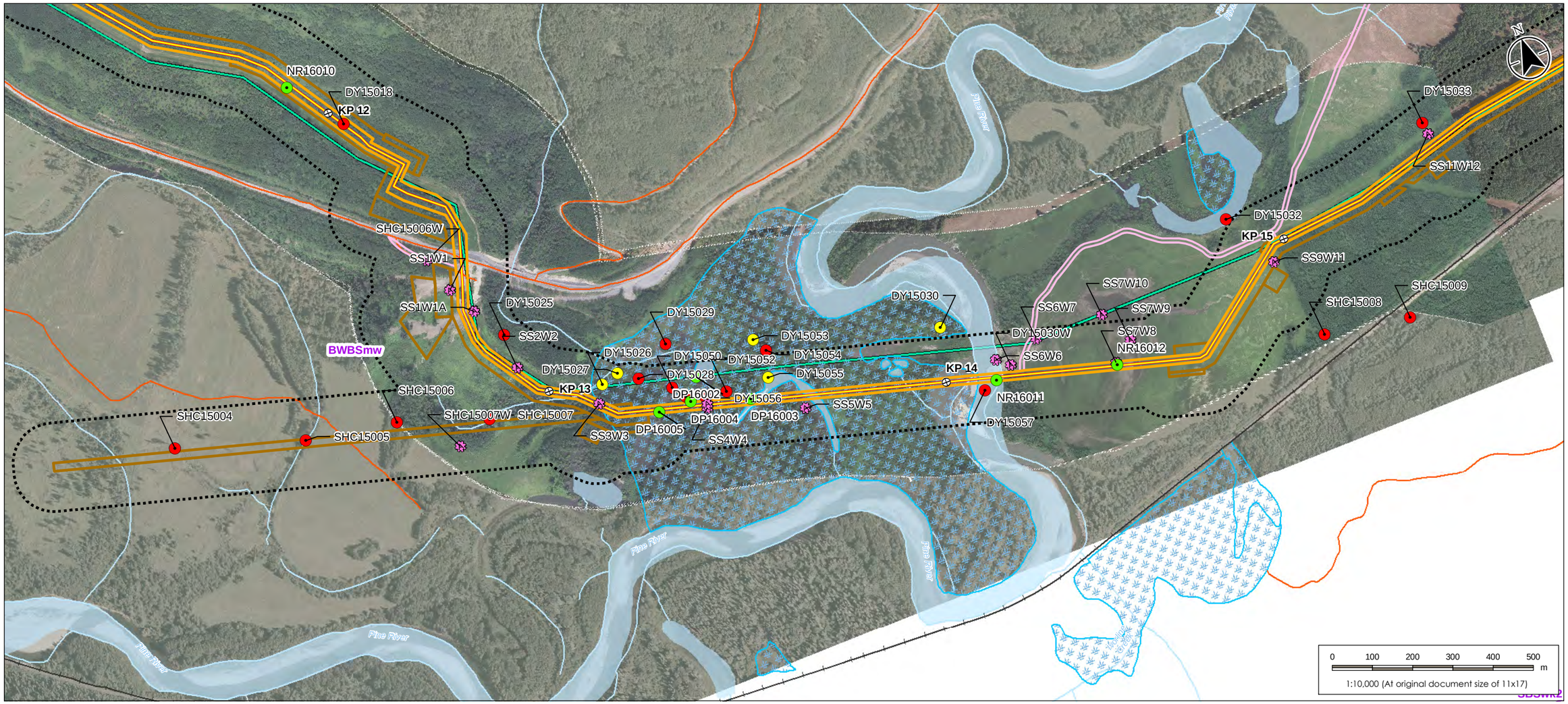

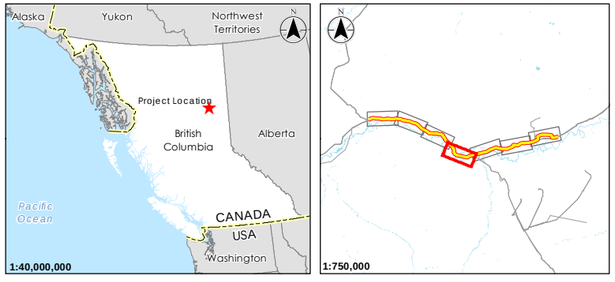

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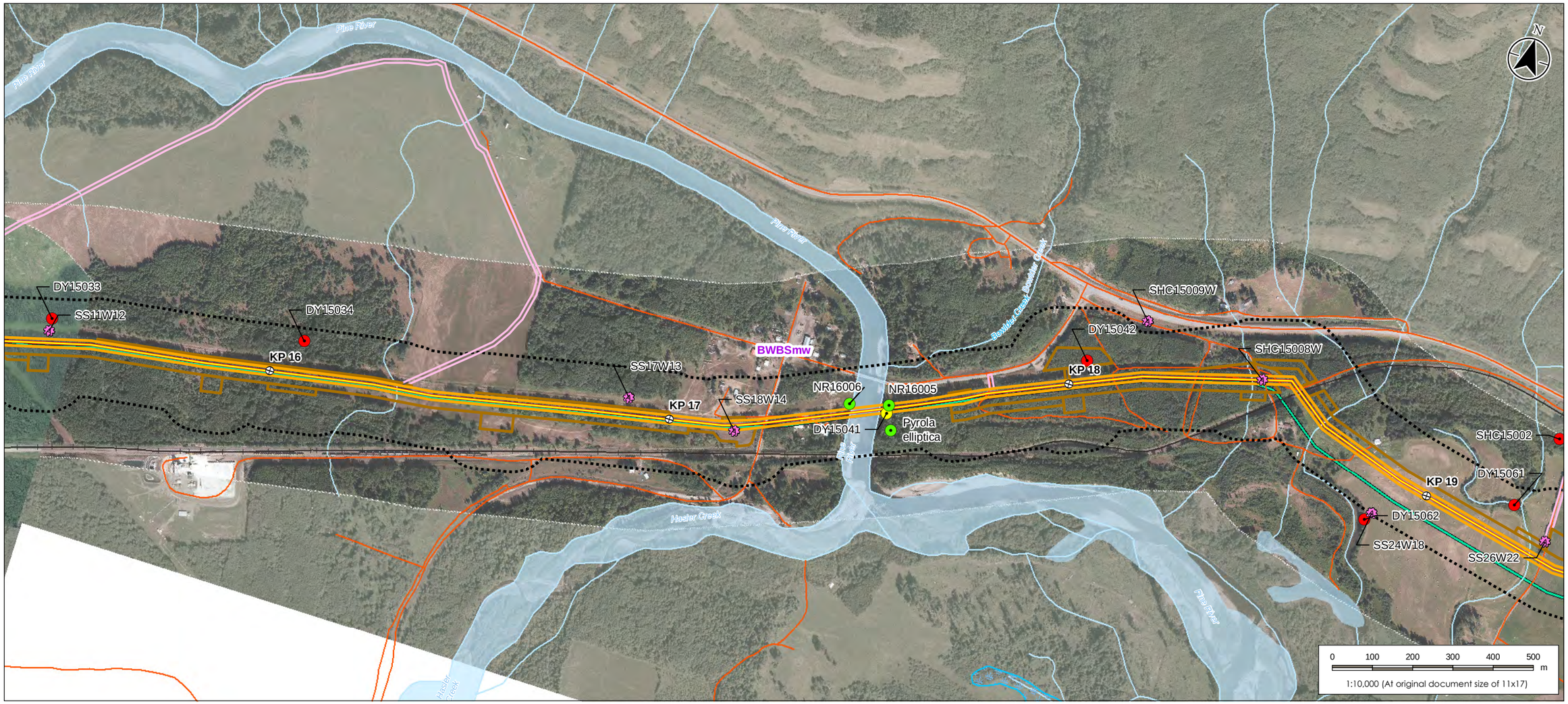

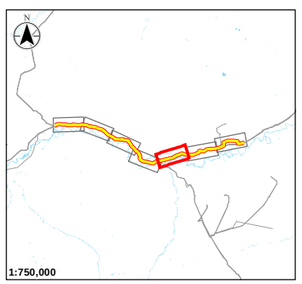

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Title
Wyndwood Expansion Project
Vegetation Survey
Sheet 5 of 7

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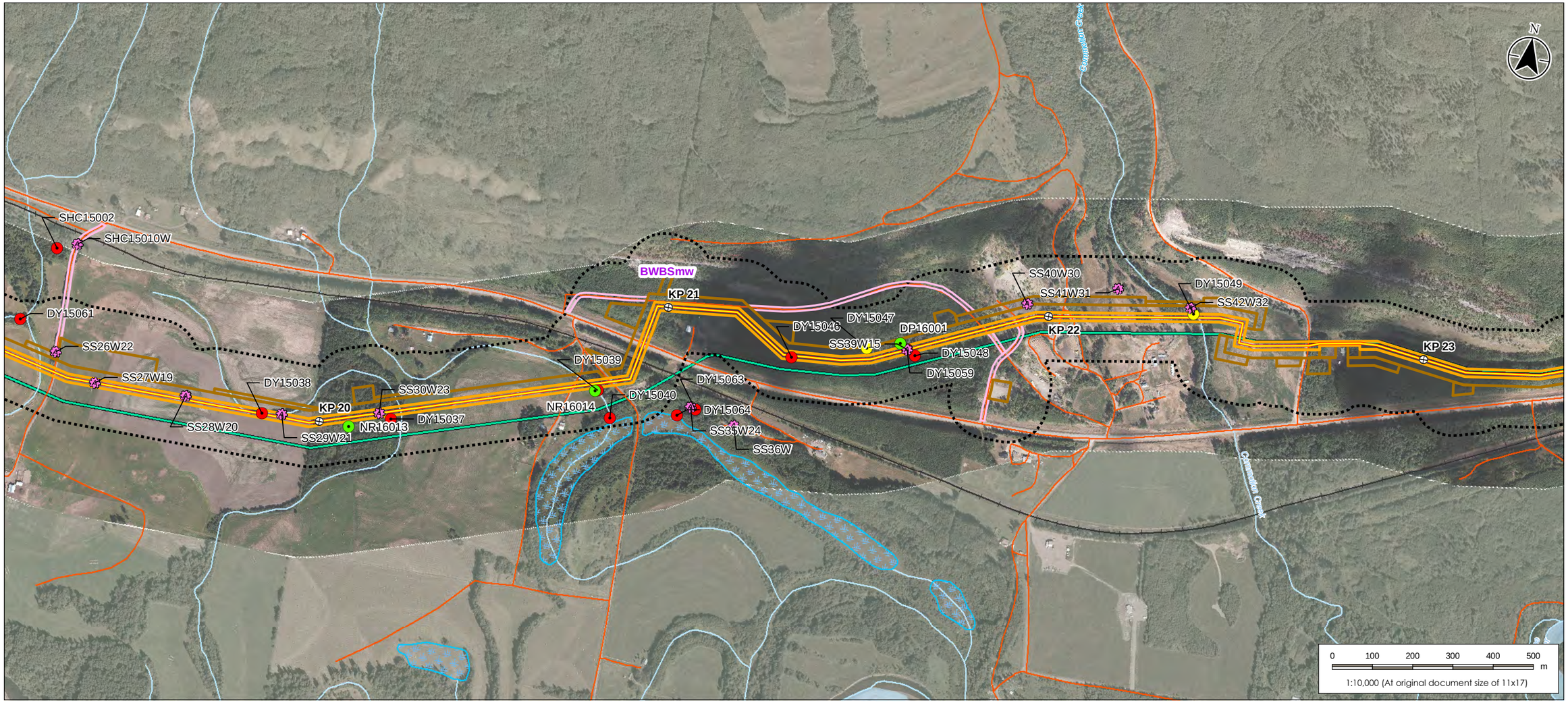

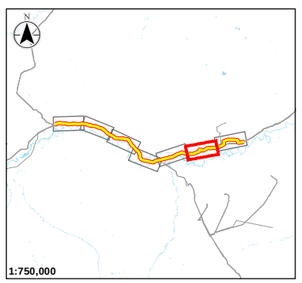

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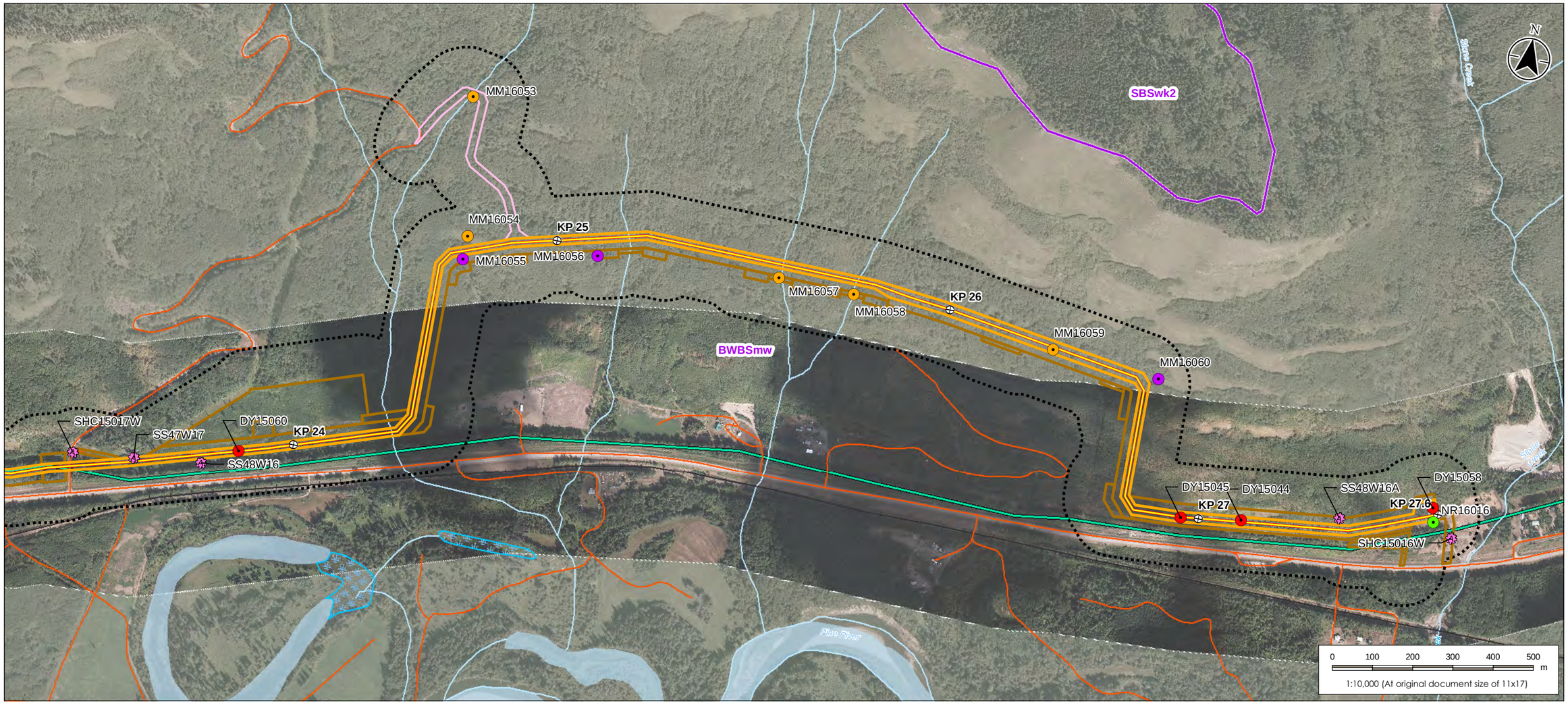
Figure No.
4-1

Title
Wyndwood Expansion Project
Vegetation Survey
Sheet 6 of 7



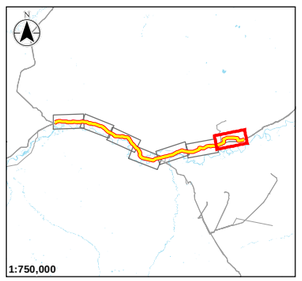


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Figure No.
4-1

Title
Wyndwood Expansion Project
Vegetation Survey
Sheet 7 of 7

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APPENDIX B
PLANT SPECIES LIST

Stantec

October 21, 2016

Appendix B: Plant Species List

Plant Species Field Identified in Survey Plots, September 22 to October 3 and October 16 to October 19, 2015; June 14 to June 15 and July 2 to July 4, 2016 and September 13, 2016

Scientific Name	Authority	English Name	Lifeform
Acer glabrum	Torr.	Douglas maple	broad-leaved tree
Achillea millefolium	L.	yarrow	forb
Achnatherum richardsonii	(Link) Barkw.	Richardson needlegrass	graminoid
Actaea rubra	(Ait.) Willd.	baneberry	forb
Alnus incana	L.	mountain alder	broad-leaved tree
Alnus viridis	(Chaix) DC.	green alder	deciduous shrub
Alnus viridis ssp. sinuata	(Regel) A. & D. Löve	Sitka alder	deciduous shrub
Amelanchier alnifolia	Nutt.	Saskatoon	deciduous shrub
Anaphalis margaritacea	(L.) Benth. & Hook. f. ex C.B. Clarke	pearly everlasting	forb
Androsace spp.		fairy candlelabra	forb
Angelica genuflexa	Nutt.	kneeling angelica	forb
Antennaria microphylla	Rydb.	white pussytoes	forb
Antennaria neglecta	Greene	field pussytoes	forb
Antennaria parviflora	Nutt.	Nuttall's pussytoes	forb
Antennaria rosea	Greene	rosy pussytoes	forb
Anthoxanthum nitens	(Weber) Y. Schouten & Veldkamp	sweetgrass	graminoid
Apocynum androsaemifolium	L.	spreading dogbane	forb
Aquilegia formosa	Fisch. ex DC.	red columbine	forb
Arabis glabra	(L.) Bernh.	tower mustard	forb
Arabis holboellii	Hornem.	Holboell's rockcress	forb
Aralia nudicaulis	L.	wild sarsaparilla	forb
Arnica cordifolia	Hook.	heart-leaved arnica	forb

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Appendix B: Plant Species List

Plant Species Field Identified in Survey Plots, September 22 to October 3 and October 16 to October 19, 2015; June 14 to June 15 and July 2 to July 4, 2016 and September 13, 2016

Scientific Name	Authority	English Name	Lifeform
Arctostaphylos uva-ursi	(L.) Spreng.	kinnikinnick	dwarf woody plant
Aruncus dioicus	(Walt.) Fern.	goatsbeard	forb
Aster spp.		aster species	forb
Athyrium filix-femina	(L.) Roth	lady fern	fern or fern-ally
Aulacomnium palustre	(Hedw.) Schwaegr.	glow moss	moss
Avena fatua	L.	wild oat	graminoid
Barbilophozia lycopodioides	(Wallr.) Loeske	common leafy liverwort	hepatic
Betula papyrifera	Marsh.	paper birch	broad-leaved tree
Brachythecium frigidum	(C. Müll.) Besch.	golden short-capsuled moss	moss
Brachythecium sp.		ragged-moss	moss
Brachythecium rivulare	Schimp.	river ragged-moss	moss
Brachythecium turgidum	(C. J. Hartm.) Kindb.	thick ragged-moss	moss
Brassica sp.		mustard species	forb
Bromus inermis	Leys.	smooth brome	graminoid
Calamagrostis canadensis	(Michx.) Beauv.	bluejoint reedgrass	graminoid
Calamagrostis stricta	(Timm) Koel.	slimstem reedgrass	graminoid
Canadanthus modestus	(Lindl.) G.L. Nesom	great northern aster	forb
Carex aquatilis	Wahlenb.	water sedge	graminoid
Carex concinna	R. Br.	low northern sedge	graminoid
Carex foenea	Willd.	dry-spike sedge	graminoid
Carex utriculata	Boott	beaked sedge	graminoid
Carex sp.		sedge species	graminoid

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Scientific Name	Authority	English Name	Lifeform
Castilleja miniata	Dougl. ex Hook.	scarlet paintbrush	forb
Cenchrus longispinus	(Hack.) Fern.	burgrass	graminoid
Centaurea solstitialis	L.	yellow starthistle	forb
Chrysanthemum majus	(Desf.) Asch.	daisy	forb
Cicuta douglassi	(DC.) Coult. & Rose	water hemlock	forb
Cinna latifolia	(Trev. ex Goepp.) Griseb.	nodding wood-reed	graminoid
Circaea alpina	L.	small enchanter's nightshade	forb
Cirsium arvense	(L.) Scop.	Canada thistle	forb
Cirsium vulgare	(Savi) Tenore	bull thistle	forb
Cladonia sp.		cladonia species	lichen
Clematis occidentalis	(Hornem.) DC.	Columbia bower	forb
Coeloglossum viride	(L.) Hartmann	long-bracted frog orchid	forb
Collomia linearis	Nutt.	narrow-leaved collomia	forb
Conyza canadensis	(L.) Cronq.	horseweed	forb
Corallorhiza maculata	(Raf.) Raf.	spotted coralroot	forb
Cornus canadensis	L.	bunchberry	forb
Cornus stolonifera	Michx.	red-osier dogwood	deciduous shrub
Crepis tectorum	L.	annual hawksbeard	forb
Deschampsia sp.		hairgrass	graminoid
Deschampsia cespitosa	(L.) Beauv.	tufted hairgrass	graminoid
Descurainia sophia	(L.) Webb ex Prantl	flixweed	forb
Dicranum acutifolium	(Lindb. & Arnell) C. Jens. ex Weinm.	-	moss

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Scientific Name	Authority	English Name	Lifeform
Dicranum sp.		heron's-bill moss	moss
Dicranum fuscescens	Turn.	curly heron's-bill moss	moss
Dryopteris cristata	(L.) A. Gray	crested woodfern	forb
Elymus glaucus	Buckl.	blue wildrye	graminoid
Elymus repens	(L.) Gould	quackgrass	graminoid
Elymus trachycaulus ssp. trachycaulus		slender wheatgrass	graminoid
Epilobium angustifolium	L.	fireweed	forb
Epilobium glaberrimum	Barbey	smooth willowherb	forb
Epilobium palustre	L.	swamp willowherb	forb
Equisetum arvense	L.	common horsetail	fern or fern-ally
Equisetum fluviatile	L.	swamp horsetail	fern or fern-ally
Equisetum hyemale	L.	scouring-rush	fern or fern-ally
Equisetum pratense	L.	meadow horsetail	fern or fern-ally
Equisetum scirpoides	Michx.	dwarf scouring-rush	fern or fern-ally
Equisetum sylvaticum	L.	wood horsetail	fern or fern-ally
Erucastrum gallicum	(Willd.) O.E. Schulz	dog mustard	forb
Eurybia conspicua	(Lindl.) Á. Löve & D. Löve	showy aster	forb
Fragaria vesca	L.	wood strawberry	forb
Fragaria virginiana	Duchesne	wild strawberry	forb
Festuca altaica	Trin.	altai fescue	graminoid
Festuca rubra	L.	red fescue	graminoid
Festuca sp.		fescue	graminoid

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Scientific Name	Authority	English Name	Lifeform
Fragaria virginiana	Duchesne	wild strawberry	forb
Galeopsis tetrahit	L.	hemp-nettle	forb
Galium boreale	L.	northern bedstraw	forb
Galium trifidum	L.	small bedstraw	forb
Geocaulon lividum	(Richards.) Fern.	false toad-flax	forb
Geum aleppicum	Jacq.	yellow avens	forb
Geum macrophyllum	Willd.	large-leaved avens	forb
Glyceria grandis	S. Wats. ex A. Gray	reed mannagrass	graminoid
Glyceria striata	(Lam.) A.S. Hitchc.	fowl mannagrass	graminoid
Gymnocarpium dryoteris	(L.) Newman	oak fern	forb
Helodium blandowii	(Web. & Mohr) Warnst.	pond fern-moss	moss
Heracleum maximum	Bartr.	cow-parsnip	forb
Hieracium umbellatum	L.	narrow leaf hawkweed	forb
Hordeum jubatum	L.	foxtail barley	graminoid
Hylocomium splendens	(Hedw.) Schimp.	step moss	moss
Juncus alpinoarticulatus	Chaix	alpine rush	graminoid
Juniperous communis	L.	common juniper	shrub
Lathyrus ochroleucus	Hook.	creamy peavine	forb
Leucanthemum vulgare	Lam.	oxeye daisy	forb
Leymus innovatus	(Beal) Pilger	fuzzy-spiked wildrye	graminoid
Leymus sp.		wildrye	graminoid
Linnaea borealis	L.	twinflower	dwarf woody plant

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Scientific Name	Authority	English Name	Lifeform
Listera borealis	Morong	northwestern twayblade	forb
Lonicera diocia	L.	honeysuckle	shrub
Lonicera involucrata	(Richards.) Banks ex Spreng.	black twinberry	shrub
Lycopus asper	Greene	rough water horehound	forb
Maianthemum racemosum	(L.) Link	false Solomon's-seal	forb
Maianthenum canadense	Desf.	false lily of the valley	forb
Maianthenum stellatum	(L.) Link	star false lily-of-the-valley	forb
Medicago sativa	L.	alfalfa	forb
Melampyrum lineare	Desr.	cow-wheat	forb
Melilotus alba	Desr.	white sweet-clover	forb
Melilotus officinalis	(L.) Lam.	yellow sweet-clover	forb
Mentha arvensis	L.	field mint	forb
Mertensia paniculata	(W. Ait.) G. Don	tall bluebells	forb
Mitella nuda	L.	common mitrewort	forb
Moehringia lateriflora	(L.) Fenzl	blunt-leaved sandwort	forb
Moneses uniflora	(L.) A. Gray	single delight	forb
Mnium sp.		leafy moss	moss
Nassella viridula	(Trin.) Barkw.	green needlegrass	graminoid
Neckera douglasii	Hook.	Douglas' neckera	moss
Orthilia secunda	(L.) House	one-sided wintergreen	forb
Osmorhiza depauperata	Phil.	blunt-fruited sweet-cicely	forb
Petasites frigidus	(L.) Fries	sweet coltsfoot	forb

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Scientific Name	Authority	English Name	Lifeform
Petasites frigidus var. palmatus	(Ait.) Cronq.	palmate coltsfoot	forb
Phalaris arundinacea	L.	reed canarygrass	graminoid
Phegopteris connectilis	(Michx.) Watt	narrow beech fern	forb
Phleum pratense	L.	common timothy	graminoid
Phragmites australis	(Cav.) Trin. ex Steud.	common reed	graminoid
Picea glauca	(Moench) Voss	white spruce	coniferous tree
Pinus contorta	Dougl. ex Loud.	lodgepole pine	coniferous tree
Plantago major	L.	common plantain	forb
Pleurozium schreberi	(Brid.) Mitt.	red-stemmed feathermoss	moss
Poa sp.		bluegrass	graminoid
Poa palustris	L.	fowl bluegrass	graminoid
Poa pratensis	L.	Kentucky bluegrass	graminoid
Populus balsamifera	L.	balsam poplar	broad-leaved tree
Populus tremuloides	Michx.	trembling aspen	broad-leaved tree
Potentilla norvegica	L.	Norwegian cinquefoil	forb
Prosartes trachycarpa	S. Wats.	rough-fruit fairybells	forb
Prunus pensylvanica	L.f.	pin cherry	broad-leaved tree
Prunus virginiana	L.	choke cherry	broad-leaved tree
Pyrola asarifolia	Michx.	pink wintergreen	forb
Pyrola elliptica	Michx.	shinleaf wintergreen	forb
Ranunculus acris	L.	meadow buttercup	forb
Rhizocarpon grande	(Flörke ex Flotow) Arnold	-	lichen

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Scientific Name	Authority	English Name	Lifeform
Ribes bracteosum	Dougl. ex Hook.	stink currant	deciduous shrub
Ribes hudsonianum	Richards.	northern blackcurrant	shrub
Ribes lacustre	(Pers.) Poir.	black gooseberry	deciduous shrub
Ribes laxiflorum	Pursh	trailing black current	deciduous shrub
Ribes oxyacanthoides	L.	gooseberry	deciduous shrub
Ribes triste	Pallas	red swamp currant	deciduous shrub
Rosa acicularis	Lindl.	prickly rose	deciduous shrub
Rubus idaeus	L.	red raspberry	deciduous shrub
Rubus parviflorus	Nutt.	thimbleberry	deciduous shrub
Rubus pubescens	Raf.	dwarf red raspberry	deciduous shrub
Rumex acetosa	L.	green sorrel	forb
Rumex crispus	L.	curled dock	forb
Salix arbusculoides	Andersson	northern bush willow	deciduous shrub
Salix bebbiana	Sarg.	Bebb's willow	broad-leaved tree
Salix exigua	Nutt.	narrow-leaf willow	deciduous shrub
Salix glauca	L.	grey-leaved willow	deciduous shrub
Salix lucida	Muhl.	Pacific willow	broad-leaved tree
Salix maccaliana	Rowlee	MacCalla's willow	deciduous shrub
Salix pedicellaris	Pursh	bog willow	deciduous shrub
Salix petiolaris	Sm.	meadow willow	deciduous shrub
Salix planifolia	Pursh	plane-leaved willow	deciduous shrub
Salix psedudomonticola	C.R. Ball	mountain willow	deciduous shrub

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Scientific Name	Authority	English Name	Lifeform
Salix scouleriana	J. Barratt ex Hook.	Scouler's willow	broad-leaved tree
Salix serissima	Nutt.	autumn willow	deciduous shrub
Salix sp.		willow species	deciduous shrub
Sanionia uncinata	(Hedw.) Loeske	sickle-moss	moss
Schizachne purpurascens	(Torr.) Swallen	false melic grass	graminoid
Scirpus microcarpus	J.& K. Presl	small-flowered bulrush	graminoid
Scorpidium revolvens	(Sw. ex Anonymo) Rubers	rusty hook-moss	moss
Scutellaria galericulata	L.	marsh skullcap	forb
Sedum lanceolatum	Torr.	lance-leaved stonecrop	forb
Senecio triangularis	Hook.	arrow-leaved groundsel	forb
Shepherdia canadensis	(L.) Nutt.	soopolallie	deciduous shrub
Sium suave	Walt.	water parsnip	forb
Solidago canadensis	L.	golden rod	forb
Sonchus arvensis	L.	perennial sow-thistle	forb
Spiraea betulifolia	Pall.	birch-leaved spirea	deciduous shrub
Streptopus amplexifolius	(L.) DC.	clasping twistedstalk	forb
Streptopus roseus	(L.) DC.	clasping twistedstalk	forb
Symphoricarpos albus	(L.) Blake	common snowberry	deciduous shrub
Symphoricarpos occidentalis	Hook.	wolfberry	deciduous shrub
Symphyotrichum ciliolatum	(Lindl.) Á. Löve & D. Löve	Lindley's aster	forb
Symphyotrichum puniceum	(L.) Á. Löve & D. Löve	purple-stemmed aster	forb
Tanacetum vulgare	L.	common tansy	forb

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Scientific Name	Authority	English Name	Lifeform
Taraxacum officinale	G.H. Weber ex Wiggers	common dandelion	forb
Thalictrum occidentale	A. Gray	western meadowrue	forb
Thlaspi arvense	L.	field pennycress	forb
Tragopogon dubius	Scop.	yellow salsify	forb
Trifolium hybridum	L.	alsike clover	forb
Trifolium repens	L.	white clover	forb
Tripleurospermum inodorum	(L.) Schultz-Bip.	scentless mayweed	forb
Typha latifolia	L.	common cattail	forb
Urtica dioica	L.	stinging nettle	forb
Vaccinium caespitosum	Michx.	dwarf blueberry	dwarf woody plant
Vaccinium uliginosum	L.	bog blueberry	dwarf woody plant
Vaccinium myrtillus	L.	low bilberry	dwarf woody plant
Valeriana diocia	L.	marsh valerian	forb
Veronica americana	Schwein. ex Benth.	brooklime	forb
Veronica beccabunga	L.	American speedwell	forb
Viburnum edule	(Michx.) Raf.	highbush-cranberry	deciduous shrub
Vicia americana	Muhl. ex Willd.	American vetch	forb
Viola canadensis	L.	Canada violet	forb
Viola canadensis	L.	Canada violet	forb
Viola palustris	L.	marsh violet	forb
Viola renifolia	L.	kidney leafed violet	forb

APPENDIX C
BC CONSERVATION DATA CENTRE: SPECIES OCCURRENCE REPORT SHINLEAF WINTERGREEN

BC Conservation Data Centre: Species Summary

Pyrola elliptica
shinleaf wintergreen

Scientific Name [Author]: *Pyrola elliptica* [Nutt.]

English Name: shinleaf wintergreen

Classification / Taxonomy

Scientific Name - Concept Reference: Kartesz, J.T. 1994. A synonymized checklist of the vascular flora of the United States, Canada, and Greenland. 2nd edition. 2 vols. Timber Press, Portland, OR.

Classification Level: Species

Species Group: Vascular Plant

Species Code: PYROELL

Kingdom	Phylum	Class	Order	Family
Plantae	Anthophyta	Dicotyledoneae	Ericales	Pyrolaceae

Conservation Status / Legal Designation

Global Status: G5 (Aug 2015)

Provincial Status: S3 (Apr 2015)

BC List: Blue

Identified Wildlife:

Provincial Wildlife Act:

COSEWIC Status:

SARA Schedule:

General Status Canada: 4 - Secure (2010)

Ecology & Life History

General Description:

Technical Description:

Similar Species:

Forest / Conifer Forest - Dry / Facultative - occassional use
Forest / Conifer Forest - Mesic (average) / Facultative - frequent use

Habitats: (Type / Subtype / Dependence)	Forest / Conifer Forest - Moist/wet / Facultative - occassional use Forest / Mixed Forest (deciduous/coniferous mix) / Facultative - frequent use
Provincial Phenology: (1st half of month/ 2nd half of month)	
Elevation (m) (min / max):	Provincial:
Known Pests:	
Pollen Vector:	
Pollinator:	
Dispersal:	

Provincial Inventory

Inventory Priority:	
Ownership of occurrences (Known locations):	
Inventory Need:	

Economic Attributes

Distribution

Endemic:	N
Disjunct, more common elsewhere:	
Peripheral, major distribution elsewhere:	

Distribution Unit	Occurrence Status	Origin Status
Biogeoclimatic Unit		
BWBSmw - Boreal White and Black Spruce - Moist Warm	Confident or certain	Native or natural
CWHvm - Coastal Western Hemlock - Very Wet Maritime	Confident or certain	Native or natural
ESSFmw - Engelmann Spruce - Subalpine Fir - Moist Warm	Confident or certain	Native or natural

ICHmw - Interior Cedar - Hemlock - Moist Warm	Confident or certain	Native or natural
IDFww - Interior Douglas-fir - Wet Warm	Confident or certain	Native or natural
IDFxm - Interior Douglas-fir - Very Dry Mild	Confident or certain	Native or natural
MHmm - Mountain Hemlock - Moist Maritime	Confident or certain	Native or natural
MSxk - Montane Spruce - Very Dry Cool	Confident or certain	Native or natural
SBSdw - Sub-Boreal Spruce - Dry Warm	Confident or certain	Native or natural
SBSmh - Sub-Boreal Spruce - Moist Hot	Confident or certain	Native or natural

Ministry of Environment Region

1- Vancouver Island	Confident or certain	Native or natural
3- Thompson	Confident or certain	Native or natural
5- Cariboo	Possible	Native or natural
7- Omineca	Confident or certain	Native or natural
8- Okanagan	Confident or certain	Native or natural
9- Peace	Confident or certain	Native or natural

Forest District

Arrow Boundary Forest District (DAB)	Confident or certain	Native or natural
Cascades Forest District (DCS)	Confident or certain	Native or natural
Central Cariboo Forest District (DCC)	Possible	Native or natural
Chilliwack Forest District (DCK)	Confident or certain	Native or natural
Kamloops Forest District (DKA)	Confident or certain	Native or natural
North Island - Central Coast Forest District (DNI)	Possible	

		Native or natural
Okanagan Shuswap Forest District (DOS)	Confident or certain	Native or natural
Peace Forest District (DPC)	Confident or certain	Native or natural
Prince George Forest District (DPG)	Confident or certain	Native or natural
Quesnel Forest District (DQU)	Possible	Native or natural
South Island Forest District (DSI)	Confident or certain	Native or natural

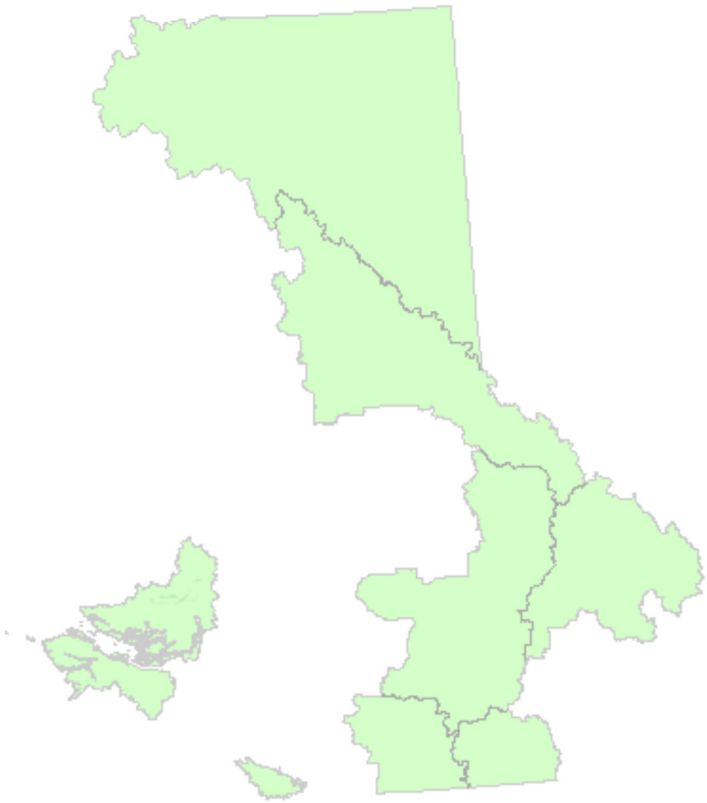
Regional District

Columbia-Shuswap (CSRD)	Confident or certain	Native or natural
Fraser Valley (FVRD)	Confident or certain	Native or natural
Fraser-Fort George (FFRD)	Confident or certain	Native or natural
Mount Waddington (RDMW)	Possible	Native or natural
Nanaimo (RDN)	Confident or certain	Native or natural
Okanagan-Similkameen (OSRD)	Confident or certain	Native or natural
Peace River (PRRD)	Confident or certain	Native or natural
Thompson-Nicola (TNRD)	Confident or certain	Native or natural

Regional District Map

This is not a range map.

This species is known to occur somewhere in the shaded regional district(s). The actual range of the species within each regional district may be much smaller.



Authors / Contributors

Global Information
Author:

Last Updated:

Provincial Information
Author:

Last Updated:

Last Literature Search:

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Please visit the website http://www.env.gov.bc.ca/cdc/Reports/summary_data_fields_08.htm for definitions of the data fields used in this summary report.

Suggested Citation:

B.C. Conservation Data Centre. 2016. Species Summary: *Pyrola elliptica*. B.C. Minist. of Environment. Available: http://a100.gov.bc.ca/pub/eswp/ (accessed Jul 15, 2016).