

November 23, 2016



City of Winnipeg
Asset Management Office
414A Osborne Street
Winnipeg, Manitoba
R3L 2A1

Attention: Mr. Jesse Crowder, P.Eng.
Project Manager

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**Plan to Address Clause 12 'Wetland Offset', Revised Environment Act Licence
No. 3121 E (Aug. 8, 2016): Southwest Transit Corridor Project, Stage 2 (SWT2) Project**

Dear Mr. Crowder:

To address the matter of appeals to the original Environment Act Licence (EAL) No. 3121 issued by the Manitoba Environmental Approvals Branch (EAB) dated December 18, 2014, the EAB issued a revised EAL No. 3121 E dated August 8, 2016. The scope of this memorandum is regarding Dillon's proposed plan to address the 'Wetland Offset' requirement (Clause 12) of the revised EAL which states:

"The Licencee shall:

- a) replace the structure and function of cattail stands and wet meadow areas in the Parker Lands that are impacted by the Development with new areas of semi-aquatic vegetation, aquatic vegetation and a pond habitat through the development of the planned Parker Retention Pond; and*
- b) prior to January 1, 2017, submit a plan, for approval by the Director, to demonstrate how the Licencee will manage to offset the loss of wetlands (including wet meadow and cattail stands) by at least a three to one ratio of area of restored wetlands to the area of those lost through construction of the Development. Specifically, the plan shall demonstrate how offsetting measures will be undertaken within, or adjacent to, the project area or alternatively within the City of Winnipeg."*

The revised EAL defines 'wetlands' as meaning "...those areas where the water table is at or above the land surface for a long enough period each year to make the area capable of supporting aquatic or hydrophilic vegetation, and which have soils with characteristics indicative of wet conditions."



Wetland Compensation/Offsetting Methods

Area of Wet Meadows and Cattail Ponds Impacted by the Development

The areas of existing wet meadows and cattail ponds in the SWT2 Project area within the Parker Lands were verified based on field surveys conducted in conjunction with Species at Risk (SAR) surveys during May and June, 2016 (**Figure 1**). Considering the area of cattail ponds, and especially the wet meadow areas, may differ from year-to-year depending on variability in annual/season rainfall and snowmelt conditions and land use activities (e.g., Manitoba Hydro transmission/distribution line right-of-way maintenance/activities), aerial imagery from 2013 to June 2016 of the Project area within the Parker Lands were also used to delineate the area of wet meadows and cattail ponds that will be impacted by the Project.

Of the three Prairie Provinces, the government of Alberta currently has the most detailed guidance regarding wetland compensation. The [Alberta Wetland Policy \(2013\)](#) indicates that ephemeral¹ water bodies are not subject to replacement should they be impacted. The [Alberta Wetland Identification and Delineation Directive \(2015\)](#) provides guidance regarding distinguishing ephemeral water bodies from 'wetlands' and indicates that a wetland boundary can usually be delineated as the point at which the abundant species in the outermost plant community are made up of greater than 50% facultative wetland or obligate wetland species². Using this guidance, delineation of the cattail ponds in the Project area was straightforward. Field visits to the Project area during May and June in 2016 verified that three cattail ponds currently exist (**Figure 1**, see attached). However, in the wet meadow areas, no obligate wetland plant species were observed and the percentage of facultative wetland plant species in the wet meadow areas outlined in **Figure 1** was variable. Prairie Cordgrass (*Spartina pectinata*) was the facultative wetland plant species common in the wet meadow areas, but the abundance was highly variable based on field observations in May and June in 2016. Some locations within the wet meadow areas had variable or indistinct transition zones between facultative or obligate wetland species, making precise delineation of the wet meadow areas impractical. As a conservative approach, the areas of wet meadow outlined in **Figure 1** contain areas with less than 50% facultative wetland plant species intermixed with areas of greater than 50% facultative wetland plant species and include the most conservative area delineation boundaries apparent in aerial imagery from 2013 to June 2016. Therefore, all of the wet meadow area outlined in **Figure 1** would not be considered wetlands that require compensation under the [Alberta Wetland](#)

¹ **Ephemeral Water Bodies** are defined in the Alberta Wetland policy as a shallow water body that temporarily contains water after spring snowmelt or a heavy rainfall and typically dries up within a matter of days to weeks.

² **Facultative** wetland species are species that occur in wetlands 67% to 99% of the time and **obligate** wetland species occur in wetlands >99% of the time.

[Policy \(2013\)](#) as an example policy for wetland compensation. The wet meadows in the Project area are also identified as a blend of Class I (Ephemeral Wetlands) and Class II (Temporary Wetlands) according to the Canadian prairie standard '[Stewart and Kantrud Wetland Classification System](#)'.

The area of wet meadow and cattail ponds that will be impacted by Project development was determined to be the footprint area of Project components and including adjacent ditching/modified drainage areas that overlap with the wet meadow and cattail pond areas (**Figure 1**). Two of the three cattail ponds in the Project area will be filled to accommodate the transitway, roadway, and AT path. The third wetland located 80 m south of the northern most cattail pond (**Figure 1**) may be impacted by improvements to that area to accommodate a dog park (plans currently under discussion/development). As a conservative approach, this cattail pond is also included in the total cattail pond area requiring compensation (*i.e.*, offsetting). In total, an estimated 2.99 ha (7.39 acres) of wet meadow area and 0.13 ha (0.32 acres) of cattail pond area may be potentially impacted by Project development.

Proposed Parker Retention Pond as Compensation

The City of Winnipeg (City) is planning to construct a 3.53 ha (8.72 acre) retention pond³ in an area of the Parker Lands north of Heatherdale Avenue and south of the railway tracks which delineate the east and north boundary of the Parker Lands (**Figure 1**). The retention pond is planned to have a maximum depth of approximately 2.7 m⁴, and will be 3.53 ha in total area which includes 6 m-wide periphery of natural semi-aquatic and aquatic native vegetation including cattails, sedges, rushes, and possibly soft-stem bulrush, from various donor site within the City (**Attachment A**). We propose that this planned retention pond (*i.e.*, the Parker Retention Pond) will provide appropriate compensation for the wet meadow and cattail pond areas that will be impacted by the SWT2 Project within the Parker Lands area.

The ecological value of a cattail pond is considered greater in terms of its degree of permanence and its ecological function in potentially supporting higher biodiversity as compared to a similar area of wet meadow with a lower degree of permanence and water depth (*e.g.*, Williams *et al.* 2004⁵). The deeper permanent Parker Retention Pond will provide more suitable potential breeding habitat for the Northern Leopard Frog

³ The retention pond area includes the surface water area plus a 6 m-wide surrounding area of native semi-aquatic and aquatic wetland plants including cattails.

⁴ The pond water level will be controlled by a weir set at 227.7 masl and the base of the pond is 225.0 masl.

⁵ Williams, P., M. Whitfield, J. Biggs, S. Bray, G. Fox, P. Nicholet and D. Sear. Comparative biodiversity of rivers, streams, ditches and ponds in and agriculture landscape in Southern England. *Biological Conservation*. 115(2): 329-341.

(which is a SAR⁶) rather than the shallow wet meadow habitat that is susceptible to drying-out resulting in egg and tadpole mortality. The depth of the proposed Parker Retention Pond (*i.e.*, approximately 2.7 m) will also provide potential Northern Leopard Frog overwintering habitat, which is currently lacking in the Parker Lands, and will therefore provide valuable connectivity between potential overwintering and breeding habitat within the Parker Lands area. Northern Leopard Frogs require water bodies that do not freeze to the bottom in which to overwinter (COSEWIC 2009⁷). The proposed Parker Retention Pond is not expected to freeze to the bottom considering the ice thickness on the proposed pond is not anticipated to exceed the thickness of ice that formed on the lakes at the Fort Whyte Centre during the past three winters (maximum ice thickness was 1.22 m on one of the five lakes in 2013⁸). Additionally, should the 2.99 ha area of impacted wet meadows be replaced (offset) at a 3:1 ratio, that would create a considerable amount of additional mosquito breeding habitat in the City (8.97 ha) as compared to the smaller surface area of impacted cattail ponds (0.13 ha) that would be offset by an approximate 27:1 ratio by the Parker Retention Pond. Larger expanses of wet meadow areas provide ideal abundant breeding habitat for mosquitoes. This is a consideration with respect to risk of mosquito nuisance and potential disease transmission in an urban environment (Schäfer *et. al* 2004⁹). Therefore, the establishment of the planned 3.53 ha Parker Retention Pond is proposed to provide sufficient compensation for both the impacted wet meadow and cattail pond areas in consideration of:

- The conservative estimation of area that could be classified as ‘wet meadow’ wetlands;
- The periodically disturbed nature of the potentially impacted wet meadow areas that are within the Manitoba Hydro transmission/distribution line right-of-way due to maintenance (*e.g.*, mowing) activities (**Figure 1**);
- The potentially lower ecological value of shallow wet meadows which are susceptible to drying-out as compared to a permanent cattail pond (on a hectare by hectare basis); and
- The increased mosquito nuisance and potential disease vector risk associated with creating larger areas of wet meadow within an urban area.

⁶ The Northern Leopard Frog (*Lithobates pipiens*) is listed as a species of ‘Special Concern’ by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and [Schedule 1](#) of the federal Species at Risk Act.

⁷ COSEWIC. 2009. COSEWIC assessment and update status report on the Northern Leopard Frog *Rana pipiens*, Rocky Mountain population, Western Boreal/Prairie populations and Eastern populations, in Canada. http://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_northern_leopard_frog_0809i_e.pdf

⁸ Fort Whyte lakes ice thickness data received from Katrina Froese, ecologist and education coordinator, FortWhyte Alive, Oct. 27, 2016

⁹ Schäfer, M.L., J.O. Lundström, M. Pfeffer, E. Lundkvist and J. Landin. 2004. Biological diversity versus risk for mosquito nuisance and disease transmission in constructed wetlands in southern Sweden. *Medical and Veterinary Entomology*. 18(3): 256-267.



There is precedence for allowing compensation for the loss of one type of wetland (e.g., shallow wet meadows) with another type of wetland (e.g., permanent cattail ponds). For example, the Alberta Wetland Mitigation Directive ([Alberta Government 2016](#)) allows for the replacement of a lower 'value' wetland with a higher value wetland at a compensation ratio that varies from 0.125:1 to 0.5:1. The Alberta government determines the 'value' of a wetland based on a wide variety of factors that represent wetland function, with one of the key factors being the capacity of the wetland to support a diversity of ecological functions (i.e., habitat for wetland flora and fauna) which is linked to the degree of permanence of the water within the wetland ([Alberta Government 2015](#)).

Using a conservative wetland area replacement ratio of 0.31:1 (the median ratio when replacing lower value wetland with higher value wetland: [Alberta Government 2016](#)) to recalculate the area of impacted wet meadow area requiring 3:1 replacement (as per EAL No. 3121 E), Dillon recommends that the total wet meadow area requiring compensation should be recalculated (using the 0.31:1) ratio to 0.93 ha from the originally impacted wet meadow area of 2.99 ha. The compensation calculation matrix is provided below in **Table 1**. After recalculation of the wet meadow area considered for compensation, Dillon has determined that the proposed Parker Retention Pond will exceed the required 3:1 compensation area by 10 % when considering the value of the impacted wetlands verses the value of the proposed Parker Retention Pond.

TABLE 1: PROPOSED WETLAND COMPENSATION AREAS AND RATIONALE

Wetland Type	Area (ha) Potentially Impacted	Compensation Area Calculation based on Replacing Lower Value Wetland with Higher Value Wetland at 0.31:1 Ratio	Proposed 3:1 Compensation Area Considering Value of Impacted Wetlands and Value of Parker Retention Pond	Area of Proposed Parker Retention Pond
Cattail Pond	0.13	N/A ^a	0.13 x 3 = 0.39	3.53 ^d
Wet Meadow	2.99 ^b	2.99 x 0.31 ^c = 0.93	0.93 x 3 = 2.79	
Total (ha)	3.12		3.18	3.53

^a The existing cattail ponds are not considered 'lower value' regarding their ecological structure and function compared to the proposed Parker Retention Pond.

^b Conservative estimate of wet meadow area potentially impacted by the Project.

^c Using a conservative wetland area replacement ratio of 0.31:1 (the median ratio when replacing lower value wetland with higher value wetland: Alberta Government 2016) to recalculate the area of impacted wet meadow area requiring 3:1 replacement (as per EAL No. 3121 E).

^d This proposed Parker Retention Pond area includes a 6 m-wide periphery of aquatic and semi-aquatic vegetation.



Recommendations and Conclusion:

In consideration of the safety and well-being of Winnipeg residents in the vicinity of the Parker Lands (with respect to mosquito populations) and the marginal habitat quality of the wet meadows due to disturbance (*e.g.*, mowing) and susceptibility to drying, Dillon recommends that wet meadow areas that will be impacted by the Project not be compensated by the creation of 'like for like' wet meadows in a 3:1 ratio as indicated in Clause 12 of the revised EAL. Rather, we recommend that the planned Parker Retention Pond be constructed to provide a more desirable wetland compensation scenario for both the wet meadow and cattail pond areas impacted by the Project in consideration of the ecological value of the wetlands that will be impacted by the Project. Dillon concludes that the planned Parker Retention Pond will adequately compensate for the loss of the wet meadow and cattail pond areas impacted by the Project, particularly considering the Parker Retention Pond will provide higher wetland value in terms of permanence of the pond which will protect the structure and function of the pond, and will potentially provide more ideal Northern Leopard Frog (*i.e.*, SAR) habitat (for breeding and overwintering) as compared to the wetland habitats that will be impacted as a result of the Project.

Sincerely,

DILLON CONSULTING LIMITED

Marlene Gifford, M.Sc., P.Biol., R.P. Bio., Adv. GIS Dipl.
Biologist

MMG:knp

Attachments: Figure 1 – Area of Wet Meadow and Cattail Pond Potentially Impacted by the SWT2 Project



Appendix A – Parker Retention Pond Plan Information

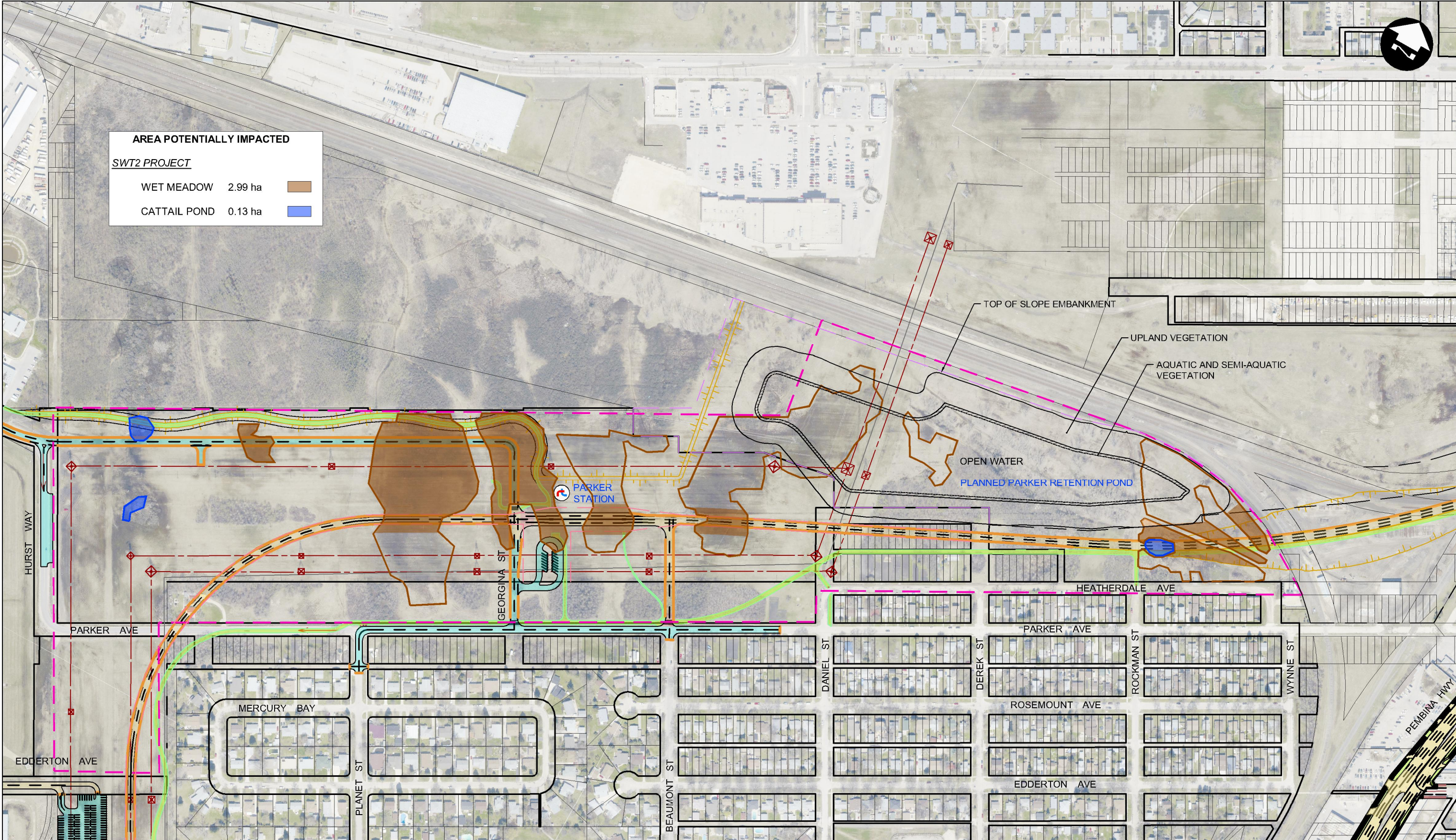
cc: Scott Payne, C.E.T, Manager of Major Works, Winnipeg Transit
Dennis Heinrichs, M.Sc., P.Eng, Partner, Dillon Consulting Limited
David Krahn, P.Eng., Partner, Dillon Consulting Limited
Taran J Peters, P.Eng., Partner, Dillon Consulting Limited




Our file: 16-3611

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AREA POTENTIALLY IMPACTED		
SWT2 PROJECT		
WET MEADOW	2.99 ha	
CATTAIL POND	0.13 ha	



WET MEADOW	
CATTAIL POND	
PROJECT AREA PARKER LANDS	

LEGEND	
TRANSITWAY	
ROADWAY	
A.T. PATHWAY	

MB HYDRO INFRASTRUCTURE	
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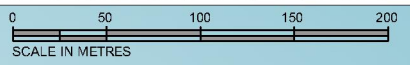


PHOTO IMAGERY: CITY OF WINNIPEG 2013

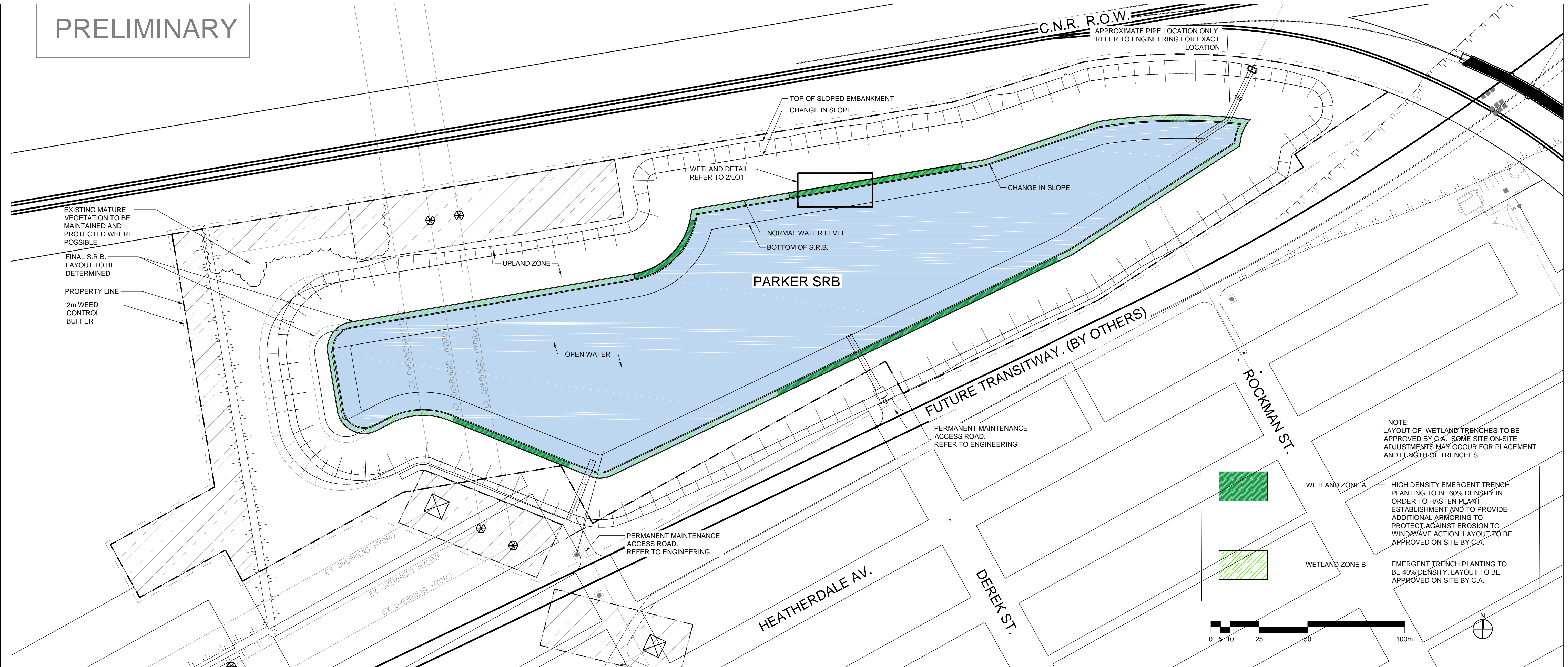
AREA OF WET MEADOW AND CATTAIL POND POTENTIALLY IMPACTED BY THE SWT2 PROJECT

FIGURE 1
PARKER LANDS - SWT2 PROJECT IMPACT
DRAWING 1 OF 1

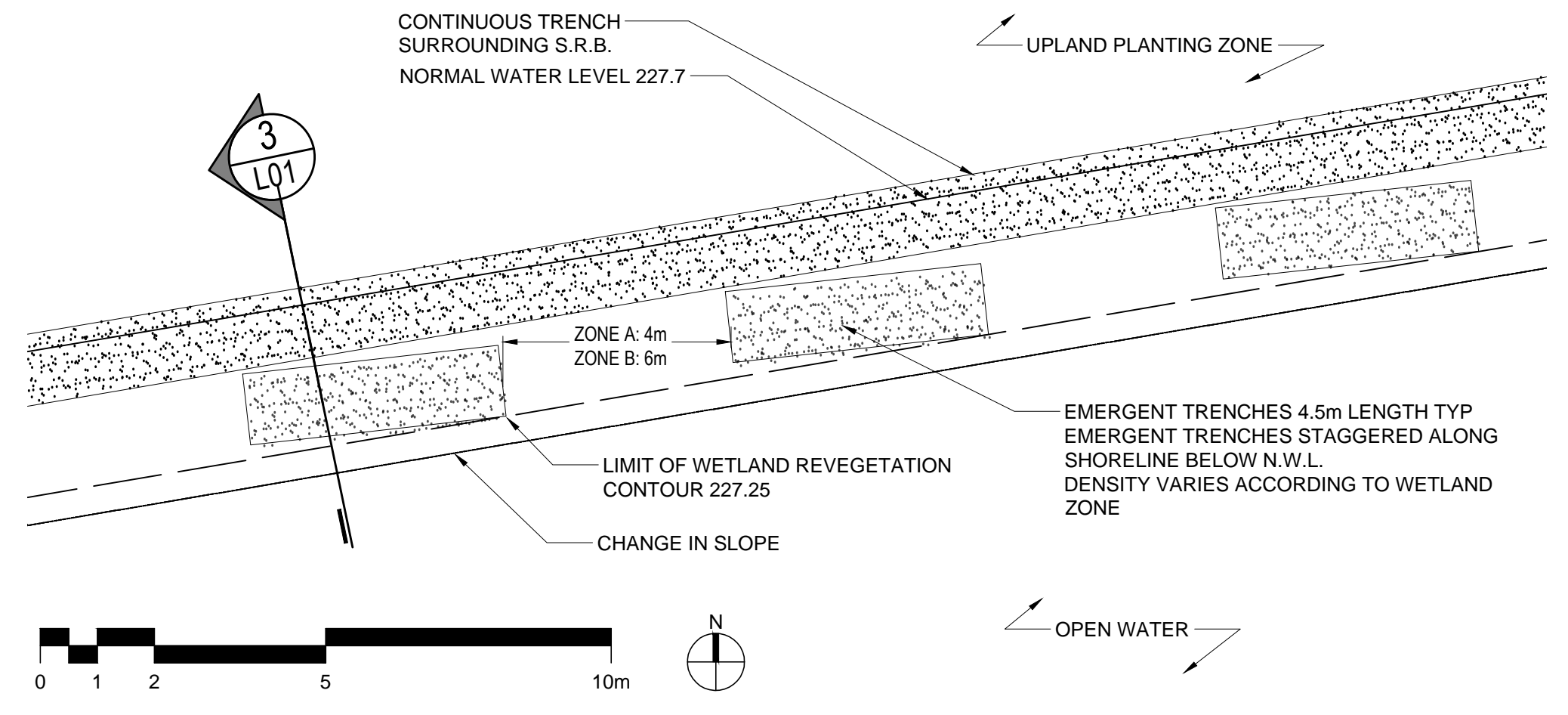
DRAFT

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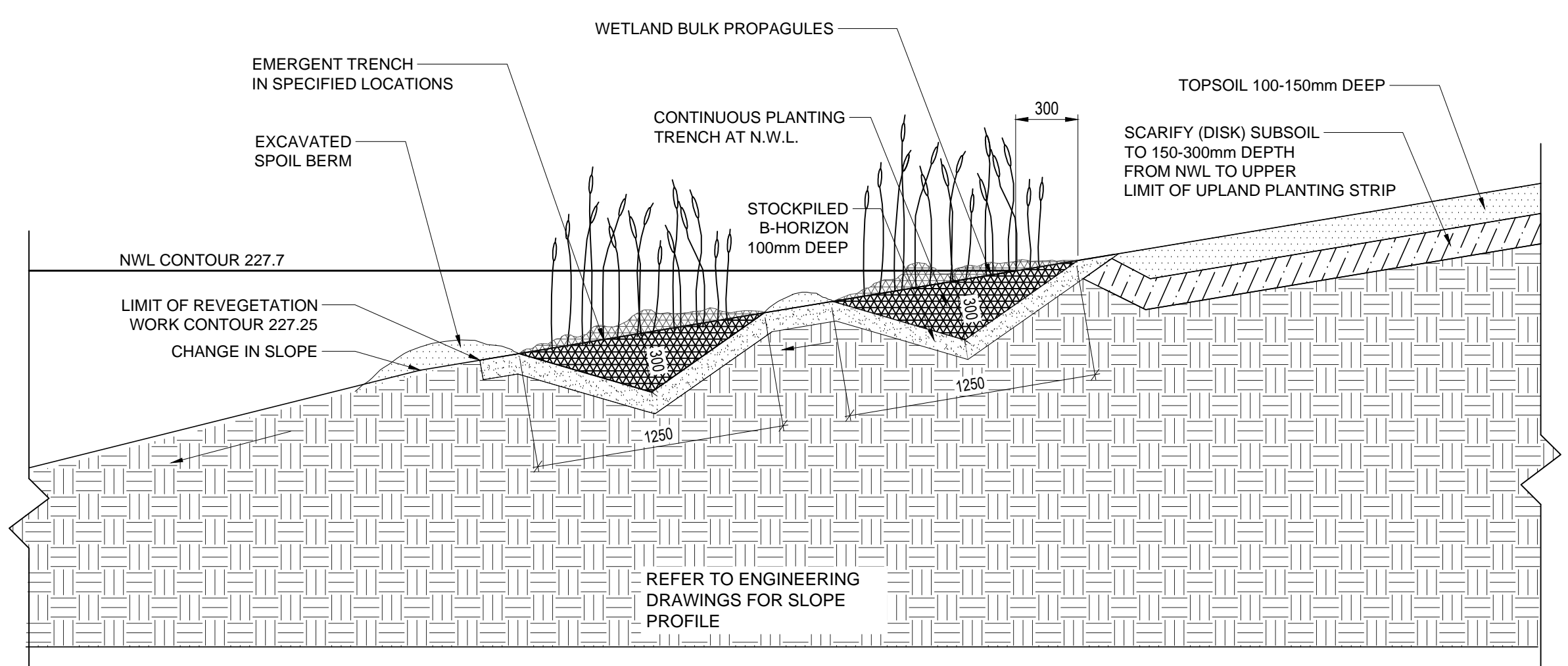
PRELIMINARY



1
L01
PARKER SRB WETLAND REVEGETATION PLAN
1 : 1000



2
L01
WETLAND TYPICAL TRENCH PLANTING LAYOUT
1 : 100



3
L01
WETLAND PLANTING TRENCH DETAIL
1 : 25

NOTE:
LAYOUT OF WETLAND TRENCHES TO BE APPROVED BY C.A. SOME SITE-ON-SITE ADJUSTMENTS MAY OCCUR FOR PLACEMENT AND LENGTH OF TRENCHES

	WETLAND ZONE A	HIGH DENSITY EMERGENT TRENCH PLANTING TO BE 60% DENSITY IN ORDER TO HASTEN PLANT ESTABLISHMENT AND TO PROVIDE ADDITIONAL ARMORING TO PROTECT AGAINST EROSION TO WIND/WAVE ACTION. LAYOUT TO BE APPROVED ON SITE BY C.A.
	WETLAND ZONE B	EMERGENT TRENCH PLANTING TO BE 40% DENSITY. LAYOUT TO BE APPROVED ON SITE BY C.A.



NO.	YY/MM/DD	DESCRIPTION	BY

REVISIONS / ISSUE

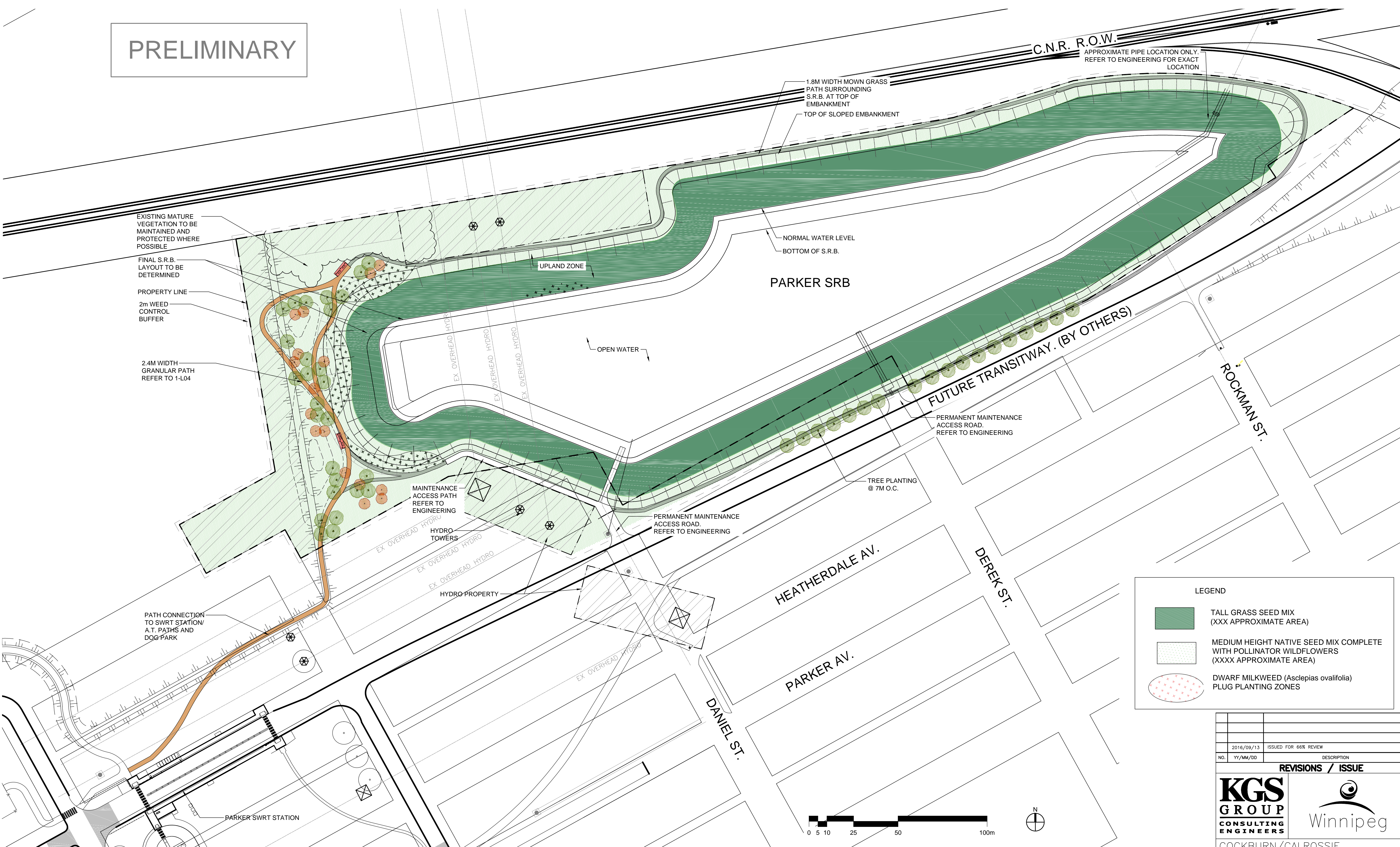
COCKBURN/CALROSSIE
COMBINED SEWER RELIEF WORKS
PRELIMINARY DESIGN REPORT

SCATLIFF + MILLER + MURRAY
visionary urban design + landscapes

PARKER STORM RETENTION BASIN WETLAND REVEGETATION PLAN		REV: 0
AUGUST 2015	L01	

11x17
 11x17 Plot Scale: 1:1000
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PRELIMINARY



1 UPLAND PLANTING PLAN
L02 1 : 1000

LEGEND

- TALL GRASS SEED MIX (XXX APPROXIMATE AREA)
- MEDIUM HEIGHT NATIVE SEED MIX COMPLETE WITH POLLINATOR WILDFLOWERS (XXXX APPROXIMATE AREA)
- DWARF MILKWEED (*Asclepias ovalifolia*) PLUG PLANTING ZONES

NO.	YY/MM/DD	DESCRIPTION	BY
	2016/09/13	ISSUED FOR 66% REVIEW	MB

REVISIONS / ISSUE

KGS
GROUP
CONSULTING
ENGINEERS

Winnipeg

COCKBURN/CALROSSIE
COMBINED SEWER RELIEF WORKS
PRELIMINARY DESIGN REPORT

SCATLIFF + MILLER + MURRAY
visionary urban design + landscapes

PARKER STORM RETENTION BASIN
UPLAND REVEGETATION PLAN

AUGUST 2015	L02	REV: 0
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