iPort Cambridge

Environmental Impact Study Addendum No. 2

Prepared for:

Healthcare of Ontario Pension Plan (HOOPP)
c/o Peter Kulkarni
Triovest Realty Advisors
40 University Avenue, Suite 1200
Toronto, Ontario
M5J 1T1

Project No. 2384 | March 2021

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

iPort Cambridge

Environmental Impact Study Addendum No. 2

Project Team

David Stephenson	Senior Biologist/Certified Arborist, Project Advisor
Desta Frey	Aquatic and Terrestrial Biologist, Project Manager

Report submitted on March 16, 2021

Desta Frey
Project Manager
Terrestrial and Aquatic Biologist

Table of Contents

List of Tables

List of Figures

1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by HOOPP (c/o Triovest), the Proponent, in early 2020 to provide ecological consulting services for the iPort Cambridge Draft Plan of Industrial Subdivision. The lands proposed for development are bounded by Riverbank Drive to the west, Middle Block Road to the north, Fountain Street to the east, and Allendale Road to the south in the City of Cambridge. To date, NRSI has prepared the following reports:

- iPort Cambridge Environmental Impact Study (EIS), dated March 31, 2020
- iPort Cambridge Detailed Vegetation Management Plan (DVMP), dated March 31, 2020
- iPort Cambridge Environmental Impact Study Addendum, dated October 29, 2020

This EIS Addendum No. 2 is provided to address natural heritage comments received from agency staff on the October 29, 2020 EIS Addendum. Agency comments on the 2nd submission of the iPort Draft Plan of Subdivision Application were received as follows:

- GRCA comments from Resource Planning (John Brum) dated December 3, 2020
- City of Cambridge comments from Environmental Planning (Kathy Padgett) dated December 23, 2020
- Region of Waterloo comments from Environmental Planning (Jane Gurney) dated January 5, 2021

GRCA comments 1 through 6 and 9 through 12 refer to the Planning Justification Report (prepared by MHBC), water resources engineering and design drawings (prepared by EXP), and the fluvial geomorphology assessment (prepared by Water's Edge). This report addresses GRCA comments 7 and 8, and natural heritage comments received from the City and Region.

To inform this addendum, NRSI has reviewed and incorporated information from the following updated reports prepared by the project team:

- Draft Plan of Subdivision, dated February 19, 2021 (MHBC)
- Stormwater Management Report, dated February 26, 2021 (EXP)
- Preliminary Functional Servicing Report, dated February 26, 2021 (EXP)
- iPort Cambridge Phase 3 Drawing Set, dated February 26, 2021 (EXP)
- Technical Memorandum: iPort Wetland Groundwater Flow Model (EXP)

On February 12, 2021, MHBC submitted a letter to the Region of Waterloo to further a discussion about the recommended buffer width for the Significant Woodland portion of candidate Environmental Sensitive Policy Area (ESPA) #3. NRSI has reviewed this letter, as well as the email response received from the Region on March 3, 2021.

This report is to be read in conjunction with the EIS and 1st Addendum, and provides additional information and rationale on the topics of natural feature buffers, water balance ecological impacts, and wildlife movement corridor functionality. Relevant comments from each agency staff are provided at the beginning of each section for context.

2.0 Proposed Natural Feature Buffers

GRCA Comment 7: *Additional details are required to support a reduced 17 m buffer along the south and southeast edge of the Provincially Significant Wetland (PSW). We also suggest that there is an opportunity to restore additional wetland habitat in the wet area located near the waterfowl stopover and staging monitoring area. The proposed setback is not adequate to capture this seasonally flooded area, which qualifies as significant wildlife habitat according to the original EIS submitted by NRSI. A detailed buffer restoration plan is required to support the reduced setbacks. We agree this should be a condition of draft plan approval.*

City of Cambridge Comment: *The second submission provided additional information with respect to my previous questions on the waterfowl stopover and staging area. I echo comment 7 provided by the Grand River Conservation Authority on December 3, 2020 that suggests there is an opportunity to restore additional wetland habitat in the area located near the waterfowl stopover and staging monitoring area.*

NRSI Response: As detailed in Section 2.1 of the EIS Addendum (NRSI 2020b), a variable buffer ranging between 15m and 87.5m has been applied to the Maple Grove Road PSW. The buffer is less than 30m wide in only 2 locations: a 20m-long portion adjacent to the west point of the Thicket Wetland lobe (15m buffer), and a 40m-long portion along the southern edge (17m buffer), as shown on Map 1 of the EIS Addendum. The Draft Plan of Subdivision has been revised so that the lot line at the extreme southeastern corner of the PSW now encompasses a full 30m setback in that location.

Topographic lows along the southern and eastern edges of the PSW result in a seasonally flooded field that attracts waterfowl in the spring due to the presence of row crop waste grains. A large (1.75ha) portion of the flooded field is located off-property. Due to crop rotations, waste grains may not be present every year. Under the post-development condition, approximately 60% of the flooded agricultural field that falls within the lands owned by the Proponent will be retained and enhanced.

Detailed buffer restoration plans prepared as a condition of draft plan approval will consider the inclusion of plant species, soil amendments, and minor grading that encourages the continued seasonal use of the buffer area by waterfowl and other wildlife. In reiteration of the conclusions of the EIS, results from 2019 field surveys indicated that the flooded field area is likely used for only a short period of time in the early spring before waterfowl disperse to other aquatic and terrestrial staging areas that provide better quality habitat. Without the presence of waste grains from agricultural activities, waterfowl are unlikely to be attracted to this area. The most abundant species observed during targeted waterfowl stopover and staging area surveys was

the Mallard (*Anas platyrhynchos*). This species is a habitat generalist and uses many types of terrestrial and aquatic features during the spring migration period and throughout the year; it is therefore anticipated that the restored buffer areas will continue to provide habitat for this species and others post-development. Since the waterfowl stopover and staging area on the subject property is essentially created by anthropogenic activity that will cease post-development, and is used predominantly by a ubiquitous habitat generalist (Mallard), preserving and enhancing 60% of the flooded field is considered appropriate.

Topographic lows in the same location along the southern edge of the PSW also result in a 40m-long lobe where wetland vegetation extends to the edge of the tilled agricultural field. The wetland area proposed for the reduced 17m buffer is relatively small (<0.05ha). The wetland boundary in this location currently shows signs of edge effects (such as a gradation in vegetation structure from historical clearing within the first 5-10m) and is presently subjected to impacts associated with agricultural activities (e.g., dust and pesticide drift, vegetation management). A photograph of this location is shown on Figure 1.

A restored (re-vegetated) 17m buffer is considered adequate to protect this somewhat disturbed area of the PSW. The loss of buffer width will be offset by extensive restoration efforts within the gap between the upland woodlot and the PSW further west, as well as the within the area south of the Thicket Wetland lobe where up to 60m has been added on top of the required 30m buffer. Currently, the total area of Block 5 (encompassing the PSW, Significant Woodland, their buffers, and the east-west wildlife corridor) measures 21.31ha. This represents an additional 0.52ha of naturalized open space gained in comparison to a layout that considers an unmodified 30m PSW buffer (20.79ha). This 0.52ha net gain is substantial, and will not only offset the 2 areas where 15m and 17m buffers are proposed, but will also result in net ecological benefits in the long term.

Figure 1. Southern boundary of the Maple Grove Road Provincially Significant Wetland looking east towards Fountain Street (October 9, 2018).

2.1 Candidate Environmentally Sensitive Policy Area #3

Region of Waterloo Comment: *The EIS Addendum has addressed some of the most significant concerns previously identified by Environmental Planning staff related to the configuration of the proposed plan of subdivision and associated impacts to, and removal of, Core Environmental Features. However, no new information or assessment has been provided to clearly support the reduced buffer proposed around the southern (woodland) portion of the Candidate Environmentally Sensitive Policy Area (ESPA) identified in the Subwatershed Study.*

NRSI Response: As described in the EIS and its 1st Addendum, NRSI recommends a 10m buffer for the upland woodland portion of candidate ESPA #3 that falls partially within the subject lands. Following the completion of detailed field surveys and a comprehensive review of the field data and criteria for designation as an ESPA outlined in the Freeport Creek and Tributary to the Grand Subwatershed Study (Aquafor Beech Ltd. 2013) (referred to herein as

'the SWS'), NRSI biologists determined that the ecological characteristics meeting the criteria for designation as an ESPA were specific to the PSW portion, rather than the upland woodlot. The following analysis provides additional information and rationale supporting the recommendation for a 10m Significant Woodland buffer.

A natural area must fulfill sufficient criteria under Policy 7.C.5 (a), (b), or (c) of the Region of Waterloo Official Plan (ROP, 2015) in order to be considered an ESPA. These criteria are provided in Table 1, along with an analysis of if the criteria are met by either a) the PSW portion, or b) the Significant Woodland portion of the ESPA. While these analyses are based on the results of the more recent, detailed field surveys completed by NRSI biologists in 2019, they remain consistent with the older field data and the rationale provided in the SWS. Considered on its own, the Significant Woodland portion of the ESPA does not meet the required criteria. It provides habitat for organisms native to the region recognized as regionally and provincially significant (meeting criteria 7.C.5 (b) iv), but does not meet any other criteria; to be considered as an ESPA, at least 2 criteria must be met under Policy 7.C.5 (b).

As stated in the SWS, it was the opinion of Aquafor Beech Ltd. that the PSW and Significant Woodland functions as a single habitat block because they are connected by a hedgerow, and the gap between features is 'relatively small'. However, this conclusion does not consider the existing land use of the area between the features, nor does it consider the condition and ecological function of the hedgerow.

The Natural Heritage Reference Manual (NHRM, OMNR 2010) states that:

> "*Woodland areas are considered to be generally continuous even if intersected by narrow gaps 20 m or less in width between crown edges."*

In the gap areas, the distance between tree crowns at the edge the PSW and Significant Woodland ranges from 30m in the east, to 65m in the west. Within the gap, mowed sod comprises the entire area and there is no natural cover or habitat available for plants or wildlife. A narrow hedgerow runs from the northeastern corner of the Significant Woodlot to meet the PSW community 100m to the east. Based on the results of the Detailed Vegetation Management Plan (DVMP), this hedgerow contains 28 trees with a DBH ≥10cm arranged in a single row, with a 20m-wide gap in the middle containing shrubs and saplings but no mature trees. During field surveys, NRSI biologists observed very few wildlife species using or travelling through the gap space or the hedgerow.

Table 1. Analysis of Environmentally Sensitive Policy Area Criteria

Region of Waterloo Official Plan Policy 7.C.5 Criteria		Criteria met?	
		Maple Grove Road Provincially Significant Wetland	Significant Woodland
a)	Provincially significant Life Science Areas of Natural and Scientific Interest, regionally significant Life Science Areas of Natural and Scientific Interest, or provincially significant Earth Science Areas of Natural and Scientific Interest	No	No
b)	At least 2 of the following criteria:		
i.	comprise ecological communities deemed unusual, of outstanding quality or particularly representative regionally, provincially or nationally	No	No
ii.	contain critical habitats which are uncommon or remnants of once extensive habitats such as old growth forest, forest interior habitat, Carolinian forest, prairie-savanna, alvars, cliffs, bogs, fens, marl meadows, and cold water streams	**Yes** Forest interior habitat	No
iii.	provide a large area of natural habitat of at least 20 hectares which affords habitat to species intolerant of human intrusion	No	No
iv.	provide habitat for organisms native to the region recognized as regionally, provincially or nationally significant	**Yes** <u>Provincially Significant:</u> Eastern Wood-pewee (*Contopus virens*) Wood Thrush (*Hylocichla mustelina*) <u>Regionally Significant:</u> Eastern Cottonwood (*Populus deltoides* var. *deltoides*) Virginia-creeper (*Parthenocissus quinquefolia*).	**Yes** <u>Provincially Significant:</u> Eastern Wood-pewee <u>Regionally Significant:</u> Wood's Sedge (*Carex woodii*)
c)	Fulfill one of the criteria in Policy 7.C.5(b) and any two of the following:		
i.	contain an unusual diversity of native life forms due to varied topography, microclimates, soils and/or drainage regimes	No	No
ii.	perform a vital ecological function such as maintaining the hydrological balance over a widespread area by acting as a natural water storage, discharge or recharge area	**Yes** Provides a water storage and recharge function.	No
iii.	provide a linking system of relatively undisturbed forest or other natural	No	No

Region of Waterloo Official Plan Policy 7.C.5 Criteria		Criteria met?	
		Maple Grove Road Provincially Significant Wetland	Significant Woodland
	habitat for the movement of wildlife over a considerable distance		
iv.	serve as major migratory stop-over or significant over-wintering habitat	No	No
v.	contain landforms deemed unusual or particularly representative at the regional scale	No	No

Due to the large gap between the PSW and Significant Woodland (which is 10m to 45m greater than the 20m gap width recommended in the NHRM for considering woodlands continuous), the absence of cover or habitat features within the gap, and the limited ecological function of the narrow, sparsely treed hedgerow, NRSI considers it unlikely that the 2 features are currently functioning as a single unit. It is therefore recommended that for the purposes of determining buffer width suitability, the PSW and Significant Woodland be considered as independent habitat units.

Both the Significant Woodland and the PSW are valuable components of candidate ESPA #3, and are recommended for protection and enhancement in the long-term. However, based on the existing conditions and ecological functions of the Significant Woodland portion, a 10m buffer is considered appropriate and will adequately protect the feature from edge effects resulting from adjacent land use changes. A variable 15m to 87.5m-wide buffer is recommended for the PSW portion as discussed in the section above. Functional connectivity between the features will be restored post-development, as described in the EIS Addendum. Through gap restoration, buffer plantings, and the creation of the east-west wildlife movement corridor, an overall net ecological benefit will be achieved without the application of a 30m buffer to the entire candidate ESPA area. The recommended buffer widths comply with the policies outlined in Section C of the ROP; the proposed approach is also consistent with methods used to determine buffer widths for other ESPAs in the Region of Waterloo.

3.0 Water Balance Ecological Impact Analysis

GRCA Comment #8: *The water balance assessment suggests there will be an alteration in the drainage patterns on this site as follows:*

a. *The catchment for the PSW will increase from 32.72 to 40.36 hectares (a 23% increase).*
b. *Annual surface water runoff volume toward the wetland is predicted to decrease by 49% whereas annual infiltration will increase by 123%.*
c. *The EIS notes that monthly infiltration volumes will increase between 5,734 and 7,694 m^3 during the growing season. Infiltration volumes in May are expected to increase by 300%, which is significant.*
d. *Under current conditions, there is no infiltration during the months of June, July, and August. According to the hydrogeology assessment, groundwater elevations fluctuate seasonally, with high elevations in the spring and low elevations through the late summer and winter. However, post-development infiltration volumes are expected to increase by 6,814 m^3, 7,694 m^3, and 7,233 m^3. Assuming 10 rainfall events per month, the maximum volume infiltrated per event would be 769 m^3, not 77 m^3 as reported in the EIS.*

The EIS addendum suggests that the annual net surplus of 15,290 m^3 will not likely result in significant impacts but does not comment on the monthly changes. It is unclear if or how hydroperiods within the PSW, a mature swamp, will be altered. Potential ecological impacts should be identified. Please address and clarify.

NRSI Response: To correct the noted calculation error, the 3rd sentence of paragraph 6, Section 2.6 (Water Balance) in the EIS Addendum is replaced with the following text: "This represents a maximum of approximately 769m^3 per rain event, assuming a rate of 10 events per month."

To further address ecological impacts potentially resulting from the proposed alterations to the drainage patterns on site, the following sections expand on the Water Balance Analysis provided in the 1st Addendum.

3.1 Wetland Sensitivity Characterization

To better describe the potential impacts to the PSW as a result in changes to drainage patterns on site, a brief analysis was conducted in reference to the document *Wetland Water Balance Risk Evaluation*, prepared by the Toronto and Region Conservation Authority (TRCA, 2017). This document identifies that the affected wetland should be characterized, the magnitude of hydrological change quantified, and risks to the feature assessed and mitigated for based on evaluation results.

An analysis is detailed in Table 2 that focuses on the ecological sensitivity of the PSW. The majority of assessment criteria fall within the "medium sensitivity" category, indicating that slight changes to the hydrological regime are expected to be tolerated by the vegetation communities and wildlife that characterize the PSW. While the PSW is generally considered an isolated wetland type, recent investigations by the hydrogeological project team have determined that culverts are located to the northwest of the wetland on Middle Block Road, as well as to the southeast across Fountain Street North. While no field observations have specifically confirmed these locations as surface flow outlets from the PSW, it is assumed that these culvert locations provide overland flow routes during seasonal flooding. Based on this information and modelling results, the wetland is assumed to be located within a drainage divide (H. Jaggard, *pers. comm*). This assumption is further supported by observations made by NRSI biologists during field surveys; pools of surface water were observed in the agricultural fields both northwest and southeast of the PSW during early spring surveys. As also stated in EXP's Groundwater Flow Modelling Technical Memo, the wetland must continue to have outlets at Middle Block Road and at Fountain Street North to ensure that drainage to adjacent lands is maintained. Ensuring that flow conveyance from the wetland to the remainder of its catchment continues under the post-development scenario is critical to avoiding the inundation of the wetland in the long-term. In general, the sensitivity characterization of the PSW on the subject lands indicates that ecological processes and habitat functionality are unlikely to be impacted by minor changes to the drainage patterns on site. The discussion on water balance in the EIS Addendum (Section 2.6 of that report) indicates that hydrological changes during June, July and August may not be minor. However, the hydroperiod of the PSW is not well understood and the water balance analysis conducted by EXP is based on modelling only. A hydrogeological monitoring program is now being implemented by EXP to address this data gap.

The monitoring program targeting surface and local groundwater elevations in the PSW was initiated by the hydrogeology team at EXP in January 2021. Measurements collected manually during follow-up monitoring in February indicated a downward gradient within the wetland. The following section further discusses the recommended water balance mitigation measures and ecological monitoring.

Table 2. Wetland Sensitivity to Hydrological Change

No.	Criteria (TRCA 2017)	Assessment
1	Vegetation Community Type (ELC)	The PSW is a Swamp Maple Mineral Deciduous Swamp (SWD3-3) community that is considered "tolerant of slight hydrological change" and placed under the **medium sensitivity** category in Appendix 2 of TRCA, 2017.
2	High Sensitivity Fauna Species	The presence of 3 frog species, Spring Peeper (*Pseudacris crucifer*), Gray Treefrog (*Hyla versicolor*), and Wood Frog (*Lithobates sylvaticus*) with high sensitivity to hydrological change (as per Appendix 3 of TRCA, 2017), was confirmed in the PSW during EIS surveys. However, none of these species was determined to be breeding, and therefore this criterion is considered in the **medium sensitivity** category.
3	High Sensitivity Flora Species	The presence of 1 plant species considered to have high sensitivity, Hop Sedge (*Carex lupulina*), and 27 plant species considered to have medium sensitivity (as per Appendix 3 of TRCA, 2017), was confirmed in the PSW during EIS surveys. The **medium sensitivity** category is met when multiple species with medium sensitivity are detected (high sensitivity is met only when multiple high-sensitivity species are present).
4	Significant Wildlife Habitat (SWH)	No SWH types were confirmed within the PSW; however, the criteria for Terrestrial Waterfowl Stopover and Staging SWH was met in the seasonally flooded agricultural field adjacent to the southeast corner of the PSW. Waterfowl species, Wood Duck (*Aix sponsa*) and American Black Duck (*Anas rubripes*), both with medium sensitivity (as per Appendix 3 of TRCA, 2017), were confirmed using the flooded field area during EIS surveys. Therefore, this criterion is considered in the **medium sensitivity** category, since this SWH type is dependent hydrological processes. A portion (60%) of the flooded field area is to be naturalized and retained post-development.
5	Hydrological Classification Considering Ecology	The hydrogeomorphic setting of a wetland influences its sensitivity to hydrological change. The PSW is an isolated wetland type; isolated wetlands have no defined surface water outlet, and therefore any increased volume of runoff must either be infiltrated or lost to evapotranspiration, and similarly any reduction in surface water inflows will not be compensated for by any other inflow processes. This makes isolated wetlands more sensitive to hydrological change than other types of wetlands. This criterion is considered in the **high sensitivity** category.

3.2 Wetland Hydroperiod Modelling and Mitigation Measures

The hydrogeology team at EXP developed a conceptual Groundwater Flow Model to estimate the potential drawdown (or lowering of the water table) in the PSW resulting from the proposed

development. The local groundwater high is located in the general area of the wetland feature and lands to the southeast, and is at an approximate elevation of 313masl. Under a post-development scenario with no mitigation measures implemented, recharge volumes within the PSW catchment were estimated to decrease by 284.3m^3/day. However, with mitigation measures in place, proof-of-concept modelling indicates that recharge can be provided to the wetland to completely offset drawdown in the PSW. The current SWM design includes clean rooftop runoff directed to underground infiltration galleries installed adjacent to the PSW. In general, surface runoff will be conveyed to the on-site SWM pond in the western portion of the subject lands. At this Draft Plan of Subdivision stage, the various modelling and studies conducted by EXP show that providing the necessary recharge volumes to the PSW is feasible. At the detailed design stage, refinements and modifications to the SWM approach can be undertaken to ensure that the necessary mitigation of PSW drawdown is achieved using site-specific solutions. These refinements and modifications should also avoid conveying volumes in exceedance of those required to achieve a balanced water budget, as determined by the hydrogeology project team.

The Groundwater Flow Model considers the use of shallow subsurface infiltration galleries; detailed site design should incorporate the use infiltration galleries to meet the required recharge volumes, as well as other Low Impact Design (LID) approaches. It is NRSI's understanding that the current SWM strategy has been designed to accommodate refinements at the detailed design stage, and that future modifications are feasible for the purposes of achieving water balance and ensuring the long-term persistence of the PSW and its ecological functions. As long as the appropriate recharge volume is provided through the mitigation strategy, the overall health of the wetland should be maintained (H. Jaggard, *pers. comm*).

A phased approach to construction of the subdivision blocks is anticipated for the project. As shown on Figure 1 of EXP's Groundwater Flow Model Technical Memorandum, the PSW currently receives inputs from lands that overlap with portions of Blocks 1, 3, and 5 (refer to Map 1 of the EIS Addendum). While the Wildlife Corridor component of Block 5 will be conveying stormwater runoff west towards the SWM pond, the areas of that Open Space block overlapping with the PSW catchment will not be graded, and are expected to generally continue draining towards the wetland. At the detailed design stage for Blocks 1 and 3, refinements to the SWM strategy are recommended. Should construction on Block 1 proceed in advance of Block 3, it may be necessary to consider interim mitigation measures (e.g., conveying rooftop runoff from

Block 1 to the PSW) to ensure that water balance targets are met throughout all construction phases.

3.3 Ecological Monitoring Program

A comprehensive Ecological Monitoring Program for the pre-, during, and post-development periods will be prepared, and is anticipated as a condition of Draft Plan Approval. The program will be designed in keeping with the recommendations of the SWS, and will include targeted field surveys assessing the condition and character of the PSW and Allendale Creek. Survey results will be used to identify changes to vegetation communities and wildlife habitat functions that may occur and trigger additional water balance-related mitigation measures.

Field surveys completed in 2019 will provide the baseline data for most components of the program, with additional pre-construction surveys taking place in the year or so preceding construction if needed. The during-construction period is defined as the time between construction activity initiation anywhere on site and the 90% build-out stage. It is anticipated that ecological monitoring will take place every other year during this period. Post-construction ecological monitoring is expected to be completed during Year 1, 3, and 10 following 90% build-out. Based on the monitoring requirements outlined in the SWS, the following field surveys are anticipated to be included in the ecological monitoring program:

- Vegetation community Ecological Land Classification (ELC) confirmation;
- Natural feature boundary confirmation;
- Permanent vegetation monitoring plots;
- Fixed photo plot monitoring;
- Natural feature and buffer integrity monitoring;
- Anuran call surveys;
- Road mortality surveys;
- Breeding bird surveys;
- Winter wildlife surveys;
- Fish community sampling;
- Benthic invertebrate monitoring; and
- Aquatic habitat monitoring.

The timing and protocol for each of the above-noted surveys, as well as the associated monitoring reports, will be detailed in a separate Ecological Monitoring Program document that

will be circulated for agency review and approval. NRSI will continue to collaborate with the project team to identify additional mitigation solutions if needed, should it be determined through monitoring that unwanted changes or impacts are occurring due to alterations in drainage patterns.

4.0 Wildlife Movement Corridor Function

City of Cambridge Comment: *The second submission provided further useful details with respect to the wildlife corridor in terms of a cross-section and proposed plantings. City Engineering have a number of comments with respect to the SWM function of the wildlife corridor that I am also interested in having answered. Particularly, how is the lowest portion of the wildlife corridor intended to function – will it be holding water only after a large storm event? How long will it take to infiltrate after a large storm event? How will this impact it's use as a wildlife corridor? The SWM report states the wildlife corridor will encourage infiltration, but no details of how this will be achieved are provided. My previous comment to ensure that this area functions first and foremost as a wildlife corridor still applies.*

In reference to the maps provided in Appendix III of the EIS Addendum, the 50m-wide wildlife corridor will be fully restored with tree, shrub, and herbaceous plantings arranged in 3 general 'bands'. Trees will be planted or retained in the southern-most band, which will range in width between approximately 10-20m and slope gently northwards. A 20-30m swale planted with meadow species will comprise the lowest portion of the corridor, and a mixture of trees, shrubs, and meadow vegetation will comprise the remaining band along the north boundary of the corridor. A pedestrian trail will also be located along the north boundary.

In designing the conceptual planting plan for the wildlife corridor, it was envisioned that a mosaic of habitat types be created, including wooded areas, meadow or meadow-marsh habitats, and thickets. A variety of habitats will provide movement, foraging, and propagation opportunities for a higher diversity of plant and wildlife species. The lowest portion of the corridor, where meadow plantings are proposed, will also provide temporary flow attenuation and flood storage after storm events, up to the 100-year elevation limit. The Stormwater Management Report states:

"The overall grading within the Wildlife/SWM corridor have been designed to provide clear overland flow route, positive drainage and stormwater quantity control. Opportunities of water quality and infiltration from the Wildlife/SWM Corridor should be refined during detailed design."

An analysis of channel hydraulics within the meadow swale indicates that under the 2 and 5-year storm scenarios, the maximum amount of storage used amounts to 31% or less of the total storage available in the corridor. Based on the expected inflow and outflow rates for the corridor, temporary inundation of the meadow swale will occur following large storm events; specific drawdown time will be dependent on final testing and refinements to the corridor that will be developed at the detailed design stage. Permanent inundation is not anticipated. Regardless of drawdown time, the presence of floodwater in the corridor is not anticipated to

impact its wildlife movement function. Travel routes in the upland areas will be available for wildlife during periods of inundation, and the presence of water will benefit many species using the corridor. The Conceptual Planting Plan (Appendix III of the EIS Addendum) includes the use of a seed mix suitable for mesic and periodically wet periods in the 100-year flood elevation area. Since the species planted in the inundated areas of the corridor will be tolerant of occasional flooding, vegetation in the corridor will persist in the long-term with minimal to no intervention required. As also noted in the Stormwater Management Report, lot-level opportunities for managing water quality should be explored to ensure that contaminants from roadways and parking lots are minimized as much as possible by the time runoff reaches the meadow swale.

To accommodate sufficient flood storage in the corridor, the 100-year flood elevation area will require periodic maintenance to ensure that large, woody species do not establish in the meadow vegetation communities. The following maintenance regime is recommended specifically for the meadow/swale area within the 100-year elevation limit:

- This area should be mowed once every 3 to 5 years with a brush hog or flail mower to control woody shrubs and trees that have become established through natural recruitment. Mowing should take place in the month of November. This timing will coincide with the period well outside of the breeding bird season, and will allow the native grass and forb meadow species to mature and produce seeds that will in turn be dispersed during mowing. Dispersed seeds will then germinate the following spring and ensure the persistence of native seed mixture species within the 100-year storage area.
- Persistent trees and shrubs, or those that grow too large to mow within the meadow/swale, can be felled by hand or subjected to an herbicide spot treatment as needed. Felled material and dead woody vegetation should be removed to avoid impeding future mowing activities; however, it is recommended that at least some of this material be kept within the corridor at the edge of 100-year storage area to enrich these edge habitats and provide cover and thermal regulation areas for snakes and small mammals.
- During the development of the detailed planting plan for the corridor, gaps will be specified in a few locations along the 3:1 slopes where no trees or shrubs will be planted to allow for maintenance equipment access.
- Prior to the first mowing, the edges of the 100-year storage area are to be clearly marked so as to ensure that plantings installed on the slopes above are not inadvertently cut during mowing. As vegetation becomes established, this delineation is not likely necessary in future maintenance years.
- Lastly, to minimize the introduction and spread of invasive species, all maintenance equipment must be clean and free of seeds and root material prior to mowing.

Adhering to this maintenance regime will assist in maintaining the require flood storage area, and will also ensure the persistence of meadow and/or marsh-meadow habitats within the wildlife corridor that are a beneficial part of the overall mosaic of naturalized lands available for wildlife travel, cover, and propagation. Areas outside of the meadow swale will not require maintenance, and have been designed as self-sustaining natural areas.