SANDWICH SOUTH
MASTER SERVICING PLAN

STATION #5

Updated Floodplain Mapping and Stormwater Management

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ONTARIO, CANADA

Floodplain Mapping

Finding solutions to address flooding concerns and minimize the probability of flooding in the future development of Sandwich South is one of the main priorities of the SWP.

To achieve this, we have updated and extend flood risk mapping to guide development in the Study Area:

- Surveyed watercourses, bridges and culverts to help define the capacity of the drainage system to handle flood flows.
- Developed a hydrologic model to estimate flood flows.
- Developed a hydraulic model to update floodplain maps and set floodproofing standards for future development areas. Development will be directed away from flood risk areas and constructed higher than expected flood elevations.
- Current Status of the Floodplain Mapping Component:
- Floodplain models and technical reports currently being reviewed by ERCA and a third party reviewer.
- To be completed:
- Finalize floodline mapping upon approval from ERCA.
- Finalize floodproofing elevations for future development areas.
- Evaluate changes to the floodplain under development conditions within the study area, including drainage servicing and modification of existing municipal drains to be abandoned, enhanced, or realigned.

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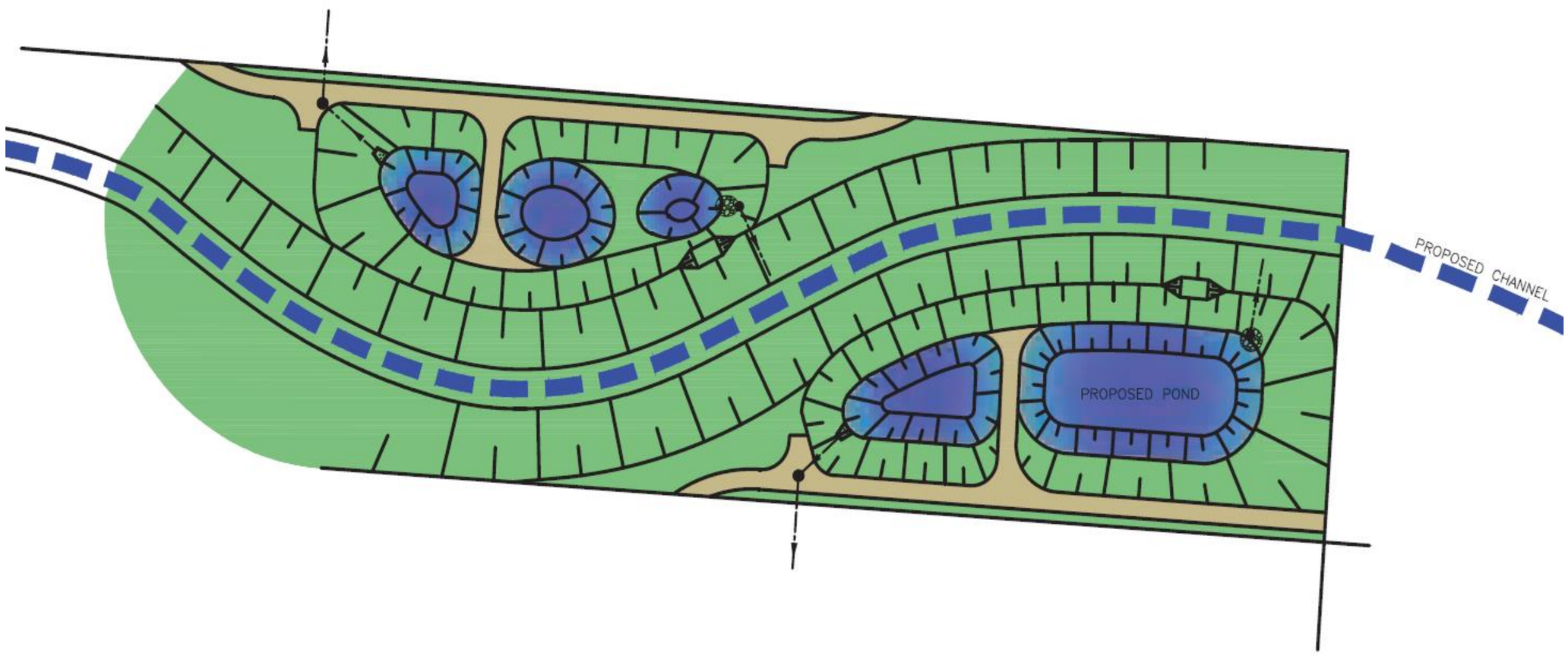
Stormwater Management

- This component of the study will determine the required stormwater management (SWM) alternative for the Sandwich South Master Planning Area within the City of Windsor. SWM servicing manages runoff quantity to prevent flood impacts and treats runoff quality.
- The Upper Little River Watershed Master Drainage and SWM Plan EA that is currently being finalized (Stantec, Draft 2017) was developed for the study area. It identified a number of SWM alternatives that were assessed including:
- Do Nothing
- Water Quality and Erosion Control Only
- Communal Stormwater Facilities
- On-Line Quantity Control with Local Quality and Erosion Controls
- Distributed Off-Line SWM Controls; and
- Grouped Off-Line SWM Controls
- Based on the evaluation of alternatives, Alternative 6 (Grouped Off-Line SWM Controls) was preferred. Details of this alternative include:
- Grouped facilities to be constructed within SWM corridors along respective municipal drains providing water quantity and quality control on a standalone basis;
- Control for more than one property and located adjacent to other facilities;
- Grouped facilities can be constructed as development proceeds; and
- SWM corridors are to promote natural linkages, recreation trails and greenways.



Preferred SWM Alternative Concept - Upper Little River Stormwater Master Plan Class EA (Stantec, Draft 2017)

Stormwater Management – Possible Solutions

- Based on the Preferred Alternative 6 of Grouped Off-Line SWM controls from the Upper Little River Watershed Master Drainage and SWM Plan EA, a number of design options are to be evaluated. The alternatives considered for the Sandwich South MP area will be as follows:

Option 1a – Grouped end-of-pipe **wet pond** facilities to provide both water quantity and quality control.

Option 1b – Grouped end-of-pipe **wet pond** facilities with at-source quantity and quality control storage and Low Impact Development (**LID**) controls to reduce end-of-pipe facility size.

Option 2a – Grouped end-of-pipe **dry pond** facilities for quantity control with localized on-site quality control.

Option 2b – Grouped end-of-pipe **dry pond** facilities for quantity control with localized on-site quality, quantity control and Low Impact Development (**LID**) controls to reduce end-of-pipe facility size.

The final SWM component of this Study will provide more detail on SWM design options to meet the Schedule B requirements of the Class EA.

Stormwater Management – Possible Solutions

Wet Ponds vs. Dry Ponds

SWM Facility Type	Advantages	Disadvantages
Wet Pond 	• Most common facility for end-of-pipe SWM control. • Provides both water quantity and quality control. • Permanent pool minimizes re-suspension of sediment and blockage of the outlet. • Cost effective solution as an end-of-pipe treatment.	• Requires a deeper facility with a permanent pool. • Has the potential to attract geese which impact local airport lands. • Requires the potential for safety mitigation measures above permanent pool such as fencing, safety benching etc. • Permanent pool increases water temperature that may adversely affect aquatic habitat.
Dry Pond 	• Shallow dry facility providing only water quantity control with no permanent pool. • Design can include the option of a wet forebay to provide quality treatment. • Minimal safety concerns during dry periods. • Can have multi-use functions during dry periods (i,e., parkland area, soccer field). • With no permanent pool, facility has the potential to deter geese.	• Quality control is a function of detention time, but traditionally requires water quality control treatment upstream of facility. • More costly overall than wet ponds due to requirement of water quality treatment upstream. • Requires a quicker draindown time to function as a multi-use facility.

Stormwater Management – Possible Solutions

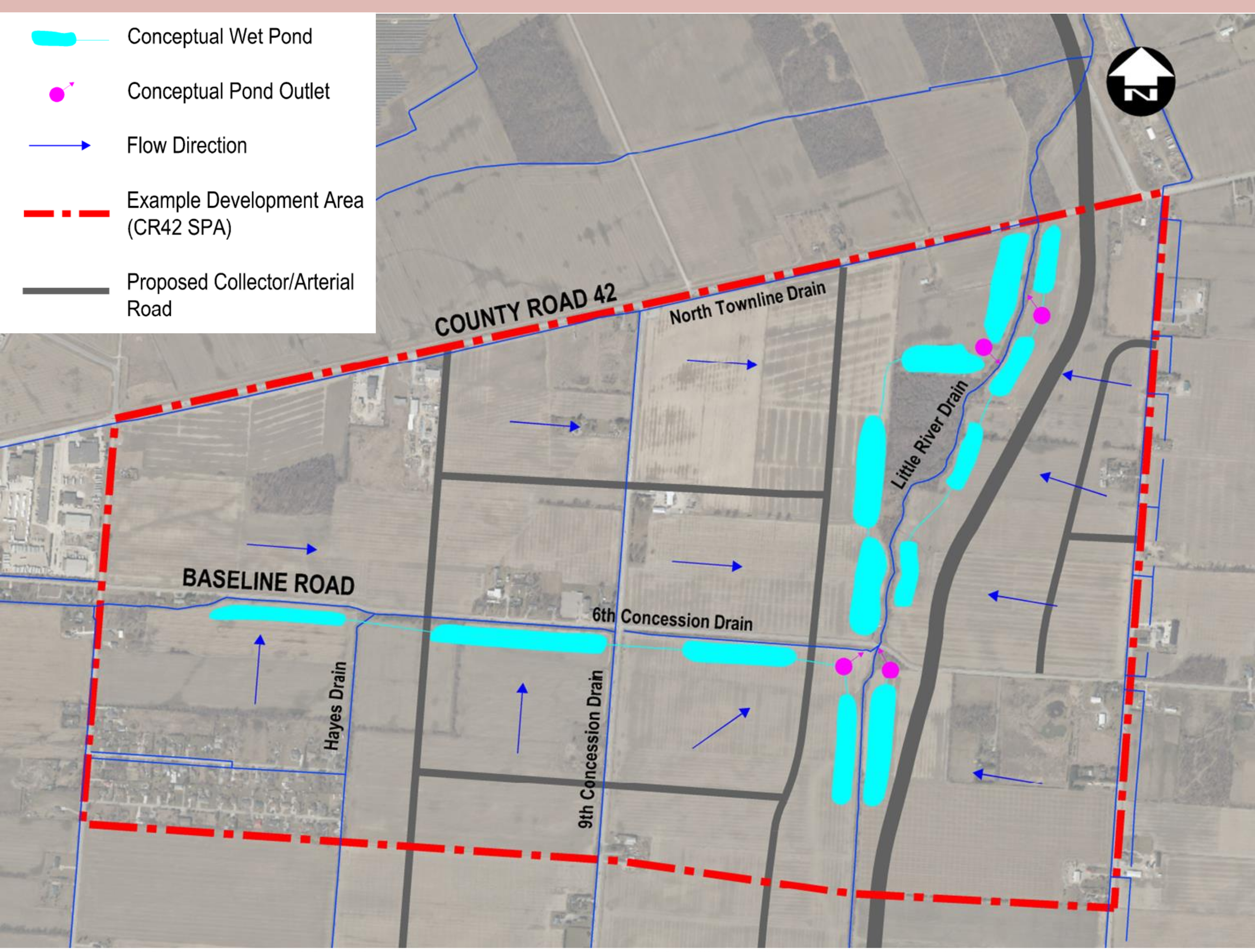
Low Impact Development Design

Advantages	Disadvantages

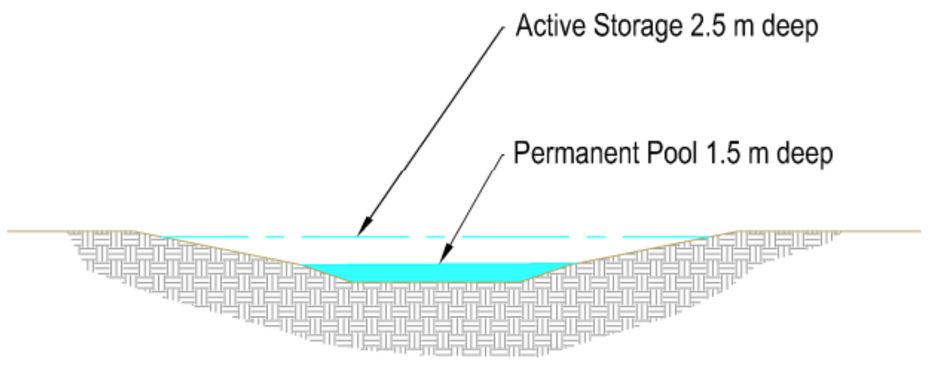
• Environmental benefits by mimicking the natural water cycle:
  • Promotes groundwater recharge through directing runoff into the ground through infiltration to sustain groundwater resources,
  • Promotes evaporation and transpiration from plantings to reduce runoff volumes and reduce erosion stresses.
 	
• Act as co-benefits to the community for measures with plantings:
  • Improved aesthetics;
  • Climate mitigation, improved air quality and reduced heat island effects.
	• Higher capital cost compared to centralized facilities.
	
	• Higher long-term lifecycle costs compared to traditional drainage works:
	  • Higher operation and maintenance costs;
	  • Shorter service life.
	
	• Limited effectiveness in low-permeability local soils, thus servicing minimal benefit for water quantity control.

Stormwater Management – Example SWM Layout Strategy

Option 1a – Grouped end-of-pipe **wet pond** facilities to provide both water quantity and quality control.



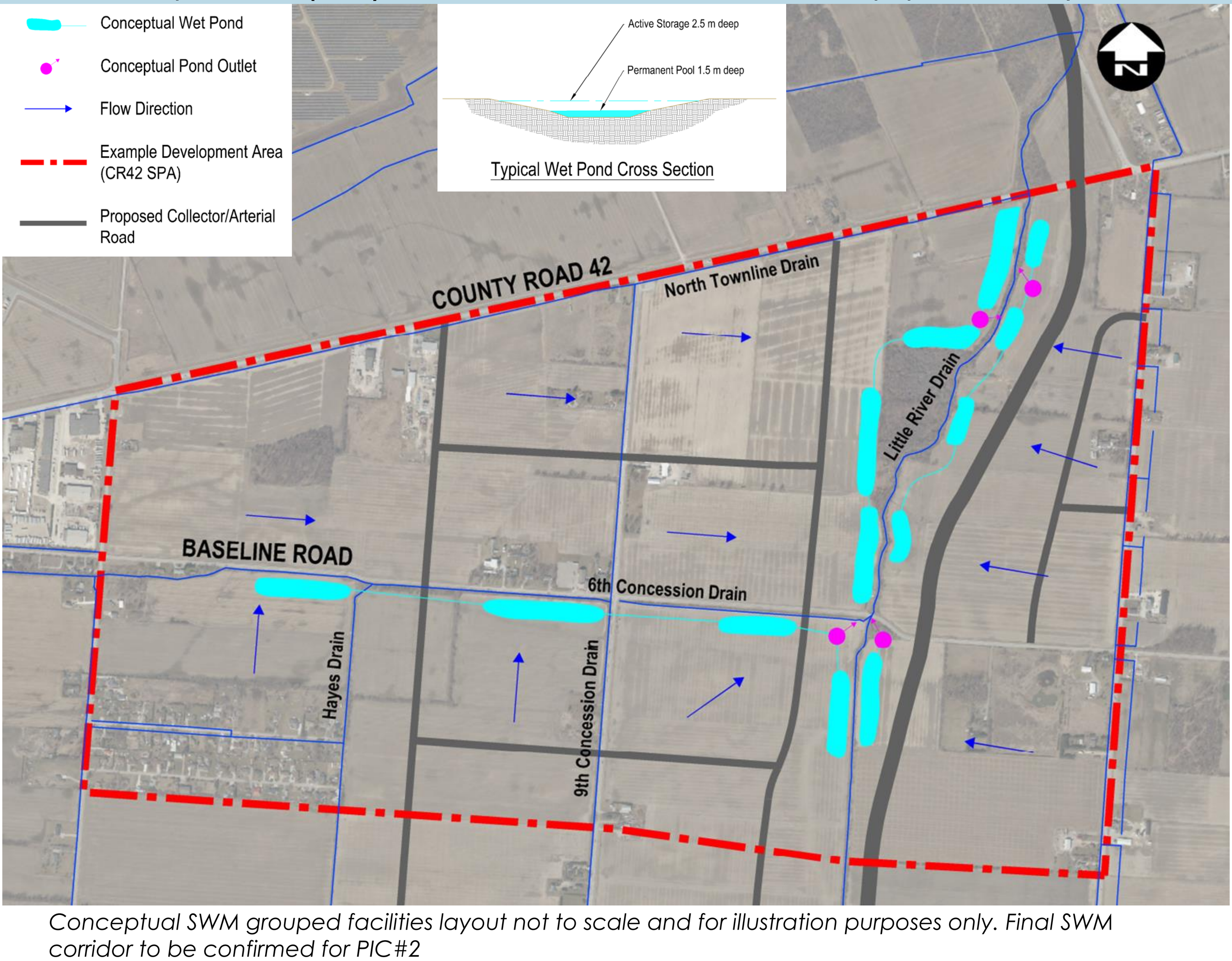
Conceptual SWM grouped facilities layout not to scale and for illustration purposes only. Final SWM corridor to be confirmed for PIC#2



Typical Wet Pond Cross Section

Stormwater Management – Example SWM Layout Strategy

Option 1b – Grouped end-of-pipe **wet pond** facilities with at-source quantity and quality control storage and Low Impact Development (**LID**) controls to reduce end-of-pipe facility size.



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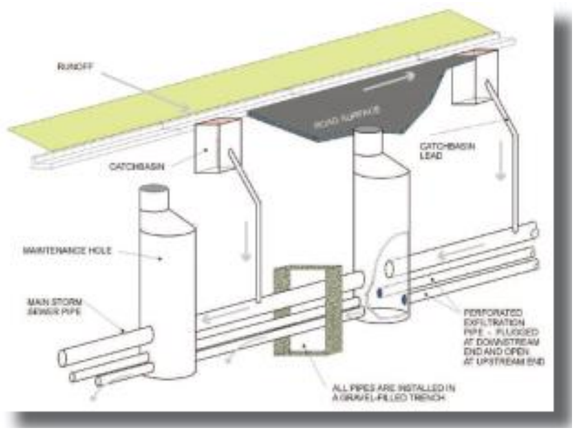
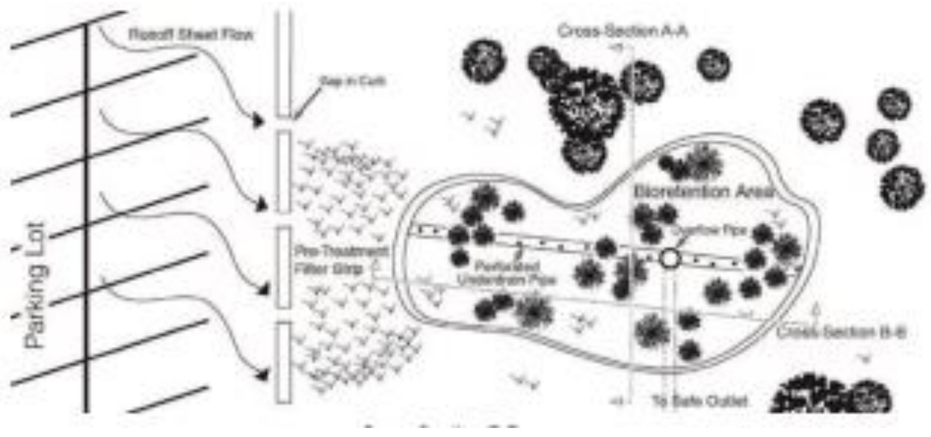
Example At-Source LID Techniques



Exfiltration Trench System (CVC/TRCA LID Planning and Design Guide)

Soakway and Infiltration Trench Systems (CVC/TRCA LID Planning and Design Guide)



Bioretention Cell System (CVC/TRCA LID Planning and Design Guide)

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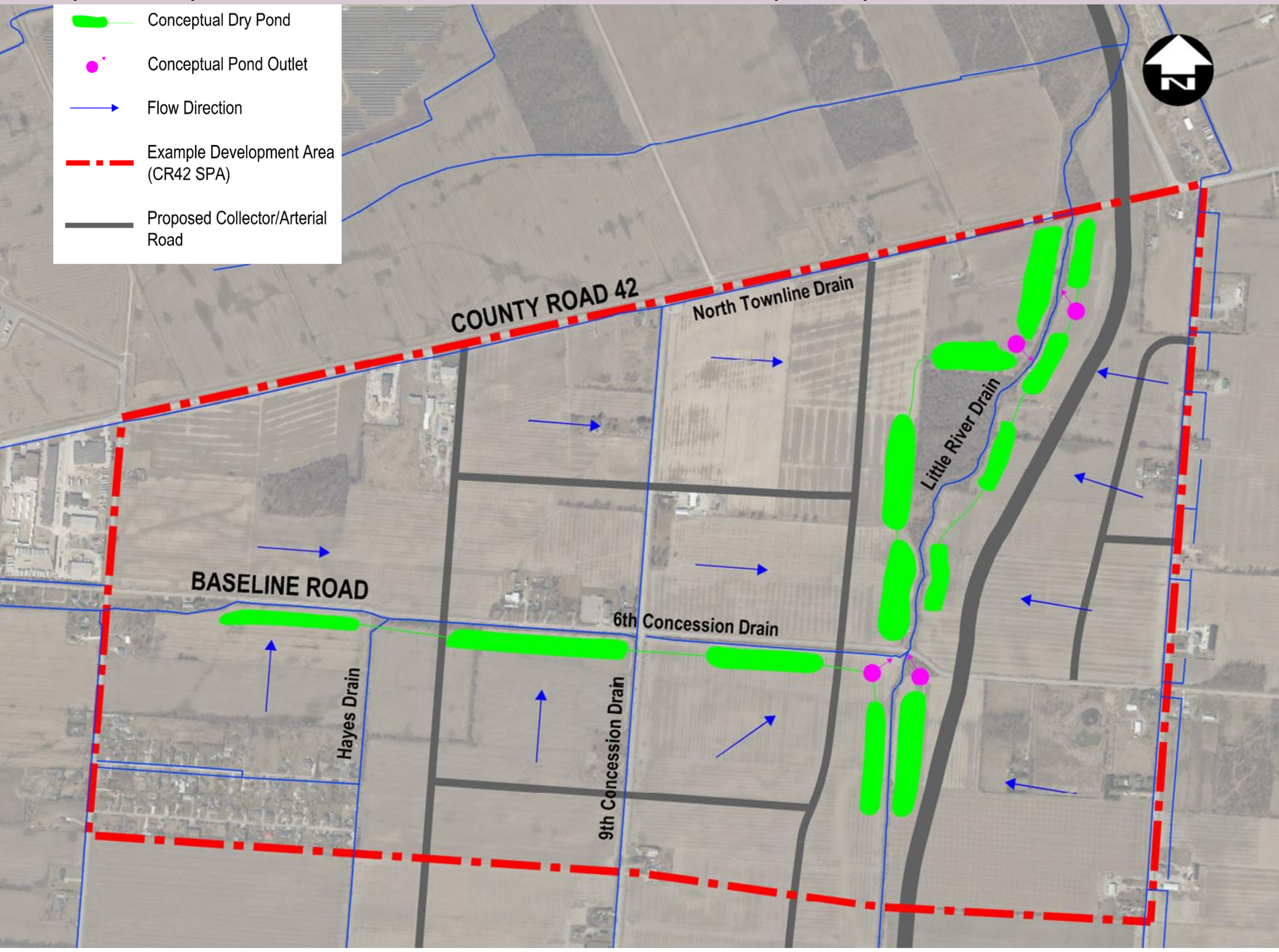
Stormwater Management – Example SWM Layout Strategy

Option 2a – Grouped end-of-pipe **dry pond** facilities for quantity control with localized on-site quality control.



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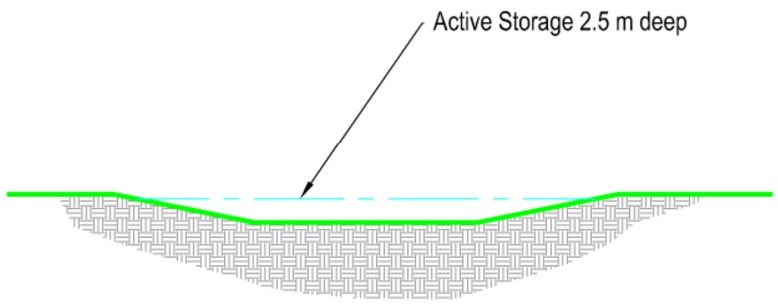
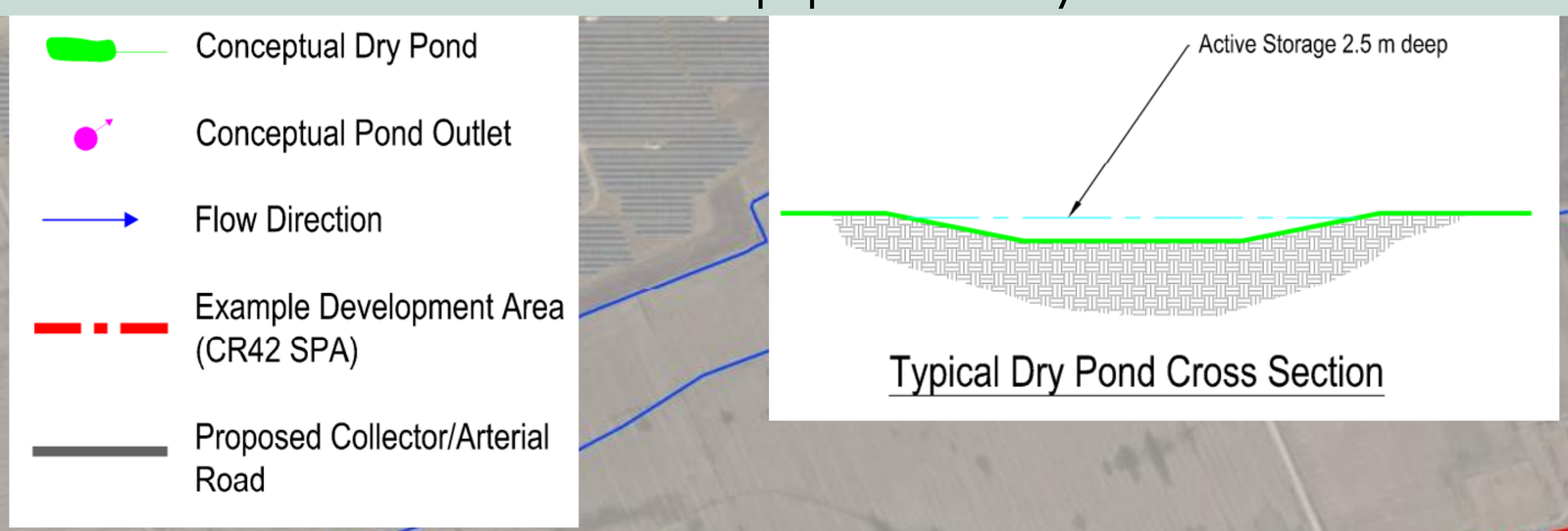


Typical Dry Pond Cross Section

Stormwater Management – Example SWM Layout Strategy

Option 2b – Grouped end-of-pipe **dry pond** facilities for quantity control with localized on-site quality, quantity control and Low Impact Development (**LID**) controls to reduce end-of-pipe facility size.



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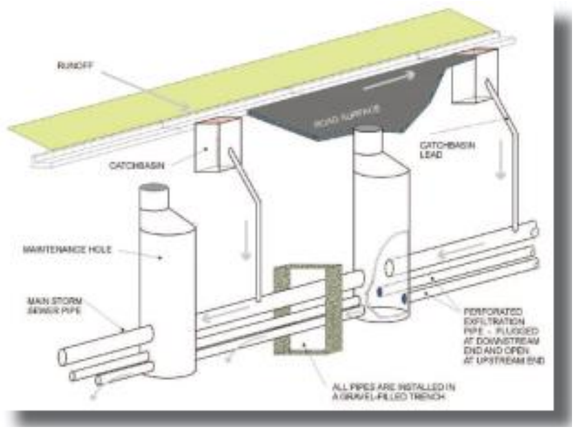

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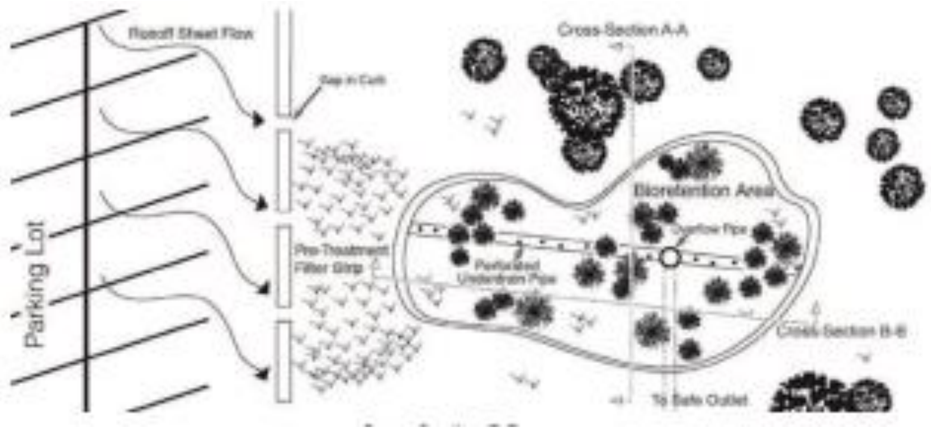

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We want to hear your thoughts!

What do you like about these stormwater management options? What do you not like? What is missing?

You can provide your feedback by visiting the survey link:

https://www.surveymonkey.com/r/sandwichsouth

Or by scanning the QR code with your phone or tablet:

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Next Steps and Staying Connected

Your feedback will be used to help us refine the decision making criteria and the options being considered in the next phase of the project.

We encourage you to continue to engage with us and stay connected.

Visit our website to stay up to date

www.sandwichsouth.ca

Follow us on Social Media

Twitter: @CityWindsorON
Facebook: @CityofWindsor
Instagram: @citywindsoron

Upcoming Meetings

Next PIC Scheduled for Spring 2021. Stay tuned for more details on the date and details.

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