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South Innisfil Creek Drain Peer Review

January 6, 2016



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Peer Review – 2 Phases

- Phase 1
 - Drainage Referee's Orders
 - Documentation
 - Preliminary Report
 - Final Report
 - Public Comments
 - Process and General Concepts
- Phase 2
 - Technical Review
 - Hydrologic and Hydraulic Modelling
 - Recommendations



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Background of South Innisfil Creek Drain

- Created over 100 years ago – Engineer's Report by M. Gaviller in 1903
- Repair and improvements under report by D.H. Weir, P.Eng. in 1956
 - 10th S.R. Branch added
 - 3rd Line Branch added
- Outlet is natural watercourse known as Innisfil Creek, tributary of Nottawasaga River
- Clean out and repair - late 1970's and 2004

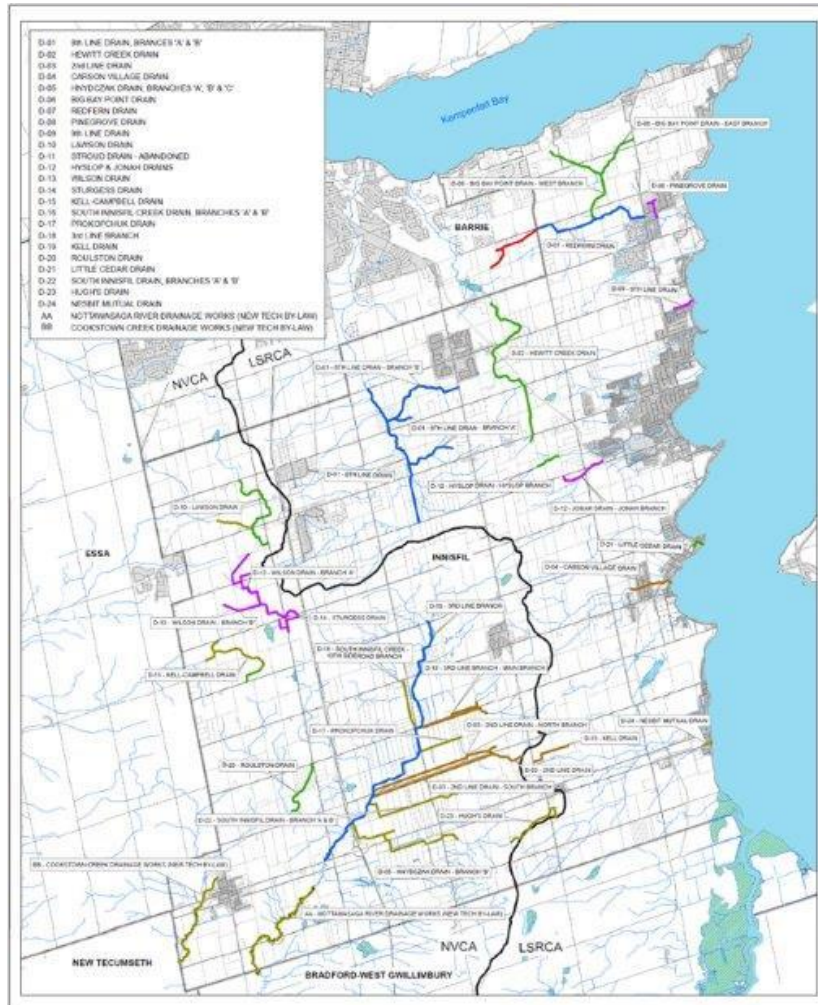


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Ontario Drainage Referee Order

March 31, 2005

- Town of Innisfil to appoint Engineer pursuant to Section 78 of Drainage Act
- Prepare Preliminary and Final Engineers Report
- Improve and/or extend the drain
- Address flooding in area of Market Garden Lands
- Consider extending downstream and one or more stormwater management facilities



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Preliminary Engineer's Report

- Town appointed Dillon Consulting
- Preliminary Report submitted February 2006
- Addressed South Innisfil Creek Drain as well as 3rd Line and 10th Sideroad Branches and Hnydczak Outlet Relief Drain
- 3 Options set out
 - #1 – Improvements to Drain and branches and over flow area between Hwy 89 and 5th S.R. (\$2.2M)
 - #2 – Add overflow area immediately upstream of muck soil area and south of 4th Line (~~\$5.2M~~)(\$3.0M)
 - #3 – Add overflow area in vicinity of 5th Line(~~\$4.9M~~)(\$2.7M)
- One in two year design criteria



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Drainage Referee Order

August 31, 2006

- Considered Report July 24, 2006
- Report presented and public participation
- Order to prepare Final Findings Report adopting Option 1 and Option 3 (~~\$4.9M~~)
(\$2.7M)
- Order provided very specific direction



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Final Engineer's Report

- Filed August 2013
- Improvements included
 - Channel cross section improvements to the 15th Line
 - Hnydczak Outlet Relief Drain channel improvements
 - Overflow Area No. 1
 - 3rd Line Branch Drain and 3rd Line Branch Spur
 - 10th SR Branch improvements
 - Overflow Area No. 3
 - Farm crossings and channel improvements
- One in two year design criteria
- \$6.7M total cost



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Public Concerns

- Estimated costs had exceeded expectations
- Extent of work proposed
- Overflow Area No. 1 and No. 3
- Level of protection



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Referee's Order

November 14, 2014

- Result of unforeseen costs
- Town no longer bound by the specific direction given in August 31, 2006 Order
- Review August 2013 report and consider improvement alternatives to alleviate flooding and options such as phasing, maintenance and repair



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Current Status

- No longer bound by Order of Drainage Referee dated August 31, 2006
- Supplementary information and meetings with public
- Alternatives
 - Refer report back to Engineer
 - Proceed with report as is
 - Start the process over
- New report still required
- Dillon provided possible revisions to reduce total costs
 - Remove free board
 - Low flow crossings
 - Shared crossings
 - Phasing project
 - Reduced cost to Approx. \$5M (very preliminary estimate)
- Comments from public and parties representing public
- Peer review completed



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Peer Review – Phase 1

- One in two year storm design criteria
- Established the need to review the modelling to:
 - Confirm channel capacity
 - Impact of overflow Area No. 1
 - Impact of overflow Area No. 3
 - Impact of Highway 400 crossings
 - Impact of Hnydczak Outlet Relief Drain
- Considered sharing of farm crossing
- Considered serviceability requirements of farm crossings and need for deep pile foundations
- Evaluated extent of proposed work on 3rd Line Branch and 10th Sideroad Branch



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Phase 1 Summary

- Ontario Drainage Referee Orders set out direction
 - March 31, 2005 – Engineer to consider specific improvements and/or changes
 - August 21, 2006 – Engineer to include Option 1 and Option 3
- Estimated cost in 2006 Preliminary Report (~~\$4.9M~~) **\$2.7**
- Estimated cost in 2013 Final Report \$6.7M
- Reduced estimated cost as presented by Dillon (Prelim.)
- Cost Benefit ratio as per report is still positive
- Costs are heavy burden to affected property owners
- Recommend continued efforts to reduce scope/costs
- Proceed to Phase 2



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Peer Review – Phase 2

- Review of modelling completed by Consultants
- Provided overall comments on modelling
- Specific attention to:
 - Modelling the impact and results for drain downstream of Highway 400 to 15th Line
 - Impact of overflow Area No. 1
 - Highway 400 culverts
 - Grade line
 - Impact of over flow Area No. 3
 - Design criteria and post storm event drainage
 - Hnydczak Outlet Relief Drain
- Costs of Work
 - Minor adjustments to unit rates and cost will not provide impact desired
 - Need to adjust design criteria and/or proposed scope of work



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Recommendations

- Additional details and modelling of the section of drain between Highway 89 and 15th Line including 15th Line Bridge and the new Highway 89 Bridge to more accurately determine merits of overflow Area No. 1
- Reconsider design criteria for the portion of the drain downstream of Highway 400
- Open discussions with MTO regarding Highway 400 and in particular timing of improvements to South Innisfil Creek and Hnydczak Outlet Relief Drain crossings
 - Consider capacity of crossings
 - Consider grade of crossings



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Recommendations (cont'd)

- Revisit grade line downstream and upstream of Highway 400
- Include Hnydczak Outlet Relief Drain in hydrologic and hydraulic modelling
- Consider a revised design criteria for 3rd Line and 10th Sideroad Branches
 - Include in report but closer to a maintenance/repair



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Recommendations (cont'd)

- Consider consequences of events greater than 1 in 2 year design criteria to lands behind berms and facilitation of physical removal of flood water and responsibility for flood water removal
- Reduce number of farm crossings
- Investigate potential settlement of farm crossings and reduce foundation requirements
- Send report back to Engineer to consider above noted recommendations



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South Innisfil Creek Drain

Questions ??



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