

Table of Contents

Executive Summary	i
1 Introduction	1
1.1 Project Background and Objectives	1
1.2 Previous Studies	1
1.3 Problem Statement.....	1
2 Goals and Overview	2
2.1 Hydrologic and Hydraulic Modeling	2
2.2 Rainfall Data	3
2.3 Time of Concentration	3
2.4 Soil Conditions and Ground Cover	3
3 Watershed Areas.....	4
3.1 Telfer Creek Overview	4
3.1.1 Telfer Creek Proposed Analysis Methodology.....	4
3.2 Kenny Drain Overview	4
3.2.1 Kenny Drain Proposed Analysis Methodology	5
3.3 East Bluffs Area (21st Street East) Overview.....	5
3.3.1 East Bluffs Area Proposed Analysis and Methodology	6
3.4 15th Street “B” East Storm Sewer	6
4 Telfer Creek Analysis	6
4.1 Existing Hydrology	6
4.1.1 General	6
4.1.2 Soil Conditions	7
4.1.3 Land Use Patterns.....	7
4.1.4 Hydrologic Analysis and Results.....	7

Table of Contents

4.2 Proposed Hydrology 8

 4.2.1 General 8

 4.2.2 Post-Development Drainage (Application of this Approach)..... 9

4.3 Erosion Threshold Analysis 9

4.4 Water Quality Control..... 10

4.5 Conclusions and Recommendations Telfer Creek..... 10

5 Kenny Drain Analysis..... 11

5.1 Existing Hydrology 11

 5.1.1 General 11

 5.1.2 Soils Conditions 11

 5.1.3 Existing & Proposed Land Use Patterns..... 12

 5.1.4 Hydrologic Analysis 13

 5.1.5 Hydrologic Results 14

5.2 Proposed Hydrology 15

 5.2.1 General 15

 5.2.2 Analysis and Commentary 16

5.3 Erosion Threshold Analysis 18

5.4 Water Quality Control..... 19

5.5 Conclusions and Recommendations for Stormwater Management Kenny Drain 19

5.6 Hec-Ras Modeling Kenny Drain 20

 5.6.1 Hydraulic Analysis..... 20

 5.6.2 Study Approach 21

 5.6.3 Floodplain Topography 22

 5.6.4 The HEC-RAS Computer Model 22

 5.6.5 Selection of Digitized Cross-Sections 23

 5.6.6 Hydraulic Parameters..... 24

 5.6.7 Flood Flows..... 24

 5.6.8 Starting Water Surface Elevations 25

 5.6.9 Hydraulic Structures 25

 5.6.10 Flood-Prone Areas 25

 5.6.11 Analysis of Spill Areas 26

Table of Contents

6	East Bluffs Storm Sewer Analysis	26
6.1	Introduction	26
6.2	Purpose	27
6.3	Background Information	27
6.4	Study Approach	27
6.4.1	Purpose.....	27
6.4.2	Tasks.....	27
6.5	The Rational Method.....	28
6.5.1	Hydrologic Parameters	28
6.6	Hydraulic Parameters	28
6.7	Analysis of the Rational Method.....	29
6.7.1	Existing Condition Results.....	29
6.8	Future Alternative Solution Results.....	30
6.9	Conclusions/Recommendations	31
7	15th Street “B” East Storm Sewer Analysis	31
7.1	Introduction and Purpose	31
7.2	Background Information	31
7.3	Study Approach	32
7.3.1	Tasks.....	32
7.4	Summary of Dual Drainage Analysis (OTTSWMM)	32
7.4.1	Existing Condition Results	32
7.5	Proposed Modification to Existing System	33
7.6	Public Consultation	34
7.7	Flow Monitoring	34
7.8	Conclusions/Recommendations 15th Street “B” East	34

Table of Contents

Appendix A – Telfer Creek

Appendix A1 – Telfer Creek (Existing Condition)

1. SWMHYMO Input Table- Telfer Creek Existing Condition
2. SWMHYMO Dat and Summary File
3. Telfer Creek Existing Condition Flow Summary

Appendix A2 – Telfer Creek (Proposed Condition)

1. SWMHYMO Dat and Summary File
2. Table 1: Unit Flow Rates for Return Periods
3. Table 2: Allowable Release Rates for Each Land Use based on Pre-Development Unit Flow Rates
4. Table 3: Required Storage Volumes for Each Land Use based on Pre-Development Flow Rates
5. Table 4: Required Unit Flow Rate Storage Volumes for Each Land Use based on Storage/Volume/ Land Use Drainage Area

Appendix B – Kenny Drain

1. Kenny Drain Field Investigation and Site Photos

Appendix B1 – Kenny Drain (Existing Condition)

1. SWMHYMO Input Table- Kenny Drain Existing Condition
2. SWMHYMO Dat and Summary File

Appendix B2 – Kenny Drain (Proposed Condition)

1. SWMHYMO Input Table- Kenny Drain Existing Condition
2. SWMHYMO Dat and Summary File (Without Ponds)
3. SWMHYMO Dat and Summary File (With Ponds)

Appendix B3 – Kenny Drain Hec-Ras Modelling

1. Hec-Ras Input and Output Tables

Appendix C – Telfer Creek and Kenny Drain Erosion Analysis

1. Aqualogic Erosion Threshold Analysis

Appendix D – East Bluffs Storm Sewer

1. North Storm Sewer Design Sheet
2. South Storm Sewer Design Sheet-Scenario #1
3. South Storm Sewer Design Sheet-Scenario #2

Appendix E – 15th Street East Storm Sewer Analysis

1. PowerPoint Presentation – July 4, 2006

Table of Contents

Appendix F – Figures and Drawings

- HEC1 – Kenny Drain Floodplain Map
- Figure 1 – Site Location Plan
- Figure 2 – East Bluffs South Storm Sewer Analysis Scenario #1
- Figure 3 – East Bluffs South Storm Sewer Analysis Scenario #2
- Figure 4 – East Bluffs North Storm Sewer Analysis
- SWM1 – East Owen Sound Catchment Areas with Official Plan
- SWM2 – East Bluffs Storm Sewer Catchment Areas
- SWM3 – Telfer Creek Existing Conditions Plan
- SWM4 – Telfer Creek Proposed SWM Plan
- SWM5 – Kenny Drain Existing Conditions Plan
- SWM6 – Kenny Drain Proposed SWM Plan
- SWM7 – Kenny Drain Proposed SWM Plan with Aerial Photography
- SWM8 – Kenny Drain SWMHYMO Flow Schematic