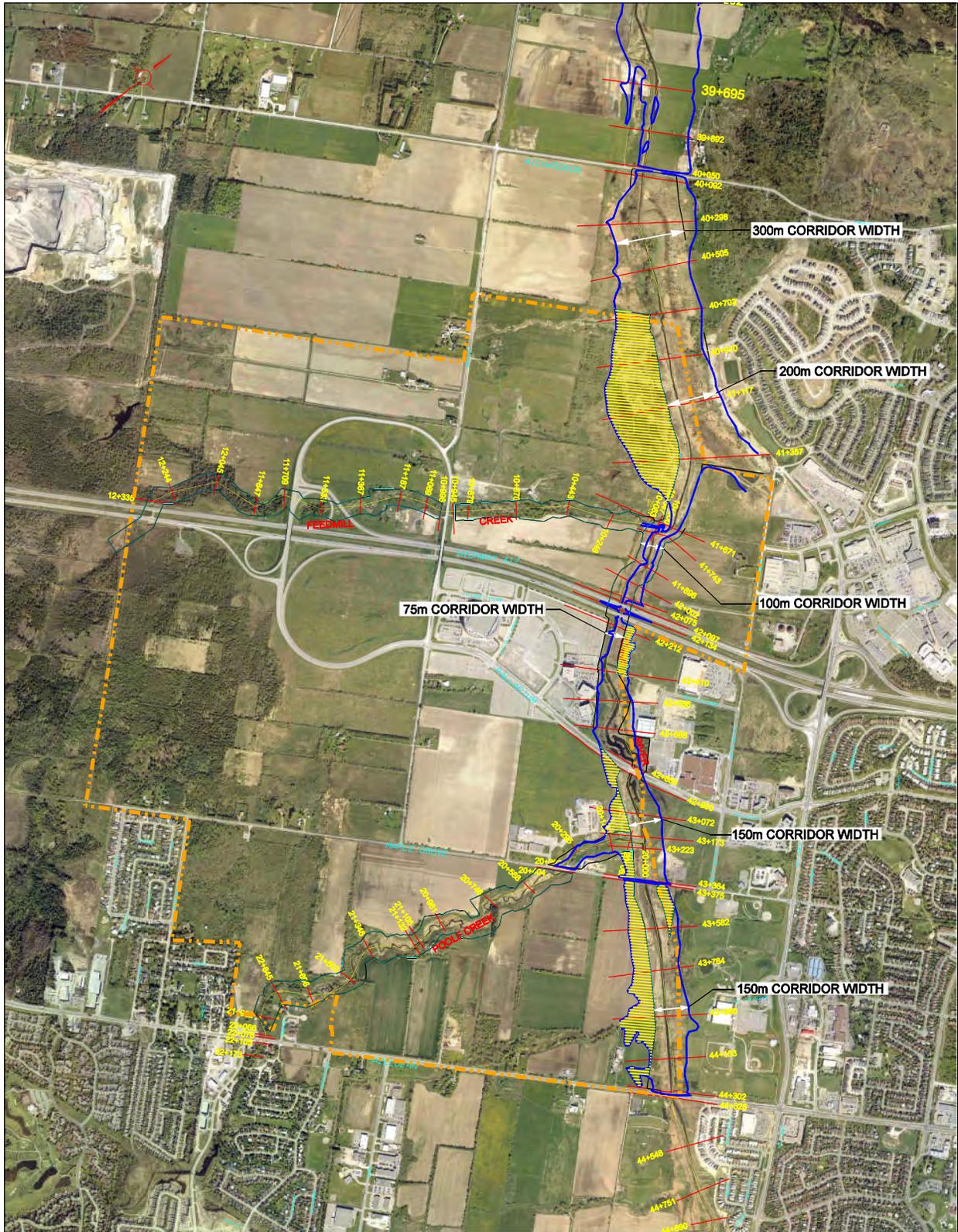


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Attachment 1

Carp River Study Area



LEGEND

-  PROPOSED FILL AREAS
-  KANATA WEST STUDY LIMIT
-  EXIST. REGIONAL FLOOD LINE
-  PROPOSED STREAM CORRIDOR
-  44+153 SURVEYED CROSS SECTIONS

FIGURE 6 UPPER CARP PROPOSED FILL AREAS

Attachment 2

Appendix 4.2 of June 2006 MSS

APPENDIX 4.2

Pumping Station Overflow Analysis

Memo

To: Rob Phillips
City of Ottawa

From: Steve Pichette
Stantec - Ottawa

File: 1604-00406

Date: October 11, 2005

In response to comments from the City of Ottawa dated September 16, 2005, an assessment of the sanitary sewer HGL during a "catastrophic event" was performed. The analysis assumed that both the Signature Ridge pump station (SRPS) and Kanata West pump station (KWPS) were out of service, and overflow by gravity outlets was operating against 100yr stormwater levels.

The analyses were conducted using XPSWMM2000 Version 8.5. The proposed sanitary infrastructure was added to existing storm sewer models. Storm hydrographs from the August 12, 2005 submission remain at all storm nodes, and constant inflows equal to the peak sanitary design flow (as provided in design sheets) were added at the appropriate nodes.

Kanata West Pump Station

Overflow from the KWPS was assumed to flow via a 1.8m x 0.9m box pipe @ 1.0% to SWM Pond 5 which has a 100 yr peak water level of 94.91. The storm sewers and Pond 5 facility were modeled as in the August 12, 2005 submission of the Master Servicing Study.

During initial simulations, the sanitary flows caused an increase in the sanitary HGL such that it was 0.3m above the storm HGL in some areas. Under this condition, the sanitary HGL would control building footings. Subsequent simulations were completed while varying sanitary pipe sizes. Increasing the sanitary sewers by two sizes resulted in the sanitary HGL being below the storm HGL in most areas, as seen on sketch SK1, with some exceptions at those nodes adjacent to Pond 5. It is noted that at these locations the sanitary HGL is within 0.3m of the storm HGL, and hence, remains below proposed footing elevations.

Proposed grades and HGL elevations for the KWPS lands are provided on Sketch SK1.

Signature Ridge Pump Station

Overflow for the SRPS was assumed to outlet to the both proposed Pond 2 and the existing Broughton- Richardson SWM facility, via twin 525mm sewers @ 0.40%. This facility was assigned a 100 yr HGL of 93.65 (equal to the Mississippi Valley Conservation Authority (MVCA) 100 yr floodplain in the Carp River).

Stantec

October 3, 2005

Rob Phillips

Page 2 of 2

Sanitary sewers tributary to the SRPS were also increased two pipe sizes in order to reduce the HGL. The resulting sanitary HGL is below the storm HGL in most areas with the exception of node 14A west of Pond 2. All HGL values and proposed grade elevations for the Signature Ridge pump station are provided on sketch SK2.

Conclusion

As indicated above, under a catastrophic event involving failure of the sanitary pump stations in conjunction with a 100yr storm event, the proposed system will provide protection for proposed footings.

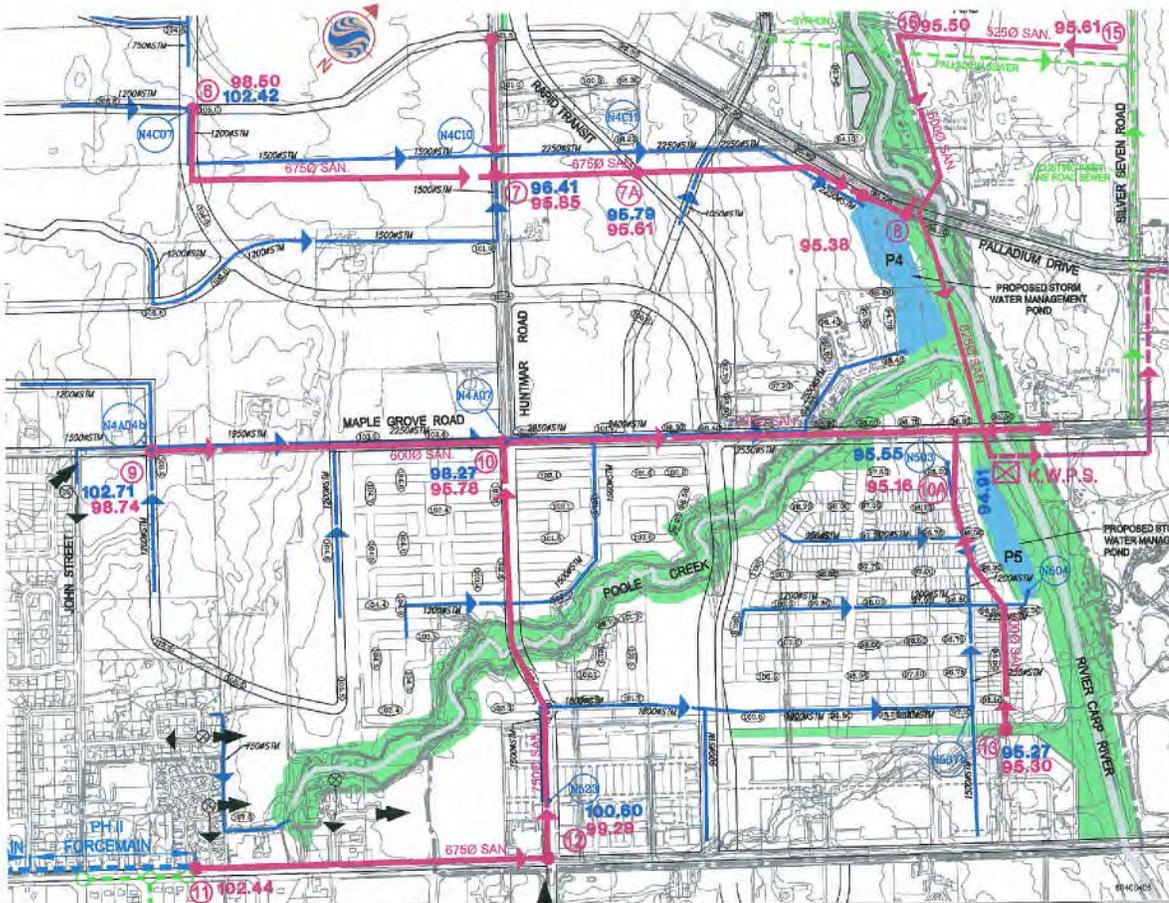
It is noted that revised stormwater modeling is currently underway in order to address City comments. Any changes made to the storm sewer system will be implemented in the revised sanitary HGL analyses which will be included in the subsequent submission of the Kanata West Master Servicing Study.

Output files for the two simulations are attached for reference. Digital copies of input and output files will be provided to Curtis Rampersad for his review.

STANTEC CONSULTING LTD.

Stephen Pichette, P. Eng
Principal - Urban Land
spichette@stantec.com

KANATA WEST PUMP STATION HYDRAULIC ANALYSIS



STORM		SANITARY	
NODE	HGL (m)	NODE	HGL (m)
N4C07	102.42	6	98.50
N4C10	96.41	7	95.85
N4C11	95.79	7A	95.61
CARP RIVER	94.20	8	95.38
N4A04b	102.71	9	98.74
N4A07	98.27	10	95.78
N503/P5	95.55/94.91	10A	95.16
-	-	11	102.44
N523	100.60	12	99.29
N507b	95.27	13	95.30
-	-	15	95.61
-	-	16	95.50

95.27 Hydraulic Gradeline (m)
[Storm Aug 12/05]

95.30 Hydraulic Gradeline (m)
[Sanitary Sept 29/05]

N.T.S.

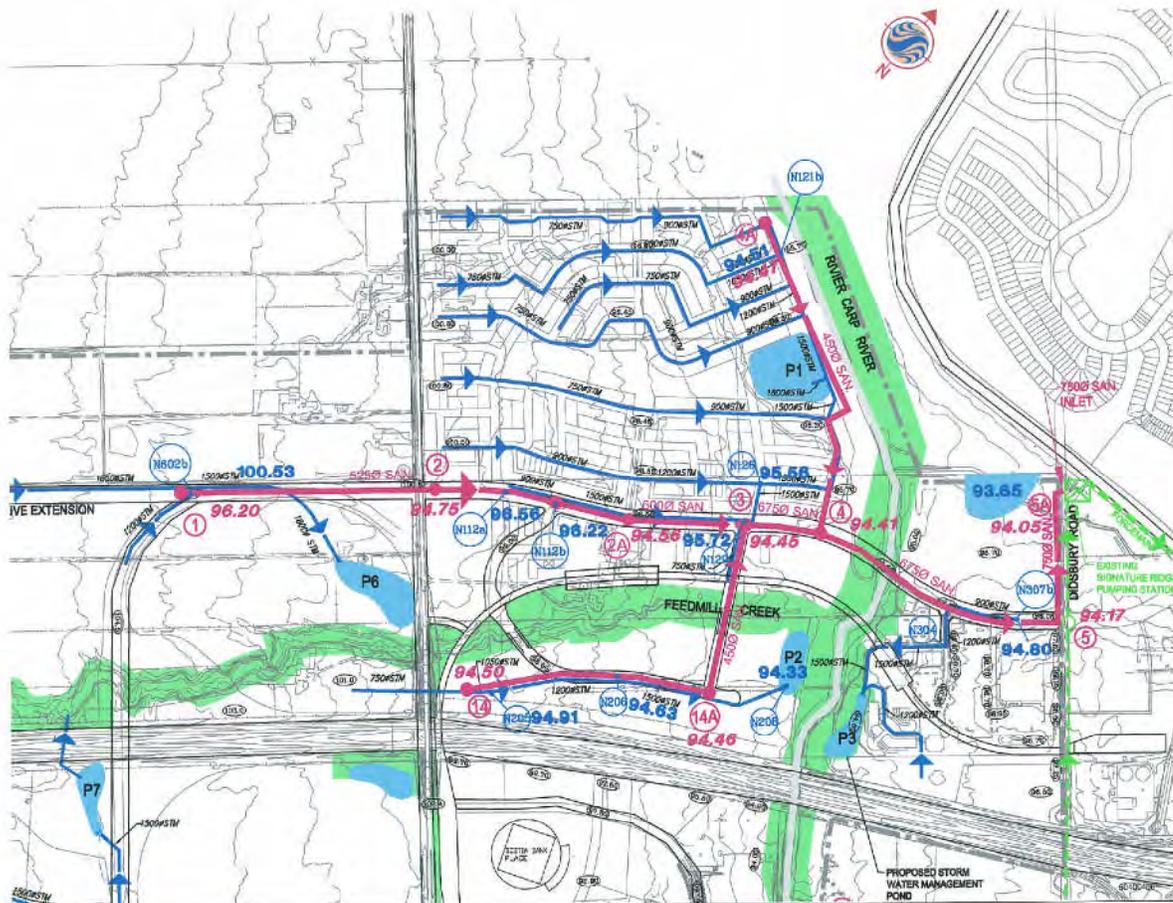
NOTE: SANITARY PIPE DIAMETERS WERE INCREASED TWO SIZES TO REDUCE THE HGL IN THE SANITARY SEWER DURING AN EMERGENCY OVERFLOW CONDITION



OCTOBER 03 2005

SK1

SIGNATURE RIDGE PUMP STATION HYDRAULIC ANALYSIS



STORM		SANITARY	
NODE	100yr HGL (m)	NODE	HGL (m)
N602b	100.49	1	95.20
N112a	95.55	2	94.75
N112b	95.22	2A	94.56
N129	95.72	3	94.45
N125	95.55	4	94.41
N121b	94.51	4A	94.47
N307b	94.80	5	94.17
BROUGHTON POND	93.65	5A	94.05
N205	94.91	14	94.50
N206	94.63	14A	94.46
N208	94.33		

95.27 Hydraulic Gradeline (m)
[Storm Dec/05]

95.30 Hydraulic Gradeline (m)
[Sanitary Dec/05]

N.T.S.

NOTE: SANITARY PIPE DIAMETERS WERE INCREASED TWO SIZES TO REDUCE THE HGL IN THE SANITARY SEWER DURING AN EMERGENCY OVERFLOW CONDITION

Revise:
JANUARY, 2008

SK2



Attachment 3

Executive Summary

Carp River Audit Report



Office of the Auditor General / Bureau du vérificateur général

**AUDIT OF THE CARP RIVER WATERSHED STUDY AND
RELATED PROJECTS**

2007

Chapter 16

**VÉRIFICATION DE L'ÉTUDE SUR LE BASSIN HYDROGRAPHIQUE
DE LA RIVIÈRE CARP ET DES PROJETS CONNEXES**

2007

Chapitre 16

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EXECUTIVE SUMMARY

Introduction

This audit was conducted as a result of a report to the Fraud and Waste Hotline. It was not originally identified in the 2007 Audit Plan that was presented to Council.

Audit Objectives

The various reports included in this audit were subject of reports to the Planning and Environment Committee and to Council as the projects progressed, and they were approved by both the Committee and Council. The purpose of this audit is to review the information presented to the Planning and Environment Committee and to Council.

Audit Objective No. 1 – To examine the application of the Two-Zone Concept to the Carp River within the Kanata West Community.

Audit Objective No. 2 – Determine whether the studies, processes and methodologies were consistent and compliant with all relevant policies, procedures, legislation and regulations.

Audit Objective No. 3 – Examine the reports and studies prepared to support the development upstream and adjacent to the proposed channelization near Glen Cairn to determine if the City should be responsible for the channelization work or if others should pay for the work. *Note: Based on legal advice, the results of our audit work on this objective are not provided in this report.*

Audit Objective No. 4 – Examine the reports and studies to discern if the fact that consultants were working both for the City and developers at the same time affected the recommendations in the reports.

Audit Objective No. 5 – Examine the processes followed by the consultants for the developers and by the City in the Class Environmental Assessment (EA) studies, to determine if the processes and methodologies followed accepted practice and the requirements of the Environmental Assessment Act.

Audit Scope

The Audit Scope encompassed the following tasks:

- Review of the legislative framework for the projects, to confirm the requirements that should have been followed in their development;
- Briefing meetings with City staff;
- Collection and review of the background information;

- Review of the reports will be completed to evaluate the methodologies used and the options examined; and,
- The results of the review will be an evaluation of the recommendations to determine whether the interests of the City were adequately considered.

Summary of Findings

Based on the reviews undertaken to date it is concluded that:

1. The Mississippi Valley Conservation Authority (MVCA) representative was the first one to suggest as a viable option for consideration by the City that the Two-Zone Concept could be applied to the Study Area.
2. The City and the MVCA applied the Two-Zone Concept to an area that is undeveloped, which is not normally accepted by other conservation authorities in Ontario, including the Rideau Valley Conservation Authority.
3. It is noted that the Provincial Policy Statement does not contain a specific limitation to the application of the Two-Zone Concept to undeveloped areas. However, the practice by other municipalities and conservation authorities is to discourage such applications. Examination of the Provincial Policy together with the Technical Guides reveals that the intent of the Provincial Policy Statement was not followed in the case of the Carp River.
4. The application of the Two-Zone Concept followed Provincial Policy in principle, but did not take into account the Technical Guides.
5. The Provincial Policy Statement requires that all the hazards be evaluated to determine if the Two-Zone Concept can be applied to a stream reach. The hazards include hydrologic and hydraulic, as well as erosion and geotechnical aspects, such as deep peats and sensitive clays, organic soils, and unstable bedrock such as karst formation areas. The considerations taken into account during the application of the Two-Zone Concept were restricted to the hydrologic and hydraulics aspects, but did not take into account the suitability of the concept to an area of deep peats and sensitive clays.
6. The consideration of the Two-Zone Concept did not take into account the “design with nature” policies of the Official Plan. In our opinion, the application of the Two-Zone Concept in this case seems to have been carried out in isolation, without explicitly taking into account the requirements of the Official Plan with respect to the “design with nature” policies. For example, the decision to apply the Two-Zone Concept took into consideration only hydrologic and hydraulic effects, leaving out other risks such as sensitive clays and organic soils; another example is that the potential effects of the Carp River restoration on sedimentation in downstream reaches has not been addressed.

7. The Servicing Report indicates that to service the low-lying areas along the Carp River it will be necessary to use special housing built forms and/or conventional building design with sump pumps. In addition, the Servicing Report indicates that the submerged inlet condition of the future stormwater management ponds will cause sedimentation with the storm sewers, which could result in a lowering of the level of service from the 100-year storm to the 25-year storm. On this basis, it was found that the application of the Two-Zone Concept results in sub-standard servicing for parts of the developments, as a result of potential sewer backups and basement floor heaving.
8. For the hydrologic and hydraulic analysis of the potential impacts of the application of the Two-Zone Concept, neither the MVCA nor the City provided a clear target maximum increase in water levels and flows.
9. The hydrologic and hydraulic analyses were completed on the basis of the wrong drainage area.
10. The impact of the error in drainage area on the calculated water levels in the Poole Creek is high (about 20 cm) and in the Carp River is low (about 3 cm).
11. The largest effect is on the floodlines of the Poole Creek, where the peak discharge for the 100-year flood is 16% lower than calculated and the water levels differences of 7 cm to more than 20 cm were noted. In the Carp River itself, the effect of the change in flows in the Poole Creek (reduced by approximately 16% at the outlet to the Carp River) are minor for existing conditions, ranging from 0 cm to 3 cm.
12. The effect of the error in the drainage area is compounded by failure to recognize that the hydrologic models underestimated the volumes of runoff produced by the watershed.
13. The hydrologic model underestimates significantly the volume of runoff produced by the watershed. The calibration efforts did not address this discrepancy. The effect of the lack of calibration of the runoff volume is to underestimate the water levels in the Carp River by more than 1.0 m in some locations of the study reach.
14. The hydraulic routing model of the Carp River was calibrated on the basis of hydrographs with too low runoff volumes. Consequently, the calibration must be corrected.
15. The proposed restoration of the Carp River through the Kanata West lands could result in additional sedimentation in downstream reaches. The impact of the additional sediment loads should be quantified. Nevertheless, the low sediment transport capacity of the overall Carp River to its mouth should be carefully considered before improvements are carried out in an upstream reach.
16. Although the City staff on the project tried to review the information produced on behalf of the Kanata West Owners Group (KWOG) as at arm's length as possible, it is evident in the correspondence and reports that the fact that the City was a co-

proponent in the Class EA projects and was a member of the KWOG affected the reviews by the City staff. Examples of correspondence and reports that lead us to our conclusions that staff's review was affected by ownership are listed in the detailed report.

17. The Carp River Watershed/Subwatershed Study report lacks some information that would normally be required, for example, a table summarizing the drainage areas and flows at different parts of the watershed; the conclusion that the Two-Zone Concept can be applied to the Carp River is not fully explained.
18. The "Flow Characterization and Flood Level Analysis" report addresses the area to Richardson Road only, leaving out the remainder of the watershed. Although a basic problem, the report was completed without correcting this.
19. Regarding the same report, it was accepted although not all the comments by the City were fully addressed in the report.
20. The "Post-Development Flow Characterization and Flood Level Analysis" report does not fully address all the comments provided by the City, but it was accepted.
21. It is understood that the City participated in the KWOG as a non-voting member, and as mentioned above, the staff tried to review the information produced by the KWOG at arm's length. However, there might be a conflict of interest on the part of the City by participating on the KWOG and being the approval entity on the same projects.
22. In general terms, the Class EA projects were completed in accordance with the Municipal Class Environmental Assessment.
23. Development in the flood fringe as proposed in the Servicing Report could lead to unanticipated liability to the City, as there are difficulties in meeting the City standards.
24. A consultant worked concurrently for the City of Ottawa in preparing the Carp River Watershed and Subwatershed Plan and for the developers as part of the Kanata West Concept Plan (KWCP). This may place the consultant in possible conflict of interest. This is a case in which disclosure of potential conflict of interest may not be sufficient. The interests of the City and the KWCP proponents should be separate. Notwithstanding that the City was aware that the consultant was working for both, the potential for conflict of interest remains. It is also noted that the City may not have agreed to the consultant being part of both teams if the City was not part of the KWOG. Both the City and the KWCP proponents, as well as other parties, were fully aware of this fact and both agreed that the arrangement addressed the Professional Engineers of Ontario (PEO) Code of Ethics.
25. The Class EA processes were conducted in accordance with the appropriate Class EA Schedule, except for the Carp River et al. restoration project which, given the

potential environmental effects, should have been conducted as a Schedule C project.

Recommendations and Management Responses

Recommendation 1

That the City develop a policy to preserve flood plains as a flood damage reduction measure.

Management Response

Management agrees with this recommendation in principle.

Management would like to address the fact that there are examples in other Conservation Authority watersheds, of implementing a concept where the regulatory flood plain is redefined and riparian storage is maintained in a developing area (i.e., Toronto and Region Conservation Authority- TRCA). The TRCA Valley and Stream Corridor Management Program (October 1994) has policies for “unusually wide flood plain with shallow depths of infrequent flooding”. In section 3.2.2 (2) on page 21 of the policy, it states that alterations to stream corridor boundaries within shallow flood plains may be permitted. The TRCA Valley and Stream Corridor Management Program also notes on page 22 that:

“Within passive or inactive storage areas, re-grading may be permitted that retains existing stage/storage characteristics provided it does not conflict with the policies outlined above.”

Therefore, the TRCA allows redefinition of the regulatory flood plain line to allow new development if flood plain storage is maintained. This is the same concept that is being applied, in the case of the reach of the Carp River, in the Kanata West area. Therefore, if the Carp River was within the TRCA’s watershed, their present policies would allow the development into the flood plain without identifying the area as a Two Zone.

There are also examples of the Ontario Municipal Board (OMB) decisions implementing the Two Zone concept in new development areas (i.e., Amberlakes in Stittsville). Furthermore, the Ministry of Natural Resources (MNR) technical guidelines do not specify or restrict which type of lands the Two Zone concept can be applied to or whether it applies to existing or proposed development.

Notwithstanding the above, a draft Official Plan Amendment (OPA) for new Flood Plain Management policies is currently underway. This document has been circulated to various public agencies and will be presented to Council by Q4 2008.

Recommendation 2

That the City develop a policy for Council approval to apply the Two-Zone Concept only to areas of the City with existing development and not to areas that heretofore are undeveloped.

Management Response

Management agrees with this recommendation in principle.

Development of the lands adjacent to the Carp River was initially characterized as a Two Zone approach. One of the main benefits of the application of the Two Zone concept was the restoration of this reach of the Carp River. Historically, the channel of the Carp River has been straightened and lowered. This restoration will return it to a more natural state.

The Carp River Restoration project proposes re-grading and balanced cut and fill, with the effect that some lands are removed entirely from the flood plain. Since these lands are entirely removed from the floodplain, the Carp River Restoration is better described as a modified one-zone approach. This is the advice provided to the City, by the Ministry of Natural Resources, along with the opinion that the restoration as proposed satisfied the intent of the Provincial Policy Statement's (PPS) Natural Hazards policy. In a letter dated April 26, 2007 David Ramsay, the Minister of Natural Resources, stated "the Ministry believes the objectives of the provincial natural hazards policy have been met in the Carp River Restoration Plan. Furthermore, the flexibility provided by the policy has been appropriately used by the MVCA given the wide shallow floodplain in this urbanizing area."

As mentioned in the previous recommendation, a draft OPA for new Flood Plain Management policies is currently underway and will be presented to Council by Q4 2008.

Recommendation 3

That the City ensure that the evaluation of the flood fringe for development includes examination of all potential hazards, including slope stability and risk incurred by the City as a consequence of reduced design standards.

Management Response

Management agrees with this recommendation, as this is the City's current practice.

As stipulated in the City's Official Plan, each development application is required to submit studies that examine and assess all potential hazards. Included in this submission is a geotechnical study which incorporates a slope stability assessment.

Management disagrees, however, with the comments in the audit that a reduced design standard for development of lands was applied to Kanata West. There is no municipal or provincial standard that requires basements. The applicable standard is the requirement for footing elevations to be designed to maintain at least a 0.3m clearance above the 100-year Hydraulic Grade Line (HGL). This will continue to be a requirement for any development in Kanata West.

Management will be seeking, within the terms of reference for the third party engineering firm, advice on the appropriate timing within the process for examination of geotechnical hazards. See the response to recommendation 11 for a

more complete discussion of the background and scope of the third party review of the Carp River Restoration Environmental Assessment (EA).

Recommendation 4

That the City develop a policy for Council approval to not participate in landowners groups, including selling the subject lands or putting them in a blind trust.

Management Response

Management disagrees with this recommendation.

The City requires the same flexibility as any other landowner in managing real estate. The forced sale or placement in a blind trust, of real property would limit or restrict the City's ability to fulfill programming needs.

The City has endorsed a corporate landlord model within the Real Property Asset Management Branch (RPAM) that operates independently from the approval authorities within the Planning Transit and Environment department.

RPAM participated in the Kanata West Owners Group's (KWOG) meetings as an observer. The City has participated financially but has not signed the KWOG agreement. As a result, City staff has not voted on any direction or matters considered by the KWOG including the Carp River Restoration plan. In this circumstance, management chose to exercise flexibility and was not a direct participant in order to avoid conflict of interest.

Recommendation 5

- a) **That the City ensure that the benefit of additional tax revenues should be measured against the costs of preparing the lands for development, including the cost of the land, and the potential liability exposure by permitting development in lands that do not meet the existing municipal standards.**
- b) **That a cost-benefit analysis be carried out with respect to the additional lands gained by applying the Two-Zone Concept.**

Management Response

Management disagrees with this recommendation.

A cost-benefit analysis cannot be carried out to any reasonable degree of accuracy at this point in time as the key variable inputs cannot be measured, or are simply unknown.

There are three key variables that would need to be determined to validate the recommendation. First, the type and level of development within the impacted area has not been determined. The general uses can range from office/ industrial/commercial development, to low/ medium density residential development, or even to land dedicated for parkland.

Secondly, given that the specific type of development is unknown, any attempt to measure the exposure liability by permitting development on the additional lands gained by applying the Two Zone concept, would be difficult at best to assess.

Finally, given the unknown nature of development, an offset tax revenue cannot be reasonably estimated. Until these key variables are more clearly defined, the recommended cost-benefit analysis would be highly theoretical and speculative, and would be of minimal value to management.

Recommendation 6

That the City require consultants to discuss in detail the potential impacts of discharging sanitary sewer overflow to the proposed stormwater management pond, including confirming that this procedure is acceptable to the Ministry of the Environment.

Management Response

Management disagrees with this recommendation.

The discharging of the sanitary sewer overflow in a storm water management pond as an emergency measure practice when a sanitary pump station experiences a catastrophic failure, has been a standard practice for a number of years. This option is further supported in the City of Ottawa's Sewer Design Guidelines (section 7.2.1.6 - System Reliability and Contingency Planning), when it is feasible to do so. This emergency measure is also noted in the City's draft Storm Water Management Design guidelines and is an accepted measure by the Ministry of Environment by virtue of their issuance of Certificates of Approval, which call for an overflow into storm water ponds. All emergency conduit connections to storm sewers, storage facilities, natural watercourses or surface outfall points are subject to approval by the Ontario Ministry of the Environment.

Recommendation 7

That the City re-evaluate the total suspended solids removal criteria and requests the developers' engineers to address in qualitative terms the potential effects of the river restoration on sedimentation in downstream reaches.

Management Response

Management agrees with this recommendation in principle.

In the Carp River Restoration project, the storm water management ponds will provide for quality control and will augment low flow during dry weather conditions. The Carp River Watershed/Subwatershed study determined criteria that would meet both environmental and functional objectives. Specifically, all development flows would need to be controlled to result in: 80% suspended solids removal in Poole and Feedmill Creeks, and 70% suspended solids removal in the Carp River. In fact, runoff from urban development will contain less sediment than

what is currently coming from farmers' fields, even before suspended solids removal.

Management will include, in the terms of reference for the third party engineering firm, a review of the criteria for suspended solids removal. See the response to recommendation 11 for a more complete discussion of the background and scope of the third party review of the Carp River Restoration EA.

Recommendation 8

That the City ensure that the Restoration Project design provides a quantitative estimate of the volume of sediment that will be transported to downstream reaches as a result of the restoration, including a quantitative evaluation of the sediment transport capacity of the downstream reaches.

Management Response

Management agrees with this recommendation.

Accordingly, one of the objectives in the design of the Carp River Restoration project was to achieve a sediment balance in the Carp River within the natural erosion/deposition process. This means there will be no increase in sedimentation in downstream reaches.

In management's opinion, the following statement in the audit: "However, there is only cursory examination of the potential impacts of transferring the sediment that is currently being stored by the river in the restoration reach to the downstream reaches..." incorrectly assumes that the existing sediment in the restoration reach will be transported downstream. In fact, a criterion of the restoration project is to ensure that the design provides for remediation of existing erosion and encourages sediment balance. This includes the removal of existing sediment deposits in localised areas thereby reducing the movement of the sediment downstream. The Carp River, Poole Creek and Feedmill Creek Restoration EA identified the need to monitor sediment movement to ensure impacts to downstream reaches are mitigated, per pages 73, 78, 90, 91 and page 93 (Monitoring Plan).

When preparing the terms of reference for the third party engineering firm, management will include the requirement for confirmation as to whether a sediment balance was achieved, and for advice on the need for quantitative estimates in regard to the volume of sediment and sediment transport capacity (including provision of quantitative estimates if required). See the response to recommendation 11 for a more complete discussion of the background and scope of the third party review of the Carp River Restoration EA.

Recommendation 9

That the City require consultants to correct the errors in the hydrology, hydraulics and other parts of the work, resulting from the errors in the drainage area, at no cost to the City.

Management Response

Management agrees with this recommendation.

The consultants are addressing the error in the drainage area and the impacts on hydrology, hydraulics and other aspects. These results, among others, will be used to address recommendation 13. This analysis will be included in the terms of reference for the third party engineering firm review. See the response to recommendation 13 for a more complete discussion of the background and scope of the third party review of the Carp River Restoration EA.

Recommendation 10

That the City require consultants to properly calibrate the runoff model and the hydraulic routing model to represent properly the response of the watershed to the rainfall input, at no cost to the City.

Management Response

Management defers its response to a third party review on the issue of calibration.

Staff did undertake to calibrate the model using what data was available. As detailed on page 138 of the Carp River Watershed/Subwatershed study, various Soil Conservation Service (SCS) storm durations (1 hr, 3 hr, 6 hr, 12 and 24 hr) were reviewed. It was determined that the 12 hour storm best represented the peak flow conditions in the subwatershed area. The type of storm distribution (Chicago vs. SCS) related to the size of the area being modelled, not just the future land use.

As stated in the Flow Characterization and Flood Level analysis, temporary water level gauges were established at Richardson Side Road, Palladium Drive and the Glen Cairn Pond. During the time these monitoring stations were in place, only one large storm was recorded (September 9 2004, -the tail-end of Hurricane Francis). Therefore, only one event was available for calibration/verification.

Management will seek guidance from the third party reviewer on the issue of calibration and whether the steps undertaken, including sensitivity analysis, were reasonable. See the response to recommendation 13 for a more complete discussion of the background and scope of the third party review of the Carp River Restoration EA.

Recommendation 11

That the City require consultants to re-evaluate the results of the subsequent analyses and designs, and to modify them as required, at no cost to the City.

Management Response

Management agrees with this recommendation.

In January 2008, City staff discovered that modeling developed by an external engineering firm on behalf of the City and the Kanata West Owners Group for the

Carp River, Poole Creek and Feedmill Creek Restoration EA contained an error. The engineering firm has confirmed to City staff that an error has, in fact, been made.

The Restoration EA is currently before the Ontario Ministry of the Environment (MOE) as several parties made Part II order requests. In light of this error, the City immediately advised the MOE to refrain from taking any decisions related to this assessment until the impact of the error has been fully assessed.

Currently, the City is in the process of engaging a third party engineering firm to independently review the analysis. The review is expected to take a few months to complete. The terms of reference will include a complete review of all aspects of the technical analysis for the Restoration EA as it relates to flood elevations and water flows and the impacts of any changes on the design. The review will also include the issues referenced in management's earlier responses. Once the results of the review are known, management will advise City Council and MOE of the outcome. Issues related to cost and next steps will be determined at that time.

Recommendation 12

That the City ensure that consultants not be allowed to work on the same project for the City and for the developers, even if the City is fully aware of the fact. This recommendation applies even if the initial assignment is complete.

Management Response

Management agrees with this recommendation in principle.

The Professional Engineers Code of Ethics permits a professional engineer to work for two different employers on the same subject matter where such has been disclosed to both employers. While this does put such professional engineer in a position of having two masters, it is noted that the Code of Ethics provides that the professional engineer's duty to the public transcends his/her other obligations, that the professional engineer's duty to the public welfare is "paramount".

To implement this recommendation would reduce the available number of firms for an assignment, as some may have worked for developers on the same subject matter in the past or may not be willing to be precluded from working for developers in the future. It may also increase the cost of assignments, as the City, not being able to hire a firm that had worked for a developer in the past on an assignment, would always have to hire a firm that is starting fresh. This may also mean that the City is not able to benefit from the expertise of "the best" in the business.

Nevertheless, management concurs having a consultant that has not and will not work for a different employer on the same subject matter is, in most cases, a desirable outcome. Therefore, management supports an amendment to the City's Purchasing By-law to implement this recommendation, subject to exceptions being permitted when authorized by a Deputy City Manager, or by the City Manager for branches that report directly to him. If however, these exceptions become the norm and the

number of consultants available to work on City projects is significantly reduced by the implementation of this recommendation, such that truly competitive bids are no longer possible, staff will seek instruction from Committee and Council to resolve this issue.

Recommendation 13

That the City ensure that a full evaluation of the risk of proceeding with detailed design on a project that is under review by the MOE based on a Part II Order request be submitted to Council for prior approval.

Management Response

Management agrees with this recommendation.

In the future, Council will be notified in advance whenever management proposes to proceed with design while the Ministry of the Environment is reviewing a Part II order request.

Conclusion

The audit revealed that the application of the Two-Zone Concept to the Carp River within the Kanata West area satisfied only in part the requirements of the Official Plan, as it did not address the “design with nature” requirements of the Official Plan. In addition, the studies required to determine whether the Two-Zone Concept should be applied did not completely address the slope stability and soil hazards found in the area.

The studies and reports carried out as part of the development satisfied Provincial Policy and the City’s Official Plan only in part, as noted above. In addition, the technical components of the studies and reports were based on an erroneous drainage area and did not properly calculate the volumes of runoff that are contributed by the drainage areas.

It is our opinion that the consultant was in a possible conflict of interest when the firm worked concurrently on the Kanata West Concept Plan for private interests and the Carp River Watershed Plan Study for the City of Ottawa, notwithstanding that both parties agreed to the arrangement, which is in conformance with the PEO Code of Ethics. The implications of the possible conflict of interest were exacerbated by the fact that the City of Ottawa may be in conflict of interest when the City formed part of a landowners group (the Kanata West Owners Group) located within the City; at the same time, the City had the obligation of reviewing and approving the studies and reports being produced by consultants paid for by the KWOG.

The Class Environmental Assessment studies for Roads, Servicing, and the Carp River Restoration Project followed the Municipal Class Environmental Assessment and complied fully with the Class EA requirements. Part II Order requests were submitted

by members of the public to the Minister of the Environment and are currently under review.

Acknowledgement

We wish to express our appreciation for the cooperation and assistance afforded the audit team by management and staff.

Attachment 4

Carp Part II Order – 21 July 2008

Ministry
of the
Environment

Office of the Minister

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JUL 21 2008

ENV1283MC-2006-3549

Mr. Rob Mackay
Director
Economic and Environmental Sustainability Branch
Planning, Transit and the Environment
City Of Ottawa
110 Laurier Avenue West
Ottawa ON K1P 1J1

Dear Mr. Mackay:

Between July 13 and 20, 2006, the former Minister of the Environment received four requests from members of the public that the City of Ottawa (City) and Kanata West Owners Group (KWOG) be required to prepare an individual Environmental Assessment (EA) for the proposed Carp River, Poole Creek and Feedmill Creek Restoration Class EA Project (Carp River Restoration Project); several projects under the Kanata West Master Servicing Study, specifically, Stormwater Management Ponds # 1, 2, and 5, and Signature Ridge Pump Station Upgrade and associated gravity sanitary sewers; and, selected projects under the Kanata West Road Network Transportation Master Plan, specifically, Maple Grove Road Widening from west of Huntmar Road to Terry Fox Drive and North-South Arterial from Hazeldean Road to Campeau Drive Extension, located in the City (Projects). I understand that the seven projects are part of a larger development plan, the Kanata West development area, the lands defined by the Kanata West Concept Plan, which is comprised of a total of 22 projects.

It is the understanding of this ministry that these Projects are being planned as Schedule B projects under the Municipal Engineers Association's Municipal Class Environmental Assessment (Class EA), except for the Maple Grove Road Widening from west of Huntmar Road to Terry Fox Drive and the North-South Arterial from Hazeldean Road to Campeau Drive Extension, which are being planned as Schedule C projects. The Class EA is an approved planning process that proponents must follow for projects of this type in order to obtain authorization to proceed with the project under the *Environmental*

...2



Mr. Rob Mackay

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Assessment Act (EAA). Despite this process, the Class EA includes a provision whereby any member of the public who has unresolved concerns with a proposed project can request that I require the proponent of the project to prepare an individual EA. This requirement to prepare an individual EA is referred to by the Class EA as a Part II Order.

Since the time of the submission of the Part II Order requests, ministry staff have been thoroughly reviewing the issues raised in the requests. On January 25, 2008, the Environmental Assessment and Approvals Branch (EAAB) received a letter from the City asking that the ministry put on hold its review of the four Part II Order requests, due to errors recently found with stormwater management modeling for the Carp River Restoration Project. Following the receipt of the letter, the ministry was advised that the City is actively seeking a third-party engineering review of the stormwater management modeling. The timeframe for determining the implications of these modeling errors to the seven projects subject to the Part II Order requests, and the remaining of the 22 projects within the Kanata West development area, and the impact to floodplain levels, is unknown. Staff at EAAB are also in receipt of your April 22, 2008 letter in which you provide a draft Terms of Reference for the third-party review of the technical analysis for the Carp River Restoration Project and related issues. Ministry staff provided comments to the draft Terms of Reference on May 14, 2008, requesting several additional terms as part of the third-party review.

This ministry is also in receipt of the February 8, 2008 memo submitted to the City's Mayor and Council, signed by the City's Director of the Planning Branch, in which the City assessed which subdivision applications within the Kanata West development area, are not impacted by the Carp River Restoration Project. This ministry finds this assessment to be of insufficient detail for determining the potential impact to the Carp River Restoration Project, as well as all other projects occurring within the Kanata West development area. Other projects, including those not subject to the Part II Order requests, such as the stormwater management ponds, may be impacted by the errors in hydraulic and hydrologic analysis, and also need to be considered.

Lastly, the ministry is in receipt of the City's Auditor General Report of the Carp River Watershed Study and Related Projects. This report identifies incomplete or erroneous aspects of the study and indicates that the Carp River Restoration Project should have been planned as a Schedule C undertaking under the Class EA.

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Mr. Rob Mackay
Page 3.

I am taking this opportunity to inform you that, due to the uncertainties about the stormwater management and floodplain impacts to the Kanata West development area, I am imposing several conditions on the City and KWOG under section 16(3) of the EAA, requiring the City and KWOG to complete additional work before continuing to proceed through the Class EA process. This decision was made after giving careful consideration to the issues raised in the Part II Order requests, the recent turn of events with respect to the errors found, the Auditor General Report, and the City's insufficient rationale for determining the impact of these errors on the Kanata West projects, and to ensure that the environment will be protected, as required under the EAA.

Therefore, to address the errors found in the stormwater management modeling and to ensure that the environment is protected, I am making an Order imposing a number of conditions in respect of the Projects.

1. Third-Party Review Regarding Stormwater Management Modeling

1.1. Following the completion of a third-party review, to which the City has committed to conducting, the City and KWOG shall provide a report to the District Manager, Ottawa District Office and Director, Environmental Assessment and Approvals Branch, containing a detailed qualitative and quantitative assessment and rationale as to:

1.1.1. How the 22 projects within the Kanata West development area are impacted by the modeling errors.

1.1.2. Whether or not each of the 15 projects that have already proceeded through the Class EA have resulted in a change to the undertakings, such that the projects can no longer be implemented in the manner outlined in the Class EA reports or the changes have resulted in new environmental implications, thereby warranting an addendum.

1.1.3. Whether or not the Class EA study reports for the seven projects subject to the Part II Order requests require revision.

1.2. The City and KWOG shall report back on impacts, if any, of the inconsistencies in the application of one and two-zone floodplain policies and identify what actions the City intends to take to address these impacts, where needed. It is my understanding that such actions could include the City

enacting a by-law to apply a two-zone floodplain policy along the reach of the Carp River in the Kanata West development area.

2. *Carp River, Poole Creek and Feedmill Creek Restoration Class EA, Master Servicing Study and Transportation Master Plan*

Water Level and Flow Modeling Data

2.1. The City and KWOG shall consider, based on the results of the third-party review, the level of additional information required to calibrate all models and validate the water level and flow modeling results, detailed in the post-development flow characterisation and flood level analysis for Carp River, Feedmill Creek and Poole Creek. The City and KWOG shall also determine, based on the third-party review, whether these details warrant a revision to the Carp River Restoration Project, Master Servicing Study, and Transportation Master Plan.

Water Level and Flow Rate Monitoring Plan

2.2. The City and KWOG shall consider, based on the results of the third-party review, the details of a water level and flow rate monitoring plan for the Carp River, Feedmill Creek and Poole Creek. The City and KWOG shall also determine, based on the results of the third-party review, whether these details warrant a revision of the Carp River Restoration Project, Master Servicing Study and Transportation Master Plan.

Development Phasing Plan Relating to Stormwater Management

2.3. The City and KWOG shall design a detailed development phasing plan for development occurring within the Kanata West development area to identify opportunities to mitigate increased surface water runoff impacts from the anticipated urbanization, based on input from the water level and flow rate monitoring plan. This plan shall at a minimum include details on:

- the timing of all phases of the Kanata West development;
- the filling in the Carp River floodplain and /or riparian lands;
- restoration works;

- how to enhance mitigation opportunities, to address any increased surface water runoff impacts from the resulting urbanization, related to development phasing;
- issues related to riparian storage; and,
- the manner and frequency in which the monitoring reports will be made available to the public and agencies.

2.3.1. The City and KWOG shall include this development phasing plan in the revised Carp River Restoration Project, Master Servicing Study and Transportation Master Plan.

Records in Public File

2.4. The City and KWOG shall include all agency and public correspondence related to the Projects in the revised Class EA Studies.

3. Updated Project Documentation and Notice

3.1. The City and KWOG shall revise and update the Carp River Restoration Project, Master Servicing Study, and Transportation Master Plan to include the results of the third-party review, the details of conditions 1 and 2, and re-issue a Notice of Completion, complete with a 30-day public comment period, and all the provisions of the comment period, including provisions for Part II Order requests.

I would also like the City and KWOG to consider climate change adaptation in the Kanata West development area, particularly with respect to future flooding events. Studies project increases in the frequency and intensity of extreme rainfall events resulting in increased flooding risks due to climate change. Aspects to consider should include the impact of changes in the frequency and magnitude of extreme climate events, changes in basin characteristics, such as the proportion of impervious areas, and adaptation strategies that address infrastructure, land-use vulnerability and associated risks.

I would also request that the City and KWOG continue to work with staff at this ministry's Eastern Regional Office and Environmental Assessment and Approvals Branch, to continue discussions about how climate change adaptation can be implemented as part of the Kanata West development, if feasible.

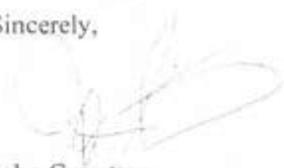
Mr. Rob Mackay

Page 6.

Lastly, I would like to ensure that the City and KWOG understands that failure to comply with the EAA and the conditions of my decision are contraventions of the EAA and may result in prosecution under section 38 of the EAA. I would also like to ensure that the City meet the requirements of the Director's letter that preceded this letter, outlining the additional information that the ministry is requesting for submissions for approval under the *Ontario Water Resources Act*. The City and KWOG should not interpret this Order as approval to proceed with the Projects. I am confident that the City and KWOG recognizes the importance and value of the EAA and will ensure that its requirements are satisfied.

If you have further questions, please feel free to contact Ms. Sarah Paul, Manager, Client Services Section, at 416-314-7135.

Sincerely,

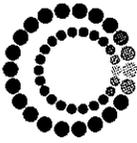


John Gerretsen
Minister of the Environment

c: Mr. Mike Green, Senior Project Manager, Kanata West Owners Group
Ms. Kelly Roberts, Planner, Delcan
His Worship Larry O'Brien, Mayor, City of Ottawa
Requesters

Attachment 5

MVCA Letter of support for TPR



Mississippi Valley Conservation

File: P09-31

April 9, 2009

Mr Rob MacKay
Manager, Strategic Projects
City of Ottawa
Real Estate Partnerships and Development Office
110 Laurier Avenue West
4th Floor
Ottawa, ON K1P 1J1

Dear Mr. MacKay:

**Re: Third Party Review Report – Carp River Restoration Plan
City of Ottawa (Kanata)**

Staff of Mississippi Valley Conservation (MVC) have reviewed the Third Party Review Report –Carp River Restoration Plan (Phases 1 and 2).

The analysis and review detailed in this report is comprehensive and MVC supports the conclusions and recommendations.

If you have any questions please contact the undersigned.

Yours truly,

John Price, P. Eng.
Watershed Management Coordinator



A Member of the
Conservation
Ontario Network

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Attachment 6

Sewer Design Guidelines

Section 5.4.3 - Design Storms

IDF curve equations (Intensity in mm/hr)

100 year Intensity	= 1735.688 / (Time in min + 6.014) ^{0.820}
50 year Intensity	= 1569.580 / (Time in min + 6.014) ^{0.820}
25 year Intensity	= 1402.884 / (Time in min + 6.018) ^{0.819}
10 year Intensity	= 1174.184 / (Time in min + 6.014) ^{0.816}
5 year Intensity	= 998.071 / (Time in min + 6.053) ^{0.814}
2 year Intensity	= 732.951 / (Time in min + 6.199) ^{0.810}

The IDF curves based on the above equations can be found in Appendix 5-A

5.4.3 Design Storms

Computer modeling requires the input of a design storm. The design storm is then used to generate a runoff hydrograph to determine how an area will respond and perform. Numerous types of design storms can be used ranging from historical storms to IDF curve-derived storms. This section briefly discusses the various types of design storms.

5.4.3.1 Application to Hydrologic Models

The design storms presented herein are meant to be used in hydrologic models to simulate runoff from events of various return frequencies. When choosing a design storm, the designer should perform a sensitivity analysis using various storms and use the one that is most conservative.

As noted below, the Chicago distribution is one of the most used storms for urban runoff applications. When dealing with rural areas, the SCS Type II storm is preferred. The AES storm can also be used for urban applications; however, care must be taken when choosing the type of distribution. As a rule of thumb, the 30% distribution should be used unless historical data proves otherwise.

When using a design storm, the designer must be careful in choosing the right storm time step. The storm's duration should be greater than twice the basin's time of concentration. A time step that is too small may overestimate peak flows. Should it be required to maintain a storm time step less than 10 minutes, consideration should be given to averaging the peak intensities to a 10-minute or greater average.

Some historical storms are also presented below and are to be used as a check of how various systems function during extreme events. It is not the intent of these guidelines to require that these storms be used for design purposes.

5.4.3.2 Chicago Design Storm

The Chicago storm distribution was developed by C.J. Keifer and H. Chu and is based on 25 years of rainfall record in the city of Chicago. This storm distribution, which is derived with IDF curves, is generally applied to urban basins where peak runoff rates are largely influenced by peak rainfall intensities.

The time step for the storm should be chosen very carefully, as it is related to the computational time step and may therefore impact the accuracy of the generated hydrograph. Small time steps may produce peak flows that are unrealistically high. In general, the time step for this type of design storm should not be less than 10 minutes for most urban applications. The duration of the storm should also be chosen carefully as it will have an impact on the peak flows. For example, a small duration storm in a large watershed may produce unrealistically low flows. Generally, the storm's duration should be greater than twice the basin's time of concentration.

The Chicago storm is widely used in the Ottawa area with respect to urban drainage. Table 5.2 provides both a 3-hour and 6-hour Chicago storm with a 10-minute storm time step for a 100-year storm.

Table 5.2 100 year – 3 and 6-Hour Chicago Storm

10 MIN TIME STEPS

Time	Chicago Storm		Time	Chicago Storm		Time	Chicago Storm	
(min)	3Hr (mm/hr)	6Hr (mm/hr)	(min)	3Hr (mm/hr)	6Hr (mm/hr)	(min)	3Hr (mm/hr)	6Hr (mm/hr)
10	6.05	2.91	130	8.02	54.04	250	-	4.54
20	7.54	3.17	140	7.08	27.31	260	-	4.25
30	10.17	3.48	150	6.34	18.23	270	-	3.99
40	15.98	3.88	160	5.76	13.73	280	-	3.77
50	40.76	4.39	170	5.28	11.05	290	-	3.57
60	178.56	5.08	180	4.88	9.28	300	-	3.40
70	54.04	6.05	190	-	8.02	310	-	3.24
80	27.31	7.55	200	-	7.08	320	-	3.10
90	18.23	10.17	210	-	6.34	330	-	2.97
100	13.73	15.98	220	-	5.76	340	-	2.85
110	11.05	40.67	230	-	5.28	350	-	2.74
120	9.28	178.56	240	-	4.88	360	-	2.64

5.4.3.3 AES Design Storm

The Meteorological Services of Canada (formerly Atmospheric Environment Services or AES) is the main source of meteorological data in Canada. MSC undertook an investigation of the variability of the time distribution of rainfall from storms across Canada. Figures 5.1 and 5.2 depict an AES distribution for 1-hour and 12-hour storms that would apply to the Ottawa area.

Figure 5.1 12-Hour AES Distribution –Southern Ontario

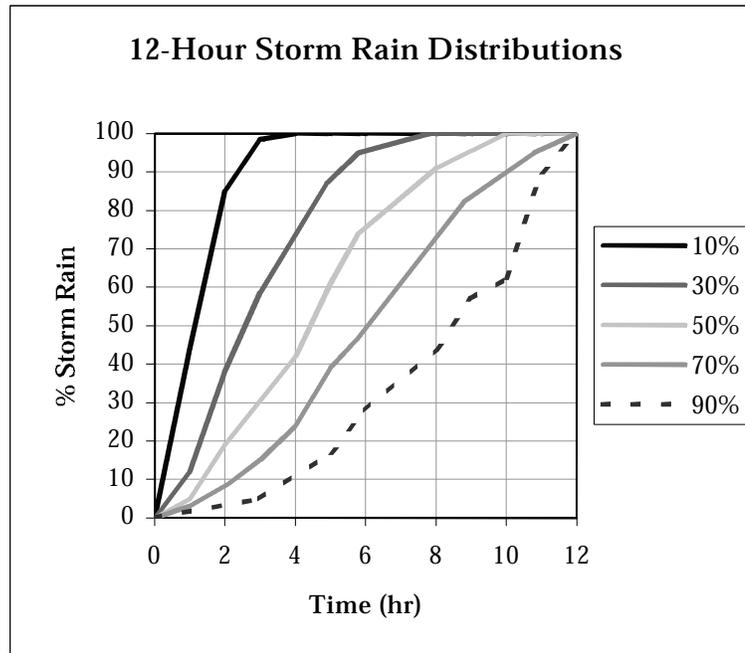


Figure 5.2 1-Hour AES Distribution –Southern Ontario

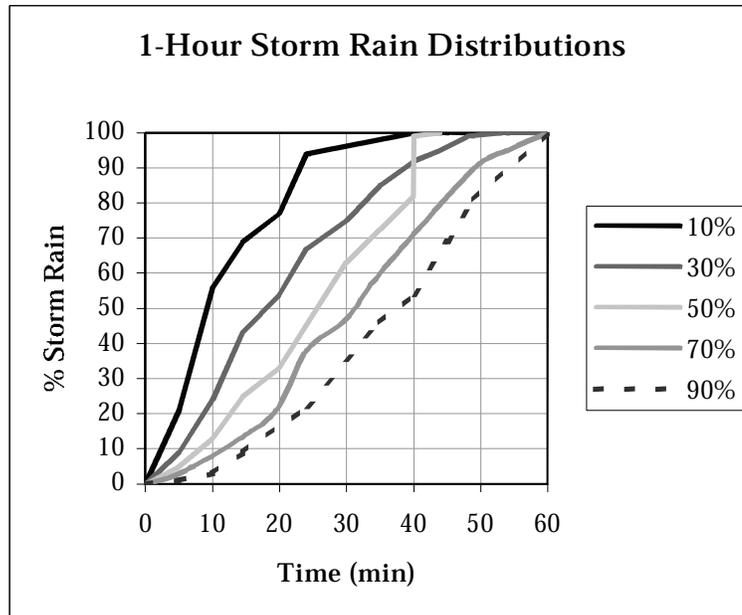


Table 5.3 outlines the rainfall intensity derived from the AES curves for a 30mm storm using a 1-hour 30% distribution.

Table 5.3 1-Hour 30% AES Distribution for 30 mm storm

AES 30% Distribution 1 hour storm -30 mm				
Time	Rainfall Distribution	Cumulative Rainfall	Incremental Rainfall	Intensity
(min)	%	mm	mm	mm/hr
0	0	0		
5	10%	3	3	36
10	24%	7.2	4.2	50.4
15	41%	12.3	5.1	61.2
20	53%	15.9	3.6	43.2
25	67%	20.1	4.2	50.4
30	75%	22.5	2.4	28.8

AES 30% Distribution 1 hour storm -30 mm				
Time	Rainfall Distribution	Cumulative Rainfall	Incremental Rainfall	Intensity
(min)	%	mm	mm	mm/hr
35	86%	25.8	3.3	39.6
40	92%	27.6	1.8	21.6
45	96%	28.8	1.2	14.4
50	99%	29.7	0.9	10.8
55	100%	30	0.3	3.6
60	100%			

The designer must exercise caution when selecting a rainfall distribution from the AES graphs. For example, a 10% distribution will result in an advanced pattern of excess rainfall and may result in lower runoff due to high losses at the initial part of the storm. Alternatively, a 90% distribution will have the reverse effect. The use of the 50% curve can give misleading flow results, as the intensity during the storm would be fairly uniform, which contradicts observed distribution data. It is suggested that the designer analyze local storm data to establish an appropriate distribution. Where no such data is available, the 30% curve is recommended.

5.4.3.4 SCS Type II Design Storm

The Soil Conservation Service of America developed the SCS Type II distribution in 1973 for applications in agricultural and rural areas. The SCS distributions are commonly applied as design storms in Ontario.

The 12 and 24-hour SCS storms are generally applicable to undeveloped or rural basins where peak flow rates are largely influenced by the total volume of rainfall. Depending on the design application, the designer should verify the results for a range of storm durations to ensure that a conservative design assessment is maintained. Table 5.4 outlines the SCS Type II Distribution and Table 5.5 shows a typical distribution example for a 6-hour storm with a volume of 54 mm (5 year storm, approximately).

Table 5.4 SCS Type II Distribution

3 hr	6 hr	12 hr	24 hr	V_{cum}/V_{tot}
		0.5		0.015
	0.5	1.0	2	0.022
		1.5		0.035
0.5	1.0	2.0	4	0.048
		2.5		0.065
	1.5	3.0	6	0.080
		3.5		0.100
1.0	2.0	4.0	8	0.120
		4.5		0.147
	2.5	5.0	10	0.181
		5.5		0.235
1.5	3.0	6.0	12	0.663
		6.5		0.772
	3.5	7.0	14	0.820
		7.5		0.852
2.0	4.0	8.0	16	0.880
		8.5		0.902
	4.5	9.0	18	0.925
		9.5		0.940
2.5	5.0	10.0	20	0.952
		10.5		0.969
	5.5	11.0	22	0.980
		11.5		0.990
3.0	6.0	12.0	24	1.000

$V_{cum} / V_{tot} = \text{Cumulative volume} / \text{total volume}$

Total volume is obtained from IDF curve (mm/hr X duration)

Table 5.5 Example of SCS Type II Distribution**6-Hour Storm – 54 mm**

Time (hrs)	Time Inc. (hrs)	Rainfall Cumul. (%)	Rainfall Increment (%)	Rainfall Inc. Vol. (mm)	Rainfall Intensity (mm/hr)
0.00	0.0000	0.0	0.0	0.00	0.00
0.50	0.5000	2.2	2.2	1.19	2.38
1.00	0.5000	4.8	2.6	1.40	2.81
1.50	0.5000	8.0	3.2	1.73	3.46
2.00	0.5000	12.0	4.0	2.16	4.32
2.50	0.5000	18.1	6.1	3.29	6.59
3.00	0.5000	66.3	48.2	26.03	52.06

Time (hrs)	Time Inc. (hrs)	Rainfall Cumul. (%)	Rainfall Increment (%)	Rainfall Inc. Vol. (mm)	Rainfall Intensity (mm/hr)
3.50	0.5000	82.0	15.7	8.48	16.96
4.00	0.5000	88.0	6.0	3.24	6.48
4.50	0.5000	92.5	4.5	2.43	4.86
5.00	0.5000	95.2	2.7	1.46	2.92
5.50	0.5000	98.0	2.8	1.51	3.02
6.00	0.5000	100.0	2.0	1.08	2.16
				54	mm total

5.4.3.5 Historical Storms

An historical storm represents a flood of magnitude exceeding all predated events. The historical storm that has been commonly applied in Ottawa since the early 80s has been the July 1, 1979, storm. Since that date, there have been other significant events such as the August 4, 1988, event and the August 8, 1996, event. Historical storm events are used as analytical tools in the analysis of existing systems to assess how a system may function under extreme events. Compared to design storms, historical storms produce higher runoff volumes or higher peak flows, which may influence the design of SWM facilities and/or conveyance systems. The July 1, 1979, August 4, 1988, and August 8, 1996, storms are presented in Table 5.6, while Figure 5.3 compares these historical storms to the City of Ottawa IDF curves.

5.4.3.6 When to Use Specific Design Storms

The following is a summary of when to use the various design storms presented herein. When choosing a design storm, the designer should perform a sensitivity analysis using various storms and use the one that is most conservative.

- *Chicago Design Storm:* The Chicago storm is widely used in the Ottawa area with respect to urban drainage. In general, the time step for this type of design storm should not be less than 10 minutes for most urban applications. The duration of the storm should also be chosen carefully, as it will have an impact on the peak flows. In general, the storm's duration should be greater than twice the basin's time of concentration.
- *AES Storm:* The AES storm should be used for urban drainage. Typically, the 30% distribution should be used in design. Similar to the Chicago storm, the time step should not be less than 10 minutes for most urban applications and the storm duration should be greater than twice the basin's time of concentration.
- *SCS Storm:* The SCS storms are generally applicable to undeveloped or rural basis where peak flow rates are largely influenced by the total depth of rainfall. The designer should use both the 12-hour and 24-hour storm to

see which one has the greater impact. SCS storms are also checked when the peak volume is at issue in the urban area, suggest using the 6-hour storm.

- *Historical Storms:* Historical storm events are used as an analytical tool in the analysis of existing system to establish how a system may function under extreme events.

Figure 5.3 – Historical Storms vs. IDF Curves

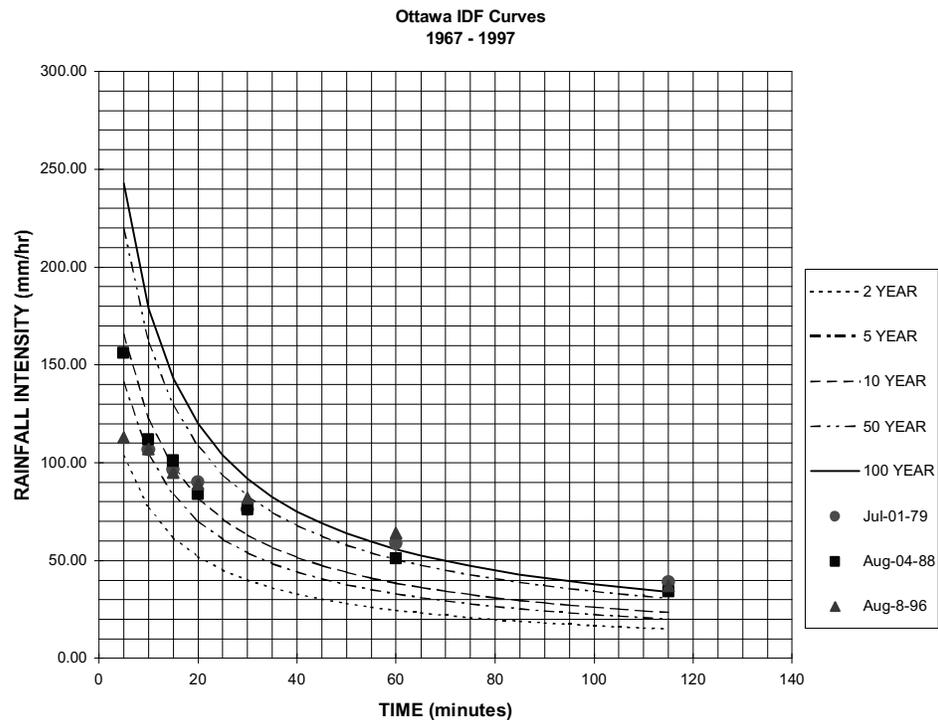


Table 5.6 Historical Storms

Time vs. Intensity (MM/HR) – 5 Minute intervals

Time-min	Jul-1-79	Aug-4-88	Aug-8-96	Time-min	Jul-1-79	Aug-4-88	Aug-8-96
0	0	0.0	4.0	175	3.8	0.2	69.0
5	2.3	0.1	11.9	180	3.8	12.8	63.7
10	2.3	0.1	26.5	185		14.0	58.4
15	8.89	0.0	13.3	190		22.2	47.8
20	8.89	3.7	0.0	195		21.8	15.9
25	8.89	6.2	2.7	200		1.4	13.3
30	8.89	101.5	0.0	205		0.2	8.0
35	38.1	15.5	8.0	210		0.2	5.3
40	38.1	29.3	18.6	215		0.2	6.6

Time-min	Jul-1-79	Aug-4-88	Aug-8-96	Time-min	Jul-1-79	Aug-4-88	Aug-8-96
45	38.1	19.8	10.6	220		0.2	2.7
50	38.1	1.5	21.2	225		0.2	4.0
55	38.1	1.7	2.7	230		0.2	2.7
60	38.1	5.4	2.7	235		0.2	4.0
65	38.1	24.6	15.9	240		0.2	2.7
70	50.8	26.5	66.3	245		0.2	5.3
75	50.8	34.9	55.7	250		0.2	4.0
80	76.2	10.2	122.0	255		0.2	2.7
85	106.7	27.1	88.9	260		0.2	4.0
90	106.7	104.4	9.3	265		0.2	2.7
95	71.1	27.5	8.0	270		0.2	1.3
100	71.1	62.5	4.0	275		0.2	1.3
105	30.5	31.8	0.0	280		0.2	0.0
110	30.5	79.8	2.7	285		0.2	0.0
115	30.5	67.5	0.0	290		0.2	0.0
120	30.5	156.2	0.0	295		0.2	0.0
125	3.8	5.1	0.0	300		2.9	2.7
130	3.8	0.2	5.3	305		7.8	0.0
135	3.8	0.2	0.0	310		10.0	0.0
140	3.8	0.2	0.0	315		6.3	0.0
145	3.8	0.2	0.0	320		5.1	0.0
150	3.8	0.2	0.0	325		9.8	0.0
155	3.8	0.2	0.0	330		2.6	0.0
160	3.8	0.2	0.0	335		1.7	0.0
165	3.8	0.2	4.0	340		0.0	1.3
170	3.8	0.2	53.1	345		0.0	0.0

5.4.4 Computation of Runoff

Stormwater runoff is one of the components for the complex phenomena comprising the hydrologic cycle. The computation of runoff includes assessment of the precipitation event, interception, depression storage, evaporation, and infiltration. There are different methods available to estimate runoff flows and volumes. Care should be taken in the selection and application of a preferred method, considering the complexity of the runoff process. The analysis requires an understanding of the hydrologic cycle as well as advantages and limitations of the methodology selected to model the process.

5.4.4.1 Rational Method

The Rational Method is a runoff estimation method based on an empirical formula relating the peak flow rate to the drainage area, rainfall intensity and a runoff coefficient.

See Section 3 for restrictions regarding when the Rational Method can be used.

Attachment 7

January 15 2009 Superior Court Decision

City Third Part Claim Against MMM & Rob Bishop, P.Eng.

ONTARIO

SUPERIOR COURT OF JUSTICE

B E T W E E N:

R.G. ROBINSON, M.E. ROBINSON,
CHRISTINE BOURRE, JOHANNE
MARSHALL, BELAIR DIRECT

Plaintiffs

)
)
) Derek G. Nicholson, for the
) Plaintiffs/Responding Party
)
)

- and -

THE CORPORATION OF THE CITY OF
OTTAWA, MARSHALL, MACKLIN
MONAGHAN LIMITED and ROBERT
BISHOP

Defendants

)
)
) Brian Parnega, for the
) Defendants/Responding Party, The
) Corporation of the City of Ottawa
)
)

- and -

MARSHALL, MACKLIN MONAGHAN
LIMITED and ROBERT BISHOP

Third Parties

)
)
) Jennifer A. Roberts-Logan, for the
) Defendants and Third Parties, Marshall
) Macklin Monaghan Limited and Robert
) Bishop/Moving Party
)
)

) **HEARD:** May 22, 2008

REASONS FOR DECISION

R. Smith J.

Overview

[1] In this case, the Court must decide if a novel legal issue can be decided on a summary motion. The novel legal issue is whether the City of Ottawa (the “City”) can sue its own expert

witness, Robert Bishop, for alleged negligence in preparing an expert witness report which was filed as evidence in a previous legal proceeding. The expert report was filed by the City as part of its defence to a motion for summary judgment brought by a group of homeowners in 1997. The homeowners had claimed that the City had failed to ensure that the drainage system met the required standards and as a result was responsible for damages caused to their homes by the 1996 flood. The matter was settled before the summary motion was heard.

[2] A second flood occurred in the same area of the City in 2002, at which time the homeowners made a second claim for damages against the City. In his 1997 expert witness report, Bishop gave his opinion that the Glen Cairn drainage system met existing standards. The City claims that it relied on Bishop's expert opinion to decide not to proceed with any upgrading of the drainage system following the first flood. The City alleges that after the second flood, it discovered that the drainage system did not meet the required standards and alleges that Bishop was negligent in conducting his investigation and giving his expert opinion. The City has issued a Third Party claim against Bishop claiming over for any damages it may be found liable to pay the homeowners as a result of the second flood.

[3] Bishop has brought a motion under Rule 20 seeking an order dismissing the claim against him on the basis that the opinion given by him in his expert report was evidence given in a legal proceeding which is protected by absolute privilege and he is entitled to rely on witness immunity protection.

[4] The City and the plaintiffs argue that the law with regards to witness immunity protection for expert witnesses who give opinion evidence in legal proceedings is unsettled, and therefore this question should not be decided on a summary motion. The City further submits that an expert witness should not be protected from subsequent legal action by his or her client, for conducting their investigation negligently or for giving a negligent opinion in their expert report, simply because the opinion was given as evidence in a legal proceeding. The City also submits that it relied on the expert witness report for a dual purpose, firstly to defend against the summary motion and secondly to decide whether or not to upgrade the drainage system and that

witness immunity protection should not apply where the expert witness opinion is relied on for a dual purpose.

Issues

[5] The main issue to be decided is: Can a party sue his or her own expert witness for giving negligent expert opinion evidence in a legal proceeding, or is the expert witness protected by absolute privilege and entitled to rely on witness immunity protection?

[6] In order to determine the main issue, the following issues must be decided:

1. Is the law settled with regards to witness immunity protection for expert witnesses who conduct an investigation and give expert opinion evidence in legal proceedings?
2. If the law is not settled, should the legal issue be decided on a Rule 20 summary motion?
3. If the issue may be decided on a Rule 20 motion, should Bishop's opinion evidence contained in his expert witness report be protected by absolute privilege and is he entitled to rely on witness immunity protection?

Background Facts

The First Flood

[7] In 1996, a number of residents of the Glen Cairn area of Kanata (now part of the City of Ottawa) suffered flooding damages to their homes. The residents commenced legal action and ultimately brought a motion for summary judgment in 1997 against the City for damages.

[8] In response to the motion for summary judgment, the City's insurer's legal counsel McCague & Wires, retained Robert Bishop, an engineer with the engineering firm of Marshall, Macklin Monaghan Limited ("MMM") (herein after collectively referred to as "Bishop") to provide her with an expert witness report. The law firm's letter states that Bishop was retained:

- (i) to investigate the severity and return period of the 1996 storm in the Glen Cairn area;

- (ii) to investigate the causes of the flooding in the Glen Cairn area, and
- (iii) to review and comment on the criteria and standards used in the design of the Glen Cairn drainage system and the extent of upgrading and maintenance carried out by the City.

[9] Mr. Bishop conducted an investigation and prepared an expert witness report that he sent to counsel for the City, which contained the following opinions and conclusions:

- (a) that the areas where the rainfall was heaviest experienced well in excess of a 1 in 100 year rainfall for a 42 hour duration;
- (b) the primary cause of the flooding in the Glen Cairn area was an overflow of water from the upper Carp River at Castlefrank Road;
- (c) the overflow occurred as the flow in the watercourse exceeded the capacity of the Channel and culverts at Castlefrank Road; based on hydraulic and hydrologic calculations Bishop concluded that the flow exceeded a 1 in 100 year flow at Castlefrank Road;
- (d) extensive studies and remedial measures were completed in the 1980's which brought the minor and major drainage systems up to current standards;
- (e) the area of Glen Cairn, where flooding occurred, was inspected by video cameras and cleaned as necessary during the spring and summer of 1996 and the drainage systems were in a good state of repair without significant deficiencies or defects.

The Second Flood

[10] In 2002, the Glen Cairn area experienced another severe rainstorm and several homes sustained flood damages for a second time.

[11] In 2003, the Glen Cairn residents commenced an action under the *Class Proceedings Act* claiming damages against the City. The City then retained the engineering firm of Cumming Cockburn to review the Glen Cairn Drainage System. The Cumming Cockburn report concluded that the major drainage system in the Glen Cairn area did not meet either the 1996 or 2002 standards.

[12] The Cumming Cockburn report expressed the opinion that Bishop had relied on outdated and inappropriate data and that his conclusions were incorrect because he used rainfall distribution data applicable to a predominantly rural watershed, instead of data applicable to an urban watershed. In 1983, at the time of the flood plain mapping, the Glen Cairn area was

predominantly rural but by the time of the 1996 storm, the Glen Cairn area had developed to become a predominantly urban watershed.

[13] The Cumming Cockburn report states that by relying on the data for a predominantly rural watershed instead of an urban watershed, Bishop used a rainfall distribution pattern that was not high enough and as a result he erroneously concluded that the Glen Cairn drainage system met the required standards in 1996.

[14] Following the receipt of the Cumming Cockburn expert report, the City commenced the third party action against MMM and Bishop seeking to hold them responsible for any damages it may be required to pay to the Glen Cairn residents in the class action proceeding. The plaintiffs have also added MMM and Bishop as defendants in their action.

Pleadings

[15] The City has pleaded that Bishop was negligent in providing it with an expert witness report that was factually inaccurate, that was not completed in accordance with good engineering practices. The City also pleads that it relied on the opinion contained in Bishop's report to decide not to complete the required upgrades to the drainage system, which has caused it to become responsible for the flooding damages. Although not pleaded, the City alleges in its factum that the expert report had a dual purpose, firstly to be used as evidence in a legal proceeding and secondly to be relied on by the City to decide whether or not to upgrade the drainage system. In his statement of defence, Bishop pleads that he is protected from suit by the City by the doctrine of witness immunity protection, because his investigation and allegedly negligent opinion was prepared and used as evidence in a judicial proceeding.

[16] In his defence, Bishop denies that he was negligent in the manner that he conducted his investigation, denies that any of the opinions expressed in his expert witness report were negligently made, denies that the City relied on his expert report to decide not to upgrade the drainage system (although this was admitted for purpose of the motion), denies that he owed the City a duty of care, denies that there was a causal connection between his expert report and the

damages suffered, claims that the City was contributorily negligent, and pleads a limitation defence.

Undisputed Factual Record

[17] A summary of the factual record before me, which is not contested is as follows:

- (a) As a result of a flood in 1996, the residents of Glen Cairn commenced a legal action against the City for damages, claiming that the drainage system had not been adequately designed or maintained.
- (b) In 1997 the residents brought a motion for partial summary judgment against the City.
- (c) In response to the motion for summary judgment, the City's Insurer's solicitor retained Bishop to provide it with an expert witness report. Bishop was retained:
 - (i) to investigate the severity and return period of the 1996 storm in the Glen Cairn area;
 - (ii) to investigate the causes of the flooding in the Glen Cairn area, and
 - (iii) to review and comment on the criteria and standards used in the design of the Glen Cairn drainage system and the extent of upgrading and maintenance carried out by the City.
- (d) Bishop attended at the Kanata city offices, viewed the site and design plans and investigated the amount of rainfall that fell in the relevant period.
- (e) Bishop prepared an expert witness report and sent a draft to the city's Inspectors/Construction Co-ordinator, Paul Neldon, for review. Some minor corrections and comments were made and the report was returned to Bishop.
- (f) Bishop finalized his report, signed it and sent it to the City's insurer's solicitor who was handling the defence to the residents' claim and responding to the motion for partial summary judgment.
- (g) Bishop's expert report was attached to an affidavit and was filed with the court in the legal proceeding in response to the motion for partial summary judgment.
- (h) Bishop's opinion did not include any recommendation for any future action and his conclusions were as set out above in paragraph [9] and included a conclusion that extensive studies and remedial measures were completed in the 1980's which brought the minor and major drainage systems up to current standards.
- (i) The motion for partial summary judgment was never heard as the parties settled the 1997 claim for damages without proceeding to a trial.
- (j) In 2002, residents of the Glen Cairn area suffered flooding damages to their homes after a heavy rainfall for a second time.
- (k) This time, the City retained the engineering firm of Cumming Cockburn Ltd. to conduct a performance review of the Glen Cairn Drainage System in view of the flooding that had occurred in 1996 and again in 2002.
- (l) The engineering firm of Cumming Cockburn Ltd. provided the City with its opinion that the Glen Cairn drainage system was not up to current standards and was seriously undersized.

- (m) Cumming Cockburn Ltd. (“C.C.”) concluded that Bishop based his report on outdated and inappropriate data which lead Bishop to incorrectly conclude that the Glen Cairn drainage system met the appropriate standards in 1996.
- (n) C.C.’s report stated that Bishop relied on the rainfall distribution data applicable to a predominately rural watershed, instead of distribution data for an urban area, which the Glen Cairn area had become by 1996.
- (o) The City commenced the third party claim against Bishop based on the above opinion expressed in Cumming Cockburn Ltd.’s report.
- (p) Bishop’s expert report contained no restriction qualification or disclaimer.
- (q) The City reviewed Bishop’s report and relied on the expertise of Bishop and the conclusions in the report to decide not to upgrade the drainage system (admitted for this motion).

Issue #1 **Is the law settled with regards to witness immunity protection for expert witnesses who conduct an investigation and give expert opinion evidence in legal proceedings?**

[18] The City submits that where matters of law are not fully settled in the jurisprudence they should not be disposed of at an interlocutory stage of the proceeding and should be determined only in the context of a full factual record, possibly including expert evidence. The City relies on the recent Court of Appeal decisions of *Reynolds v. Smith* (2006), 267 D.L.R. (4th) 409 (Ont. Div. Ct.) at paragraphs 86, 101, 105, 112, 113, 130 and 131, (majority overturned at (2007) 45 C.C.L.T. (3d) 19 (Ont. C.A.)) and the case of *Romano v. D’Onofrio et al.* (2005), 77 O.R. (3rd) 583 (Ont. C.A.).

[19] In *Reynolds, supra*, Ms. Reynolds alleged that pathologist, Dr. Charles Smith had prepared his Coroner’s report in bad faith and had engaged in misfeasance in a public office, while acting in his role as a Coroner. Dr. Smith subsequently testified in the criminal proceedings against Ms. Reynolds based on his findings and opinions contained in his Coroner’s report. Dr. Smith argued that he was protected from any claim for damages against him by absolute privilege, because the claim was based on evidence he had given in a legal proceeding.

[20] In her dissent at the Divisional Court (which was largely adopted by the Court of Appeal), Wilson J. stated that the law relating to the doctrine of witness immunity and the law relating to the tort of public misfeasance were uncertain and constantly evolving. In paragraph 23 of the Court of Appeal’s decision in *Reynolds supra*, Borins J.A. stated as follows:

The essence of Ms. Reynolds' claims against Dr. Smith is in respect to his role as a public official investigating a suspicious death under the *Coroners Act*, and not to his role in testifying in her criminal prosecution. [emphasis added]

[21] In the *Reynolds* decision, the court was dealing with a motion to strike the plaintiff's pleading as disclosing no reasonable cause of action against Dr. Smith under Rule 21.01(1)(b) of the *Rules of Civil Procedure*. On a Rule 21.01(1)(b) motion the Court must be satisfied that it is "plain and obvious" that the claim cannot succeed in order to strike out a claim on such a motion. *Hunt v. Carey Canada Inc.*, [1990] 2 S.C.R. 959 (S.C.C.). Also on a Rule 21.01(1)(b) motion, the pleadings are deemed to be proven for purposes of the motion and no evidence is admissible without leave of the court.

[22] In *Reynolds, supra*, Borins J.A., stated that it would have been more appropriate had the motion been brought under Rule 20, but concluded that the result would have been the same in any event as there would have been a genuine issue for trial and a more fulsome factual record was required in the circumstances of the *Reynolds* case.

[23] In paragraph 14 of the *Reynolds, supra* decision, Borins J.A. made the following statement about the doctrine of witness immunity:

The absolute immunity of parties and witnesses from subsequent liability for their testimony in judicial proceedings developed in early English cases and is well established at common law. Any communication, even perjured testimony, made in the course of a judicial proceeding, cannot serve as the basis for a suit in tort.

The above statement makes it quite clear that a witness in a judicial proceeding enjoys absolute immunity from subsequent liability based on their testimony in a judicial proceeding. The *Reynolds* case however, did not deal with a claim against a party's own expert witness, as Dr. Smith testified as an adverse expert witness, in addition to carrying out his role as the Coroner.

[24] In *Reynolds, supra*, Borins J.A. went on to state that the rationale for the witness immunity rule was that "... the proper administration of justice requires full and free disclosure from witnesses unhampered by fear of retaliatory lawsuits." which he quoted from the case of

Samuel Manu-Tech Inc. v. Redipac Recycling Corp. (1999), 38 C.P.C. (4th) 297 (Ont. C.A.) at paragraphs 19 and 20.

[25] In England, the law is settled that a witness who gives evidence in a court proceeding is immune from responsibility in a subsequent action. In the case of *Watson v. McEwan*, [1905] A.C. 480 (H.L.), at page 486, the law on witness immunity in England was set out by the Earl of Halsbury, L.C. who stated:

By complete authority, including the authority of this House, it has been decided that the privilege of a witness, the immunity from responsibility in an action when evidence has been given by him in a Court of Justice, is too well established now to be shaken. Practically I may say that in my view it is absolutely unarguable – it is settled law and cannot be doubted.

[26] In the case of *Elliott v. Insurance Crime Prevention Bureau*, 2005 Carswell N.S. 353 (N.S.C.A.). Cromwell J.A., of the Nova Scotia Court of Appeal thoroughly reviewed the law on the issue of witness immunity protection. Cromwell J.A. outlined the two main policy rationales for the doctrine of witness immunity as set out at paragraphs 116-199 as follows:

- (a) so that witnesses may give their evidence without fear that it may be used against them in a future civil prosecution and
- (b) to avoid a multiplicity of proceedings where the evidence in one proceeding is retried over and over again in civil claims against the witnesses.

A similar rationale was given for granting witnesses immunity in the English case of *Watson v. McEwan*, *supra* at page 487.

[27] In the case of *Samuel Manu-Tech Inc.*, *supra*, at page 5, paragraph 13, Feldman J.A. of the Ontario Court of Appeal held that an affidavit submitted in a prior legal proceeding was privileged and protected by witness immunity. In this case, Bishop's expert witness report was attached to an affidavit filed in response to a motion for summary judgment, and as such was evidence in a prior legal proceeding.

[28] In *Fabian v. Margulies* (1985), 53 O.R. (2d) 380 (C.A.) the Court of Appeal upheld a decision of Labrosse J. as he then was, who held that the contents of an expert medical report to

be used in accordance with section 52 of the *Evidence Act*, which was prepared in the ordinary course of judicial proceedings was protected by absolute privilege. The Court of Appeal stated as follows:

The report is absolutely privileged and the defendant is not liable in law for its contents. The absolute privilege extending to the oral evidence of the doctor would be rendered illusory if he could be sued for the same statements made in a report that he is statutorily required to prepare in order to give his oral testimony.

[29] In this case, the City and plaintiffs in their pleadings base their claim against Bishop on the opinions expressed by him in his expert witness report filed in the first legal proceeding. Bishop's expert report was prepared at the request of and delivered to the solicitors for the City in order to respond to a summary judgment motion. The report was attached to an affidavit filed in the previous legal proceeding and following the decisions of the Court of Appeal in *Fabian* and *Samuel Manu-Tech* above, would be entitled to the same privilege and protection as if his opinion evidence had been given as oral testimony. However, the City asserts that it is owed a separate and distinct duty of care by Bishop.

[30] In *Elliott, supra*, Cromwell J.A. dealt with the extent the court should accord witness immunity protection to out of court statements made by investigators reporting to the insurer on the cause of a fire. The four investigators had reported on the cause of the fire and much later in the proceeding testified as expert witnesses at the trial in the insurance action. The investigators claimed witness immunity protection for stating their opinion on the cause of the fire in their reports to the insurer. They claimed immunity because their only relationship with the plaintiff was solely as a result of the insurance action and they were possible witnesses in possible future litigation at the time they investigated and submitted their reports to the insurer.

[31] In *Elliott*, Cromwell J.A. held that "The immunity applies only to those statements made for the purpose of preparing evidence for legal proceedings and to those statements which must be protected in order to make the immunity for testimony effective."

[32] Cromwell J.A. stated that while witness immunity was most commonly claimed in defamation cases he held that it also barred other causes of action and quoted the following

statement from *Halsbury's* with approval "A witness is protected from civil proceedings in respect of the evidence which he gives in judicial proceedings, and in respect of things said or done in the course of preparing evidence for such proceedings." *Halsbury's Laws of England*, 4th ed., vol. 17 (London: Butterworths, 1976).

[33] Both Cromwell J.A. in *Elliott, supra* and Borins J.A. in *Reynolds v. Smith, supra* described the above statement quoted from *Halsbury's* as being well established by authority. Neither Cromwell J.A. in the *Elliott* case nor Borins J.A. in *Reynolds* case discussed whether the above principle would be affected by whether the witness was called by one party or the other.

[34] In *Elliott, supra*, Nova Scotia Court of Appeal recognized that witness immunity was a blunt instrument which in some circumstances would protect wrongdoers and held that the protection of witnesses from the risk of suit was more important to the administration of justice than righting a wrong in a particular case. Cromwell J.A. also held that to achieve its objective the immunity must be clear; so that individuals would know in advance whether they were protected or not.

[35] In *Elliott, supra*, the court set out four questions to be answered to determine whether a defendant was entitled to witness immunity protection.

1. What is the conduct that forms the basis of the appellant's cause of action ... that is, what is the "gist and essence" of the claim?
2. What is the scope of the claimed immunity and does the "gist and essence" of the appellant's claim fall within it?
3. Is the scope of the claimed immunity settled by authority?
4. If not, does the claimed immunity meet the test of the necessity?

[36] In this case, Bishop had no role or responsibility as a public official and was retained to provide an expert report on the cause of the flooding and to review and comment on the standards used in the design of the drainage system. Bishop knew that his report would be filed as expert evidence in the Horning action and he was aware the City would receive a copy of his report. The "gist and essence" of Bishop's conduct was his investigation and providing his expert opinion, which was contained within the expert report filed in the legal proceeding. However,

because Bishop was retained by the City, there is a separate contractual link between him and the City, which is not present in any of the other Canadian cases. The City also argues that it is owed a separate and distinct duty of care because it retained Bishop and relied on his opinion that the drainage system met the existing standards.

[37] In *Reynolds v. Smith, supra*, an important part of Wilson J.'s reason for allowing the claim to continue against Dr. Smith and for Borins J.A.'s decision on appeal was the finding that the essence of Ms. Reynolds' claims against Dr. Smith "was in respect to his role as a public official investigating a suspicious death under the Coroners Act, and not to his role in testifying in her criminal prosecution." This is a very important distinction from the case before me, where the City and plaintiffs base their claim on Bishop's opinion contained in his expert report which was filed as evidence in a legal proceeding.

[38] In this case, the evidence is not disputed that Bishop's report was prepared in the ordinary course of a judicial proceeding and was filed as evidence, but his opinions expressed in the expert report were also relied on by the City for a second purpose, namely to decide whether or not to upgrade the drainage system. The scope of immunity claimed is quite wide as it would protect Bishop from any liability for breaching any implied terms of the contract between him and the City, because his expert report was filed as evidence in a legal proceeding.

[39] Bishop claims witness immunity protection on the basis that he conducted an investigation, prepared an expert witness report, and provided it to the City's solicitor to be attached to an affidavit for the purpose of being filed as evidence in a legal proceeding. While Bishop did not testify at a trial because the 1997 legal action was settled before the summary motion was heard, his written report was tendered as evidence in the previous legal proceeding.

[40] In this case, the City does not assert that it had any prior relationship with Bishop before he was retained to prepare an expert witness report. The sole relationship between Bishop and the City was through his retainer with the law firm of McCague, Wires, Peacock, Borlack, McInnis & Lloyd who retained him on behalf of the City to prepare an expert report in order to assist in defending against the upcoming summary motion.

[41] In the case of *Carnahan v. Coates* (1990), 71 D.L.R. (4th) 464 (B.C.S.C.) 477, Huddart J. concluded that witness immunity applied to expert witnesses as well as regular witnesses and held that the two rationales for the privilege were implicated, namely, the need for witnesses to testify fully and freely and most persuasively the protection of the court process by avoiding relitigation of the issues in the original action against the witnesses. However, the court also stated that an expert's "... professional negligence is not immunized whenever an expert later relies on it in court".

[42] However, in *Carnahan v. Coates, supra*, the court was dealing with a claim against an expert witness called by an opposing party and the only relationship between the claimant and the expert witness was through the litigation. In *Carnahan*, the court left open the question of whether immunity should extend to prevent a suit against an expert witness by the party who retained him or her.

[43] In the case of *Kansa General International Insurance Co. v. Morden & Helwig Ltd.* (2001), 57 O.R. (3d) 58 (Ont. S.C.J.), an insurer sued its own adjuster for breach of contract and negligence related to evidence given in court and for statements made in preparation for his testimony. Sutherland J. found that there was no actionable breach of duty in tort or in contract after conducting a full trial. However, the case is distinguishable as the adjuster was treated as a fact witness and not as an expert witness and the matter was decided after a full trial. However, the court held that the adjuster could rely on witness immunity protection with regards to the evidence given by him at trial and for communications with counsel in preparation for trial.

Negligent Investigation

[44] The City argues that while opinions expressed within the expert witness report may be covered by witness immunity protection, Bishop was negligent in the manner in which he conducted his investigation, which constitutes a separate tort which is not protected by witness immunity protection. In the *Elliott* decision, Cromwell J.A. held that absolute privilege applied to investigations conducted for the purpose of preparing evidence for litigation that was part of the "adversary" as opposed to the "matters of detection stage". In the case before me Bishop's

expert report was commissioned by legal counsel in response to a motion for summary judgment, after litigation had been commenced, and as such was not part of the pre-litigation “detection stage” but rather was part of the “adversary stage”.

[45] In *Elliott, supra*, Cromwell J.A. held that once expert reports were exchanged, it was a reasonable inference that the authors were operating in the role of witnesses for the purpose of preparing evidence for litigation where the scope of their immunity was established by “strong authority”. In this case, the City’s allegations of negligence are based on the opinion expressed in Bishop’s expert report which had been served on the opposing party and filed with the court. The City does not dispute that Bishop’s expert report was prepared to be used as evidence in the 1997 litigation. However, the *Elliott* case involved a claim against the opposing parties’ adjusters and was not a claim against a party’s own expert witness.

[46] In this case, the allegation of negligent investigation did not occur during the period prior to litigation being commenced, as the homeowners had already commenced their action against the City before Bishop was retained and Bishop had no separate statutory duty to investigate as part of a public authority as in *Darker v. Chief Constable of West Midlands Police*, [2000] H.L.J. No. 44, [2001] 1 A.C. 435 (H.L.(E)) or to prepare a Coroner’s report as in *Reynolds, supra*. Also, the City has not made any allegation of bad faith against Bishop in its pleadings, which was the case in *Reynolds v. Smith*.

Actions Beyond Scope of Retainer

[47] In the case of *Read v. Munt*, [2004] 71 O.R. (3d) 22, Rutherford J. dealt with the issue of whether a court appointed assessor of parenting capacity was protected by witness immunity on a Rule 21.01(1)(b) motion. The assessor was alleged to have called the plaintiff’s employer and “... implied that [she] Tina was a criminal ...” and “... threatened to write a negative review of her in the Assessment if she did not comply with her husband’s various requests for additional access time ...” and also the assessor allegedly “made unlawful use of the consent ... to have access to certain personal information.”

[48] Rutherford J. stated that “Unless an action is confined to statements made either in a report to or evidence given in court ... there seems to me room to argue that some activity of such an expert could attract criminal or civil liability.” Implied in his reasoning is that if the action was confined to statements made in a report to or given in court then witness immunity would apply. In this case, the City’s claims against Bishop are confined to statements made in his report filed as evidence in court and there is no conduct outside of the opinion expressed in the report relied on as the basis for the claim against Bishop. Also the City has made no allegation that Bishop was acting outside of the scope of his retainer, which was the allegation in *Read v. Munt*.

Law in England

[49] In England the law is settled regarding to witness immunity for an expert witness from suit by the retaining party based on the decision of *Stanton et al. v. Callaghan et al.*, [1998] 4 All E.R. 961 (C.A.) which held that witness immunity applied even though the witness did not give evidence at trial. The Court stated that “It was also so notwithstanding the existence of a contract for the expert’s services between the expert and the party who sought to bring suit against him.” The court went on to state that

[i]t is clear to me that in order to enable the court to arrive at the fair and just result in the way set out by Lord Morris of Borth-y-Gest, expert witnesses must be given full opportunity to uphold their duty to the court, and achieve it in the way set out by Cresswell J. and Lord Woolf MR, in an atmosphere free from threats of suit from disappointed clients.

Law in the United States of America

[50] In the United States, the courts have been divided on whether expert witnesses are entitled to witness immunity protection from the party retaining them. In *Bruce v. Byrne-Stevens & Associates Engineers Inc.*, 776 P.2d 666 (Wash. 1989), the Washington Supreme Court applied the doctrine of witness immunity to preclude suits against a “friendly” expert witness. However, the Pennsylvania Supreme Court came to the opposite conclusion in *LLMD of*

Michigan Inc. v. Jackson-Cross Co., 559 Pa. 297, 740 A.2d 186 (Pa. Sup. Ct. 1999) as did the Louisiana Supreme Court in *Marrogi v. Howard*, 805 So.2d 1118, 1133 (La. 2002).

[51] The City urges me to follow the reasoning of the Louisiana Supreme Court in *Marrogi, supra*. In the *Marrogi* case an accounting firm submitted a report calculating the plaintiffs' damages which contained a mathematical error. As a result of the error, the expert's evidence was struck from the court record and the plaintiff recovered a lesser amount of damages. The Louisiana Supreme Court allowed the action against the accounting firm to proceed and stated as follows:

Without some overarching purpose, it would be illogical, if not unconscionable, to shield a professional, who is otherwise held to the standards and duties of his or her profession, from liability for his or her malpractice simply because a party to a judicial proceeding has engaged that professional to provide services in relation to the judicial proceeding and that professional testifies by affidavit or deposition.

[52] The Louisiana Court did give some weight to the provisions of its *Civil Code* which is a distinguishing feature from a common law jurisdiction. However, no Canadian decisions have specifically addressed the issue raised by the City, namely its ability to sue its own expert for negligence or breach of contract in the investigation and preparation of an expert witness report.

Disposition of Issue #1

[53] There are no decisions of the Court of Appeal for Ontario, or any other Canadian court which has decided the issue of whether witness immunity should be extended to prevent a party from suing his or her own expert witness in negligence or for breach of contract, based on the opinion evidence given in a Court proceeding. Given the absence of any Canadian authority directly on point, I conclude that the law is unsettled on this issue.

Issue #2 **If the law is not settled, should the legal issue be decided on a Rule 20 summary motion?**

[54] While Bishop did not specify which subsection of Rule 20 he relies on, the relevant subsections are Rules 20.04(2) and 20.04(4) of the *Rules of Civil Procedure* which are set out as follows.

Rule 20.04(2)

The Court shall grant summary judgment if,

(a) the court is satisfied that there is no genuine issue for trial with respect to a claim or defence; ...

Rule 20.04(4)

Where the court is satisfied that the only genuine issue is a question of law, the court may determine the question and grant judgment accordingly, ...

[55] In the case of *Irving Ungerman Ltd. v. Galanis* (1991), 4 O.R. (3d) 545 (C.A.) at pages 550-551, the Court of Appeal held that the moving party had to show that there was “no genuine issue as to any material fact that requires a trial for its resolution” in order to succeed on a summary motion. The burden is on the moving party to satisfy the Court that the above test has been met.

[56] In *Guarantee Co. of North America v. Gordon Capital Corp.*, [1999] 3 S.C.R. 423, the Supreme Court of Canada confirmed that the appropriate test for summary judgment was satisfied “... when the applicant has shown that there is no genuine issue of material fact requiring trial.”

[57] In the case of *Rozin v. Ilitchev et al.* (2003), 66 O.R. (3d) 410 at page 413 the court held that on a motion for summary judgment, “... the judge cannot assess credibility, weigh evidence or find facts. Rather, the judge is limited to assessing the threshold issue of whether there is a genuine issue for trial ...”.

[58] If there is a question of material fact or a finding of credibility that requires a trial then a matter may not be decided on a Rule 20 motion see *Irving Ungerman Ltd.*, *supra*. In addition, in both *Reynolds v. Smith*, *supra* and *Romano v. D’Onofrio*, *supra*, the Ontario Court of Appeal has held that if a more complete factual record, which would be obtained at a trial, is required in

order to decide the legal issue, whether novel or not, then a matter should not be decided on a Rule 20 motion.

[59] Rule 20.04(4) may be relied on where the court is satisfied that the only genuine issue is a question of law and if so the court may determine the legal question and grant judgment accordingly. In this case, the question of law is whether Bishop is protected by absolute privilege and witness immunity from a claim for damages for negligence from the City, who had retained him to prepare an expert witness report in a legal proceeding. If the doctrine of witness immunity applies in these circumstances then it would be determinative of the third party action against Bishop.

[60] However, if Bishop's expert witness report is not protected by absolute privilege and witness immunity then there are other genuine issues requiring a trial namely:

- (a) Was Bishop negligent in the manner he carried out his investigation to prepare his expert report or in the opinions expressed therein?
- (b) Did Bishop owe a separate duty of care to the City?
- (c) Did the City rely on Bishop's opinion expressed in his expert report to decide not to upgrade the drainage system?
- (d) Was it reasonably foreseeable that the City would rely on Bishop's expert witness report filed in a legal proceeding to decide whether or not to upgrade the drainage system?
- (e) Was there a causal connection between Bishop's opinion evidence and the damages suffered by the City?
- (f) Was there contributory negligence by the City?
- (g) Does a statute of limitations apply?
- (h) Was there an implied term of the retainer agreement that Bishop could rely on witness immunity protection and was the use of the expert report limited to being used as evidence in the legal proceeding?

[61] However, if Bishop's investigation to prepare his expert witness report and the opinions expressed in the report are privileged and protected by witness immunity from suit by the City then the above issues would not need to be decided at a trial. Substantial savings in legal costs, time and judicial resources would be achieved for all of the parties if the legal question could be decided without a trial on the witness immunity protection issue.

Test to Apply to Determine a Novel Question of Law on a Rule 20 Motion

[62] In the case of *Bader v. Rennie*, [2007] O.J. No. 3441 the Divisional Court held that a court may determine a question of law on a summary motion where the motions judge is in just as good a position as a trial judge to determine the question of law and where under Rule 20.04, the motion judge is satisfied that the only genuine issue is a question of law. I find that this decision is not inconsistent with the decisions of the Court of Appeal in *Reynolds v. Smith, Law Society v. Ernst & Young or Romano, supra*, because in all of those cases the Court of Appeal held that the factual foundation before them and the motion judge was insufficient to decide a novel legal issue.

[63] When deciding a novel issue of law, the matter should generally proceed to trial unless there are no material facts in dispute and there is a full factual record, which is sufficient to decide the legal issue. Therefore, in order to decide a novel legal issue on a Rule 20 motion, I conclude that the motion judge must be satisfied that:

- (a) there are no material facts in dispute or credibility findings which require a trial for their resolution; and,
- (b) there must be a sufficient factual foundation to decide the legal issue such that a trial judge would not be in any better position to decide the legal issue.

[64] I reach the above conclusion for the following reasons:

- (a) The fundamental principles to be used to interpret the *Rules of Civil Procedure* are set out in Rule 1.04 which states that the rules are to be construed liberally to secure the just, most expeditious and least expensive determination on the merits.
- (b) If a question of law could not be decided in circumstances where a trial was not required to make factual or credibility findings, and there was an adequate evidentiary record to make the required finding then this would cause the parties to ensue unnecessary legal costs, cause unnecessary delay for litigants and would not make efficient use of the Court and its resources; and would not be consistent with the principles set out in Rule 1.04.

- (c) Rule 20.04 specifically permits a court to decide a question of law on a summary judgment where it is the only genuine issue. If the court could not decide a question of unsettled law where it was the only issue, where there was no dispute as to material facts or credibility, and where there was a sufficient factual record that a trial was not necessary, it would render Rule 20.04 meaningless, which could not be consistent with the intention of the drafters of the *Rules of Civil Procedure*.

Are There any Material Facts in Dispute?

[65] In this case, Bishop states in his affidavit that he conducted his investigation and prepared his expert witness report for the purpose of giving expert evidence in a legal proceeding at the request of the solicitor for the City's insurer. The legal proceeding was a motion for summary judgment. This statement is not denied or contested by the City. In its affidavit evidence, the City states that upon receiving and reviewing a copy of Bishop's expert witness report, it relied on his expert report for a second purpose, namely to decide whether or not to upgrade the drainage system. The fact that the City subsequently relied on Bishop's expert report to decide not to upgrade the drainage system was not denied or contested by Bishop and agreed to be proven for purposes of this motion. However, the City argues that the subsequent reliance by the City on Bishop's opinion evidence is irrelevant if the expert report is privileged.

[66] In his affidavit sworn on October 10, 2007, Paul Neldon does not contradict Bishop's evidence. He confirms the terms of Bishop's retainer at paragraph 7, and at paragraph 8 sets out Bishop's conclusions in his expert report. In paragraph 10, he states that he reviewed Bishop's report and states "Kanata relied upon the expertise of MMM and the conclusions contained in their report. The report was produced without any expressed restrictions, qualifications or disclaimers. As a result of such reliance, Kanata planned no immediate remedial action to be taken with the major drainage system in the Glen Cairn area."

Dual Purpose

[67] The City submits that Bishop's expert report was relied on by the City for a dual purpose, firstly to assist in defending against the summary judgment motion and secondly to decide whether or not to upgrade the Glen Cairn drainage system. This allegation is not disputed by Bishop. The City alleges that a material finding of fact must be made to determine whether Bishop was retained to prepare an expert report solely for the purpose of litigation or whether one of the purposes of his retainer was to prepare a report to allow the City to decide whether to take on remedial action on the drainage system. This is a material question of fact.

[68] In her initial letter requesting Bishop to provide his expert opinion, the City's solicitor did not specify that the Bishop's expert opinion evidence was required for any purpose other than to respond to the summary motion. However, Bishop's expert report did not contain any limitation on its use.

Separate Duty of Care Owed to the City

[69] The City submits that it was reasonably foreseeable that it would rely on Bishop's opinions and findings contained in his report especially if his opinion was to the effect that the drainage system met the required standards. If Bishop's opinion was wrong and was negligently given then damages from future floods to citizens of the Glen Cairn area would be reasonably foreseeable. The City also argues that Bishop owed a separate and distinct duty of care to the City to take reasonable care to provide it with an opinion that would minimize the City's exposure to future flood damage claims by residents of the Glen Cairn area.

[70] To determine if a separate duty of care is owed then the court must consider firstly whether there is a sufficiently close relationship so that in the reasonable contemplation of the defendant, carelessness on his part might cause damages to that person (the proximity test) and secondly are there any considerations which ought to limit the scope of the duty, the class of persons to whom it is owed or damages to which a breach would give rise. These tests were set out in the case of *Anns v. Merton London Borough Council*, 1978 A.C. 728 (H.L.) at pages 751-2 and adopted by the Supreme Court of Canada in *Kamloops (City) v. Nielsen*, [1984] 2 S.C.R. 2.

[71] Whether these are special considerations which should limit imposing a duty of care is really the same question as whether an expert witness retained by a party should be entitled to rely on witness immunity protection.

Separate Contractual Link

[72] An expert witness who is retained by a party involved in litigation has a separate contractual arrangement with the expert witness, which is not the case for an ordinary fact witness or for an expert witness called by the opposing party. The terms of the contract or retainer therefore becomes a key question. Was there an express or implied term of the retainer agreement that the expert witness would enjoy witness immunity protection for his investigation and opinion evidence given in his expert report or would the expert be subject to suit for damages both in negligence and for breach of contract if he did not perform his obligations in accordance with the appropriate standards and duties of his profession?

[73] The issue of whether Bishop is entitled to rely on witness immunity protection to prevent any suit against him or her by the retaining party requires a finding of the implied terms of the contract or retainer agreement. Did the parties agree or intend that the expert would not be subject to suit for negligence or failure to perform the agreed upon work to standards of the expert's profession? Were there any limits on claims for damages? For example, were the damages intended to be limited to those flowing from the litigation or were other future damages, unrelated to the 1996 litigation contemplated? A separate direct contractual arrangement exists between the retaining party and the expert witness, which does not exist with an ordinary fact witness or with an opposing expert witness, which distinguishes this situation from all of the other Canadian decisions.

[74] Where a party seeks to sue an ordinary fact witness called by him or her based on evidence given in a legal proceeding, two valid policy reasons exist to prevent such actions as set out in *Elliott, supra*. A second reason for preventing such actions is the absence of a separate contractual agreement between an ordinary witness, who has been subpoenaed to testify, and the party calling him or her. However, in the case of an expert witness retained by a party, there is a

retainer agreement or contract between the expert witness and his or her client. This contractual link exists in addition to the fact that the expert gives evidence in a court proceeding.

[75] In order to decide this issue, the implied terms of the retainer agreement must be determined and this is an issue of material fact as the intentions of the parties if they had directed their minds to it and the reasonable expectations of the parties must be considered. While the interpretation of a contract has been held to be a question of law, a determination of what the implied terms of a contract would be is mixed question of fact and law and would require a trial.

[76] A trial of an issue would be the most effective use of judicial resources in order to answer Issue #3. Such a procedure is contemplated by the proposed amendments to Rule 20, however, these amendments are not yet in force and as a result, I am unable to order a trial of this issue at this time.

Disposition of Issue #2 and Issue #3

[77] Given that the legal issue is novel, the law is unsettled, and it is necessary to imply a term of their contract which is a question of mixed fact and law, I find that a trial of the issue as stated in Issue #3 is required in order to provide the court with a full factual record. Given my finding, it is not necessary to deal with Issue #3.

[78] The motion for summary judgment is therefore dismissed with the *proviso* that if Rule 20 is amended as proposed either party could bring a motion for a trial of the above issue.

[79] The City and plaintiffs shall have fifteen (15) days to make submissions on costs, Bishop shall have ten (10) days to respond and the City and plaintiffs shall have seven (7) days to reply.

R. Smith J.

DATE RELEASED: January 15, 2009

COURT FILE NOS.: 02-CV-21270,
02-CV-21270A
DATE HEARD: 2008/05/22

ONTARIO

SUPERIOR COURT OF JUSTICE

B E T W E E N:

R.G. ROBINSON, M.E. ROBINSON, CHRISTINE
BOURRE, JOHANNE MARSHALL, BELAIR
DIRECT

for the Plaintiffs / Responding Party

- and -

THE CORPORATION OF THE CITY OF
OTTAWA, MARSHALL, MACKLIN
MONAGHAN LIMITED and ROBERT BISHOP

for the Defendants/Responding Party

- and -

MARSHALL, MACKLIN MONAGHAN
LIMITED and ROBERT BISHOP

for the Defendants and
Third Parties / Moving Party

REASONS FOR DECISION

R. Smith J.

DATE RELEASED: January 15, 2009

Attachment 8

Urban-Rural Split - Castlefrank Road - Glen Cairn

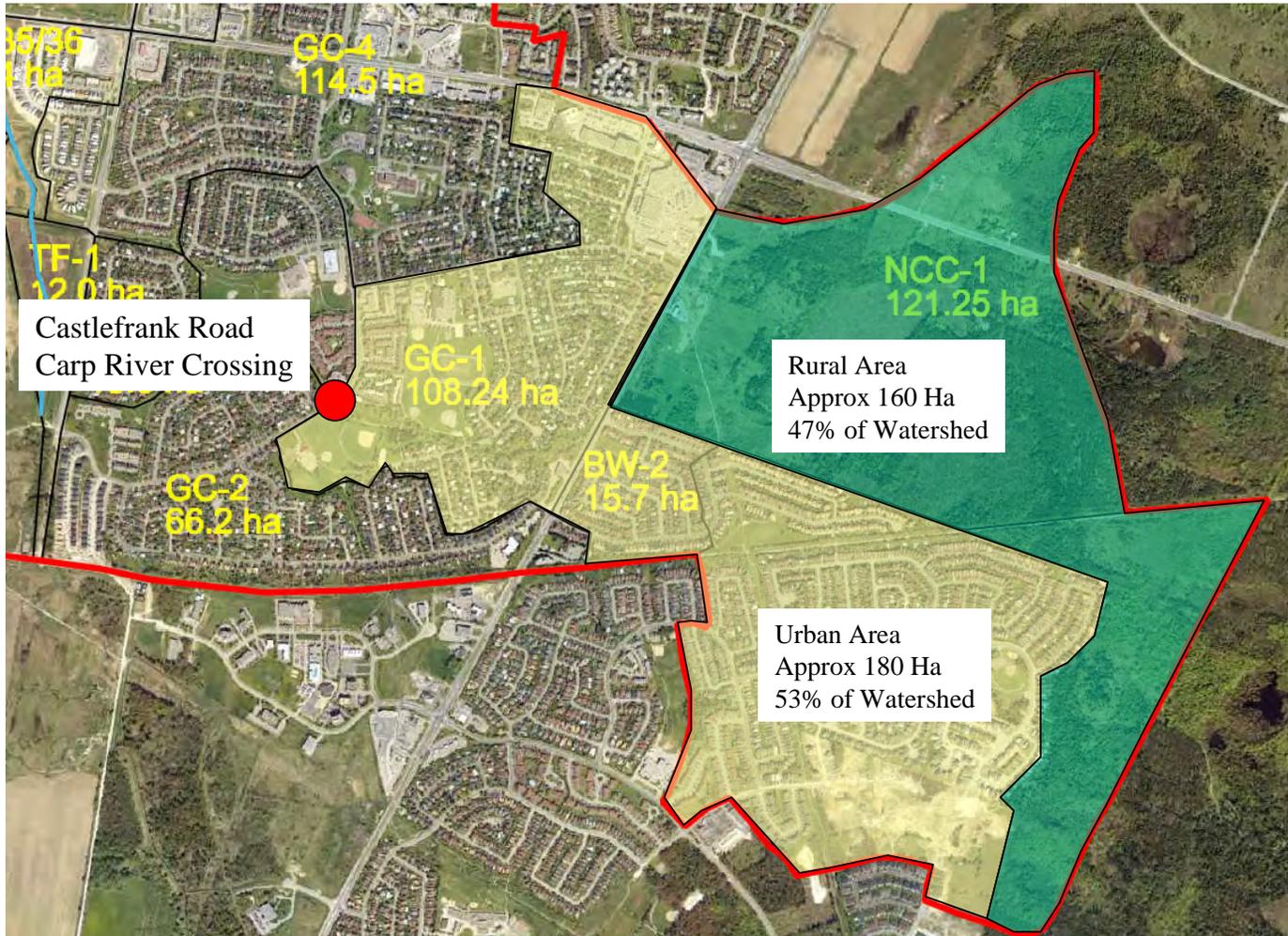


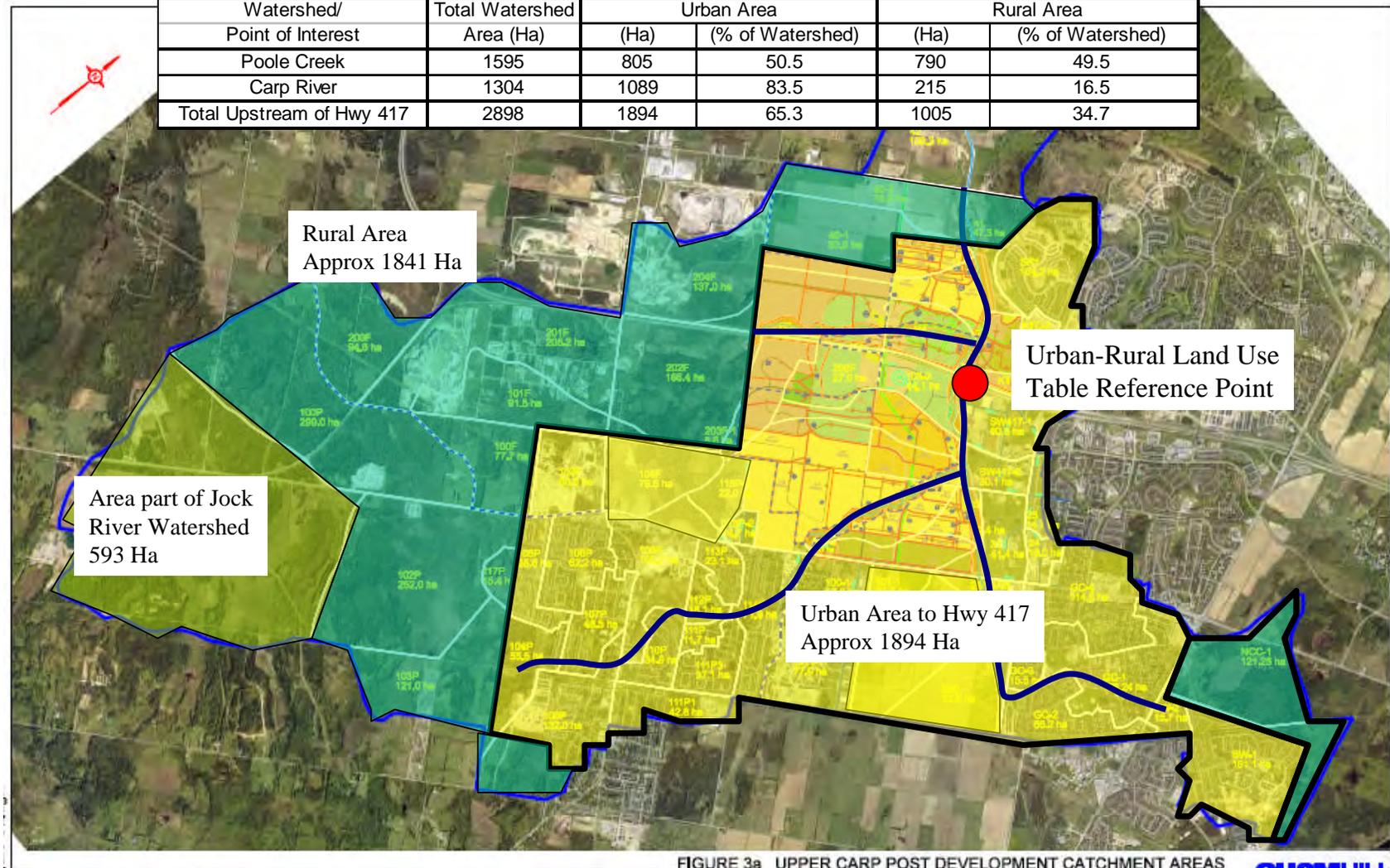
FIGURE 2.1 HYDROLOGY MODEL SUB AREAS

Attachment 9

Urban-Rural Split - Hwy 417 and Richardson SR - Carp River

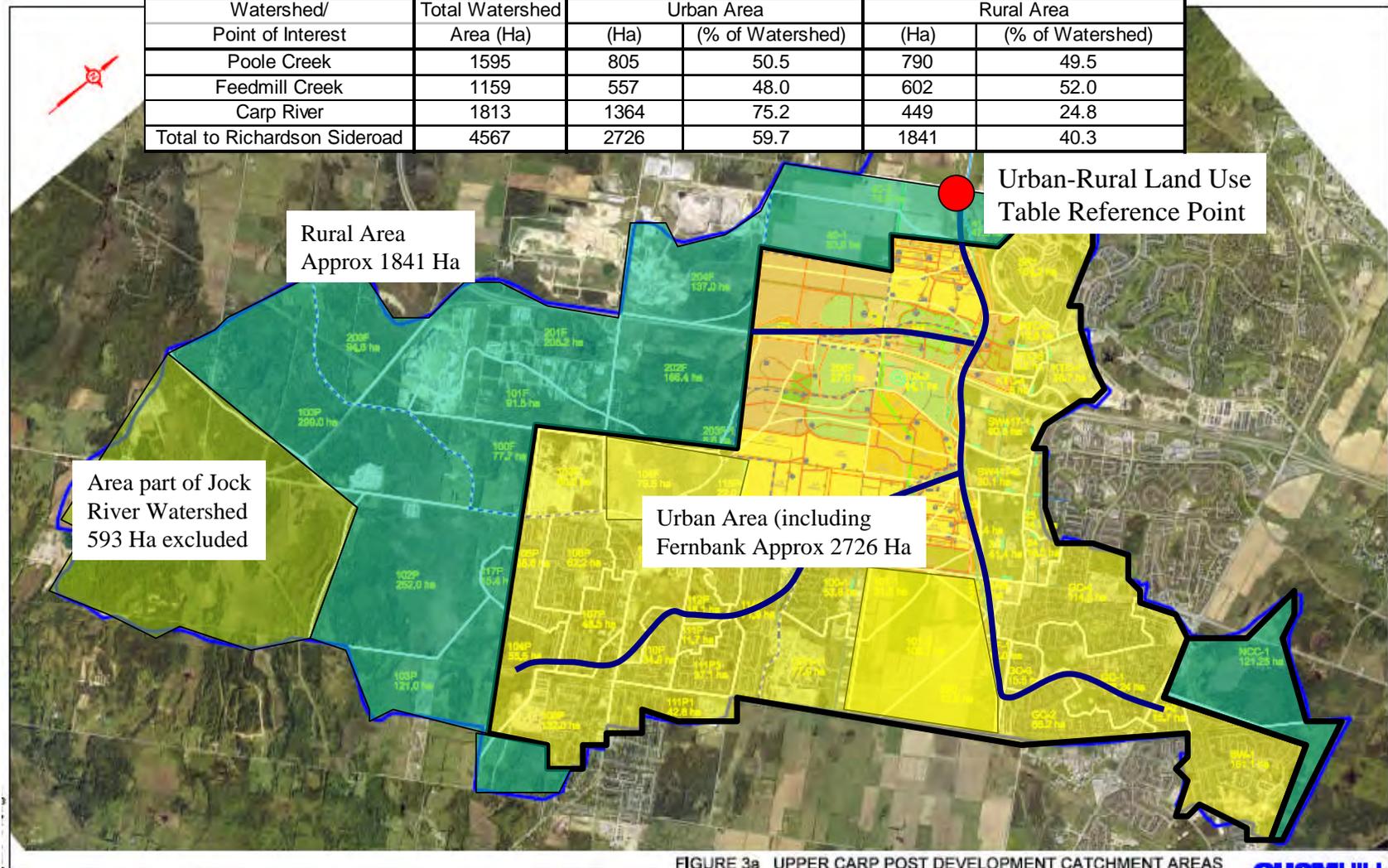
Urban : Rural Land Use at Highway 417

Watershed/ Point of Interest	Total Watershed Area (Ha)	Urban Area		Rural Area	
		(Ha)	(% of Watershed)	(Ha)	(% of Watershed)
Poole Creek	1595	805	50.5	790	49.5
Carp River	1304	1089	83.5	215	16.5
Total Upstream of Hwy 417	2898	1894	65.3	1005	34.7



Urban : Rural Land Use when error excluded from Carp River Analysis–Fernbank Urban

Watershed/ Point of Interest	Total Watershed Area (Ha)	Urban Area		Rural Area	
		(Ha)	(% of Watershed)	(Ha)	(% of Watershed)
Poole Creek	1595	805	50.5	790	49.5
Feedmill Creek	1159	557	48.0	602	52.0
Carp River	1813	1364	75.2	449	24.8
Total to Richardson Sideroad	4567	2726	59.7	1841	40.3



Attachment 10

Table 3-6 of TPR

had the Manning's n value set at 0.07. This could only be defended by applying additional measures in the field during detailed design.

In an attempt to follow the same methodology with the new model runs, TSH determined that to balance flood levels, the Manning's n value at Richardson Side Road would have to be increased considerably (0.40) to ensure downstream water levels are maintained. This would not be a defensible application, therefore TSH has provided a model run with the Manning's n value set at the normal value of 0.013 at the Richardson Side Road bridge. It was determined that the change in flood levels would be compared with existing conditions from this model scenario. **Table 3-6** provides the comparison of flood levels at key locations.

Table 3-6 Comparison of Water Level Changes with Revised TSH Models

Location Description		HEC-RAS Cross-Section	Peak Water Level (m)		
			Existing CH2MHill Revised	TSH Future w n=0.013	
Glen Cairn Pond	d/s of outlet	44953	94.92	94.95	0.03
Hazeldean Road	u/s	44325	94.87	94.92	0.05
	d/s	44302	94.53	94.71	0.18
Maple Grove Road	u/s	43375	94.44	94.69	0.25
	d/s	43364	94.43	94.65	0.22
Palladium Drive	u/s	42890	94.36	94.64	0.28
	d/s	42855	94.33	94.33	0.00
Hwy417 Bridge	u/s	42182	94.18	94.12	-0.06
	d/s	42097	94.00	93.74	-0.26
Future Transitway	u/s	41743	93.98	93.77	-0.22
	d/s	41725	-	-	-
Future Campeau		41609.2	-	-	-
		41117	93.57	93.63	0.06
Richardson Side Road	u/s	40092	93.48	93.59	0.11
	d/s	40050	93.44	93.52	0.08
		39202	93.39	93.50	0.11
Huntmar	u/s	37894	93.36	93.47	0.11
	d/s	37869	92.97	92.97	0.00
March Road	u/s	33201	92.63	92.66	0.03
	d/s	33181.1	92.60	92.64	0.04
Carp Road	u/s	31662	92.53	92.53	0
	d/s	31642.1	92.52	92.53	0.01

The introduction of the normal value for Manning's n has a major bearing on local water levels. The flood levels further downstream are not impacted significantly by this strategy.