



The Corporation
of the City
of Cambridge



Forbes Creek Subwatershed Study

APPENDICES



**PLANNING &
ENGINEERING
INITIATIVES LTD.**

IN ASSOCIATION WITH:

C. Portt and Associates
Dougan and Associates
Naylor Engineering Associates
Schroeter and Associates
Ag Plan
Paradigm Transportation Ltd.

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APPENDICES

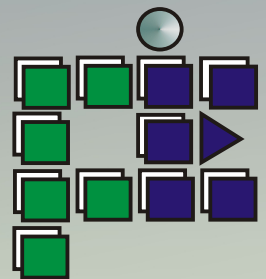
- Appendix A – Terms of Reference
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Appendix A

Terms of Reference



PLANNERS
CONSULTING
ENGINEERS &
LANDSCAPE
ARCHITECTS

Forbes Creek Subwatershed Plan

Final Terms of Reference

1. Background:

The Forbes Creek subwatershed encompasses approximately 600 hectares, which lie in the extreme northeast sector of the City of Cambridge (see Figure 1). Small sections in the northern and eastern limits of the subwatershed lie outside the City in Woolwich and Puslinch Townships respectively. Woolwich Township is within the Regional Municipality of Waterloo, while Puslinch Township lies within the County of Wellington. Forbes Creek drains relatively flat tablelands and it outlets into the Speed River, a major tributary of the Grand River. Land use is primarily agriculture, with a private “wildlife sanctuary” at the downstream end. The wildlife sanctuary includes two on-line ponds, which were created decades ago. Upstream, two main headwater drainage swales join, just south of Black Bridge Road.

2. Purpose:

The Forbes Creek Subwatershed Study is required by the City of Cambridge to provide comprehensive input of environmental considerations into the land use planning process. The primary intent of this subwatershed study is to protect, maintain and enhance surface water and groundwater quality and quantity through environmentally sound policy development. The resulting plan will provide recommendations as to where and how development activity can safely occur so as to minimize flood risks, stream erosion, degradation of water quality and negative impacts on natural systems, including groundwater. Recommendations will also identify opportunities for ecological enhancement and recreation.

The immediate area of urban development interest is the land within the “urban boundary”, east of Guelph Ave, south of Black Bridge Road and west of the CNR tracks. However, the area of study will include the entire geographic area of the subwatershed, some of which lies outside the City of Cambridge.

3. Goals and Objectives:

The goal of the Forbes Creek Subwatershed Study is to protect, maintain and enhance the ecological processes and functions and significant natural features of the subwatershed in a way which is environmentally sound and socially and economically sustainable.

The *objectives* of the Forbes Creek Subwatershed Study, which must be met in order to achieve the goal, are:

- *To identify, protect, maintain and enhance aquatic resources;*
- *To identify, protect, maintain and enhance terrestrial resources;*
- *To minimize the risk to life and property due to flooding and erosion;*
- *To preserve natural hydrological and hydrogeological systems;*
- *To develop an ecosystem-based approach to land use planning and resource management (including agricultural lands) in the subwatershed; and*
- *To produce an implementation and monitoring plan to guide future development in the subwatershed.*

The Regional Municipality of Waterloo, through the Regional Official Policies Plan (Section 3.1.4) has the following interests in subwatershed studies, which must be considered:

- Protection and management of quantity and quality of groundwater resources;
- Surface water quality with reference to Regional water-taking requirements and the capability of receiving streams to assimilate effluent from wastewater treatment plants;
- Identification, protection and management of Environmental Preservation Areas, Environmentally Sensitive Policy Areas and Regionally Significant Natural Corridors; and
- The implications of development opportunities on the provision of Regional infrastructure.

4. Issues and Problem Statements:

The following are issues unique to the Forbes Creek Subwatershed, which must be addressed through the study. Additional issues may emerge once the study

has commenced and the consultant completes the background study and public consultation.

- Forbes Creek Wildlife Sanctuary – status and future plans – ownership, management;
- Bridges, Dam and Ponds – impact on fisheries, current state of repair, recommendations;
- Fisheries – status, potential, management objectives (per Grand River Fisheries Management Plan);
- Wellhead protection area – implications for storm water infiltration;
- Potential road and servicing crossings of Forbes Creek and its wetlands;
- Forbes Creek Wetland Complex – confirmation of wetland boundaries, buffers from development;
- Location and status of municipal drains;
- Elements of the Natural Habitat Network per the Regional Official Policies Plan;
- Woodlot protection and vegetation management;
- Potential trail linkages (within the subwatershed and beyond) and interconnection of natural areas;
- Agricultural land classification and consideration.

5. Steering Committee:

Through Development Charges By-law No. 138-99, the City of Cambridge is responsible for the completion of subwatershed plans. Cambridge Council has identified the Forbes Creek subwatershed as a priority in its Staging of Development report. The City will engage the services of an independent consulting firm to conduct the study, under the direction of City staff and a Steering Committee.

Council will establish a Steering Committee. It will consist of staff from the City's Planning and Community Services Departments, the ward Councillor, the Regional Municipality of Waterloo (RMOW), the Grand River Conservation Authority (GRCA) and the Ministries of Natural Resources (MNR) and Agriculture, Food and Rural Affairs (OMAFRA). Staff from the other affected municipalities (Townships of Woolwich and Puslinch and the County of

Wellington) has asked to be informed of the study's progress, but not to be active on the Steering Committee.

City staff will chair the Steering Committee. It will provide direction to the consultant and oversee the preparation of the study and the resolution of issues from a technical perspective. It will also work closely with property owners and development interests. Meetings of the Steering Committee will be open to members of Council, the public and the development industry.

6. Study Process:

In order to meet the study's goals and objectives, an interdisciplinary consultant study team is required. It will assess the environmental features and functions as well as existing and proposed land uses, which may currently be, or have potential to impact the quantity and quality of water in Forbes Creek. The study will be conducted in three phases, as describe below.

Phase 1 Initiation

Step 1: Background Information

Collection and review of existing physiographic, hydrologic, hydrogeologic, natural features and land use information. Synthesis, interpretation and integration of existing information. Production of a base plan map for the subwatershed, which is current and correct. Provide a preliminary description of the ecosystem functions and linkages.

Step 2: Issue Identification

Refine issues and problem statements. Refine and prioritize goals and objectives. Identify data deficiencies. Familiarize the Steering Committee with the existing database and watershed characteristics. Field monitoring initiated. Revised work plan based on information gathered to date. Initial contact with landowners, special interest groups and directly affected parties. Public meeting.

Phase 2 Study and Refine

Step 3: Detailed Study

Commence base line data gathering and detailed study, inventory, and analysis addressing hydrology (model to be determined in consultation with the City and the GRCA), flooding, erosion, hydrogeologic and baseflow characteristics, fisheries, natural environment and surface water quality. Review existing and proposed trail linkages. Produce a seasonal and annual water budget. Gain an understanding of the relationship between the biophysical aspects of the

subwatershed and the existing and potential land uses. Identify opportunities and constraints.

Step 4: Targets

Establish the targets necessary to achieve the objectives. Investigate and develop various management plans, which include practices and measures to meet watershed objectives and targets.

Step 5: Alternatives and Recommended Plan

Evaluate alternative management plans. Recommend the preferred Subwatershed Plan for Forbes Creek. Hold a public meeting to receive input. Provide twenty-five (25) copies of the draft Subwatershed Plan to the City.

Step 6: Implementation and Monitoring Plans

Prepare the Implementation Plan and long term Monitoring Plan with specific time frames and responsible parties.

Phase 3 Study Finalization

Step 7: Final Plan/Presentation to Council

Produce final Forbes Creek Subwatershed Plan, including an Executive Summary, the Implementation and Monitoring Plans. Present to Cambridge Council (and potentially Regional Council) at a public meeting for approval. A total of forty (40) copies of the final Plan will be required.

7. Public Participation and Consultation:

The public and members of Council will have opportunities to participate throughout the subwatershed study process and will be encouraged to have input to the study. The consultants can expect public consultation on an individual basis throughout plan preparation. The following scheduled opportunities will be provided:

- After Council has given approval to the preparation of the study, an informal neighbourhood meeting to introduce the project and solicit the input of the property owners and community groups will be conducted. The initial neighbourhood meeting will be chaired by the ward Councillor and used to describe the area, the content and purpose of the subwatershed study, the process to be followed and to seek input from area residents and development interests into the study (Phase 1, Step 2).

- Following the information gathering process and the development of various options, a second informal neighbourhood meeting will be held to present the findings to the public and receive additional input (Phase 2 Step 5).
- When the final version of the Forbes Creek Subwatershed Plan has been completed a formal public meeting will be held with the Planning and Development Committee as part of the presentation of the recommended plan. Copies of the final plan will be available for inspection through the Planning Services Department (Phase 3, Step 7)

The informal meetings will be advertised in the local newspaper and Council and appropriate advisory committees will be informed of the time and location. Individual notices will be mailed to known development interests and parties expressing an interest in development proposals in the area. Clerks of the adjacent municipalities (Townships of Woolwich, Puslich and County of Wellington) will be informed of all public and council/committee meetings involving the Forbes Creek Subwatershed study. Throughout the process, the public will have access to public reports and documents through the consultant and/or City staff.

An invitation will be made to Jacob Hespeler High School to allow teachers and students to participate in the study, as appropriate.

The input of the Cambridge Environmental Advisory Committee (CEAC) will be solicited through presentations to the committee and requests for input at key points of the study. The completed Subwatershed Plan will be reviewed by CEAC prior to consideration by Cambridge Council.

If an amendment to the official plan or other planning document is required, that process including public involvement should be completed concurrent with the preparation of the subwatershed plan to avoid duplication and maximize public involvement. This is also to be done for the Environmental Assessment Act process for servicing studies, which will be initiated in the subwatershed study.

8. Forbes Creek Subwatershed Plan Contents

At a minimum, the product of the study should be a subwatershed plan, which includes:

- a) Recommendations for the following, which meet subwatershed goals, objectives and targets:
 - Natural system linkages and functions
 - Natural areas qualifying as ESPAs or EPAs
 - Surface and groundwater quantity and quality management
 - Areas suitable for development

- Areas of no development and adjacent buffers
 - Agricultural land protection
 - Implications for Regional and City infrastructure (e.g. creek and wetland crossings with services)
 - Areas where more detailed site specific Environmental Impact Statements may be required to assess development proposals (for the immediate development area, this should be included in the Subwatershed Study)
 - Best management practices for incorporation into subdivision designs, new aggregate extraction licenses and farm management programs
 - The enhancement, restoration and/or rehabilitation of natural features
 - Delineation of and management practices for open space areas and green space corridors and trail connections
- b) Delineation on a reconnaissance scale of:
- Recharge areas for the shallow and regional groundwater systems
 - The groundwater resources potential of the area
- c) Information and direction for:
- Ecological integrity and carrying capacity of the subwatershed
 - Servicing needs/availability of water/sewerage (sanitary and storm)/transportation (wherever possible, the study shall fulfil, in whole, or in part, the Environmental Assessment Act requirements for major infrastructure works to be located within the subwatershed. At a minimum, this will identify the problem and document existing conditions with some regard to the feasibility of preliminary servicing solutions)
 - A vegetation management strategy
- d) A master drainage plan for the system. To include identification of system constraints and any recommended remedial measures which could affect flow targets or design of master drainage plan system.
- e) Directives for stormwater management plans, scoped environmental impact studies and other studies/designs for specific areas within the subwatershed.
- f) A detailed Environmental Impact Study that provides sufficient analysis to formulate general parameters for development through the Cambridge Official Plan, a community plan, zoning by-law, site plan approval, and other means of land use regulation.
- g) A Green Space Plan and Natural Areas Strategy that includes any applicable Environmental Preservation Area, Environmentally Sensitive Policy Area, other elements of the Regional Natural Habitat Network as well as Locally Significant Natural Area and wetlands boundaries mapping and management

recommendations.

- h) Floodplain mapping – to be approved by the Grand River Conservation Authority. Deliver digital floodline, cross-sections and watershed and subcatchment delineation in dxf or dwg V14 or arcinfo formats, NAD 83. Deliver cross-section survey data, bridge/culvert inventory. HEC-RAS to be used for floodplain mapping work.
- i) An Implementation Plan
 - Specific implementation schemes and responsibilities for all recommendations
 - Recommended modification to existing planning documents (e.g. official plan)
 - Recommendations for new planning documents (e.g. community plans)
 - The type and scope of background studies which must be submitted in support of development applications
 - Enforcement measures
 - Timing and responsibilities for future studies
 - Phasing of development/servicing
- j) A Monitoring Plan
 - The long-term plan of action and the information basis for assessing whether the management plan objectives and targets are being achieved. While the monitoring plan may include continuous groundwater and surface water monitoring, an ecological approach to monitoring is preferred.

9. Adoption:

The Subwatershed Plan will be recommended for adoption by Council resolution. However, matters relating to major natural features and elements of the City's Open Space System may be adopted by amendment to the official plan or otherwise implemented. Regional planning staff will be involved throughout the preparation of the Subwatershed Study as a member of the steering committee. The ROPP directs that portions of watershed studies that deal with Regional interests (quantity and quality of groundwater resources; surface water quality with reference to Regional water-taking requirements and the capability of receiving streams to assimilate effluent from wastewater treatment plants; identification, protection and management of EPAs, ESPAs and Regionally Significant Natural corridors; and the implications of development opportunities on the provision of Regional infrastructure), must be approved by the Region prior to the adoption of ROPP Amendment(s), Area Municipal Official Plan Amendments or approval of Area Municipal implementation plans such as the

community plan that implement the recommendations of the Subwatershed Study.

10. Consultant's Submission of Proposals:

Consultants who represent development interests in the area of the Forbes Creek Subwatershed are ineligible to contract to do this study for the City of Cambridge.

The consultant's Detailed Proposal should include:

- a) a detailed project schedule/chart, outlining in detail the tasks and time anticipated for completion and including cost estimates for each task (project is anticipated to start in October, 2000 and be one year in duration);
- b) a separate page itemizing an estimated breakdown of disbursements. The disbursement cost is to be an estimate only to allow for completion of the project. Payment of disbursements will be based on actual costs incurred plus a mark up (in an amount to be specified by the consultant but not exceeding 5%) and G.S.T. Disbursements would include such items as mileage, telephone, copying and photographs. Please note that computer costs (e.g. computer time) are not to be included as a disbursement item but are to form part of the consultant's overall pricing;
- c) the completion of the attached "Summary Bid Submission Form" on company letterhead, which consolidates the details required in a) and b) above;
- d) the Project Manager and project team, their fields of expertise and time commitments, their relevant experience, background and rates (e.g. hourly, per diem). The team should include some expertise in agricultural land use planning;
- e) a list of recent similar projects completed and contacts which have involved the project team; and
- f) innovation/technology which is intended to be used in undertaking this project.

(15 copies of the Detailed Proposal must be submitted)

11. Other General Comments:

- a) The consultant should expect to meet regularly with the Steering Committee and will be responsible for recording and distributing the minutes of these minutes;
- b) Contact with other stakeholders, including the residents and property owners, should be expected at public meetings, and on an individual basis. The consultant is responsible for addressing all comments made on draft reports and raised at public meetings. The comments and response made must be compiled in an appendix;
- c) Occasional contact with the local media should be expected for the duration of the project;
- d) Mapping is to be 1:2000 scale digital topographic of the watershed, in NAD 83. Data structure to be determined in consultation with the City's Technology Services Division. Deliver boundaries mapping in digital format (see floodplain mapping). Cambridge was flown in 2000 as part of a tri-cities ortho photography project. Thus, high quality recent photo base of high horizontal accuracy is available this fall.
- e) All drawings, renderings and specifications are to be submitted on reproducible mylar and/or electronic format as deemed appropriate by the City of Cambridge (.pdf). All tabular data to be provided digitally with suitable metadata. All information, data, sketches, drawings and reports generated by the consultant for the purpose of the study will be owned and permitted to be used by the City of Cambridge as it sees fit, including promotional purposes;
- f) The identification of ecological communities should be consistent with the provincial ecological land classification system, and species information should be submitted in a form compatible with the Waterloo Regional Ecological Database (WRED) and the Cambridge Natural Areas Inventory (CNAI).
- g) The City of Cambridge will make available any other supporting resources in its possession;
- h) The City of Cambridge Purchasing By-law requires that prior to entering into any agreement for the purchase of goods or services, the total cost of such goods or services must be known or estimated as accurately as possible;

- i) The City of Cambridge will require the consultant to enter into a standard agreement for consulting services;
- j) The consultant will provide project progress reports on at least a bi-weekly basis from initiation to project completion; and
- k) The municipal co-ordinator for this project shall be April Souwand or her designate.

If additional information or clarification is required regarding these Terms of Reference, please contact April Souwand, Senior Environmental Planner, at 740-4650 extension 4601.

To be submitted on Company Letterhead

SUMMARY BID SUBMISSION FORM

Forbes Creek Subwatershed Study

Phase 1

- | | |
|--|----|
| 1. Background Information | \$ |
| 2. Issue Identification/Public Meeting | \$ |

Phase 2

- | | |
|--|----|
| 3. Detailed Study | \$ |
| 4. Targets | \$ |
| 5. Alternatives and Recommended Plan/Public Meeting | \$ |
| 6. Implementation and Monitoring Plans | \$ |

Phase 3

- | | |
|---|----|
| 7. Final Plan/Presentation to Council/Public Meeting | \$ |
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| | |
|---------------|----|
| Disbursements | \$ |
|---------------|----|

| | |
|--------|----|
| G.S.T. | \$ |
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|--------------|-----------|
| TOTAL | \$ |
|--------------|-----------|

