SUBJECT: Hannon Creek Subwatershed - North Glanbrook Industrial Business Park Master Drainage Plan (PW08031) - (Wards 6, 7, 9 and 11)

RECOMMENDATION:

(a) That the General Manager, Public Works, be authorized and directed to file the Hannon Creek Subwatershed - North Glanbrook Industrial Business Park Master Drainage Plan with the Municipal Clerk for a minimum thirty day public review period.

(b) That upon the completion of the thirty day public review and final approval, the General Manager of the Public Works Department be authorized and directed to include the stormwater management projects identified in the Master Plan in the capital budget for future years;

(c) That upon completion of the Class EA process, the General Manager, Public Works Department and the General Manager, Planning and Economic Development Department, be authorized and directed to proceed with implementation of the recommended works, as outlined in the Hannon Creek Subwatershed - North Glanbrook Industrial Business Park Master Drainage Plan.

(d) That the General Manager, Planning and Economic Development Department be authorized and directed to include the recommendations of the Hannon Creek Subwatershed Study in Planning processes for the area covered by the Subwatershed Study, as appropriate.
EXECUTIVE SUMMARY:

The North Glanbrook Industrial Business Park (NGIBP) is an industrial-commercial area in the south-central part of the City of Hamilton. In order to facilitate responsible future development through appropriate servicing, a Master Drainage Plan and Stormwater Management plan has been developed. This study has been designed to conform to a subwatershed context to identify the future Subwatershed management requirements within the study area, as well as the drainage and stormwater management (SWM) needs.

The purpose of this study was to develop a Master Drainage Plan for the Hannon Creek Subwatershed and NGIBP. This process was carried out in the context of a subwatershed study, including aquatic and terrestrial studies and the development of a management strategy for the area. This plan will be a supporting document to other ongoing Planning and Public Works initiatives. The objectives of the study were to provide:

- Appropriate methods of accommodating the pre and post development stormwater discharge and water quality control from lands located within the Hannon Creek Subwatershed;
- Appropriate methods of accommodating the pre and post development stormwater discharge and water quality control from lands located within the NGIBP (including areas within the Twenty Mile Creek Subwatershed);
- Appropriate stormwater management control strategy; and
- Preliminary design and location feasibility of any SWM facilities and major storm drainage infrastructure identified in this study.

Key findings of the study include:

- There are a number of karst features throughout the Hannon Creek Subwatershed; most of which are located in or around creek tributaries. All the watercourses in the study area are headwater systems originating in the study area.
- Most of the streams in the study area provide little or no in-situ fish habitat, and there is little riparian vegetation, except along the main branch of Hannon Creek.
- There are a number of barriers to fish movement downstream of the study area, including a karst feature and bedrock ledges.
- Historical stream modification has eliminated aquatic habitat in many of the tributaries.
- Significant erosion of four reaches downstream of Rymal Road was noted. These streams will need to be protected, rehabilitated or enhanced in their current location, and the function of these streams is to be preserved.
- A stream classification system was developed as part of this study. Recommendations for the high and medium constraint streams include re-establishing a functioning floodplain, providing a low-flow channel, re-establishing a "natural" meander planform and re-establishing riparian vegetation.
- Eight stormwater management ponds are recommended to serve the Hannon Creek Subwatershed - North Glanbrook Industrial Business Park area.
- At the draft plan stage, additional field searches for American Badger should be carried out.
BACKGROUND:

Study Purpose and Goals

The Hannon Creek Subwatershed - North Glanbrook Industrial Business Park Master Drainage Plan study area includes the entire Hannon Creek subwatershed and the portions of the Twenty Mile Creek subwatershed that are within the limits of the North Glanbrook Industrial Business Park. The North Glanbrook Industrial Business Park is located on the drainage divide between the Hannon Creek subwatershed and the Twenty Mile Creek subwatershed. The study area is shown in Appendix A.

The Hannon Creek Subwatershed has a drainage area of 1308ha, representing approximately 20.4% of the Red Hill Creek Watershed. It is entirely within the City of Hamilton and is within Hamilton Conservation Authority jurisdiction. Land use in the Hannon Creek area is primarily rural. The majority of the NGIBP is located within the Hannon Creek Subwatershed.

The southern portion of the NGIBP is within the Twenty Mile Creek subwatershed, which is within the jurisdiction of the Niagara Peninsula Conservation Authority.

The Hannon Creek Subwatershed - North Glanbrook Industrial Business Park Master Drainage Plan was undertaken to assess current environmental and watershed conditions, to determine future stormwater servicing requirements, and to set out an implementation plan for stormwater servicing for the Industrial Business Park. Completing the study in this fashion allowed for a comprehensive approach to siting required stormwater management facilities for the entire subwatershed, and for the Industrial Business Park, instead of reviewing stormwater just on a site by site basis.

Study Process

The study steps included:

- A review of background information
- Additional collection of field information to augment available data, including:
  - Aquatic surveys
  - Terrestrial surveys
  - Fluvial geomorphological data
  - Topographic information
  - Hydrogeologic surveys
- Characterization of streams and terrestrial conditions
- Identification and evaluation of stormwater management options
- Development of an overall drainage and stormwater management plan.

The Hannon Creek Subwatershed - North Glanbrook Industrial Business Park Master Drainage Plan will constitute the basis for the planning and design of future stormwater management infrastructure. The study has followed the Municipal Engineers Association (MEA) Class Environmental Assessment process. The Hannon Creek study was prepared under the direction of a Technical Steering Committee consisting of City staff, the Hamilton Conservation Authority, the Niagara Peninsula Conservation Authority, the Ministry of Natural Resources and the Department of Fisheries and Oceans.
Policies and Standards

The Hannon Creek Subwatershed - North Glanbrook Industrial Business Park Master Drainage Plan has been prepared following the guidelines and criteria of the agencies listed above. In addition, the implementation plan of this study is in line with the recommendations of the Red Hill Creek Watershed Plan (1998) and the Hamilton Harbour Remedial Action Plan.

ANALYSIS/RATIONALE:

The Hannon Creek Subwatershed - North Glanbrook Industrial Business Park Master Drainage Plan was completed to develop a management approach for key resources within the study area. The study included hydrology and hydraulics, hydrogeology, fisheries, and terrestrial and natural heritage resources, and identified constraints and issues associated with these disciplines.

Environmental Assessment

The Hannon Creek Subwatershed - North Glanbrook Industrial Business Park Master Drainage Plan was completed in accordance with the Municipal Engineers Association Municipal Class Environmental Assessment (Municipal Class EA), and has satisfied the Municipal Class EA requirements for Schedule A, A+ and B projects. The Municipal Class EA process requires that reasonable and feasible alternatives be considered, and that they be evaluated based on their impacts on the natural environment, economics and the social environment.

The Hannon Creek Subwatershed - North Glanbrook Industrial Business Park Master Drainage Plan also includes a table of monitoring parameters and a management strategy for:

• Stream corridor protection and enhancement;
• The floodplain;
• The terrestrial System;
• Security, site grading and stormwater management;
• Hydrogeology/karst feature management; and
• Monitoring.

Key Findings and Recommendations of the Study

• There are a number of karst features throughout the Hannon Creek Subwatershed. Most of the karst features found were located in or around creek tributaries. Additional study of the impact on these features on groundwater is required as part of future planning studies.
• All the watercourses in the study area are headwater systems originating in the study area.
• Most of the streams in the study area provide little or no in-situ fish habitat, with the exception of Hannon Creek itself and one other reach.
• There are a number of barriers to fish movement downstream of the study area, including a karst feature and bedrock ledges.
• There is natural riparian vegetation along the main branch of Hannon Creek, but not along most of the tributaries.
• Historical stream modifications including realignment, removal of vegetation and plowing has eliminated aquatic habitat in many of the tributaries.
• Significant erosion of four reaches downstream of Rymal Road was noted. Further geomorphic study of these areas is required as part of future development planning.
• A stream classification system was developed to determine which tributaries were to be maintained as natural channels in their current location, which tributaries could be relocated, and which tributaries did not need to remain open. The classification of each reach was reviewed and agreed to by the Department of Fisheries and Oceans, the Ministry of Natural Resources and the Conservation Authorities (Hamilton and Niagara Peninsula). Recommendations for the high and medium constraint streams include re-establishing a functioning floodplain, providing a low-flow channel, re-establishing a “natural” meander planform and re-establishing riparian vegetation.
• Eight stormwater management ponds are recommended to serve the Hannon Creek Subwatershed – North Glanbrook Industrial Business Park area. The recommended stormwater management system includes source controls (capturing stormwater on site and providing stormwater quality and quantity control), conveyance controls (capturing on site and roadway runoff), and end-of-pipe controls (providing water quality, erosion and flood control for the study area). Some previously proposed stormwater management facilities have not been carried forward in this study; their proposed function and drainage areas, however, have been accounted for in the eight proposed facilities. The proposed stormwater management pond locations are shown in Appendix B.
• During the course of the study, a potential sighting of American Badger (an endangered species) was made. Additional fieldwork was undertaken, in consultation with the Ministry of Natural Resources’ Badger Recovery Team, but no badgers or badger dens were found. At the draft plan stage additional field searches for American Badger should be carried out.

**ALTERNATIVES FOR CONSIDERATION:**

The following list of alternative stormwater solutions to address the stormwater component:

1. Distributed Stormwater Management Facilities - this scenario that combines source and conveyance controls with regional SWM facilities throughout the study area. Source and conveyance controls were only applied to parcels within the NGIBP and urban expansion areas that have been re-zoned to Industrial, Commercial, Institutional, and Urban Expansion land uses. Additional source and conveyance controls could be implemented as part of re-development, infill, and retrofit, as well as in other land use categories.

2. Recommended Stormwater Management Facilities - includes only the most hydraulically beneficial and/or feasible locations for wet detention facilities source and conveyance controls throughout the NGIBP and urban expansion areas.
Evaluation of Alternatives

The dispersed nature of the SWM facilities in Alternative 1 is undesirable from a City operations and maintenance perspective. As a result, Alternative 2 includes 8 SWM facilities (of the original 17 in Alternative 1). Additionally, the berm height was increased in selected facilities in order to provide the required storage capacity for the entire study area. All other sizing characteristics as described in Alternative 1 remain the same in Alternative 2. The total volume provided for all proposed SWM facilities is 175,000 m$^3$, which exceeds the 174,000 m$^3$ that is required. **Thus, Alternative 2 was identified as the most preferred alternative.**

**FINANCIAL/STAFFING/LEGAL IMPLICATIONS:**

**Financial**

The identified stormwater management facilities and creek works will need to be included in future Capital Budgets, and in the upcoming Development Charges Study (2009). The Hannon Creek Subwatershed - North Glenbrook Industrial Business Master Drainage Plan will be forwarded to the Development Charges Co-ordinating Committee for inclusion in the next update of the Hamilton Development Charges Background Study.

**Staffing**

There are no staffing implications.

**Legal**

Municipal undertakings such water and wastewater projects are subject to Ontario's Environmental Assessment Act. The Act allows for the approval of Class Environmental Assessments and the municipality has the option of following the planning process set out in the Municipal Engineers Association Class Environmental Assessment (June 2000, amended 2007). This study has followed the Schedule B Planning and Design Process and will fulfill phases 1 and 2 of the Class EA process. The City is required to file the Environmental Study report on the public record for a minimum thirty day review period.

**POLICIES AFFECTING PROPOSAL:**

The Hannon Creek Subwatershed - North Glenbrook Industrial Business Park Master Drainage Plan addresses the Red Hill Creek Watershed Action Plan (1998) recommendations for the Hannon Creek subwatershed of aquatic restoration, stable creeks with normal levels of erosion, and riparian vegetation enhancement. This study has also been completed in accordance with the City’s Storm Drainage Policy (2004) and the draft Criteria and Guidelines for Stormwater Infrastructure Design (2006), and the policies and guidelines of the Hamilton Conservation Authority, the Niagara Peninsula Conservation Authority, the Ministry of the Environment, the Ministry of Natural Resources and the Department of Fisheries and Oceans.

The Hannon Creek Subwatershed - North Glenbrook Industrial Business Park Master Drainage Plan supports the Public Works Strategic Plan by being a leader in the “greening” and stewardship of the City, through the stormwater management practices...
that are proposed, and through the comprehensive planning approach that was taken during this study.

**RELEVANT CONSULTATION:**

**Agency Consultation**

The following City of Hamilton Departments were contacted for this project:
- Planning and Economic Development (Industrial Parks and Airport Development, Community Planning and Design, Heritage and Development Planning)
- Public Works (Capital Planning and Implementation)

The following agencies were contacted for this project:
- Department of Fisheries and Oceans (DFO)
- Ministry of the Environment (MOE)
- Ministry of Natural Resources (MNR)
- Hamilton Conservation Authority (HCA)
- Niagara Peninsula Conservation Authority (NPCA)
- First Nations

Two Public Information Centres (PICs) were held during the course of the Hannon Creek Subwatershed - North Glenbrook Industrial Business Park Master Drainage Plan. The first was held in conjunction with the PIC for the Dartnall Road realignment, and was attended by 57 people. The second PIC was held on July 19, 2007, and was attended by 33 people. The second PIC was held to present overall study findings and the proposed stormwater management approach.

Many of the comments received at the Public Information Centres did not relate to the Hannon Creek study; these comments were forwarded to the appropriate Departments for responses. Of the comments that did relate to the Hannon Creek study, there was general agreement with the proposed plan and an appreciation for minimizing the number of stormwater management ponds.

Comments were also received from the development community about the effects of the proposed plan on future development of lands at the east limit of the subwatershed (Rymal Road Planning Area). Proponents for these lands asked about the potential of adjusting the drainage pattern proposed in the study. Recognizing that this is a higher level plan, there is the opportunity for some adjustments as more detailed studies are undertaken, however, changes that would impact the stream classification identified in this report will require approval from City staff, as well as the relevant Conservation Authority, the Ministry of Natural Resources and the Department of Fisheries and Oceans.

In addition, comments were received requesting more details about how the Hannon Creek Subwatershed - North Glenbrook Industrial Business Park Master Drainage Plan addresses the recommendations of the Red Hill Creek Watershed Action Plan. The final report was revised to address these comments.
By evaluating the “Triple Bottom Line”, (community, environment, economic implications) we can make choices that create value across all three bottom lines, moving us closer to our vision for a sustainable community, and Provincial interests.

Community Well-Being is enhanced.  ☑ Yes  ☐ No
The preferred alternative allows for enhanced water quality and quantity in the subject area.

Environmental Well-Being is enhanced.  ☑ Yes  ☐ No
Ecological function and the natural heritage system are protected.

Economic Well-Being is enhanced.  ☑ Yes  ☐ No
Hamilton's high-quality environmental amenities are maintained and enhanced.

Does the option you are recommending create value across all three bottom lines?  ☑ Yes  ☐ No

Do the options you are recommending make Hamilton a City of choice for high performance public servants?  ☐ Yes  ☑ No
APPENDIX B - Location of Proposed Stormwater Management Facilities