Stormwater Site Management plan

1.0 INTRODUCTION

1.1 Site Location and description

The Kanata Lakes North development is comprised of 225 hectares of residential development located at the north limit of the Kanata lakes Golf Course Community as shown in Figure 1. In the centre of the site is the Kizell Pond and the Beaver pond Stormwater Management Facility. The remainder of the site is predominantly consists of large areas of rock outcropping.

1.2 Storm Drainage System Overview

Layout of the trunk storm sewers for this development is shown in drawing 5001. A total of three storm outlets are proposed to outlet into the Kizell Pond Beaver Pond Stormwater Management Facility. All storm sewers are to be designed to convey a storm with a five year design frequency and all catch basins will contain an inlet control device equivalent to an IPEX type "A". Major system flows will be conveyed overland via roadway and surface swales directly to the Kizell and Beaver Pond and to the existing Shirley's Brook water course north of the ponds.

1.3 Stormwater Treatment Overview

As stated in 1.2 all minor system stormwater enters the Beaver Pond Stormwater Management Facility via direct outlets and through Kizell Pond which is considered part of the facility. In the "Kanata Lakes Beaver Pond, Urban Stormwater Quality Control" report by Cumming Cockburn 1994, the Beaver Pond was demonstrated to function as a quantity/quality facility for all new phases of development with separate connections to the pond, including Kanata Lakes North. At the new outlets energy dissipators will be constructed to minimize the effect of the stormwater outflows on the natural areas of the ponds.

As part of the development north of the Kizell Pond a portion of Shirley's Brook will be realigned in a corridor adjacent to the railway tracks. This realignment will allow the existing natural flow from the undeveloped area west of the study area to pass through the development without being contaminated from untreated stormwater flow from the proposed urban area.

Servicing Study

1.0 INTRODUCTION

This study deals with the wastewater, stormwater and water servicing issues for a 225 hectare site which comprises the north limit of the Kanata Lakes Golf Course Community as shown on Figure No.1. Large rock outcropping is predominant throughout the study area while the environmentally sensitive low lands of the Kizell Pond and Beaver Pond Stormwater Management Facility is located in the centre of the site,

Four major construction phases are identified on figure 2. Phase 1 will proceed with the extension of the trunk watermain from Castlefrank Drive on the Goulbourn Forced Road, the extension of the Beaver Pond Sanitary Sewer and a new storm outlet into the Kizell Pond. In Phase 2 the existing watermain on Walden Drive will be extended and connected to the Goulbourn Forced Road watermain, the sanitary sewer will be extended from the trunk sewer at Kimmins Court and a new storm outlet will be constructed into the Beaver Pond. Water and sanitary for Phase 3 will be provided by extending the Walden Drive watermain and trunk sanitary sewer from Phase 2 and a new storm outlet will be constructed in the Kizell Pond. Water, sanitary and storm service for Phase 4 will be extended from Phase 3 and will include the completion of the Goulbourn Forced Road and trunk watermain to the north limit of the development.

2.0 WASTEWATER SYSTEM (SANITARY SEWERS)

Sanitary drainage for the Phase 1 lands south of the Kizell Pond is provided through the recently constructed Beaver Pond Trunk Sanitary Sewer which has been extended to the Goulbourn Forced Road adjacent to the Teron Inc. Rockeries Site. Capacity is available for the Phase 1 lands as well for a potential 500 residential unit site located west of the development as shown in figure 3.

For the lands north of the Kizell and Beaver Pond Ponds the sanitary outlet is provided at the existing trunk sanitary sewer north of Kimmins Court at the east end of the development.

A trunk sewer will extend east to service all the Phases 2, 3 and 4 lands as shown on Figure 3. An allowance for 9.5 hectares of medium density residential land located along the future Solandt Drive extension is included. The sanitary drainage scheme for this development is in conformance with sanitary sewer Master Drainage Plan for Kanata Lakes prepared by J.L. Richards and Associates Limited, May 1986.

Sanitary sewer design speed sheets and a summary of land use and population criteria used is included in the Appendix.

3.0 STORMWATER SYSTEM

All minor system (storm sewers) for the study area drain into the Kizell and Beaver Pond Stormwater Management Facility To reduce the impacts to the environmentally sensitive lands a minimum of three storm outlets into the ponds are proposed as shown in Figure 4.The alignment of the trunk storm sewers and locations of the outlets will allow the development to proceed in a phased manner consistent with the sanitary sewer and water distribution systems

As the Beaver Pond Storm Water Management Facility is a quantity/quality facility it is not necessary to construct full sediment forebays for each outlet. To reduce the impact of the stormwater outflows it is proposed to construct energy dissipators at the outlets that will prevent erosion damage during peak flows. The energy dissipators will also separate course sediments that can be removed without disturbing the natural pond areas. No allowance for storm drainage from the lands west of Phase 1 is included as these lands are In the Carp River watershed requiring a separate outlet.

Major system (overland flow) drainage for the Phases 1 and 2 and a portion of the Phase 3 lands is directed towards the Kizell and Beaver Ponds. For the remainder of Phases 3 and 4 the major system overflow. is directed towards the existing Shirley's Brook watercourse adjacent to the Goulbourn Forced Road. A small area of the north limit of the site will outlet to the north along future Terry Fox Drive or major flows will be retained on site should an outlet not be readily available In all areas of the study area on-site surface ponding roadway and rear yard sags will be utilized where possible to reduce the amounts of major system overflows.

Realignment of Shirley’s Brook west of the Goulbourn Forced Road is required as part of this development. The proposed plan will provide a corridor adjacent to the railway line to allow a naturalized channel to be built that will allow existing flow from the undeveloped area west of the study area to pass through the development and flow into the existing Shirley’s Brook channel at the Goulbourn Forced Road. Coordination with the design of future Terry Fox Drive is being undertaken to ensure the maximum amount of existing natural flow is directed to the Shirley’s Brook realignment in order to provide the maximum amount of uncontaminated base flow.

Stormwater management design parameters used in the study are in the Appendix/

4.0 WATER DISTRIBUTION SYSTEM

A network of existing watermains is located in the developed portion of Kanata Lakes to the south of the study area. An existing 610 mm watermain is located on Castlefrank Road and has recently been extended to the Goulbourn Forced Road which will serve as the primary .watermain feed for the study area. At the east end of the site an existing 406 mm watermain is located on Walden Drive adjacent to Kirnmins Court which will also serve as a watermain feed.

As part of the *study* a computer *model* of the water distribution network was developed incorporating boundary hydraulic grade line conditions at the two watermain feed locations. The proposed .water distribution system as shown on Figure 5 shows that the 610 mm diameter watermain will be extended along tl1e Goulbourn Forced Road to the north limit of the study area where an allowance for extension into the Morgan's Grant

development is included. The *406* mm watermain on Walden Drive will be extended through Phase 2 lands and connect to the *610* mm watermain on the Goulbourn Forced Road. A *305* mm diameter watermain loop is identified In Phase 1 and a 406 mm diameter watermain loop joins the Phases 3 and 4 lands. All other mains will be 202 or 152 mm diameter. Due to water quality concerns all "P" loop streets will have a dual watermain connection from the principal watermain to increase water circulation.

The boundary hydraulic grade line conditions and the water demand design sheets are included in the Appendix.

5.0 CONCLUSIONS

Based on the analysis provided the following conclusions may be drawn from this report.

.Sanitary drainage for the study area is provided in the existing Beaver Pond and Kimmins Court sewers. The sanitary sewer system can efficiently service all areas of the study area without excessive depths or grade rises and can provide service to potential development areas west of Phase 1 and north of Phase 2.

.Storm sewers for the study area have been developed to efficiently service the development area and minimize the impact to natural areas. Major system flows are routed to the discharge points on the Kizell and Beaver Ponds and natural drainage features.

.Water distribution system has been developed to be constructed in stages in accordance with the major construction phases.