BLUE VISTA
Town of The Blue Mountains

Functional Servicing Report

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prepared for
Royalton Homes Inc.
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1 Introduction

This functional servicing report has been prepared in support of the Blue Vista residential development which is located on the west side of Grey Road 21 (Osler Bluff Road), north of Grey Road 19/Mountain Road, in the Town of The Blue Mountains, as illustrated in Figure 1.

The purpose of this report is to address the servicing requirements of the Town of The Blue Mountains and Grey County with respect to the existing and proposed condition of the sanitary servicing, water supply for domestic use, drainage and stormwater management (SWM), safe vehicular access to the site and utilities common to support a residential development (phone, hydro, cable, TV, gas, etc.). Several other reports as well as engineering drawings have been prepared in conjunction with this report in support of the proposed residential development and are summarized below:

- *Preliminary Stormwater Management Report*, prepared by C.C. Tatham & Associates Ltd. (February 27, 2019);
- *Traffic Impact Study*, prepared by C.C. Tatham & Associates Ltd. (February 27, 2019);
- *Preliminary Infiltration Assessment*, prepared by Peto MacCallum Ltd. (August 20, 2018); and

Chapter 2 of this report presents the proposed Blue Vista development and existing site conditions. Chapters 3 and 4 address the sanitary sewer system and water supply distribution plans respectively. Chapter 5 summarizes the stormwater management plan and Chapter 6 highlights the key findings of the Traffic Impact Study. Servicing of common utilities is discussed in Chapter 7, and finally Chapter 9 provides an overall summary.
2 Blue Vista Development

2.1 Site Location & Description

As previously noted, the Blue Vista residential development is located on the west side of Grey Road 21 (Osler Bluff Road), north of Grey Road 19/Mountain Road, in the Town of The Blue Mountains (refer to Figure 1). It is bordered by Osler Bluff Road to the east, the Scandinave Spa and the Windfall Development Lands to the south, the Second Nature Phase 3 Development Lands to the west, and the Monterra golf course to the north. The legal description of the site refers to Part Lot 17, Concession 1, Town of The Blue Mountains (formerly the Township of Collingwood), in the County of Grey. The Blue Vista property consists of approximately 20.4 ha of undeveloped land.

Existing site topography, ground cover, land use and drainage patterns were established through site visitation, interpretation of topographic maps, aerial photography and a site survey. The development site generally slopes from southwest to the northeast with approximately 15 m of fall across the property. An intermittent tributary watercourse wetland feature bisects the property into a west and east portion. The central and west portions have predominantly woodland ground cover and the east portion has predominantly pasture ground cover. Under existing conditions, drainage is conveyed as overland flow to two outlet locations; to the roadside ditch along Osler Bluff Road and continuing north to connect with an unnamed tributary watercourse within Grey Sauble Conservation Authority (GSCA) jurisdiction, and to the 600 mm diameter culvert that crosses under Osler Bluff Road and continuing east to connect with Silver Creek within Nottawasaga Valley Conservation Authority (NVCA) jurisdiction.

Ontario Soil Survey Report No. 17 (Grey County North) defines the site to be a mix of Kemble silty clay (Ksc) and Brighton sand (Brs).

2.2 Proposed Land Use

Residential Units

The proposed development, as shown on the Overall Site Plan (Figure 2), is for 133 single detached residential dwellings units. The proposed units will have a minimum lot size depth of 30 m with 15 m of frontage. A secondary development plan, to increase the unit count to 180 residential units (accomplished through changing select single-detached units to semi-detached units), will be considered should the Town require an increased lot density.

Other Amenities

The proposed development will also include park areas, an open space area, two stormwater management blocks, and community trails with connection to the existing Town community trail system.
As noted in the site plan, a 5.2 m widening along Grey Road 21 (Osler Bluff Road) has been dedicated to Grey County for future development and expansion of Grey Road 21.

**Area Land Uses**

Historically, land use in the surrounding area has been a mix of woodland, residential as well as recreational and agricultural activities. Residential development of the surrounding areas has increased in recent years resulting in required upgrades to municipal infrastructure to service the area appropriately.

**2.3 Site Access & Internal Road System**

The proposed development will be serviced by municipal roads within 20.0 m rights-of-way, to be constructed to urban standards. The primary site access will be via Grey Road 21 (Osler Bluff Road), from which Street A will extend through the development and connect to Crosswinds Boulevard, providing access to the Second Nature development. This will entail a road crossing of the intermittent tributary watercourse wetland feature to provide a secondary means of access and connectivity between the adjacent developments. Furthermore, the crossing is required to provide municipal services to the proposed development (i.e. sanitary, water, stormwater and utilities).
3 **Sanitary Servicing**

3.1 **Existing Infrastructure**

**Grey Road 21 Sanitary Sewer**

In 2012, a trunk sanitary sewer was designed along Grey Road 21 (Osler Bluff Road) to collect and convey wastewater from existing and proposed development lands located within the Town of The Blue Mountains adjacent to and upstream of Grey Road 21 (Osler Bluff Road). The sewer was designed to be extended from Highway 26 south for approximately 6.5 km to the Osler Bluff Ski Club then west approximately 3.0 kms to the proposed Castle Glen development on Grey Road 19, and accommodate a total of 4,622 residential units having a contributing drainage area of approximately 1,094 hectares. A total of 180 residential units were allocated to the Blue Vista development lands in the design process.

Construction of approximately 2.5 km of the 450 mm trunk sewer was completed in 2012 extending from Highway 26 to approximately 300 m south of the Blue Vista development (to provide service to the Mountain House and Windfall developments). At its downstream end, the sewer was connected to an existing 300 mm diameter sanitary sewer located on the south side of Highway 26 (as in interim measure). In the future, the trunk sewer will be extended across Highway 26 and run north directly to a new lift station at the Craigleith Sewage Treatment Plant. Refer to Appendix A for additional information.

**Highway 26 Sanitary Sewer**

As previously noted, there is an existing 300 mm diameter sanitary sewer located on the south side of Highway 26. This sewer directs flows west for a distance of approximately 1.3 km, at which point it is increased in size to 750 mm diameter and continues west for another 240 m where it outlets to an existing sanitary sewage pumping station located at Lakeshore Road East. Until the future extension of the trunk sewer across Highway 26 to the new lift station at the Craigleith Sewage Treatment Plant is constructed, the “short term sewage servicing alternative – 4B” as described in Section 8.2.2 of the Combined EA Master Plan for Craigleith, Castle Glen and Osler relies on the existing 300 mm diameter sewer on Highway 26 to convey flows to the sewage pumping station at Lakeshore Road East and ultimately to the Craigleith Sewage Treatment Plant.

An assessment of the capacity of the existing 300 mm diameter sewer between Grey Road 21 (Osler Bluff Road) and the sewage pumping station was completed in March 2012 and is included in Appendix A for information. The assessment concluded the existing sewer had capacity to convey peak flows from a total of 840 to 1,260 residential units (the lower capacity is based on a theoretical peak flow of 0.054L/unit/s, whereas the higher capacity is based on historical flow data at the plant of 0.036 L/unit/s).

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Lakeshore Road East Pumping Station & Highway 26 Forcemain

The sewage pumping station at Lakeshore Road East pumps wastewater to the Craigleith Sewage Treatment Plant via 2 - 300 mm diameter forcemains via a crossing to the north side of Highway 26 then east approximately 1.5 km to Long Point Road then north approximately 450 m to the STP.

Information regarding the capacity of the pumping station and the existing forcemains was not readily available at the time of this report. The Town should provide confirmation that there is available capacity to receive and convey wastewater flows generated by the connected sewers including existing and proposed residences and developments.

Craigleith Sewage Treatment Plant

The 2017 Annual Performance Report for the Craigleith Wastewater Treatment Plant and Associated Collection System prepared by Town Wastewater Operation Staff for the reporting period of January 1 to December 31, 2017 was reviewed to confirm available capacity of the treatment plant to handle additional wastewater flows.

The report demonstrated the treatment plant has an average design capacity of 8,133 m$^3$/d and a peak design capacity of 19,640 m$^3$/d. In 2017 the average day flow was 3,383 m$^3$/d and the peak day flow was 8,956 m$^3$/d. The plant operated at approximately 39% of the capacity based on a 5 year rolling average of daily flows.

3.2 Proposed Blue Vista Infrastructure

An internal sanitary sewer collection system has been designed to convey all sewage flows generated from the development to the existing 450 mm diameter trunk sewer on Grey Road 21 (Osler Bluff Road). There will be two connections to the trunk sewer on Grey Road 21 (Osler Bluff Road) as follows:

1. one connection at the proposed road access at Grey Road 21 (Osler Bluff Road) and Street A; and

2. one connection at the proposed servicing easement at Grey Road 21 (Osler Bluff Road) to the cul-de-sac on Street B.

The preliminary sanitary sewer design sheet (refer to Appendix A) has been developed to support the maximum density of 180 residential units within the development lands which is considered as conservative given the current development proposal includes a total of 133 residential units. The sanitary flows resulting from the maximum 180 units conforms with the original Master Servicing Plan and can be conveyed to the 450 mm diameter trunk sewer via a 200 mm diameter sanitary main.

The sanitary sewer servicing plan is denoted in Figure 3.
3.3 Assessment

Sewage Demands

Since construction of the trunk sanitary sewer on Grey Road 21 was completed, several surrounding developments have connected to and now contribute flows to this sewer. These developments are at various stages with some being completed while others are still under construction. Table 1 summarizes known completed or active surrounding developments (including existing development and that of Blue Vista) and associated timelines for sewer connections. As noted, a total of 1258 units are anticipated.

Table 1: Area Development Sewer Demands

<table>
<thead>
<tr>
<th>Development</th>
<th>Anticipated Number of Residential Connections within Sanitary Drainage Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2018</td>
</tr>
<tr>
<td>Existing on Highway 26</td>
<td>75</td>
</tr>
<tr>
<td>Blue Vista</td>
<td>180</td>
</tr>
<tr>
<td>Monterra Phase 2</td>
<td></td>
</tr>
<tr>
<td>Plateau East</td>
<td>39</td>
</tr>
<tr>
<td>Le Scandinaive Spa</td>
<td>15</td>
</tr>
<tr>
<td>Mountain House Ph 1</td>
<td>70</td>
</tr>
<tr>
<td>Mountain House Ph 2</td>
<td>75</td>
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<td>Mountain House Ph3</td>
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<td>Windfall Phase 1</td>
<td>37</td>
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<td>Windfall Phase 2</td>
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<td>Windfall Phase 3</td>
<td>69</td>
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<td>Windfall Phase 4A</td>
<td>70</td>
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<td>Windfall Phase 4B</td>
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<td>Windfall Phase 5A</td>
<td></td>
</tr>
<tr>
<td>Windfall Phase 5B</td>
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</tr>
<tr>
<td>Windfall Phase 6A</td>
<td></td>
</tr>
<tr>
<td>Windfall Phase 6B</td>
<td></td>
</tr>
<tr>
<td><strong>Annual Total</strong></td>
<td>472</td>
</tr>
<tr>
<td><strong>Cumulative Total</strong></td>
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</table>
Capacity Assessment

The sanitary sewer on Grey Road 21 (Osler Bluff Road) has been designed to convey flow from 4,622 units and therefore has capacity to convey the anticipated flows generated by the existing and proposed connections noted in Table 1, including those of Blue Vista.

The existing 300 mm diameter sanitary sewer on Highway 26 was estimated to have capacity to convey flow from approximately 840 units (based on theoretical peak flow demands) to 1260 units (based on historic peak flow demands). In considering the application of actual observed data within the existing sanitary infrastructure, as opposed to theoretical data, the system has capacity to accommodate all of the noted development, including Blue Vista. If however, the theoretical demands are adopted (which are 50% greater than the actual demands), capacity will be reached in 2020 based on the development timelines presented in Table 1.

Flow Monitoring

Given the range of remaining capacity identified within the system and recognizing the number of variables that impact peak flow demands (occupancy rate, per capita flows, peaking factors, and sewer design coefficients), it is recommended that a sewer flow monitoring program be initiated by the Town as soon as possible to measure and record actual flows within the system during the peak spring period to fully assess the available capacity of the system. Measures should be taken at the treatment plant (to capture all demand and infiltration) and just downstream of the Windfall development (from which actual demands can be derived with little infiltration given the age of the infrastructure).

Infrastructure Improvements

Depending on the realization of actual flow demands through flow monitoring, infrastructure improvements including the extension of the Grey Road 19 (Osler Bluff Road) trunk sanitary sewer across Highway 26 to the Craigleith Sewage Treatment Plant and construction of a lifting station may be required as early as the next several years, or not at all. It is recommended the Town initiate the engineering studies, design and approvals for this work (as may be required) such that construction could proceed when deemed necessary to service the existing developments under construction and/or proposed within the sanitary drainage area. It is understood the cost for the required infrastructure improvements would be addressed through development charges.

3.4 Summary

- There is a trunk sanitary sewer on Grey Road 21 (Osler Bluff Road) with excess available capacity to collect and convey flows from existing and proposed residential units including those within Blue Vista and other surrounding developments within the sanitary drainage area.
▪ There is a 300 mm diameter sewer on Highway 26 that is being utilized as a “short term sewage servicing alternative” until such time as the proposed extension of the trunk sewer and lifting station at the sewage treatment plant are constructed.

▪ There is a potential for the 300 mm diameter sewer on Highway 26 to reach capacity in 2020 based on the projected number and timing of new connections from existing/proposed developments under construction, and considering conservative, theoretical peak flow demands (based on actual demands, capacity will be reached after all noted developments are complete).

▪ It is recommended a flow monitoring program be implemented to confirm the actual flow within and upstream of the 300 mm diameter sewer on Highway 26 to fully assess the capacity of the system and to determine timing for infrastructure improvements.

▪ It is recommended the Town initiate the engineering studies, design and approvals such that construction of required infrastructure improvements can be completed to meet future demands (without hindering development).
4 Water Supply and Distribution

4.1 Existing Infrastructure

Grey Road 19 & 21 Watermains

An existing 300 mm diameter trunk watermain located along Grey Road 21 (Osler Bluff Road) supplies water from the Collingwood water distribution system to a booster pumping station (BPS) at the intersection of Grey Road 19 and Grey Road 21. The BPS is at an elevation of 215.0 metres and currently pumps at a rate of 4,000 m$^3$/day with an agreement in place between the Town of Collingwood and the Town of The Blue Mountains to potentially increase the rate to 8,000 m$^3$/day as demands warrant.

A 350 mm diameter trunk watermain on the south and west side of Grey Road 19 delivers water from the BPS to a reservoir on Happy Valley Road while servicing the Blue Mountain Ski Resort and adjacent commercial and residential areas. The reservoir located on Happy Valley Road is approximately 2.5 km from the BPS and is at an elevation of 280.0 metres.

Second Nature Water Service

The property west of Blue Vista is known as the Second Nature subdivision and is currently being constructed by others. Second Nature has constructed a 300 mm diameter watermain from Grey Road 19 along Crosswinds Boulevard, which currently terminates at the north limit of the Windfall subdivision. Once Crosswinds Boulevard has been fully constructed, the 300 mm diameter watermain will be connected to the existing 300 mm watermain through Windfall, providing a looped water distribution.

In addition, Second Nature will construct a 200 mm diameter watermain from Crosswinds Boulevard, which will terminate at the east property boundary of Second Nature. A 200 mm diameter connection will be made between Blue Vista and Second Nature at Street A to supply water to the Blue Vista subdivision.

4.2 Proposed Blue Vista Infrastructure

Design Criteria

Water supply demands for the Blue Vista development have been calculated based on Ministry guidelines and the Town of The Blue Mountain design standards, as noted below:

<table>
<thead>
<tr>
<th>Description</th>
<th>Requirement</th>
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<tr>
<td>Residential Population</td>
<td>2.3 persons per unit</td>
</tr>
<tr>
<td>Average daily demand per person</td>
<td>450 L/day</td>
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</tbody>
</table>
Maximum day factor 2.0
Peak hour factor 4.5
Minimum fire flow 66.67 L/s (4000 L/min)
Maximum watermain velocity 5.0 L/s

Allowable Pressure Ranges:
Average and maximum day demand 350 kPa to 550 kPa (50 psi to 80 psi)
Minimum and peak hour demand 275 kPa to 700 kPa (40 psi to 100 psi)
Maximum day plus fire suppression 140 kPa to 700 kPa (20 psi to 100 psi)

Water Demands

While the development is currently proposing 133 residential units, water demands have been based on 180 units (considered the upper threshold).

Design Population = Number of units x Persons per units
= 180 units x 2.3 persons per unit
= 413 persons

Average day demand (ADD) = design population x Average daily demand per person
= 413 persons x 450 L/day
= 185,850 L/day
= 186 m³/day (2.16 L/s)

Maximum day demand (MDD) = Average day demand (ADD) x Maximum day factor
= 186 m³/day x 2.0
= 372 m³/day (4.31 L/s)

Maximum day plus fire flow = Maximum day demand (MDD) + Minimum fire flow
= 4.31 L/s + 67.67 L/s
= 71.98 L/s (for 2 hours)
**Water Distribution System**

A water distribution system layout has been prepared to demonstrate the feasibility of providing water service to the Blue Vista development based on the proposed number of units. The layout shown on Figure 4 includes a 200 mm diameter watermain on Street A with a connection to the Second Nature Development proposed 200 mm diameter watermain. The remaining residential streets throughout the Blue Vista development will consist of looped 200 mm diameter watermains.

**Water Distribution Analysis**

CCTA has developed a steady state WaterCAD computer model of the portion of the Town of The Blue Mountains water distribution system in the vicinity of Blue Vista. The model is based on plan and profile drawings of all existing and proposed watermains servicing the Windfall and Second Nature subdivisions, and on operating data provided by the Town of The Blue Mountains.

The model has been updated with the proposed Blue Vista watermains and demands, and subsequently used to analyse flows and pressures throughout the system under the following water servicing schemes (the WaterCAD model settings and detailed model results are included in Appendix B):

- average day demand
- maximum day demand;
- minimum hour demand;
- peak hour demand; and
- fire flow.

The model results predict the following:

- pressures within the Blue Vista water distribution system will range between 69 psi and 81 psi, which is well within the Town of The Blue Mountains design criteria.

- available flow under a fire scenario in Blue Vista will range between 83 L/s and 120 L/s while maintaining a minimum system pressure of 120 psi, which is above the minimum required 67 L/s; and

- a maximum watermain velocity of 2.24 m/s is predicted to occur in the 200 mm diameter watermain on Street A during a fire scenario.

### 4.3 Summary

The WaterCAD computer model results predict that the proposed 200 mm diameter watermains servicing Blue Vista will provide an adequate supply of water to meet all applicable design criteria.
5 Stormwater Management Plan

A Preliminary Stormwater Management (SWM) Report has been completed by C.C. Tatham & Associates Ltd. under separate cover to review the existing and proposed stormwater conditions for the proposed Blue Vista subdivision as well as the surrounding area. The SWM report should be read in conjunction with this report, the study findings and conclusions are summarized below.

Stormwater Management Plan

The proposed stormwater management plan maintains existing drainage conditions at the existing site outlets by restricting post development peak flow rates to pre-development levels. The stormwater management plan provides the required Level 1 “Enhanced” water quality control for the site effluent at all site outlets. Safe conveyance of the Regulatory storm event peak flows through the site to the downstream drainage system is provided and the drainage from all external lands is accommodated within the proposed drainage design.

The storm sewer servicing plan is illustrated in Figure 5.

Stormwater Management Facilities

The report concludes that one dry pond will be necessary to provide stormwater quantity control for outlet to the north (Outlet 1). The dry pond in combination with a proposed oil-grit separator unit and enhanced grass swales will provide Level 1 “Enhanced” protection and will discharge to the roadside ditch at the Osler Bluff Road.

There will also be one extended detention wet pond to provide both stormwater quantity and quality controls for outlet to the east (Outlet 2). The wet pond will provide the requisite Level 1 “Enhanced” protection and will discharge to the intermittent tributary watercourse to Silver Creek.

Natural Erosion Hazard Limit

A natural hazards analysis was conducted to establish the appropriate erosion hazard setback for development of the area adjacent to the open space block.

Siltation & Erosion Control

Construction and maintenance of siltation and erosion control facilities and adherence to strict housekeeping measures during site servicing and building construction will reduce the transportation of sediment from the site, improving stormwater quality and mitigating environmental impacts during construction.
6 Traffic Impact Study

A Traffic Impact Study has been prepared by C.C. Tatham & Associated Ltd. under separate cover to address the traffic and transportation issues related to the Blue Vista development from the perspectives of external and internal road systems. The traffic study should be read in conjunction with this report, the study findings and conclusions are summarized below.

Blue Vista Traffic Generation

Overall, the development is expected to generate 132 trips during the Friday PM peak hour and 124 trips during the Saturday peak hour. Given the ski activities during the winter in the area, winter Friday PM and Saturday peak hours have been used as the study periods.

Site Access

Blue Vista traffic will have direct access to Grey Road 21 (Osler Bluff Road) to the east and access to Crosswinds Boulevard to the west via connection of the internal road through the Second Nature development.

Future Traffic Projections

To address the potential impacts of the proposed site, peak hour operations were reviewed for the 2025 (build-out of Blue Vista), 2030 (5 years beyond build-out) and 2035 (10 years beyond build-out) horizons at the intersections of Grey Road 21 (Osler Bluff Road) with Grey Road 19, Monterra Road and the proposed site access. In addition to Blue Vista traffic, future traffic volumes considered overall growth in the area plus traffic associated with other area developments either under construction or in the planning stages, including:

- additional commercial and residential development at the Blue Mountain Village;
- Manorwood Blocks 152 and 153;
- Monterra Phase 2;
- Mountain House;
- Plateau East;
- Second Nature; and
- Windfall.
Planned Road Improvements

The following road system improvements have been previously identified and were considered in this review:

- provision of a roundabout at the intersection of Grey Road 19 and Grey Road 21 for the time period 2020-2021; and


The above noted roundabout is expected to be the same size as that at Grey Road 19 / Grey Road 119 / Gord Canning Drive, thus providing consistency along the Grey Road 19 corridor.

Traffic Operations

In addressing the study area traffic operations, the intersections of Grey Road 19 (Osler Bluff Road) with Grey Road 21 and Monterra Road were analysed under existing conditions (2018) and for the 2025, 2030 and 2035 horizon periods. The results of the operational analyses indicate that the study area intersections will provide good overall operations through 2035 under both future background and future total conditions. The operations at the site access point on Grey Road 21 (Osler Bluff Road) was also reviewed and is expected to provide excellent conditions (LOS B or better) through 2035.

The capacity of the adjacent road network was reviewed under background conditions. With projected volumes expected to exceed the planning capacity on Grey Road 19, the long-term need for additional road capacity (i.e. additional lanes) was confirmed, while Grey Road 21 (Osler Bluff Road) is expected to operate well below capacity through the 2035 horizon. It is noted that additional lane capacity on Grey Road 19 through the study area was also identified in *The Town of The Blue Mountain Comprehensive Transportation Strategic Plan* and the *Blue Mountain Resort South Base & Orchard Expansion, Town of The Blue Mountains, Traffic Impact Study*.

Turn Lane Requirements

The intersection of Grey Road 21 (Osler Bluff Road) with the proposed site access point were reviewed with respect to the need to implement exclusive turn lanes to accommodate the projected traffic volumes. While a right turn lane is not warranted at the noted intersection, a northbound left turn lane on Grey Road 21 is warranted under 2030 total conditions. It is noted that the timing of such should be confirmed through ongoing monitoring, recognizing that the assessment considers fairly conservative background growth assumptions.

Sight Line Review

Sight lines were reviewed on Grey Road 21 (Osler Bluff Road) at the proposed Site Access. The available sight distances exceed the minimum stopping sight distance requirements for a design speed
of 70 km/h. As such, vehicles manoeuvring to/from the development can do so in a safe and efficient manner and no further improvements to address sight lines are required.
Utilities

Electrical Service

Hydro One was contacted to determine the availability of hydro services to the development area. Confirmation that the current system on the east side of Grey Road 21 (Osler Bluff Road) has capacity for the proposed units is still required.

Gas Service

Union Gas confirmed that there is a natural gas main in the area. Confirmation of the capacity in the current system to provide service to the proposed subdivision development is still required.

Telephone & Internet Service

Bell Canada has confirmed that there is servicing in this area and has confirmed their intention to service the development site.

Rogers Communications Inc. has confirmed their intention to provide telecommunication services to the proposed development.
8 Summary

Based on the preceding analysis, the development has adequate services available to support the draft plan of subdivision, including the potential increase in lot count from 133 units to 180 units. Specifically, the proposed servicing includes:

1. an internal sanitary sewer collection system to convey sewage to the existing trunk sewer on Grey Road 21 (Osler Bluff Road) and ultimately to the Craigleith Sewage Treatment Plant;

2. an internal water distribution system to supply the needs of the development without the need for external improvements;

3. an internal storm sewer collection system to convey surface water runoff to the proposed stormwater management facilities that will provide the requisite SWM quantity and quality controls for the development; and

4. electrical, telephone, cable and gas utilities.

Detailed design drawings will be completed for both internal services and the Grey Road 21 (Osler Bluff Road) access, for approval by the Town, County and relevant approval agencies as required in support of draft plan approval and registration of the associated Subdivision Agreement.

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Vice President Head Office Operations

Holly Clayton, B.Sc., EIT  
Intern Engineer

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SECOND NATURE DEVELOPMENT (PHASE 3)

WINDFALL DEVELOPMENT (PHASE 4B)

MONTERRA GOLF COURSE

STREET 'A'
STREET 'B'
STREET 'C'
STREET 'D'

INTERMITTENT WATERCOURSE

STORMWATER MANAGEMENT BLOCK

LA SCANDINAVE SPA

GREY RD 21 (OSLER BLUFF ROAD)

MONTERRA GOLF COURSE

STORMWATER MANAGEMENT BLOCK

LA SCANDINAVE SPA

GREY RD 21 (OSLER BLUFF ROAD)

MONTERRA GOLF COURSE

STORMWATER MANAGEMENT BLOCK

LA SCANDINAVE SPA

GREY RD 21 (OSLER BLUFF ROAD)
SECOND NATURE DEVELOPMENT (PHASE 3)

WINDFALL DEVELOPMENT (PHASE 4B)

LA SCANDINAVE SPA

MONTERRA GOLF COURSE

STORMWATER MANAGEMENT BLOCK

STREET 'A'

STREET 'B'

STREET 'C'

STREET 'D'

GREY RD 21 (OSLER BLUFF ROAD)

LA SCANDINAVE SPA

OVERALL STORM SEWER PLAN

C.C. Tatham & Associates Ltd.
Consulting Engineers

Collingwood  Barrie  Orillia  Barrie  Ottawa

SCALE 1: 2,500

FIG-5

DRAFT PLAN APPROVAL  NOV/18

REVISIONS

DATE

1

DESIGN

JPA

CHECKED

RS

DRAWN

RD

DATE

LOR NO

177159

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owner/client and the engineer without the
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Ltd.
APPENDIX A:
SANITARY SERVICING ATTACHMENTS
# Grey County Road 21 - Trunk Sanitary Sewer Design Sheet

**C.C. Tatham & Associates Ltd.**

Consulting Engineers

**Cellingwood Road Bridge Oshawa Balam**

**Flow Criteria:**
- Average Flow Rate: 125,000 litres
- Infiltration (Avg): 90 litres per day
- Infiltration (Peak): 227 litres per day
- Population: 2.5 inhabitants
- Peaking Factor: Harmon

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**Flow Rate:**

- Residential: 80 litres
- Infiltration: 10 litres
- Total: 90 litres

**Velocity:**

- Peak Flow: 2.5 m/s
- Average Flow: 1.2 m/s

**Pipe Diameter:**

- 2700 mm

**Length of Pipe:**

- 375 m

**Flow Rate:**

- Residential: 75 litres
- Infiltration: 10 litres
- Total: 85 litres

**Velocity:**

- Peak Flow: 2.5 m/s
- Average Flow: 1.2 m/s

**Pipe Diameter:**

- 2700 mm

**Length of Pipe:**

- 375 m
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Notes:
1. Flow criteria based on the MOE Design Guidelines included in the Class EA for Creiglels Sewage Treatment Plant Expansion Environmental Study Report (May 2009)
2. Flow calculated for MOP 93. Price and Windfall based on Windfall Master Servicing Sanitary Sewer Design Sheet and Tirs criteria for residential and commercial flows.
3. Total peak flow generated by La Scandinave Spa based on Part 7 of the Ontario Building Code. The calculated peak flow is used as an average flow to be conservative. See attached summary and design sheet for more information.
### Preliminary Sanitary Sewer Design Sheet

**Flow Criteria**

- **Average Flow Rate:** 450 l/cap/d
- **Infiltration Rate:** 0.23 l/s/ha
- **Population:** 2.3 cap/unit
- **Peaking Factor:** Harmon

**Project Details**

- **Project Name:** BlueVista
- **Project Number:** October 7, 2220
- **Municipality:** Town of The Blue Mountains
- **Designed By:** ARO
- **Date:** Nov 30 2018
- **Checked By:**
- **Date:**
- **Revision Number:**

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### Notes:

1. Refer to Overall Sanitary Drainage Plan Figure FIG-3 prepared by C.C. Tatham and Associates for catchment areas.
March 13, 2012

Reg Russwurm
Director of Engineering and Public Works
Town of The Blue Mountains
32 Mill Street
P.O. Box 310
Thornbury, ON N0H 2P0

Re: Grey County Road 21 Trunk Sanitary Sewer Outlet Capacity

Dear Reg:

1.0 Introduction

Further to the Project Initiation Meeting on February 24, 2012, we have prepared the following technical summary in support of the Grey County Road 21 (GR 21) Trunk Sanitary Sewer project.

The primary purpose of this summary is to provide background for the areas included on the sanitary sewer design sheet and to assess the capacity of the downstream sanitary sewer along Highway 26 in order to determine the approximate number of additional units from the Windfall and surrounding properties that can be accommodated before the trunk sanitary sewer north of Highway 26 and the lift station at the sewage treatment plant are required.

We have also provided an overview to address the Town's comments with respect to the depth of the trunk sewer and the ability to extend the sewer to service the future developments south of the Mountain Road.

2.0 Unit Allocation

In order to estimate the sanitary sewage flows for the service areas contributing to the GR 21 trunk sewer, various municipal documents were reviewed. The following list summarizes the sources for the service areas shown on the overall Sanitary Contribution Area Plan (SAN-1):

Castle Glen: Development Plan and Combined EA Master Servicing Plan (June 2006)

Osler Lands: Combined EA Master Servicing Report
Deferred Development (1 & 2): Official Plan – DD designation – Assumed 75% of area would be developed (excluding EP & slope lands) at a rate of 5 units/ha.

Town of Collingwood: Town request to service only lands fronting on the Town line (GR's 19 & 21)

Medium Density adjacent to Price Subdivision: Official Plan

Price Subdivision: Actual lot count

Georgian Gate (Windfall): Initial Plan of Subdivision (Draft Plan and future medium density)

Le Scandinave Spa: Building Code

Nederend Property: Assumption similar to adjacent lands

Plateau East (Intrawest): Draft Plan

RR-50: Assumption based on comparison to Plateau East

Monterra Phase 2: Draft Plan

The total unit count of 4,622 shown on Drawing SAN-1 was used to develop the overall sanitary sewer design sheet for GC 21.

3.0 Temporary System Capacity

The "short term sewage servicing alternative – 4 'B'" as described in Section 8.2.2 of the Combined EA Master Plan for Craigleith, Castle Glen and Osler (June 2006), relies on the existing 300 mm diameter sanitary sewer between GR 21 and Timmins Road to provide the initial capacity until such time as the section of trunk sewer north of Highway 26 and the lift station at the plant are required.

We have reviewed the record drawings provided by the Town for the existing 300 mm diameter sanitary sewer between GR 21 and Timmins Road. The 300 mm dia. sewer east of Timmins Road between San MH 56 to San MH 66 has been installed at an average slope of 0.22% for the first 863 m. Although the drawings show some sewer sections at flatter slopes we believe it is reasonable to use the average slope in this section to calculate the available capacity. The sewer increases in slope east of San MH 66, to approximately 0.5%, to San MH 69 where the GR 21 sewer will connect. The capacity of a 300 mm diameter sewer at 0.22% is calculated to be 45.35 L/s for a pipe coefficient n=0.013. Although 0.013 is a generally accepted coefficient for sanitary sewers, the literature suggests that a coefficient of 0.011 to 0.009 is appropriate for PVC pipe. Applying these would produce a capacity for this pipe in the range of 54 L/s to 66 L/s.

There are currently approximately 38 parcels of land connected on the south side of Highway 26 and 7 on the north for a total of 45 parcels. Included in these 45 parcels is a motel converted to a condominium, plus 2 motels and two other commercial operations. Conservatively, we estimate a total of 75 equivalent units are currently or could be directly connected to the existing 300 mm diameter sanitary sewer between GR 21 and the Timmins Road sewer (750 dia. trunk).
3.1 Estimated Flow Per Unit

In order to estimate future overall sanitary sewage generation rates, MOE design guidelines as presented on page 12 of the Class Environmental Assessment for the Craigleith Sewage Treatment Plant Stage 3 Expansion (2009) were considered. The assessment uses an average flow rate of 1,125 L/unit/day (450 L/cap/day x 2.5 cap/unit) plus 225 L/unit/day for infiltration or a total of 1,350 L/unit/day. Considering the peak season average flows presented in Table 3 on page 7 of the assessment which shows the average daily flow of 890 L/unit/day, the above noted design criteria of 1,350 L/unit/day could be reduced by .34%.

In order to estimate the peak flow per unit we have considered the flows calculated using the Windfall Sanitary Sewer Design Sheets which was based on the Town of the Blue Mountains Engineering Standards. The Town standards apply an average flow rate of 1,035 L/unit/day (450 L/cap/day x 2.3 cap/unit) plus 0.23 L/s/ha for infiltration. The service area contributing to the 300 mm diameter sewer connecting Windfall to GR 21 at MH E29 includes a total of 1,071 equivalent units for a total population of 2,463 with a calculated peak flow of 57.95 L/s or 0.054 L/unit/s. A copy of the Windfall Sanitary Sewer Design Sheet is attached.

The overall trunk sewer design sheet uses similar per capita flows based on MOE design guidelines presented on page 12 of the Class Environmental Assessment for the Craigleith Sewage Treatment Plant Stage III Expansion (2009) (excluding the Windfall connection) of 1,125 L/unit/day (450 L/capita/day x 2.5 capita/unit) and peak infiltration of 227 L/capita/d. The resulting peak flow for 4,622 equivalent units was thus calculated to be 267.44 L/s or 0.058 L/unit/s. A copy of the GC 21 Trunk Sanitary Sewer Design Sheet is enclosed.

3.2 Available Capacity

By comparing the design flows to the historical flow data at the plant, it is reasonable to assume that the range of peak flows to use to establish the available capacity is in the range of 0.054 L/unit/s to 66% of design flow or 0.036 L/unit/s.

Assuming the overall capacity of the existing 300 mm dia. sewer on Highway 26 is 45.35 L/s, the capacity in terms of units would range from 840 to 1,260 units.

Considering the existing Highway 26 frontage already conveys sewage flows from approximately 75 equivalent units, the capacity in terms of units available for the GR 21 trunk sewer would be in the range of 765 to 1,185.

Assuming a growth rate of 60 units per year, the extension of the larger sewer will not be required for at least 12 years and likely over 20 years depending on the per capita flow being generated and the rate of development.
3.3 Monitoring

In light of all the variables involved in these calculations (occupancy rate, per capita flows, peaking factors, and sewer design coefficient) we recommend that a sewer flow monitoring program be established to check flows during the peak winter period starting in approximately 5 years and then repeating every 3 to 5 years depending on the results. By monitoring the actual flow to calculate the sewer capacity combined with knowing the actual number of connections, the Town can determine well in advance when the trunk sewer extension and lift station will be required.

4.0 Future Developments South of Windfall Development

In addition to the plan-profile drawings included with the submission, we have included drawing PP-10 which shows a future trunk sanitary sewer adjacent to the Windfall development from San MH E29 to San MH 32 at the intersection of GR 21 to GR 19 (Mountain Road). The future sanitary sewer at San MH E32 has the potential to be over 6 m in depth.

The road continues to rise to the south at an average grade of approximately 0.66% to the 6th Street intersection after which the grade increases. We also considered the need to cross under a significant culvert located approximately 1,200 m south of Mountain Road and determined that the proposed pipe and grade are appropriate. A more detailed assessment can be made at the time the sewer is extended, but at this time the design is considered conservative. We have included copies of the plan and profile sheets that were prepared in 1989 which have been marked up to demonstrate the grades shown on the sewer design sheet.

We trust you will find the above satisfactory. Should you require more detailed calculations please let us know.

Yours truly,

C.C. Tatham & Associates Ltd.

Original Signed by

Larry Hogarth, C.E.T.
Senior Municipal Technologist

Original Signed by

Kevin Sansom, B.A.Sc., P.Eng.
Project Manager

I:\2012 Projects\112006 - Grey County Road 21\Documents\L- Reg Russwurm, March 13, 2012.doc
## Grey County Road 21 - Trunk Sanitary Sewer Design Sheet

**C.C. Thatham & Associates Ltd.**  
Consulting Engineers

Collingwood  Brontebridge  Orillia  Barrie

### Flow Criteria (See Note 1)

- Average Flow Rate: 1125 gpd
- Infiltration (Avg): 90% gpd
- Infiltration (Peak): 227% gpd
- Population: 3,500 capita
- Peaking Factor: Harmon

**Project Name:** Trunk Sanitary Sewer  
**Project Number:** August 31, 2006  
**Municipality:** Town of The Blue Mountains  
**Designed By:** JPA / P.W.  
**Date:** September 22, 2011  
**Checked By:** KRS  
**Date:** February 5, 2012  
**Revision Number:** 1

### Location of Section

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### Table Annotation

- **MH No.:** Manhole Number
- **Number Outlets:** Total number of outlets
- **Population:** Total population
- **Accumulated Population:** Accumulated population
- **Peak Flow:** Peak flow rate
- **Average Flow:** Average flow rate
- **Length of Pipe:** Length of pipe
- **Diameter:** Pipe diameter
- **Grade:** Grade of the system
- **Full Flow Capacity:** Full flow capacity
- **Full Flow Volume:** Full flow volume
- **Construction Activities:** Construction activities
- **Estimated Cost:** Estimated cost

### Notes

1. [Note 1](#)
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Notes:
1. Flow criteria based on the MOE Design Guidelines included in the Class EA for Craigleith Sewage Treatment Plant Expansion Environmental Study Report (Nov. 2008).
3. Total peak flow generated by Le Scandinave Spa based on Part 7 of the Ontario Building Code. The calculated peak flow is used as an average flow to be conservative. See attached summary and design sheet for more information.
# Master Servicing - Sanitary Sewer Design Sheet

## Location of Section

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### Notes:
1. Refer to Master Servicing Sanitary Drainage Plan drawing SAN-1 prepared by C.C. Tatham and Associates for catchment areas.
APPENDIX B:
WATER SUPPLY AND DISTRIBUTION ATTACHMENTS
### WATERCAD MODEL DEMANDS - BUILD-OUT

**Nederan Subdivision**  
**Town of The Blue Mountains**  
**File No. 117159**

**December 2, 2018**

**Proposed Residential Unit (ppu) 2.30 TOBM**

**Single Family Consumption Rate (L/day)**  
450 TOBM

**Minimum Residential Fire Flow - Single family unit (L/s)**  
168.67 TOBM

**Max Day Factor**  
2 TOBM

**Peak Hour Factor**  
4.5 TOBM

**Maximum Velocity (m/s)**  
5 TOBM

**Total Number of Units**  
180

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<th>ADD (L/s)</th>
<th>MIN HR (m³/d)</th>
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<th>PEAK (m³/d)</th>
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**Development & Design Criteria**

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**Nederan Water Demand Calculations**

**WaterCAD demands - Build-out 12/11/2018**

1 of 1
Summary of the modelling results:

**Minimum Hour Demand (MinHD)**

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<th>HGL (m)</th>
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Total MinHD 1.40 L/s

**Maximum Daily Demand (MDD)**

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Total MDD 4.32 L/s

**Peak Hour Demand (PHD)**

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Total PHD 5.72 L/s

**Available Fire Flow (AFF)**

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<th>Elevation (m)</th>
<th>AFF (L/s)</th>
<th>HGL (m)</th>
<th>Pressure (kPa)</th>
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Total AFF 5.72 L/s

**Pipe**

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<th>Roughness</th>
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* Hazen-Williams "C"
Scenario: Future MinHD
Scenario: Future ADF Base
Scenario: Future Max Day
Scenario: Future MDD with AFF
Scenario: Future Max Day with Fire @ J-82