



April 17, 2020
RS# 2019-195

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SUBJECT: Tree Inventory, Assessment and Preservation Plan, 2 Arbour Trail, City of Barrie.

BACKGROUND

RiverStone Environmental Solutions Inc. (hereafter, “RiverStone”) was retained to prepare a *Tree Inventory, Assessment and Preservation Plan* to support a development application in the City of Barrie (hereafter, “the City”). The land subject to the proposed development (hereafter, “subject property”) is located at 2 Arbour Trail in Barrie (**Figure 1**).

Per Schedule A of the City’s Official Plan (Office Consolidation January 2018), the subject property is designated “Residential” with no Natural Heritage designations indicated on Schedule H (Natural Heritage Resources). The north portion of the property falls within the regulation limits of a Conservation Authority (Schedule F). Based on a review of the City of Barrie Zoning Bylaw 2009-141 (Office Consolidation December 2017), the subject property is currently zoned Residential (R1), with the Zoning By-law Amendment proposing rezoning the south portion of the property to Residential (R2). The property is 0.2 ha in size and currently contains a residential dwelling with attached garage and boathouse. The yard is highly manicured containing mown yard and mature trees along the west and north property boundaries and younger trees along the east property boundary. The property is situated within a residential community with waterfront residential lots to the east, road right of way to the west, and conventional residential dwellings in the backlot. To the east of the road right of way a private beach and marina are located.

It is our understanding (based on the site plan provided) that that the applicant is currently seeking to sever the existing 0.2 ha lot into a retained lot (0.14 ha) and a new lot (0.06 ha). A new single use residential dwelling is proposed for the new lot. Given that the current zoning is R1, a zoning change of the south portion of the property to R2 is required given the proposed size of lots. Based on communications with planning staff at the City of Barrie, the City requires the completion of Tree Inventory, Assessment and Preservation Plan to determine what trees may be impacted as part of the proposed development, as well as provide protection measures for those that are to be retained.

Riverstone’s on-site tree inventory was conducted in a manner consistent with the City of Barrie *Tree Protection Manual* (Version 4, Revised January 2019). A Natural Heritage Evaluation report has also been prepared by RiverStone to support the development application under a separate cover.

APPROACH AND METHODS

Background/Site Investigation

Prior to undertaking the site visit the tree preservation policies as they relate to the subject property were reviewed. The property survey, site plan drawings, and correspondence from the City was also considered. The limits of study were restricted to the confines of lot boundaries, road allowances, and boundary trees. The tree inventory and health assessment was carried out on December 13, 2019, by C. Mann (Ecologist/ISA-certified Arborist). All trees 10 cm diameter at breast height (DBH) or greater (including multi-stemmed trees where total DBH exceeded 10 cm), were inventoried and assessed. Such trees were: (1) inventoried using metal number-stamped tags, (2) identified to species, (3) measured at approximately 1.37 metres above ground with a diameter tape, (4) assessed for defects and indicators of decline (e.g., open wounds, broken branches, etc.), and (5) digitized with a high-accuracy GPS (**Figure 2**). Based on the information collected, an overall visual assessment of tree health and structural integrity is provided, supported by preservation/removal direction based on their health, other attributes, and location on the subject property. Notwithstanding the above, it must be recognized that all trees (in good health or otherwise) have the potential for failure given adverse weather, damage due to mechanical injury, or other factors that cause stress. A general assessment of trees that occur on adjacent lands within 6 m of subject property boundaries also occurred during the tree inventory. Trees assessed in this Tree Inventory, Assessment and Preservation Plan were observed to occur as landscape trees with compensation calculated accordingly.

Impact Assessment

Trees may be negatively impacted during grading, construction, and other activities associated with implementation of the proposed development plan via the following pathways:

- Direct tree removal in areas where trees conflict with the development envelopes or areas of site alteration (e.g., grading, etc.);
- Mechanical injury to the trunk, roots, branches, and/or foliage during construction activities;
- Soil compaction within the rooting zone; and
- Smothering or exposure of roots due to changes in grade.

A graphic depicting the proposed building plan was provided to RiverStone by Innovative Planning Solutions (prepared by M.K. & Company, dated February 25, 2020). Based on this figure, RiverStone has illustrated the proposed development plan graphically in **Figure 3**.

Applicable Tree Protection Policies

This study has been conducted in accordance with Section 3.1 of the City of Barrie *Tree Protection Manual* (Version 4, Revised January 2019). This manual provides guidance for the assessment and protection of trees located on city property and adjacent lands during new development proposals wherever practical and feasible.

TREE INVENTORY AND HEALTH ASSESSMENT

The results of the tree inventory and health assessment are provided in **Appendix A**. The locations of all tagged and assessed trees specifying those > 10 cm DBH are shown in **Figure 2**.

Eighteen (18) trees >10cm DBH were tagged and assessed. Norway Spruce (*Picea abies*) was the most abundant tree assessed followed by Red Maple (*Acer rubrum*) and White Spruce (*Picea glauca*) all within the manicured area of the subject property. Overall, individuals are in good to fair health, with some exhibiting a range of defects. For safety reasons, the property owner should be reviewing these trees regularly to ensure the trees for

decline to prevent hazards in the future. No Butternut (*Juglans cinerea*) were observed on the subject property, or on neighboring property during the field assessment.

The majority of trees were determined to be boundary trees with either the trunks of the trees or large portions of the tree canopies being on both the subject property and neighboring properties. If work within the dripline of these trees is required, discussions with the associated neighbouring landowner is recommended. Eight (8) boundary trees (211, 212, 213, 214, 215, 216, 217, 218) were located along the Cox Mill Road Boulevard and the west property boundary. Of these trees, all but one (214) have trunks partially on both properties. The trunk of tree 214 is solely on the subject property however, a large portion of branches are on the neighboring city property. Along the east property line seven (7) trees (223, 222, 224, 225, 226, 227, 228) are boundary trees with 223, 222, 224 having trunks solely on the neighbouring property and trees 225, 226, 227, 228 having trunks on the property boundary. One (1) additional tree is present along the property boundary but the diameter is below the 10 cm threshold and was not included in the inventory. Based on the current development plan (dated February 25, 2020 by M.K. & Company) there are no direct requirements for tree removal. However, due to the assessed structural condition of tree 213 and the anticipated amount of root damage that may occur during the construction of a new driveway off Cox Mill Road to connect the existing garage (**Figure 3**), tree 213 may require removal and should be monitored by the landowner for signs of decline. Additionally, the canopy and roots of some boundary trees may be impacted during the proposed development.

IMPACT ASSESSMENT AND RECOMMENDATIONS

Existing trees within the subject property may be negatively impacted during grading, construction, and other activities associated with implementation of residential development activities via the following pathways:

- Direct tree removal in areas where trees conflict with building envelopes or areas of site alteration (e.g., grading of building site and driveways, etc.);
- Mechanical injury to the trunk, roots, branches, and/or foliage during construction activities;
- Soil compaction within the rooting zone; and
- Smothering or exposure of roots as a result of changes in grade.

Figure 3 provides an overlay of the proposed building siting with RiverStone's tree preservation/removal direction. Based on discussions with the project team RiverStone one (1) tree may need to be removed during the project, as noted in **Appendix A**. In accordance with City of Barrie policy, consultation with neighbours would be required if work around boundary trees is to occur. As no grading limit was specifically defined, it was assumed that all trees within 3 m of the development may experience some damage to canopies and roots. These include trees 212, 212, 214, for the construction of a new driveway off Cox Mill Road into the existing garage and construction of a new dwelling and trees 224, 225, 226, 227, 228 during the removal of the existing driveway and site grading. The tree protection zone (TPZ) extends from the outside edge of the tree base. Based on the development plan provided only trees 212 and 214 have canopies that extend over walkways, driveways, and the proposed dwelling.

All trees that were inventoried were given a tree protection value as outlined in the City of Barrie Tree Protection Manual. Based on Step 9 of the manual, there are no endangered species and/or habitat or heritage trees on the subject property. Eight (8) boundary trees (211, 212, 213, 214, 215, 216, 217, 218) were located along the west property boundary and an additional seven (7) trees (223, 222, 224, 225, 226, 227, 228) along the east property boundary. These bordering trees either have canopy, or part-of or all the tree trunk growing on or overhanging the subject property. Consultation with neighbours would be required if work around boundary trees is to occur. All trees that occur along the east and west property boundaries have been given protection value of 2 until consent for removal has been secured. The City of Barrie's tree compensation plan is based on several factors including the health of the tree, species of tree, location of tree and current size of tree. For

coniferous trees, the compensation cost is \$400 for a nursery tree plus one hundred and sixty dollars per metre of tree height. These numbers are then multiplied by a score factor for health, species, and location from the City of Barrie *Tree Protection Manual* (Version 4, Revised January 2019).

In accordance with the City of Barrie tree compensation plan, should tree 213 require removal a total of \$1722.00 compensation would be required. The compensation by individual tree is shown in **Appendix A**.

In addition to the trees planned for removal, it is important to note that construction activities adjacent to trees being retained may cause indirect disturbance such as compaction of soils near the root zone or movement of branches within the dripline area. Due to the proximity of the proposed development to the driplines of trees to be retained these specimens require protection measures to be implemented. To guide the preparation of final building permit drawings for the subject property, RiverStone recommends the following measures:

- **Prior to removal of any trees, along the east or west property boundaries, consent from adjacent landowner will be required.**
- **Detailed redevelopment and grading plans for subject property consider all trees recommended for retention on Figure 3 as design constraints.**
- **At a minimum, tree protection fence should be installed for all trees along the boundary of the property growing on adjacent land for the duration of the proposed development and tree protection zones shall be established for all trees not approved for removal on the subject property. Tree protection zones are to be placed at a minimum distance from trees according to individual minimum tree protection zones shown in Appendix A. No site alteration activities (e.g., grading, etc.), machinery movement, or storage of any equipment or materials should occur within the tree protection fencing.**
- **Where tree protection fence cannot be installed at the limit of the tree protection zone, tree protection should be established as far from the tree as practical. Alternative protection may be required (e.g., mulch layers, protection pads, etc.)**
- **In the event of mechanical injury to any trees recommended for retention and/or their branches, or if pruning is required to provide clearance for construction machinery, the following actions are recommended:**
 - **Prune damaged limbs cleanly and according to standard arboricultural practices.**
 - **Prune damaged roots that have been exposed cleanly and according to standard arboricultural practices.**
 - **Trim loose bark but avoid enlarging any open wounds.**
- **Tree or vegetation removal and other disturbances outside of the development envelopes should be minimized to the extent possible.**
- **Any necessary tree or shrub removal should be completed outside of the primary breeding bird nesting window (i.e., between April 1 and August 31). If vegetation removal occurs during this period, a nest survey should be conducted by a qualified biologist within 5 days of commencement of construction activities to identify and locate active nests of bird species (where present) covered by the federal *Migratory Bird Convention Act, 1994* or provincial *Fish and Wildlife Conservation Act, 1997*. If a nest is located or evidence of breeding noted, a mitigation plan should be developed to avoid any potential impacts on birds or their active nests. Mitigation may require establishing appropriate buffers around active nests or delaying construction activities until the conclusion of the nesting season.**
- **Any necessary replacement tree plantings should consist of native species suitable to site conditions (e.g., light, moisture, etc.). Some examples of tree species suitable for replanting onsite include (but are not limited to) Sugar Maple, Bitternut Hickory, Ironwood and American Beech.**

CITY OF BARRIE TREE PROTECTION MANUAL

Provided that RiverStone's proposed recommendations and mitigation measures outlined herein are implemented in full, we believe that this tree inventory and preservation plan meets the requirements of the City of Barrie Tree Preservation Guidelines.

Please contact us if there are any questions regarding the report, or if further information is required.

Best regards,

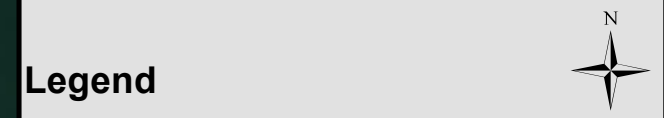
RiverStone Environmental Solutions Inc.



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Craig Mann, H.B.Sc.F., Diplo. IFRM
Ecologist and ISA Certified Arborist (ON-2369A)



Legend
Ontario Base Mapping (OBM)
 — Roads
Planning Boundaries
 [Yellow dashed box] Subject Property

Orthorectified aerial photo - spring 2018

Scale	RS Project No.	Date Last Updated	By
1:2,000	2019-195	Apr 16, 2020	JG

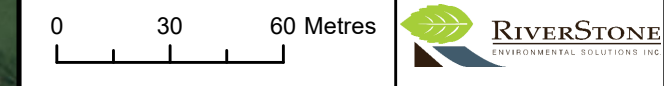


Figure 1. Location Of Subject Property.
 2 Arbour Trail, City of Barrie.

Prepared for Innovative Planning Solutions.

Inset: General Location Of Subject Property

Disclaimers:

- the scale text on this figure (e.g., 1:1000) is based on a 11x17" print. If this figure has been printed on a different page size, then only the scale bar is accurate.
- figure should not be used in place of a professional survey



Legend

Ontario Base Mapping (OBM)

— Roads

Planning Boundaries

▭ Subject Property

Features with Recognized Natural Heritage Value - Identified by the Province or the Relevant Approval Authorities

▭ LSRCA Regulated Area

Tree Inventory

⊕ Tree Assessed



Location of assessed trees based on the survey provided by Innovative Planning Solutions

Orthorectified aerial photo - spring 2018

Scale	RS Project No.	Date Last Updated	By
1:300	2019-195	Apr 16, 2020	JG

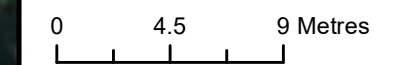


Figure 2. Tree Inventory.
2 Arbour Trail, City of Barrie.

Prepared for Innovative Planning Solutions.

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Legend

Ontario Base Mapping (OBM)

— Roads

Planning Boundaries

▭ Subject Property

Features with Recognized Natural Heritage Value - Identified by the Province or the Relevant Approval Authorities

▭ LSRCA Regulated Area

Features Taken from Existing Survey

▭ Garage

▭ Primary Residence

Tree Preservation Plan

⊕ Boundary Tree - Retain

⊕ Boundary Tree - Potentially Remove

⊕ Retain Tree

Development Setbacks Required by Relevant Approval Authorities

○ Tree Protection Zone*

Proposed Development and Site Alteration

▭ Lot Line

▭ Building Envelope for Primary Residence

▭ Driveway

▭ Walkway

▭ Open Porch

Note:
Tree Cutting Will Be Restricted To Times Outside The Migratory Breeding Bird And Bat Maternal Roosting Periods

*Tree Protection Zone – Based on City of Barrie Tree Protection Manual (v.4, Revised January 2019)

Orthorectified aerial photo - spring 2018

Scale	RS Project No.	Date Last Updated	By
1:300	2019-195	Apr 16, 2020	JG

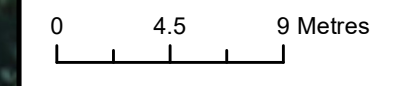


Figure 3. Tree Preservation Plan:
Site Features, Proposed Development, Constraints, Recommendations.
2 Arbour Trail, City of Barrie.

Prepared for Innovative Planning Solutions

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Appendix A. Tree Inventory



Tag No.	Common Name	Scientific Name	DBH (cm)	Height (m)	Min. Tree Protection Zone (m)	Crown Radius (m)	Tree Health	Structural Condition	Defects and Decline Indicators	Preservation Value ¹	Protection Level ¹	Health Factor	Species Factor	Location Factor	Height Based Cost	Replacement Cost (If removed)
211	Norway Spruce	<i>Picea abies</i>	65.2	22.0	3.0	5.0	good	good	pruned lower branches, some die back, pitch nodules, pruned lower branches	High	1	0.5	1	0.9	22	Retain
212	Norway Spruce	<i>Picea abies</i>	60.8	21.5	3.0	5.0	good	good	some die back, pitch nodules, pruned lower branches - possibly on neighbours no tag	High	1	0.5	1	0.9	21.5	Retain
213	Norway Spruce	<i>Picea abies</i>	71.5	20.5	3.0	5.0	good	poor	broken top at ~14 m, seam from base into crown, some die back	Medium	1	0.5	1	0.9	20.5	1722
214	Norway Spruce	<i>Picea abies</i>	54.3	22.0	2.5	5.0	good	good	some die back, pitch nodules, pruned lower branches - possibly on neighbours no tag	High	1	0.5	1	0.9	22	Retain
215	Norway Spruce	<i>Picea abies</i>	59.3	13.5	2.5	3.0	fair	fair	missing top, some dieback, pitch nodules, pruned lower branches, satalite in tree	Medium	1	0.5	1	0.9	13.5	Retain
216	Norway Spruce	<i>Picea abies</i>	60.5	19.0	3.0	5.0	fair	good	die back due to adjacent tree, large lateral branches, pruned lower branches	High	1	0.5	1	0.9	19	Retain
217	Norway Spruce	<i>Picea abies</i>	57.3	18.0	2.5	36.0	fair	fair	stem split at ~2.5 m, seam 1 to 2.5 m with bark inclusion, die back due to adjacent tree, pruned lower branches	Medium	1	0.5	1	0.9	18	Retain
218	Norway Spruce	<i>Picea abies</i>	59.2	21.0	2.5	4.0	good	good	Some die back, pitch nodules, pruned lower branches	High	1	0.5	1	0.9	21	Retain
219	Norway Spruce	<i>Picea abies</i>	35.8	N/A	2	4.0	fiar	good	some die back, Riverbank Grape growing up tree, light attached to tree	High	2	0.5	1	0.9	N/A	Retain
220	Norway Spruce	<i>Picea abies</i>	47.4	N/A	2.5	5.0	good	good	some die back, pruned lower braches	High	2	0.75	1	0.9	N/A	Retain
221	Norway Spruce	<i>Picea glauca</i>	67.2	N/A	3	7.0	good	good	some die back in top of tree, pruned lower branches	High	2	0.75	1	0.9	N/A	Retain
222	Norway Maple	<i>Acer platanoides</i>	48	N/A	2.5	4.5	good	good	tar spot, fubbing branches, pruned branches	high	2	0.5	1	0.9	N/A	Retain
223	Norway Maple	<i>Acer platanoides</i>	56.2	N/A	2.5	6	good	fiar	tar spot, split at 2.5 m, bark inclusion - no tag possibly on neighbours property	high	1	0.5	1	0.9	N/A	Retain
224	Red Maple	<i>Acer rubrum</i>	47.2	N/A	2.5	5.0	good	poor	multiple branched at 2.0 m, seam in bark with possible rot, bark inclusion, raised root ball - no tag possibly on neighbours property	Medium	1	0.75	0.8	0.9	N/A	Retain
225	Red Maple	<i>Acer rubrum</i>	47.4	N/A	2.5	4.5	good	fair	multiple stems at 1.75 m, bark inclusion, raised root ball, root flare wounds - possibly on neighbours no tag	Medium	1	0.75	0.8	0.9	N/A	Retain
226	Red Mpale	<i>Acer rubrum</i>	24.5	N/A	1.5	4.0	good	fair	large lateral branch, some die back, bark inclusion - possibly on neighbours no tag	Medium	1	0.75	0.8	0.9	N/A	Retain
227	White Spruce	<i>Picea glauca</i>	26.0	12.0	2.00	3.0	fair	good	some die back, pitch nodules, pruned lower branches - possibly on neighbours no tag	Medium	1	0.5	0.8	0.9	N/A	Retain
228	White Spruce	<i>Picea glauca</i>	27.9	12.0	2.00	2.5	fair	fair	some die back, split stem at 4.25 m, pitch nodules, orange needles, pruned lower branches	Low	n/a	0.5	0.8	0.9	N/A	Retain

¹per City of Barrie Tree Protection Manual (Version 4, Revised January 2019)