

**CONTRIBUTION AGREEMENT
(the "Agreement")**

THIS AGREEMENT is made in duplicate this day of , 2017 (the "Effective Date")

BETWEEN

Mississippi Valley Conservation Authority
(The "Recipient")

AND

CITY OF OTTAWA
(the "City")

WHEREAS The City recognizes the need to maintain accurate flood plain mapping and its associated regulation limit mapping across the City for use with land use planning, subwatershed studies, storm water management planning, transportation planning, emergency preparedness and other needs ("Municipal Purposes");

AND WHEREAS conservation authorities have been delegated floodplain management responsibilities by the Ontario Ministry of Natural Resources. Within the boundaries of the City there are three conservation authorities that have responsibility for flood plain management; South Nation Conservation Authority (SNCA), the Rideau Valley Conservation Authority and the Recipient (hereinafter collectively the "Conservation Authorities");

AND WHEREAS the majority of the City's floodplain maps were created 20 to 30 years ago and need to be reviewed and updated to ensure that they are consistent with current conditions and information;

AND WHEREAS, the Conservation Authorities have collaboratively prepared *A Proposal for the Review and Maintenance of Flood Plain Mapping within the City of Ottawa*, which is attached as Schedule "A" to this Agreement (the "Proposal");

AND WHEREAS, pursuant to the Proposal the Conservation Authorities have offered to carry out, within their respective territorial jurisdictions, certain flood plain management work for the City in exchange for the City contributing approximately fifty percent (50%) of the cost of that work, as identified in the Proposal;

AND WHEREAS, pursuant to the Proposal the Conservation Authorities have offered to provide the City, *inter alia*;

- certain additional products produced from the information obtained from prior flood plain mapping projects;
- the completion of new or updated flood plain mapping studies for additional watercourses; and

- the maintenance of the flood plain maps and analyses completed by the Conservation Authorities prior to the Effective Date.

AND WHEREAS the Recipient has responsibility for flood plain management activities over the area delineated in Appendix 2 of the Proposal (the “Recipient’s Territory”);

AND WHEREAS the City wishes to retain the Recipient to carry out, within the Recipient’s Territory, the work set out in the Proposal (the “Work” as described below);

AND WHEREAS the parties agree and acknowledge that the City will use the Work and the products produced as part of the Work to assist the City in addressing various Municipal Purposes;

AND WHEREAS the Recipient covenants that it has allocated sufficient funds through its General Levy to carry out the Work;

AND WHEREAS the Parties hereto agree and acknowledge that the City’s financial contribution to the Work is contingent on the annual approval of City Council of the necessary funding for the work and that should City Council withdraw funding for the Work, there shall be no liability on the City under this Agreement or at law, for any loss, injury or damage caused to the Recipient as a result of the withdrawal of the funds.

NOW THEREFORE, the Parties agree as follows:

1. THE AGREEMENT

1.1 In addition to any terms defined within this Agreement or its Schedule, the following terms shall have their respective meanings indicated below:

- 1.1.1 City Contribution – has the meaning ascribed to it in Section 5.1 of this Agreement;
- 1.1.2 City Data – means, *inter alia*, any and all information, data, or documents, whether in electronic or paper form, provided by the City to the Recipient as part of the City’s obligations under this Agreement. Without limiting the foregoing, City Data includes the information provided by the City pursuant to Sections 5.6 and 5.7 of this Agreement. City Data does not include maps, models or other products created by the Recipient using or incorporating City Data.
- 1.1.3 Contract Year – means a period of time during the Term of the Contract beginning on the Effective Date or the anniversary of the Effective Date and extending for three hundred and sixty-five calendar days (or in the case of a leap year, three hundred and sixty-six calendar days). However, the last Contract Year during the Term shall commence on the last anniversary of the Effective Date to occur during the Term and shall end on either the completion of the Work or the sixth anniversary of the Effective Date, whichever date occurs earlier. For greater certainty and as an aid to interpreting this Agreement, Contract Year One shall commence on the Effective Date and extend from the Effective Date for three hundred and sixty-five calendar days and end on the one year anniversary of the Effective Date.

- 1.1.4 Party or Parties – means, depending on the context, either or both of the parties to this Agreement.
 - 1.1.5 Previous Agreement – means the contribution Agreement entered into between the parties hereto in approximately 2012 pursuant to which the Recipient agreed to perform certain flood plain mapping work for the City which included, *inter alia*, completing flood plain mapping for various watercourses within the City of Ottawa.
 - 1.1.6 Recipient’s Contribution – has the meaning set out in s. 4.2 of this Agreement.
 - 1.1.7 Recipient Data – means any and all data, information, files, models or documents, whether in electronic or paper form, provided by the Recipient to the City as part of the Recipient’s obligations under this Agreement. However, the Parties agree and acknowledge that the Recipient’s Data does not include the data, information, files, models or documents, whether in electronic or paper form, which constitute the Work to be completed by the Recipient pursuant to this Agreement. The Parties agree that the intent of this definition is to apply to any data, information, files, models or documents which do not form part of the Work but are provided by the Recipient to the City.
 - 1.1.8 Substantial Completion – means the submission by the Recipient to the City of a draft report for technical review.
 - 1.1.9 Work – is the work and deliverables which the Recipient agrees to perform for the City pursuant to this Agreement and has the meaning ascribed to it in Section 3.1 of this Agreement.
- 1.2 Unless the context otherwise requires or it is otherwise stated, the following rules shall apply to the interpretation of this Agreement:
- 1.2.1 the insertion of headings into this Agreement is for convenience only and shall not affect its interpretation;
 - 1.2.2 the Agreement has been negotiated by each Party with the benefit of legal representation, and any rule of construction to the effect that any ambiguities are to be resolved against the drafting party does not apply to the construction or interpretation of this Agreement;
 - 1.2.3 references to a specified article, Section, Subsection, or Schedule, shall be construed as references to that specified article, Section, Subsection or Schedule of this Agreement;
 - 1.2.4 words importing the singular number include the plural and vice versa and words importing gender include all genders;
 - 1.2.5 the word “person” includes an individual, partnership, association, body corporate, trustee, executor, administrator or legal representative;
 - 1.2.6 the word “dollar” and the “\$” sign refer to Canadian currency;

- 1.2.7 any reference in this Agreement to all or any part of any statute, regulation, by-law or rule shall be construed as a reference to that statute, regulation, by-law or rule or the relevant part thereof, as amended, replaced or re-enacted from time to time;
 - 1.2.8 grammatical variations of any terms defined in this Agreement shall have similar meanings to such defined terms;
 - 1.2.9 the words “including” and “include” shall each mean “including without limitation”, and shall not be construed as limiting any general statement which they follow to the specific or similar items or matters immediately following such words;
 - 1.2.10 any reference to “City” in this Agreement, includes where necessary the City’s employees, agents and subcontractors; and
 - 1.2.11 the recitals form part of this Agreement.
- 1.3 The following are the schedules attached to and forming part of this Agreement (the “Schedules”), to the extent of any inconsistency or conflict among the provisions of the main body of this Agreement and the provisions of any Schedules, the main body of this Agreement shall govern:
- 1.3.1 Schedule “A” – *A Proposal for the Review and Maintenance of Flood Plain Mapping within the City of Ottawa.*
- 1.4 This Agreement together with the Schedules hereto, constitutes the entire Agreement between the Parties with respect to the subject matter hereof. There are no restrictions, promises, representations, warranties, covenants or undertakings other than those expressly set forth herein and therein. This Agreement supersedes all prior negotiations, agreements and undertakings between the Parties with respect to such matter. This Agreement including the schedules hereto may be amended only by an instrument in writing executed by both Parties or their permitted assignees.
- 1.5 This Agreement may not be assigned by either Party, by operation of law or otherwise, without the prior written consent of the other Party, which consent may not be unreasonably withheld.
- 1.6 This Agreement shall inure to the benefit of, and shall be binding upon, the successors and permitted assigns of the City and the Recipient.

2. TERM AND TERMINATION

- 2.1 The term of this Agreement shall begin on the Effective Date and continue until;
- 2.1.1 completion of the Work; or
 - 2.1.2 the sixth anniversary of the Effective Date, whichever date occurs earlier.
- (the “Term”)

- 2.2 The Parties agree and acknowledge that the Previous Agreement shall remain in force until the Recipient has completed to the City's satisfaction the work and deliverables required under the Previous Agreement.
- 2.3 Notwithstanding anything contained in this Agreement, the Parties may at any time terminate this Agreement without cause by providing at least sixty (60) calendar days written notice (the "Termination for Convenience Notice"). The Termination for Convenience Notice shall set out the termination date for this Agreement pursuant to this Section (the "Termination for Convenience Date").
- 2.3.1 In the event of a Termination for Convenience Notice being given pursuant to this Section, the Recipient shall;
- 2.3.1.1 be entitled to be paid for all the Work that is completed and accepted by the City in accordance with this Agreement up to the Termination for Convenience Date;
- 2.3.1.2 be required to deliver to the City, prior to being paid in accordance with Section 2.3.1.1 above, all the Work completed as of the Termination for Convenience Date.
- 2.3.2 The Parties shall have no claim for any loss, injury, damage, damages, compensation, loss of profit, allowance or otherwise by reason of or directly or indirectly arising out of any action taken or Termination for Convenience Notice given under this Section except to the extent that this Section expressly provides.
- 2.4 Notwithstanding anything contained in this Agreement, the Parties agree and acknowledge that they may, in their sole discretion, decide to withdraw or reduce their respective Contributions for the Project. Each Party hereto agrees that they shall have no claim for any loss, injury, damage, damages, compensation, loss of profit, allowance or otherwise by reason of the withdrawal or reduction of the other Party's Contribution to the Project.
- 2.5 Notwithstanding anything contained in this Agreement, this Agreement may be terminated by the Parties prior to the end of the Term if either of the Parties are in default of the terms or conditions of this Agreement (a "Termination for Default"). Where one of the Parties are in default of this Agreement the other Party may, after giving ten (10) calendar days written notice, immediately terminate this Agreement, in whole or in part, without liability. Reasons constituting default include, *inter alia*:
- 2.5.1 Failure to comply with the plan for the Work as set out in the Proposal;
- 2.5.2 Failure to comply with a direction or decision of the City properly given under the terms of this Agreement;
- 2.5.1 Use of any portion of the City's Contribution for purposes not in accordance with the Proposal;
- 2.5.2 Failure to substantially complete the Work in accordance with the Proposal;
- 2.5.3 Failure to adhere to the standards set out in Section 3.1.2 of this Agreement in completing the Work;

- 2.5.4 Material breach of the duties and obligations under this Agreement;
 - 2.5.5 Cumulative breaches of duties and obligations under this Agreement that collectively constitutes a material breach;
 - 2.5.6 Fraud or gross misconduct; and
 - 2.5.7 Either of the Parties become bankrupt or insolvent, makes an assignment for the benefit of creditors, or takes benefit of any statute relating to bankrupt or insolvent debtors or where a receiver is appointed under a debt instrument or a receiving order is made against either of the Parties or the either of the Parties is wound up.
- 2.6 In the event of a Termination for Default pursuant to Section 2.5 of this Agreement, the Party terminating the Agreement may do such things and incur such costs as deemed necessary to correct the default, including without limitation the withholding of payment due or accrued for services rendered pursuant to this Agreement, which moneys may be set off against any expenses that may be incurred in remedying a default. In addition, without limiting the foregoing, the Party in Default shall be liable for;
- 2.6.1 that portion of the City's Contribution paid to the Recipient for Work which was not completed as of the date of the termination notice; and
 - 2.6.2 all losses, injuries and damages which may be suffered by the Party terminating the Agreement by reason of the default or occurrence upon which the termination notice was based.

The Parties may also pursue any other remedies existing at law or in equity with respect to a Termination for Default.

3. SCOPE OF THE WORK

- 3.1 As is described in greater detail in Schedule "A" hereto, the Recipient agrees to produce for the City during the Term of this Agreement, the following work and deliverables (the "Work");
- 3.1.1 The Recipient shall provide the City with additional products as described in greater detail in Section 2.0 of the Proposal (the "Additional Products"). The Additional Products will generally be produced from the information, data and deliverables produced under the Previous Agreement. The Additional Products shall consist of, *inter alia*, the following:
 - 3.1.1.1 The Delineation of Additional Flood Lines as described in Section 2.1 of the Proposal;
 - 3.1.1.2 Flood Depth Maps as described in Section 2.2 of the Proposal; and
 - 3.1.1.3 An Inventory of Flood Vulnerable Areas as described in Section 2.3 of the Proposal;

The Recipient agrees to produce the Additional Products for the specific watercourses within the Recipient's Territory as identified in Table 1 of the Proposal.

- 3.1.2 The Recipient shall provide the City with certain new flood plain mapping studies for certain watercourses within the Recipient's Territory as described in greater detail in Table 2 of the Proposal (the "New Flood Plain Mapping Studies"). In addition to complying with the requirements set out in Section 3.0 of the Proposal, these New Flood Plain Mapping Studies shall be carried out in accordance with the following documents;
 - 3.1.2.1 MNR (1986). Floodplain Management in Ontario – Technical Guidelines. Ontario Ministry of Natural Resources, Conservation Authorities and Water Management Branch, Toronto;
 - 3.1.2.2 MNR (2002). Technical Guide – River and Stream systems: Flooding Hazard Limit. Ontario Ministry of Natural Resources, Water Resources Section, Peterborough, Ontario, 2002; and
 - 3.1.2.3 Conservation Ontario (2005). Guidelines for Developing Schedules of Regulated Areas – Section 3.0. Conservation Ontario and Ministry of Natural Resources, October 2005.
- 3.1.3 The Recipient shall provide the City flood plain mapping maintenance as described in greater detail in Section 4.0 of the Proposal (the "Flood Plain Mapping Maintenance").
- 3.1.4 The Recipient shall provide to the City the additional data and information as described in greater detail in Section 4.3 (sic 5.3) on pages 11 and 12 of the Proposal (the "Additional Data").
- 3.1.5 The Recipient acknowledges and agrees to provide the City with a copy of any and all relevant plans, documents, models, data or files related to the Work or developed for or in conjunction with the Work, including but not limited to;
 - 3.1.5.1 hydrologic and hydraulic models and supporting maps and analyses, for each watercourse and/or reach of watercourse as per Table 2 of the Proposal;
 - 3.1.5.2 Public and private structures information, including culvert and bridge detail, collected for the Work, as determined through discussions with the City, with the intention being to gather additional information, where feasible, that will enhance the City's information base; and
 - 3.1.5.3 Other information as mutually agreed upon by the parties hereto.
(the "Other Information")
- 3.1.6 The Parties agree that the City shall retain a third party (the "City Consultant") to conduct a technical review of the Work. The City Consultant shall provide the

Recipient with comments on the Work. The Recipient shall respond in a manner which it sees fit to the City Consultant's comments.

3.1.7 The Recipient agrees that for the following elements of the Work, where those elements are updated, modified or amended after an initial copy of the Work was provided to the City, the Recipient shall provide the City with an updated copy;

3.1.7.1 Flood Plain Lines for the Zoning overlay, with a Memorandum describing the changes signed by the Professional Engineer responsible.

3.1.7.2 Additional Products, (flood lines for other return periods and inventory of vulnerable areas where the changes are significant in terms of emergency planning purposes)

3.1.8 The Recipient agrees that for the following elements of the Work, where those elements are updated, modified or amended after an initial copy of the Work was provided to the City, the City shall have the right upon request to receive an updated copy.

3.1.8.1 Technical Reports, hydrologic and hydraulic models and supporting information.

3.2 The Recipient agrees that it shall provide to the City final copies of the Work in accordance with;

- the schedule set out in the Recipient's portion of Table 3 of the Proposal, located at page 15 of the Proposal; and
- the Annual Work Plans, developed in accordance with Section 3.3.1 of this Agreement,

The final copies of the Work may be provided in electronic or paper format, as agreed to by the Parties.

3.3 In furtherance of the performance of the Work and as described in Section 5.0 of the Proposal, the Recipient agrees;

3.3.1 at the beginning of each Contract Year during the Term to provide the City with a detailed plan for the elements of the Work which the Recipient agrees to perform during that Contract Year (the "Annual Work Plan"). The Annual Work Plan shall prioritize the elements of the Work to be completed during the Contract Year with the intention that generally the Recipient shall carry out those elements of the Work which are of greater importance first. The Annual Work Plan, including the prioritization of the elements of the Work to be completed during that Contract Year, shall be drafted, compiled and agreed to in a joint effort between the Recipient and the City. The form of the Annual Work Plan shall be agreed to by the Parties acting reasonably.

- 3.3.2 to meet with the City at a minimum of once per quarter during each Contract Year of the Term to review, *inter alia*, the progress of the Annual Work Plan and the Work;
 - 3.3.3 to keep records of all expenditures related to the Work; and
 - 3.3.4 to provide the City, on a quarterly basis, with reports on the status of the Work and an accounting of the expenditures incurred by the Recipient in the performance of the Work (the "Quarterly Reports"). The form of the Quarterly Reports shall be agreed to by the Parties acting reasonably.
- 3.4 The Parties acknowledge that the Work as set out in the Proposal, and/or the Annual Work Plans, may need to be amended as conditions and priorities change. The Parties agree that the Work and the Annual Work Plans may be amended or refined on the consent in writing of both Parties.

4. THE BUDGET FOR THE WORK

- 4.1 The Recipient has prepared a budget and schedule for the Work as set out in greater detail in Section 6.0, Table 3 and Table 4 of the Proposal. For greater certainty, page 15 of the Proposal sets out the elements of the Work which the Recipient will perform in each year of the Term of the Agreement and the budget for each of the elements. The Recipient covenants that, subject to the terms and conditions of this Agreement and any amendments to this Agreement, the total budget for the performance of the Work over the Term is four hundred eighty-seven thousand, eight hundred fifty dollars (\$487,850.00) (the "Total Budget for the Work").
- 4.2 The Recipient covenants and agrees that it has allocated sufficient funds in its own total yearly budget to be able to contribute fifty percent (50%) of the Total Budget for the Work (the "Recipient's Contribution"). For greater certainty and subject to the terms and conditions of this Agreement and any amendments to this Agreement, the Recipient's Contribution to the Work shall be two hundred forty-three thousand, nine hundred and twenty-five dollars (\$243,925.00).

5. CITY OBLIGATIONS

- 5.1 The City agrees, subject to the terms and conditions of this Agreement and in accordance with Sections 5.2, 5.3, 5.4 and 5.5 of this Agreement, to contribute to the Recipient over the Term of this Agreement 50% of the Total Budget for the Work (the "City's Contribution"). For greater certainty and subject to the terms and conditions of this Agreement and to any amendments to this Agreement, the City's Contribution to the Work shall be two hundred forty-three thousand, nine hundred and twenty-five dollars (\$243,925.00).
- 5.2 In furtherance of the objective set out in Section 5.1 of this Agreement, in accordance with Table 4 of the Proposal and subject to the terms and conditions of this Agreement, including the schedule set out in Section 5.3 of this Agreement, the City shall pay to the Recipient during each Contract Year of this Agreement the following amounts:

- 5.2.1 In Contract Year One (2017), the City shall pay the Recipient forty-eight thousand, seven hundred eighty-five dollars (\$48,785.00);
 - 5.2.2 In Contract Year Two (2018), the City shall pay the Recipient forty-eight thousand, seven hundred eighty-five dollars (\$48,785.00);
 - 5.2.3 In Contract Year Three (2019), the City shall pay the Recipient forty-eight thousand, seven hundred eighty-five dollars (\$48,785.00);
 - 5.2.4 In Contract Year Four (2020), the City shall pay the Recipient forty-eight thousand, seven hundred eighty-five dollars (\$48,785.00);
 - 5.2.5 In Contract Year Five (2021), the City shall pay the Recipient forty-eight thousand, seven hundred eighty-five dollars (\$48,785.00); and
 - 5.2.6 In Contract Year Six (2022), the City shall pay the Recipient zero dollars (\$0.00).
- 5.3 The schedule for the City's Contribution as set out in Section 5.2 shall be as follows:
- 5.3.1 For Contract Year One (2017), the City shall pay the Recipient the City's Contribution for Contract Year One upon;
 - a. The completion, to the sole satisfaction of the City acting reasonably, of the work and deliverables required of the Recipient by the Previous Agreement;
 - b. Receipt by the City of the draft Final Report for the work and deliverables performed by the Recipient under the Previous Agreement;
 - c. The City's review and approval of the Recipient's Annual Work Plan for Contract Year Two; and
 - d. Approval by City Council of the expenditure by the City of the City's Contribution for Contract Year Two.
 - 5.3.2 For Contract Year Two (2018), the City shall pay the Recipient the City's Contribution for Contract Year Two upon;
 - a. The Substantial Completion, to the sole satisfaction of the City acting reasonably, of the elements of the Work required to be performed by the Recipient during Contract Year One;
 - b. The City's review and approval of the Recipient's Annual Work Plan for Contract Year Two; and
 - c. Approval by City Council of the expenditure by the City of the City's Contribution for Contract Year Two.
 - 5.3.3 For Contract Year Three (2019), the City shall pay the Recipient the City's Contribution for Contract Year Three upon;
 - a. The Substantial Completion, to the sole satisfaction of the City acting reasonably, of the elements of the Work required to be performed by the Recipient during Contract Year Two;

- b. The City's review and approval of the Recipient's Annual Work Plan for Contract Year Three; and
 - c. Approval by City Council of the expenditure by the City of the City's Contribution for Contract Year Three.
- 5.3.4 For Contract Year Four (2020), the City shall pay the Recipient the City's Contribution for Contract Year Four upon;
 - a. The Substantial Completion, to the sole satisfaction of the City acting reasonably, of the elements of the Work required to be performed by the Recipient during Contract Year Three;
 - b. The City's review and approval of the Recipient's Annual Work Plan for Contract Year Four; and
 - c. Approval by City Council of the expenditure by the City of the City's Contribution for Contract Year Four.
- 5.3.5 For Contract Year Five (2021), the City shall pay the Recipient the City's Contribution for Contract Year Five upon;
 - a. The Substantial Completion, to the sole satisfaction of the City acting reasonably, of the elements of the Work required to be performed by the Recipient during Contract Year Four;
 - b. The City's review and approval of the Recipient's Annual Work Plan for Contract Year Five; and
 - c. Approval by City Council of the expenditure by the City of the City's Contribution for Contract Year Five.
- 5.3.6 For Contract Year Six (2022), the City shall pay the Recipient zero dollars.
- 5.4 The Recipient acknowledges and agrees that the maximum total City Contribution to be provided by the City to the Recipient, over the Term of the Agreement is two hundred forty-three thousand, nine hundred and twenty-five dollars (\$243,925.00) and that the City's Contribution is subject to the annual approval of City Council of the City's Contribution.
- 5.5 The City's Contribution for any Contract Year shall be used by the Recipient in a manner which is consistent with the top priority items for the elements of the Work as set out in the Annual Work Plan for that Contract Year.
- 5.6 The City agrees to provide the information set out in Section 4.2 (sic 5.2) on page 11 of the Proposal to the Recipient. The information provided pursuant to this Section shall be information pertaining to the Recipient's Territory.
- 5.7 The City agrees to provide the Recipient with the following information:
 - 5.7.1 Surface elevation information, using LiDAR, which meets the technical specifications for flood plain mapping. The City has also derived a number of products from the LiDAR data at the subwatershed levels and will provide this information to the Recipient. The information includes:

- 5.7.1.1 a full resolution Digital Elevation Model (terrain model);
- 5.7.1.2 a 1 m cell raster derived from the terrain (raster DEM);
- 5.7.1.3 Hillshade information; and
- 5.7.1.4 Information on Slopes.

5.7.2 City structures information, detailing culvert and bridge detail, as available;

5.7.3 Other information as mutually agreed upon in writing by the parties hereto.

All information provided pursuant to this Section shall be information pertaining to the Recipient's Territory.

6. ADDITIONAL OBLIGATIONS OF THE RECIPIENT

- 6.1 The Recipient acknowledges and agrees that it will undertake the Work in accordance with this Agreement.
- 6.2 The Recipient acknowledges and agrees that it will review, on an annual basis, in consultation with the City and the other Conservation Authorities the Work as described in the Proposal and the Annual Work Plans developed in accordance with this Agreement. Any update to the Work shall be agreed to by the Parties as an amendment to this Agreement.
- 6.3 The Recipient acknowledges and agrees to use the City's Contribution solely to pay for the Work and in accordance with this Agreement.
- 6.4 The Recipient reserves the right to amend and modify the models, reports and plans created as part of the Work from time to time according to its usual mandate.
- 6.5 The Recipient acknowledges and agrees that the City or City Consultant shall be entitled to review and provide comment on preliminary drafts of any and all documents produced by the Recipient pursuant to this Agreement.
- 6.6 The Recipient shall acknowledge the financial contribution received from the City in all communication, including advertising, publicity, documentation, and websites related to the Project.
- 6.7 The Recipient acknowledges and agrees that the Project shall be completed by the sixth anniversary of the Effective Date.

7. WARRANTY

- 7.1 The Recipient represents and warrants that it is competent to perform the Work and that it has the necessary qualifications, including knowledge, skill and experience to perform the Work.
- 7.2 The Recipient shall;
 - 7.2.1 Carry out the Work in a diligent and efficient manner;
 - 7.2.2 Ensure the Work;

- 7.2.2.1 is of proper quality, material and workmanship and is carried out to the standard of a reasonably competent Conservation Authority in similar circumstances;
- 7.2.2.2 is in full conformity with the Proposal; and
- 7.2.2.3 meets all the requirements of this Agreement.

7.3 The Recipient represents and warrants that the Work will be free from any defect. Notwithstanding prior acceptance of the Work by the City, the Recipient shall replace or correct, at its own expense, any defective Work.

8. OWNERSHIP OF THE WORK, OTTAWA DATA AND RECIPIENT DATA

8.1 The following provisions apply to the ownership of the Work and the City's right to use the Work;

8.1.1 Subject to the provisions of this Agreement, the Recipient owns and retains all rights, title and interest in and to the Work produced pursuant to this Agreement.

8.1.2 Subject to the provisions of this Agreement, the Recipient grants to the City a non-exclusive, non-transferable right to use all copies of the Work provided to the City pursuant to this Agreement in perpetuity. The City may make as many copies of the Work as is reasonably required by the City for Municipal Purposes. Without limiting the foregoing, the City may use the Work for projects that may be influenced by, or depend upon, the Work. The City may transfer the Work, copies of the Work or portions of the Work to any and all City departments, agencies, employees or bodies that require the Work in order to fulfill a Municipal Purpose.

8.1.3 The City agrees not to disclose, provide, sell, license, rent, or otherwise transfer the Work to any third party. Requests from third parties to the City for the Work will be subject to the Recipient's standard data sharing agreement.

8.2 The following provisions apply to the ownership of Ottawa Data and the Recipient's right to use City Data;

8.2.1 Subject to the provisions of this Agreement, the City owns and retains all rights, title and interest in and to the City Data.

8.2.2 Subject to the provisions of this Agreement, the City grants to the Recipient for the Term a non-exclusive, non-transferable right to use City Data provided pursuant to this Agreement.

8.2.1 The Recipient agrees not to disclose, provide, sell, license, rent, or otherwise transfer City Data to any third party.

- 8.3 The following provisions apply to the ownership of the Recipient's Data and the City's right to use the Recipient's Data;
- 8.3.1 Subject to the provisions of this Agreement, the Recipient owns and retains all rights, title and interest in and to the Recipient's Data.
 - 8.3.2 Subject to the provisions of this Agreement, the Recipient grants to the City a non-exclusive, non-transferable right to use the Recipient's Data provided to the City pursuant to this Agreement in perpetuity. The City may make as many copies of the Recipient's Data as is reasonably required by the City for Municipal Purposes. Without limiting the foregoing, the City may use the Recipient's Data for projects that may be influenced by, or depend upon, the Recipient's Data. The City may transfer the Recipient's Data, copies of the Recipient's Data or portions of the Recipient's Data to any and all City departments, agencies, employees or bodies who require the Work in order to fulfill a Municipal Purpose.
 - 8.3.3 The City agrees not to disclose, provide, sell, license, rent, or otherwise transfer the Recipient's Data to any third party without the prior written consent of the Recipient. Requests from third parties for the Recipient's Data will be subject to the Recipient's standard data sharing agreement.

9. CONFIDENTIALITY

- 9.1 The Parties acknowledge that by reason of their relationship hereunder, they may from time to time disclose information, whether by oral or written or means, regarding their business, employees, clients, software, software technology, intellectual property and other information that is confidential (the "Confidential Information").

Confidential Information includes, but is not limited to, the terms of this Agreement, the Ottawa Data, the Recipient Data, the Work, any information which is confidential or proprietary to third parties, any information conceived, developed, produced, stored or handled as part of the performance of this Agreement. For greater certainty, any such information that a reasonable person would determine to be confidential shall be deemed Confidential Information hereunder. Confidential Information shall not include information that (i) is or becomes generally available to the public other than as a result of the breach of the confidentiality obligations in this Agreement by the receiving party, (ii) is or has been independently acquired or developed by the receiving party without violating any of the confidentiality obligations in this Agreement, (iii) was within the receiving party's possession prior to it being furnished to the receiving party by or on behalf of the disclosing party, or (iv) is received from a source other than the disclosing party; provided that, in the case of (iii) and (iv) above, the source of such information was not known by the receiving party to be bound by a confidentiality obligation to the disclosing party or any other party with respect to such information.

Each party agrees that it will keep the Confidential Information strictly confidential and will not use in any way for its own account or the account of any third party, nor disclose

to any third party, any Confidential Information revealed to it by the other party without the other party's prior written consent, except to the extent expressly permitted by this Agreement; provided, however, that the receiving party may disclose the Confidential Information, or any portion thereof, to its directors, officers, employees, legal and financial advisors, controlling persons and entities who need to know such information to perform such party's obligations under this Agreement and who agree to treat the Confidential Information in accordance with the confidential obligations in this Agreement.

Each party shall use the same degree of care, which in no event shall be less than a reasonable degree of care, to avoid disclosure or use of the other party's Confidential Information, as it employs with respect to its own Confidential Information of like importance and represents that it has adequate procedures to protect the secrecy of such Confidential Information.

In the event that either party receives a request to disclose all or any part of the Confidential Information of the other party under the terms of a court order, subpoena, document request, or other legal or regulatory proceeding, such party receiving the request agrees to notify the other party within forty-eight (48) hours after receipt of such legal request, and the party receiving such request agrees to cooperate with the notified party in any attempt to obtain a protective order.

Each party agrees, as applicable, that any violation of Sections 8 or 9 of this Agreement, may result in irreparable harm to the non-breaching party and said non-breaching party may be entitled to apply for injunctive relief, in any court having proper jurisdiction (notwithstanding anything herein to the contrary) without the necessity of proving actual damages, in addition to any other remedy that the non-breaching party may have.

10. ACCOUNTING

- 10.1 The Recipient shall keep and maintain records, invoices, and other documents relating to both the Recipient's Contribution and the City's Contribution in a manner consistent with generally accepted accounting principles and clerical practices, and shall preserve such records for a minimum period of seven (7) years from the date of the receipt of the funds which make up the Recipient's Contribution or the City's Contribution.
- 10.2 The Recipient shall keep and maintain proper accounts and all records of transactions and activities associated with the Agreement and the Work, including but not limited to all invoices, purchase orders, reports, correspondence and other documents, in addition to all expenditures or commitments made by the Recipient in connection therewith and shall keep all such documents relating thereto for a period of seven (7) years. All such documents shall at all times be open to audit, inspection and examination by the City.
- 10.3 Copies of all records identified by Sections 10.1 and 10.2 of this Agreement shall be provided to the City when requested.

- 10.4 The Recipient authorizes the City, its employees, agents, and the City Auditor General, at all reasonable times, to inspect and copy any records, invoices, and other documents related to the funds that are in the possession or control of the Recipient. This right of inspection includes the right to perform a full or partial audit of the Work.
- 10.5 As part of the Quarterly Reports the Recipient will provide to the City quarterly accounting of expenditures by task, including level of effort by position, disbursements, percent of budget by task spent, and percent of tasks complete.
- 10.6 The Recipient represents, warrants and covenants to the City that it is not aware of any actions, suits or proceedings pending or to its knowledge threatened against or adversely affecting it, which might materially affect its financial condition or its ability to perform and meet all duties, liabilities and obligations as may be required of it under this Agreement.

11. DISCLOSURE

- 11.1 The Recipient acknowledges and agrees that the City is subject to the *Municipal Freedom of Information and Protection of Privacy Act*, R.S.O. 1990, c. M. 56, as amended ("*MFIPPA*"), with respect to documents and information under its custody and control. Accordingly, all documents provided to the City by the Recipient may be subject to release under *MFIPPA*.
- 11.2 Subject to the provisions of this Agreement, the Recipient consents to the release by the City in accordance with *MFIPPA*, of information on the Work, this Agreement and any documents or reports submitted to the City pursuant to this Agreement.

12. DISPUTE RESOLUTION

- 12.1 In the event of a dispute arising under the terms of this Agreement, the Parties agree to make a good-faith attempt to settle the dispute.
- 12.2 Should the parties not be able to resolve the Dispute at the mediation, the parties may commence a proceeding in the Ontario Superior Court of Justice in Ottawa, Ontario to resolve the matter.
- 12.3 The City and the Recipient shall continue to fulfill their obligations in respect of the Agreement during this dispute resolution procedure.

13. EXTENSION OF DEADLINES

- 13.1 In the event that the Recipient is unable to fulfill an obligation by the deadline set by this Agreement, the City may, at its sole discretion, allow, in writing, an extension of such deadline.
- 13.2 The extension of any deadline may not exceed a period of one (1) calendar year.

14. LIMITATION OF LIABILITY

- 14.1 Neither Party shall be liable for indirect, special, incidental or consequential damages, or damages for economic loss arising directly or indirectly from any tort or breach of contract. For greater certainty and without limiting the application of the foregoing, this limitation of liability includes damages incurred as the result of one of the parties having entered into a loan agreement, subcontractor agreement or other obligation in relation to the Work. The limitation of liability set out in this Section does not apply to any obligation of the Recipient arising under Section 15 of this Agreement.

15. INDEMNIFICATION

- 15.1 Each party hereto agrees to indemnify the other (including the other's employees, agents, directors, councilors, officers and executives) against all losses, injury, damage, actions and costs (including reasonable legal fees) which the other may incur by reason of the indemnifying party's negligence in performance of the obligations set out in this Agreement or the breach of any term, provision, covenant, warranty or representation contained in this agreement or in connection with the enforcement of this agreement or any provision of it.

16. INSURANCE

- 16.1 The Recipient shall obtain and maintain during the term of the contract the following insurance coverage.
- 16.1.1 Commercial General Liability Insurance issued on an occurrence basis for an amount of not less than \$10,000,000 per occurrence / \$10,000,000 annual aggregate for any negligent acts or omissions by the Recipient. Such insurance shall include, but is not limited to bodily injury and property damage including loss of use; personal injury and advertising injury; blanket contractual liability; premises, property & operations; non-owned automobile; broad form property damage; owners & contractors protective; occurrence property damage; products; broad form completed operations; employees as additional Insured(s); contingent employers liability; extended bodily injury; cross liability and severability of interest clause. Property damage deductible shall not exceed ten thousand (\$10,000) dollars and shall be the sole responsibility of the Recipient. Such insurance shall add the City of Ottawa; their elected officials, agents, officers and employees as additional Insured with respect to the work carried out pursuant to this Agreement. This insurance shall be non-contributing with and apply as primary and not as excess of any insurance available to the City of Ottawa.
- 16.1.2 Professional liability (errors and omissions) insurance coverage shall be obtained to a limit of not less than \$10,000,000. If such insurance is written on a claim made basis, the coverage shall contain a 24 month extended reporting period or be maintained for a period of two years subsequent to conclusion of services

provided under this Agreement. The deductible shall be no greater than \$25,000 and will be the sole responsibility of the Recipient. Such insurance shall add the City of Ottawa; their elected officials, agents, officers and employees as additional insureds with respect to the work carried out pursuant to this Agreement.

- 16.2 All the above insurance policies shall contain an endorsement to provide the City with thirty (30) days prior written notice of cancellation or of material change that would diminish coverage.
- 16.3 The Recipient shall provide certificates of insurance as evidence of the above noted insurance policies prior to execution of the agreement and upon the anniversary date(s) of all applicable policies described herein.
- 16.4 As determined by the City, the Recipient may be required to provide and maintain additional insurance coverage, which are related to the contract requirements.

17. NOTICE

- 17.1 Any notice, information or document required under this Agreement shall be deemed given if it is hand-delivered, sent by facsimile, email or post. Any notice delivered, sent by facsimile or email shall be deemed to have been received on the next working day after it is sent. Any notice that is mailed via post shall be deemed to have been received five (5) working days after being mailed.
- 17.2 The City's Program Manager of the Infrastructure Policy Unit (subject to change prior to signing of agreement) will be the designated liaison officer for the Recipient regarding all matters relating to this Agreement.

18. PARTNERSHIP

- 18.1 The Parties acknowledge that this Agreement does not constitute an association for the purpose of establishing a partnership or joint venture and does not create an agency, employment or contractor relationship between the City and the Recipient, and that this Agreement in no way implies any agreement or undertaking to conclude any subsequent agreement.

19. BILINGUALISM

- 19.1 The City recognizes both official languages as having the same rights, status and privileges, and is committed to providing equal treatment to people with respect to the use and benefit of City services, programs, and goods in a manner that respects their linguistic preferences. The Recipient undertakes to perform all of the obligations of this Agreement while meeting the requirements and provisions of the City's Bilingualism Policy, such as they apply to the active delivery of goods and services in both official languages, including bilingual publications.

- 19.2 The Recipient's responsibility is limited to translating maps, press releases and executive summaries in French and to have someone present in the open houses to interpret in French. It has no obligation to translate the technical reports in French.

20. GENERAL

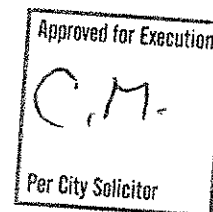
- 20.1 The Recipient is required to disclose to the City any potential conflict of interest prior to commencing the Work. If a conflict of interest does exist, the City may, at its discretion, withhold the City's Contribution from the Recipient until the matter is resolved to the satisfaction of the City. If, during the Agreement, a potential conflict of interest arises, then the Recipient shall so inform the City and if a significant conflict of interest is deemed to exist by the City, then the Recipient shall take such steps as are necessary to remove the conflict of interest.
- 20.2 All Recipient representations and warranties set out in this Agreement as well as the provisions concerning indemnity against claims and accounts, limitation of liability, audit and confidentiality shall survive the expiry or termination of this Agreement as shall any other provision of the Agreement which, by the nature of the rights or obligations set out therein, might reasonably be expected to be intended to survive.
- 20.3 If any provision of this Agreement becomes illegal or unenforceable in whole or in part, the remaining provisions shall nevertheless be valid, binding and subsisting.
- 20.4 The Agreement shall inure to the benefit of, and shall be binding upon, the successors and permitted assigns of the City and of the Recipient.
- 20.5 Time is of the essence of the agreement.
- 20.6 During the development of the Work, the Recipient shall advise the City in writing before publishing or issuing any information regarding the Work.
- 20.7 No Party will be deemed to have waived the exercise of any right that it holds under this Agreement unless such waiver is made in writing. No waiver made with respect to any instance involving the exercise of any such right will be deemed to be a waiver with respect to any other instance involving the exercise of the right or with respect to any other such right.

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IN WITNESS WHEREOF, the Parties have entered into this Agreement to be executed by the duly authorized representatives authorized in that behalf on the date below indicated.

CITY OF OTTAWA

Date: _____



Name: Stephen Willis

Position: General Manager Planning, Infrastructure & Economic Development Department

I have authority to bind the corporation

MISSISSIPPI VALLEY CONSERVATION AUTHORITY

Date: _____

Name: John Karau

Position: Chair

I have authority to bind the organization

Date: _____

Name: Paul Lehman

Position: General Manager

I have authority to bind the organization

SCHEDULE "A"



A Proposal for the

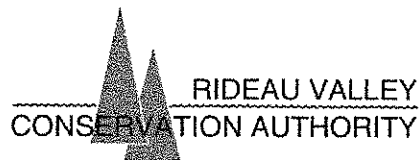
Review and Maintenance of Flood Plain Mapping within the City of Ottawa

October 2016

Prepared by:



SOUTH NATION
CONSERVATION
DE LA NATION SUD



RIDEAU VALLEY
CONSERVATION AUTHORITY



Mississippi Valley
Conservation Authority

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Appendices

- Appendix 1 – Floodplain Mapping Priority Methodology
- Appendix 2 – Overview Maps

1.0 Background

Conservation Authorities (CA) have been delegated flood plain management responsibilities by the Ontario Ministry of Natural Resources and Forestry at a watershed scale throughout most of southern Ontario. Specifically within the City of Ottawa, three CAs have flood plain management responsibilities: South Nation Conservation (SNC), the Rideau Valley Conservation Authority (RVCA) and Mississippi Valley Conservation Authority (MVCA). Their responsibilities include the identification lands that are subject to flood hazards, to support regulations made under Section 28 the *Conservation Authorities Act*, and to support Official Plan land use designations and zoning by-laws adopted by municipalities, in accordance with the *Planning Act* and the associated Provincial Policy Statement.

Accurate engineered flood plain mapping is the foundation for effective flood plain management. In Eastern Ontario, the 1:100 year flood plain is the Regulatory standard, calculated as having a 1% chance of occurring in any given year. Outdated flood plain mapping is difficult to defend on technical grounds and therefore complicates the regulation process. A majority of the flood plain maps within the City's boundary were created 20 to 30 years ago and require attention. In addition to the need to periodically review and update their inventories of existing flood plain mapping, CAs are also faced with the need for flood plain analysis and mapping on rivers and streams which have yet to be covered by such mapping throughout their respective jurisdictions.

The perception that the existing flood plain mapping is out of date also weakens the City's ability to effectively implement the flood plain provisions in the Zoning By-law.

SNC, MVCA, and RVCA are soon to complete a successful 5 year agreement that addressed updating flood plain mapping within the City of Ottawa to ensure the data is accurate and to produce necessary flood plain mapping where it currently does not exist. While this agreement addressed some of watercourses, there is still additional work required. This proposal addresses an additional 5-6 year partnership agreement and includes three priorities:

- 1) Additional products produced from the flood plain mapping projects completed under the first agreement.
- 2) The completion of new or updated flood plain mapping studies for additional watercourses within the City of Ottawa.
- 3) Maintenance of the flood plain maps and analyses completed under these agreements.

2.0 Additional Products for Previously Completed Flood Plain Mapping Projects

While flood hazard mapping serves as valuable piece of information in understanding the extent of flooding for specific events, flood hazard mapping alone does not provide the information required to fully understand flood risk. Flood risk is a combination of the likelihood and consequence from flooding associated with communities, buildings and infrastructure. Therefore the additional products listed below will also be completed as part of this agreement.

There will be floods greater than the 1 in 100 and delineating a more severe flood event (the 1:350 year as described below) will assist in insights to risks beyond the 1 in 100 for emergency management and assessment of mitigation measures. The purpose of the additional flood lines are for scoping analyses only and not for defining specific/regulatory limits. Therefore, the level of effort and exactness in delineating these additional flood events will also be consistent with the purpose of framing the risk zone.

The preparation of the flood depth products are to provide screening level assessment extent of flooding over roadways as well an inventory of communities, buildings, dwelling units and flooded roads. Their main users of these maps will be emergency management personnel.

2.1 Delineation of Additional Flood Lines

For the flood plain mapping studies completed under the first agreement, the “final product” was the production of flood plain maps showing the delineation of the 1:100 year flood plain line. The 1:100 year flood is the flood hazard criteria for eastern Ontario as defined in the *Technical Guide River and Stream Systems: Flood Hazard Limit* (MNR 2002) and is defined as the flood event standard in all three of the CA regulations approved by the Minister of Natural Resources under Section 28 of the *Conservation Authorities Act*.

In addition to the 1:100 year flood line, the City of Ottawa requested the following flood lines will be delineated for Emergency Planning purposes:

- 1:5 year
- 1:25 year
- 1:50 year
- 1:350 year

The range of return periods, as noted above, was chosen to provide a distinguishable range of flood lines and also considering:

- The 1:5 year flood would be a nuisance or minor classification of flood event in the context of flood forecasting and warning and this could represent a “frequent” event.
- The 1:25 year, 1:50 year and 1:100 year are used as the design return period flows in the design of bridges and culverts, based on the functional road classification, by the Ontario Ministry of Transportation.
- The 1:350 year return period flood event:
 - I. Has a 25% chance of occurring or being exceeded in the next 100 years.
 - II. Is comparable to the return period of Hurricane Hazel or the Timmins Storm, already used to guide development in other areas in Ontario.
 - III. International practice often includes flood hazard mapping ranging between 1:300 Years to 1:1,000 Years (e.g. Germany and the United Kingdom)
 - IV. The 1:350 year is the standard recommended for creating Flood Hazard Maps in the *National Floodplain Mapping Assessment* report prepared for Public Safety Canada.

These additional flood lines will generally be produced from existing information and will be based on a desk top GIS exercise. Therefore, no allowance has been included in the budget for additional field surveys. The delineation of the additional flood lines will require some additional hydrologic and hydraulic calculations and these calculations will follow the same general procedures as contained in the original reports.

2.2 Flood Depth Maps

To develop a more comprehensive flood plain management data base another additional product that will be produced are maps showing the depth of flooding under various flood events. As requested by the City of Ottawa for Emergency Planning purposes, these maps will be produced for the following events:

- 1:5 year
- 1:25 year
- 1:50 year
- 1:100 year
- 1:350 year

Again these products will utilize information produced during the original studies and analyses completed as described in Section 2.1 above. Discussions will be completed with City of Ottawa staff to determine the depth intervals to shown on these maps.

2.3 Inventory of Flood Vulnerable Areas

For Emergency Planning purposes, the City of Ottawa requested that for the 1:5 year, 1:25 year, 1:50 year and 1:100 year flood events the existing development and inundated (flooded) roads will be identified as flood vulnerable areas. These areas will be identified using City data, if available, on the maps by colour coding the affected location(s) and assembling a data base that includes:

- Total number of buildings
- Number of Dwellings
- Hospitals and Nursing Homes
- Schools
- Roads flooded by more than 0.3 m

2.4 Reporting

The additional products detailed in Section 2.1, 2.2 and 2.3 will generally be produced from exiting information. A technical memorandum will be produced to document any additional hydrologic and hydraulic calculations and all procedures used in the process of delineating the additional flood lines and flood depths, identifying the flood vulnerable areas and the inventory data base. Since the original flood plain mapping report included a technical review and this work is simply an extension of the original analysis, an additional technical review is not required.

Maps will be produced and flood line and depth maps will be provided in Geodata base format for use by the City of Ottawa and the Conservation Authorities.

For the products described in Section 2.1, 2.2 and 2.3, Table 1 shows the watercourse reaches that will be addressed.

Table 1: Additional Products	
Watercourse	Reach
South Nation Conservation	
John Boyce MD	Rideau St to Mitch Owens Rd.
Osgoode Gardens Cedar Acres MD	Stage Coach to John Quin Rd.
Cassidy MD	Pana rd. to Middle Castor River
Grays Creek	Mitch Owens Rd to Snake Island Rd.
McCooye MD	Cooper Hill Rd. to Cassidy MD
McKinnon's Creek	McKinnon's Creek Subwatershed
Mc Fadden	Navan Road to Perrault Road
East Branch of the Savage	Navan Rd. to Perrault Rd.
Devine MD	Forest Rd. to Russland Rd.
Marshal Seguin	Devine Rd. to 417
South Castor	Village of Kenmore

Table 1: Additional Products	
Watercourse	Reach
Nelson Charlebois Drain	Giroux Rd. to Delson Rd. (railroad
South Bear Brook	417 to Russell Rd
Rideau Valley Conservation Authority	
Rideau River	RF to HB
Rideau River	HB to Kars
Rideau River	Kars to BR
Ottawa River	Shirley's Bay to Cumberland
Flowing Creek	Gervin Road to Fallowfield Road
Hobbs Drain	Jock River to Fallowfield Road
Kings Creek	Jock River to Brunton Road
Nichols Creek	Jock River to Dwyer Hill Road
Becketts Creek	Ottawa River to Sersfield Road
Billberry Creek	Ottawa River to Innes Road
Mississippi Valley Conservation Authority	
Ottawa River	Mississippi River to Watts Creek
Feedmill Creek	Echewoods Subdivision to Carp River
Poole Creek	Westridge Drive to Carp River
Huntley Creek	Beavertail Road to Carp River
Kizell Drain	Beaver Pond to Watts Creek
Shirley's Brook	Goulbourn Forced Road to Ottawa River

3.0 New Flood Plain Mapping Studies

While flood plain mapping studies were completed for many watercourses within the City of Ottawa under the first agreement, there are additional watercourses where new or updated studies are required.

A total of 58 watercourses or reaches of watercourses were originally identified within the City of Ottawa that may require flood plain mapping updates or production, where the mapping currently does not exist. In order to ensure the watercourses most in need of accurate flood plain mapping are completed within the allocated budget, a prioritization ranking system was created.

The three CAs agreed to rank all of their watercourses in the same manner, so that priorities for floodplain mapping are consistent across the entire City. Although the same ranking system was used by all three CAs, it should be noted that the existing and future development pressures within the three CAs jurisdictional watersheds, within the City of Ottawa, are different. The RVCA watershed includes the oldest urban development (old City of Ottawa) and the most hydraulically complicated flood plain areas (e.g. spills). The SNC watershed includes many villages on various watercourses and thus development pressures are spread out across the City. The MVCA development pressure is more concentrated on fewer watercourses and much of it on the Carp River.

Initial screening eliminated all of those watercourses where it is understood that there is no existing development and little future development pressure. All remaining watercourses were evaluated for the presence and intensity of existing development and the intensity of predicted future development. In addition, the usability of the existing mapping was considered based on the experience of staff using the mapping on a daily basis when reviewing planning applications and permit approvals.

These values were combined to create a score for each watercourse or reach of watercourses, and the resultant values (0 to 32) were used to rank each segment. A detailed description of the Floodplain Mapping Prioritization can be found in **Appendix 1**. Table 2 shows the new or updated flood plain mapping studies to be completed as part of this agreement.

The maps found in Appendix 2 show the watercourses within the City of Ottawa where flood plain maps have been completed, are in progress, or are planned to be completed.

Table 2: Priority Watercourses for the Completion of New Flood Plain Mapping Studies									
Priority	Watercourse / Reach of Watercourses	Coverage	Development				Existing Mapping		Score
			Existing Development Density (L,M,H)	Other Constrains (Y/n)	Future Development Pressure (L,M,H)	Date Completed	Usability (L,M,H)		
South Nation Conservation									
H	South Castor Extension	Spring Island Road to Ray Wilson Road	H	Y	H	N/A	None	24	
H	Findlay Creek	White Alder Avenue to Mitch Owens Road	H	n	H	N/A	None	24	
H	Buckles MD + unnamed stream	Osgoode town centre to environmental protection zone east of Stagecoach Road	H	n	H	N/A	None	24	
H	Stream 5	8th Line Road to North Castor River	M	n	H	N/A	None	20	
M	Middle Castor River	Snake Island Road to 9th Line Road	H	Y	H	1992	L	18	
M	Regimbald MD/Shaw's Creek	417 to start of agricultural area (north of Forced Road)	H	Y	H	1991	L	18	
Rideau Valley Conservation Authority									
M	Monahan Drain	Hope Side Road to Jock River	L	n	H	N/A	None	16	
M	Steven Creek	Rideau River to Malakoff Road	M	n	M	1995	L	12	

Table 2: Priority Watercourses for the Completion of New Flood Plain Mapping Studies									
Priority	Watercourse / Reach of Watercourses	Coverage	Development			Existing Mapping		Score	
			Existing Development Density (L,M,H)	Other Constraints (Y/n)	Future Development Pressure (L,M,H)	Date Completed	Usability (L,M,H)		
M	Mosquito Creek	Mitch Owens to Earl Armstrong	L	n	H	N/A	None	16	
M	Mud Creek	1 st Line to Prince of Wales	L	n	M	N/A	None	12	
Mississippi Valley Conservation Authority									
M	Harwood Creek	Marchurst Road to Constance Lake	L	n	M	N/A	None	12	
M	Unnamed Tributary 3 - Constance Creek	Thomas Dolan Parkway to Constance Lake	L	n	M	N/A	None	12	
L	Carp River	Carp Road to Ottawa River	L	n	M	1983	M	6	
M	Carp River	Egleson Road to Carp Road	H	n	H	1983	M	12	

3.1 Floodplain Mapping Methodology

The methodology for completing flood plain studies and mapping is fairly standardized throughout Canada and the US. The methodology for the completion of flood plain studies and the production of flood plain maps is described in the following documents:

- MNR (1986). Floodplain Management in Ontario – Technical Guidelines. Ontario Ministry of Natural Resources, Conservation Authorities and Water Management Branch, Toronto.
- MNR (2002). Technical Guide – River & Stream systems: Flooding Hazard Limit. Ontario Ministry of Natural Resources, Water Resources Section, Peterborough, Ontario, 2002.
- Conservation Ontario (2005). Guidelines for Developing Schedules of Regulated Areas - Section 3.0. Conservation Ontario and Ministry of Natural Resources, October 2005.

There are three major components of technical work needed for floodplain mapping:

Step 1 – Estimation of design flows: Various hydrologic methods are available for estimating flows to be used in floodplain mapping. Depending on the available data, the analyst can use any of the following: single station flood frequency analysis, data transposition, area pro-rating method, event-based modeling, continuous watershed modeling, etc. The Conservation Partners are proposing to complete a hydrologic analysis in areas where it currently does not exist or requires updating.

Step 2 – Computation of the water surface level corresponding to design floods: Hydraulic computations are necessary to calculate the water levels for design floods. Usually, data describing the river configuration and associated crossings is necessary. There is a host of hydraulic tools that can be used, although simple, steady state river models such as HEC-RAS have become the norm. In case of lakes, other types of hydraulic calculations are used, depending on the outlet condition. As infrastructure has been changing over the years, the current models need to be updated to reflect the current conditions. Therefore, field surveys and ground-thruthing will be required for municipal and private structures. Based on the collected data, hydraulic computation will be conducted or revised, where necessary.

Step 3 – Plotting flood lines: Once the hydraulic computation is done, estimated flood lines corresponding to the Regulatory (1:100 year) flood elevation are plotted using available topography adjacent to rivers and lakes. Flood line plotting can be automated using computer programs and the Digital Elevation Model (DEM) or done manually by interpolating contour lines.

4.0 Flood Plain Mapping Maintenance

After the flood plain maps, under the City of Ottawa/Conservation Authority agreement, are completed, there will be a requirement to maintain the integrity of the information shown on the maps. While the initial production of the flood plain maps requires a review and/or major update of all components (e.g. hydrology, hydraulics, topographic information) for the entire watercourse reach, the maintenance of the maps, if completed on an on-going basis, will only need to address one or two components of the input to the flood plain maps and/or will address a specific area or reach of the watercourse or watershed.

Since the flood lines shown on the maps are a combination of hydrologic, hydraulic and topographic information there are many triggers that may necessitate a **maintenance update** to be decided by the Conservation Authority in consultation with the City. These include:

- **Change in Land Use.** A change in land use, such as the conversion of rural areas to urban development, expansion of the general urban boundary or a village boundary or the conversion of existing hydrologic “storage” areas (e.g. deforestation, loss of wetlands) that would impact the magnitude, timing or volume of peak flows would trigger a maintenance update of the flood plain maps.
- **Drainage Basin Revisions.** If a change or revision in the tributary drainage basin area of a watercourse (e.g. diversion) occurs that would, again, impact the magnitude, timing or volume of peak flows would trigger a maintenance update of the flood plain maps.
- **Crossing Structure Changes.** The upgrading, reconstruction or replacement of watercourse crossings may impact the water level and flow regime and thus would trigger a maintenance update of the flood plain maps.
- **Change in Regulatory Standard.** A change in the Regulatory standard used in the production of flood plain maps such as may result from the impacts of and adaptations for climate change a maintenance update of the flood plain maps may be triggered.
- **Changes in Topography.** Changes in topography in the flood plain area or channel as result of filling, grading or excavation would trigger a maintenance update of the flood plain maps.
- **Age of the Flood Plain Maps.** To ensure the general integrity of the flood plain maps, it is recommended that the need for a maintenance update of the flood plain maps be reviewed every 10 years.

For any flood plain maps or studies completed under this or the previous agreement, maintenance of the products will be included. The budget for maintenance, if required, is approximately 1.5% of the total funding invested in flood plain mapping products within the City of Ottawa and has been distributed over the latter years of the agreement.

5.0 Deliverables

5.1 Project Management

In order to successfully execute the work plan and to ensure all 3 CAs and the City of Ottawa are informed of the project’s progress, a representative from each CA and the project lead from the City of Ottawa will meet at a minimum of quarterly per year. Items that may be discussed at the meetings include: project status, progress, results, unexpected challenges, work plan, and any proposed variances from the proposed work schedule and budget.

Each CA will keep records of all expenditures related to this project, including staff time. Quarterly reports will be sent to the City on the status and expenditures of the project.

4.2 Data Transfer from City of Ottawa to Conservation Authorities

The following information will be provided by the City of Ottawa to the three CAs at the onset of the project:

- LiDAR, DTM, contour lines for the City of Ottawa (data may also come from third parties such as previous reports from consultants, etc.);
- Any available data on all public structures; and
- Any available data on all private structures

4.3 Data Transfer from Conservation Authorities to City of Ottawa

The following information will be provided by the three CAs to the City:

- Additional data collected on public and private structures;
- Technical reports prepared following industry-standard formatting for each watercourse or reach of watercourses; and
- Updated 1: 100 year floodplain mapping in a suitable GIS layer format
 - The City may make the floodplain layer publicly available; however, this information shall only be used for information purposes.
- Geodata base information as detailed in Sections 2.1, 2.2 and 2.3.

All information and data developed under the 'City of Ottawa Floodplain Mapping - Review and Maintenance' project will be owned by the each respective CA. Any data/model file requests need to be made to each CA and will be subjected to a user-share agreement.

6.0 Schedule and Budget

A cost estimate and schedule was prepared, as shown in Table 3, for the duration of the agreement. The budget for new flood plain mapping studies includes all the additional products detailed in Sections 2.1, 2.2 and 2.3 and the reporting for these additional products will be as documented in Section 2.4. The budgets shown in Table 3 also includes an increase for inflation over the duration of the agreement. The City of Ottawa will continue the provision and management of the technical review for new flood plain mapping studies and thus the budgets shown do not include an allowance for this review. Table 4 shows the total yearly budget and funding for all three CAs. The CAs and the City of Ottawa will review the work plan and budget annually; any proposed changes will be presented to the City for approval.

7.0 Prerequisites

Prior to commencing the project, the following must be obtained:

1. Contribution Agreement between Conservation Partners (or each CA) and the City of Ottawa for the administration and execution of the City of Ottawa Floodplain Mapping Review and Maintenance, which will acknowledge:
 - a. A 50% cost-share partnership between each CA and the City of Ottawa.
 - b. The City's allocated funds will be provided to the CAs at the onset of every year described in the workplan.
2. Necessary data transfers from the City to the CAs.

Once the commitments have been finalized, the work plan described in **Section 6.0** of this document may be initiated. Yearly start and end dates will be identified in the Contribution Agreement.

Table 3: Budget and Schedule						
South Nation Conservation Authority Budget						
Year	Flood Plain Mapping Studies	Budget	Additional Flood Lines, Flood Depth Maps and Inventory of Flood Vulnerable Areas	Budget	Maintenance	Total Budget
1 (2017)	South Castor Extension	\$49,330.00	John Boyce Creek	\$47,430.00		\$96,760.00
			Osgoode Garden Cedar Acres Creek			
2 (2018)	Findlay Creek	\$14,864.00	Cassidy Creek	\$145,136.00		\$160,000.00
			Marshall Sequin Creek			
			Devine Creek			
			McCooye Creek			
			Nelson Charlebois Creek			
			Savage Creek			
			McKinnons Creek			
3 (2019)	Findlay Creek	\$111,218.00		\$0.00	\$3,500.00	\$160,000.00
			Buckles Creek			
			Buckles Creek			
4 (2020)	Middle Castor River	\$103,613.00		\$0.00	\$5,000.00	\$160,000.00
			Middle Castor River			
5 (2021)	Shaws Creek	\$94,769.00		\$0.00	\$7,000.00	\$160,000.00
			Ebbers Creek			
6 (2022)		\$80,260.00		\$0.00	\$9,000.00	\$89,260.00
Total		\$608,954.00	Total	\$192,566.00	\$24,500.00	\$826,020.00
					Grand Total	\$413,010.00

Table 3: Budget and Schedule						
Rideau Valley Conservation Authority Budget						
Year	Flood Plain Mapping Studies	Budget	Additional Flood Lines, Flood Depth Maps and Inventory of Flood Vulnerable Areas	Budget	Maintenance	Total Budget
1 (2018)	Stevens Creek	\$91,800.00	Ottawa River (starting mid 2017)			
			Rideau River (RF to HB)	\$94,860.00	\$0.00	\$247,860.00
	Mud Creek	\$61,200.00	Rideau River (HB to Kars)			\$123,930.00
2 (2019)	Stevens Creek	\$49,480.00	Rideau River (Kars to BR)			
	Mud Creek	\$51,560.00	Hobbs Drain	\$16,125.00	\$3,500.00	\$176,850.00
	Mosquito Creek	\$56,185.00				\$88,425.00
3 (2020)	Stevens Creek	\$16,979.00	Flowing Creek	\$16,450.00	\$5,000.00	\$212,975.00
	Mud Creek	\$16,979.00				
	Mosquito Creek	\$67,365.00				\$106,488.00
4 (2021)	Monahan Drain ¹	\$90,202.00	Kings Creek	\$33,555.00	\$7,000.00	\$65,845.00
	Monahan Drain ¹	\$25,290.00	Nichols Creek			
5 (2022)	Monahan Drain ¹	\$17,115.00	Billberry Creek	\$34,225.00	\$9,000.00	\$78,000.00
	Mosquito Creek	\$17,660.00	Becketts Creek			
	Total	\$561,815.00	Total	\$195,215.00	\$24,500.00	\$781,530.00
					Grand Total	\$390,766.00

Notes: 1 - The scope, methodology, budget and workplan of the Monahan Drain project cannot be accurately predicted at this time. Therefore, the budget shown is only preliminary and subject to review and adjustment. It is anticipated that pertinent City and RVCA staff will be consulted from time to time to assess and adjust the scope and budget of the project as more information is collected and analyzed. MNRF and other stakeholders may also be consulted if needed.

Table 3: Budget and Schedule						
Mississippi Valley Conservation Authority Budget						
Year	Flood Plain Mapping Studies	Budget	Additional Flood Lines, Flood Depth Maps and Inventory of Flood Vulnerable Areas	Budget	Maintenance	Total Budget
1 (2017)	Harwood Creek	\$66,570.00	Ottawa River Poole Creek	\$31,000.00	\$0.00	\$97,570.00
2 (2018)	Harwood Creek Tributary 3 ¹	\$20,002.00 \$45,948.00	Feedmill Creek Kizell Drain/Watts Creek	\$31,620.00	\$0.00	\$97,570.00
3 (2019)	Tributary 3 ¹ Carp River - Ottawa River to Carp Road	\$47,433.00 \$14,137.00	Shirley's Brook Huntley Creek	\$32,500.00	\$3,500.00	\$97,570.00
4 (2020)	Carp River - Ottawa River to Carp Road	\$76,070.00	Constance Creek and Lake	\$16,500.00	\$5,000.00	\$97,570.00
5 (2021)	Carp River - Ottawa River to Carp Road Carp River - Carp Road to Eagleson ²	\$18,810.00 \$71,760.00			\$7,000.00	\$97,570.00
	Total	\$360,730.00	Total	\$111,620.00	\$15,500.00	\$487,850.00
					Grand Total	\$243,925.00

Notes: 1 - Tributary to Constance Lake
 2 - Budget does not include the production of new topographic information, after the completion of the Carp River Restoration Plan, for the flood plain map base

Table 4: Yearly Budget and Funding

Conservation Authority	Budget												Project		Totals			
	2017		2018		2019		2020		2021		2022		50% Funding		CA Total		50% Funding	
	Total	50% Funding	Total	50% Funding	Total	50% Funding	Total	50% Funding	Total	50% Funding	Total	50% Funding	Total	50% Funding	Total	50% Funding		
South Nation	\$96,760	\$48,380	\$160,000	\$80,000	\$160,000	\$80,000	\$160,000	\$80,000	\$160,000	\$80,000	\$89,260	\$44,630	\$826,020	\$413,010				
Rideau Valley	\$0	\$0	\$247,860	\$123,930	\$176,850	\$88,425	\$212,975	\$106,488	\$65,845	\$32,923	\$78,000	\$39,000	\$781,530	\$390,765				
Mississippi Valley	\$97,570	\$48,785	\$97,570	\$48,785	\$97,570	\$48,785	\$97,570	\$48,785	\$97,570	\$48,785	\$0	\$0	\$487,850	\$243,925				
Total	\$194,330	\$97,165	\$505,430	\$252,715	\$434,420	\$217,210	\$470,545	\$235,273	\$323,415	\$161,708	\$167,260	\$83,630	\$2,095,400	\$1,047,700				

Appendix 1 – Detailed Floodplain Mapping Prioritization Methodology

Detailed Floodplain Mapping Prioritization Methodology:

Through discussion with the 3 CAs it was determined that the importance of having updated floodplain mapping for the purposes of this project is dependent on the presence of existing development, the probability of future development, and the quality of existing mapping. If there were other constraints that would restrict or prevent development, then the importance should decrease.

Each of these components (Existing Development, Future Development, and usability) were given a value of High, Medium, and Low. For consistency, these values were defined as:

Existing Development (choices made by existing zoning; dominant condition was used):

- None – No development; vacant land, unused farmland, etc.: EP, AG
- Low – Rural (anything else not listed)
- Medium – Estate Residential, ICI: I(any), RC, RG, RH, RI, LC, GM, TM, AM, MC, MD
- High – Urban, village, or Waterfront development: R1-5, RM, T1, T2, V(any), DR, adjacent to Major River/Lake

Future Development (choices made by Official Plan or other source of plan; highest condition was used):

- None – other constraints: Sand/Gravel/Limestone resource area, Greenbelt, Major Open Space
- Low – restricted development: Rural Natural Feature
- Medium – Previously approved development: Carp Corridor, Carp Airport, known developments
- High – Within urban/village boundary

Usability:

- None – Never been mapped
- Low – Unacceptable; decisions should not be made using this information
- Medium – Satisfactory; generally a reasonable representation of reality
- Good – Easy to use; high confidence that what is shown accurately represents existing conditions

Existing and Future development were each given a score of 0 (none) to 3 (High); Usability was given a score of 4 (none) to 1 (High), and Other Constraints 1 (no) or 0 (yes). Components were then combined using the formula:

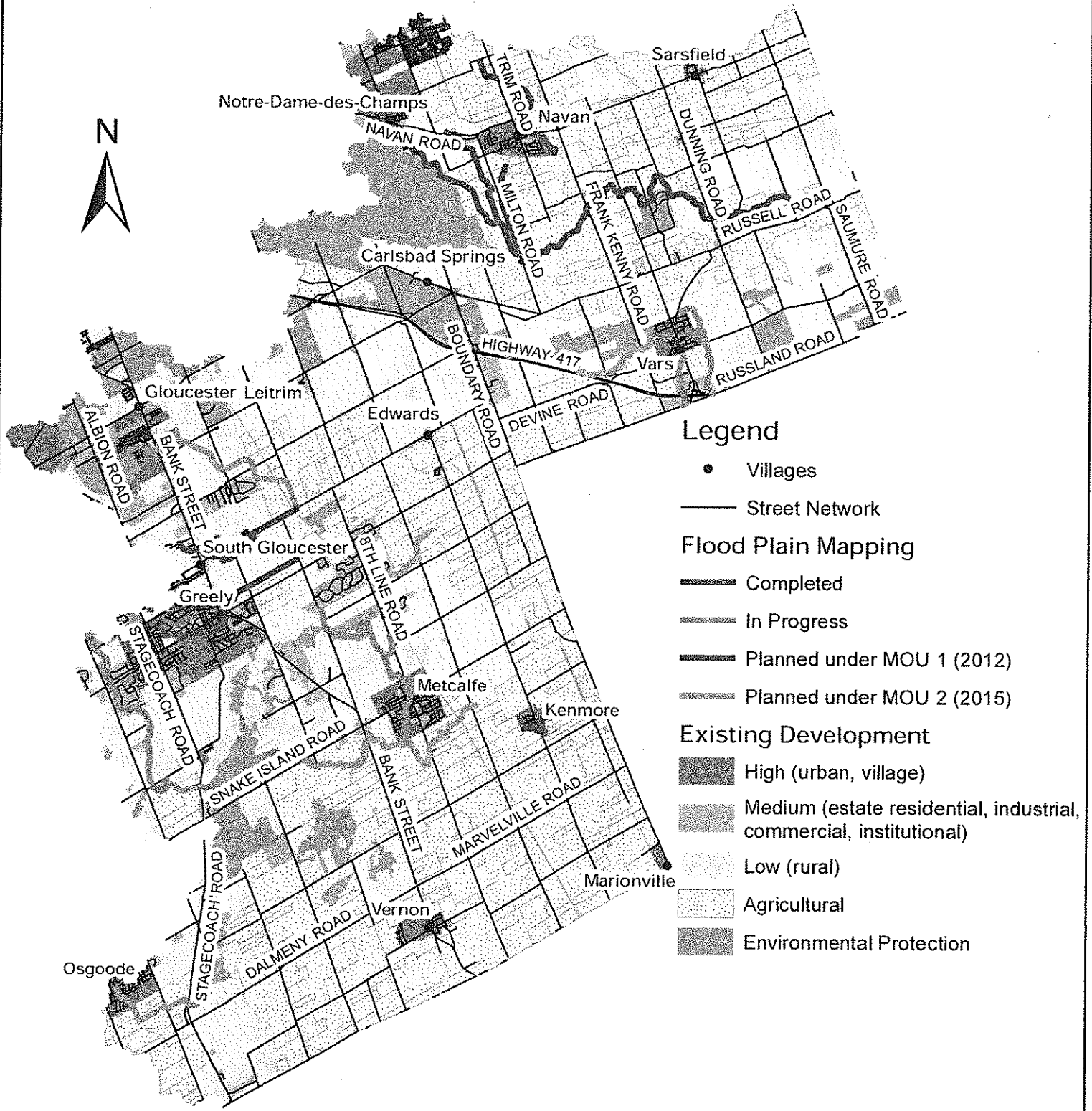
Score = (Existing Development + Future Development) * Usability

Final scores determine whether the watercourse/reach of watercourses is high, medium, or low in terms of requiring floodplain mapping:

- Low = Less than 10
- Medium = 10 to less than 20
- High = 20 and higher

Appendix 2 – Overview Maps

Flood Plain Mapping: City of Ottawa



Legend

- Villages
- Street Network
- Flood Plain Mapping**
- ▬ Completed
- ▬ In Progress
- ▬ Planned under MOU 1 (2012)
- ▬ Planned under MOU 2 (2015)
- Existing Development**
- High (urban, village)
- Medium (estate residential, industrial, commercial, institutional)
- Low (rural)
- Agricultural
- Environmental Protection

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Kilometers



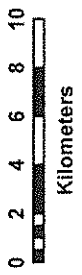
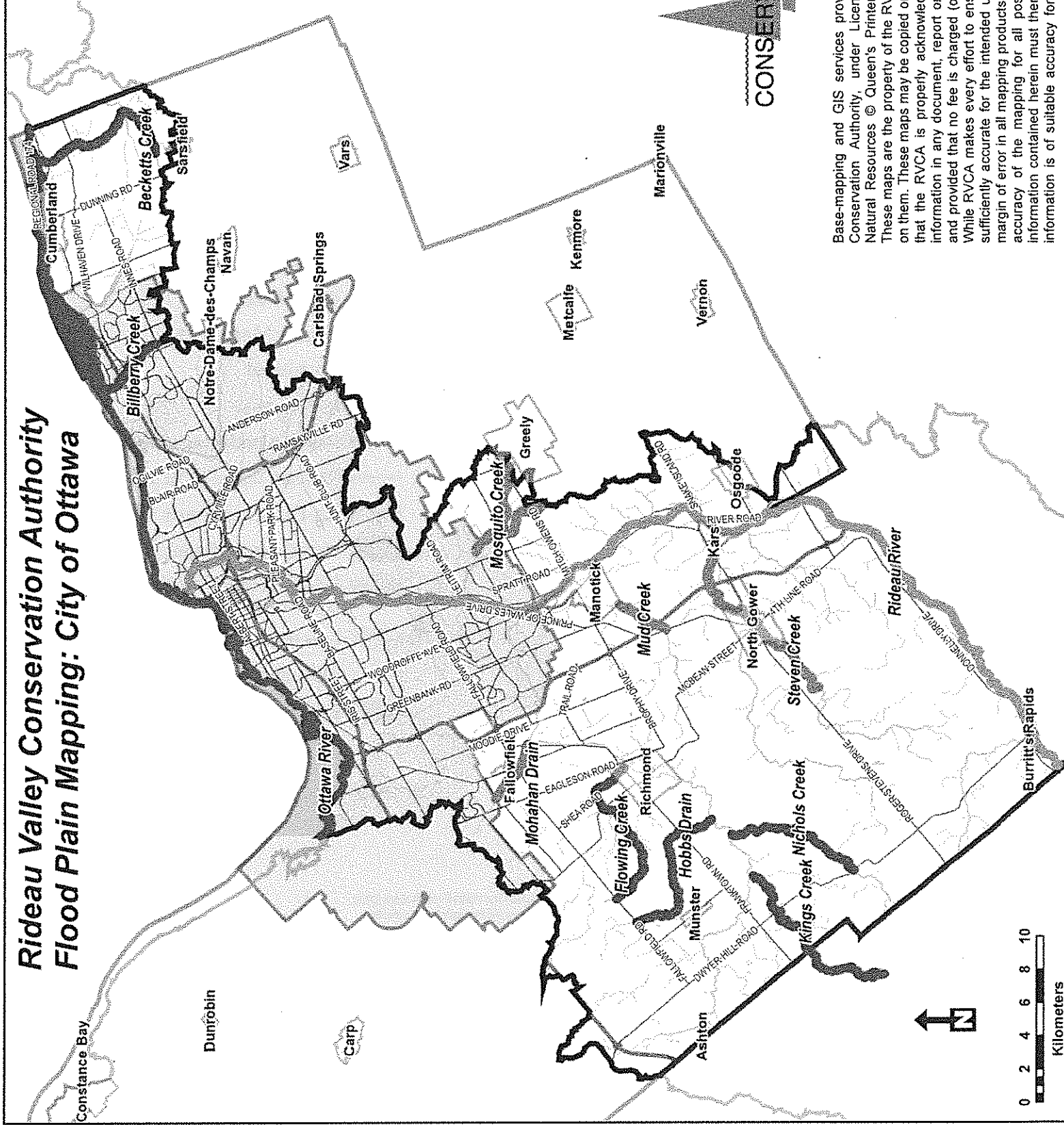
**SOUTH NATION
CONSERVATION**
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Rideau Valley Conservation Authority Flood Plain Mapping: City of Ottawa

LEGEND

- Village Boundaries
- Flood Plain Mapping
- Completed
- In Progress
- Planned under MOU1
- Planned under MOU2
- City Boundary
- RVCA (in Ottawa)
- Highways
- Major Roads
- Waterbodies
- Watercourses
- Minor
- Major
- Greenbelt
- Urban Boundary

RIDEAU VALLEY CONSERVATION AUTHORITY



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Mississippi Valley Conservation Authority Flood Plain Mapping: City of Ottawa

0 2.5 5 Kilometers



Legend

- Village Boundaries
- Flood Plain Mapping**
- Completed
- In Progress
- Planned under MOU 1 (2012)
- Planned under MOU 2 (2015)
- Ottawa Boundary
- MVCA Boundary in Ottawa
- Ottawa Urban Boundary
- Streams
- Waterbodies
- Roads
- Highways



Ashton

Münster

Richmond

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Flood Plain Mapping Project Details							
Watercourse/Reach Name	Coverage	Total Length of Watercourse (km)	Length of Flood Plain Mapping Reach (km)	Total Watercourse Drainage Area (km ²)	Number of Structures within Flood Plain Mapping Reach	Previous Flood Plain Mapping Produced?	Comments
South Nation Conservation							
Findlay Creek	White Alder Avenue to Mitch Owens Road	38.6	8.9	35.8	19		
Buckles MD + Unnamed Stream	Osgoode town centre to environmental protection zone east of Stagecoach Road	8.7	5.1	11.5	13		
Stream 5	8th Line Road to North Castor River	6.3	4.5	3.9	13		
Middle Castor River	Snake Island Road to 9th Line Road	147.7	11.0	100.0	14		
Regimbald MD/Shaws Creek	417 to start of agricultural area (north of Forced Road)	48.0	7.4	82.0	14		
Rideau Valley Conservation Authority							
Monahan Drain	Hope Side Road to Jock River	9.0	6.0	43.0	4	No	
Steven Creek	Rideau River to Malakoff Road	30.0	14.0	154.0	10	Yes	
Mosquito Creek	Mitch Owens to Earl Armstrong	17.0	11.0	38.0	12	No	
Mud Creek	1 st Line to Prince of Wales	17.0	4.0	62.0	10	No	
Mississippi Valley Conservation Authority							
Harwood Creek	Marchurst Road to Constance Lake	10.0	7.0	13.5	6	No	
Unnamed Tributary 3 - Constance Creek	Thomas Dolan Parkway/ Marchurst Road to Constance Lake	28.0	16.0	55.0	11	No	

Flood Plain Mapping Project Details							
Watercourse/Reach Name	Coverage	Total Length of Watercourse (km)	Length of Flood Plain Mapping Reach (km)	Total Watercourse Drainage Area (km ²)	Number of Structures Within Flood Plain Mapping Reach	Previous Flood Plain Mapping Produced?	Comments
Carp River	Carp Road to Ottawa River	36.0	25.0	180.0	15	Yes	
Carp River	Eagleson Road to Carp Road	36.0	12.0	126.0	11	Yes	To be started after the completion of the Carp River Restoration Plan and the production of updated topographic information

