

REQUEST FOR PROPOSAL

RFP# 976

ENGINEERING DESIGN SERVICES FOR SISTER LAKES STORMWATER RETROFIT

City of Ann Arbor
Systems Planning Unit



Due Date: Tuesday, June 21 2016, 10:00 AM (Local Time)

Issued By:

City of Ann Arbor
Procurement Unit
301 E. Huron Street
Ann Arbor, MI 48104

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SECTION I- GENERAL INFORMATION

A. OBJECTIVE

The City of Ann Arbor is seeking engineering design services for a retrofit of stormwater features for First Sister Lake. Features will include water quality improvements, conveyance modifications, and ecological habitat improvements. This project will have a significant amount of public engagement with the neighborhood and the local community.

Work will include, at a minimum, historic document review, survey, preliminary design, final design, construction documents, and bid specifications.

B. QUESTIONS ABOUT AND CLARIFICATIONS OF THE REQUEST FOR PROPOSAL

All questions regarding this Request for Proposal (RFP) shall be submitted via e-mail. Questions will be accepted and answered accordance with the terms and conditions of this RFP.

All questions shall be submitted on or before Friday, June 10, 2016, at 5:00 p.m., and should be addressed as follows:

Scope of Work/Proposal Content questions shall be e-mailed to Brian Slizewski – bslizewski@a2gov.org

RFP Process and HR Compliance questions shall be e-mailed to Colin Spencer - cspencer@a2gov.org

Should any prospective consultant be in doubt as to the true meaning of any portion of this RFP, or should the consultant find any ambiguity, inconsistency, or omission therein, the consultant shall make a written request for an official interpretation or correction by the due date above.

All interpretations, corrections, or additions to this RFP will be made only as an official addendum that will be posted to a2gov.org and MITN.info and it shall be the consultant's responsibility to ensure they have received all addenda before submitting a proposal. Any addendum issued by the City shall become part of the RFP, and must be incorporated in the proposal where applicable.

C. PRE-PROPOSAL MEETING

There will be a mandatory pre-proposal meeting on Tuesday, June 7, 2016, at 10:00 A.M, in the 6th Floor Conference Room, Larcom City Hall, 301 E. Huron Street, Ann Arbor, MI 48104

D. PROPOSAL FORMAT

To be considered, each firm must submit a response to this RFP using the format provided in Section III. No other distribution of proposals is to be made by the consultant. An official authorized to bind the consultant to its provisions must sign the proposal in ink. Each proposal must remain valid for at least ninety days from the due date of this RFP.

Proposals should be prepared simply and economically providing a straightforward, concise description of the consultant's ability to meet the requirements of the RFP. No erasures are permitted. Mistakes may be crossed out and corrected and must be initialed in ink by the person signing the proposal.

E. SELECTION CRITERIA

Responses to this RFP will be evaluated using a point system as shown in Section III. A selection committee comprised of staff from the City will complete the evaluation.

The fee proposals will not be reviewed at the initial evaluation. After initial evaluation, the City will determine top consultants, and open only those fee proposals. The City will then determine which, if any, firms will be interviewed. During the interviews, the selected firms will be given the opportunity to discuss their proposal, qualifications, past experience, and their fee proposal in more detail. The City further reserves the right to interview the key personnel assigned by the selected consultant to this project. If the City chooses to interview any consultants, the interviews will be held the week of October 26, 2015. Consultant must be available on these dates.

All proposals submitted may be subject to clarifications and further negotiation. All agreements resulting from negotiations that differ from what is represented within the RFP or in the consultant's response shall be documented and included as part of the final contract.

F. SEALED PROPOSAL SUBMISSION

All proposals are due and must be delivered to the City Procurement Unit on, or before, Tuesday, June 21, 2016, at 10:00 A.M. (local time). Proposals submitted late or via oral, telephonic, telegraphic, electronic mail or facsimile **will not** be considered or accepted.

Each respondent must submit in a sealed envelope

- **one (1) original proposal,**
- **six (6) additional proposal copies**
- **one (1) digital copy of the proposal on a flash drive, preferably in PDF format**

Each respondent must submit in a separate sealed envelope marked Fee Proposal

- **one (1) original of the fee proposal**
- **six (6) additional fee proposal copies**

The fee proposal and all costs must be separate from the rest of the proposal.

Proposals submitted must be clearly marked: “RFP No.976 –Engineering Design Services for Sister Lakes Stormwater Retrofit” and list the consultant’s name and address.

Proposals must be addressed and delivered to:

City of Ann Arbor
c/o Customer Service
301 East Huron Street
P.O. Box 8647
Ann Arbor, MI 48107

All proposals received on or before the due date will be publicly opened and recorded on the due date. No immediate decisions will be rendered.

Hand delivered proposals must be date/time stamped by the Customer Service Department at the address above in order to be considered. Delivery hours are 8:00 a.m. to 5:00 p.m. Monday through Friday, excluding Holidays.

The City will not be liable to any consultant for any unforeseen circumstances, delivery, or postal delays. Postmarking on the due date will not substitute for receipt of the proposal. Consultants are responsible for submission of their proposal. Additional time will not be granted to a single consultant. However, additional time may be granted to all consultants at the discretion of the City.

A proposal will be disqualified if:

- 1. The fee proposal is not contained within a separate sealed envelope.**
- 2. The fee proposal is submitted as part of the digital copy. Provide fee proposal in hard copy only.**
- 3. The forms provided as Attachment B - City of Ann Arbor Non-Discrimination Declaration of Compliance, Attachment C - City of Ann Arbor Living Wage Declaration of Compliance, Attachment D - Vendor Conflict of Interest Disclosure Form of the RFP Document must be included in submitted proposals.**

Proposals that fail to provide these completed forms listed above upon proposal opening will be deemed non-responsive and will not be considered for award.

G. DISCLOSURES

Under the Freedom of Information Act (Public Act 442), the City is obligated to permit review of its files, if requested by others. All information in a consultant's proposal is subject to disclosure under this provision. This act also provides for a complete disclosure of contracts and attachments thereto.

H. TYPE OF CONTRACT

A sample of the General Terms and Conditions is included as Appendix A. Those who wish to submit a proposal to the City are required to review the General Terms and Conditions carefully. **The City will not entertain changes to its General Terms and Conditions.**

The City reserves the right to award the total proposal, to reject any or all proposals in whole or in part, and to waive any informality or technical defects if, in the City's sole judgment, the best interests of the City will be so served.

This RFP and the selected consultant's response thereto, shall constitute the basis of the scope of services in the contract by reference.

I. HUMAN RIGHTS REQUIREMENTS

All contractors proposing to do business with the City shall satisfy the contract compliance administrative policy adopted by the City Administrator in accordance with the Section 9:158 of the Ann Arbor City Code. Breach of the obligation not to discriminate as outlined in Attachment E shall be a material breach of the contract. Contractors are required to post a copy of Ann Arbor's Non-Discrimination Ordinance attached at all work locations where its employees provide services under a contract with the City.

J. WAGE REQUIREMENTS

The Attachments provided herein outline the requirements for payment of prevailing wages or of a "living wage" to employees providing service to the City under this contract. The successful consultant must comply with all applicable requirements and provide documentary proof of compliance when requested.

K. CONFLICT OF INTEREST DISCLOSURE

The City of Ann Arbor Purchasing Policy requires that the consultant complete a Conflict of Interest Disclosure form. A contract may not be awarded to the selected consultant unless and until the Procurement Unit and the City Administrator have reviewed the Disclosure form and determined that no conflict exists under applicable federal, state, or local law or administrative regulation. Not every relationship or situation disclosed on the Disclosure Form may be a disqualifying conflict. Depending on applicable law and regulations, some contracts may awarded on the recommendation of the City Administrator after full disclosure, where such action is allowed by law, if demonstrated competitive pricing exists and/or it is determined the award is in

the best interest of the City. A copy of the Conflict of Interest Disclosure Form is attached.

L. COST LIABILITY

The City of Ann Arbor assumes no responsibility or liability for costs incurred by the consultant prior to the execution of a Professional Services Agreement. The liability of the City is limited to the terms and conditions outlined in the Agreement. By submitting a proposal, consultant agrees to bear all costs incurred or related to the preparation, submission, and selection process for the proposal.

M. DEBARMENT

Submission of a proposal in response to this RFP is certification that the Respondent is not currently debarred, suspended, proposed for debarment, and declared ineligible or voluntarily excluded from participation in this transaction by any State or Federal departments or agency. Submission is also agreement that the City will be notified of any changes in this status.

N. PROPOSAL PROTEST

All proposal protests must be in writing and filed with the Purchasing Manager within five (5) business days of the award action. The consultant must clearly state the reasons for the protest. If a consultant contacts a City Service Area/Unit and indicates a desire to protest an award, the Service Area/Unit shall refer the consultant to the Purchasing Manager. The Purchasing Manager will provide the consultant with the appropriate instructions for filing the protest. The protest shall be reviewed by the City Administrator or designee, whose decision shall be final.

O. SCHEDULE

The proposals submitted should define an appropriate schedule in accordance with the requirements of the Proposed Work Plan in Section III.

The following is the schedule for this RFP process.

Activity/Event	Anticipated Date
Pre-Proposal Meeting (mandatory)	June 7, 2016, 10:00 A.M.
Written Question Deadline	June 10, 2016, 5:00 P.M.
Proposal Due Date	June 21, 2016, 10:00 A.M.
Interviews (if needed)	Week of July 11, 2016
Selection	Week of July 18, 2016
City Council Contract Authorization	September 6, 2016
Agreement Execution	September 16, 2016

The above schedule is for information purposes only and is subject to change at the City's discretion.

O. IRS FORM W-9

The selected consultant will be required to provide the City of Ann Arbor an IRS form W-9.

P. RESERVATION OF RIGHTS

1. The City reserves the right in its sole and absolute discretion to accept or reject any or all proposals, or alternative proposals, in whole or in part, with or without cause.
2. The City reserves the right to waive, or not waive, informalities or irregularities in terms or conditions of any proposal if determined by the City to be in its best interest.
3. The City reserves the right to request additional information from any or all consultants.
4. The City reserves the right to reject any proposal that it determines to be unresponsive and deficient in any of the information requested within RFP.
5. The City reserves the right to determine whether the scope of the project will be entirely as described in the RFP, a portion of the scope, or a revised scope be implemented.
6. The City reserves the right to select one or more consultants to perform services.
7. The City reserves the right to retain all proposals submitted and to use any ideas in a proposal regardless of whether that proposal is selected. Submission of a proposal indicates acceptance by the firm of the conditions contained in this RFP, unless clearly and specifically noted in the proposal submitted.
8. The City reserves the right to disqualify proposals that fail to respond to any requirements outlined in the RFP, or failure to enclose copies of the required documents outlined within RFP.

SECTION II - SCOPE OF WORK

Task 1 – Survey Work

The consultant will be responsible for survey of the project area, including wetland delineation within project scope.

Task 2 – Preliminary Design & Review

The consultant will develop up to three design alternatives to address the needs and recommendations from the 2015 *Sister Lakes Review* Report. These alternatives will shall address water quality improvements and achieve a minimum of 80% Total Suspended Solids (TSS) reduction. The alternatives will be crucial in the public engagement process, and ultimately be developed into a final design.

Task 3 - Public Engagement

The consultant will not perform this task. The consultant will be expected to create public engagement presentation plans. The selected consultant will be required to collaborate with City Staff that will be performing the public engagement. The purpose of the public engagement is to share design alternatives and collect neighborhood feedback prior to final design. The final design will be presented at a subsequent meeting.

Task 4 - Permitting

The consultant will facilitate application process including all applicable permit documentation for MDEQ/USACE Wetlands Impacts.

Task 5 - Construction Drawings & Specifications

The consultant will develop the approved final design into construction drawings, maintenance plans, and bid specifications to be used for construction.

SECTION III - MINIMUM INFORMATION REQUIRED

PROPOSAL FORMAT

Consultants should organize Proposals into the following Sections:

- A. Professional Qualifications
- B. Proposed Work Plan
- C. Fee Proposal (include in a separate sealed envelope clearly marked "Fee Proposal")
- D. Authorized Negotiator
- E. Attachments

The following describes the elements that should be included in each of the proposal sections and the weighted point system that will be used for evaluation of the proposals.

- A. Professional Qualifications/Quality of Work – 50 points
 - 1. State the full name and address of your organization and, if applicable, the branch office or other subsidiary element that will perform, or assist in performing, the work hereunder. Indicate whether it operates as an individual, partnership, or corporation. If as a corporation, include whether it is licensed to operate in the State of Michigan.
 - 2. Include the name of executive and professional personnel by skill and qualification that will be employed in the work. Show where these personnel will be physically located during the time they are engaged in the work. Indicate which of these individuals you consider key to the successful completion of the project. Identify only individuals who will do the work on this project by name and title. Resumes and qualifications are required for all proposed project personnel, including all subcontractors. Qualifications and capabilities of any subcontractors must also be included.
 - 3. (10 Points) State history of the firm, in terms of length of existence, types of services provided, etc. Identify the technical details that make the firm uniquely qualified for this work.
 - 4. (20 Points) Project team personnel experience in the design and construction of green infrastructure. Identify and provide background information on the key personnel who take the most active role(s) in the administration and management of the project. Provide resumes and biographical information on key professionals that will be directly involved in the project. Include the number of years at your firm, total years of experience, and professional licenses and designations (if applicable).

5. (20 points) Past project descriptions of the design, construction and maintenance of green infrastructure BMPs.

B. Proposed Work Plan – 40 points

A detailed work plan is to be presented which lists all tasks determined to be necessary to accomplish the work detailed in the scope of services. The work plan shall define resources needed for each task. In addition, the work plan shall include a timeline schedule depicting the sequence and duration of tasks showing how the work will be organized and executed. The work plan shall include the proposed methodology that will incorporate public engagement across all appropriate aspects of the project. The consultant may propose tasks and deliverable outside of those listed above if they believe they are necessary to support the city's objectives.

In the scoring for this section, consultants shall be evaluated on the clarity, thoroughness, and content of their responses to the above items.

C. Fee Proposal - 10 points

1. Fee quotations shall be submitted in a separate, sealed, envelope as part of the proposal. Fee quotations are to include the names, title, hourly rates, overhead factors, and any other details, including hours of effort for each team member by task, and sub-task, by which the overall and project element costs have been derived. The fee quotation is to relate in detail to each item of the proposed work plan. Consultants shall be capable of justifying the details of the fee proposal relative to personnel costs, overhead, how the overhead rate is derived, material and time.
2. The fee proposed must include the total estimated cost for the project when it is 100% complete. This total may be adjusted after negotiations with the City and prior to signing a formal contract, if justified. A sample of the required agreement form is included as Attachment A in Section IV of this RFP.

D. Authorized Negotiator

Include the name, phone number, and e-mail address of persons(s) in your organization authorized to negotiate the agreement with the City.

E. Attachments

Legal Status of Respondent, Vendor Conflict of Interest, Living Wage Compliance Form, and the Non-Discrimination Compliance Form shall be

completed and returned with the proposal. These elements should be included as attachments to the proposal submission.

PROPOSAL EVALUATION

1. The selection committee will evaluate each proposal by the above-described criteria and point system (A through B, based on 90 points) to select a short-list of firms for further consideration. The City reserves the right to reject any proposal that it determines to be unresponsive and deficient in any of the information requested for evaluation. A proposal with all the requested information does not guarantee the proposing firm to be a candidate for an interview. The committee may contact references to verify material submitted by the consultants.
2. The committee then will schedule the interviews with the selected firms if necessary. The selected firms will be given the opportunity to discuss in more detail their qualifications, past experience, proposed work plan and fee proposal.
3. The interview must include the project team members expected to complete a majority of work on the project, but no more than six members total. The interview shall consist of a presentation of up to thirty minutes by the consultant, including the person who will be the project manager on this contract, followed by approximately thirty minutes of questions and answers. Audiovisual aids may be used during the oral interviews. The committee may record the oral interviews.
4. The firms interviewed will then be re-evaluated by the above criteria (A through C), and adjustments to scoring will be made as appropriate. After evaluation of the proposals, further negotiation with the selected firm may be pursued leading to the award of a contract by City Council, if suitable proposals are received.

The City also reserves the right to waive the interview process and evaluate the consultants based on their proposals and fee schedules alone.

The City will determine whether the final scope of the project to be negotiated will be entirely as described in this RFP, a portion of the scope, or a revised scope.

Work to be done under this contract is generally described through the detailed specifications and must be completed fully in accordance with the contract documents.

Any proposal that does not conform fully to these instructions may be rejected.

PREPARATION OF PROPOSALS

Proposals should be prepared providing a straightforward, concise description of the consultant's ability to meet the requirements of the RFP. Proposals shall be typewritten. No erasures are permitted. Mistakes may be crossed out and corrected and must be initialed and dated in ink by the person signing the proposal.

Proposals should have no plastic bindings. Staples or binder clips are acceptable. Proposals should be printed double sided on recycled paper. Proposals should be no more than 10 sheets excluding resumes and past project descriptions.

Each person signing the proposal certifies that he or she is the person in the consultant's firm/organization responsible for the decision as to the fees being offered in the Proposal and has not and will not participate in any action contrary to the terms of this provision.

ADDENDA

If it becomes necessary to revise any part of the RFP, notice of the addendum will be posted to Michigan Inter-governmental Trade Network (MITN) www.mitn.info and/or the City of Ann Arbor web site www.A2gov.org for all parties to download.

Each consultant must acknowledge in its proposal all addenda it has received. The failure of a consultant to receive or acknowledge receipt of any addenda shall not relieve the consultant of the responsibility for complying with the terms thereof. The City will not be bound by oral responses to inquiries or written responses other than official written addenda.

SECTION IV - ATTACHMENTS

Attachment A: - Legal Status of Respondent

Attachment B – Non-Discrimination Ordinance Declaration of Compliance Form

Attachment C – Living Wage Declaration of Compliance Form

Attachment D – Vendor Conflict of Interest Disclosure Form

Attachment E – Non-Discrimination Ordinance Poster

Attachment F – Living Wage Ordinance Poster

ATTACHMENT A LEGAL STATUS OF RESPONDENT

(The Respondent shall fill out the provision and strike out the remaining ones.)

The Respondent is:

- A corporation organized and doing business under the laws of the state of _____, for whom _____ bearing the office title of _____, whose signature is affixed to this proposal, is authorized to execute contracts on behalf of respondent.*

*If not incorporated in Michigan, please attach the corporation's Certificate of Authority

- A limited liability company doing business under the laws of the state of _____, whom _____ bearing the title of _____ whose signature is affixed to this proposal, is authorized to execute contract on behalf of the LLC.

- A partnership organized under the laws of the state of _____ and filed with the county of _____, whose members are (attach list including street and mailing address for each.)

- An individual, whose signature with address, is affixed to this RFP.

Respondent has examined the basic requirements of this RFP and its scope of services, including all Addendum (if applicable) and hereby agrees to offer the services as specified in the RFP.

Signature Date: _____,

(Print) Name _____ Title _____

Firm: _____

Address: _____

Contact Phone _____ Fax _____

Email _____

**CITY OF ANN ARBOR
DECLARATION OF COMPLIANCE**

Non-Discrimination Ordinance

The “non discrimination by city contractors” provision of the City of Ann Arbor Non-Discrimination Ordinance (Ann Arbor City Code Chapter 112, Section 9:158) requires all contractors proposing to do business with the City to treat employees in a manner which provides equal employment opportunity and does not discriminate against any of their employees, any City employee working with them, or any applicant for employment on the basis of actual or perceived age, arrest record, color, disability, educational association, familial status, family responsibilities, gender expression, gender identity, genetic information, height, HIV status, marital status, national origin, political beliefs, race, religion, sex, sexual orientation, source of income, veteran status, victim of domestic violence or stalking, or weight. It also requires that the contractors include a similar provision in all subcontracts that they execute for City work or programs.

In addition the City Non-Discrimination Ordinance requires that all contractors proposing to do business with the City of Ann Arbor must satisfy the contract compliance administrative policy adopted by the City Administrator. A copy of that policy may be obtained from the Purchasing Manager

The Contractor agrees:

- (a) To comply with the terms of the City of Ann Arbor’s Non-Discrimination Ordinance and contract compliance administrative policy, including but not limited to an acceptable affirmative action program if applicable.
- (b) To post the City of Ann Arbor’s Non-Discrimination Ordinance Notice in every work place or other location in which employees or other persons are contracted to provide services under a contract with the City.
- (c) To provide documentation within the specified time frame in connection with any workforce verification, compliance review or complaint investigation.
- (d) To permit access to employees and work sites to City representatives for the purposes of monitoring compliance, or investigating complaints of non-compliance.

The undersigned states that he/she has the requisite authority to act on behalf of his/her employer in these matters and has offered to provide the services in accordance with the terms of the Ann Arbor Non-Discrimination Ordinance. The undersigned certifies that he/she has read and is familiar with the terms of the Non-Discrimination Ordinance, obligates the Contractor to those terms and acknowledges that if his/her employer is found to be in violation of Ordinance it may be subject to civil penalties and termination of the awarded contract.

Company Name

Signature of Authorized Representative	Date
--	------

Print Name and Title

Address, City, State, Zip

Phone/Email address

Questions about the Notice or the City Administrative Policy, Please contact:
Procurement Office of the City of Ann Arbor
(734) 794-6500



ATTACHMENT D

VENDOR CONFLICT OF INTEREST DISCLOSURE FORM

All vendors interested in conducting business with the City of Ann Arbor must complete and return the Vendor Conflict of Interest Disclosure Form in order to be eligible to be awarded a contract. Please note that all vendors are subject to comply with the City of Ann Arbor's conflict interest policies as stated within the certification section below.

If a vendor has a relationship with a City of Ann Arbor official or employee, an immediate family member of a City of Ann Arbor official or employee, the vendor shall disclose the information required below.

Certification: I hereby certify that to my knowledge, there is no conflict of interest involving the vendor named below:

1. No City official or employee or City employee's immediate family member has an ownership interest in vendor's company or is deriving personal financial gain from this contract.
2. No retired or separated City official or employee who has been retired or separated from the City for less than one (1) year has an ownership interest in vendor's Company.
3. No City employee is contemporaneously employed or prospectively to be employed with the vendor.
4. Vendor hereby declares it has not and will not provide gifts or hospitality of any dollar value or any other gratuities to any City employee or elected official to obtain or maintain a contract.
5. Please note any exceptions below:

Vendor Name	Vendor Phone Number
Conflict of Interest Disclosure *	
Name of City of Ann Arbor employees, elected officials, or immediate family members with whom there may be a potential conflict of interest.	<input type="checkbox"/> Relationship to employee <input type="checkbox"/> Interest in vendor's company <input type="checkbox"/> Other

*Disclosing a potential conflict of interest does not disqualify vendors. In the event vendors do not disclose potential conflicts of interest and they are detected by the City, vendor will be exempt from doing business with the City.

I certify that the information provided is true and correct by my signature below:

 Signature of Vendor Authorized Representative Date Printed Name of Vendor Authorized Representative

PROCUREMENT USE ONLY

- Yes, named employee was involved in Bid / Proposal process.
- No, named employee was not involved in procurement process or decision.

ATTACHMENT E

CITY OF ANN ARBOR NON-DISCRIMINATION ORDINANCE

Relevant provisions of Chapter 112, Nondiscrimination, of the Ann Arbor City Code are included below. You can review the entire ordinance at [www. a2gov.org/departments/city-clerk](http://www.a2gov.org/departments/city-clerk)

Intent: It is the intent of the city that no individual be denied equal protection of the laws; nor shall any individual be denied the enjoyment of his or her civil or political rights or be discriminated against because of actual or perceived age, arrest record, color, disability, educational association, familial status, family responsibilities, gender expression, gender identity, genetic information, height, HIV status, marital status, national origin, political beliefs, race, religion, sex, sexual orientation, source of income, veteran status, victim of domestic violence or stalking, or weight.

Discriminatory Employment Practices: No person shall discriminate in the hire, employment, compensation, work classifications, conditions or terms, promotion or demotion, or termination of employment of any individual. No person shall discriminate in limiting membership, conditions of membership or termination of membership in any labor union or apprenticeship program.

Discriminatory Effects: No person shall adopt, enforce or employ any policy or requirement which has the effect of creating unequal opportunities according to actual or perceived age, arrest record, color, disability, educational association, familial status, family responsibilities, gender expression, gender identity, genetic information, height, HIV status, marital status, national origin, political beliefs, race, religion, sex, sexual orientation, source of income, veteran status, victim of domestic violence or stalking, or weight for an individual to obtain housing, employment or public accommodation, except for a bona fide business necessity. Such a necessity does not arise due to a mere inconvenience or because of suspected objection to such a person by neighbors, customers or other persons.

Nondiscrimination by City Contractors: All contractors proposing to do business with the City of Ann Arbor shall satisfy the contract compliance administrative policy adopted by the City Administrator in accordance with the guidelines of this section. All city contractors shall ensure that applicants are employed and that employees are treated during employment in a manner which provides equal employment opportunity and tends to eliminate inequality based upon any classification protected by this chapter. All contractors shall agree not to discriminate against an employee or applicant for employment with respect to hire, tenure, terms, conditions, or privileges of employment, or a matter directly or indirectly related to employment, because of any applicable protected classification. All contractors shall be required to post a copy of Ann Arbor's Non-Discrimination Ordinance at all work locations where its employees provide services under a contract with the city.

Complaint Procedure: If any individual has a grievance alleging a violation of this chapter, he/she has 180 calendar days from the date of the individual's knowledge of the allegedly discriminatory action or 180 calendar days from the date when the individual should have known of the alleged discriminatory action to file a complaint with the city's Human Rights Commission. If an individual fails to file a complaint alleging a violation of this chapter within the specified time frame, the complaint will not be considered by the Human Rights Commission. The complaint should be made in writing to the Human Rights Commission. The complaint may be filed in person with the City Clerk, by e-mail at aahumanrightscommission@gmail.com, or by mail (Ann Arbor Human Rights Commission, PO Box 8647, Ann Arbor, MI 48107). The complaint must contain information about the alleged discrimination, such as name, address, phone number of the complainant and location, date and description of the alleged violation of this chapter.

Private Actions For Damages or Injunctive Relief: To the extent allowed by law, an individual who is the victim of discriminatory action in violation of this chapter may bring a civil action for appropriate injunctive relief or damages or both against the person(s) who acted in violation of this chapter.

**CITY OF ANN ARBOR
LIVING WAGE ORDINANCE**

RATE EFFECTIVE APRIL 30, 2016 - ENDING APRIL 29, 2017

\$12.93 per hour

If the employer provides health care benefits*

\$14.43 per hour

If the employer does **NOT** provide health care benefits*

Employers providing services to or for the City of Ann Arbor or recipients of grants or financial assistance from the City of Ann Arbor for a value of more than \$10,000 in a twelve-month period of time must pay those employees performing work on a City of Ann Arbor contract or grant, the above living wage.

ENFORCEMENT

The City of Ann Arbor may recover back wages either administratively or through court action for the employees that have been underpaid in violation of the law. Persons denied payment of the living wage have the right to bring a civil action for damages in addition to any action taken by the City.

Violation of this Ordinance is punishable by fines of not more than \$500/violation plus costs, with each day being considered a separate violation. Additionally, the City of Ann Arbor has the right to modify, terminate, cancel or suspend a contract in the event of a violation of the Ordinance.

* Health Care benefits include those paid for by the employer or making an employer contribution toward the purchase of health care. The employee contribution must not exceed \$.50 an hour for an average work week; and the employer cost or contribution must equal no less than \$1/hr for the average work week.

The Law Requires Employers to Display This Poster Where Employees Can Readily See It.

**For Additional Information or to File a Complaint Contact
Colin Spencer at 734/794-6500 or cspencer@a2gov.org**

APPENDIX A: SAMPLE PROFESSIONAL SERVICES AGREEMENT

If a contract is awarded, the selected Firm(s) will be required to adhere to a set of general contract provisions which will become a part of any formal agreement. These provisions are general principles which apply to all contractors/service providers to the City of Ann Arbor. The required provisions are:

SAMPLE PROFESSIONAL SERVICES AGREEMENT BETWEEN

AND THE CITY OF ANN ARBOR
FOR _____

The City of Ann Arbor, a Michigan municipal corporation, having its offices at 301 E. Huron St. Ann Arbor, Michigan 48103 ("City"), and _____

("Contractor") a(n) _____
(State where organized) (Partnership, Sole Proprietorship, or Corporation)

with its address at _____
agree as follows on this _____ day of _____, 20____.

The Contractor agrees to provide services to the City under the following terms and conditions:

I. DEFINITIONS

Administering Service Area/Unit means _____.

Contract Administrator means _____, acting personally or through any assistants authorized by the Administrator/Manager of the Administering Service Area/Unit.

Deliverables means all Plans, Specifications, Reports, Recommendations, and other materials developed for and delivered to City by Contractor under this Agreement

Project means _____
Project name

II. DURATION

This Agreement shall become effective on _____, 20____, and shall remain in effect until satisfactory completion of the Services specified below unless terminated as provided for in Article XI.

III. SERVICES

A. The Contractor agrees to provide _____
type of service

("Services") in connection with the Project as described in Exhibit A. The City retains the right to make changes to the quantities of service within the general scope of the Agreement at any

time by a written order. If the changes add to or deduct from the extent of the services, the contract sum shall be adjusted accordingly. All such changes shall be executed under the conditions of the original Agreement.

- B. Quality of Services under this Agreement shall be of the level of quality performed by persons regularly rendering this type of service. Determination of acceptable quality shall be made solely by the Contract Administrator.
- C. The Contractor shall perform its Services for the Project in compliance with all statutory, regulatory and contractual requirements now or hereafter in effect as may be applicable to the rights and obligations set forth in the Agreement.
- D. The Contractor may rely upon the accuracy of reports and surveys provided to it by the City (if any) except when defects should have been apparent to a reasonably competent professional or when it has actual notice of any defects in the reports and surveys.

IV. INDEPENDENT CONTRACTOR

The Parties agree that at all times and for all purposes under the terms of this Agreement each Party's relationship to any other Party shall be that of an independent contractor. Each Party will be solely responsible for the acts of its own employees, agents, and servants. No liability, right, or benefit arising out of any employer/employee relationship, either express or implied, shall arise or accrue to any Party as a result of this Agreement.

V. COMPENSATION OF CONTRACTOR

- A. The Contractor shall be paid in the manner set forth in Exhibit B. Payment shall be made monthly, unless another payment term is specified in Exhibit B, following receipt of invoices submitted by the Contractor, and approved by the Contract Administrator.
- B. The Contractor will be compensated for Services performed in addition to the Services described in Section III, only when the scope of and compensation for those additional Services have received prior written approval of the Contract Administrator.
- C. The Contractor shall keep complete records of work performed (e.g. tasks performed/hours allocated) so that the City may verify invoices submitted by the Contractor. Such records shall be made available to the City upon request and submitted in summary form with each invoice.

VI. INSURANCE/INDEMNIFICATION

- A. The Contractor shall procure and maintain during the life of this contract such insurance policies, including those set forth in Exhibit C, as will protect itself and the City from all claims for bodily injuries, death or property damage which may

arise under this contract; whether the act(s) or omission(s) giving rise to the claim were made by the Contractor, any subcontractor or anyone employed by them directly or indirectly. In the case of all contracts involving on-site work, the Contractor shall provide to the City, before the commencement of any work under this contract, documentation satisfactory to the City demonstrating it has obtained the policies and endorsements required by Exhibit C.

- B. Any insurance provider of Contractor shall be admitted and authorized to do business in the State of Michigan and shall carry and maintain a minimum rating assigned by A.M. Best & Company's Key Rating Guide of "A-" Overall and a minimum Financial Size Category of "V". Insurance policies and certificates issued by non-admitted insurance companies are not acceptable unless approved in writing by the City.
- C. To the fullest extent permitted by law, Contractor shall indemnify, defend and hold the City, its officers, employees and agents harmless from all suits, claims, judgments and expenses, including attorney's fees, resulting or alleged to result, from any acts or omissions by Contractor or its employees and agents occurring in the performance of or breach in this Agreement, except to the extent that any suit, claim, judgment or expense are finally judicially determined to have resulted from the City's negligence or willful misconduct or its failure to comply with any of its material obligations set forth in this Agreement.

VII. COMPLIANCE REQUIREMENTS

- A. Nondiscrimination. The Contractor agrees to comply, and to require its subcontractor(s) to comply, with the nondiscrimination provisions of MCL 37.2209. The Contractor further agrees to comply with the provisions of Section 9:158 of Chapter 112 of the Ann Arbor City Code and to assure that applicants are employed and that employees are treated during employment in a manner which provides equal employment opportunity.
- B. Living Wage. If the Contractor is a "covered employer" as defined in Chapter 23 of the Ann Arbor City Code, the Contractor agrees to comply with the living wage provisions of Chapter 23 of the Ann Arbor City Code. The Contractor agrees to pay those employees providing Services to the City under this Agreement a "living wage," as defined in Section 1:815 of the Ann Arbor City Code, as adjusted in accordance with Section 1:815(3); to post a notice approved by the City of the applicability of Chapter 23 in every location in which regular or contract employees providing services under this Agreement are working; to maintain records of compliance; if requested by the City, to provide documentation to verify compliance; to take no action that would reduce the compensation, wages, fringe benefits, or leave available to any employee or person contracted for employment in order to pay the living wage required by Section 1:815; and otherwise to comply with the requirements of Chapter 23.

VIII. WARRANTIES BY THE CONTRACTOR

- A. The Contractor warrants that the quality of its Services under this Agreement shall conform to the level of quality performed by persons regularly rendering this type of service.
- B. The Contractor warrants that it has all the skills, experience, and professional licenses necessary to perform the Services specified in this Agreement.
- C. The Contractor warrants that it has available, or will engage, at its own expense, sufficient trained employees to provide the Services specified in this Agreement.
- D. The Contractor warrants that it is not, and shall not become overdue or in default to the City for any contract, debt, or any other obligation to the City including real and personal property taxes.
- E. The Contractor warrants that its proposal for services was made in good faith, it arrived at the costs of its proposal independently, without consultation, communication or agreement, for the purpose of restricting completion as to any matter relating to such fees with any competitor for these Services; and no attempt has been made or shall be made by the Contractor to induce any other perform or firm to submit or not to submit a proposal for the purpose of restricting competition.

IX. OBLIGATIONS OF THE CITY

- A. The City agrees to give the Contractor access to the Project area and other City-owned properties as required to perform the necessary Services under this Agreement.
- B. The City shall notify the Contractor of any defects in the Services of which the Contract Administrator has actual notice.

X. ASSIGNMENT

- A. The Contractor shall not subcontract or assign any portion of any right or obligation under this Agreement without prior written consent from the City. Notwithstanding any consent by the City to any assignment, Contractor shall at all times remain bound to all warranties, certifications, indemnifications, promises and performances, however described, as are required of it under the Agreement unless specifically released from the requirement, in writing, by the City.
- B. The Contractor shall retain the right to pledge payment(s) due and payable under this Agreement to third parties.

XI. TERMINATION OF AGREEMENT

- A. If either party is in breach of this Agreement for a period of fifteen (15) days following receipt of notice from the non-breaching party with respect to a breach, the non-breaching party may pursue any remedies available to it against the

breaching party under applicable law, including but not limited to, the right to terminate this Agreement without further notice. The waiver of any breach by any party to this Agreement shall not waive any subsequent breach by any party.

- B. The City may terminate this Agreement, on at least thirty (30) days advance notice, for any reason, including convenience, without incurring any penalty, expense or liability to Contractor, except the obligation to pay for Services actually performed under the Agreement before the termination date.
- C. Contractor acknowledges that, if this Agreement extends for several fiscal years, continuation of this Agreement is subject to appropriation of funds for this Project. If funds to enable the City to effect continued payment under this Agreement are not appropriated or otherwise made available, the City shall have the right to terminate this Agreement without penalty at the end of the last period for which funds have been appropriated or otherwise made available by giving written notice of termination to Contractor. The Contract Administrator shall give Contractor written notice of such non-appropriation within thirty (30) days after it receives notice of such non-appropriation.
- D. The provisions of Articles VI and VIII shall survive the expiration or earlier termination of this Agreement for any reason. The expiration or termination of this Agreement, for any reason, shall not release either party from any obligation or liability to the other party, including any payment obligation that has already accrued and Contractor's obligation to deliver all Deliverables due as of the date of termination of the Agreement.

XII. REMEDIES

- A. This Agreement does not, and is not intended to, impair, divest, delegate or contravene any constitutional, statutory and/or other legal right, privilege, power, obligation, duty or immunity of the Parties.
- B. All rights and remedies provided in this Agreement are cumulative and not exclusive, and the exercise by either party of any right or remedy does not preclude the exercise of any other rights or remedies that may now or subsequently be available at law, in equity, by statute, in any agreement between the parties or otherwise.
- C. Absent a written waiver, no act, failure, or delay by a Party to pursue or enforce any rights or remedies under this Agreement shall constitute a waiver of those rights with regard to any existing or subsequent breach of this Agreement. No waiver of any term, condition, or provision of this Agreement, whether by conduct or otherwise, in one or more instances, shall be deemed or construed as a continuing waiver of any term, condition, or provision of this Agreement. No waiver by either Party shall subsequently effect its right to require strict performance of this Agreement.

XIII. NOTICE

All notices and submissions required under this Agreement shall be delivered to the respective party in the manner described herein to the address stated in this Agreement or such other address as either party may designate by prior written notice to the other. Notices given under this Agreement shall be in writing and shall be personally delivered, sent by next day express delivery service, certified mail, or first class U.S. mail postage prepaid, and addressed to the person listed below. Notice will be deemed given on the date when one of the following first occur: (1) the date of actual receipt; (2) the next business day when notice is sent next day express delivery service or personal delivery; or (3) three days after mailing first class or certified U.S. mail.

If Notice is sent to the CONTRACTOR, it shall be addressed and sent to:

If Notice is sent to the CITY, it shall be addressed and sent to:

City of Ann Arbor

(insert name of Administering Service Area Administrator)

301 E. Huron St.
Ann Arbor, Michigan 48103

XIV. CHOICE OF LAW AND FORUM

This Agreement will be governed and controlled in all respects by the laws of the State of Michigan, including interpretation, enforceability, validity and construction, excepting the principles of conflicts of law. The parties submit to the jurisdiction and venue of the Circuit Court for Washtenaw County, State of Michigan, or, if original jurisdiction can be established, the United States District Court for the Eastern District of Michigan, Southern Division, with respect to any action arising, directly or indirectly, out of this Agreement or the performance or breach of this Agreement. The parties stipulate that the venues referenced in this Agreement are convenient and waive any claim of non-convenience.

XV. OWNERSHIP OF DOCUMENTS

Upon completion or termination of this Agreement, all documents (i.e., Deliverables) prepared by or obtained by the Contractor as provided under the terms of this Agreement shall be delivered to and become the property of the City. Original basic survey notes, sketches, charts, drawings, partially completed drawings, computations, quantities and other data shall remain in

the possession of the Contractor as instruments of service unless specifically incorporated in a deliverable, but shall be made available, upon request, to the City without restriction or limitation on their use. The City acknowledges that the documents are prepared only for the Project. Prior to completion of the contracted Services the City shall have a recognized proprietary interest in the work product of the Contractor.

Unless otherwise stated in this Agreement, any intellectual property owned by Contractor prior to the effective date of this Agreement (i.e., Preexisting Information) shall remain the exclusive property of Contractor even if such Preexisting Information is embedded or otherwise incorporated in materials or products first produced as a result of this Agreement or used to develop Deliverables. The City's right under this provision shall not apply to any Preexisting Information or any component thereof regardless of form or media.

XV. CONFLICTS OF INTEREST OR REPRESENTATION

Contractor certifies it has no financial interest in the Services to be provided under this Agreement other than the compensation specified herein. Contractor further certifies that it presently has no personal or financial interest, and shall not acquire any such interest, direct or indirect, which would conflict in any manner with its performance of the Services under this Agreement.

Contractor agrees to advise the City if Contractor has been or is retained to handle any matter in which its representation is adverse to the City. The City's prospective consent to the Contractor's representation of a client in matters adverse to the City, as identified above, will not apply in any instance where, as the result of Contractor's representation, the Contractor has obtained sensitive, proprietary or otherwise confidential information of a non-public nature that, if known to another client of the Contractor, could be used in any such other matter by the other client to the material disadvantage of the City. Each matter will be reviewed on a case by case basis.

XVII. SEVERABILITY OF PROVISIONS

Whenever possible, each provision of this Agreement will be interpreted in a manner as to be effective and valid under applicable law. However, if any provision of this Agreement or the application of any provision to any party or circumstance will be prohibited by or invalid under applicable law, that provision will be ineffective to the extent of the prohibition or invalidity without invalidating the remainder of the provisions of this Agreement or the application of the provision to other parties and circumstances.

XVIII. EXTENT OF AGREEMENT

This Agreement, together with any affixed exhibits, schedules or other documentation, constitutes the entire understanding between the City and the Contractor with respect to the subject matter of the Agreement and it supersedes, unless otherwise incorporated by reference herein, all prior representations, negotiations, agreements or understandings whether written or

oral. Neither party has relied on any prior representations, of any kind or nature, in entering into this Agreement. No terms or conditions of either party's invoice, purchase order or other administrative document shall modify the terms and conditions of this Agreement, regardless of the other party's failure to object to such form. This Agreement shall be binding on and shall inure to the benefit of the parties to this Agreement and their permitted successors and permitted assigns and nothing in this Agreement, express or implied, is intended to or shall confer on any other person or entity any legal or equitable right, benefit, or remedy of any nature whatsoever under or by reason of this Agreement. This Agreement may only be altered, amended or modified by written amendment signed by the Contractor and the City. This Agreement may be executed in counterparts, each of which shall be deemed an original, but all of which together shall be deemed to be one and the same agreement.

FOR CONTRACTOR

By _____
Type Name
Its

FOR THE CITY OF ANN ARBOR

By _____
Christopher Taylor, Mayor
By _____
Jacqueline Beaudry, City Clerk

Approved as to substance

Steven D. Powers, City Administrator

Type Name
Service Area Administrator

Approved as to form and content

Stephen K. Postema, City Attorney

**EXHIBIT A
SCOPE OF SERVICES**

(Insert/Attach Scope of Work & Deliverables Schedule)

**EXHIBIT B
COMPENSATION**

General

Contractor shall be paid for those Services performed pursuant to this Agreement inclusive of all reimbursable expenses (if applicable), in accordance with the terms and conditions herein. The Compensation Schedule below/attached states nature and amount of compensation the Contractor may charge the City:

(insert/Attach Negotiated Fee Arrangement)

**EXHIBIT C
INSURANCE REQUIREMENTS**

Effective the date of this Agreement, and continuing without interruption during the term of this Agreement, Contractor shall provide certificates of insurance to the City on behalf of itself, and when requested any subcontractor(s). The certificates of insurance shall meet the following minimum requirements.

A. The Contractor shall have insurance that meets the following minimum requirements:

1. Professional Liability Insurance or Errors and Omissions Insurance protecting the Contractor and its employees in an amount not less than \$1,000,000.

2. Worker's Compensation Insurance in accordance with all applicable state and federal statutes. Further, Employers Liability Coverage shall be obtained in the following minimum amounts:

Bodily Injury by Accident - \$500,000 each accident
Bodily Injury by Disease - \$500,000 each employee
Bodily Injury by Disease - \$500,000 each policy limit

3. Commercial General Liability Insurance equivalent to, as a minimum, Insurance Services Office form CG 00 01 07 98 or current equivalent. The City of Ann Arbor shall be an additional insured. There shall be no added exclusions or limiting endorsements which diminish the City's protections as an additional insured under the policy. Further, the following minimum limits of liability are required:

\$1,000,000 Each occurrence as respect Bodily Injury Liability or Property Damage Liability, or both combined
\$2,000,000 Per Job General Aggregate
\$1,000,000 Personal and Advertising Injury

4. Motor Vehicle Liability Insurance, including Michigan No-Fault Coverages, equivalent to, as a minimum, Insurance Services Office form CA 00 01 07 97 or current equivalent. Coverage shall include all owned vehicles, all non-owned vehicles and all hired vehicles. Further, the limits of liability shall be \$1,000,000 for each occurrence as respects Bodily Injury Liability or Property Damage Liability, or both combined.

5. Umbrella/Excess Liability Insurance shall be provided to apply in excess of the Commercial General Liability, Employers Liability and the Motor Vehicle coverage enumerated above, for each occurrence and for aggregate in the amount of \$1,000,000.

- B. Insurance required under A.3 above shall be considered primary as respects any other valid or collectible insurance that the City may possess, including any self-insured retentions the City may have; and any other insurance the City does possess shall be considered excess insurance only and shall not be required to contribute with this insurance. Further, the Contractor agrees to waive any right of recovery by its insurer against the City.

- C. Insurance companies and policy forms are subject to approval of the City Attorney, which approval shall not be unreasonably withheld. Documentation must provide and demonstrate an unconditional 30 day written notice of cancellation in favor of the City of Ann Arbor. Further, the documentation must explicitly state the following: (a) the policy number; name of insurance company; name and address of the agent or authorized representative; name and address of insured; project name; policy expiration date; and specific coverage amounts; (b) any deductibles or self-insured retentions which shall be approved by the City, in its sole discretion; (c) that the policy conforms to the requirements specified. Contractor shall furnish the City with satisfactory certificates of insurance and endorsements prior to commencement of any work. Upon request, the Contractor shall provide within 30 days a copy of the policy(ies) to the City. If any of the above coverages expire by their terms during the term of this contract, the Contractor shall deliver proof of renewal and/or new policies to the Administering Service Area/Unit at least ten days prior to the expiration date.

APPENDIX B: 2015 *SISTER LAKES REVIEW* REPORT

Sister Lakes Review

An in-depth review of past and present recommendations, actions, changes from the *First and Second Sister Lakes Diagnostic/Feasibility Study*.

I. REPORT OVERVIEW AND OBJECTIVES

The following is a third-party review of the *First and Second Sister Lakes Diagnostic/Feasibility Study* (hereby referred to as the *Lake Study*) of 1997 by Limno-Tech. The review attempts to validate the recommended pollution control and restoration techniques (identified by the *Lake Study*) in the following three ways:

1. Those that are still appropriate.
2. Those that are outdated.
3. Additional or more contemporary approaches to design or treatment for accomplishing the same end-goal.

Over the past 20 years, a large paradigm switch has occurred in the field of stormwater management. The concept of Integrated Stormwater Management has evolved into a more widely-practiced approach that includes decentralized treatment and engineered design approaches that mimic natural systems more closely and incorporate various methods of green infrastructure into traditional grey infrastructure. In order to maintain the continuity between past and present recommendations, the end-use and water quality goals outlined in *Lake Study* were used to guide the review process.¹

This review also attempts to document steps that the City and other entities have taken over nearly two decades to begin addressing some of the previous recommendations.

II. PRESENT-DAY EUTROPHICATION RATES AND URBAN DEVELOPMENT

Upon reviewing both the *Lake Study* and the *Dolph Park Master Plan – Environmental Analysis* of 1976, it is clear that these lake areas and the surrounding watershed have been both changing and monitored for more than a century. Such interest undoubtedly stems from the Lakes' glacial origins and characterization as the only natural lakes in the City of Ann Arbor. Equally important is the knowledge that development, planning, zoning, and technology have also evolved over this same time frame. The concept of a natural feature such as Sister Lakes is both attractive for residential development and easily damaged by such development if preservation and management are not completed in tandem.

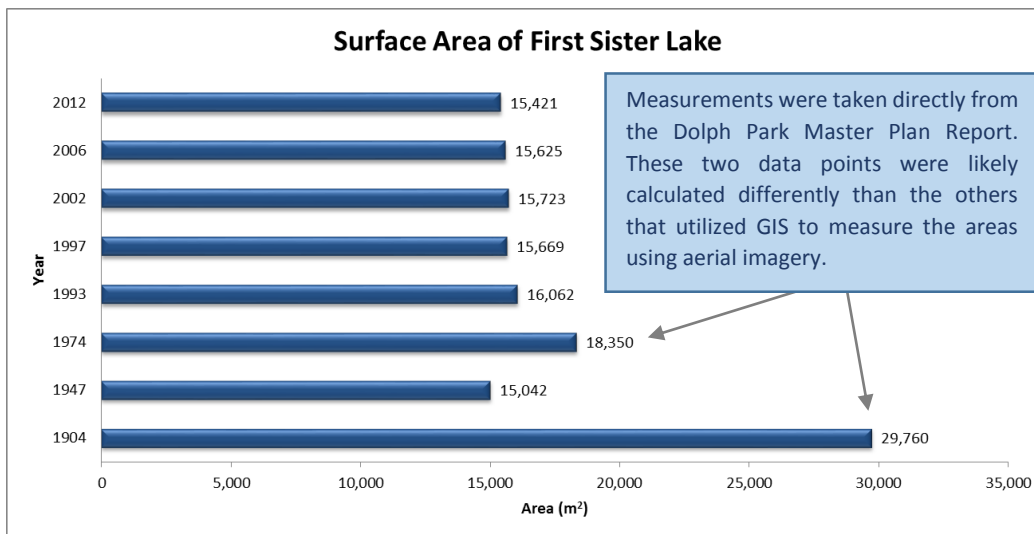


Figure 1 - Measurements of the Surface Area of First Sister Lake Utilizing Two Methods

While verifying the rate of eutrophication for these lakes was outside the scope of this review, it was important to take a cursory look at the data (or lack thereof) to see how the rates compared to those predicted in the Dolph Park Master Plan. Only First Sister Lake was examined as part of this exercise.

¹ The goals can be found on pages 3-5 of the *Lake Study*.

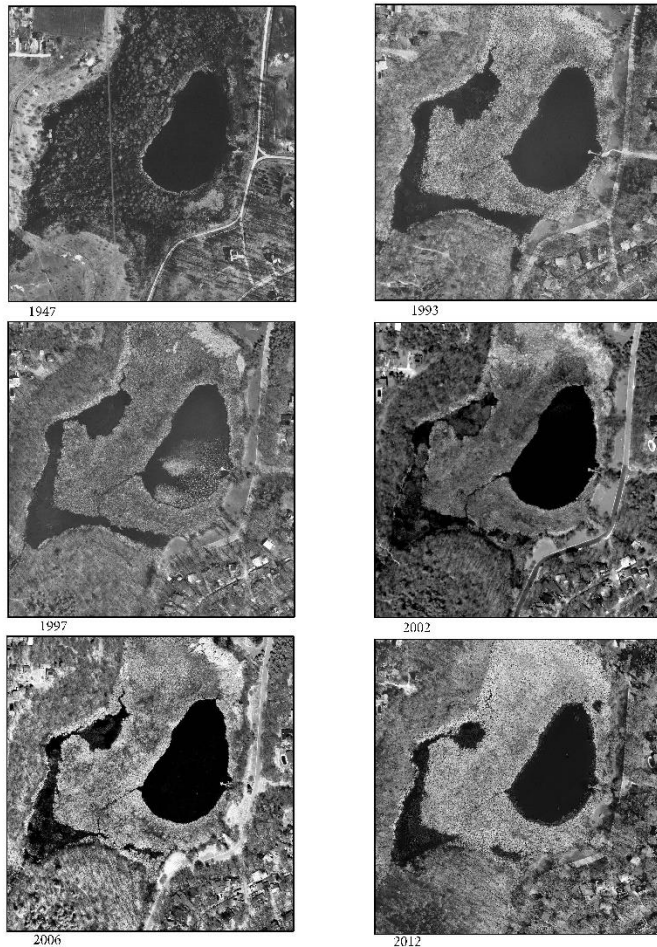


Figure 2 - Aerial Photos of First Sister Lake (Provided by Matt Naud, City of Ann Arbor)

The changes in surface area of First Sister Lake were evaluated two ways. The first method used both Graphical Information Systems (GIS) tools and aerial photos (See Figure 2) to measure the free-water surface area in the given years. The second method referenced the surface areas cited in the Dolph Park Master Plan, 1976. The first method would indicate that there is very little shrinkage in total surface area since 1947 (See Figure 1). Even when taking into account the measurement in 1974, the annual average rate of decline is less than 0.3%. This is significantly less than the annual rate of 0.8% estimated in the Dolph Park Master Plan.

The *Dolph Park Master Plan, '75* states the following²:

Due to the paucity of past information and the high disturbance by man on the lakes, it is difficult to predict actual rates of change. However, from the previously mentioned changes, it is possible to roughly estimate eutrophication rates. For example, the lake basin for First Sister Lake was 29,760 m² in 1904 and has decreased to 18,350 m² by 1974. Thus, in 70 years the lake had decreased by 11,410 m² (2.8 ac.) or 163m² (0.04 ac) per year. If only the very shallowest areas (<1meter) fill in at this rate, in the future the lake will still be reduced by 20% in the next 25 years...

Certainly, the lake will not fill in during the immediate future, but it will maintain a heavy growth of aquatic macrophytes unless an active control program is undertaken. The amount of nutrients stored in the lake or put in by "natural" sources is

probably sufficient to maintain a relatively high growth rate. Thus, even eliminating all of man's inputs would only partially alleviate the "problem." Thus it appears that First Sister Lake is in the final stages of eutrophication and due to its present chemistry, plant life and shallowness will continue to undergo "rapid" aging under existing conditions....

Although there is a disparity between the surface areas measured from the aerial photos and those cited in the Dolph Park report, it is clear that actions taken to address water quality entering and within the lakes (the actions taken to-date are stated in subsequent sections) have helped to slow the rate of eutrophication.

Likewise, it is important to balance the inevitability of eutrophication with those anthropogenic effects which might lead it to accelerate. Upon reviewing the recommendations below, the amount of impact was taken into account such that investment opportunities were optimized to those with the greatest impact.

² Excerpts come from page 48 and 51 of the Dolph Park Master Plan

III. CURRENT APPLICABILITY OF PREVIOUS RECOMMENDATIONS

A summary score box has been created for each of the previous recommendations. The box, which appears at the head of each recommendation, includes the following four items:

1. Validity of the original recommendation for present day application.
2. Recognition of any City action taken since the Lake Study.
3. Resultant impacts that can be quantified from City actions.
4. An indicator for any additional amendments to the original recommendation.

Since this review also entails the review of many documents and supporting items, the original recommendations are not included in their entirety. Rather, the table below provides an over-view of each of the recommendations, and a brief summary appears at the start of each section³. The full versions can be found in the original report (included here-in for easy access).


Table 1. Outline of Previously Recommended Treatment Options

Recommendations from the 1997 Lake Study Report*	Present-Day Validity	Has the City taken action?
1. Property Owner Education Program – Both Lakes	Yes	Yes
2. Program To Reduce Road Salt Usage	Accomplished	Yes
3. Increased Street Sweeping In Areas Directly Draining To The Lakes	Yes	No
4. Increased Compliance With Construction Runoff BMP Requirements	Accomplished	Yes
5. Volunteer Monitoring Program	Yes	Yes
6. An Interpretive Education Program For Visitors And Area Schools	Yes	Yes
7. Retrofit Of The Stormwater Detention Basin	Yes	No
8. Redirection Of Tributary Drain Into First Sister Lake	Yes	
9. Alum Treatment In First Sister Lake If Necessary	No	n/a
10. Hypolimnetic Withdrawal In Second Sister Lake	n/a	n/a

*Recommendations from the *Sister Lakes Clean Lakes Study*; Section B item 1. Pg. 60 for; “Selected Pollution Control and Restoration Procedures”

1. Property Owner Education Program – Both Lakes

Lake Study’s Predicted Reduction of Total Phosphorus (TP): First Sister Lake 20 – 28%; Second Sister Lake 17 – 23%

Recommendation Validity	The City Has Taken Action	Impact Potential	Modifications/Additions to this Recommendation
	Yes	Moderate	Yes

³ These come directly from the *Sister Lakes Clean Lakes Study*; Section B item 1. Pg. 60 for; “Selected Pollution Control and Restoration Procedures”

Summary of Previous Recommendations

The Lake Study identified the need for education and homeowner Best Management Practices (BMP) programs to reduce TP contributions to both First and Second Sister Lakes. The goal of the education program is to provide greater homeowner awareness and stewardship around stormwater and its connectivity to Sister Lakes. Residents would gain a bigger-picture understanding of how runoff from their property is one of the main sources of water entering the Sister Lakes. By improving their stormwater management at home, they can improve water quality downstream in the Lakes. The act of creating a homeowner BMP program would further the education program by providing specific measures individuals could take to improve water quality running off their property. The following were called out as specific action items as part of such a program:

- Public workshops on homeowner BMPs (e.g. fertilizer management, yard waste disposal)
- Watershed guide describing homeowner BMPs
- School activities
- Clean-up events
- Interpretive signs at key features, such as stormwater basins
- Labeling of storm drains to indicate that they drain to a particular water body
- Contacting commercial and industrial properties, and subdivision developers in the watershed and encouraging them to use appropriate management practices to reduce nutrients and road salt in runoff.

Current Recommendations and Efforts To-Date

Over the past decade the City has invested a multitude of resources and effort in stormwater education and outreach. In-part, greater spending began in response to the City's National Pollutant Discharge Elimination System (NPDES) permit that required education as part of permit compliance. In an effort to achieve permit compliance, the City has developed strong partnerships with local non-profits including the Huron River Watershed Council (HRWC) and the Ecology Center. The city has retained both non-profit organizations annually, to help develop and implement education programs.

Listed below are both actions and efforts that have been initiated as part of NPDES compliance, as well as other actions originating from the Parks Advisory and Environmental Commissions⁴. The implementation of these actions has undoubtedly had significant impacts on the Honey Creek watershed and Sister Lakes. In some cases, the strength and outcomes of these initiatives have had greater impacted than that of a neighborhood-led effort alone, because they hold regulatory enforcing power. Such programs include, but are not limited to, the following:

City Lead Efforts To-Date

1. Phosphorus Ban in the City of Ann Arbor; passed 2006 and took effective 2007
 - While phosphorus levels had fallen 25% between 1995 and 2011 (Biolchini, 2013), levels in Honey Creek were reduced by 45% (2008-2009) as compared to pre-ordinance levels
2. Compost Cart and Pick-up and Street-leaf Pick-up Ban took effect 2010
 - This ordinance bans the placement of leaf litter in the street. Instead, residents are required to either use their compost carts (City wide Compost collection began in 2008) for yard waste disposal, mulch the leaves or maintain them onsite by spreading them over the lawn. Such an

⁴ According to the City of Ann Arbor's website, the Environmental Commission is a City Council appointed commission that began in 2000. The Commission advises and make recommendations to City Council and the City Administrator on environmental policy, environmental issues and environmental implications of all City Programs and proposals on air, water, land, and public health

ordinance has significant impacts on reducing yard waste entering the storm drains and Sister Lakes.

2. In the late 1990's the Park Advisory Commission (PAC) developed a specialized volunteer position, giving individuals the opportunity to become Park Stewards for a given park of their interest. Park Stewards help the City's Natural Area Preservation (NAP) division maintain the park ecosystems. This may include weeding, planting, educating, and more.
3. Waste Watcher – citywide circulation that includes, but is not limited to, where stormwater runoff and pollution comes from, how it travels to lakes and streams, and what residents can do to improve the quality, and reduce the quantity, of stormwater runoff.
4. Over the past decade, the HRWC and the Ecology Center has contracted with the City to support stormwater education. While such education is mandated as part of the City's NPDES permit, it also supports education in the Sister Lakes communities. Many different projects have come out of these annual efforts, including the following:
 - The city of Ann Arbor began an Adopt-a-Drain program in 2011. The management of this program is now being outsourced to the HRWC. While all new storm drains are cast with a label displaying that runoff enters the Huron River, the old drains were not. The Adopt-a-Drain program is a way for citizen groups, schools, residents, etc. to volunteer and retrofit the old drains with the signage.
 - Annually the Ecology Center provides 110 solid waste youth presentations at Ann Arbor-based k-12 schools, preschools, and youth groups, both public and private. Many of these presentations include a large emphasis on stormwater education. One such example includes the hands-on stormwater and watershed exhibit presented as part of the Ann Arbor Material Recovery Facility (MRF) student tours. The MRF tours engage students in an interactive display of how stormwater travels through the watershed, interacts with surface pollutants, and carries runoff to the Huron.
 - The Ecology Center has also developed a free-downloadable groundwater curriculum for school teachers (grades k to 6th); GEE WOW: Adventures in Water. While the curriculum was first developed in the 1990s, it has gone through 4 revisions (most recently 2012) and was only recently made available for free on the internet.



Figure 3 - Example of label embedded in drain grates through Adopt-a-Drain program

The current validity of this recommendation was assessed as moderate because many of the City lead efforts described above have had equal or greater impact than what could be accomplished through volunteer efforts. The Phosphorus and Street-Leaf Collection bans have the ability to issue citations to residents, whereas Best Management Practice (BMP) program guides do not. Furthermore, the State of Michigan followed suit after the City banned phosphorus in 2006. In 2010, the State issued their own phosphorus ban which has had even greater impact on First Sister Lake, since some of the major inflows come from commercial and industrial entities that are not located within City jurisdiction.

The following are revised and/or extensions of the original recommendations specific to volunteer efforts that could be executed as part of an Education and Homeowner BMP effort:


- ✓ **Dissemination of a watershed guide describing homeowner BMPs** – a new guide is not needed, rather the existing City and HRWC literature can be used. As part of both the bans and the National Pollution Discharge Elimination System (NPDES) permit education program, described above, many pieces of literature have been generated to help educate Residents city wide on how to manage their runoff, compost, and fertilizers.
- ✓ **School activities** – elementary schools within the Sister Lakes watershed could be included.
- ✓ **Clean-up events** – the Dolph Park report states that continuing an active control program for managing aquatic macrophytes will help slow eutrophication.
- ✓ **Interpretive signs at key features, such as stormwater basins** – such signage should be integrated as part of infrastructure efforts described in recommendations 6 and 7 below.
- ✓ **Labeling of storm drains** – a group of volunteers should coordinate with HRWC through the adopt-a-drain program to increase signage and awareness of where the runoff is going.

Estimated Costs

The relative cost of this effort was reduced by 20% of the original estimates - \$1,300 to \$4,000. While it is unknown how the Lake Study costs were calculated, the given reduction relates to an assumed reduction in the level of effort required to execute many of the original recommendations. Since many of the recommended homeowner BMP guides, educational curriculum, signage, etc. have been developed as part of other similar efforts, the time and cost for creating these should be greatly reduced.

2. Program To Reduce Road Salt Usage – Both Lakes

Lake Study's Predicted Reductions - Unknown

Recommendation Validity	The City Has Taken Action	Impact Potential	Modifications/Additions to this Recommendation
	Yes	Moderate	Yes

Summary of Previous Recommendations

This recommendation is focused on reducing salt application to surfaces in the watershed in order to reduce runoff to the lakes. It states that the City of Ann Arbor currently follows a no salt policy for the Lakewood Subdivision bordering First Sister Lake (although there is 5% salt mixed with the sand to prevent clumping). However, this policy should be expanded to all other subdivisions in the watershed.

Current Recommendations and Efforts To-Date

Salt-laden runoff and high chloride issues are problematic in all urban lakes and streams. Sources to First Sister Lake include runoff from Weber’s parking lot, the Car Dealerships, and a large portion of Jackson Road, all located to the north and north-east. Since the time of the Lake Study report, state agencies, such as the Department of Environmental Quality and the Michigan Department of Transportation, have begun investigating salt alternatives, including agricultural by-products (ABP) such as beet-based deicers. Unfortunately, such alternatives have been found to have significant negative impacts on DO and phosphorus (Quality, 2013).

More importantly, at the time of the Lake Study, the City was using a sand: salt mix of approximately 40:50. At present, a no salt policy exists for all residential streets within the City limits. The exception occurs at major intersections and on steep inclines, where a predominantly-sand mix is applied for safety (the mix contains less


than 10% salt). The nominal amount of salt added avoids clumping and freezing in equipment. Ann Arbor Public Schools (AAPS) also has a salt policy that could be reviewed, and amended, if proven to have a detrimental impacts of the adjacent water bodies. This includes review of the winter road and walkway maintenance for Lakewood Elementary School. Although the elementary school is buffered from Second Sister Lake by a large forested area, it has a significant impervious footprint. If AAPS salting practices are more liberal than the City's own, it could warrant a review of Lakewood's percentage of directly-connected stormsewer to Second Sister Lake.

The validity of this was given a thumbs down, because the City has taken the maximum action possible. However, as mentioned above, the Property Owner Education Program should include methods for residential snow removal to help minimize the amount of salt applied, and an investigation could be conducted into AAPS winter maintenance practices.

Estimated Costs
Not applicable

3. Increased Street Sweeping In Direct Drainage Areas – Second Sister Lake

Lake Study's Predicted Reduction of Total Phosphorus and Sediment: First Sister Lake 14%; Second Sister Lake 7.5%

Recommendation Validity	The City Has Taken Action	Impact Potential	Modifications/Additions to this Recommendation
	No	Moderate	Yes

Summary of Previous Recommendations

This recommendation proposed increased street sweeping in the Lakewood Subdivision along areas with drains that enter directly to the lakes. An increase from twice-per-year to once-per-week was recommended to help remove dust, sediment, nutrients, woody debris, and trash from the stormsewer system and lakes system.

Current Recommendations and Efforts To-Date

The frequency of street sweeping has not increased since the time of the Lake Study. Upon review of this recommendation, it is most important to note that the current City budgets do not fund street sweeping through stormwater funds. Rather, funding sources are currently derived through a combination of ACT 51 road funding and the solid waste budget. Together the funds are used to ensure the safe movement of vehicles, and to lessen the burden of street debris on residents from fallen leaves in the autumn. While increased street sweeping is an effective method for increased water quality in the lakes, funding through stormwater would need to be allocated for supporting such service. The City has 309 miles of streets that are swept at various intervals, with most residential streets being swept twice annually. An increased frequency within the Sister Lakes neighborhoods of 26 times the current rate, per the original recommendation, would have impacts on City personal, equipment, and disposal costs. It is uncertain if these additional burdens were fully-calculated in the Lake Study Report.

The current recommendation is to conduct a business case analysis to both fully-understand the cost implications of additional sweeping frequency, and to justify the fund appropriations. This includes quantifying

the relative cost of increased personal, operations, and maintenance of equipment, as well as disposal costs compared to the resultant increased water quality. Additionally, the time, frequency, and pounds of debris removed by cleaning catch basins within the stormsewer and lakes system feeding both Sister Lakes should also be calculated⁵. These calculations should be compared to that of increased street sweeping to determine whether or not there is an advantage to preventing debris from entering the stormsewer. Should this comparison result in either a cost advantage, or cost neutrality, the findings could be a means of justifying the use of stormwater budget for increased street sweeping.


The street sweeping frequency can be reduced back to the current rate if recommendations 7 and 8 (below) were implemented. Both recommendations would eliminate direct residential discharge into the lakes.

Estimated Costs

The estimated cost of increased street sweeping to once-per-week along the areas that drain directly to the lakes is estimated to be \$8,200 for labor alone. While this is roughly equal to the original calculation of \$5,000 when adjusted for inflation, it does not include equipment capital, equipment maintenance, increased pounds, disposal costs, or the cost of personal time for logistics in determining the routing and disposal methods. The business case should be conducted to calculate a more refined estimate of cost.

4. Increased Compliance With Construction Runoff BMPS – Both Lakes

Lake Study’s Predicted Reduction of Total Phosphorus and Total Suspended Solids: unknown

Recommendation Validity	The City Has Taken Action	Impact Potential	Modifications/Additions to this Recommendation
	Yes	Moderate	No

Summary of Previous Recommendations

This recommendation called for the consistent and timely enforcement of the State of Michigan’s Act 451 of 1994, Part 91 (PA451), Soil Erosion and Sediment Control. To achieve this, the Lake Study gave a two-part approach. The first would be for citizens and project sponsors to work with City, Township, and County officials to develop an effective construction runoff control program in the watershed. The second effort would provide thorough and ongoing education for lake users and watershed property owners about the impacts of construction runoff, explanation for which government agencies are responsible for establishing and monitoring runoff control practices, and approaches to improve current monitoring and regulation of runoff.

Current Recommendations and Efforts To-Date

The rationale in the original recommendation remains valid; however, the recommendation is no longer needed. Over the past 5 years, the City has taken steps to ensure consistent and timely enforcement of PA 451.

City Lead Efforts To-Date

⁵ A grant funded study entitled “Quantifying the Impact of Catch Basin and Street Sweeping on Storm Water Quality for a Great Lakes Tributary: A Pilot Study,” was published in 2001 for Jackson, MI that show a cost and environmental advantage for increasing street sweeping over catch basin clean-out:
<http://www.uppergrandriver.org/files/Street%20Sweeping%20Study.pdf>

On Nov. 4, 2010, City Council approved an ordinance (Ordinance No. ORD-10-36) to amend the proposed stormwater code (Chapter 63) to require stormwater management on single- and two-family residential properties when properties increase impervious area by 200 or more square feet (Hancock, 2014). Property owners are now required to control the “first flush” (first inch of runoff during any rainstorm) from the new impervious surface areas. The first flush is responsible for 85% of rain event volumes and carries approximately 90% of pollutants (Committee, 2014). While the benefits of this resolution have not yet been quantified, there are significant ramifications for improved water quality, in not only the Huron River, but in all water bodies within the watershed.


Another significant change also occurred in 2010. The Michigan Department of Environmental Quality conducted an audit on behalf of the EPA to evaluate compliance of the City’s Stormwater Management programs. Deficiencies were found in the PA 451 Inspection and Enforcement Program. Because of these deficiencies, the program was strengthened by the enforcement capabilities and inspection frequencies to eliminate construction runoff impacts on Waters of the State.

Estimated Costs

Not applicable

5. Monitoring – Both Lakes

Lake Study’s Predicted Reduction– Not Applicable

Recommendation Validity	The City Has Taken Action	Impact Potential	Modifications/Additions to this Recommendation
	Yes	Moderate	Yes

Summary of Previous Recommendations

The Steering Committee that convened at the time of the Lake Study report expressed interest in parlaying their committee into a volunteer monitoring program for the Sister Lakes. At a minimum, such a program would include being part of the MDNR/Michigan Lake and Stream Association Self Help program. Monitoring activities under this program would include: Summer Secchi disk testing and spring grab samples for total phosphorus. The committee would also investigate the monitoring of additional nutrients through the use of either a commercial laboratory or that of the City’s water treatment plant.

Current Recommendations and Efforts To-Date

Through the process of reviewing the Lake Study report, it became clear that the Sister Lakes data gaps and inconsistencies have made it difficult to draw definite conclusions on either the rate of eutrophication or the related changes in nutrient loading. While a detailed analysis of the monitoring data was outside of the scope of this review, the secchi disk data was modified to see if a temporal trend would result from looking at samples taken around the same time of year. Instead, the results varied greatly. This weakens the ability to use the information as objective data to validate eutrophication rates. Therefore, the original recommendation remains valid. To extend it, a regular sampling and monitoring program should incorporate the following components for both Sister Lakes:

- Secchi disk testing – taken at least three times-per-year at the same location, using the same equipment, and ideally the same volunteer set.
- Grab samples for testing total phosphorus and dissolved oxygen– taken at least twice-per-year at two to three locations.

- Staff gauge readings – data recorded monthly.
- All data sets should be plotted and compared to include seasonal precipitation data.

While it is clear that eutrophication is occurring, the rate of change and root causes are more subjective. As such, data are needed to evaluate how the climatic effects of rainfall, snowfall, extreme summer temperatures, etc. all affect nutrient and chemical changes in both lakes.

City Lead Efforts To-Date

- **MiCorps Nutrient Monitoring** - Secchi Disk, Total Phosphorus, Chlorophyll, and Dissolved Oxygen
 - Sampling occurred in 2013.
 - All equipment was purchased so there would be no capital cost for this.
 - The City paid the cost for this effort, and neighbors carried out the sampling.
- **Free-water Surface Area Changes in First Sister Lake** – compiling and calculating surface area change through aerial photography
 - Analysis occurred in 2014.

Estimated Costs

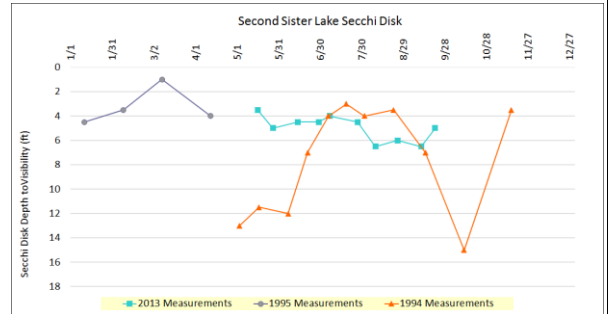
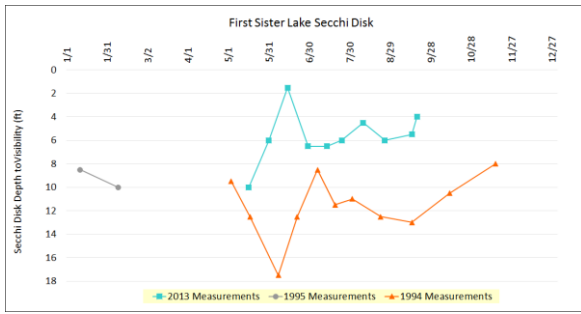
The cost of monitoring can vary depending on which laboratory is used, how many samples are analyzed, the constituents measured, and how data is recorded and published. However, the formation of a volunteer monitoring program that includes active and engaged volunteers could help keep costs down while maintaining the data integrity. Should there be lack of neighborhood volunteers, the HRWC could be engaged to provide volunteers for sampling. In 2013, the City paid for sampling through the MiCorps Nutrient Monitoring program (Cooperative Lakes Monitoring Program). If a volunteer committee decided to continue utilizing this program, the costs would range from approximately \$500 to \$1,000 annually.

Figure 4 and 5 – First and Second Sister Lake Secchi Disk Readings and Dissolved Oxygen Measurements, data obtained from [MI Clean Water Corps Data Set](#)

First Sister Lake Monitoring Data

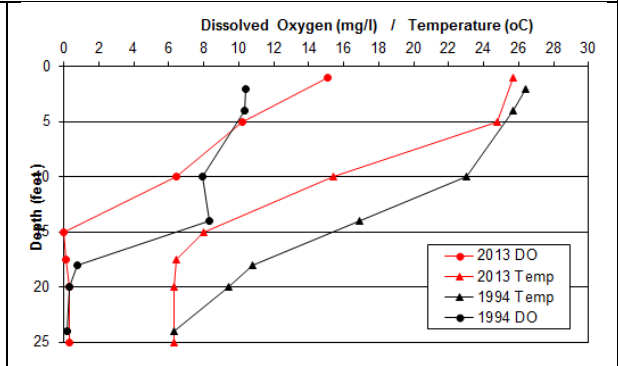
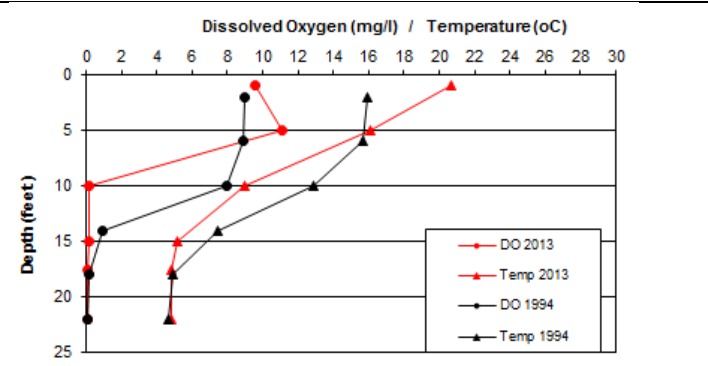
Second Sister Lake Monitoring Data

Secchi Disk Sampling:

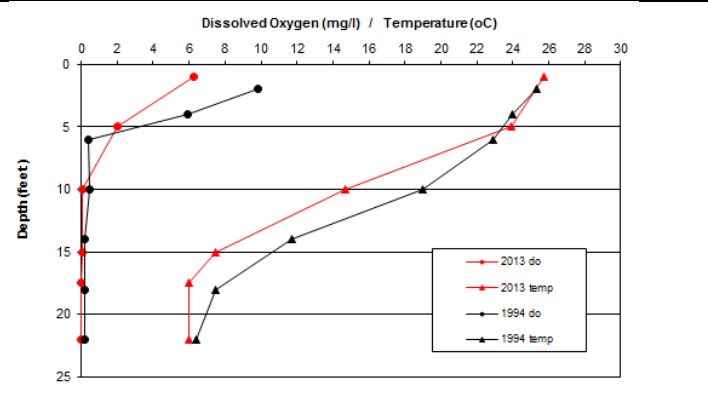


Dissolved Oxygen Measurements:

May collection

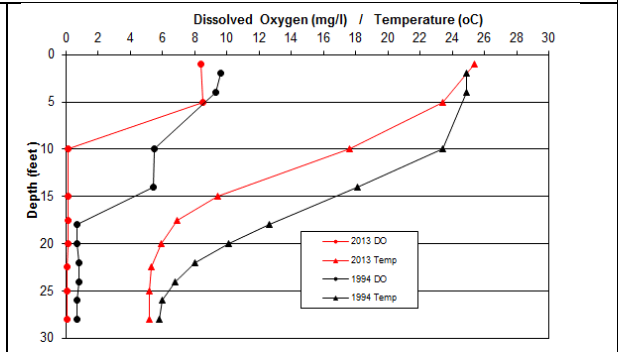
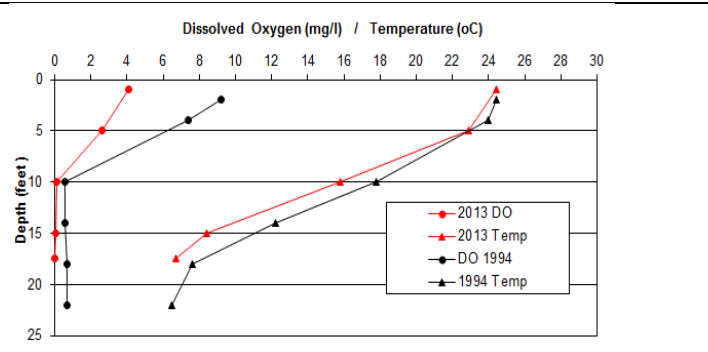


July collection




NO DATA AVAILABLE

August collection



6. An Interpretive Educational Program For Visitors And Area Schools – Both Lakes

Lake Study's Predicted Reduction – Not Measureable

Recommendation Validity	The City Has Taken Action	Impact Potential	Modifications/Additions to this Recommendation
	Yes	Unknown	No

Summary of Previous Recommendations

A Community initiated education program was recommended to focus on the creation of educational and interpretive programs within Dolph Park. As part of the program education material, curriculum and guided tours within the park would be developed to encourage a wide-range of visitors from school children to hikers. The goal was to engage visitors and encourage them to discover the park’s unique ecosystems. Recommended material ranged from guidebooks containing interpretive discussion to curriculum packages for local school teachers. Partnerships with environmental stewardship entities were also a primary focus. Collaborators such as the Leslie Science Center (which already offers interpretive programs) and local schools would be brought in to help encourage the use of Dolph Park as a key local education destination for adults and children alike.

Current Recommendations and Efforts To-Date


This recommendation has some goals that overlap with the first recommendation: Property Owner Education Program. However, this education effort is targeted at individuals outside of the Sister Lakes neighborhood and watershed. The recommendation still remains valid. Increasing awareness and interest in Dolph Park would help support the preservation of this natural features area, thereby helping increase stewardship, too. Furthermore, the City’s regional education and outreach partners could be called upon to help solicit more interest in utilizing Dolph Park as a destination for field trips, religious groups, outdoor enthusiasts, etc. Entities like the HRWC and the Ecology Center already engage in outreach and education efforts for the same target demographics. Partnering with such non-profits would help expand an Interpretive Educational Program and help bring people into Dolph Park from outside of Ann Arbor, too.

Estimated Costs

Once again, how the original Lake Study costs were calculated are unknown. The materials needed for this effort are likely to be specific to the Park itself and cannot be easily adopted from existing efforts. Therefore the cost was not reduced from the original. The cost of this effort was kept the same and adjusted for inflation: \$8,300.

7. Retrofit Of The Privately-Owned Stormwater Detention Basin – Second Sister Lake

Lake Study's Predicted Reduction of Total Phosphorus 30% - 40%; Sediment 50% -70%

Recommendation Validity	The City Has Taken Action	Impact Potential	Modifications/Additions to this Recommendation
	No	High	Yes

Summary of Previous Recommendations

The Lake Study recommended retrofitting (see figure below) the current retention facility to enhance water quality through increased sediment trapping and nutrient uptake. The first step of the recommendation includes a feasibility study to review which retrofit options are most economical while providing the greatest level of treatment. Suggested retrofits included modifications to outflow structures to increase retention times, regrading of pond bottoms to increase storage volume or create different functional compartments, construction of wetland and/or forebay areas, and re-vegetation of shorelines and tributary corridors.

Some of the possibilities for retrofitting this facility include the following:

- Modification of the outlet structure to provide extended detention and control of floatables.
- Creation of an easily maintained forebay area for sediment trapping.
- Creation of an expanded wetland area for nutrient uptake and habitat enhancement.

The specification of a retrofit design for this pond will require a separate feasibility and design effort, focused on characterizing the existing conditions in the pond, and identifying and developing specific modifications that will provide both flood control and water quality benefits under current and future conditions within a reasonable budget.

Current Recommendations and Efforts To-Date

While the original recommendations all have merit and would help significantly enhance water quality, the Lake Study report never identified the ownership of the detention basin. Likewise, the location of the detention basin was not explicitly called out within either a graphic or photo, nor latitude and longitude. Unfortunately, the City does not own the detention basin, and therefore, cannot easily incorporate it into the Capital Improvement Plan for modified infrastructure. However, the area surrounding Second Sister Lake is owned by the City and can be evaluated for similar opportunities.

A feasibility study should be conducted to determine what areas to the west of the detention basin, if any along Parklake Avenue or Lake Avenue, could be retrofit to create a sediment forebay or other structure(s) to help slow flows and increase settling times before entering Second Sister Lake. The study could also quantify the estimated average discharge, total annual loading, and investigate the feasibility of daylighting stormsewer discharge that is currently entering directly into the lake. As part of this effort, the ownership of various stormwater infrastructure elements through this system could be beneficial to include for future project design and implementation (see recommendation 11, below for further detail).

Estimated Costs

The feasibility study, engineering costs, permitting, and construction costs were kept the same as those in the Lake Study. While the revised recommendation is not focused on the detention basin retrofits, an equivalent

Figure 6 – Privately owned detention basin identified in the Lake Study for retrofit to improve water quality in Second Sister Lake



amount of time and resources are needed to assess the potential retrofit of the space along the right-of-way of Parkland Drive and the stormsewer inlet. Present day cost equivalents are approximately as follows:

Feasibility and engineering design	\$82,700
Permitting	\$8,300
Construction	\$91,000
TOTAL	\$182,000

8. Redirection Of Tributary Drain into First Sister Lake

Lake Study's Predicted Reduction of Total Phosphorus 0% - 7%; Sediment 4% -12%

Recommendation Validity	The City Has Taken Action	Impact Potential	Modifications/Additions to this Recommendation
✎	Yes	Moderate	Yes

Summary of Previous Recommendations

The Lake Study Report recommends that one storm drain, SD 5, which drains Lakeview Drive and the surrounding areas, be retrofitted to avoid direct discharge into the First Sister Lake (see figure 7 below). Unlike SD 5, the other eight drains discharge into the wetlands that buffer the lake, thereby increasing settling times. The recommendation remains valid; however, the suggested method may not. The Lake Study report suggests extending the existing drain pipe 100 yards southward along the shore to drain into the cattail marsh area, into which the adjacent SD 4 currently flows.

Current Recommendations and Efforts To-Date

The revised recommendation is to conduct a feasibility study prior to any engineering design. The study should be conducted to evaluate the potential for use of an up gradient, decentralized treatment approach. An example of this is the treatment approach employed on the recent redesign of Miller Avenue from Maple Road to Newport Road. Due to the significant grade along Lakeview Drive. and the high runoff flow rates, a decentralized treatment approach may better accomplish the stated goals of reducing sediment and total phosphorus in the lakes. The options analysis would also review the following:

1. Areas of Lakeview Drive where stormwater treatment and flow rate reduction could occur using green infrastructure methods within the right of way.
2. The intersection of Parklake Avenue and Lakeview Drive could be considered for an integrated green infrastructure and traffic control structure such as a roundabout or vegetated, raised cross-walks.

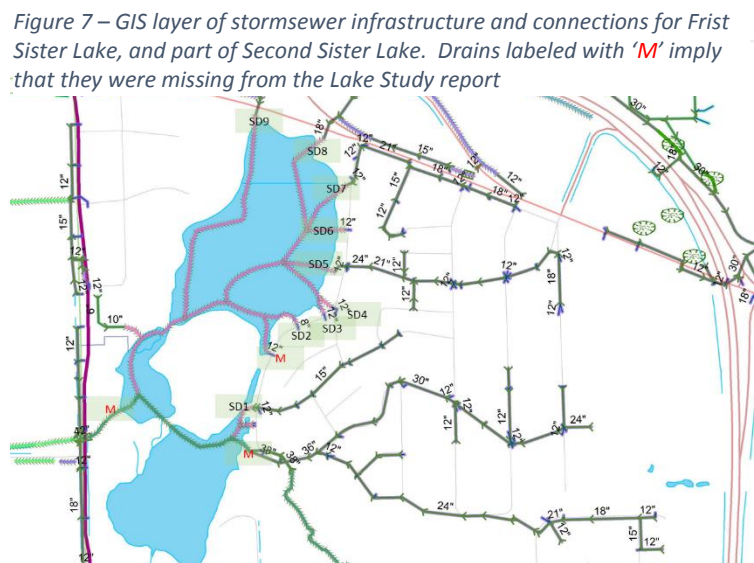


Figure 7 – GIS layer of stormsewer infrastructure and connections for First Sister Lake, and part of Second Sister Lake. Drains labeled with 'M' imply that they were missing from the Lake Study report

3. Retrofitting the lawn area between SD5 and SD4 to include a large rain garden and/or constructed wetland as a means of initial discharge.

While SD 5 was identified as the largest single stormwater discharge into this lake, this review found that SD 7 and SD 8 may have comparable, or greater, flows due to the size of the pipes up gradient of their respective discharge points. In 2007, the City underwent a major infrastructure mapping project that cost approximately \$1,000,000, and resulted in digitized GIS based mapping of all infrastructure, including stormsewer, inverts, and flow directions managed by the City. It is unclear whether such detailed information existed at the time of the Lake Study report. However, the addition of such information can result in greater opportunity for identifying alternative project locations and opportunities. Based on the infrastructure map obtained for this review, SD8 appears to both drain the largest portion of impervious land mass and convey the largest flows based on pipe size. Therefore, it is further recommended that the City identify additional opportunities.


Estimated Costs

The engineering design, permitting, and construction costs were kept the same as the Lake Study report. However, an additional \$10,000 was added to account for the newly recommended feasibility study. The total present day costs are summarized here:

Feasibility	\$ 10,000.00
Engineering Design	\$13,500
Permitting	\$3,300
Construction	\$200,000
Total	\$226,800

9. Alum In First Sister Lake

Lake Study's Predicted Reduction of In-Lake Total Phosphorus 80% - 90%

Recommendation Validity	The City Has Taken Action	Impact Potential	Modifications/Additions to this Recommendation:
	Yes	Moderate	Yes

Summary of Previous Recommendations

A chemical treatment process was recommended for removing phosphorus from the water column. The chemical additive process, known as Alum treatment, utilizes either aluminum sulfate or sodium aluminate. The Lake Study also outlined five steps that would need to take place before the treatment. Three of the five include calculating, procuring, and applying the Alum. The others two are related to permitting and gaining approval from MDEQ.

Current Recommendations and Efforts To-Date

On August 1, 1997, the USEPA provided half a page of comments on the Lake Study report. Alum treatment was among one of the two items they addressed. It states that the “effective life of Alum treatments are difficult to predict.” The author of this review has observed similar findings. Additionally, the EPA suggests using Alum treatment as a last effort. While Alum treatment may have proven successful in other locations, it is merely treating the symptoms and not the cause. If phosphorus loading does not decrease overtime, the need for Alum becomes chronic and the effectiveness could decrease. However, treatment could be justified as an adjunct

when done in tandem with a larger infrastructure project upstream. In this case, the financial investment and potential environmental impacts would need to be further investigated and justified.

Estimated Costs

Not applicable

10. Hypolimnetic Withdrawal – Second Sister Lakes

Lake Study’s Predicted Reduction of DO in Bottom Waters and Reduced Total Phosphorus - Unknown

Recommendation Validity:	The City Has Taken Action	Impact Potential	Modifications/Additions to this Recommendation:
✖	n/a	n/a	Yes

Summary of Previous Recommendations

Hypolimnetic withdrawal from Second Sister Lake was suggested to increase dissolved oxygen (DO) levels near the lake bottom. The recommendation could result in greater overturning within the water column in order to mix low DO waters from the bottom with higher DO waters near the surface. The suggested recommendation would have extended Killin’s Concrete Company’s water withdrawal pipe beyond the 15 foot lake level in order to create a mechanical siphon.

Current Recommendations and Efforts To-Date

While hypolimnetic withdrawal would have been a cost effective and beneficial solution in 1997, it is no longer a feasible option. Killin’s stopped operations sometime in the late 1990’s to early 2000’s. The City bought the property in 2004, so a withdrawal of this kind is no longer applicable. Addressing DO is still an issue and can be addressed with increased aeration of both the incoming flows and increased movement within the lake itself. Performing a water-balance was outside of the scope of this review. However, understanding the interactions and flow between First and Second Sister Lakes can provide key information for how structures might be designed to control and enhance such movement.

Estimated Costs

Not applicable

IV. CONCLUSIONS AND SUGGESTED OPTIONS FOR ADDITIONAL TREATMENT MEASURES

11. Gather Data On First And Second Sister Lakes Hydraulic Connectivity

One of the greatest challenges for preserving Sister Lakes is determining which party must shoulder this burden. While the City of Ann Arbor clearly owns the lake properties, much of the engineering infrastructure - carrying flows in and out – are either co-owned with Washtenaw County or privately owned, like in the case of the detention basin to the south (upstream) of Second Sister Lake. The Lake Study and past reports reflect this discontinuity between trying to preserve the system but not having full knowledge of what is affecting it. As such it is further recommended that a water balance be conducted in order to understand the lake interactions

between First and Second Sister Lake and to account for inputs that were not known or factored-in as part of the past studies.

Estimated Costs

Identifying all inputs and ownership and conducting a water balance: \$10,000

12. Gather Bathymetric Data For First Sister Lake

Bathymetry is a term that describes the topography of land located underwater. Unlike surveying techniques that gather topographic data on land, bathymetric data is typically collected using sonography. Soundwaves are sent out and their deflection times are measured to generate a mapping of the subsurface below. In the recent decades, technologies that utilize light beams, rather than soundwaves, have also taken hold of the market place. LIDAR/LADAR, as this process is called, has led to more innovative and economical ways of collecting bathymetric data.

Having bathymetry data would greatly enhance and compliment any of the previously described recommendations. Measured changes in the lake floor topography could help with the following:

- Determine rates of shrinkage in the lake’s surface area.
- Determine sediment loading and shifting along the lake bottoms.
- Track changes in depth over time, rather than just visibility as given by secchi disk readings.

While this data would not negate the need for nutrient monitoring or , it could help quantify the effects of a given project, or lack thereof. Likewise, the visual and quantitative nature of these maps would give residents a better understanding of what is occurring beneath the surface when subjective views differ.

Estimated Costs

Due to a wide range of options for gathering the data, the cost can vary widely. It is estimated that the cost for bathymetry of both Sister Lakes will range from \$700 to \$3,000.

V. SUMMARY TABLE OF COSTS ESTIMATES FOR REVISED RECOMMENDATIONS

Recommendations from the 1997 Lake Study and Current Recommendations	Lake Study Costs <i>original cost adjusted for inflation to reflect present day value</i>		Current Recommendations Cost	
	Subtotals	Total	Subtotals	Total
Property owner education program		\$1,600 to \$5,000		\$1,300 to \$4,000
Program to reduce road salt usage		minimal		not applicable
Increased street sweeping in areas directly draining to the lakes		\$8,300/year		\$8,300 to \$11,000/year
Increased compliance with construction runoff BMP requirements		minimal		n/a
Monitoring		minimal		\$300 to \$1,000/year
An interpretive education program for visitors and area schools		\$8,300		\$ 8,300.00
Retrofit of the stormwater detention basin (Retrofit the inlets Second Sister Lake and adjacent land along Parkview Drive)		\$182,000		\$ 182,000.00
Feasibility and engineering design	\$ 82,700.00		\$ 82,700.00	
Permitting	\$ 8,300.00		\$ 8,300.00	
Construction	\$ 91,000.00		\$ 91,000.00	
Redirection of the outlet that directly enters First Sister Lake (Retrofit the land mass along Lakeview Drive to incorporate green infrastructure options for influent treatment of outlet SD 5)		\$216,800		\$ 226,800.00
Feasibility	n/a		\$ 10,000.00	
Engineering Design	\$ 13,500.00		\$ 13,500.00	
Permitting	\$ 3,300.00		\$ 3,300.00	
Construction	\$ 200,000.00		\$ 200,000.00	
Alum treatment in First Sister Lake if necessary (Alum treatment not recommended as a stand alone treatment)		\$11,500	Not recommended	Not recommended
Calculate Dosage Requirements	\$ 2,500.00			
Permitting	\$ 3,300.00			
Application	\$ 5,700.00			
Hypolimnetic withdrawal in second sister lake (No longer an option - due to Plant closure)		\$16,800		Not Applicable
Engineering Design	\$ 3,300.00			
Permitting	\$ 2,500.00			
Construction	\$ 11,000.00			
Gather Bathymetric data and tracking		---		\$700 to \$3,000
Gather data on first and second Sister Lakes hydraulic connectivity to determine mixing and movement and infrastructure ownership				\$ 10,000.00

Works Cited

- Biolchini, A. (2013, July Sunday). *The Ann Arbor News*. Retrieved from <http://www.annarbor.com/news/huron-river-health-phosphorus-levels-have-dropped-25-percent-in-the-past-15-years/>
- Committee, E. C. (2014, November 5). <http://www.a2gov.org/departments/systems-planning/water-resources/Pages/WaterResources.aspx>. Retrieved from City of Ann Arbor: <http://www.a2gov.org/departments/systems-planning/water-resources/Documents/Chapter%2063%20Resolution-Approved-Final.pdf>
- Hancock, J. (2014, 11 05). *Stormwater Code Requirements*. Retrieved from City of Ann Arbor Website: <http://www.a2gov.org/departments/planning-development/building/Pages/StormwaterCodeRequirements.aspx>
- Quality, M. D. (2013, October). *POTENTIAL ADVERSE IMPACTS OF DEICERS WITH A* . Retrieved from http://www.michigan.gov/documents/deq/deq-ess-faq-water-wb-deicers_255906_7.pdf