CITY OF KELOWNA

MEMORANDUM

Date: **April 14, 2009**

File No.: 5600-01

To: City Manager

From: General Manager, Community Services

Subject: **Water Improvement District Request for Grant Funding Support**

RECOMMENDATION:

THAT Council consider all water capital projects identified as "Required to Remove All Boil Water Notice" for future federal/provincial grant opportunities that may arise subject to the water purveyor's support and participation in a water governance review.

AND THAT Council award to Associated Engineering the Stage 1 and Stage 2 City-wide Master Water Plan at a cost of $ 112,995.

AND THAT Council approves funding for this plan from the Partnership Reserve and amend the 2009 Financial Plan to incorporate this study.

AND THAT Council supports consideration of the balance of the water improvement projects subject to the outcome of the City-wide Master Water Plan and participation of those Improvement Districts in the governance review.

AND FURTHER THAT Council direct staff to work with the Ministry of Community Development to develop a proposal for a city wide water governance study.

BACKGROUND:

On March 9th, 2009 Council received a report entitled "Water Quality Improvement Plan Overview" and a presentation by the Kelowna Joint Water Committee (KJWC) on capital projects necessary to achieve Interior Health Authority mandated water quality standards. The Improvement Districts requested Council's support for their applications to senior levels of government for funding support to achieve these capital improvements; recognizing the significant cost impact to their customers who are also Kelowna residents and taxpayers.

Kelowna is a very unique community from a water supply perspective in that there are five fully independent water purveyors serving the business, residential and agricultural water needs of the community. This has evolved through the history and development of this community. Each utility has its own water sources, treatment, distribution and administrative systems and are fully self funded through user fees. The five utilities work together in areas of joint interest and benefit through the

KJWC. Each utility is well managed by their own board of directors and staff and are regulated through the provincial government.

IHA is requiring all water utilities in the Interior to undertake improvements in order to meet Canadian Drinking Water Guidelines. This triggers varying degrees of costs to each utility customer dependent on their water source quality. The KJWC identified that improvements to achieve elimination of Boil Water Notices will cost $21.7 million, to achieve IHA requirements $41.4 million, and $161 million to provide filtration. These costs result in significant user cost impacts which is the basis for their request for funding to senior levels of government.

Council discussed this matter at length with the Improvement District representatives at the meeting. This triggered considerable discussion around the best water governance model to serve the community. Council members noted that residents often did not understand the current model and looked to Council to deal with water quality concerns and their costs. It was noted that with and without grants there will be significant cost differences between the customers in different utilities. Improvement Districts noted that the current model allows for single focused organizations that deliver cost effective, high quality services. They noted their long history of providing these services to Kelowna property owners.

Following further discussions, City Council requested that a city wide Water Master Plan be done to verify that the projects proposed would provide the most cost effective long term method to provide all properties in the City with water that meets Canadian Drinking Water Guidelines. However they agreed that the projects identified to eliminate Boil Water Notices would be required under any circumstance and therefore supported their inclusion for funding consideration as soon as grant programs are available. They felt that this information would assist in considering the best governance model. Associated Engineering had conducted the KJWC Water Quality Improvement Plan Overview and therefore is well positioned to quickly conduct the work. They have identified a multi stage study process leading to the information needed to make long term servicing decisions. By conducting Stage 1 and Stage 2 Council should have sufficient information to support governance discussions. Recognizing the community wide benefit of such a review, it was felt these should not be funded by the City Water Utility. The Finance Department has identified funds available in the Partnership Reserve to cover these costs. It is also anticipated that Provincial funds may be available to cover some of these costs.

City staff has had discussions with the Ministry of Community Development to request their assistance in structuring a governance review that should begin this fall after the Master Plan review is complete. They have extensive experience in assisting local governments and Improvement Districts in such discussions. This governance discussion would involve Council, Improvement District representatives and property owners. Leading from these discussions could be decisions to leave the current structure as is, reduce to 2 or 3 larger utilities with sufficient customer base to support future decisions, or develop a single city wide water utility. These governance discussions can lead to resolution to long standing uncertainty for the Improvement Districts and ensure proper ongoing financial support. Staff will report back with more information and options over the coming months so this review can proceed this fall.

There currently are no senior level of government grant programs to apply for at this time. However, there are indications that there will be programs announced in the coming months. By supporting the first level of projects, this ensures that the highest priority projects will be considered by Council with other city priorities when these grant programs are announced.

INTERNAL CIRCULATION TO:
Utility Services Manager
Financial Services Director
Integrated Infrastructure Planning Manager
City Clerk

Considerations that were not applicable to this report:

LEGAL/STATUTORY AUTHORITY:
LEGAL/STATUTORY PROCEDURAL REQUIREMENTS:
EXISTING POLICY:
FINANCIAL/BUDGETARY CONSIDERATIONS:
PERSONNEL IMPLICATIONS:
TECHNICAL REQUIREMENTS:
EXTERNAL AGENCY/PUBLIC COMMENTS:
COMMUNICATIONS CONSIDERATIONS:
ALTERNATE RECOMMENDATION:

Submitted by:

John Vos

J. Vos, General Manager Community Sustainability

Attachment

Associated Engineering

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March 30, 2009
File: KEL P 2009 012

Don Degen
Manager, Utility Services
City of Kelowna
1435 Water Street
Kelowna, BC
V1Y 1J4

Re: CITY OF KELOWNA
CITY-WIDE MASTER WATER PLAN

Dear Mr. Degen:

Associated Engineering is pleased to submit this proposal to undertake a more comprehensive review of technical options for area wide water supply and distribution planning. This work would be a natural extension from the preliminary options developed for the Kelowna Joint Water Committee in our report entitled Water Quality Improvement Plan Overview.

It is our understanding that the City wishes for this review to cover both water quality improvements as well as water supply and distribution on a City-wide basis within the areas presently served by the GEID, BMID, RWD, SEKID, and the City water utility.

STUDY APPROACH

1 STAGE I – OPTIONS IDENTIFICATION

1.1 PROJECT INITIATION

This task would consist of collecting existing data on the existing supply and distribution system. It would also involve holding a workshop with the City to establish a clear understanding of the study objectives and refine the work plan to address any modifications agreed to at the workshop to the objectives we have defined in this proposal. We expect that the objectives will include a combination of treated water quality improvements, supply capacity, future development scenarios, life cycle cost, and sustainability. At the workshop, we will present and discuss these with the City to ensure the criteria and measurement of these objectives are agreed to and clearly understood prior to developing and costing options. The work plan will be updated following this meeting to ensure that it fulfills the City's objectives.

As part of the workshop, we would recommend inviting IHA to attend in order to obtain their opinion of the general direction in the water quality improvements currently being planned for the metropolitan Kelowna area and to clarify their position regarding the long-term sustainability of filtration deferral.

Deliverables: Assimilated data and record of Workshop.No. 1 – Study Scope and Objectives

1.2 WATER SOURCES AND TREATABILITY

This task will involve characterizing the water quality and capacity of the existing water supply sources. We intend draw this information from the existing KJWC 2005 Strategic Water Servicing Plan and other information already obtained in completing the WQIP Overview. Utilizing this information, we propose to develop life cycle costing criteria to confirm a cost per million litres (ML) to treat water to the standard(s) established under Task 1. In addition to this treatment cost, we propose to develop a cost per ML per metre of hydraulic grade line (HGL) to deliver the treated water into the distribution system. These costing criteria will be used to determine the suitability of each supply as either a source for agricultural use or domestic use or both. This will in turn prepare for development of City-wide options.

Basically, sources with low treatment costs and low to moderate delivery costs (e.g., Okanagan Lake water in the valley) would be considered most suitable for drinking water use while sources with high treatment costs, but low delivery costs (e.g., high colour, high elevation sources) would be considered more suitable for agricultural water use. By using this costing method we believe that it will provide the City with a very clear tool for developing strategies for utilization of each of the existing sources of supply.

Depending on the objectives defined under Task 1.1 and the outcome of discussions with the IHA, it may be necessary to develop treatment costing based on provision of filtration versus no filtration. If this is the case, then a second set of costing should be developed for the other scenario to determine whether it changes the overall strategy in terms of utilization of services.

Deliverables: Technical Memorandum No. 1-1 - Source Treatability and Capacity Characterization.

1.3 WATER DEMANDS

We believe that one of the key factors in evaluating water supply on a City-wide basis is to identify the domestic versus agricultural demands. Domestic demands in the context used herein would include all indoor and outdoor residential, commercial, industrial, and institutional demands. Agricultural demands would include water used for purely agricultural irrigation purposes. These two demand groups have uniquely different characteristics in terms of water quality and delivery requirements. System options should be developed to best meet these requirements.

For the purpose of the Stage 1 analysis we would propose to identify the two demand types in a bulk basis for each service area. Service areas will be identified based on a combination of land use, land elevation and, to a certain degree, how they are presently supplied or serviced. The purpose here will be to simplify demand allocation in order to develop "big picture" system options. Much of this information will be drawn from the KJWC 2005 Strategic Water Servicing Plan.

Deliverables: Technical Memorandum No. 1-2 - Water Demand Projections and Allocation.

1.4 CONCEPTUALIZE OPTIONS

Based on the outcome of Task 1.2, several basic options will be developed to a conceptual screening level of detail. The primary utilization of each source (domestic or agricultural) will be defined and skeleton transmission network colour coded based on water quality (domestic or agricultural).

We would expect that the options would be similar in basic concept to what was presented in the Overview, although significantly refined to optimize source utilization and preliminary delivery routing. Each option may have two sub-options based on filtered or unfiltered treatment as noted under Task 1.2.

Option 1: Optimized Current Plan
Option 2: Minimize System Separation – Maximize Upland Sources
Option 3: Minimize System Separation – Maximize Lake Okanagan
Option 4: Maximize System Separation – Maximize Upland Sources
Option 5: Maximize System Separation – Maximize Lake Okanagan

All options would probably include maximizing use of groundwater for domestic use due to its low treatment requirements and costs. Upon conceptualizing these options we propose to hold a workshop with the City to confirm our findings from Stage 1 and to review the conceptualized options before proceeding into component sizing and costing.

Deliverables: Record of Workshop No. 2 – Treatment and Delivery Option Concepts.

2 STAGE 2 – OPTIONS EVALUATION AND SHORTLISTING

2.1 DEVELOP OPTIONS

Subsequent to Workshop No. 2 the components within each option will be sized to meet the demands identified under Task 1.3. Conceptual level capital cost estimates will then be prepared for each option based on the component sizing. Basic annual operating costs will be calculated including estimated pumping (energy) costs and treatment (labour, energy, and chemicals) costs. We would also suggest calculating the potential impacts of senior government funding on the capital costs in order to be able to evaluate their potential impacts on options evaluation.

Deliverables: Technical Memorandum No. 2-1 - Options Definition and Costing.

2.2 OPTIONS EVALUATION

Each system will be evaluated based on the following criteria:

1. Cost and Project Risk:
   - .1 Estimated Capital Cost
   - .2 Potential Senior Government Funding Impact on Cost
   - .3 Estimated Operating Cost
   - .4 Constructability
   - .5 Facilities Site Availability

2. Health Risk:
   - .1 Raw Water Quality / Variability
   - .2 Source Resilience to Quality Deterioration
   - .3 Treated Water Conformances to GCDWQ
   - .4 Treatment Process Robustness to Changing Conditions
   - .5 Risk of Non-Potable Water Consumption

3. Operation and Security:
   - .1 Operational Robustness
   - .2 Operational Complexity / Operator Qualifications
   - .3 Maintenance Complexity
   - .4 Operational Consolidation
   - .5 Supply Risk
   - .6 Security

4. Sustainability:
   - .1 Construction Environmental Impact
   - .2 Operation Environmental Impact
   - .3 Societal Impact

Evaluation of alternatives will be done on both a qualitative and quantitative basis with the quantitative involving use of a weighted scoring system. Weighted scoring systems are a valuable tool but are inherently vulnerable to manipulation or accusation of manipulation, especially where qualitative parameters are involved. Therefore, to ensure an open process, we propose to hold a meeting with City staff to review and refine the decision matrix and the weighting to be applied to each of the criteria. A sensitivity analysis will be applied to identify if any of the weightings have an overwhelming impact on the evaluation. The weighted scoring system will also be provided with context to emphasize that it is only a tool to assist with the evaluation and does not deliver absolute answers.

Deliverables: Record of Workshop No. 3 – Review and Refine Decision Matrix and Technical Memorandum No. 2-2 - Evaluation and Comparison of System Options.

2.3 OPTIONS SHORTLISTING REPORT

Stage 1 would culminate in the preparation of a draft report which would consist of the following:

- Options Shortlisting Report
- Technical Memorandum No. 1-1 – Source Treatability and Capacity Characterization
- Technical Memorandum No. 1-2 – Water Demand Projections and Allocation
- Technical Memorandum No. 2-1 – System Options Definition and Costing
- Technical Memorandum No. 2-2 – Evaluation and Comparison of System Options

We propose to hold the following meetings with the City during the course of Stages 1 and 2, the costs of which are included in the associated tasks:

Meeting/Purpose	Attendees
Workshop No. 1 - Project Initiation	Bill Harvey, Ian Wright
Workshop No. 2 – Treatment and Delivery Option Concepts	Bill Harvey, Ian Wright
Workshop No. 3 – Review and Refine Decision Matrix	Bill Harvey, Ian Wright
Workshop No. 4 – Options Shortlisting Report Review	Bill Harvey, Ian Wright

We do not envision developing a staging plan under Stage 2, however it should provide a clear outline of the big picture options and costing. This will allow the City to determine the direction that the next stage of the study should take. It is possible that at this point of the study one option may stand out as the clear winner giving the City the information it requires to define the scope of the subsequent stages.

The draft report will be submitted to the City subsequent to which Workshop No. 4 would be held to present and review the report findings. Outcomes from this workshop will be incorporated into the finalized document.

Deliverables: Record of Workshop No. 4 and Options Shortlisting Report.

3 FUTURE OPTIONS DEVELOPMENT

For the purpose of this proposal, we have assumed that the City will have adequate information upon the completion of Stages 1 and 2 to determine which basic option(s) best meet its objectives for a City-wide water supply and treatment strategy. We believe that at this point further analysis should be considered to refine the preferred option(s) to a higher level of detail and to determine the most logical staging of improvements. However, this analysis is beyond the current scope of this proposal.

4 STUDY TEAM

Associated Engineering proposes to involve both Bill Harvey and Ian Wright in significant roles for this study to bring forward the knowledge gained from the KJWC assignment.

Our team will therefore include the following key personnel who have been selected based on their relevant knowledge and expertise:

- Project Manager, Bill Harvey, P.Eng. - Kelowna based water supply engineer with 36 years water system engineering experience.
- Water Treatment Specialist, Ian Wright, P.Eng. - Water treatment planning and design specialist with 32 years of experience.
- Water Systems Planning Engineer, Rod MacLean, M.Sc., P.Eng. - Kelowna based agricultural engineer with 19 years water system engineering experience including planning of SEKID and RWD water distribution systems.
- Design Engineer, Matthew Lozie - Kelowna based with recent experience in hydraulic assessment of the Kelowna Poplar Point Supply System.

Resumes for the above named personnel are included herein.

5 FEES

We have prepared an estimated fee for each stage of the study herein, thereby allowing the City the option of awarding the assignment on a staged basis. The fees are provided as fixed fees for each of the two stages to be reviewed as part of this submission. In order for you to understand the effort that the estimated fees are based on, please refer to the attached Table 1. Invoicing will be submitted on a monthly basis. The following tables provide a brief summary of the estimated fees for each stage of the study.

STAGE I – OPTIONS IDENTIFICATION		
Task 1-1	Project Initiation	$8,240
Task 1-2	Water Sources and Treatability	$12,570
Task 1-3	Water Demands	$28,420
Task 1-4	Conceptualize Options	$16,045
	Total Stage 1	**$65,275**

STAGE 2 – OPTIONS EVALUATION AND SHORTLISTING		
Task 2-1	Develop Options	$19,560
Task 2-2	Options Evaluation	$10,530
Task 2-3	Options Shortlisting Report	$17,630
	Total Stage 2	**$47,720**

6 SCHEDULE

The named team is presently available to undertake the study almost immediately. We would expect Stages 1 and 2 to take approximately four months to complete.

Associated Engineering

We look forward to working with the City on this study. We would be pleased to meet with you to further discuss the scope of the study and changes that the City requires relative to our proposed approach.

Yours truly,

W.J. (Bill) Harvey, P.Eng.
Project Manager

Ian P.D. Wright, P.Eng.
Vice President, Water

WJH/IPDW/cb

Enclosures:

Table 1 - Level of Effort and Fees
Resumes - Bill Harvey
- Ian Wright
- Rod MacLean
- Matthew Lozie