

The Corporation of the City of Kawartha Lakes
Council Report

Report Number WWW2017-007

Date: October 10, 2017
Time: 2:00 p.m.
Place: Council Chambers

Ward Community Identifier: 9, 10, 11, 12

Subject: Coagulant Selection for the Lindsay Water Treatment Plant

Author Name and Title: Rob MacPherson, Water and Wastewater Technician

Recommendation(s):

RESOLVED THAT Report WWW2017-007, Coagulant Selection for the Lindsay Water Treatment Plant, be received;

THAT Staff be directed to negotiate a contract in accordance with the Purchasing Policy, between the City and Kemira, the sole supplier of SternPAC, for continued supply and delivery of SternPAC to the Lindsay Water Treatment Plant; and

THAT Staff continues to review new technology, products and pricing to ensure the most cost effective delivery of services.

Department Head: _____

Financial/Legal/HR/Other: _____

Chief Administrative Officer: _____

Background:

At the Lindsay Water Treatment Plant (WTP), coagulation is one of the key treatment processes completed. A chemical, or coagulant, is added to the raw, untreated water as part of the coagulation/flocculation stage to aid in this step of the process. During this stage impurities in the water join into small lumps and to aide in removal from the raw water. The Lindsay WTP currently uses SternPAC as their primary coagulant during the winter months, typically from October – May of each year when water temperatures are colder.

At the Council Meeting of January 13, 2015, Council adopted the following resolution:

Moved by Councillor Yeo, seconded by Councillor Junkin,

RESOLVED THAT Report PUR2015-001, **2014-107-SS - Sole Source Approval of SternPAC Coagulant for the Lindsay Water Treatment Plant**, be received;

THAT, in keeping with Policy No. 065 FD 007, Interim Spending Prior to the Adoption of Annual Operating Budget, that Kemira Water Solutions Canada Inc. of Brantford, be selected for the award for the supply and delivery of SternPAC over a two (2) year term at the proposed price of \$0.501 per liquid kilogram for 2015 and \$0.513 per liquid kilogram for 2016;

THAT subject to the approval of the award and receipt of the required documents, the Purchasing Division be authorized to issue a purchase order; and

THAT during the two year contract time frame that further testing be done on alternative coagulants products for the Lindsay Water Treatment Plant to allow for future purchases to be conducted through a competitive procurement process prior to the expiration of the contract.

CARRIED CR2015-079

In response to the resolution above in 2016 WSP Canada Inc., was retained by the City of Kawartha Lakes to explore alternative coagulants for the Lindsay WTP. Through their study ten coagulants were reviewed and it was recommended that two coagulants, SternPAC and DeltaFloc-1118, were the best available coagulant options for the Lindsay WTP based on Lindsay's specific treatment process, source water conditions, chemical specifications of coagulants, and compatibility with plant equipment. Before either coagulant was selected by the City as a preferred choice, WSP recommended both chemicals be further tested to determine what one could work most efficiently during cold water temperatures. Due to the timing of the testing, water temperatures were too high to continue testing the two recommended coagulants at that time. A report was brought to Council to provide an update.

At the Council Meeting of August 9, 2016, Council adopted the following resolution:

Moved by Councillor Dunn and seconded by Councillor O'Reilly

RESOLVED THAT Report WWW2016-006, **Coagulant Testing at Lindsay Water Treatment Plant**, be received;

THAT additional testing be undertaken in 2017 on two specific coagulants that performed better than the others, based on results from recent comparative testing, to further assess their capability under various conditions to treat water at the Lindsay Water Treatment Plant, as recommended in the June 23, 2016 WSP report;

THAT staff be directed to negotiate a contract between the City and Kemira, the sole supplier of SternPAC, for continued supply and delivery of SternPAC to the Lindsay Water Treatment Plant for a period of one year extending from December 31, 2016 to December 31, 2017; and

THAT upon completion of the additional coagulant testing in 2017, staff report back to Council regarding the conclusions from the testing and make recommendations for the long term procurement of coagulants for the Lindsay Water Treatment Plant.

CARRIED: CR2016-714

This report provides an update on the results collected from the testing of the two coagulants and the recommendations made by WSP on the preferred cold water coagulant to be used at the Lindsay Water Treatment Plant.

WSP continued their testing in the winter of 2017 to determine whether SternPAC or DeltaFloc-1118 exhibited superior performance at the Lindsay WTP during cold temperature conditions for the raw water source. This process was broken down into two stages.

The initial stage aimed to optimize the testing parameters surrounding the coagulant to ensure that once the coagulants were tested there would be significantly fewer sources of error. Microsand dosage, polymer dosage, and pH were adjusted to create the ideal environment for each coagulant in order to utilize the coagulants full water treatment capabilities. An in depth explanation of how each parameter was optimized can be found in the Attachment 1: *Follow up Coagulant Testing for the Lindsay Water Treatment Plant*.

Once the ideal environment was created for each coagulant, WSP was able to conduct the second stage of the experiment, optimizing the coagulant dosage. The following water quality parameters were analyzed to compare the effectiveness of each coagulant concentration in 4 °C water: Alkalinity, Colour, Apparent Colour, Total Dissolved Solids (TDS), Dissolved Organic Carbon (DOC), Total Organic Carbon (TOC), and Hardness.

The results indicated that while DeltaFloc-1118 was marginally less corrosive than SternPAC, the effectiveness of each coagulant was similar in performance.

WSP concluded that from a water quality and financial standpoint, the use of DeltaFloc-1118 does not provide significant benefits over the currently used SternPAC. It is therefore the recommendation of WSP and endorsed by Staff that a change in coagulant at this time should not occur and that SternPac should be continued to be used as the cold water coagulant.

Rationale:

As indicated in the report prepared by WSP, based on the results obtained from the further testing and the financial evaluation SternPAC remains the preferred cold water coagulant at the Lindsay WTP.

Based on an estimate calculated by WSP and shown in more detail under the Financial Impacts section of this Report, the continued usage of SternPAC as the primary coagulant for cold temperature raw water would cost approximately \$10,000 less per year than DeltaFloc-1118.

Changing the coagulant would also result in additional costs to the City to perform additional testing to assess the impact on corrosion control within the distribution system as per the requirement in the Drinking Water Works Permits and potential retrofits required to chemical pumping and storage equipment.

Staff did negotiate with Kemira in late 2016 for a one year extension of the contract for the supply and delivery of SternPAC for 2017 until a final decision on preferred coagulant could be made. Since Kemira is the sole provider of SternPAC and based on the professional opinion of WSP, it is recommended that staff negotiate a contract between the City and Kemira for the continued supply and delivery of SternPAC to the Lindsay Water Treatment Plant for a term that would be most cost effective.

Through the review process it was determined there are a number of municipalities that also use SternPAC and are satisfied with its performance. In addition, experts from the Walkerton Clean Water Center are supportive of the applicability of SternPAC in the Lindsay WTP.

Other Alternatives Considered:

As indicated in the Background Section of this Report, ten (10) alternative coagulants were reviewed and tested before further research and testing was conducted on the two short listed coagulants, SternPAC and DeltaFloc-1118, in order to determine their application in colder water.

Based on the testing and analysis, there are no alternate recommendations to SternPAC.

Financial/Operation Impacts:

The cost of each coagulant for a one year supply was estimated by WSP based on water usage rates provided by the City. The City provided a current SternPAC unit price and the supplier, Control Chem, provided a unit price for DeltaFloc-1118. Based on estimated consumption rates, DeltaFloc-1118 would be approximately \$10,000 more per year in comparison to SternPAC.

Therefore the most cost effective coagulant would be the SternPAC. The estimates which are provided in the WSP report may vary from the actual costs depending on volume of water treated per year and the quality of raw water.

All costs for coagulant are included in the department's annual operating budget. There is adequate funds to support the recommendations in this report.

Relationship of Recommendation(s) To The 2016-2019 Strategic Plan:

This Report contributes to the Council Adopted Strategic Plan in the following ways:

This report directly addresses "*Goal 3 – A Healthy Environment; Objective 3.1: A healthier environment; Action 3.1.6: Protect & enhance water quality*" of the Strategic Plan. The coagulant dosage used has been researched and optimized for the Lindsay WTP, enhancing the treated water quality and protecting the public health.

This report relates to *Objective 1: Best technology and best use of technology of the Enabler 4: Efficient Infrastructure and Asset Management*" of the Strategic Plan. The selection of the optimized coagulant has reduced waste, improved asset management and allows for a more efficient water treatment process.

This Report is in line with the City of Kawartha Lakes values, specifically continuous improvement and excellence as this proposed program will improve the municipal drinking water system quality as well as provide excellent, efficient, and safe services for the public of Kawartha Lakes.

Review of Accessibility Implications of Any Development or Policy:

There are no accessibility implications associated with this report.

Servicing Implications:

There are no servicing implications associated with this report.

Consultations:

Manager, Revenue and Procurement
Supervisor, Water & Wastewater Operations

Manager, Environmental Services
WSP Canada Inc.
Walkerton Clean Water Centre
Municipalities across Ontario

Attachments:

Attachment 1- Appendix A: Follow up Coagulant Testing for the Lindsay Water Treatment Plant, WSP, July 17, 2017



Follow Up Coagulant
Testing for the Lindsay

Attachment 2 – Appendix B: Coagulant Testing for the Lindsay Water Treatment Plant, WSP, June 23, 2016



Coagulant Testing for
the Lindsay Water Tre

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Department Head: Bryan Robinson, Director of Public Works