



Office of the Auditor General

AUDIT OF

The Munster Hamlet Sewer Rehabilitation Project

2006 Report

Chapter 11

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EXECUTIVE SUMMARY

Introduction

The Audit of the Munster Hamlet Sewer Rehabilitation Project was carried out at the request of Council to the Auditor General in February 2006.

Background

Munster Hamlet is a residential community established in the former Township of Goulbourn between 1970 and 1975. The population of the community in 1996 was 1,265 people. When it was developed, Munster Hamlet was served by sanitary sewers discharging to a pumping station and a sewage lagoon.

Investigations carried out in the early 1990s indicated that the lagoon was too small for its design population. Flow measurements showed that the sanitary sewers were receiving significant extraneous flow. Additional evidence of problems with the lagoons was the seepage of liquid waste from the side slopes of the lagoons, and from the spray irrigation fields.

Several studies were completed since 1990 addressing the problems that were experienced in the Munster Hamlet municipal sewage system. Engineering studies addressed the sewage lagoons, extraneous flows and water conservation. As a result of the studies, a Class Environmental Assessment was carried out and completed in 1996. The 1996 Class EA report recommended the upgrade and expansion of the lagoons and expansion of the spray irrigation area. Following a 'bump-up'¹ request that was dismissed by the Ministry of the Environment, the Regional Municipality of Ottawa-Carleton authorized the detailed design and tender documents.

As a result of objections from the Township of Goulbourn and a proposal by a manufacturer of a treatment system using snow as the effluent disposal system, the RMOC retained a different consultant to re-evaluate the 1996 Class Environmental Assessment study and to make recommendations, including a Class EA Addendum if warranted.

Based on these subsequent analyses, the consultant recommended as the preferred solution construction of a pumping station at Munster and a forcemain to transport

¹ 'Bump-up' was defined in the 1993 Class Environmental Assessment (EA) as "the decision by the proponent or by the Minister [of the Environment] that the environmental significance of a project is of such importance that the procedures for environmental assessment under the Class EA process are not sufficient and that an individual environmental assessment is required; the procedure which allows the proponent for the Minister to make such a decision." At present, 'bump-up' is referred to as "Part II Order" in the Environmental Assessment Act. The terms are used interchangeably in this report, depending on the chronology of the audited reports.

sewage to the Richmond pumping station and from there to the regional treatment system. An Addendum to the 1996 Environmental Study Report (ESR) was prepared and submitted. The 1999 ESR Addendum was subject of 'bump-up' requests, which were also dismissed by the Ministry of the Environment.

To implement the pumping station and pipeline to Richmond solution, the Regional Municipality of Ottawa-Carleton required an amendment to its Official Plan. The required Official Plan Amendment was passed by the Region's council. A number of individuals and the manufacturers of two of the communal wastewater treatment systems evaluated during the preparation of the ESR. Addendum presented objections, and the matter was referred to the Ontario Municipal Board.

As a result of the decision of the Ontario Municipal Board, the City of Ottawa retained a third consultant to examine the environmental assessment process carried out to that date, including three alternatives, namely the pipeline to Richmond, a mechanical tertiary treatment with discharge to the Jock River, and snowmaking treatment with spray irrigation.

Following further studies, the forcemain alternative solution was reaffirmed as the preferred solution for implementation.

In June 2003, City Council approved the implementation of the forcemain from Munster Hamlet to the pumping station at Richmond. Detailed design was carried out in 2003 and 2004, and construction commenced in the winter of 2004; the pumping station at Munster, the forcemain, and modifications to the Richmond pumping station were commissioned in April 2005. By the summer of 2005, odours emanating from the forcemain and the Richmond pumping station became an issue.

Audit Objectives

The overall objective of the audit was to examine and evaluate the processes and methodologies used to manage and control the project from its inception, and based on examination and evaluation, determine whether the processes and methodologies were consistent and compliant with all relevant policies, procedures, legislation and regulations. To achieve the project objective, the study was required to assess whether:

- Project budgets and cost estimates were timely, accurate and reliable.
- The alternative assessment and evaluation methodologies for the three alternatives followed industry-accepted criteria and practices.
- The forcemain route selection study conducted to select the forcemain option was done properly and thoroughly.

- Design and construction of the forcemain provides effective and safe long-term operation.
- The various studies and designs and other tasks provided value for money.

Audit Scope

The Audit of the Munster Hamlet Sewer Rehabilitation Project comprised a review of the various reports, drawings, and other documentation available for the project from the City and from interested private citizens. In addition, the audit included interviews with various individuals who participated in the project since its inception. A field investigation was completed to review the construction of the forcemain.

The audit scope was based on the existing reports and documentation and selected field work, as required to address the audit objectives. It should be noted that the audit was not required to assess the design criteria or the detailed design calculations used to size the various components of the alternatives. The audit was not required to attempt to reproduce every detail of the studies and designs. The audit was focussed more on the overall picture of the solution.

Findings

The following summarizes the findings of the audit:

Environmental Study Report, 1996

1. The 1996 ESR met the requirements of the Class EA and the solution selected based on the study was supported by the engineering analysis, public and agency input, and the evaluation of the various alternatives.
2. The public participation component of the 1996 ESR exceeded the requirements of the Class EA. In addition, Totten Sims Hubicki Associates (TSH) met with individual property owners to review their concerns.
3. The 1996 ESR included Snowfluent as part of the alternative solutions. The Snowfluent system was subsequently evaluated as part of the alternative designs, but was not selected based on the evaluation method.
4. TSH adjusted the Snowfluent cost data to ensure that the interests of the Region would be protected if the Snowfluent system was the highest ranking design.
5. The pipeline solution had many serious constraints at the time that the ESR was done (1995, 1996), which made it unfeasible. The main constraint was the result of the policy used to determine the committed hydraulic capacity at the Richmond Pumping Station. Based on the policy at the time, the hydraulic capacity of the Richmond Pumping Station was fully committed. The committed hydraulic capacity allocation policy resulted in other constraints, including the negative effect of receiving Munster flows at Richmond, which would remove development potential

in Richmond; and the very high cost of improving the Richmond Pumping Station and the forcemain to accommodate the additional flows from Munster and from future development in Richmond.

6. The 'bump-up' requests received in 1996 delayed the start of the implementation of the preferred solution by about one year.

Unsolicited Proposals

1. It appears that Delta's intention, when it made the unsolicited proposal, was to be allowed as an alternative to the upgrade to the lagoons and spray irrigation system (in other words, that the Region would consider an alternative bid when the tenders were solicited).
2. Once Delta made its unsolicited proposal, CMS became involved and opened the door for the re-evaluation and eventual ESR Addendum study.
3. The design of the upgrades to the sewage lagoons and the spray irrigation system was practically complete when the implementation process was halted by Council in March 1998.
4. Staff was committed to implementing the upgrades to the sewage lagoons and the spray irrigation system, and correctly recommended to Council to stay the course.
5. Re-opening the evaluation of alternatives, as directed by Council, at such a late stage did not take into account the increase in cost due to the required additional studies and extension of the voluntary abatement process.
6. Staff indicated to Council that such course of action would require a re-evaluation of alternatives, and that the project implementation could be delayed 12 to 18 months.

ESR Addendum, 1999

1. The Conestoga Rovers and Associates (CRA) re-evaluation of alternatives correctly started at Phase 2 of the Class EA process.
2. The use of a design/build proposal call as part of the CRA re-evaluation process in the form of a formal request for proposals is unusual during a Class EA study.
3. The request for proposals (RFP) had the appearance and wording to lead the proponents to conclude that a contract would be negotiated if their proposal was considered acceptable. The RFP document contained legal clauses to permit the Region to not enter into negotiations; however, the overall document format and the circumstances of the competition supported the perception by the proponents that the Region would enter into negotiations with the successful proponent.
4. The RFP document accepted technologies and implementation programs, thus opening the door to pipeline alternatives.

5. The RFP document was not clear that the proposals were intended to provide firm cost estimates for use in the ESR Addendum and not for the selection of a particular proponent.
6. Based on the RFP document, the proponents were correct in expecting that the result would be negotiation of a contract with them.
7. It appears that up until the pipeline alternatives were received as a result of the RFP, the Region staff had not considered a pipeline as a viable alternative (possibly as a result of the previous estimates and constraints).
8. For completeness and to comply with the Class EA, the CRA ESR Addendum study had to examine the pipeline option and other options.
9. The CRA studies were carried out in accordance with the Class EA process requirements.
10. The CRA public participation scope and methods went far beyond the requirements of the Class EA, and were similar to those that would have been used in an individual Environmental Assessment.
11. The weights used in the evaluation methods took into account the input from the public and the professional experience of the project team. The weights were similar to those applied by TSH.
12. The cost estimates for the various alternatives were adjusted by CRA to normalize them. CRA had a duty to ensure that the costs used in the evaluations reflected all the costs of the projects.
13. The pipeline alternative became feasible when the policy of the Region changed and permitted the “just-in-time” provision of sewer capacity, rather than the use of capacity allocations for events long into the future. This change in policy allowed the excess capacity at the Richmond Pumping Station to be used for Munster Hamlet.
14. CRA evaluated five alternative pipeline routes using standard evaluation procedures that took into account the input received from the Region and the public. The evaluation of the alternative pipeline routes included a comprehensive public participation process.
15. The Richmond Pumping Station improvements were part of the overall wastewater system master plan, and would have proceeded regardless of the events at Munster.
16. The ‘bump-up’ requests in 1999 delayed the project by up to one year.
17. CRA included in their report the time that may have been required for a ‘bump-up’ request and noted the need for an Official Plan Amendment and possible OMB hearing.

Ontario Municipal Board Hearing

1. The Ontario Municipal Board decision took an excessive amount of time.

2. The OMB disregarded the fact that a Class EA process, correctly conducted as confirmed by the MOE decision to reject the 'bump-up' requests, had already been conducted.
3. The OMB decision should have been limited to whether the Official Plan Amendment No. 5 should be upheld. Instead, the OMB provided a decision that delved into the method of selection of alternatives, without a clear understanding of the process.
4. Aside from the long time that it took to render a decision, the OMB decision was incomplete, as it should have either approved or rejected the OPA. If it considered that the evidence for a communal system was more credible than that for a pipeline solution, the decision should have been for rejection of the OPA; on the other hand, if the pipeline solution was acceptable, then the OPA should have been approved.
5. The OMB hearing was not a hearing under the Environmental Assessment Act and hence had no jurisdiction on the selection of the preferred solution.

Design/Build Contract

1. The award of the design and construction management contract to Doran Contractors was endorsed by the Ottawa Construction Association to maintain the integrity of the request for proposals process.
2. Award of the contract was done to expedite implementation of the project, at the City's risk. However, staff apprised Council of the risks, including the possibility of having to throw out the design if the OMB denied the OPA.

Re-Evaluation of Alternatives

1. In our interpretation of the OMB decision, the City could have indicated that they were satisfied with the Class EA report and proceeded with implementation of the recommended solution, i.e. the Munster Pumping Station and the forcemain to Richmond.
2. The RVA Re-evaluation of Alternatives presented at the meeting in December 2002 was incomplete; the report should have taken into account the factors that were later included in the Technical Memorandum. For example, the impact of having to re-open the ESR process if a solution other than the pipeline was selected, the regulatory risk to the City in case of further delays in implementing a solution to the Munster sewage treatment problem, and the impact of the additional property acquisition required if the Snowfluent design assumptions were not accepted by the MOE.
3. Staff committed to release the RVA Re-evaluation of Alternatives to the public without first reviewing the results of the study. This was a well-intentioned error in judgment caused by the desire to demonstrate that the study was conducted independently of the City. However, it is unusual for a consultant to present results

of a study to the public without allowing the client an opportunity to review the report. Review by City staff would have disclosed before the December presentation that the report work was not complete.

4. The additional analyses required by City staff were necessary to complete the Re-evaluation of Alternatives. Without the additional analysis, the report would not be complete.
5. Once the City was satisfied with the results of the re-evaluation of alternatives, it was correct in proceeding to completion as recommended by staff. Further delays in implementing a solution to the Munster Hamlet sewage problem substantially increased the risk to the City of being found non-compliant by the Ministry of the Environment.

Detailed Design and Construction

1. The design of the pumping station and the forcemain were completed in accordance with the accepted standards for design.
2. The construction methodology used reduced the impact of the forcemain during construction and the cost of implementation.
3. The design made provisions for protection of the wells in Richmond by selecting the route that had the least number of wells; used high-density polyethylene pipe with a thick wall and thermally-fused joints; and provided a control valve west of Richmond to reduce the operating pressures through Richmond to provide a 5.0 factor of safety against failure of the pipe.
4. The design and construction has implemented an acceptable, state-of-the-art system for monitoring of forcemain pressures for leak detection.
5. The construction of the forcemain generally conforms to the plans and specifications. Two excavations were done on May 31, 2006 to inspect the forcemain, and it was possible to confirm that construction was done per the design.
6. The design of the pumping station made provisions for odour control due to hydrogen sulfide emissions by installation of a bio-scrubber at the Richmond Pumping Station.
7. The malodour problem in the summer of 2005 was the result of an operational mistake that was corrected immediately. Subsequent malodour problems were due to the release of gases other than hydrogen sulfide, which could not be controlled using a bio-scrubber; the City installed a temporary biofilter and the malodours have been controlled. The City is currently constructing a permanent biofilter at the Richmond Pumping Station.

General

1. In general terms, if Council had followed staff recommendations in 1998 it would have saved the City about \$7.9 million dollars, although the solution would have

been on-site treatment rather than a forcemain. In all instances in which Council superseded the recommendations of staff, the cost of the project went up and the project was delayed substantially.

2. Much of the delays have been caused by the multiple objections and roadblocks placed by individuals and interest groups. Some of the objections and roadblocks do not appear to be based on factual information.
3. All pertinent costs have been included in the project budget.
4. All pertinent costs have been reported to Council in various forms.

Recommendation 1

That staff provide an assessment of time and subsequent costs to Council when presenting alternative courses of action.

Management Response

Agree in principle. This would have been particularly difficult in earlier stages (prior to amalgamation) of the project due to the unusual and occasionally unpredictable nature of the Council direction and decision making. The final report to Committee/Council in May/June 2003 addressed timelines and associated costs extremely well.

Recommendation 2

That the Public Works and Services Department develop a policy for Council approval that once an Environmental Study Report has been in the public record for the statutory 30-day review period and any Part II Order requests have been resolved or the Ministry of the Environment has rejected them, the Class EA process not be re-opened unless the factors provided for in the Municipal Class Environmental Assessment take effect (Section A.4.2.2 of the Municipal Class EA).

Management Response

Disagree. The Municipal Engineers Association Class Environmental Assessment process is itself an undertaking approved under the Environmental Assessment Act. Both processes recognize and include provisions for changing circumstances including for completed Class EAs a mandatory requirement to review and reconfirm or modify both the assumptions and conclusions of a completed EA study every 5 years. The recommendation would seem to contradict this legislated requirement. The provisions for mandatory review contained in the Class EA process anticipate a wide range of circumstances including changes in legislation, new technologies, changes in original assumptions, etc.

Although this resulted in long delays and created controversies in the community in the case of Munster, there are often instances where revisiting EA decisions due to

new information is warranted. Restricting the reconsideration of decisions previously made would not be in keeping with intent of the overall Class EA process.

Recommendation 3

That the RFP process not be used during an EA study to obtain firm prices for alternative solutions. Instead, if alternative technologies are desired, that the City solicit Expressions of Interest or other non-binding solicitations with clear objectives and explanation to the invitees. To confirm cost estimates during a study or preliminary design, that the City consider retaining a contracting firm to provide cost estimates.

Management Response

Agree. Although Supply Management had no involvement in the RFP process described in this audit report, we agree with this recommendation, and would not issue an RFP that was not intended to result in a contract award. We also agree that if cost estimates are sought for solutions, the RFP is not an appropriate mechanism, and as suggested by the AG, a consulting firm could have been retained to provide those estimates.

Recommendation 4

If the maker of proprietary product submits a proposal for its use by the City, that the City accept it only with a clear understanding by the proponent that any evaluation or consideration of the proposal does not bind the City to its use.

Management Response

Agree.

Recommendation 5

That City staff do not release results of consultant's studies without previous review.

Management Response

Agree in general. Staff generally work closely with consultants to carry out studies and develop appropriate recommendations. However, in the case of Munster, the City intentionally had RVA undertake an independent re-evaluation and make recommendations based upon their re-evaluation of the three treatment alternatives. To do otherwise in this situation, recognizing the long history of this project even at that time would have been problematic.

Recommendation 6

That all major changes in policies regarding the use of infrastructure capacity be brought forward for Council approval.

Management Response

Agree in principle. For the particular issue that seems to have resulted in this recommendation – capacity allocation – the Region’s 1997 Wastewater Master Plan included policies regarding capacity allocation and system efficiencies. The report does not make further references, however if there is other evidence that policies are not being brought forward to Council this recommendation may have value. If the recommendation is related only to the specific issue of capacity allocation, related policies were presented to and approved by Regional Council.

Conclusion

The studies carried out as part of the Class Environmental Assessment process were completed in accordance with the required process, and the public participation program exceeded in both cases the minimum requirements. The evaluation methods used in the Class Environmental Assessments used generally accepted methodologies.

The alternative development, initial evaluation, detailed ranking and the evaluation methodologies were completed in accordance with the Class EA requirements and normal engineering practice.

The forcemain selection was done without bias in its favour. In fact, the original recommendation (in the Environmental Study Report) was for on-site treatment. From the documentation reviewed as part of this audit, it appears that the pipeline option became attractive during the ESR Addendum process when the unsolicited pipeline proposals were submitted containing the option of using actual flows to the pumping station instead of the methodology used up to that time; the result of the change in policy was to make the pipeline option economical.

Design and construction of the Munster Hamlet pumping station and forcemain to Richmond provides effective and safe long term operation.

The following provided value for money:

- The 1996 Environmental Study Report
- The subsequent detailed design and preparation of plans
- The 1998 Addendum Study
- The 2003-2004 detailed design and services during construction of the pumping station and forcemain.
- Construction of the Munster Pumping Station and forcemain project

The following work and activities provided relatively low or no value for the money spent:

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- The 'bump-up' requests
 - The Ontario Municipal Board hearing and decision, which went much further than warranted and that delayed the process
 - The decision in response to the OMB hearing decision to undertake a re-evaluation of alternatives. City Council had the option to respond to the OMB that it was satisfied with the previous studies and reports, and to proceed to implementation.

Acknowledgement

We wish to express our appreciation for the cooperation and assistance afforded the audit team by Management.

SOMMAIRE

Introduction

La vérification portant sur le projet de traitement des eaux usées de Munster Hamlet a été réalisée à la suite de la demande que le Conseil municipal a adressée au vérificateur général en février 2006.

Contexte

Munster Hamlet est un ensemble résidentiel qui a été fondé dans l'ancien Canton de Goulbourn entre 1970 et 1975. En 1996, la population de cette communauté s'élevait à 1 265 personnes. Au moment de sa création, Munster Hamlet avait été raccordé à un système d'égout séparatif, qui acheminait les eaux usées à une station de pompage et à un bassin de stabilisation des eaux usées.

Des enquêtes réalisées au début des années 1990 ont révélé que le bassin de stabilisation des eaux usées était trop petit par rapport à la population à desservir. Des mesures de débit ont démontré que le système d'égout séparatif recevait une quantité considérable d'écoulements parasites. Une preuve supplémentaire des problèmes liés aux bassins de stabilisation des eaux usées était le suintement des eaux usées par les parois latérales des bassins et dans les champs de vaporisation des déchets liquides.

Plusieurs études portant sur les problèmes du réseau d'égout municipal de Munster Hamlet ont été réalisées depuis 1990. Des études techniques ont été faites sur les bassins de stabilisation des eaux usées, les écoulements parasites et la conservation de l'eau. Ces études se sont traduites par une évaluation environnementale de portée générale (EEPG), qui a été achevée en 1996. Dans le rapport qui a été déposé après cette EEPG, il était recommandé d'améliorer et d'agrandir les bassins et d'accroître la superficie de la zone de vaporisation. À la suite d'une demande de changement de catégorie², qui a été rejetée par le ministère de l'Environnement, la Municipalité régionale d'Ottawa-Carleton (MROC) a donné son autorisation relativement aux documents de conception détaillés et aux documents d'appel d'offres.

En raison d'objections provenant des représentants du Canton de Goulbourn et d'une proposition faite par le fabricant d'un système de traitement des eaux fondé sur la technologie de cristallisation, la MROC a retenu les services d'un autre expert-conseil

² Dans l'EEPG de 1993, la notion de changement de catégorie était définie comme étant [Traduction] « une décision prise par le promoteur ou le ministre [de l'Environnement] selon laquelle un projet nécessite une évaluation environnementale distincte en raison de l'importance de la portée environnementale du projet et de l'insuffisance du processus d'EEPG dans un tel cas; et le processus permettant au promoteur ou au ministre de prendre une telle décision ». Actuellement, dans la *Loi sur les évaluations environnementales*, un changement de catégorie est appelé un arrêté de conformité à la partie II. Ces termes sont utilisés de façon interchangeable dans le présent rapport, en fonction de la chronologie des rapports vérifiés.

afin qu'il réévalue l'évaluation environnementale de portée générale (EEPG) de 1996, formule des recommandations et, au besoin, qu'il rédige un addenda à l'EEPG.

À la suite de ces analyses subséquentes, l'expert-conseil a recommandé, comme solution privilégiée, la construction d'une station de pompage à Munster et d'une conduite de refoulement qui permettrait d'acheminer les eaux d'égout à la station de pompage de Richmond et par la suite jusqu'au système de traitement régional. Un addenda au Rapport d'étude environnementale de 1996 a été déposé. Cet addenda de 1999 a également fait l'objet de demandes de changement de catégorie, lesquelles ont également été rejetées par le ministère de l'Environnement.

Afin de pouvoir mettre en œuvre la solution consistant à construire une station de pompage et une canalisation jusqu'aux installations de Richmond, la MROC devait modifier son Plan officiel, et cette modification a été adoptée par le Conseil de la MROC. Un certain nombre de particuliers et les fabricants de deux des systèmes de traitement des eaux usées communautaires qui avaient été évalués pendant la préparation de l'addenda au Rapport d'étude environnementale ont présenté leurs objections, de sorte que le dossier a été transféré à la Commission des affaires municipales de l'Ontario.

En raison de la décision prise par la Commission des affaires municipales de l'Ontario, la Ville d'Ottawa a retenu les services d'un troisième expert-conseil pour examiner le processus d'évaluation environnementale mis en œuvre jusqu'à cette date, y compris trois solutions de rechange, soit la canalisation jusqu'à Richmond, un traitement tertiaire physique avec évacuation dans la rivière Jock et un traitement par cristallisation et vaporisation.

À l'issue d'autres études, le projet de conduite de refoulement a de nouveau été confirmé comme étant la solution privilégiée à mettre en œuvre.

En juin 2003, le Conseil municipal a approuvé la mise en œuvre du projet de conduite de refoulement allant de Munster Hamlet à la station de pompage de Richmond. La conception détaillée du projet a été réalisée en 2003 et en 2004, et la construction a débuté à l'hiver 2004. La station de pompage à Munster, la conduite de refoulement et les modifications apportées à la station de pompage de Richmond ont été mises en service en avril 2005. À l'été 2005, les odeurs provenant de la conduite de refoulement et de la station de pompage de Richmond étaient devenues problématiques.

Buts de la vérification

En général, la vérification avait pour objet d'examiner et d'évaluer les méthodes et les processus utilisés pour gérer et surveiller le projet dès sa création et, en fonction de l'examen et de l'évaluation, de déterminer si les méthodes et les processus étaient

uniformes et conformes à l'ensemble des politiques, des règles de procédure, des lois et des règlements pertinents. Il a fallu, dans le cadre de la vérification, déterminer si :

- les budgets et les prévisions de coûts du projet tenaient compte des délais et s'ils étaient exacts et fiables;
- les méthodes utilisées pour examiner et évaluer les trois solutions de rechange étaient conformes aux pratiques et aux critères reconnus par l'industrie;
- l'étude menée pour sélectionner le tracé de la conduite de refoulement a été faite adéquatement et de façon approfondie;
- la conception et la construction de la conduite de refoulement permettent une utilisation efficace et sécuritaire à long terme;
- les diverses études, les documents de conception et les autres activités présentaient un bon rapport qualité-prix.

Portée de la vérification

La vérification portant sur le projet de traitement des eaux usées de Munster Hamlet comprenait un examen des divers rapports, schémas et autres documents liés au projet et obtenus de citoyens intéressés et de la Ville. Dans le cadre de la vérification, des entrevues ont également été menées avec diverses personnes ayant participé au projet depuis sa création. Par ailleurs, une enquête sur le terrain a été réalisée afin d'examiner la construction de la conduite de refoulement.

La portée de la vérification a été établie en fonction des rapports et des documents existants, du travail particulier qui a été fait sur le terrain et des éléments requis pour répondre aux buts de la vérification. Il est à noter que la vérification n'avait pas pour objet d'évaluer les critères de conception ni les calculs détaillés ayant servi à évaluer la dimension des diverses composantes des solutions de rechange. Elle ne visait pas non plus à essayer de reproduire tous les détails des études et des concepts antérieurs. Elle portait plutôt sur la vue d'ensemble concernant la solution.

Constatations

Voici un résumé des constatations de la vérification.

Rapport d'étude environnementale (REE), 1996

1. Le REE de 1996 était conforme à l'EEPG, et la solution retenue à la fin de l'étude était fondée sur l'étude technique, les commentaires du public et des agences et l'évaluation des différentes solutions de rechange.
2. Le volet du REE de 1996 portant sur la participation du public allait au-delà des exigences de l'EEPG. En outre, la société Totten Sims Hubicki Associates (TSHA) a rencontré individuellement des propriétaires pour examiner leurs préoccupations.

3. Le REE de 1996 comptait la technologie de cristallisation à froid (TCF) parmi les solutions de rechange. Le système fondé sur cette technologie a par la suite été évalué avec les autres concepts de rechange, mais n'a pas été sélectionné en raison de la méthode d'évaluation.
4. La société TSHA a rajusté les données relatives au coût de la TCF pour s'assurer de protéger les intérêts de la Région si ce concept devait obtenir le meilleur classement.
5. Le projet de canalisation présentait de nombreux obstacles d'importance pendant la période à laquelle l'étude environnementale a été réalisée (1995-1996), de sorte qu'il n'était pas réalisable. Le principal obstacle était le résultat de la politique ayant servi à déterminer la capacité hydraulique engagée de la station de pompage de Richmond. En fonction de la politique en vigueur à l'époque, la capacité hydraulique de la station de pompage de Richmond était entièrement engagée. La politique d'attribution de la capacité hydraulique a soulevé d'autres obstacles, comme l'effet négatif découlant du fait d'accueillir les eaux de Munster à Richmond, ce qui réduirait le potentiel de mise en valeur de Richmond, et le coût très élevé des travaux d'amélioration de la station de pompage de Richmond et de construction de la conduite de refoulement, travaux qu'il fallait entreprendre pour accueillir les eaux supplémentaires provenant de Munster et des projets futurs de mise en valeur de Richmond.
6. Les demandes de changement de catégorie qui ont été reçues en 1996 ont retardé le début de la mise en œuvre de la solution privilégiée d'environ un an.

Propositions spontanées

1. Il semble que, lorsque la société Delta a présenté sa proposition spontanée, elle souhaitait être autorisée à présenter une solution de rechange à l'amélioration des bassins et du système de vaporisation (c'est-à-dire, qu'elle s'attendait à ce que la Région considère une variante lorsque les appels d'offres seraient lancés).
2. Après que la proposition spontanée de Delta ait été présentée, la société CMS s'est intéressée au dossier, ce qui a ouvert la porte à la réévaluation de l'étude environnementale et à l'éventuel ajout d'un addenda.
3. La conception des améliorations à apporter aux bassins de stabilisation des eaux usées et au système de vaporisation était presque terminée lorsque le processus de mise en œuvre a été arrêté par le Conseil au mois de mars 1998.
4. Le personnel s'était engagé à mettre en œuvre les améliorations des bassins de stabilisation des eaux usées et du système de vaporisation, et il a, à juste titre, recommandé au Conseil de garder le cap.
5. Le fait de réévaluer les solutions de rechange à un stade aussi avancé, à la demande du Conseil, ne permettait pas de tenir compte de l'augmentation du coût découlant

des études supplémentaires exigées et du prolongement du processus de réduction volontaire.

6. Le personnel a avisé le Conseil que des mesures semblables exigeraient la réévaluation des solutions de rechange et que la mise en œuvre du projet pourrait être retardée de 12 à 18 mois.

Addenda de 1999 à l'étude environnementale

1. La réévaluation des solutions de rechange faite par la société Conestoga Rovers and Associates (CRA) a débuté, comme il se doit, à l'étape 2 du processus d'EEPG.
2. Le recours à un appel de proposition relativement à la conception et aux travaux de construction dans le cadre du processus de réévaluation mis en œuvre par la société CRA et qui a pris la forme d'une demande de proposition officielle est inhabituel dans le cadre d'une EEPG.
3. La forme et le libellé de la demande de proposition pouvaient porter les promoteurs à croire qu'un contrat serait attribué si leur soumission était considérée comme étant acceptable. Le document de la demande de proposition renfermait des dispositions juridiques permettant à la région de ne pas engager de négociations. Toutefois, la présentation générale du document et les circonstances entourant l'appel de proposition entretenaient la perception du point de vue des promoteurs que la Région engagerait des négociations avec le soumissionnaire retenu.
4. Le document de demande de proposition acceptait des propositions en matière de technologies et de programmes de mise en œuvre, ce qui ouvrait la porte aux solutions proposant des canalisations.
5. Le document de demande de proposition n'indiquait pas clairement que les propositions serviraient à fournir des devis estimatifs fiables pour l'addenda à l'étude environnementale et non à sélectionner un soumissionnaire particulier.
6. Les promoteurs avaient raison de croire, en se fondant sur le document de demande de proposition, que ce processus aboutirait à l'attribution d'un contrat.
7. Il semble que, jusqu'à ce que les promoteurs transmettent des solutions proposant la construction d'une canalisation à la suite de la demande de proposition, le personnel de la Région n'avait pas considéré une canalisation comme solution viable (peut-être en raison des estimations et des obstacles antérieurs).
8. Afin d'être complet, et en vue de se conformer à l'EEPG, l'addenda à l'étude environnementale qui a été rédigé par la société CRA devait contenir un examen des projets de canalisation et des autres options.
9. Les études menées par la société CRA ont été réalisées conformément aux exigences du processus d'EEPG.
10. La portée et les méthodes liées aux activités de la société CRA portant sur la participation publique ont largement dépassé les exigences de l'EEPG, et elles

étaient semblables à celles qui auraient été utilisées dans le cadre d'une évaluation environnementale distincte.

11. La pondération utilisée dans les méthodes d'évaluation a tenu compte de la contribution du grand public et de l'expérience professionnelle de l'équipe de projet. Elle était semblable à celle utilisée par la société TSHA.
12. Les évaluations de coûts des différentes solutions de rechange ont été rajustées par la société CRA dans le but de les normaliser. La société CRA devait s'assurer que les coûts utilisés dans les évaluations reflétaient tous les coûts des projets.
13. La solution concernant la canalisation est devenue viable lorsque la politique de la Région a été modifiée et qu'elle a permis d'offrir la capacité d'égout selon le principe du juste à temps, au lieu d'attribuer des niveaux de capacité hydraulique à des activités prévues dans un avenir lointain. Ce changement de politique permettait d'utiliser la capacité excédentaire de la station de pompage de Richmond pour répondre aux besoins de Munster Hamlet.
14. La société CRA a évalué cinq tracés de canalisation différents au moyen de méthodes d'évaluation types et en tenant compte des commentaires de la Région et du grand public. Le processus d'évaluation des différents tracés pour la canalisation comportait un vaste volet de participation du public.
15. Les améliorations de la station de pompage de Richmond faisaient partie de l'ensemble du Plan directeur de gestion des eaux usées, et elles auraient eu lieu peu importe les problèmes survenus à Munster.
16. Les demandes de changement de catégorie faites en 1999 ont reporté le projet pendant au plus un an.
17. La société CRA a inclus dans son rapport le temps qui aurait pu être nécessaire pour une demande de changement de catégorie et a signalé la nécessité de modifier le Plan officiel et la possibilité de tenir une audience de la Commission des affaires municipales de l'Ontario.

Audience de la Commission des affaires municipales de l'Ontario

1. La décision de la Commission des affaires municipales de l'Ontario (CAMO) a été rendue après un délai excessivement long.
2. La CAMO a fait abstraction du fait qu'une EEPG avait déjà été réalisée, et qu'elle avait été menée correctement comme l'a confirmé la décision du ministère de l'Environnement de rejeter les demandes de changement de catégorie.
3. La CAMO aurait dû limiter sa décision, à savoir si la modification numéro 5 du Plan officiel aurait dû être confirmée. Au contraire, la CAMO a formulé une décision qui portait sur la méthode de sélection des solutions de rechange, sans avoir une idée claire du processus.

4. À part le fait que la CAMO a mis beaucoup de temps à rendre sa décision, cette dernière était incomplète étant donné que la CAMO aurait dû soit approuver, soit rejeter la modification du Plan officiel. Si la CAMO estimait que les éléments de preuve favorisant la mise en place d'un système communautaire étaient plus crédibles que ceux en faveur d'une canalisation, sa décision aurait dû rejeter la modification du Plan officiel. Par contre, si la solution de canalisation était acceptable, il fallait alors approuver la modification du Plan officiel.
5. L'audience tenue par la CAMO n'était pas conforme à la *Loi sur les évaluations environnementales*, et la CAMO n'avait donc aucun pouvoir quant à la sélection d'une solution privilégiée.

Contrat de conception-construction

1. L'attribution du contrat de gestion des activités de conception-construction à la société Doran Contractors a été approuvée par l'Association de la construction d'Ottawa pour maintenir l'intégrité du processus de demande de proposition.
2. Le contrat a été attribué en vue d'accélérer la mise en œuvre du projet, ce qui faisait courir un risque à la Ville. Toutefois, le personnel a avisé le Conseil de ce risque, y compris la possibilité de devoir refuser le concept si la CAMO rejetait la modification du Plan officiel.

Réévaluation des solutions de rechange

1. Dans notre interprétation de la décision de la CAMO, la Ville aurait pu indiquer qu'elle était satisfaite du rapport de l'EEPG et aller de l'avant avec la mise en œuvre de la solution qui avait été recommandée, c'est-à-dire la station de pompage de Munster et la conduite de refoulement vers Richmond.
2. Le document de la société RVA portant sur la réévaluation des solutions de rechange qui a été présenté à la réunion de décembre 2002 était incomplet. Le rapport aurait dû tenir compte des éléments qui avaient été inclus par la suite dans le document technique. Par exemple, les répercussions découlant de la reprise du processus d'étude environnementale, dans le cas où une solution autre que le projet de canalisation aurait été sélectionnée, les risques en matière de réglementation courus par la Ville dans le cas de retards supplémentaires dans la mise en œuvre d'une solution au problème de traitement des eaux d'égout de Munster ainsi que les répercussions découlant des propriétés supplémentaires qu'il aurait fallu acquérir dans le cas où les hypothèses du concept concernant la technologie de cristallisation à froid auraient été refusées par le ministère de l'Environnement.
3. Le personnel s'était engagé à diffuser le document de la société RVA portant sur la réévaluation des solutions de rechange au grand public sans d'abord examiner les résultats de l'étude. Il s'agit d'une erreur de jugement partant d'une bonne intention en vue de démontrer que l'étude avait été menée indépendamment de la

Ville. Toutefois, il est inhabituel pour un expert-conseil de présenter les résultats d'une étude au public sans donner au client la chance d'examiner préalablement le rapport. Si le personnel de la Ville avait examiné le document avant sa présentation en décembre, les responsables se seraient rendu compte que le travail d'établissement du rapport n'était pas complet.

4. Le personnel de la Ville avait besoin des analyses supplémentaires pour achever le processus de réévaluation des solutions de rechange. Sans ces analyses, le rapport n'était pas complet.
5. Une fois que la Ville était satisfaite des résultats de la réévaluation des solutions de rechange, elle avait raison d'aller de l'avant avec la mise en œuvre du projet, conformément aux recommandations de son personnel. D'autres retards liés à l'application d'une solution au problème des eaux d'égout de Munster Hamlet auraient accru considérablement le risque couru par la Ville de se trouver en situation de non-conformité par le ministère de l'Environnement.

Détails de la conception-construction

1. La conception de la station de pompage et de la conduite de refoulement a été réalisée conformément aux normes de conception reconnues.
2. La méthode de construction utilisée a permis de réduire l'incidence des travaux de construction de la conduite de refoulement ainsi que le coût de sa mise en œuvre.
3. La conception permettait de protéger les puits de Richmond en sélectionnant le tracé qui comportait le moins grand nombre de puits, en utilisant des tuyaux de polyéthylène haute densité aux parois épaisses et aux joints soudés par fusion thermique et en installant une vanne de réglage à l'ouest de Richmond en vue de réduire la pression d'utilisation à Richmond et de fournir un coefficient de sécurité de l'ordre de 5.0 en ce qui touche la rupture des tuyaux.
4. La conception-construction a permis de mettre en place un système acceptable et à la fine pointe de la technologie pour surveiller la pression de la conduite de refoulement et déceler les fuites.
5. La construction de la conduite de refoulement est généralement conforme aux plans et devis. Deux fouilles ont été faites le 31 mai 2006 pour inspecter la conduite de refoulement, et il a été possible de confirmer que la construction avait été faite selon le concept établi.
6. La conception de la station de pompage permettait de prendre des mesures pour le contrôle des odeurs résultant des émissions de sulfure d'hydrogène en installant un appareil de biofiltration à la station de pompage de Richmond.
7. Le problème de mauvaises odeurs à l'été 2005 résultait d'une erreur opérationnelle qui a été corrigée immédiatement. Les problèmes subséquents de mauvaises odeurs étaient causés par la fuite de gaz autres que le sulfure d'hydrogène, lesquels ne

peuvent pas être contrôlés au moyen d'un appareil de biofiltration. La Ville a installé un biofiltre temporaire, ce qui a permis de réduire les mauvaises odeurs. La Ville construit actuellement un biofiltre permanent à la station de pompage de Richmond.

Généralités

1. Dans l'ensemble, si le Conseil avait suivi les recommandations du personnel en 1998, la Ville aurait économisé environ 7,9 millions de dollars, même si la solution retenue avait été le traitement des eaux usées sur les lieux au lieu de la construction d'une conduite de refoulement. Chaque fois que le Conseil a ignoré les recommandations du personnel, le coût du projet s'est accru et le projet a été considérablement retardé.
2. Les retards ont en grande partie été causés par les multiples objections et difficultés provenant de particuliers et de groupes d'intérêt. Certains de ces obstacles ne sont apparemment pas fondés sur des renseignements concrets.
3. Tous les coûts pertinents ont été comptabilisés dans le budget du projet.
4. Tous les coûts pertinents ont été déclarés au Conseil sous une forme ou une autre.

Recommandations

Recommandation 1

Le personnel devrait fournir une estimation des délais et des coûts ultérieurs au Conseil lorsqu'il présente des solutions de rechange.

Réponse de la direction

D'accord en principe. Cela aurait été particulièrement difficile lors des premières étapes (avant la fusion) du projet en raison de l'orientation et de la prise de décision inhabituelles et parfois imprévisibles du Conseil. Le rapport final présenté au Comité et au Conseil en mai-juin 2003 présentait les calendriers et les coûts connexes parfaitement bien.

Recommandation 2

Services et Travaux publics devraient élaborer une politique pour approbation du Conseil selon laquelle, une fois qu'un rapport d'étude environnementale a été déposé dans les dossiers publics pour la période légale d'examen de 30 jours et que toutes les demandes relatives à l'arrêté prévu à la partie II ont été traitées ou bien rejetées par le ministère de l'Environnement, le processus d'EEPG ne devrait pas être repris de nouveau à moins que les éléments prévus dans l'EEPG n'entrent en vigueur (Section A.4.2.2 de l'EEPG).

Réponse de la direction

Pas d'accord. Le processus d'EEPG adopté par la Municipal Engineers Association est en soi une activité approuvée en vertu de la *Loi sur les évaluations environnementales*. Les deux processus reconnaissent la possibilité de changements de circonstances et comprennent des dispositions à cet égard, y compris, dans le cas des EEPG terminées, l'obligation d'examiner et de reconfirmer ou modifier les hypothèses ainsi que les conclusions d'une EEPG terminée aux cinq ans. La recommandation semblerait contredire cette exigence législative. Les dispositions visant l'examen obligatoire qui se trouvent dans l'EEPG prévoient une vaste gamme de circonstances, y compris des changements aux lois et règlements, les nouvelles technologies, la modification des hypothèses initiales, etc.

Même si, dans le cas de Munster, ces dispositions ont provoqué de longs retards et soulevé des controverses au sein de la communauté, dans bien des cas, la révision des décisions prises à la suite d'une EEPG en raison de nouvelles informations peut être justifiée. Le fait d'empêcher le réexamen des décisions antérieures ne serait pas conforme à l'intention globale des EEPG.

Recommandation 3

Le processus de demande de proposition ne devrait pas servir, dans le cadre d'une évaluation environnementale, à obtenir des prix fermes pour des solutions de rechange. Il est plutôt recommandé, pour obtenir de l'information sur des technologies de remplacement, que la Ville diffuse des déclarations d'intérêt ou d'autres types de demandes de soumissions à caractère non obligatoire, qui définiraient clairement les objectifs et fourniraient des explications aux soumissionnaires. Afin de confirmer les prévisions de coûts dans le cadre d'une étude ou d'une étude préliminaire, la Ville devrait examiner la possibilité de retenir les services d'une société contractante qui fournirait les prévisions de coûts.

Réponse de la direction

D'accord. Même si les responsables de la Gestion de l'approvisionnement n'ont aucunement participé au processus de demande de proposition décrit dans le présent rapport de vérification, nous acceptons cette recommandation et nous ne publierons pas de demandes de proposition n'ayant pas pour objet d'aboutir à l'attribution d'un contrat. Nous sommes également d'accord pour dire qu'une demande de proposition ne constitue pas un moyen approprié pour obtenir des prévisions de coûts par rapport à diverses solutions et que, conformément à la suggestion du vérificateur général, nous aurions pu retenir les services d'une société contractante pour obtenir ces prévisions.

Recommandation 4

Lorsque le fabricant d'un produit de marque présente une soumission pour que la Ville utilise son produit, la Ville devrait accepter cette soumission uniquement si le promoteur comprend bien que toute évaluation ou considération de la soumission par la Ville n'oblige pas cette dernière à utiliser ce produit.

Réponse de la direction

D'accord.

Recommandation 5

Le personnel de la Ville ne devrait pas diffuser les résultats des études d'experts-conseils avant de les avoir examinés préalablement.

Réponse de la direction

D'accord en général. Habituellement, le personnel travaille de près avec les experts-conseils à la réalisation d'études et à l'élaboration de recommandations adéquates. Toutefois, dans le cas de Munster, la Ville a sciemment demandé à la société RVA de réaliser une réévaluation indépendante et de formuler des recommandations en fonction de sa réévaluation des trois solutions proposées pour le traitement des eaux usées. Le fait d'agir autrement dans ces circonstances, et lorsqu'on tient compte de la longue évolution de ce projet, aurait été, même à l'époque, problématique.

Recommandation 6

Tous les changements majeurs en ce qui touche les politiques concernant la capacité des infrastructures devraient être présentés au Conseil aux fins d'approbation.

Réponse de la direction

D'accord en principe. En ce qui concerne la question particulière qui semble être à la source de cette recommandation – soit l'attribution des niveaux de capacité hydraulique – le Plan directeur des eaux usées de 1997 de la Région comprenait des directives sur l'attribution des niveaux de capacité et le rendement des systèmes. Le rapport n'évoque pas cette question à d'autres reprises; toutefois, s'il y a d'autres éléments de preuve qui indiquent que les politiques ne sont pas présentées devant le Conseil, cette recommandation pourrait être valable. Par contre, si cette recommandation ne vise que la question d'affectation des niveaux de capacité, il faut noter que les politiques connexes à cet égard ont été présentées au Conseil régional et approuvées par ce dernier.

Conclusion

Les études menées dans le cadre de l'EEPG ont été réalisées conformément au processus établi, et le volet relatif à la participation du grand public a, dans les deux cas, dépassé

les exigences minimales. Les méthodes d'évaluation utilisées dans l'EEPG étaient conformes aux normes généralement reconnues.

L'élaboration de solutions de rechange, les évaluations initiales, le classement détaillé et les méthodes d'évaluation ont été réalisés en conformité avec les exigences des EEPG et les méthodes d'ingénierie habituelles.

La sélection de la conduite de refoulement a été faite sans parti pris. En fait, la recommandation d'origine (dans le rapport d'étude environnementale) prévoyait le traitement sur les lieux. Si l'on se fonde sur les documents qui ont été examinés dans le cadre de la présente vérification, il semblerait que le scénario de canalisation ne soit devenu intéressant que lors du processus de préparation d'un addenda au rapport d'étude environnementale, c'est-à-dire lorsque des propositions spontanées ont été présentées et qu'elles proposaient d'utiliser les débits actuels vers la station de pompage au lieu de la méthode utilisée jusqu'à ce moment-là. Le changement de politique a fait en sorte que le scénario de canalisation est devenu une possibilité rentable.

La conception et la construction de la station de pompage et de la conduite de refoulement de Munster Hamlet pour acheminer les eaux vers Richmond assurent un fonctionnement efficace et sécuritaire à long terme du poste et de la conduite.

Les éléments suivants ont présenté un bon rapport qualité-prix :

- Le Rapport d'étude environnementale de 1996;
- La conception détaillée et la préparation des plans qui ont été réalisés ultérieurement;
- L'étude menant à l'addenda de 1998;
- Les éléments de la conception détaillée et les services qui ont été assurés en 2003-2004 pendant la construction de la station de pompage et de la conduite de refoulement;
- La construction de la station de pompage de Munster et le projet de conduite de refoulement;
- Les activités et les travaux suivants ont présenté relativement peu ou pas de valeur par rapport au montant engagé :
- Les demandes de changement de catégorie;
- L'audience et la décision de la Commission des affaires municipales de l'Ontario, qui sont allées bien au-delà de ce qui était justifié et qui ont retardé le processus;
- La décision prise en réponse à la décision de la Commission des affaires municipales de l'Ontario, qui consistait à procéder à une réévaluation des solutions de rechange. Le Conseil municipal avait la possibilité d'aviser la Commission des affaires

municipales de l'Ontario que la Ville était satisfaite des études et rapports antérieurs, et d'aller de l'avant avec la mise en œuvre.

Remerciement

Nous désirons remercier la direction pour la collaboration et l'aide apportées à l'équipe de vérification.

1 BACKGROUND

The Audit of the Munster Hamlet Sewer Rehabilitation Project was carried out at the request of Council to the Auditor General in February 2006.

Munster Hamlet is a residential community established in the former Township of Goulbourn between 1970 and 1975. The population of the community in 1996 was 1,265 people.

When it was developed, Munster Hamlet was served by sanitary sewers discharging to a pumping station and a sewage lagoon. The sewage lagoon was constructed with 3 cells in 1970. The sewage collection system was expanded in 1973 and one cell added to the lagoon in 1974. An emergency lagoon spill containment basin was constructed circa 1994.

The lagoons were initially designed for an average per capita flow rate of 295 l/cap/day, smaller than the 454 l/cap/day standard at the time. Investigations done in 1992 revealed that the capacity of the lagoons was in fact 211 l/cap/day, based on measurements of the area and depth of the lagoons and the service population. In addition, flow measurements showed that the sanitary sewers were receiving significant extraneous flow.

Additional evidence of problems with the lagoons was the seepage of liquid waste from the side slopes of the lagoons, and from the spray irrigation fields.

Several studies were completed since 1990 addressing the problems that were experienced in the Munster Hamlet municipal sewage system. Engineering studies addressed the sewage lagoons, extraneous flows and water conservation. As a result of the studies, a Class Environmental Assessment (EA) was carried out and completed in 1996. The 1996 Class EA report examined a wide range of alternatives. The 1996 Class EA report recommended the upgrade and expansion of the lagoons and expansion of the spray irrigation area. Following a 'bump-up' request³ (now termed Part II order requests) that was dismissed by the Ministry of the Environment, the Regional Municipality of Ottawa-Carleton authorized the detailed design and tender documents for this option.

³ 'Bump-up' was defined in the 1993 Class Environmental Assessment as "the decision by the proponent or by the Minister [of the Environment] that the environmental significance of a project is of such importance that the procedures for environmental assessment under the Class EA process are not sufficient and that an individual environmental assessment is required; the procedure which allows the proponent for the Minister to make such a decision." At present, 'bump-up' is referred to as "Part II Order" in the Environmental Assessment Act. The terms are used interchangeably in this report, depending on the chronology of the audited reports.

As a result of objections from the Township of Goulbourn and a proposal by a manufacturer of a treatment system using snow as the effluent disposal system, the RMOC retained a different consultant to re-evaluate the 1996 Class Environmental Assessment study and to make recommendations, including a Class EA Addendum if warranted. The consultant examined the above alternatives, which can be grouped as follows:

- Upgrading and expanding the existing lagoons
- Providing alternative treatment processes within the lagoons site
- Conveying the sewage in a forcemain to the R. O. Pickard treatment plant, a central treatment facility

Based on these subsequent analyses, the consultant recommended that the forcemain alternative be selected as the preferred solution. An Addendum to the 1996 Environmental Study Report (ESR) was prepared and submitted. The 1999 ESR Addendum was subjected to 'bump-up' requests, which were also dismissed by the Ministry of the Environment.

To implement the pumping station and pipeline to Richmond solution, the Regional Municipality of Ottawa-Carleton (RMOC) was required to amend its Official Plan. The required Official Plan Amendment was passed by the Region's Council. A number of individuals and the manufacturers of two of the communal wastewater treatment systems evaluated during the preparation of the ESR Addendum presented objections and the matter was referred to the Ontario Municipal Board.

The recommended solution necessitated Official Plan Amendment (OPA) No. 5, as the Official Plan did not have the required designations to permit connection of the Munster Hamlet sewage collection system to the Richmond Pumping Station. The RMOC Council approved the OPA in May 1999, but several interested parties appealed the OPA before the OMB in 1999.

Following the decision by the Ministry of the Environment to deny the 'bump-up' of the project, the RMOC awarded a design/build contract to construct the pumping station and forcemain to Doran Contractors. Design was started, but the appeal to the OMB eventually resulted in the cessation of work on the design/build project.

As a result of the decision of the Ontario Municipal Board, the City of Ottawa retained a third consultant to examine the environmental assessment process carried out to that date and the following three alternatives:

- Pipeline/Forcemain
- Mechanical tertiary treatment with discharge to the Jock River

- Snowmaking treatment with spray irrigation.

Following further studies, including examination of proprietary treatment methods and other options, the forcemain alternative solution was reaffirmed as the preferred solution for implementation.

In June 2003, City Council approved the implementation of the forcemain from Munster Hamlet to the pumping station at Richmond. Detailed design was carried out in 2003 and 2004, and construction commenced in the winter of 2004; the pumping station at Munster, the forcemain, and modifications to the Richmond Pumping Station were commissioned in April 2005. By the summer of 2005, odours emanating from the forcemain and the Richmond Pumping Station became an issue.

A motion requesting that the Auditor General (AG) undertake a review of the Munster Hamlet Sewage Lagoon Rehabilitation Project was passed by the Council of the City of Ottawa on February 22, 2006. The audit commenced in March 2006.

2 AUDIT OBJECTIVES

The overall objective of the audit was to examine and evaluate the processes and methodologies used to manage and control the Project from its inception, and based on the examination and evaluation, determine whether the processes and methodologies were consistent and compliant with all relevant policies, procedures, legislation and regulations. To achieve the project objective, the study was required to assess whether

- Project budgets and cost estimates were timely, accurate and reliable.
- The alternative assessment and evaluation methodologies for the three alternatives followed industry-accepted criteria and practices.
- The forcemain route selection study conducted to select the forcemain option was done properly and thoroughly.
- Design and construction of the forcemain provides effective and safe long-term operation.
- The various studies and designs and other tasks provided value for money.

3 AUDIT SCOPE

The audit of the Munster Hamlet Sewer Rehabilitation Project comprised a review of the various reports, drawings, and other documentation available for the project from the City and from interested private citizens. In addition, the audit included interviews with various individuals, who participated in the project since its inception. A field investigation was completed to review the construction of the forcemain.

The audit scope was based on the existing reports and documentation and selected field work, as required to address the audit objectives. It should be noted that the audit was not required to assess the design criteria or the detailed design calculations used to size the various components of the alternatives. The audit did not attempt to reproduce every detail of the studies and designs, but rather was focussed on the overall chronology of the solution and assessing the adequacy of the key steps in that process.

4 AUDIT TASKS

The following description of study tasks defines the activities that were undertaken to complete the work.

4.1 Review Legislative Framework

The terms of reference required a review of the legislative requirements for this category of projects, including the Class Environmental Assessment for Municipal Water and Sewage Projects applicable to the project, the Ontario Water Resources Act and Regulations, Conservation Authorities Act and Regulations and the Ontario Municipal Board process.

4.2 Briefing with AG

Briefing meetings were held with the Auditor General at the commencement of the study on the project and the documentation.

4.3 Interviews

Interviews were held in late March and early April 2006 with the following persons:

- City Council representatives
- Deputy City Manager, Public Works & Services
- Deputy City Manager, Planning & Growth Management
- Current Project Manager
- Past Project Manager
- Citizen representatives

4.4 Review of Background Data

An extensive review of background reports, drawings, correspondence, staff reports, committee minutes and Council minutes was conducted during the study.

4.5 Review of Timelines

The audit terms of reference required a review of the timeline for the entire process, including the environmental assessment and the OMB hearing process, to provide an opinion on whether they were reasonable given the tasks that needed to be completed.

4.6 Design/Build Project

The design/build proposals were called by CRA at the City's direction to obtain firm costs on the alternatives, to enable the City to more accurately evaluate the alternatives.

The audit examined the reasons for the delay and the manner in which the work on the design/build project was managed up to the stoppage of the project.

4.7 Route Analysis

The audit examined the forcemain route alternatives based on the background information available and field examination of the alternative routes. Based on this information, an assessment of the route analysis and selection process was undertaken to determine if the process could be replicated to arrive at the same selection. As part of the audit, the analysis evaluated whether the most cost-effective route was selected.

4.8 Review Construction File

The audit examined the construction file, comprising the plans and specifications, contract documents and "as-constructed" drawings, as well as the City's Project Manager file, with the purpose of evaluating whether the forcemain was designed to provide long-term safe and effective operation.

4.9 Review Current State of Forcemain

Two excavations were carried out to review the installed forcemain in the field in order to complement the information obtained from the review of the construction file. The AG coordinated the excavations with Public Works and Services, who provided and coordinated the required crew and equipment.

4.10 Estimated and Actual Expenditures

An analysis of the estimated costs and the actual expenditures was conducted based on the data provided, to document all project-related costs to the beginning of this audit; determine if all pertinent costs have been included in the project costs; and determine if all pertinent costs have been reported to Council.

5 FINDINGS

This section presents a summary of the main findings of the project components, from the 1996 Class Environmental study to the implementation of the final solution.

5.1 Munster Hamlet Environmental Study Report, 1996

The Regional Municipality of Ottawa-Carleton retained Totten Sims Hubicki Associates (TSH) to prepare an Environmental Study under the terms of the Class Environmental Assessment for Municipal Water and Wastewater Projects, 1993. The results of the

study were presented in the *Munster Hamlet Environmental Study Report*, dated January 1996.

The report and appendices were reviewed and evaluated against the following criteria:

1. Adherence to the requirements of the Class EA process
2. Alternatives evaluated
3. Public participation process
4. Cost estimates
5. Timelines
6. Cost-effectiveness of study

The study process as presented in the Environmental Study Report and Appendices meet the requirements of the Class Environmental Assessment for Municipal Water and Wastewater Projects, 1993. Several studies were carried out in anticipation of the environmental assessment to fully identify the deficiencies in sewage treatment for Munster Hamlet. During the environmental assessment, several alternative solutions were examined to arrive at the preferred solution. Once the preferred solution was identified, the study proceeded to investigate and evaluate alternative methods of implementing the preferred solution. The study process and recommendations were documented in an Environmental Study Report. Phase 5 of the Class EA process was underway when the Council of the RMOC decided to re-open the evaluation process to examine in detail proprietary methods of sewage treatment.

The 1996 Class EA examined several alternative solutions, as follows:

1. Do nothing
2. Limit community growth
3. Reduce flow in the sewer collection system
4. Reduce flow through water conservation
5. Pump sewage to Richmond
6. Pump sewage to Stittsville
7. Truck sewage to a Regional Municipality of Ottawa-Carleton (RMOC) regional disposal station
8. Upgrade and expand the lagoons and expand the spray irrigation area
9. Upgrade and expand the lagoons with constructed wetlands
10. Upgrade and expand the lagoon with snowmaking system
11. Upgrade and expand the lagoon, solar aquatic system treatment, and land-based application
12. Construct a sewage treatment plant discharging treated effluent to the Jock River.

The list of alternatives covered a broad segment of possible solutions, which were evaluated qualitatively to determine those alternatives that had feasibility of solving the problem. It is noted that Alternative 5 – Pump sewage to Richmond was discarded from further evaluation at this stage because of lack of sewer capacity in Richmond. The available capacity of the Richmond Pumping Station was determined based on the existing and committed population served. Alternative 6 – Pump sewage to Stittsville was discarded for similar reasons.

The Class EA document and in general the environmental assessment procedures permit the initial evaluation of alternative solutions to determine whether they can be implemented for the particular problem. The ‘short-list’ of alternatives that passed the initial evaluation can then be subjected to additional development and evaluation. In reviewing the various initial alternative solutions, the reader of the ESR can follow the reasoning behind the final selection of feasible alternatives.

The evaluation criteria used by TSH were as follows:

- Wastewater treatment process
- Natural environment
- Social and cultural environment
- Land use and property impacts
- Economics

The alternatives were evaluated using a Weighted Additive Method, which is widely used in Ontario for evaluation of alternatives by the Ministry of Transportation and the Ministry of the Environment.

The important fact with respect to the evaluation method is that all evaluation methods reflect to a large degree the experience and biases of the evaluators and the public. This fact was brought to light very strongly later in the project by the impossibility of the parties to the Ontario Municipal Board hearing to come to an agreement.

Each of the criteria is assigned sub-factors that help in defining the effect of the alternative on the specific component of the environment or criterion.

The values assigned to the weights for the primary factors and the sub-factors are based on subjective assessment by the evaluator. Naturally, those factors reflect the experience and biases of the evaluator. To attempt to reduce the effect of the biases, TSH used a sensitivity analysis to assess the effects that different weight choices would have on the selected alternative.

The following table presents the factors and sub-factors used by TSH in their evaluation:

Table 1

TSH Weights

TSH		Weight.
FACTORS	SUB-FACTORS	
Wastewater Treatment	Treatment process Treatment experience Process operation and complexity System expansion	22.5
Natural Environment	Aquatic habitat Surface water quality Terrestrial wildlife habitat Construction timing on terrestrial habitat Groundwater quality impacts Surface erosion impacts	21.7
Social environment	Aesthetics impacts Construction disruption Displacement of livelihood Recreation opportunities impacts Air quality Climatic changes Public health risk exposure Traffic impacts	20.0
Land Use	Official Plan/ Zoning-by law changes Agriculture land use changes	16.5
Economics	Capital cost O&M Cost	19.3

The TSH Sensitivity Analysis involved the following steps:

- Eliminate one of the factors
- Modification of weights assigned to sub-factors
 - i. Average project team weight for individual sub-factor
 - ii. Highest weight by any team member for individual sub-factors
 - iii. Lowest weight by any team member for individual sub-factors

The evaluation indicated that the preferred wastewater treatment solution is to repair and expand the existing lagoons and expand the spray irrigation field area. Following selection of the technically preferred alternative, TSH undertook the evaluation of alternative spray irrigation sites.

As with any evaluation methodology, the Weighted Additive Method has advantages (it permits ranking of the alternatives, provides a matrix that can be followed once the weights are assigned, permits the assessment of sensitivity of the ranking to the weights, and reflects to some degree the preferences of the evaluators and the public) and disadvantages (it gives the impression of rigor, when in fact it may not be that rigorous).

The Class EA requires public consultation at the following points in the Class EA process for Schedule C⁴ projects:

- During Phase 1, Problem Identification, a discretionary public consultation to review the problem.
- During Phase 2, Alternative Solutions, one mandatory consultation with review agencies and the public to review the problem and the alternative solutions.
- During Phase 3, Alternative Designs, one mandatory consultation with review agencies and the public to review the problem and the alternative solutions.
- During Phase 4, Environmental Study Report, a Notice of Completion to review agencies and the public, plus a 30-day ESR review period.

A review of the Environmental Study Report and appendices confirmed that the public consultation process was followed carefully; in fact, the process used included public participation beyond the minimum requirements of the Class EA.

Cost estimates in the ESR were examined based on the information contained in the report; no issues were found. For the pump sewage alternatives, the estimates in the ESR are based on the pumping station and forcemain only.

Generally, a study of this magnitude is expected to last 12 to 18 months. The Class EA to completion of the ESR took from June 1994 to January 1996, just over 18 months. This period is considered appropriate. It should be noted that the engineering studies for the project commenced in June 1992 and were completed in January 1993. A number of activities preceded the ESR commencement, including inflow-infiltration studies and toilet replacement studies and implementation.

The analysis completed in the 1996 ESR established that the communal treatment option of upgrading the lagoons and expanding the spray irrigation system was the most appropriate solution. During the 1996 ESR, the pipeline option was examined but was discarded due to the restrictions that existed on the pipeline in 1995/1996.

⁴ The Class Environmental Assessment for Municipal Water and Wastewater Projects classified projects into three Schedules, A, B, and C, depending on the potential environmental impacts of the project. Schedule C projects have the potential for significant environmental effects and must proceed under the full planning and documentation procedures specified in the Class EA document.

Documentation in the City's files shows that the City provided the Township and the public with detailed explanations that justified the recommendation of upgrading the lagoons and expanding the spray irrigation system.

Review of a report dated April 28, 1997, prepared by the Township of Goulbourn engineer indicated that the residents' representatives had brought up a number of concerns relating to the ESR and its conclusions. Among the primary issues of concern was "that the various options to connect to the RMOC Sewage system in Richmond or Stittsville were not properly evaluated as solutions".

Following completion of the ESR in January 1996, a number of issues and concerns were submitted to the Region by residents and the Township of Goulbourn. The Region responded to those concerns in a brief dated June 1996.

One of the concerns expressed was that the ESR did not deal satisfactorily with the option to connect Munster Hamlet to the Regional sewer system. As a result of this concern, the Region directed TSH to prepare a detailed cost estimate of the options to convey Munster sewage to Richmond. TSH prepared a brief circa April 1996 summarizing the estimated costs of pumping sewage to the Richmond Pumping Station, including a discussion of capital and operation and maintenance costs, and upgrades to the Richmond Pumping Station.

At the time that TSH examined the option of a pumping station at Munster and a forcemain to Richmond, the spare capacity of the Richmond Pumping Station was calculated using the developed area served and the areas that were undeveloped at the time but had been approved for development (by Official Plan designation and zoning by-law provisions). Based on these assumptions, the capacity of the Richmond Pumping Station was completely committed; as a result, accepting flows from Munster would have the effect of removing development potential in Richmond. Consequently, this option was not acceptable.

Subsequent to completion of the ESR, a number of "bump-up" requests were submitted to the Minister of the Environment (MOE), and all were denied by the Minister. It is interesting to note that at this time the RMOC defended the preferred solution against objectors who favoured the pump sewage to Richmond or pump sewage to Stittsville alternative solutions.

Following the MOE denial of the bump-up requests, the Regional Municipality of Ottawa-Carleton retained TSH to proceed with the preparation of the detail design, plans and specifications for tendering and construction of the preferred solution, upgrading and expanding the lagoons and expanding the spray irrigation system.

5.2 Unsolicited proposal, 1998

In March 1998, the plans and specifications for the rehabilitation of the sewage lagoons had been submitted to the MOE for Certificate of Approval; the plans and specifications for the spray irrigation fields were under preparation and were scheduled to be submitted to the MOE in April 1998. Overall tendering of the project was scheduled for June 1998.

In January 1998, the manufacturer of a proprietary system, Snowfluent, submitted an unsolicited proposal to the Region as an alternative method of treating the effluent from the lagoons. Several meetings were held between Snowfluent and the Region's staff, who sought the advice of Conestoga Rovers & Associates (CRA) in evaluating Snowfluent's proposal. The process led to the motion by Council on March 11, 1998 to delay tendering until further direction from Council, to negotiate a revised voluntary compliance program with MOE, and to select an independent consultant to review alternative wastewater treatment processes and prepare an addendum to the ESR.

The decision to stop tendering the project and to re-evaluate the alternatives in light of the unsolicited proposal was unfortunate. The technology proposed by Delta, makers of Snowfluent, had already been evaluated during the preparation of the ESR; the cost estimates prepared by TSH were based on data provided by Delta; and the results of the evaluation determined that the Snowfluent process was not the selected alternative, based on the evaluation procedures. It is reasonable to state that the findings and recommendations of the ESR had been confirmed when the Minister of the Environment denied the "bump-up" requests. Two years passed from the time that the ESR was submitted in January 1996 to the presentation of unsolicited proposal in January 1998.

At the time, it was obvious that re-opening the ESR process could delay the implementation of the solution by at least one year in the best-case scenario. Given the experience with the ESR, the fact that the project could be delayed up to two years (six months for the ESR studies, six more for bump-up requests and six to twelve months for detail design) was also a possibility.

In reviewing the staff reports and the minutes of the Corporate Services and Economic Development Committee and Council, it appears clear that staff attempted to fully evaluate the Snowfluent proposal as an alternative to spray irrigation. This was the appropriate course of action, given that the ESR was completed and that the Snowfluent process is similar in concept to spray irrigation.

Several meetings were held with Snowfluent and more detailed plans prepared by Snowfluent were examined. However, the staff reports indicate that staff had a number of concerns that they considered should be resolved before they could authorize

Snowfluent as an alternative to spray irrigation. Snowfluent wanted to delay resolution of the concerns until detailed design, but staff correctly argued that the concerns should be resolved *a priori*.

The staff recommendation to the Committee was to stay the course and to carry through to implementation of the lagoon and spray irrigation upgrades. Nevertheless, staff provided an alternative process, as follows:

If Council nonetheless wishes to proceed with further analysis of the Delta proposal, the adoption of the following recommendations would be appropriate:

- 1. That the advertisement of the tender call be delayed until further direction by Council.*
- 2. That Regional staff meet with staff from the Ministry of the Environment to attempt to obtain a revised voluntary compliance program.*
- 3. That the Region retain a qualified independent consultant to prepare an addendum to the Environment Study Report for Munster and that Corporate Services and Economic Development Committee be delegated the authority to approve the selection of such consultant.*

It is noted that the recommendation to re-open the Class EA process by the Committee directed staff to retain Delta to carry out the re-evaluation. This recommendation was not appropriate and not in the best interest of the RMOC, as the proponent of the technology would be evaluating itself against other solutions; an arms-length review was required, as recommended by staff. The Council amendments to the resolution corrected this point.

The RMOC Council resolution of March 11, 1998 was

THAT the advertisement of the tender call be delayed until further direction by Council; and

FURTHER THAT staff be directed to enter into an agreement, to be awarded by the Chief Administrative Officer, with a qualified independent consultant to prepare an addendum to the Munster Wastewater Treatment Plant ESR, that properly and accurately reflects the Delta Snowfluent combination Intermittent Filtration proposal as an alternative to Spray Irrigation, as well as any other proposal that meets the requirements outlined in the final paragraph of the Committee recommendation, for submission to the RMOC and appropriate authorities.

FURTHER THAT, regional staff meet with staff from the MOE to attempt to obtain a revised voluntary compliance program; and

FURTHER THAT any other proponents of wastewater treatment facilities who can meet the requirements of improving the level of treatment; can guarantee to meet the compliance schedule; and can guarantee its price, be allowed to submit a proposal for the treatment of wastewater for the Munster Hamlet lagoon system.

5.3 CRA Wastewater Treatment Alternative Evaluation, 1998

RMOC invited four consulting companies to submit proposals for the re-evaluation of the alternatives and preparation of an ESR Addendum, if required. Based on the proposals submitted, the RMOC retained Conestoga Rovers & Associates (CRA) to undertake the work.

In this audit, the CRA study was examined in light of the same criteria as the TSH study, namely:

1. Adherence to the requirements of the Class EA process
2. Alternatives evaluated
3. Public participation process
4. Cost estimates
5. Timelines
6. Cost-effectiveness of study

The last paragraph of the Council resolution accepts that other proposals aside from Snowfluent's can be received if they meet the requirements of the paragraph. This direction has been interpreted by some as restricting the scope of the alternatives to be reviewed during the addendum study to treatment alternatives. This may have been suitable in a simpler, less controversial projects, but in this one, where some groups had requested a 'bump-up' of the Class EA, restricting the addendum work to a few alternatives could have resulted in a 'bump-up' being ordered by the MOE.

In its assessment of the alternative solutions, CRA returned to Phase 2 - Alternative Solutions of the Class EA, and re-evaluated all the alternatives that TSH had examined. In our opinion, this was required for a complete re-evaluation and to meet the intent of the Class EA. It is noted that the Class EA leaves the selection of the schedule and the process details to the discretion of the proponent (the municipality), but also warns that failure to follow the process outlined in the Class EA document is a breach of the EA approval under the EA Act, and therefore places the proponent in contravention of the EA Act.

The circumstances had changed with respect to those existing during the ESR preparation, for instance, the Region completed in 1997 a Wastewater Master Plan; in addition, the criteria for designating committed pumping, conveyance and treatment capacity changed. As a result, if CRA had not evaluated a full complement of

alternatives they could have been accused of not complying fully with Phase 2 of the Class EA. Therefore, it is considered that CRA complied with the requirements of the Class EA.

CRA evaluated several wastewater treatment alternatives, namely

1. Snowfluent and Snow Filtration with Spray Irrigation of Filtered Effluent
2. Conveyance via a Pipeline/Forcemain to the RMOC's Collection and Treatment Facility
3. Upgraded Lagoons with Spray Irrigation
4. Mechanical Wastewater Treatment Plant discharging treated effluent to the Jock River
5. Mechanical Wastewater Treatment Plant discharging to groundwater
6. Upgrading of Existing Lagoons and Expansion with Constructed Wetlands
7. Upgrading of Existing Lagoons and Expansion with Solar Aquatic System

The last two alternatives were eliminated from detailed evaluation because they were not considered technically feasible.

The alternatives listed above are essentially similar to those previously examined in the TSH ESR. The list of alternative solutions covers the gamut of alternatives that were available. Some alternatives listed by TSH were not repeated by CRA because they had already been implemented (e.g. Reduce Flows in the Sewer System, Water Conservation Measures) or because they were not an option, but a fact (e.g. Restrict Community Growth).

A number of documents state that the unsolicited private sector proposals presenting innovative approaches to wastewater treatment were submitted to and entertained by RMOC. Based on our analysis, we noted that the Snowfluent alternative had already been evaluated in the 1996 ESR; mechanical sewage treatment plants were also examined in the ESR and were not pursued due to the restrictions that existed on the discharge of treated effluent to the Jock River, a restriction that exists to date.

There has been criticism of the fact that CRA brought forth the pipeline conveyance option when it had been discarded in the 1996 ESR. In fact, one of the reasons for this audit is the ultimate selection of the forcemain as the preferred solution. As a result, we paid particular attention to the reports and the background correspondence associated with the forcemain.

As noted previously, the analysis completed in the 1996 ESR established that the communal treatment option of upgrading the lagoons and expanding the spray irrigation system was the most appropriate solution. During the 1996 ESR; the pipeline

option was examined but was discarded due to the restrictions that existed on the pipeline, namely the lack of hydraulic capacity and the potential reduction in development potential in Richmond. Documentation in the City's files shows that the City provided the Township and the public with detailed explanations that justified the recommendation of upgrading the lagoons and expanding the spray irrigation system.

There is no indication in the documentation that the pipeline was selected a priori by the Region or CRA as the preferred solution; the pipeline option was examined in the re-evaluation to ensure completeness of the process. It also would appear from the documentation reviewed that the Region's staff was in favour of the communal treatment option; after all, they had worked for over 4 years on determining the preferred solution and had invested time and effort on developing the solution for implementation. The staff report to the Committee recommended that the ESR recommendation be implemented. The Region staff recognized and advised Council that re-opening the review of alternatives would delay the implementation of the ultimate solution to the Munster Hamlet sewage treatment problem.

During the CRA re-evaluation of alternatives, the pipeline option was assigned the cost of one year of sewage haulage to the Regional treatment plant, anticipating the cost to the Region of delays in the approval process – such as an addendum plus an Official Plan amendment and the time required for detail design – if the pipeline option was selected.

Based on the previous requests for “bump-up” and the objections that had been received regarding the TSH ESR, it makes a lot of sense that CRA would have revisited the pipeline option. Failure to do so would have not met the requirements of the Class EA and would have left CRA vulnerable to criticism for an incomplete assessment.

As will be discussed in the subsequent section, the pipeline solution was found to be feasible once the policy for assigning pumping capacity at Richmond was revised from one of using the existing and planned development with design flow per capita to one of using the actual existing flows with the measured flow per capita in Richmond and Munster. Had this policy change occurred in 1996, the pipeline option would have been viewed as feasible at that time. Although this policy change was documented in an internal staff memorandum in August 1998, no record of this change having been presented for Council approval could be located.

The evaluation criteria used by CRA was as follows:

- Natural Environment
- Social Environment
- Land Use

- Sewage Conveyance
- Economics

CRA used three methods for evaluation of the alternatives, with the purpose of providing some redundancy to the evaluation process, thereby trying to reduce the level of uncertainty in the evaluation. The methodology for evaluation was based on the Weighted Additive Method, the Non-parametric Additive Method, and the Dominance Set Method.

The values assigned to the weights for the primary factors and the sub-factors are based on subjective assessment by the evaluator. Naturally, those factors reflect the experience and biases of the evaluator. CRA took into account the results of the public participation process in setting the values of the weights. To attempt to reduce the effect of the biases, CRA used a sensitivity analysis to assess the effects that different weight choices would have on the selected alternative.

The following table presents a brief comparison of the factors and sub-factors used by TSH and CRA in their respective evaluations:

Table 2
Comparison of TSH and CRA Weights

TSH		Weight.	CRA		Weight
FACTORS	SUB-FACTORS		FACTORS	SUB-FACTORS	
Wastewater Treatment	Treatment process Treatment experience Process operation and complexity System expansion	22.5	Wastewater Treatment	Consistently meets objectives Reliability Demonstrated performance Expansion capability	22
Natural Environment	Aquatic habitat Surface water quality Terrestrial wildlife habitat Construction timing on terrestrial habitat Groundwater quality impacts Surface erosion impacts	21.7	Natural environment	Aquatic/terrestrial habitat Surface water resource Groundwater	20
Social environment	Aesthetics impacts Construction disruption Displacement of livelihood Recreation opportunities impacts Air quality Climatic changes Public health risk	20.0	Social Environment	Groundwater quality Air quality Noise levels Aesthetics	23

TSH		Weight.	CRA		Weight
FACTORS	SUB-FACTORS		FACTORS	SUB-FACTORS	
	exposure Traffic impacts				
Land Use	Official Plan/Zoning- by law changes Agriculture land use changes	16.5	Land Use	Land use Agricultural land use	17
Economics	Capital cost O&M Cost	19.3	Economics	Life-cycle cost	18

It can be observed from the above table that the weights assigned to the factors by TSH and CRA are similar.

As noted previously, the TSH Sensitivity Analysis involved elimination of one of the factors at a time and modifications to the weights assigned to the sub-factors. CRA performed a sensitivity analysis in which they eliminated from the matrix, individually or in combination, the factors of economics, land use and wastewater treatment. In addition, they carried out the evaluation using the highest life cycle cost.

As was seen evidently during the subsequent OMB hearing, the results of the evaluation method will depend on who does the evaluation. To be able to quantify the effect of those variations, CRA examined a range of weight values, in each case applying the methodology per the described methods.

The most important conclusion of the CRA re-evaluation of alternatives was that the highest ranked alternative was the pipeline, even as they modified the weights and removed factors from the evaluation.

The public participation process used by CRA was comprehensive and complete. The use of a Public Liaison Committee (PLC), newsletters, and public information sessions is a well-accepted method of making the progress of the study available to the public. It is noted that the Public Liaison Committee included members from Munster and from other potentially affected communities, including Stittsville and Richmond. It is reasonable for the RMOC and CRA to have expected that the members of the PLC would make the process and results available to their respective communities. The public information sessions complemented the PLC.

The cost estimates provided in the CRA reports were based on the design/build proposals solicited by CRA at the direction of Council, per the March 11, 1998 resolution. We discuss the design/build project in detail in a subsequent section of this report. For the purposes of this section, we note that the proposals were used to canvass the wastewater treatment community for potential solutions to the Munster Hamlet wastewater problems and to obtain firm costs for the implementation. Two pipeline proposals were received from two design/build joint ventures, which

provided cost estimates for the implementation of the conveyance via a pipeline to the RMOC's Collection and Treatment Facility.

CRA used the cost estimates received in the various submissions and adjusted them to ensure that all the alternatives were compared on the same basis. Correspondence between CRA and the proponents shows that CRA discussed these changes with them and obtained the proponents' input during the evaluation of alternatives. Our review of the manner in which the cost estimates provided in the various proposals received were modified by CRA disclosed that the modifications were done to permit a proper comparison of the options. All alternatives were assigned costs in a similar manner.

Our evaluation of the cost estimates provided by CRA in their reports indicates that they were arrived at using methodology similar to that used by other consultants in other similar studies. The factors included in the cost estimates make sense.

There is no evidence in the documentation that CRA or the Region favoured the pipeline option over other alternatives, or that the evaluation was biased toward the pipeline solution. Our evaluation of the documentation would tend to support the opposite conclusion: that CRA and the Region staff started out the reassessment of the alternatives practically ignoring the pipeline alternative, but the results of the pipeline proposals made them reconsider and include the pipeline option as one of the feasible alternatives.

The pipeline proposal by Thorburn Penny stated that they had re-evaluated the option to pump sewage to the main pumping station at Richmond and found it to be feasible. They based their conclusion on the "Richmond Pump Station and Forcemain Study" 1998 report by Connely McManus Engineering (CME). This pipeline proposal also proposed the use of the lagoons at Richmond for storage of excess flows, also based on the results of the CME report.

Subsequent to the pipeline proposals, the City evaluated the flow capacity and flow ranges at both the Munster and Richmond pumping stations. Based on this evaluation it was concluded that the Richmond Pumping Station would have adequate capacity to accept the Munster flows, except during periods of high flow, which were estimated to be 1-2 days up to twice per year. Projections of flows to 2021 using data from flow monitoring in Richmond and Munster (assuming that the intermediate booster station on the Richmond forcemain was in place) showed that the Munster flows could be accepted at Richmond and that this pumping station could convey all flow conditions. For full build-out conditions, storage at Munster would have been necessary.

It is noted that any modification of the originally selected solution in the 1996 ESR, that is upgrade the sewage lagoons and expand the spray irrigation system, would have

required an ESR Addendum. The pipeline was the only alternative that required an Official Plan Amendment.

CRA was commissioned to undertake the evaluation of wastewater alternatives in April 1998 and submitted their report on the Wastewater Treatment Alternatives Evaluation in October 1998. Based on experience with similar studies, the time frame of these studies and reports is comparable to similar projects.

5.4 CRA Wastewater Pipeline Route Alternatives Evaluation, 1999

The subsequent Wastewater Pipeline Route Alternatives Evaluation commenced immediately thereafter and the report was submitted in April 1999.

The audit examined the forcemain route alternatives based on the background information available and field examination of the alternative routes. Based on this information, an assessment of the route analysis and selection process was undertaken to determine if the process could be replicated to arrive at the same selection. As part of the audit, the analysis evaluated whether the most cost-effective route was selected.

The main aspects to review in this respect are the evaluation criteria and methodology, and whether both were applied consistently. The audit review examined the following aspects:

1. Adherence to the requirements of the Class EA process
2. Alternatives evaluated
3. Evaluation criteria and methodology
4. Public participation process
5. Cost estimates
6. Cost effectiveness of study

The process of selecting the most appropriate pipeline solution is consistent with the requirements of the Class EA: Once the process has proceeded through Phase 2 - Alternative Solutions, it then moves to Phase 3 - Alternative Designs. The level of detail of the environmental investigations increases relative to Phase 2.

CRA identified a total of five alternative routes for the pipeline. In addition, CRA examined variations to some of these alternative routes. The following table summarizes the various alternative pipeline routes examined by CRA, including their main characteristics. In all cases, the route is described starting at the Munster Pumping Station.

Table 3

Alternative Pipeline Routes

Route Alternative	Description	Remarks
1 - Richmond Pumping Station	<ul style="list-style-type: none"> ▪ South on Munster Road to Copeland Road ▪ East on Copeland Road to Conley Road ▪ South on Conley Road to Franktown Road ▪ East on Franktown Road to Richmond ▪ Connect to Richmond Pumping Station 	<ul style="list-style-type: none"> ▪ Requires 3 pumps: 2 rated at 30 l/s and 48 m dynamic head, 1 at 22 l/s and 17 m total dynamic head ▪ The 200 mm diameter, 11.6 km long pipeline crosses three major utilities. ▪ The detention time in the pipe is 15 hours. ▪ Requires minimum 5 air/vacuum valve chambers ▪ Requires actuated control valve to prevent pipeline from draining out when idle
1A - Richmond Pumping Station	<ul style="list-style-type: none"> ▪ South on Munster Road to Franktown Road ▪ East on Franktown Road to Richmond ▪ Connect to Richmond Pumping Station 	<ul style="list-style-type: none"> ▪ Same as 1, but does not cross the Bell Canada fiber optic cable. ▪ Provides shorter length adjacent to Richmond Fen.
2 - Richmond Forcemain	<ul style="list-style-type: none"> ▪ South on Munster Road to Copeland Road ▪ East on Copeland Road to Conley Road ▪ North on Conley Road to Bleeks Road ▪ East on Bleeks Road to unopened road allowance to Bronwlee Road ▪ East on Brownlee Road to Eagleson Road ▪ Connect to Richmond Forcemain 	<ul style="list-style-type: none"> ▪ Unopened road allowance contains locally significant wetland resources and wildlife habitat.
2A - Richmond Forcemain	<ul style="list-style-type: none"> ▪ North on Munster Road to Mansfield Road ▪ East on Manfield Road to unopened road allowance to Akins Road ▪ East on Akins Road to Eagleson Road ▪ Connect to Richmond Forcemain 	<ul style="list-style-type: none"> ▪ Replaced route alternative 2. ▪ Requires two pumps rated at 33 l/s and 41 m total dynamic head ▪ Pipeline would be 250 mm diameter, 13.4 km long. ▪ The detention time in the pipe would be 27 hours. ▪ Requires five major utility crossings. ▪ Connection to Richmond forcemain requires check valve to prevent Richmond sewage from flowing back to Munster Pumping Station ▪ Requires minimum 5 air/vacuum valve chambers ▪ Requires actuated control valve to prevent pipeline from draining out when idle

Route Alternative	Description	Remarks
3 - South Glen Cairn Trunk Sewer	<ul style="list-style-type: none"> ▪ North on Munster Road to Mansfield Road ▪ East on Manfield Road to Eagleson Road ▪ North on Eagleson Road to Fernbank Road ▪ Connect to South Glen Cairn Trunk Sewer, which flows to Hazeldean Pumping Station 	<ul style="list-style-type: none"> ▪ Requires two pumps rated at 33 l/s and 18 m total dynamic head ▪ Pipeline would be 250 mm diameter, 18.1 km long. ▪ The detention time in the pipeline would be 37 hours, which is excessive ▪ Requires six major utility crossings. ▪ Requires minimum 6 air/vacuum valve chambers ▪ Requires actuated control valve to prevent pipeline from draining out when idle
4 - Glen Cairn Trunk Sewer	<ul style="list-style-type: none"> ▪ North on Munster Road to Mansfield Road ▪ East on Manfield Road to Eagleson Road ▪ North on Eagleson Road to Hazeldean Road ▪ Connect to Glen Cairn Trunk Sewer 	<ul style="list-style-type: none"> ▪ Requires two pumps rated at 33 l/s and 44 m total dynamic head. ▪ Pipeline would be 250 mm diameter, 20.7 km long. ▪ The detention time in the pipe would be 42 hours, which is excessive ▪ Requires six major utility crossings ▪ Requires minimum 8 air/vacuum valve chambers ▪ Requires actuated control valve to prevent pipeline from draining out when idle
5 - Stittsville Trunk Sewer	<ul style="list-style-type: none"> ▪ North on Munster Road to Mansfield Road ▪ East on Mansfield Road to Conley Road ▪ North on Conley Road to Flewellyn Road ▪ East on Flewellyn Road to Shea Road ▪ North on Shea Road to Stittsville ▪ Connect to Stittsville Trunk Sewer 	<ul style="list-style-type: none"> ▪ Requires two pumps rated at 33 l/s and 28 m total dynamic head. ▪ Pipeline would be 250 mm diameter, 16.9 km long. ▪ The detention time in the pipe would be 32 hours, which is excessive ▪ Requires five major utility crossings ▪ Requires minimum 9 air/vacuum valve chambers ▪ Requires actuated control valve to prevent pipeline from draining out when idle

Based on the reported information, we conclude that CRA examined a broad range of alternative routes. Although some additional variations to the five routes could have been examined, they do not constitute new alternatives.

During the interviews with private citizen representatives, we were asked to meet with an engineer who had worked in the preparation of the proposal for detail design of the pipeline. He indicated that he had identified an alternative route that permitted gravity flow to Eagleson Road. However, that conclusion was based on mapping information; a review of the topographic mapping data disclosed that the depth of a gravity sewer would exceed 15 m at high point in the alignment and would have been over 10 m below the grade at Eagleson Road. In addition, the route examined is the unopened extension of Copeland Road, which if used would have affected the Richmond Bog. As such, it was concluded that this option is not feasible. This confirms that CRA examined an exhaustive range of alternative pipeline routes.

The feasibility of using a gravity sewer to convey the sewage from near Munster to the pumping station at Richmond was examined in this audit. It was concluded that a sanitary sewer along Franktown and Perth Road would have required longitudinal slopes of less than 0.1%, which are considered too flat, particularly for the length of sewer that would be needed. In addition to the problems with low flow velocities and odours along the way, deposition of solids with all the inherent concerns would have been a serious maintenance issue. We note that the feasibility of using a gravity sewer was also examined subsequently during the detailed design and was eliminated for similar reasons. Therefore, we concur with the decision to use a forcemain (i.e. solution 1A described in Table 3).

The evaluation criteria used by CRA was as follows:

- Natural Environment
- Social Environment
- Land Use
- Sewage Conveyance
- Economics

CRA used the same three methods for the evaluation of conveyance route alternatives used in the evaluation of the wastewater treatment alternatives. The methodology for evaluation was based on the Weighted Additive Method, the Non-parametric Additive Method, and the Dominance Set Method.

The level of public participation exceeded significantly the requirements of the Class EA and the EA Act. CRA recognized that the project was controversial and set out to involve the public in as many ways as are available: public meetings, newsletters, Public Liaison Committee, and government agency participation. Because at this stage

the project had narrowed down the alternative solutions (alternatives to the undertaking) to the evaluation of alternative designs (alternative methods of implementing the undertaking), it was appropriate for CRA to restrict the scope of the public meetings, newsletters, and public liaison committee.

One aspect that seems to have caused some concern was the fact that CRA asked potential PLC members to declare whether they supported the pipeline; in our opinion, this is a valid qualification, since the intent of the process was to concentrate on determining the most appropriate way of implementing the pipeline option, which had been determined to be the preferred solution.

The selection of the route through Richmond may have warranted some additional investigation once the evaluation ranked that alternative as the preferred option. On the other hand, one must recognize that the route through Richmond could be selected during the detailed design. In our view, the route through Richmond had a main option and some minor variations of it, and thus could be relegated to the final design.

The ESR Addendum resulted in the selection of the forcemain route from the Munster Hamlet pumping station site to the west entrance to Richmond. The detailed routing through Richmond was not part of the Class EA work, because the City and the consultant reasoned that the level of detail required for that purpose is more appropriate at the detailed design stage. Since the route was to be located within an existing urban right-of-way, the detailed route selection is a fairly well established process.

We note that selection of the route through Richmond during the detailed design left open the possibility that if a major environmental concern was found during the selection of the route in the detail design, this could have resulted in the need to re-visit the ESR and the ESR Addendum. However, we concur that this possibility was small, and the associated risk was one that the Region was prepared to take to move the project along.

We believe that the forcemain solution is the alternative that permits the closest control on possible leaks to groundwater, as the volume of sewage being handled is closely controlled and accurately measured. Identifying sewage losses in the Snowfluent and the Upgrade Lagoons and Spray Irrigation alternatives is not simple, due to evaporation and groundwater infiltration.

The cost estimates prepared by CRA for the evaluation of alternatives were based on the results of the proposals received, adjusted to ensure that all the requirements of the Region were included. We consider that these adjustments were consistent with normal practice and did not favour one alternative over another.

CRA made the following recommendations regarding the detailed design of the pumping station and pipeline:

- Monitoring of peak hour flows from Munster Hamlet.
- Evaluate pipe materials to minimize possibility of corrosion.
- Carry out a hydraulic transient study for design of protection equipment.
- Carry out additional geotechnical investigations along the route for design of pipe bedding, excavations and to determine rock excavation quantities.
- Integration of control system with Richmond system.
- Carry out additional investigations to route the forcemain through Richmond.
- Consider using an existing gravity sewer if feasible.

5.5 Design/Build Project, 1998-2000

The design/build proposals were called by CRA in mid-1998 at the Region's direction to obtain firm costs on the alternatives, to enable the Region to more accurately evaluate the alternatives.

The appeal to the OMB, discussed in the following section, eventually resulted in the cessation of work on the design/build project. The audit examined the design/build process and the manner in which the work on the design/build project was managed up to the stoppage of the project.

As noted previously, on March 11, 1998 the Regional Council adopted a resolution that, among other items, "any other proponents of wastewater treatment facilities who can meet the requirements of improving the level of treatment; can guarantee to meet the compliance schedule; and can guarantee its price, be allowed to submit a proposal for the treatment of wastewater for the Munster Hamlet lagoon system."

With this authority, Regional staff retained CRA, on the basis of a competitive proposal, to prepare the Addendum to the Munster Wastewater Treatment Plant ESR. Based on this resolution, CRA prepared a proposal call document and the Region issued a Request for Proposals (RFP). The intent of the RFP was to obtain detailed submissions with firm prices that would enable CRA to evaluate the alternative solutions, and also to canvass the industry in a formal manner to determine what innovative solutions could be applied to Munster Hamlet to solve the wastewater treatment problem.

We reviewed the RFP document, the RFP advertisement, and the minutes of the mandatory site meeting. Based on these documents we have concluded that the document and the advertisement had the format normally associated with a tender process and the meeting was conducted as if the process would lead to the award of a contract. Although the document has a number of "escape clauses" that may have allowed the Region to reject all proposals, the format and process followed during the proposal made rejection of the proposals unfair to the proponents.

The RFP document states that the ESR has been completed, but does not explain that the process being conducted at the time would lead to the requirement to issue an Addendum to the ESR. The RFP document states that the “Corporation has completed an Environmental Study Report (ESR) and is currently undertaking an independent engineering study to determine best available wastewater solution for Munster”. This sentence makes it appear as if the RFP process is the next step after the ESR.

The timing of the request for proposals as part of the ESR Addendum study should have been made clear. As well, the document should have stated that the RFP would not lead to immediate implementation of one of the proposals, since the ESR approved solution, namely the lagoon upgrades and spray irrigation expansion, was still the only valid one.

The RFP document has a number of sentences that should have made it clear that the purpose of the RFP was not necessarily to award a contract based on the documents. For example,

- the RFP indicates that the objective of the RFP is to determine if there were wastewater technologies and implementation programs available with attractive financial and environmental benefits;
- the Corporation may or may not elect to enter into a contract with the successful proponent.

However, most tender documents have similar escape clauses, so the proponents might have dismissed them as “boiler plate” language.

At the mandatory site visit, the Region and CRA staff clarified the following points:

- The Region could reject all proposals and proceed to implement their own solution.
- The Region could also elect to proceed with its previous lagoon/spray irrigation program.
- The independent evaluation including the RFP will be completed by September.
- Amendment to the ESR would follow, if required. The Amendment will be the responsibility of the Region and CRA.
- At the completion of the independent evaluation, the amended ESR will be placed in the public record for 30 days if a solution other than lagoon/spray irrigation is selected.
- Following this, the RMOC will have the option to proceed with the successful proponent.

The minutes of the mandatory site meeting were distributed to the interested bidders present. Thus they could be considered as an addendum.

The issue of whether the pipeline proposals were unsolicited is not clear. The Region indicated that they were; the pipeline proponents affirmed that the Region invited them. In the end, the Region accepted the proposals. There is no documentation to clearly determine whether they were unsolicited.

Based on the documentation reviewed and our judgement, we believe that the pipeline proposals were unsolicited, because the RFP document was set up for wastewater treatment technologies. The General Description of Work states as follows:

“1.1 Work included under this proposal includes the design, supply of all materials, labour and equipment, installation and construction, start-up, commissioning and facility tests, for a wastewater (sewage) treatment facility for Munster Hamlet. In addition, the Corporation has included the option of providing operation and maintenance work. A further description is provided in Section 01000-1, Item 1.2”.

We note that Section 01000-1, Item 1.2 describes in detail the requirements of a wastewater facility at the Munster Hamlet site, located on Lots 9 and 10, Concession 3, Township of Goulbourn. Further information in Section 02145-4 provides Effluent Compliance Objectives.

Furthermore, if the pipeline option was selected, as it was, the next step would be to select the pipeline route; thus, the pipeline proposals were premature.

In our opinion, since the intent of the RFP was to solicit proposals for innovative wastewater treatment technologies, the correct course of action by CRA and the Region should have been to reject the pipeline proposals outright, as they did not meet the RFP requirements.

However, the pipeline proponents were present at the Mandatory Site Meeting, their proposals were received by the Region and the information in the proposals was used in the subsequent stages of the wastewater treatment alternative evaluations. In essence the Region accepted the pipeline proposals as compliant.

The fact that the pipeline proposals, although unsolicited, were not rejected as non-compliant resulted in the eventual contract for construction management services with Doran Contractors (a subsidiary of Taggart Contractors).

We have not found the reason why the proposed contract award to Doran Contractors was discussed at a Corporate Services and Economic Development Committee meeting in January 1999. Reports from staff to the Corporate Services and Economic Development Committee at a meeting held on January 1999 recommend using a design-tender-and-construct process in accordance with the Corporate Policy Manual, Section 4.5-Tenders, Negotiations and Proposals. Staff advised the Committee that the ESR

addendum was not complete, the pipeline route had not been selected and additional studies required had not been completed; as a result, to implement either of the two pipeline proposals could require significant modifications without the benefit to the Region of a competitive environment.

After considerable discussion, including a lost motion to defer the decision on whether to tender until the addendum has been filed, the Committee moved to recommend to Council to approve entering into negotiations with the two pipeline proponents upon filing of the ESR Addendum.

At the meeting of January 13, 1999, Council did not approve the recommendation, and approved a motion to defer the decision on whether to tender the design and construction of the system until the addendum had been filed.

At the meeting of July 14, 1999, Council considered the deferred decision, and resolved to direct staff to enter into negotiations with Taggart et al. The Commissioner's report recommendation reviewed three implementation modes, namely:

- Design-Tender-Construct
- Design/Build
- Construction Management

The Commissioner's report concluded that either option would be acceptable in this case. The Corporate Services committee recommended to Council to enter into negotiations with Taggart et al. Council endorsed the recommendation.

The matter was brought forth again for the consideration of Committee on 18 January 2000, with the recommendation by the Environment and Transportation Commissioner to award the design and construction management to Doran Contractors (a subsidiary of Taggart Contractors). The Committee approved the recommendation, which Council ratified on 26 January 2000.

The construction management method selected and approved by Council was a reasonable solution to the situation and was endorsed by the Ottawa Construction Association because it respected the design/build proposal process.

The rationale for awarding the contract prior to the OMB hearing was based on the urgency that MOE had imparted to arriving at a solution to the wastewater problems in Munster. It is evident that staff wished to expedite the implementation of the solution once the ESR Addendum was submitted and the MOE had rejected the 'bump-up' requests in October 1999.

The implementation plan was to undertake the design of the pipeline alternative while the MOE considered the 'bump-up' requests and the OMB hearing proceeded. As discussed in the following section, the OMB hearings had been scheduled for March and April 2000 and a decision was anticipated after June 2000. Consequently, this would permit tendering of the construction contracts in the second half of 2000. Construction would be completed in late 2001. As will be discussed in the following section, this schedule was reasonable since most OMB decisions are usually rendered within 90 days of the hearing.

From the review of the design/build process it can be concluded that the Request for Proposals document was sufficiently binding as to commit the Region to enter into an agreement with one of the proponents even though the situation had changed, and the Region's preference would have been to tender the project.

In our view, the process of acquiring information and costs on alternative treatment technologies may have been handled just as effectively with a request for expressions of interest rather than an RFP, in which the Region could have explored the wastewater technology market without issuing a fairly binding document.

One of the benefits to the Region that resulted from the RFP process was the fact that contractors provided competitive cost estimates for the construction of the pipeline, and CRA was able to refine the cost estimates used in the evaluation. We submit that a similar outcome could have been obtained by inviting a contracting firm to be part of the design team, similar to the manner in which a value engineering study is conducted. However, value engineering was not as accepted then as it is now.

5.6 Ontario Municipal Board Hearing, 2000-2001

The recommended solution necessitated Official Plan Amendment No. 5, as the Official Plan did not have the required designations to permit connection of the Munster Hamlet sewage collection system to the Richmond Pumping Station. The RMOC Council approved the OPA in May 1999, but several interested parties appealed the OPA before the OMB in 1999.

The Ontario Municipal Board hearing was brought about as a result of Appeals to RMOC Official Plan Amendment No. 5 (ROPA 5). The purpose of ROPA 5 was to permit implementation of the pipeline solution, which had been selected as the preferred alternative in the ESR Addendum prepared by CRA. ROPA 5 was approved by Regional Council on May 12, 1999.

The hearing took place between March and July 2000. The OMB decision was issued on June 8, 2001, almost one year after the hearings.

The issue before the OMB was the Official Plan Amendment. Based on a review of the OMB decision, it would appear that there was no issue from a Planning Act perspective with the OPA. The Board approved the OPA modification to allow a communal wastewater facility located in Munster Hamlet, which could be either the pipeline, the mechanical treatment plant discharging to the Jock River, or the Snowfluent option.

The OMB decision permitted the required change with the proviso that the three alternatives be re-evaluated to the satisfaction of Council. The decision also advised [but did not specifically order] the City to retain a qualified independent person to carry out a re-evaluation of the three treatment alternatives, who should critically assess the evaluation methods used, use standard qualitative assessment of merits and demerits of each alternative, to seek facts and opinions from interested parties, CRA, and wastewater treatment proponents; and to make a recommendation based on the quantitative and qualitative methods.

For clarity, we include the decision text hereafter.

OMB Decision

Based upon the planning evidence and the arguments, the Board, allows the appeal in part and modifies the Official Plan as shown below:

Schedule H. Rural Servicing, is hereby amended as follows:

- a. Delete the symbol for a City communal lagoon located in Munster Hamlet as shown on Schedule “1” attached; and*
- b. Add the symbol for a City communal wastewater facility located in Munster Hamlet as shown on Schedule “1” attached, which may be one of the following: (1) the pipeline; or (2) the mechanical treatment plant discharging to the Jock river (CMS); or (3) the Snowfluent provided the following a reevaluation of these alternatives, to the satisfaction of Council.*

In undertaking the reevaluation, the City is advised to consider the following factors among others, as part of the analysis:

- 1. The City is advised to consider retaining a qualified person or persons who has or have not been associated with the project so far to undertake a reevaluation of the three treatment alternatives;*
- 2. The City is advised to consider instructing the evaluating person/s to critically assess the Weighted Additive Method and employ it with modifications if necessary and if found appropriate, and assess the treatment alternatives;*
- 3. The City is advised to consider instructing the evaluating person/s to also employ the standard qualitative assessment of merits and demerits of the alternatives;*
- 4. The City is advised to consider instructing the evaluating person/s to seek facts and opinions from interested people, the CRA, and the proponents of the treatment*

- alternatives to ensure a thorough canvassing of all the facts and opinions and take account of them in both the quantitative and qualitative methods of evaluation, including an explanation why certain facts and opinions were disregarded; and*
- 5. The City is advised to consider instructing the evaluating person/s to make a recommendation based upon the quantitative and qualitative methods.*

We consider that the Ontario Municipal Board took a very long time to render a decision, which resulted in additional cost to the City. According to OMB report on Annual Operations 2001-2002, in the period 2000-2001, 94% of the OMB decisions were rendered within 90 days, and in the period 2001-2002 the result was 95%. Therefore, 330 days for a decision is an extremely and unduly long time.

In addition, the decision itself increased the time for implementation of the solution. The Board should have taken into account that the Class EA process was conducted based on accepted procedures and using accepted methodologies, and that the public had already had an opportunity to comment on the ESR and the Addendum. Furthermore, the MOE had already dismissed the 'bump-up' requests, validating the process followed by CRA and the City.

The evaluation method recommended by the OMB member in his decision is as subject to experience, judgement and bias as the process used in the ESR and the ESR Addendum. In our opinion, it was not the place of the Board member to enter into the details of the engineering aspects of the process, because those had already been addressed and were not within the jurisdiction of the Board. The objective of the Board hearing was simply to determine whether the ROPA 5 met the requirements of the Official Plan and Provincial Planning Policy.

The Board decision was to approve ROPA 5. If the Board considered that ROPA 5 should be approved, then it follows that the pipeline option or any of the three alternatives was acceptable, and there was no need to carry out additional studies by a third party. Council had delegated to staff the responsibility for carrying out the Class EA and selecting a solution. Council received CRA's and staff reports, and through the pertinent committee heard the input from the public.

If the intention of the decision was to leave the ultimate selection of the preferred solution to Council, as the last sentence of the decision indicates, perhaps the Board member should have been clearer.

It is most unusual to see a decision that is not a firm decision. A review of multiple decisions available in the OMB website (www.omb.gov.on.ca) illustrated that decisions are mostly approved, not approved, or approved in part or with modifications. Some decisions are conditional on additional planning work, but not on additional studies.

We could not find other decisions in which the OMB approves an Official Plan Amendment subject to further engineering analysis to the satisfaction of Council.

5.7 R.V. Anderson Re-Evaluation of Alternatives, 2002

The R.V. Anderson Associates (RVA) review of the three alternatives is the clearest sign that the City did everything they could to ensure that the objectors to the project were satisfied. In reading the OMB decision, we came to the conclusion that the City could have said “we are satisfied with the studies and analyses done to date” and adopted the solution that it considered most appropriate, subject of course to the ESR Addendum. Nevertheless, Council elected to carry out additional studies to satisfy the OMB decision.

The RVA Re-evaluation of Alternatives commenced in March 2002, following the OMB decision on the ROPA 5, which was rendered in June 2001. The RVA report was submitted in December 2002. RVA acted independently of the City of Ottawa and their report was presented to the public without it first being reviewed by the City. This procedure is most unusual and reflected the desire of the City to demonstrate that they had acted in an impartial manner in the selection of the pumping station and forcemain as the preferred alternative.

The RVA report confirmed that the requirements of the Class Environmental Assessment for Municipal Water and Wastewater Projects were met by CRA in their preparation of the ESR Addendum.

Based on their evaluation of alternatives, RVA concluded that any one of the alternatives could be selected, given that the utility scores are subject to a good deal of professional judgement. Their ranking of the three alternatives placed the Snowfluent alternative first by the Weighted Additive Method and the Weighted Product Method, the CMS Rotordisk system second and the pipeline third. However, we note that the weights assigned by RVA were determined based on the judgement of the professionals conducting the study, without input from the public or the City.

RVA then carried out a qualitative evaluation of the three alternatives. Based on their evaluation, RVA recommended that either the Snowfluent or CMS process be implemented in Munster.

Unfortunately, the qualitative evaluation did not refer to the input already received from the public. The community of Munster was opposed to spray irrigation, which in our opinion should have ranked the Snowfluent alternative lower. After all, the Snowfluent alternative requires spraying during the winter and in the summer. The land requirements for the Snowfluent system would be similar to the initial ESR availability of land. Another factor not given sufficient emphasis in the evaluation was the ability to obtain the land required for snow storage and spray irrigation.

The track record of the CMS Rotordisk Treatment regarding phosphorus concentrations and the discharge to the Jock River were not discussed in detail. In addition, the Rideau Valley Conservation Authority (RVCA) and the MOE were also concerned about phosphorus loadings to the Jock River, not just the concentration. It is not clear from the documentation if CMS had other similar or larger plants in operation in Ontario. The current CMS plant in Manotick is a small plant discharging to the Rideau River, another Policy 2 watercourse, but there was no operating data that could be used in the analysis at the time.

Regarding the pipeline option, the issues of concern were its capital cost and diversion of flows from the Jock River watershed to the Ottawa River; we note that Jock River watershed at the time did not receive the benefit of the sewage infiltration, as the sewage was being trucked to ROPEC. Effectively the Jock River had already experienced any impacts of diversion, at least part of the year.

RVA carried out a qualitative analysis of the alternatives, which demonstrated balance between them, leading to the conclusion that any of the three alternatives would be equally acceptable. Our own assessment is that the Northern Watertek Snowfluent option presented a high risk of not being implementable due to its land requirements and the anticipated opposition from Munster residents, given that this alternative is in effect a variation of the spray irrigation process.

Based on our evaluation of the RVA December 2002 report, we would have expected that, given that the three alternatives were equal, RVA would have taken into account a number of factors that needed attention before recommending the Snowfluent process. We have noted that issues that existed with this system, and also must emphasize that the RVA report did not have any public participation. Consequently, the City could not proceed directly to submission of an ESR Addendum.

Following the presentation of the December 2002 report, the City asked RVA to address the issues discussed, among others. The result was the Technical Memorandum that addressed each alternative as if it in fact was being implemented.

In our opinion, the December 2002 RVA report was incomplete. All the considerations in the Technical Memorandum should have been included in the report prior to it being released to the public in December 2002. Because the analysis carried out for the Technical Memorandum should have been completed as part of the initial study, the additional fees paid for the memorandum (approximately \$43,000) could have been avoided.

The RVA Technical Memorandum discusses long-term life cycle costs: 60 and 90 years. For the calculation of the life cycle costs, the cost of trucking sewage for the pipeline alternative was assumed to be only \$500,000 less than the other two alternatives

(reflecting a one year delay in the implementation of the other two alternatives), when in reality, given the City's experience on the project to that time, the anticipated delay from choosing another option could be at least two years (six months addendum, six to nine months bump-up, at least six months detailed design). Consequently, the cost of the other two alternatives should have been assumed to be at least \$1,000,000 more than in the RVA Technical Memorandum.

Snowfluent has a significant timing penalty, due to a need to acquire additional lands and the fact that its use would require another Addendum to the ESR. In addition, it had a significant risk that the solution may not be approved as proposed, since the costs provided were based on sewage application rates twice as large as permitted in the MOE guidelines. This alone could have resulted in significant delays while the application rates were discussed with MOE; there was no certainty that the MOE would approve them. A further risk was that the required property may not be available and the time required for expropriation.

MOE had explicitly asked that delays be factored into the alternative evaluations. The City was mindful that the process had required over six years since the voluntary abatement program was agreed between the City and the MOE. In addition, a complaint against the City had been lodged at the MOE.

In our opinion, Snowfluent would have the same constraints as the 1996 ESR preferred solution, upgrade lagoons and spray irrigation system: they both spray treated wastewater and require a significant land area. We noted also that the Snowfluent design was based on 112 m³/ha/d, while the MOE standard is only 55 m³/ha/d. This assumption in itself is a significant problem, since the MOE may not approve the Snowfluent proposal without modifications, and the land requirements would be more than double if the MOE standard is used; the lagoon storage requirements would also be greater. In reviewing the CRA ESR Addendum, this is the kind of discrepancy that was normalized by CRA, to ensure that the alternatives were indeed comparable.

A further risk that existed at the time of the RVA re-evaluation was that the ESR is valid for a period of five years. If construction had not started on the preferred solution before May 2004, the ESR would have lapsed, with the resulting difficulties to the City.

The CMS Rotordisk system is an effective system and based on present knowledge, it appears to have produced the phosphorus targets in Manotick that were predicted for the Munster Hamlet system. However, the cost of the Manotick system escalated substantially above the initial costs presented by CMS, and the project experienced significant delays before becoming operational. Furthermore, the decision in 2003 had to be made based on data available at the time, and the Manotick installation had not been in operation.

Considerable concern has been expressed over the choice of a 60-year project horizon for evaluation of the alternatives used in the RVA Technical Memorandum. Our experience is that project horizons of 50 to 75 years are not uncommon. For example, the Ministry of Natural Resources has used 50 years since the early 1980s. Pavement design trends are now to design what are termed “perpetual pavements”, where the life cycle cost of the pavement structure is evaluated over 50 or more years. In the Highway 407 Express Toll Route project, the alternatives had to be evaluated over a project horizon of 99 years. The trend in building life cycle cost analysis is to use at least 40 years as a project horizon. The Ministry of Transportation requires that life cycle cost analysis be based on a 75 year project horizon.

In our view, the actions of City staff reflected the duty of care that they owed to the City’s ratepayers. There were simply too many risks in the communal treatment solutions that required resolution prior to any of them being accepted at that project stage. Furthermore, it should be kept in mind that the evaluation by RVA was qualitative as well, and that it reflected the bias of the engineering firm’s staff.

Perhaps the three options were equally acceptable, as indicated by RVA. However, when examined in light of the specific circumstances of the project at the specific time when decisions had to be made, the pipeline resulted in the least level of risk to the City. Not factored explicitly in the evaluation was the risk of action by the MOE if they perceived that the City continued with a trend of studies and more studies, but no solution implemented.

In addition to the costs listed by RVA it would have been reasonable to include about \$500,000 for a revised EA study, defence of a bump-up request, and defence of further legal challenges by persons who were opposed to the communal system in the first place. In this regard, a meeting with Munster residents during the course of this audit revealed that they are highly satisfied with the solution implemented by the City. Based on this information, we conclude that re-opening the ESR with a recommendation to implement the Snowfluent system could have resulted in significant further delays in implementation.

5.8 Review Construction File

The audit examined the construction file, comprising the plans and specifications, contract documents, inspector diary notes, photographs and “as-constructed” drawings as well as the City’s Project Manager file, with the purpose of evaluating whether the forcemain was designed to provide long-term safe and effective operation.

The project detailed design was assigned to Stantec Consulting Limited and Delcan Corporation, who began design following the approval of the forcemain option by Council on June 11, 2003.

The major aspects of the design work are as follows:

- Route selection through Richmond
- Public information through web site, newsletters, two open houses
- Well monitoring before and after construction
- Phase I Environmental Site Assessment for pipeline route
- Phase II Environmental Site Assessment for Munster Hamlet Lagoons
- Stage 1 Archaeological Assessment of pipeline route
- Selection of pipeline detail alignment
- Selection of pipeline material
- Design of pumping station and control valve chambers
- Design of pipeline monitoring system

The route selection through Richmond constitutes a refinement of the preferred alternative. The route selection was carried out using a similar process of development of alternatives, evaluation, public and agency input and evaluation to the ESR Addendum. The consulting team examined six alternative alignments through Richmond, including public participation and agency review. The City maintained a website for the project in which it provided background information and design information as it was developed (the website is still accessible).

To reduce the possibility that a forcemain leak may affect the groundwater in Richmond, the design proposed a pressure reduction valve at the west end of Richmond to alleviate concerns regarding the wells in Richmond. The Public Consultation Report indicates that a Public Open House took place on September 23, 2003; notification was made by newspaper advertisements and flyers sent to all households in Richmond and Munster Hamlet. At the time, the six alternative routes were presented and comments sought on the alternatives.

A second meeting was held on December 9, 2003 which was attended by more than 115 people. At this meeting the preferred route was presented together with the mitigative measures proposed.

A review of the Final Design Report dated February 2004, the Public Consultation Report and other reports indicate that the design was carried out in a professional manner, taking into account the various constraints that existed on the project.

The design of the pumping station and the forcemain contain a number of provisions to mitigate the potential effects of the project:

- A pressure reducing valve was installed at the west entrance to Richmond
- The Franktown Road – Perth Street – Cochrane Street sections of the forcemain were constructed using horizontal directional drilling (HDD).

- The forcemain pipe is a high-density polyethylene (HDPE) pipe, with joints sealed using heat fusion.
- Joints at launching pits were joined using high-density polyethylene sleeves (HDPE fusion couplers) that result in a fully integral, thermal fused joint of the same strength and robustness as the thermal butt-fused joint used for other joints in the pipeline.
- The route through Richmond was selected based on an evaluation of the following factors:
 - i. Construction Disturbances/Duration
 - ii. Affordability
 - iii. Groundwater Conditions
 - iv. Fisheries and Aquatic Habitat
 - v. Soil and Bedrock Conditions
 - vi. Site Specific Issues (e.g. Industrial/commercial land uses)
 - vii. Integration with Existing Infrastructure
 - viii. Integration with Other Construction Activities
 - ix. Existing Utilities
 - x. Heritage Features
 - xi. Functional, Operational, and Maintenance Issues
- Protection of the wells in Richmond was provided by the following steps:
 - i. The maximum operating pressure in the forcemain is 618 kPa (90 psi) from the Munster Pumping Station to the control valve at the west end of Richmond, where it is reduced to 138 kPa (20 psi) through Richmond to the pumping station. Normal operating pressures are 75 psi in the main section of the forcemain and 10 psi through Richmond.
 - ii. The route through Richmond is the one with the least number of wells located along the forcemain route.
 - iii. The forcemain was constructed using high-density polyethylene (HDPE) to minimize joints, thus the possibility of leakage.
 - iv. Provision of a 5.0 factor of safety against failure at peak pressures through Richmond.
- The Richmond Fen was protected by constructing the forcemain using HDD.
- The Jock River was protected by using HDD for construction of the forcemain under the river.
- The SCADA system monitors the pressure in the pipe, to be able to quickly identify a leak.
- Isolation valves were placed at least every 2 km, to minimize future impacts of maintenance.

- A generator was provided for emergency power to the pumps to permit operation of the system during a power outage.

Construction of a sanitary sewer system in an area served by private water wells is not uncommon, and in Richmond there are a number of areas served this way. In Ontario, specific requirements for separation between sewage treatment systems and water wells are given in the Building Code (Ont. Reg. 403/97), in Part 8 – Sewage Systems. The Ministry of the Environment accepts a minimum separation of 2.5 m between a sanitary sewer or forcemain and watermains. Similarly, minimum separations are specified in municipal design standards. A review of literature on this subject indicates that in many jurisdictions in North America, the practice is permitted with minimum separation provided that the sewer material is suitable for forcemain construction. In the case of Richmond, the low pressure forcemain does not pose more cause for concern than the sanitary sewer or the private sewage systems at the various properties.

The City tendered the project in four phases, namely:

- Phase 1 Cockburn Street and Jock River Crossing - Forcemain construction on Cockburn Street between Perth Street and the Jock River, including the Jock River Crossing.
- Phase 2 Perth Street and Franktown Road - Forcemain construction on Perth Street and Franktown Road from Cockburn Street to Conley Road.
- Phase 3 Franktown Road and Munster Road - Forcemain construction on Franktown Road from Conley Road to Munster Road and on Munster Road from Franktown Road to the Munster Pumping Station site.
- Phase 4 Munster Pumping Station, Control Valve Chamber, Richmond Pump Station Odour Control Facility, and Wide Area Network installation.
- Phase 5 Munster Hamlet Lagoon De-commissioning.

Tendering of the project began with Phase 1 in January 2004 and was completed with the tender for Phase 4 in May 2004. Construction started in March 2004 and was completed in December 2004. Commissioning of the pumping station proceeded thereafter. Decommissioning of the lagoons was completed in 2005.

In 2005, the bioscrubber installed at the Richmond Pumping Station to control odours produced by hydrogen sulfide failed as a result of an operational mistake, and released strong odours to the neighbourhood. The City's Public Works and Services Department corrected this problem during the summer 2005, and hydrogen sulfide was controlled as a source of malodours. Unfortunately, the City found that a second type of malodour still existed, different from hydrogen sulfide and hence not controlled by the bioscrubber. Following investigation of the source and nature of the malodour, the City installed a temporary biofilter, which resolved this problem. A permanent biofilter was designed over the winter 2006 and construction of the biofilter is underway.

A review of the construction file revealed that the City undertook the contract administration and the site services during construction. The review of the contract administration files indicates that the City carried out these duties in a professional manner. The daily inspector records and photographs indicate that standard construction administration and site inspection was provided.

5.9 Review Current State of Forcemain

With respect to the construction, information provided by private citizens who observed the construction was taken into account in the preparation of this audit. The comments provided are as follows:

1. At the Jock River crossing, the forcemain crossing was done under the mud in the river bottom and not through the rock. Observations by these members of the public noted that the drill bit took one hour to cross the river. They were concerned that the forcemain would be exposed to ice or debris.
2. CCTV inspection of the sewer laterals along Cockburn Street showed that several were separated or broken. The City repaired only some of them.
3. In the area of the Joys Side Road the forcemain was installed at a depth less than the specified 1.8 m, as shallow as 1.5 m
4. The forcemain was constructed using more sleeve connections than the specifications required. The contractor cut the forcemain outside the junction boxes and used a sleeve, instead of extending the pipe into the junction box.
5. In sections of the forcemain where the forcemain trench was blasted, the shot rock was mixed with other excavation material thereby creating the risk of a puncture to the forcemain

We reviewed the drawings, the specifications and the inspector daily reports for the period when the pipe was constructed under the Jock River. The drawings indicate that the forcemain should be placed about 1 m below the lowest point in the river bed, within the stiff silty clay. There is no requirement for the forcemain to be placed in the bedrock. The as-constructed drawings and the record of horizontal directional drilling elevations indicate that the pipe was installed generally lower than indicated on the drawings.

Horizontal directional drilling requires two operations: (1) a pilot hole is drilled following the alignment of the proposed pipe; (2) the pipe is pulled through the pilot hole to its final location. Review of the construction inspection notes (inspector daily reports) indicate that the pilot hole drill operation took about one hour; the pipe pulling operation required over two hours to complete. These time frames are similar to the time frames required in the remainder of the project. Based on these results, it can be concluded that the pipe was placed in accordance with the design.

The issue of the house sewer laterals was reviewed. It appears that the contractor could not inspect all the laterals prior to construction because some of the owners refused permission. The contractor repaired two laterals as a result of concern that the horizontal directional drilling procedure could impact them during construction due to their condition. Repairs to identified problems were not undertaken as the project was a “no dig” project.

The horizontal directional drilling records in the as-constructed data indicates that the forcemain was installed at, or lower than, the grade specified on the drawings. Thus, the forcemain has cover equal to or greater than the depth specified. To determine if the pipe was installed too shallow in the area of Joys Side Road, with the assistance of the City’s Project Manager and the Public Works and Services Department, we opened the chamber at station 9+750, to verify the depth of the pipe. Measurement of the chamber indicates that the chamber floor is 3.3 m below the top of the cover, and the pipe is 2.75 m below the top of the chamber cover. This information confirms that the forcemain was installed at the required depth.

A videotape provided by private citizens was studied to determine if the forcemain was constructed too shallow and whether no proper bedding was provided. The videotape shows construction of the forcemain at Station 8+648. Based on the tape, it can be observed that the forcemain was installed at a depth of about 1.4 m below the finished grade; there is not enough information to confirm whether the forcemain was bedded appropriately. We reviewed the design drawings for this location, and noted that it is adjacent to the TransCanada Forcemains right-of-way; due to the depth of the TCPL pipes, the design required that the forcemain pipe be placed above the TCPL pipes. Consequently, the forcemain pipe has less than the 1.8 m required cover; however, the design requires that the forcemain be protected with rigid insulation to compensate for the depth of soil not provided. This solution is perfectly acceptable.

Two excavations were carried out on May 31, 2006 to review the installed forcemain in the field in order to complement the information obtained from the review of the construction file. The Auditor General coordinated the excavations with the Public Works and Services Department, who provided and coordinated the required crew and equipment.

The first excavation was at Station 8+648, adjacent to the chamber. The excavation permitted confirmation that the pipe was protected with the rigid insulation boards, as required by the design. The pipe at this location was pulled using HDD, so there is not bedding in the pulled sections. In the section within the chamber excavation, the pipe was provided with the required cover material; however, no granular bedding was provided because the native stiff silty clay provides very firm support to the pipe. It can be concluded that the construction of the pipe at this location meets the specifications.

The excavation near the chamber structure permitted the evaluation of the joints constructed when heat fusion of the pipe ends was not possible. The construction of the chambers makes it impossible to thread the pipe through the chamber openings provided for the pipe, due to the angles at which the forcemain is pulled. The chambers were located at the locations of the HDD construction pits. The Friatec sleeves used to fuse the pipe at each side of the chambers are high-density polyethylene fusion couplers that result in joints that are thermal butt fused, which is equivalent to the thermal butt fusion method used to joint the pipe elsewhere. We are satisfied that the procedure will not affect the pipe durability or watertightness.

A second excavation was done on Munster Road, about 150 m north of Franktown Road. This section of the pipe was constructed in open cut. The excavation revealed that the pipe was placed 3 m from the edge of pavement, the top of the forcemain was 2.4 m below the shoulder gravel, granular A pipe cover was provided, and the bedding was constructed using clear stone. Therefore, it was confirmed that the pipe was installed at the specified depth and that its bedding was as specified. During the excavation it was observed that large pieces of shot rock were used in the backfill, but not within about 30 cm from the pipe, which was surrounded with granular A material. This procedure is acceptable and does not place any stress on the pipe.

5.10 Review of Timelines

In reviewing the timelines for the various activities undertaken, it can be observed that the 1996 ESR, the 1999 ESR Addendum and the 2002 RVA Re-evaluation of Alternatives were completed within time frames that are typically associated with such activities. The various objections and the resulting time periods added the following time to the implementation:

1996 ESR 'bump-up' request	12 months
1999 ESR Addendum 'bump-up' request	9 months
OMB Hearing and Decision	15 months
RVA Re-evaluation of Alternatives	18 months

A total of 54 months or 4-1/2 years were lost to the various objections and the resulting additional work required. It is noted that the initial re-aperture of the 1996 ESR was ill advised, as the project had already passed through the Class EA process - including a "bump-up" request that was denied by the Ministry of the Environment - and the detailed design was almost complete. The solution that emanated from the 1996 ESR was the most appropriate solution given the information that existed when the study was completed. The fact that the MOE reviewed the requests for 'bump-up' and dismissed them had already confirmed the validity of the Class EA process and the resulting solution. If the process had not been arrested then, the upgraded lagoons and expanded spray irrigation system would have been in operation in late 1999.

Once the 1996 ESR was re-opened, the time frame to complete the studies took the typical time required to carry out a project of the sensitivity of this one. Other activities that resulted from the re-opening of the ESR, such as the “bump-up” requests, OMB hearings, OMB decision, and subsequent studies extended excessively the time period for completion. From the completion of the 1999 ESR Addendum, a total of 42 months were “lost” to additional studies, hearings, “bump-up” requests and reviews. This is a significant period.

Annex A describes the main events in the project in more detail along with comments on the reasonableness of the time frame required for its completion. The timeline is also presented graphically in Annex A.

5.11 Estimated and Actual Expenditures

An analysis of the estimated costs and the actual expenditures was conducted based on the data provided, in order to:

- Document all project-related costs to the beginning of this audit.
- Determine if all pertinent costs have been included in the project costs.
- Determine if all pertinent costs have been reported to Council.

Table 4 summarizes the costs incurred to the beginning of 2006.

Table 4
Summary of Project Costs

Item	Cost	Remarks
Engineering studies and Class EA 1996	\$303,550	
Bump-up request response	\$85,250	
Detailed Design	\$467,342	Amount authorized. Since design was stopped at 90% complete, we have assumed entire amount was used.
ESR Addendum 1999 including Bump up request	\$462,571	
Doran Contractors	\$128,900	Estimate based on Doran proposal dated Dec. 1/99
OMB Hearing	\$350,000	Estimate
Wastewater Haulage	\$3,500,000	1998 to 2005 at \$500K/yr
Re-evaluation of Alternatives	\$158,064	Approved amount June 2002
Detailed Design	\$1,692,908	
Construction	\$6,527,797	
Total	\$13,676,382	

Funding required to complete the decommissioning of the existing wastewater lagoons in Munster, and to complete the design and construction of a permanent polishing biofilter at the Richmond Pumping Station is included in the above costs.

Some costs were incurred that are not included above, e.g. the cost of upgrading the Richmond Pumping Station and forcemain. It was noted that the Region changed its policy for allocation of sewer capacity from future development allocation to “just-in-time” improvements. The improvements to the Richmond Pumping Station and forcemain were required regardless of whether the Munster Hamlet sewage was transported to Richmond.

A number of projects have taken place in Richmond to improve the road and sewer infrastructure. It should be noted that they are not related to the Munster Hamlet project and would have been carried out in any case.

We believe that all project costs have been reported to Council, either through specific staff reports or in the budget documents. As noted above, a number of projects are slated for or have been carried out on streets along the path of the project that would have been required regardless of the Munster pipeline.

6 CONCLUSIONS

6.1 *Environmental Study Report, 1996*

1. The 1996 ESR met the requirements of the Class EA and the solution selected based on the study was supported by the engineering analysis, public and agency input, and the evaluation of the various alternatives.
2. The public participation component of the 1996 ESR exceeded the requirements of the Class EA. In addition, Totten Sims Hubicki Associates (TSH) met with individual property owners to review concerns.
3. The 1996 ESR included Snowfluent as part of the alternative solutions. The Snowfluent system was subsequently evaluated as part of the alternative designs, but was not selected based on the evaluation method.
4. TSH adjusted the Snowfluent cost data to ensure that the interests of the Region would be protected if the Snowfluent system was the highest ranking design.
5. The pipeline solution had many serious constraints at the time that the ESR was done (1995, 1996), which made it unfeasible. The main constraint was the result of the policy used to determine the committed hydraulic capacity at the Richmond Pumping Station. Based on the policy at the time, the hydraulic capacity of the Richmond Pumping Station was fully committed. The committed hydraulic capacity allocation policy resulted in other constraints, including the negative effect of receiving Munster flows at Richmond, which would remove development potential in Richmond; and the very high cost of improving the Richmond

Pumping Station and the forcemain to accommodate the additional flows from Munster and from future development in Richmond.

6. The 'bump-up' requests received in 1996 delayed the start of the implementation of the preferred solution by about one year.

6.2 Unsolicited Proposals

1. It appears that Delta's intention, when it made the unsolicited proposal, was to be allowed as an alternative to the upgrade to the lagoons and spray irrigation system (in other words, that the Region would consider an alternative bid when the tenders were solicited).
2. Once Delta made its unsolicited proposal, CMS became involved and opened the door for the re-evaluation and eventual ESR Addendum study.
3. The design of the upgrades to the sewage lagoons and the spray irrigation system was practically complete when the implementation process was halted by Council in March 1998.
4. Staff was committed to implementing the upgrades to the sewage lagoons and the spray irrigation system, and correctly recommended to Council to stay the course.
5. Re-opening the evaluation of alternatives, as directed by Council, at such a late stage did not take into account the increase in cost due to the required additional studies and extension of the voluntary abatement process.
6. Staff indicated to Council that such course of action would require a re-evaluation of alternatives, and that the project implementation could be delayed 12 to 18 months.

6.3 ESR Addendum, 1999

1. The Conestoga Rovers and Associates (CRA) re-evaluation of alternatives correctly started at Phase 2 of the Class EA process.
2. The use of a design/build proposal call as part of the CRA re-evaluation process in the form of a formal request for proposals is unusual during a Class EA study.
3. The request for proposals (RFP) had the appearance and wording to lead the proponents to conclude that a contract would be negotiated if their proposal was considered acceptable. The RFP document contained legal clauses to permit the Region to not enter into negotiations; however, the overall document format and the circumstances of the competition supported the perception by the proponents that the Region would enter into negotiations with the successful proponent.
4. The RFP document accepted technologies and implementation programs, thus opening the door to pipeline alternatives.
5. The RFP document was not clear that the proposals were intended to provide firm cost estimates for use in the ESR Addendum and not for the selection of a particular proponent.
6. Based on the RFP document, the proponents were correct in expecting that the result would be negotiation of a contract with them.

7. It appears that up until the pipeline alternatives were received as a result of the RFP, the Region staff had not considered a pipeline as a viable alternative (possibly as a result of the previous estimates and constraints).
8. For completeness and to comply with the Class EA, the CRA ESR Addendum study had to examine the pipeline option and other options.
9. The CRA studies were carried out in accordance with the Class EA process requirements.
10. The CRA public participation scope and methods went far beyond the requirements of the Class EA, and were similar to those that would have been used in an individual Environmental Assessment.
11. The weights used in the evaluation methods took into account the input from the public and the professional experience of the project team. The weights were similar to those applied by TSH.
12. The cost estimates for the various alternatives were adjusted by CRA to normalize them. CRA had a duty to ensure that the costs used in the evaluations reflected all the costs of the projects.
13. The pipeline alternative became feasible when the policy of the Region changed and permitted the “just-in-time” provision of sewer capacity, rather than the use of capacity allocations for events long into the future. This change in policy allowed the excess capacity at the Richmond Pumping Station to be used for Munster Hamlet.
14. CRA evaluated five alternative pipeline routes using standard evaluation procedures that took into account the input received from the Region and the public. The evaluation of the alternative pipeline routes included a comprehensive public participation process.
15. The Richmond Pumping Station improvements were part of the overall wastewater system master plan, and would have proceeded regardless of the events at Munster.
16. The ‘bump-up’ requests in 1999 delayed the project by up to one year.
17. CRA included in their report the time that may have been required for a ‘bump-up’ request and noted the need for an Official Plan Amendment and possible OMB hearing.

6.4 Ontario Municipal Board Hearing

1. The Ontario Municipal Board decision took an excessive amount of time.
2. The OMB disregarded the fact that a Class EA process, correctly conducted as confirmed by the MOE decision to reject the ‘bump-up’ requests, had already been conducted.
3. The OMB decision should have been limited to whether the Official Plan Amendment No. 5 should be upheld. Instead, the OMB provided a decision that delved into the method of selection of alternatives, without a clear understanding of the process.

4. Aside from the long time that it took to render a decision, the OMB decision was incomplete, as it should have either approved or rejected the OPA. If it considered that the evidence for a communal system was more credible than that for a pipeline solution, the decision should have been for rejection of the OPA; on the other hand, if the pipeline solution was acceptable, then the OPA should have been approved.
5. The OMB hearing was not a hearing under the Environmental Assessment Act and hence had no jurisdiction on the selection of the preferred solution.

6.5 Design/Build Contract

1. The award of the design and construction management contract to Doran Contractors was endorsed by the Ottawa Construction Association to maintain the integrity of the request for proposals process.
2. Award of the contract was done to expedite implementation of the project, at the City's risk. However, staff apprised Council of the risks, including the possibility of having to throw out the design if the OMB denied the OPA.

6.6 Re-Evaluation of Alternatives

1. In our interpretation of the OMB decision, the City could have indicated that they were satisfied with the Class EA report and proceeded with implementation of the recommended solution, i.e. the Munster Pumping Station and the forcemain to Richmond.
2. The RVA Re-evaluation of Alternatives presented at the meeting in December 2002 was incomplete; the report should have taken into account the factors that were later included in the Technical Memorandum. For example, the impact of having to re-open the ESR process if a solution other than the pipeline was selected, the regulatory risk to the City in case of further delays in implementing a solution to the Munster sewage treatment problem, and the impact of the additional property acquisition required if the Snowfluent design assumptions were not accepted by the MOE.
3. Staff committed to release the RVA Re-evaluation of Alternatives to the public without first reviewing the results of the study. This was a well-intentioned error in judgment caused by the desire to demonstrate that the study was conducted independently of the City. However, it is unusual for a consultant to present results of a study to the public without allowing the client an opportunity to review the report. Review by City staff would have disclosed before the December presentation that the report work was not complete.
4. The additional analyses required by City staff were necessary to complete the Re-evaluation of Alternatives. Without the additional analysis, the report would not be complete.
5. Once the City was satisfied with the results of the re-evaluation of alternatives, it was correct in proceeding to completion as recommended by staff. Further delays in implementing a solution to the Munster Hamlet sewage problem substantially

increased the risk to the City of being found non-compliant by the Ministry of the Environment.

6.7 Detailed Design and Construction

1. The design of the pumping station and the forcemain were completed in accordance with the accepted standards for design.
2. The construction methodology used reduced the impact of the forcemain during construction and the cost of implementation.
3. The design made provisions for protection of the wells in Richmond by selecting the route that had the least number of wells; used high-density polyethylene pipe with a thick wall and thermally-fused joints; and provided a control valve west of Richmond to reduce the operating pressures through Richmond to provide a 5.0 factor of safety against failure of the pipe.
4. The design and construction has implemented an acceptable, state-of-the-art system for monitoring of forcemain pressures for leak detection.
5. The construction of the forcemain generally conforms to the plans and specifications. Two excavations were done on May 31, 2006 to inspect the forcemain, and it was possible to confirm that construction was done per the design.
6. The design of the pumping station made provisions for odour control due to hydrogen sulfide emissions by installation of a bio-scrubber at the Richmond Pumping Station.
7. The malodour problem in the summer of 2005 was the result of an operational mistake that was corrected immediately. Subsequent malodour problems were due to the release of gases other than hydrogen sulfide, which could not be controlled using a bio-scrubber; the City installed a temporary biofilter and the malodours have been controlled. The City is currently constructing a permanent biofilter at the Richmond Pumping Station.

6.7.1 General

1. In general terms, if Council had followed staff recommendations in 1998 it would have saved the City about \$7.9 million dollars, although the solution would have been on-site treatment rather than a forcemain. In all instances in which Council superseded the recommendations of staff, the cost of the project went up and the project was delayed substantially.
2. Much of the delays have been caused by the multiple objections and roadblocks placed by individuals and interest groups. Some of the objections and roadblocks do not appear to be based on factual information.
3. All pertinent costs have been included in the project budget.
4. All pertinent costs have been reported to Council in various forms.

Recommendations

Recommendation 1

That staff provide assessment of time and subsequent costs to Council when presenting alternative courses of action.

Management Response

Agree in principle. This would have been particularly difficult in earlier stages (prior to amalgamation) of the project due to the unusual and occasionally unpredictable nature of the Council direction and decision making. The final report to Committee/Council in May/June 2003 addressed timelines and associated costs extremely well.

Recommendation 2

That the Public Works and Services Department develop a policy for Council approval that once an Environmental Study Report has been in the public record for the statutory 30-day review period and any Part II Order requests have been resolved or the Ministry of the Environment has rejected them, the Class EA process not be reopened unless the factors provided for in the Municipal Class Environmental Assessment take effect (Section A.4.2.2 of the Municipal Class EA).

Management Response

Disagree. The Municipal Engineers Association Class Environmental Assessment process is itself an undertaking approved under the Environmental Assessment Act. Both processes recognize and include provisions for changing circumstances including for completed Class EAs a mandatory requirement to review and reconfirm or modify both the assumptions and conclusions of a completed EA study every 5 years. The recommendation would seem to contradict this legislated requirement. The provisions for mandatory review contained in the Class EA process anticipate a wide range of circumstances including changes in legislation, new technologies, changes in original assumptions, etc.

Although this resulted in long delays and created controversies in the community in the case of Munster, there are often instances where revisiting EA decisions due to new information is warranted. Restricting the reconsideration of decisions previously made would not be in keeping with intent of the overall Class EA process.

Recommendation 3

That the RFP process not be used during an EA study to obtain firm prices for alternative solutions. Instead, if alternative technologies are desired, that the City solicit Expressions of Interest or other non-binding solicitations with clear objectives and explanation to the invitees. To confirm cost estimates during a study or preliminary design, that the City consider retaining a contracting firm to provide cost estimates.

Management Response

Agree. Although Supply Management had no involvement in the RFP process described in this audit report, we agree with this recommendation, and would not issue an RFP that was not intended to result in a contract award. We also agree that if cost estimates are sought for solutions, the RFP is not an appropriate mechanism, and as suggested by the AG, a consulting firm could have been retained to provide those estimates.

Recommendation 4

If the maker of proprietary product submits a proposal for its use by the City, that the City accepts it only with a clear understanding by the proponent that any evaluation or consideration of the proposal does not bind the City to its use.

Management Response

Agree.

Recommendation 5

That City staff do not release results of consultant's studies without previous review.

Management Response

Agree in general. Staff generally work closely with consultants to carry out studies and develop appropriate recommendations. However, in the case of Munster, the City intentionally had RVA undertake an independent re-evaluation and make recommendations based upon their re-evaluation of the three treatment alternatives. To do otherwise in this situation, recognizing the long history of this project even at that time would have been problematic.

Recommendation 6

That all major changes in policies regarding the use of infrastructure capacity be brought forward for Council approval.

Management Response

Agree in principle. For the particular issue that seems to have resulted in this recommendation – capacity allocation – the Region's 1997 Wastewater Master Plan included policies regarding capacity allocation and system efficiencies. The report does not make further references, however if there is other evidence that policies are not being brought forward to Council this recommendation may have value. If the recommendation is related only to the specific issue of capacity allocation, related policies were presented to and approved by Regional Council.

7 CONCLUSION

The studies carried out as part of the Class Environmental Assessment process were completed in accordance with the required process, and the public participation

program exceeded in both cases the minimum requirements. The evaluation methods used in the Class Environmental Assessments used generally accepted methodologies.

The alternative development, initial evaluation, detailed ranking and the evaluation methodologies were completed in accordance with the Class EA requirements and normal engineering practice.

The forcemain selection was done without bias in its favour. In fact, the original recommendation (in the Environmental Study Report) was for on-site treatment. From the documentation reviewed as part of this audit, it appears that the pipeline option became attractive during the ESR Addendum process when the unsolicited pipeline proposals were submitted containing the option of using actual flows to the pumping station instead of the methodology used up to that time; the result of the change in policy was to make the pipeline option economical.

Design and construction of the Munster Hamlet pumping station and forcemain to Richmond provides effective and safe long term operation.

The following provided value for money:

- The 1996 Environmental Study Report
- The subsequent detailed design and preparation of plans
- The 1998 Addendum Study
- The 2003-2004 detailed design and services during construction of the pumping station and forcemain
- Construction of the Munster Pumping Station and forcemain project

The following work and activities provided relatively low or no value for the money spent:

- The 'bump-up' requests
- The Ontario Municipal Board hearing and decision, which went much further than warranted and that delayed the process
- The decision in response to the OMB hearing decision to undertake a re-evaluation of alternatives. The City Council had the option to respond to the OMB that it was satisfied with the previous studies and reports, and to proceed to implementation.

8 ACKNOWLEDGEMENT

We wish to express our appreciation for the cooperation and assistance afforded the audit team by Management.

Annex A

Summary of Timelines

Date	Event	Documentation	Remarks
1992/93	<p>The lagoons were undersized for the number of residents (approximately 450) it was servicing. The lagoons were experiencing overflow and leakage issues.</p> <p>Added a fifth “overflow” lagoon to deal with expansion issues. The lagoons had deteriorated and were having trouble meeting the “certificate of approval” (COA) standards for testing and monitoring. There was regular and ongoing maintenance done on the lagoons but nothing of significance.</p> <p><i>Lagoon history: The municipality of Goulbourn originally owned the lagoon and the MOE did the regular monitoring and testing. In later years, RMOC became responsible for the lifecycle management of the lagoons and trunk collector system and the municipality was responsible for the local collection system.</i></p>		Between the municipality and RMOC, there was no comprehensive lifecycle management plan in place.
1994	Received \$540,000 in capital funding for the project. Total project estimate was \$5.4 million.	1994 Capital Budget - RMOC	
1995	It was determined that something had to be done to resolve the overflow and leakage issues, and to ensure compliance with the MOE’s COA. RMOC hired the engineering firm Totten Sims Hubicki Associates	No documentation regarding awarded contract could be located.	

Date	Event	Documentation	Remarks
	(TSH) to undertake an Environmental Assessment (EA) to determine the preferred means to remedy the problems with the existing lagoon and spray irrigation treatment system		
1996	Implementation of the Munster Hamlet Toilet Replacement Program. Resident's were given low-flow toilets and showerheads to reduce the amount of flow into the lagoons. The flow was reduced by 300 m ³ , from 900 m ³ per day to 600 m ³ per day.	No documentation regarding invoice and contract amounts could be located.	
January 1996	Munster Hamlet Sewage Treatment Environmental Study Report (ESR) by TSH recommended upgrading/expanding the existing facility.	Munster Hamlet Environmental Study Report (ESR): - Volume 1: ESR - Volume 2: Appendices - Volume 3: Appendices	
May 1996	At the request of staff, TSH did a detailed costing analysis of the pipeline option in the spring of 1996.	No documentation regarding contract amount for subsequent study could be located.	Detailed pipeline costing was required as part of response to 'bump-up' request.
January 1997	The Ministry of Environment (MOE) denied all Phase 2 Order ("bump-up") requests. There were 9 applications by citizens and developers, which resulted in a 6-month delay.	TSH Brief, dated June 1996 Fees authorized by Council	
1997	RMOC proceeded with preliminary and detailed design for upgrading/expanding the existing lagoon and spray irrigation treatment system. TSH was engaged to complete the work. If this work had continued, it was scheduled to be completed in 1998.	Authorized by CSED committee in February 1997	Upgrade to sewage lagoons had been submitted to MOE for C of A. Spray irrigation design was ready for submission to MOE.

Date	Event	Documentation	Remarks
Early 1998	Before the implementation of the solution, RMOC received an unsolicited proposal for an on-site proprietary treatment facility. Delta Engineering (Snowfluent) approached Council members and proposed their technology and that it could save the Region millions of dollars.	Planning and Environment Services Committee Minutes - 14 April, 1998 Corporate Services and Economic Development Committee Minutes - 3 March, 1998	Snowfluent had been evaluated in the ESR by TSH.
13 February 1998	Staff requested an updated costing of the pipeline option from TSH. The original costing was in 1996 dollars and staff requested an update in 1998 dollars.		Among the objections to the 1996 ESR recommended solution was that the pipeline did not receive adequate evaluation.
11 March 1998	RMOC Regional Council directed staff to re-evaluate treatment options and prepare an addendum to the ESR. It was the recommendation of staff to proceed with the Council's initial approval to expand the lagoons.	Regional Council Minutes - 11 March, 1998	The original motion put forward at the Committee meeting directed staff to engage Delta Engineering to conduct the re-evaluation of treatment options (including their own) and issue an addendum to the ESR.
April 1998	RMOC engaged the engineering firm Conestoga-Rovers and Associates (CRA) to complete the re-evaluation, on an independent basis, take into account new information and to solicit and identify other applicable treatment alternatives. CAO approved the selection of CRA to do the addendum to the ESR.		

Date	Event	Documentation	Remarks
July 1998	Design-build proposals were received. The submissions were used as a means to obtain price-guaranteed alternatives to be considered by CRA.		Usually the ESR process evaluates different technology options but does not request or receive detailed bids from vendors. Council directed staff to follow a different process for the ESR addendum and receive proposals from vendors with price guarantees. There was significant debate which involved Legal Services over the wording of the RFP. Some proponents felt that the RFP was worded specifically for communal treatment options and that pipeline bids should be rejected. Other pipeline contractors agreed saying the wording in the RFP suggested a communal treatment alternative and as a result, they did not submit a bid. They requested an opportunity to open the tender again but it was denied.
May 1999	CRA completed their assessment of treatment alternatives and issued an addendum to the ESR. The addendum recommended that Munster Hamlet be connected to the central sewage collection and treatment systems by means of a pipeline to Richmond.	Policy change regarding use of capacity at the Richmond Pumping Station.	
12 May 1999	Regional Council approved an amendment to the Regional Official Plan to allow for the implementation of the pipeline solution. Several interested parties appealed the amendment to the Ontario Municipal		The OMB took significantly longer than expected (almost 1 year) to render its decision.

Date	Event	Documentation	Remarks
	Board (OMB). The OMB does not typically get involved at a technical level. The Region was very surprised at the level of involvement the OMB took in this matter.		
October 1999	All Phase 2 Order requests submitted to the MOE were denied. Resulted in a 9-month delay.		
26 January 2000	Regional Council approved the award of a contract to Doran Contractors Limited to complete the preliminary and detailed designs and project management for construction of the pumping station and forcemain. RMOC entered into a Professional Engineering Agreement with Doran Contractors Limited, dated January 2000, to complete the work.		Staff was not comfortable moving ahead with the design work on the pipeline until the OMB had rendered its decision. However, Legal Services advised that the work could continue without impacting the hearing.
March - July 2000	OMB hearings on the appeal of the amendment to the Regional Official Plan.		
2 June 2000	Work under the agreement with Doran Contractors Limited was suspended, pending the outcome of the OMB hearings due to the OMB Chair's reaction to the work being done.		The OMB member reviewed whether the award of the Contract to Doran Contractors represented work on the undertaking. He concluded it did not, but commented that the optics were not appropriate.
9 June 2001	OMB released its decision on the appeal. The OMB approved Official Plan Amendment No. 5, but directed the City to re-evaluate three of the alternatives (CMS, pipeline, and Snowfluent). In accordance with the OMB decision, the re-evaluation		City staff was very surprised with the outcome of the decision because the OMB does not usually get involved on this level. The OMB took one year to release its decision.

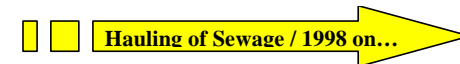
Date	Event	Documentation	Remarks
	had to completed to the satisfaction of City Council. The OMB advised the City to consider 5 factors in their re-evaluation.		
18 June 2001	MOE sent a letter to the City stating its position on the EA process. Specifically, the MOE indicated that a re-opening of the ESR process would require review of all alternatives.		
3 July 2001	Corporate Services and Economic Development Committee authorized the seeking of leave to appeal the OMB decision. To minimize delays, staff also brought forward a report recommending an Action Plan to satisfy the OMB decision.	The Action Plan	The Action Plan clearly stated that the evaluation of the 3 options would be a third-party independent review and the recommendations would be brought forward to Committee and Council for approval. Staff provided their own analysis and report to Committee and Council.
11 July 2001	Council approved Environmental Services Report No. 6. The Action Plan included the retention of a consultant to conduct an independent re-evaluation of the three alternatives.		
October 2001	A Request for Proposal (RFP) was distributed to four consultants.		
29 October 2001	Divisional Court denied the leave to appeal the OMB decision.		

Date	Event	Documentation	Remarks
December 2001	<p>Staff completed the review and evaluation of the consultants proposals, submitted in response to the RFP.</p> <p>Additional funding of \$2.8 million was added to the capital budget in 2002 for a total of \$12.8 million available to date.</p>		
5 February 2002	An Information Previously Distributed Memo advised that the Department had selected the engineering firm R.V. Anderson and Associates Limited (RVA) and would enter into an agreement with them to complete the re-evaluation of three alternatives for the Munster Hamlet Treatment Facility.		
12 February 2002	RVA submitted final work plan for the re-evaluation.		
26 February 2002	The memo noted above was listed on the Environmental Services Committee agenda.		
16 December 2002	The Re-evaluation of Alternatives report was submitted to the City by RVA. RVA recommended the City proceed with the implementation of a communal wastewater treatment system (CMS or Snowfluent). The results of the report were presented to Munster Hamlet residents that evening. This meeting was scheduled in advance of receiving the report to demonstrate transparency to the public. The consultants presented the report and their findings. City staff said they had just received the report and		The RVA report did not include a number of cost items and risk factors that were required for a complete evaluation.

Date	Event	Documentation	Remarks
	<p>needed time to review it. City staff expressed surprise at the consultant recommendation against the pipeline option.</p> <p>Based on the OMB criteria used, the qualitative analysis said all options were technically viable. The quantitative analysis (based on CRA numbers from previous years) recommended the communal options because the upfront capital costs for the pipeline were too expensive.</p>		
Early 2003	<p>City staff quickly put a plan together to do additional analysis taking into account other evaluation criteria. RVA were engaged by the City again to assist in completing additional investigations before recommending a solution for Council approval. The additional investigations included regulatory and procedural requirements of the <i>Environment Assessment Act</i>, the need and availability for additional land, timing of implementation, associated costs, risks, and environmental impacts. The first re-evaluation by RVA was based on a specific set of constraints and guidelines in response to the OMB ruling.</p>		
14 February 2003	<p>City staff and RV Anderson met with the MOE to discuss the required EA process if a communal treatment alternative was chosen.</p>	<p>RV Anderson's minutes from the meeting. Decision letter by the</p>	<p>City staff say that RV Anderson was not provided with the full information from the MOE during their initial evaluation.</p>

Date	Event	Documentation	Remarks
		MOE.	They were led to believe that a communal alternative would only require a small change to the ESR. The MOE was very clear that a communal option would mean a full EA process of at least 6 alternatives.
30 April 2003	RVA submitted a Technical Memorandum providing supporting information to outline the implication of implementing each of the three alternatives.		The information contained in the Technical Memorandum should have formed part of the Re-evaluation of Alternatives Report submitted in December 2002.
27 May 2003	Based on the additional investigations and Technical Memorandum submitted by RVA, staff recommend in a report to the Environmental Services Committee to proceed with the implementation of the pipeline solution.		
11 June 2003	<p>Council approved the implementation of the pipeline alternative as the recommended solution for Munster Hamlet Wastewater Treatment.</p> <p>The plan was to break ground in May 2004 (after which time the EA expires) and have the project complete in May 2005.</p>	<p>\$12.8 million available to date with \$5 million already spent (\$2.5 million in haulage, \$2 million for engineering consultants, and \$0.5 million in misc.). Staff maintains a detailed "account status report" for all expenditures (including staff time) incurred.</p> <p>There was \$7.4 million remaining in the capital</p>	

Date	Event	Documentation	Remarks
		budget to finish the project. The last staff analysis estimated between \$7.1 million and \$8.1 million to complete the project.	
August 2003	The City retained a team of consultants (Stantec Consulting Limited, Delcan Corporation, Jacques Whitford, EHG and MHPM Project Management) to carry out the selection of the route through Richmond and the detail design of the Munster Hamlet pumping station and the forcemain.		
January 2004	Initial tender for construction of the pipeline		
December 2004	Work on the project is completed		
May 2005	System is fully commissioned		In the summer of 2005 the odour control system failed, releasing “rotten eggs” smell in the area of the Richmond Pumping Station. The City staff resolved this problem. Subsequently a different type of smell was found, which required the addition of a biofilter; the smell was not due to the sewage from Munster.
Summer 2006	The City is installing the biofilter for odour control system.		



1972	1992-1993	1995	1996	1997	1998	1999
Lagoons & Spray Irrigation System built	Spill containment basin built to accommodate overflow sewage on emergency basis	TSH hired to undertake EA	JAN: TSH-ESR recommends upgrading lagoons (did not consider pipeline option re: capacity issue)	RMOC proceeds with preliminary and detailed design of lagoon upgrades. Estimated construction completion '98	Council receives unsolicited snow fluent proposal Early 1998	CRA completed work and recommend pipeline – amended ESR completed May
			MAY: At request of staff, TSH completed detailed costing of pipeline alternative.	RMOC stops design work (approx 80% of design completed)	MAR: Council directs staff to re-evaluate options and amend ESR	Rezoning required due to pipeline option May '99
					APR: CRA hired for re-evaluation	Zoning appealed to OMB
2000	2001		2002	2003		2004-2006
JAN: Non-competitive contract awarded to Doran for design – build pipeline	OMB accepted amendment to ESR and required City to re-evaluate 3 options June 2001	Action Plan Meet OMB requirements	RVA contract awarded February 2002	City requested RVA complete additional analysis using other criteria including the need to amend ESR – Early 2003	Council approves pipeline June 2003	JAN. 2004: Construction tendered
MARCH 2000 to JUNE 2001: OMB considered appeal	City Appeals	Issued RFP 4 firms October 2001 to re-evaluate 3 options	Review completed. Recommended communal system or snow fluent December 2002	RVA technical memo April 2003	Consultant hired to design pipeline July 2003	DEC. 2004: Construction completed
Suspended work on project pending OMB hearing JUN	Appeal dismissed October 2001			Based on tech memo City staff recommend pipeline May 2003		MAY 2005: System fully commissioned

ANNEX B – BACKGROUND DATA

Munster Hamlet Environmental Study Report for a Class Environmental Assessment Wastewater Treatment System Expansion/Upgrade:

Volume 1, January 1996, Totten Sims Hubicki Associates, Engineers Architects and Planners, re-printed on May 21, 1999.

Volume 2, Appendices A to D, January, 1996, Totten Sims Hubicki Associates, Engineers Architects and Planners, re-printed on May 21, 1999.

Volume 3, Appendices E to K, January, 1996, Totten Sims Hubicki Associates, Engineers Architects and Planners, re-printed on May 21, 1999.

Munster Hamlet Sewage Treatment Facility Environmental Study Report, A Review of Issues and Concerns Submitted to the Township of Goulbourn (April 23, 1996), June 1996.

Richmond Pumping Station and Forcemain Study Environmental Screening Report, Schedule "B" Environmental Assessment for the Richmond Pumping Station and Forcemain Contingency Plan prepared by: Region of Ottawa-Carleton Engineering Services Branch, 1 June 1999.

Ottawa Water Master Plan, Regional Municipality of Ottawa -Carleton, Approved by Regional Council, July 1997.

Wastewater Master Plan, Regional Municipality of Ottawa-Carleton, Approved by Regional Council, July 1997, Ottawa-Carleton.

CRA, Public and Government Consultation Summary, Wastewater Treatment Alternatives Evaluation Munster Hamlet, Ontario, Prepared for: Regional Municipality of Ottawa-Carleton, September 1998, Ref. No. 12152, re-printed on May 21, 1999.

Hydrogeological Evaluation, Munster Hamlet - Wastewater Treatment Facility Site Regional Municipality of Ottawa-Carleton, October 1998, Ref. No. 12152 (3), re-printed on May 21, 1999.

Final Report for Wastewater Treatment Alternatives Evaluation, Munster Hamlet, Prepared for: The Regional Municipality of Ottawa-Carleton, Prepared by: Conestoga-Rovers & Associates, Ottawa, Ontario, October 1998, Ref. No. 12152 (5)

Wastewater Pipeline Route Alternatives Evaluation, Munster Hamlet, Volume 1, Final Report, Prepared for: The Regional Municipality of Ottawa-Carleton, Prepared by: Conestoga-Rovers & Associates, Ottawa, Ontario, Natural Resource Solutions Inc., Waterloo, Ontario, April 1999. Ref. No. 13455 (1)

Wastewater Pipeline Route Alternatives Evaluation, Munster Hamlet, Volume 2: Public and Government Consultation Summary, Prepared for: The Regional Municipality of Ottawa-

Carleton, Prepared by: Conestoga-Rovers & Associates, Ottawa, Ontario, Natural Resource Solutions Inc., Waterloo, Ontario, April 1999, Ref. No. 13455 (1)

Addendum for the Environmental Study Report, Class Environmental Assessment Wastewater Treatment System Expansion/Upgrade, Munster Hamlet, Prepared for: The Regional Municipality of Ottawa-Carleton, Prepared by: Conestoga-Rovers & Associates, May 1999, Ref. No. 12152 (6).

Ottawa, Munster Hamlet Wastewater Treatment Facility Re-evaluation of Alternatives, Final Report, December 16, 2002, Prepared for: City of Ottawa, R.V. Anderson Associates Limited, XCG Consultants.

Ottawa, Munster Hamlet Wastewater Treatment Facility Technical Memorandum, March 2003, Prepared for: City of Ottawa, R.V. Anderson Associates Limited, XCG Consultants.

Ottawa, Environmental Services Committee, Agenda and Reports, Tuesday, 27 May, 2003.

Hydraulic Transient Analysis of the Richmond Pump Station and Forcemain and Break Investigation - Jock River Crossing in the City of Ottawa, Ontario, Canada, Prepared for David McManus Engineering Limited, Nepean, Ontario, Canada, Environmental Hydraulics Group Inc., August 2003.

Detailed Design Data – Stantec Consulting Limited et al, 2004-2005