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**YDSS INTERCEPTOR TRUNK SEWER PROJECT
NEW COMPARISON OF ALTERNATIVE ROUTE ALIGNMENTS
TOWN OF RICHMOND HILL, PROJECT 76050**

(Regional Council at its meeting on June 23, 2005 amended the following Report by deleting Recommendations 1, 2 and 3 of the Commissioner of Transportation and Works and replace them with the following:

- 1. *Regional Council endorse the 19th Avenue and Leslie Street (Y.R. 12) alignment as the preferred solution for the YDSS Interceptor Sewer Project***
- 2. *Staff be authorized to finalize the new comparison of alternative route alignments report, submit it to the independent peer review team, submit it to the Director, Ministry of the Environment, Central Region and place the report on public record as requested by the October 1, 2004 letter from the Ministry of the Environment. Staff report back to Committee with the full results of the peer review at least 30 days prior to the award of the contract for the tender referred to in recommendation 3; and***
- 3. *Staff be authorized to proceed with the tendering of the contract for the YDSS Interceptor Sewer in the fall of 2005 based on the revised project cost estimate of \$44.1 million.***

The Transportation and Works Committee recommends:

- 1. The presentation by Bala Araniyasundaran, Manager Engineering, Water and Wastewater, be received;**
- 2. The following communications be received:**
 - (a) Cathy Miller, resident, Richmond Hill, June 7, 2005;**
 - (b) Lloyd Helferty, resident, Thornhill, June 13, 2005;**
 - (c) Ben Arasu & Suhitha Ramasamy, residents, Richmond Hill, June 14, 2005;**
 - (d) Sunny Reuter, resident, Richmond Hill, June 14, 2005, forwarding copy of letter to The Honourable Leona Dombrowsky, Minister of the Environment;**
 - (e) Kath McBride, resident, Richmond Hill, June 15, 2005;**
 - (f) Marianne Yake, President, Richmond Hill Naturalists, June 15, 2005;**
- 3. The following deputations and/or written submissions be received:**

- (a) **Marie Thomson, resident, Richmond Hill;**
- (b) **Sharon Bradley, representing Oak Ridges Friends of the Environment and written submission;**
- (c) **Cathy Miller, resident, Richmond Hill and written submission;**
- (d) **Susan Walmer, Chairperson Ratepayers of Aurora Yonge South (RAYS) and written submission;**
- (e) **Josh Matlow, representing Earthroots;**
- (f) **Councillor Erin Shapiro, Town of Markham, representing Thornhill constituents;**
- (h) **Carrie Hoffelner, resident, Richmond Hill and written submission; and**

- 4. The recommendations contained in the following report, May 31, 2005, from the Commissioner of Transportation and Works be adopted.**

1. RECOMMENDATIONS

It is recommended that:

1. Regional Council endorse the 19th Avenue and Leslie Street (Y.R. 12) alignment as the preferred solution for the YDSS Interceptor Sewer Project.
2. Staff be authorized to finalize the new comparison of alternative route alignments report and submit it to the Director, Ministry of the Environment, Central Region and place the report on public record as requested by the October 1, 2004 letter from the Ministry of the Environment.
3. Staff be authorized to proceed with tendering and award of the contract for the YDSS Interceptor Sewer in the fall of 2005 based on the revised project cost estimate of \$44.1 million.

2. PURPOSE

The purpose of this report is to seek endorsement by Regional Council on selection of the preferred solution for the YDSS Interceptor Trunk Sewer Project.

This report also addresses the need to proceed as soon as possible with the utility relocations on 19th Avenue, from Bayview Avenue to Leslie Street to facilitate the reconstruction of 19th Avenue.

3. BACKGROUND

3.1 Basis for Project

In 1997, The Regional Municipality of York completed the Master Plan study for the York Durham Sanitary Sewer (YDSS). This Master Plan was completed to identify and review current conditions and future servicing alternatives necessary to meet population projections in the Region. This Master Plan identified several priority and strategic projects to be implemented. The Ninth Line, 16th Avenue, Highway 404, Lower Leslie Street, and 19th Avenue Trunk sewers were all identified as priority and strategic projects to be completed within ten years of the study. The completion of these projects would twin the existing YDSS through the Towns of Richmond Hill and Markham, and provide relief for the existing sewer system and provide sewage servicing in accordance with the Region's Official Plan. In 2002, the Region completed an update to the Master Plan for the YDSS to ensure continued timely decision-making on the infrastructure considering the most recent planning forecasts. This update confirmed the need for the Lower Leslie Street and 19th Avenue Interceptor sewers and classified them both as priority projects, which were to be completed by 2007. The Lower Leslie Street Trunk and 19th Avenue Interceptor Sewers will provide relief to the existing YDSS along Yonge Street south of 19th Avenue.

Recent modelling work carried out by the Region has confirmed the immediate need for this sewer.

3.2 Project Status

3.2.1 Class Environmental Assessment

The 19th Avenue and Lower Leslie Trunk Sewer project was undertaken as a Schedule B project in accordance with the Municipal Engineers Association's Class Environmental Assessment (Class EA) document (June 2000). Two Public Information Centres were held and a Schedule B Environmental Screening Report was prepared. The report described the problem, the assessment of alternatives and the preferred route alignment, as well as public and agency consultation programs and its results. The Notice of Completion for the Screening Report was filed on June 7, 2003 and no Part II Orders were received on this project within the prescribed 30 day period that ended on July 7, 2003. Therefore the project proceeded to the detailed design phase.

3.2.2 Detailed Design Phase

Earth Tech was retained in November of 2003 through a competitive process to undertake the detailed design and contract administration services for the 19th Avenue Interceptor Leslie Street Trunk Sewer Project at an upset limit of \$794,655.00.

The location of the sewer and artesian conditions expected along 19th Avenue required additional detailed hydrogeotechnical investigations as part of the detailed design phase. In order to confirm the groundwater levels and quantify the zone of influence, pump tests were necessary at strategic locations along the preferred alignment. Prior to installing the

pumping wells, the Region initiated an enhanced public consultation program to inform residents about the project and the expected environmental field investigations. A public information session was held on June 8, 2004 to provide the local residents with an understanding of the project and the need for pumping tests to quantify potential impacts to local wells and environmental features.

The Region's recent experiences with the 16th Avenue Trunk Sewer project had highlighted new and emerging technical, hydrogeological, environmental and stakeholder concerns and issues which were also applicable to this project. Dialogue with a number of the regulatory agencies had identified that these agencies will now demand a much higher standard of study of numerous issues through the project.

Additional consultation with the agencies was necessary to understand the expected level of study, investigations and supporting documentation for both temporary Permit to Take Water (TPTTW) for test wells and construction PTTW for this project. A temporary PTTW is required if water takings beyond 50,000 Litres per day are expected for the pump tests. These pump tests are used to quantify the amount of water that will need to be pumped during construction. The pump tests also provide valuable information on quantifying the expected zone of influence or impact on area wells and the natural environment as it relates to the water takings. The TPTTW application was submitted on July 23, 2004.

3.2.3 Part II Order (Bump-Up) Request Denied with Conditions

On October 1, 2004, the Minister of the Environment formally notified the Region that they had received a request to require York Region to prepare an individual environmental assessment for all remaining YDSS Projects. There were specific concerns with the proximity of the proposed 19th Avenue Interceptor Lower Leslie Trunk Sewer Project to the Jefferson Forest, Oak Ridges Moraine and Rouge Headwaters Complex. Although the Minister denied the request for a Part II Order for this project, eleven project specific conditions have been imposed and have resulted in significant changes in the scope of works for this project. Two conditions which have been the focus of the work plan to-date are as follows:

Condition # 8 states "The Regional Municipality of York shall conduct a new comparison of alternative route alignments having consideration for, among other criteria to be applied in the comparison, the potential dewatering impacts of each alternative. This shall be carried out in full consultation with the public and interested stakeholders. This comparison and the results, including the preferred route alignment which is selected, shall be documented in a report for public record for the proposed project."

Condition #10 states "The Regional Municipality of York shall carry out and document a review of sewer design and construction techniques. The results of this review shall be used to evaluate all reasonable design and construction techniques for this proposed project, and to select the preferred sewer design and

construction technique for the preferred route alignment for this project. The evaluation shall provide an assessment of the impacts of the design and construction technique on all local natural heritage features including, but not limited to, the provincially significant Rouge Headwaters Wetland Complex, the Jefferson Forest Area of Natural and Scientific Interest. The results of the evaluation and the reasons for the selection of the preferred design and construction technique shall be documented in a report by the Regional Municipality of York be placed on public record on the proposed project. The report shall be provided prior to construction, to the Director, MOE, Central Region.”

3.3 19th Avenue Road Improvements

The widening and reconstruction of 19th Avenue was programmed within the 2005 10 Year Capital Program for construction commencement in 2005. Utility relocations and Tenders were subsequently deferred until the outcome of the YDSS route selection review is complete.

The Class EA for the reconstruction of 19th Avenue was completed in 2000 as a Schedule C project in accordance with the Municipal Engineers Association’s Class Environmental Assessment Document. The recommended solution from Bayview Avenue to Leslie Street was to replace the existing two-lane road with a new two lane road constructed to a rural standard. The rural standard will provide granular shoulders and ditches for drainage.

4. ANALYSIS AND OPTIONS

4.1 Project Status

An extensive public consultation program was initiated in January 2005 to complement the extensive work plan designed to satisfy the Minister of the Environment’s Conditions of October 1, 2004. The following table provides a chronology of the events related to the Evaluation Process.

Table 1
Chronology of Events for Evaluation Process

Task/Event	Date
Outreach in Expanded Study Area	November-December 2004
New Research on Expanded Study Area	December - ongoing
Kick Off Meeting for Interceptor Sewer Advisory Committee (ISAC)	January 19, 2005
Second ISAC Meeting	February 1, 2005
Public Information Forum	February 8, 2005
Project Website Launch	February 25, 2005
Third ISAC Meeting (review of Charrette Process)	March 1, 2005
Draft Analysis of Alternatives and Construction Techniques delivered to all Charrette Participants	March 15, 2005
Briefing Session with Charrette Participants who were not ISAC members (familiarize with project)	March 21, 2005
First Charrette to Review Alternatives	March 22, 2005
Second Charrette to Establish Criteria and Weightings	March 29, 2005
Preliminary Evaluation and Ranking of Alternatives by Core Team (based on input from Charrettes)	March 31 – Apr 6
Fourth ISAC Meeting to review evaluation	April 19, 2005
Public Information Forum	April 26, 2005
Update to T&W Committee	May 4, 2005
Update to Richmond Hill Committee of the Whole	May 16, 2005
Fifth ISAC Meeting	May 24, 2005
Finalize Alternatives Assessment Report	End of June 2005

4.1.1 Establishment of the Interceptor Sewer Advisory Committee (ISAC)

The Interceptor Sewer Advisory Committee (ISAC) is a new, collaborative approach process based on the principle, “come, let us sit down and reason together”. York Region created ISAC to act as a sounding board for the draft reports and proposals regulating the YDSS Interceptor Sewer Construction Project. ISAC provides advice and feedback to York Region regarding this study, data and proposed plans.

York Region is committed to satisfying the Minister’s conditions regarding public consultation by increasing project scope and awareness with more clear and informed mechanisms. As such, ISAC provides increased public access to involvement in the detailed planning and construction of the project.

ISAC Members:

Residents and Ratepayers in the Study Area

- Resident – Cathy Miller
- Property Owner – Laurie Canning
- Resident – Lyn Watt
- Resident – Marie Thomson

- Resident – Mark McGuire
- Resident – Neil Mortson
- Resident and Farmer – John Doner
- Resident – Jim Canale-Parola
- Resident – Christine Duncan
- Resident – Brian Biggings
- Resident – Rupi Jeji

Environmental and Conservation NGO's

- Richmond Hill Naturalists – Marianne Yake/ Natalie Helferty
- STORM – Debbe Crandall/ Anna Tillman
- Richmond Hill ACT Now! – Carrie Hoffelner
- Rouge Park Alliance – Barb Davies

Economic Development

- York Region Real Estate Board – Lydia Ingles
- Metrus Developments – Fraser Nelson
- Bazil Development – Paul Bailey
- Ballymore Homes – Gerard Gervais
- Richmond Hill Chamber of Commerce – Mike Mancett

Regulators

- Ministry of the Environment – Anne Neary
- Toronto Region Conservation Authority – Beth Williston/ Don Ford

Town of Richmond Hill

- Commissioner, Engineering and Public Works - Bruce Macgregor

York Region and its Consultants

- YR Senior Project Manager – Laura McDowell
- YR Manager Engineering Water and Wastewater – Bala Araniyasundaran
- YR Director Water and Wastewater – Debbie Korolnek
- Earth Tech – Sal Marrelli/ John Bourrie
- Beatty and Associates – Nancy Rennie
- Michalski Nielsen Associates Limited – Gord Nielson
- Parish Geomorphic – Kim LeBrun

Independent Public Facilitator

- Ogilvie, Ogilvie & Company – Robb Ogilvie/ Debbie Clayton/ Anne Kewley

4.1.2 Alternative Routes

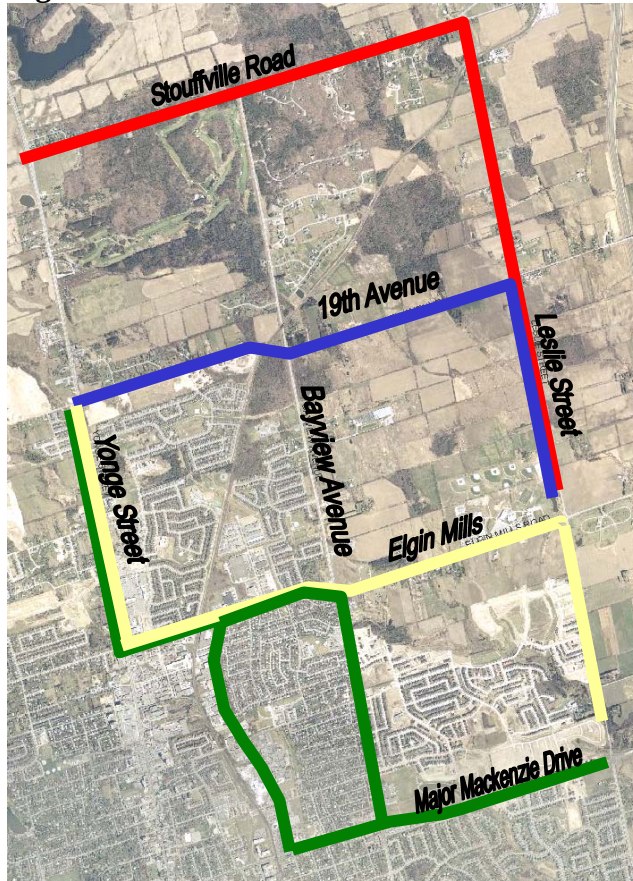
In order to establish the routes for consideration, the team needed to review the function of the interceptor sewer which was to intercept flows just north of 19th Avenue to alleviate the potential for surcharging in the system. In addition to alleviating surcharging potential, the interceptor sewer needed to provide sewage servicing for approved growth

in accordance with the Region's Official Plan. As a result, the study area expanded as far north as Stouffville Road to allow for capturing flows from King City and as far south as Major Mackenzie Drive. Any routes further south than Major Mackenzie Drive resulted in excessive costs due to further twinning of the sewer south of Elgin Mills and limited the ability to eventually divert flows to the new 16th Avenue Sewer currently under construction.

A description of the four alternative alignments is as follows and is illustrated in Figure 1 – Alternative Routes:

1. **Stouffville Road** - Yonge Street to Leslie Street, south on Leslie Street to just north of Elgin Mills Road.
2. **19th Avenue** - Yonge Street to Leslie Street, south on Leslie Street to just north of Elgin Mills Road.
3. **Elgin Mills Road** – from 19th Avenue south on Yonge Street across Elgin Mills to Leslie Street, south on Leslie Street to Major Mackenzie Drive.
4. **Major Mackenzie Drive** – from 19th Avenue south on Yonge Street across Elgin Mills, south on Newkirk Road or Bayview Avenue across Major Mackenzie Drive to Leslie Street.

Figure 1: Alternative Routes



Alternative A:

Tunnel Stouffville Rd, Open Cut Leslie St.

Alternative A2:

Tunnel Stouffville Rd. and Leslie St. to 19th Ave.

Alternative B:

Pumping Station and Forcemain on Stouffville Rd. and Leslie St.

Alternative C:

Open Cut 19th Ave. and Leslie St.

Alternative D:

Tunnel 19th Ave., Open Cut Leslie St.

Alternative G:

Open Cut Yonge St, Elgin Mills, Leslie St

Alternative Gtw:

Tunnel Yonge St, Open Cut Elgin Mills Leslie St.

Alternative H:

Open Cut Yonge St., Elgin Mills, Pumping Station on Elgin Mills

Alternative E:

Open Cut Yonge St, Elgin Mills, Newkirk, Major Mackenzie

Alternative F:

Yonge St, Elgin Mills, Bayview Avenue, Major Mackenzie Drive

4.1.3 Alternative Construction Techniques

The basic alternatives used in the design and construction of sewers involves either gravity sewer system in which the sewage flows through a down gradient sewer or a pressurized system using a series of pump stations and forcemains.

Two primary construction techniques were considered for each of the alternative alignments:

- Open cut excavation and / or tunnelling using an Earth Pressure Balance Tunnelling Machine (EPBM).
- Constructing pumping stations and forcemains just below the surface.

4.2 Evaluation Process

The Alternatives were evaluated according to the following 16 categories of criteria. Life cycle costing was not considered at this stage of the evaluation. It was applied after the evaluation was completed:

- Health and Safety (safe for workers and public).
- Impact on Wells (maintain water supply).
- Impact to Groundwater (protect the groundwater resource).

- Impact on Aquatic Habitat (protect fish and other aquatic life).
- Impact on Wildlife (protect animals and their habitats).
- Affect on significant areas -Jefferson Forest, wetlands, and Oak Ridges Moraine Core and Linkage Areas (minimize impacts on sensitive areas).
- Land Use Impacts (minimize disruption to adjacent land uses).
- Affects on Archeological and Cultural Areas (preserve heritage features).
- Stakeholder Acceptability (acceptance of different groups).
- Constructability (ability to construct).
- Time to complete (ability to construct within acceptable time frame).
- Operability and Maintenance (ease of long-term operation and maintenance).
- Operational Environmental Risk.
- Property Requirements (minimize property requirements).
- Impacts on Traffic (minimize traffic disruption).
- Noise, Vibration, Odour, Construction Nuisance to Public.

4.2.1 Criteria Weightings

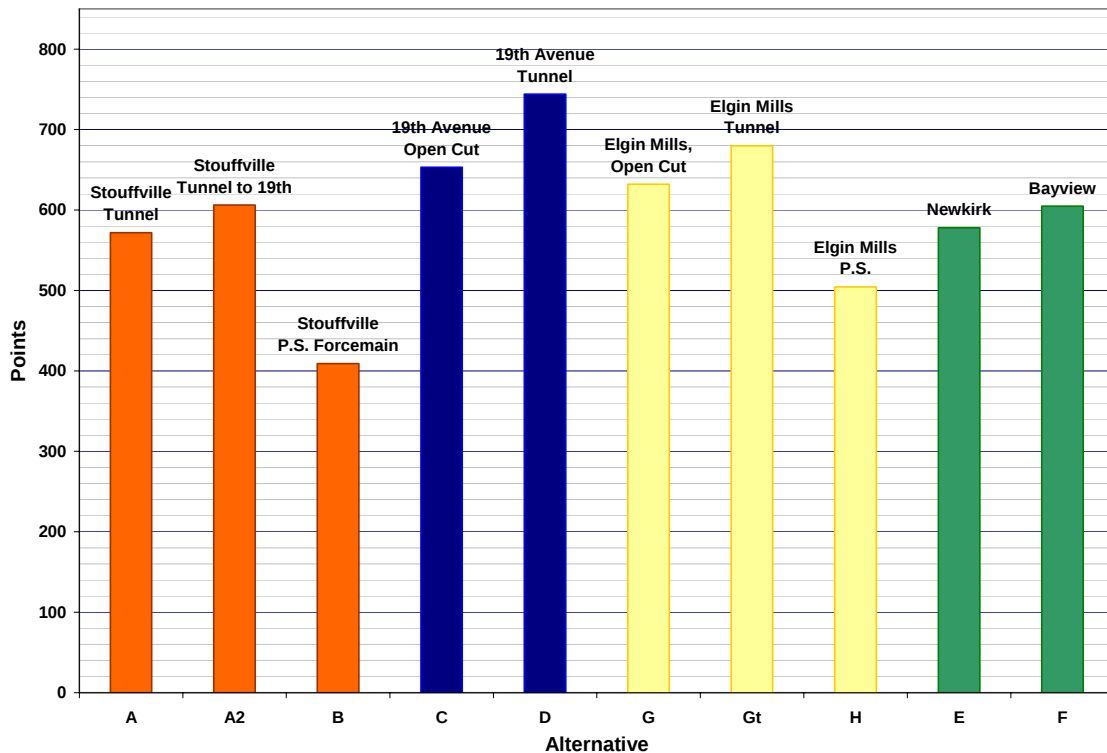
Participants of the Charrettes were consulted on their preferred weightings for each of the criteria categories. The following table provides a summary of the criteria weightings.

Table 2
Criteria Weightings for Evaluation Process

Criteria Category	Weighting
Natural Environment	42%
Impact on Groundwater	
Impact on Aquatic Habitat	
Impact on Aquatic Wildlife	
Affect on Significant Areas	
Operational and Environmental Risk	
Technical	18%
Constructability	
Time to Complete	
Operability and Maintenance	
Property Requirements	
Social/Cultural	40%
Health and Safety	
Impact on Wells	
Stakeholder Acceptability	
Impact on Traffic	
Affects on Archeological Areas	
Noise, Vibration, Odour	

Cost was considered separately following 1st phase of evaluation

4.2.2 Ranking Results Independent of Life Cycle Cost



The top ranked alternative was the tunnelling option along 19th Avenue and using “open-cut” construction along Leslie Street to Elgin Mills Road. The Elgin Mills option including tunnelling along Yonge Street ranked second just slightly ahead of the open cut option along 19th Avenue. In order to determine the best value option, a life cycle cost analysis which considered operation and maintenance costs over a 50-year period were applied to each alternative.

4.2.3 Stakeholder Feedback

4.2.3.1 Key Issues and Concerns

Once the evaluation was complete staff shared the evaluation results with the public, the agencies and key stakeholders through meetings including the Interceptor Sewer Advisory Committee, public meetings, separate stakeholder meetings and the project website.

The feedback staff are receiving from the stakeholders and the public is that their primary concerns relate to dewatering, the impacts to private wells, impacts to the Oak Ridges Moraine, Compliance with the Oak Ridges Moraine Legislation and the potential for urban sprawl on the ORM and in the vicinity of the sewer.

The evaluation process did take into account these concerns and our evaluation process reflected appropriate emphasis on dewatering, impacts to private wells and impacts to all natural features including the ORM and its associated features.

However, Save the Oak Ridges Moraine (STORM) and some members of ISAC continue to express concern that a sewer located along 19th Avenue will open the door to further development both north and south of 19th Avenue and furthermore that a sewer along 19th Avenue will not address the issue of intensification within Richmond Hill. The project teams position on this is that any development in this area would be subject to the Oak Ridges Moraine Legislation, Greenbelt Act, the Planning Act as well as approval from both local and Regional municipal requirements. With respect to the issue raised regarding intensification, once the relief sewer is in place, any intensification planned within Richmond Hill can be accommodated through local servicing connected to the YDSS system either at Yonge Street or at Leslie Street. The YDSS Interceptor Sewer is not required to be constructed in the proposed area of intensification in order to accommodate future planned intensification in Richmond Hill.

4.2.3.2 Oak Ridges Moraine Legislation

With the legislation and the ORMCP in mind, taking into account the broader context of the Ministers conditions – routes along Yonge Street /Elgin Mills Road are not reasonable alternatives to 19th Avenue because:

- The open cut along Yonge Street requires extensive dewatering of the ORM aquifer and has much greater impacts on the environment and local residents and businesses.
- The tunneled option along Yonge Street would be better than the open cut but would cost an additional estimated \$10 million and would present greater construction challenges in locating shafts with the high traffic volume and utility corridors along Yonge Street.

Furthermore, there is no disruption to the Natural Linkage Area (NLA) or to the functions associated with the NLA.

4.2.3.3 Additional Alternative Proposed by Select ISAC Members

On May 12, 2005 the Project Team met with a select group of ISAC Members at their request. These members had retained the Hydrogeological and Geotechnical services from Ernst Zaltsberg and John Morton respectively to offer technical resource services during the alternatives evaluation. These services were funded by the Region as part of our requirement by the Minister of the Environment to provide a technical resource to local residents regarding any future well complaints as a result of dewatering activities. The Region advanced these services and offered \$1,500 funding per ISAC member to provide them access to technical resources during the process to conduct a new comparison of alternative route alignments. This funding amount is consistent with the Council approved process for providing technical resources to local residents as part of the well mitigation and response program, Report 2, Clause 2 of the February 2, 2005 Transportation and Works Committee.

Mr. Morton and Dr. Zaltsberg presented an additional alternative for the Project Team to consider. The additional alternative involves tunnelling by EPBM technology westward from Major Mackenzie Drive and Leslie Street to Newkirk Road, tunnelling north along Newkirk Road to Elgin Mills Road, tunnelling eastward along Elgin Mills Road to Bayview Avenue, open cutting Bayview Avenue north of Elgin Mills Road to 19th Avenue and slightly westward along 19th to the CN tracks, where tunnelling would be re-initiated to Yonge Street. A second variation of this alternative was presented at the ISAC meeting on May 24th, 2005 which involved open cut construction along Bayview Avenue between 19th Avenue and Major Mackenzie Drive in lieu of tunnelling along Newkirk Road. The two routes are depicted in Figure 2 –Additional Alternatives Proposed by John Morton.

The Project Team reviewed these proposed alternatives as part of the public input on this project. The Project Team presented their concerns related to this latest proposed alternative by John Morton at the ISAC meeting on May 24th, 2005. Concerns relate to significant environmental impacts associated with proximity to a provincially significant wetland, as well as open cut construction along Bayview Avenue which runs parallel to two significant cold water fisheries that have been identified as rare spawning areas for Brook Trout. Open cut construction along this area would require dewatering due to the upward water pressures in this area.

Other potential environmental impacts include:

- Reduced discharge to streams from flowing wells along Bayview Avenue.
- Potential to affect groundwater inputs to wetland.
- Potential to impact amphibian recruitments.
- Lowering of water levels at 30 to 40 wells on 19th Avenue and to north and 6 to 10 wells on Bayview Avenue.

The first alternative along Newkirk Road scored 568 points whereas the second variation of that alternative along Bayview Avenue scored 575 points.

In addition to the additional environmental impacts associated with the additional routes proposed by Mr. Morton, the cost is estimated to be \$69 million, over \$25 million more than the preferred alternative along 19th Avenue using EPBM technology. The second variation of the alternative proposed by Mr. Morton with open cut construction along Bayview Avenue between 19th Avenue and Major Mackenzie Drive resulted in a lower cost estimated to be \$48 million but only ranked seventh in the best value analysis.

The additional route will be included in the Public Consultation section of the Alternative Analysis Report which will be placed on public record following endorsement by Council of the preferred route.

Figure 2 – Additional Alternatives Proposed by John Morton

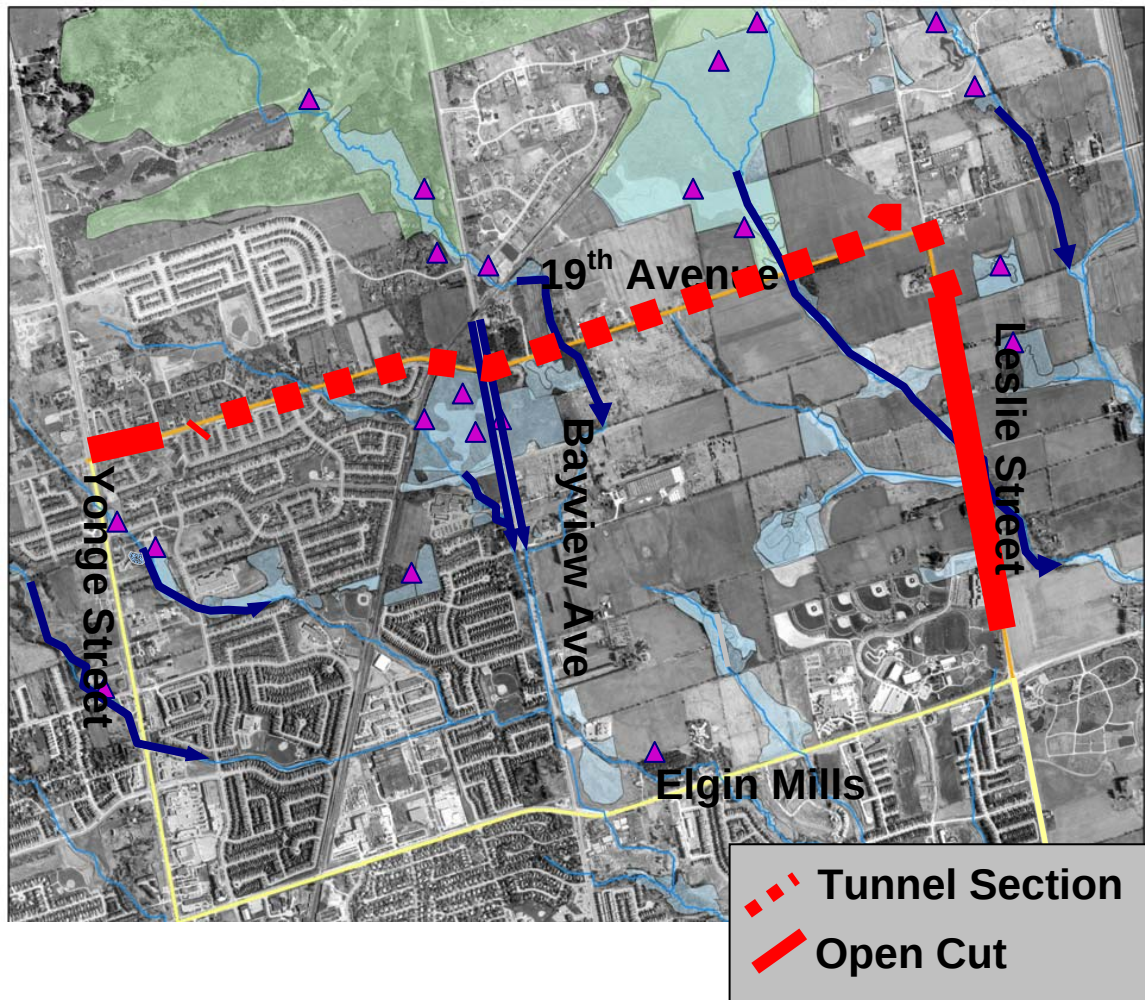


4.2.4 Preferred Alternative

The preferred alignment for the YDSS Interceptor Sewer Project as shown in Table 4 is 19th Avenue and Leslie Street. Although the best value option shown in Table 4 is the open-cut option along 19th Avenue, Regional staff recommends the top technical ranked option, tunnelling along 19th Avenue using EPBM technology (see Figure 3), for the following reasons:

- Requires the least amount of dewatering.
- Results in the least impacts to private wells.
- Results in the least impacts on natural features.
- Results in the least impacts to the Oak Ridges Moraine Aquifer.
- Results in the least amount of disruption to local residents, businesses and traffic.
- Costs approximately \$10 million less expensive than the Yonge/Elgin Mills EPBM.

Figure3 – Preferred Alternative



4.3 19th Avenue Road Improvements

The widening and reconstruction of 19th Avenue, from Yonge Street to Leslie Street, is an independent project that is not dependant upon the YDSS review; however, commencement was deferred pending the outcome of alternative YDSS routes analysis in the event there was opportunity to combine the road and sewer construction contracts along 19th Avenue.

To facilitate the road reconstruction it is necessary to relocate the existing hydro pole line and the existing buried Bell cable since they are presently located within the proposed ditch. Clearing and trimming of existing trees on the north side of 19th Avenue within the public road allowance will be required to relocate the utilities to their ultimate location.

Since the relocation of the Hydro Poles and Bell cable is necessary to facilitate reconstruction of the road only and does not influence the review of alternative YDSS options, proceeding with the utility relocates in the summer of 2005 will ensure the

utilities are relocated in time to enable a call for tenders for road construction in the fall of 2005 upon finalization of the YDSS Interceptor review.

5. FINANCIAL IMPLICATIONS

5.1 Lifecycle Cost Estimate for Preferred Alternative

The top ranked alternative, 19th Avenue using EPBM technology was the third lowest lifecycle cost estimated at \$44.1 million. Although 19th Avenue open cut represented the best value considering it was the lowest lifecycle cost estimated at \$31.5 million, staff recommend that the additional \$12.6 million in cost represents a solution with less impacts to the environment and the public.

Table 3
Lifecycle Cost Comparison for Each Alternative

Route and Construction Technique	Lifecycle Cost (\$ millions)
C- 19 th Avenue (o/c, some tunnel)	\$31.5
D – 19 th Avenue (tunnel using EPBM)	44.1
G – Yonge/Elgin Mills (o/c)	38.4
Gtw – Yonge/Elgin Mills (EPBM Yonge St)	53.5
F – Yonge/Elgin Mills/Bayview/Major Mac (o/c)	43.8
E – Yonge/Elgin Mills/Newkirk/Major Mac (o/c)	43.4
A2 – Stouffville (tunnel Stouffville and Leslie)	61.4
A – Stouffville (tunnel Stouffville, o/c Leslie)	63.6
H – Yonge/Elgin Mills (PS on Elgin Mills)	85.5
B – Stouffville (PS on Stouffville Road)	\$96.2

Notes: 1. The above lifecycle costs do not include any contingencies.
2. O/C - Open Cut Construction
3. EPBM – Earth Pressure Balancing Machine for Tunnelling
4. PS – Pressurized System using Pumping Station and Forcemain

5.2 Best Value Analysis

The following table summarizes the life cycle cost analysis as well as the best value analysis for all alternatives considered. In order to determine the best value to the stakeholders, the technical score is divided by the life cycle cost for each alternative. Therefore, the highest scores represent the best value to the Region and our stakeholders.

Table 4
Ranking of Alternatives based on Value

Route and Construction Technique	Lifecycle Cost (\$ millions)	Points	Value in Points/\$million
C- 19 th Avenue (o/c, some tunnel)	\$31.5	653	20.7
D – 19 th Avenue (tunnel using EPBM)	44.1	744	16.9
G – Yonge/Elgin Mills (o/c)	38.4	632	16.5
F – Yonge/Elgin Mills/Bayview/Major Mac (o/c)	43.8	605	13.8
E – Yonge/Elgin Mills/Newkirk/Major Mac (o/c)	43.4	578	13.3
Gtw – Yonge/Elgin Mills (EPBM Yonge St)	53.5	680	12.7
A2 – Stouffville (tunnel Stouffville and Leslie)	61.4	606	9.9
A – Stouffville (tunnel Stouffville, o/c Leslie)	63.6	572	9.0
H – Yonge/Elgin Mills (PS on Elgin Mills)	85.5	504	5.9
B – Stouffville (PS on Stouffville Road)	\$96.2	409	4.1

Notes: O/C - Open Cut Construction
EPBM – Earth Pressure Balancing Machine for Tunnelling
PS – Pressurized System using Pumping Station and Forcemain

Best Value Analysis shows that in fact 19th Avenue Open Cut is the highest points per million dollars spent, primarily attributed to this being the lowest cost alternative. However, the project team recommend that the next best value option, the 19th Avenue Tunnel using EPBM, be the preferred alternative as it represents the highest evaluation ranking, least amount of impacts to the environment, local residents and businesses and still remains a cost effective option.

5.3 Project Funding

In the 2005 Approved Capital Plan, a total of \$21.5 million has been approved for project 76040 and 76050 the 19th Avenue and Lower Leslie Trunk Sewer Projects. Based on this, there are sufficient funds available to cover expenditures to the end of the fiscal year. It should be noted that the 2005 Budget for this project was based on open cut technology along 19th Avenue and did not reflect the extensive environmental monitoring and mitigation measures that are now required to satisfy agency requirements. In 2006, additional funds will be budgeted in the capital plan as required.

Funding for this project will be allocated 80% development charges and 20% wastewater rates. Additional funds are required due to the higher costs associated with the EPBM technology.

6. LOCAL MUNICIPAL IMPACT

This sewer is required to accommodate future growth within York Region as well as alleviate constraints within the Yonge Street Sewer by intercepting the flows and diverting to the Lower Leslie Street Trunk Sewer. The trunk sewer expansion will continue to provide service to the Towns of Markham, Richmond Hill, Aurora, Newmarket, Whitchurch-Stouffville, the City of Vaughan and the communities of Holland Landing, Queensville and King City.

To ensure timely planned development approvals, the 19th Avenue Interceptor Lower Leslie Street Trunk Sewer must be in place within a timely manner. This project is considered critical to the ability to provide wastewater service to the Region.

The preferred route along 19th Avenue combined with the planned road reconstruction works along 19th Avenue provides a coordinated solution to the infrastructure needs in that area. As a result impacts to the local residents and businesses are kept to a minimum by restricting the construction zone along one main arterial road along 19th Avenue as opposed to two main arterial roads, one for the road project along 19th Avenue and another route either along Stouffville, Elgin Mills or Major Mackenzie Drive for the YDSS Interceptor Sewer Project.

7. CONCLUSION

The preferred route along 19th Avenue and Leslie Street using an Earth Pressure Balancing Machine (EPBM) technology represents the best solution for the YDSS Interceptor Sewer Project as it has the least impacts to the environment, local residents and businesses and is cost effective when compared to other alternatives considered for this project.

The Finalized Report on the Alternative Analysis will be submitted to the Peer Review and placed on Public Record at the end of June 2005.

Staff will continue with the detailed design, approvals, tender and construction phases of this project based on the preferred alternative while the Final Report on the Alternatives Assessment Analysis is posted on public record.

The Senior Management Group has reviewed this report.