



Appendix R

Net Effects Assessment and Comparative Evaluation of the York Durham Sewage System



Appendix R

Net Effects Assessment and Comparative Evaluation of the York Durham Sewage System Modifications Alternative Routes

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Appendix R-1

Table R.1
Net Effects Assessment – York Durham Sewage System Modifications
Alternative Route A

Table R.1: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route A

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
Technical	Carbon Dioxide (CO ₂) Equivalent Footprint	Equivalent CO ₂ (CO ₂ e) generated in tonnes CO ₂ e/year ¹	<ul style="list-style-type: none"> Approximately 207 tonnes CO₂e /year. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures. 	<ul style="list-style-type: none"> Approximately 207 tonnes CO₂e /year.
Natural Environment	Effect on groundwater	Temporary and/or long-term change in groundwater quality	<ul style="list-style-type: none"> Temporary decrease in groundwater quality due to dewatering during construction of the YDSS Modifications Alternative Route along the East Holland River². No long-term change in groundwater quality during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Use construction methods such as limiting excavations below the water table, use directional drilling methods where suitable, use groundwater cut-off structures where appropriate to minimize the amount of temporary dewatering required. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary decrease in groundwater quality due to dewatering during construction of the YDSS Modifications Alternative Route along the East Holland River would be minimized by using appropriate construction methods. No net effects.
		Temporary and/or long-term change in groundwater quantity	<ul style="list-style-type: none"> Temporary decrease in groundwater quantity due to dewatering during construction of the YDSS Modifications Alternative Route along the East Holland River³. No long-term change in groundwater quantity during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Use construction methods such as limiting excavations below the water table, use directional drilling methods where suitable, use groundwater cutoff structures where appropriate to minimize the amount of temporary dewatering required. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary decrease in groundwater quantity due to dewatering during construction of the YDSS Modifications Alternative Route along the East Holland River would be minimized by using appropriate construction methods. No net effects.
	Effect on surface water	Temporary and/or long-term change in surface water quality	<ul style="list-style-type: none"> Temporary decrease in surface water quality at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) due to increased sediment in surface water runoff during construction of the YDSS Modifications Alternative Route. No long-term change in surface water quality during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Develop and implement an Erosion and Sediment Control Plan consistent with the policies outlined in the Erosion and Sediment Control Guidelines for Urban Construction (2006) during construction. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary decrease in surface water quality at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be minimized by developing and implementing an erosion and sediment control plan consistent with policies outlined in the Erosion and Sediment Control Guidelines for Urban Construction (2006). No net effects.
		Temporary and/or long-term change in surface water quantity	<ul style="list-style-type: none"> Temporary increase in surface water quantity at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) due to increase in overland flow during construction of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Develop and implement an Erosion and Sediment Control Plan consistent with the policies outlined in the Erosion and Sediment Control Guidelines for Urban Construction (2006) during construction. 	<ul style="list-style-type: none"> The temporary increase in surface water quantity at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) due to increase in overland flow during construction of the YDSS Modifications Alternative Route would be minimized by developing and implementing an erosion and sediment control plan consistent with policies outlined in the Erosion and Sediment Control Guidelines for Urban Construction (2006).

1. Equivalent CO₂ generated indicator includes direct and indirect emissions (i.e., from electricity generation) of CO₂, CH₄, N₂O. Direct emissions include natural gas, transportation related emissions, process related emissions, equipment related emissions, chemical usage related emissions, and off-site biosolids/residuals decomposition emission. Further details are provided in the Technical Concept Level 2 Document, (CRA et al., February 2013).

2. Due to the expected presence of coarse grained alluvial materials and a high water table, dewatering along Alternative Route A has the potential to be significant.

3. Due to the expected presence of coarse grained alluvial materials and a high water table, dewatering along Alternative Route A has the potential to be significant

Table R.1: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route A

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> No long-term change in surface water quantity during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
	Effect on aquatic habitat or functions	Area (m ²) of temporary or permanent loss of aquatic features or categorical loss of functions by type – including Provincially Significant Wetland, Locally Significant Wetland, watercourses by sensitivity type, and others ⁴	<ul style="list-style-type: none"> Temporary loss of aquatic habitat and function at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route. No permanent loss aquatic habitat or function during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Undertake construction outside of the relevant fish spawning timing window, and in the low-flow, dry summer periods where possible. Implement as appropriate construction Best Management Practices such as dewatering and fish relocation during construction works based on consultations with review agencies. Limit removal of riparian vegetation, especially mature shrubs and trees. Stabilize banks and implement a restoration plan to compensate for temporary loss of aquatic habitat. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary loss of aquatic habitat and function at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be mitigated and compensated for (as required) by undertaking construction outside of the relevant fish spawning timing window, implementing appropriate construction Best Management Practices based on consultations with review agencies, limiting removal of riparian vegetation, stabilizing the banks and implementing a restoration plan. No net effects.
	Effect on stream geomorphology	Change in geomorphic form/function/stability in affected channels	<ul style="list-style-type: none"> Temporary change to channel form, function and stability at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route. No long-term change in geomorphic form, function or stability during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Limit removal of riparian vegetation. Implement post construction restoration of channel form and function. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary change to channel form, function and stability at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be mitigated by limiting vegetation removal and implementing post construction restoration. No net effects.
	Effect on aquatic species including Species at Risk (species of special concern, threatened, endangered) and species of local concern, native and invasive species	Number and type of aquatic species ⁵ potentially affected temporarily or permanently ⁶	<ul style="list-style-type: none"> Temporary disturbance⁷ to aquatic species at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) due to a decrease in surface water quality during construction of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Undertake construction outside of relevant fish spawning timing window, and in the low-flow, dry summer periods where possible. Implement appropriate construction Best Management Practices such as dewatering and fish relocation during construction works. 	<ul style="list-style-type: none"> The temporary disturbance to aquatic species at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) due to a decrease in surface water quality during construction of the YDSS Modifications Alternative Route would be mitigated by undertaking construction outside of the relevant fish spawning timing window and implementing appropriate construction Best Management Practices.

4. Provincially Significant Wetlands, Locally Significant Wetlands and permanent and intermittent watercourses were avoided during the generation of the long list of potential YDSS Modifications Alternative Routes.

5. Aquatic species include species of local concern, native and invasive species.

6. Refer to the Natural Environment Baseline Conditions Report (CRA et al., February 2013) for detailed information on aquatic species.

7. Temporary disturbance to aquatic species at crossings due to decrease in surface water quality during construction of the YDSS Modifications Alternative Route.

Table R.1: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route A

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> No permanent disturbance to aquatic species during operation of the YDSS Modifications Alternative Route. No temporary or permanent disturbance to aquatic Species at Risk during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects. No net effects.
	Effect on groundwater recharge and discharge areas in relation to aquatic/wetland habitat	Area (m ²) of temporary or permanent loss of recharge and discharge areas	<ul style="list-style-type: none"> Temporary reduction in groundwater discharge (baseflow) at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route. No permanent loss of groundwater recharge and discharge areas as they relate to aquatic/wetland habitat during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Use standard construction methods such as limiting excavations below the water table, using groundwater cut-off structures where appropriate to minimize the amount of temporary dewatering required. Direct dewatering discharge back to local watercourse following temperature and clarity control to mitigate temporary loss of baseflow. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary reduction in groundwater discharge (baseflow) at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be mitigated by using appropriate construction methods and directing the discharge back to the local watercourse. No net effects.
	Effect on terrestrial habitat or functions	Area (m ²) of temporary and/or permanent loss of natural heritage features by type – including Environmentally Sensitive Areas (ESAs), Areas of Natural and Scientific Interest (ANSIs), wildlife corridors, and others	<ul style="list-style-type: none"> No temporary or permanent loss of ESAs, ANSIs or wildlife corridors during construction and operation of the YDSS Modifications Alternative Route. Temporary and permanent loss of 3.3 ha of meadow, thicket, plantation, forest, marsh and swamp habitat and associated wildlife habitat (in the Wesley Brooks Conservation Area, the Mabel Davis (Fairy Lake) Conservation Area, the Bailey Ecological Park and within the flood plain of Tannery Creek) during construction and operation of the YDSS Modifications Alternative Route⁸. Temporary and permanent loss of 0.13 ha of cultural meadow, shallow marsh and deciduous swamp habitat and associated wildlife habitat (in the Wesley Brooks Conservation Area, the Mabel Davis (Fairy Lake) Conservation Area, the Bailey Ecological Park and within the flood plain of Tannery Creek) from construction of the staging areas⁹ for the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. Develop and implement a habitat restoration plan to compensate for loss of vegetation communities based on consultations with agencies. Develop and implement a habitat restoration plan to compensate for loss of vegetation communities based on consultations with review agencies. 	<ul style="list-style-type: none"> No net effects. The temporary and permanent loss of 3.3 ha of meadow, thicket, plantation, forest, marsh and swamp habitat and associated wildlife habitat (in the Wesley Brooks Conservation Area, the Mabel Davis (Fairy Lake) Conservation Area, the Bailey Ecological Park and within the flood plain of Tannery Creek) during construction and operation of the YDSS Modifications Alternative Route would be compensated for (as required) by implementing a habitat restoration plan based on consultations with review agencies. The temporary and permanent loss of 0.13 ha of cultural meadow, shallow marsh and deciduous swamp habitat and associated wildlife habitat (in the Wesley Brooks Conservation Area, the Mabel Davis (Fairy Lake) Conservation Area, the Bailey Ecological Park and within the flood plain of Tannery Creek) from construction of the staging areas for the YDSS Modifications Alternative Route would be compensated for (as required) by implementing a habitat restoration plan based on consultations with review agencies.

8. It has been assumed that the YDSS Modifications Alternative Route will disturb a 20 m width over the entire length of Alternative Route A within the Tannery Creek Valley. It has also been assumed that construction of the YDSS Modifications Alternative Route will be conducted using open cut construction methods rather than less invasive methods such as directional drilling. This likely has led to an over estimation of the area of terrestrial habitat affected, as many areas within the Tannery Creek Valley are planned to be constructed using less invasive directional drilling, wherever practical.

9. The area disturbed during construction of the staging areas has been estimated assuming that land clearing will be required for directional drilling and staging under all major stream crossings and at approximately 400 m intervals within the Tannery Creek Valley along YDSS Modifications Alternative Route A.

Table R.1: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route A

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
	Effect on terrestrial species including Species at Risk, (species of special concern, threatened, endangered) species of local concern, native and invasive species, and area-sensitive species	Number and type of terrestrial species ¹⁰ potentially affected temporarily and/or permanently ¹¹	<ul style="list-style-type: none"> ▪ Temporary and permanent disturbance¹² to terrestrial species in the Wesley Brooks Conservation Area, the Mabel Davis (Fairy Lake) Conservation Area, the Bailey Ecological Park and within the flood plain of Tannery Creek during construction and operation of the YDSS Modifications Alternative Route and associated staging areas. ▪ Temporary disturbance to terrestrial species within the north-south wildlife corridor along Tannery Creek during construction of the YDSS Modifications Alternative Route. ▪ Temporary disruption to Savannah Sparrow bird species during construction of the YDSS Modifications Alternative Route. ▪ No temporary or permanent disturbance to Species at Risk during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> ▪ Use construction methods such as timing/noise restrictions to protect nesting birds, wildlife, and amphibians. ▪ Provide tree protection and delineation of work adjacent to natural areas. ▪ Relocate amphibian species during construction works, if required. ▪ Use construction methods such as tree protection, delineated setbacks from natural areas and timing/noise restrictions to protect terrestrial species. ▪ Conduct pre-construction bird surveys to determine habitat use. ▪ Use construction Best Management Practices such as tree protection, delineated setbacks from natural areas and timing/noise restrictions to protect nesting bird species and wildlife. ▪ No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> ▪ The temporary and permanent disturbance to terrestrial species in the Wesley Brooks Conservation Area, the Mabel Davis (Fairy Lake) Conservation Area, the Bailey Ecological Park and within the flood plain of Tannery Creek during construction and operation of the YDSS Modifications Alternative Route and associated staging areas would be minimized by using appropriate construction methods, providing tree protection and delineation or work adjacent to natural areas and relocating amphibian species, as required ▪ The temporary disturbance to terrestrial species within the north-south wildlife corridor along Tannery Creek during construction of the YDSS Modifications Alternative Route would be minimized by using appropriate construction methods. ▪ The temporary disruption to Savannah Sparrow bird species during construction of the YDSS Modifications Alternative Route would be minimized by conducting pre-construction bird surveys to determine habitat use and using construction Best Management Practices. ▪ No net effects.
	Effect on groundwater recharge and discharge areas in relation to terrestrial habitat	Area (m ²) of temporary and/or permanent loss of recharge and discharge areas	<ul style="list-style-type: none"> ▪ No temporary or permanent loss of groundwater recharge and discharge areas in relation to terrestrial habitat during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> ▪ No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> ▪ No net effects.

10. Terrestrial species include species of local concern, native and invasive species and area-sensitive species.

11. Refer to the Natural Environment Baseline Conditions Report (CRA et al., April 2013) for detailed information on terrestrial species.

12. Disturbance refers to construction-related activities (i.e., noise, vibration, dust, etc.)

Table R.1: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route A

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
Built Environment	Effect on agricultural operations and capital investment related to agriculture	Approximate area (ha) of active agricultural operations ¹³ affected	<ul style="list-style-type: none"> No temporary or permanent loss of active agricultural operations during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
		Extent of disruption of active agricultural operations such as: <ul style="list-style-type: none"> Fragmentation of agricultural fields Disturbance to artificial drainage systems and agricultural drains Removal and/or disturbance of farm fences, entrances and paddocks Disruption of agricultural-related businesses Disruption of normal external haul routes for farm machinery movements 	<ul style="list-style-type: none"> No temporary or permanent disruption to active agricultural operations during construction or operation of the YDSS Modifications Alternative Route as it is located within an Urban Area. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
	Effect on existing residences, businesses, and/or community, institutional, and recreational facilities ¹⁴	Number and type of residences displaced Number and type of residences temporarily or permanently disrupted ¹⁵	<ul style="list-style-type: none"> No displacement of residences during construction and operation of the YDSS Modifications Alternative Route. Temporary disruption to driveway access for approximately 41 private residences during construction of the YDSS Modifications Alternative Route, including: <ul style="list-style-type: none"> Section of Route along Bayview Parkway from Newmarket Pumping Station to Davis Drive – 29 private residences with 29 driveway accesses: <ul style="list-style-type: none"> 28 private residences each with 1 access off of Bayview Parkway 1 private residence with 1 access off of Bayview Parkway and 1 undisturbed access off of Heman Street Section of Route from Davis Drive to Water Street – 9 private residences with 9 driveway accesses off of Charles Street. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. Provide temporary driveway access and arrangements for waste collection to affected residences and notify residences of alternate arrangements. 	<ul style="list-style-type: none"> No net effects. The temporary disruption to driveway access for approximately 41 private residences during construction of the YDSS Modifications Alternative Route would be minimized by providing temporary driveway access, arrangements for waste collection and notifying residents of the alternative arrangements.

13. Active agricultural land removed refers to the area being ploughed (i.e., excludes barns, buildings etc).

14. Information regarding existing residences and businesses is accurate as of May, 2012.

15. Disruption to residences has been applied with respect to driveway accesses (including waste collection). Disruption that relates to odour, noise and vibration are considered in the respective indicators below.

Table R.1: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route A

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> ▪ Section of Route from Water Street to Mulock Drive – 3 private residences with 3 driveway accesses and 2 private residences whose access is only by Cotter Street: <ul style="list-style-type: none"> ▪ 2 private residences each with 1 access off of Cotter Street ▪ 1 private residence with 1 access off of Cotter Street and 1 undisrupted access off of Second Street ▪ Section of Route from Mulock Drive to Connection to Existing Gravity Sewer – No residences ▪ Temporary disruption to road access for 2 private residences that can only be accessed by Cotter Street (section of route from Water Street to Mulock Drive) during construction of the YDSS Modifications Alternative Route. ▪ Temporary disruption to small portions of 4 private residences (including 1 multi-unit residential complex) where staging areas are constructed within these properties, and disruption to 1 multi-unit residential complex owned by York Region where the YDSS Modifications Alternative Route is constructed. <ul style="list-style-type: none"> ▪ Section of Route from Davis Drive to Water Street –2 multi-unit residential complexes (1 private property and 1 property owned by York Region), where the YDSS Modifications Alternative Route will be constructed within the properties but will not disrupt accesses off of Timothy Street ▪ Section of Route from Water Street to Mulock Drive – 1 private residence where the staging area will be constructed within the property but will not disrupt driveway access off of Second Street ▪ Staging Sites at Cotter Street and Bogart Pumping Station (Bogart Route) – 2 private residences where the staging areas will be constructed within the properties but will not disrupt driveway access off of Second Street and Hamilton Street ▪ No permanent disruption to residences during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> ▪ Provide temporary access for local roads and arrangements for waste collection to affected residences and notify residences of alternate arrangements. ▪ Provide compensation in accordance with York Region’s policies. ▪ No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> ▪ The temporary disruption to road access for 2 private residences that can only be accessed by Cotter Street during construction of the YDSS Modifications Alternative Route would be minimized by providing access for local roads and notifying residents of the alternative arrangements. ▪ The temporary disruption to small portions of approximately 4 private residences (including 1 multi-unit residential complex) where staging areas are constructed within the properties, and 1 multi-unit residential complex owned by York Region where the YDSS Modifications Alternative Route is constructed would be compensated for (as necessary) in accordance with York Region’s policies. ▪ No net effects.

Table R.1: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route A

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
		Number and characteristics of businesses displaced ¹⁶	<ul style="list-style-type: none"> No displacement of businesses during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
		Number and characteristics of businesses temporarily or permanently disrupted ^{17,18}	<ul style="list-style-type: none"> Temporary disruption to approximately 12 driveway accesses for 14 businesses during construction of the YDSS Modifications Alternative Route¹⁹, including: <ul style="list-style-type: none"> Section of Route along Bayview Parkway from Newmarket Pumping Station to Davis Drive – 2 businesses with 3 driveway accesses, as well as 1 business with 1 driveway access and construction of YDSS Modifications Alternative Route within property: <ul style="list-style-type: none"> 1 business with 1 access off of Bayview Parkway 1 business with 2 accesses off of Bayview Parkway 1 business with 1 access off of Bayview Parkway and 1 undisrupted access off of Davis Drive Section of Route from Davis Drive to Water Street - 11 businesses with 8 driveway accesses: <ul style="list-style-type: none"> 3 businesses each with 1 access off of Charles Street 2 businesses each with 2 accesses off of Charles Street 6 businesses that share 1 access off of Charles Street and 1 undisrupted access off of Davis Drive Section of Route from Water Street to Mulock Drive – No businesses Temporary disruption to small portions of 3 private businesses where the YDSS Modifications Alternative Route and/or staging areas are constructed within the business properties, including: <ul style="list-style-type: none"> Section of Route along Bayview Parkway from Newmarket Pumping Station to Davis Drive <ul style="list-style-type: none"> 1 business with 1 access off of Bayview Parkway and 1 undisrupted access off of Davis Drive (included above) 	<ul style="list-style-type: none"> Provide temporary driveway access and access signage, arrangements for waste collection to affected businesses and notify businesses of alternative arrangements. Provide compensation in accordance with York Region's policies. 	<ul style="list-style-type: none"> The temporary disruption to approximately 12 driveway accesses for 14 businesses during construction of the YDSS Modifications Alternative Route would be minimized by providing temporary driveway access and access signage, arrangements for waste collection and notifying businesses of the alternative arrangements. The temporary disruption to small portions of 3 private businesses where the YDSS Modifications Alternative Route and/or staging areas are constructed within the business properties would be compensated for (as necessary) in accordance with York Region's policies.

16. Does not include agricultural businesses. Agricultural businesses are included under the evaluation criteria: "Effect on agricultural operations and capital investment related to agriculture".

17. Does not include agricultural businesses. Agricultural businesses are included under the evaluation criteria: "Effect on agricultural operations and capital investment related to agriculture".

18. Disruption to businesses has been applied with respect to driveway accesses, which considers customer access, deliveries and waste collection, etc. Disruption that relates to odour, noise and vibration are considered in the respective indicators below.

19. See the Land Use Baseline Conditions Report (CRA et al., April 2013) for descriptions and characteristics of businesses.

Table R.1: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route A

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> ▪ Section of Route from Mulock Drive to Connection to Existing Gravity Sewer – 2 businesses with construction of YDSS Modifications Alternative Route and/or staging areas within the properties but undisrupted driveway accesses off of Mulock Drive ▪ Staging Sites at Cotter Street and Bogart Pumping Station (Bogart Route) – No businesses ▪ No permanent disruption to businesses during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> ▪ No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> ▪ No net effects.
		Number and characteristics of community, institutional, and recreational facilities displaced	<ul style="list-style-type: none"> ▪ No displacement of community, institutional, and recreational facilities during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> ▪ No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> ▪ No net effects.
		Number and characteristics of community, institutional, and recreational facilities temporarily or permanently disrupted	<ul style="list-style-type: none"> ▪ Temporary disruption to 7 driveway accesses for 5 community, institutional and recreational facilities (including Tom Taylor Trail, George Richardson Park, Lake Simcoe Region Conservation Authority, York Region Community Service Housing Department, and Newmarket Recreation Youth Centre and Sk8park) during construction of the YDSS Modifications Alternative Route. ▪ Section of route along Bayview Parkway from Newmarket Pumping Station to Davis Drive - 2 facilities with 2 driveway accesses and 2 facilities with 3 driveway accesses: <ul style="list-style-type: none"> ▪ 2 recreational facilities, including Tom Taylor Trail and George Richardson Park each with 1 access off of Bayview Parkway. ▪ 2 community/institutional facilities, including the Lake Simcoe Region Conservation Authority with 2 accesses off of Bayview Parkway and the York Region Community Service Housing Department with 1 access off of Bayview Parkway. ▪ Section of Route from Davis Drive to Water Street – 1 recreational facility, the Newmarket Recreation Youth Centre and Sk8park, with 2 accesses off of Charles Street. ▪ Temporary disruption to portions of 9 community, institutional and recreational facilities where the YDSS Modifications Alternative Route and/or staging areas are constructed within these properties. 	<ul style="list-style-type: none"> ▪ Provide temporary driveway access and access signage, arrangements for waste collection to affected community, institutional, and recreational facilities and notify facilities of alternative arrangements. ▪ Provide compensation in accordance with York Region's policies. 	<ul style="list-style-type: none"> ▪ The temporary disruption to 7 driveway accesses for 5 community, institutional and recreational facilities (including Tom Taylor Trail, George Richardson Park, Lake Simcoe Conservation Authority, York Region Community Service Housing Department, and Newmarket Recreation Youth Centre and Sk8park) during construction of the YDSS Modifications Alternative Route would be minimized by providing temporary driveway access and access signage, arrangements for waste collection and notifying the facilities of the alternative arrangements. ▪ The temporary disruption to portions of 9 community, institutional and recreational facilities (including Tom Taylor Trail, Lake Simcoe Conservation Authority, York Region Community Service Housing

Table R.1: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route A

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> ▪ Section of route along Bayview Parkway from Newmarket Pumping Station to Davis Drive - 1 facility with no driveway accesses where the YDSS Modifications Alternative Route will be constructed within the property, and 2 facilities with 3 driveway accesses where the YDSS Modifications Alternative Route will be constructed within the property: <ul style="list-style-type: none"> ▪ 1 recreational facility with no accesses, Mabel Davis Conservation Area where the YDSS Modifications Alternative Route will be constructed within the property ▪ 2 community/institutional facilities, including the Lake Simcoe Region Conservation Authority with 2 accesses off of Bayview Parkway and the York Region Community Service Housing Department with 1 access off of Bayview Parkway, where the YDSS Modifications Alternative Route will be constructed within the properties (included in the totals above) ▪ Section of Route from Davis Drive to Water Street –2 facilities where the YDSS Modifications Alternative Route will be constructed within the properties: <ul style="list-style-type: none"> ▪ 1 recreational facility, Tom Taylor Trail, where the YDSS Modifications Alternative Route will be constructed within the property but will not disrupt accesses off of Timothy Street ▪ 1 institutional facility, the York Regional Police District 1 Headquarters, where the YDSS Modifications Alternative Route will be constructed within the property but will not disrupt accesses off of Prospect Street and Water Street ▪ Section of Route from Water Street to Mulock Drive – 1 facility, Fairy Lake Park, where the YDSS Modifications Alternative Route will be constructed within the property but accesses off of Water Street and Cane Parkway are undisrupted ▪ Section of Route from Mulock Drive to Connection to Existing Gravity Sewer – 2 recreational facilities, the Bailey Ecological Park and St. Andrew's Valley Golf Club, where the YDSS Modifications Alternative Route will be constructed within the properties but accesses are undisrupted 		<p>Department, Mabel Davis Conservation Area, York Regional Police District 1 Headquarters, Fairy Lake Park, Bailey Ecological Park, St. Andrew's Valley Golf Club, and College Manor Park) where the YDSS Modifications Alternative Route and/or staging areas are constructed within these properties would be compensated for (as necessary) in accordance with York Region's policies.</p>

Table R.1: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route A

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> Staging Sites at Cotter Street and Bogart Pumping Station (Bogart Route) – 1 recreational facility, College Manor Park, where the staging area will be constructed within the property but will not disrupt the access off of College Manor Drive No permanent disruption to community, institutional, and recreational facilities during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
	Effect of vibration on existing buildings	Number of existing buildings affected and extent and duration of adverse effects ²⁰	<ul style="list-style-type: none"> Temporary increase in vibration levels at approximately 118 adjacent²¹ buildings (including 87 residences, 16 businesses and 15 community/ institutional/ recreation facilities) during construction of the YDSS Modifications Alternative Route. Structural damage to historic buildings potentially sensitive to noise and vibration²² in close proximity and of inferior / aged condition during construction of the YDSS Modifications Alternative Route. No permanent increase in vibration levels during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Implement Best Management Practices for vibration reduction to minimize temporary construction-related effects, including measures such as: <ul style="list-style-type: none"> Staged construction so demolition, earth-moving and ground-impacting activities do not occur at the same time. Relocate heavy equipment travel routes away from sensitive buildings. Limit heavy construction to daytime hours. Use specialized drilling equipment and methods (avoid sheet piling, jack hammer, vibratory rollers, etc.). Establish minimum setback distances between the YDSS Modifications Alternative Route and historic buildings (e.g., built heritage resources etc.). No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary increase in vibration levels at approximately 118 adjacent buildings (including 87 residences, 16 businesses and 15 community/ institutional/ recreation facilities) during construction of the YDSS Modifications Alternative Route would be minimized by implementing Best Management Practices for vibration reduction (i.e. staged construction, limiting construction hours, use of specialized drilling equipment, etc.). The structural damage to historic buildings potentially sensitive to noise and vibration in close proximity and of inferior / aged condition during construction of the YDSS Modifications Alternative Route would be mitigated by establishing a minimum safe setback distance between the YDSS Modifications Alternative Route and sensitive buildings. No net effects.
	Effect on property	Number and extent of properties affected and ownership	<ul style="list-style-type: none"> No property acquisition required during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects

20. Effect will depend on proximity to construction activity, building construction and subsurface soil conditions.

21. Adjacent buildings were evaluated for the YDSS Modifications Alternative Route since the noise effects are construction-related and the equipment is mobile rather than stationary. Potentially affected locations would be those receivers immediately adjacent to the road.

22. The locations of historic buildings potentially sensitive to noise and vibration within the UYSS EA study area were identified in the Cultural Heritage Baseline Conditions Report (CRA et al., April 2013).

Table R.1: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route A

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> ▪ Permanent modification to existing easement²³ within approximately 24 properties during operation of the YDSS Modifications Alternative Route: <ul style="list-style-type: none"> ▪ Section of Route from Newmarket Pumping Station to Heman Street <ul style="list-style-type: none"> ▪ Potential extension of existing easement to the east of the existing forcemain within 2 properties owned by the Town of Newmarket. ▪ Section of Route along Bayview Avenue from to Heman Street to Davis Drive <ul style="list-style-type: none"> ▪ Potential extension of existing easement to the west of the existing forcemain within 1 property owned by the Lake Simcoe Region Conservation Authority, 1 property owned by York Region and 1 private property (multi-unit business complex). ▪ Section of Route along Queen Street <ul style="list-style-type: none"> ▪ Potential extension of existing easement to the north of the existing easement within 2 property owned by the Lake Simcoe Region Conservation Authority and 2 properties owned by the Town of Newmarket. ▪ Section of Route from Queen Street to Water Street <ul style="list-style-type: none"> ▪ Potential extension of existing easement to the east of the existing easement within 1 property owned by the Town of Newmarket, 1 private property (multi-unit residential complex), and 2 properties owned by York Region (1 Police Station and 1 multi-unit residential complex). ▪ Potential extension of existing easement to the west of the existing easement within 1 property owned by the Town of Newmarket. ▪ Section of Route from Water Street to Mulock Drive <ul style="list-style-type: none"> ▪ Potential extension of existing easement to the east of the existing easement within 4 properties owned by the Town of Newmarket, and 1 property owned by Lake Simcoe Region Conservation Authority. 	<ul style="list-style-type: none"> ▪ Compensate for acquisition of permanent easement on private property in accordance with standard Regional procedures and policies. 	<ul style="list-style-type: none"> ▪ The permanent modification to existing easement within approximately 24 properties during operation of the YDSS Modifications Alternative Route would be compensated for (as necessary) in accordance with standard Regional procedures and policies.

23. Exact extent of easement required to be determined during detailed design.

Table R.1: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route A

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> Section of Route from Mulock Drive to Existing Gravity Sewer <ul style="list-style-type: none"> Potential extension of existing easement to the east of the existing easement within 1 property owned by Lake Simcoe Region Conservation Authority, 3 private properties (1 business, 1 vacant, 1 recreational), and 1 hydro corridor owned by Hydro One. 		
		Total area of property acquisition required (ha)	<ul style="list-style-type: none"> No property acquisition during construction or operation of the YDSS Modifications Alternative Route. Permanent acquisition of existing easement²⁴ within approximately 24 properties (listed above) during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. Compensate for acquisition of permanent easement on private property in accordance with standard Regional procedures and policies. 	<ul style="list-style-type: none"> No net effects. The permanent acquisition of existing easement within approximately 24 properties during operation of the YDSS Modifications Alternative Route would be compensated for (as necessary) in accordance with standard Regional procedures and policies.
	Effect on existing roadway/utility infrastructure	Number of roadways and type affected and extent and duration of adverse effects	<ul style="list-style-type: none"> Temporary disruption to 10 roadways, where the alternative route follows or crosses the existing roadway, during construction of the YDSS Modifications Alternative Route: <ul style="list-style-type: none"> Bayview Parkway (Town Minor Collector Road) and access to Heman Street (Town Local Road) to accommodate closures of some lanes on Bayview Parkway for up to 4 months Charles Street (Town Local Road) and access to Granby Place (Town Local Road) to accommodate closure of the west lane of Charles Street for up to 1 month Queen Street (Town Minor Collector Road) to accommodate crossing at Concession Street for 2 weeks Concession Street (Town Local Road) to accommodate closure of the west lane for up to 2 months Water Street (Town Primary Collector Road) to accommodate crossing of Water Street Cotter Street (Town Local Road) to accommodate closure of all lanes for approximately 12 months Mulock Drive (Region Arterial Road) to accommodate crossing of Mulock Drive. Davis Drive (Region Arterial Road) to accommodate crossing of Davis Drive 	<ul style="list-style-type: none"> Prepare and implement a traffic management plan describing detours for road closures and/or lane closures during construction of the YDSS Modifications Alternative Route and provision of temporary access, as required. 	<ul style="list-style-type: none"> The temporary disruption to 10 roadways, where the Alternative Route follows or crosses the existing roadway, during construction of the YDSS Modifications Alternative Route would be minimized by implementing a traffic management plan and providing temporary access, as required to the following: <ul style="list-style-type: none"> Bayview Parkway (Town Minor Collector Road) and access to Heman Street (Town Local Road) to accommodate closures of some lanes on Bayview Parkway for up to 4 months Charles Street (Town Local Road) and access to Granby Place (Town Local Road) to accommodate closure of the west lane of Charles Street for up to 1 month Queen Street (Town Minor Collector Road) to accommodate crossing at Concession Street for 2 weeks Concession Street (Town Local Road) to accommodate closure of the west lane for up to 2 months Water Street (Town Primary Collector Road) to accommodate crossing of Water Street Cotter Street (Town Local Road) to accommodate closure of all lanes for approximately 12 months Mulock Drive (Region Arterial Road) to accommodate crossing of Mulock Drive.

24. Exact extent of easement required to be determined during detailed design.

Table R.1: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route A

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> ▪ Timothy Street (Town Local Road) to accommodate crossing of Timothy Street ▪ Pearson Street (Town Local Road) to accommodate crossing of Pearson Street ▪ No permanent disruption to roadways during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> ▪ No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> ▪ Davis Drive (Region Arterial Road) to accommodate crossing of Davis Drive ▪ Timothy Street (Town Local Road) to accommodate crossing of Timothy Street ▪ Pearson Street (Town Local Road) to accommodate crossing of Pearson Street ▪ No net effects.
		Number and type of utilities affected and extent and duration of adverse effects ²⁵	<ul style="list-style-type: none"> ▪ Temporary disruption to 4 major utilities (York Region Water and Wastewater Bayview Operations Centre, Canadian National rail corridor, hydro corridor and Bogart Pumping Station) located adjacent to the YDSS Modifications Alternative Route during construction. ▪ Temporary disruption to the watermain, sanitary sewer, local gas, local hydro, local cable and local telephone utilities on Cotter Street between Water Street and 100 m south of Second Street for up to 4 months during construction of the YDSS Modifications Alternative Route. ▪ No permanent disruption to utilities during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> ▪ Locate utilities based on consultations with utility providers and relocate utilities if required. ▪ Locate utilities based on consultations with utility providers and relocate utilities if required. ▪ No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> ▪ The temporary disruption to 4 major utilities (York Region Water and Wastewater Bayview Operations Centre, Canadian National rail corridor, hydro corridor and Bogart Pumping Station) during construction of the YDSS Modifications Alternative Route would be mitigated by locating utilities based on consultations with utility providers and relocating if required. ▪ The temporary disruption to watermain, sanitary sewer, local gas, local hydro, local cable and local telephone utilities on Cotter Street between Water Street and 100 m south of Second Street would be minimized by locating utilities based on consultation with utility providers and, if confirmed on-site, relocating if required (Temporary interruption of service during relocation is anticipated). ▪ No net effects.

25. Distances are accurate within 50 m.

Table R.1: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route A

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
Social Environment	Effect on wells	Number of wells and type affected, extent and duration and nature (water quality/quantity) of adverse effects.	<ul style="list-style-type: none"> No temporary or long-term change to groundwater wells during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
	Effect of noise on sensitive receptors ²⁶	Number of sensitive receptors affected and extent and duration of adverse effects	<ul style="list-style-type: none"> Temporary increase in noise levels at approximately 87 adjacent²⁷ residences (including 2 multi-unit complexes) during construction of the YDSS Modifications Alternative Route. No permanent increase in noise levels during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Adhere to Ministry of the Environment (MOE) Urban (NPC-205) and Rural (NPC-232) noise limits. Adhere to Town of East Gwillimbury's Noise By-law (2004-80) limits. Implement Best Management Practices for noise reduction to minimize temporary construction-related nuisance effects (i.e., operators limit impact noise from tailgate, use of construction equipment that meets the requirements of the MOE Construction Equipment Publication (NPC-115). Develop complaint resolution procedure for responding to complaints resulting from construction. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary increase in noise levels at approximately 87 adjacent residences (including 2 multi-unit complexes) during construction of the YDSS Modifications Alternative Route would be minimized by adhering to the Ministry of the Environment's noise limits, the Town of East Gwillimbury's Noise By-law (2004-80), implementing construction Best Management Practices for noise reduction and developing a complaint resolution procedure. No net effects.
	Effect of perceptible vibration levels on sensitive receptors	Number of sensitive receptors ²⁸ affected and extent and duration of adverse effects	<ul style="list-style-type: none"> Temporary increase in vibration levels at approximately 87 residences (including 2 multi-unit complexes) during construction of the YDSS Modifications Alternative Route. No permanent increase in vibration levels during operation of the YDSS Modifications Alternative Route 	<ul style="list-style-type: none"> Adhere to MOE vibration limits as set out in NPC-207 Publication (NPC 207 Impulse Vibration in Residential Buildings). Implement Best Management Practices for vibration reduction to minimize temporary construction-related nuisance effects during daytime, including: <ul style="list-style-type: none"> Staged construction so demolition, earth-moving and ground-impacting activities do not occur at the same time Relocate heavy equipment travel routes away from sensitive buildings. Limit heavy construction to daytime hours. Use specialized drilling equipment and methods (avoid sheet piling, jack hammer, vibratory rollers, etc.). Develop complaint resolution procedure for responding to complaints resulting from construction. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary increase in vibration levels at approximately 87 residences (including 2 multi-unit complexes) during construction of the YDSS Modifications Alternative Route would be minimized by adhering to the Ministry of the Environment's vibration limits as set out in the NPC-207 Publication, implementing Best Management Practices for vibration reduction, and developing a complaint resolution procedure. No net effects.

26. As defined by the Ministry of the Environment (MOE) in NPC-205, a sensitive "point of reception" means any point on the premises of a person where sound or vibration originating from other than those premises is received. For the purpose of approval of new sources of noise, including verifying compliance with Section 9 of the Environmental Protection Act, the point of reception may be located on any of the following existing or zoned for future use premises: permanent or seasonal residences, hotels/motels, nursing/retirement homes, rental residences, hospitals, camp grounds, and noise sensitive buildings such as schools and places of worship.

27. Adjacent buildings were evaluated for the YDSS Modifications Alternative Route since the noise effects are construction related and the equipment is mobile rather than stationary. Potentially affected locations would be those receivers immediately adjacent to the road.

28. Sensitive receptors from a vibration perspective include permanent or seasonal residences, hotels/motels, nursing/retirement homes, rental residences, hospitals, campgrounds and vibration sensitive buildings.

Table R.1: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route A

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
	Effect of odour sensitive receptors from current conditions ²⁹	Number of sensitive receptors impacted and extent and duration of impacts	<ul style="list-style-type: none"> No temporary or permanent increase in odour during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
Economic Environment	Effect on approved/planned land uses	Number, extent, and type of approved/planned land uses affected	<ul style="list-style-type: none"> No effects on approved/planned land uses during construction or operation of the YDSS Modifications Alternative Route, as there will be no permanent above ground structures associated with YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
	Effect on agricultural soil resources	<p>Approximate area (ha) of Class 1, Class 2, and Class 3 soils removed (priority in that order).</p> <p>Approximate area (ha) of Specialty Cropland removed, and/or area of agricultural soils disturbed, and/or area of active agricultural land removed</p>	<ul style="list-style-type: none"> No removal of Class 1, Class 2 and Class 3 soils along the route during construction or operation of the YDSS Modifications Alternative Route. No removal of Specialty Cropland, no disturbance to agricultural soils and no removal of active agricultural land during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects. No net effects.
Cultural Environment	Effects on known or potential significant archaeological resources	Number and type of potentially significant, known archaeological sites affected.	<ul style="list-style-type: none"> No known archaeological sites affected during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
		Area (ha) of archaeological potential (i.e., lands with potential for the presence of significant archaeological resources) affected.	<ul style="list-style-type: none"> Disturbance of 1.57 ha with archaeological potential during construction of the YDSS Modifications Alternative Route. No disturbance to lands with archaeological potential during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Complete a Stage 2 Archaeological Assessment to determine the presence of archaeological sites within the alternative route alignment. If warranted, undertake a Stage 3 Archaeological Assessment for any archaeological sites discovered during the Stage 2 Archaeological Assessment. A Stage 4 Archaeological Assessment (i.e., avoidance or salvage excavation) will be completed, if required, following the Stage 3 Archaeological Assessment. At these sites, appropriate consultations with Aboriginal communities will be undertaken in accordance with Ministry of Tourism Culture and Sport guidelines. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The disturbance to 1.57 ha with archaeological potential during construction of the YDSS Modifications Alternative Route would be minimized and appropriate mitigation measures would be identified if required in the Stage 2 Archaeological Assessment and if warranted during the Stage 3 or Stage 4 Archaeological Assessments. No net effects.

29. Sensitive receptors include residences, child care facilities, health care facilities, senior citizens' residence, long-term care facilities schools, and for this assessment, businesses have been included as well.

Table R.1: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route A

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
	Effects on built heritage resources and cultural heritage landscapes.	Number and type of built heritage resources and cultural heritage landscapes displaced ³⁰ or disrupted ³¹	<ul style="list-style-type: none"> ▪ Disruption to 6 cultural heritage resources during construction of the YDSS Modifications Alternative Route: <ul style="list-style-type: none"> ▪ Newmarket Canal at 4 intersection points between Mullock Drive and St. John’s Sideroad and within the Wesley Brooks Conservation Area ▪ Bailey Ecological Park ▪ Wesley Brooks Conservation Area ▪ Open space located between former rail corridor and Prospect Street, north of Timothy Street ▪ Former Toronto Transit Commission electric railway corridor, north of Heman Street ▪ George Richardson Park ▪ Displacement of 1 cultural heritage resource³² (543 Timothy Street; Factory Complex designated under the Ontario Heritage Act) during construction of the YDSS Modifications Alternative Route. ▪ No disruption or displacement to cultural heritage resources during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> ▪ Undertake detailed heritage evaluation and analysis to develop appropriate mitigation measures (e.g., façade stabilization, identification of buffer requirements, monitoring of construction vibration; avoidance of tree and fence removals, post-construction landscaping; documentation prior to alteration, commemoration etc.). ▪ Undertake detailed heritage evaluation and analysis to develop appropriate mitigation measures (e.g. commemoration, salvage, and/or documentation prior to resource removal). ▪ Undertake a site-specific heritage evaluation to develop appropriate mitigation measures prior to resource removal (e.g., relocation, partial retention, adaptive re-use, commemoration, salvage, and/or documentation). ▪ No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> ▪ The disruption to 6 cultural heritage resources during construction of the YDSS Modifications Alternative Route would be minimized through a detailed heritage evaluation to develop appropriate mitigation measures (e.g., façade stabilization, identification of buffer requirements, monitoring of construction vibration; avoidance of tree and fence removals, post-construction landscaping; documentation prior to alteration, commemoration etc.) <ul style="list-style-type: none"> ▪ Newmarket Canal (at 4 intersection points) ▪ Bailey Ecological Park ▪ Wesley Brooks Conservation Area ▪ Open Space (north of Timothy Street) ▪ Former Transit Toronto Commission electric railway ▪ George Richardson Park ▪ The displacement of 1 cultural heritage resource (543 Timothy Street; Factory Complex designated under the Ontario Heritage Act) during construction of the YDSS Modifications Alternative Route would be addressed through preparation of a detailed heritage evaluation to develop appropriate mitigation measures (i.e. commemoration, salvage, and/or documentation prior to resource removal). ▪ No net effects.
Financial	50-year Net Present Worth Costs	50-year present net worth costs associated with the capital investment, land acquisition, and operating and maintenance of the infrastructure, systems and equipment	<ul style="list-style-type: none"> ▪ \$ 89,230,000³³ 	<ul style="list-style-type: none"> ▪ No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> ▪ \$ 89,230,000

30. Displacement is indicated by removal or loss of heritage attributes of the cultural heritage resource at a scale where its heritage significance is no longer conserved and/or communicated. Pre-mature deterioration refers to construction-related effects such as vibration that could result in deterioration and ultimately a displacement of cultural heritage resources.

31. Disruption to cultural heritage resources refers to partial modification of cultural heritage resources.

32. Refer to 583 Timothy Street Factory Complex (CHR 507) in the Cultural Heritage Baseline Conditions Report (CRA et al., April 2013).

33. Alternative Methods of Carrying Out the Undertaking – Cost Estimates Report (CRA et al., February 2013).



Appendix R-2

Table R.2

Net Effects Assessment – York Durham Sewage System Modifications Alternative Route B

Table R.2: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route B

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
Technical	Carbon Dioxide (CO ₂) Equivalent Footprint	Equivalent CO ₂ (CO ₂ e) generated in tonnes CO ₂ e/year ¹	<ul style="list-style-type: none"> Approximately 235 tonnes CO₂e /year. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures. 	<ul style="list-style-type: none"> Approximately 235 tonnes CO₂e /year.
Natural Environment	Effect on groundwater	Temporary and/or long-term change in groundwater quality	<ul style="list-style-type: none"> Temporary decrease in groundwater quality due to dewatering during construction of the YDSS Modifications Alternative Route through the Tannery Creek valley.² No long-term change in groundwater quality during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Use construction methods such as limiting excavations below the water table, use directional drilling methods where suitable, use groundwater cut-off structures to where appropriate to minimize the amount of temporary dewatering required. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary decrease in groundwater quality due to dewatering during construction of the YDSS Modifications Alternative Route through the Tannery Creek Valley would be minimized by using appropriate construction methods. No net effects.
		Temporary and/or long-term change in groundwater quantity	<ul style="list-style-type: none"> Temporary decrease in groundwater quantity due to dewatering during construction of the YDSS Modifications Alternative Route through the Tannery Creek valley³. No long-term change in groundwater quantity during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Use construction methods such as limiting excavations below the water table, use directional drilling methods where suitable, use groundwater cutoff structures where appropriate to minimize the amount of temporary dewatering required. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary decrease in groundwater quantity due to dewatering during construction of the YDSS Modifications Alternative Route through the Tannery Creek valley would be minimized by using appropriate construction methods. No net effects.
	Effect on surface water	Temporary and/or long-term change in surface water quality	<ul style="list-style-type: none"> Temporary decrease in surface water quality at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) due to increased sediment in surface water runoff during construction of the YDSS Modifications Alternative Route. No long-term change in surface water quality during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Develop and implement an Erosion and Sediment Control Plan consistent with the policies outlined in the Erosion and Sediment Control Guidelines for Urban Construction (2006) during construction. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary decrease in surface water quality at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be minimized by developing and implementing an erosion and sediment control plan consistent with policies outlined in the Erosion and Sediment Control Guidelines for Urban Construction (2006). No net effects.
		Temporary and/or long-term change in surface water quantity	<ul style="list-style-type: none"> Temporary increase in surface water quantity at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) due to increase in overland flow during construction of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Develop and implement an Erosion and Sediment Control Plan consistent with the policies outlined in the Erosion and Sediment Control Guidelines for Urban Construction (2006) during construction. 	<ul style="list-style-type: none"> The temporary increase in surface water quantity at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) due to increase in overland flow during construction of the YDSS Modifications Alternative Route would be minimized by developing and implementing an erosion and sediment control plan consistent with policies outlined in the Erosion and Sediment Control Guidelines for Urban Construction (2006).

1. Equivalent CO₂ generated indicator includes direct and indirect emissions (i.e., from electricity generation) of CO₂, CH₄, and N₂O. Direct emissions include natural gas, transportation related emissions, process related emissions, equipment related emissions, chemical usage related emissions, and off-site biosolids/residuals decomposition emission. Further details are provided in the Technical Concept Level 2 Document, (CRA et al., February 2013).

2. Due to the expected presence of coarse grained alluvial materials and a high water table, dewatering along Alternative Route B has the potential to be significant.

3. Due to the expected presence of coarse grained alluvial materials and a high water table, dewatering along Alternative Route B has the potential to be significant

Table R.2: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route B

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> No long-term change in surface water quantity during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
	Effect on aquatic habitat or functions	Area (m ²) of temporary or permanent loss of aquatic features or categorical loss of functions by type – including Provincially Significant Wetland, Locally Significant Wetland, watercourses by sensitivity type, and others ⁴	<ul style="list-style-type: none"> Temporary loss of aquatic habitat and function at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route. No permanent loss to aquatic habitat or function during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Undertake construction outside of the relevant fish spawning timing window, and in the low-flow, dry summer periods where possible. Implement as appropriate construction Best Management Practices such as dewatering and fish relocation during construction works based on consultations with review agencies. Limit removal of riparian vegetation, especially mature shrubs and trees. Stabilize banks and implement a restoration plan to compensate for temporary loss of aquatic habitat. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary loss of aquatic habitat and function at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be mitigated and compensated for (as required) by undertaking construction outside of the relevant fish spawning timing window, implementing appropriate construction Best Management Practices based on consultations with review agencies, limiting removal of riparian vegetation, stabilizing the banks and implementing a restoration plan. No net effects.
	Effect on stream geomorphology	Change in geomorphic form/function/stability in affected channels	<ul style="list-style-type: none"> Temporary change to channel form, function and stability at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route. No long-term change in geomorphic form, function or stability during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Limit removal of riparian vegetation. Implement post construction restoration of channel form and function. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary change to channel form, function and stability at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be mitigated by limiting vegetation removal and implementing post construction restoration. No net effects.
	Effect on aquatic species including Species at Risk (species of special concern, threatened, endangered) and species of local concern, native and invasive species	Number and type of aquatic species ⁵ potentially affected temporarily or permanently ⁶	<ul style="list-style-type: none"> Temporary disturbance⁷ to aquatic species at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) due to a decrease in surface water quality during construction of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Undertake construction outside of relevant fish spawning timing window, and in the low-flow, dry summer periods where possible. Implement appropriate construction Best Management Practices such as dewatering and fish relocation during construction works. 	<ul style="list-style-type: none"> The temporary disturbance to aquatic species at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) due to a decrease in surface water quality during construction of the YDSS Modifications Alternative Route would be mitigated by undertaking construction outside of the relevant fish spawning timing window and implementing appropriate construction Best Management Practices.

4. Provincially Significant Wetlands, Locally Significant Wetlands and permanent and intermittent watercourses were avoided during the generation of the long list of potential YDSS Modifications Alternative Routes.

5. Aquatic species include species of local concern, native and invasive species.

6. Refer to Natural Environment Baseline Conditions Report (CRA et al., April 2013) for detailed information on aquatic species.

7. Temporary disturbance to aquatic species at crossings due to decrease in surface water quality during construction of the YDSS Modifications Alternative Route.

Table R.2: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route B

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> No permanent disturbance to aquatic species during operation of the YDSS Modifications Alternative Route. No temporary or permanent disturbance to aquatic Species at Risk during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects. No net effects.
	Effect on groundwater recharge and discharge areas in relation to aquatic/wetland habitat	Area (m ²) of temporary or permanent loss of recharge and discharge areas	<ul style="list-style-type: none"> Temporary reduction in groundwater discharge (baseflow) at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route. No permanent loss of groundwater recharge and discharge areas as they relate to aquatic/wetland habitat during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Use standard construction methods such as limiting excavations below the water table, using groundwater cut-off structures where appropriate to minimize the amount of temporary dewatering required. Direct dewatering discharge back to local watercourse following temperature and clarity control to mitigate temporary loss of baseflow. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary reduction in groundwater discharge (baseflow) at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be mitigated by using appropriate construction methods and directing the discharge back to the local watercourse. No net effects.
	Effect on terrestrial habitat or functions	Area (m ²) of temporary and/or permanent loss of natural heritage features by type – including ESAs, ANSIs, wildlife corridors, and others	<ul style="list-style-type: none"> No temporary or permanent loss of ESAs, ANSIs or wildlife corridors during construction and operation of the YDSS Modifications Alternative Route. Temporary and permanent loss of 2.8 ha of meadow, thicket, plantation, forest, marsh and swamp habitat (in the Bailey Ecological Park and within the flood plain of Tannery Creek) during construction and operation of the YDSS Modifications Alternative Route⁸. Temporary and permanent loss of 0.08 ha of cultural meadow and shallow marsh habitat (in the Bailey Ecological Park and within the flood plain of Tannery Creek) from construction of the staging areas⁹ for the YDSS Modifications Alternative Route 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. Develop and implement a habitat restoration plan to compensate for loss of vegetation communities based on consultations with agencies. Develop and implement a habitat restoration plan to compensate for loss of vegetation communities based on consultations with review agencies. 	<ul style="list-style-type: none"> No net effects. The temporary and permanent loss of 2.8 ha of meadow, thicket, plantation, forest, marsh and swamp habitat and associated wildlife habitat (in the Bailey Ecological Park and within the flood plain of Tannery Creek) during construction and operation of the YDSS Modifications Alternative Route would be compensated for (as required) by implementing a habitat restoration plan based on consultations with review agencies. The temporary and permanent loss of 0.08 ha of cultural meadow and shallow marsh habitat (in the Bailey Ecological Park and within the flood plain of Tannery Creek) from construction of the staging areas for the YDSS Modifications Alternative Route would be compensated for (as required) by implementing a habitat restoration plan based on consultations with review agencies.

8. It has been assumed that the YDSS Modifications Alternative Route will disturb a 20 m width over the entire length of Route B within the Tannery Creek Valley. It has also been assumed that construction of the YDSS Modifications Alternative Route will be conducted using open cut construction methods rather than less invasive methods such as directional drilling. This likely has led to an over estimation of the area of terrestrial habitat affected, as many areas within the Tannery Creek Valley are planned to be constructed using less invasive directional drilling, wherever practical.

9. The area disturbed during construction of the staging areas has been estimated assuming that land clearing will be required for directional drilling and staging under all major stream crossings and at approximately 400 m intervals within the Tannery Creek valley south of Mulock Drive along YDSS Modifications Alternative Route B.

Table R.2: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route B

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
	Effect on terrestrial species including Species at Risk, (species of special concern, threatened, endangered) species of local concern, native and invasive species, and area-sensitive species	Number and type of terrestrial species ¹⁰ potentially affected temporarily and/or permanently ¹¹	<ul style="list-style-type: none"> ▪ Temporary and permanent disturbance¹² to terrestrial species in the Bailey Ecological Park and within the flood plain of Tannery Creek during construction and operation of the YDSS Modifications Alternative Route and associated staging areas. ▪ Temporary disturbance to terrestrial species within the north-south wildlife corridor along Tannery Creek during construction of the YDSS Modifications Alternative Route. ▪ Temporary disruption to Savannah Sparrow bird species during construction of the YDSS Modifications Alternative Route. ▪ No temporary or permanent disturbance to Species at Risk during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> ▪ Use construction methods such as timing/noise restrictions to protect nesting birds, wildlife, and amphibians. ▪ Provide tree protection and delineation of work adjacent to natural areas. ▪ Relocate amphibian species during construction works, if required. ▪ Use construction methods such as tree protection, delineated setbacks from natural areas and timing/noise restrictions to protect terrestrial species. ▪ Conduct pre-construction bird surveys to determine habitat use. ▪ Use construction Best Management Practices such as tree protection, delineated setbacks from natural areas and timing/noise restrictions to protect nesting bird species and wildlife. ▪ No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> ▪ The temporary and permanent disturbance to terrestrial species in the Bailey Ecological Park and within the flood plain of Tannery Creek during construction and operation of the YDSS Modifications Alternative Route and associated staging areas would be minimized by using appropriate construction methods, providing tree protection and delineation or work adjacent to natural areas and relocating amphibian species, as required. ▪ The temporary disturbance to terrestrial species within the north-south wildlife corridor along Tannery Creek during construction of the YDSS Modifications Alternative Route would be minimized by using appropriate construction methods. ▪ The temporary disruption to Savannah Sparrow bird species during construction of the YDSS Modifications Alternative Route would be minimized by conducting pre-construction bird surveys to determine habitat use and using construction Best Management Practices. ▪ No net effects.
	Effect on groundwater recharge and discharge areas in relation to terrestrial habitat	Area (m ²) of temporary and/or permanent loss of recharge and discharge areas	<ul style="list-style-type: none"> ▪ No temporary or permanent loss of groundwater recharge and discharge areas in relation to terrestrial habitat during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> ▪ No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> ▪ No net effects.

10. Terrestrial species include species of local concern, native and invasive species and area-sensitive species.

11. Refer to the Natural Environment Baseline Conditions Report (CRA et al., April 2013) for detailed information on terrestrial species.

12. Disturbance refers to construction-related activities (i.e., noise, vibration, dust, etc.)

Table R.2: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route B

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
Built Environment	Effect on agricultural operations and capital investment related to agriculture	Approximate area (ha) of active agricultural operations ¹³ affected	<ul style="list-style-type: none"> No temporary or permanent loss of active agricultural operations during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
		Extent of disruption of active agricultural operations such as: <ul style="list-style-type: none"> Fragmentation of agricultural fields Disturbance to artificial drainage systems and agricultural drains Removal and/or disturbance of farm fences, entrances and paddocks Disruption of agricultural-related businesses Disruption of normal external haul routes for farm machinery movements 	<ul style="list-style-type: none"> No temporary or permanent disruption to active agricultural operations during construction or operation of the YDSS Modifications Alternative Route as it is located within an Urban Area. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
	Effect on existing residences, businesses, and/or community, institutional, and recreational facilities ¹⁴	Number and type of residences displaced Number and type of residences temporarily or permanently disrupted ¹⁵	<ul style="list-style-type: none"> No displacement of residences during construction and operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
			<ul style="list-style-type: none"> Temporary disruption to approximately 145 driveway accesses for 149 private residences during construction of the YDSS Modifications Alternative Route, including: <ul style="list-style-type: none"> Section of Route along Bayview Parkway from Newmarket Pumping Station to Davis Drive – 29 private residences with 29 driveway accesses: <ul style="list-style-type: none"> 28 private residences each with 1 access off of Bayview Parkway 1 private residence with 1 access off of Bayview Parkway and 1 undisrupted access off of Heman Street 	<ul style="list-style-type: none"> Provide temporary driveway access and arrangements for waste collection to affected residences and notify residences of alternate arrangements. 	<ul style="list-style-type: none"> The temporary disruption to approximately 145 driveway accesses for 149 private residences during construction of the YDSS Modifications Alternative Route would be minimized by providing temporary driveway accesses, arrangements for waste collection and notifying residents of the alternative arrangements.

13. Active agricultural land removed refers to the area being ploughed (i.e., excludes barns, buildings etc).

14. Information regarding existing residences and businesses is accurate as of May, 2012.

15. Disruption to residences has been applied with respect to driveway accesses (including waste collection). Disruption that relates to odour, noise and vibration are considered in the respective indicators below.

Table R.2: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route B

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> ▪ Section of Route along Davis Drive from Bayview Parkway to Prospect Street and Prospect Street from Davis Drive to Water Street – 61 private residences with 58 driveway accesses, as well as 5 private residences that can only be accessed by Prospect Street: <ul style="list-style-type: none"> ▪ 48 private residences each with 1 access off of Prospect Street ▪ 1 private residence with 1 shared access with a business off of Prospect Street¹⁶ ▪ 1 retirement residence with 1 access off of Prospect Street ▪ 8 private residences with 4 shared accesses off of Prospect Street ▪ 1 private residence with 2 accesses off of Prospect Street ▪ 1 private residence with 1 access off of Prospect Street and 1 undisrupted access off of Wellington Street ▪ 1 private residence with 1 access off of Prospect Street and 1 undisrupted access off of Timothy Street ▪ 3 private residences that can only be accessed by Skelton Street (off of Prospect Street) ▪ 2 private residences that can only be accessed by Poplar Lane (off of Prospect Street) ▪ Section of Route along Prospect Street from Water Street to Mulock Drive – 59 private residences with 58 driveway accesses: <ul style="list-style-type: none"> ▪ 43 private residences each with 1 access off of Prospect Street ▪ 1 low rise apartment property with 1 access off of Prospect Street ▪ 1 low rise apartment property with 1 access off of Prospect Street and 1 undisrupted access off of Cotter Street ▪ 1 private residence with 1 access off of Prospect Street and 1 undisturbed access off of Second Street ▪ 1 private residence with 2 accesses off of Prospect Street 		

16. Note: Accesses are counted under both of the following indicators: "Number and characteristics of businesses temporarily or permanently disrupted" and "Number and type of residences temporarily or permanently disrupted".

Table R.2: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route B

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> ▪ 2 properties with 1 shared access off of Prospect Street ▪ 1 private residence with 2 accesses off of Bayview Avenue ▪ 4 private residences with 2 shared accesses off of Prospect Street ▪ 2 private residences each with 1 shared access with 2 businesses off of Bayview Avenue ▪ 1 private residence with 1 access off of Bayview Avenue and 1 undisrupted access off of College Street ▪ 2 Pickering College private residences each with 1 access off of Bayview Avenue ▪ Section of Route along Mulock Drive from Bayview Avenue to the East Holland River – No private residences ▪ Section of Route from Mulock Drive to Connection to Existing Gravity Sewer – No private residences ▪ Temporary disruption to road access for approximately 5 private residences that can only be accessed by Prospect Street (section of route along Davis Drive from Bayview Parkway to Prospect Street and Prospect Street from Davis Drive to Water Street) during construction of the YDSS Modifications Alternative Route. ▪ Temporary disruption to a small portion of 1 private residence due to construction of the staging area within a portion of the property. <ul style="list-style-type: none"> ▪ Staging Sites at Prospect Street and Bogart Pumping Station (Bogart Route) – 1 private residence where the staging areas will be constructed within the property but will not disrupt driveway access off of Hamilton Street ▪ No permanent disruption to residences during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> ▪ Provide temporary access for local roads and arrangements for waste collection to affected residences and notify residences of alternate arrangements. ▪ Provide compensation in accordance with York Region’s policies. ▪ No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> ▪ The temporary disruption to road access for approximately 5 private residences that can only be accessed by Prospect Street during construction of the YDSS Modifications Alternative Route would be minimized by providing access for local roads and notifying residents of the alternative arrangements. ▪ The temporary disruption to a small portion of 1 private residence due to construction of the staging area within a portion of the property would be compensated for (as necessary) in accordance with York Region’s policies. ▪ No net effects.
		Number and characteristics of businesses displaced ¹⁷	<ul style="list-style-type: none"> ▪ No displacement of businesses during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> ▪ No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> ▪ No net effects.

17. Does not include agricultural businesses. Agricultural businesses are included under the following evaluation criteria: “Effect on agricultural operations and capital investment related to agriculture”.

Table R.2: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route B

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
		Number and characteristics of businesses temporarily or permanently disrupted ^{18,19}	<ul style="list-style-type: none"> ▪ Temporary disruption to approximately 28 driveway accesses for 73 businesses during construction of the YDSS Modifications Alternative Route²⁰, including: <ul style="list-style-type: none"> ▪ Section of Route along Bayview Parkway from Newmarket Pumping Station to Davis Drive – 1 business with 2 driveway accesses, as well as 2 businesses with 2 driveway accesses and construction of YDSS Modifications Alternative Route within property: <ul style="list-style-type: none"> ▪ 1 business with 1 access off of Bayview Parkway and where the YDSS Modifications Alternative Route will be constructed within the property ▪ 1 business with 2 accesses off of Bayview Parkway ▪ 1 business with 1 access off of Bayview Parkway and 1 undisrupted access off of Davis Drive and where a staging area will be constructed within the property ▪ Section of Route along Davis Drive from Bayview Parkway to Prospect Street and Prospect Street from Davis Drive to Water Street – 20 businesses with 13 driveway accesses, as well as 1 business that can only be accessed by Prospect Street: <ul style="list-style-type: none"> ▪ 4 businesses each with 1 accesses off of Prospect Street ▪ 1 business with 1 shared access with a private residence off of Prospect Street²¹ ▪ 6 businesses with 1 shared access off of Prospect Street ▪ 2 businesses with 2 shared accesses off of Prospect Street ▪ 2 businesses with 1 shared access with an institution facility off of Prospect Street ▪ 2 businesses with 1 shared access off of Prospect Street and 1 undisrupted shared access off of Queen Street 	<ul style="list-style-type: none"> ▪ Provide temporary driveway access and access signage, arrangements for waste collection to affected businesses and notify businesses of alternative arrangements. 	<ul style="list-style-type: none"> ▪ The temporary disruption to approximately 28 driveway accesses for 73 businesses during construction of the YDSS Modifications Alternative Route would be minimized by providing temporary driveway access, arrangements for waste collection and notifying businesses of the alternative arrangements.

18. Does not include agricultural businesses. Agricultural businesses are included under the following evaluation criteria: "Effect on agricultural operations and capital investment related to agriculture".

19. Disruption to businesses has been applied with respect to driveway accesses, which considers customer access, deliveries and waste collection, etc. Disruption that relates to odour, noise and vibration are considered in the respective indicators below.

20. See the Land Use Baseline Conditions Report (CRA et al., April 2013) for descriptions and characteristics of businesses.

21. Note: Accesses are counted under both of the following indicators: "Number and characteristics of businesses temporarily or permanently disrupted" and "Number and type of residences temporarily or permanently disrupted".

Table R.2: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route B

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> ▪ 1 business with 1 access off of Prospect Street and 1 undisrupted access off of Queen Lane ▪ 1 business with 1 access off of Prospect Street and 1 undisrupted access off of Grace Street ▪ 1 business with 1 access off of Prospect Street and 1 undisrupted access off of Granby Place ▪ 1 business that can only be accessed by Poplar Lane (off of Prospect Street) ▪ Section of Route along Prospect Street from Water Street to Mulock Drive – 2 businesses with 2 driveway accesses: <ul style="list-style-type: none"> ▪ 2 businesses each with 1 shared access with 2 private residences off of Bayview Avenue ▪ Section of Route along Mulock Drive from Bayview Avenue to the East Holland River – 47 businesses with 7 driveway accesses, as well as 42 businesses that can only be accessed by Mulock Drive: <ul style="list-style-type: none"> ▪ 6 businesses with 1 shared access off of Mulock Drive ▪ 1 business with 1 access off of Mulock Drive and 1 undisrupted access off of Kent Drive ▪ 3 businesses each with 1 access off of Mulock Drive ▪ 4 businesses with 1 shared access off of Mulock Drive ▪ 33 businesses with 1 access off of Mulock Drive and 1 undisrupted access off of Bayview Avenue ▪ 42 businesses that can only be accessed by Steven Court (off of Mulock Drive) ▪ Section of Route from Mulock Drive to Connection to Existing Gravity Sewer – 1 business with 2 accesses off of Mulock Drive ▪ Staging Sites at Prospect Street and Bogart Pumping Station (Bogart Route) – No businesses ▪ Temporary disruption to road access for approximately 43 businesses that can only be accessed by Prospect Street and Mulock Drive (included in section of route along Davis Drive from Bayview Parkway to Prospect Street and Prospect Street from Davis Drive to Water Street (1 business) and section of route along Mulock Drive from Bayview Avenue to the East Holland River (42 businesses)) during construction of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> ▪ Provide temporary access and access signage for local roads and arrangements for waste collection to affected businesses and notify businesses of alternate arrangements. 	<ul style="list-style-type: none"> ▪ The temporary disruption to road access for approximately 43 businesses that can only be accessed by Prospect Street and Mulock Drive during construction of the YDSS Modifications Alternative Route would be minimized by providing access for local roads and access signage, arrangements for waste collection and notifying businesses of the alternative arrangements.

Table R.2: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route B

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> Temporary disruption to small portions of 2 private businesses where the YDSS Modifications Alternative Route and/or staging area is constructed within the business property (disruption to driveway access for these businesses included above) : <ul style="list-style-type: none"> 1 business with 1 access off of Bayview Parkway and where the YDSS Modifications Alternative Route will be constructed within the property 1 business with 1 access off of Bayview Parkway and 1 undisrupted access off of Davis Drive and where a staging area will be constructed within the property No permanent disruption to businesses during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Provide compensation in accordance with York Region's policies. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary disruption to small portions of 2 private businesses where the YDSS Modifications Alternative Route and/or staging area is constructed within the business properties would be compensated for (as necessary) in accordance with York Region's policies. No net effects.
		Number and characteristics of community, institutional, and recreational facilities displaced	<ul style="list-style-type: none"> No displacement of community, institutional, and recreational facilities during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
		Number and characteristics of community, institutional, and recreational facilities temporarily or permanently disrupted	<ul style="list-style-type: none"> Temporary disruption to 14 driveway accesses for 9 community, institutional and recreational facilities (including Tom Taylor Trail, George Richardson Park, Lake Simcoe Region Conservation Authority, York Region Community Service Housing Department, York Regional Police District 1 Headquarters, Canadian Cancer Society, Pickering College Independent Day and Boarding Co-ed School, Newmarket Municipal Offices, and York Region Health Services) during construction of the YDSS Modifications Alternative Route. Section of Route along Bayview Parkway from Newmarket Pumping Station to Davis Drive - 2 facilities with 2 driveway accesses, and 2 facilities with 3 driveway accesses where the YDSS Modifications Alternative Route will be constructed within the property: <ul style="list-style-type: none"> 2 recreational facilities, including Tom Taylor Trail and George Richardson Park each with 1 access off of Bayview Parkway 2 community/institutional facilities, including the Lake Simcoe Region Conservation Authority with 2 accesses off of Bayview Parkway and the York Region Community Service Housing Department with 1 access off of Bayview Parkway where the YDSS Modifications Alternative Route will be constructed within the properties 	<ul style="list-style-type: none"> Provide temporary driveway access and access signage, arrangements for waste collection to affected community, institutional, and recreational facilities and notify facilities of alternative arrangements. 	<ul style="list-style-type: none"> The temporary disruption to 14 driveway accesses for 9 community, institutional and recreational facilities (including Tom Taylor Trail, George Richardson Park, Lake Simcoe Conservation Authority, York Region Community Service Housing Department, York Regional Police District 1 Headquarters, Canadian Cancer Society, Pickering College Independent Day and Boarding Co-ed School, Newmarket Municipal Offices, and York Region Health Services) during construction of the YDSS Modifications Alternative Route would be minimized by providing temporary driveway access and access signage, arrangements for waste collection and notifying the facilities of the alternative arrangements.

Table R.2: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route B

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> ▪ Section of Route along Davis Drive from Bayview Parkway to Prospect Street and Prospect Street from Davis Drive to Water Street – 3 institutional facilities, including Canadian Cancer Society with 1 shared access with 2 businesses off of Prospect Street; York Regional Police District 1 Headquarters with 1 access off of Prospect Street and 1 uninterrupted access off of Water Street; and York Region Health Services with 1 access off of Prospect Street ▪ Section of Route along Prospect Street from Water Street to Mulock Drive – 1 facility with 5 driveway accesses: <ul style="list-style-type: none"> ▪ 1 institutional facility, the Pickering College Independent Day and Boarding Co-ed School with 5 accesses off of Bayview Avenue ▪ Section of Route along Mulock Drive from Bayview Avenue to the East Holland River – 1 facility with 1 driveway access, as well as 5 facilities that can only be accessed by Mulock Drive <ul style="list-style-type: none"> ▪ 1 institutional facility, Newmarket Municipal Offices, with 1 access off of Mulock Drive that is shared with a business ▪ 2 institutional facilities, including York Region Property Services and the Newmarket Telephone Centre, that can only be accessed by Steve Court (Mulock Drive) ▪ 3 recreational facilities, including CanAm Karate, Newmarket Budokan Judo Club and Newmarket Soccer Club, that can only be accessed by Steve Court (Mulock Drive) ▪ Temporary disruption of road access for 5 community, recreational and institutional facilities (including, CanAm Karate, Newmarket Budokan Judo Club, Newmarket Soccer Club, The Newmarket Telephone Centre, and York Region Property Services) that can only be accessed by Mulock Drive and Pearson Street (section of route along Mulock Drive from Bayview Avenue to the East Holland River) during construction of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> ▪ Provide temporary access for local roads and arrangements for waste collection to affected community, recreational, and institutional facilities and notify facilities of alternate arrangements. 	<ul style="list-style-type: none"> ▪ The temporary disruption to road access for 5 community, recreational and institutional facilities (including, CanAm Karate, Newmarket Budokan Judo Club, Newmarket Soccer Club, The Newmarket Telephone Centre, and York Region Property Services) that can only be accessed by Mulock Drive and Pearson Street would be minimized by providing access for local roads and access signage, arrangements for waste collection and notifying the facilities of the alternative arrangements.

Table R.2: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route B

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
	Effect of vibration on existing buildings	Number of existing buildings affected and extent and duration of adverse effects ²²	<ul style="list-style-type: none"> Temporary increase in vibration levels at approximately 313 adjacent²³ buildings (including 203 residences, 93 businesses and 17 community/ institutional/ recreational facilities) during construction of the YDSS Modifications Alternative Route. Structural damage to historic buildings potentially sensitive to noise and vibration²⁴ in close proximity and of inferior / aged condition during construction of the YDSS Modifications Alternative Route. No permanent increase in vibration levels during operation of the YDSS Modifications Alternative Route 	<ul style="list-style-type: none"> Implement Best Management Practices for vibration reduction to minimize temporary construction-related effects, including measures such as: <ul style="list-style-type: none"> Staged construction so demolition, earth-moving and ground-impacting activities do not occur at the same time. Relocate heavy equipment travel routes away from sensitive buildings. Limit heavy construction to daytime hours. Use specialized drilling equipment and methods (avoid sheet piling, jack hammer, vibratory rollers, etc.). Establish minimum setback distances between the YDSS Modifications Alternative Route and historic buildings (e.g., built heritage resources etc.). No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary increase in vibration levels at approximately 313 adjacent buildings (including 203 residences, 93 businesses and 17 community/institutional/recreational facilities) during construction of the YDSS Modifications Alternative Route would be minimized by implementing Best Management Practices for vibration reduction (i.e. staged construction, limiting construction hours, use of specialized drilling equipment, etc.). The structural damage to historic buildings potentially sensitive to noise and vibration in close proximity and of inferior / aged condition during construction of the YDSS Modifications Alternative Route would be mitigated by establishing a minimum safe setback distance between the YDSS Modifications Alternative Route and sensitive buildings. No net effects.
	Effect on property	Number and extent of properties affected and ownership	<ul style="list-style-type: none"> No property acquisition required during construction or operation of the YDSS Modifications Alternative Route. Permanent modification to existing easement²⁵ within approximately 10 properties during operation of the YDSS Modifications Alternative Route: <ul style="list-style-type: none"> Section of Route from Newmarket Pumping Station to Heman Street <ul style="list-style-type: none"> Potential extension of existing easement to the east of the existing forcemain within 2 properties owned by the Town of Newmarket. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. Compensate for acquisition of permanent easement on private property in accordance with standard Regional procedures and policies. 	<ul style="list-style-type: none"> No net effects. The permanent modification to existing easement within approximately 10 properties during operation of the YDSS Modifications Alternative Route would be compensated for (as necessary) in accordance with standard Regional procedures and policies.

22. Effect will depend on proximity to construction activity, building construction and subsurface soil conditions.

23. Adjacent buildings were evaluated for the YDSS Modifications Alternative Route since the noise effects are construction-related and the equipment is mobile rather than stationary. Potentially affected locations would be those receivers immediately adjacent to the road.

24. The locations of historic buildings potentially sensitive to noise and vibration within the UYSS EA study area were identified in the Cultural Heritage Baseline Conditions Report (CRA et al., April 2013).

25. Exact extent of easement required to be determined during detailed design.

Table R.2: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route B

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> ▪ Section of Route along Bayview Avenue from to Heman Street to Davis Drive <ul style="list-style-type: none"> ▪ Potential extension of existing easement to the west of the existing forcemain within 1 property owned by the Lake Simcoe Region Conservation Authority, 1 property owned by York Region and 1 private property (multi-unit business complex). ▪ Section of Route from Mulock Drive to Existing Gravity Sewer ▪ Potential extension of existing easement to the east of the existing easement within 1 property owned by Lake Simcoe Region Conservation Authority, 3 private properties (1 business, 1 vacant, 1 recreational), and 1 hydro corridor owned by Hydro One. 		
		Total area of property acquisition required (ha)	<ul style="list-style-type: none"> ▪ No property acquisition during construction or operation of the YDSS Modifications Alternative Route. ▪ Permanent acquisition of existing easement²⁶ within approximately 10 properties (listed above) during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> ▪ No avoidance/mitigation/compensation required. <p>Compensate for acquisition of permanent easement on private property in accordance with standard Regional procedures and policies.</p>	<ul style="list-style-type: none"> ▪ No net effects. ▪ The permanent acquisition of existing easement within approximately 10 properties during operation of the YDSS Modifications Alternative Route would be compensated for (as necessary) in accordance with standard Regional procedures and policies.
	Effect on existing roadway/utility infrastructure	Number of roadways and type affected and extent and duration of adverse effects	<ul style="list-style-type: none"> ▪ Temporary disruption to 7 roadways, where the alternative route follows or crosses the existing roadway, during construction of the YDSS Modifications Alternative Route: <ul style="list-style-type: none"> ▪ Bayview Parkway (Town Minor Collector Road) and access to Heman Street (Town Local Road) to accommodate closures of some lanes on Bayview Parkway for up to 4 months ▪ Timothy Street (Town Local Road) to accommodate crossing of Timothy Street ▪ Prospect Street (Region Primary Collector Road), and access to Grace Street (Town Local Road), Granby Place (Town Local Road), Queen Street (Town Minor Collector Road), Wellington Street (Town Local Road), Skelton Street (Town Local Road), Srigley Street (Town Minor Collector Road), Timothy Street (Town Local Road), Lydia Street (Town Local Road), Water Street/Gorham 	<ul style="list-style-type: none"> ▪ Prepare and implement a traffic management plan describing detours for road closures and/or lane closures during construction of the YDSS Modifications Alternative Route and provision of temporary access, as required. 	<ul style="list-style-type: none"> ▪ The temporary disruption to 7 roadways, where the Alternative Route follows or crosses the existing roadway, during construction of the YDSS Modifications Alternative Route would be minimized by implementing a traffic management plan and providing temporary access as required to the following: <ul style="list-style-type: none"> ▪ Bayview Parkway (Town Minor Collector Road) and access to Heman Street (Town Local Road) to accommodate closures of some lanes on Bayview Parkway for up to 4 months ▪ Timothy Street (Town Local Road) to accommodate crossing of Timothy Street ▪ Prospect Street (Region Primary Collector Road), and access to Grace Street (Town Local Road), Granby Place (Town Local Road), Queen Street (Town Minor Collector Road), Wellington Street (Town Local Road), Skelton Street (Town Local

26. Exact extent of easement required to be determined during detailed design.

Table R.2: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route B

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<p>Street (Town Primary Collector Road), Pearson Street (Town Local Road), and Second Street (Town Local Road), to accommodate full road closure of Prospect Street for up to 12 months</p> <ul style="list-style-type: none"> ▪ Bayview Avenue (Region Arterial Roads), and access to College Street (Town Local Road), Bondie Avenue/Penrose Street (Town Local Road), and Mulock Court (Town Local Road) to accommodate full road closure of Bayview Avenue for up to 12 months ▪ Mulock Drive (Region Arterial Road) and access to Steven Court/Kent Drive (Town Local Road) to accommodate closure of the north lane on Mulock Drive for up to 4 months. ▪ Davis Drive (Region Arterial Road) to accommodate crossing of Davis Drive ▪ Pearson Street (Town Local Road) to accommodate crossing of Pearson Street <p>▪ No permanent disruption to roadways during operation of the YDSS Modifications Alternative Route.</p>	<p>▪ No avoidance/mitigation/compensation measures required.</p>	<p>Road), Srigley Street (Town Minor Collector Road), Timothy Street (Town Local Road), Lydia Street (Town Local Road), Water Street/Gorham Street (Town Primary Collector Road), Pearson Street (Town Local Road), and Second Street (Town Local Road), to accommodate full road closure of Prospect Street for up to 12 months</p> <ul style="list-style-type: none"> ▪ Bayview Avenue (Region Arterial Roads), and access to College Street (Town Local Road), Bondie Avenue/Penrose Street (Town Local Road), and Mulock Court (Town Local Road) to accommodate full road closure of Bayview Avenue for up to 12 months ▪ Mulock Drive (Region Arterial Road) and access to Steven Court/Kent Drive (Town Local Road) to accommodate closure of the north lane on Mulock Drive for up to 4 months. ▪ Davis Drive (Region Arterial Road) to accommodate crossing of Davis Drive ▪ Pearson Street (Town Local Road) to accommodate crossing of Pearson Street <p>▪ No net effects.</p>
		Number and type of utilities affected and extent and duration of adverse effects ²⁷	<ul style="list-style-type: none"> ▪ Temporary disruption to 6 major utilities (York Region Water and Wastewater Bayview Operations Centre, Canadian National rail corridor, Hydro One transformer station, hydro corridor, Newmarket Hydro and Bogart Pumping Station) located adjacent to the YDSS Modifications Alternative Route during construction. ▪ Temporary disruption to the watermain, sanitary sewer, storm sewer, local gas, local hydro, local cable and local telephone utilities on Prospect Street between Davis Drive and Mulock Drive for up to 12 months during construction of the YDSS Modifications Alternative Route. <p>▪ No permanent disruption to utilities during operation of the YDSS Modifications Alternative Route.</p>	<ul style="list-style-type: none"> ▪ Locate utilities based on consultations with utility providers and relocate utilities if required. ▪ Locate utilities based on consultations with utility providers and relocate utilities if required. <p>▪ No avoidance/mitigation/compensation measures required.</p>	<ul style="list-style-type: none"> ▪ The temporary disruption to 6 major utilities (including York Region Water and Wastewater, Bayview Operations Centre, Canadian National rail corridor, Hydro One transformer station, Newmarket Hydro, hydro corridor and Bogart Pumping Station) during the construction of the YDSS Modifications Alternative Route would be mitigated by locating utilities based on consultations with utility providers and relocating if required. ▪ The temporary disruption to watermain, sanitary sewer, storm sewer, local gas, local hydro, local cable and local telephone utilities on Prospect Street between Davis Drive and Mulock Drive would be minimized by locating utilities based on consultation with utility providers and, if confirmed on-site, relocating if required (Temporary interruption of service during relocation is anticipated). <p>▪ No net effects.</p>

27. Distances are accurate within 50 m.

Table R.2: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route B

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
Social Environment	Effect on wells	Number of wells and type affected, extent and duration and nature (water quality/quantity) of adverse effects	<ul style="list-style-type: none"> No temporary or permanent change to groundwater wells during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
	Effect of noise on sensitive receptors ²⁸	Number of sensitive receptors affected and extent and duration of adverse effects	<ul style="list-style-type: none"> Temporary increase in noise levels at approximately 203 adjacent²⁹ residences (including 4 multi-unit complexes) during construction of the YDSS Modifications Alternative Route No permanent increase in noise levels during operation of the YDSS Modifications Alternative Route 	<ul style="list-style-type: none"> Adhere to Ministry of the Environment (MOE) Urban (NPC-205) and Rural (NPC-232) noise limits. Adhere to Town of East Gwillimbury's Noise By-law (2004-80) limits. Implement Best Management Practices for noise reduction to minimize temporary construction-related nuisance effects (i.e., operators limit impact noise from tailgate, use of construction equipment that meets the requirements of the MOE Construction Equipment Publication (NPC-115). Develop complaint resolution procedure for responding to complaints resulting from construction. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary increase in noise levels at approximately 203 adjacent residences (including 4 multi-unit complexes) during construction of the YDSS Modifications Alternative Route would be minimized by adhering to the Ministry of the Environment's noise limits, the Town of East Gwillimbury's Noise By-law (2004-80), implementing construction Best Management Practices for noise reduction and developing a complaint resolution procedure. No net effects.
	Effect of perceptible vibration levels on sensitive receptors	Number of sensitive receptors ³⁰ affected and extent and duration of adverse effects	<ul style="list-style-type: none"> Temporary increase in vibration levels at approximately 203 adjacent residences (including 4 multi-unit complexes) during construction of the YDSS Modifications Alternative Route No permanent increase in vibration levels during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Adhere to MOE vibration limits as set out in NPC-207 Publication (NPC 207 Impulse Vibration in Residential Buildings). Implement Best Management Practices for vibration reduction to minimize temporary construction-related nuisance effects during daytime, including: <ul style="list-style-type: none"> Staged construction so demolition, earth-moving and ground-impacting activities do not occur at the same time. Relocate heavy equipment travel routes away from sensitive buildings. Limit heavy construction to daytime hours. Use specialized drilling equipment and methods (avoid sheet piling, jack hammer, vibratory rollers, etc.). Develop complaint resolution procedure for responding to complaints resulting from construction. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary increase in vibration levels at approximately 203 adjacent residences (including 4 multi-unit complexes) during construction of the YDSS Modifications Alternative Route would be minimized by adhering to the Ministry of the Environment's vibration limits as set out in the NPC-207 Publication, implementing Best Management Practices for vibration reduction, and developing a complaint resolution procedure. No net effects.

28. As defined by the Ministry of the Environment (MOE) in NPC-205, a sensitive "point of reception" means any point on the premises of a person where sound or vibration originating from other than those premises is received. For the purpose of approval of new sources of noise, including verifying compliance with Section 9 of the Environmental Protection Act, the point of reception may be located on any of the following existing or zoned for future use premises: permanent or seasonal residences, hotels/motels, nursing/retirement homes, rental residences, hospitals, camp grounds, and noise sensitive buildings such as schools and places of worship.

29. Adjacent buildings were evaluated for the YDSS Modifications Alternative Route since the noise effects are construction related and the equipment is mobile rather than stationary. Potentially affected locations would be those receivers immediately adjacent to the road.

30. Sensitive receptors from a vibration perspective include permanent or seasonal residences, hotels/motels, nursing/retirement homes, rental residences, hospitals, campgrounds and vibration sensitive buildings.

Table R.2: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route B

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
	Effect of odour sensitive receptors from current conditions ³¹	Number of sensitive receptors impacted and extent and duration of impacts	<ul style="list-style-type: none"> No temporary or permanent increase in odour during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
Economic Environment	Effect on approved/ planned land uses	Number, extent, and type of approved/planned land uses affected	<ul style="list-style-type: none"> No effects on approved/planned land uses during operation of the YDSS Modifications Alternative Route, as there will be no permanent, above ground structures associated with YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
	Effect on agricultural soil resources	Approximate area (ha) of Class 1, Class 2, and Class 3 soils removed (priority in that order)	<ul style="list-style-type: none"> No removal of Class 1, Class 2 and Class 3 soils along the route during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
		Approximate area (ha) of Specialty Cropland removed, and/or area of agricultural soils disturbed, and/or area of active agricultural land removed	<ul style="list-style-type: none"> No removal of Specialty Cropland, no disturbance to agricultural soils and no removal of active agricultural land during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
Cultural Environment	Effects on known or potential significant archaeological resources	Number and type of potentially significant, known archaeological sites affected	<ul style="list-style-type: none"> No known archaeological sites affected during construction and operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
		Area (ha) of archaeological potential (i.e., lands with potential for the presence of significant archaeological resources) affected	<ul style="list-style-type: none"> Disturbance to 0.96 ha with archaeological potential during construction of the YDSS Modifications Alternative Route. No disturbance to lands with archaeological potential during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Complete a Stage 2 Archaeological Assessment to determine the presence of archaeological sites within the alternative route alignment. If warranted, undertake a Stage 3 Archaeological Assessment for any archaeological sites discovered during the Stage 2 Archaeological Assessment. A Stage 4 Archaeological Assessment (i.e., avoidance or salvage excavation) will be completed, if required, following the Stage 3 Archaeological Assessment. At these sites, appropriate consultations with Aboriginal communities will be undertaken in accordance with Ministry of Tourism, Culture, and Sport guidelines. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The disturbance to 0.96 ha with archaeological potential during construction of the YDSS Modifications Alternative Route would be minimized and appropriate mitigation measures would be identified if required in the Stage 2 Archaeological Assessment and if warranted during the Stage 3 or Stage 4 Archaeological Assessments. No net effects.

31. Sensitive receptors include residences, child care facilities, health care facilities, senior citizens' residence, long-term care facilities schools, and for this assessment, businesses have been included as well.

Table R.2: Net Effects Analysis –York Durham Sewage System Modifications Alternative Route B

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
	Effects on built heritage resources and cultural heritage landscapes.	Number and type of built heritage resources and cultural heritage landscapes displaced ³² or disrupted ³³	<ul style="list-style-type: none"> Disruption to 4 cultural heritage resources during construction of the YDSS Modifications Alternative Route: <ul style="list-style-type: none"> Newmarket Canal at 4 points between Mulock Drive and St. John's Sideroad and within the Wesley Brooks Conservation Area. Bailey Ecological Park Former Toronto Transit Commission electric railway corridor, north of Heman Street George Richardson Park 	<ul style="list-style-type: none"> Undertake detailed heritage evaluation and analysis to develop appropriate mitigation measures (e.g., façade stabilization, identification of buffer requirements, monitoring of construction vibration; avoidance of tree and fence removals, post-construction landscaping, documentation prior to alteration, commemoration etc.). 	<ul style="list-style-type: none"> The disruption to 4 cultural heritage resources during construction of the YDSS Modifications Alternative Route would be minimized through preparation of detailed heritage evaluations to develop appropriate mitigation measures (e.g., façade stabilization, identification of buffer requirements, monitoring of construction vibration, avoidance of tree and fence removals, post-construction landscaping, documentation prior to alteration, commemoration etc.) <ul style="list-style-type: none"> Newmarket Canal Bailey Ecological Park Former Toronto Transit Commission electric railway corridor, north of Heman Street George Richardson Park
			<ul style="list-style-type: none"> Displacement and/or premature deterioration to 37 cultural heritage resources (listed in Table R-2.1 below) located along Bayview Avenue, between Penrose Street and Davis Drive during construction of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Avoid displacement and/or premature deterioration of cultural heritage resources through appropriate siting of staging areas and access routes; monitoring construction vibration; avoidance of tree removals and fence removals; and post-construction landscaping activities. 	<ul style="list-style-type: none"> The displacement and/or premature deterioration to 37 cultural heritage resources (listed in Table R-2.1 below) located along Bayview Avenue, between Penrose Street and Davis Drive during construction of the YDSS Modifications Alternative Route would be avoided through appropriate siting of staging areas and access routes, monitoring construction vibration, avoiding tree removals and fence removals, and post-construction landscaping activities.
			<ul style="list-style-type: none"> No disruption or displacement to built heritage landscapes or cultural heritage resources during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
Financial	50-year Net Present Worth Costs	50-year present net worth costs associated with the capital investment, land acquisition, and operating and maintenance of the infrastructure, systems and equipment	<ul style="list-style-type: none"> \$90,790,000³⁴ 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> \$90,790,000

32. Displacement is indicated by removal or loss of heritage attributes of the cultural heritage resource at a scale where its heritage significance is no longer conserved and/or communicated. Pre-mature deterioration refers to construction-related effects such as vibration that could result in deterioration and ultimately a displacement of cultural heritage resources.

33. Disruption to cultural heritage resources refers to partial modification of cultural heritage resources.

34. Alternative Methods of Carrying Out the Undertaking – Cost Estimates Report (CRA et al., February 2013).

Table R.2.1: YDSS Modifications Alternative Route B: Potentially Affected Cultural Heritage Resources

ID	Township	Municipal Address	Year Built	Property Description	Site Type and/or Designation
CHR237	Newmarket	596 Davis Drive			
CHR244	Newmarket	344 Millard Avenue	1910/11	Residence	Plaque
CHR409	Newmarket	16874 Bayview Avenue	circa 1890	Residence	Plaque
CHR411	Newmarket	16916 Bayview Avenue	1865	Residence	
CHR509	Newmarket	16945 Bayview Avenue	1908-1909	Public	Significant
CHR626	Newmarket	61 Prospect Street	1920	2-storey house; 3-bay façade; centred main entrance; large arched window; corner tower;	Plaque
CHR627	Newmarket	146 Prospect Street		2 storey brick and frame residence	Plaque
CHR628	Newmarket	222 Prospect Street			Plaque
CHR629	Newmarket	75 Prospect Street	1886	2 1/2 storey brick house; double gable roof with dormers; 4-bay façade; arched windows on second storey; bay windows; verge board;	Plaque
CHR630	Newmarket	270 Prospect Street		single-storey painted brick on stone rubble foundation; hip roof; small closed veranda addition; all windows have been replaced;	Plaque
CHR631	Newmarket	233 Prospect Street		buff brick with banding on stone rubble foundation; 2-storey house; Italianate features; hanging bracket veranda; projecting eaves;	Plaque
CHR632	Newmarket	266 Prospect Street		Architect: William Bunney; incorporates Baptist Church - built circa 1848; storey red brick dwelling on stone rubble foundation; complex gable and hip roof; 2-bay façade; side entrance; large brick arches with key stone over ground floor	Plaque
CHR633	Newmarket	67 Prospect Street	1886	2-storey brick house on stone rubble foundation; gable roof; 1-bay façade; bay window; side entrance; side veranda	Plaque
CHR634	Newmarket	322 Prospect Street		2 storey, brick, "Victorian" Style of architecture.	Plaque
CHR635	Newmarket	221 Prospect Street		2 storey frame wooden clad residence in "Carpenter Italianate" style	Designated/Plaque
CHR636	Newmarket	291 Prospect Street		2 storey semi-detached frame vinyl clad residence	Plaque
CHR637	Newmarket	97 Prospect Street		1 1/2 storey frame dwelling with shiplap siding; L-shaped floor plan; 2-bay façade;	Plaque
CHR638	Newmarket	216 Prospect Street		Architect: William Bunney 2-storey frame house on stone rubble foundation; 2-bay façade; side hall plan; clapboard siding had been altered slightly; 2-storey frame house on stone rubble foundation; 2-bay façade; side hall plan;	Plaque
CHR639	Newmarket	295 Prospect Street		2 storey frame, brick veneer now vinyl clad semi-detached residence	Plaque
CHR640	Newmarket	190 Prospect Street		2 1/2 storey red brick house on limestone block foundation; 3-bay façade; centred entrance; corner tower; complex gable roof with balcony; single storey veranda with 2nd storey balcony;	Plaque
CHR641	Newmarket	232 Prospect Street Suite 234		2-storey solid brick house on stone rubble foundation; 3-bay façade; centred entrance with side lights and flat transom; L-shaped floor plan; 2x2 windows with arched openings; hip roof with projecting eaves; single storey with square posts on brick piers	
CHR642	Newmarket	334 Prospect Street		Queen Anne revival style; prominent corner tower; clapboard siding; 2-storey home; 2-bay façade; side entrance; single-storey veranda;	Plaque
CHR643	Newmarket	253 Prospect Street		2-storey frame house with aluminum siding; rough-cast; 3-bay façade; centred entrance; original windows replaced; gable roof with eaves facing street; end chimneys; centred dormer - not original; off-centred tail wing;	
CHR644	Newmarket	230 Prospect Street		1 1/2 storey brick house on concrete foundation with gambel roof; open veranda with roof supported by wood posts on brick pilasters; double-hung windows on stone sills;	Plaque
CHR645	Newmarket	342 Prospect Street		1 1/2 storey house; board and batten on stone rubble foundation; 3-bay façade; French windows flanking entrance; gable roof; tail wing (may be older)	
CHR646	Newmarket	85 Prospect Street		2-storey house; L-shaped floor plan; 3-bay façade; centred main entrance; gable roof; single storey veranda with 2nd storey door opening onto veranda roof terrace; small gable over 2nd storey door;	
CHR647	Newmarket	181 Prospect Street		Builder: Isaac Rose 2-storey red brick on limestone block foundation; hip roof; 3-bay façade; side door at recessed entrance; shallow bay windows along front and side façade; single storey brick veranda on southwest corner of house; 1x1 window sashes;	
CHR648	Newmarket	226 Prospect Street			Plaque
CHR649	Newmarket	158 Prospect Street			Plaque

Table R.2.1: YDSS Modifications Alternative Route B: Potentially Affected Cultural Heritage Resources

ID	Township	Municipal Address	Year Built	Property Description	Site Type and/or Designation
CHR650	Newmarket	185 Prospect Street		2-storey yellow brick veneer; hip roof; 3-bay façade; centred projecting eaves with brackets above entrance; 2x2 window sashes;	Plaque
CHR651	Newmarket	276 Prospect Street		Single-storey frame house on stone rubble foundation; 3-bay façade; centred entrance and gable; 2-storey veranda; veranda photo in Newmarket 1857-1957	
CHR652	Newmarket	163 Prospect Street		1 1/2 storey frame house; originally finished with rough cast scored ashlar; 2-bay façade; gable roof; bay window on side; Historical Society Photo circa 1910; featured in Era 20.4.1906	
CHR653	Newmarket	152 Prospect Street		Brick, 2 storey semi-detached property	Plaque
CHR655	Newmarket	330 Prospect Street		2 12 storey red brick house; 2-bay façade; gable roof; side entrance in alcove which has been closed in by window on south side;	
CHR656	Newmarket	208 Prospect Street		1 1/2 storey frame house; L-shaped floor plan with tail wing; gable roof; 2-bay façade with side entrance; originally clad with clapboard siding, now aluminum; originally had a single storey open veranda, now enclosed;	
CHR657	Newmarket	86 Prospect Street		2-storey yellow brick house with red brick quoining and arches over windows; ornamental key stones in arches; gable roof; stone rubble foundation;	
CHR659	Newmarket	173 Prospect Street		1 1/2 storey frame dwelling on stone rubble foundation; 4-bay façade; front entrance on side of 2-storey projecting vestibule; clapboard siding; gable roof; slightly arched 2x2 windows; single storey veranda on both sides of vestibule	



Appendix R-3

Table R.3
Net Effects Assessment – York Durham Sewage System Modifications Alternative Route C

Table R.3: Net Effects Analysis – York Durham Sewage System Modifications: Alternative Route C

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
Technical	Carbon Dioxide (CO ₂) Equivalent Footprint	Equivalent CO ₂ (CO ₂ e) generated in tonnes CO ₂ e/year ¹	<ul style="list-style-type: none"> Approximately 241 tonnes CO₂e /year. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures. 	<ul style="list-style-type: none"> Approximately 241 tonnes CO₂e /year.
Natural Environment	Effect on groundwater	Temporary and/or long-term change in groundwater quality	<ul style="list-style-type: none"> Temporary decrease in groundwater quality due to dewatering during construction of the YDSS Modifications Alternative Route². No long-term change in groundwater quality during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Use construction such as limiting excavations below the water table, use directional drilling methods where suitable, use groundwater cut-off structures where appropriate to minimize the amount of temporary dewatering required. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary decrease in groundwater quality due to dewatering during construction of the YDSS Modifications Alternative Route would be minimized by using standard construction methods. No net effects.
		Temporary and/or long-term change in groundwater quantity	<ul style="list-style-type: none"> Temporary decrease in groundwater quantity due to dewatering during construction of the YDSS Modifications Alternative Route³. No long-term change in groundwater quantity during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Use construction methods such as limiting excavations below the water table, use directional drilling methods where suitable, use groundwater cutoff structures where appropriate to minimize the amount of temporary dewatering required. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary decrease in groundwater quantity due to dewatering during construction of the YDSS Modifications Alternative Route would be minimized by using construction methods. No net effects.
	Effect on surface water	Temporary and/or long-term change in surface water quality	<ul style="list-style-type: none"> Temporary decrease in surface water quality at 7 surface water crossings (1 at Weslie Creek, 1 at Bogart Creek, 1 at Marsh Creek, 2 tributaries to Tannery Creek and 2 unnamed tributaries along Bayview Parkway) due to increased sediment in surface water runoff during construction of the YDSS Modifications Alternative Route. No long-term change in surface water quality during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Develop and implement an Erosion and Sediment Control Plan consistent with the policies outlined in the Erosion and Sediment Control Guidelines for Urban Construction (2006) during construction. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary decrease in surface water quality at 7 surface water crossings (1 at Weslie Creek, 1 at Bogart Creek, 1 at Marsh Creek, 2 tributaries to Tannery Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be minimized by developing and implementing an erosion and sediment control plan consistent with policies outlined in the Erosion and Sediment Control Guidelines for Urban Construction (2006). No net effects.

1. Equivalent CO₂ generated indicator includes direct and indirect emissions (i.e., from electricity generation) of CO₂, CH₄ and N₂O. Direct emissions include natural gas, transportation related emissions, process related emissions, equipment related emissions, chemical usage related emissions and off-site biosolids/residuals decomposition emission. Further details are provided in the Technical Concept Level 2 Document, (CRA et al., February 2013).

2. Dewatering is expected to be relatively minor along Alternative Route C, because the route would be located in upland areas within existing roadways.

3. Dewatering is expected to be relatively minor along Alternative Route C, because the route would be located in upland areas within existing roadways.

Table R.3: Net Effects Analysis – York Durham Sewage System Modifications: Alternative Route C

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
		Temporary and/or long-term change in surface water quantity	<ul style="list-style-type: none"> Temporary increase in surface water quantity at 7 surface water crossings (1 at Weslie Creek, 1 at Bogart Creek, 1 at Marsh Creek, 2 tributaries to Tannery Creek and 2 unnamed tributaries along Bayview Parkway) due to an increase in overland flow during construction of the YDSS Modifications Alternative Route. No long-term change in surface water quantity during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Develop and implement an Erosion and Sediment Control Plan consistent with the policies outlined in the Erosion and Sediment Control Guidelines for Urban Construction (2006) during construction. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary increase in surface water quantity at 7 surface water crossings (1 at Weslie Creek, 1 at Bogart Creek, 1 at Marsh Creek, 2 tributaries to Tannery Creek and 2 unnamed tributaries along Bayview Parkway) due to an increase in overland flow during construction of the YDSS Modifications Alternative Route would be minimized by developing and implementing an erosion and sediment control plan consistent with policies outlined in the Erosion and Sediment Control Guidelines for Urban Construction (2006). No net effects.
	Effect on aquatic habitat or functions	Area (m ²) of temporary or permanent loss of aquatic features or categorical loss of functions by type – including Provincially Significant Wetland, Locally Significant Wetland, watercourses by sensitivity type, and others ⁴	<ul style="list-style-type: none"> Temporary loss of aquatic habitat and function at 7 surface water crossings (1 at Weslie Creek, 1 at Bogart Creek, 1 at Marsh Creek, 2 tributaries to Tannery Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route. No permanent loss of aquatic habitat or function during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Undertake construction outside of the relevant fish spawning timing window, and in the low-flow, dry summer periods where possible. Implement appropriate construction Best Management Practices such as dewatering and fish relocation during construction works based on consultations with review agencies. Limit removal of riparian vegetation, especially mature shrubs and trees. Stabilize banks and implement a restoration plan to compensate for temporary loss of aquatic habitat. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary loss of aquatic habitat and function from a decrease in surface water quality at 7 surface water crossings (1 at Weslie Creek, 1 at Bogart Creek, 1 at Marsh Creek, 2 tributaries to Tannery Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be mitigated and compensated for (as required) by undertaking construction outside of relevant fish spawning and timing window, implementing appropriate construction Best Management Practices based on consultations with review agencies, limiting removal of riparian vegetation, stabilizing the banks and implementing a restoration plan. No net effects.
	Effect on stream geomorphology	Change in geomorphic form/function/stability in affected channels	<ul style="list-style-type: none"> Temporary change to channel form, function and stability at 7 surface water crossings (1 at Weslie Creek, 1 at Bogart Creek, 1 at Marsh Creek, 2 tributaries to Tannery Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route. No long-term change in geomorphic form, function or stability during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Limit removal of riparian vegetation. Implement post construction restoration of channel form and function. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary change to channel form, function and stability at 7 surface water crossings (1 at Weslie Creek, 1 at Bogart Creek, 1 at Marsh Creek, 2 tributaries to Tannery Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be mitigated by limiting vegetation removal and implementing post construction restoration. No net effects.

4. Provincially Significant Wetlands, Locally Significant Wetlands and permanent and intermittent watercourses were avoided during the generation of the long list of potential YDSS Modification Alternative Routes.

Table R.3: Net Effects Analysis – York Durham Sewage System Modifications: Alternative Route C

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
	Effect on aquatic species including Species at Risk (species of special concern, threatened, endangered) and species of local concern, native and invasive species	Number and type of aquatic species ⁵ potentially affected temporarily or permanently ⁶	<ul style="list-style-type: none"> Temporary disturbance⁷ to aquatic species at 7 surface water crossings (1 at Weslie Creek, 1 at Bogart Creek, 1 at Marsh Creek, 2 tributaries to Tannery Creek and 2 unnamed tributaries along Bayview Parkway) due to a decrease in surface water quality during construction of the YDSS Modifications Alternative Route. No permanent disturbance to aquatic species during operation of the YDSS Modifications Alternative Route. No temporary or permanent disturbance to aquatic Species at Risk during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Undertake construction outside of relevant fish spawning timing window, and in the low-flow, dry summer periods where possible. Implement appropriate construction Best Management Practices such as dewatering and fish relocation during construction works. No avoidance/mitigation/compensation measures required. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary disruption to aquatic species at 7 surface water crossings (1 at Weslie Creek, 1 at Bogart Creek, 1 at Marsh Creek, 2 tributaries to Tannery Creek and 2 unnamed tributaries along Bayview Parkway) due to a decrease in surface water quality during construction of the YDSS Modifications Alternative Route would be mitigated by undertaking construction outside of the relevant fish spawning timing window and implementing appropriate construction Best Management Practices. No net effects. No net effects.
	Effect on groundwater recharge and discharge areas in relation to aquatic/wetland habitat	Area (m ²) of temporary or permanent loss of recharge and discharge areas	<ul style="list-style-type: none"> Temporary reduction in groundwater discharge (baseflow) at 7 surface water crossings (1 at Weslie Creek, 1 at Bogart Creek, 1 at Marsh Creek, 2 tributaries to Tannery Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route. No permanent loss of groundwater recharge and discharge areas as they relate to aquatic/wetland habitat during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Use construction methods such as limiting excavations below the water table, use temporary groundwater cutoff structures where appropriate to minimize the amount of temporary dewatering required. Direct dewatering discharge back to local watercourse following temperature and clarity control to mitigate temporary loss of baseflow. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary reduction in groundwater discharge (baseflow) at 7 surface water crossings (1 at Weslie Creek, 1 at Bogart Creek, 1 at Marsh Creek, 2 tributaries to Tannery Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be mitigated by using appropriate construction methods and directing the discharge back to the local watercourse. No net effects.
	Effect on terrestrial habitat or functions	Area (m ²) of temporary and/or permanent loss of natural heritage features by type – including ESAs, ANSIs, wildlife corridors, and others	<ul style="list-style-type: none"> No temporary or permanent loss of ESAs, ANSIs or wildlife corridors during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.

5. Aquatic species include species of local concern, native and invasive species.

6. Refer to the Natural Environment Baseline Conditions Report (CRA et al., April 2013) for detailed information on aquatic species.

7. Temporary disturbance to aquatic species at crossings due to decrease in surface water quality during construction of the YDSS Modifications Alternative Route.

Table R.3: Net Effects Analysis – York Durham Sewage System Modifications: Alternative Route C

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
	Effect on terrestrial species including Species at Risk, (species of special concern, threatened, endangered) species of local concern, native and invasive species, and area-sensitive species	Number and type of terrestrial species ⁸ potentially affected temporarily and/or permanently ⁹	<ul style="list-style-type: none"> No temporary or permanent disturbance¹⁰ to terrestrial species during construction or operation of the YDSS Modifications Alternative Route. No temporary or permanent disturbance to Species at Risk during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects. No net effects.
	Effect on groundwater recharge and discharge areas in relation to terrestrial habitat	Area (m ²) of temporary and/or permanent loss of recharge and discharge areas	<ul style="list-style-type: none"> No temporary or permanent loss of groundwater recharge and discharge areas in relation to terrestrial habitat during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
Built Environment	Effect on agricultural operations and capital investment related to agriculture	Approximate area (ha) of active agricultural operations ¹¹ affected	<ul style="list-style-type: none"> No temporary or permanent loss of active agricultural operations during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
		Extent of disruption of active agricultural operations such as: <ul style="list-style-type: none"> Fragmentation of agricultural fields Disturbance to artificial drainage systems and agricultural drains Removal and/or disturbance of farm fences, entrances and paddocks Disruption of agricultural-related businesses Disruption of normal external haul routes for farm machinery movements 	<ul style="list-style-type: none"> No temporary or permanent disruption to active agricultural operations during construction or operation of the YDSS Modifications Alternative Route as it is located within an Urban Area. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
	Effect on existing residences, businesses, and/or community, institutional, and recreational facilities ¹²	Number and type of residences displaced	<ul style="list-style-type: none"> No displacement of residences during construction and operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.

8. Terrestrial species include species of local concern, native and invasive species and area-sensitive species.
9. Refer to the Natural Environment Baseline Conditions Report (CRA et al., April 2013) for detailed information on terrestrial species.
10. Disturbance refers to construction-related activities (i.e., noise, vibration, dust, etc.).
11. Active agricultural land removed refers to the area being ploughed (i.e., excludes barns, buildings etc).
12. Information regarding existing residences and businesses accurate as of May 2012.

Table R.3: Net Effects Analysis – York Durham Sewage System Modifications: Alternative Route C

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
		Number and type of residences temporarily or permanently disrupted ¹³	<ul style="list-style-type: none"> ▪ Temporary disruption to approximately 157 driveway accesses for 162 private residences during construction of the YDSS Modifications Alternative Route, including: <ul style="list-style-type: none"> ▪ Section of Route along Bayview Parkway from Newmarket Pumping Station to Davis Drive – 29 private residences with 29 driveway accesses: <ul style="list-style-type: none"> ▪ 28 private residences each with 1 access off of Bayview Parkway ▪ 1 private residence with 1 access off of Bayview Parkway and 1 undisrupted access off of Heman Street ▪ Section of Route along Charles Street from Davis Drive to Queen Street and Queen Street from Charles Street to Prospect Street – 16 private residences with 16 driveway accesses: <ul style="list-style-type: none"> ▪ 9 private residences each with 1 access off of Charles Street ▪ 7 private residences each with 1 access off of Queen Street ▪ Section of Route along Prospect Street from Queen Street to Mulock Drive – 117 private residences with 112 driveway accesses: <ul style="list-style-type: none"> ▪ 87 private residences each with 1 access off of Prospect Street ▪ 1 private residence with 1 shared access with a business off of Prospect Street¹⁴ ▪ 1 private retirement residence with 1 access off of Prospect Street ▪ 14 private residences with 7 shared accesses off of Prospect Street ▪ 1 private residences with 2 accesses off of Prospect Street ▪ 1 private residence with 1 access off of Prospect Street and 1 undisrupted access off of Wellington Street ▪ 1 private residence with 1 access off of Prospect Street and 1 undisrupted access off of Timothy Street ▪ 2 private residences each with 1 access off of Queen Street 	<ul style="list-style-type: none"> ▪ Provide temporary driveway access and arrangements for waste collection to affected residences and notify residences of alternate arrangements. 	<ul style="list-style-type: none"> ▪ The temporary disruption to approximately 157 driveway accesses for 162 private residences during construction of the YDSS Modifications Alternative Route would be minimized by providing temporary driveway access, arrangements for waste collection and notifying residents of the alternative arrangements¹⁵

13. Disruption to residences has been applied with respect to driveway accesses (including waste collection). Disruption that relates to odour, noise and vibration are considered in the respective indicators below.

14. Accesses for businesses operated out of residences are counted under both of the following indicators: “Number and characteristics of businesses temporarily or permanently disrupted” and “Number and type of residences temporarily or permanently disrupted”.

15. Note that there are a number of townhomes and commercial property currently under construction at the southeast corner of Bayview Avenue and St. John’s Sideroad East that when complete may experience temporary disruption to accesses depending on construction completion schedules.

Table R.3: Net Effects Analysis – York Durham Sewage System Modifications: Alternative Route C

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> ▪ 1 private low rise apartment property with 1 access off of Prospect Street ▪ 1 private low rise apartment property with 1 access off of Prospect Street and 1 undisturbed access off of Cotter Street ▪ 1 private residence with 1 access off of Prospect Street and 1 undisturbed access off of Second Street ▪ 1 private residence with 2 accesses off of Bayview Avenue ▪ 2 private residences each with 1 shared access with 2 businesses off of Bayview Avenue ▪ 1 private residence with 1 access off of Bayview Avenue and 1 undisturbed access off of College Street ▪ 2 Pickering College residences each with 1 access off of Bayview Avenue ▪ Temporary disruption to road access for approximately 1,226 private residences that can only be accessed by Prospect Street, Bayview Avenue, and St. John's Sideroad East during construction of the YDSS Modifications Alternative Route. <ul style="list-style-type: none"> ▪ Section of Route along Prospect Street from Queen Street to Mulock Drive –5 private residences that can only be accessed by Prospect Street: <ul style="list-style-type: none"> ▪ 3 private residences that can only be accessed by Skelton Street (off of Prospect Street) ▪ 2 private residences that can only be accessed by Poplar Lane (off of Prospect Street) ▪ Section of Route along Bayview Avenue from Mulock Drive to St. John's Sideroad – 1,023 private residences that can only be accessed from Bayview Avenue or St. John's Sideroad E: <ul style="list-style-type: none"> ▪ 447 private residences whose access is only by McBean Avenue and Silken Laumann Drive (both roads off of Bayview Avenue) ▪ 136 private residences whose access is only by Laurelwood Gate (off of Bayview Avenue) ▪ 292 private residences whose access is only by Brooker Ridge (off of Bayview Avenue) ▪ 148 private residences whose access is only by Ballymore Drive and Trent Street (off of Bayview Avenue and St. John's Sideroad E, respectively) 	<ul style="list-style-type: none"> ▪ Provide temporary access for local roads and arrangements for waste collection to affected residences and notify residences of alternate arrangements. 	<ul style="list-style-type: none"> ▪ The temporary disruption to road access for approximately 1,226 private residences that can only be accessed by Prospect Street, Bayview Avenue, and St. John's Sideroad East during construction of the YDSS Modifications Alternative Route would be minimized by providing access for local roads and notifying residents of the alternative arrangements.

Table R.3: Net Effects Analysis – York Durham Sewage System Modifications: Alternative Route C

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> ▪ Section of Route along St. John’s Sideroad from Bayview Avenue to Aurora Pumping Station – 198 private residences that can only be accessed from St. John’s Sideroad: <ul style="list-style-type: none"> ▪ 198 private residences whose access is only by Pinnacle Trail ▪ Temporary disruption to a small portion of 1 private residence due to the construction of the staging areas at Prospect Street and Bogart Pumping Station (Bogart Route) (will not disrupt driveway access off of Hamilton Street) within a portion of the property. ▪ No permanent disruption to residences during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> ▪ Provide compensation in accordance with York Region’s policies. ▪ No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> ▪ The temporary disruption to a small portion of 1 private residence due to the construction of the staging areas at Prospect Street and Bogart Pumping Station (Bogart Route) would be compensated for (as necessary) in accordance with York Region’s policies. ▪ No net effects.
		Number and characteristics of businesses displaced ¹⁶	<ul style="list-style-type: none"> ▪ No displacement of businesses during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> ▪ No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> ▪ No net effects.
		Number and characteristics of businesses temporarily or permanently disrupted ^{17,18}	<ul style="list-style-type: none"> ▪ Temporary disruption to approximately 29 driveway accesses for 107 businesses with businesses during construction of the YDSS Modifications Alternative Route. <ul style="list-style-type: none"> ▪ Section of Route along Bayview Parkway from Newmarket Pumping Station to Davis Drive – 2 businesses with 3 driveway accesses, as well as 1 business with 1 driveway access and construction of YDSS Modifications Alternative Route within property: <ul style="list-style-type: none"> ▪ 1 business with 1 access off of Bayview Parkway ▪ 1 business with 2 accesses off of Bayview Parkway ▪ 1 business with 1 access off of Bayview Parkway and 1 undisrupted access off of Davis Drive ▪ Section of Route along Charles Street from Davis Drive to Queen Street and Queen Street from Charles Street to Prospect Street – 13 businesses with 9 driveway accesses: <ul style="list-style-type: none"> ▪ 3 businesses each with 1 access off of Charles Street 	<ul style="list-style-type: none"> ▪ Provide temporary driveway access and access signage, arrangements for waste collection to affected businesses and notify businesses of alternative arrangements. 	<ul style="list-style-type: none"> ▪ The temporary disruption to approximately 29 driveway accesses for 107 businesses during construction of the YDSS Modifications Alternative Route would be minimized by providing temporary driveway access and access signage, arrangements for waste collection and notifying businesses of the alternative arrangements.

16. Does not include agricultural businesses. Agricultural businesses are included under the evaluation criteria: “Effect on agricultural operations and capital investment related to agriculture”.

17. Does not include agricultural businesses. Agricultural businesses are included under the evaluation criteria: “Effect on agricultural operations and capital investment related to agriculture”.

18. Disruption to businesses has been applied with respect to driveway accesses, which considers customer access, deliveries and waste collection, etc. Disruption that relates to odour, noise and vibration are considered in the respective indicators below.

Table R.3: Net Effects Analysis – York Durham Sewage System Modifications: Alternative Route C

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> ▪ 2 businesses each with 2 accesses off of Charles Street ▪ 6 businesses that share 1 access off of Charles Street and 1 undisrupted access off of Davis Drive ▪ 2 businesses with 1 shared access off of Queen Street and 1 undisrupted shared access off of Prospect Street ▪ Section of Route along Prospect Street from Queen Street to Mulock Drive – 7 businesses with 7 driveway accesses: <ul style="list-style-type: none"> ▪ 2 businesses each with 1 access off of Prospect Street ▪ 2 businesses with 2 shared accesses off of Prospect Street ▪ 1 business with 1 access off of Poplar Lane ▪ 2 businesses each with 1 access off of Bayview Avenue ▪ Section of Route along Bayview Avenue from Mulock Drive to St. John’s Sideroad – 81 businesses with 8 driveway accesses: <ul style="list-style-type: none"> ▪ 1 business with 1 access off of Bayview Avenue and 1 undisrupted access off of Mulock Drive ▪ 33 businesses with 1 shared access off of Bayview Avenue and 1 undisrupted shared access off of Mulock Drive ▪ 1 business with 1 access off of Bayview Avenue and 1 undisrupted access off of Steven Court ▪ 15 businesses with 1 shared access off of Bayview Avenue ▪ 17 businesses with 2 shared accesses off of Bayview Avenue and 1 undisrupted shared access off of Steven Court ▪ 14 businesses with 2 shared accesses off of Bayview Avenue ▪ Section of Route along St. John’s Sideroad from Bayview Avenue to Aurora Pumping Station – 3 businesses with 1 shared access off of Bayview Avenue and 3 undisrupted shared accesses off of Earl Stewart Drive ▪ Staging Sites at Prospect Street and Bogart Pumping Station (Bogart Route) – No disruption to businesses 		

Table R.3: Net Effects Analysis – York Durham Sewage System Modifications: Alternative Route C

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> ▪ Temporary disruption to road access for approximately 10 businesses that can only be accessed by Bayview Avenue during construction of the YDSS Modifications Alternative Route. <ul style="list-style-type: none"> ▪ Section of Route along Bayview Avenue from Mullock Drive to St. John's Sideroad –10 businesses that can only be accessed by Bayview Avenue: <ul style="list-style-type: none"> ▪ 2 businesses whose access is only by Newpark Boulevard (off of Bayview Avenue) ▪ 8 businesses whose access is only by Brooker Ridge (off of Bayview Avenue) ▪ Temporary disruption to a small portion of 1 business along the Section of Route along Bayview Parkway from Newmarket Pumping Station to Davis Drive where the YDSS Modifications Alternative Route is constructed within the business property (disruption to driveway access for this business is included above). ▪ No permanent disruption to businesses during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> ▪ Provide temporary access for local roads and access signage, arrangements for waste collection to affected businesses and notify businesses of alternative arrangements. ▪ Provide compensation in accordance with York Region's policies. ▪ No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> ▪ The temporary disruption to road access for approximately 10 businesses that can only be accessed by Bayview Avenue during construction of the YDSS Modifications Alternative Route would be minimized by providing access for local roads and access signage, arrangements for waste collection and notifying businesses of the alternative arrangements. ▪ The temporary disruption to a small portion of 1 business where the YDSS Modifications Alternative Route is constructed within the business property would be compensated for (as necessary) in accordance with York Region's policies. ▪ No net effects.
		Number and characteristics of community, institutional, and recreational facilities displaced	<ul style="list-style-type: none"> ▪ No displacement of community, institutional, and recreational facilities during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> ▪ No avoidance/mitigation/compensation measures required 	<ul style="list-style-type: none"> ▪ No net effects.
		Number and characteristics of community, institutional, and recreational facilities temporarily or permanently disrupted	<ul style="list-style-type: none"> ▪ Temporary disruption to approximately 15 driveway accesses for 8 community, institutional and recreational facilities (including Tom Taylor Trail, George Richardson Park, Lake Simcoe Region Conservation Authority, York Region Community Service Housing Department, York Regional Police District 1 Headquarters, Pickering College Independent Day and Boarding Co-ed School, unnamed cemetery off of Bayview Avenue, and unnamed park off of St. John's Sideroad E) during construction of the YDSS Modifications Alternative Route. <ul style="list-style-type: none"> ▪ Section of route along Bayview Parkway from Newmarket Pumping Station to Davis Drive – 2 facilities with 2 driveway accesses and 2 facilities with 3 driveway accesses where the YDSS Modifications Alternative Route will be constructed within the property: <ul style="list-style-type: none"> ▪ 2 recreational facilities, including Tom Taylor Trail and George Richardson Park each with 1 access off of Bayview Parkway 	<ul style="list-style-type: none"> ▪ Provide temporary driveway access and access signage, arrangements for waste collection to affected community, institutional, and recreational facilities and notify the facilities of alternative arrangements. 	<ul style="list-style-type: none"> ▪ The temporary disruption to approximately 15 driveway accesses for 8 community, institutional and recreational facilities (including Tom Taylor Trail, George Richardson Park, Lake Simcoe Region Conservation Authority, York Region Community Service Housing Department, York Regional Police District 1 Headquarters, Pickering College Independent Day and Boarding Co-ed School, unnamed cemetery off of Bayview Avenue, and unnamed park off of St. John's Sideroad East) during construction of the YDSS Modifications Alternative Route would be minimized by providing temporary driveway access and access signage, arrangements for waste collection and notifying the facilities of the alternative arrangements.

Table R.3: Net Effects Analysis – York Durham Sewage System Modifications: Alternative Route C

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> ▪ 2 community/institutional facilities, including the Lake Simcoe Region Conservation Authority with 2 accesses off of Bayview Parkway and the York Region Community Service Housing Department with 1 access off of Bayview Parkway and where the YDSS Modifications Alternative Route will be constructed within the properties ▪ Section of route along Charles Street from Davis Drive to Queen Street and Queen Street from Charles Street to Prospect Street – No community, institutional, and recreational facilities accesses will be disrupted ▪ Section of route along Prospect Street from Queen Street to Mulock Drive – 2 facilities with 6 driveway accesses: <ul style="list-style-type: none"> ▪ 2 institutional facilities, including the Pickering College Independent Day and Boarding Co-ed School with 5 accesses off of Bayview Avenue, and the York Regional Police District 1 Headquarters, with 1 access off of Prospect Street and 1 undisrupted access off of Water Street ▪ Section of route along Bayview Avenue from Mulock Drive to St. John’s Sideroad – 1 facility with 1 driveway access: <ul style="list-style-type: none"> ▪ 1 institutional facility, including a cemetery with 1 access off of Bayview Avenue ▪ Section of route along St. John’s Sideroad from Bayview Avenue to Aurora Pumping Station – 1 facility with 3 driveway accesses: <ul style="list-style-type: none"> ▪ 1 local park with 2 accesses off of St. John’s Sideroad and 1 access off of Downey Circle ▪ Temporary disruption to road access for 3 community, recreational and institutional facilities (including Art Ferguson Park, Hamilton Park and St. Andrew’s Valley Golf Club) that can only be accessed by Bayview Avenue and St. John’s Sideroad East. ▪ Section of route along Bayview Avenue from Mulock Drive to St. John’s Sideroad –1 recreational facility, Art Ferguson Park, whose access is only by Brooker Ridge (off of Bayview Avenue). 	<ul style="list-style-type: none"> ▪ Provide temporary access for local roads and access signage, arrangements for waste collection, to affected community, institutional and recreational facilities and notify facilities of alternative arrangements. 	<ul style="list-style-type: none"> ▪ The temporary disruption to road access for 3 community, recreational and institutional facilities (including Art Ferguson Park, Hamilton Park and St. Andrew’s Valley Golf Club) that can only be accessed by Mulock Drive and Pearson Street would be minimized by providing access for local roads and access signage, arrangements for waste collection and notifying the facilities of the alternative arrangements.

Table R.3: Net Effects Analysis – York Durham Sewage System Modifications: Alternative Route C

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> ▪ Section of route along St. John’s Sideroad from Bayview Avenue to Aurora Pumping Station –2 facilities that can only be accessed by St. John’s Sideroad E: <ul style="list-style-type: none"> ▪ 2 recreational facilities including Hamilton Park whose access is only by Pinnacle Trail (off of St. John’s Sideroad E) and St. Andrew’s Valley Golf Club whose access is only by Pinnacle Trail (off of St. John’s Sideroad E) ▪ Temporary disruption to portions of 5 community, institutional and recreational facilities (including Lake Simcoe Region Conservation Authority, York Region Community Service Housing Department, Mabel Davis Conservation Area, College Manor Park, and Barrington Park) where the YDSS Modifications Alternative Route and/or staging areas are constructed within these properties (2 of these facilities have 3 accesses that will be disrupted and are also included above). ▪ Section of route along Bayview Parkway from Newmarket Pumping Station to Davis Drive –1 facility with no driveway accesses where the YDSS Modifications Alternative Route will be constructed within the property, and 2 facilities with 3 driveway accesses where the YDSS Modifications Alternative Route will be constructed within the property: <ul style="list-style-type: none"> ▪ 1 recreational facility with no accesses, Mabel Davis Conservation Area where the YDSS Modifications Alternative Route will be constructed within the property ▪ 2 community/institutional facilities, including the Lake Simcoe Region Conservation Authority with 2 accesses off of Bayview Parkway and the York Region Community Service Housing Department with 1 access off of Bayview Parkway and where the YDSS Modifications Alternative Route will be constructed within the properties ▪ Staging Sites at Prospect Street and Bogart Pumping Station (Bogart Route) – 2 facilities with no disrupted accesses where the staging area will be constructed within the properties: <ul style="list-style-type: none"> ▪ 2 recreational facilities, College Manor Park and Barrington Park, where the staging area will be constructed within the property but will not disrupt the accesses off of College Manor Drive and Terry Carter Crescent 	<ul style="list-style-type: none"> ▪ Provide compensation in accordance with York Region’s policies. 	<ul style="list-style-type: none"> ▪ The temporary disruption to portions of 5 community, institutional and recreational facilities (including Lake Simcoe Conservation Authority, York Region Community Service Housing Department, Mabel Davis Conservation Area, College Manor Park, and Barrington Park) where the YDSS Modifications Alternative Route and/or staging areas are constructed within these properties would be compensated for (as necessary) in accordance with York Region’s policies (2 of these facilities have 3 accesses that will be disrupted and are also included above).

Table R.3: Net Effects Analysis – York Durham Sewage System Modifications: Alternative Route C

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> No permanent disruption to community, institutional, and recreational facilities during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
	Effect of vibration on existing buildings	Number of existing buildings affected and extent and duration of adverse effects ¹⁹	<ul style="list-style-type: none"> Temporary increase in vibration levels at approximately 487 adjacent²⁰ buildings (including 345 residences, 124 businesses and 18 community, institutional, and recreational facilities) during construction of the YDSS Modifications Alternative Route. Structural damage to historic buildings potentially sensitive to noise and vibration²¹ in close proximity and of inferior / aged condition during construction of the YDSS Modifications Alternative Route. No permanent increase in vibration levels during operation of the YDSS Modifications Alternative Route 	<ul style="list-style-type: none"> Implement Best Management Practices (BMPs) for vibration reduction to minimize temporary construction-related effects, including measures such as: <ul style="list-style-type: none"> Staged construction so demolition, earth-moving and ground-impacting activities do not occur at the same time Relocate heavy equipment travel routes away from sensitive buildings Limit heavy construction to daytime hours Use specialized drilling equipment and methods (avoid sheet piling, jack hammer, vibratory rollers, etc.) Establish a minimum setback distances between the YDSS Modifications Alternative Route and historic buildings (e.g., built heritage resources etc.). No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary increase in vibration levels at approximately 487 adjacent buildings (including 345 residences, 124 businesses and 18 community, institutional, and recreational facilities) during construction of the YDSS Modifications Alternative Route would be minimized by implementing Best Management Practices for vibration reduction (i.e., staged construction, limiting construction hours, use of specialized drilling equipment, etc.). The structural damage to historic buildings potentially sensitive to noise and vibration in close proximity and of inferior / aged condition during construction of the YDSS Modifications Alternative Route would be mitigated by establishing a minimum safe setback distance between the YDSS Modifications Alternative Route and sensitive buildings. No net effects.
	Effect on property	Number and extent of properties affected and ownership	<ul style="list-style-type: none"> No property acquisition required during construction or operation of the YDSS Modifications Alternative Route. Permanent modification to existing easement within approximately 5 properties during operation of the YDSS Modifications Alternative Route: <ul style="list-style-type: none"> Section of Route from Newmarket Pumping Station to Heman Street <ul style="list-style-type: none"> Potential extension of existing easement to the east of the existing forcemain within 2 properties owned by the Town of Newmarket. Section of Route along Bayview Avenue from to Heman Street to Davis Drive <ul style="list-style-type: none"> Potential extension of existing easement to the west of the existing forcemain within 1 property owned by the Lake Simcoe Region Conservation Authority, 1 property owned by York Region and 1 private property (multi-unit business complex). 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. Compensate for acquisition of permanent easement on private property in accordance with standard Regional procedures and policies. 	<ul style="list-style-type: none"> No net effects. The permanent modification to existing easement within approximately 5 properties during operation of the YDSS Modifications Alternative Route would be compensated for (as necessary) in accordance with standard Regional procedures and policies.

19. Effect will depend on the proximity to construction activity, and subsurface soil conditions.

20. Adjacent buildings were evaluated for the YDSS Modifications Alternative Route since the noise effects are construction-related and the equipment is mobile rather than stationary. Potentially affected locations would be those receivers immediately adjacent to the road.

21. The locations of historic buildings potentially sensitive to noise and vibration within the UYSS EA study area were identified in the Cultural Heritage Baseline Conditions Report (CRA et al., April 2013).

Table R.3: Net Effects Analysis – York Durham Sewage System Modifications: Alternative Route C

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
		Total area of property acquisition required (ha)	<ul style="list-style-type: none"> ▪ No property acquisition during construction or operation of the YDSS Modifications Alternative Route. ▪ Permanent acquisition of existing easement²² within approximately 5 properties (listed above) during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> ▪ No avoidance/mitigation/compensation required. ▪ Compensate for acquisition of permanent easement on private property in accordance with standard Regional procedures and policies. 	<ul style="list-style-type: none"> ▪ No net effects. ▪ The permanent acquisition of existing easement within approximately 5 properties during operation of the YDSS Modifications Alternative Route would be compensated for (as necessary) in accordance with standard Regional procedures and policies.
	Effect on existing roadway/utility infrastructure	Number of roadways and type affected and extent and duration of adverse effects	<ul style="list-style-type: none"> ▪ Temporary disruption to 9 roadways, where the alternative route follows or crosses the existing roadway, during construction of the YDSS Modifications Alternative Route: <ul style="list-style-type: none"> ▪ Bayview Parkway (Town Minor Collector Road) and access to Heman Street (Town Local Road) to accommodate closures of some lanes on Bayview Parkway for up to 4 months ▪ Charles Street (Town Local Road) and access to Granby Place (Town Local Road) to accommodate closure of the west lane of Charles Street for 1 month ▪ Queen Street (Town Minor Collector Road) to accommodate closure of the north lane of Queens Street for 1 month ▪ Prospect Street (Region Primary Collector Road), and access to Grace Street (Town Local Road), Granby Place (Town Local Road), Queen Street (Town Minor Collector Road), Wellington Street (Town Local Road), Skelton Street (Town Local Road), Srigley Street (Town Minor Collector Road), Timothy Street (Town Local Road), Lydia Street (Town Local Road), Water Street/Gorham Street (Town Primary Collector Road), Pearson Street (Town Local Road), and Second Street (Town Local Road), to accommodate full road closure of Prospect Street for up to 12 months ▪ Bayview Avenue north of Mulock Drive (Region Arterial Roads), and access to College Street (Town Local Road), Bondie Avenue/Penrose Street (Town Local Road), and Mulock Court (Town Local Road) to accommodate full road closure of Bayview Avenue for up to 12 months 	<ul style="list-style-type: none"> ▪ Prepare and implement a traffic management plan describing detours for road closures and/or lane closures during construction of the YDSS Modifications Alternative Route and provision of temporary access, as required. 	<ul style="list-style-type: none"> ▪ The temporary disruption to 9 roadways, where the Alternative Route follows or crosses the existing roadway, during construction of the YDSS Modifications Alternative Route would be minimized by implementing a traffic management plan and providing temporary access as required to the following: <ul style="list-style-type: none"> ▪ Bayview Parkway (Town Minor Collector Road) ▪ Charles Street (Town Local Road) ▪ Queen Street (Town Minor Collector Road) ▪ Prospect Street (Region Primary Collector Road) ▪ Bayview Avenue north of Mulock Drive (Region Arterial Roads) ▪ Bayview Avenue south of Mulock Drive (Region Arterial Roads) ▪ St. John's Sideroad (Region Arterial Road) ▪ Davis Drive (Region Arterial Road) ▪ Pearson Street (Town Local Road)

22. Exact extent of easement required to be determined during detailed design.

Table R.3: Net Effects Analysis – York Durham Sewage System Modifications: Alternative Route C

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
			<ul style="list-style-type: none"> Bayview Avenue south of Mulock Drive (Region Arterial Roads), and access to Mulock Drive (Region Arterial Road), Carberry Street (Town Local Road), Newpark Boulevard/McBean Avenue (Town Local Road), Silken Laumann Drive/Stonehaven Avenue (Town Local Road), Brooker Ridge (Town Minor Collector Road), and Ballymore Drive (Town Local Road) to accommodate closure of east lane on Bayview Avenue for up to 4 months St. John's Sideroad (Region Arterial Road), and access to Trent Street (Town Local Road), Earl Stewart Drive (Town Minor Collector Road), Gateway Drive (Town Major Collector), and Industrial Parkway North (Town Major Collector) to accommodate closure of south lane on St. John's Sideroad for up to 4 months Davis Drive (Region Arterial Road) to accommodate crossing of Davis Drive Pearson Street (Town Local Road) to accommodate crossing of Pearson Street No disruption to roadways during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
		Number and type of utilities affected and extent and duration of adverse effects	<ul style="list-style-type: none"> Temporary disruption to 4 major utilities (York Region Water and Wastewater Bayview Operations Centre, Bayview Pumping Station, Hydro Corridor and Bogart Pumping Station) located adjacent to the YDSS Modifications Alternative Route during construction. Temporary disruption to the watermain, sanitary sewer, storm sewer, local gas, local hydro, local cable and local telephone utilities on Prospect Street between Davis Drive and Mulock Drive for up to 12 months during the construction of the YDSS Modifications Alternative Route. No permanent disruption to utilities during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Locate utilities based on consultations with utility providers and relocate utilities if required. Locate utilities based on consultations with utility providers and relocate utilities if required. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary disruption to 4 major utilities (York Region Water and Wastewater, Bayview Pumping Station, Hydro Corridor and Bogart Pumping Station) during construction of the YDSS Modifications Alternative Route would be mitigated by locating utilities based on consultations with utility providers and relocating if required. The temporary disruption to the watermain, sanitary sewer, storm sewer, local gas, local hydro, local cable and local telephone utilities on Prospect Street between Davis Drive and Mulock Drive would be minimized by locating utilities based on consultation with utility providers and, if confirmed on-site, relocating if required (Temporary interruption of service during relocation is anticipated). No net effects.

Table R.3: Net Effects Analysis – York Durham Sewage System Modifications: Alternative Route C

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
Social Environment	Effect on wells	Number of wells and type affected, extent and duration and nature (water quality/ quantity) of adverse effects.	<ul style="list-style-type: none"> No temporary or permanent change to groundwater wells during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
	Effect of noise on sensitive receptors ²³	Number of sensitive receptors affected and extent and duration of adverse effects	<ul style="list-style-type: none"> Temporary increase in noise levels at approximately 345 adjacent²⁴ residences (including 6 multi-unit complexes) during construction of the YDSS Modifications Alternative Route. No permanent increase in noise levels during operation of the YDSS Modifications Alternative Route 	<ul style="list-style-type: none"> Adhere to Ministry of the Environment (MOE) Urban (NPC-205) and Rural (NPC-232) noise limits. Adhere to Town of East Gwillimbury's Noise By-law (2004-80) limits for construction activity. Implement Best Management Practices for noise reduction to minimize temporary construction-related nuisance effects (i.e., operators limit impact noise from tailgate, use of construction equipment that meets the requirements of the MOE Construction Equipment Publication (NPC-115). Develop complaint resolution procedure for responding to complaints resulting from construction. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary increase in noise levels at approximately 345 adjacent residences (including 6 multi-unit complexes) during construction of the YDSS Modifications Alternative Route would be minimized by adhering to the Ministry of the Environment's noise limits, the Town of East Gwillimbury's Noise By-law (2004-80), implementing construction Best Management Practices for noise reduction and developing a complaint resolution procedure. No net effects.
	Effect of perceptible vibration levels on sensitive receptors	Number of sensitive receptors ²⁵ affected and extent and duration of adverse effects	<ul style="list-style-type: none"> Temporary increase in vibration levels at approximately 345 adjacent²⁶ residences (including 6 multi-unit complexes) during construction of the YDSS Modifications Alternative Route. No permanent increase in vibration levels during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Adhere to MOE vibration limits as set out in NPC-207 Publication (NPC 207 Impulse Vibration in Residential Buildings). Implement Best Management Practices for vibration reduction to minimize temporary construction-related nuisance effects during daytime, including: <ul style="list-style-type: none"> Staged construction so demolition, earth-moving and ground-impacting activities do not occur at the same time. Relocate heavy equipment travel routes away from sensitive buildings. Limit heavy construction to daytime hours. Use specialized drilling equipment and methods (avoid sheet piling, jack hammer, vibratory rollers, etc.). Develop complaint resolution procedure for responding to complaints resulting from construction. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The temporary increase in vibration levels at approximately 345 adjacent residences (including 6 multi-unit complexes) during construction of the YDSS Modifications Alternative Route would be minimized by adhering to the Ministry of the Environment's vibration limits as set out in the NPC-207 Publication, implementing Best Management Practices for vibration reduction, adhering to MOE's NPC-207 vibration limits, and developing a complaint resolution procedure. No net effects.

23. As defined by the Ministry of the Environment (MOE) in NPC-205, a sensitive "point of reception" means any point on the premises of a person where sound or vibration originating from other than those premises is received. For the purpose of approval of new sources of noise, including verifying compliance with Section 9 of the Environmental Protection Act, the point of reception may be located on any of the following existing or zoned for future use premises: permanent or seasonal residences, hotels/motels, nursing/retirement homes, rental residences, hospitals, camp grounds, and noise sensitive buildings such as schools and places of worship.

24. Adjacent buildings were evaluated for the YDSS Modifications Alternative Route since the noise effects are construction related and the equipment is mobile rather than stationary. Potentially affected locations would be those receivers immediately adjacent to the road.

25. Sensitive receptors from a vibration perspective include permanent or seasonal residences, hotels/motels, nursing/retirement homes, rental residences, hospitals, campgrounds and vibration sensitive buildings.

26. Adjacent buildings were evaluated for the YDSS Modifications Alternative Route since the noise effects are construction related and the equipment is mobile rather than stationary. Potentially affected locations would be those receivers immediately adjacent to the road.

Table R.3: Net Effects Analysis – York Durham Sewage System Modifications: Alternative Route C

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
	Effect of odour sensitive receptors from current conditions ²⁷	Number of sensitive receptors impacted and extent and duration of impacts	<ul style="list-style-type: none"> No temporary or permanent increase in odour during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
Economic Environment	Effect on approved/planned land uses	Number, extent, and type of approved/planned land uses affected	<ul style="list-style-type: none"> Temporary disruption to driveway accesses for 28 townhomes, 135 stacked townhomes, 16 townhome condos and commercial property currently under construction at the southeast corner of Bayview Avenue and St. John's Sideroad East, during construction of the YDSS Modifications Alternative Route. No permanent effects on approved/planned land uses during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Provide temporary driveway access and access signage, and arrangements for waste collection to properties and notify residents and businesses of alternate arrangements. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects. No net effects.
	Effect on agricultural soil resources	<p>Approximate area (ha) of Class 1, Class 2, and Class 3 soils removed (priority in that order).</p> <p>Approximate area (ha) of Specialty Cropland removed, and/or area of agricultural soils disturbed, and/or area of active agricultural land removed</p>	<ul style="list-style-type: none"> No removal of Class 1, Class 2 and Class 3 soils along the route during construction or operation of the YDSS Modifications Alternative Route. No removal of Specialty Cropland, no disturbance to agricultural soils and no removal of active agricultural land during construction or operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects. No net effects.
Cultural Environment	Effects on known or potential significant archaeological resources	Number and type of potentially significant, known archaeological sites affected.	<ul style="list-style-type: none"> No known archaeological sites affected during construction and operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> No net effects.
		Area (ha) of archaeological potential (i.e., lands with potential for the presence of significant archaeological resources) affected.	<ul style="list-style-type: none"> Disturbance to 0.74 ha with archaeological potential during construction of the YDSS Modifications Alternative Route. No disturbance to lands with archaeological potential during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> Complete a Stage 2 Archaeological Assessment to determine the presence of archaeological sites within the alternative route alignment. If warranted, undertake a Stage 3 Archaeological Assessment for any archaeological sites discovered during the Stage 2 Archaeological Assessment. A Stage 4 Archaeological Assessment (i.e., avoidance or salvage excavation) will be completed, if required, following the Stage 3 Archaeological Assessment. At these sites, appropriate consultations with Aboriginal communities will be undertaken in accordance with Ministry of Tourism, Culture and Sport guidelines. No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> The disturbance to 0.74 ha with archaeological potential during construction of the YDSS Modifications Alternative Route would be minimized and appropriate mitigation measures would be identified, if required, in the Stage 2 Archaeological Assessment and if warranted, during the Stage 3 or Stage 4 Archaeological Assessments. No net effects.

27. Sensitive receptors include residences, child care facilities, health care facilities, senior citizens' residences, long-term care facilities, schools, and for this assessment, businesses have been included as well.

Table R.3: Net Effects Analysis – York Durham Sewage System Modifications: Alternative Route C

Category	Criteria	Indicator	Potential Effects	Avoidance/Mitigation/Compensation Measures	Net Effects
	Effects on built heritage resources and cultural heritage landscapes.	Number and type of built heritage resources and cultural heritage landscapes displaced ²⁸ or disrupted ²⁹ .	<ul style="list-style-type: none"> ▪ Disruption of 2 cultural heritage resources during construction of the YDSS Modifications Alternative Route: <ul style="list-style-type: none"> ▪ Former Toronto Transit Commission electric railway corridor, north of Heman Street ▪ George Richardson Park ▪ Displacement and/or premature deterioration to 32 cultural heritage resources (listed in Table R-3.1 below) located along Bayview Avenue, between Penrose Street and Queen Street during construction of the YDSS Modifications Alternative Route. ▪ No disruption or displacement of cultural heritage landscapes or built heritage resources during operation of the YDSS Modifications Alternative Route. 	<ul style="list-style-type: none"> ▪ Undertake detailed heritage evaluation and analysis to develop appropriate mitigation measures (e.g., façade stabilization, identification of buffer requirements, monitoring of construction vibration; avoidance of tree and fence removals, post-construction landscaping; documentation prior to alteration, commemoration etc.). ▪ Avoid displacement and/or premature deterioration of cultural heritage resources through appropriate siting of staging areas and access routes; monitoring construction vibration; avoidance of tree removals and fence removals; and post-construction landscaping activities. ▪ No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> ▪ The disruption of 2 cultural heritage resources during construction of the YDSS Modifications Alternative Route would be minimized through preparation of detailed heritage evaluations to develop appropriate mitigation measures (e.g., façade stabilization, identification of buffer requirements, monitoring of construction vibration; avoidance of tree and fence removals, post-construction landscaping; documentation prior to alteration, commemoration etc.) <ul style="list-style-type: none"> ▪ Former Toronto Transit Commission electric railway corridor, north of Heman Street ▪ George Richardson Park ▪ Displacement and/or premature deterioration to 32 cultural heritage resources (listed in Table R-3.1 below) located along Bayview Avenue, between Penrose Street and Queen Street during construction of the YDSS Modifications Alternative Route would be avoided through appropriate siting of staging areas and access routes, monitoring construction vibration, avoiding tree removals and fence removals, and post-construction landscaping activities. ▪ No net effects.
Financial	50-year Net Present Worth Costs	50-year present net worth costs associated with the capital investment, land acquisition, and operating and maintenance of the infrastructure, systems and equipment	<ul style="list-style-type: none"> ▪ \$96,200,000³⁰ 	<ul style="list-style-type: none"> ▪ No avoidance/mitigation/compensation measures required. 	<ul style="list-style-type: none"> ▪ \$96,200,000

28. Displacement is indicated by removal or loss of heritage attributes of the cultural heritage resource at a scale where its heritage significance is no longer conserved and/or communicated. Pre-mature deterioration refers to construction-related effects such as vibration that could result in deterioration and ultimately a displacement of cultural heritage resources.

29. Disruption to cultural heritage resources refers to partial modification of cultural heritage resources.

30. Alternative Methods of Carrying Out the Undertaking – Cost Estimates Report (CRA et al., February 2013).

Table R.3.1 YDSS Modifications Alternative Route C: Potentially Affected Cultural Heritage Resources

ID	Township	Municipal Address	Year Built	Property Description	Site Type and/or Designation
CHR409	Newmarket	16874 Bayview Avenue	circa 1890	Residence	Plaque
CHR411	Newmarket	16916 Bayview Avenue	1865	Residence	
CHR509	Newmarket	16945 Bayview Avenue	1908-1909	Public	Significant
CHR627	Newmarket	146 Prospect Street		2 storey brick and frame residence	Plaque
CHR628	Newmarket	222 Prospect Street			Plaque
CHR629	Newmarket	75 Prospect Street	1886	2 1/2 storey brick house; double gable roof with dormers; 4-bay façade; arched windows on second storey; bay windows; verge board;	Plaque
CHR630	Newmarket	270 Prospect Street		single-storey painted brick on stone rubble foundation; hip roof; small closed veranda addition; all windows have been replaced;	Plaque
CHR631	Newmarket	233 Prospect Street		buff brick with banding on stone rubble foundation; 2-storey house; Italianate features; hanging bracket veranda; projecting eaves;	Plaque
CHR632	Newmarket	266 Prospect Street		Architect: William Bunney; incorporates Baptist Church - built circa 1848; storey red brick dwelling on stone rubble foundation; complex gable and hip roof; 2-bay façade; side entrance; large brick arches with key stone over ground floor	Plaque
CHR633	Newmarket	67 Prospect Street	1886	2-storey brick house on stone rubble foundation; gable roof; 1-bay façade; bay window; side entrance; side veranda	Plaque
CHR634	Newmarket	322 Prospect Street		2 storey, brick, "Victorian" Style of architecture.	Plaque
CHR635	Newmarket	221 Prospect Street		2 storey frame wooden clad residence in "Carpenter Italianate" style	Designated/Plaque
CHR636	Newmarket	291 Prospect Street		2 storey semi-detached frame vinyl clad residence	Plaque
CHR637	Newmarket	97 Prospect Street		1 1/2 storey frame dwelling with shiplap siding; L-shaped floor plan; 2-bay façade;	Plaque
CHR638	Newmarket	216 Prospect Street		Architect: William Bunney 2-storey frame house on stone rubble foundation; 2-bay façade; side hall plan; clapboard siding had been altered slightly; 2-storey frame house on stone rubble foundation; 2-bay façade; side hall plan;	Plaque
CHR639	Newmarket	295 Prospect Street		2 storey frame, brick veneer now vinyl clad semi-detached residence	Plaque
CHR640	Newmarket	190 Prospect Street		2 1/2 storey red brick house on limestone block foundation; 3-bay façade; centred entrance; corner tower; complex gable roof with balcony; single storey veranda with 2nd storey balcony;	Plaque
CHR641	Newmarket	232 Prospect Street Suite 234		2-storey solid brick house on stone rubble foundation; 3-bay façade; centred entrance with side lights and flat transom; L-shaped floor plan; 2x2 windows with arched openings; hip roof with projecting eaves; single storey with square posts on brick piers	
CHR642	Newmarket	334 Prospect Street		Queen Anne revival style; prominent corner tower; clapboard siding; 2-storey home; 2-bay façade; side entrance; single-storey veranda;	Plaque
CHR643	Newmarket	253 Prospect Street		2-storey frame house with aluminum siding; rough-cast; 3-bay façade; centred entrance; original windows replaced; gable roof with eaves facing street; end chimneys; centred dormer - not original; off-centred tail wing;	
CHR644	Newmarket	230 Prospect Street		1 1/2 storey brick house on concrete foundation with gambel roof; open veranda with roof supported by wood posts on brick pilasters; double-hung windows on stone sills;	Plaque
CHR645	Newmarket	342 Prospect Street		1 1/2 storey house; board and batten on stone rubble foundation; 3-bay façade; French windows flanking entrance; gable roof; tail wing (may be older)	
CHR646	Newmarket	85 Prospect Street		2-storey house; L-shaped floor plan; 3-bay façade; centred main entrance; gable roof; single storey veranda with 2nd storey door opening onto veranda roof terrace; small gable over 2nd storey door;	
CHR647	Newmarket	181 Prospect Street		Builder: Isaac Rose 2-storey red brick on limestone block foundation; hip roof; 3-bay façade; side door at recessed entrance; shallow bay windows along front and side façade; single storey brick veranda on southwest corner of house; 1x1 window sashes;	
CHR648	Newmarket	226 Prospect Street			Plaque
CHR649	Newmarket	158 Prospect Street			Plaque
CHR650	Newmarket	185 Prospect Street		2-storey yellow brick veneer; hip roof; 3-bay façade; centred projecting eaves with brackets above entrance; 2x2 window sashes;	Plaque
CHR651	Newmarket	276 Prospect Street		single-storey frame house on stone rubble foundation; 3-bay façade; centred entrance and gable; 2-storey veranda; veranda photo in Newmarket 1857-1957	

Table R.3.1 YDSS Modifications Alternative Route C: Potentially Affected Cultural Heritage Resources

ID	Township	Municipal Address	Year Built	Property Description	Site Type and/or Designation
CHR652	Newmarket	163 Prospect Street		1 1/2 storey frame house; originally finished with rough cast scored ashlar; 2-bay façade; gable roof; bay window on side; Historical Society Photo circa 1910; featured in Era 20.4.1906	
CHR653	Newmarket	152 Prospect Street		Brick, 2 storey semi-detached property	Plaque
CHR655	Newmarket	330 Prospect Street		2 1/2 storey red brick house; 2-bay façade; gable roof; side entrance in alcove which has been closed in by window on south side;	
CHR656	Newmarket	208 Prospect Street		1 1/2 storey frame house; L-shaped floor plan with tail wing; gable roof; 2-bay façade with side entrance; originally clad with clapboard siding, now aluminum; originally had a single storey open veranda, now enclosed;	
CHR657	Newmarket	86 Prospect Street		2-storey yellow brick house with red brick quoining and arches over windows; ornamental key stones in arches; gable roof; stone rubble foundation;	
CHR659	Newmarket	173 Prospect Street		1 1/2 storey frame dwelling on stone rubble foundation; 4-bay façade; front entrance on side of 2-storey projecting vestibule; clapboard siding; gable roof; slightly arched 2x2 windows; single storey veranda on both sides of vestibule	



Appendix R-4

Table R.4
Comparative Evaluation of the York Durham Sewage System Modifications Alternative Routes

Table R.4: Comparative Evaluation of the YDSS Modifications Alternative Routes

Category	Criteria	Indicator	Rationale for Ranking ¹	Alternative Route A	Alternative Route B	Alternative Route C
Technical	Carbon Dioxide (CO ₂) Equivalent Footprint	Equivalent CO ₂ (CO ₂ e) generated in tonnes CO ₂ e/year ²	<ul style="list-style-type: none"> The lower CO₂e/year, the better the ranking. 	<ul style="list-style-type: none"> Approximately 207 tonnes CO₂e /year. <p style="text-align: center;">First</p>	<ul style="list-style-type: none"> Approximately 235 tonnes CO₂e /year. <p style="text-align: center;">Second</p>	<ul style="list-style-type: none"> Approximately 241 tonnes CO₂e /year. <p style="text-align: center;">Third</p>
Technical Category Ranking & Rationale:				Most Preferred	Moderately Preferred	Least Preferred
				The Route is Most Preferred from a Technical Category perspective compared to the other Routes because it would generate the lowest amount of CO ₂ e/year.	The Route is Moderately Preferred from a Technical Category perspective compared to the other Routes because it would generate lower amount of CO ₂ e/year than Route C.	The Route is Least Preferred from a Technical Category perspective compared to the other Routes because it would generate the highest amount of CO ₂ e/year.
Natural Environment	Effect on groundwater	Temporary and/or long-term change in groundwater quality	<ul style="list-style-type: none"> The greater the potential for dewatering during construction, the worse the ranking. 	<ul style="list-style-type: none"> The temporary decrease in groundwater quality due to dewatering during construction of the YDSS Modifications Alternative Route along the East Holland River would be minimized by using appropriate construction methods³. No long-term net effects. <p style="text-align: center;">Third</p>	<ul style="list-style-type: none"> The temporary decrease in groundwater quality due to dewatering during construction of the YDSS Modifications Alternative Route along the East Holland River would be minimized by using appropriate construction methods⁴. No long-term net effects. <p style="text-align: center;">Second</p>	<ul style="list-style-type: none"> The temporary decrease in groundwater quality due to dewatering during construction of the YDSS Modifications Alternative Route would be minimized by using appropriate construction methods. No long-term net effects. <p style="text-align: center;">First</p>
		Temporary and/or long-term change in groundwater quantity	<ul style="list-style-type: none"> The greater the potential for dewatering during construction, the worse the ranking. 	<ul style="list-style-type: none"> The temporary decrease in groundwater quantity due to dewatering during construction of the YDSS Modifications Alternative Route would be minimized by using appropriate construction methods. No long-term net effects. <p style="text-align: center;">Third</p>	<ul style="list-style-type: none"> The temporary decrease in groundwater quantity due to dewatering during construction of the YDSS Modifications Alternative Route would be minimized by using appropriate construction methods. No long-term net effects. <p style="text-align: center;">Second</p>	<ul style="list-style-type: none"> The temporary decrease in groundwater quantity due to dewatering during construction of the YDSS Modifications Alternative Route would be minimized by using appropriate construction methods. No long-term net effects. <p style="text-align: center;">First</p>

1. In general, no net effects ranked better than temporary effects and temporary effects ranked better than permanent effects.

2. Equivalent CO₂ generated indicator includes direct and indirect emissions (i.e., from electricity generation) of CO₂, CH₄, N₂O. Direct emissions include natural gas, transportation related emissions, process related emissions, equipment related emissions, chemical usage related emissions, and off-site biosolids/residuals decomposition emission. Further details are provided in the Technical Concept Level 2 Document, (CRA et al., February 2013).

3. Due to the expected presence of coarse grained alluvial materials and a high water table, dewatering along Alternative Route A has the potential to be significant.

4. Due to the expected presence of coarse grained alluvial materials and a high water table, dewatering along Alternative Route B has the potential to be significant.

Table R.4: Comparative Evaluation of the YDSS Modifications Alternative Routes

Category	Criteria	Indicator	Rationale for Ranking ¹	Alternative Route A	Alternative Route B	Alternative Route C
	Effect on Groundwater Criterion Ranking			Least Preferred	Moderately Preferred	Most Preferred
	Effect on surface water	Temporary and/or long-term change in surface water quality	<ul style="list-style-type: none"> All three alternative Routes have the same number of crossings, but at different locations. All watercourses have similar surface water quality characteristics. 	<ul style="list-style-type: none"> The temporary decrease in surface water quality at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be minimized by developing and implementing an erosion and sediment control plan consistent with policies outlined in the Erosion and Sediment Control Guidelines for Urban Construction (2006). No long-term net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> The temporary decrease in surface water quality at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be minimized by developing and implementing an erosion and sediment control plan consistent with policies outlined in the Erosion and Sediment Control Guidelines for Urban Construction (2006). No long-term net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> The temporary decrease in surface water quality at 7 surface water crossings (1 at Weslie Creek, 1 at Bogart Creek, 1 at Marsh Creek, 2 tributaries to Tannery Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be minimized by developing and implementing an erosion and sediment control plan consistent with policies outlined in the Erosion and Sediment Control Guidelines for Urban Construction (2006). No long-term net effects. <p style="text-align: center;">First (Tied)</p>
		Temporary and/or long-term change in surface water quantity	<ul style="list-style-type: none"> All three alternative Routes have the same number of crossings, but at different locations. All surface water crossings have similar surface water flow regimes. 	<ul style="list-style-type: none"> The temporary increase in surface water quantity at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) due to an increase in overland flow during construction of the YDSS Modifications Alternative Route would be minimized by developing and implementing an erosion and sediment control plan consistent with policies outlined in the Erosion and Sediment Control Guidelines for Urban Construction (2006). No long-term net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> The temporary increase in surface water quantity at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) due to an increase in overland flow during construction of the YDSS Modifications Alternative Route would be minimized by developing and implementing an erosion and sediment control plan consistent with policies outlined in the Erosion and Sediment Control Guidelines for Urban Construction (2006). No long-term net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> The temporary increase in surface water quantity at 7 surface water crossings (1 at Weslie Creek, 1 at Bogart Creek, 1 at Marsh Creek, 2 tributaries to Tannery Creek and 2 unnamed tributaries along Bayview Parkway) due to an increase in overland flow during construction of the YDSS Modifications Alternative Route would be minimized by developing and implementing an erosion and sediment control plan consistent with policies outlined in the Erosion and Sediment Control Guidelines for Urban Construction (2006). No long-term net effects. <p style="text-align: center;">First (Tied)</p>

Table R.4: Comparative Evaluation of the YDSS Modifications Alternative Routes

Category	Criteria	Indicator	Rationale for Ranking ¹	Alternative Route A	Alternative Route B	Alternative Route C
Effect on Surface Water Criterion Ranking				Most Preferred (Tied)	Most Preferred (Tied)	Most Preferred (Tied)
Effect on aquatic habitat or functions	Area (m ²) of temporary or permanent loss of aquatic features or categorical loss of functions by type – including Provincially Significant Wetland, Locally Significant Wetland, watercourses by sensitivity type, and others		<ul style="list-style-type: none"> All three alternative Routes have the same number of crossings, but at different locations. All surface water crossings have similar aquatic habitat potential and similar sensitivity classifications. 	<ul style="list-style-type: none"> The temporary loss of aquatic habitat and function at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be mitigated and compensated for (as required) by undertaking construction outside of the relevant fish spawning timing window, implementing appropriate construction Best Management Practices based on consultations with review agencies, limiting removal of riparian vegetation, stabilizing the banks and implementing a restoration plan. No permanent net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> The temporary loss of aquatic habitat and function at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be mitigated and compensated for (as required) by undertaking construction outside of the relevant fish spawning timing window, implementing appropriate construction Best Management Practices based on consultations with review agencies, limiting removal of riparian vegetation, stabilizing the banks and implementing a restoration plan. No permanent net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> The temporary loss of aquatic habitat and function from a decrease in surface water quality at 7 surface water crossings (1 at Weslie Creek, 1 at Bogart Creek, 1 at Marsh Creek, 2 tributaries to Tannery Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be mitigated and compensated for (as required) by undertaking construction outside of relevant fish spawning and timing window, implementing appropriate construction Best Management Practices based on consultations with review agencies, limiting removal of riparian vegetation, stabilizing the banks and implementing a restoration plan. No permanent net effects. <p style="text-align: center;">First (Tied)</p>
Effect on Aquatic Habitat or Functions Criterion Ranking				Most Preferred (Tied)	Most Preferred (Tied)	Most Preferred (Tied)
Effect on stream geomorphology	Change in geomorphic form/function/ stability in affected channels		<ul style="list-style-type: none"> All three alternative Routes have the same number of crossings, but at different locations. All surface water crossings have similar geomorphic form and function. 	<ul style="list-style-type: none"> The temporary change to channel form, function and stability at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be mitigated by limiting vegetation removal and implementing post construction restoration. No permanent net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> The temporary change to channel form, function and stability at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be mitigated by limiting vegetation removal and implementing post construction restoration. No permanent net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> The temporary change to channel form, function and stability at 7 surface water crossings (1 at Weslie Creek, 1 at Bogart Creek, 1 at Marsh Creek, 2 tributaries to Tannery Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be mitigated by limiting vegetation removal and implementing post construction restoration. No permanent net effects. <p style="text-align: center;">First (Tied)</p>

Table R.4: Comparative Evaluation of the YDSS Modifications Alternative Routes

Category	Criteria	Indicator	Rationale for Ranking ¹	Alternative Route A	Alternative Route B	Alternative Route C
Effect on Stream Geomorphology Criterion Ranking						
	Effect on aquatic species including Species at Risk (species of special concern, threatened, endangered) and species of local concern, native and invasive species	Number and type of aquatic species ⁵ potentially affected temporarily or permanently ⁶	<ul style="list-style-type: none"> All three alternative Routes have the same number of crossings, but at different locations. All surface water crossings have similar aquatic habitat potential and similar aquatic species. 	<ul style="list-style-type: none"> The temporary disturbance to aquatic species at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) due to a decrease in surface water quality during construction of the YDSS Modifications Alternative Route would be mitigated by undertaking construction outside of the relevant fish spawning timing window and implementing appropriate construction Best Management Practices. No permanent disturbance to aquatic species. No temporary or permanent disturbance to aquatic Species at Risk. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> The temporary disturbance to aquatic species at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) due to a decrease in surface water quality during construction of the YDSS Modifications Alternative Route would be mitigated by undertaking construction outside of the relevant fish spawning timing window and implementing appropriate construction Best Management Practices. No permanent disturbance to aquatic species. No temporary or permanent disturbance to aquatic Species at Risk. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> The temporary disruption to aquatic species at 7 surface water crossings (1 at Weslie Creek, 1 at Bogart Creek, 1 at Marsh Creek, 2 tributaries to Tannery Creek and 2 unnamed tributaries along Bayview Parkway) due to a decrease in surface water quality during construction of the YDSS Modifications Alternative Route would be mitigated by undertaking construction outside of the relevant fish spawning timing window and implementing appropriate construction Best Management Practices. No permanent disturbance to aquatic species. No temporary or permanent disturbance to aquatic Species at Risk. <p style="text-align: center;">First (Tied)</p>
Effect on Aquatic Species Criterion Ranking						
	Effect on groundwater recharge and discharge areas in relation to aquatic/ wetland habitat	Area (m ²) of temporary or permanent loss of recharge and discharge areas	<ul style="list-style-type: none"> All three alternative Routes have the same number of crossings, but at different locations. All surface water crossings have the potential to require temporary dewatering 	<ul style="list-style-type: none"> The temporary reduction in groundwater discharge (baseflow) at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be mitigated by using appropriate construction methods and directing the discharge back to the local watercourse. No permanent net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> The temporary reduction in groundwater discharge (baseflow) at 7 surface water crossings (3 at Tannery Creek, 1 at Weslie Creek, 1 at Bogart Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be mitigated by using appropriate construction methods and directing the discharge back to the local watercourse. No permanent net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> The temporary reduction in groundwater discharge (baseflow) at 7 surface water crossings (1 at Weslie Creek, 1 at Bogart Creek, 1 at Marsh Creek, 2 tributaries to Tannery Creek and 2 unnamed tributaries along Bayview Parkway) during construction of the YDSS Modifications Alternative Route would be mitigated by using appropriate construction methods and directing the discharge back to the local watercourse. No permanent net effects. <p style="text-align: center;">First (Tied)</p>

5. Aquatic species include species of local concern, native and invasive species.

6. Refer to the Natural Environment Baseline Conditions Report (CRA et al., April 2013) for detailed information on aquatic species.

Table R.4: Comparative Evaluation of the YDSS Modifications Alternative Routes

Category	Criteria	Indicator	Rationale for Ranking ¹	Alternative Route A	Alternative Route B	Alternative Route C
			during construction.			
	Effect on Groundwater Recharge and Discharge areas in Relation to Aquatic/Wetland Habitat Criterion Ranking			Most Preferred (Tied)	Most Preferred (Tied)	Most Preferred (Tied)
	Effect on terrestrial habitat or functions	Area (m ²) of temporary and/or permanent loss of natural heritage features by type – including Environmentally Sensitive Areas (ESAs) and Areas of National and Scientific Interest (ANSIs), wildlife corridors, and others	<ul style="list-style-type: none"> The lower the area and quality of terrestrial habitat lost, the better the ranking. 	<ul style="list-style-type: none"> No temporary and/or permanent net effects to ESAs, ANSIs or wildlife corridors. The temporary and permanent loss of 3.3 ha of meadow, thicket, plantation, forest, marsh and swamp habitat and associated wildlife habitat (in the Wesley Brooks Conservation Area, the Mable Davis (Fairy Lake) Conservation Area, the Bailey Ecological Park and within the flood plain of Tannery Creek) during construction and operation of the YDSS Modifications Alternative Route⁷ would be compensated for (as required) by implementing a habitat restoration plan based on consultations with review agencies. The temporary and permanent loss of 0.13 ha of cultural meadow, shallow marsh and deciduous swamp habitat and associated wildlife habitat (in the Wesley Brooks Conservation Area, the Mable Davis (Fairy Lake) Conservation Area, the Bailey Ecological Park and within the flood plain of Tannery Creek) from construction of the staging areas⁸ for the YDSS Modifications Alternative Route would be compensated for (as required) by implementing a habitat restoration plan based on consultations with review agencies. <p style="text-align: center;">Third</p>	<ul style="list-style-type: none"> No temporary and/or permanent net effects to ESAs, ANSIs or wildlife corridors. The temporary and permanent loss of 2.8 ha of meadow, thicket, plantation, forest, marsh and swamp habitat and associated wildlife habitat (in the Bailey Ecological Park and within the flood plain of Tannery Creek) during construction and operation of the YDSS Modifications Alternative Route would be compensated for (as required) by implementing a habitat restoration plan based on consultations with review agencies. The temporary and permanent loss of 0.08 ha of cultural meadow and shallow marsh habitat (in the Bailey Ecological Park and within the flood plain of Tannery Creek) from construction of the staging areas for the YDSS Modifications Alternative Route would be compensated for (as required) by implementing a habitat restoration plan based on consultations with review agencies. <p style="text-align: center;">Second</p>	<ul style="list-style-type: none"> No temporary and/or permanent net effects to ESAs, ANSIs or wildlife corridors. No temporary and/or permanent net effects. No temporary and/or permanent net effects. <p style="text-align: center;">First</p>
	Effect on Terrestrial Habitat or Functions Criterion Ranking			Least Preferred	Moderately Preferred	Most Preferred
	Effect on terrestrial species including	Number and type of terrestrial species ⁹ potentially affected		<ul style="list-style-type: none"> The temporary and permanent disturbance to terrestrial species in the Wesley Brooks 	<ul style="list-style-type: none"> The temporary and permanent disturbance to terrestrial species in the Bailey 	<ul style="list-style-type: none"> No temporary and/or permanent net effects.

7. It has been assumed that the YDSS Modifications Alternative Route will disturb a 20 m width over the entire length of Alternative Route A within the Tannery Creek Valley. It has also been assumed that construction of the YDSS Modifications Alternative Route will be conducted using open cut construction methods rather than less invasive methods such as directional drilling. This has led to an over estimation of the area of terrestrial habitat affected, as many areas within the Tannery Creek Valley are planned to be constructed using less invasive directional drilling, wherever practical.

8. The area disturbed during construction of the staging areas has been estimated assuming that land clearing will be required for directional drilling under all major stream crossings and at approximately 400 m intervals within the Tannery Creek Valley along YDSS Modifications Alternative Route A.

9. Terrestrial species include species of local concern, native and invasive species and area-sensitive species.

Table R.4: Comparative Evaluation of the YDSS Modifications Alternative Routes

Category	Criteria	Indicator	Rationale for Ranking ¹	Alternative Route A	Alternative Route B	Alternative Route C
	Species at Risk, (species of special concern, threatened, endangered) species of local concern, native and invasive species, and area-sensitive species	temporarily and/or permanently ¹⁰	<ul style="list-style-type: none"> The number and sensitivity of terrestrial species potentially affected is related to the amount and type of habitat potentially affected. 	<p>Conservation Area, the Mable Davis (Fairy Lake) Conservation Area, the Bailey Ecological Park and within the flood plain of Tannery Creek during construction and operation of the YDSS Modifications Alternative Route and associated staging areas would be minimized by using appropriate construction methods, providing tree protection and delineation or work adjacent to natural areas and relocating amphibian species, as required.</p> <ul style="list-style-type: none"> The temporary disturbance to terrestrial species within the north-south wildlife corridor along Tannery Creek during construction of the YDSS Modifications Alternative Route would be minimized by using appropriate construction methods. The temporary disruption to Savannah Sparrow bird species during construction of the YDSS Modifications Alternative Route would be minimized by conducting pre-construction bird surveys to determine habitat use and using construction Best Management Practices. No temporary or permanent net effects to terrestrial Species at Risk. <p style="text-align: center;">Third</p>	<p>Ecological Park and within the flood plain of Tannery Creek during construction and operation of the YDSS Modifications Alternative Route and associated staging areas would be minimized by using appropriate construction methods, providing tree protection and delineation or work adjacent to natural areas and relocating amphibian species, as required.</p> <ul style="list-style-type: none"> The temporary disturbance to terrestrial species within the north-south wildlife corridor along Tannery Creek during construction of the YDSS Modifications Alternative Route would be minimized by using appropriate construction methods. The temporary disruption to Savannah Sparrow bird species during construction of the YDSS Modifications Alternative Route would be minimized by conducting pre-construction bird surveys to determine habitat use and using construction Best Management Practices. No temporary or permanent net effects to terrestrial Species at Risk. <p style="text-align: center;">Second</p>	<ul style="list-style-type: none"> No temporary and/or permanent net effects. No temporary and/or permanent net effects to terrestrial species. No temporary or permanent net effects to terrestrial Species at Risk. <p style="text-align: center;">First</p>
Effect on Terrestrial Species, Including Species at Risk Criterion Ranking				Least Preferred	Moderately Preferred	Most Preferred
	Effect on groundwater recharge and discharge areas in relation to terrestrial habitat	Area (m ²) of temporary and/or permanent loss of recharge and discharge areas	<ul style="list-style-type: none"> The net effects are the same for all alternatives. 	<ul style="list-style-type: none"> No temporary and/or permanent net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> No temporary and/or permanent net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> No temporary and/or permanent net effects. <p style="text-align: center;">First (Tied)</p>

10. Refer to the Natural Environment Baseline Conditions Report (CRA et al., April 2013) for detailed information on terrestrial species.

Table R.4: Comparative Evaluation of the YDSS Modifications Alternative Routes

Category	Criteria	Indicator	Rationale for Ranking ¹	Alternative Route A	Alternative Route B	Alternative Route C
	Effect on Groundwater Recharge and Discharge Areas in Relation to Terrestrial Habitat Criterion Ranking			Most Preferred (Tied)	Most Preferred (Tied)	Most Preferred (Tied)
Natural Environment Category Ranking & Rationale: + Denotes an advantage for an alternative Route relative to other Routes - Denotes a disadvantage for an alternative Route relative to other Routes				Least Preferred The Route is Least Preferred from a Natural Environment Category perspective compared to the other Routes, because it has the following disadvantages: <ul style="list-style-type: none"> - Highest volume of temporary groundwater dewatering - Temporary and long-term disturbance to the largest area of moderate quality meadow, thicket, plantation, forest, marsh and swamp communities (3.4 ha) - Temporary and long-term disturbance to terrestrial habitat and wildlife species in the highest number of natural heritage areas, including Wesley Brooks Conservation Area, the Mable Davis (Fairy Lake) Conservation Area, the Bailey Ecological Park and within the flood plain of Tannery Creek 	Moderately Preferred The Route is Moderately Preferred from a Natural Environment Category perspective compared to the other Routes, because it has the following disadvantages: <ul style="list-style-type: none"> - Higher volume of temporary groundwater dewatering - Temporary and long-term disturbance to a larger area of moderate quality meadow, thicket, plantation, forest, marsh and swamp communities (2.8 ha) - Temporary and long-term disturbance to terrestrial habitat and wildlife species in a higher number of natural heritage areas, including Bailey Ecological Park and within the flood plain of Tannery Creek 	Most Preferred The Route is Most Preferred from a Natural Environment Category perspective compared to the other Routes, because it has the following advantages: <ul style="list-style-type: none"> + Lowest volume of temporary groundwater dewatering + No temporary or long-term disturbance to vegetation communities + No temporary disturbance to terrestrial habitat or wildlife species
Built Environment	Effect on agricultural operations and capital investment related to agriculture	Approximate area (ha) of active agricultural operations affected	<ul style="list-style-type: none"> ▪ The net effects are the same for all alternatives. 	<ul style="list-style-type: none"> ▪ No net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> ▪ No net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> ▪ No net effects. <p style="text-align: center;">First (Tied)</p>
		Extent of disruption of active agricultural operations such as: <ul style="list-style-type: none"> • Fragmentation of agricultural fields • Disturbance to artificial drainage systems and agricultural drains • Removal and/or disturbance of farm fences, entrances and paddocks • Disruption of agricultural-related businesses • Disruption of normal external haul Routes for farm machinery movements 	<ul style="list-style-type: none"> ▪ The net effects are the same for all alternatives. 	<ul style="list-style-type: none"> ▪ No net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> ▪ No net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> ▪ No net effects. <p style="text-align: center;">First (Tied)</p>

Table R.4: Comparative Evaluation of the YDSS Modifications Alternative Routes

Category	Criteria	Indicator	Rationale for Ranking ¹	Alternative Route A	Alternative Route B	Alternative Route C
	Effect on Agricultural Operations and Capital Investment Related to Agriculture Criterion Ranking			Most Preferred (Tied)	Most Preferred (Tied)	Most Preferred (Tied)
	Effect on existing residences, businesses, and/or community, institutional, and recreational facilities	Number and type of residences displaced	<ul style="list-style-type: none"> The net effects are the same for all alternatives. 	<ul style="list-style-type: none"> No net effects. <p>First (Tied)</p>	<ul style="list-style-type: none"> No net effects. <p>First (Tied)</p>	<ul style="list-style-type: none"> No net effects. <p>First (Tied)</p>
		Number and type of residences temporarily or permanently disrupted ¹¹	<ul style="list-style-type: none"> The fewer residential accesses disrupted, the better the ranking. 	<ul style="list-style-type: none"> The temporary disruption to driveway access for approximately 41 private residences during construction of the YDSS Modifications Alternative Route would be minimized by providing temporary driveway access, arrangements for waste collection and notifying residents of the alternative arrangements. The temporary disruption to road access for 2 private residences that can only be accessed by Cotter Street during construction of the YDSS Modifications Alternative Route would be minimized by providing access for local roads and notifying residents of the alternative arrangements. The temporary disruption to small portions of approximately 4 private residences (including 1 multi-unit residential complex) where staging areas are constructed within the properties, and 1 multi-unit residential complex owned by York Region where the YDSS Modifications Alternative Route is constructed would be compensated for (as necessary) in accordance with York Region's policies. No permanent net effects. <p>First</p>	<ul style="list-style-type: none"> The temporary disruption to approximately 145 driveway accesses for 149 private residences during construction of the YDSS Modifications Alternative Route would be minimized by providing temporary driveway accesses, arrangements for waste collection and notifying residents of the alternative arrangements. The temporary disruption to road access for approximately 5 private residences that can only be accessed by Prospect Street during construction of the YDSS Modifications Alternative Route would be minimized by providing access for local roads and notifying residents of the alternative arrangements. The temporary disruption to a small portion of 1 private residence due to construction of the staging area within a portion of the property would be compensated for (as necessary) in accordance with York Region's policies. No permanent net effects. <p>Second</p>	<ul style="list-style-type: none"> The temporary disruption to approximately 157 driveway accesses for 162 private residences during construction of the YDSS Modifications Alternative Route would be minimized by providing temporary driveway access, arrangements for waste collection and notifying residents of the alternative arrangements¹². The temporary disruption to road access for approximately 1,226 private residences that can only be accessed by Prospect Street, Bayview Avenue, and St. John's Sideroad East during construction of the YDSS Modifications Alternative Route would be minimized by providing access for local roads and notifying residents of the alternative arrangements. The temporary disruption to a small portion of 1 private residence due to the construction of the staging areas at Prospect Street and Bogart Pumping Station (Bogart Route) would be compensated for (as necessary) in accordance with York Region's policies. No permanent net effects. <p>Third</p>

11. Disruption to residences has been applied with respect to driveway accesses (including waste collection). Disruption related to odour, noise and vibration are considered in the respective indicators below.

12. Note that there are a number of townhomes and commercial property currently under construction at the southeast corner of Bayview Avenue and St. John's Sideroad East that when complete may experience temporary disruption to accesses depending on construction completion schedules.

Table R.4: Comparative Evaluation of the YDSS Modifications Alternative Routes

Category	Criteria	Indicator	Rationale for Ranking ¹	Alternative Route A	Alternative Route B	Alternative Route C
		Number and characteristics of businesses displaced ¹³	<ul style="list-style-type: none"> The net effects are the same for all alternatives. 	<ul style="list-style-type: none"> No net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> No permanent net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> No permanent net effects. <p style="text-align: center;">First (Tied)</p>
		Number and characteristics of businesses temporarily or permanently disrupted ^{14,15}		<ul style="list-style-type: none"> The temporary disruption to approximately 12 driveway accesses for 14 businesses during construction of the YDSS Modifications Alternative Route would be minimized by providing temporary driveway access, arrangements for waste collection and notifying businesses of the alternative arrangements. The temporary disruption to small portions of approximately 3 private businesses where the YDSS Modifications Alternative Route and/or staging areas are constructed within the business properties would be compensated for (as necessary) in accordance with York Region's policies. 	<ul style="list-style-type: none"> The temporary disruption to approximately 28 driveway accesses for 73 businesses during construction of the YDSS Modifications Alternative Route would be minimized by providing temporary driveway access, arrangements for waste collection and notifying businesses of the alternative arrangements. The temporary disruption to road access for approximately 43 businesses that can only be accessed by Prospect Street and Mulock Drive during construction of the YDSS Modifications Alternative Route would be minimized by providing access for local roads and access signage, arrangements for waste collection and notifying businesses of the alternative arrangements. The temporary disruption to small portions of 2 private businesses where the YDSS Modifications Alternative Route and/or staging area is constructed within the business properties would be compensated for (as necessary) in accordance with York Region's policies. <p style="text-align: center;">First</p>	<ul style="list-style-type: none"> The temporary disruption to approximately 29 driveway accesses for 107 businesses during construction of the YDSS Modifications Alternative Route would be minimized by providing temporary driveway access and access signage, arrangements for waste collection and notifying businesses of the alternative arrangements. The temporary disruption to road access for approximately 10 businesses that can only be accessed by Bayview Avenue during construction of the YDSS Modifications Alternative Route would be minimized by providing access for local roads and access signage, arrangements for waste collection and notifying businesses of the alternative arrangements. The temporary disruption to a small portion of 1 business where the YDSS Modifications Alternative Route is constructed within the business property would be compensated for (as necessary) in accordance with York Region's policies. <p style="text-align: center;">Second</p>
		Number and characteristics of community, institutional, and recreational facilities displaced	<ul style="list-style-type: none"> The fewer business accesses disrupted, the better the ranking. 	<ul style="list-style-type: none"> No permanent net effects. <p style="text-align: center;">Third</p>	<ul style="list-style-type: none"> No permanent net effects. <p style="text-align: center;">Third</p>	
			<ul style="list-style-type: none"> The net effects are the same for all alternatives. 	<ul style="list-style-type: none"> No net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> No net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> No net effects. <p style="text-align: center;">First (Tied)</p>

13. Does not include agricultural businesses Agricultural businesses are included under the evaluation criteria: "Effect on agricultural operations and capital investment related to agriculture".

14. Does not include agricultural businesses. Agricultural businesses are included under the evaluation criteria: "Effect on agricultural operations and capital investment related to agriculture".

15. Disruption to businesses has been applied with respect to driveway accesses, which considers customer access, deliveries and waste collection etc. Disruption that relate to odour, noise and vibration are considered in the respective indicators below.

Table R.4: Comparative Evaluation of the YDSS Modifications Alternative Routes

Category	Criteria	Indicator	Rationale for Ranking ¹	Alternative Route A	Alternative Route B	Alternative Route C
		Number and characteristics of community, institutional, and recreational facilities temporarily or permanently disrupted		<ul style="list-style-type: none"> The temporary disruption to 7 driveway accesses for 5 community, institutional and recreational facilities (including Tom Taylor Trail, George Richardson Park, Lake Simcoe Conservation Authority, York Region Community Service Housing Department, and Newmarket Recreation Youth Centre and Sk8park) during construction of the YDSS Modifications Alternative Route would be minimized by providing temporary driveway access and access signage, arrangements for waste collection and notifying the facilities of the alternative arrangements. The temporary disruption to portions of 9 community, institutional and recreational facilities (including Tom Taylor Trail, Lake Simcoe Conservation Authority, York Region Community Service Housing Department, Mabel Davis Conservation Area, York Regional Police District 1 Headquarters, Fairy Lake Park, Bailey Ecological Park, St. Andrew's Valley Golf Club, and College Manor Park) where the YDSS Modifications Alternative Route and/or staging areas are constructed within these properties would be compensated for (as required) in accordance with York Region's policies. 	<ul style="list-style-type: none"> The temporary disruption to 14 driveway accesses for 9 community, institutional and recreational facilities (including Tom Taylor Trail, George Richardson Park, Lake Simcoe Conservation Authority, York Region Community Service Housing Department, York Regional Police District 1 Headquarters, Canadian Cancer Society, Pickering College Independent Day and Boarding Co-ed School, Newmarket Municipal Offices, and York Region Health Services) during construction of the YDSS Modifications Alternative Route would be minimized by providing temporary driveway access and access signage, arrangements for waste collection and notifying the facilities of the alternative arrangements. The temporary disruption to road access for 5 community, recreational and institutional facilities (including, CanAm Karate, Newmarket Budokan Judo Club, Newmarket Soccer Club, The Newmarket Telephone Centre, and York Region Property Services) that can only be accessed by Mulock Drive and Pearson Street would be minimized by providing access for local roads and access signage, arrangements for waste collection and notifying the facilities of the alternative arrangements. The temporary disruption to portions of 8 community, institutional and recreational facilities (including Lake Simcoe Conservation Authority, York Region Community Service Housing Department, Mabel Davis Conservation Authority, Fairy Lake Park, Bailey Ecological Park, St. Andrew's Valley Golf Club, College Manor Park, and Barrington Park) where the YDSS Modifications Alternative Route and/or staging areas are constructed within these properties would be compensated for (as required) in accordance with York Region's policies. 	<ul style="list-style-type: none"> The temporary disruption to 15 driveway accesses for 8 community, institutional and recreational facilities (including Tom Taylor Trail, George Richardson Park, Lake Simcoe Conservation Authority, York Region Community Service Housing Department, York Regional Police District 1 Headquarters, Pickering College Independent Day and Boarding Co-ed School, unnamed cemetery off of Bayview Avenue, and unnamed park off of St. John's Sideroad E) during construction of the YDSS Modifications Alternative Route would be minimized by providing temporary driveway access and access signage, arrangements for waste collection and notifying the facilities of the alternative arrangements. The temporary disruption to road access for 3 community, recreational and institutional facilities (including Art Ferguson Park, Hamilton Park and St. Andrew's Valley Golf Club) that can only be accessed by Mulock Drive and Pearson Street would be minimized by providing access for local roads and access signage, arrangements for waste collection and notifying the facilities of the alternative arrangements. The temporary disruption to portions of 5 community, institutional and recreational facilities (including Lake Simcoe Conservation Authority, York Region Community Service Housing Department, Mabel Davis Conservation Area, College Manor Park, and Barrington Park) where the YDSS Modifications Alternative Route and/or staging areas are constructed within these properties would be compensated for (as required) in accordance with York Region's policies (2 of these facilities have 3 accesses that will be disrupted and are also included above).

Table R.4: Comparative Evaluation of the YDSS Modifications Alternative Routes

Category	Criteria	Indicator	Rationale for Ranking ¹	Alternative Route A	Alternative Route B	Alternative Route C
			<ul style="list-style-type: none"> The fewer community, institutional, and recreational facilities accesses disrupted, the better the ranking. 	<ul style="list-style-type: none"> No permanent net effects. <p style="text-align: center;">First</p>	<ul style="list-style-type: none"> No permanent net effects. <p style="text-align: center;">Third</p>	<ul style="list-style-type: none"> No permanent net effects. <p style="text-align: center;">Second</p>
Effect on Existing Residences, Businesses, and/or Community, Institutional, and Recreational Facilities				Most Preferred	Least Preferred	Moderately Preferred
Criterion Ranking						
Effect of vibration on existing buildings	Number of existing buildings affected and extent and duration of adverse effects ¹⁶		<ul style="list-style-type: none"> The lower the number of adjacent buildings, the lower the potential future vibration related complaints, the better the ranking. 	<ul style="list-style-type: none"> The temporary increase in vibration levels at approximately 118 adjacent¹⁷ buildings (including 87 residences, 16 businesses and 15 community/institutional/recreation facilities) during construction of the YDSS Modifications Alternative Route would be minimized by implementing Best Management Practices for vibration reduction (i.e. staged construction, limiting construction hours, use of specialized drilling equipment, etc.). The structural damage to historic buildings potentially sensitive to noise and vibration¹⁸ in close proximity and of inferior / aged condition during construction of the YDSS Modifications Alternative Route would be mitigated by establishing a minimum safe setback distance between the YDSS Modifications Alternative Route and sensitive buildings. No permanent net effects. <p style="text-align: center;">First</p>	<ul style="list-style-type: none"> The temporary increase in vibration levels at approximately 313 adjacent buildings (including 203 residences, 93 businesses and 17 community/institutional/recreational facilities) during construction of the YDSS Modifications Alternative Route would be minimized by implementing Best Management Practices for vibration reduction (i.e. staged construction, limiting construction hours, use of specialized drilling equipment, etc.). The structural damage to historic buildings potentially sensitive to noise and vibration in close proximity and of inferior / aged condition during construction of the YDSS Modifications Alternative Route would be mitigated by establishing a minimum safe setback distance between the YDSS Modifications Alternative Route and sensitive buildings. No permanent net effects. <p style="text-align: center;">Second</p>	<ul style="list-style-type: none"> The temporary increase in vibration levels at approximately 487 adjacent buildings (including 345 residences, 124 businesses and 18 community, institutional, and recreational facilities) during construction of the YDSS Modifications Alternative Route would be minimized by implementing Best Management Practices for vibration reduction (i.e., staged construction, limiting construction hours, use of specialized drilling equipment, etc.). The structural damage to historic buildings potentially sensitive to noise and vibration in close proximity and of inferior / aged condition during construction of the YDSS Modifications Alternative Route would be mitigated by establishing a minimum safe setback distance between the YDSS Modifications Alternative Route and sensitive buildings. No permanent net effects. <p style="text-align: center;">Third</p>

16. Effect will depend on proximity to construction activity, building construction and subsurface soil conditions.

17. Adjacent buildings were evaluated for the YDSS Modifications Alternative Route since the noise effects are construction-related and the equipment is mobile rather than stationary. Potentially affected locations would be those receivers immediately adjacent to the road.

18. The locations of historic buildings potentially sensitive to noise and vibration within the UYSS EA study area were identified in the Cultural Heritage Baseline Conditions Report (CRA et al., April 2013).

Table R.4: Comparative Evaluation of the YDSS Modifications Alternative Routes

Category	Criteria	Indicator	Rationale for Ranking ¹	Alternative Route A	Alternative Route B	Alternative Route C
Effect of Vibration on Existing Buildings Criterion Ranking				Most Preferred	Moderately Preferred	Least Preferred
	Effect on property	Number and extent of properties affected and ownership	<ul style="list-style-type: none"> The lower the number of properties affected, the better the ranking. 	<ul style="list-style-type: none"> No property acquisition required for the construction and operation of the YDSS Modifications Alternative Route. The permanent modification to existing easement¹⁹ within approximately 24 properties during operation of the YDSS Modifications Alternative Route would be compensated for (as required) in accordance with standard Regional procedures and policies. <p style="text-align: center;">Third</p>	<ul style="list-style-type: none"> No property acquisition required for the construction and operation of the YDSS Modifications Alternative Route. The permanent modification to existing easement within approximately 10 properties during operation of the YDSS Modifications Alternative Route would be compensated for (as required) in accordance with standard Regional procedures and policies. <p style="text-align: center;">Second</p>	<ul style="list-style-type: none"> No property acquisition required for the construction and operation of the YDSS Modifications Alternative Route. The permanent modification to existing easement within approximately 5 properties during operation of the YDSS Modifications Alternative Route would be compensated for (as required) in accordance with standard Regional procedures and policies. <p style="text-align: center;">First</p>
		Total area of property acquisition required (ha)	<ul style="list-style-type: none"> The fewer property acquisitions required, the better the ranking. 	<ul style="list-style-type: none"> No area of property acquisition required for the construction and operation of the YDSS Modifications Alternative Route. The permanent acquisition of existing easement within approximately 24 properties during operation of the YDSS Modifications Alternative Route would be compensated for (as necessary) in accordance with standard Regional procedures and policies. <p style="text-align: center;">Third</p>	<ul style="list-style-type: none"> No area of property acquisition required for the construction and operation of the YDSS Modifications Alternative Route. The permanent acquisition of existing easement within approximately 10 properties during operation of the YDSS Modifications Alternative Route would be compensated for (as necessary) in accordance with standard Regional procedures and policies. <p style="text-align: center;">Second</p>	<ul style="list-style-type: none"> No area of property acquisition required for the construction and operation of the YDSS Modifications Alternative Route. The permanent acquisition of existing easement within approximately 5 properties during operation of the YDSS Modifications Alternative Route would be compensated for (as necessary) in accordance with standard Regional procedures and policies. <p style="text-align: center;">First</p>
Effect on Effect on Property Criterion Ranking				Least Preferred	Moderately Preferred	Most Preferred
	Effect on existing roadway/ utility infrastructure	Number of roadways and type affected and extent and duration of adverse effects ^{20,21}	<ul style="list-style-type: none"> No net effects. 	<ul style="list-style-type: none"> The temporary disruption to 10 roadways, where the Alternative Route follows or crosses the existing roadway, during construction of the YDSS Modifications Alternative Route would be minimized by implementing a traffic management plan and providing temporary access, as required. No net effects. 	<ul style="list-style-type: none"> The temporary disruption to 7 roadways, where the Alternative Route follows or crosses the existing roadway, during construction of the YDSS Modifications Alternative Route would be minimized by implementing a traffic management plan and providing temporary access, as required. No net effects. 	<ul style="list-style-type: none"> The temporary disruption to 9 roadways, where the Alternative Route follows or crosses the existing roadway, during construction of the YDSS Modifications Alternative Route would be minimized by implementing a traffic management plan and providing temporary access, as required. No net effects.

19. Exact extent of easement required to be determined during detailed design.

20. Distances are accurate within 50 m.

21. Assumes construction associated with the conveyance infrastructure would occur on roadway for entire frontage of property.

Table R.4: Comparative Evaluation of the YDSS Modifications Alternative Routes

Category	Criteria	Indicator	Rationale for Ranking ¹	Alternative Route A	Alternative Route B	Alternative Route C
			<ul style="list-style-type: none"> The fewer roadways affected, the better the ranking. 	Third	First	Second
		Number and type of utilities affected and extent and duration of adverse effects	<ul style="list-style-type: none"> The lower the number of utilities affected, the better the ranking. 	<ul style="list-style-type: none"> The temporary disruption to 4 major utilities (York Region Water and Wastewater Bayview Operations Centre, CN Corridor, Hydro Corridor and Bogart Pumping Station) during construction of the YDSS Modifications Alternative Route would be mitigated by locating utilities based on consultations with utility providers and relocating if required. The temporary disruption to watermain, sanitary sewer, local gas, local hydro, local cable and local telephone utilities on Cotter Street between Water Street and 100 m south of Second Street would be minimized by locating utilities based on consultation with utility providers and, if confirmed on-site, relocating if required (Temporary interruption of service during relocation is anticipated). No net effects. 	<ul style="list-style-type: none"> The temporary disruption to 6 major utilities (including York Region Water and Wastewater, Bayview Operations Centre, CN Rail Corridor, Hydro One transformer station, Newmarket Hydro, Hydro Corridor and Bogart Pumping Station) during the construction of the YDSS Modifications Alternative Route would be mitigated by locating utilities based on consultations with utility providers and relocating if required. The temporary disruption to watermain, sanitary sewer, storm sewer, local gas, local hydro, local cable and local telephone utilities on Prospect Street between Davis Drive and Mulock Drive would be minimized by locating utilities based on consultation with utility providers and, if confirmed on-site, relocating if required (Temporary interruption of service during relocation is anticipated). No net effects. 	<ul style="list-style-type: none"> The temporary disruption to 4 major utilities (York Region Water and Wastewater, Bayview Pumping Station, Hydro Corridor and Bogart Pumping Station) during construction of the YDSS Modifications Alternative Route would be mitigated by locating utilities based on consultations with utility providers and relocating if required. The temporary disruption to the watermain, sanitary sewer, storm sewer, local gas, local hydro, local cable and local telephone utilities on Prospect Street between Davis Drive and Mulock Drive would be minimized by locating utilities based on consultation with utility providers and, if confirmed on-site, relocating if required (Temporary interruption of service during relocation is anticipated). No net effects.
				First (Tied)	Third	First (Tied)
				Least Preferred (Tied)	Least Preferred (Tied)	Most Preferred
				Most Preferred	Least Preferred	Moderately Preferred
Built Environment Category Ranking & Rationale: <ul style="list-style-type: none"> + Denotes an advantage for an alternative Route relative to other Routes - Denotes a disadvantage for an alternative Route relative to other Routes 				<p>The Route is Most Preferred from a Built Environment Category perspective compared to the other Routes, because it has the following advantages:</p> <ul style="list-style-type: none"> + Temporary disruption to accesses for approximately 43 residences, 17 businesses and 10 roadways + Temporary disruption to accesses for 5 community, institutional and recreational facilities + Temporary disruption to 4 major utilities/service providers including York 	<p>The Route is Least Preferred from a Built Environment Category perspective compared to the other Routes, because it has the following disadvantages:</p> <ul style="list-style-type: none"> - Temporary disruption to accesses for approximately 154 residences, 116 businesses and 7 roadways - Temporary disruption to accesses for 14 community, institutional and recreational facilities - Temporary disruption to 6 major utilities/service providers including York Region 	<p>The Route is Moderately Preferred from a Built Environment Category perspective compared to the other Routes, because it has the following disadvantages:</p> <ul style="list-style-type: none"> - Temporary disruption accesses for approximately 1,388 residences, 117 businesses and 9 roadways - Temporary disruption to accesses for 11 community, institutional and recreational facilities - Temporary increase in vibration levels at approximately 487 adjacent buildings,

Table R.4: Comparative Evaluation of the YDSS Modifications Alternative Routes

Category	Criteria	Indicator	Rationale for Ranking ¹	Alternative Route A	Alternative Route B	Alternative Route C
				Region Water and Wastewater Bayview Operations Centre, CN Corridor, Hydro Corridor, and Bogart Pumping Station + Temporary increase in vibration levels at approximately 118 adjacent buildings, including 87 residences, 16 businesses and 15 community, institutional, and recreation facilities	Water and Wastewater Bayview Operations Centre, CN Rail Corridor, Hydro One transformer station, Newmarket Hydro, Hydro Corridor and Bogart Pumping Station - Temporary increase in vibration levels at approximately 313 adjacent buildings, including 203 residences, 93 businesses and 17 community, institutional, and recreational facilities	including 345 residences, 124 businesses and 18 community, institutional, and recreational facilities Notwithstanding this, the Route has the following advantages: + Temporary disruption to 4 major utilities/service providers including York Region Water and Wastewater Bayview Operations Centre, Bayview Pumping Station, Hydro Corridor and Bogart Pumping Station
Social Environment	Effect on wells	Number of wells and type affected, extent and duration and nature (water quality/quantity) of adverse effects ²²	<ul style="list-style-type: none"> The net effects are the same for all alternatives. 	<ul style="list-style-type: none"> No net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> No net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> No net effects. <p style="text-align: center;">First (Tied)</p>
	Effect on Wells Criterion Ranking			Most Preferred (Tied)	Most Preferred (Tied)	Most Preferred (Tied)
	Effect of noise on sensitive receptors ²³	Number of sensitive receptors affected and extent and duration of adverse effects	<ul style="list-style-type: none"> The lower the number of adjacent sensitive receptors, the lower the potential future noise related complaints, the better the ranking. 	<ul style="list-style-type: none"> The temporary increase in noise levels at approximately 87 adjacent²⁴ residences (including 2 multi-unit complexes) during construction of the YDSS Modifications Alternative Route would be minimized by adhering to the Ministry of the Environment's noise limits, the Town of East Gwillimbury's Noise By-law (2004-80), implementing construction Best Management Practices for noise reduction and developing a complaint resolution procedure. No net effects. <p style="text-align: center;">First</p>	<ul style="list-style-type: none"> The temporary increase in noise levels at approximately 203 adjacent residences (including 4 multi-unit complexes) during construction of the YDSS Modifications Alternative Route would be minimized by adhering to the Ministry of the Environment's noise limits, the Town of East Gwillimbury's Noise By-law (2004-80), implementing construction Best Management Practices for noise reduction and developing a complaint resolution procedure. No net effects. <p style="text-align: center;">Second</p>	<ul style="list-style-type: none"> The temporary increase in noise levels at approximately 345 adjacent residences (including 6 multi-unit complexes) during construction of the YDSS Modifications Alternative Route would be minimized by adhering to the Ministry of the Environment's noise limits, the Town of East Gwillimbury's Noise By-law (2004-80), implementing construction Best Management Practices for noise reduction and developing a complaint resolution procedure. No net effects. <p style="text-align: center;">Third</p>

22. The number of wells was estimated from a search of the Ministry of the Environment Water Well Database and includes the on-site well(s).

23. As defined by the Ministry of the Environment (MOE) in NPC-205, a sensitive "point of reception" means any point on the premises of a person where sound or vibration originating from other than those premises is received. For the purpose of approval of new sources of noise, including verifying compliance with Section 9 of the Environmental Protection Act, the point of reception may be located on any of the following existing or zoned for future use premises: permanent or seasonal residences, hotels/motels, nursing/retirement homes, rental residences, hospitals, camp grounds, and noise sensitive buildings such as schools and places of worship.

24. Adjacent buildings were evaluated for the YDSS Modifications Alternative Route since the noise effects are construction related and the equipment is mobile rather than stationary. Potentially affected locations would be those receivers immediately adjacent to the road.

Table R.4: Comparative Evaluation of the YDSS Modifications Alternative Routes

Category	Criteria	Indicator	Rationale for Ranking ¹	Alternative Route A	Alternative Route B	Alternative Route C
Effect of Noise on Sensitive Receptors Criterion Ranking				Most Preferred	Moderately Preferred	Least Preferred
	Effect of perceptible vibration levels on sensitive receptors	Number of sensitive receptors ²⁵ affected and extent and duration of adverse effects	<ul style="list-style-type: none"> The lower the number of adjacent sensitive receptors, the lower the potential future vibration related complaints, the better the ranking. 	<ul style="list-style-type: none"> The temporary increase in vibration levels at approximately 87 residences (including 2 multi-unit complexes) during construction of the YDSS Modifications Alternative Route would be minimized by adhering to the Ministry of the Environment's vibration limits as set out in the NPC-207 Publication, implementing Best Management Practices for vibration reduction, and developing a complaint resolution procedure. No permanent net effects. <p style="text-align: center;">First</p>	<ul style="list-style-type: none"> The temporary increase in vibration levels at approximately 203 adjacent residences (including 4 multi-unit complexes) during construction of the YDSS Modifications Alternative Route would be minimized by adhering to the Ministry of the Environment's vibration limits as set out in the NPC-207 Publication, implementing Best Management Practices for vibration reduction, and developing a complaint resolution procedure. No permanent net effects. <p style="text-align: center;">Second</p>	<ul style="list-style-type: none"> The temporary increase in vibration levels at approximately 345 adjacent residences (including 6 multi-unit complexes) during construction of the YDSS Modifications Alternative Route would be minimized by adhering to the Ministry of the Environment's vibration limits as set out in the NPC-207 Publication, implementing Best Management Practices for vibration reduction, and developing a complaint resolution procedure. No permanent net effects. <p style="text-align: center;">Third</p>
Effect of Perceptible Vibration Levels on Sensitive Receptors Criterion Ranking				Most Preferred	Moderately Preferred	Least Preferred
	Effect of odour sensitive receptors from current conditions ²⁶	Number of sensitive receptors impacted and extent and duration of impacts	<ul style="list-style-type: none"> The net effects are the same for all alternatives. 	<ul style="list-style-type: none"> No net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> No net effects. <p style="text-align: center;">First (Tied)</p>	<ul style="list-style-type: none"> No net effects. <p style="text-align: center;">First (Tied)</p>
Effect of Odour on Sensitive Receptors from Current Conditions Criterion Ranking				Most Preferred (Tied)	Most Preferred (Tied)	Most Preferred (Tied)
Social Environment Category Ranking & Rationale:				Most Preferred	Moderately Preferred	Least Preferred
<ul style="list-style-type: none"> + Denotes an advantage for an alternative Route relative to other Routes - Denotes a disadvantage for an alternative Route relative to other Routes 				<p>The Route is "Most Preferred" from a Social Environment Category perspective compared to the other Routes, because it has the following advantages:</p> <ul style="list-style-type: none"> + Temporary increase in noise and vibration levels at the lowest number of sensitive receptors (approximately 87 residences) 	<p>The Route is "Moderately Preferred" from a Social Environment Category perspective compared to the other Routes, because it has the following disadvantages:</p> <ul style="list-style-type: none"> - Temporary increase in noise and vibration levels at a higher number of sensitive receptors (approximately 203 residences) 	<p>The Route is "Least Preferred" from a Social Environment Category perspective compared to the other Routes, because it has the following disadvantages:</p> <ul style="list-style-type: none"> - Temporary increase in noise and vibration at the highest number of sensitive receptors (approximately 345 residences)

25. Sensitive receptors from a vibration perspective include permanent or seasonal residences, hotels/motels, nursing/retirement homes, rental residences, hospitals, camp grounds, and vibration sensitive buildings.

26. Sensitive receptors include residences, child care facilities, health care facilities, senior citizens' residence, long-term care facilities, schools, and for this assessment, businesses have been included as well.

Table R.4: Comparative Evaluation of the YDSS Modifications Alternative Routes

Category	Criteria	Indicator	Rationale for Ranking ¹	Alternative Route A	Alternative Route B	Alternative Route C
Economic Environment	Effect on approved/planned land uses	Number, extent, and type of approved/ planned land uses affected	<ul style="list-style-type: none"> The net effects are the same for all alternatives. 	<ul style="list-style-type: none"> No net effects. <p>First (Tied)</p>	<ul style="list-style-type: none"> No net effects. <p>First (Tied)</p>	<ul style="list-style-type: none"> No net effects. <p>First (Tied)</p>
	Effect on Approved/Planned Land Uses Criterion Ranking			Most Preferred (Tied)	Most Preferred (Tied)	Least Preferred
	Effect on agricultural soil resources	Approximate area (ha) of Class 1, Class 2 and Class 3 soils removed (priority in that order).	<ul style="list-style-type: none"> The net effects are the same for all alternatives. 	<ul style="list-style-type: none"> No net effects. <p>First (Tied)</p>	<ul style="list-style-type: none"> No net effects. <p>First (Tied)</p>	<ul style="list-style-type: none"> No net effects. <p>First (Tied)</p>
		Approximate area (ha) of Specialty Cropland removed, and/or area of agricultural soils disturbed, and/or area of active agricultural land removed	<ul style="list-style-type: none"> The net effects are the same for all alternatives. 	<ul style="list-style-type: none"> No net effects. <p>First (Tied)</p>	<ul style="list-style-type: none"> No net effects. <p>First (Tied)</p>	<ul style="list-style-type: none"> No net effects. <p>First (Tied)</p>
	Effect on Agricultural Soil Resources Criterion Ranking			Most Preferred (Tied)	Most Preferred (Tied)	Most Preferred (Tied)
Economic Environment Category Ranking & Rationale:				<p>Most Preferred (Tied)</p> <p>No difference between the 3 alternative Routes based on the application of the 2 Economic Category Evaluation Criteria (no potential negative environmental effects were identified).</p>	<p>Most Preferred (Tied)</p> <p>No difference between the 3 alternative Routes based on the application of the 2 Economic Category Evaluation Criteria (no potential negative environmental effects were identified).</p>	<p>Most Preferred (Tied)</p> <p>No difference between the 3 alternative Routes based on the application of the 2 Economic Category Evaluation Criteria (no potential negative environmental effects were identified).</p>
Cultural Environment	Effects on known or potential significant archaeological resources	Number and type of potentially significant, known archaeological sites affected	<ul style="list-style-type: none"> The net effects are the same for all alternatives. 	<ul style="list-style-type: none"> No net effects. <p>First (Tied)</p>	<ul style="list-style-type: none"> No net effects. <p>First (Tied)</p>	<ul style="list-style-type: none"> No net effects. <p>First (Tied)</p>
		Area (ha) of archaeological potential (i.e., lands with potential for the presence of significant archaeological resources) affected	<ul style="list-style-type: none"> The smaller the area with archaeological potential, the lower the potential for presence of significant archaeological resources, the better the ranking. 	<ul style="list-style-type: none"> The disturbance to 1.57 ha with archaeological potential during construction of the YDSS Modifications Alternative Route would be minimized and appropriate mitigation measures would be identified if required in the Stage 2 Archaeological Assessment and if warranted during the Stage 3 or Stage 4 Archaeological Assessments. No net effects. <p>First</p>	<ul style="list-style-type: none"> The disturbance to 0.96 ha with archaeological potential during construction of the YDSS Modifications Alternative Route would be minimized and appropriate mitigation measures would be identified if required in the Stage 2 Archaeological Assessment and if warranted during the Stage 3 or Stage 4 Archaeological Assessments. No net effects. <p>Second</p>	<ul style="list-style-type: none"> The disturbance to 0.74 ha with archaeological potential during construction of the YDSS Modifications Alternative Route would be minimized and appropriate mitigation measures would be identified, if required, in the Stage 2 Archaeological Assessment and if warranted, during the Stage 3 or Stage 4 Archaeological Assessments. No net effects. <p>Third</p>
	Effects on Known or Potential Significant Archaeological Resources Criterion Ranking			Most Preferred	Moderately Preferred	Least Preferred

Table R.4: Comparative Evaluation of the YDSS Modifications Alternative Routes

Category	Criteria	Indicator	Rationale for Ranking ¹	Alternative Route A	Alternative Route B	Alternative Route C
	Effects on built heritage resources and cultural heritage landscapes.	Number and type of built heritage resources and cultural heritage landscapes displaced ²⁷ or disrupted ²⁸	<ul style="list-style-type: none"> Displacement of cultural heritage resources, worse than disruption of cultural heritage resources. The lower number of cultural heritage resources displaced or disrupted, the better the ranking. Avoidance of displacement or disruption of cultural heritage resources takes precedence over minimizing/compensating for displacement/disruption of 	<ul style="list-style-type: none"> The disruption to 6 cultural heritage resources²⁹ during construction of the YDSS Modifications Alternative Route would be minimized through a detailed heritage evaluation to develop appropriate mitigation measures (e.g., façade stabilization, identification of buffer requirements, monitoring of construction vibration, avoidance of tree and fence removals, post-construction landscaping, documentation prior to alteration, commemoration etc.) The displacement of 1 cultural heritage resource (543 Timothy Street; Factory Complex designated under the Ontario Heritage Act) during construction of the YDSS Modifications Alternative Route would be addressed through preparation of a detailed heritage evaluation to develop appropriate mitigation measures (i.e. commemoration, salvage, and/or documentation prior to resource removal). No net effects during operation of the YDSS Modifications Alternative Route. <p style="text-align: center;">Third</p>	<ul style="list-style-type: none"> The disruption to 4 cultural heritage resources³⁰ during construction of the YDSS Modifications Alternative Route would be minimized through preparation of detailed heritage evaluations to develop appropriate mitigation measures (e.g., façade stabilization, identification of buffer requirements, monitoring of construction vibration, avoidance of tree and fence removals, post-construction landscaping, documentation prior to alteration, commemoration etc.) The displacement and/or premature deterioration to approximately 37 cultural heritage resources located along Bayview Avenue, between Penrose Street and Davis Drive during construction of the YDSS Modifications Alternative Route would be avoided through appropriate siting of staging areas and access Routes, monitoring construction vibration, avoiding tree removals and fence removals, and post-construction landscaping activities. No net effects during operation of the YDSS Modifications Alternative Route. <p style="text-align: center;">Second</p>	<ul style="list-style-type: none"> The disruption of 2 cultural heritage resources³¹ during construction of the YDSS Modifications Alternative Route would be minimized through preparation of detailed heritage evaluations to develop appropriate mitigation measures (e.g., façade stabilization, identification of buffer requirements, monitoring of construction vibration, avoidance of tree and fence removals, post-construction landscaping, documentation prior to alteration, commemoration etc.). The displacement and/or premature deterioration to approximately 32 cultural heritage resources located along Bayview Avenue, between Penrose Street and Queen Street during construction of the YDSS Modifications Alternative Route would be avoided through appropriate siting of staging areas and access Routes, monitoring construction vibration, avoiding tree removals and fence removals, and post-construction landscaping activities. No net effects during operation of the YDSS Modifications Alternative Route. <p style="text-align: center;">First</p>

27. Displacement is indicated by removal or loss of heritage attributes of the cultural heritage resource at a scale where its heritage significance is no longer conserved and/or communicated. Pre-mature deterioration refers to construction-related effects such as vibration that could result in deterioration and ultimately a displacement of cultural heritage resources.

28. Disruption to cultural heritage resources refers to partial modification of cultural heritage resources.

29. Cultural heritage resources disrupted along Alternative Route A include the Newmarket Canal, Bailey Ecological Park, Wesley Brooks Conservation Area, George Richardson Park, the former Toronto Transit Commission electric railway corridor (north of Heman Street) and Open space located between former rail corridor and Prospect Street, north of Timothy Street.

30. Cultural heritage resources disrupted along Alternative Route B include the Newmarket Canal, Bailey Ecological Park, the former Toronto Transit Commission electric railway corridor (north of Heman Street) and George Richardson Park.

31. Cultural heritage resources disrupted along Alternative Route C include the former Toronto Transit Commission electric railway corridor (north of Heman Street) and George Richardson Park.

Table R.4: Comparative Evaluation of the YDSS Modifications Alternative Routes

Category	Criteria	Indicator	Rationale for Ranking ¹	Alternative Route A	Alternative Route B	Alternative Route C	
			cultural heritage resources.				
Effects on Built Heritage Resources and Cultural Heritage Landscapes Criterion Ranking				Least Preferred	Moderately Preferred	Most Preferred	
Cultural Environment Category Ranking & Rationale:				Least Preferred	Moderately Preferred	Most Preferred	
<ul style="list-style-type: none"> + Denotes an advantage for an alternative Route relative to other Routes - Denotes a disadvantage for an alternative Route relative to other Routes 				<p>The Route is Least Preferred from a Cultural Environment perspective compared to the other Routes, because it has the following disadvantages:</p> <ul style="list-style-type: none"> - Disturbance to the largest area of archaeological potential (1.6 ha) - Disruption to the highest number of cultural heritage resources (approximately 6) - Displacement of 1 cultural heritage resource 	<p>The Route is Moderately Preferred from a Cultural Environment perspective compared to the other Routes, because it has the following advantages:</p> <ul style="list-style-type: none"> + Disturbance to a smaller area of archaeological potential (1.0 ha) + Disruption to a higher number of cultural heritage resources (approximately 4) + No displacement of cultural heritage resources 	<p>The Route is Most Preferred from a Cultural Environment perspective compared to the other Routes, because it has the following advantages:</p> <ul style="list-style-type: none"> + Disturbance to the smallest area of archaeological potential (0.7 ha) + Disruption to the lowest number of cultural heritage resources (approximately 2) + No displacement of cultural heritage resources 	
Financial	50-year Net Present Worth Costs	50-year present net worth costs associated with the capital investment, land acquisition, and operating and maintenance of the infrastructure, systems and equipment ³²	<ul style="list-style-type: none"> ▪ The lower the overall 50-year present net worth costs, the better the ranking 	<ul style="list-style-type: none"> ▪ \$ 89, 230,000 <p style="text-align: center;">First</p>	<ul style="list-style-type: none"> ▪ \$ 90,790,000 <p style="text-align: center;">Second</p>	<ul style="list-style-type: none"> ▪ 96,200,000 <p style="text-align: center;">Third</p>	
Financial Category Ranking & Rationale:				Most Preferred	Moderately Preferred	Least Preferred	
				<p>The Route is Most Preferred from a Financial perspective compared to the other Routes because it has the lowest 50-year Net Present Worth Costs.</p>	<p>The Route is Moderately Preferred from a Financial perspective compared to the other Routes because it has lower 50-year Net Present Worth Costs than Route C.</p>	<p>The Route is Least Preferred from a Financial perspective compared to the other Routes because it has the highest 50-year Net Present Worth Costs.</p>	
OVERALL RECOMMENDATION AND RATIONALE				Recommended	Not Recommended	Not Recommended	
<ul style="list-style-type: none"> + Denotes an advantage for the recommended alternative - Denotes a disadvantage for an alternative Route relative to the recommended Route 				<ul style="list-style-type: none"> ▪ An overall ranking of Recommended was assigned to an alternative having the greatest number of top placed category rankings (e.g., more Most Preferred, More Preferred and Moderately Preferred rankings) among all of the alternatives being considered, thus providing the highest number of advantages and the least number of disadvantages overall. ▪ An overall ranking of Not Recommended was assigned to an alternative 	<ul style="list-style-type: none"> + Lower Carbon Dioxide (CO₂) Equivalent Footprint / year + Lower number of accesses to residences, businesses and community, institutional and recreational facilities temporarily affected + Lower number of major utilities/service providers temporarily affected than Alternative Route B + Lower number of adjacent buildings affected by a temporary increase in noise and vibration levels + Lower 50-year Net Present Worth Costs 	<ul style="list-style-type: none"> - Higher Carbon Dioxide (CO₂) Equivalent Footprint / year - Higher number of accesses to residences and businesses temporarily affected - Higher number of major utilities/service providers temporarily affected - Higher number of adjacent buildings affected by a temporary increase in noise and vibration levels - Higher 50-year Net Present Worth Costs 	<ul style="list-style-type: none"> - Higher Carbon Dioxide (CO₂) Equivalent Footprint / year - Higher number of accesses to residences and businesses temporarily affected - Higher number of adjacent buildings affected by a temporary increase in noise and vibration levels - Higher 50-year Net Present Worth Costs

32. Alternative Methods of Carrying Out the Undertaking – Cost Estimates Report (CRA et al., February 2013).

Table R.4: Comparative Evaluation of the YDSS Modifications Alternative Routes

Category	Criteria	Indicator	Rationale for Ranking ¹	Alternative Route A	Alternative Route B	Alternative Route C
			<p>having fewer number of top placed category rankings (e.g., more Most Preferred, More Preferred and Moderately Preferred rankings) among all of the alternatives being considered, thus providing the higher number of disadvantages and lower number of advantages overall.</p>			