

IN THIS SECTION

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**Section 6.0
Commitments and Monitoring for the Proposed Undertaking**

In accordance with the Minister-approved (as amended) UYSS EA Terms of Reference, a monitoring framework was developed for the proposed Undertaking that addresses both environmental effects monitoring and compliance monitoring. Since the proposed Undertaking is composed of a number of integrated components (i.e., proposed Water Reclamation Centre including reclaimed water, proposed Project-Specific Phosphorus Off-Setting Program, and proposed YDSS modifications), the environmental effects and compliance monitoring framework is specified individually by each component.

The purpose of environmental effects monitoring is to monitor the net effects associated with the construction, operation, and maintenance of the proposed Undertaking, as necessary, and implement further mitigation measures, monitoring, and contingency plans, where possible, so that:

1. Predicted net negative effects are not more than expected
2. Unanticipated negative effects are addressed
3. Predicted benefits are realized

The purpose of compliance monitoring is to ensure that the proposed Undertaking has been constructed, implemented, and/or operated in accordance with the commitments made by York Region during preparation of the UYSS EA, as well as any conditions of *EA Act* approval.

As per Section 4.3.5 of the Ministry of the Environment's (MOE) *Code of Practice for Preparing and Reviewing Environmental Assessments in Ontario*, January 2014, if the proposed Undertaking is approved by the Minister of the Environment under the *EA Act*, then York Region will report to the MOE on how the monitoring framework was complied with.

In order to fulfill this reporting requirement, an EA Compliance Monitoring Program will be prepared following approval of the proposed Undertaking under the *EA Act*, which will include all of the commitments outlined in **Sections 6.1 and 6.2**, as well as any *EA Act* conditions of approval (see **Figure 6.1**).

Following establishment of the EA Compliance Monitoring Program, York Region will report annually on how they fulfilled the commitments until all commitments are fulfilled. The results of the EA Compliance reporting will be retained at York Region’s office and/or another location such as a site office to be determined. The results will also be made available to the MOE, upon request, in accordance with the *Code of Practice for Preparing and Reviewing Environmental Assessments in Ontario*, January 2014.

Figure 6.1: EA Compliance Monitoring Program



6.1 Environmental Effects Monitoring

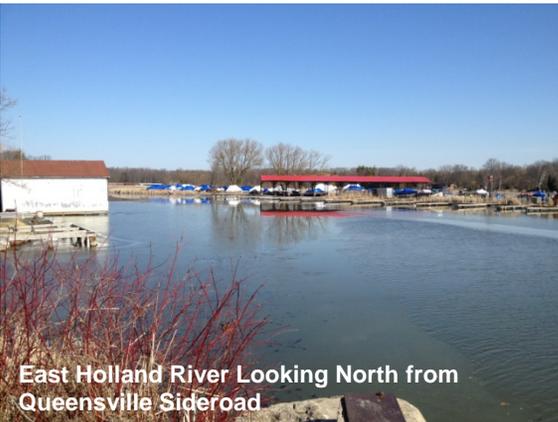
Table 6.1 outlines the environmental effects monitoring associated with the proposed Undertaking based on the mitigation and compensation measures described in **Section 5**. In particular, **Table 6.1** lists the environmental effects monitoring by net effect within each Environment category (i.e., Natural Environment, Built Environment, Social Environment, etc.) and includes the anticipated timing of the monitoring (i.e., pre-construction, construction, operation).

Table 6.1: Summary of Environmental Effects Monitoring

Category	Net Effect	Environmental Effects Monitoring	Timing of Monitoring
Proposed Water Reclamation Centre Site, Conveyance Infrastructure, Outfall, and Reclaimed Water			
Natural Environment	The temporary decrease in groundwater quality and quantity would be minimized by using appropriate construction methods.	<p>Pre-construction Groundwater Monitoring: Establish baseline groundwater conditions through the existing monitoring well network within the area of influence along 2nd Concession between the Queensville Pumping Station and the Site, and along Queensville Sideroad between 2nd Concession and the East Holland River via the following measurement and collection activities (for a two year period prior to construction):</p> <ul style="list-style-type: none"> ▪ Bi-monthly (every two months) groundwater level measurements from the monitoring well network ▪ Semi-annual groundwater sample collection at selected wells within the monitoring well network ▪ Bi-monthly (every two months) groundwater level measurements at selected private wells, and private shallow sand point wells located along Queensville Sideroad (and Queens Court) ▪ Semi-annual groundwater sample collection at selected private wells, and private shallow sand point wells located along Queensville Sideroad (and Queens Court) 	Pre-Construction
		<p>Construction Groundwater Monitoring: Verify the amount of the proposed water takings and predicted groundwater level changes at active construction water taking locations along 2nd Concession between the Queensville West Pumping Station and the Site and along Queensville Sideroad between 2nd Concession and the East Holland River through the following measurement and sampling activities:</p> <ul style="list-style-type: none"> ▪ Weekly to monthly groundwater level measurements from the Conveyance Infrastructure monitoring well network along Queensville Sideroad (and Queens Court) ▪ Selected water quality sampling at private well locations on one or more occasions 	Construction

Category	Net Effect	Environmental Effects Monitoring	Timing of Monitoring
		<p>Post-construction Groundwater Monitoring: Verify aquifer recovery (80 percent) subsequent to the proposed active construction water takings through the following measurement and sampling activities:</p> <ul style="list-style-type: none"> ▪ Bi-monthly (every two months) groundwater level measurements from the monitoring well network ▪ Semi-annual groundwater sample collection at selected wells 	Operation
	<p>Temporary changes in surface water quantity and quality in the Ravenshoe/Boag, Queensville, and Holborn drainage ditches would be mitigated by implementing a Stormwater Management Plan, including an Erosion and Sediment Control Plan (in accordance with a permit obtained under Ontario Regulation 179/06).</p>	<p>Pre-construction Surface Water Monitoring: Establish baseline surface water quantity and quality conditions to characterize the hydrological regime at the established monitoring stations (one station in the Ravenshoe/Boag drainage ditch (SW 50); four stations in the Queensville drainage ditch (SW 20, SW 34, and SW 52); and one station in the Holborn drainage ditch (SW 23)) through the following measurement and sampling activities (for a two year period prior to construction):</p> <ul style="list-style-type: none"> ▪ Monthly manual baseflow measurements at the established monitoring stations ▪ Continuous level/flow measurements at two stations (SW 34 and SW 23) seasonally (March or April through November or December) ▪ Monthly measurements of water quality field parameters at the established monitoring stations ▪ Quarterly surface water quality sampling representative of seasonal variances in February, May, August, and November at the established monitoring stations 	Pre-Construction
		<p>Construction Surface Water Monitoring: Confirm the effectiveness of the construction mitigation measures implemented in the Stormwater Management Plan, including the Erosion and Sediment Control Plan through surface water quantity and quality monitoring at established monitoring stations (one station in the Ravenshoe/Boag drainage ditch (SW 50); three stations in the Queensville drainage ditch (SW 20, SW 34, and SW 52); and one station in the Holborn drainage ditch (SW 23)) via the following measurement and sampling activities:</p> <ul style="list-style-type: none"> ▪ Monthly manual baseflow measurements at the 	Construction

Category	Net Effect	Environmental Effects Monitoring	Timing of Monitoring
		<p>established monitoring stations</p> <ul style="list-style-type: none"> ▪ Continuous level/flow measurements at two stations (SW 34 and SW 23) ▪ Monthly measurements of water quality field parameters at the established monitoring stations ▪ Quarterly surface water quality sampling representative of seasonal variances in February, May, August, and November at the established monitoring stations ▪ Bi-weekly or as needed inspection of erosion and sediment control measures (i.e., silt fences, coffer dams, etc.) 	
		<p>Post-construction Surface Water Monitoring: If construction causes unanticipated adverse effects as determined through the Construction Surface Water Monitoring, then implement additional corrective measures and conduct surface water monitoring to verify recovery of surface watercourses.</p>	Operation
	<p>Surface water quality in the Queensville drainage ditch and the East Holland River downstream of the proposed Outfall would be permanently improved due to high quality treated water being discharged from the proposed Water Reclamation Centre that meets the Provincial Water Quality Objectives.</p> <p>Surface water quantity in the East Holland River would be permanently improved during low flow periods with no changes to regional flood lines because of baseflow augmentation through the high quality treated water from the proposed Water Reclamation Centre.</p>	<p>Pre-construction East Holland River Surface Water Monitoring: Establish baseline surface water quantity and quality conditions to characterize hydrological regime at the established monitoring stations (one station in the East Holland River (SW 33) and the Queensville drainage ditch (SW 49)) through the following measurement and sampling activities (for a two year period prior to construction):</p> <ul style="list-style-type: none"> ▪ Monthly manual baseflow measurements at the established monitoring stations ▪ Continuous level/flow measurements at SW 33 seasonally (March or April through November or December) ▪ Monthly measurements of water quality field parameters at the established monitoring stations ▪ Quarterly surface water quality sampling representative of seasonal variances in February, May, August, and November at the established monitoring stations ▪ Continuous water temperature measurements at SW 33 in the East Holland River and SW 49 in the Queensville drainage ditch 	Pre-Construction

Category	Net Effect	Environmental Effects Monitoring	Timing of Monitoring
	 <p data-bbox="401 691 842 743">East Holland River Looking North from Queensville Sideroad</p>	<p data-bbox="1003 329 1640 354">Construction East Holland River Surface Water Monitoring:</p> <p data-bbox="1003 355 1659 532">Verify the effectiveness of the construction mitigation measures implemented in the Stormwater Management Plan, including the Erosion and Sediment Control Plan associated with the proposed Outfall through surface water quantity and quality monitoring at established monitoring stations (one location in the East Holland River (SW 33) and one station in the Queensville drainage ditch (SW 49)) via the following measurement and sampling activities:</p> <ul data-bbox="1045 548 1671 808" style="list-style-type: none"> <li data-bbox="1045 548 1514 573">▪ Continuous level measurements at SW 33 <li data-bbox="1045 581 1654 630">▪ Monthly measurements of water quality field parameters at the established monitoring stations <li data-bbox="1045 646 1671 719">▪ Quarterly surface water quality sampling representative of seasonal variances in February, May, August, and November at the established monitoring stations <li data-bbox="1045 735 1654 808">▪ Bi-weekly or as needed inspection of erosion and sediment control measures (i.e., silt fences, coffer dams, etc.) 	Construction
		<p data-bbox="1003 833 1566 857">Post-construction East Holland River Surface Water Monitoring:</p> <p data-bbox="1003 859 1667 1011">If construction causes unanticipated adverse effects as determined through the Construction East Holland River Surface Water Monitoring, then implement additional corrective measures and conduct surface water monitoring to verify recovery of the Queensville drainage ditch and the East Holland River downstream of the proposed Outfall.</p> <p data-bbox="1003 1027 1671 1125">Continuously monitor the quality of the treated clean water discharge at the Water Reclamation Centre in accordance with the Environmental Compliance Approval (ECA) during operation of the Water Reclamation Centre.</p> <p data-bbox="1003 1141 1671 1239">Monitor water quality in the East Holland River quarterly (February, May, August, and November) for one year at each of the following effluent volume thresholds: 10 megalitres per day (MLD), 20 MLD, 30 MLD and 40 MLD.</p>	Operation

Category	Net Effect	Environmental Effects Monitoring	Timing of Monitoring
	<p>Changes in water temperatures (i.e., higher in the winter and lower in the summer) in the Queensville drainage ditch and East Holland River downstream of the proposed Outfall due to the treated clean water discharge from the proposed Water Reclamation Centre.</p>	<p>East Holland River Water Temperature Monitoring: Assess the anticipated changes in water temperatures in the Queensville drainage ditch and East Holland River downstream of the proposed Outfall due to the treated clean water discharge by monitoring water temperature in the East Holland River continuously for one year at each of the following effluent volume thresholds: 10 MLD, 20 MLD, 30 MLD and 40 MLD during operation of the Water Reclamation Centre.</p>	<p>Operation</p>
	<p>Changes to the ice regime during the winter at the proposed Outfall for over 1 kilometre (km) (and possibly up to 4 km) due to the thermal effects from the Water Reclamation Centre discharge under extreme concurrent conditions (full 40 MLD flow from full 2031 growth and a mild winter).</p>	<p>East Holland River Ice Regime Monitoring: Assess the anticipated changes to the ice regime in the East Holland River in consultation with Lake Simcoe Region Conservation Authority by monitoring the ice regime in the East Holland River continuously as follows:</p> <ul style="list-style-type: none"> ▪ Monitoring will be undertaken between November 15 and April 15 of each year, beginning in the year that the UYSS EA is approved until 2031 or the Water Reclamation Centre reaches its 40 MLD capacity, whichever comes first. ▪ Monitoring will take place in the East Holland River both upstream and downstream of the proposed Outfall discharge location at Queensville Sideroad. This may be accomplished via closed circuit television (CCTV) cameras facing north and south of the Queensville Sideroad based on a suggestion from the Lake Simcoe Region Conservation Authority. 	<p>Pre-Construction, Construction, Operation</p>
	<p>The temporary loss of aquatic habitat and function at one crossing of Ravenshoe/Boag drainage ditch and one crossing of the Queensville drainage ditch and temporary disturbance to aquatic species would be minimized by implementing appropriate construction Best Management Practices (BMPs), such as dewatering and fish relocation during construction works; undertaking construction outside</p>	<p>Construction Aquatic Habitat Monitoring: Confirm the effectiveness of the proposed mitigation measures, including BMPs, working outside of timing windows and in the dry, Aquatic Habitat Restoration Plan, bank stabilization measures, and channel realignments through bi-weekly or as needed inspection of proposed mitigation measures during construction and following construction until restoration is complete.</p>	<p>Construction</p>

Category	Net Effect	Environmental Effects Monitoring	Timing of Monitoring
	<p>of the relevant fish spawning timing window and in the low-flow, dry or frozen periods where possible; limiting removal of riparian vegetation; stabilizing watercourse banks; implementing an Aquatic Habitat Restoration Plan; and restoring/stabilizing disturbed areas and returning run-off water quality to pre-construction conditions.</p> <p>The temporary loss of aquatic habitat and function and/or temporary changes to channel form, function and stability of the Ravenshoe/Boag drainage ditch due to removal of drainage swales during operation of the Water Reclamation Centre would be minimized and compensated for by implementing the Aquatic Habitat Restoration Plan and replicating the functions of vegetated drainage swales on the Site.</p>	<p>Post-construction Aquatic Habitat Monitoring: Establish that proper restoration, stabilization, and overall quality of runoff is returned to pre-construction conditions by monitoring once per quarter for one year following construction. If construction causes unanticipated adverse effects as determined through the Construction Aquatic Habitat Monitoring, then implement additional corrective measures.</p>	<p>Operation</p>
	<p>The temporary disturbance to aquatic habitat and function within approximately 250 m of the Queensville drainage ditch during construction of the proposed Outfall channel would be mitigated by implementing appropriate construction Best Management Practices as previously described, and implementing an Aquatic Habitat Restoration Plan following construction.</p> <p>The permanent disturbance to aquatic species in the East Holland River and the Queensville drainage ditch would be</p>  <p>Mouth of the Queensville drainage ditch at the East Holland River</p>	<p>Pre-construction Aquatic Habitat Monitoring: Establish baseline aquatic habitat conditions and fish community within the proposed Outfall channel, between 100 m upstream and 100 m downstream of the proposed Outfall within the East Holland River, and within the East Holland River near the mouth of Soldiers' Bay through the following activities using standardized, repeatable sampling methods and sampling intensities:</p> <ul style="list-style-type: none"> ▪ Complete fish habitat surveys for two years in the summer prior to construction of the proposed Outfall, including rapid habitat assessments, measurement of field water quality parameters, and benthic invertebrate surveys. ▪ Complete fish community surveys for two years in the winter and summer prior to construction of the proposed Outfall, including one electrofishing under appropriate weather conditions (summer) to collect quantitative data (Catch Per Unit Effort) and underwater video (winter) to collect qualitative data (species and habitat use near the proposed Outfall). ▪ Complete angler surveys to establish angler presence for two years in the winter at the proposed Outfall location prior to construction of the proposed Outfall, including incidental observations (person counts) by use of a video camera and/or during other routine monitoring events. 	<p>Pre-Construction</p>

Category	Net Effect	Environmental Effects Monitoring	Timing of Monitoring
	<p>minimized by containing the proposed Outfall channel in a separate channel to mitigate any obstruction to fish passage in the existing Queensville drainage ditch, constructing the proposed Outfall channel according to natural channel design principles to reduce potential for obstructions to fish passage, and maintaining connectivity between the East Holland River and Queensville drainage ditch.</p> <p>Long term benefit to aquatic habitat and function in the East Holland River due to improved water quality and quantity from the treated clean water discharge during operation of the proposed Water Reclamation Centre.</p>	<p>Post-construction Aquatic Habitat Monitoring: Assess the anticipated long term benefit to aquatic habitat and function in the East Holland River due to improved water quality and quantity from the treated clean water discharge by monitoring in the East Holland River at the proposed Outfall through the following activities:</p> <ul style="list-style-type: none"> ▪ Complete fish community surveys and habitat surveys on a yearly basis for three years post-construction to monitor changes in form of aquatic habitat using the same methods and monitoring locations established during pre-construction surveys. Employ appropriate statistical methods to test for changes in function of aquatic habitat and species/life cycle stage composition. ▪ Complete fish community surveys and habitat mapping for two years using the same methods and monitoring locations established during pre-construction surveys when at each of the following effluent volume thresholds is met or exceeded: 10 MLD, 20 MLD, 30 MLD and 40 MLD to monitor changes in function of aquatic habitat and species/life cycle stage composition. ▪ Complete angler surveys during the winter at each of the effluent volume thresholds (10 MLD, 20 MLD, 30 MLD and 40 MLD) at the proposed Outfall location using the same methods and monitoring locations established during pre-construction surveys to determine changes in angler presence habitat use and changes due to thermal effects. <p>If the treated clean water discharge causes unanticipated adverse effects as determined through the Post-Construction Aquatic Habitat Monitoring, then implement additional corrective measures and/or undertake more intensive fisheries studies based on consultation with regulatory agencies (DFO, LSRCA, MNR and MOE, as required).</p>	<p>Operation</p>
	<p>Changes in overall submerged and emergent aquatic vegetation cover and species within the proposed Outfall channel and opening to the East Holland River due to the water temperature changes and/or water quality improvements resulting from the treated clean water</p>	<p>Submerged and Emergent Aquatic Vegetation Monitoring: Determine changes in submerged and emergent aquatic vegetation cover and composition within the proposed Outfall channel and opening to the East Holland River following operation of the proposed Water Reclamation Centre through the</p>	<p>Pre-Construction and Operation</p>

Category	Net Effect	Environmental Effects Monitoring	Timing of Monitoring
	<p>discharge would be monitored and any determined adverse changes would be minimized through corrective management.</p>	<p>following activities:</p> <ul style="list-style-type: none"> ▪ Complete one plant survey to analyze and record the percent cover and composition of submerged and emergent aquatic vegetation within the channel and opening to the East Holland River during the peak growing period between mid-June and mid-September prior to constructing the proposed Outfall and channel. ▪ Complete plant surveys to record the percent cover and composition of submerged and emergent aquatic vegetation within the channel and opening to the East Holland River once per season for three years between mid-June and mid-September following the start of operation of the proposed Water Reclamation Centre. Compare post construction monitoring results with pre-construction monitoring results to determine if corrective management is necessary to improve cover or control invasive species. 	
	<p>Changes to amphibian populations within the proposed Outfall channel and opening to the East Holland River due to cooler water temperatures in late spring and early summer and/or water quality improvements resulting from the treated clean water discharge would be monitored and any determined adverse changes would be minimized through corrective management.</p>	<p>Amphibian Monitoring: Determine changes to amphibian populations within the proposed Outfall channel and opening to the East Holland River following operation of the proposed Water Reclamation Centre through the following activities:</p> <ul style="list-style-type: none"> ▪ Conduct one year of standardized amphibian surveys within the proposed Outfall channel and opening to the East Holland River in accordance with the Marsh Monitoring Protocol, to record the species and number of individuals prior to constructing the proposed Outfall and channel. ▪ Conduct standardized amphibian surveys within the proposed Outfall channel and opening to the East Holland River in accordance with the Marsh Monitoring Protocol, to record the species and number of individuals for three years following the start of operation of the proposed Water Reclamation Centre. Compare post construction monitoring results with pre-construction monitoring results to determine if corrective management is necessary to address declines in amphibian populations. 	<p>Pre-Construction and Operation</p>

Category	Net Effect	Environmental Effects Monitoring	Timing of Monitoring
	<p>The temporary changes to channel form, function and stability of the Ravenshoe/Boag drainage ditch would be compensated for by micrograding the landscape and using stormwater management to replicate existing headwater channel functions.</p>	<p>Geomorphologic Post-construction Site Monitoring: Confirm that micrograding and stormwater management is implemented and functioning properly to ensure continuity of headwater channel functions by monitoring the proposed Water Reclamation Centre Site once per quarter for one year following construction. Implement additional corrective measures if monitoring indicates unanticipated adverse effects on the Ravenshoe/Boag drainage ditch.</p>	Operation
	<p>Permanent alteration to the existing form and functions of approximately 150 m of the Queensville drainage ditch because of widening and rock lining would be minimized by limiting the extent of stone placement along the banks where possible and compensated for by incorporating variability in bed morphology and in-stream roughness elements (e.g., large woody debris, large boulders).</p>	<p>Geomorphologic Pre-construction Queensville Drainage Ditch Monitoring: Establish baseline suspended sediment conditions through quarterly suspended sediment sampling for two years at one station in the East Holland River (SW 33) and one station in the Queensville drainage ditch (SW 49) prior to construction of the proposed Outfall and channel.</p>	Pre-Construction
	<p>A negligible permanent change in sediment loading to the East Holland River and Cook's Bay (less than 1 percent of the annual sediment load) would result from the proposed Queensville drainage ditch channel widening and rock lining.</p>	<p>Geomorphologic Post-construction Queensville Drainage Ditch Monitoring: Confirm anticipated negligible permanent change in sediment loading to the East Holland River and Cook's Bay by monitoring suspended sediment at one station in the East Holland River (SW 33) and one station in the Queensville drainage ditch (SW 49) quarterly for one year at each of the following effluent volume thresholds: 10 MLD, 20 MLD, 30 MLD and 40 MLD.</p>	Operation
	<p>The temporary disturbance to terrestrial habitat and functions within the Core Natural Heritage System area in the eastern portion of the proposed Water Reclamation Centre Site would be avoided by establishing a minimum 30 m buffer and installing and maintaining temporary protective fencing to delineate the 30 m buffer wherein no construction would occur.</p> <p>The temporary disturbance to natural vegetation during construction of the Conveyance Infrastructure to and from the proposed Water Reclamation Centre Site and proposed Outfall would be avoided by installing and maintaining temporary protective fencing to delineate the construction areas immediately adjacent to natural vegetation.</p>	<p>Protective Vegetation Fence Monitoring: Assess that the terrestrial habitat and functions within the Core Natural Heritage System area within the proposed Water Reclamation Centre Site and natural vegetation immediately adjacent to the Conveyance Infrastructure to and from the proposed Water Reclamation Centre Site remains undisturbed during construction by carrying out monthly inspections of the installed protective fencing at the following locations:</p> <ul style="list-style-type: none"> ▪ Along the delineated 30 m buffer from the Core Natural Heritage System area boundary located in the eastern portion of the proposed Water Reclamation Centre Site ▪ Along the delineated construction areas adjacent to natural vegetation associated with the Conveyance 	Construction

Category	Net Effect	Environmental Effects Monitoring	Timing of Monitoring
	 <p>Proposed Water Reclamation Centre Site Looking towards Core Natural Heritage System</p>	<p>Infrastructure to and from the proposed Water Reclamation Centre Site and the proposed Outfall</p> <p>Repair/replace the installed protective fencing as necessary to ensure it remains intact throughout construction based on the monitoring results.</p>	
	<p>Changes in overwintering waterfowl populations, including Canada Geese, from the creation of open water in the East Holland River due to thermal effects from the Water Reclamation Centre treated clean water discharge in the winter months.</p>	<p>Post-construction Waterfowl Monitoring: Determine if an increased number of waterfowl species are using the open water created in the East Holland River due to the thermal effects from the treated clean water discharge by carrying out one survey during the winter in the East Holland River at the proposed Outfall at each of the effluent volume thresholds described above (10 MLD, 20 MLD, 30 MLD and 40 MLD), in conjunction with the angler surveys.</p>	<p>Operation</p>
	<p>The permanent loss of 0.92 ha of deciduous hedgerow communities on the proposed Water Reclamation Centre Site would be compensated for by implementing a Terrestrial Habitat Restoration Plan within the 30 m buffer applied to the Core Natural Heritage System area.</p>	<p>Terrestrial Planting Survivorship Monitoring: Confirm the survival of new plantings and detect the presence of invasive species (i.e., Common Buckthorn (<i>Rhamnus cathartica</i>)) in the re-vegetated 30 m buffer from the key natural heritage and hydrological features (once per growing season for two years following initial planting season).</p>	<p>Operation</p>
	<p>The permanent loss of 0.27 ha of meadow marsh communities within the Holland Marsh Provincially Significant Wetland, the Holland Landing Environmentally Sensitive Area (ESA), and the Holland Landing Fen and Wildlife Provincially Significant Candidate Area of Natural and Scientific Interest (ANSI) due to the proposed Outfall would be minimized and compensated for by minimizing disturbance to the area outside of the municipal right-of-way south of Queensville Sideroad and implementing a Wetland Habitat Restoration and Compensation Plan in</p>	<p>Wetland Vegetation Planting Survivorship Monitoring: Confirm the survival of new wetland vegetation plantings and document species composition and vegetation structure, including the presence of invasive wetland species in the restored wetland at the proposed Outfall once per growing season for two years following construction of the propose Outfall and channel or as required by the Wetland Habitat Restoration and Compensation Plan.</p>	<p>Operation</p>

Category	Net Effect	Environmental Effects Monitoring	Timing of Monitoring
	consultation with Lake Simcoe Region Conservation Authority and/or Ministry of Natural Resources.		
Built Environment	No specific environmental effects monitoring required for the Built Environment based on identified net effects.		
Social Environment	Partially obstructed or unobstructed views of the proposed Water Reclamation Centre from 15 residences in the general vicinity (within 1 km) of the facility would be minimized through a Landscape Development Plan for the Site (i.e., new plantings, berms, etc.), which would be further refined and finalized during detailed design.	Landscape Planting Survivorship Monitoring: Confirm the survival of new plantings and detect the presence of invasive species (once per growing season for two years following initial planting season) in concert with the Terrestrial Planting Survivorship Monitoring.	Operation
	The short-term decrease in groundwater quality and quantity in private groundwater wells would be minimized by using appropriate construction methods and, if required, affected residents would be provided with a temporary potable water source.	Private Well Groundwater Monitoring: Groundwater monitoring would be undertaken prior to, during and following construction in accordance with the Pre-construction Groundwater Monitoring, Construction Groundwater Monitoring, and Post-construction Groundwater Monitoring programs described above. These programs would be carried out in accordance with York Region's Protocol for Management and Settlement of Claims Related to Private Well Interference and Associated Damages Due to Construction Activity by York Region (Well Mitigation Policy), as appropriate.	Pre-Construction, Construction and Operation
Economic Environment	No specific environmental effects monitoring required for the Economic Environment based on identified net effects.		
Cultural Environment	No specific environmental effects monitoring required for the Cultural Environment based on identified net effects.		
Proposed Project-Specific Phosphorus Off-Setting Program			
Natural Environment	The short-term decrease in groundwater quality and quantity from minor temporary localized dewatering during construction would be minimized by using appropriate construction methods, such as limiting excavations below the water table or using temporary groundwater cut-off structures where appropriate.	Construction Groundwater Monitoring: Should dewatering be required for construction of the retrofits, monitor water takings and discharge to watercourses in accordance with the Permit to Take Water.	Construction

Category	Net Effect	Environmental Effects Monitoring	Timing of Monitoring
	Temporary changes in surface water quantity and quality in downstream waterbodies during construction would be minimized by implementing a Stormwater Management Plan, including an Erosion and Sediment Control Plan (in accordance with a permit obtained under Ontario Regulation 179/06).	Construction Surface Water Monitoring: Confirm the effectiveness of the construction mitigation measures implemented in the Stormwater Management Plan, including the Erosion and Sediment Control Plan through surface water quantity and quality monitoring in each downstream waterbody in accordance with a permit obtained under Ontario Regulation 179/06).	Construction
Built Environment	No specific environmental effects monitoring required for the Built Environment based on identified net effects.		
Social Environment	No specific environmental effects monitoring required for the Social Environment based on identified net effects.		
Economic Environment	No specific environmental effects monitoring required for the Economic Environment based on identified net effects.		
Cultural Environment	No specific environmental effects monitoring required for the Cultural Environment based on identified net effects.		
Proposed York Durham Sewage System Modifications			
Natural Environment	No temporary or permanent changes in groundwater quantity and quality would occur along the majority of the YDSS Modifications Routes because most of the construction would be in low permeable till. A temporary decrease in groundwater quantity and/or quality locally along Bayview Parkway and near Wellington Street due to dewatering would be mitigated by using appropriate construction methods.	Pre-construction Groundwater Monitoring: Establish baseline groundwater conditions through the existing monitoring well network within the area of influence along YDSS Modifications Route A through the following measurement and collection activities (for a two year period prior to construction):	Pre-Construction
		<ul style="list-style-type: none"> ▪ Bi-monthly groundwater level measurements from the YDSS Modifications Route A monitoring well network ▪ Semi-annual groundwater sample collection at selected wells within the monitoring well network 	
		Construction Groundwater Monitoring: Verify the amount of the proposed water takings and predicted groundwater level changes at active construction water taking locations locally along Bayview Parkway and near Wellington Street through the following measurement and sampling activities:	Construction
		<ul style="list-style-type: none"> ▪ Weekly to monthly groundwater level measurements from the YDSS Modifications Route A monitoring well network locally along Bayview Parkway and near 	

Category	Net Effect	Environmental Effects Monitoring	Timing of Monitoring
		Wellington Street	
		<p>Post-construction Groundwater Monitoring: Verify aquifer recovery (80 percent) subsequent to the proposed active construction water takings through the following measurement and sampling activities:</p> <ul style="list-style-type: none"> ▪ Bi-monthly groundwater level measurements from the YDSS Modifications Route A monitoring well network ▪ Semi-annual groundwater sample collection at selected wells 	Operation
	<p>The temporary changes in surface water quantity and quality in the East Holland River, Wesley Creek, Bogart Creek, and unnamed tributaries in George Richardson Park would be mitigated by implementing a Stormwater Management Plan, including an Erosion and Sediment Control Plan (in accordance with a permit obtained under Ontario Regulation 179/06).</p>	<p>Pre-construction Surface Water Monitoring: Establish baseline surface water quantity and quality conditions to characterize the hydrological regime at the established monitoring stations (five stations within the main channel of the East Holland River (SW 4, SW 8, SW 11, SW 42, and SW 44), and other tributaries comprised of Wesley Creek (one station - SW 43), Bogart Creek (one station SW 7) and the unnamed tributaries off Bayview Parkway in George Richardson Park (five stations - SW 31, SW 45, SW 46, SW 47, and SW 48) through the following measurement and sampling activities (for a two year period prior to construction):</p> <ul style="list-style-type: none"> ▪ Monthly manual baseflow measurements at the established monitoring stations ▪ Continuous level/flow measurements at seven locations seasonally (SW 4, SW 7, SW 8, SW 11, SW 42, SW 43, and SW 44 from March or April through November or December) ▪ Monthly measurements of water quality field parameters at the established monitoring stations ▪ Quarterly surface water quality sampling representative of seasonal variances in February, May, August, and November at the established monitoring stations 	Pre-Construction
	 <p>East Holland River South of Mulock Drive</p>		
		<p>Construction Surface Water Monitoring: Verify the effectiveness of the mitigation measures implemented through the Stormwater Management Plan, including the Erosion and Sediment Control Plan through surface water quantity and quality monitoring at established monitoring stations (five stations within</p>	Construction

Category	Net Effect	Environmental Effects Monitoring	Timing of Monitoring
	 <p>Watercourse Crossing along the YDSS Modifications Route</p>	<p>the main channel of the East Holland River (SW 4, SW 8, SW 11, SW 42, and SW 44), and other tributaries comprised of Wesley Creek (one station - SW 43), Bogart Creek (one station - SW 7) and the unnamed tributaries off Bayview Parkway in George Richardson Park (five stations - SW 31, SW 45, SW 46, SW 47, and SW 48)) via the following measurement and sampling activities:</p> <ul style="list-style-type: none"> ▪ Monthly manual baseflow measurements at the established monitoring stations ▪ Continuous level/flow measurements at seven locations (SW 4, SW 7, SW 8, SW 11, SW 42, SW 43, and SW 44) ▪ Monthly measurements of water quality field parameters at the established monitoring stations ▪ Quarterly surface water quality sampling representative of seasonal variances in February, May, August, and November at the established monitoring stations ▪ Monthly or as needed inspection of erosion and sediment control measures (i.e. silt fences, coffer dams, etc.) 	
	<p>The temporary loss of aquatic habitat and function at 17 open cut and trenchless watercourse crossings would be minimized by implementing appropriate construction Best Management Practices (BMPs), such as undertaking construction during low flow or frozen conditions; dewatering and fish relocation during construction works; undertaking construction outside of the relevant fish spawning timing window; limiting removal of riparian vegetation; stabilizing watercourse banks; implementing an Aquatic Habitat Restoration Plan; and restoring/stabilizing disturbed areas and returning run-off water quality to pre-construction conditions (Potential effects would depend on the construction methodology, proximity of construction areas to the watercourses,</p>	<p>Post-construction Surface Water Monitoring: If construction causes unanticipated adverse impacts as determined through the Construction Surface Water Monitoring, then implement additional corrective measures and conduct surface water monitoring to verify recovery of surface watercourses.</p>	<p>Operation</p>
		<p>Pre-Construction Aquatic Habitat Mapping: Complete detailed habitat mapping prior to construction at all watercourse crossings to establish baseline conditions, including substrate, in-stream cover, riparian cover, flow, morphology, and water quality field parameters.</p>	<p>Pre-Construction</p>
		<p>Construction Aquatic Habitat Monitoring: Verify the effectiveness of the proposed mitigation measures, including BMPs, working outside of timing windows and in the dry, Aquatic Habitat Restoration Plan, bank stabilization measures, and channel realignments through biweekly or as needed inspection of proposed mitigation measures during construction and</p>	<p>Construction</p>

Category	Net Effect	Environmental Effects Monitoring	Timing of Monitoring
	duration of construction activity, and watercourse sensitivity.	following construction until restoration is complete.	
		<p>Post-construction Aquatic Habitat Monitoring: Assess that proper restoration, stabilization, and overall quality of runoff is returned to pre-construction conditions by monitoring once per quarter for one year following construction. If construction causes unanticipated adverse effects as determined through the Construction Aquatic Habitat Monitoring, then implement additional corrective measures.</p>	Operation
	<p>The temporary disturbance to amphibians moving between their breeding habitat and summer ranges during construction would be minimized by undertaking daily monitoring of open-cut and excavated areas and relocating any trapped amphibians to nearby suitable habitats if required.</p> <p>The temporary disturbance to wildlife moving in the north-south wildlife corridor along the East Holland River would be minimized by implementing daily monitoring of open-cut and excavated areas and relocating any trapped animals to nearby suitable habitats if required.</p>	<p>Amphibian and Wildlife Monitoring: Ensure any amphibians or animals, which have become trapped by falling into open-cut or excavated areas overnight are relocated to suitable habitats by daily monitoring of open-cut and excavated areas for the duration of construction (prior to that day's construction beginning in relation to open-cut and excavated areas).</p>	Construction
	<p>The permanent interference with future channel processes and fish passage from the new forcemains would be avoided by installing forcemains at sufficient depth beneath the watercourse so that the forcemains do not become exposed on the channel bed during operation.</p>	<p>Pre-Construction Scour Assessment: Confirm the appropriate depth of the new forcemains by conducting a scour assessment in the East Holland River taking into consideration the following:</p> <ul style="list-style-type: none"> ▪ Long-term channel bed lowering potential ▪ Even based scour depth ▪ Maximum channel bed profile deviation from average channel bed line 	Pre-Construction
	<p>The temporary change to channel form, function and stability at eight open-cut watercourse crossing locations would be minimized and compensated for by implementing an Erosion and Sediment Control Plan, undertaking</p>	<p>Pre-Construction Geomorphologic Monitoring: Establish upstream and downstream baseline conditions at each of the eight open-cut crossing locations for a two year period prior to construction.</p>	Pre-Construction

Category	Net Effect	Environmental Effects Monitoring	Timing of Monitoring
	<p>construction during low flow or frozen conditions, limiting vegetation removal, and implementing site-specific mitigation measures and post-construction restoration.</p>	<p>Construction Geomorphologic Monitoring: Verify the effectiveness of the construction mitigation measures, and effectiveness of the design through biweekly or as needed inspections at each of the eight open-cut crossing locations during construction and following construction until restoration is complete.</p>	Construction
		<p>Post-construction Geomorphologic Monitoring: Verify surface watercourse recovery via geomorphic monitoring once per quarter for one year following construction. If construction causes unanticipated adverse effects as determined through the Construction Geomorphic Monitoring, then implement additional corrective measures.</p>	Operation
	<p>The spread of invasive plant species into upland and wetland communities due to construction disturbance would be minimized by re-vegetating areas disturbed during construction with native plants after construction (expected to reduce the incidence of invasive species colonization), and implementing corrective measures such as applying an LSRCA-approved herbicide, if required, based on the results of post-construction monitoring.</p>	<p>Terrestrial Planting Survivorship Monitoring: Confirm the survival of new plantings and detect the presence of invasive species in re-vegetated disturbed areas (once per growing season for two years following initial planting season). If unanticipated adverse effects occur as determined through the Terrestrial Planting Survivorship Monitoring, then implement corrective measures such as applying an LSRCA-approved herbicide.</p>	Operation
	<p>The temporary loss of up to 0.7 ha of unevaluated wetland communities would be minimized and compensated for by minimizing vegetation removal within wetlands to the extent possible, re-vegetating disturbed areas with native wetland species, implementing a Wetland Habitat Restoration and Compensation Plan developed in consultation with LSRCA, and undertaking corrective measures if necessary (e.g. replanting) based on the results of post-construction monitoring.</p>	<p>Wetland Vegetation Pre-Construction Inventory: Catalogue the structure and composition of the existing vegetation (i.e., dominant species, cover and community structure) in the SWD4-1 vegetation community where temporary vegetation removal is proposed for a staging area and determine appropriate restoration methods through an inventory prior to construction.</p>	Pre-Construction
	<p>The temporary effect on unevaluated wetland communities from construction dewatering would be minimized and compensated for by implementing a Wetland Habitat Restoration and Compensation Plan developed in consultation with LSRCA, and undertaking corrective measures if necessary (e.g., replanting) based on the results of post-construction monitoring.</p>	<p>Wetland Vegetation Planting Survivorship Monitoring: Verify the survival of new wetland vegetation plantings and document species composition and vegetation structure, including the presence of invasive wetland species in the restored wetland once per growing seasons for two years following construction or as required by the Wetland Habitat Restoration and Compensation Plan. If unanticipated adverse effects occur as determined through the Wetland Vegetation Planting Survivorship Monitoring, then implement corrective measures including re-planting and an extended post-construction monitoring period.</p>	Operation

Category	Net Effect	Environmental Effects Monitoring	Timing of Monitoring
Built Environment	Excessive ground movements in close proximity to transportation corridors (i.e. rail lines and high traffic Regional roads) due to pipe jacking would be reduced through appropriate construction methods.	<p>Ground Settlement Monitoring Program: Ensure ground conditions remain stable underneath transportation corridors during pipe jacking by carrying out the following activities:</p> <ul style="list-style-type: none"> ▪ Pre-construction monitoring to establish baseline ground conditions ▪ Monitoring of ground conditions during pipe jacking activities 	Pre-Construction and Construction
Social Environment	No specific environmental effects monitoring required for the Social Environment based on identified net effects.		
Economic Environment	No specific environmental effects monitoring required for the Economic Environment based on identified net effects.		
Cultural Environment	No specific environmental effects monitoring required for the Cultural Environment based on identified net effects.		

6.2 EA Commitments and Compliance Monitoring

York Region has made a number of commitments, including the mitigation and compensation measures and monitoring requirements listed in **Table 6.1**, based on the impact assessments and consultation carried out during the UYSS EA. **Table 6.2** summarizes the commitments providing the following information in accordance with the *Code of Practice for Preparing and Reviewing Environmental Assessments in Ontario*, January 2014:

- Brief commitment description
- UYSS EA Report section and/or Reference Document where the commitment is mentioned
- Commitment timing (i.e., when the commitment will be implemented)
- How the commitment will be monitored for compliance (i.e., fulfilled)

The commitments have been grouped into one of the following three categories:

- **General** (not specific to a particular environmental category or directly the result of consultation carried out during the UYSS EA)
- **Environment** (i.e., Natural Environment, Built Environment, Social Environment, etc.)
- **Consultation** (in response to a particular issue raised during the UYSS EA)

Since the proposed Undertaking is made up of a number of components, the preceding groupings or categories have been sub-divided by component in **Table 6.2** as follows:

- Proposed Undertaking
- Proposed Water Reclamation Centre Site, Conveyance Infrastructure, Outfall and Reclaimed Water
- Proposed Project-Specific Phosphorus Off-Setting Program
- Proposed York Durham Sewage System Modifications

As mentioned, if the proposed Undertaking is approved by the Minister of the Environment under the *EA Act*, then York Region will prepare an EA Compliance Monitoring Program, which will include all of the commitments outlined in **Table 6.2**, as well as any *EA Act* conditions of approval.

Table 6.2: UYSS EA Commitments and Compliance Monitoring

Category	ID #	Commitment Description	EA Report Section(s) and/or Reference Document	Commitment Timing
Proposed Undertaking				
General	1.	Required permits and approvals will be obtained for the proposed Undertaking following EA Act approval by the Minister of the Environment.	Section 8	Pre-Construction and Construction
	2.	Any unforeseen change to the Minister-approved Undertaking will be reviewed by York Region prior to the change being implemented in accordance with the proposed UYSS EA Change Review Process.	Section 9	Pre-Construction and Construction
	3.	The mitigation/compensation measures and monitoring requirements associated with the Minister-approved Undertaking will be implemented unless they are determined and documented to be no longer applicable or required.	Section 5 and Section 6	Pre-Construction, Construction and Operation
Proposed Water Reclamation Centre Site, Conveyance Infrastructure, Outfall, and Reclaimed Water				
Natural and Economic Environments	-	No specific commitments associated with the proposed mitigation/compensation measures and monitoring requirements identified for the Natural and Economic Environments.	Not required.	Not required.
Built Environment	4.	Pre-construction surveys and video records of the seven existing buildings within 250 metres (m) of the proposed Water Reclamation Centre Site property line will be completed.	Noise and Vibration Impact Assessment Report	Pre-Construction
Social Environment	5.	A complaint protocol will be developed prior to construction and implemented during construction of the proposed Water Reclamation Centre for responding to potential noise and vibration related complaints from area residents.	Noise and Vibration Impact Assessment Report	Pre-construction and Construction
	6.	A complaint protocol will be developed prior to construction and implemented during construction and operation of the proposed Water Reclamation Centre for responding to potential odour related complaints from area residents.	Odour Impact Assessment Report	Pre-construction, Construction and Operation
	7.	The conventional treatment odour control facility would be tested upon commissioning of the proposed Water Reclamation Centre to verify that it is performing as specified in accordance with equipment specifications and confirm there is no off-site odour	Odour Impact Assessment Report	Operation

Category	ID #	Commitment Description	EA Report Section(s) and/or Reference Document	Commitment Timing	
Cultural Environment	8.	A Stage 2 archaeological assessment will be conducted on the remaining 5 ha of the proposed Water Reclamation Centre Site (exhibits archaeological potential) that was not assessed during the UYSS EA.	 <p>Area of Archaeological Potential (unploughed)</p>	Archaeological Impact Assessment Report	Pre-Construction
Consultation	9.	An East Holland River Ice Regime Monitoring Program will be developed and implemented in consultation with the Lake Simcoe Region Conservation Authority to monitor the ice regime in the East Holland River at the treated clean water discharge.	Section 7.8 and Section 6.1	Pre-Construction, Construction, Operation	
	10.	York Region will develop Project-Specific Reclaimed Water Guidelines in consultation with the Ministry of the Environment, to be incorporated into the Environmental Compliance Approvals for reclaimed water end users and potentially the Environmental Compliance Approval for the proposed Water Reclamation Centre.	Section 7.8	Pre-Construction and Construction	
	11.	First Nations involved in the UYSS EA will be invited to provide an archaeological monitor to personally witness the completion of the remaining Stage 2 Archaeological Assessment required.	Section 7.8	Pre-Construction	
	12.	Affected residents and business owners immediately adjacent to construction will be notified of construction activities (i.e., road/lane closures, municipal service/utility disruptions, driveway access) a minimum of 24 hours prior to construction in their immediate area.	Section 7.8	Construction	
	13.	The Holland Landing Snowmobile Club will be consulted to finalize York Region's support for an alternate snowmobile trail.	Section 7.8	Pre-Construction	
	14.	York Region will undertake a reclaimed water distribution demonstration project during the initial years of operation of the proposed Water Reclamation Centre by entering into an agreement with one end user (i.e., sod farm) for a set period of time (2 seasons). York Region will be responsible for end user permitting for the demonstration project.	Section 5.2.4.6	Operation	

Category	ID #	Commitment Description	EA Report Section(s) and/or Reference Document	Commitment Timing
	15.	York Region will pilot and implement an on-site reverse osmosis (RO) concentrate treatment process to remove phosphorus from the RO concentrate, allowing a treated RO concentrate stream to be re-blended with the RO permeate prior to discharge to surface water. The on-site demonstration and validation testing would be required prior to obtaining the Ministry of Environment approval and implementing the full-scale RO concentrate treatment process.	Section 5.7.1	Operation
Proposed Project-Specific Phosphorus Off-Setting Program				
Natural, Built, Social, and Economic Environments	-	No specific commitments associated with the proposed mitigation/compensation measures and monitoring requirements identified for the Natural, Built, Social, and Economic Environment.	Not required.	Not required.
Cultural Environment	16.	A Stage 1 Archaeological Assessment will be completed prior to construction at all properties to ensure deeply buried archaeological sites are not inadvertently destroyed as per the <i>Ontario Heritage Act</i> .	Section 5.3.3.5	Pre-Construction
Consultation	17.	Affected residents and business owners immediately adjacent to construction will be notified of construction activities a minimum of 24 hours prior to construction in their immediate area.	Section 5.3.3.2	Construction
	18.	York Region will establish an individual Phosphorus Off-set Transfer Agreements with each of the Towns of Aurora, Newmarket, East Gwillimbury, and Georgina for implementing the proposed stormwater management pond retrofits.	Section 7.8	Pre-Construction
	19.	York Region will implement the proposed Project-Specific Phosphorus Off-Setting Program prior to the proposed Water Reclamation Centre commencing operation in 2019. This will provide an immediate benefit to the Lake Simcoe watershed of 5,866 kilograms (kg) of phosphorus removed between 2019 and 2031.	Section 5.3.1	Construction
	20.	York Region will implement an additional 154 kg/year of phosphorus off-sets before the proposed Water Reclamation Centre reaches an inflow of 32 MLD (approximately 2028).	Section 5.3.1	Operation
Proposed York Durham Sewage System Modifications				
Natural and Economic Environments	-	No specific commitments associated with the proposed mitigation/compensation measures and monitoring requirements identified for the Natural and Economic Environments.	Not required.	Not required.

Category	ID #	Commitment Description	EA Report Section(s) and/or Reference Document	Commitment Timing
Built Environment	21.	Pre-construction surveys and video records for the 118 existing buildings immediately adjacent to the proposed construction area will be completed.	Noise and Vibration Impact Assessment Report	Pre-Construction
Social Environment	22.	A complaint protocol will be developed prior to construction and implemented during construction to respond to potential noise and vibration related complaints from area residents.	Noise and Vibration Impact Assessment Report	Pre-Construction and Construction
Cultural Environment	23.	A Stage 2 archaeological assessment will be conducted on the 400 m of land at the south end of YDSS Modifications Route (exhibits archaeological potential) that was not assessed during the UYSS EA.	Archaeological Impact Assessment Report	Pre-Construction
				
Consultation	24.	First Nations involved in the UYSS EA will be invited to provide an archaeological monitor to personally witness the completion of the remaining Stage 2 Archaeological Assessment required.	Section 7.8	Pre-Construction
	25.	Affected residents and business owners immediately adjacent to construction will be notified of construction activities (i.e., road/lane closures, municipal service/utility disruptions, driveway access) a minimum of 24 hours prior to construction in their immediate area.	Section 7.8	Construction
				