Port Lands Flood Protection and Enabling Infrastructure Due Diligence Report

Toronto, Ontario

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WATERFRONTToronto

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Prepared for:

- **Government of Canada**
- **Province of Ontario**
- **City of Toronto**

October 20, 2016

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MANITOBA

Artist Rendering Looking West Across the Naturalized Mouth of the Don River in Full Vision Scenario

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1. Executive Summary

The Port Lands Flood Protection and Enabling Infrastructure Project (the Project) is a comprehensive plan for flood protecting southeastern portions of downtown Toronto – including parts of the Port Lands, South Riverdale, Leslieville, south of Eastern Avenue and the First Gulf/Unilever development site – that are at risk of flooding under a provincially-defined Regulatory Storm event. As a result, these areas are within a Provincially-designated Special Policy Area and are effectively undevelopable and economically underutilized until the flood risk is removed.

This $1.25 billion project – which enjoys broad support from diverse stakeholders including community groups, developers and environmentalists, and which has secured key environmental assessment approvals from the Ministry of the Environment and Climate Change (MOECC)[1] – will unlock nearly 290 hectares (715 acres) for revitalization and facilitate billions of dollars in private investment. It also represents the second phase of a two-phased project; the first phase being the flood protection landform built in the West Don Lands that now protects 210 hectares (519 acres) of eastern downtown Toronto and enabled the emergence of a new mixed-use community in a former floodplain, including the successful construction of the Pan/Parapan Am Games Athletes' Village.

Naturalizing the mouth of the Don River for flood protection is not a new idea; it was one of the first priority projects that the three orders of government mandated Waterfront Toronto to advance. Working together over the past decade, Waterfront Toronto, Toronto and Region Conservation Authority (TRCA), the City of Toronto and the Toronto Port Lands Company (TPLC) have developed and refined a solution to protect the Port Lands and adjacent areas from potential loss of life and costly flood damage associated with a major flood event, while also triggering economic development – as was the case in the West Don Lands. The Project provides flood protection through the creation of a new, naturalized mouth for the Don River and other significant flood protection measures. This will result in two additional outlets for the Don River, which ultimately will be surrounded by new parks, green space and public realm enhancements before and as development occurs in the area.

This Project will provide critical flood protection and will also spur innovation, economic growth and create jobs while allowing for the development of mixed-use communities for all ages and income levels that are sustainable, livable, and beautiful.

The Project will enable the delivery of climate-positive strategies and outcomes, setting a compelling environmental and economic example for other cities to follow. As cities around the world gain a better understanding of the necessary changes to design, planning, transit, infrastructure and technology to create more sustainable and livable cities, this Project will serve as an ideal testbed for solutions to tackle the challenges posed by climate change. The Port Lands and the growth of a new climate-positive community on the waterfront will serve as a platform to showcase and bring to scale innovative products, policies, solutions and processes in strategic economic sectors such as clean technology, design, sustainable construction and energy systems. This will both attract private equity investment and foster collaboration between governments and private enterprises.

In the last decade, governments across the country have had to contend with weather events that are occurring with more frequency and severity.

1 Don Mouth Naturalization and Port Lands Flood Protection Project Environmental Assessment received MOECC approval on January 28, 2015, and the Lower Don Lands Master Plan Class Environmental Assessment was approved by MOECC in 2014.

Figure 1 *Lower Don River Project area set within the context of the Port Lands and the Central Waterfront*

In particular, floods are happening more often in urban areas and the financial risk to governments to pay for the damages is also increasing. Without adequate mitigation and protection measures in place, governments will continue to assume the risk and costs associated with major flooding across this vast area as a result of damage to existing bridges, roads, utilities and buildings. Moreover, a lack of flood protection infrastructure means the Port Lands cannot be transformed into a long-term asset; an asset that could help to achieve climate change objectives and support the growth and economic competitiveness of Toronto, Ontario and Canada. Investing strategically in the Project not only unlocks development value and protects existing neighbourhoods, but also protects governments from significant financial risk. This is underlined by the Canadian National Disaster Management Strategy's estimated cost-benefit ratio for investment in flood protection: for every dollar invested, five dollars of potential damages are avoided. See **Section 2.1: The Case for Flood Protection.**

Achieving flood protection through a green infrastructure approach will also help achieve several additional strategic public policy objectives:

- *City building:* Unlocking the Port Lands for revitalization will help curb urban sprawl by allowing the development of new communities next to Toronto's downtown core that are connected by transit and cycling networks. Further, flood protection is vital for the development of the First Gulf/Unilever site, which offers significant potential as an employment hub.
- *Climate change:* This creative approach to flood protection will improve Toronto's resiliency. Over 1,000 metres of new river channel, 13 hectares of new coastal wetland and four hectares of terrestrial habitat will strengthen biodiversity and help clean our water.
- *Economic development:* The Project and the future development of Villiers Island are opportunities to develop platforms to showcase innovative products, policies, solutions and processes in strategic economic sectors such as cleantech, design, sustainable construction and energy systems.

There exists here enormous potential for residential and employment-generating commercial development in a part of the city that has been left unchanged during decades of development and modernization elsewhere in Toronto's downtown. The Project will also substantially enhance the area's public realm, beautifying a key part of the downtown, and continuing the transformation and revitalization of Toronto's waterfront.

The Project's construction phase has the potential to deliver wide economic benefits. A 2016 update to the study completed by urbanMetrics estimates that spending on design and construction of the Project will generate approximately:

- $1.1 billion in value to the Canadian economy;
- 10,829 person years of employment; and
- $373 million in tax revenues to all orders of government.

The urbanMetrics report also indicates that there are economic benefits related to future development unlocked by the Project, including approximately:

- $4.0 billion in value added to the Canadian economy;
- 41,100 person years of employment; and
- $1.5 billion in revenues to the three orders of government.

These numbers do not include the additional long-term economic impact associated with the proposed development of the First Gulf/Unilever

site, a 60-acre, 12 million square foot commercial development, envisaged as a major employment node (approximately 50,000 jobs) on the east bank of the Don River. Nor do the numbers include the financial impact generated by net new economic activities driven by commercial and residential occupants in these newly flood-protected areas.

This Project is an ideal investment to revitalize the waterfront while creating durable economic benefits to the city, the province and the nation. In addition, the Project will make a significant contribution towards strengthening our climate change resiliency, which is a priority for each order of government.

1.1 Evolution of the Project

In 2006, the Ontario Ministry of Environment (now Ministry of Environment and Climate Change) approved the Environmental Assessment Terms of Reference for the Don Mouth Naturalization and Flood Protection Project EA (DMNP EA). In 2007, the Port Lands Estuary Plan submitted by Michael Van Valkenburgh Associates Inc. (MVVA) won Waterfront Toronto's international design competition, which specifically sought a master vision and solution that integrated naturalization, flood protection, infrastructure and the land use potential of the area. This design has continued to evolve over time and forms the basis for the Project. See **Section 2.2: Project History.**

The Project has progressed through several necessary regulatory approvals. On January 28, 2015, the MOECC approved the DMNP EA, which documents the Project's core elements. Beyond the required flood protection infrastructure described in the DMNP EA, the Project includes associated major municipal infrastructure needed to enable flood protection and unlock development, such as bridges, roads, and underground services. This infrastructure was outlined in the companion Lower Don Lands Master Plan Class Environmental Assessment (LDL MPEA), which came into effect in 2014. Taken together, the Project provides necessary infrastructure to establish new communities in the Port Lands, including Villiers Island, Polson Quay, South River and the Film Studio District (including the new McCleary District), which could accommodate housing for 18,000-25,000 people and commercial space for 25,000-30,000 jobs. It also enables the redevelopment of the significant First Gulf/Unilever site and other nearby areas.

The Project has been informed by extensive engagement and consultation with the public, government agencies, stakeholders, landowners and developers, and is consistent with the City of Toronto's primary waterfront planning document, the Central Waterfront Secondary Plan.

1.2 Due Diligence Program

In order to create more certainty on the Project's cost, schedule and risks, the Project Team began a due diligence program in June 2015. A team of professional consultants was competitively procured and engaged to conduct the due diligence program. The consulting team includes expertise in major project development, geotechnical, civil, environmental, hydraulic and structural engineering, landscape, river and dock wall design, environmental law, project planning, cost estimating, scheduling, risk assessment, public-private partnership (P3)/alternative finance and procurement (AFP) screening, economic and real estate impact analysis.

While the ultimate scope of the Project was derived from the approved Environmental Assessments, there were still many aspects that required further detail in order to develop a more reliable and detailed cost estimate, schedule, risk assessment and risk mitigation plan. Therefore, the due diligence program began with refining

the river valley and flood protection infrastructure design, detailed investigations into site, soils and environmental conditions, and developing an environmental strategy to address those conditions.

More specifically, a concept design was developed that outlines key elements of the Project in sufficient detail to enable the Project Team to determine the underlying engineering, structural and environmental requirements, and to better calculate costs and quantify risks. For example, the Project Team has established what the river profile looks like and how wide and deep it must be to accommodate a Regulatory Flood event. The Project Team has also modelled the flow of water in the proposed river valley during severe storm events, and the resulting forces acting to erode the valley surface. This provided the necessary understanding of the detailed requirements for flood protection infrastructure.

Finally, because of the unique and unprecedented aspects of the Project, the Project Team is working closely with the MOECC and other agencies on developing an environmental management framework, including the completion of a Community Based Risk Assessment. The Project Team is also aware of other specific and predictable environmental and regulatory approvals needed, and has determined requirements, approvals and processes to proceed with other Project infrastructure, such as roads, bridges and utilities.

As part of the due diligence program, a project delivery options analysis was conducted, including examining P3/AFP and conventional delivery options. Potential revenues from the sale of City-owned lands and development charges were also assessed, and the underlying economic impact study used to outline the Project's benefits was validated.

This report has also been subject to two independent third-party peer reviews by organizations familiar with delivering similar infrastructure projects. The objective of the peer review was to assess the strengths of the process/analyses undertaken and the rationale for the conclusions and recommendations presented.

1.3 Recommended Project Scope

The due diligence findings have led the Project Team to a revised scope for the Project, which is called the Recommended Scope, with a cost estimate of $1.25 billion in year-of-expenditure (YOE) dollars, which includes hard (construction) costs, soft costs (such as design, engineering, and approvals), taxes, and a contingency of 30 per cent to address escalation and risk. Through probabilistic risk assessment, the Project Team has determined that there is a 90 per cent probability of completing the Project on or below budget and on schedule, taking into account all identified cost and schedule risks and opportunities. High-level cost estimate methodologies can be found in **Section 5: Recommended Scope, Cost Estimate and Financial Due Diligence.** The current cost estimate is based on a project-specific delivery model. **Section 6: Procurement Strategy** outlines the project delivery model assessment.

The Recommended Scope balances the delivery of flood protection and enabling infrastructure, such as roads, bridges, municipal servicing, parks and transit right-of-ways, with the necessary amount of public realm needed to serve as a catalyst for future residential and commercial investment and development. The Recommended Scope includes all flood protection and naturalization infrastructure – including river valley wetlands, natural habitat and public realm – as well as adjacent parks, roads, bridges and municipal services. The Recommended Scope also includes interim Bus Rapid Transit (BRT) infrastructure, which can be readily converted to accommodate future Light Rail

Transit (LRT). These Project components enable the immediate development of Villiers Island, the First Gulf/Unilever site and other adjacent development areas. For a full understanding of the Recommended Scope, please see **Figures 33a/b.**

The Recommended Scope does not include some parks, public realm and local roads and bridges that can be built as development proceeds (for example, Promontory Park North).

The initial cost estimate, before the due diligence program, was $975 million (YOE). The key drivers of the increased cost estimate for the Project's Recommended Scope are the results of work done to update and collect new information on the site's soil characteristics. Specifically, an additional 179 boreholes and 98 monitoring wells were drilled, and several test pits were excavated across the Project site (on an approximate 50 metre grid spacing) to gather more soil and groundwater data. The results of these new soil samples, combined with data from 288 previously-drilled boreholes, were thoroughly analyzed by the Project Team, resulting in a better understanding of the nature, extent, and distribution of soil and groundwater contamination.

This work also led to the most relevant new finding, which is that the soils within and underneath the planned river valley/channel and adjoining lands are characterized by flowing sand and compressible peat. As a result, the excavation of the river valley must be wider and deeper than previously anticipated, because of the tendency for exposed soils on the river bank to erode during excavation. This approach is a more complex and costly construction than had previously been anticipated.

The presence of compressible peat layers has a number of implications for the design and construction of settlement-sensitive features, such as roads and park areas, both in terms of cost and the time required to allow for fill settlement before the surface finishes can be installed, which is an important constraint on the overall Project schedule. The peat will also limit storage of excavated soils on adjoining lands through the construction phase of the Project, as the weight of excessive excavated soils, if applied, could cause sinking/settlement on the soil storage sites.

The Project Team has also determined that additional flood protection infrastructure, in the form of raised grades and perimeter reinforcement along the river valley and spillway, is required in the short-term as opposed to the preliminary phasing plan which had relied upon developers to protect individual sites as they were developed over time. Another driver of the cost increase is escalation; several years have passed since the original cost estimate, and therefore cost escalation over this time is factored into the current cost estimate.

Individual cost components and cost increase/decrease details are provided in **Section 5: Recommended Scope, Cost Estimate and Financial Due Diligence.**

1.4 Schedule

The Project Team has developed a schedule for the Recommended Scope with a target completion date in late 2023. This requires that the Project be funded in the second calendar quarter of 2017 and construction mobilization begin in the fourth calendar quarter of 2017. Should funding be delayed past the second quarter of 2017, additional costs due to escalation would increase the total estimated Project cost by approximately $30 million per year.

We recognize that there are other major infrastructure projects that will be underway adjacent to the Project site that may affect the cost and schedule. Waterfront Toronto, together with the City of Toronto, Metrolinx and Infrastructure

Ontario have committed to working collaboratively and have initiated a coordination committee for this purpose. This committee will assess the potential impacts, risks and opportunities presented by these activities happening concurrently, and will develop a coordinated schedule. Please refer to **Section 7.5: Coordination.**

1.5 Procurement Delivery Options Analysis

Project delivery options (or models) define and establish the relationships among the various parties involved in delivering a capital project and the associated scope, and distribution of responsibility and risk. No one perfect model exists and potential options must be individually assessed for fit with a project's particular circumstances. This is especially true given the unique nature of the Project and the fact that a decade of work has already been invested in its development and in working through myriad complex regulatory and other issues.

A fundamental distinguishing feature of this Project is that the entire site is a brownfield, consisting of reclaimed land built over a marsh, surrounded by water and connected to the lake; the scale of soil and groundwater environmental issues is central to the Project and significantly influences and constrains risk transfer potential. In addition to allowing for the efficient, timely and cost-effective management of environmental risks in a collaborative manner with regulatory authorities, the selected delivery model should also allow for controlling the program and design content and quality to the extent necessary to ensure design excellence, enable an expedited start to construction, and provide sufficient flexibility to respond to a changing environment and logistical requirements.

The Project Team reviewed a broad range of delivery options, which included an in-depth assessment of the potential for utilizing a P3/AFP model, and concluded that the needs of this unique and multi-faceted Project demand a customized delivery solution. A comprehensive set of principles was jointly formulated by the Project Team and Infrastructure Ontario (IO) to guide its development.

The customized delivery solution will incorporate elements of the widely-used Construction Manager/General Contractor (CM/GC) model along with specific approaches and incentives developed as part of P3/AFP project delivery and proven in that context. CM/GC is a two-phase process. In the pre-construction phase, the public sector contracts with a consultant team to design an infrastructure asset and in parallel retains a construction contractor to work collaboratively on developing the Project. In the subsequent construction phase, the construction contractor provides the full range of construction services normally provided by a general contractor, including responsibility for coordinating all work on site and for compliance with applicable Occupational Health and Safety legislation and regulations.

The customized delivery solution will also be structured into two phases, and will be designed to:

- Allow for the segmentation of the project into components that can be procured in the most appropriate and advantageous fashion consistent with the procurement principles;
- Enable procurement of integrated design and construction services (design-build) for specific Scope Items, where appropriate to do so;
- Provide for the acquisition of a full range of pre-construction planning services and as and where necessary during construction, the assumption of construction logistics planning and Occupational Health and Safety compliance at the Project site;

- Transfer risk where this can be done at reasonable cost and encourage collaborative management of residual risk that must be retained by the public sector;
- Facilitate early owner-consultant-contractor collaboration to progressively reduce risk; and
- Allow for early constructive engagement between regulatory authorities and the full delivery team, particularly with respect to innovative design and construction approaches.

1.6 Implementation Plan

Waterfront Toronto will assemble an expanded project management team to implement future phases of the Project. To ensure continuity, the team will include some of the same key staff who have led the due diligence program, augmented with experts drawn from the collective resources of Waterfront Toronto and its partner organizations TRCA, the City of Toronto, and TPLC, and potentially other public agencies and consultants. The on-going roles and responsibilities of the key consultants will be assessed and adjusted as necessary to align with the detailed procurement strategy.

In the near term, executive level leadership of the Project will continue to be provided by the Executive Steering Committee, which comprises senior executives from Waterfront Toronto, TRCA, and the City of Toronto. A Project Charter will be created, which will document the responsibilities and accountabilities of Waterfront Toronto and its partner organizations, and the Project governance structure and approval processes.

The project management team and the constructor will collaborate to develop and implement a risk management framework that builds on the risk assessment work completed as part of due diligence and to advance discussions with regulatory authorities to progressively reduce regulatory risk. The project management team and the constructor will also jointly develop a comprehensive Project Execution Plan, which will document the scope, detailed budget and schedule, risk management framework, delivery organization, approval requirements and milestones, contracting, construction staging and interface management strategies, and control processes for the Project.

Realistic contingencies, controlled by the project management team under executive oversight, will be held in reserve to address challenges faced through completion of the Project.

1.7 Peer Review Results

As the Project is an unprecedented proposal for Toronto, the Project Team opted to have the Due Diligence Report peer reviewed to ensure its adequacy and accuracy were independently examined by qualified organizations.

Two separate, independent peer reviews of the due diligence program and results were completed. The first peer reviewer, Rijkswaterstaat is the organization that designs, constructs, manages and maintains flood protection, water, and road infrastructure on behalf of the Ministry for Infrastructure and the Environment in the Netherlands. Rijkswaterstaat is a world leader in the assessment and delivery of infrastructure comparable to the Project; its review was conducted from the perspective of a public sector project delivery agency. The second review, which was competitively procured, was undertaken by the Peter Kiewit Infrastructure Co. (Kiewit), a global construction services provider specializing in water and marine-based projects. Kiewit provided the complementary perspective of a heavy civil contractor with expertise in executing projects of

similar scale and complexity to the Project using a range of traditional and innovative delivery models.

The peer review terms of reference included providing an opinion on the scope, process, and thoroughness of the due diligence process, the project planning work completed and the conclusions reached. The peer reviewers also offered implementation recommendations for consideration by the Project Team. The peer reviewers examined an advanced draft of the due diligence report and supporting documentation, along with final consultant reports.

Both peer review teams concluded that the due diligence work completed by the Project Team was appropriately detailed.

Rijkswaterstaat agreed with the Project Team's conclusion that the $1.25 billion recommended budget would be sufficient to deliver the Recommended Scope, and that the budget's contingency matched similar projects. It further noted that:

- Excavation of the river valley, soil handling and filling (also referred to as earthworks) will drive the construction phasing, and by applying the proposed construction schedule, the Project can be completed in 2023;
- The Project's identified risks are well documented and comparable with Rijkswaterstaat's projects; and
- The scale and complexity of managing soil in the Project is exceptional and the risk of unknown soil characteristics will remain significant.

From a contractor perspective, Kiewit noted that the Project elements that pose the greatest risk to meeting the proposed budget and schedule relate to:

- Confirming the regulatory requirements with respect to soil contaminants and the associated Risk Management Measures; and
- Poor subsurface conditions (such as compressible peat layers) that could result in damage to services such as roads and underground utilities when soils excavated from the river valley are placed on the site and cause sinking/settlement.

One of Kiewit's major recommendations for reducing the risks posed by poor subsurface conditions was to develop a Ground Improvement Plan that would aim to improve the strength of the soils/subsurface conditions, as an early step in the pre-construction phase.

Kiewit was of the opinion that using a collaborative delivery model with early contractor involvement would enable the Project to be developed within the budget and schedule.

Both peer review teams have extensive experience with P3 project delivery and neither considered the model a good fit for the Project.

1.8 Conclusions

The Project Team has identified a Recommended Scope with a cost estimate of $1.25 billion and a target completion date of late 2023. Completion of the Project will deliver flood protection, help to advance revitalization of the Port Lands and the adjacent First Gulf/Unilever site, drive economic growth, spur innovation and the delivery climate-positive strategies. Following a thorough assessment of project delivery alternatives, the Project Team recommends a customized delivery

solution, which reduces risk by leveraging contractor expertise during pre-construction planning, transfers design and construction risk where this can be done at reasonable cost, and encourages collaborative management of residual risk.

In order to deliver the Project within the $1.25 billion recommended budget and to achieve the 2023 target completion date, funding would need to be in place in the second calendar quarter of 2017 to allow the immediate commencement of detailed design and enable mobilization for construction in the fourth calendar quarter of 2017. Should commencement of the Project be delayed, additional costs of approximately $30 million annually would be incurred, owing to the impact of construction escalation.

2. Project Background

Toronto's long-term economic success is linked to its ability to attract the highly-mobile knowledge workers that drive continued investment, economic growth and jobs in the city. In competing with the top tier of global cities, Toronto must create the strong combination of opportunity and quality of life that appeals to these knowledge workers: active, sustainable urban communities – close to employment and transit – with easy access to the amenities that define city living.

As Toronto's downtown experiences continued population and job growth, the 356-hectare (880-acre) Port Lands remains the last significant undeveloped space in the heart of Canada's largest city. Formerly one of the largest natural wetlands in Lake Ontario, the Port Lands has the potential to substantially transform Toronto and support the city's competitiveness. Few cities have such a large swath of downtown waterfront land with an accompanying plan to unlock development. Currently, about 290 hectares (715 acres) of the area – including parts of South Riverdale, Leslieville, south of Eastern Avenue and the First Gulf/Unilever development site at the eastern base of the Don River – are at risk of flooding from the Don River watershed and cannot be revitalized until they are flood protected.

A solution is needed to address the fundamental challenge of transforming the underutilized Port Lands into a long-term asset for the people and economy of Toronto, Ontario and Canada.

2.1 The Case for Flood Protection

Providing flood protection for the Port Lands was identified as a top priority by all three orders of government when they first established Waterfront Toronto in 2001. The Project is the response to this challenge. A new mouth for the Don River will be created by excavating a new channel in the middle of the Port Lands between the Ship Channel and the Keating Channel, as well as a greenway for overflow in the event of a Regulatory Flood. The Project will result in two new outlets for the river into Lake Ontario, new parks and green space along the river and inner harbour, continuous riverfront open space and expanded opportunities for people to experience the water's edge.

The Project would effectively complete flood protection for the Lower Don River area; the first phase being the flood protection infrastructure recently completed in the West Don Lands, which flood protects 210 hectares (519 acres) of eastern downtown Toronto, including the West Don Lands, East Bayfront and parts of the Financial District and South Core. That work enabled considerable development, including $1.3 billion of early-stage

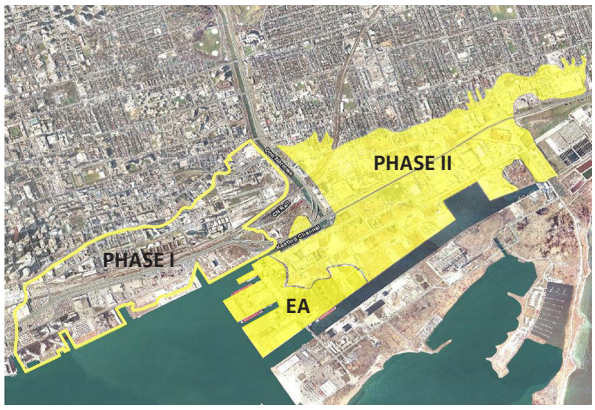


Figure 2 *DMNP EA Flood Plain Map Illustrating the areas that are currently at risk of flooding under the Regulatory Flood Event*

development in each of the West Don Lands and East Bayfront, in addition to other commercial and residential developments in the surrounding area.

The appended PwC report, *Port Lands Flood Protection Preliminary Business Case, September 25, 2014*, stated the following with respect to the investment return on flood protection efforts:

> *Experience suggests that flood protection infrastructure can minimize the adverse effects of floods and can result in significant cost avoidance. Canada's own National Disaster Management Strategy stipulates that ''Benefit-cost ratios for flood prevention measures in Australia, the United States and the United Kingdom are 3:1, 4:1 and 5:1, respectively''. In Canada, the Red River Floodway was opened in 1968 following an investment of $63 million by the Government of Manitoba and the Government of Canada. It provides protection for the 90-year flood risk. Since its construction, the floodway has been operated over 20 times and has prevented $8 billion in flood damages in the province. The recent $665 million expansion of the floodway now provides protection for the 700-year flood an event that could otherwise result in $12 billion in damages. The estimated savings from Red River Floodway expansion represent a return of more than 200% on initial investment.*
>
> *The Project, as proposed, incorporates the lessons learned in other jurisdictions and will mitigate potential flood damage for existing properties in the proposed development area while unlocking the economic potential of the Port Lands. The provision of flood protection in the proposed development area would save hundreds of millions or even billions in flood damage to existing infrastructure and recovery costs in the event of a regulatory flood event. Based on the return realized by the investment in the Red River Floodway and the damage caused by the June 2013 flood in Calgary, the estimated benefit cost ratio for investment in the Project will be approximately 5:1. In other words, a $1 investment in flood prevention infrastructure will mitigate $5 in flood damage. Irrespective of the cost benefit benchmark used to estimate the benefits generated by the Project, the reality is that the investment in flood protection infrastructure will result in savings equal to a multiple of the initial investment.*

The Government of Ontario has put land use and development limitations in place in the Port Lands through the Special Policy Area (SPA) designation to minimize the cost impact of flooding. Notwithstanding the SPA, which would mitigate the cost of potential flood damage, a major flood event would still materially impact existing bridges, roads, utilities and buildings over this vast area. Such a flooding event would cause significant damage in the immediate area, with some effects more broadly felt across the city should regional transportation and utility infrastructure sustain significant flood damage.

Flood protection will allow for the removal of the SPA and allow for prime urban waterfront land to be developed in a highly-sustainable manner, and effectively reintegrate the Port Lands into Toronto's urban fabric. The Project will transform underutilized brownfield land into new resilient and sustainable communities. It will also enhance habitat for natural species and re-establish wetlands in the area, which provide social and environmental benefits and naturally moderate the effects of flooding and erosion.

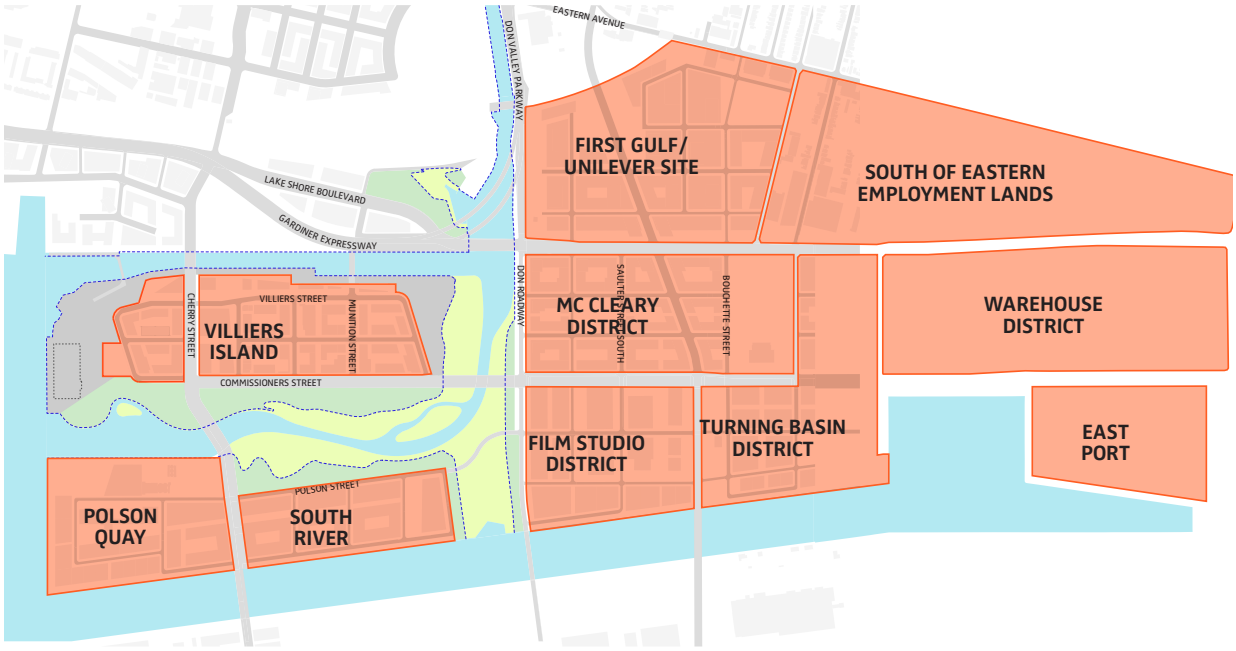


Figure 3 *Land Available for Development*

There is a strong business case for investing in flood protection and other enabling infrastructure in the Port Lands, as it would:

- Protect against the potential loss of human life as a result of a catastrophic flooding at the mouth of the Don River;
- Mitigate the very substantial costs of repairing flood damage;
- Help governments achieve the goal of mitigating the impact of climate change and improving resiliency;
- Support the development of new, highly-livable, climate-positive mixed-use communities close to downtown employment areas;
- Attract a growing number of people to this new community, where they can experience the city's quality of life and its economic opportunities;
- Invite investment in commercial, institutional and other development; and
- Create jobs and drive economic development.

The net, long-term economic impact of the Project, as described in **Section 5.3: Market Demand Analysis**, will be a positive return on investment that will create an attractive new community in Toronto's downtown that will draw both residents and visitors. It will also make a substantial contribution to Toronto's economic competitiveness and add to the health, vitality and sustainability of Toronto's waterfront, to the benefit of the city, the province and the nation.

Figure 4 *Aerial View of Existing Conditions*

An updated and validated independent study completed by urbanMetrics in 2016 estimates that spending on Project design and construction will generate $1.1 billion in value to the Canadian economy, 10,829 person years of employment and $373 million in tax revenues to all orders of government. In addition, urbanMetrics estimates that future construction activity in the Port Lands – specifically, the development areas unlocked by the Project – is ultimately expected to generate 41,100 person years of employment, $4.0 billions in value added to the Canadian economy, and $1.5 billion in labour income and revenue to all orders of government. This study was peer reviewed by PwC as a part of the due diligence program and then updated by urbanMetrics based on peer review input.

These numbers do not include the additional long-term economic impact of developing the First Gulf/ Unilever site. Nor do they include the financial impact generated by net new economic activities driven by commercial and residential tenants in those areas.

Figure 5 *Aerial View of Proposed Full Vision for the Port Lands and Surrounding Areas*

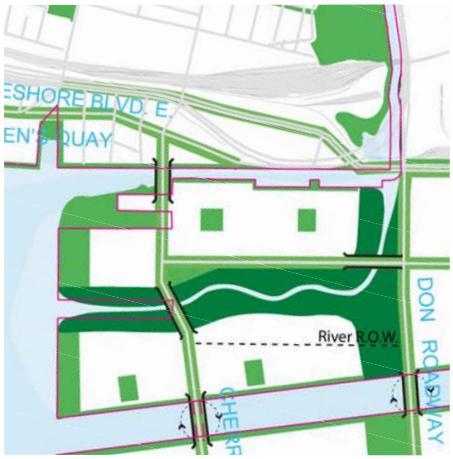
2.2 Project History

A workable proposal to flood protect, plan and develop the Port Lands and surrounding area has been a major focus for Waterfront Toronto since it was created. In addition to flood protecting the Port Lands, planning for the area needed to address a number of requirements and significant technical challenges such as municipal servicing infrastructure, urban design and a lack of suitable and modern transportation infrastructure. To do this, a comprehensive process was required to produce a master vision to bring these components together into a larger concept. In 2006, the then Ontario Ministry of Environment (now Ministry of the Environment and Climate Change (MOECC)) approved the Environmental Assessment Terms of Reference for the Don Mouth Naturalization and Flood Protection Project EA (DMNP EA). The Terms of Reference set the parameters for the work that has been underway since, including the design that forms the basis of the Project.

2003 - Central Waterfront Secondary Plan

2007 - Design Competition MVVA Winning Submission

2010 - DMNP EA / Framework Plan



May 2012 - PLAI Realigned

August 2012 - PLAI Recommended Realigned

October 2015 - Refined Design - Due Diligence

Figure 6 *Evolution of Plan Development*

In February of 2007, Waterfront Toronto launched an International Design Competition, seeking a master vision that recognized the need for an integrated solution to naturalization, flood protection, infrastructure and the land use potential of the area. The competition's stated goal was to obtain a bold and comprehensive concept design and a unifying vision to guide revitalization of the Port Lands and surrounding area, merge the natural and urban fabric, and establish an iconic identity for the Don River that accommodates habitat restoration and crucial flood protection. In May 2007, the submission from Michael Van Valkenburgh Associates Inc. (MVVA) ''Port Lands Estuary'' was announced as the winning design. The jury felt the MVVA design of big bold moves impressively integrated the natural and wild elements of the river mouth and the Port Lands with urban placemaking, creating a spectacular and compelling vision for the area. The submission also best addressed the competition's two key objectives of providing a naturalized mouth and iconic identity for the Don River, and creating a comprehensive plan for addressing urban design, transportation, naturalization, sustainability and other ecological issues. As well, it was the most cost-effective solution and also maximized developable land.

In April 2008, Waterfront Toronto, the City of Toronto and the Toronto Transit Commission, as tri-proponents, began a study to integrate the Municipal Class Environmental Assessment (Class EA) process with the precinct planning process. The result was a Master Plan for transportation, water/wastewater and storm water management. This integrated planning process allowed for work on the design of the site as a whole, and the integration of the Project's numerous concurrent Environmental Assessments. This included the Lower Don Lands Master Plan Class EA (LDL MP EA), which proposes transportation and servicing infrastructure necessary to support revitalization and development, and the DMNP EA, which proposes the route for the new river, other flood protection, naturalization and city-building requirements, along with the design of the Precinct Plan for the Keating Channel and Villiers Island neighbourhoods.

On September 21, 2011, Toronto City Council unanimously adopted a protocol, later to be called the Port Lands Acceleration Initiative (PLAI), to review the city's priorities for the Port Lands. The goal of the PLAI was to refine the DMNP EA and develop a business and implementation plan with the objective of accelerating revitalization in the Port Lands and maximizing its value to the City.

A refinement of PLAI, PLAI 2, was initiated in 2012 and is now almost complete. It includes the development of the Port Lands Framework Plan, Villiers Island Precinct Plan and the Port Lands and South of Eastern Transportation and Servicing Master Plan Environmental Assessment. The findings from these three studies were presented at a public meeting and consultation in November 2015. Final reports are anticipated for early 2017.

The DMNP EA was approved in early 2015 and the LDL MP EA came into effect concurrently. Extensive planning and design work has been done, and the Project is ready to proceed once funding is received.

Once completed, the Project will achieve several critical priorities for all orders of government:

- Protect against the potential loss of human life as a result of a catastrophic flooding at the mouth of the Don River;
- Reduce the financial risk to governments relating to the potential loss of property and rebuilding due to flood damage, as investment in flood protection infrastructure will result in savings equal to a multiple of the initial investment;

- Mitigate the risk of flooding in a key part of Toronto through building strategic infrastructure;
- Manage existing soil, groundwater and water contaminants from historical industrial uses and fill placement;
- Contribute to a healthier Lake Ontario by providing important ecological systems through the creation of new terrestrial and aquatic habitat connections. The naturalized connection of the mouth of the Don River to Lake Ontario is recognized as a key project that will contribute to the delisting of Toronto as an ''Area of Concern'' by Environment Canada and therefore contribute to the Remedial Action Plan objectives for water quality and habitat in Lake Ontario;
- Contribute to a stronger local, regional and national economy by creating jobs and economic value through the investment in construction, residential and commercial development and other employment-generating uses;
- Enable development of a strategic area in downtown Toronto to create strong and sustainable communities that will serve the city's growing population and economy;
- Deliver long-term tax revenues that flow to all orders of government;
- Revitalize Toronto's waterfront by extending the continuity of high-quality public space throughout the waterfront for the enjoyment of residents and visitors; and
- Maintain Toronto's working port.

Also of importance, this Project will deliver benefits to the surrounding area through flood protecting nearby commercial and residential areas and helping to unlock the development value of the First Gulf/Unilever site, where a planned large-scale commercial development (12 million square feet, accommodating 50,000 jobs – according to First Gulf) is effectively blocked due to flood risk.

The Project creates resilient, attractive urban infrastructure that mitigates the flooding risk to governments, and unlocks a vast area for revitalization and development that creates billions of dollars of economic development opportunities. The Project has already undergone extensive stakeholder engagement and public consultation over the past decade, enjoys broad public support and has secured key environmental assessment approvals from the MOECC.

3. Due Diligence Overview

The creation of a new river valley, carved from post-industrial lands, is a unique undertaking with no local, regional or national precedents. While the original $975 million cost estimate was reasonable based on the information available at the time, the ability to generate an accurate capital cost estimate was restricted in a number of ways, including:

- Limited engineering studies had been completed;
- A site-specific environmental approval process had not been determined;
- Very limited site-specific characterization data was available, such as environmental and geotechnical soil properties specific to planned designs;
- Detailed construction logistics had not yet been determined, particularly with respect to excavation and soil management operations;
- Specific design concepts for erosion protection and the required extent of such protection had not yet been established; and
- Project scheduling and implementation planning had not yet been examined in any depth.

3.1 Due Diligence Program Goals

A robust due diligence program was established with the following goals in mind:

- Reducing cost and schedule uncertainty, particularly the uncertainty arising from environmental and geotechnical factors, to allow for more informed and accurate cost estimating;
- Making and documenting reasonable assumptions regarding site characteristics, design parameters, construction methods, regulatory approval requirements, and implementation strategies and scheduling;

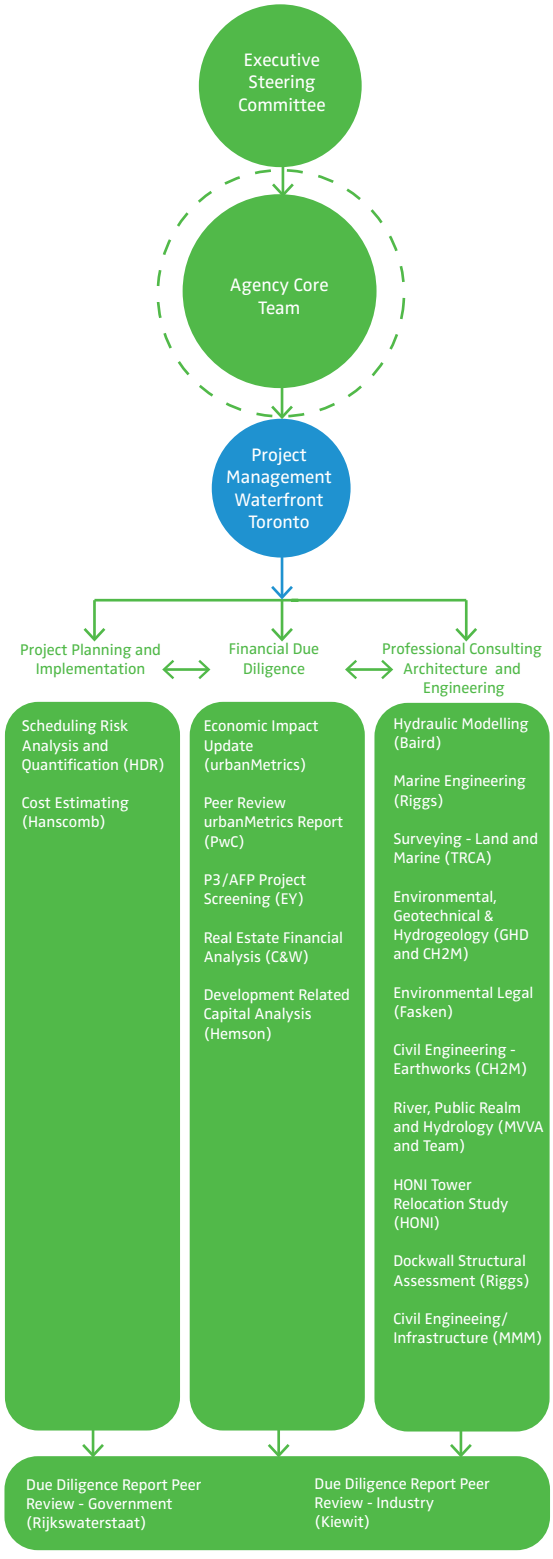


Figure 7 *Team Organization Chart and Integration*

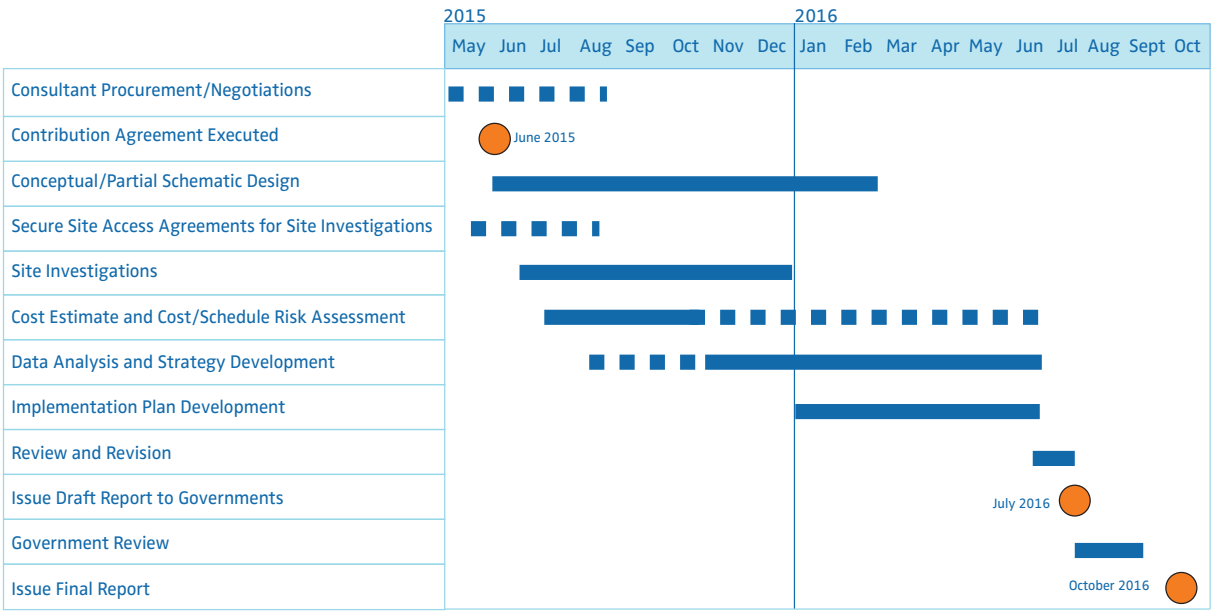


Figure 8 *Due Diligence Schedule Overview*

- Thoroughly understanding and quantifying the risks and uncertainties (as well as opportunities) inherent in this early stage of the Project, in order to support risk analysis, and confirm the Project scope and budget to government partners; and
- Determining the best project delivery strategy.

3.2 Project Team Organization and Approach

The structure of the team for the Project's due diligence program is depicted in **Figure 7.** Executive level leadership for the program was provided by an Executive Steering Committee, comprising senior executives from Waterfront Toronto, TRCA and the City of Toronto; the three co-proponents of the DMNP EA. Coordination across organizational boundaries was accomplished through a core team, which included representatives from the Toronto Port Lands Company (TPLC) in addition to Waterfront Toronto, TRCA, and the City. As the project manager, Waterfront Toronto was charged with engaging expert consultants, coordinating consultant and partner workflow and inputs, and delivering the due diligence report in 2016.

Waterfront Toronto began retaining the required consultants in June 2015, with each consultant completing a specialized scope of work that was coordinated within a broader, integrated team. Integration of work-in-progress was ensured through weekly meetings, coordinated cross communication between team members on a daily basis, and strict reporting requirements and timelines. This approach allowed for complete transparency in workflow. It also allowed all consultants and partners to actively monitor the work and progress of their peers, facilitating rapid response and alignment to planning, process, engineering, cost and risk issues, as they arose.

Figure 8 provides a high-level overview of the due diligence program schedule and the key milestones.

Site investigations were undertaken across the Project site in order to fill gaps in available soil and groundwater data. Building on fresh data, a comprehensive grading plan was prepared for the overall site and conceptual design developed for the flood protection features, new land to be created through lakefilling, and enabling municipal infrastructure. Potential approaches and

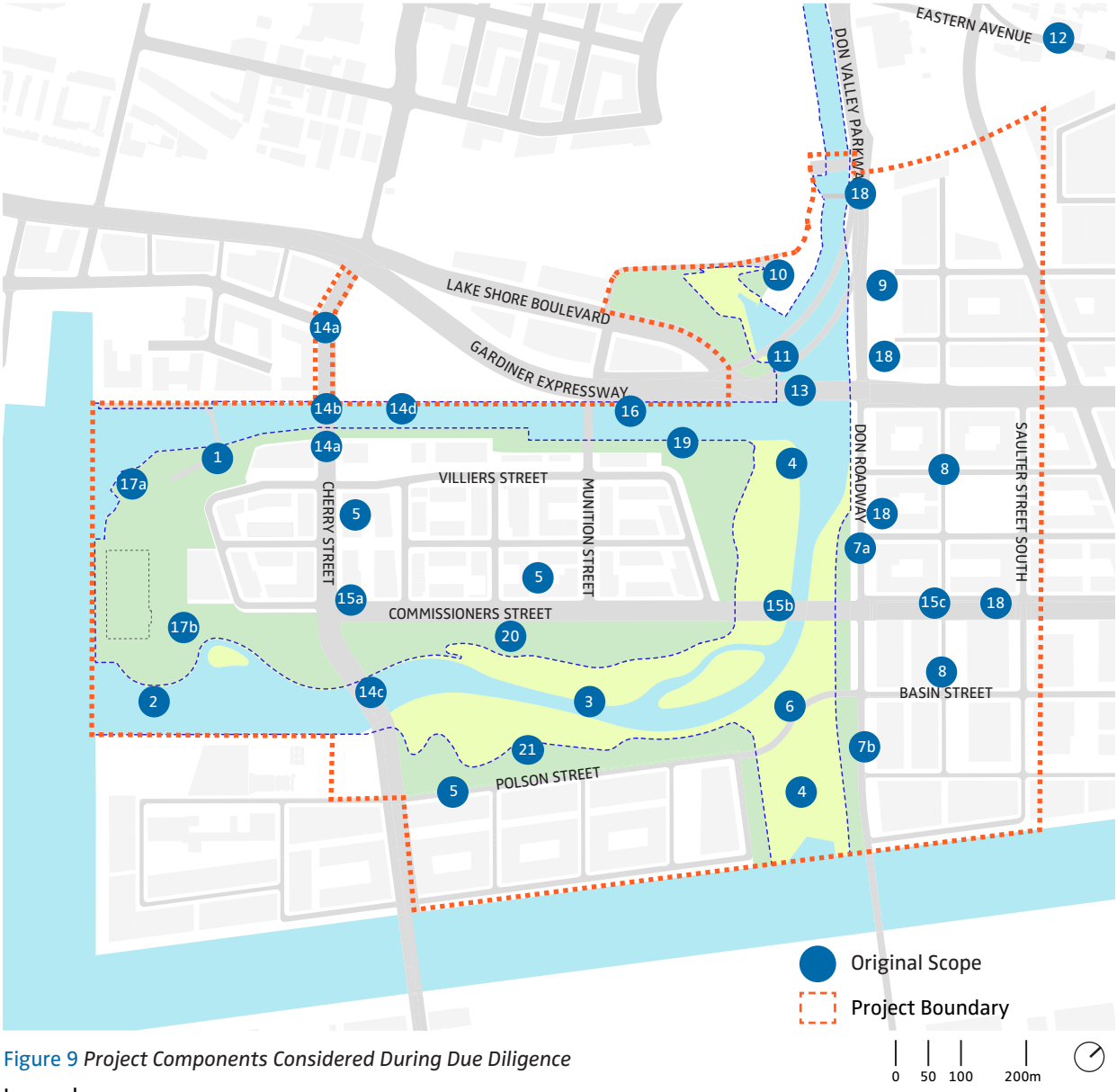


Figure 9 *Project Components Considered During Due Diligence*

Legend

- 1 Essroc Quay Lakefilling
- 2 Polson Slip Naturalization
- 3 River Valley System
- 4 Don Greenway (Spillway & Wetland)
- 5 Site Wide Muncipal Infrastructure
- 6 Basin Street Bridge
- 7a Don Roadway North
- 7b Don Roadway South
- 8 Don Roadway Valley Wall Feature
- 9 First Gulf/Unilever Site Flood Protection Land Form
- 10 Sediment and Debris Management Area
- 11 Flow Control Weirs
- 12 Eastern Ave. Flood Protection
- 13 Lake Shore Road & Rail Bridge Modifications
- 14a Cherry Street Re-alignment
- 14b Cherry Street Bridge North
- 14c Cherry Street Bridge South
- 14d Old Cherry Street Bridge Demolition
- 15a Commissioners Street West to New Cherry Street
- 15b Commissioners Street Bridge
- 15c Commissioners Street East to Saulter Street
- 16 Keating Channel Modifications
- 17a Promontory Park North
- 17b Promontory Park South
- 18 Hydro One Integration
- 19 Villiers Island Grading
- 20 River Park North
- 21 River Park South

sequencing options for completing the required earthworks were worked out in parallel, allowing for the production of cost estimates and a Project implementation schedule.

A risk workshop provided an opportunity for the Project Team to collectively review the cost estimates to pinpoint key issues and uncertainties, further refine the design, approval, and implementation schedule, and identify risks and opportunities. This information, together with the Project Team's consensus view of the potential risk and opportunity impacts, provided the necessary input to build an integrated cost and schedule risk model of the Project and to conduct a probabilistic risk simulation in order to better understand the range of possible cost and schedule outcomes for such a large and complex undertaking. The estimate and risk assessment results were reviewed in detail by the Project Team and recommendations were developed to adjust the Project scope to respond to the updated cost projections.

A second risk workshop was held to refine the outputs from the initial workshop and to identify proactive responses to key Project risk factors, which could reduce risk and uncertainty.

3.3 Project Scope

The Project scope is multi-faceted and complex, comprising multiple components as generally depicted in **Figure 9.**

While the Project builds upon the work begun in the DMNP and LDL MP EAs, and is being coordinated with other parallel planning initiatives – such as the Villiers Island Precinct Plan, Port Lands Planning Framework, and the Port Lands and South of Eastern Transportation and Servicing Master Plan Environmental Assessment – the Project's primary focus is delivering flood protection infrastructure integrated with improved natural habitat and public open spaces in order to enable development. The Project also includes new and modified municipal and marine infrastructure that is necessary to maintain transportation and servicing networks and enable construction of the flood protection components. The Project is not intended to deliver all of the infrastructure described in the LDL MP EA and/or required to support the development of Villiers Island, although it will effectively deliver nearly all of the needed major municipal infrastructure. The remaining infrastructure, described in the approved LDL MP EA and the Villiers Island Precinct Plan, can be categorized as "development driven". That is, it can be constructed independently of the flood protection and enabling infrastructure, in co-ordination with development. That additional infrastructure has been excluded from the Project scope.

3.4 Due Diligence Program Scope and Deliverables

In addition to Waterfront Toronto, the City of Toronto, TRCA and TPLC, the Project Team comprises a team of consultants with a depth of experience in conducting the required due diligence and Project planning. The following is a brief description of each scope of responsibility. A more detailed scope of work and deliverables can be found in the appended reports submitted by each consultant.

Role and Responsible Team Member(s)	Deliverables
Project Management **Waterfront Toronto, City of Toronto, TRCA, TPLC**	• Manage Project Team • Procurement strategy development • Due Diligence Report
Site Characterization, Data Validation, and Feasibility Assessment	
Environmental, Geotechnical and Hydrogeological Site Investigation: **GHD Limited (GHD)**	Stage 1 field sampling program, focused on accessible excavation and fill areas, including: • 127 boreholes drilled to depths ranging from 3.05 to 24.8 metres below ground surface • 72 boreholes instrumented with groundwater monitoring wells • Field screening of soil and groundwater samples • Collect groundwater levels from the monitoring wells • Analyze select soil and groundwater samples for chemical content • Test soil and bedrock samples to determine geotechnical properties Stage 2 field sampling program, focused on portions of the site inaccessible during the 2015 Pan/Parapan Am Games, including: • 52 additional boreholes drilled • 26 additional groundwater monitoring wells established • Monitoring well testing, sample collection and laboratory testing similar to Stage 1 work program Report on Stage 1 and 2 investigation findings, including: • Subsurface soil conditions • Bedrock elevation contours • Site hydrogeology • Laboratory test results for soil and groundwater environmental quality and soil geotechnical properties
Land and Marine Survey Data Compilation and Validation: **City of Toronto** and **Toronto Region Conservation Authority (TRCA)**	• Confirmatory bathymetric surveys in Don Narrows • Topographic surveys at underpasses in the Lower Don, as required to eliminate data gaps • Acoustic Doppler Current Profiler (ADCP) stream discharge measurements for two storm events • Bathymetric surveys for Essroc Quay, Polson Quay, and Ship Channel areas • Supplementary topographic surveys for various areas east of the Don River, including the Eastern Avenue underpass and Don Roadway (north of Lake Shore Blvd.) areas • Geo-referencing of existing topographic survey of First Gulf (21 Don Roadway) site
Dockwall Structural Assessment: **Riggs Engineering (Riggs)** (through TPLC)	• Visually assess structural condition of existing dockwalls from both the topside and the waterside • Document changes in condition compared with previous studies • Conceptual level cost estimates for rock revetments (dockwall supports), dockwall demolition, and dockwall repairs, prepared as input to consolidated cost estimates

Role and Responsible Team Member(s)	Deliverables
Preliminary (Concept) Design and Strategy Development	
Design Lead and Landscape Architect: **Michael Van Valkenburgh and Associates (MVVA)** Hydrology/Geomorphology Sub-consultant: **LimnoTech** Ecology Sub-consultant: **Inter-Fluve**	• Site grading plan • Conceptual geomorphology and slope armouring design • Conceptual wetland design • Flow control weir design parameters • Conceptual design of other flood protection features • Conceptual design of park program areas • Integration of sub-consultant design
Municipal Engineering: **WSP/MMM Group (MVVA Sub-consultant)**	• Preliminary bridge design parameters • Conceptual design of municipal services to suit Recommended Scope • Confirm road cross sections • Refine designs to accommodate construction phasing and interim (pre-development) requirements
Geotechnical and Environmental Engineering: **Golder Associates Ltd (Golder)** (MVVA Sub-consultant)	• Assess environmental conditions and implications for design of roads, municipal services, parks and public realm
Earthwork Engineering, and Environmental, Geotechnical and Hydrogeological Strategy Development **CH2M**	• Review and analyze available historical investigation data and data collected as part of GHD Stage 1 and 2 field sampling and laboratory testing program • Digital Elevation Model (DEM) and preliminary cut/fill balance • Preliminary constructability assessment and design optimization (in collaboration with MVVA and other Project Team members) to resolve constructability issues related to ground conditions • Suite of Reports, including: - Conceptual Site Model - Screening Level Risk Assessment - Regulatory Approach - Geotechnical Conditions - Remediation and Treatment Options - Soil Management Plan - Groundwater Management Plan - Earthworks Methodology - Cost Opinion of Environmental Work • Community Based Risk Assessment (CBRA) Terms of Reference
Environmental Legal Services **Fasken Martineau Dumoulin LLP (Fasken)**	• Legal opinion regarding proposed environmental approvals and instruments
Flood Modelling (for Regulatory Purposes) **W.F. Baird & Associates Coastal Engineers Ltd. (Baird)**	• Refine hydrodynamic model previously developed in support of DMNP EA • Support TRCA in application of hydrodynamic model to test design refinements and construction sequencing options

Role and Responsible Team Member(s)	Deliverables
Marine Engineering (Lakefill) Design (through TRCA): **Riggs Engineering** with Geotechnical Sub-consultant Peto McCallum and Natural Heritage Sub-consultant Natural Resource Solutions Inc.	• Review existing conditions and identify design considerations and constraints • Confirm foundation conditions for perimeter containment structures • Engineering concepts and construction methodology options for perimeter containment structures, shoreline protection works, and land creation process for the proposed lakefill surrounding Essroc Quay • Concept design for naturalized shoreline area and aquatic habitat • Conceptual level cost estimates for proposed confinement structures, based on purchasing rock materials at market value • Designed filling operations for containment structures, in collaboration with CH2M • Review proposed habitat enhancement features and extent of proposed habitat creation with Aquatic Habitat Toronto (AHT)
Financial Due Diligence	
Real Estate Financial Analysis **Cushman + Wakefield (C+W)**	• Update market demand forecast and land sale revenue projections over the 2023-2042 time horizon in the Port Lands • Complete summary report
Development Charges Analysis **Hemson Consulting Ltd. (Hemson)**	• Development Charge (DC) Revenue Analysis, including forecast of potential revenue projections over the 2016-2045 time horizon
Peer Review of Economic Impact Analysis (urbanMetrics Report) **Pricewaterhouse Coopers LLP (PwC)**	• Peer review report assessing conclusions of urbanMetrics report (previously commissioned by WT)
Economic Benefits Analysis update **urbanMetrics**	• Update analysis of the economic benefits associated with the Waterfront Toronto 2.0 investment program specifically relating to the Project • Update report based on PwC recommendations.

Role and Responsible Team Member(s)	Deliverables
Project Execution Planning	
Cost Estimating Consultant **Hanscomb Ltd. (Hanscomb)**	• Recommendations and rationale for construction cost escalation factors • Preliminary cost estimates for Original Scope Project components • Preliminary cost estimates for proposed additional Project components • Consolidated cost estimate for Recommended Project Scope
Scheduling, Risk Analysis, and Quantification **HDR Inc. (HDR)**	• Baseline project schedule • Baseline cash flow projection • Facilitate risk workshops and produce risk register • Elicitation and documentation of treatment strategies for identified risks • Probabilistic risk simulation model • S-curves depicting target budgets and timelines for various risk thresholds
Public Private Partnership (P3)/Alternative Finance and Procurement (AFP) Screening **Ernst & Young Orenda Corporate Finance Inc. (EY)**	• Compile market sounding participant list and draft questions to be explored during market sounding • P3/AFP suitability screen matrix • Preliminary identification of procurement alternatives • Complete P3/AFP suitability screen • Complete market sounding of potential constructors, developers, lenders, and equity providers accessing interest in P3 procurement approach and obtaining feedback on opportunities/contraints • Undertake qualitative assessment of procurement alternatives • Undertake commercially-focused risk assessment workshop to allocate project risks and value retained vs. transferred risks • Financial model and Value for Money (VFM) analysis • Final report
Due Diligence Peer Review	
Due Diligence Peer Review - Government **Rijkswaterstaat Ministry of Infrastructure and the Environment, Government of the Netherlands**	• Review due diligence report and interact with Project Team as needed in order to evaluate the approach, methodology, costing/scheduling, procurement, and implementation • Make further recommendations as warranted
Due Diligence Peer Review - Industry **Peter Kiewit Infrastructure Co.**	• Review due diligence report and interact with Project Team as needed in order to evaluate the project approach, methodology, costing/scheduling, procurement, and implementation. • Make further recommendations as warranted
Agency Advisors	
AFP Procurement Delivery Subject Matter Expert: **Infrastructure Ontario (IO)**	• General review and advice regarding: - Market sounding process and participants - P3/AFP suitability screen matrix - P3/AFP process - Risk transfer considerations and P3 procurement opportunities • Provide input to risk workshop and qualitative and quantitative (VFM) assessment of procurement alternatives
Hydro Transmission Line Relocation Feasibility Study: **Hydro One Networks Inc. (HONI)**	• Complete a feasibility study of transmission line and utility bridge relocation options • Generate and evaluate options; develop cost estimates and finalize report

4. Technical Due Diligence Results

Over the past year, the Project Team has defined a Recommended Scope, key Project components and how the Project can effectively be implemented. Additional characterization of sub-surface site conditions and hydraulic validation has provided essential information to support design refinement, the development of approval and implementation strategies, and cost estimate validation.

The due diligence work has produced:

- A strong understanding of the environmental and geotechnical site conditions;
- A workable environmental approvals process, developed in collaboration with regulatory authorities;
- A logical plan for completing the major earthwork and land creation at the heart of the Project;
- A summary of the Project's scope and conceptual design;
- Results of integrated cost, schedule, and risk assessment; and
- A Recommended Scope, cost estimate, and target time frame for completion.

The following is a summary of the work completed to date. For the benefit of readers seeking additional detail on a particular aspect of the work, cross-references to appended supporting documentation prepared by the Project Team are also provided.

4.1 Subsurface Site Conditions

The Port Lands is the result of decades of infilling what was once one of the largest wetlands on Lake Ontario. Beginning in the early 1900s, the area was gradually infilled to make more land available to serve the city's growing industrial and shipping sectors. The current and historical uses include: storage facilities for coal and oil, an electrical generating station, cement storage and production, a residential waste transfer station (previously operated as an incinerator), film studios and media arts, port facilities, bulk salt storage, and a variety of municipal yards and facilities.

Native soils in the area generally consist of layers of poorly graded sand and silt, and extensive areas of peat, organic clays and other compressible soils. Soil properties, determined through analyzing data from 288 previously-drilled and 179 newly drilled boreholes, 98 monitoring wells and several excavated test pits across the Project site, identified one to five metres of debris, ash, coal, concrete, wood, brick and other waste materials intermixed with imported soil (much of it dredged sediments) covering the native soil. These properties increase the amount of unsuitable soil that may need to be removed and constrain design because of the need to prevent unacceptable soil settlement under the weight of additional fill or new construction. Bedrock is present at depths of typically ten 10 metres to 20 metres below the present ground surface, with some limited areas up to 40 metres below the present ground surface.

Laboratory analyses of soils sampled from across the site indicate the presence of a variety of chemical contaminants, all of which are common to the previous industrial uses. Petroleum hydrocarbons (PHCs), such as oil, gas, and solvents, were found to be the main contaminant present across the area at very high concentrations in some places. Groundwater was also found to be impacted by the same contaminants. In several areas, free-phase petroleum was found in the groundwater table.

The appended GHD report, *Port Lands Environmental, Geotechnical, and Hydrogeological Investigation,* summarizes soil and groundwater physical and environmental properties determined through drilling 179 boreholes and installing 98

monitoring wells, excavating test pits, collecting soil and groundwater samples, and performing field testing and laboratory analysis on selected samples.

4.2 Environmental Management Approach

There is no current environmental regulatory approval process in Ontario for a project of this nature. Therefore, the Project Team has collaborated with the Ministry of Environment and Climate Change (MOECC) and other regulatory agencies to develop a feasible and mutually acceptable approach for the regulatory approval of this unique and complex Project. The Project Team anticipates that the environmental protection and management of the Project site will be achieved using a combination of regulatory tools, including:

- Community-Based Risk Assessment (CBRA) process carried out in consultation with MOECC and Aquatic Habitat Toronto, which includes federal, provincial and municipal agencies; and
- Site-specific risk assessment (RA) processes that may be conducted under Ontario Regulation (O. Reg.) 153/04 prior to beginning site-specific development projects that require land use changes to more sensitive uses.

Although the area comprises a number of individual properties, from an environmental perspective, the Project will be dealt with as a single entity. This means when remediation is undertaken, soils can be moved, treated and placed across the entire Project site rather than contained to individual properties.

The appended CH2M *Report C: Regulatory Approach (Definition of RSC Areas)* further details the recommended approach to securing environmental approvals, which is the subject of on-going discussions with MOECC and other regulatory authorities. Further details are provided in **Section 7.3: Permitting and Approvals.**

A CBRA process will be completed to evaluate risks, establish site specific soil and groundwater standards, and design soil and groundwater management plans to reduce contaminant levels. Through this process, risk management measures (RMMs) will also be developed to protect people and the environment from potential exposures to any remaining contaminants.

The CBRA will support the creation of land (i.e., through lakefilling around Essroc Quay) and a water lot (i.e., the river and floodplain), as these are not activities subject to the O. Reg. 153/04 Record of Site Condition (RSC) process. The O. Reg. 153/04 requires that an RSC – a document summarizing the environmental condition of a property – be filed before changing its use to a more sensitive land use (e.g., conversion from commercial or industrial to residential or parkland use). This process will be followed for development lands. Filing an RSC, where permitted by regulation, addresses future liability for new owners. As there is no regulatory framework for constructing a river valley under the brownfield regulation, liability issues are addressed through the CBRA and implementation of the Project, which improves the environmental condition of the area.

The CBRA will be the main mechanism for defining the environmental remediation objectives and risk management measures to be incorporated into the design and specifications for construction of the new river mouth, flood protection landforms, municipal infrastructure and all the other components of the Project. This will ensure the protection of people and the environment from any remaining contaminants in soil or groundwater.

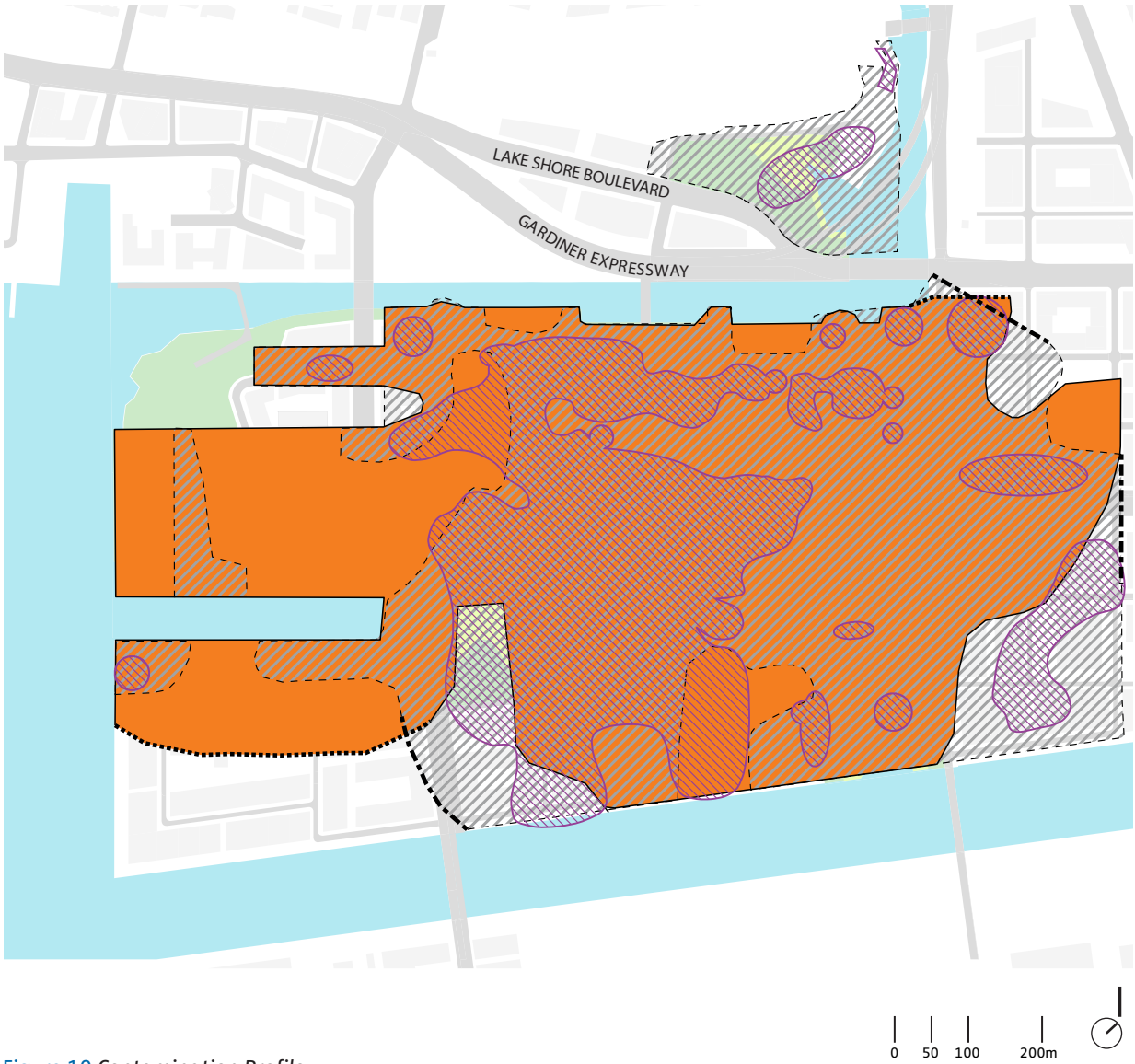


Figure 10 *Contamination Profile*

Legend

- Zone affected by Surface Contamination
- Zone affected by Sub-surface Contamination
- Zone affected by Significant Contamination
- Surface Contamination Extent
- Sub-surface Contamination Extent
- Surface Contamination Extent Unknown
- Sub-surface Contamination Extent Unknown

Although the proposed risk management measures have not yet been fully defined, it is anticipated that they will fall into the following general categories:

- Building physical barriers, which are intended to limit the potential for future contact between existing soils that do not meet current site condition standards and humans (e.g., park users or maintenance workers) or ecological receptors (e.g., plants or wildlife);
- Building physical barriers to limit the potential for migration of impacted groundwater or separate liquid contaminants into the river channel; and
- Building barriers to limit the potential for migration of contaminant vapours (particularly associated with petroleum hydrocarbon or solvent impacts) into commercial or residential buildings or other enclosed occupied spaces (e.g., enclosed park pavilions, maintenance facilities or similar structures).

The appended CH2M *Report B: Screening Level Risk Assessment* outlines the preliminary process applied as part of the due diligence to examine the potential for elevated risks and understand the need for risk management measures, remediation of contaminated soils and groundwater, or a combination, across the Project site.

4.3 Earthwork

A defining aspect of the Project is the extensive earthwork (excavation, soil handing and fill placement) required to:

- Create the naturalized river valley and Don Greenway (forms part of **Scope Items** 2, 3 and 4);
- Reclaim land around Essroc Quay by means of lakefilling (**Scope Item** 1);
- Create a sediment management area north of the Keating Channel (**Scope Item** 10); and
- Implement grade changes for flood protection.

To support an accurate calculation of excavation (cut) and fill volumes for cost estimating purposes, CH2M generated a three dimensional Digital Elevation Model (DEM) with a series of layers that represent individual elements of the Project and physical site settings (e.g., existing ground, final excavation surface and bedrock surface). The DEM projected the following requirements in order to achieve final grades: approximately 1.5 million cubic metres of soil excavation, approximately 1.1 million cubic metres of earth fill, and approximately 0.45 million cubic metres of gravel, rock and other specialized materials. The appended CH2M *Report F: Soil Management Plan* details the assumptions, guiding principles and process used to perform preliminary soil/fill balance analysis and matching.

The depth of the required excavation along much of the river valley is expected to be approximately six metres, increasing to approximately ten metres near the downstream portion. These depths include approximately two metres of excavation beyond the planned final river and floodplain grade elevations (shown in the set of plans (the "MVVA Plans") accompanying the MVVA Report), in order to remove potentially contaminated and otherwise unsuitable soil. Opportunities to

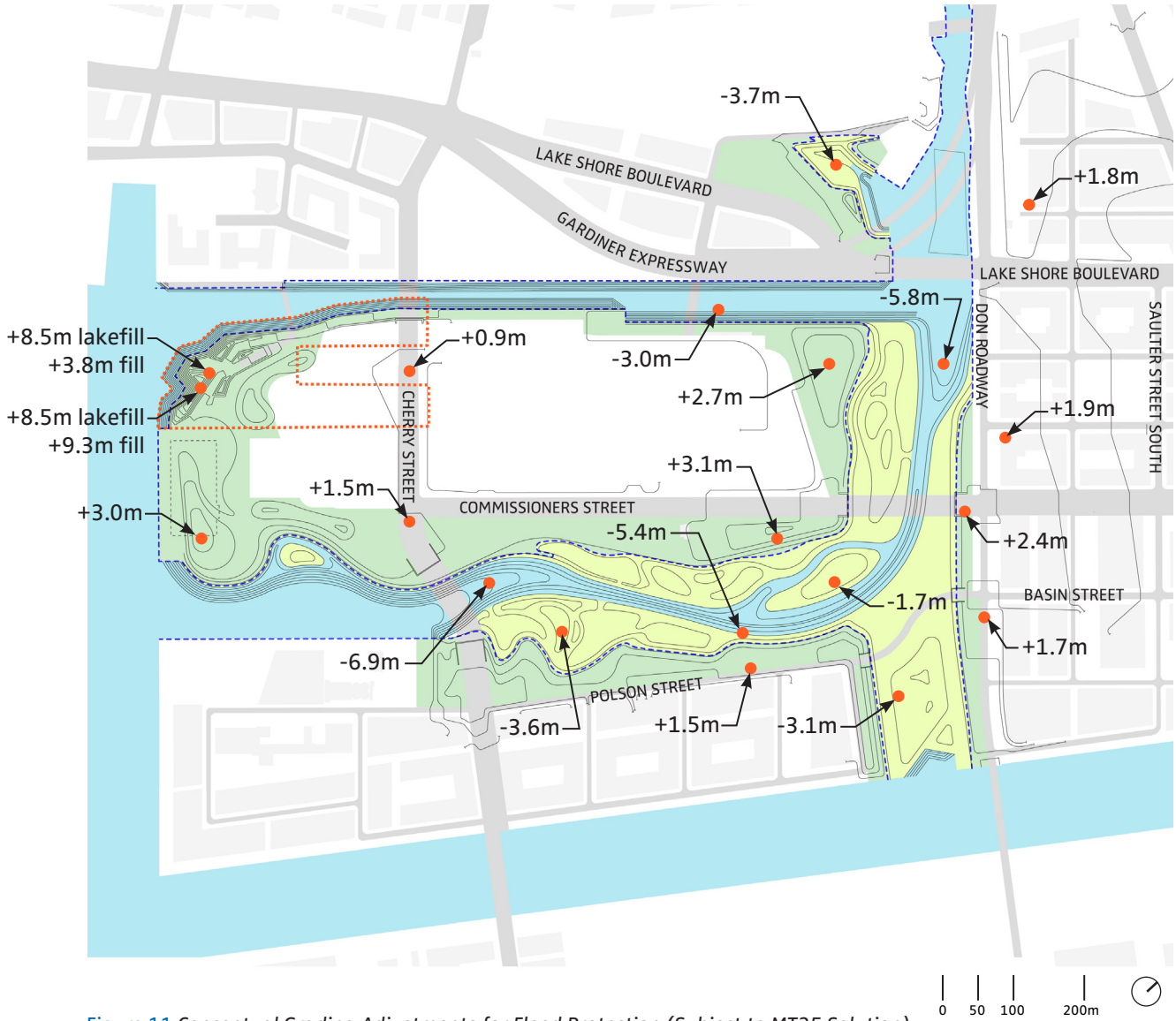


Figure 11 *Conceptual Grading Adjustments for Flood Protection (Subject to MT35 Solution)*

Legend

- Spot Elevation
- ±m Grade Difference
- Proposed 1m Contour Line
- Regulatory Flood Line
- Zone of Lakefill

reduce clean soil coverage depths within the river valley, while still meeting environmental and geotechnical requirements, will be explored in the future approval and design phases. This extra excavation depth will also provide sufficient space to build the grade control structures (forming part of the armouring described below), wetlands, and other river valley features. Much of the material excavated from the river valley will be loose or flowing native sands and, as a result, sheet

piling and additional excavation will be required to compensate for predictable erosion that is experienced with this type of soil. These areas will need to be replaced with structural/granular fill in order to create stable river banks. Sheet piling will be installed behind the location of structural/ granular fill before excavation in order to minimize the excavation in the loose material and to perform as a second erosion/ failure barrier system during flood events.

The appended CH2M *Report H: Earthworks Methodology* describes a practical approach to carrying out the required major earthworks, including work sequencing and construction methodologies. Dry material will be excavated using conventional excavating equipment and wet material (below the water table) may be most efficiently excavated using dredging techniques.

The following overall conceptual approach to treating excavated soils, illustrated in CH2M *Report E: Remediation and Treatment Options,* has been used for developing cost estimates. That report also provides a preliminary evaluation of potential soil treatment technologies.

Excavated soils will be dewatered and then sorted into different streams for treatment and future reuse. Mobile soil processing systems will be established at multiple locations near excavation areas. Soil will be screened, dry soils will be washed and wet soils dewatered, after which they will be immediately categorized for treatment or direct reuse. Soil that does not meet site-specific quality standards will be hauled to and treated at a central soil processing and stockpiling facility to reduce contaminants to protective levels before it can be reused. Approximately 80 per cent of the soil from the river valley is expected to be reusable, however, some unsuitable soil will be exported and there will be a need to import a minimal amount of soil to meet fill requirements in a timely manner. Excess fill will be stockpiled and used as needed.

It is estimated that about 0.4 million cubic meters of excess soil will be available for use at the end of the Project; this material will be placed on development sites on Villiers Island and vacant areas in the South River precinct.

4.4 Earthwork Staging

As illustrated in **Figures 12, 13, 14** and **15,** a four stage earthwork plan is proposed. As part of this implementation plan, the Project Team considered various timing options for opening the new river channel. This plan keeps the newly cut river bed isolated/ disconnected from both the lake and from the Keating Channel until the final phase of related construction activity. This is considered the most balanced approach to dealing with environmental constraints related to managing contaminated soil and groundwater in the excavated river valley area, while also allowing plantings and the natural habitat to establish.

The schedule for the remaining Project components – such as roads, bridges, municipal services, parks and open spaces, and the First Gulf/Unilever site – is affected by the earthwork sequencing. The necessary assumptions have been taken into account to enable such a coordination once the Project progresses to implementation. We specifically examined the construction sequencing and methodology needed to address business operations and heritage buildings currently in place in the Villiers Island Precinct and on Polson Quay. Implications of the proposed construction sequencing will have a limited impact on the interim flood risk as noted in **Section 4.6: Hydraulic Validation.**

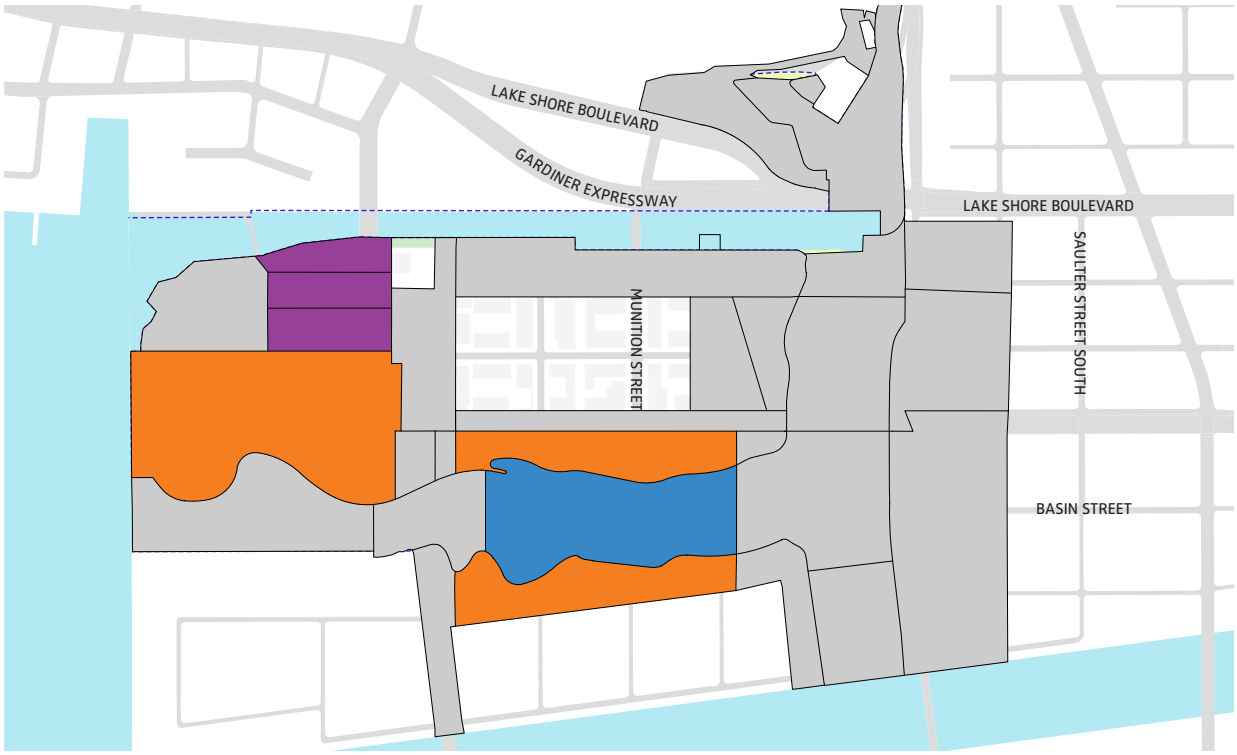


Figure 12 *Earthworks: Stage I*

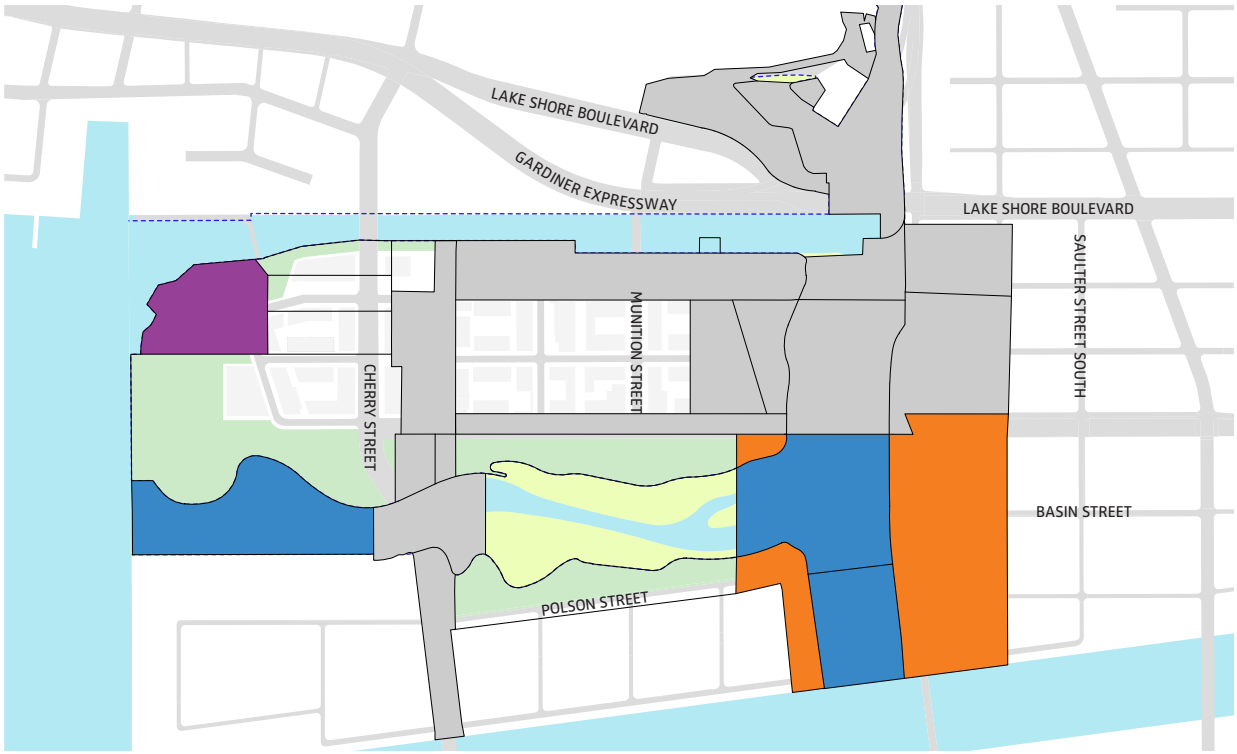


Figure 13 *Earthworks: Stage II*

Legend

Area to Cut

Area to Fill

RA/RM Cut Area to Fill

Area to be Constructed

0 50 100 200m

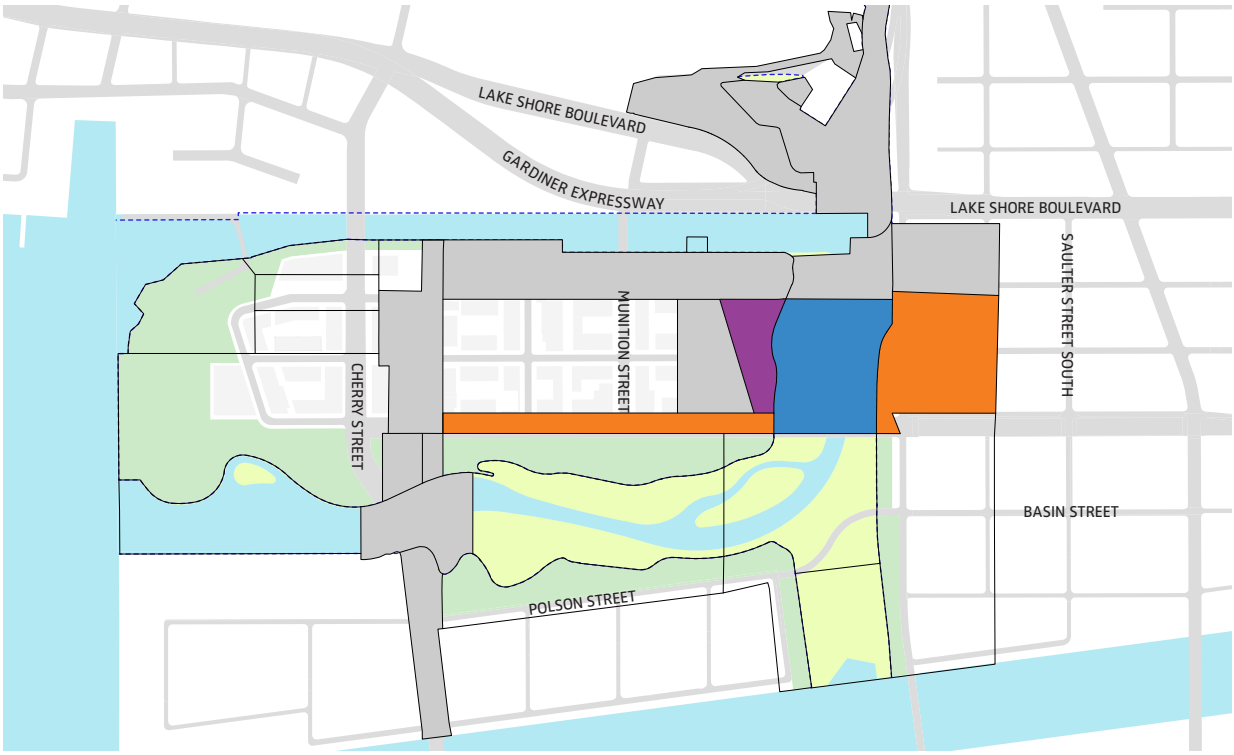


Figure 14 *Earthworks: Stage III*

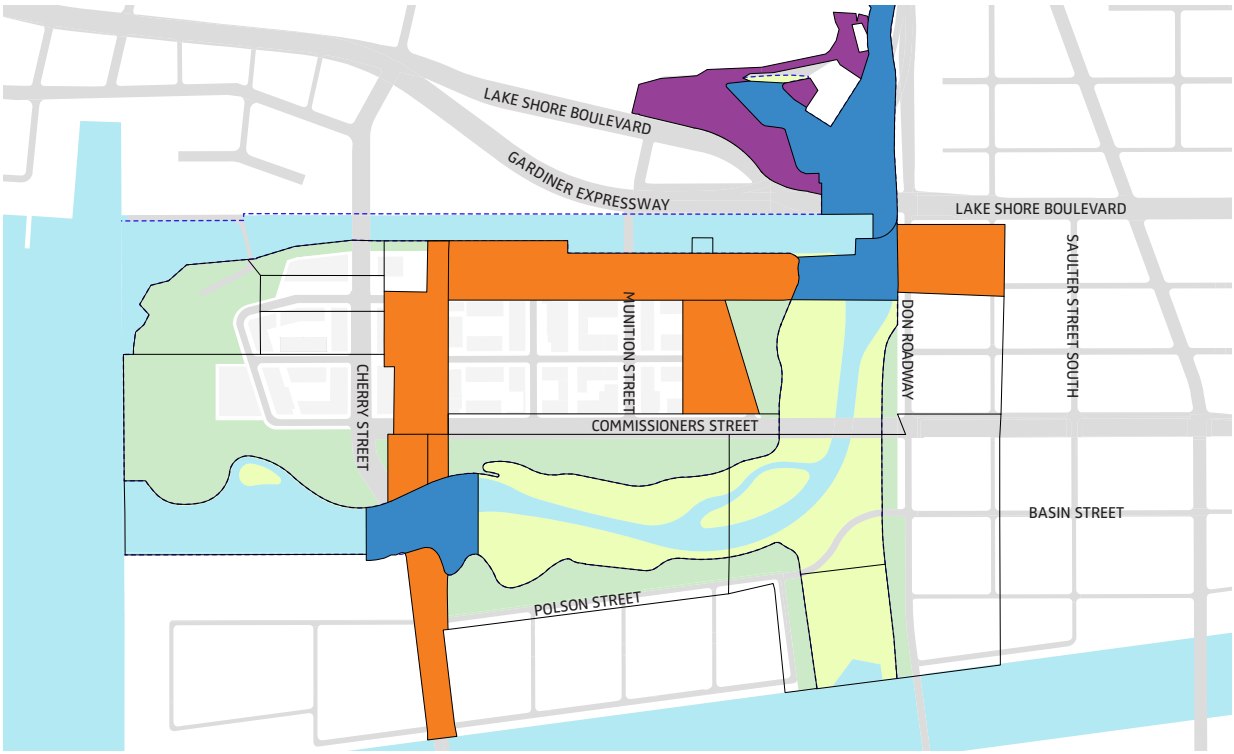


Figure 15 *Earthworks: Stage IV*

Legend

Area to Cut

Area to Fill

RA/RM Cut Area to Fill

Area to be Constructed

0 50 100 200m

4.5 Flood Protection Features

The Project's solution to flood protection is more than pure engineering. The innovative approach couples flood protection and river hydrology with the creation of a river mouth that will promote biodiversity and serve as the center around which new neighbourhoods can emerge. The validated conceptual design and new findings have been consolidated and summarized in the appended MVVA Report and MVVA Plans.

4.5.1 Site Grading Strategy

Preliminary phasing plans had relied upon developers to flood protect individual sites when they are developed over time. The MVVA Plans now detail required grading, or berms, along the new river edge, the green spillway and Keating Channel that will provide full flood protection upon the completion of the Project. Grades on individual sites within the Project boundaries will need to be raised when development takes place. In the interim, grading strategies are needed to tie the existing grades into the above-mentioned berms. Future grading of individual sites will be the responsibility of the developer, done at the developer's cost and to suit the timing of development.

Our due diligence has confirmed that the approach outlined above will provide full flood protection upon completion of the Project, and enable future development to proceed at a pace established by market forces. A fully coordinated, comprehensive and permanent grading plan for Villiers Island, Polson Quay and South River, which considers flood protection requirements, existing heritage structures on site and public realm aspirations will be developed as part of the Project to guide these developments in the future.

In order to avoid potential gaps in the overall system of flood protection it is necessary to raise the grades in the areas of the future Keating Channel Esplanade, the east side of Villiers Park, the strip of land between Commissioners Street and the Regulatory Flood Line to the south, and the strip of land between the easternmost South River Precinct development blocks and the Regulatory Flood Line. The earthwork required to accomplish this and interim finishing of the newly raised areas has been added to the Recommended Scope.

Some areas where extra fill will be needed to raise current grades may experience soil settlement due to the presence of peat and other organic materials that will compress in response to the additional load. Preloading (applying fill as soon as practical and allowing sufficient time for compression and settlement to take place) and surcharging (a technique involving the application of excess soil to accelerate settlement and then cutting back to the desired grade) may be employed to reduce post-construction settlement to acceptable levels. As surcharging involves additional material handling cost, it will need to be used selectively in areas such as road rights-of-way where earthwork completion is time-critical.

The application of fill to raise grades will take place generally in accordance with the earthwork staging plan described previously, with local modification as necessary to accommodate pre-loading or surcharging requirements, or to allow for the timely use of generated soils. In some fill areas, soil cutting may also be required to accommodate risk management measures, such as clean fill cap. These areas are presented as ''RA/RM Cut Areas to Fill'' in **Figures 12-15.**

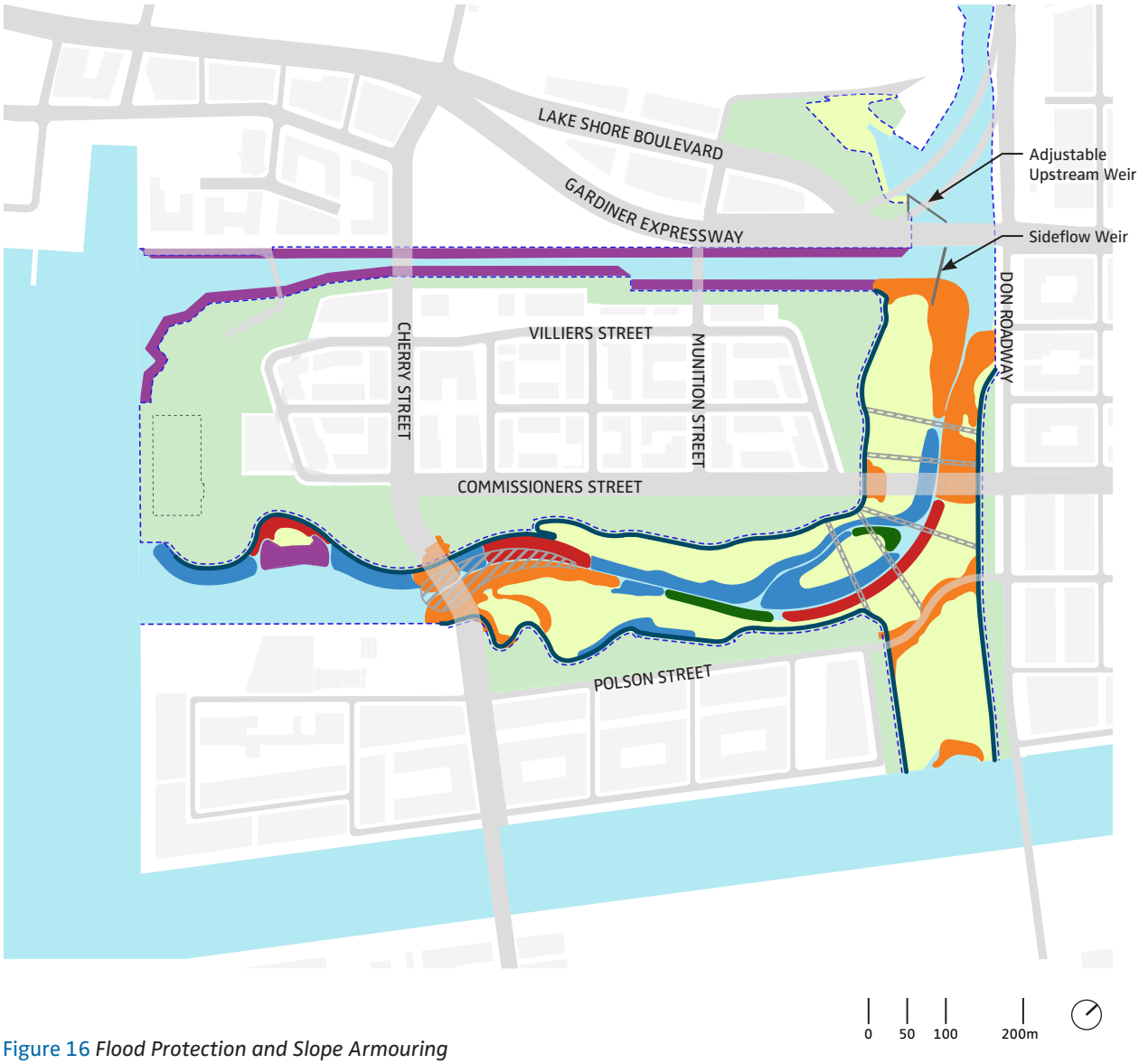


Figure 16 *Flood Protection and Slope Armouring*

Legend

- Bioengineered Bank *
- Buried Grade Control Structure
- Exposed Armour **
- Gravel Bank
- Large Wood Stabilization ***
- Rocky Harbor Edge
- Parkland
- Floodplain
- Buried Armour/ Dock Wall
- Regulatory Flood Line

* See Figure 18
** See figure 17a & 17b
*** See figure 19

4.5.2 River Slope Armouring

Engineering design and landscape treatment combine to address the need for armouring strategies to resist the forces of flood water during storm events. Consideration has also been given to the integration of these armouring strategies with control structures along the river, as well as with elements of the public realm, such as pedestrian paths and bridges. See **Figure 16.**

Shear stresses imposed by flood waters on the river channel and banks were calculated for a range of flooding scenarios and their accompanying water flows. These are depicted in Appendix A of the MVVA Report. Based on those stresses, and considering the need to protect adjacent infrastructure from flood damage, the naturalized channel has been designed with armouring for the river bed and adjacent slopes where necessary to prevent erosion (forms part of **Scope Items** 2, 3 **and** 4). In areas where the stress of flood water is greatest, as well as in the ice management area and areas where the public may access the water, hard armouring is proposed to protect the channel and the banks from erosion. See examples of armouring in **Figures 17a** and **17b.**

In areas where the channel bottom is susceptible to erosion, particularly during a flood, buried grade control structures are proposed to maintain the basic channel elevation and alignment. In other areas, particularly inside the bend of the new river valley, the channel can be protected using bioengineering techniques, which will simultaneously serve as naturalized habitat areas. See **Figure 18.**

Large wood treatments will be focused on the outer bends, or strategic habitat points where the force of water flow is high, to maintain pools and provide fish habitat. See **Figure 19.**

Additional stabilization measures will also be required for critical areas near the bridge piers, as well as an isolated area upstream of the Cherry Street Bridge South. This is based on shear stress exhibited during a Regulatory Flood event and other lower flow storm events.

4.5.3 Don Greenway (**Scope Item** 4)

The Don Greenway is a naturalized open space that connects the new river valley with the Ship Channel to the south. Its primary function is as a naturalized area but it will also function as a spillway that provides additional flood water conveyance capacity when needed. Water level control structures, with adjustable weirs for water regulation, will be installed to optimize the performance of the spillway and the wetland systems along the naturalized channel. These control structures will be tied into the levees (the natural raised edges) that contain the wetlands. This will allow the water level in the wetlands to be actively controlled to optimize their ecological performance, permitting them to be filled, retain water, or be drained throughout the year without being directly governed by lake and river system water levels.

4.5.4 Don Roadway Valley Wall Feature (**Scope Item** 8)

A valley wall feature, which is a geographic feature created through fill placement and grading that is stable from its toe to the top of bank, is required to form the perimeter of the flood zone along the Don Roadway and to eliminate the risk of flooding for lands east of the Project site.

Figure 17a *Example of Exposed Armour - boulders and large cobbles are used in critical areas to resist erosion from flood events and provide access to the river's edge.*

Figure 17b *Example of Exposed Armour with Wetland Habitat*

Figure 18 *Example of Bioengineered Bank - soil at river's edge is encapsulated in biodegradable fabric to prevent erosion as plantings become established.*

Figure 19 *Example of Large Wood Stabilization - large wood installed in the bank toe provides erosion resistance, as well as excellent aquatic and terrestrial habitat.*

4.5.5 First Gulf/Unilever Flood Protection Landform (**Scope Item 9**)

A flood protection landform will be located on the east bank of the Don River between the Metrolinx Rail Bridge over the Don Valley Parkway and the Keating Yard on the First Gulf/Unilever site to permanently eliminate the risk of flooding to the east of the Don River, including the First Gulf/ Unilever site. The scope of the Project is limited to constructing only what is needed to ensure complete flood protection for the identified flood zone, without any gaps, and that does not require removing the existing structures on that site. If the redevelopment of the site proceeds on the timeline currently anticipated by the site's owners, alternative configurations of the flood protection landform may become possible; this would require coordinated effort during a future site planning and approval process. Should the owners elect to re-configure the landform to better suit their redevelopment plans it would be at their expense and must still meet the requirements of providing passive permanent flood protection acceptable to Ministry of Natural Resources and Forestry.

4.5.6 Sediment and Debris Management Area (**Scope Item 10**)

Regular sediment and debris removal is required to maintain safe navigation and flood protection through the river channel. Detailed design of the management area and selection of specific operational design will be refined as part of the next phase of design, through on-site testing of various operational systems and refinement of spatial design requirements. Coordination with the Gardiner East project is ongoing. See **Section 7.5: Coordination.**

4.5.7 Flow Control Weir System (**Scope Item 11**)

The weir system, which will control the water flow split between the Keating Channel and the naturalized mouth of the Don River, is a critical part of this Project and will have significant impacts on the flood conveyance of the river system, as well as the ecological systems in the naturalized channel. The adaptive weir system near the Lake Shore Bridge is a mixed fixed/adjustable weir system that will allow for control of the water flow split between the naturalized channel and the Keating Channel.

4.5.8 Keating Channel Modification (**Scope Item 16**)

The addition of the flow control weir system will reduce the flow from the Don River into the Keating Channel, therefore design solutions will be required to ensure that the Keating Channel does not become stagnant. Other changes include the addition of stone armouring and in-channel habitat structures along the edges of the Keating Channel, and several structures that currently protrude into the Keating Channel will be removed to increase water flow during flood events.

4.5.9 Eastern Avenue Flood Protection (**Scope Item 12**)

Grade modifications are required surrounding the Eastern Avenue underpass of the CN Rail line (a localized low-lying area northeast of the Project boundary) to protect against flooding during the Regulatory Flood event.

4.6 Hydraulic Validation

During the DMNP EA, a Delft3D hydraulic model was developed to define existing flood conditions in the study area and to further confirm the feasibility of implementing a construction phasing approach that would progressively eliminate flood risk within the Port Lands without increasing flood risk to the remaining unprotected lands. In order to reconfirm the DMNP EA results and to allow for scenario testing throughout the design development process, the Delft3D model was refined to a higher level of resolution with a denser and more extensive model grid system. The refined model produced results consistent with the original DMNP EA output for both the existing conditions and the construction phases that were proposed during the DMNP EA. Full details of the Delft3D model refinements and the process of testing them are in the appended Baird Report, *Lower Don River Delft3D Model Refinement*.

The refined model was used for a number of simulations in support of the due diligence process and for parallel planning initiatives in the Port Lands that have implications on the Project, specifically the Gardiner East EA and the Port Lands and South of Eastern Class EA Master Plan (see **Section 7.5: Coordination** for further detail).

Limnotech, a globally recognized leader in flow simulations development, was retained under contract with MVVA to complete a parallel review of flow characteristics achieved through the implementation of the MVVA river valley design. Findings were materially consistent with those developed by TRCA and their consultants. For further detail please refer to Appendices 1 and 2.

Using the refined Delft3D model, TRCA confirmed that the earthwork staging approach described in **Section 4.4: Earthwork Staging** did not increase flood risk in the Port Lands during the construction period. However, the modelling results indicated that flood protection work proposed for the First Gulf/Unilever site cannot be completed until all of the proposed flood control work has been completed in the Project area, including the reconstruction of the Lake Shore Boulevard bridge and the widening of the Don River north of Lake Shore Boulevard. Details of the preliminary modelling are provided in the appended TRCA Report, *Delft Modelling Results, February 2016*.

Hydraulic modelling will continue throughout design development to ensure that final designs fully address flood protection requirements.

Port Lands and South of Eastern Class EA Master Plan

TRCA assisted the City of Toronto and Waterfront Toronto in developing a grading plan for the First Gulf/Unilever site that is consistent with the Project activities, while also providing for a new grade separation for the proposed Broadview Avenue extension under the elevated railway corridor.

Gardiner East EA

Delft3D modelling was applied to the City Council-approved Hybrid Three alternative for the Gardiner East EA. The modelling assumed that the existing DVP-Gardiner ramps and piers will be relocated further north and that the Logan ramp portion of the Gardiner Expressway will be removed. The results of the modelling suggest that the Hybrid Three alternative presents opportunities, such as improved sediment and debris management north of Lake Shore Boulevard, and improved flow conveyance and freeboard under Lake Shore Boulevard. Additional modelling will be required as the design of both flood protection and the Gardiner East alignment is refined.

Please refer to **Section 7.5: Coordination** for details on the coordination committee being established to ensure the successful delivery of the various infrastructure projects that will be underway in the immediate area.

4.7 Land Creation

The Project includes the creation of a new land base by lakefilling around Essroc Quay (**Scope Item** 1), which will ultimately accommodate the re-alignment of Cherry Street and much of the proposed Promontory Park North. The lakefilling operation also provides an opportunity in terms of managing excess soils generated during the excavation of the new river valley and the Don Greenway.

Conceptual design of the new land base has been completed by marine engineering specialists Riggs Engineering Ltd. (Riggs), with input from MVVA, in order to ensure coordination with the overall vision for this area. The appended Riggs Report, *Marine Engineering Services to Develop Preliminary Designs for Land Creation Works Surrounding Essroc Quay,* provides details. The conceptual design considers a wide range of constraints and opportunities while achieving the following objectives:

- Providing design hydraulic capacity;
- Effectively using surplus materials generated during demolition and the construction of other Project components, including flexibility to accommodate a range of fill materials;
- Securely containing fill materials;
- Accommodating existing and future municipal infrastructure (primarily to meet stormwater management requirements);
- Stabilizing the shoreline under flood conditions;
- Enhancing aquatic habitat;
- Accommodating proposed programming and design for Promontory Park; and
- Allowing for staged construction, consistent with overall Project needs, particularly the required timing for building the Cherry Street North Bridge and re-aligning Cherry Street.

Further geotechnical data is being collected to confirm or modify assumptions made with respect to the foundation design for the fill containment structure and to enable design refinement.

4.8 Marine Structures

Riggs was retained by the Toronto Port Lands Company to carry out a visual assessment of the dockwalls within the study area and to provide estimates for recommended rehabilitation or modifications necessary to achieve Project objectives. Their full work is presented in the appended report, *Dockwall Structural Assessment, Lower Don Lands.*

The dockwalls within the study area were built between 1912 and 1939 and comprise three different types of structures: timber cribs, timber sheet piling and steel sheet piling. The timber and steel sheet pile walls are secured with tie rods to an anchorage component set inland from the face of the wall. It is worth noting that almost all of these dockwalls are beyond their theoretical service life and most of them would require considerable rehabilitation if they were to stay in service.

The evaluation and recommendations related to each of these structures varies based on the proposed change of use and related structural changes. In most cases, the significant structural concerns with the existing dockwalls are irrelevant as they will be either encapsulated by rock revetment or removed (see items labelled *Removal of Existing Structures* and *New Rock Revetment* in **Figure 20**). There are a few new sections of dockwall that have been added where the proposed Project changes results in exposed earth (see items labelled *New Retaining Wall* in **Figure 20**).

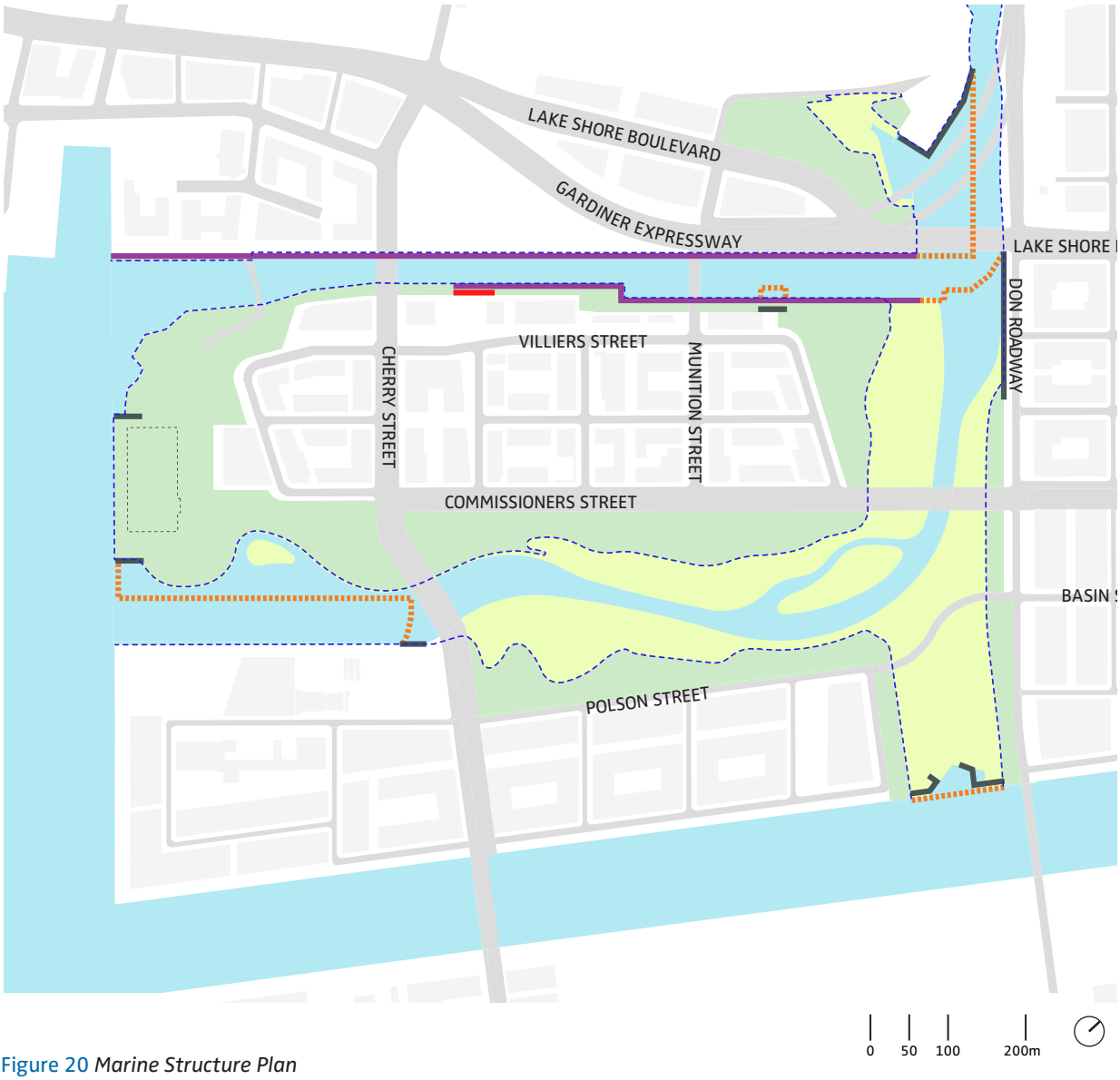


Figure 20 *Marine Structure Plan*

4.9 Public Realm, Parkland and Habitat Enhancement

The MVVA Plans and Report provide further detailed description of the long-term public realm vision for the river valley, including the landscape within the floodplain (forming part of **Scope Items** 2, 3 and 4) as well as adjacent parkland. In addition to 29 hectares (72 acres) of naturalized area within the new river valley, the conceptual design identifies an additional 16 hectares (39.5 acres) of parkland that is intended to accommodate passive and active recreational uses. This parkland includes Promontory Park North (**Scope Item** 17**a**), Promontory Park South (**Scope Item** 17**b**),Villiers Park (Future Scope), River Park North (**Scope Item** 20) and River Park South (**Scope Item** 21).

4.9.1 Planting

Approximately 32.7 hectares (81 acres) of naturalized area is proposed as part of the full vision conceptual design and consists of the following habitat types, as identified during the DMNP EA process:

- 5.4 hectares (13.3 acres) of terrestrial habitat above the Regulatory Flood line;
- 13 hectares (32 acres) of wetland habitat below the Regulatory Flood line; however, it has been identified as part of due diligence that some of this area will need to be armoured to resist erosion; and
- 14.3 hectares (35.3 acres) of permanent aquatic habitat.

The creation of new naturalized areas contributes positively to achieving the objectives of TRCA's Toronto Remedial Action Plan (RAP) for improving ecosystem health and rehabilitating fish and wildlife habitat. The habitat types that will be created comprise the vegetation communities identified in the DMNP EA, which include: forests, thickets, swamps and various types of marsh.

Additional planting will be carried throughout the parkland area, in some areas limited with more hard surface and paving, whereas other program areas, such as public gardens, will contribute significant planted area to the overall site.

Planting within the floodplain will create functional wetlands while accommodating flood conveyance for a regulatory storm event. The floodplain will also provide comfortable, safe, and pleasing spaces for public access and use.

4.9.2 Aquatic Habitat

One of the goals of the Project is to establish habitat to support game fish, including walleye, northern pike and other native species. Ongoing fish survey work by TRCA will be used to evaluate the priority of habitat creation for a range of native fish species. The river bottom has been designed to mimic natural river mouths and will include diversity of depths in various locations. The intent of the design is to provide a broad range of habitat that will accommodate changes in lake levels due to climate and the operation of water management features such as the Flow Control Weir System. The location of the large wood structures as well as the river bank design will accommodate recreational users and fish species at low water flow, while also providing the robust structure needed to remain secure in higher water flow events.

In the Keating Channel, the placement of stone armouring (revetments) will act to stabilize existing dockwalls and simultaneously provide structure for fish habitat. (**Scope Item** 16)

4.10 Roads and Bridges

(**Scope Items** 7**a/b,** 14**a**, and 15**a/c** and **Scope Items** 6, 13, 14**b/c,** and 15**b,** respectively)

There are three new bridges proposed in the Project (**Scope Items** 6, 14**b/c**, and 15**b**). Bridges will reflect appropriate levels of utility and design excellence to complement the unique characteristics and qualities of the accompanying river and park system within the Project. Bridge design, described in detail in the appended MVVA Report, has been studied and refined in an effort to ensure that the structures, including deck, piers, and abutments, accommodate the water flow expected during the Regulatory Flood and also allow for adequate space to be maintained between the water and the bridge deck. In addition, overall road profiles have been modified where necessary to reflect required bridge elevations.

The bridge designs will require supplementary testing through flood modelling in subsequent design phases to ensure there is no impediment to flood water conveyance as a result of modifications to the quantity and arrangement of bridge piers, and the designs may require further refinement.

The construction of bridge crossings will be coordinated with the main river valley excavation. For preliminary planning purposes, it is assumed the foundations for the Cherry Street Bridge South and Commissioners Street Bridge across the Don River will be constructed before excavating to the final river valley depths.

The existing Lake Shore Boulevard bridge over the Lower Don River and the adjacent rail bridge (which accommodates a rail spur line serving the Port Lands) act as a pinch point that restricts the passage of water. The Project includes extending the Lake Shore Boulevard bridge at its west end by three spans in order to create a sufficiently wide opening over the river to convey the flows anticipated during a Regulatory Flood. (**Scope Item** 13)

Road cross-section designs have been refined from the EA configurations as a result of the parallel planning processes being undertaken for the Villiers Island and the Film Studio Precincts and the Port Lands Framework Plan. The quality of roads is intended to match surrounding urban conditions and promote pedestrian and bicycle access. Space will be provided to accommodate dedicated higher order transit lanes on Cherry Street and Commissioners Street and on the Cherry Street Bridge North, which will be used as a BRT for the interim period until it can be replaced by an LRT. Buses will join mixed traffic over the Cherry Street South and Commissioners Street bridges. Based on current demand projections, LRT will be implemented around 2033. The exact timing of implementation may be further influenced by the Waterfront Transit Reset Study that is currently underway.

In preparation for reconstructing Commissioners Street East (**Scope Item** 15**c**), the Don Roadway North (**Scope Item** 7**a**), and the Don Roadway Valley Wall Feature (**Scope Item** 8), it will be necessary to adjust portions of Hydro One's existing transmission line, located within or immediately adjacent to the road rights-of-way. A Hydro One utility bridge that currently crosses the Lower Don River north of the rail bridge also impedes flood water flows and will need to be modified in order to deliver flood protection. Hydro One has assessed options for modifying its network in order to accommodate the needs of the Project (**Scope Item** 18).

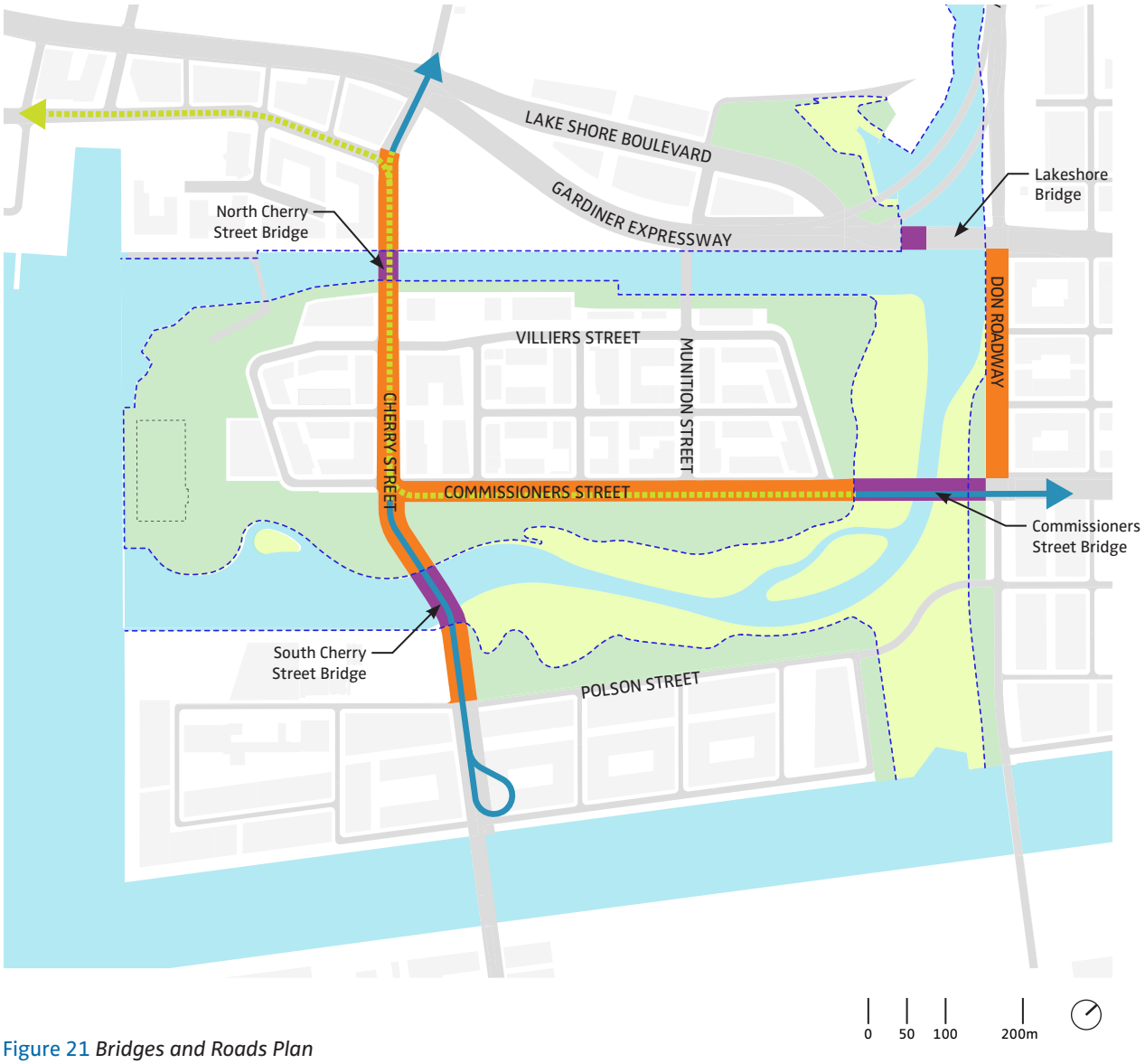


Figure 21 *Bridges and Roads Plan*

Legend

- Proposed Roads
- Proposed Bridges
- Bridges (not in scope)
- Interim BRT (Future LRT, not in scope)
- Regulatory Flood Line
- Bus Route (in mixed traffic)

Municipal services located within the road rights-of-way will generally be constructed in conjunction with the roads, except for certain deeply buried piping, which may be installed later by micro-tunnelling.

The need to raise grades within the rights-of-way provides an opportunity to address potential soil contamination existing in these areas. Although additional localized environmental risk management measures may be incorporated into road and sidewalk designs, where necessary.

The quality of streetscaping within the rights-of-way and the materials used are anticipated to match the quality of Cherry Street in the West Don Lands and the revitalized Queens Quay.

This work will continue to be refined and validated in upcoming design phases.

4.11 Existing Buildings: Relocations/Demolition

The Project Team has carefully considered and determined the best way to manage existing buildings and tenants in the Project site. Due to the extent of the required work, some buildings must be raised, relocated or removed. There are only a few privately-held properties that will be impacted by the Project, as the majority of the lands are government-owned (TPLC, Waterfront Toronto, The City of Toronto and Ports Toronto).

Recognizing that businesses will need to relocate from leased facilities in the planned construction area, impacted property owners and tenants will be notified of lease terminations as soon as possible, but no sooner than the receipt of Project funding. All current leases have termination provisions, which have been considered in the Project schedule.

Several buildings will need to be either fully or partially demolished in order to enable the construction of the river valley, future road alignments and the regrading required for flood protection. The MT35 building is located at the future mouth of the river and consequently at least a portion of the building will be demolished before the construction of the new river mouth commences.

The heritage buildings identified in **Figure 22** will be retained and selectively raised or relocated. Interim access and services will be provided during construction.

Figure 22 provides a comprehensive plan of buildings to be demolished or relocated during the construction of the Project. It also outlines the interim road access to be provided during construction and before the redevelopment of the Villiers Island and Polson Quay Precincts.

Costs for relocation, demolition, reconstruction, temporary access and maintenance of servicing utilities are accounted for in the Project cost estimate.

4.12 Municipal Services

Figure 23 illustrates the municipal services (watermains, wastewater, and stormwater sewers) required to support future development. The plan depicts the ultimate layout and configuration of proposed services within the Project boundary and also select services lying outside the boundary, as required to service private landowners and long-term lessees located on Polson Quay. To minimize overall Project construction and infrastructure costs, the Project includes pre-servicing portions of the ultimate municipal watermain, sanitary, and stormwater network as the means of providing interim servicing. Further analysis has been completed, assessing opportunities to improve on municipal servicing configurations shown in the EA to optimize construction costs realized prior to re-development of the River South Precinct.

New municipal infrastructure is planned to be installed to depths below the water table. A

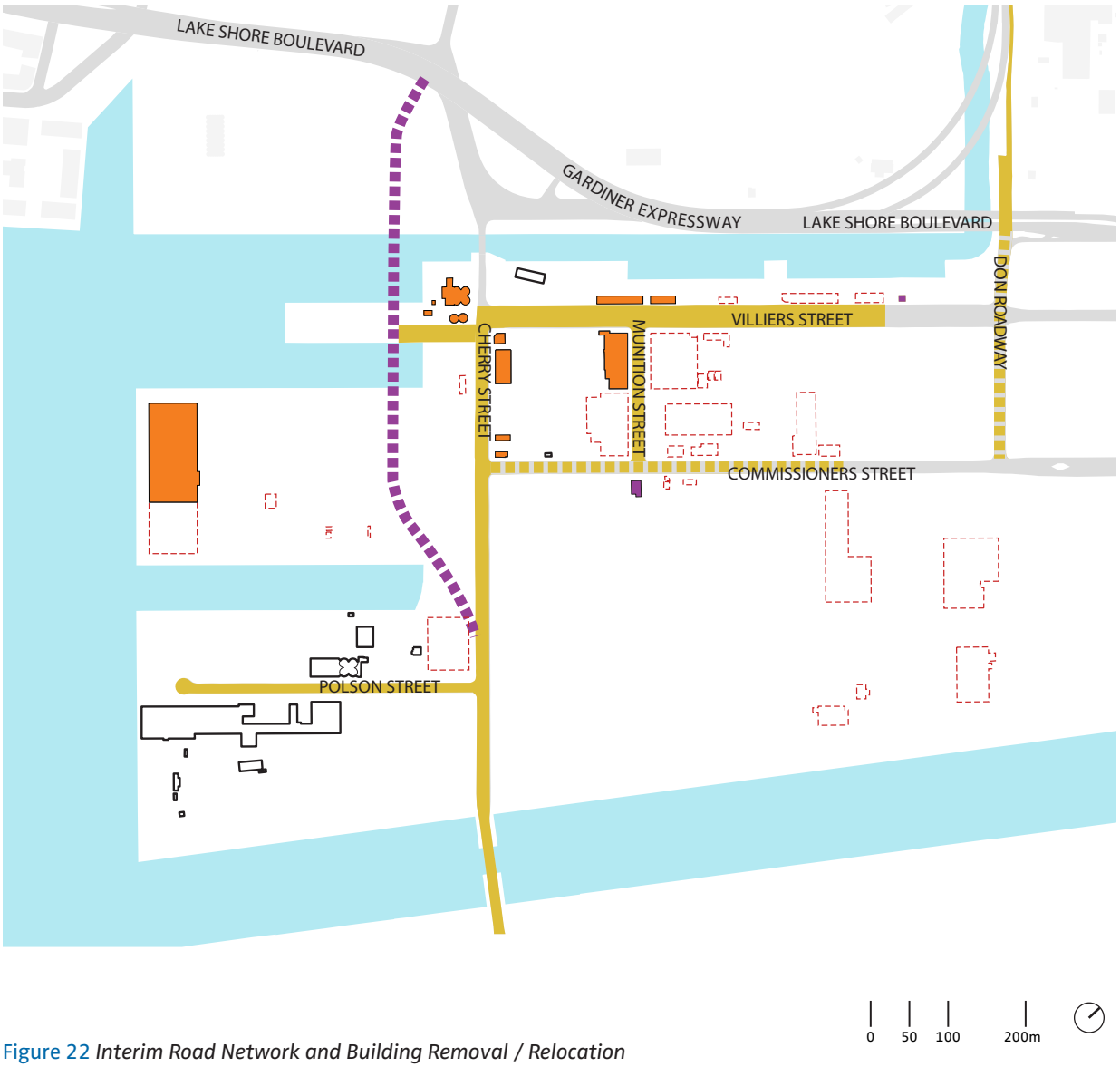


Figure 22 *Interim Road Network and Building Removal / Relocation*

robust dewatering program will be required during construction due to the high permeability of the soil, shallow groundwater table, and the depth of services. Watertight shoring technology will be required to provide a suitable trench condition during installation of the municipal services. It is anticipated that groundwater collected during construction will be contaminated due to the historical industrial uses of the Port Lands and will require treatment before it is discharged.

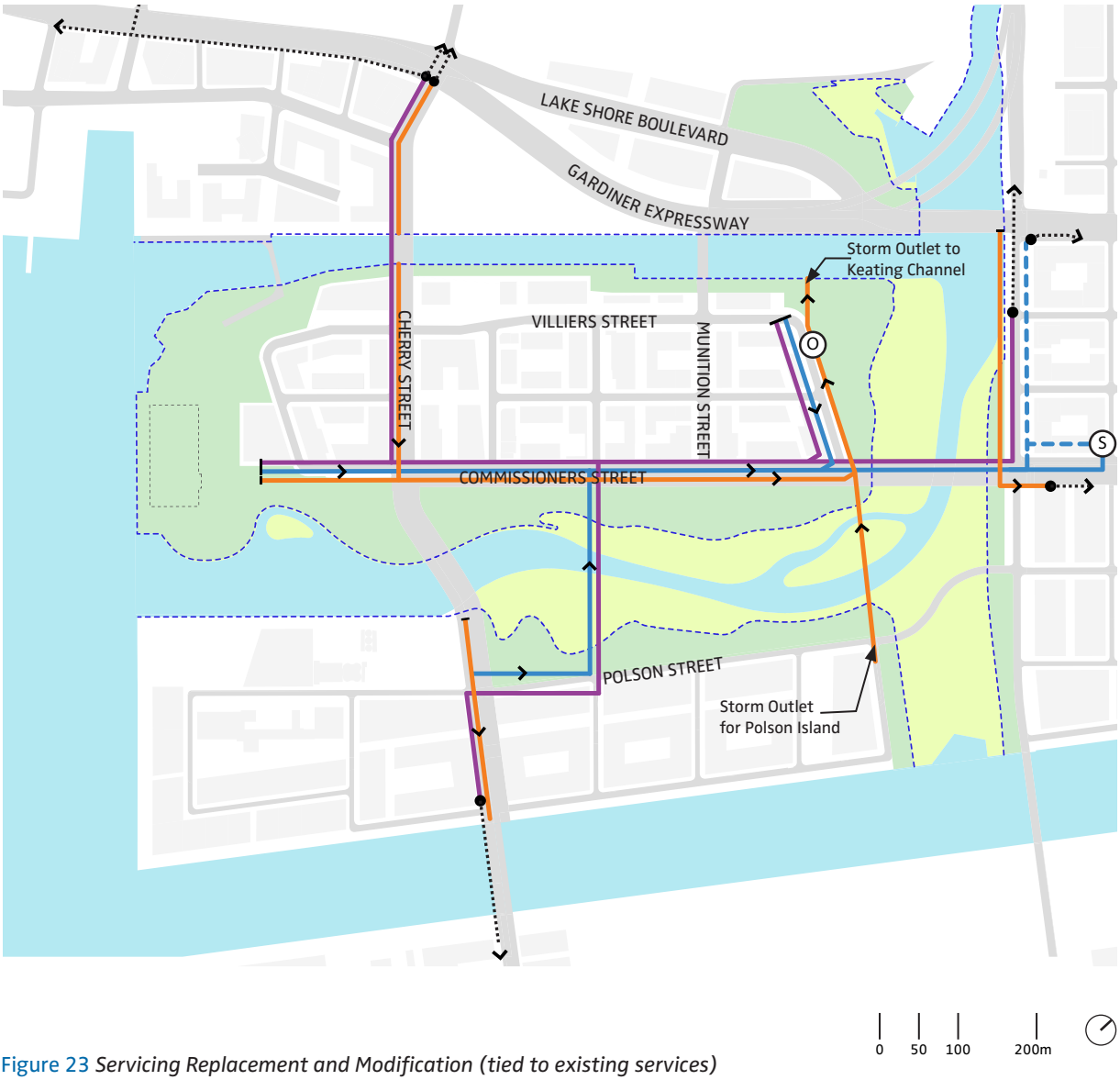


Figure 23 *Servicing Replacement and Modification (tied to existing services)*

In addition to the services described above, the Project also includes the construction of a temporary wastewater pumping station to accommodate interim flows and the underground portion of a future Stormwater Treatment Facility.

Locations for these facilities are shown notionally on the appended MVVA Plans, but location suitability is being assessed and the facilities may be relocated as a result.

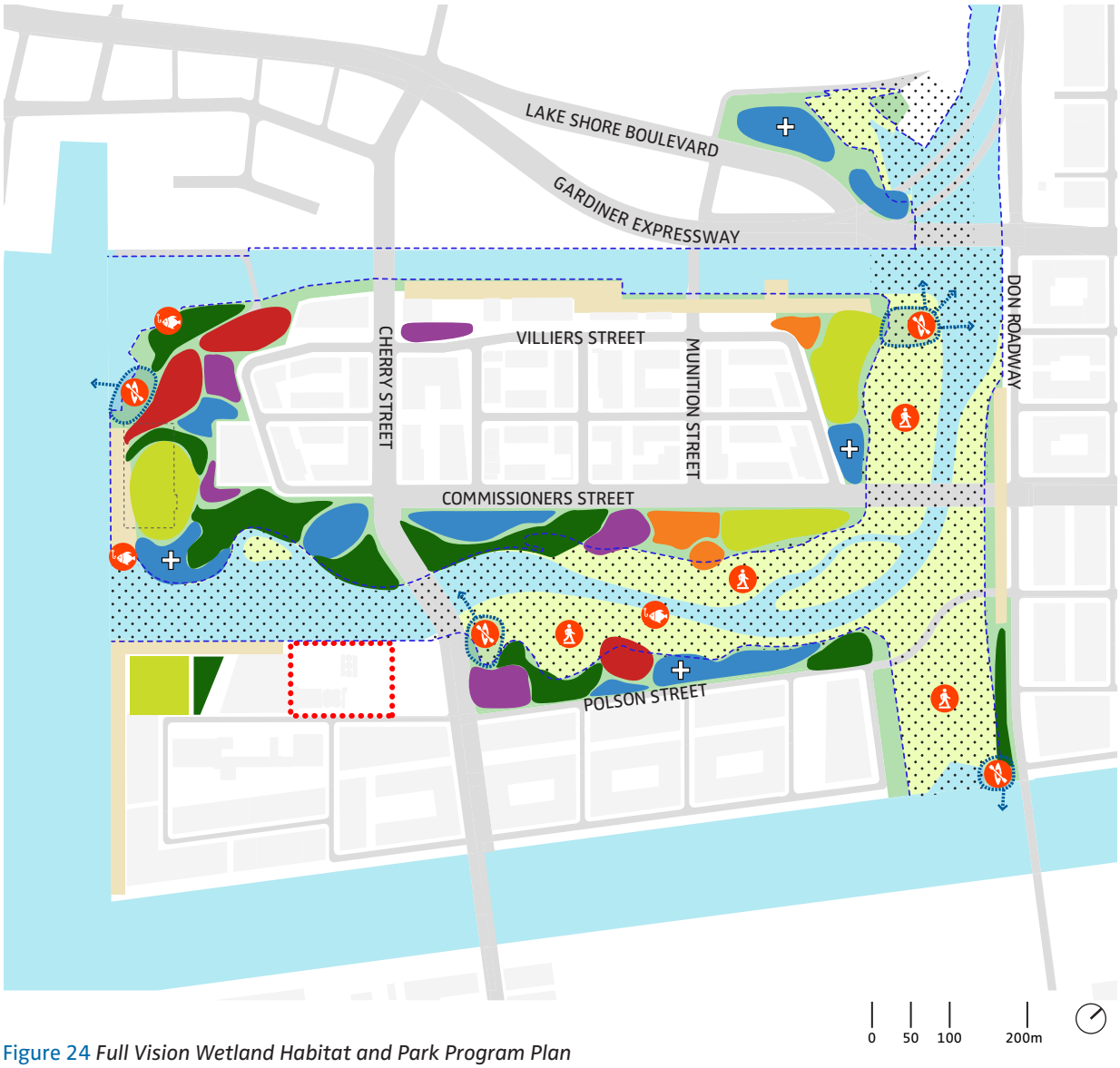


Figure 24 *Full Vision Wetland Habitat and Park Program Plan*

Legend

- River Valley + Wetlands
- Wooded Upland
- Passive Use Lawn
- Active Recreation
- Water Access
- Esplanade
- Playground
- Public Gardens
- Event Space
- Prospect / Overlook
- Other Parkland
- Floodplain
- Private Land
- Regulatory Flood Line
- Trail
- Small Boat Launch
- Fishing Area

Figure 25 *Water Access at Brooklyn Bridge Park, Brooklyn, NY (Michael Van Valkenburgh Associates, Inc.)*

4.13 Park Program

Figure 24 illustrates a full and long-term vision for park programming. The distribution of these program types considers access, views from the island, proposed topography, and distribution of activity across the site. As the public realm and parkland components of the design are primarily located outside of the naturalized areas and floodplain, there are minimal technical issues or constraints, although some consideration of settlement mitigation measures will be required following the raising of the grade in many of the park areas. Within the floodplain, in the area noted on the MVVA Plans as River Valley and Wetlands, passive program use such as trails, boardwalks, overlooks, a small boat launch, and fishing sites will be provided. **Figure 25** provides an example of an armoured boat launch, showing the quality of material and construction intended for these elements. There will be limited active recreational facilities, and there will not be light poles or ancillary features (such as parking) within the floodplain.

Examples of park programming include paths, planted woodlands (**Figure 26**), water's edge promenade (**Figure 27**), upland prospects (**Figure 28**) and children's playground (**Figure 29**) as well as active recreation, such as tennis or basketball courts.

The Project cost estimate reflects park elements of a quality consistent with the programming elements illustrated in **Figure 24** and waterfront parks delivered to date. Future programming decisions and design refinements will be undertaken within the confines of this budget.

The Recommended Scope includes the parks which, together with the naturalized river, will facilitate development and act as a catalyst to unlock residential and commercial uses. Specifically, this includes River Park North, River Park South and Promontory Park South. This Recommended Scope is outlined in **Figure 33a/b.**

Figure 26 *Wooded Upland at Corktown Common, Toronto, ON (Michael Van Valkenburgh Associates, Inc.)*

Figure 27 *Esplanade at East Bayfront Water's Edge Promenade, Toronto, ON (West 8)*

Figure 28 *Prospect at Brooklyn Bridge Park, Brooklyn, NY (Michael Van Valkenburgh Associates, Inc.)*

Figure 29 *Playground at Corktown Common, Toronto, ON (Michael Van Valkenburgh Associates, Inc.)*

5. Recommended Scope, Cost Estimate and Financial Due Diligence

Through the completion of the due diligence program, the Project Team developed a detailed cost estimate based on drawings, specifications, concept design and soil volumes provided. Further details related to the estimating, Project scope adjustments, risk analysis, and contingency setting processes and results are included in this section and the related appendices.

As part of this program, the $975 million (YOE) cost estimate for the Original Scope was updated based on current due diligence findings, then used to develop the Recommended Scope, which has an estimated cost of $1.25 billion (YOE) that in turn includes hard (construction) costs, soft costs (such as design, engineering, and permitting/approval fees), applicable taxes, and a contingency of 30 per cent, including an allowance for escalation.

In addition to the cost estimating work, and to validate projections identified in earlier studies, consultants were retained to update the Market Demand Analysis, Land Sale Revenue Projections, Development Charges Analysis and Economic Impact Analysis. These updated studies and peer reviews are included as appendices, referenced within individual sections below.

5.1 Integrated Cost, Schedule and Risk Assessment

Cost consultants Hanscomb Limited (Hanscomb) have prepared base cost estimates in 2016 dollars for individual Project components based on the integrated concept designs and preliminary construction methodologies developed and documented by the Project Team, and have consolidated these into comprehensive Project cost estimates. In addition to using its own construction cost database, informed by an understanding of current market trends, Hanscomb has integrated cost data provided by CH2M (documented in its Environmental Cost Estimate) and Riggs, respectively, for specialized soil/environmental management and marine construction work.

Hanscomb's base cost estimates incorporate quantities and unit prices (or lump sums) that are representative of average, planned conditions, exclusive of hidden risk factors, and that are as unbiased as possible (i.e., neither over-optimistic nor over-conservative). Unit price assumptions have also been critically reviewed by other members of the Project Team.

A design and pricing allowance equivalent to 10 per cent of the estimated construction cost has been added to each component estimate to account for items that have not been sufficiently defined in concept design to be quantified in the estimate. For example, a general requirement for a physical barrier – such as stone armouring – has been identified, but its exact form and extent remain to be determined. As the design proceeds, and decisions are made regarding the Project's detailing and materials, this allowance will be consumed or transferred to the Project's contingency.

Over and above the direct cost of constructing the physical work shown on the drawings, a contractor will incur a variety of indirect costs including General Requirements and Contractor Overhead and Profit. General Requirements include items such as mobilization at the construction site, environmental protection during construction, temporary facilities such as site trailers and temporary power, storage and staging areas, site management, project coordination, and bonding and insurance. These indirect costs have been accounted for by applying a factor of 13 per cent.

Cost Element	Amount ($ millions)
Base Construction Cost Estimate (2016$)[1]	**$ 784**
20% Soft Cost Factor (2016$)	$ 157
1.76% Non-recoverable HST (2016$)	$ 17
Base Project Cost Estimate (2016$)	**$ 958**
Escalation Allowance[2]	$ 119
Escalated Project Cost Estimate (YOE$)	**$ 1,077**
Contingency[2]	$ 173
Recommended Project Budget (YOE$)	**$ 1,250**

1. Includes 13% General Requirements/Contractor Overhead and Profit, totalling $71 million; and 10% Design and Pricing Allowance totalling $82 million.
2. Combined Escalation Allowance plus Contingency equal approximately 30% of Base Project Cost Estimate.

Figure 30 *Cost Estimate Build-up*

In order to convert the base construction cost estimate into a base project cost estimate (please refer to **Figure 30**), markups were then applied to cover:

- Soft costs, including design, engineering, and specialist consultant fees, permit and approval fees, and project management costs. The applied 20 per cent soft cost factor is also intended to cover lease termination and business relocation costs, which are assumed to total approximately $5 million; and
- Non-recoverable (net) Harmonized Sales Tax, at 1.76 per cent.

No provision was made in the base cost estimates for financing costs, premium costs or innovation opportunities that may be associated with the application of a P3/AFP process. Applicable escalation and contingency allowances were calculated through the process described below, which integrates cost and schedule considerations.

A high-level project schedule, which addressed design, approval and construction activities, was developed by HDR through a collaborative effort with the Project Team. The schedule[1], presented in **Figure 31**, was developed based on detailed consideration of earthwork staging (including the need to mitigate the risk of flooding during construction), traffic management and maintenance of access, the proposed procurement/project delivery methodology, and the potential for design or construction efficiencies. This schedule baseline also assumes negligible delay due to unforeseen circumstances. In essence, a project timeline was constructed assuming the Project is delivered to plan, and on this basis, an expected completion date of late 2023 was established.

1 Note that the identification of specific scope items as potential advance work in Figure 31 represents one possible scenario, which forms the basis for the work presented in this Due Diligence report, but which is subject to change. The Project Team has and will continue to assess whether there are other scope items that could be advanced. Certain schedule assumptions have been superseded, given the September 14, 2016 announcement by representatives from the three orders of government that funding has been allocated to accelerate designing and constructing the entirety of Scope Item 1 (Essroc Quay Lakefill).

		2016	2017	2018	2019	2020	2021	2022	2023	2024
	Community Based Risk Assessment									
	Design and Engineering/Procurement (Bridges)									
1	Essroc Quay Advance Work									
14b	Cherry Street Bridge North									
14c	Cherry Street Bridge South									
15b	Commissioners Street Bridge									
	Design, Engineering, Procurement and Approvals									
3	River Valley System									
1	Balance of Essroc Quay Lakefilling									
18	Hydro One Integration									
2	Polson Slip Naturalization									
4	Don Greenway (Spillway & Wetland)									
10	Sediment and Debris Management Area									
8	Don Roadway Valley Wall Feature									
13	Lake Shore Road and Rail Bridge Modifications									
19	Villiers Island Grading									
11	Flow Control Weirs									
14a	Cherry Street Re-alignment									
15a	Commissioners Street West									
5	Site Wide Municipal Infrastructure									
14d	Old Cherry Street Bridge Demolition									
15c	Commissioners Street East									
7a	Don Roadway North									
16	Keating Channel Modifications									
	Park Design Approvals/Construction Procurement									
17b 20 21	Park Construction									
12	Eastern Avenue Flood Protection									
9	First Gulf/Unilever Site Flood Protection Landform									

Legend

- Design and Approvals
- Potential Advance Construction Scope
- Core Construction Scope
- Park Construction Scope
- Stand-alone Construction

Figure 31 *Project Delivery Schedule*

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The projected 2023 finish date relies upon the early retention of a constructor as part of implementing the customized delivery solution described in **Section 6: Procurement Strategy.** Working collaboratively with a constructor facilitates concurrent design and construction, enabling certain Project components to be advanced. In addition, to support completion in 2023, funding would need to be confirmed no later than the second calendar quarter of 2017.

As part of the due diligence work, HDR Corporation (HDR) conducted an initial two-day risk identification and quantification workshop with full participation by the Project Team and various Project stakeholders. During this workshop, potential risks and opportunities were identified and recorded in a Project Risk Register, accompanied by a consensus view of the probability of occurrence and the likely cost and schedule impacts should the risk manifest. The workshop also included an assessment of the base cost uncertainty, which considered the quantity and unit price estimates based on the concept design developed for each component of the Project.

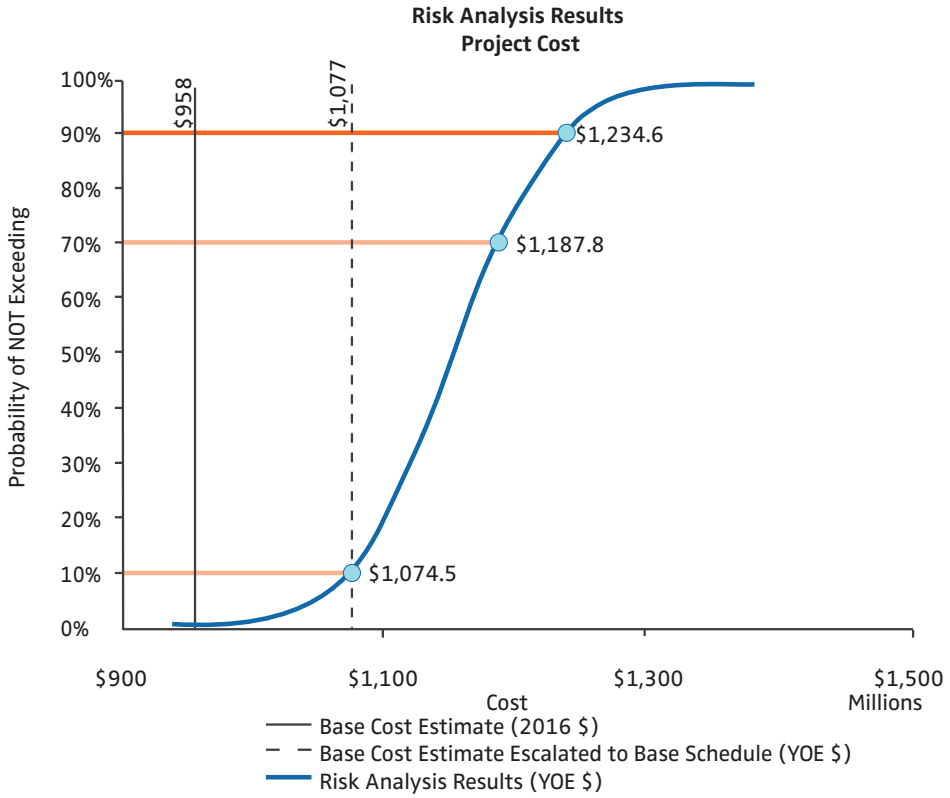
HDR conducted a follow-up risk workshop to further refine the outputs, and to identify and evaluate proactive responses to key Project risk factors, which could reduce risk and uncertainty.

HDR developed a project-specific risk assessment simulation model, which employs industry best practice probabilistic techniques to perform risk-based cost and schedule analyses. The foundation for the model has been utilized extensively by HDR in providing decision support for numerous other large scale infrastructure projects, adjusted for project-specific conditions. The model inputs include:

- The detailed baseline construction cost estimate marked up by 20 per cent for soft costs and a further 1.76 per cent for non-recoverable HST;
- The corresponding HDR baseline Project schedule, with costs allocated to the appropriate schedule activities;
- Base cost uncertainty information; and,
- The Risk Register.

The model calculates the probability that a project can be completed within a given budget and by a selected target date, in order to support contingency setting or validation. This model features a methodology where specific event risks are identified and quantified instead of applying fixed percentages for unknowns. In this manner, a project-specific risk reserve is developed by quantifying the risk events that can affect the given project. The risk-based approach is particularly appropriate for projects having few precedents or benchmarks.

This contrasts with the traditional method of dealing with project unknowns by applying an across the board contingency factor based on judgment, experience, and a set of assumptions with unknown confidence. More often than not, the traditional single-value estimate under- or over-represents the project cost, masking the critical uncertainty inherent in a particular project. It



Note: $957.9 million is the unescalated base cost estimate for the Project, while $1,076.8 million is the escalated base cost estimate. The curve shows the range of potential cost outcomes for the Project and the corresponding probabilities that the Project can be completed at or below the indicated cost.

Figure 32 *Project Cost Risk Analysis*

implies a sense of precision beyond what can be achieved during planning, scoping or early design phases.

Hanscomb analyzed applicable construction escalation trends over time and recommended a 3.3 per cent year-over-year escalation rate be used for the Project (refer to the appended Hanscomb Report, *Recommendations and Rationale for Construction Cost Escalation Factors*). A year-over-year escalation rate of 2.5 per cent was adopted, however, in order to be consistent with the City of Toronto's standard practice for budgeting major capital infrastructure investments. The escalation rate assumption was built into HDR's model to allow the cost results to be expressed in nominal (or year of expenditure (YOE)) dollars and the model was run to produce probability distributions for cost and schedule outputs. Sensitivity to changes in the assumed escalation rate was addressed in the risk assessment simulation model.

Figure 32 represents the simulation results for Project cost, after taking into consideration escalation, base cost uncertainty (variability), the monetary impact of the risks and opportunities identified in the Risk Register, and the monetary impact of schedule delays which give rise to additional overhead costs and increased escalation costs.

As shown in **Figure 32**, the un-escalated baseline cost for the Project has been estimated at approximately $958 million, based on the

$784 million construction cost estimated by Hanscomb (appended as the *Conceptual Estimate for Waterfront Toronto's Recommended Scope*) plus 20 per cent markup for soft costs and a further 1.76 per cent markup for non-recoverable HST. Running the model including projected escalation but without the risk component shows the base cost dollars to be approximately $1.08 billion (YOE).

The risk analysis results are shown in the form of an S curve, with the ultimate Project cost in year-of-expenditure dollars plotted on the horizontal axis and the corresponding probability that the Project will be completed at or below budget on the vertical axis. Taking into account all identified cost and schedule risks and opportunities, the results show that there is:

- A 90 per cent probability that the Project can be completed for $1.23 billion or less;
- A 70 per cent probability that the Project can be completed for $1.19 billion or less; and
- A 10 per cent probability that it can be completed for less than $1.07 billion.

On the basis of these simulation results, a Project cost estimate of $1.25 billion has been carried. The cost estimate incorporates a total reserve of $292 million, or approximately 30 per cent, to address the potential impacts of project risk and construction escalation (please refer to **Figure 31**). This yields a high – or approximately 90 per cent – probability that the Project will be delivered within or below the cost estimate based on implementation using a flexible, customized project delivery solution, as recommended in **Section 6: Procurement Strategy.**

Figure 33a shows the Recommended Scope of the Project and **Figure 33b** breaks down the $1.25 billion recommended budget by individual Project components.

5.2 Comparison Between Original Scope and Recommended Scope Cost Estimate

In July 2015, representatives of the Government of Canada, the Province of Ontario, and the City of Toronto announced funding for the due diligence project. The announcement referenced a preliminary $975 million cost estimate, which had been developed based on the substantial work of the EA but without the benefit of the extensive site characterization and other due diligence undertaken since.

Through the completion of due diligence work, it was determined that the preliminary budget figure was insufficient to achieve the Project goals.

Figure 33b also provides a breakdown of the original $975 million cost estimate (the Original Scope estimate) by Project Component, and compares these component costs to the updated estimates, which add up to the $1.25 billion Recommended Scope cost estimate. The key factor driving the increased cost is the enhanced understanding of site conditions gained through due diligence. This in turn drives additional soil excavation, soil/groundwater treatment, and material handling/import costs resulting from:

- The extent of flowing sand and compressible soils identified through borehole and soil sampling work;
- Design development; and
- Enhanced erosion control and risk management measures.

In order to allow for some additional required scope identified through due diligence, and to offset some of the increased cost, the Project scope was reviewed in detail to identify opportunities to defer non-essential work that does not have an immediate impact on Project goals.

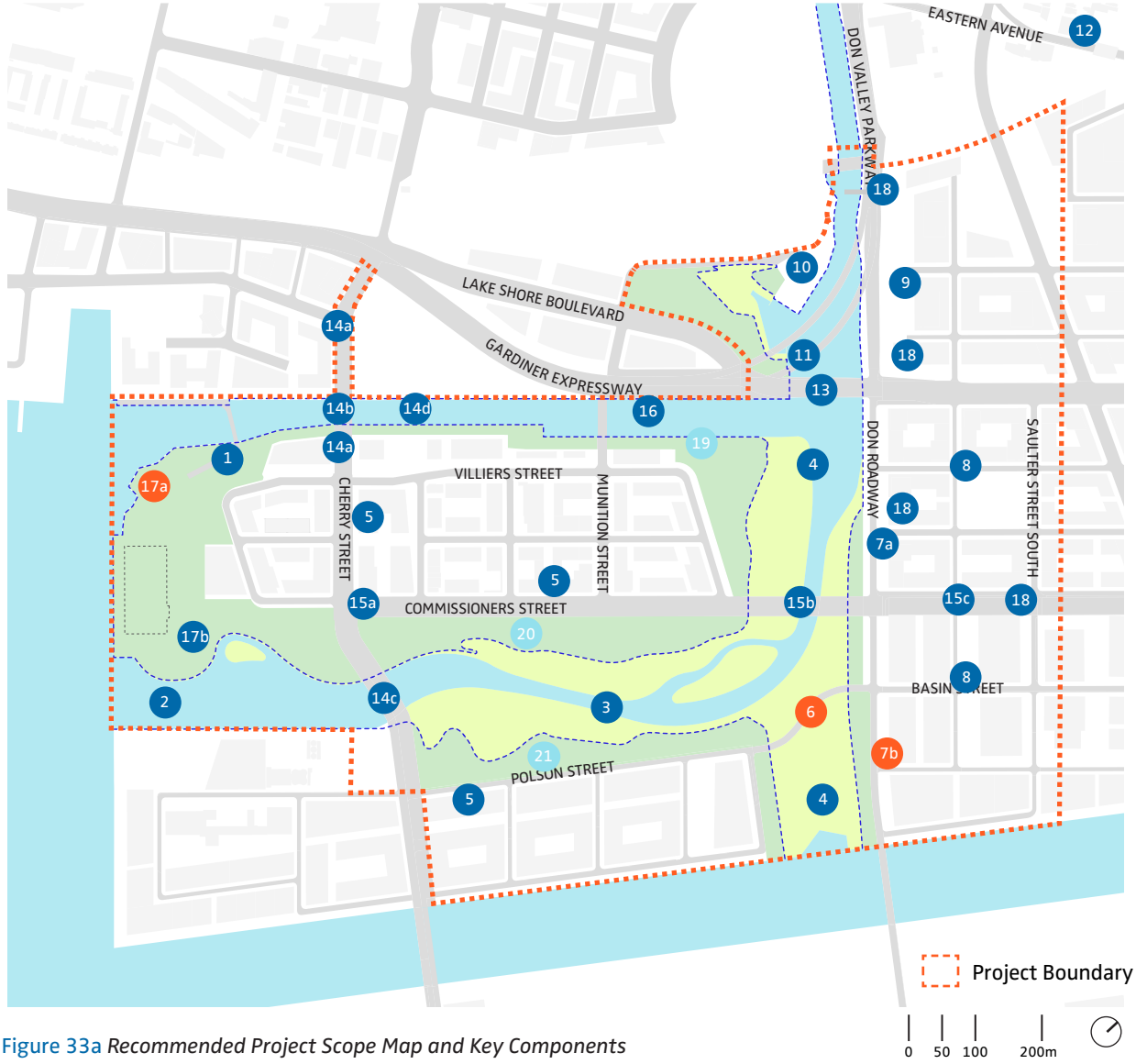


Figure 33a *Recommended Project Scope Map and Key Components*

Legend

- 1 Essroc Quay Lakefilling
- 2 Polson Slip Naturalization
- 3 River Valley System
- 4 Don Greenway (Spillway & Wetland)
- 5 Site Wide Muncipal Infrastructure
- 6 Basin Street Bridge
- 7a Don Roadway North
- 7b Don Roadway South
- 8 Don Roadway Valley Wall Feature
- 9 First Gulf/Unilever Site Flood Protection Land Form
- 10 Sediment and Debris Management Area
- 11 Flow Control Weirs
- 12 Eastern Avenue Flood Protection
- 13 Lake Shore Road & Rail Bridge Modifications
- 14a Cherry Street Re-alignment (incl. BRT)
- 14b Cherry Street Bridge North (incl. BRT)
- 14c Cherry Street Bridge South (vehicular only)
- 14d Old Cherry Street Bridge Demolition
- 15a Commissioners Street West (incl. BRT)
- 15b Commissioners Street Bridge (vehicular only)
- 15c Commissioners Street East (vehicular only)
- 16 Keating Channel Modifications
- 17a Promontory Park North
- 17b Promontory Park South
- 18 Hydro One Integration
- 19 Villiers Island Grading
- 20 River Park North
- 21 River Park South

		Estimated Cost (YOE $millions)			
		Recommended Scope	Original Scope	Variance	Explanation
1 2	Essroc Quay Lakefilling and Polson Slip Naturalization	$ 125	$ 90	$ 35	Refined design of lakefill and naturalized river mouth; more complex construction requirements.
3 4	River Valley System and Don Greenway (Spillway and Wetland)	$ 486	$ 128	$ 358	Refined earthwork methodology/quantity and cost assumptions and environmental management requirements.
5	Site Wide Municipal Infrastructure	$ 102	$ 36	$ 66	Municipal services originally carried with roads is now broken out separately, actual network design have replaced previous allowances.
6	Basin Street Bridge	-	$ 37	$ (37)	
7a 7b	Don Roadway North and South	$ 7	$ 63	$ (56)	South portion deferred. Current estimate breaks out costs for municipal services and Hydro One infrastructure modifications elsewhere. See items 5 & 18.
8	Don Roadway Valley Wall Feature	$ 27	$ 12	$ 15	Refined design
9	First Gulf/Unilever Site Flood Protection Landform	$ 5	$ 5	$ 0	
10	Sediment and Debris Management Area	$ 78	$ 53	$ 25	Refined design
11	Flow Control Weirs	$ 38	$ 38	$ 0	
12	Eastern Avenue Flood Protection	$ 5	$ 5	$ 0	
13	Lake Shore Road and Rail Bridge Modifications	$ 19	$ 71	$ (52)	Dimensions reduced from prior assumptions. Proposed Gardiner/Lake Shore reconfiguration has eliminated need for the rail bridge modifications.
14a	Cherry Street Re-alignment (incl. BRT)	$ 22	$ 62	$ (40)	Current estimate breaks out costs for municipal services elsewhere. See item 5. Improvements deferred south of Polson Street.
14b	Cherry Street Bridge North (incl. BRT)	$ 55	$ 32	$ 23	Revised pricing assumptions and additional design information.
14c	Cherry Street Bridge South (vehicular only)	$ 42	$ 42	$ 0	
14d	Old Cherry Street Bridge Demolition	$ 4	$ 13	$ (9)	Reduced extent of dockwall work related to demolition.
15a	Commissioners Street West (incl BRT)	$ 18	$ 40	$ (22)	Current estimate breaks out costs for municipal services elsewhere. See item 5.
15b	Commissioners Street Bridge (vehicular only)	$ 43	$ 54	$ (11)	Revised pricing assumptions and additional design information.
15c	Commissioners Street East (vehicular only)	$ 7	$ 60	$ (53)	Current estimate breaks out costs for municipal services and Hydro One infrastructure modifications elsewhere. See Items 5 & 18.
16	Keating Channel Modifications	$ 35	$ 50	$ (15)	Duplicate scope eliminated.
17a 17b	Promontory Park North and South	$ 42	$ 63	$ (21)	Refined design and park programming. Full landscaping limited to south end of park.
18	Hydro One Integration	$ 12	$ 21	$ (9)	Reduced scope of work assumed required specifically to enable flood protection. Note: original estimate also included supplementary allowances for modifications to Hydro One assets in Items 7a & 15c.
19	Villiers Island Grading	$ 28	-	$ 28	New scope required to achieve complete flood protection without reliance on adjacent development progress.
20	River Park North	$ 23	-	$ 23	Partially replaces deferred (north) portion of Promontory Park.
21	River Park South	$ 27	-	$ 27	Partially replaces deferred (north) portion of Promontory Park.
	Total	**$ 1,250**	$ 975	$ 275	

Original Scope Added Scope Deferred Scope

Figure 33b *Recommended Scope Cost Estimate by Component*

The Recommended Scope and corresponding cost estimate of $1.25 billion reflects the following changes to the Original Scope:

Deferrals:

- Basin Street Bridge (**Scope Item** 6);
- Don Roadway South (**Scope Item** 7**b**); and
- Promontory Park North (**Scope Item** 17**a**).

Reductions:

- Reduced scope to defer construction of transit infrastructure on two of the three remaining bridges (**Scope Items** 14**c** and 15**b**). The Cherry Street Bridge North (**Scope Item** 14**b**) will include dedicated lanes for interim BRT service and all three of these bridges will be designed and constructed with the capacity to accommodate future LRT infrastructure;
- Reduced scope to defer LRT infrastructure on all roads, but space will be provided for interim BRT service that can later be replaced by an LRT;
- Rail bridge modification allowance (originally part of **Scope Item** 13) deleted due to Gardiner East work; and
- Allowance for modification of Hydro One transmission infrastructure reduced, based on assumed minimum requirements for achieving flood protection.

Additions:

- Villiers Island flood protection grading (**Scope Item** 19);
- River South Precinct flood protection grading (accounted for in conjunction with **Scope Items** 3 and 4);
- River Park North (**Scope Item** 20); and
- River Park South (**Scope Item** 21).

Additional upward and downward adjustments were made internal to various scope items, which resulted in a net zero impact on the overall budget. Of particular note, the plan to relocate the Gardiner East ramps to the Don Valley Parkway renders the extension of the rail bridge across the Lower Don River (part of **Scope Item** 13) obsolete.

5.3 Market Demand Analysis

Cushman & Wakefield was retained to complete a high level update of its 2012 Market demand forecast, which included revenue projections. The updated 2016 forecast focused on the market demand and land sale revenue for the period from 2023 to 2042 within Villiers Island and the Film Studio District (McCleary District) of the Port Lands.

The Cushman & Wakefield update concluded that:

- *Residential:* Growth in high-rise development is expected to remain strong over the forecast period. Residential demand in Villiers Island and the McCLeary District is estimated at approximately 5,000 units over the 2023 to 2042 forecast period. This would account for all of the residential capacity in Villiers Island and part of the McCleary district. A higher residential forecast of 6,500 units was also deemed reasonable (325 units annually).

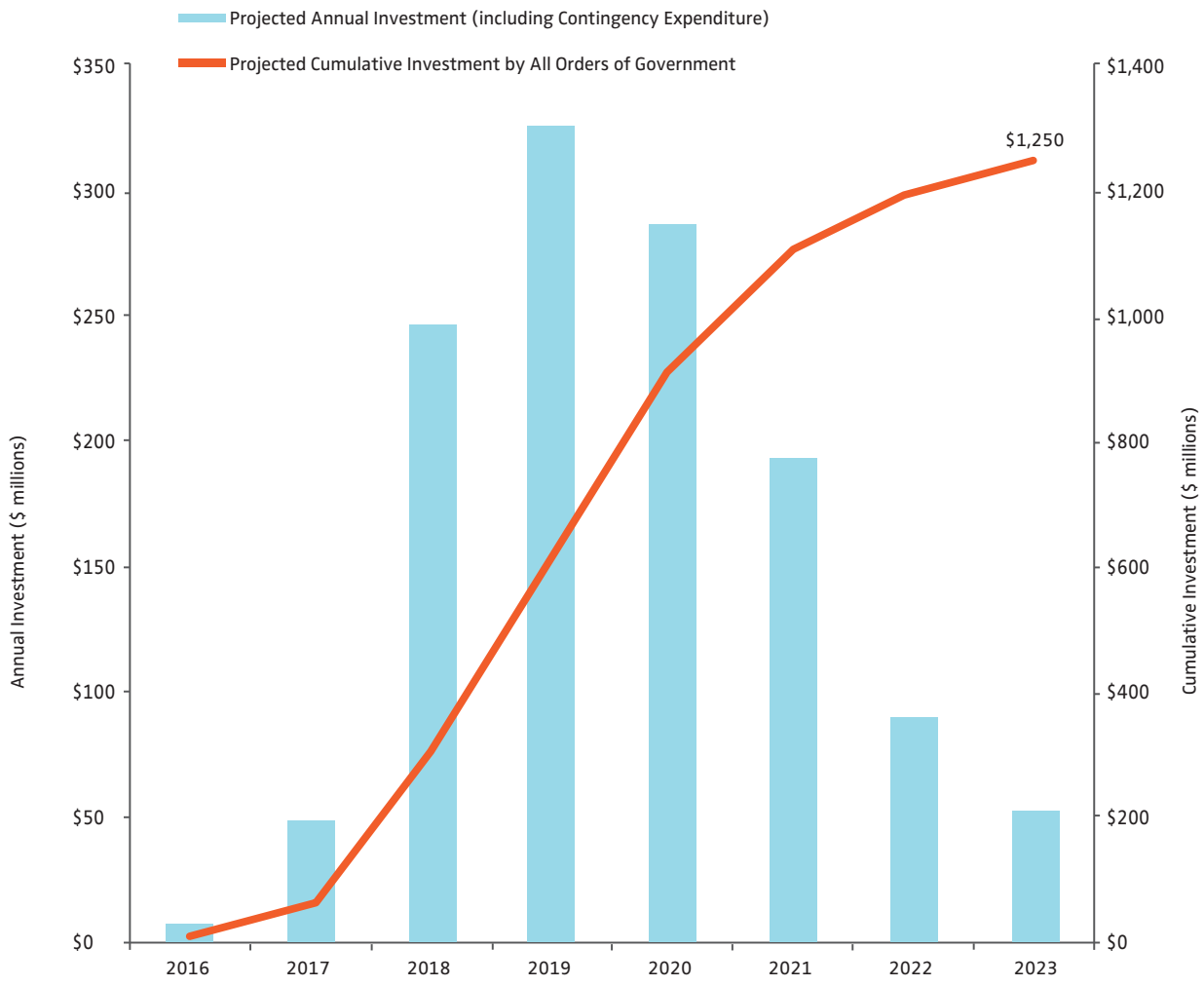


Figure 34 *Annual and Cumulative Investments*

- *Office:* Significant office demand of 1.2 million square feet to 2.6 million square feet is also forecasted, assuming higher order transit is in place. The midpoint of this range is 1.9 million square feet.
- *Retail:* Demand for local serving retail is projected at 296,000 square feet.

N. Barry Lyon Consulting were retained to complete a peer review of the updated Cushman & Wakefield findings and generally concurred with the findings of Cushman & Wakefield.

5.4 Development Charges Eligibility Analysis

In August 2012, Hemson completed a peer review of the financial elements of the 2012 PLAI Report. A key component of this work involved reviewing the development-related capital costs and revenues associated with the Port Lands development over a long-term time horizon. In 2013, Hemson completed a Development Charges Background Study for the City of Toronto and incorporated inputs from the 2012 PLAI Report.

Since then, Waterfront Toronto and the City of Toronto have updated Project scope, timing, and cost estimates. Accordingly, Hemson was retained in 2016 to update the development charge eligibility analysis and concluded that the majority of Project costs are growth-related and the City has the option to recover a portion of its costs from future development charges. This can represent a significant source of municipal capital funding for the Project over the long term.

5.5 Economic Impact Analysis

Waterfront Toronto retained urbanMetrics Inc. (urbanMetrics) in 2014 to complete an analysis of the potential economic impacts generated by long-term future construction activity in the Port Lands beyond 2023. This was part of a larger study looking at the various benefits likely to be generated by planned revitalization investment programs over a ten-year period between 2014 and 2023.

As requested by the Province, and as part of the due diligence program, PricewaterhouseCoopers (PwC) was retained to conduct a peer review of the urbanMetrics report. In particular, PwC was asked to analyze the urbanMetrics report and opine on the following:

- urbanMetrics' calibrations of its proprietary input-output model;
- Estimated expenditures and industry categorization used to estimate economic impacts for the Project and Port Lands future development;
- Assumptions used in analyzing the economic impacts; and
- Interpretation of the economic impact model's results.

PwC concluded that while the applied methodologies were reasonable, certain minor aspects of the methodology could be improved, such as using a more current Statistics Canada input-output model and a slightly revised discount rate.

In light of more recent development data produced through the ongoing planning in the Port Lands, as well as the PwC recommendations, urbanMetrics was engaged to update their analysis of the economic benefits associated with the Project.

urbanMetrics projected the following economic impacts of the Project, which are stronger than their earlier 2014 estimates:

- $1.1 billion in value to the Canadian economy;
- 10,829 person years of employment; and
- $373 million in tax revenues to all orders of government.

The economic benefits associated with the First Gulf/Unilever site proposal were not included in the urbanMetrics' calculation. The 2016 study further provides a high level review and update of the potential economic impacts that could ultimately be generated by new construction in the Port Lands at full build-out (not including First Gulf/Unilever). The report concluded that this future construction activity is ultimately expected to generate:

- $4.0 billion in value added to the Canadian economy;
- 41,100 person years of employment; and,
- $1.5 billion in revenues to the three orders of government.

These estimates are in line with previous projections in the urbanMetrics Waterfront Toronto 2.0 Economic Impacts of Planned Investment (2014-2023) report.

Flood Protection and Future Development of the Port Lands Will Generate

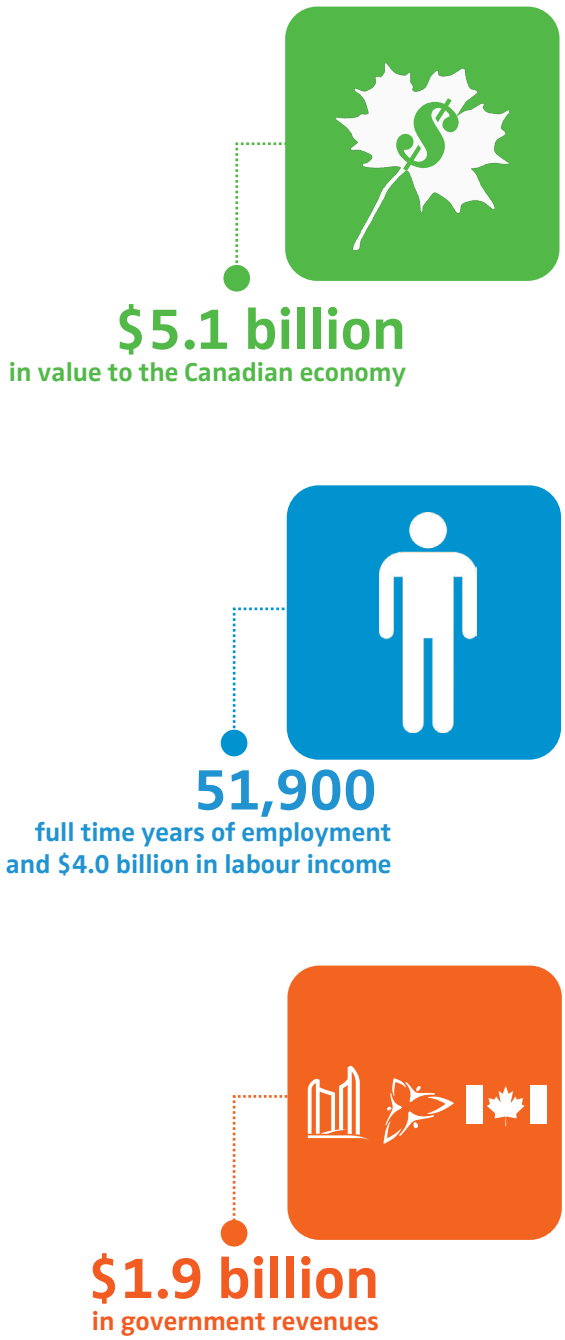


Figure 35 Selected *Economic Impacts*

6. Procurement Strategy

Developing a procurement strategy that is aligned with a project's unique characteristics and challenges is a critical step on the path to successfully delivering major infrastructure. Key elements of a procurement strategy include: packaging components for efficient delivery; selecting the optimal project delivery option(s); and determining contracting format(s) and contract terms.

6.1 Component Packaging for Procurement Analysis

For the purpose of procurement analysis, the components of the Recommended Scope identified in **Figure 33** were grouped into four categories:

- Potential advance work, including Essroc Quay Lakefilling (eastern portion of **Scope Item** 1), Cherry Street Bridges North and South (**Scope Items** 14**b/c**), Commissioners Street Bridge North (**Scope Item** 15**b**)[1];
- Park programming and landscaping work, including Promontory Park South, River Park North, and River Park South (**Scope Items** 17**b**, 20 and 21);
- Stand-alone work, consisting of features located outside the primary project boundary, including those affecting privately-owned property slated for development (i.e., **Scope Item** 9: First Gulf/Unilever Site Flood Protection Landform and **Scope Item** 12: Eastern Avenue Flood Protection); and
- Core work (representing about 80 per cent of the estimated overall construction value and including all remaining Scope Items).

Logistical factors were the principal consideration in establishing these packages and assigning Project components to them. The nature of required resources and expertise was also taken into account. Dividing the Project components this way allows for construction to start as soon as possible, and to find efficiencies and cost savings related to delivering similar work components.

6.2 Context for Delivery Option Selection

Flood protection is a unique form of civil infrastructure. Although international precedent does exist (mostly in the Netherlands), there are few, if any, projects of truly similar scope and scale that have been completed in Canada. This must be taken into consideration when weighing delivery options for the Project. Some salient features of the Project and its environment must be considered when evaluating potential delivery options, such as the fact that the entire Project site is a brownfield, consisting of reclaimed land built over a marsh, surrounded by water and connected to the lake. Consequently, soil and groundwater environmental issues are central to the Project; their scale in proportion to the overall scope has significant implications for the Project's risk profile as well as the potential – and corresponding limitations – for risk transfer. Another important feature of the project that should be considered in evaluating delivery options, is that there is no established

1 The identification of specific scope components as potential advance work represents one possible scenario, which forms the basis for the work presented in this Due Diligence report, but which is subject to change. The Project Team has and will continue to assess whether there are other scope items that could be advanced. As announced on September 14, 2016 by representatives from the three orders of government, funding has been allocated to accelerate the design and construction of all of Scope Item 1, rather than just the eastern part, as described above.

environmental regulatory process governing the creation of a river through environmentally compromised lands (discussed in more depth in **Section 7.3: Permitting and Approvals**).

6.3 Assessment of Delivery Options

Over the past decade, Ontario and other Canadian provinces have been utilizing public-private partnerships (P3s) to deliver large scale social and civil infrastructure projects. P3s are one of a number of alternatives to the conventional, sequential Design-Bid-Build (DBB) contracting process, each of which aims to address, to some degree, the widely-acknowledged problem of construction cost overruns and other drawbacks of the DBB approach.

Ernst and Young Orenda Corporate Finance Inc. (EY) was engaged to help assess the numerous delivery options by performing market sounding and undertaking comprehensive qualitative and quantitative analyses using industry standard decision support tools. The process and results are detailed in the appended EY report. Our peer reviewers also provided opinions on the applicability of delivery options that informed our ultimate recommendation.

EY began by applying PPP Canada's P3 Screen – Suitability Assessment tool, which evaluates P3 applicability using 12 criteria. Market sounding was undertaken to gauge the level of market interest, capability, and capacity for delivering the Project, with a focus on P3/AFP delivery potential. The process leveraged a cross section of P3 industry intelligence, including general heavy civil and specialty contractors experienced with P3 delivery of similarly-scaled works, infrastructure developers/operators, lenders, and equity investors.

Industry participants were generally of the opinion that:

- Under a P3 model, the private sector will accept risk transfer for known or reasonably inferable conditions; however, uncertain site conditions and environmental approval risks would not be acceptable and would have to remain with the public sector;
- The selected delivery model should:
  - allow for early contractor involvement (constructability input); and
  - maximize opportunities for industry to provide innovation;
- The value of potential operations and maintenance scope does not appear sufficient to justify inclusion of these elements in a P3 procurement; and
- It is unlikely that 100 per cent of the design/construction scope can be bundled into a single efficient P3 procurement.

Of the possible P3 options, Design-Build-Finance (DBF) was considered by market sounding participants to be the most appropriate of the P3 alternatives.

Next, a list of conventional and P3 delivery options was developed for a deeper review (see **Figure 36**). Using a qualitative assessment process, a panel of senior project delivery staff from Waterfront Toronto, the City of Toronto, Infrastructure Ontario (IO), TRCA and the Ontario Ministry of Transportation identified the preferred conventional and P3 options to undergo a Value for Money (VfM) analysis: Construction Manager/General Contractor (CM/GC) and DBF.

The less preferred conventional options included DBB and Design-Build (DB). DBB, the most commonly used delivery method for civil infrastructure projects, is considered well suited

Traditional Models	
Design-Bid-Build (DBB)	The most common method of infrastructure procurement by the public sector. Design and construction are performed sequentially by a design consultant team and a construction contractor retained under separate contracts. The completed infrastructure asset is then handed over to the public sector for operation and maintenance.
Design-Build (DB)	Integrates the design and construction functions within a single team and contract, providing the public sector with a single contractual point of responsibility through the end of the construction phase.
Construction Manager/General Contractor (CM/GC)	A two-phase process typically adopted in order to accelerate project delivery. In the first (design) phase, the public sector contracts with a design consultant team to design an infrastructure asset, and also retains a construction contractor to work with the consultant to develop the project. Once the design is sufficiently advanced, the CM and the public sector may agree on a Guaranteed Maximum Price (GMP), which is based on the construction documents and specifications at the time of the GMP plus any reasonably inferable items or tasks. In the second (construction) phase, the CM provides the services of a general contractor, including competitively tendering sub-trade contracts, and takes on the risk of completing the agreed scope of work at or below the GMP, if one has been agreed.
P3 Delivery Models	
Build-Finance (BF)	Similar to DBB, but with the addition of a financing component, which puts private capital at risk in order to incentivize timely construction completion and handover.
Design-Build-Finance (DBF)	Similar in many respects to DB, but with the addition of a financing component, which puts private capital at risk in order to incentivize timely construction completion and handover. Under a DBF contract, the private sector assumes responsibility for the majority of the design work, all construction activities, and the short-term financing, and the risk of providing these services for a fixed fee.

Figure 36 *Summary of Procurement Options*

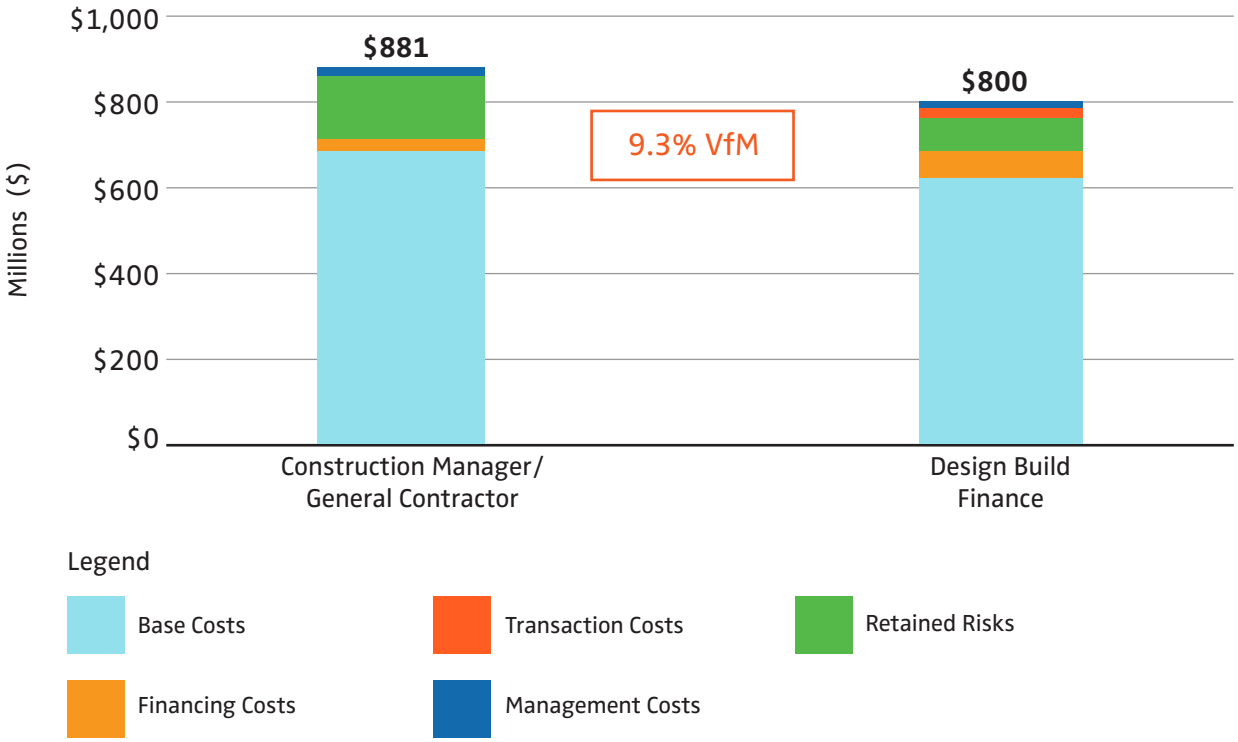


Figure 37 *Procurement Options - Value for Money Assessment*

to recurring, repetitive projects for which the public sector has a desire to specify its exact requirements and obtain firm, competitive prices based on a complete design. Key disadvantages of DBB are that the design is fully developed without the benefit of construction expertise, the highly prescriptive design requirements further limit potential innovation during construction, and the public sector retains the risk for design errors and omissions. DB partially overcomes these disadvantages by combining design and construction responsibilities in a single procurement, allowing for greater risk transfer, but this comes at the cost of reduced public sector control over design decisions.

The CM/GC delivery method augments the traditional scope of work of the general contractor with that of a construction manager under a single contract. This provides a number of benefits for projects with sensitive schedules and potential constructability challenges that require special qualifications and extraordinary contractor cooperation. The early collaboration characteristic of the CM/GC approach, with ongoing owner-consultant-CM integration through the planning and design phases, allows for the efficient assessment of alternatives and innovation proposals, and enables the owner to make informed decisions on design options based on construction expertise. This helps to avoid costly change orders, decrease risk, optimize the construction schedule and minimize public impact. However, detailed implementation must be carefully managed to ensure that the benefits provided by competitive tension are not lost.

VfM is a quantitative analysis methodology intended to be used by the public sector as a decision-making tool to support and justify the selection of a project delivery model. This is undertaken separately from the budget-setting

process. Risk-adjusted costs are used to compare a P3 option with a Public Sector Comparator, in this case DBF and CM/GC, respectively (See **Figure 37**). Just like any business case or investment analysis, VfM is based on a number of critical estimates and assumptions, and on the judgement of those undertaking the analysis. While the fundamental concept behind VfM analysis is common to many jurisdictions, the specific assumptions and detailed application vary from place-to-place.

A fundamental principle underlying VfM analysis is the appropriate allocation of risk between the public and private sectors. The foundation for risk allocation is based on the premise that the party that is able to manage a given risk most efficiently (i.e., at the lowest cost) should assume that risk. In general, the private sector can better manage business-related risks, the public sector is better suited to handle regulatory risks, and some risks can and should be shared.

6.4 interpretation of Results

A clearly preferred single procurement option did not emerge based on applying standard qualitative and quantitative assessment procedures. This result can be explained, in part, by the fact that both DBF and CM/GC are designed to align owner/contractor objectives, reduce risk, and drive better project outcomes than conventional DBB delivery, albeit in fundamentally different ways. Both options have strengths and weaknesses. For example, the DBF model provides a high degree of competitive tension and a range of incentives aimed at improving contractor and project performance while the early collaboration inherent in the CM/GC approach, with ongoing owner-consultant-CM integration through the planning and design phases, allows for the efficient assessment of alternatives and innovation proposals. Detailed implementation must, however, be carefully managed to ensure that the benefits provided by competitive tension are not lost.

6.5 Project-Specific Procurement Principles

Since the EY procurement assessment results did not produce a clear preferred option, the Project Team collaborated with IO and jointly established a comprehensive set of procurement principles to guide the development of a customized, project-specific delivery solution (see **Figure 38**).

1. CONDUCT OPEN, FAIR, TRANSPARENT, AND COMPETITIVE PROCUREMENT
a. Comply with Waterfront Toronto's approved procurement policies in order to ensure fair, open, and transparent procurement. b. Competitively procure all work in order to achieve best value. c. Attract the best local and global innovators with relevant, suitably scaled construction experience and create the conditions required to maximize value and secure competitive pricing.
2. MANAGE OCCUPATIONAL HEALTH AND SAFETY COMPLIANCE RISK
a. The public sector (Waterfront Toronto, Infrastructure Ontario, the City of Toronto, and/or any other delivery partners) will not assume the Constructor role and must not be exposed to any liability for ensuring compliance with Occupational Health and Safety legislation.
3. MANAGE RISK APPROPRIATELY
a. Transfer risk to the private sector to the greatest extent reasonable to do so, consistent with the private sector's ability to price and manage such risk. b. If and where appropriate, procure integrated design and construction services. c. Ensure that the public sector is equipped with the necessary information, mechanisms, and contingency to effectively manage the residual risk it may be required to retain. d. Limit the number of separate procurements (using a smaller number of larger contracts).
4. PRE-CONSTRUCTION PLANNING AND PROCUREMENT READINESS
a. In order to complete critical pre construction planning tasks, ensure timely collaboration between a contractor and the Owner and its consultants to address: i. construction logistics planning (staging, access, interfaces) ii. constructability evaluation iii. innovative technology identification and suitability assessment (with respect to earthwork, soil and groundwater management, etc.) iv. value improvement/engineering support v. cost estimating, scheduling, risk evaluation, and scope management support; and vi. contract packaging strategy development without creating a conflict of interest when procuring one or more of the work packages. b. Prior to procuring specific work packages, complete sufficient design, site characterization, and other further analyses, and establish requirements, processes, and constraints (with respect to project performance, interfaces, and interaction with regulatory authorities, etc.) to the extent required to achieve reasonable certainty regarding the scope and conditions of work, accomplish effective risk transfer, and procure firm pricing.
5. ENCOURAGE INNOVATION
a. Create conditions and provide incentives to facilitate innovation with respect to design, technology, construction means, methods, and logistics, etc., to achieve best value with respect to cost, time, quality, and construction execution (e.g., minimizing disruption to the public and businesses).
6. ALIGN PRIORITIES AND INCENTIVIZE VENDOR PERFORMANCE
a. Include mechanisms or strategies to limit and manage integration risk with adjacent works, in order to ensure safe working conditions and avoid potential delays and claims. b. Include mechanisms to encourage the Contractor to collaborate with the Owner in developing appropriate and cost effective responses for addressing any conditions and circumstances differing from those known at the procurement stage.

7. MANAGE INTEGRATION AND CHANGED CONDITIONS RISK
a. Include mechanisms or strategies to limit and manage integration risk with adjacent works, in order to ensure safe working conditions and avoid potential delays and claims. b. Include mechanisms to encourage the Contractor to collaborate with the Owner in developing appropriate and cost effective responses for addressing any conditions and circumstances differing from those known at the procurement stage.
8. ACHIEVE DESIGN EXCELLENCE
a. Ensure design is optimized to address maintenance/life cycle considerations. b. Encourage integrated design of project components. c. Utilize Michael Van Valkenburgh and Associates (MVVA), who were selected through a competitive international design competition, to ensure that the competition-winning vision is achieved and that the final product provides a high quality of place and an excellent user experience. d. Complete the project within the approved budget.
9. MANAGE MARKET UNCERTAINTY TO CONTAIN COST
a. Waterfront Toronto to lead the procurement and implementation with the support of other public agencies as appropriate, using forms of contract and contract terms (including flow through provisions mandated by Federal, Provincial, and municipal governments) already accepted in the broader Ontario and Canadian construction markets. b. Establish and communicate clear roles and responsibilities for public stakeholders with respect to project delivery oversight, support, and approval.

Figure 38 *Procurement Principles*

6.6 Recommended Project Delivery Option

Considerable effort has been invested in assessing the fit of the DBF and CM/GC delivery models to the Project, which has led to the conclusion that each of these options has merit. A comprehensive set of principles has been jointly formulated by the Project Team and IO to guide the development of a customized project delivery solution, which can be tailored to meet the needs of this unique and multi faceted Project and which will:

- Allow for the segmentation of the project into components that can be procured in the most appropriate and advantageous fashion consistent with the procurement principles:
- Enable procurement of integrated design and construction services (design-build) for specific Scope Items, where appropriate to do so;
- Provide for the acquisition of a full range of pre-construction planning services and as and where necessary during construction, the assumption of construction logistics planning and Occupational Health and Safety compliance at the Project site;
- Transfer risk where this can be done at reasonable cost and encourage collaborative management of residual risk that must be retained by the public sector and facilitate early owner-consultant-contractor collaboration to progressively reduce risk; and
- Allow for early constructive engagement between regulatory authorities and the full delivery team, particularly with respect to innovative design and construction approaches.

Figure 39 summarizes at a high level the assessment of delivery options and provides a preliminary indication of the specific Scope Components (or portions thereof) to which a given approach might be applied. The proposed delivery approaches are subject to change based on the constructor's input and as additional information becomes available. Project Components listed below are not intended to illustrate the proposed organization of scope for construction tendering purposes.

The proposed delivery approaches presented all presuppose a financing element as part of the overall delivery solution. In this instance, financing does not refer to project finance and the complex lending agreements it entails, but rather denotes the payment regimes and related mechanisms defined in Principle 6(b). The use of tools such as milestone payments and increased retainage (beyond the statutory holdbacks required under construction lien legislation) provide additional financial incentive for the constructor and its subcontractors to meet required performance standards, such as schedule and quality compliance, and can be accommodated through traditional corporate lending to these entities.

Once the Project moves into implementation, the appropriate procurement approach for each component will be determined in consultation with the constructor, the Project Team and partner agencies (i.e., TRCA, TPLC, IO) and will be presented to the Project's Executive Steering Committee and Waterfront Toronto's Board of Directors for endorsement.

Proposed Delivery Approach	Project Components
Transfer construction (and potentially detailed design) responsibility to Gardiner East project delivery team	13 Lake Shore Road & Rail Bridge Modifications 11 Flow Control Weirs 10 Sediment & Debris Management Area
Transfer detailed design and construction responsibility to site owner/developer	9 First/Gulf Unilever Flood Protection Landform
Procure as stand-alone construction contract, upon completion of detailed design	12 Eastern Avenue Flood Protection
Procure integrated design and construction (design-build) services through the constructor for the Scope Item as a whole, subject to outcome of further feasibility assessment	1 Essroc Quay Lakefilling 14b Cherry Street Bridge North (incl. BRT) 14c Cherry Street Bridge South (vehicular only) 15b Commissioners Street Bridge (vehicular only)
Procure integrated design and construction (design-build) services through the constructor for selected portions of the Scope Item (e.g., earthwork aspects), subject to outcome of further feasibility assessment	2 Polson Slip Naturalization 3 River Valley System 4 Don Greenway (Spillway & Wetland) 8 Don Roadway Valley Wall Feature 19 Villiers Island Grading
Procure construction services through the constructor, once detailed design is complete, or sufficiently advanced	2 Polson Slip Naturalization * 3 River Valley System 4 Don Greenway (Spillway & Wetland) * 5 Site Wide Municipal Infrastructure 7a Don Roadway North 8 Don Roadway Valley Wall Feature * 14a Cherry Street Re-alignment (incl. BRT) 14d Old Cherry Street Bridge Demolition 15a Commissioners Street West (incl. BRT) 15c Commissioners Street East (vehicular only) 16 Keating Channel Modifications 17b Promontory Park South 19 Villiers Island Grading * 20 River Park North 21 River Park South
Delivery approach to be determined in consultation with Hydro One upon confirmation of requirements	18 Hydro One Integration
* Includes final grading, finishes and potentially earthworks if Design-Build does not prove feasible.	

Figure 39 *Proposed Procurement Approaches*

7. Implementation Plan

7.1 Implementation Approach and Team Organization

In the near term, executive level leadership of the Project will continue to be provided by the Executive Steering Committee, which comprises senior executives from Waterfront Toronto, TRCA, and the City of Toronto. Given the nature and scale of work required to implement the Project, and the many critical decisions that lie ahead, a detailed review of Project governance requirements would be conducted as part of implementation planning, and the composition and mandate of the Executive Steering Committee would be confirmed or modified as necessary. A Project Charter will be created, which will document the responsibilities and accountabilities of Waterfront Toronto and its partner organizations, and the ultimate governance structure and approval processes.

Waterfront Toronto will assemble an expanded project management team, which will utilize some of the same key staff and supporting resources who have led the due diligence program, to implement future phases of the Project (including design, field investigation and pilot testing, securing regulatory approvals, detailed construction planning and procurement, and construction). To ensure effective and efficient delivery, current resources would be augmented with the necessary additional project management and subject matter experts, drawn from the collective resources of Waterfront Toronto and its partner organizations TRCA, the City of Toronto, and TPLC, and potentially other public agencies and consultants.

The on-going roles of the key consultants will be assessed and the scope of their roles and responsibilities adjusted, as necessary, to align with the detailed procurement strategy. For example, should it be determined that integrated design and construction services will be procured for certain components of the Project, the design consultant could transition to the role of compliance consultant, once performance specifications have been developed for a design-build procurement.

The need to ensure Project Team continuity was identified through the peer review, which concluded that:

> *"The project team is qualified and experienced, and capable to manage this complex project. We found that the project team thoroughly understands the problems involved and has clear ideas to solve them. The knowledge they have accumulated is vital and the continuity of the project team is a key factor to success." [Rijkswaterstaat]*

The peer review also emphasized the importance of carefully defining roles and responsibilities with respect to the design of the Project, noting that:

> *"The quality of the design is of high level. The design as a whole will enhance the spatial quality of the Port Lands immensely and its positive effect on Toronto cannot be overstated. However, it will be a challenge to maintain or even enhance this level in the subsequent design, procurement and construction phases." [Rijkswaterstaat]*

The Project Team proposes to retain a constructor, to take on pre-construction planning and construction phase responsibilities as described in **Section 6: Procurement Strategy.** The constructor would be selected through a two-stage process (a request for qualifications followed by a request for proposals from pre-qualified firms or teams) based on a range of criteria, including:

- Demonstrated experience in completing major river, coastline infrastructure;
- Contracting team experience in completing comparable works;

- Demonstrated ability to work strategically in sub-trade packaging;
- Ability to drive innovation through design and tendering processes;
- Overall cost and transparency in the determination of general conditions expenses;
- Contracting team fit with Project management team;
- Proposed plan to deliver required services; and
- Additional services and bid innovation offered in proposal.

The project management team will develop a comprehensive Project Execution Plan, which will more fully set out the scope, detailed budget, schedule, risk management framework, delivery organization, approval requirements and milestones, contracting, construction staging and interface management strategies, and project control processes. In order to meet the Project delivery schedule, preparation of the Project Execution Plan would begin immediately, incorporate the outcomes of joint pre-construction planning with the constructor, and be subject to approval by the Executive Steering Committee.

The project management team and the constructor would work together to develop and implement a risk management framework that builds on the risk assessment work completed as part of due diligence. In addition to maintaining the risk register, quantitative risk analysis will be performed on a regular basis during Project execution. Permitting and regulatory requirements are an important element of this Project and it will be a priority for the constructor to work with the Project Team to advance discussions with regulatory authorities to progressively reduce regulatory risk.

Realistic contingencies, controlled by the Project Team under executive oversight, will be held in reserve to address challenges faced through all stages of Project delivery.

7.2 Climate Change Considerations

Climate change considerations were a core tenet of the DMNP EA from the beginning and were central to the flood protection features designed as part of the naturalization of the mouth of the Don River. A variety of passive and active adaptive management approaches for hydraulic and ecological variables have been incorporated into the design, such as:

- The wetlands have been designed to ensure a significant amount of bathymetric variability to address lake level fluctuations as a result of climate change. With undulating bathymetry, there will remain a diversity of wetland habitats and functions regardless of lake level changes;
- The valley system has been designed to accommodate water flows equivalent to a Hurricane Hazel-sized flood event, plus an additional 0.5 metres of water clearance to allow for increases in flood flow due to climate change;
- The wetland control structure will allow for the wetland to be temporarily closed off from Lake Ontario. This will allow the system to draw down the water in the wetland to encourage regrowth of species in the event of disruption due to prolonged high lake levels, ice damage or other causes that may result from climate change; and
- Flow control weirs will to divert river flows during high frequency flood events into the Keating Channel, thereby reducing the effects of highly erosive storm flows on the naturalized habitats. Furthermore, a passive design element, in the form of the Spillway, has been integrated to help disperse the erosive energy of water during a major flood event by directing water into the Ship Channel. This mitigates the potential damages caused by large flood events.

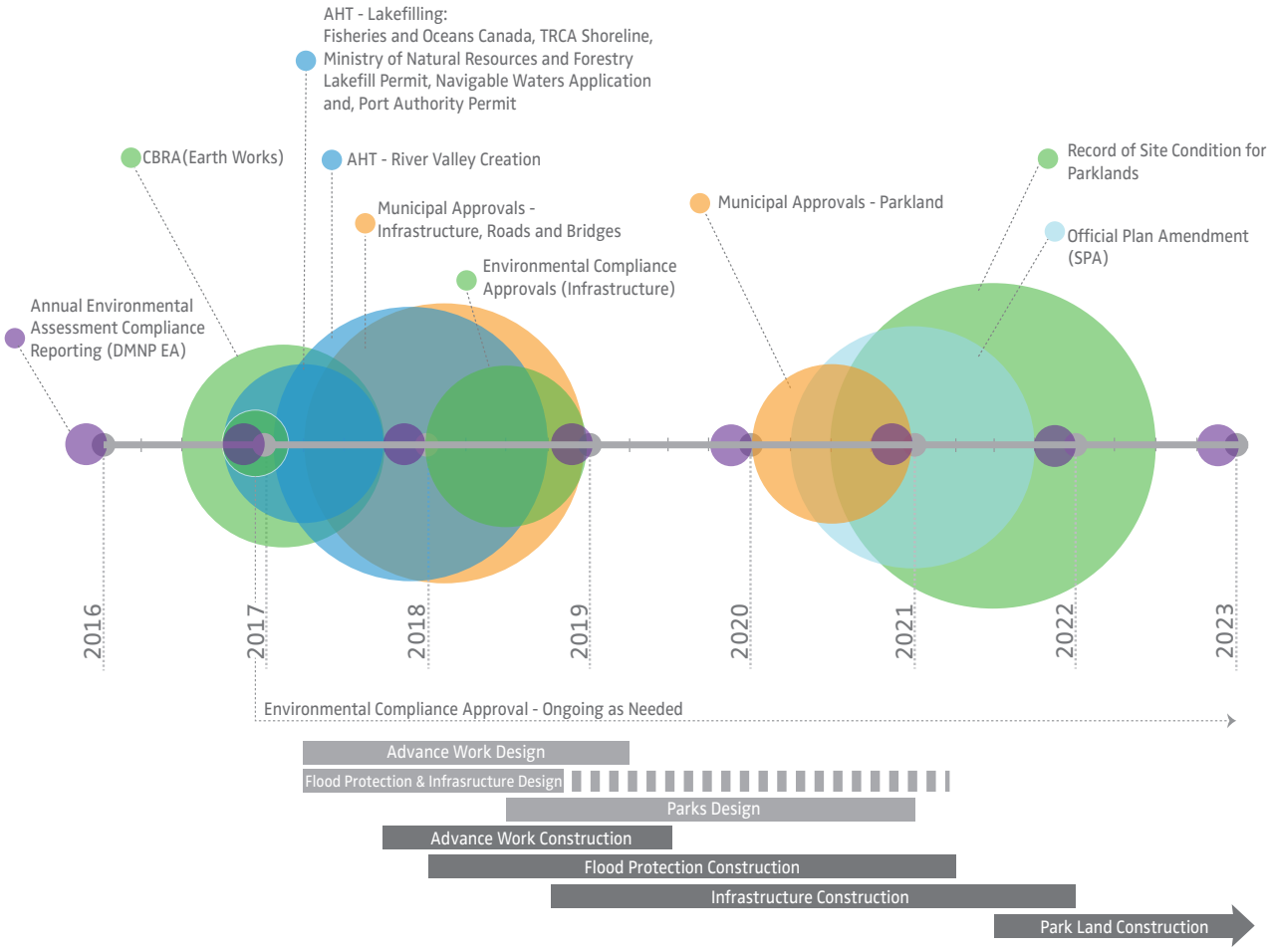


Figure 40 *Approvals Timeline*

7.3 Permitting and Approvals

Two key environmental assessment approvals have already been secured from the MOECC (the DMNP EA and LDL MP EA, received in 2015 and 2014, respectively), which serve as the blueprints for the flood protection and enabling infrastructure detailed in this report.

The environmental, planning, design and construction permitting and approvals applicable to delivering this Project are unique, but based on early engagement with MOECC and Aquatic Habitat Toronto (AHT) are considered to be achievable with diligent planning and management. **Figure 40** maps out the necessary approvals, their timing and the activity for which they are required.

It is important to note that given the unique character of this Project, the approval processes for some of the key Project components, such as the river creation and soil and groundwater management, are being developed in collaboration with regulatory authorities. As a result, the environmental management framework for the Project includes completing a Community Based Risk Assessment (CBRA) for the entire project area (consistent with the MOECC draft CBRA guidance document). In general, the CBRA uses the same technical and scientific practices used in Brownfield approvals. Records of Site Condition (RSC) for individual sites, where applicable, will be completed in accordance with O. Reg. 153/04. This CBRA and RSC approach has been discussed and preliminarily agreed upon with the MOECC, AHT

and project partners (City of Toronto, TPLC and TRCA). Given the uncertainties associated with the environmental conditions and complexity of the Project, ongoing involvement and concurrence with the environmental management approach from local (TRCA, City of Toronto), provincial (MOECC, Ministry of Natural Resources and Forestry), and federal (Fisheries and Oceans Canada, Transport Canada – Navigable Protection Act) regulators is critical to the successful and timely delivery of the Project.

Planning Approvals

- *Creating the Water Lot*: Thirteen properties will be merged to create the water lot (i.e., the river and floodplain), all of which are currently owned by TPLC. This merger will be done in compliance with the *Planning Act* RSO 1990 and will be achieved either by *Planning Act* exemption from subdivision control and/or Conservation Authorities Act section (24), depending on if the water lot will be owned by the TRCA, City of Toronto, or another public entity.
- *Official Plan Amendment to remove the Flood Plain and Special Policy Area designation:* The subject lands are within a Special Policy Area in the former City of Toronto Official Plan (currently in-force). An Official Plan Amendment (OPA) is not needed to complete the Project as flood protection construction is permitted under the Special Policy Area designation. However, an OPA will be required to remove or alter the Special Policy Area designation and boundary to change the land use designation and official plan policies to allow for future development, and to re-designate the new river valley and floodplain as Natural Areas within the Official Plan. The OPA to designate the new river valley is anticipated to be submitted to City Council for approval in early 2017. A separate OPA will be required to lift the Special Policy Area designation at a later date. The City of Toronto, TRCA and appropriate provincial ministries (Ministry of Municipal Affairs and Housing and Ministry of Natural Resources and Forestry) will be consulted in a timely manner consistent with development related enabling works.
- *Lakefilling:* The Port Lands are subject to the former City of Toronto Official Plan, which contains policies restricting lakefilling in Lake Ontario. Prior to commencement of the lakefilling around Essroc Quay, a Zoning by-law will need to be enacted by City Council identifying the use to which the land created by lakefilling may be put.

Environmental permitting and approvals

- *Community Based Risk Assessment (CBRA):* The environmental regulatory framework in Ontario (i.e. Brownfields regulation) deals only with contamination within a single continuous property. Given the size of the Project area and the volume of soil movement required, the Project cannot be completed within this regulatory framework. To address this challenge, Waterfront Toronto has engaged the MOECC and AHT in the development of a CBRA solution that will be applicable to the entire Project area. This approach allows all the lands to be treated as a contiguous property for the purpose of evaluating the environmental conditions and developing a plan to ensure protection of human health and the environment, and obtaining the concurrence of all the regulators and agencies with the proposed approaches and assessment. Ongoing reporting and agency involvement and consultation will likely be required through construction. This ongoing involvement will likely result in project modifications to address issues that may emerge due to changes in environmental conditions and the

expectations of agencies/regulators. Once the Project is completed, development areas will be transitioned to segregated sites and would generally be subject to the MOECC Brownfields regulatory approval process for any future work and development.

Aquatic Habitat Toronto (AHT) Coordinated Approvals

- *Land Creation / Lake Filling & River Creation:* The Essroc Quay land creation will impact fish habitat, navigable waterways and usable dockwall space and, as a result, approvals will be required from the Department of Fisheries and Oceans Canada, Transport Canada and Ports Toronto. This will be undertaken as a comprehensive process given that both the land creation/lake fill and the river creation are so closely interrelated in terms of fish habitat and port/transportation related issues. We will work collaboratively with AHT to develop a phased approach to enable the land creation/lake fill to occur in advance of the river creation. AHT will also provide guidance and advice throughout this process to help clearly define, develop solutions and as a result expedite the process. Ongoing reporting and regulator involvement and consultation will also be required during construction to respond to refinements and/or modifications to the design that will occur as a result of unknown site conditions.

Some additional environmental permits and approvals may be required. The Table below provides a summary of the anticipated environmental review and approval processes that would be required.

Permit/Application	Managing Authority	Required Response
CBRA	MOECC/AHT	Acknowledgement
Record of Site Condition for Parklands[1]	MOECC	Acknowledgement
Fisheries Act	AHT/DFO	Approval
Environmental Compliance Approval[2]	MOECC	Approval
Lakefill: Public Lands Act Approval and Lakes and Rivers Improvement Act Permit	MNRF	Approval/Permit
Shoreline Development Approval	TRCA	Review Only
Permit-to-take-water	MOECC	Approval
Species at Risk	MNRF	Permit
Migratory Bird Conservation Act	Environment Canada	N/A
Navigation	Transport Canada	Approval
Harbour Master Authorization	Ports Toronto	Authorization

1. Application includes supplemental Phase One and Phase Two ESA and Risk Assessments.
2. Aspects of the work would require City of Toronto approval to discharge to sanitary or storm sewers.

Environmental Assessment Compliance

- DMNP EA approvals included a requirement for Annual EA Compliance Monitoring Reports outlining the progress of the DMNP EA Project design, implementation and post-implementation stages. TRCA, with the support of Waterfront Toronto and the City of Toronto, completed the EA Compliance Monitoring Program and the first Annual Report in early 2016.
- Waterfront Toronto will work with TRCA, to ensure that all future Annual EA Compliance Monitoring Reports are completed on time as specified in the approved EA Compliance Monitoring Program.

Design Approvals and Construction Permits

- *Municipal Approvals:* Waterfront Toronto will work closely with the TRCA and City of Toronto as the future owners of the Project throughout the design, implementation and commissioning of the Project. This will include obtaining formal sign-off on design details for infrastructure, roads, public realm and parks. All necessary permits will be obtained before commencing construction, such as Toronto Public Utilities Coordinating Committee Clearance, Utility Cut Permit, Shoring and Piling Permit, Road Closure Permit, Municipal Servicing Approval, Streetscaping Approval, Parks Approval, Tree Removal Permits and Building Permits. Waterfront Toronto has been successful at developing streamlined approval processes for past projects and will work collaboratively with City and TRCA to do the same for this Project.
- *Construction Permits:* Once retained, it is expected that the contractor will comply with all permits obtained for the Project. In addition, there are specific permits that correspond to activities during construction, such as Construction Traffic Management Approvals, Ports Toronto Construction Permit and Noise Exemption Bylaws, which would be the responsibility of the contractor to obtain.

First Nations

Elements of the Crown's Duty to Consult with First Nations continue to be delegated to the co-proponents for the DMNP EA. Direct engagement with First Nations are required for specific permit related activities, such as the proposed CBRA approach, and the *Fisheries Act*, and Ports Toronto and *Navigation Protection Act* permits. LDL MP EA and DMNP EA approvals also clearly identify a need for continued engagement with First Nations throughout the design, implementation and post-implementation periods of the Project.

7.4 Legacy Ownership

Currently, the majority of properties in the Project area are government-owned (Toronto Port Lands Corporation (TPLC), Waterfront Toronto, The City of Toronto and Ports Toronto), with only six privately held parcels.

Upon completion of the Project, privately held properties will remain unchanged. The process for transferring ownership of newly created assets will be finalized in consultation with our government and agency partners and is anticipated to be as follows:

- The newly created river, aquatic habitat, sediment management basin, the Keating Channel and the spillway (from top of bank down) will be owned by TRCA;
- Roads, bridges and parkland (from the top of bank to adjoining roadways) will be owned and maintained by the City of Toronto; and

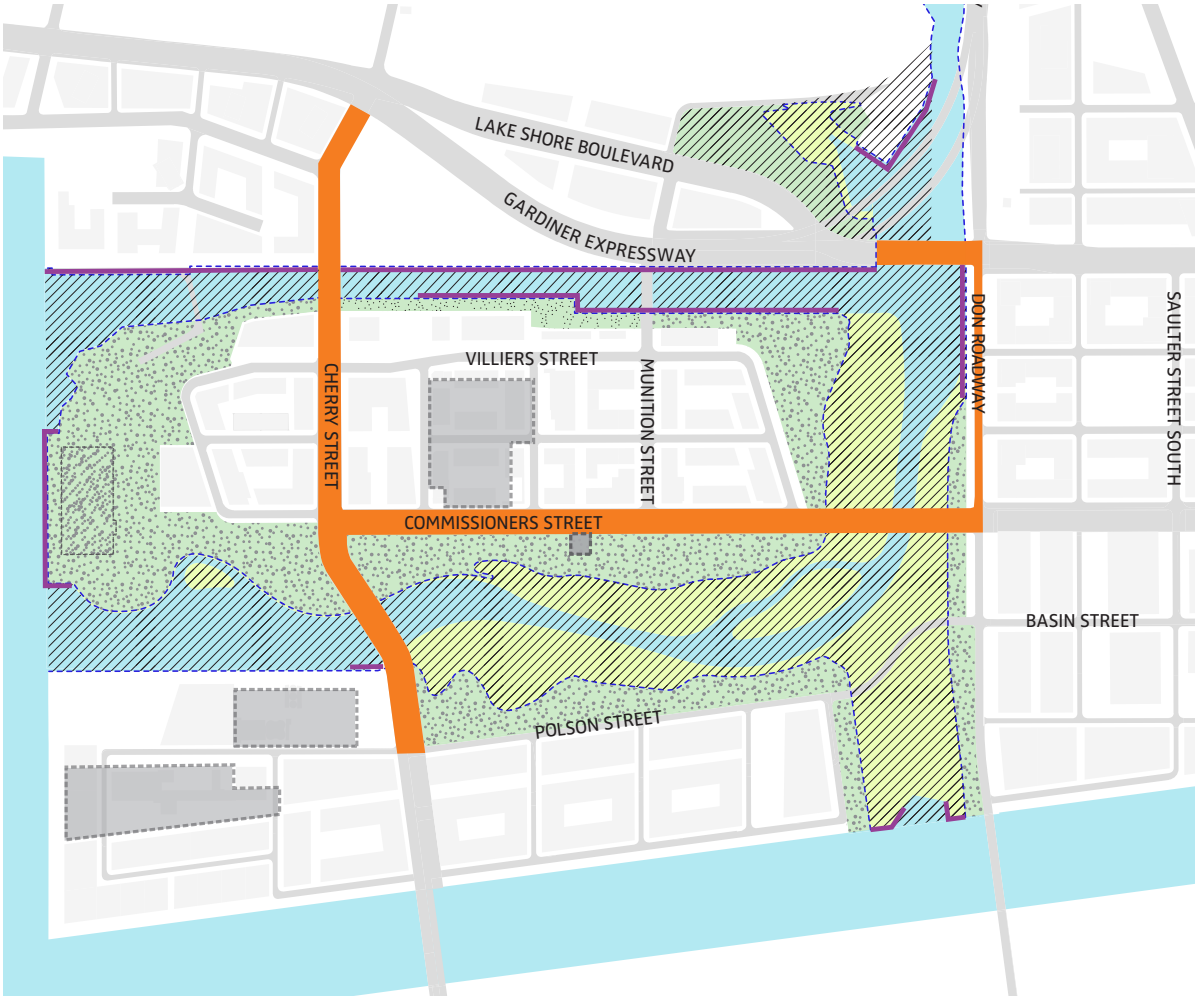


Figure 41 *Legacy Ownership*

- The disposition of the remaining lands targeted for development will be led by Waterfront Toronto. Once sold as individual sites, the private developers will be responsible for development and will be required to construct, or contribute costs towards, further enabling infrastructure within newly created development blocks. Roads and parkland created through these efforts will be owned and maintained by the City of Toronto.

A detailed review of dockwall ownership will be completed through the design phase of the Project to determine a long term, integrated plan that addresses ownership and maintenance of these structures. Only those dockwalls specifically impacted by the Project will be modified as a part of the Project.

7.5 Coordination

There are a number of other very large planned infrastructure projects with similar construction schedules as the Project and in locations that are within and adjacent to the Project site. In order to ensure the successful delivery of these projects, it is imperative that careful planning and coordination occur. Waterfront Toronto, together with the City of Toronto, Metrolinx and Infrastructure Ontario have committed to working collaboratively and have initiated a coordination committee for this purpose. This committee should be formalized, and should assess the potential impacts, risks and opportunities presented by these activities happening concurrently, and develop a coordinated schedule. It is also recommended that the procurement and delivery model selected for design and construction services for the Project provide the flexibility required to ensure integrated delivery with aligned goals and minimize conflict.

The following summarizes the Scope Items within the Project where close coordination with the neighbouring infrastructure projects identified in **Figure 42** will be required:

1. *Sediment and Debris Management Area and Flow Control Weirs:* The Sediment and Debris Management Area and Flow Control Weirs located on the west side of the Don River and north of the Lake Shore Bridge (**Scope Items** 10 and 11) are proposed as part of the Project. The details of the sediment and debris management areas and their operational designs will be further refined as part of the detailed design for the Project. Given the close proximity between this scope and that of the Gardiner East Expressway implementation construction coordination will be required.

2. *Lake Shore Road and Rail Bridge Modifications:* The Gardiner East EA proposes rebuilding the Lake Shore Boulevard Bridge over the Don River to provide sufficient width for six travel lanes, an eastbound left turn lane, as well as a multi-use trail and sidewalk. In addition, the Project identified that this bridge would need to be widened to ensure sufficient flood water conveyance (**Scope Item** 13). Coordination between the Project and the Gardiner East Project may result in efficiencies in the design of the Lake Shore Boulevard bridge.

3. *First Gulf/Unilever Flood Protection Landform:* A flood protection landform is required on the east bank of the Don River on the First Gulf/ Unilever site to permanently eliminate the risk of flooding to the east of the Don River (**Scope Item** 9). The design and implementation of this component of the Project will need to be undertaken in coordination with the adjacent or nearby projects being completed by others as well as the First Gulf/Unilever development plan.

4. *Cherry Street (North of the Keating Channel):* As part of the Project, Cherry Street north of the Keating Channel will be realigned to accommodate the relocation of the Cherry Street Bridge to the west (**Scope Item 14a**). As part of the Lake Shore Boulevard realignment and streetscape improvements it is required that the Project and Gardiner East teams work together to resolve the intersection of Lake Shore Boulevard and Cherry Street to ensure that there is a coordinated plan, with no duplication and/or gaps and a clear implementation strategy.

5. *Hydro One Bridge Modifications:* In order to reduce impacts on the flood water flows it is proposed that the Hydro One Utility Bridge that currently crosses over the Lower Don River be modified or replaced (**Scope Item 18**). Given the close proximity to the Metrolinx Rail Bridge, the Gardiner Expressway-DVP ramp and other nearby projects the construction schedule and scope of this work will need to be coordinated.

Figure 42 on the next page provides a map and a brief description of the projects being undertaken in sites adjacent to and/or overlapping with the Project.

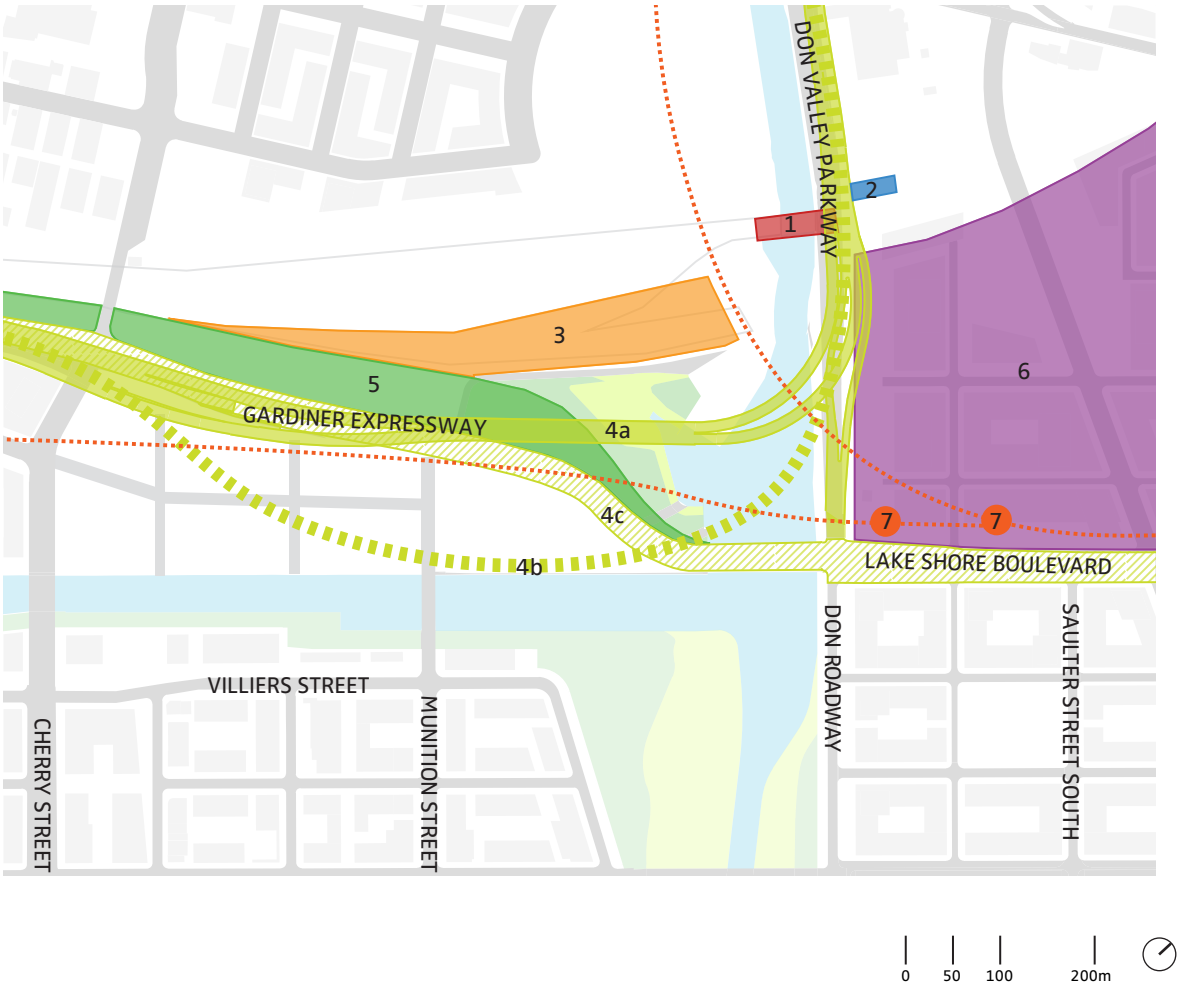


Figure 42 *Other Neighbouring Infrastructure Projects*

Legend

- 1 Don River Metrolinx Rail Bridge Widening/ Lengthening
- 2 GO Transit Electrification
- 3 Don Rail Yard Expansion
- 4a Gardiner Expressway East Hybrid 3 Implementation
- 4b Gardiner Expressway-Don Valley Parkway Ramp Demolition
- 4c Lake Shore Boulevard Realignment
- 5 Gardiner East Linear Public Space
- 6 First Gulf/Unilever Site
- 7 The Don River and Central Waterfront Project

1	**Don Valley Parkway Metrolinx Rail Bridge Widening/Lengthening:** The preferred Hybrid Three alternative for the Gardiner Expressway East includes lengthening the adjacent Metrolinx Rail Bridge across the Don Valley Parkway (DVP). This is necessary to accommodate the tighter radius of the more northern Hybrid Three alignment. Based on the concept design, it is anticipated that the eastern portion of the bridge will need to be widened and reconstructed to allow for better placement of the support columns/piers and enable the DVP-Gardiner ramp and Don Roadway to pass beneath. In addition, Metrolinx is proposing to add a fourth track on the bridge to accommodate Regional Express Rail. This additional track does not require a widening of the bridge, however, the recent announcement for a potential new station at this location that may straddle the bridge would require the widening of the bridge in order to accommodate platforms and/or additional amenities for the station at track level. Any widening of the bridge to accommodate a new station will need to avoid impacting the realigned DVP-Gardiner ramp.
2	**GO Transit Electrification:** To electrify the Lakeshore East Rail Corridor the following infrastructure will need to be built around the Don River/DVP area: an overhead contact system consisting of wires and the associated support structures running along the rail corridor; a traction power facility (TPF) that boosts voltage; and gantries that carry the power to/from the rail corridor. The TPF will be located north of the tracks and on the east side of the DVP, adjacent to a potential new station straddling the Metrolinx Rail Bridge across the DVP and Don River.
3	**Don Rail Yard Expansion:** In order to accommodate the larger fleet required for Regional Express Rail and the expansion of the Union Station Rail Corridor, including the additional fourth track along the Lakeshore East route, Metrolinx is proposing that its current yard located just west of the Don River be expanded further south.
4a 4b 4c	**Gardiner Expressway East Hybrid Three Implementation and Gardiner Expressway-Don Valley Parkway Ramp Demolition:** The City Council-approved Hybrid Alternative Three alignment for the Gardiner East Expressway includes demolishing the existing Gardiner East-DVP ramp and constructing a new ramp further north, as well as demolishing the eastbound and westbound Logan Ramps and constructing new ramps at Cherry Street. This project also includes realigning Lake Shore Boulevard between Cherry Street and Logan Avenue, and streetscape improvements to Lake Shore Boulevard.
5	**Gardiner East Linear Public Space:** The Gardiner East EA also proposed a linear public space to the north of the future Gardiner Expressway and Lake Shore Boulevard alignment that will connect the Don Valley and Lake Shore Boulevard East trails through the Keating Channel Precinct west along Lake Shore Boulevard.
6	**First Gulf/Unilever Site:** This development site is slated for redevelopment into a large commercial/retail employment node that would provide up to 50,000 jobs. Developer First Gulf initiated an OPA application to commence a policy review and to begin comprehensive planning of the Unilever site and adjacent lands.
7	**The Don River and Central Waterfront Project:** The Don River and Central Waterfront Project proposes installing new deep underground infrastructure that will capture and treat combined stormwater and sanitary sewer overflows before they enter Toronto's waterways. It includes upgrades to the Don Sanitary Trunk Sewer system and twinning the Coxwell Sanitary Trunk Sewer. Within the Project area are two large 30 metre wide vertical storage shafts and the new bypass tunnel located deep within bedrock.

7.6 Public Consultation and Communication

Consulting with the public is an important part of the decision-making process and integral to the successful completion of the Project. Extensive public and stakeholder consultations undertaken as part of the DMNP EA and the LDL MP EA have informed the current shape of Project plans. Over 5,000 members of the public were consulted from 2006 to 2015 during dozens of community meetings, open houses, tours, walks, design charettes, and other events. In addition, formal consultations were held with key stakeholders, landowners and users, utilities, railway owners and operators, agencies at all orders of government and Aboriginal communities.

As the Project proceeds beyond the current due diligence program, through the CBRA and into the detailed design and implementation phases, further consultation will be required with the public, stakeholders, government agencies, Aboriginal communities and others to ensure continued engagement with and contribution to the Project, and awareness of Project timelines and construction activities. Consultation will continue to include direct engagement and employ current methodologies, such as established stakeholder committees, public forums, site tours, as well as direct engagement with Aboriginal communities in conformance with established protocols.

During the implementation stage, consultation will primarily focus on providing information updates on new work that is about to proceed and potential impacts on the community, actions to minimize or mitigate disruption during construction, information on how construction related complaints may be raised and the completion of key milestones.

As part of the MOECC Conditions of Approval of the DMNP EA, the Project Team is required to develop a Complaints Protocol to be used during both the construction and operations stages of the Project. The complaints protocol will form part of a broader policy objective designed to ensure ongoing engagement with the community to minimize or mitigate disruption and resolve any construction-related issues.

Waterfront Toronto's existing Construction Liaison protocol, in combination with the existing City of Toronto Complaints Protocol, should be adopted to address issues that may arise during construction.

8. Peer Review

The Project Team opted to have the Due Diligence Report peer reviewed to ensure its adequacy and accuracy were independently examined by qualified organizations.

Two separate, independent peer reviews of the due diligence program and results were completed, one from the perspective of a public sector project delivery agency and the other from the private sector. The first peer reviewer, Rijkswaterstaat, is the organization that designs, constructs, manages and maintains flood protection, water, and road infrastructure on behalf of the Ministry for Infrastructure and the Environment in the Netherlands. The Rijkswaterstaat is a world leader in the assessment and delivery of infrastructure comparable to the Project, and is responsible for approximately $1.75 billion annually in water-related infrastructure development.

Over the past decade, Rijkswaterstaat has completed The Room for the River Program, a $3.5 billion flood mitigation initiative that safeguards flood prone areas in the Netherlands by increasing the capacity of rivers to safely convey far greater volumes of water and creating landscaped areas - also intended to flood - that improve the quality of the immediate surroundings. In particular, the Waal River Project in the City of Nijmegen included the construction of a secondary channel and several other key features in common with the Project, and lessons learned from its execution informed Rijkswaterstaat's peer review. Further, its approach to carrying out the peer review was based on the standard review processes employed on the Room for the River Program at the Project Decision milestone, which marks the transition from the planning to the execution phase.

The second review, which was competitively procured, was undertaken by the Peter Kiewit Infrastructure Co. (Kiewit), a global construction services provider specializing in water and marine-based projects. Kiewit provided the complementary perspective of a heavy civil contractor with expertise in executing projects of similar scale and complexity to the Project using a range of traditional and innovative delivery models. Kiewit has constructed many of the most complex projects in North America. In 2015, it completed over $10.2 billion in related infrastructure work and was ranked by Engineering News-Record as the fifth-largest North American contractor.

The terms of reference for the two peer reviews were as follows:

- Provide an opinion on the scope, process, and thoroughness of the due diligence and project planning work completed as a foundation for setting the Project budget and developing the Project delivery strategy;
- Recommend any material adjustments to the process, assumptions, and/or conclusions that should be considered by the Project Team;
- Identify any additional early works that should be undertaken to fill information gaps prior to approving the budget and committing funding; and
- Describe any alternate implementation approaches that should be considered by the Project Team, together with a rationale for the recommendation.

This was not expected to be an in-depth technical peer review, nor was it expected that the peer review teams would independently evaluate cost estimate details, such as quantities and unit prices.

The peer review teams examined an advanced draft of the due diligence report. They were given access to final consultant reports, where those were available, and to draft reports otherwise. The full peer review reports, which provide a snapshot of the due diligence program at a particular point

in time, are appended. While the fundamental technical, cost, schedule, and risk information remains unchanged from that provided to the peer reviewers, specific terminology used in the peer review reports may not be consistent with that used in the final due diligence report.

Both peer review teams concluded that the due diligence work completed by the Project Team was appropriately detailed for the current stage of project development.

> *"... the goals of the Due Diligence Program have been reached: the Due Diligence Report provides adequate information necessary for the decision at hand. The contingencies and risk estimates are comparable with the Dutch situation for this phase of the project." [Rijkswaterstaat]*

> *"The documents are in general of good quality, validated and based on adequate research and expertise." [Rijkswaterstaat]*

> *"We believe that the effort and reach of the studies carried out to prepare the Due Diligence report are reasonable, and that no further up front consulting studies would be of benefit at this time". [Kiewit]*

With respect to the recommended budget and schedule, and the risk analysis undertaken, Rijkswaterstaat stated:

> *"We confirm the conclusion of the project team that the recommended scope can be delivered within the 90% cost estimate and 90% time schedule"*

> *"Given the construction cost estimate we found that the total cost estimate is complete and consistent with the recommended scope and other documents. In our experience the contingencies match with this type of projects. The 90% probability that the project can be completed for $1.25 billion provides a realistic forecast, given the presented uncertainties".*

> *"The schedule looks feasible and adequate."*

> *"The earthworks drive the construction phasing and we agree with the project team that by applying the proposed strategy the project can be completed in 2023"*

> *"In general, the risks are recognized and controlled ... The risk register contains risks that are comparable with our projects, and they are well documented."*

Kiewit was of the opinion that using a collaborative delivery model with early contractor involvement: *"will enable the project to be developed within the budget and target schedule."* Both peer review teams had extensive experience with P3 project delivery, but neither considered the model suitable for the Project.

Kiewit noted that, from a contractor perspective, the elements of the project that pose the greatest risk to meeting the proposed budget and schedule relate to:

- Confirmation of the regulatory requirements with respect to contaminants present and the associated Risk Management Measures (RMM); and
- The poor geotechnical conditions that will result in significant total and differential settlement when loading conditions are changed (by cutting and placing fill), and that could damage existing or new services, access roads and structures, unless appropriate measures are taken.

Kiewit also cited performance of bio-remediation and other techniques in these conditions as another critical unknown.

One of Kiewit's major recommendations for reducing the risks posed by poor geotechnical conditions was the development of a Ground Improvement Plan, as an early step in the pre-construction phase.

Rijkswaterstaat also addressed the centrality of earthwork and soil management to the Project and recommended measures to counter the associated risk, as follows:

> *''The scale and complexity of managing soil in this project is exceptional. The appended reports show extensive research has been done on the existing conditions, especially on the physical and chemical characteristics of soil. The soil in the entire area is very heterogeneous and numerous contaminated spots have been determined. The risk of deviations in soil characteristics will remain significant. This risk is acknowledged by the project team and included in the Risk Register and Cost Estimate. We recommend validating the estimated volumes of soil with distinctive physical and chemical characteristics by additional surveys ... We recommend discriminating between hard requirements and assumptions with respect to earthworks in order to determine the boundary conditions within which the contractor has to work.''*

9. Summary and Recommendations

The Project is a comprehensive plan for flood protecting southeastern portions of downtown Toronto – including parts of the Port Lands, South Riverdale, Leslieville, south of Eastern Avenue and the First Gulf/Unilever development site – that are at risk of flooding under a provincially-defined Regulatory Storm event. As a result, these areas are effectively undevelopable and economically underutilized until the flood risk is removed.

The Project provides flood protection through the creation of a new, naturalized mouth for the Don River and other significant flood protection measures, which will result in two additional outlets for the river into Lake Ontario, new parks and green space along the river and inner harbor, and expanded opportunities for people to experience the water's edge. The Project also includes the major municipal infrastructure that must be constructed to maintain functional transportation and servicing networks and to enable development.

In addition to achieving flood protection, and mitigating the associated costs and risks, the completion of this Project will meet a number of other strategic objectives, such as:

- Help governments achieve the goal of mitigating the impact of climate change and improving resiliency;
- Support the development of new, highly-livable, climate-positive mixed-use communities close to downtown employment areas;
- Attract a growing number of people to this new community, where they can experience the city's quality of life and its economic opportunities;
- Invite investment in commercial, institutional and other development; and
- Create jobs and drive economic development.

9.1 Due Diligence Program Summary

Waterfront Toronto and its partner organizations, the City of Toronto, TRCA, and TPLC have completed a comprehensive due diligence program in order to create more certainty on the Project's cost, schedule and risks. Before starting the due diligence process, the Project's cost estimate was $975 million. While this estimate was reasonable based on the information available at the time, the ability to generate an accurate capital cost estimate was restricted in a number of ways, as outlined in **Section 3: Due Diligence Overview.**

As due diligence progressed, the scope was refined in order to ensure the realization of the Project's key objectives. The changes to the Project scope and the more detailed understanding of site conditions gained through due diligence (see **Section 4: Technical Due Diligence Results**) have resulted in a final Recommended Scope with a cost estimate of $1.25 billion (YOE), and with a 90 per cent probability of completing the Project on or under budget and on schedule (see **Section 5: Recommended Scope, Cost Estimate and Financial Due Diligence**). The key factors driving the increased Project cost estimate are the additional soil excavation, soil/groundwater treatment and material handling/import costs due to the site's challenging soil conditions, the details of which were discovered during the due diligence process.

The $1.25 billion cost estimate is based on commencing construction in the fourth calendar quarter of 2017, which would enable construction completion by the end of 2023. Should commencement of the Project be delayed, additional costs of approximately $30 million annually would be incurred, owing to the impact of construction escalation.

A thorough review of project delivery options was undertaken (see **Section 6: Procurement Strategy**) and a recommended high level implementation plan was developed (see **Section 7: Implementation Plan**).

Additional financial due diligence was performed to validate previous studies regarding the benefits of implementing flood protection. These benefits include the direct economic impact of the $1.25 billion investment in flood protection, the economic impacts of longer-term future construction activity in the Port Lands, forecast land sale revenues, and development charge projections (see **Sections 5.3, 5.4** and **5.5**).

Finally, given the magnitude and complexity of the Project and as a final step to validate the results of the due diligence program, we opted to have the report and selected supporting materials peer reviewed. Two independent third-party organizations were retained based on their substantial experience on programs that are directly comparable to the Project: Rijkswaterstaat, the Ministry of Infrastructure and the Environment from the Netherlands, and Peter Kiewit Infrastructure Co. (see **Section 8: Peer Review**).

It is important to note that the Rijkswaterstaat review team concluded that "the goals of the Due Diligence Program have been reached: the Due Diligence Report provides adequate information necessary for the decision at hand." These conclusions are reinforced by Kiewit's peer review, which found that "the effort and reach of the studies carried out to prepare the Due Diligence report are reasonable, and that no further up front consulting studies would be of benefit at this time."

Additionally, the Rijkswaterstaat review team found that "The contingencies and risk estimates are comparable with the Dutch situation for this phase of the project. We confirm the conclusion of the project team that the recommended scope can be delivered within the 90% cost estimate and 90% time schedule."

9.2 Recommendations

Based on the completion of the due diligence program and on the peer review findings we recommend that:

1. The findings of this Due Diligence Report be formally received by the three orders of government;

2. Waterfront Toronto continue work related to both the required CBRA process and the engagement of Aquatic Habitat Toronto to allow for construction to commence by the fourth calendar quarter of 2017;

3. A customized delivery solution be adopted for the Project that is designed to:
    - Allow for the segmentation of the Project into components that can be procured in the most appropriate and advantageous fashion consistent with the procurement principles;
    - Enable procurement of integrated design and construction services (design-build) for specific Scope Items, where appropriate to do so;
    - Provide for the acquisition of a full range of pre-construction planning services and as and where necessary during construction, the assumption of construction logistics planning and Occupational Health and Safety compliance at the Project site;

- Transfer risk where this can be done at reasonable cost and encourage collaborative management of residual risk that must be retained by the public sector and facilitate early owner-consultant-contractor collaboration to progressively reduce risk; and
- Allow for early constructive engagement between regulatory authorities and the full delivery team, particularly with respect to innovative design and construction approaches.

4. Contingency funding to be retained and managed by the Project Team, for application as reasonably required to address unknown site conditions or Project requirements; and

5. Project implementation oversight be provided in the near term by the Executive Steering Committee, which is already in place.

It is important to note that the projected 2023 Project completion date assumes that funding will be in place no later than the second calendar quarter of 2017. In the interim, Waterfront Toronto will continue with early design work and collaboration with MOECC and AHT on environmental reviews and site testing, as recommended by both our peer reviewers, to the extent that current funding will allow.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Artist Rendering Looking Northwest at the Naturalized Mouth of the Don River

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Glossary

Amouring (and Buried Armouring): Material used to protect streambeds, bridge abutments, pilings and other shoreline structures against scour or water erosion. It is made from a variety of rock types, commonly granite or limestone, and occasionally concrete rubble from building and paving demolition. It can be used on any waterway or water containment where there is potential for water erosion.

Aquatic Habitat Toronto (AHT): A consensus based partnership between agencies with a vested interest in the improvement of aquatic habitat on the Toronto Waterfront. Partners include Fisheries and Oceans Canada, Ministry of Natural Resources, Toronto and Region Conservation in consultation with the City of Toronto. Aquatic Habitat Toronto is responsible for the implementation of the Toronto Waterfront Aquatic Habitat Restoration Strategy (TWAHRS).

Bathymetry: The study of underwater depth of lake, river or ocean floors; the underwater equivalent to topography.

Bioengineered Bank: A soil conservation technique using plants and other vegetation to protect and secure unstable sites, such as shorelines. May also employ materials such as timber, concrete, rocks and dead branches as support.

Bust Rapid Transit (BRT): Bus rapid transit operates in a fully dedicated right-of-way, similar to a light rail transit, to avoid traffic congestion.

Community Based Risk Assessment (CBRA): A Ministry of Environment and Climate Change process guideline for estimating the probability of a human health or environmentally adverse effect to occur due to changes in environmental conditions resulting from human activities. It is typically conducted for multiple properties and includes the development of risk-based intervention values (IVs) for the contaminants of concern (COCs) within a given study area.

Conceptual Site Model: This is a representation of the environmental conditions within a given study area. It facilitates the communication of environmental information by providing a summary of where contaminants are present, how they move and what impacts they may have on human health or the environment.

Construction Manager/General Contractor (CM/GC): An alternative capital infrastructure procurement method used to accelerate project delivery. The CM/GC process is broken down into two contract phases. In the design (first) phase, the project owner contracts with a consulting engineer or architect to design an infrastructure asset, and separately but in parallel engages a construction contractor to work with the consultant to develop the project. Once the design is sufficiently advanced, the CM and the project owner may agree on a Guaranteed Maximum Price (GMP), which is based on the construction documents and specifications at the time of the GMP plus any reasonably inferred items or tasks. In the second contract phase, the construction phase, the CM provides the services of a general contractor, including competitively tendering sub-trade contracts, and takes on the risk of completing the agreed scope of work at or below the GMP, if one has been agreed.

Cut/fill: The process of removing (cut) or adding (fill) soil to achieve the desired level of grade.

DELFT3D Hydraulic Model: The Regulatory Flood model and design tool on record for the Project. It is an integrated modelling suite, which simulates two-dimensional (in either the horizontal or a vertical plane) and three-dimensional flow, sediment transport and morphology, waves, water quality and ecology and is capable of handling the interactions between these processes.

Design-Bid-Build (DBB): A capital infrastructure procurement method, widely used in both the public and private sectors, in which the project owner contracts with a consulting engineer or architect to design an infrastructure asset, and subsequently contracts separately with a construction contractor to build it based on the completed plans and specifications prepared by the consultant. Upon completion of construction, the infrastructure asset is handed back to the project owner for operation and maintenance.

Design-Build-Finance (DBF): An alternative capital infrastructure procurement method which combines into a single contract the responsibility for the majority of the design work, all construction activities, and the short-term financing for project, and the risk of providing these services for a fixed fee. Upon completion of construction, the infrastructure asset is handed back to the project owner for operation and maintenance.

Don Mouth Naturalization and Port Lands Flood Protection Project Environmental Assessment (DMNP EA): The DMNP EA was initiated in 2004 by the Toronto and Region Conservation Authority in co-operation with Waterfront Toronto and the City of Toronto. In 2006, the Minister of the Environment approved the Terms of Reference, which set the framework for the DMNP to proceed in its effort to provide flood protection, naturalize the mouth of the river and facilitate the redevelopment and revitalization of the Lower Don Lands. The DMNP EA was submitted on March 3, 2014 and approved on January 28, 2015.

Earthworks: Excavation, soil handing, and fill placement.

First Gulf/Unilever Site: Municipally known as 21 Don Roadway, First Gulf owns this 30-acre parcel of land located at the intersection of Lake Shore Boulevard and the Don Valley Parkway. It forms part of a larger 60-acre site for which First Gulf is developing a master plan for 12-million square feet of office and retail space that is estimated to represent 50,000 jobs at full build out.

Floodplain: The Regulatory Floodplain is the approved standard used in a particular watershed to define the limit of the floodplain for regulatory purposes. Within the TRCA's jurisdiction, the Regulatory Floodplain is based on the regional storm, Hurricane Hazel, or the 100 year flood; whichever is greater.

Full Vision: The envisioned full build-out of all public realm, park programming, and transit infrastructure. Not all of the Full Vision elements were contemplated in the Original Scope, nor are they provided for in the Recommended Scope.

Gardiner East Project: The City Council-approved Hybrid Alternative Three alignment for the Gardiner Expressway East includes demolishing the existing Gardiner East-DVP ramp and constructing a new ramp further north, as well as demolishing the eastbound and westbound Logan Ramps and constructing new ramps at Cherry Street. This project also includes realigning Lake Shore Boulevard between Cherry Street and Logan Avenue, and streetscape improvements to Lake Shore Boulevard. It is anticipated that construction will commence in 2019 or 2020 and will be completed in 2025.

Gardiner East EA: The environmental assessment undertaken to identify the preferred alternative for the Gardiner Expressway and Lake Shore Boulevard reconfiguration from approximately Lower Jarvis Street to Leslie Street. This process led to Hybrid Alternative Three as the preferred alignment.

Geomorphology: The study of the characteristics, origins, and development of land forms.

Grade Control Structure (and Buried Control Structure): A hard structural layer (typically stone) located at or below the river bed surface designed to prevent bed erosion and scour to maintain the desired river bed elevation. Buried grade control structures typically extend the entire channel width; their depth and length along the channel depends on local river hydraulics and required stone sizing

HONI: Hydro One Networks Incorporated

Lakefill: An area of land previously underwater that was reclaimed from a lake through the placement of materials primarily derived from construction excavation and demolition.

Levee: A linear embankment built to prevent water flow into a floodplain area. Levee structures can be built with soil, concrete, or metal. Levee structures constructed with native soils are the most common and are typically vegetated with non-woody vegetation.

LIDAR: Light Detection and Ranging. LIDAR data is method of collecting ground surface elevation data with enough accuracy and precision to map regulatory flood lines and replace most manual ground surveying required for projects like these. It is collected by a device on an airplane measuring the rate at which light emitted by a laser is reflected off surfaces below it. The light, however, does not reflect off of water and is absorbed, so manual surveying is still required for watercourse areas.

Lower Don Lands Master Plan Class Environmental Assessment (LDL MP EA): Establishes city building requirements, including the transit, roads, bridges and services (water, sanitary and stormwater management). The LDL MP EA was initiated in 2008 and approved in 2014.

Light Rail Transit (LRT): Light rail transit that operates primarily along exclusive rights-of-way.

MOECC: Ministry of Environment and Climate Change, formerly Ministry of Environment (MOE)

MVVA Report and MVVA Plans: MVVA's appended report *Lower Don River Due Diligence and Validation Report* and accompanying set of plans.

Original cost estimate: The Project was initially estimated in 2014 to cost $975 million (YOE) based on an assumed ten-year project schedule (2015-2025). This high level estimate was compiled by Waterfront Toronto using information from several sources and included a mark up of 40 per cent to allow for soft costs (such as design, engineering, approvals and taxes) and contingencies.

Original Scope: See Original Scope included in **Figure 33a.** The original cost estimate was based on these components.

PLAI / Port Lands Acceleration Initiative: In September 2011, Toronto City Council unanimously approved a protocol known as the Port Lands Acceleration Initiative (PLAI) to develop a business and implementation plan with the objective of accelerating development opportunities in the Port Lands. The PLAI sought to examine whether the Lower Don Lands could be developed more affordably and sooner than previously anticipated. As part of the PLAI planning process, the DMNP was put on hold and a short list of 'Alternative Methods' that were identified during the initial DMNP process were re-examined within the context of the City Council direction.

The purpose of the PLAI was to integrate core principles from the DMNP such as flood protection and naturalization, evaluate options for phased development and integrate higher-value interim and permanent uses during phasing. The PLAI also explored ways that the private sector could help spur development within the area. The ultimate goal of the PLAI was to reduce the overall cost of development and to create a phased approach to development that would provide opportunities for redevelopment to fund required infrastructure, including flood protection measures.

The analysis undertaken during the PLAI confirmed the fundamental conclusions of the DMNP EA. Certain modifications to the preferred alternative, known as Alternative 4WS (2010) were proposed. The option emerging from the review involved a slight realignment of the river, the river mouth and the Greenway. The outcomes of the PLAI indicated that large scale revitalization could occur based on phased implementation of the required flood protection and infrastructure.

PLAI 2: In 2012, Waterfront Toronto, the City of Toronto and the TRCA initiated additional planning for the Port Lands, including: amending and finalizing the DMNP EA (now complete and approved); amending and completing the LDL MP EA (now completed and approved); and precinct planning for Cousins Quay (now called Villiers Island) and the Film Studio District, the Port Lands Planning Framework, and Port Lands and South of Eastern Transportation and Servicing Master Plan Environmental Assessment, all of which are underway.

Probabilistic Risk Simulation Model: A mathematical model used to perform quantitative risk analysis. In probabilistic risk simulation, uncertain inputs in the model (such as the quantity of soil that will need to be excavated, or the cost of dewatering a cubic metre of soil excavated ''in the wet'') are represented using ranges of possible values known as probability distributions. Probability distributions associate a probability with each possible outcome and are a much more realistic way of describing the uncertainty in variables of a risk analysis. During a simulation, values are sampled at random from the input probability distributions. Each set of samples is called an iteration, and the resulting outcome from that sample is recorded. Probabilistic simulation does this thousands of times, and the result is a probability distribution of possible overall outcomes for the scenario being modelled. In this way, probabilistic simulation provides a much more comprehensive view of what may happen. Results show not only what could happen, but also how likely each outcome is. Using a probabilistic risk simulation model also makes it easy to see which input variables have the biggest effect on overall results and to address interdependent relationships between input variables, since it's important for accuracy to represent how, in the real world, when some factors go up, others go up or down accordingly.

Project: Don Mouth Naturalization and Flood Protection and Enabling Infrastructure Project.

Project Team: Waterfront Toronto, Toronto and Region Conservation Authority, City of Toronto, Toronto Port Lands Company and the consultants engaged for the due diligence program.

Public Sector Comparator (PSC): Estimates the hypothetical risk-adjusted cost if a project were to be financed, built, and potentially operated and/or maintained by the public sector using its traditional procurement approach.

Public-private partnerships (P3): Contractual agreements formed between a public agency and a private sector entity that allow for greater private sector participation in the delivery and financing of major capital infrastructure projects.

Recommended Cost Estimate: $1.25 billion (YOE) is the cost estimate to complete the Recommended Scope based on the due diligence program completed to date.

Recommended Scope: See Recommended Scope Map in **Figure 33a.** Based on due diligence completed to date and current cost estimates, the Project Team has recommended a modified scope of work from that originally proposed. The Recommended Scope provides the needed flood protection as originally contemplated, as well as short to mid-term development supporting infrastructure as needed to drive the desired economic results of the Project and defers other components until such later time as development occurs.

Records of Site Condition (RSC): A document, prepared and filed to the Environmental Site Registry by a qualified person, that summarizes the environmental condition of a property based on the completion of environmental site assessments as per the O. Reg. 153/04.

Regulatory Flood: In this area of Ontario, the rainfall from a storm equivalent to Hurricane Hazel centred over the Don Watershed is used to define the limits of flooding, known as the Regulatory Flood.

Regulatory Flood Line: The extents (areas) of flooding calculated by the computer models based on a Regulatory Flood.

Regulatory Floodplain: The approved standard used in a particular watershed to define the limit of the floodplain for regulatory purposes.

Regulatory Storm: The largest storm an area could expect at the time of study development. This storm can be either a large historical storm, such as the Regulatory Flood described above, or a theoretical storm using local rain data to estimate the worst storm which could occur in 100 years.

Risk Management: In the environmental context, risk management means the implementation of a strategy or measures to control or reduce the level of risk estimated by the risk assessment to prevent, eliminate or ameliorate any adverse effect.

Risk/Risk Register: Risk is the combination of the probability of an uncertain event and its consequences to the Project. A positive consequence presents an opportunity; a negative consequence poses a threat. A Risk Register is a project management tool that records details of all identified project risks and opportunities, their quantification in terms of likelihood of occurring and potential impact on the project, initial plans for responding to (mitigating) each high level risk, the estimated costs of such mitigation strategies, and the individual assigned responsibility for monitoring and managing a given risk.

Rock Revetment: In stream restoration, river engineering or coastal engineering, revetments are sloping structures placed along water edges in such a way as to absorb the energy of incoming water.

Rubble Containment System: Rock or other materials used to armour shorelines, bridge abutments, pilings and other shoreline structures against scour and water or ice erosion.

Scour: The effect of eroding, creating holes or otherwise compromising the integrity of shorelines and bridge abutments caused by swiftly moving water.

Site Specific Risk Assessment: This is a process for estimating the probability of a human health or environmental adverse effect to occur due to changes in environmental conditions resulting from human activities. Under the O. Reg. 153/04, it can typically only be conducted for one property and includes the development of property specific standards for the contaminants of concern (COCs) for the property.

Spill Zone: Defined areas within the Flood Plain.

TRCA: Toronto and Region Conservation Authority.

TPLC: Toronto Port Lands Company.

Toronto Remedial Action Plan (RAP): Toronto and Region is listed as one of 40 locations around the Great Lakes where local environmental degradation may be causing harm to the wider Great Lakes system. These locations are referred to as Areas of Concern (AOCs). The clean-up, or remediation, of an Area of Concern occurs through a mandated process called a Remedial Action Plan, or RAP. Stage I of the formal Toronto and Region Remedial Action Plan was initiated in 1987 and Toronto and Region is currently in Stage 3 (implementation) of the RAP process. Toronto and Region RAP team believes the Toronto and Region could be in a position to prepare the Stage 3 RAP report and seek delisting as an Area of Concern by 2020.

Value for Money (VfM) Analysis: This is a quantitative analysis methodology intended to be used by the public sector as a decision-making tool to support and justify the selection of a project delivery model. The process compares the financial impacts of delivering a project as a P3 against those for the traditional public delivery alternative (the ''Public Sector Comparator'' or PSC). The PSC estimates the hypothetical risk-adjusted cost if a project were to be designed, built, financed (and potentially operated and maintained) by the public sector using its conventional procurement approach. A Shadow Bid is developed to estimate what the private sector would bid in response to a P3 request for proposals. When a P3 presents overall savings, it is said to provide ''value for money''. This value is usually expressed as the percent difference by which the PSC cost estimate exceeds the P3 Shadow Bid.

Wetland Control Structure: A concrete or stone structure with removable gates, stop logs, and/or grates. These structures are used to regulate water levels within the wetlands and can function as a barrier to unwanted aquatic species. The structure can be as simple as a manhole with connected pipes or as complex as a vegetated open channel with an open box weir structure, depending on the site specific goals.

Year-of-Expenditure (YOE): A cost estimate expressed in Year-of-Expenditure (YOE) dollars is determined by adjusting the current dollar cost estimate for a multi-year design and construction project to account for the anticipated cost escalation (inflation) from the present time to the expected year in which construction occurs. For example, assuming three per cent year-over-year construction escalation, a construction project estimated to cost $30 million in today's dollars and scheduled to be completed over the next three years at a uniform rate of progress would require annual investments of $10 million, $10.3 million, and $10.6 million, for a total estimated cost of $30.9 million in YOE dollars.

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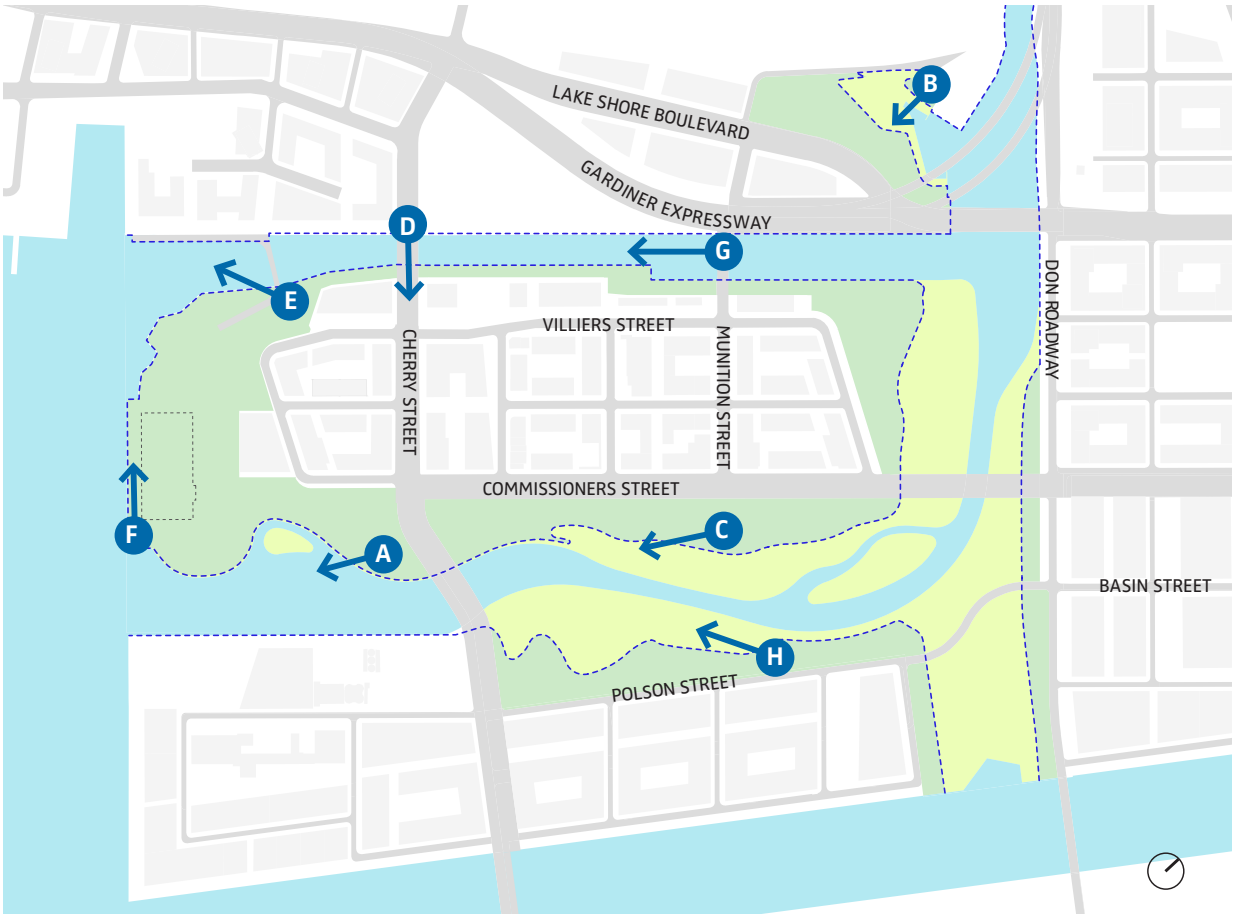

Figure 43 Artist *Renderings of Full Vision Lower Don River Naturalization and Accompanying Public Realm (Prepared for PLAI)*

A - View Looking Southwest Across the Naturalized Mouth of the Don River during Winter

B - View of Don Valley Trail Bike Path over Sediment Management Area during Spring

C - View Looking Southwest towards Naturalized Channel during Fall

D - View Looking Southeast at Cherry Street Bridge during Summer

E - View Looking Southwest from Trinity Bridge during Spring

F - View Looking Northwest from Harbour Plaza during Winter

G - View Looking West along Keating Channel

H - View Looking West towards Naturalized Channel during Fall

Call to Action

''The World Economic Forum recognizes water as the number one global risk and also mankind's greatest opportunity. It connects economy and ecology, and is a key asset for sustainability and equity for our cities. Toronto's resiliency depends on a comprehensive, collaborative approach to implementing innovative projects. Naturalizing the mouth of the Don River will increase capacity and enhance the ecology in this important watershed, restoring a vital natural environment within the city. When complete, this project will serve as a lasting example of embracing water as an asset for the city - turning the risk of flooding into an ecological, social and economic opportunity.''

Henk WJ Ovink
Special Envoy for International Water Affairs Kingdom of The Netherlands

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