



**WATERFRONT**Toronto

# Addendum to Meeting Book - Finance, Audit & Risk Management Committee Meeting

THURSDAY, JUNE 6, 2024 FROM 9:00 AM TO 11:30 AM

MICROSOFT TEAMS



**WATERFRONT**Toronto

Addendum to Meeting Book - Finance, Audit & Risk Management Committee Meeting - June 6, 2024

7b) Semi-Annual PLFP EAC and Risk Quantification

Information

D. Kusturin

Presentation - 3

# **Port Lands Flood Protection and Enabling Infrastructure Semi Annual Cost Estimate Update March 31, 2024**

**Presentation to the Finance, Audit and Risk Management Committee  
June 6, 2024**

# NOTE

## Agreed Approach

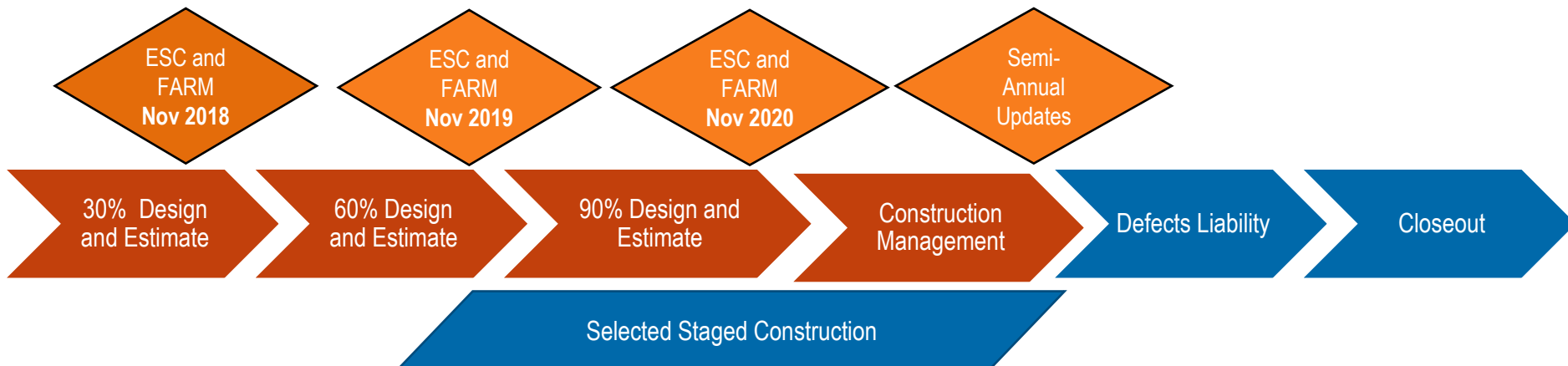
- SDMA deferred scope (\$12.9M) has been moved to the risk register at 90% probability, \$0 to \$12.9M, most likely \$8.9M
- No change in Program Budget due to Eastern Avenue Flood Protection
- Revised EAC as follows:
  - Hard Costs: **\$1,081,900,087** reflects reduction of \$12.9M (SDMA future scope)
  - Soft Costs: **\$227,599,711**

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# Process

- 30% Stage Gate design and cost estimates provided to Executive Steering Committee on November 21, 2018
- Project Charters and budgets developed from 30% cost estimates; executed April 2019
- 60% Stage Gate design and cost estimates provided to Executive Steering Committee (ESC) on November 12, 2019. ESC approved of the 60% Stage Gate Estimate at Completion
- 90% Stage Gate finalized, presented and approved at the ESC (December 9, 2020), Finance and Risk Management Committee (FARM) (November 26, 2020) and WT Board of Directors (December 10, 2020)
- Semi-Annual Cost Updates will be provided to the ESC, FARM and WT Board of Directors



# Current Status - Program



## Project Budget

- **Revised program budget is \$1.354B** to meet originally defined scope, broken down as \$1,272.9M for PLFPEI and \$81.1M for Parks Finishes
- Additional funding of **\$169M** was confirmed as follows:
  - Amendment to the existing Delivery Agreement for PLFPEI signed June 1, 2023  
- **\$87.9 M**
  - Funding for Parks Finishes secured through Investing in Canada Infrastructure Program (ICIP), Agreement to be executed end of October 2023 - **\$81.1M**

## Project Schedule

- The most recent Schedule Update #73, February 29, 2024, key milestones are as follows:
  - Achievement of flood protection and PLFPEI Substantial Completion is January 16, 2025
  - Limited seasonally dependent work (planting and asphalt paths) to be completed in Promontory Park South June 30, 2025

# Current Status – Program (Cont'd)



## Project Risks

- Quantitative Risk Analysis completed utilizing updated Estimate at Completion as of March 25, 2024, and schedule update #73 dated February 29, 2024

## Procurement

- Construction hard cost procurement status as of March 31, 2024

Awarded:	99.4 %	\$ 1,074.9 M
In Progress:	0.2 %	\$ 1.9 M
Not Started:	0.4 %	\$ 5.1 M
<b>Total:</b>		<b>\$ 1,081.9 M</b>



# Current Status – Earthworks, Marine and Parks



## Design

- Completed 60% value engineering and optimization exercise for Fire Hall 30 renovation
- Advanced public park Wi-Fi design
- Advanced and awarded Indigenous Design Features contract and hosted kick-off meetings

## Construction

- Ceased operation and commenced decommissioning of water treatment plant
- Commenced removal of west plug
- River Valley flooded to lake elevation completed February 15, 2024
- Progressed river valley finishes at west plug
- Completed Phase I excavation of river valley north of Villiers Street at north plug
- Completed removal of sheet pile, opening Canoe Cove to Polson Slip
- Completed wet utility installation in the Sediment and Debris Management Area (SDMA)
- Completed dredging and dock wall works in SDMA, east zone – stage 1
- Advanced wet utilities in Promontory Park South and in the Old Cherry St right of way in River Park North
- Completed construction of concrete foundations, footings and curbs for Swing Hill, Owl Nest and Cableway Canyon
- Begin installation of play equipment in River Park North
- Advanced the Operations & Maintenance Yard earthworks including removal of surcharge, placement of cap standard fill and fine grading
- Continue placement of stone features in River Park South
- Advanced shop drawing for bicycle bridges
- Continue earthworks including surcharge removal, rough grading, fine grading and cap standard fill placement in Promontory Park South

# Current Status – Bridges

## Design

- Enbridge progressing design for permanent relocation of NPS 20 gas main
- Issued for construction design of THESL feeder on Lake Shore bridge subject to licence agreement between the City and Enbridge
- Designed and obtained approval for permanent relocation of Beanfield and Zayo fibre cables on Lake Shore bridge

## Construction

- Opened Cherry North vehicular and LRT bridges and handed over to City January 24, 2024
- Opened Commissioners Street bridge to vehicular traffic as a construction detour January 24, 2024
- Completed analysis for mass dampers on Cherry North and Cherry South bridges
- Contractor commenced removal of bridge deck on old Cherry lift bridge
- Enbridge complete temporary relocation of NPS 20 gas main October 23, 2023
- Completed construction of east bound Lake Shore bridge and opened to traffic December 15, 2023
- Progressed permanent relocation of Beanfield and Zayo fibre cables on Lake Shore bridge
- Completed removal of existing rail bridge and deck spans on west bound Lake Shore bridge
- Begin construction of substructure work for new west bound Lake Shore bridge

# Current Status – Roads and Services

## Design

- Continue discussions with Toronto Water to obtain Release for Construction (RFC) for ISPS, OGS and SWTF
- Finalized IFC for signal timing cards for all intersections in the PLFP
- Progress IFC for permanent relocation of THESL infrastructure on Villiers Street

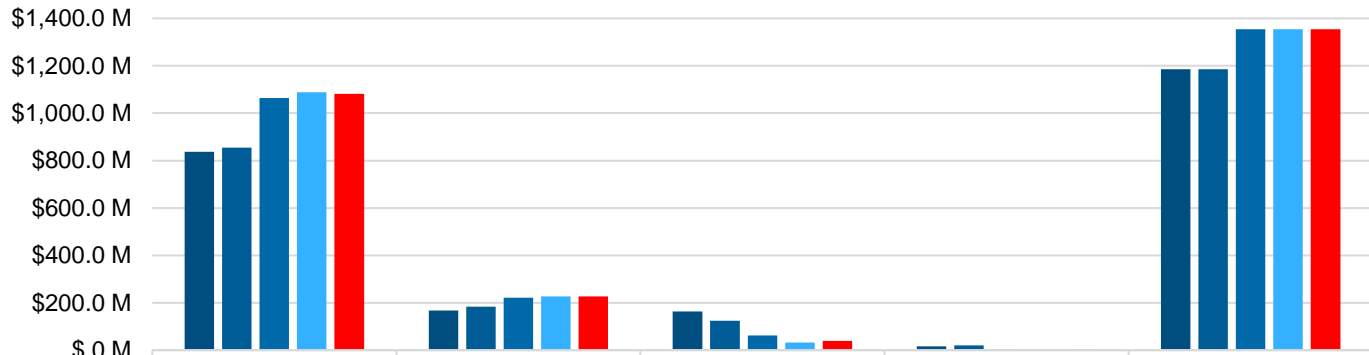
## Construction

- Completed miscellaneous metals and mechanical works in Storm Water Treatment Facility (SWTF) and Oil Grit Separator (OGS1)
- Completed outfall culvert connection through Keating Channel dock wall
- Commissioned new Enbridge gas main along Villiers Street
- Completed and opened new Cherry Street, north of Commissioners to Lake Shore Boulevard and handed over to the City
- Completed road works and opened Commissioners Street to vehicle, pedestrian, and cycle traffic as an interim construction detour
- Closed old Cherry Street south of Lake Shore to Villiers Street
- Progressed installation of rigid inclusions and construction of Load Transfer Platform on Don Roadway Villiers to Lakeshore
- Decommissioned THESL feeder and relocated 3<sup>rd</sup> party assets (Bell) on Villiers Street in preparation for future river valley
- Completed construction of Villiers U-turn west of Munitions Street

# PLFP – March 31, 2024 - EAC Forecast



**Port Lands Flood Protection  
March 31, 2024 Estimate at Completion (EAC) Forecast**



	Escalated Hard Costs	Escalated Soft Costs	Contingency	NRHST	Total
■ Due Diligence	\$837.2 M	\$167.8 M	\$164.0 M	\$16.0 M	\$1,185.0 M
■ 30% Design	\$855.4 M	\$184.6 M	\$124.5 M	\$20.5 M	\$1,185.0 M
■ September 2022 - Budget	\$1,063.7 M	\$222.3 M	\$63.0 M	\$5.0 M	\$1,354.0 M
■ September 2023 Forecast	\$1,089.0 M	\$227.2 M	\$32.8 M	\$5.0 M	\$1,354.0 M
■ March 2024 Forecast	\$1,081.9 M	\$227.6 M	\$39.5 M	\$5.0 M	\$1,354.0 M

- **The Forecast EAC remains \$1.354 B**
- Forecast construction hard cost has increased \$18.2 M since September 30, 2022, and decreased **(\$7.1 M)** from the September 30, 2023, estimate
- Soft cost estimate is \$5.3 M higher than the September 30, 2022, estimate and \$0.4 M higher than the September 30, 2023, estimate

# Q4 2023/24 Construction Cost Estimate Variance



The Construction Cost Estimate (Hard Costs) has decreased **\$7.1 M (0.7%)** from the September 2023 forecasted EAC.

Major Variances from September 2023 Forecast by segment are summarized as follows:

Program Segment	Due Diligence	30% Stage Gate: Program Budget	September 2022 Budget	September 2023 Forecast	March 2024 Forecast	Variance: September 2023 to March 2024 EAC Forecast	
						\$	%
Roads and Services	\$ 188.0 M	\$ 136.0 M	\$ 235.7 M	\$ 244.4 M	\$ 254.1 M	\$ 9.6 M	3.9 %
Earthworks, Marine and Parks	\$ 604.3 M	\$ 577.3 M	\$ 686.1 M	\$ 684.4 M	\$ 664.9.1 M	(\$ 19.5 M)	(2.9 %)
Bridges	\$ 114.9 M	\$ 142.1 M	\$ 141.8 M	\$ 160.2 M	\$ 162.9 M	\$ 2.8 M	1.8 %
<b>Escalated Construction Cost Estimate</b>	<b>\$ 837.2 M</b>	<b>\$ 855.4 M</b>	<b>\$1,063.7 M</b>	<b>\$ 1,089.0 M</b>	<b>\$1,081.9 M</b>	<b>(\$ 7.1 M)</b>	<b>(0.7 %)</b>

# March 2024, Construction Cost Estimate Variance – Breakdown

As compared to the September 2023 forecast, construction costs have decreased by **\$5.9 M**. A breakdown of the variance is provided as follows:

<b>Bridges</b>	<b>\$ 2.8 M</b>
Adjustment for THESL cost sharing for Lake Shore Bridge Feeder Main	\$ 2.4 M
Additional Costs Lake Shore Bridge	\$ 1.2 M
Cost reconciliations for Lake Shore Boulevard Utilities and PLFP Bridges	(\$ 0.5 M)
Cost Transfer to Parks electrical from Public Art Budget	(\$ 0.3 M)
<b>Roads</b>	<b>\$ 9.6 M</b>
Cost transfer related to Water Treatment Plant	\$ 6.6 M
Additional Costs for Municipal Services including OGS, SWTF, ISPS, storm and sanitary	\$ 1.9 M
Additional costs above estimate for Traffic Signals, escalation, THESL feeders and quad guards, etc	\$ 1.5 M
Hydro vac Soils Disposal and Management Extension (October to March 2024)	\$ 0.4 M
Settlement of Contractor Claim	(\$ 0.2 M)
Reconciliation of Electrical Contract	(\$ 0.6 M)
<b>Earthworks and Parks</b>	<b>(\$ 19.5 M)</b>
Cost transfer to related to Water Treatment Plant	(\$ 6.6 M)
Deferred Scope for SDMA moved to contingency	(\$ 12.9 M)
<b>Total Variance</b>	<b>(\$ 7.1 M)</b>

# March 2024 Soft Cost Estimate Variance

Soft Cost EAC Forecast is **\$0.4 M** (0.2%) higher than forecasted in September 2023

Major Variances from Q2 2023/24 Forecast is driven by:

- Increase in Contract Administration costs related to schedule extension \$ 1.6 M
- Increased legal fees for land transfer \$ 0.3 M
- Reconciliation of allowances and contracts (\$ 1.5 M)

Major Variances from September 2023 by segment are summarized as follows:

Program Segment	Due Diligence	30% Stage Gate: Program Budget	September 2022 Budget	September 2023 Forecast	March 2024 Forecast	Variance: September 2023 to March 2024 EAC Forecast	
						\$	%
Roads and Services	\$ 23.9 M	\$ 22.0 M	\$ 31.5 M	\$ 33.8 M	\$ 34.6 M	\$ 0.8 M	2.4 %
Earthworks, Marine and Parks	\$ 120.4 M	\$ 131.3 M	\$ 159.3 M	\$ 161.4 M	\$ 160.2 M	(\$ 1.2 M)	(0.7%)
Bridges	\$ 23.5 M	\$ 31.0 M	\$ 31.2 M	\$ 32.0 M	\$ 32.8 M	\$ 0.8 M	2.5 %
<b>Escalated Soft Cost Estimate</b>	<b>\$ 167.8 M</b>	<b>\$ 184.6 M</b>	<b>\$ 222.0 M</b>	<b>\$ 227.2 M</b>	<b>\$ 227.6 M</b>	<b>\$ 0.4 M</b>	<b>0.2 %</b>

# Contingency Drawdown

	Hard Cost	Soft Cost	Contingency Balance
<b>New Budget with Additional Funding</b>	<b>\$ 1,063,675,276</b>	<b>\$ 222,312,752</b>	<b>\$ 63,011,970</b>
<b>March 2023</b>	<b>\$ 1,089,401,736</b>	<b>\$ 222,496,729</b>	<b>\$ 51,437,187</b>
April 2023	\$ 109,794	\$ -	\$ 36,991,740
May 2023	\$ 5,506,336	\$ (9,887)	\$ 31,495,291
June 2023	\$ 3,893,684	\$ 195,631	\$ 27,405,976
July 2023	\$ 3,417,626	\$ 1,533	\$ 23,986,816
August 2023	\$ 1,356,318	\$ 654,726	\$ 21,975,773
September 2023	\$ 3,463,277	\$ 74,621	\$ 18,437,875
<b>September 2023 Actual EAC</b>	<b>\$ 1,107,148,771</b>	<b>\$ 223,413,353</b>	<b>\$ 18,437,875</b>
October 2023	\$ (341,964)	\$ 885,567	\$ 17,894,273
November 2023	\$ (13,319,731)	\$ 175,717	\$ 31,038,286
December 2023	\$ 4,574,997	\$ 26,148	\$ 26,437,141
January 2024	\$ 880,661	\$ (25,500)	\$ 25,581,980
February 2024	\$ 2,582,735	\$ 1,634,120	\$ 21,365,125
March 2024	\$ (15,602,537)	\$ (587,758)	\$ 36,355,421
<b>March 2024 Actual EAC</b>	<b>\$ 1,085,922,932</b>	<b>\$ 225,521,647</b>	<b>\$ 37,555,421</b>

Note: Actual commitments at end of March 2024 do not include forecasted commitments



# Changes to Risk Register

- Compared to the previous analysis update, there is approximately **\$ 5.2 M** increase in probability-adjusted high-cost impact and **4.0 months** increase in schedule impact, after implementing risk mitigation strategies
- SDMA deferred scope included in risk register at 90% probability, \$0 to \$12.9 M
- The risk analysis includes 3 opportunities:
  - The recoverable Keating Channel dredging cost: 100% probability for \$3.2M savings
  - Cost recovery related to spill way crossing: 75% probability for \$0.5 - \$1.6M savings
  - Cost recovery related to dock wall damages: 75% probability for \$0.25 - \$1.8M savings
- The sum of schedule risks does not accurately represent potential schedule delays since it assumes all delays are cumulative and on the critical path. As a result, the schedule risks reported do not account for the ability to continuously adjust the schedule by accelerating and re-sequencing work.

Stage Gate	Probable High Value (Post Mitigation)	
	Mitigated	Mitigated
Current Analysis (March 2024)	\$ 39.8 M	25.2 mo
Previous Analysis (September 2023)	\$ 34.6 M	21.2 mo
<b>Variance</b>	<b>\$ 5.2 M</b>	<b>4.0 mo</b>

Values reflect probability-adjusted high estimates from the risk register.

# Changes to Risk Register

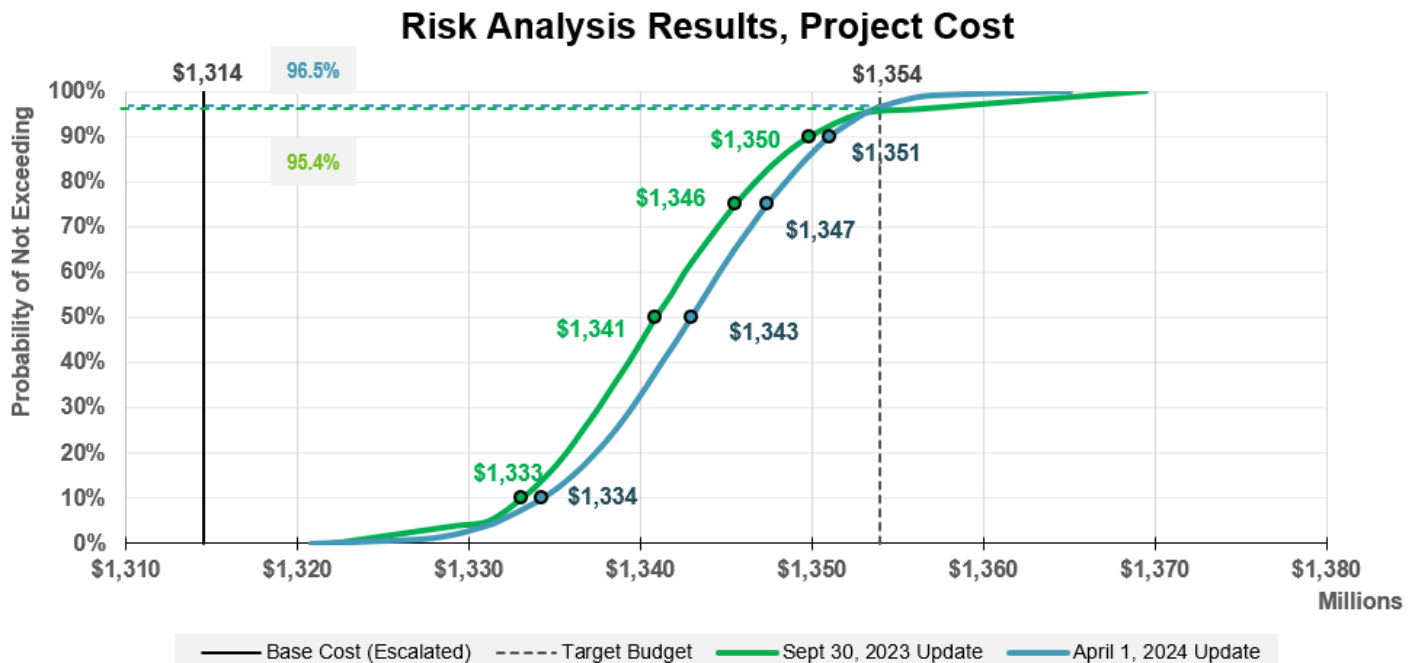
## Changes to Cost Risks

- **22** cost risks have been retired since the September 2023 update, resulting in a **\$6.7 M decrease** in probability-adjusted high-cost impact
  - **CNS 50.34** Additional SDMA dredging above and beyond capital dredging volume: City confirmed budgeted funding for maintenance dredging
    - 10% probability, \$6.3M - \$9.2M cost impact
  - **FCCO 13** Earthboring claim risk, above and beyond values carried in the EAC
    - 90% probability, \$0 - \$1.6M cost impact
- **16** cost risks have been added since the September 2023 update, resulting in **\$15.3 M increase** in expected value of the cost impact.
  - **CTR 900.13** SDMA deferred scope, 90%, \$0 to \$12.9 M cost impact
  - **MGT 30.01** Provincial land transfer tax
    - 25% probability, \$1.8M - \$3.6M cost impact
  - **CNS 900.99** Additional cost to complete 2024 maintenance in the parks
    - 70% probability, \$0.3M - \$0.8 M cost impact (\$0.56M probability high impact)
- Changes made to existing risks account for **\$3.4 M decrease** in expected value of cost impact.
  - **CNS 70.73: Increased offsite disposal for soils not meeting quality criteria:** \$2.3M decrease in cost impact
  - **CNS 70.72: Increase to soil disposal rate:** \$1.2M decrease in cost impact
  - **CTR 50.01: External market forces:** \$1M decrease in cost impact

# Cost Risk Analysis

## Comparison to Previous Update

- Since the previous analysis update, the cost estimate at 90<sup>th</sup> percentile has increased by \$1.2 million to **\$1,351 million**.
- Future SDMA funding allocation of \$12.9 M has been transferred from EAC to risk register at 90% probability, \$0 to \$12.9 M
- The current analysis assumes soft costs carried in the EAC and risk register are sufficient to cover costs through July 2025
- The percent chance of project not exceeding the target budget (\$1,354 million) is 96.5%, 1.1% higher than in the September 2023 update



*Note: Risk analysis results do not account for unknown unknowns that may impact the project budget.*

# Cost Risk Analysis

- Current base costs reduced by **\$6.7 million** compared to the previous update
- Risk-adjusted cost estimate at the 90<sup>th</sup> percentile increased by **\$ 1.2 million**
- Probability of achieving budget is now **94.4%**

	Due Diligence	30% SG	September 2022 Budget	September 2023 Forecast	March 2024 Forecast	Variance September 2023 to March 2024
Hard Costs	\$837 M	\$855 M	\$1,064 M	\$ 1,089.0 M	\$ 1,081.9 M	(\$7.1 M)
Soft Costs	\$168 M	\$185 M	\$222 M	\$ 227.2 M	\$ 227.6 M	\$ 0.4 M
NRHST	\$16.0 M	\$20.5 M	\$5.0 M	\$5.0 M	\$ 5.0 M	\$0
<b>Total Base Costs</b>	<b>\$1,021 M</b>	<b>\$1,061 M</b>	<b>\$1,291 M</b>	<b>\$1,321.2 M</b>	<b>\$ 1,314.5 M</b>	<b>(\$ 6.7 M)</b>
<b>Total Budget</b>	<b>\$1,185 M</b>		<b>\$1,354 M</b>			<b>\$0</b>
Estimated Remaining Contingency	\$164 M	\$124 M	\$ 63 M	\$32.8 M	\$ 39.5 M	\$ 6.7 M
P90 Cost Risk Estimate	\$1,185 M	\$1,220 M	\$1,344 M	\$1,350 M	\$ 1,351 M	(\$ 1.2 M)
<b>Target Budget</b>	<b>\$1,185 M</b>		<b>\$ 1,354 M</b>			
Probability of Achieving Target	90%	73%	96.4%	95.4%	96.5 %	1.1 %

# Top 10 Cost Risks

Risk	Probability	Low	High	Expected Value
SDMA Deferred Scope	90 %	\$ 0.0 M	\$ 12.9 M	<b>\$ 8.9 M</b>
Subcontractor Claims in Excess of Estimate				<b>\$ 5.7 M</b>
Contract Administration Service Extensions	100 %	\$ 3.3 M	\$ 3.3 M	<b>\$ 3.3 M</b>
NRHST Rebate - Municipal	50 %	\$ 5.7 M	\$ 5.7 M	<b>\$ 2.8 M</b>
Dock Wall Construction Under the Existing Cherry Street Bridge	50 %	\$ 2.5 M	\$ 3.5 M	<b>\$ 1.6 M</b>
Tuned Mass Dampers (Commissioners Bridge)	95 %	\$ 0.7 M	\$ 1.3 M	<b>\$ 1.1 M</b>
Provincial Land Transfer Tax	25 %	\$ 1.8 M	\$ 3.6 M	<b>\$ 0.8 M</b>
Increased Offsite Disposal – Soil Does Not Meet Quality Criteria	30 %	\$ 0.8 M	\$ 3.1 M	<b>\$ 0.8 M</b>
Disposal vs Re-use Soil Volumes - SDMA	60 %	\$ 0.3 M	\$ 1.4 M	<b>\$ 0.7 M</b>
Acceleration of Parks Work (Parks Finishes)	80 %	\$ 0.3 M	\$ 1.0 M	<b>\$ 0.7 M</b>

# Top 10 Schedule Risks

Schedule risk results do not account for the ability to continuously adjust the schedule by accelerating and re-sequencing work

Risk ID	Probability	Low	High	Expected Value
Subcontractor Change in Suppliers	90 %	2.0 mo	6.0 mo	<b>3.6 mo</b>
Delayed IFC Drawing Approvals for SWTF/SPS	90 %	2.0 mo	6.0 mo	<b>3.6 mo</b>
Extension in Parks Scope of Work	60 %	1.0 mo	6.0 mo	<b>2.3 mo</b>
Replacement Plant Availability	50 %	2.0 mo	6.0 mo	<b>2.0 mo</b>
Delay in Villiers Street Excavation	95 %	1.0 mo	2.5 mo	<b>1.8 mo</b>
Extended Operations of Toronto Water Assets	5 %	3.0 mo	24.0 mo	<b>0.6 mo</b>
Future Subcontractor Claims	90 %	0.3 mo	1.0 mo	<b>0.5 mo</b>
Migratory Bird Nesting	20 %	0.5 mo	6.0 mo	<b>0.5 mo</b>
Keating Channel Sediment Removal	5 %	1.0 mo	12.0 mo	<b>0.3 mo</b>
Keating Channel Sediment Removal Plan by the City – Potential Impacts to Dock Walls	5 %	1.0 mo	12.0 mo	<b>0.3 mo</b>

# Thank you / Questions

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