

PORT LANDS ACCELERATION INITIATIVE

Appendix 9
Flood Protection Strategy



Photo of Cherry Beach by Robert Taylor

Flood Protection Strategy - Appendix

DIRECTION FOR THE PORT LANDS

FINAL REPORT OF THE PORT LANDS ACCELERATION INITIATIVE

AUGUST 17 2012

1. FLOOD PROTECTION STRATEGY

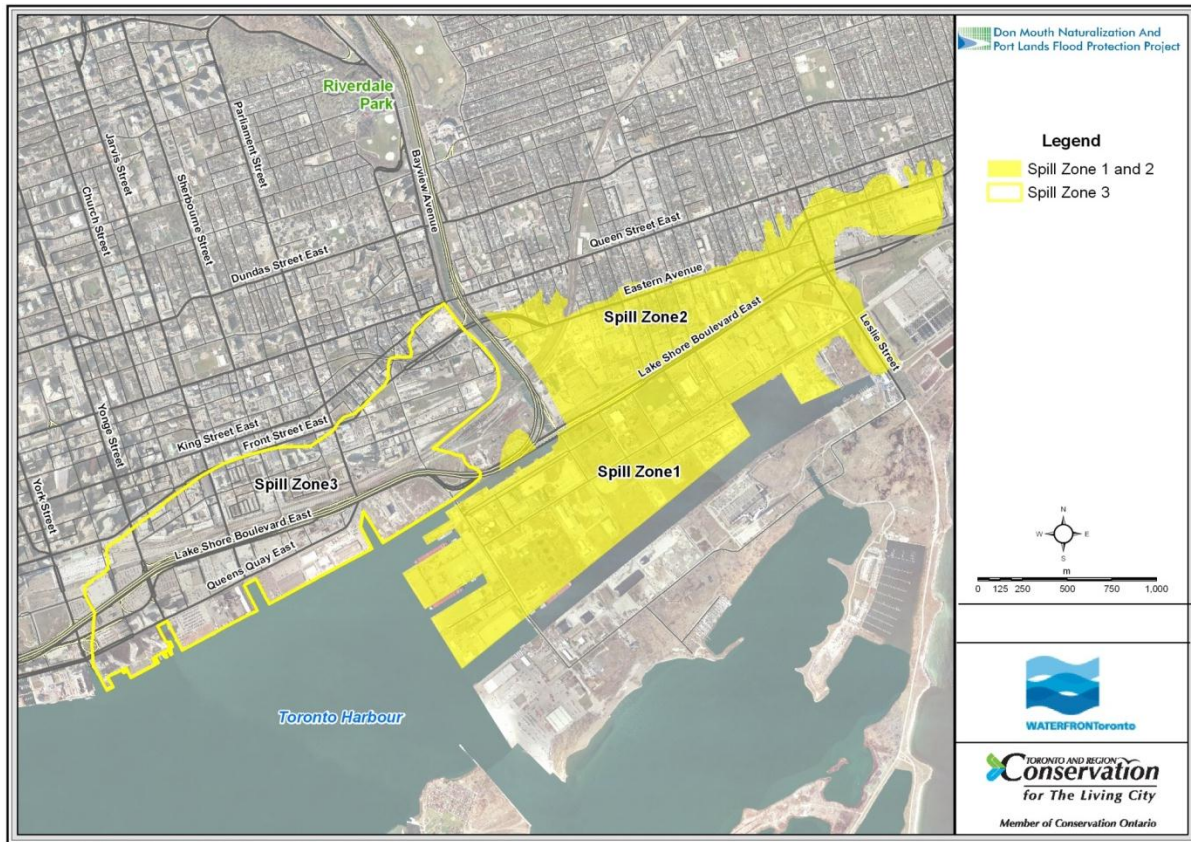
This Appendix has been prepared in support of the Port Lands Acceleration Initiative (PLAI) Report.

1.1 Background to EA Process and Review

The Environmental Assessment (EA) for the Don Mouth Naturalization and Port Lands Flood Protection Project (DMNP EA) began in 2004 with the preparation of the Terms of Reference for the project. The Terms of Reference outlined the goal and objectives of the project, as follows:

1. The goal of the DMNP EA is to establish and sustain the form, features, and functions of a natural river mouth within the context of a revitalized City environment while providing flood protection up to the Regulatory Flood.
2. The objectives are to:
 - a. Naturalize and rehabilitate the mouth of the Don River utilizing an ecosystem based approach;
 - b. Provide flood protection for Spill Zone 1 – the Port Lands, and Spill Zone 2 – east of the Don River and north of Lake Shore Boulevard (see **Figure 1**);
 - c. Maintain the provision for navigation and existing flood protection through sediment, debris and ice management;
 - d. Integrate existing infrastructure functions that could not be reasonably moved or removed (including road, rails, utilities, trails, and power);
 - e. Encourage additional compatible recreation, cultural heritage opportunities and public/universal accessibility;
 - f. Contribute to the revitalization and sustainability of the waterfront and coordinate with and inform other planning and development efforts and associated certain and foreseeable infrastructure; and
 - g. Design and implement the DMNP EA in a manner consistent with Waterfront Toronto's Sustainability Framework and applicable provincial legislation.

Figure 1. Regulatory Flood Spill Zones for the Lower Don River



Following approval of the Terms of Reference by the Minister of the Environment (MOE) in August 2006, the co-proponents (TRCA and Waterfront Toronto) spent the next four years working on the EA. The EA report that was submitted to the MOE in December 2010 proposed a new valley system for the Don River that extends south from the CN Rail Bridge to Lake Shore Boulevard East and heads southwest to discharge to the Inner Harbour between Polson Quay and Cousins Quay. In addition, two spillways help to convey larger storm events: the first spillway used the existing Keating Channel while a second greenway/spillway extended south from the valley system to the Ship Channel. At the mouth of the river, two promontories provided additional aquatic habitat in the Inner Harbour and recreational opportunities adjacent to the valley.

During the government review of the EA, a number of stakeholders in and adjacent to the study area raised concerns with MOE regarding the preferred alternative. Those concerns included navigational risk from the presence of the promontories; impacts on businesses and lost revenue for the Toronto Port Authority (TPA) related to the loss of dock wall associated with the promontories and the river mouth; and, impacts on operations of both land owners and port

users within the Polson Quay from the river mouth. In order to address these issues, the co-proponents sought and received a “pause” in the MOE EA review process. In early April 2011, the co-proponents restarted the EA review process when an amended EA was submitted to MOE, which included a disposition table outlining how TRCA, Waterfront Toronto and the City of Toronto proposed to address the comments received from stakeholders. In May 2011, the co-proponents were notified by MOE that they required a “pause” in order to consider more fully, the implications of the proposed amendments to the DMNP EA. A further extension of this “pause” was sought by the co-proponents when it became apparent that the City of Toronto was revisiting their priorities for the Port Lands, Lower Don Lands and Don Mouth during the summer of 2011. This led to a resolution being passed on September 21, 2011 by the City of Toronto Council, officially starting the PLAI. In response to the City’s direction to undertake the PLAI, the co-proponents sought and received a further extension of the “pause” until January 2012.

In January 2012, in order to allow the current PLAI review process to continue until completion, MOE granted the co-proponents a further “pause” from the EA review process until September 2012.

1.1.1 Current Review of the EA Alternatives

During the previous EA analysis, five alternatives were assessed and compared to identify a preferred alternative:

- Alternative 2 (discharge to the Inner Harbour)
- Alternative 3 (discharge to the Ship Channel)
- Alternative 4W (primary discharge to the Inner Harbour with overflow to the Ship Channel)
- Alternative 4S (primary discharge to the Ship Channel with overflow to the Inner Harbour)
- Alternative 4WS (primary discharge to the Inner Harbour with overflow through the Keating Channel and to the Ship Channel)

Assessed against the project objectives, the EA concluded that Alternative 4WS was most preferred, Alternatives 2, 3 and 4W were moderately preferred, and Alternative 4S was least preferred.

The protocol setting out the scope for the Initiative identified the City of Toronto as being added as a co-proponent for the DMNP EA with TRCA and Waterfront Toronto. Since September 21, 2011, the co-proponents have further examined options for the DMNP EA that would meet the EA's Terms of Reference.

Previous feedback from the TPA identified that those alternatives with primary discharge to the Ship Channel are not desirable due to potential impacts on shipping. The co-proponents were informed that continuous discharges into the Ship Channel produce cross-currents affecting ships even during base flow conditions. In addition, sediment and debris could end up in the channel, posing an additional navigation risk. Given the importance of shipping activities within the Ship Channel and the Turning Basin to the future of the Port Lands, Alternatives 3 and 4S (and derivatives of these two Alternatives) were therefore not further considered as part of the Initiative.

Alternatives 2, 4W, and 4WS were all reconsidered in light of comments provided by stakeholders on the EA report prior to commencement of the Initiative. Specifically, the alternatives were re-envisioned to address the following requirements while still conforming to the EA Terms of Reference regarding naturalization, flood protection, and city building:

- Accelerating development of the Keating Precinct by relocating any valley system to the south of the Keating Channel;
- Mitigating impacts on Port operations/private lands by providing for the continued use of the Polson Quay;
- Reducing costs and land requirements for flood protection implementation, and;
- Reducing costs for overall Port Lands development.

A description of Alternatives 2, 4W and 4WS as they are presented in the April 2011 DMNP EA, and the changes proposed to each alternative as part of the PLAI, are described in more detail below.

1.2 Alternative 2

The DMNP EA version of Alternative 2 discharges to the Inner Harbour along the alignment of the existing Keating Channel (see **Figure 2**) with a floodplain of 300 metres wide encompassing the area south from the Wilson Railyard to the south side of Villiers Street, and west from the western side of the Don Roadway to Cherry Street. The low flow channel is approximately 80 metres wide between Lake Shore Boulevard and east of Cherry Street, and widens to approximately 200 metres as it approaches the lake. Throughout its length, the low flow channel has a depth of 3 to 4 metres. This wide and deep channel configuration is required to be able to convey the Regulatory Flood through a single outlet to the lake.

Figure 2 - Alternative 2 (Based on DMNP EA April 2011 EA)



In the realigned version of Alternative 2 (see **Figure 3**), the floodplain has been shifted south and is situated between the north wall of the Keating Channel and the north side of Commissioners Street to support development within the Keating Precinct. The low flow channel extends further south before heading west towards the Inner Harbour. The dimensions of the floodplain and the low flow channel remain the same as the original version.

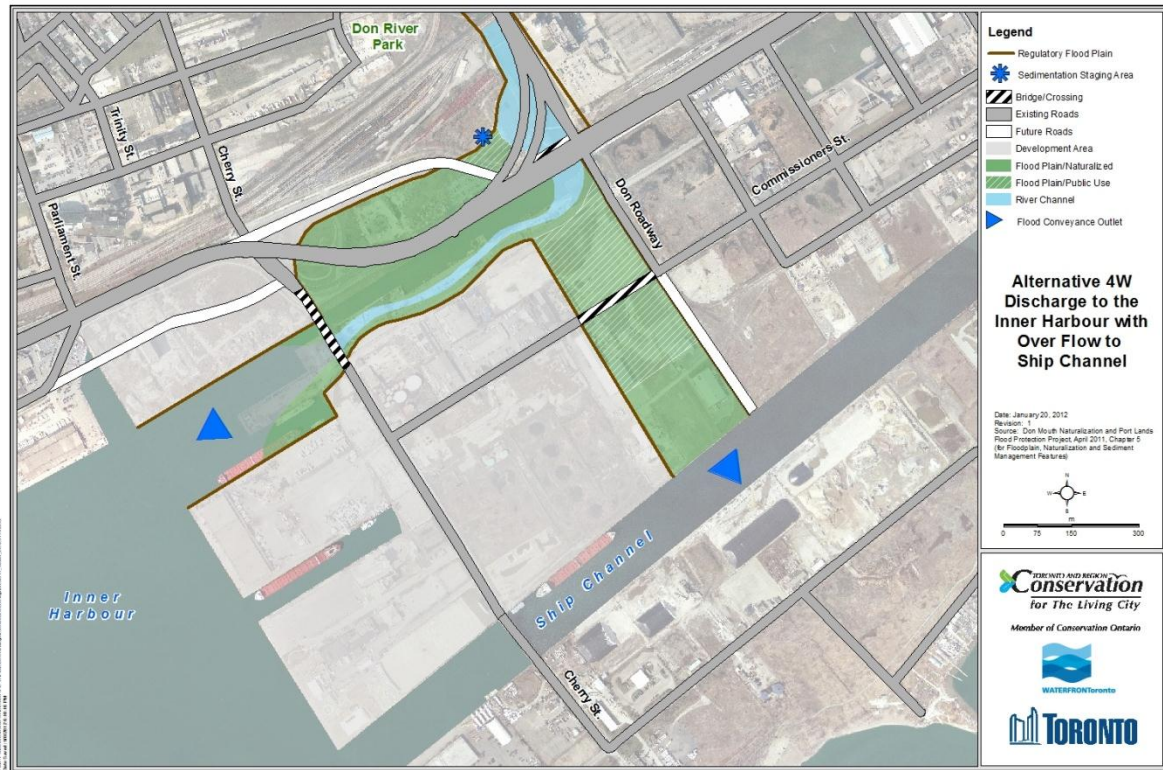
Figure 3 - Alternative 2 (Realigned)



1.3 Alternative 4W

The DMNP EA version of Alternative 4W also discharges to the Inner Harbour along the same general alignment as Alternative 2 (see **Figure 4**). The floodplain encompasses the same footprint as Alternative 2 with the addition of an overflow spillway / greenway that extends 200 metres west from the Don Roadway and south to the Ship Channel from the south end of Villiers Street. The low flow channel is approximately 80 metres wide where it crosses under Lake Shore Boulevard and narrows to between 15 and 30 metres (with a depth of approximately 1.5 metres) as it turns west from Lake Shore Boulevard and enters the lake. A shallower low flow channel increases the likelihood of plant growth and survival compared to Alternative 2, where the depths prevent sunlight from reaching vegetation (and therefore stimulating plant growth) due to the turbidity of the river.

Figure 4- Alternative 4W (Based on DMNP EA April 2011 EA)



Like Alternative 2, the floodplain of the realigned version of Alternative 4W has been shifted south and is situated between the north wall of the Keating Channel and the north side of Commissioners Street to support development within the Keating Precinct (see **Figure 5**). The river channel extends further south before heading west towards the Inner Harbour. The dimensions of the floodplain and the spillway / greenway were altered to approximately 200 m and 150 m respectively to reflect the optimization in sizing.

Figure 5 - Alternative 4W (Realigned)



1.4 Alternative 4WS

The DMNP EA version of Alternative 4WS discharges to the Inner Harbour between Polson Quay and Cousins Quay (see **Figure 6**). Two promontories are proposed in this location and extend out approximately 150 metres into the Inner Harbour from Cousins Quay and south of Polson Quay. The low flow channel is approximately 15 metres wide and 1.5 metres deep, with an associated floodplain of 150 to 200 metres wide.

Alternative 4WS has two overflow spillways: one to the west through the Keating Channel, and the second to the south that is a greenway ranging from 150 to 200 metres wide and that discharges to the Ship Channel.

Figure 6 Alternative 4WS (Based on DMNP EA April 2011)



Alternative 4WS was refined as part of the conceptual design during the EA to include a slightly narrower floodplain and smaller promontories (see **Figure 7**). However, the general alignment of the preferred alternative is similar to Alternative 4WS.

Figure 7 Preferred Alternative (Based on DMNP EA April 2011)



The realigned version of 4WS contains a number of changes to address concerns of stakeholders, including:

- Eliminating the promontories to avoid impacts on navigation risk for shipping in the Inner Harbour and to reduce the amount of lost dock wall;
- Phasing construction of the river mouth to accommodate existing uses by tapering the floodplain to match the width of Polson Slip and widening out the river mouth only after such uses no longer remain in the Quay; and
- Shifting the valley system to the north and the spillway / greenway to the east to create larger development blocks and to improve the hydraulic efficiency of the low flow channel and spillway / greenway (see **Figure 8**).

In addition, the width of the floodplain south of the Keating Channel is 150 m in its final alignment while the dimensions of the low flow channel remain the same as the original version. Please note that further refinements to the realigned version of 4WS were made in the summer of 2012 but retain the same general layout as what is described above.

Figure 8 - Alternative 4WS (Realigned)



1.5 Optimization Analysis and Results

The three realigned alternatives were assessed to confirm that they still meet the goal of the project, namely: (1) providing flood protection up to the Regulatory Flood; (2) establishing and sustaining a natural river mouth; and (3) supporting a revitalized City environment.

1.5.1 Flood protection

With regard to providing flood protection, a one-dimensional hydraulic model (HEC-RAS) was used to determine the overall likelihood that the three realigned alternatives were capable of containing the regulatory flood. The HEC-RAS model confirmed that the realigned Alternative 2 and 4W would be able to convey the Regulatory Flood. Based on the complexities of the flood conditions in the realigned Alternative 4WS, the 2D Delft hydraulic model was required to confirm that conveyance was achievable. While all three alternatives can convey the Regulatory Flood, Alternative 4WS provides the greatest floodplain area compared to the other two alternatives and therefore the greatest capacity for dealing with flood events. Alternative

4WS also includes three corridors for conveying flood events, which reduces shear stress and the likelihood of experiencing vegetation blowouts, as compared to two corridors for Alternative 4 and only one corridor for Alternative 2 (see **Table 1**).

1.5.2 Naturalization

In terms of establishing and sustaining a natural river mouth, Alternatives 4W and 4WS would significantly improve the aquatic and terrestrial habitat currently present within the Port Lands. With its larger green footprint, realigned Alternative 4WS would provide the most naturalized area. The realigned Alternative 2 provides the lowest functioning and smallest amount of naturalized habitat of the three realigned alternatives given the absence of a spillway / greenway and associated wetland, and the resulting need for a wide and deep channel required to convey the Regulatory Flood. Realigned Alternative 4WS provides higher functioning and more naturalized habitat compared to realigned Alternative 2 (see **Table 1**).

1.5.3 Revitalization

With regard to supporting a revitalized City environment, all three alternatives provide for the redevelopment of the Port Lands by removing the area from flooding. All three alternatives provide a similar amount of developable area, with Alternatives 2 and 4W providing 42.9 and 41.4 ha respectively, and Alternative 4WS providing 43.8 ha (see **Table 1**). However, only Alternatives 4W and 4WS can be phased to allow development to proceed in advance of the full build-out of the river.

The realigned Alternative 4WS has other significant benefits from a city building and development perspective. Its land subdivision is simpler, providing for a greater flexibility in development outcomes. The configuration with the Keating Channel remaining in essentially its current form and simpler bridge and road connections across the future spillway / greenway and new river course contribute greatly to both cost reduction and phasing, as well as reducing the specific construction costs of flood protection elements.

Table 1 below presents a comparative summary of the three realigned alternatives with respect to the goals of the project, namely: (1) providing flood protection up to the Regulatory Flood; (2) establishing and sustaining a natural river mouth; and (3) supporting a revitalized City environment.

Table 1. Summary of Optimization Analysis and Results for the Realigned Alternatives

Project Goals		Realigned Alternatives		
		Alternative 2	Alternative 4W	Alternative 4WS
Flood Protection	Don River Floodplain area	19.3 ha	22.8 ha	26.1 ha
	Flexibility in design to allow management of full range of flows	Single corridor conveys flood but difficult to manage high flood events (i.e., vegetation subject to high shear stress and more likely to experience blowouts during flood events)	Two corridors, including a spillway / greenway (extending south to the Ship Channel) diverting flood events from main corridor (i.e., reduced shear stress and the likelihood to experience vegetation blowouts during flood events)	Three corridors, including one spillway (the Keating Channel) and a spillway / greenway (extending from the Keating Channel to the Ship Channel) diverting flood events from main corridor (i.e., reduced shear stress and the likelihood to experience vegetation blowouts during flood events)
Naturalization	Area of naturalized habitat	11.8 ha	20.3 ha	22.5 ha
	Functioning of naturalized habitat	Lowest functioning habitat as wide and deep channel supports limited vegetation	Higher functioning habitat due to presence of spillway / greenway wetland and narrower and shallower channel	Highest functioning habitat due to presence of spillway / greenway wetland and narrower and shallower channel
Revitalization	Land area available for development or development	42.9 ha	41.4 ha	43.8 ha

	related amenities			
	Potential to phase river construction to allow for partial flood protection	No potential to phase river construction	Potential to phase river construction to allow partial flood protection and development west of Cherry Street and east of the Don Roadway to proceed following construction of the spillway / greenway and other interim flood protection measures	Potential to phase river construction to allow partial flood protection and development west of Cherry Street and east of the Don Roadway to proceed following construction of the spillway / greenway and other interim flood protection measures

Based on the optimization analysis and comparison of the three realigned alternatives, the realigned Alternative 4WS is the most preferred of the three alternatives and should be carried forward to the resumed EA process.

1.6 Refinements to the Preferred Alternative (Realigned Alternative 4WS)

The Delft3D hydrodynamic model, which was developed during the EA to support identification and selection of the preferred alternative river system and to ensure the management of the regulatory flood, was used during the Initiative to assess potential flood protection options for the realigned Alternative 4WS configuration. The model confirmed that the regulatory flood can be effectively managed and contained in conjunction with sufficient filling to create the valley feature, without any significant offsite or upstream impacts on flood levels.

While a general alignment for the alternative has been developed as part of the Initiative, this alignment will be refined as part of the EA process. Specifically, additional 2D hydrodynamic modeling will need to be undertaken to confirm the dimensions of the valley system and the low flow channel and to help set fill requirements for adjacent development blocks.

1.6.1 Interim Development Potential and Process

Consideration was given to how development within the Port Lands could be advanced prior to the full build-out of the valley system. An existing conditions hydrodynamic model was developed in Delft during the DMNP EA process to assess the extent of flooding currently experienced throughout the Port Lands, but also to use as a comparison against phasing scenarios for constructing the river. For the purposes of the review, three possible phasing scenarios were tested using the Delft model.

Scenario 1: Existing model with flooding removed from west of Cherry Street to reflect removal of flooding on lands both north and south of Polson Slip, while allowing flood waters to continue to spill into Polson Slip.

- The results of this model showed low to moderate off-site increases in flood depths during the Regulatory Flood in an area typically restricted to the lands immediately east of Cherry Street, with the most pronounced effects located north of Commissioners Street. Based on these results, development west of Cherry Street could proceed in advance of the full build-out of the river provided that the area to be developed is filled to a depth to remove it from existing flood levels. In addition, to deal with off-site impacts, flood works most likely related to an interim spillway / greenway proposed along the west side of the Don Roadway would be required (as discussed below in Scenario 3) to address questions of ingress and egress.

Scenario 2: This is the same as Scenario 1 above but with flooding also prevented from spilling to the land on the east side of the Don Roadway from the CNR Kingston line south to the Shipping Channel (i.e., lands raised out of the floodplain along the Don Roadway).

- The results of this model run depicted significant off-site impacts in flood levels throughout the area between Cherry Street and the Don Roadway including the 480 Lake Shore Boulevard area, as well as upstream, including potential flooding over the West Don Lands Flood Protection Landform (FPL). Therefore, this scenario would not be permitted unless off-site impacts could be mitigated.

Scenario 3: To determine if the off-site impacts defined in Scenario 2 could be mitigated, a further scenario was run with the full build-out of Reach 1 (north of Lake Shore Boulevard – which includes a widened Lake Shore Boulevard bridge and the upstream weir in the default down position to allow maximum flow split to the Keating Channel) combined with construction

of an “interim” spillway / greenway (200 m wide and somewhere between 1 and 2 m deep) connecting the Keating and Ship Channels along the west side of the Don Roadway.

- This model was undertaken principally to determine what flood protection measures would be required to mitigate the off-site water level impacts created by Scenario 2. Water levels between existing and this future condition were compared at various locations. The results suggest that if the flood protection works in the reach upstream from Lake Shore Boulevard plus the spillway / greenway to the Ship Channel were implemented, regulatory flood levels in the Lower Don Lands would be approximately the same as under existing conditions, while approximately 200 hectares of land east of Don Roadway in the Port Lands and South Riverdale would be eliminated from flooding.

While the draft modeling results show negative off-site water level impacts related to constraining the limits of flooding, these can be mitigated by phasing in flood protection works. Detailed modeling to define the exact dimensions of the spillway / greenway related to individual filling operations has yet to be undertaken. Further analysis will be required to develop a detailed design of the flood protection works and the most functional and cost effective manner to proceed. An ongoing formal TRCA permit process to allow for filling in the floodplain in an interim way will be required to meet provincial flood plain ingress and egress conditions. It is also recommended that the ultimate configuration for the final Ship Channel Wetland be constructed at the same time as the “interim” spillway / greenway as its function remains independent of flows from the Don River. Further study, modeling and policy considerations will be required through the DMNP EA process to confirm these phasing options.

Table 2 provides a summary of predicted regulatory flood levels through the Port Lands as a result of development west of Cherry Street and east of Don Roadway. In addition, the difference between the predicted flood levels and the existing regulatory water level are identified.

Table 3 presents a summary of the predicted flood level variations through the Port Lands as a result of the different approaches to phasing of alternative 4WS.

Table 2. Summary of the variation in flood levels through the Port Lands as a result of development west of Cherry Street and East of Don Roadway.

Location	Existing Regulatory Water Level (m)	Regulatory Flood Level with Spill Removed West of Cherry Street (m)	Flood Level Difference from Existing (m)	Reg. Flood Level with Spill Removed West of Cherry Street and East of Don Roadway (m)	Flood Level Difference from Existing (m)
Old Eastern Ave. Bridge	80.5	80.5	nil	81.0	0.5
Downstream from CN Bridge	80.2	80.2	nil	80.8	0.6
Lake Shore Blvd. E. Overpass	77.5	77.6	0.1	78.2	0.7
Cherry St. Bridge (Keating Channel)	76.7	76.8	0.1	77.4	0.7
Cherry St. (Crossing Low Flow Channel)	77.5	77.9	0.4	78.6	1.1
Don Roadway (near Villiers St.)	77.9	77.9	nil	78.5	0.6
Don Roadway (near Commissioners St.)	78.1	78.1	nil	79.0	0.9
Don Roadway (near Shipping Channel)	77.7	77.9	0.2	78.5	0.8
Villiers St. (between Don Roadway and Cherry St.)	77.6	77.8	0.2	78.5	0.9
Shipping Channel (between Don Roadway and Cherry St.)	77.5	77.9	0.4	78.7	1.2

Table 3. Summary of the variation in flood levels through the Port Lands as a result of the different approaches to phasing of the 4WS alternative.

Location	Existing Conditions	Existing Conditions Model with Reach 1 Development Blocks W. of Cherry St Spill Contained E. of Don Roadway	
		Spillway / Greenway at 76.2m	Spillway / Greenway at 75.2 m
Downstream of old Eastern Ave. Bridge Overpass	80.5	79.2	79.2
Downstream of CN Bridge Overpass	80.2	79.0	78.9
Lake Shore Blvd E. Overpass	77.5	77.7	77.5
Cherry St. Bridge (Keating Channel Outlet)	76.7	76.0	75.4
Cherry St. (Crossing Low-Flow Channel)	77.5	77.4	77.2
Don Roadway (near Villiers St.)	77.9	77.7	77.6
Don Roadway (near Commissioners St.)	78.1	77.6	77.5
Don Roadway (near Shipping Channel)	77.7	75.2	74.9
Villiers St. (between Don Roadway and Cherry St.)	77.6	77.7	77.4
Commissioners St. (between Don Roadway and Cherry St.)	77.8	77.7	77.4
Shipping Channel (between Don Roadway and Cherry St.)	77.5	77.5	77.2

1.7 Interim Development Potential

The extent and nature of development in the Port Lands within the area governed by the Special Policy Area (SPA) is currently limited to expansions of existing uses and the development of new buildings that are permitted by current zoning provided that they do not negatively impact other properties within the flood plain. The review examined the extent to which the required flood protection works can be phased, as well as under which conditions development could be permitted on an interim basis before all elements of flood protection have been constructed, in accordance with the location, nature, extent of, and potential redevelopment beyond that allowed by existing zoning and the SPA policies.

The following conditions would govern such interim development:

1. A comprehensive revitalization framework plan and phasing approach that provides for flood protection to the level of the regulatory storm, confirmed by a Council resolution, a TRCA Board resolution and an approved EA.
2. An Official Plan Amendment identifying and reserving the lands required for flood protection, supported by TRCA and approved by City Council and the Ministries of Municipal Affairs and Housing (MMAH) and of Natural Resources (MNR).
3. A commitment to implement the phasing approach in question by the City and/or other public sector agencies, through a strategy that could consist of a combination of public and private sector investment and development approval conditions and supported by a realistic funding plan and time frame.
4. With these three commitments in place, the potential for phasing in the various flood protection components and consequent interim development could be analyzed for feasibility. Sufficient interim flood control measures would be identified to ensure that any developments that wish to proceed in advance of the completion of the comprehensive solution would not result in an unacceptable increase to the level of flood risk on other properties and not jeopardize the implementation of the comprehensive solution.

Assuming satisfactory commitments were made for the construction of the identified interim measures, a further set of conditions would have to be satisfied to the extent required before any associated development could proceed:

1. An emergency response plan be developed in cooperation with the emergency response agencies and approved by them.
2. A liability management agreement, concerning potential flood related damages or delays during construction, be developed and signed between the City of Toronto, TRCA and the Province of Ontario, including provisions for indemnifications to be provided by private sector developers.
3. TRCA development permits under Ontario Regulation 166/06 be secured.

To advise the overall business and development plan, the review undertook preliminary investigations of where and how these conditions were most likely to be satisfied within the Port Lands. Such work, it must be stressed, is preliminary and must be revisited when specific precinct planning and development proposals are advanced. It nonetheless provides an initial indication of both the likely effectiveness of phased flood protection implementation and the future requirements for such flood protection for individual precincts.

The full range of possible flood protection works necessary to implement realigned alternative 4WS consists of a number of elements listed below. Initial draft engineering analysis undertaken to date would suggest that not all of these elements may be necessary for different interim stages of development in the Port Lands, to be confirmed by additional analysis.

1.7.1 The Spillway/Greenway

The Spillway / Greenway is a broad north/south green corridor extending from the Keating Channel to the Ship Channel used to convey flood waters south. Its specific width and depth varies with the different conveyance demands of different interim conditions.

Raising of the Don Roadway, in addition to filling of some of the lands to the east, will create a new valley edge along the eastern side of the Spillway / Greenway and future River with sufficient elevation and strength to protect lands to the east from flooding. The raised Don Roadway would extend from the Ship Channel to the south to Lake Shore Boulevard to the north. A separate berm or Flood Protection Landform (FPL) is required immediately east of the Don Roadway between Lake Shore Boulevard and the CNR embankment on the former Lever Bros. property.

1.7.2 The Sediment Basin / Lake Shore to CNR Flood Management

The Sediment Basin is a widened area of the Don River to the north of Lake Shore Boulevard required to collect sediment from the river and permit flood flows through this currently restricted stretch of the river. Other works will be necessary to support widening this stretch of the river to the CNR bridge, including widening of the Lakeshore Boulevard crossing, the railway spur crossing, and removal of the Hydro One utility bridge.

1.7.3 The River

The River is the new river valley created through the Lower Don Lands from the eastern end of the Keating Channel to the Inner Harbor through the Polson Slip.

Preliminary modeling suggests that the removal of lands from the flood plain to permit development of the section of the Lower Don Lands to the west of Cherry Street may have an impact that can be mitigated by the construction of just the Spillway / Greenway, combined with minor grading works west of Cherry. These lands are part of the Lower Don Lands, closest to the Inner Harbour where flood spill amounts are estimated to be lowest. Impacts on adjoining lands in the Lower Don Lands resulting from the removal of lands to the west of Cherry Street from the flood plain may be mitigated by the construction of the Spillway/ Greenway alone, in advance of later flood protection elements.

Development of lands to the east of the Don Roadway will require more substantial implementation of flood protection works. The Spillway/ Greenway, the raised Don Roadway and Sediment Basin / Lake Shore to CNR Flood Management will all have to be in place (including widening of Lakeshore Boulevard crossing, railway spur crossing, and removal of Hydro One utility bridge), as will necessary flood protection measures along the western edge of the Lever Bros property to the north of Lake Shore Boulevard East. With such measures in place full flood protection appears possible for all the lands east of the Don Roadway, between Eastern Avenue and the Ship Channel (approximately 200 hectares).

Some limited development to the east of the Don Roadway subject to the Special Policy Area designation may be possible in advance of any flood protection measures subject to the standard requirements of the SPA policies provided it is permitted by existing zoning, can be flood-proofed, does not compromise the implementation of the DMNP EA, and results in no negative flood impacts for adjoining properties. While no detailed analysis has been undertaken

to date, previous works have suggested that impacts from limited development to the south of Commissioners Street may be less problematic.

Development in the section of the Lower Don Lands between the Don Roadway and Cherry Street will require the implementation of all the flood protection works including the River in addition to raising some lands in the Film Studios District as per the 4WS preferred alternative. The flood protection phasing scenario costs are considered in the main report in the context of the investment required for other necessary infrastructure and site development preparation.

1.8 Next Steps

This section outlines the process for resubmitting the Don Mouth EA report based on the outcome of the PLAI. This process assumes that City Council, and the Board of Directors for TRCA and WT support the co-proponents' recommendation to carry the realigned version of 4WS ("realigned 4WS") forward as the new preferred alternative.

The TRCA, City of Toronto and Waterfront Toronto will advise the MOE Project Officer prior to September 30, 2012 (the expiration date of the current pause), that the recommendation to City Council is to carry the realigned version of 4WS forward and request a further extension to the pause to provide the necessary time to further refine the amendment submitted in 2011. The TRCA, City of Toronto, and Waterfront Toronto will then refine realigned 4WS to reflect the level of detail included in Chapter 6 of the April 2011 EA report regarding the preferred alternative. These refinements will include:

- Undertaking 2D hydraulic modelling to confirm the dimensions (width and depth) of the floodplain, including the interim and final spillway / greenway;
- Updating the design of the floodplain and the vegetation communities based on the outcome of the hydraulic modelling, and;
- Preparing a conceptual level of design for infrastructure (specifically bridge and utility crossings of the floodplain), recreation, and development in the surrounding Lower Don Lands area.

- Developing a detailed phasing plan for construction of the river mouth that reflects the proposed phasing identified during the PLAI for advancing development within the Port Lands.

Following the refinements to realigned 4WS, the co-proponents will update the effects assessment that was completed during the EA and documented in Chapter 7 of the April 2011 EA report. The majority of the studies that were completed for the original EA, including for archaeology and built heritage, and soils and groundwater, can be reused for the effects assessment. However, sediment modelling and socio-economic studies, including noise, will need to be updated to reflect the refinements to realigned 4WS.

The refinements and the results of the effects assessment will be presented to the Community Liaison Committee and individually to agencies and other key stakeholders (i.e., landowners) prior to presenting this information to the public at a final Public Forum.

Following the meetings with stakeholders, agencies, and the public, the EA report will be updated to describe the PLAI process, the refinements to the realigned 4WS, the updated effects assessment, the recent consultation process, and any other changes to chapters of the April 2011 EA report. The amended EA report will be resubmitted for public and government review, and ultimately for MOE approval.

Regarding the federal EA, on July 6, 2012, the changes to the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) came into force. These changes allow for a Designated Project List and for a provincial EA to be completed in place of a federal EA. As this project is unlikely to be designated and the CEA Agency would likely defer to the provincial EA in any event, completion of a federal EA will not likely be required. As such, Chapter 1 of the provincial EA report will be updated to describe the changes to CEAA 2012 and that completion of a federal EA would not be required. However, permits required from other federal agencies, such as the Department of Fisheries and Oceans Canada (DFO) and Transport Canada (TC) will still be required.

There are a number of other activities that must be completed to support implementation of an approval EA, including amending the Secondary Plan and updating the Lower Don Lands Infrastructure Municipal Class EA. The changes to these documents are beyond the scope of the EA and are therefore not discussed further.