

## **RIVER FLOOD MITIGATION PANEL FINAL REPORT**

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### **EXECUTIVE SUMMARY**

On 2013 July 23 The City of Calgary announced the creation of an Expert Management Panel (the Panel) to guide The City of Calgary's River Flood Mitigation Program and find ways of reducing damage from future river flooding. The Panel's final report and recommendations are presented along with Administration's response to the recommendations for continuing to move towards flood resilience.

### **ADMINISTRATION RECOMMENDATIONS:**

That the Priorities and Finance Committee:

1. Forward this report to the 2014 June 23 meeting of Council.

Recommend that Council:

2. Accept the report, Calgary's Flood Resilient Future: Report from the Expert Management Panel on River Flood Mitigation (Attachment 1) for information.
3. Direct Administration to bring a report to Priorities and Finance Committee no later than 2014 October 28 with the resource requirements for Corporate activities to be initiated in 2015-2018 (Attachment 2).
4. Direct Administration to bring a report to Priorities and Finance Committee no later than 2014 December 9 with a status update for Corporate activities underway, as identified in Attachment 2.
5. Request that the Glenmore Reservoir Diversion Tunnel be included in the Province of Alberta's analysis of available capital works options for flood mitigation and that The City of Calgary be engaged in the decision making process.

### **PREVIOUS COUNCIL DIRECTION / POLICY**

On 2013 December 16, Council received Expert Management Panel on River Flood Mitigation Quarterly Report 2013-0732 for information.

On 2014 March 31, Council received the report, Expert Management Panel on River Flood Mitigation Quarterly Report 2014-0100 for information.

### **BACKGROUND**

On 2013 July 23 The City of Calgary announced the creation of an Expert Management Panel to steer The City of Calgary's River Flood Mitigation Program and to find ways of reducing damage due to any future river flooding. The Program work was divided into six theme areas each focused on a specific area of study. In January of this year, a wide range of external experts were invited to generate and assess options for each of the six themes under study.

Together with the advice of the Panel and the assistance of The City of Calgary team, this information has been distilled into a series of 27 recommendations which the Panel has determined will lead to a safer, more flood resilient city. The results form the basis of the final report, Calgary's Flood Resilient Future: Report from the Expert Management Panel on River

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Flood Mitigation (Attachment 1). Associated with each of the Panel's recommendations are activities identified by Administration that are either already underway or activities identified that are not yet initiated.

### **INVESTIGATION: ALTERNATIVES AND ANALYSIS**

Administration is proposing a logical, stepwise response which would best position The City to strengthen flood mitigation and community resilience, building on the work that is already happening. As a first step, Administration has evaluated each Panel recommendation to identify the activities that are already underway as part of the on-going flood recovery, preparedness and mitigation (Attachment 2). Additional activities that would be required to fulfill the recommendations were also identified along with the lead and supporting business units which would assess the resources required to complete these activities within the 2015-2018 timeframe.

Further assessment is needed so a cohesive plan of related flood mitigation work and necessary resources can be prepared for City Council consideration. By the fourth quarter of 2014, Administration will be in a position to report on the resource requirements for the activities to be initiated and identify how to incorporate required resources into the 2015 to 2018 Action Plan for approval by Council. A small task force would assist the business units with this work and track progress.

The recommendations of the Panel have been grouped into what the Panel has called Action Areas; collections of related recommendations. This organizes the recommendations developed within each of the six theme areas into categories which more closely follow how The City is organized and carries out its business.

Action Area 1 calls for an examination of the efficacy and long term significance of the existing flood protection standard (the 1:100 standard) for both public and private infrastructure and development as well as the impacts to any change on future development and the Triple Bottom Line implications. The resilience of the infrastructure of industry partners (other utilities in particular) may need to be strengthened and an examination of this issue is included.

Action Area 2 is to examine and improve where possible, river level monitoring infrastructure, notification processes and interagency cooperation in order to improve accuracy and timeliness of the information and alerts. A program of staged flood preparation and awareness for the affected public will be outlined to increase information sharing and public preparedness.

Action Area 3 focuses on civil works such as building new or modifying existing infrastructure or changing the operation of existing infrastructure to mitigate flood water levels through protection, storage or diversion. Reducing the impact of flood waters through new or increased protection barriers is included.

The Panel recommends, in partnership with the Province that Administration compare the three major capital works options for mitigating floods on the Elbow River, including a diversion from the Elbow River to the Bow River, in accordance with the conclusions of the feasibility studies underway. At this time, the Glenmore Reservoir Diversion Feasibility Study is complete and has

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analysed the flood data, hydraulics, and capacity required to protect downstream commercial and residential areas on the Elbow River from a flood equal in size to the 2013 flood. The study by Hatch Mott MacDonald engineering consultants concludes that a diversion tunnel is feasible, and the preferred route is under Heritage Drive from Glenmore Reservoir to the Bow River. Technical details of inlet and outlet works, methods of constructing and lining the tunnel, impacts on downstream communities and a Triple Bottom Line analysis have been developed.

A cost estimate of \$457 million is given for construction and engineering. Adding environmental mitigation, regulatory and land rights costs may increase the estimate to \$500 million. Comparison with the information currently available for upstream initiatives proposed by the Province at McLean Creek and Springbank indicates that the Glenmore Diversion tunnel is the most expensive initiative. An integrated evaluation by the Province, in collaboration with The City, of the costs and benefits (operational, environmental, economic, safety) of all three options is needed.

Action Area 4 is to develop a terms of reference for the studies and engagement necessary to better understand the implications of removing structures and impediments from floodways, the flood fringe and riparian areas. This could include removal of private homes and therefore requires very careful and detailed planning of the work needed to bring an informed study before Council.

Action Area 5 comprises work that would result in an improved understanding within The City and among the public as well as regulators, developers, engineers, insurers and other professionals of the current flood risk with some informed projections for future risks. Enhancing flood mapping is the focus, including a discussion of the need for up-to-date official maps regulating development.

Action Area 6 calls for a framework and implementation plan to develop policy, best practices and strengthened partnerships with regular progress updates for Council, to ensure flood resilience stays a focus and continues to improve over the long term.

The development of the 27 recommendations was accomplished over the last five months. However, the implementation of these recommendations will involve a much longer timeline, extending well beyond 2015 in many cases. The myriad of activities vary in scope, complexity, and duration. Over the next several months, a designated task force will work with business units that have a lead or supporting role in the activities to identify resource requirements, options, and recommendations for each of the identified activities that may then be included as part of the 2015-2018 business cycle.

The recommendations from the Panel are predominately directed toward The City of Calgary and will focus The City's mitigation efforts on protecting public safety and critical infrastructure. Even with future mitigation activities undertaken, there will always be a risk of flooding and it is important to note that citizens must do what they are able to do to manage their personal and property risk, ensure their own safety and minimize financial and other losses.

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### **Stakeholder Engagement, Research and Communication**

A steering committee of Directors has been established to determine how the Administrative activities aligned to the Panel recommendations will be executed and progress tracked. Each recommendation implies a phase of study and analysis to ensure proposals for future action provide sound choices for City Council.

Communication with key stakeholders in the community will be necessary to assure citizens that work is ongoing and that this phase of analysis and preparation is necessary if The City is to carry out the Panel recommendations with any degree of success.

### **Strategic Alignment**

The purpose of the recommended actions is to move forward on flood mitigation and community resilience which are key outcomes related to the strategic goals of The City. The on-going activities associated with the Panel's recommendations aligns with The Corporation's Triple Bottom Line policy and framework, imagineCALGARY goals and the Municipal Development Plan, the Environmental Reserve Setback Policy, Riparian Strategy, and Stormwater Management Plan.

### **Social, Environmental, Economic (External)**

Mitigating future flood impacts has important benefits for the social and economic well being of The City. The financial costs, business impacts and disruptions to the lives of Calgarians can be reduced with a well planned program of change and improvement. When implemented, many of these projects will improve the resiliency of our city, by providing protection of public infrastructure, improved communications with Calgarians on flood preparedness. It is also understood, that solutions must be sought which balance these factors with environmental impacts; finding ways to maximize environmental benefits such as water quality and quantity.

### **Financial Capacity**

#### **Current and Future Operating Budget:**

There are sufficient funds remaining in the Flood Mitigation Program Budget to support a task force of three to four staff to the end of 2014. Individual business units tasked with developing the needed information in Attachment 2 will not be requesting additional budget for this activity in 2014.

Where possible, resource requests to carry out the work recommended by the Panel will be included in the 2015 to 2018 Action Plan subject to Council approval. However, understanding in some cases, that the Action Plans and related budgets may already be established for 2015-2018, consideration will need to be given to the financial resources required to sustain the flood resiliency momentum. While part of this might be achieved through financial opportunities with the Provincial government, it may require a certain level of financial commitment from The City to achieve the Panel's recommendations. Specific resource requirements will be identified over the next several months.

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### **Current and Future Capital Budget:**

The capital program is currently under development. At this time it is not known which proposed projects will qualify for Provincial funding or how flood related projects will fit into the current capital plan.

### **Risk Assessment**

Significant flood mitigation projects are capital intensive and require time to design and build. Prior to the completion of the projects the city remains vulnerable to extreme flood events. To mitigate this risk, The City continues to implement shorter term actions and will look at ways to accelerate the capital work once approved. Communication with key stakeholders in the community on progress of the flood mitigation work will be critical.

The City's purchased insurance for 2014 increased significantly as a result of the flood. The insurers that remained on the program and the new ones that came on all indicated that they would need to see what plans both The City and the Province would be taking to reduce the likelihood of another major flood event or reduce the severity of such a loss. On-going engagement with the insurance industry and having a cohesive plan, based on the Panel's recommendations, will identify the activities that The City is undertaking for future mitigation and increasing flood resilience.

### **REASONS FOR RECOMMENDATIONS:**

The report of the Expert Management Panel on River Flood Mitigation contains many sound recommendations for change. By using these recommendations to help guide flood mitigation actions, The City will ensure continued momentum of flood mitigation efforts and be able to demonstrate to key stakeholders in the community the work that The City is undertaking. In order to translate these recommendations into action, Administration needs several months to determine how they could be carried out, what resources would be required and to return to Committee in Q4 with options, resource requirements and recommendations for concrete action in 2015 to 2018. This is an important bridging step that moves The City from understanding what needs to be done to how it can be achieved. As well, there are many activities already underway aligned with the Panel's recommendations. Reporting on the status of these projects by the end of the year provides an opportunity to evaluate progress towards greater flood resilience.

### **ATTACHMENTS**

1. Calgary's Flood Resilient Future: Report from the Expert Management Panel on River Flood Mitigation
2. River Flood Mitigation Panel Recommendations and Administration Activities