



CITY OF RICHMOND

REPORT TO COMMITTEE

TO: General Purposes Committee
FROM: Chuck Gale, P. Eng.
General Manager, Engineering & Public Works
RE: **Emergency Program - Status Report**

DATE: October 10, 2000
FILE: 5125-03-02

STAFF RECOMMENDATION

1. That the staff report dated October 10, 2000, regarding "Emergency Program – Status Report", from the Manager – Environmental Programs, be received for information.
2. That the attached "Flood Protection Measures" brochure be endorsed.
3. That future quarterly progress reports regarding the Emergency Program, be submitted to members of Council in the form of an "Information Memo".

A handwritten signature in black ink, appearing to read "Chuck Gale".

Chuck Gale, P. Eng.
General Manager, Engineering & Public Works

STAFF REPORT

ORIGIN

On April 10, 2000, Council endorsed a number of projects relating to the Emergency Program. These projects will lead to the development of an up-to-date and comprehensive Emergency Plan and Program for the City of Richmond.

This report provides a status update on the projects identified for 2000 as well as other activities of the Emergency Program. Unless instructed otherwise, it is our intention to submit quarterly progress reports to members of Council in the form of an "Information Memo". The Manager – Environmental Programs will be available at the next General Purposes Committee meeting following the memo, to address any questions Council may have regarding the Information Memo.

This report presents progress since January, 2000 through September 30, 2000.

ANALYSIS

Project Status Summary

Project	Key Activities	Current Deliverables & Time Frame
<i>Emergency Social Services (ESS) – Plan Development</i>	<ul style="list-style-type: none"> Steering Committee established Demographic study underway Resource inventory/agreements being developed Facility identification commenced Consultant retained to: <ul style="list-style-type: none"> - develop volunteer base, - undertake community focus group sessions and assist with plan development. 	<p>November, 2000 – Public consultation sessions will commence. Members of Council will be apprised of dates for information</p> <p>April, 2001 – ESS Plan presented to Council for approval</p>
<i>ESS – Assistance</i>	<ul style="list-style-type: none"> Provided personal disaster assistance to 60 residents on 5 different occasions. 	
<i>Community Awareness Program Development</i>	<ul style="list-style-type: none"> Developed a "Basic Emergency Preparedness" presentation Hosted a "Volunteer Information Night" (September 21st) Developed the attached "Flood Protection Measures" brochure 	<p>December, 2000 – volunteers trained to deliver presentations</p> <p>Feedback on the brochure will be sought during presentation of this report (prior to full production/printing scheduled for November, 2000).</p>
<i>Presentations</i>	<ul style="list-style-type: none"> Conducted 15 presentations/community outreach events, involving over 833 participants 	
<i>Resources Plan/ Communications</i>	<ul style="list-style-type: none"> Actively recruiting for a secondment position through the ART Team 	<p>November, 2000 – secondment in place and project scope defined</p>
<i>Emergency Plan Document</i>	<ul style="list-style-type: none"> Emergency Management Organization established Emergency Planning Committee established (see attached) Preliminary planning session conducted on October 4, 2000 with Emergency Planning Committee to identify hazards, impacts and priorities for response Retained a consultant to assist in the preparation of a Dangerous Goods Spill Plan 	<p>November, 2000 – Bylaw 7061 updated to clarify reporting process.</p> <p>December, 2000 – Procedures in place for EOC call out and local emergency declaration. Draft emergency plan prepared.</p>

Project	Key Activities	Current Deliverables & Time Frame
<i>Training Program</i>	<ul style="list-style-type: none"> • Co-ordinated 20 training sessions relating to various aspects of emergency management for 405 attendees. 	Ongoing.
<i>Exercise Program</i>	<ul style="list-style-type: none"> • Richmond Amateur Radio Club participated in two communications exercises. • Task Group formed to develop a tabletop exercise. 	Ongoing.

For the purposes of brevity, this report presents a point form overview of the specific projects being undertaken. Staff will be available at the Committee meeting to discuss any of these projects in detail.

Issues & Challenges

Our experience in developing this program has revealed a number of issues and challenges, which are not necessarily unique to Richmond, but rather inherent in the process:

- The Emergency Planning effort is intensive and ongoing.
- Documentation of plans and related materials is critical.
- Newly obtained resource/contact and other related information is often quickly outdated.
- Maintaining interest in ongoing personal preparedness is challenging, but necessary.
- Maintaining a committed volunteer base is possible, but requires a continuous and focused effort.

To address these issues, the following key program management objectives have been identified for integration into the program.

1. A combination of temporary and secondment staff as well as consultants have been engaged to assist with our planning efforts. Their work is clearly focused with clearly defined outcomes and timeframes.
2. Documentation is important to ensure that the Emergency Plan/Program does not become reliant on any one individual's knowledge base. Therefore, we are/will:
 - clearly document all materials developed and processes employed,
 - present plans and policies, as they are developed, to Council for formal approval,
 - ensure that as plans are developed, they are communicated to the staff involved,
 - introduce a program of exercises, as plans/procedures are developed, in order to allow the players to 'practise' their defined roles and responsibilities.
3. In an effort to minimize the amount of work involved in maintaining current information in the plan/s, we are evaluating the opportunities available through the incorporation of technology, i.e. updating telephone numbers/resource information through the internet, etc.
4. To encourage personal preparedness and attract volunteers, we intend to create a positive and professional image around the program in a number of ways. For example, through the professional appearance of our brochures, presentations and the organization of community events.

FINANCIAL IMPACT

Funding for 2000 projects is provided in the Emergency Program and corporate consulting budgets. Funding needs for the 2001 portion of the program will be sought through the budget approval process. Projects for which funding will be requested in 2001 include: resource secondment, ESS Plan completion, emergency communications, community awareness and public communications.

CONCLUSION

Development of the Emergency Program is progressing well. We are confident that the approach we are pursuing will result in a comprehensive program for Richmond, and one which will contribute toward setting a high standard for emergency planning and preparedness in the Lower Mainland.



Suzanne Bycraft
Manager, Environmental Programs

SJB:

History of flooding

Freshets - The highest freshets occurred in 1894, 1948 and 1972. In each of these instances, no flooding occurred on Lulu or Sea Islands. In 1948, there was minimal flooding on Mitchell Island (where dykes had not yet been constructed).

It is also important to note that Richmond is located far to the south of the peak snowpack runoff points. This means that the water level is considerably lower in Richmond due to the widening of the river. This gives the water a larger distribution area, thus reducing its vertical influence on the river. The water then releases to the Gulf of Georgia.

Weather Events - Richmond's drainage system is designed to accommodate a 1 in 10 year storm event. There have been some minor instances of property damage to low-lying properties caused by flooding during heavy rainstorms that exceeded a 1 in 10 year storm event.

Dyke Breach - There is no record of a breach which has resulted in flooding since the major dyking network was constructed by the first settlers of our community. The dykes were further upgraded in the 70's and 80's to accommodate a 1 in 200 year event.

The City takes a number of steps to safeguard against these unlikely events, as additional precautions. See "Flood Protection Measures" located on the inside of this brochure.

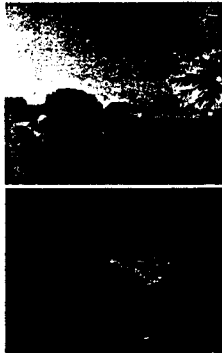
RICHLAND



City of Richmond

Emergency Programs

Flood Protection



Overview

Richmond's unique characteristics make it a great community to live, work and play. The fact that Richmond's geodetic location is approximately one metre above mean (average) sea level and on a floodplain, however, often raises questions about the potential for flooding.

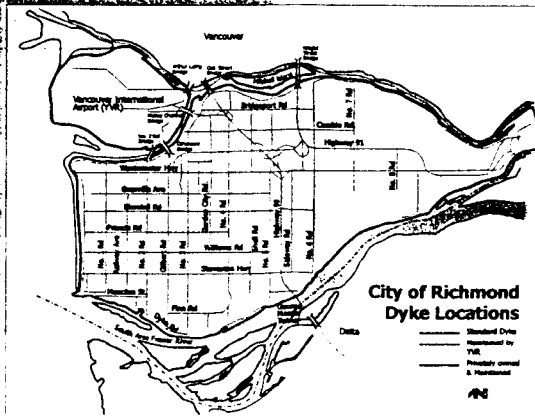
This brochure addresses the risk factor for Richmond and provides information on measures the City takes to guard against the possibility of flooding.

The facts

Although not officially designated as such, Richmond is located on a floodplain. A floodplain is land adjacent to a watercourse that is susceptible to flooding, such as from periods of high tides. In addition, isolated instances of flooding can occur in any community as a result of unanticipated weather events.

To protect Richmond from the possibility of flooding due to high tides or river floods, the City has constructed a comprehensive system of dykes on Lulu Island. These dykes are over 49 km in length and protect an area of 12,805 ha. Mitchell Island is protected by dyke which are privately owned and maintained. Sea Island dykes have been maintained and improved primarily by the Vancouver International Airport Authority.

The City has an extensive system to remove drainage water from adverse weather conditions. This system comprises 220 km of ditches and canals, and 240 km of box culverts and storm sewers.



There are primarily two types of events which could trigger flooding:

1. River Event

Freshet - higher than normal snow packs within the Fraser River Basin, combined with consistent, warmer than normal Spring weather patterns, can cause a rise in river discharge.

Dyke breach due to natural disaster - if the dyke were to breach at high tide, water could flow in over areas that are lower than the height of the tide until such time as the tide recedes.

2. Weather Events

Heavy rainfall - sudden, heavy rainfall events could exceed the processing capacity of drainage systems.

So, what are the chances that any of these risks will materialize? Let's take a look at Richmond's "History of Flooding" (overleaf →).

Please flip to the inside of this brochure for more information on "Flood Protection Measures"

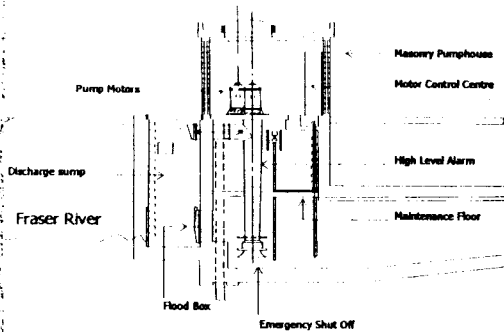


Typical Drainage Station



Motors inside drainage station pump water out at high tide

Typical Drainage Station



This diagram of a **typical drainage station** or pump station illustrates the mechanics controlling the discharge of water through our drainage system. At high tide, water level floats identify high water levels and activate the pump motors which lift the water over the head wall, into the discharge sump and out the Fraser River. At low tide, gravity assists in discharging water through the flood boxes.

Irrigation Structures - In addition to removing excess water for drainage purposes, the City supports the local farming industry by pumping water back into our system. The city has installed irrigation structures, which allow water to be drawn in from the river for our local farming operations, i.e. Cranberry and vegetable farms, etc.

Are there exceptions?

There are very few residential properties which are located outside the dyke boundary. The vast majority of these properties are generally aware of this and know that it is their responsibility to take protective measures. In some commercial and industrial areas, the dykes are situated on private property and it is the owner's responsibility to maintain the dyke to the required standards. The City, in conjunction with the Provincial Diking Authority, will work with these businesses to provide advice and guidance.

What can residents do?

Residents who live in areas that are not protected by a dyke should take the following steps to help protect their property:

- Contact the City of Richmond to determine if your property is in a flood-prone area.
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The City of Richmond is committed to providing the highest level of service to its residents. We will continue to work with the Provincial Diking Authority to ensure that our drainage system is safe and effective.

Emergency Preparedness

The City of Richmond is committed to providing the highest level of service to its residents. We will continue to work with the Provincial Diking Authority to ensure that our drainage system is safe and effective.

Additional information

Ministry of Environment
Land & Parks

Provincial Emergency Program

City of Richmond
Emergency Preparedness Office

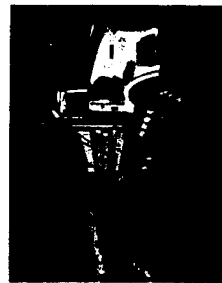
City of Richmond Flood Protection Measures



Dyke Inspection & Maintenance Program



24-Hour Monitoring System

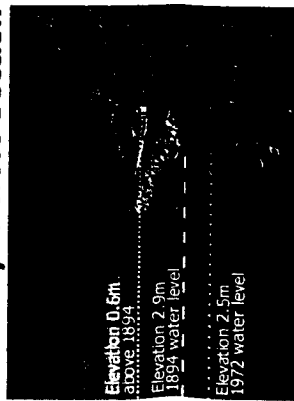


Dyke Strengthening

Protection from high tides or river floods

Richmond's dykes are constructed to a level which is two feet above the highest ever recorded water level at this location on the Fraser Basin, which occurred in 1894. See 'Typical Dyke Cross Section', below. This meets the Provincial standard, which provides protection for a 1 in 200 year flood event.

Typical Dyke Cross Section



Richmond also has a number of programs in place to ensure the integrity of our dykes. These include:

- A weekly inspection and maintenance program to ensure the dykes remain stable at all times.
- A vegetation control program, to remove any brush and tree growth which could compromise the integrity of the dykes.
- An annual dyke survey program, based on a 5 year cycle, to monitor dyke settlement and carry out required upgrades to ensure the dyke elevations are maintained at or above the

- 24-hour electronic river level monitoring systems at 4 key locations.
- A Floodplain Management Policy, which establishes minimum flood construction levels and outlines future initiatives to enhance flood protection.
- A dyke seismic study to determine the potential impacts of an earthquake on key areas of Richmond's dyke network. If required, the dykes will be strengthened.

Richmond's programs are all carried out in accordance with the dyke maintenance guidelines established by the Ministry of Environment, Lands & Parks.

Protection from flooding due to weather events

Richmond has an extensive drainage system comprised of pump stations, flood boxes, irrigation structures, and storm sewers.

Pump Stations & Flood Boxes - there are 38 stations located throughout the island which house a total of 110 pumps. At high tide, these pumps discharge drainage water into the river. At low tide, drainage water discharges through the flood boxes into the river via gravity outflow gates.

These stations are powered by electricity and have the capacity to pump over one million US gallons per minute, if required. All of the stations are monitored remotely, 24 hours per day, to ensure the pumps are operating effectively.

The drainage system is designed for a 1 in 10 year rainstorm. To help prevent isolated flooding, the City monitors weather forecasts and pumps down the level of drainage water in the canals prior to any anticipated rainstorms. This provides extra capacity to hold the surplus drainage water caused by the storm.