

An aerial photograph of a town in North Vancouver, British Columbia. The town is nestled between a large body of water (likely Burrard Inlet) to the east and a forested mountain range to the west. A river winds through the center of the town. The foreground shows a mix of residential houses, commercial buildings, and parking lots. The background features a range of mountains under a clear sky.

RISK PRESENTATION

to the District of North Vancouver

Council Workshop
March 13, 2018

Agenda

1. Introduction
2. Risk Level and What it Means
3. 2006 Risk Assessment for Canexus and TCP Project
4. Established Risk Contours and Application to Maplewood Area
5. Coordinated Emergency Planning & Response
6. Closing Comments
7. Discussion

Introduction

Everything we do has some level of risk involved.

Why Are We At This Point

- 1976 Seveso Italy
- 1984 Bophal India
- 1986 Chernobyl
- 1989 Exxon Valdez

Risk Level and “What it Means”

Annual Probability of a Fatality

Provides a means to describe risk

Provides a means to determine acceptable and unacceptable risk levels

Provides for a means to have company designs and operations managed

Provides a means for jurisdictions to approve industrial projects

1×10^{-9} One in a billion From being hit by a meteor in a lifetime

1×10^{-8} One in a hundred million From being hit by a crashing airplane

1×10^{-7} One in ten million From being hit by lightning

1×10^{-6} One in a million From traveling by commercial air, rail or bus

1×10^{-5} One in a hundred thousand From being a pedestrian

1×10^{-4} One in ten thousand From working in a manufacturing facility

1×10^{-3} One in a thousand Average annual risk from all causes.

1×10^{-2} One in a hundred From being an astronaut

1×10^{-1} One in ten From being 84 years old

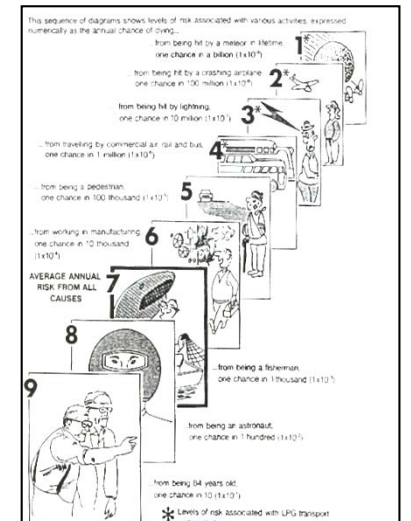
Additionally death due to a:

Motor vehicle accident 2.2×10^{-4}

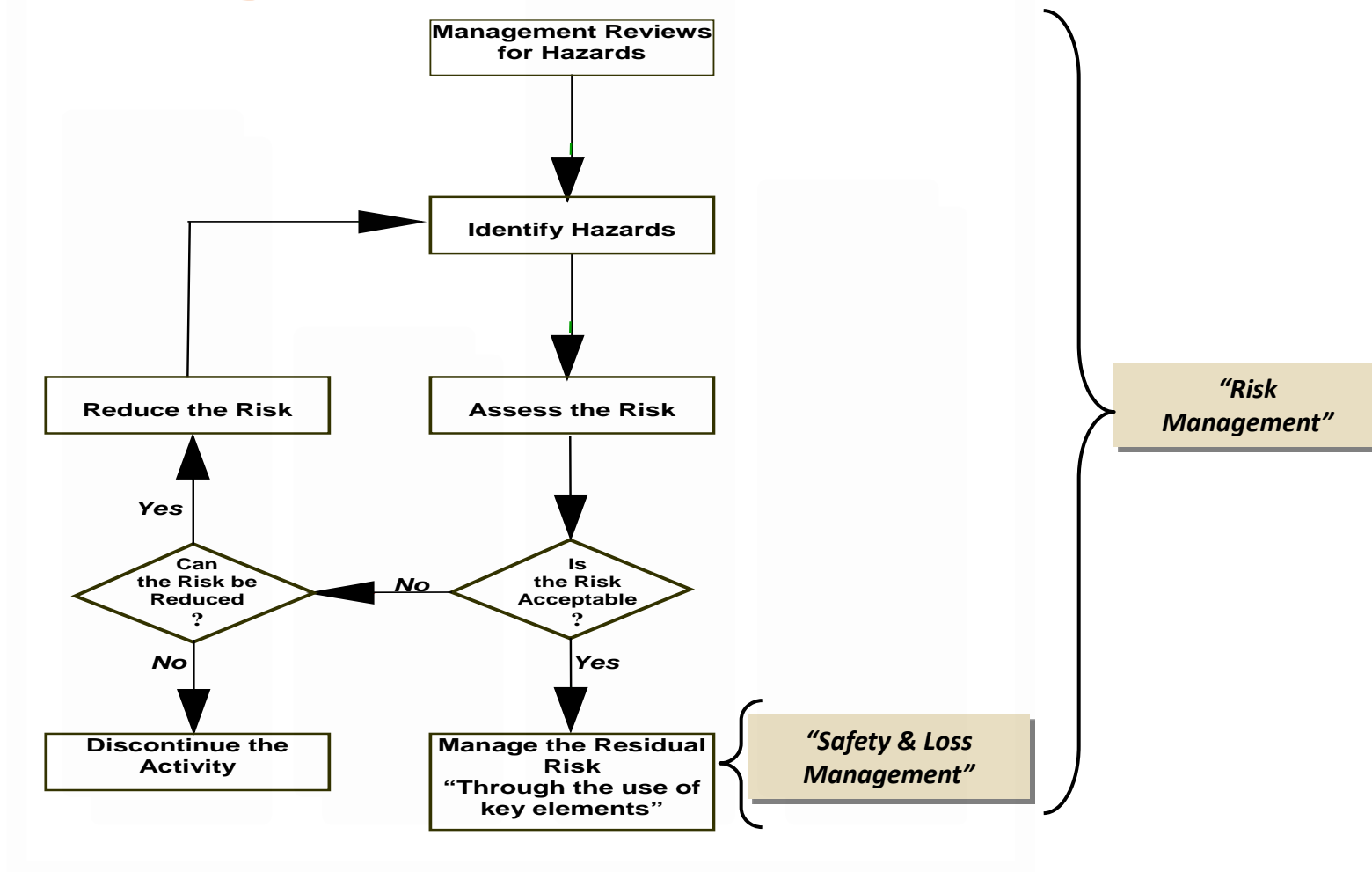
Truck driving accident 1.0×10^{-4}

Falls 7.7×10^{-5}

Home accidents 1.2×10^{-5}



Risk Management Process



Global Acceptable Level of Risk

The Risk involved is defined as the probability of a fatality imposed on an individual by an industrial operation.

Everything we do includes some possibility of causing unwanted outcomes. However, as a society we are willing to accept a certain level of risk in order to enjoy our standard of living.

The acceptable level of risk is measured as the probability (likelihood) of a fatality to an individual located in one position for an entire year. Globally the acceptable level is one chance in a million of a fatality to that individual over a one year period.

Expressed as 1×10^{-6} .

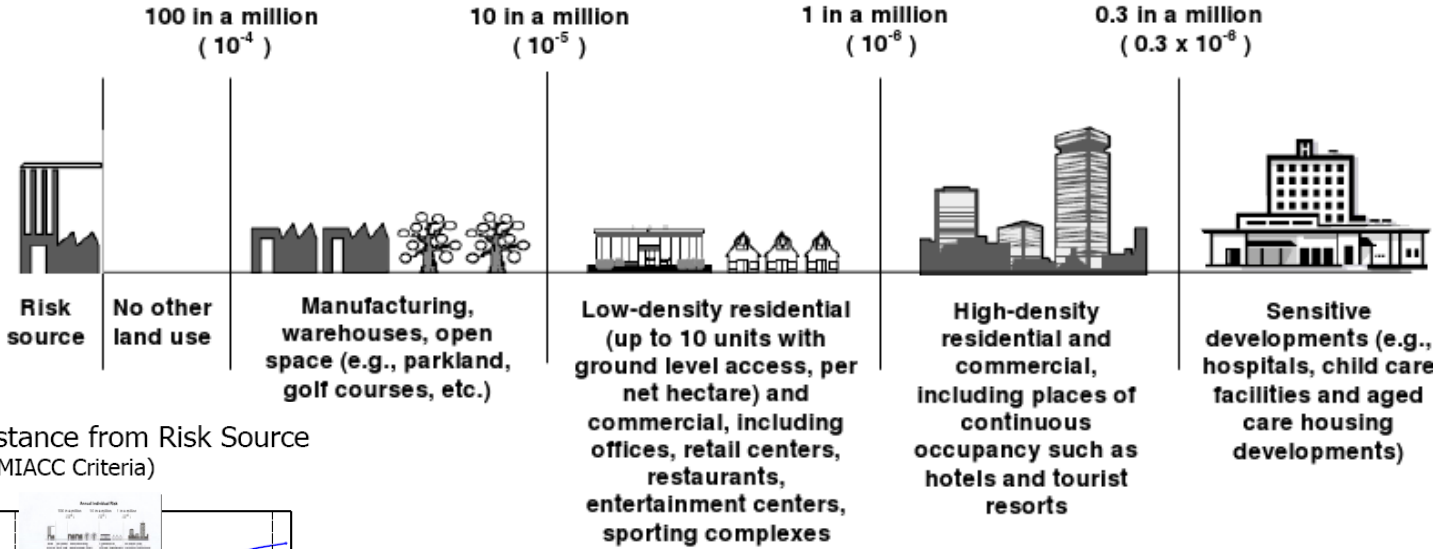
Important to community jurisdictions for land use planning and due diligence.

Important to industry to have set values to design and operate to and their due-diligence.

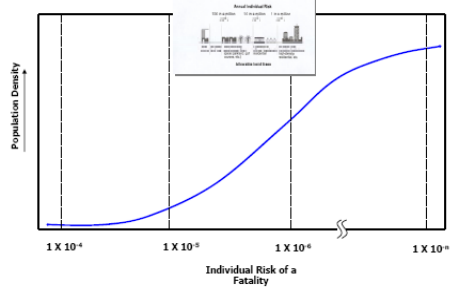
Acceptable Level of Risk in Canada

As defined through the Major Industrial Accidents Council of Canada (MIACC)
Canada's best practice

Annual Individual Risk Chance of fatality per year



Density & Distance from Risk Source (MIACC Criteria)

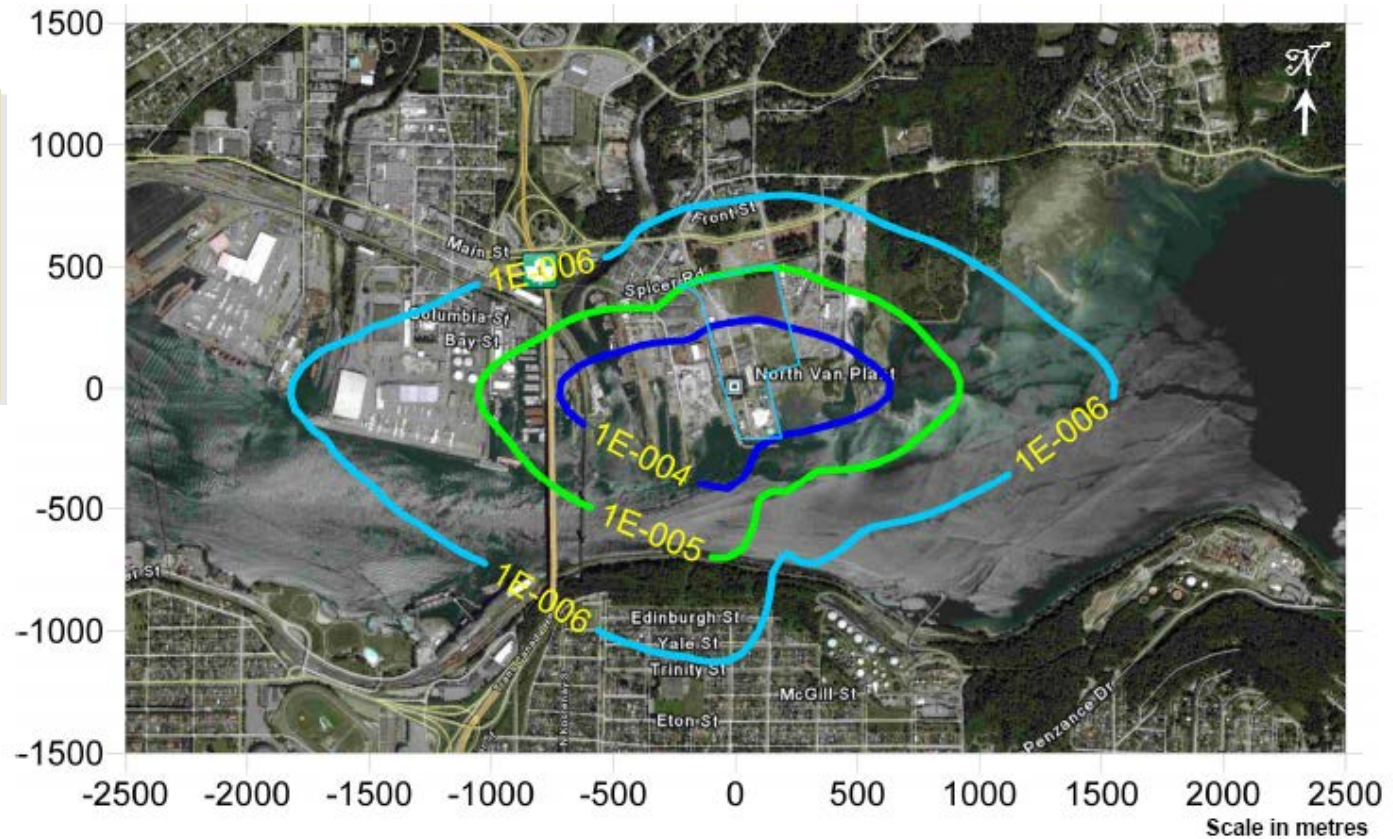


Allowable Land Uses

Original Canexus Risk Assessment - 2006

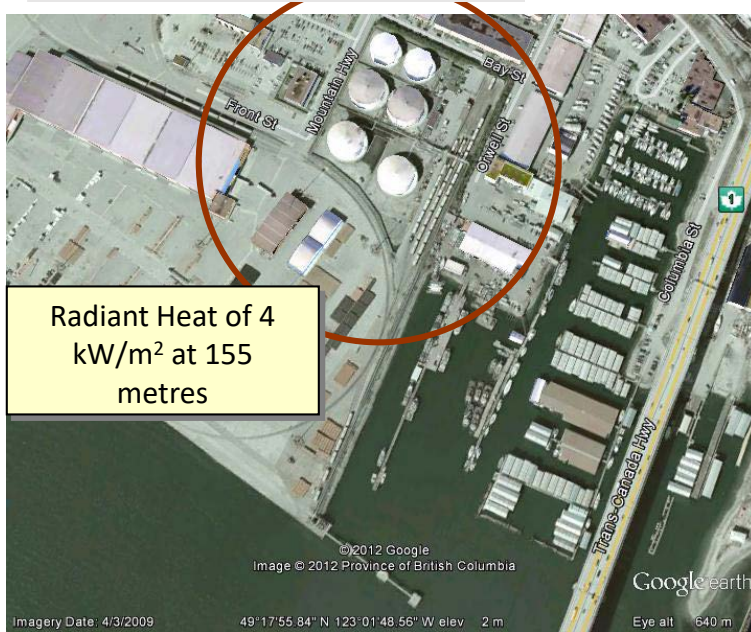
Original Risk Assessment done by Alp and Associates – 2006

Prior to the Canexus TCP project



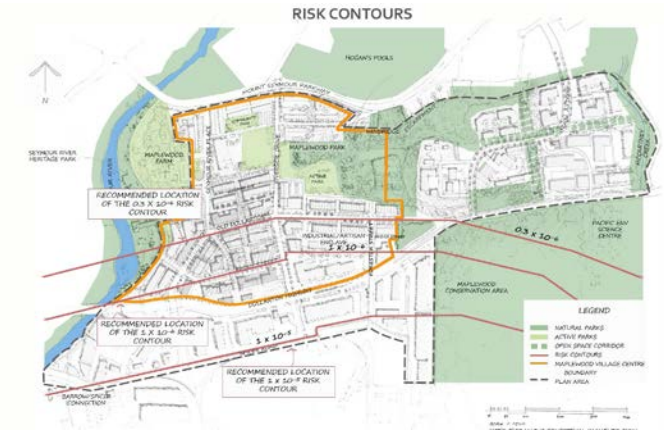
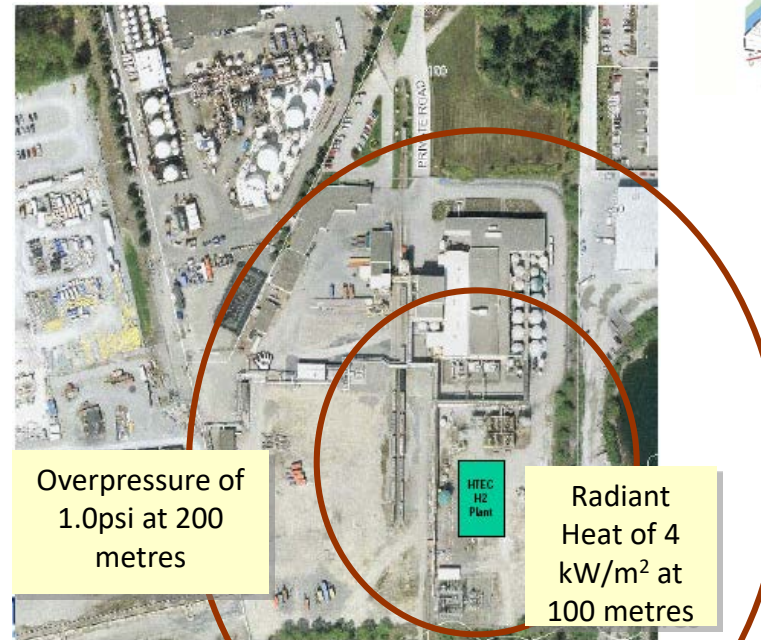
UNIVAR Canada Site

Risk Level = 1×10^{-5}



HTEC Site

Risk Level = 1×10^{-6} to 6×10^{-8}



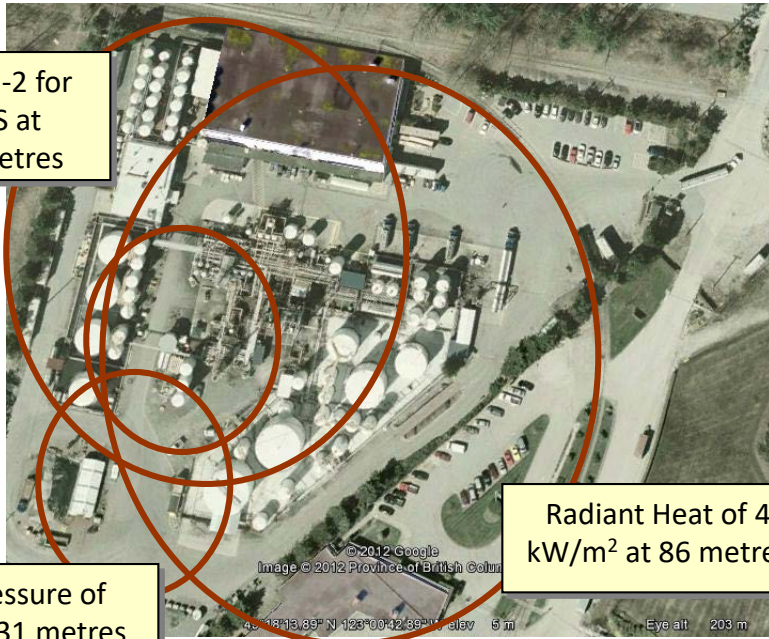
Terra Pure Environmental Site

Risk Level = 1×10^{-5} to 6×10^{-7}

ERPG-2 for H_2S at 65metres

Radiant Heat of 4 kW/m^2 at 86 metres

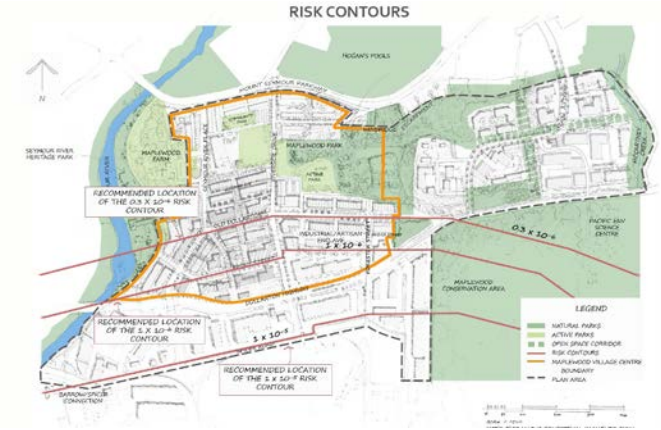
Overpressure of 1.0psi at 31 metres



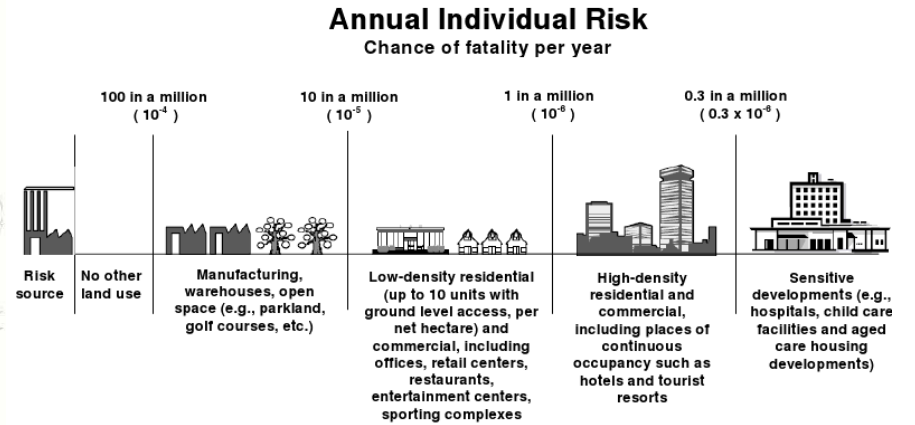
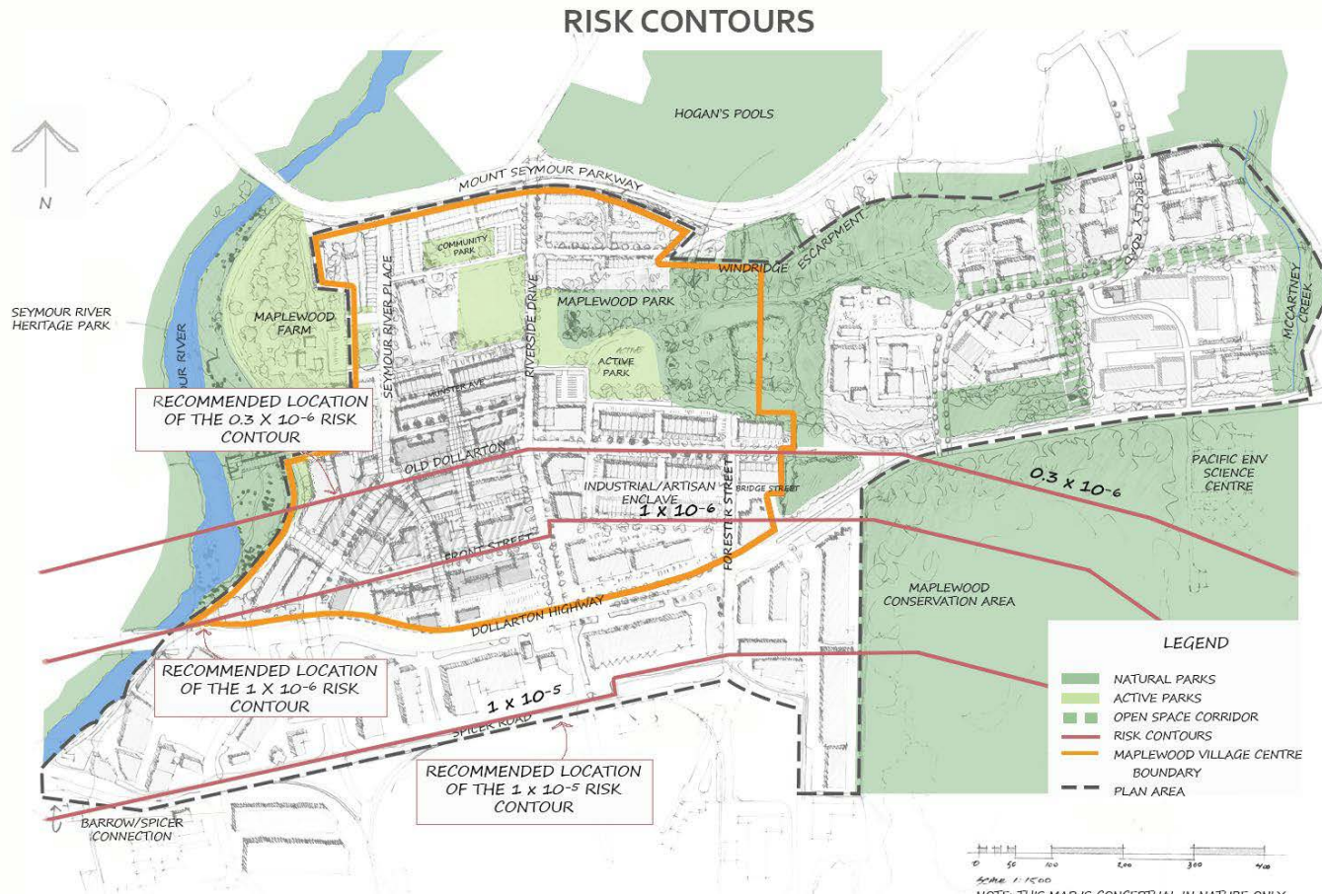
ERCO Worldwide Site

Risk Level = Nil

No flammable or toxic hazards.



Planning — Maplewood Village Centre and Innovation District Implementation Plan & Design Guidelines, 2017



Allowable Land Uses

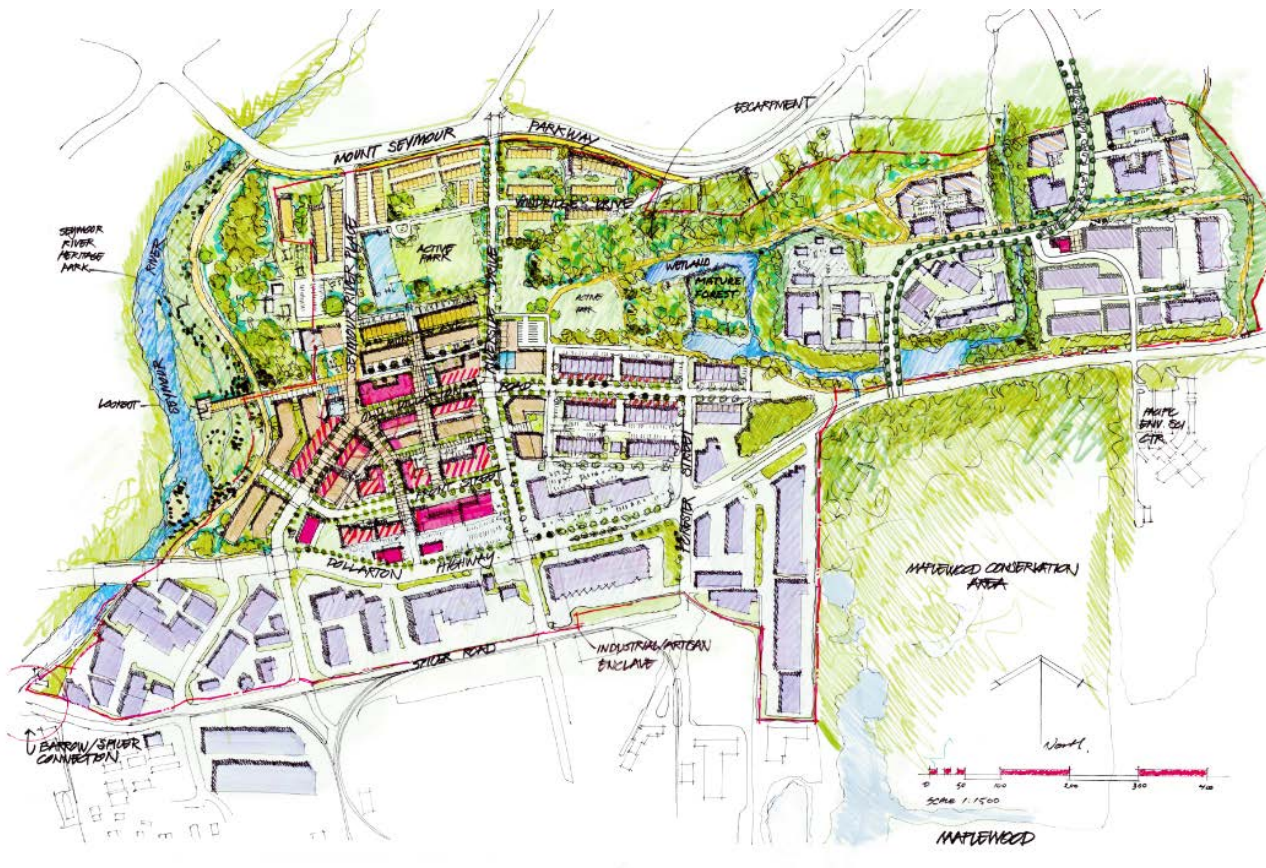
Planning –

- **Maplewood Local Plan, 2002**
- **Maplewood Project, 2004 Eco-Industrial Networking**
- **Land Use Designations for Maplewood, OCP, 2011**
- **Implementation Planning Process Concept Plan**
- **Land Use Designations for Maplewood, OCP, 2018**

Based on 2006
QRA
Pre-Canexus TCP
Project

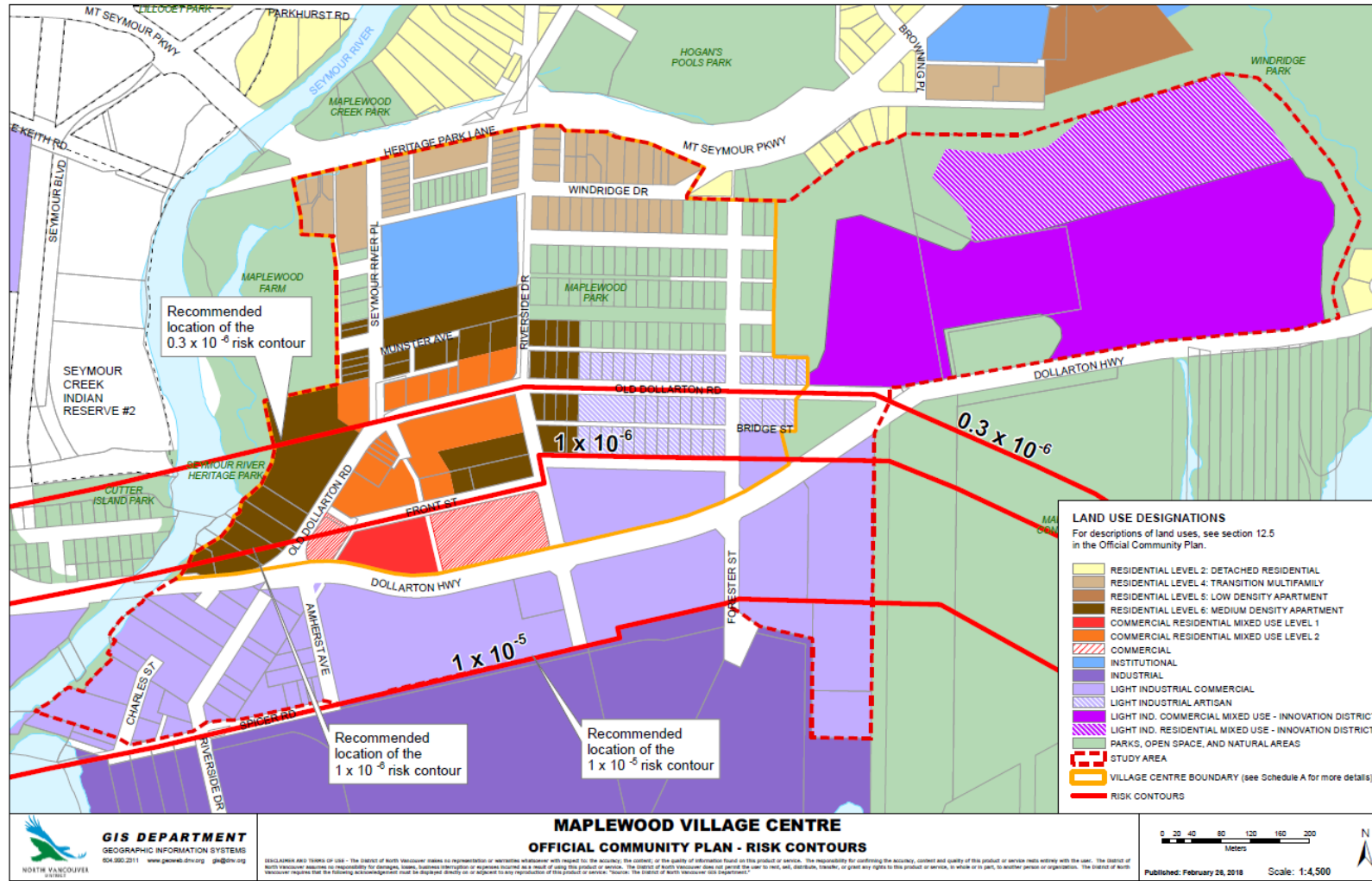
Based on 2007 Peer
Reviewed QRA
Post-Canexus TCP
Project

Planning — Maplewood Village Centre and Innovation District Implementation Plan & Design Guidelines, 2017



- Balanced land uses throughout
- Complete Community; people can live, work, learn, play, and meet most of their daily needs in their own neighbourhood
- Local jobs
- Variety of housing options

Planning — OCP Land Use Designations and Risk Contours



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Any Questions?