NOVEMBER 16, 2017

ATTENTION:
KAREN RENDER / SENIOR PLANNER,

I, VIRGILIO CHIESA OWN PROPERTY AT [redacted]
NORTH VANCOUVER.

I AM EXTREMELY IN FAVOR OF THE MAPLEWOOD VILLAGE CENTRE IMPLEMATION PLAN & DESIGN.

THANK YOU

Sincerely,

[redacted]

CAPILANO UNIVERSITY

Mayor and Council of the District of North Vancouver
355 West Queens Road
North Vancouver, BC V7N 4N5

November 28, 2017

Re: Darwin Properties Ltd. - Proposed Development

Dear Mayor Walton and Councillors,

I write to confirm Capilano University (the "University") has been in preliminary discussions with Darwin Properties Ltd. ("Darwin") regarding their interest in providing and building student residence buildings as part of their proposed redevelopment on the property located at 2468-2452 Dollarton Highway, North Vancouver, BC.

The University and Darwin initially signed an MOU in November 2016 and are in the process of signing an updated MOU. The purpose of the MOU is to provide a framework to continue discussions on how the University and Darwin can work together to further the University's goal of providing affordable student rental housing either through a long-term lease or a purchase of purpose built student residence buildings.

The Darwin property noted above is in close proximity to the University and we are temporarily occupying a number of existing student dormitory style buildings on the site pending redevelopment. Our students are telling us the student residence is a welcome addition and we are hopeful, through continuing discussions with Darwin, that a new and permanent student residence can be built on the site to replace the temporary solution.

As has been expressed previously by the University, the lack of affordable student housing and small accommodation units on the North Shore continues to be detrimental to the University's efforts to recruit and retain students. Living close to campus, students will benefit from a vibrant campus community and neighbourhood while actively promoting environmentally sustainable behaviours by reducing the number and length of commutes to campus. Furthermore, the proximity of the proposed development to the University's campus will help us achieve many of the goals contained in our Academic and Strategic Plans such as providing students with a collegial environment focused on education, wellness and personal growth. The increased availability of affordable student housing is a strategic priority and one that will be key in increasing enrollments and retention of students.

The University, as a major employer on the North Shore and as a destination for students both locally and from around the world, supports the inclusion of purpose-built student housing as a component of the overall project and further supports market housing and rental units that will provide affordable housing options which will enhance the University's ability to attract not only students but also employees to the North Shore.

Sincerely,

Soon Kim
Chair, Board of Governors

Paul Dangerfield
President and Vice-Chancellor

OFFICE OF THE PRESIDENT
2055 PURCELL WAY, NORTH VANCOUVER, BC, CANADA V7J 3H5
T 604 984 4925 · E PDANGERFIELD@CAPILANOU.CA

From: Louise Simkin
To: DNV Input
Subject: FW: approval of OCP amending bylaw
Date: January 09, 2018 8:34:07 AM

From: michael han [mailto [redacted]]
Sent: January 09, 2018 12:03 AM
To: Mayor and Council - DNV <Council@dnv.org>
Subject: approval of OCP amending bylaw

To Council,

My name is Michael Han who lives at [redacted] Since my wife and I knew about the new Maplewood Village Centre Plan that plans to turn our house from townhouse zone to the Maplewood Farm park, night mare started and it is still going on for more than 2 years. I cannot describe all the pains we are going through because of a huge devaluation of our house value. Every day is doomed for us and our two next doors. Pls, if the District really wants to turn those 3 houses into something the people can have benefits, you must have transparent procedure how to give proper compensation to those who have to accept the change and also have benefits from the change instead of thinking they are the victims of development.

I am looking forward to seeing the Council's wise decision to meet both sides' satisfaction.

Thanks

Michael Han

From: Louise Simkin
To: DNV Input
Subject: FW: Written submission on bylaw 8279 for Public Hearing on Jan 9/2018
Date: January 09, 2018 8:35:43 AM
Attachments: January 8.pdf
Risk Overview-g.pdf

-----Original Message-----
From: Corrie Kost [mailto [redacted]
Sent: January 09, 2018 7:55 AM
To: Mayor and Council - DNV <Council@dnv.org>
Cc: Corrie Kost [redacted]
Subject: Written submission on bylaw 8279 for Public Hearing on Jan 9/2018

Your Worship & Members of Council,

Attached is my input on the subject matter.

Yours truly,

Corrie Kost
[redacted]
N. Vancouver, BC , [redacted]

January 8/2018

RE: January 9/2018 Public Hearing on Bylaw 8279

Your Worship & Members of Council,

I have read all the material relating to the subject bylaw. Some of the material is illegible – particularly the updated Land Use Map Schedule 4 to Bylaw 8279. This key map should be reproduced for the public in at least twice the current resolution.

There appears to be some confusion with the land use designations shown in Map Schedule 4 (and outlined in Attachment 2) as :
Commercial Residential Mixed Use level1
Commercial Residential Mixed Use Level2
Light Industrial Artisan
Light Industrial Commercial
Light Industrial Commercial Mixed Use – Innovation District
Light Industrial Residential Mixed Use – Innovation District
Where the ones in bold above are the three land use designations now added to the OCP.

Some clarity also appears to be lacking on the changes that are made from Maps 10 and 11 from pages 25/35 and 29/39 respectively. Placing these pairs side-by-side (a sort of before/after) would have been far better.

My comments will mainly be focused on the impacts of the existing nearby chlorine plant and its relationship to the OCP amending bylaw 8279 2017 (Amendment 32). **I will attempt to justify, in my view, that while the chlorine plant remains in operation (until 2030), there should be no new residential units built in Maplewood.**

One of the weakest components of the DNV addressing the community resilience of the Maplewood area is, to me, the appearance of a lack of understanding in this community of the community risk resulting from the existence of the chlorine plant.

Having read the subsequent response by staff to a preliminary submission on the risk assessment of the chlorine plant I sent to Mayor and Council on November 19/2017 as "Risk Overview-e.pdf" (relating to council agenda item 9.2 of a regular council meeting on **Nov 20/2017**) I have updated that submission as an attachment named "Risk Overview-g.pdf".

Focusing on the January 2/2018 staff relating to the Chemical Hazard Risk in Maplewood (pages 7 to 27 of 180109PH.AdditionalInformation.pdf) I made the following observations.

- Unlike publications made in standard scientific journals no public access was ever provided to the underlying assumptions or source codes used to come up with the provided risk contours.
- Although it states that "an earthquake" was included in the 2012 risk assessment no mention was made to connect this with the much more recent earthquake risk assessments made for the Maplewood (and other Burrard inlet areas)
- The relocation – of the 10^{-5} and 10^{-6} risk contours, for the stated purpose of " to allow for reasonable land use planning" means that people will be housed in residential units where the real risks are in fact higher than now shown. It also means that economics has trumped safety.
- The justification for not calculating the societal risk assessment (which DNV council had required before proceeding with any Maplewood plans) that such assessments are "not anticipated to result in further knowledge or different recommendations than the 2006 QRA" is purely speculative.
- Since a correlation with a significant earthquake event and the simultaneous release of chlorine gas is not so unlikely, the concept of sheltering in place – with the likely breakage of building windows - seems to be an inadequate response.

- Emergency notification and response are all well and good, but how does one address the situation where some residents may be deaf and/or blind?
- **Legible** additional risk contour lines requested by Doug McCutcheon in his Nov 7/2016 letter seem not to have been provided.
- As noted again on page 2/9 of the above mentioned letter, "Low-density residential (up to **10 units with ground level access, per net hectare…**" seem to be exceeded in the proposed OCP amendments (eg see page 25 of overall report where **a density of 19.8 units/net Hectare is proposed**)
- Although odours of chlorine are detectable at very low (and thus non-lethal) levels the same cannot be said for actually seeing a chlorine cloud – which is not visible until concentrations are at a lethal level.
- A concern that emergency responders may not be able to access sites with high concentrations of chlorine in the air, due to their engines stalling at such concentrations, needs to be addressed.
- Note that the response to question 1 "A universal minimum.." on page 24 of the overall report ignores the aspect that some of the land occupied within the 10^{-4} risk contour appears to have been sold by the owners of the chlorine plant at the time when these risk contours were already available.
- Page 27 response to "6. City of Edmonton Study" misses the point that 300/74/33 times more chlorine is stored at the DNV chlorine plant than the simple calculations provided were the plant 1/2/3 Km respectively from any residential areas.

In conclusion, notwithstanding the excellent and exhausting 1410 page report I still urge council not to proceed with any densification in the Maplewood area until such time as the Chlorine plant ceases production of this dangerous substance. Accordingly, I suggest no amendments be made to the OCP at this time.

Yours truly,

Corrie Kost -

A Short Summary of Risk Assessments Related to Maplewood

by Corrie Kost [redacted]. North Vancouver email: [redacted] – version date Nov 22, 2017

A universal minimum industry requirement is that the 10^{-4} risk contour not go outside the property line (ref 1) of the creator of the risk. As indicated on page 39 of the Aug 8th 2012 Maplewood Chemical Hazard DPA Final Report by DOUG MCCUTCHEON and Associated (hereafter called the "Final Report") this is clearly not the case. See Figure 18 below. In fact, the 10^{-4} risk contour crosses over the area accessible by the general public – for example the North Shore Recycling and Drop-off Depot on Riverside Drive. In Canada the MIACC guidelines do not permit any other land uses inside the 10^{-4} annual individual risk contour. In other places (eg. slide 78 of reference 11) the Individual Fatality Risk contour of $5*10^{-5}$ per year is required to remain on site, while the $5*10^{-6}$ per year can extend into industrial developments only.

It should also be noted that on page 17 of the "Final Report" - low-density residential of up to **10units with ground level access per net hectare** should be allowed in the region bounded by 10^{-5} to 10^{-6} contours (see Figure 3 attached). This **corresponds to 4units per net acre.** Council **changed this to 8units per net acre** on the basis that the units would be so small as to likely have an occupancy of about 1 person per unit. Since the occupancy numbers per unit are not controlled by law, or is even regulated, **this relaxation should not be implemented**. It should also be noted, that to best of my knowledge the "Final Report" did not take account of the 2015 report (ref 7) of the Earthquake Risk Study for the District of North Vancouver.

In addition, I find that "voluntary" risk should be distinguished from "involuntary" risks. On page 8 of the "Final Report" it states "Globally the acceptable level of risk for an industrial operation is similar to that risk that we as individuals are willing to accept when we travel by commercial air, rail or bus" ie. 10^{-6} . This misses the point on voluntary vs. involuntary (see some definitions in the references section). The acceptable risk that others impose upon use should be no more than, say, being hit by lightning ie. 10^{-7} .

To date only Individual Risks have been calculated. That is, the risk contours in the "Final Report" only calculated the probability of a fatality to an individual who occupies a specific location 24hrs/day. **Societal Risks,** which produce f/N graphs, although requested as a condition by council in 2007 for the continued operation of the chlorine plant, were, to my knowledge, **never done**. When calculating the consequences (expected number of fatalities) of any unique accident, the answer will depend on the local population density and distribution. Therefore, unlike individual risk contours, an *f/N* curve will change if the local population density or distribution changes. For a simple explanation of the three basic calculations – Hazard Footprints, Individual Risk, and Societal Risk, please see reference 10.

Since the population distribution in the area is proposed to dramatically change it behooves council to have a consultant perform the Societal Risk. For example, the Dutch have adopted a standard which has as an acceptable guideline 10 fatalities at a frequency not more than 1.E-05/yr, 100 fatalities at no more than 1.E-07/yr, and 1000 fatalities at no more than 1.E-09/yr (ref 13)

For a chlorine plant in Melbourne (ref 2) *"the nearest resident is 1.5 km away and the surrounding land areas are either vacant or are filled with warehouses and general manufacturing activities. The plant occupies approximately 8 ha of a total land area of 20 ha, with the vacant area providing a buffer zone for risk contours from the plant. The criteria set by the state government is that the* ***10^{-6} individual fatality risk contour must not lie outside the site boundary*** *and the buffer zone ensures that this is the case".*

Distance as a guide:

In Australia, a guideline of 300 to 1500 meters from the plant boundary is used as a rule of thumb for non-major industrial developments. The DNV existing chlorine plant falls into the "major" category. In the 2014 OCP of Lloydminster Planning District, Saskatchewan, the minimum separation distance from any Hazardous Industrial Site (see attachment 1) is 1.6Km from any single family home and 2.4Km from multilot residential building sites . (ref 3) The municipality of Lumsden,

Saskatchewan uses an almost identical table (page 63 of reference 5) – that is, 1.6Km from any single family home and 2.4Km from multilot residential building sites for the separation from Hazardous Industrial sites.

Note that buildings in the DNV within the 10^{-6} risk contours will require HVAC systems (ref 4 page 36) that maintain a slight positive pressure inside the building to prevent chlorine from entering. However, if a large earthquake (see reference 7 – note particularly pages 32(attached as figure 32),33 and 35 as it relates to Maplewood) triggers a chlorine release (a much more likely time than at other times) the structure of most buildings are likely to be compromised and allow chlorine to enter. Access by emergency services would also be constrained since even a low ppm (parts per million) of chlorine will make normal engines inoperable. Recovery, not rescue, would be the likely scenario.

Notwithstanding the MIACC guidelines I find it unacceptable to move the 10^{-6} **r**isk contour (of Figure 18) some 50 metres closer to the chlorine plant in order to align it with Front Street "for land use planning purposes"

City of Edmonton

Edmonton used a more pragmatic approach. In the review "Risk Based Land-Use Planning in the Edmonton Area – by Doug McCutcheon"(ref 6) it is recommended that the maximum amount of chlorine that should be stored within a 3 Km radius of the plant is 1,825Kg. Currently there is **far** more than that stored both inside (60,000Kg) and outside of the North Vancouver Chlorine plant!

Concerns expressed by the local community

I would like to note some of concerns that have been expressed by others in the subject area. From two 2011 articles (references 8 and 9) I take particular note of *"If Canexus has a terrible release and it kills 10,000 people, Canexus will go bankrupt and they'll just walk away. The people in North Vancouver or Vancouver won't even have someone they can sue."*

Why Canexus did not cease chlorine production in 2007

In 2007 the existing lease (Ref No. V1381(06)) at that time was valid until

June 30, 2018. Despite the desires of the Maplewood community (and council) to terminate this hazard in their neighbourhood the Vancouver Port Authority, who appears to have ultimate jurisdiction of the subject land, agreed to extend the lease to 2032.

What is the worst case scenario for the release of the full 60Tons of chlorine? However unlikely it may be I believe our residents deserve to know the worst case potential impact of the complete release, say during a cloudless night and low winds, of the on-site storage tank (60Tons) of chlorine.

For the less technically minded…

You may wish to read the Oct 20/2011 Scientific American article "Chlorine Accidents Take a Big Human Toll" (ref 12)

RECOMMENDATION

Whereas, contrary to the MIACC guidelines, the chlorine plant imposes a substantial risk to the community well outside their property line, and

Whereas simple calculations indicate that the chlorine plant stores 300/74/33 times more chlorine than is prudent even if it were respectively 1/2/3Km from any residential areas, and

Whereas the Societal Risk calculations, as requested by council in 2007, have yet to be performed:

I urge council not to proceed with any further densification in the Maplewood area.

There is some evidence to support not proceeding with any new residential developments within at least 3 kilometers of the chlorine plant. This unfortunately includes all of Lower Lynn.

The safety of our residents should override any other considerations.

References

(1) http://www.planning.nsw.gov.au/~/media/Files/DPE/Reports/quantitative-risk-assessment-summary-report-botany-industrial-park-2012-09-25.ashx

(2) https://books.google.ca/books?isbn=0470999462

(3) http://crosbyhanna.ca/assets/LPD-OCP-FINAL.pdf

(4) http://www.dnv.org/sites/default/files/edocs/Maplewood-Implementatoin-Plan-Final.pdf

(5) http://lumsden.ca/wp-content/uploads/rm189/pdfs/bylaws/2014/OCP_Bylaw%2006-12%20R%20M_Lumsden.pdf

(6)http://www.cheminst.ca/sites/default/files/pdfs/Connect/PMS/CSChE%202007%20-%20McCutcheon%202.pdf

(7)http://ftp.maps.canada.ca/pub/nrcan_rncan/publications/ess_sst/296/296439/of_7816.pdf

(8) https://www.vancouverobserver.com/public%20safety/2011/03/28/after-japanese-earthquake-north-vancouver-residents-raise-questions-about

(9) https://www.vancouverobserver.com/chlorine/2011/03/31/north-vancouver-ready-chlorine-leak-during-earthquake

(10) http://www.questconsult.com/papers/risk-acceptance-criteria/

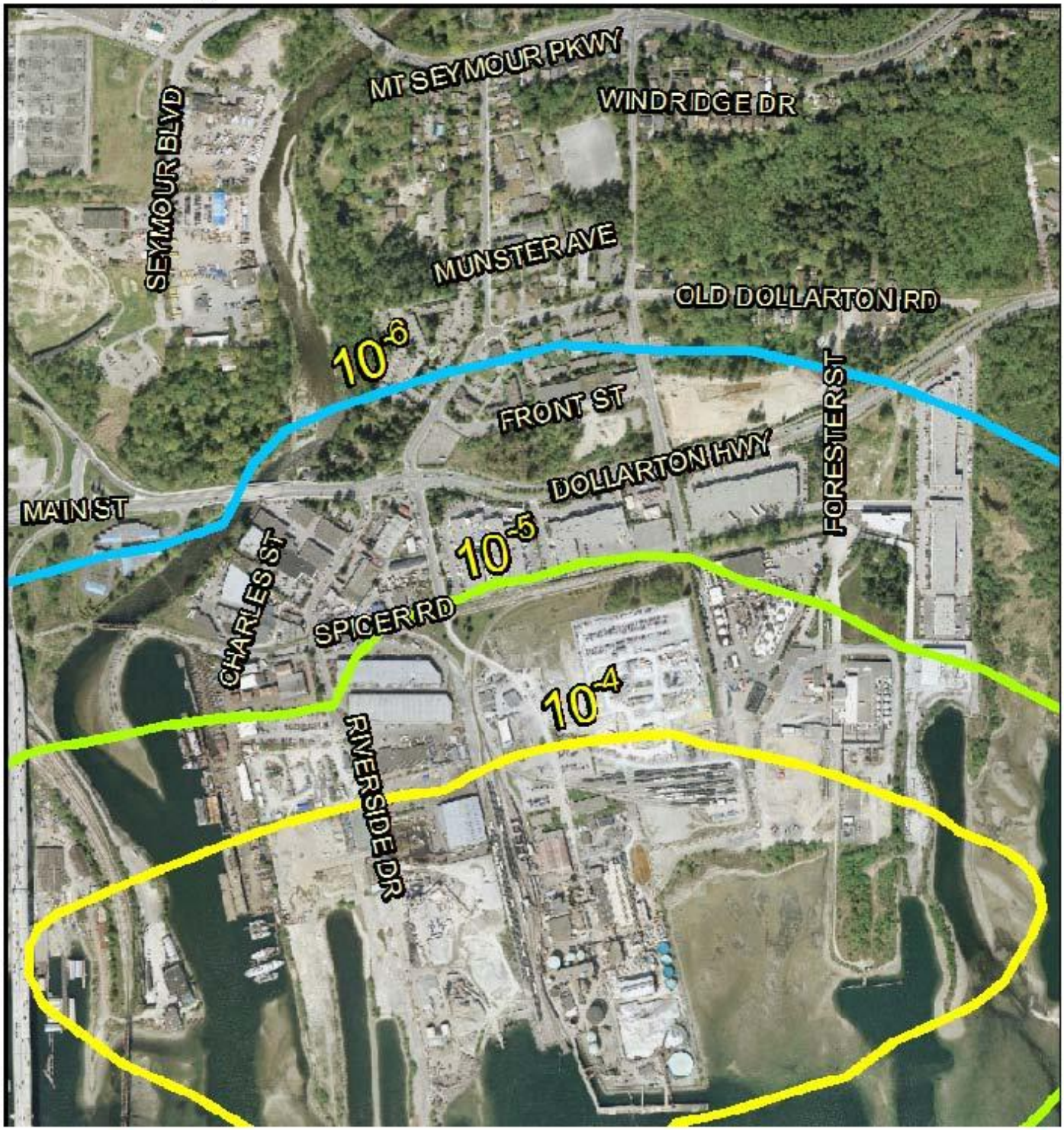
(11)https://www.researchgate.net/file.PostFileLoader.html?id=579aff8148954cd06f60c964&assetKey=AS%3A389081830838272%401469775745231

(12) https://www.scientificamerican.com/article/chlorine-accidents-take-big-human-toll/

(13)http://sache.org/workshop/2013Faculty/files/QRA%20Presentation%20for%20%20AICHEME%20in%20Richmond_1486_1.pdf -page8

- **Voluntary risk** is associated with activities in which a person participates by choice. Examples of voluntary activities include driving a car, flying in an airplane, rock climbing, and scuba diving. Generally, the individual uses his own value system and experience to determine if the risk of a voluntary activity is acceptable to him.
- **Involuntary risks** are associated with activities, conditions, or events to which a person might be exposed without his consent. Examples of involuntary risks include the risk of premature death from illness, natural disasters (earthquakes, floods, etc.), or the **production and transportation of hazardous materials**. For certain industrial activities, the "allowable" or "acceptable" levels of involuntary risk might be set by some government agency, rather than by each individual.

ıexus TCP Project Risk Contours:



Maplewood Chemical Hazard DPA Preliminary Study For The District of North Vancouver FINAL REPORT AUGUST 8th, 2012

Final Report

FIGURE 18

crosbyhanna.ca/assets/LPD-OCP-FINAL.pdf page 49 to specify minimal separation from hazardous uses
Lloydminster Planning District Commission Saskatoon, SK

Table 8-1
Lloydminster Planning District
Required Separation Distance Between Uses
(in Metres)

		Municipal Wells	Residential			City of Lloydminster	Intensive Agriculture	Airport / Airstrip	Commercial	Gravel Pit	Waste Management		Anhydrous		Industrial	Hazard Industrial
			Single	MCR	Tourist Accommodation						Solid	Liquid	Non-Refrigerate	Refrigerated		
Residential	Single [1]	--	--	--	--	--	--	--	200	150	457	600	305	600	300	1,600
	Multi-lot Country Residential [2]	--	--	--	--	--	--	800	200	300	457	600	305	600	800	2,400
	Tourist Accommodation [3]	--	--	--	--	--	--	--	200	300	457	600	305	600	800	1,600
Intensive Agriculture [4]		--	--	--	--	--	--	--	--	--	--	--	--	--	800	1,600
Airport / Airstrip [5]		--	--	800	--	800	--	--	--	--	--	--	--	--	--	--
Commercial (Agriculture) [6]		--	300	800	800	--	800	--	--	--	457	300	--	--	--	--
Waste Management [7]	Solid	1,600	457	457	457	457	457	--	457	--	--	--	--	--	457	--
	Liquid	1,600	600	600	600	600	300	--	300	--	--	--	--	--	300	--
Anhydrous [8]	Non-Refrigerated	--	300	300	300	300	--	--	--	--	--	--	--	--	--	--
	Refrigerated	--	600	600	600	600	--	--	--	--	--	--	--	--	--	--
Industrial [9]		800	300	800	800	[11]	800	--	--	--	457	300	--	--	--	--
Hazardous Industrial [10]		1,600	1,600	2,400	1,600	[11]	1,600	--	--	--	--	--	--	--	--	--

Distances are measured as follows - Between closest point of nearest:

(1) Single Residential Building...
(2) Multilot Residential Building Site...
(3) Tourist Accommodation Facility...
(4) Intensive Agricultural Site...
(5) Airport / Airstrip Facility...
(6) Commercial Site...
(7) Waste Management Facility or Lagoon...
(8) Anhydrous Ammonia Storage Facility...
(9) Industrial Site...
(10) Hazardous Industrial Site...

... to the nearest residential building, corporate limit, airport or airstrip, gravel pit, anhydrous ammonia storage, or waste management facility and the site lines for other uses.

(11) The location of Industrial and Hazardous Industrial development in the Planning District is managed by the Future Land Use Concept contained in this Official Community Plan.
(12) Refer to Section 5.1.2.4 for separation distances from land uses in an adjacent Rural Municipality.

Hazardous Industries distance from Multilot Residential Building Site: 2.4Km

Hazardous industries minimal distance from Single Family Residential: 1.6Km

ATTACHMENT 1

City of Edmonton

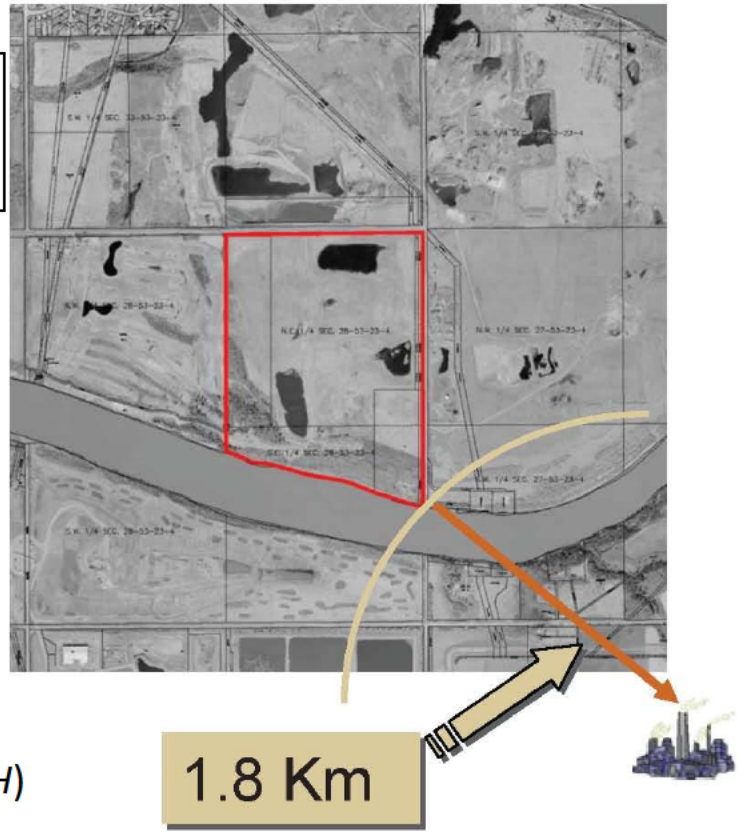
A camp for underprivileged children almost run year round. At most 1,000 people there at one time.

One approach used for a risk assessment for the City was to determine the maximum amount of hazardous chemicals could be located in a heavy industry zone to the south. The table below shows some of the quantities.

Not a lot.

IDLH for Cl_2 is 10ppm

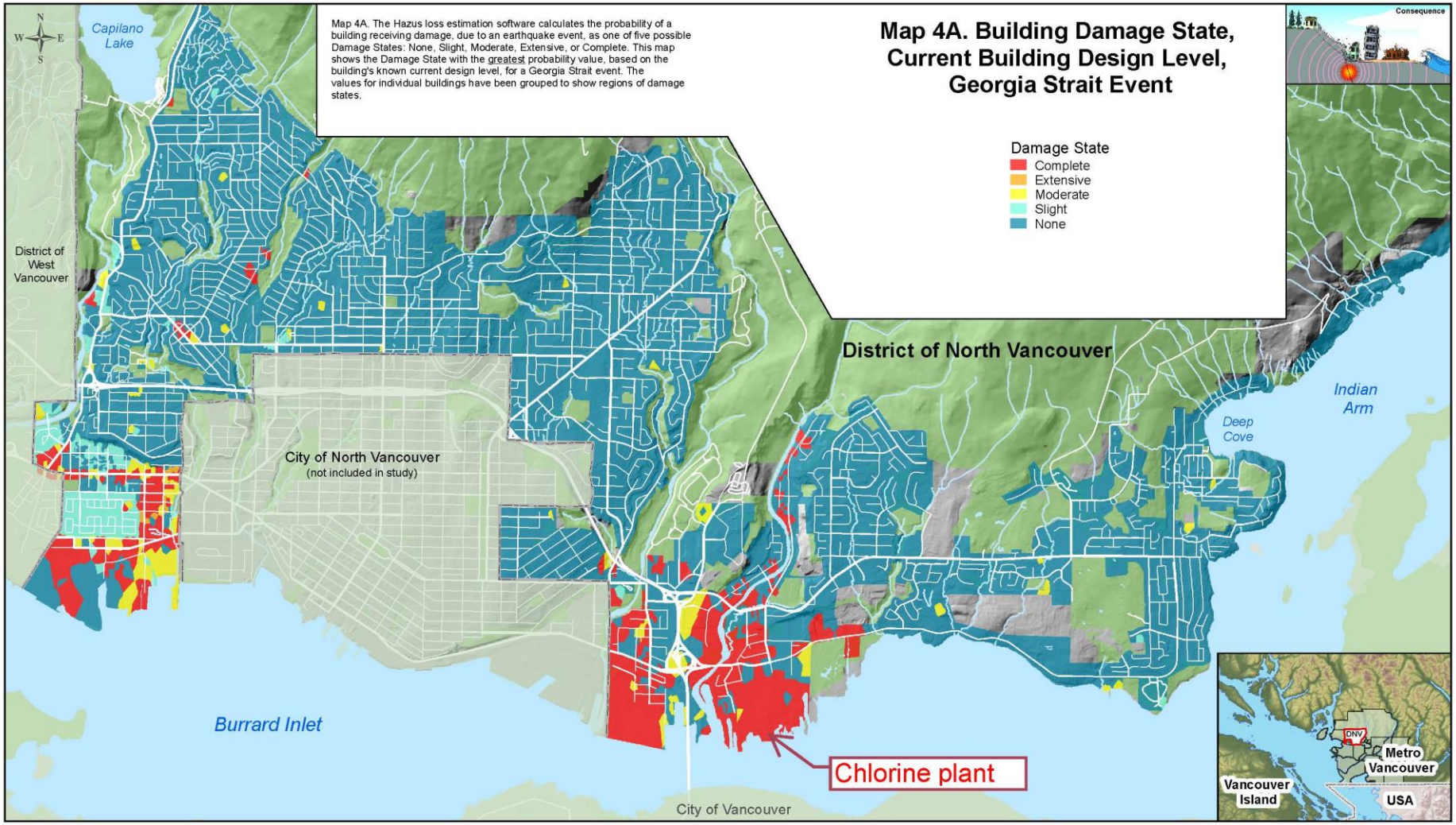
Hazard Distance to the IDLH Concentration	H_2S Kg	SO_2 Kg	Cl_2 Kg
1 Km	979	1,748	203
2 Km	3,915	6,991	811
3 Km	8,808	15,729	1,825
Resulting Probability (high end) = 4.15×10^{-5}			



Immediately Dangerous to Life or Health *Concentrations* (*IDLH*)

Note that for a chlorine cloud only a portion of the area within the circular vulnerability zone can be affected by a unique accident –see Fig 2 of ref 10 (cjk)

Page 26 of Reference 6



Disclaimer: Her Majesty the Queen in right of Canada, as represented by the Minister of Natural Resources ("Canada"), does not warrant or guarantee the accuracy or completeness of the information ("Data") on this map and does not assume any responsibility or liability with respect to any damage or loss arising from the use or interpretation of the Data. **The Data on this map are intended to convey regional trends and should be used as a guide only. Results do not replace the need for site specific geotechnical investigations for specific design, construction, and/or engineering purposes.**

0 1 2 3 4
Kilometres

Credits: Building location, occupancy, and infrastructure provided by the District of North Vancouver. Building details provided by the Earthquake Engineering Research Facility, Department of Civil Engineering, University of British Columbia. All results were generated by Natural Resources Canada in consultation with other seismic risk assessment experts, using best available data, current scientific and engineering knowledge, and reasonable assumptions. Earthquake impacts were modelled with Hazus loss estimation software. Estimates were generated for a specific earthquake scenario using limited hazard information.

Natural Resources Canada | Ressources naturelles Canada

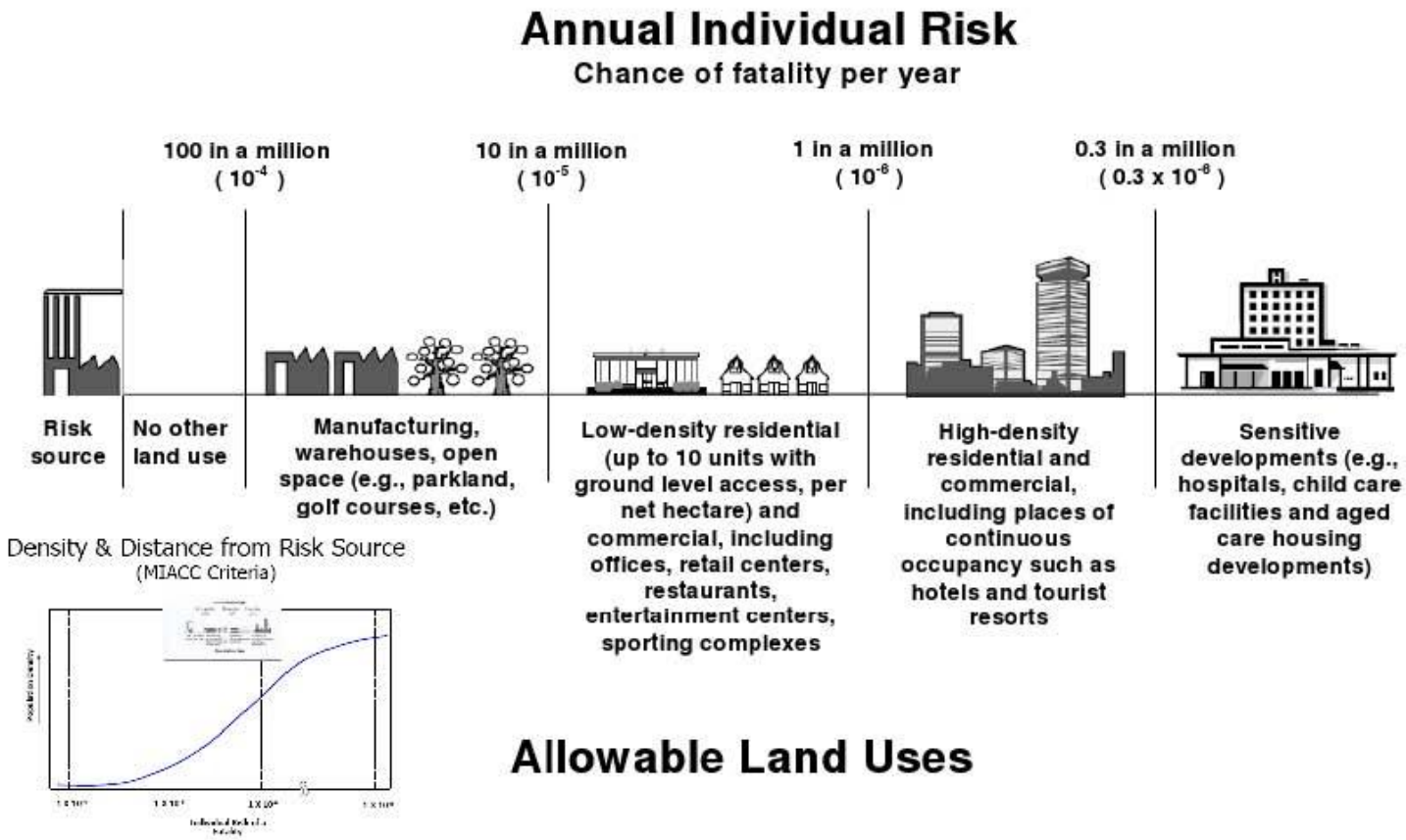
Canada

28

Figure 32

Figure 3

Figure 3: MIACC Land Use Planning Criteria



Additional Reading Material

a) http://www.epd.gov.hk/eia/register/report/eiareport/eia_2242014/EIA/text_html/S12_Hazard.htm

b) http://www.praxair.com/-/media/documents/sds/chlorine-cl-2safety-data-sheet-sds-p4580.pdf see page 4 for IDLH of 10ppm

c) http://onlinelibrary.wiley.com/doi/10.1002/9780470552940.app2/pdf

d) https://www.worksafebc.com/en/resources/health-safety/books-guides/chlorine-safe-work-practices?lang%3Den%26direct

Some useful information

If all the liquid chlorine in a 68 kg (150 lb.) container escaped, it would release so much pure chlorine gas that it would take 24 times the amount of air in BC Place stadium to dilute the gas concentration to 0.5 ppm, the maximum allowable concentration a person can be exposed to in an eight-hour period. (page 2 ref d)

Chlorine gas is not visible as a greenish-yellow cloud at concentrations below 1000 ppm. (page 3 ref d)

Linda Brick

From: [redacted]
Sent: January 09, 2018 4:53 PM
To: Mayor and Council - DNV
Subject: Public Hearing, January 9, Bylaw 8279

Good evening, Mayor Walton and members of Council,

Due to a conflict with the Blueridge Community Association's meeting tonight, I will not be able to attend the public hearing pertaining to bylaw 8279. Instead I have chosen so send you my comments via e-mail.

Having followed municipal politics for nearly 25 years I must say that I have never seen a bylaw that is so unclear as the proposed 8279.
I have had to read it and reread it a number of times and – other than adding three new land use designations – I cannot say that the proposed bylaw is clear to me at all.
Perhaps staff should be looking at making bylaws clearer in the future and explain them better to the public when they are advertized in the North Shore News and on the DNV's website.
It is not fair to the public in general to expect feedback on incomprehensible material, as this truly is.

What I will say is that I support the notion of light industrial in the Maplewood area, as there seems to be a shortage of it on the North Shore in general. However, I am extremely hesitant about the mix with residential use, such as in the proposed Artisan and the Residential Mixed Use.
Although it may sound good to have the workers live in walking distance of their workplaces, I strongly doubt that this concept will work over time.
What happens if a resident, who was working in Maplewood when he moved into his home in Maplewood, changes his job and has to start commuting to another part of the Lower Mainland? Will he be asked to leave his home, enabling another Maplewood worker to take over? I cannot realistically see that happen.
What happens when a resident, who is working in Maplewood, moves in with a spouse or partner who is working elsewhere than Maplewood? Has the added transportation been taken into consideration? As far as I know there has been no guarantee from TransLink that the scheduled B-Line on the North Shore will be extended to Maplewood – in spite of staff's hope for same.

I am very concerned about the potential replacement of the approximately 250 existing purpose-built market rental units in Maplewood. What will happen to the residents? It looks again like more renovictions are planned with no viable solutions or concern for the current residents.

If new residential is to be added to Maplewood it should be primarily non-market housing to hopefully enable the victims of the current renovictions to come back to live and work in our community.

Additionally I still have severe concerns about the potential danger from the chlorine plant and I would urge Council not to proceed with massive developments in Maplewood, as every resident's safety should be a priority.

Thanks,

Eric

Eric Godet Andersen

[redacted]

Before printing this e-mail, please assess if it is really needed

North Shore Community Resources

Connecting You to Community Services!

Don Peters
Housing Advocate

Chair, Community Housing Action Committee

Capilano Mall
Suite 201, 935 Marine Drive
North Vancouver, BC V7P 1S3
Direct: 604-982-3309
Tel: 604-985-7138 / ext. 309
Fax: 604-985-0645
don.peters@nscr.bc.ca
Website: www.nscr.bc.ca

North Shore Community Resources
Connecting You to Community Services

CHAC
Community Housing Action Committee

Chair, Community Housing Action Committee
Capilano Mall
Suite 201, 935 Marine Drive
North Vancouver, BC V7P 1S3
Direct: 604-982-3309
Tel: 604-985-7138 / ext. 309
Fax: 604-985-0645
don.peters@nscr.bc.ca
Website: www.nscr.bc.ca

January 9, 2018

Good evening, Your Worship, and Councillors:

I am pleased to add my voice to the other CHAC members who ~~have spoken tonight, or will~~ speak tonight, or have submitted our housing committee's position on this impressive plan for Maplewood. We are largely leaving to other residents various observations on the Plan concerning transit, environmental issues, parks and recreation, roadways and the other issues that are as critically important to the area as housing clearly is. For CHAC, tonight, however, it is all about the provisions for affordable housing in the Maplewood Plan.

For quite some time now CHAC has supported the vision of MW + is fully in support of the Bylaws tonight

We have two major issues with the housing policies in Section 2.7,

entitled-Non-Market Housing.

The first is, as we look at the ten policy statements, is that the expression "non-market" is used no fewer than ten times throughout the ten statements. Ten times. The word "affordable" does not appear-at all. Not once, with the exception in the introductory paragraph which refers ironically to the very policy we all worked so long to produce: namely, the District's "Rental and Affordable Rental Strategy"; you, staff, District residents, non-profit housing providers, housing agencies, representatives of the development industry, and CHAC and to quote the policy itself-a policy "intended to guide the community, developers, Council and staff towards the

provision of housing choices for low to moderate income households in the District." But, after that introductory paragraph, no mention of affordable, even though it is clearly defined, described, and explained, quite well we think, in the policy.

This use of "non-market", which refers to a large segment of the housing continuum, gives but general, even unclear direction to all of us. For example, when developers come to CHAC for comment, direction and support for a particular application, the first question we ask is: how does this application respond to the District's policy and definition of affordable??
We then proceed to assist them where we can.

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Community Housing Action Committee

So who's watching carefully tonight? We bet the Polygons, the Anthems, the Mosaics, the Chards, the Beedies AND THE DARWINS are watching along with the rest of us. Probably as we speak tonight. We at CHAC are apprehensive, to be truthful: are we to substitute "non-market" now, when we discuss "affordable"?

Which brings us to our second issue, closely related to the first: the lack of specificity in the some of the housing policy statements. As we have commented many times over the years, we like strong, clear words like "require" and "ensure" such as used in the third bullet. But, we do not find useful words like "encourage" and "consider", as we see in several other

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statements. Developers also like to know where they stand.

Finally, speaking of the first statement, CHAC firmly believes that statements like the first one should begin: "REQUIRE the replacement of the existing (NOT "encourage") 250 purpose-built market rental units" and add "in perpetuity, at 15% below market. Because that's the only (relatively) affordable stock that exists in Maplewood.

We all need a strong stand from the District, Your Worship, on these two issues: what we mean-or do not mean-by affordable housing, and on direct policy language.

Thank you.

North Shore
Community Resources
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CHAC

Community Housing Action Committee

* this is part of CHAC's presentation

2.7 Non-Market Housing

Development in Maplewood should support the District's *Rental and Affordable Housing Strategy* by providing, where possible, non-market housing secured through a number of innovative approaches including the following policies.

Non-market housing is encouraged in Maplewood Village Centre as well as in the Innovation District. A portion of the roughly 900 residential units anticipated in the Innovation District should be comprised of a mix of non-market rental and below-market ownership.

POLICIES

- Encourage the replacement of the approximately 250 existing purpose-built market rental units in Maplewood as development occurs. in perpetuity @ 15% b/m
- Use District-owned lands to generate innovative, non-market housing opportunities, where appropriate.
- Require a portion of non-market rental or price controlled/restricted ownership units, or non-market units as part of new market housing development projects, or require provision of a cash-in-lieu contribution from development projects to the District's Affordable Housing Fund to be used to establish new non-market housing units, where possible.
- Encourage and incentivize purpose-built non-market rental buildings, where appropriate.
- Consider additional height and density in order to achieve housing objectives, up to a maximum of 12 storeys, as identified on Figure 8 within Maplewood Village Centre.
- Target up to 300 net new non-market housing units in the Maplewood Village Centre.
- Ensure below-market ownership units in the Innovation District are offered to employees in the Innovation District first.
- Ensure non-market employee-oriented rental housing in the Innovation District is offered to employees in the Innovation District first.
- Secure a minimum of 50 percent of the employee-oriented rental housing units as non-market.
- Secure non-market employee-oriented housing for the life of the buildings.

2.8 Phasing

A significant portion of the overall Industrial/Commercial floor space in the Innovation District should be coordinated with any supporting residential uses to provide housing options for employees needing to locate proximate to their work.

Maplewood Village Centre Public Hearing - January 9, 2018

OCP Bylaw Amendments

Maplewood Village Centre and Innovation District Implementation Plan & Design Guidelines

Mayor and Council,

My name is Barry Fenton and I live at [redacted] I have been a resident of the Blueridge and Seymour area for almost 30 years.

I will be speaking tonight in support of the OCP Bylaw Amendments as being both a local resident and as a member of CHAC – the Community Housing Action Committee.

Thank you for the opportunity of speaking tonight. Over the past few years I have participated in several Open Houses, attended the DNV Maplewood Workshop in October 2017 and attended the recent DNV Council meeting on November 23, 2017 when Council voted to move the Maplewood plan forward to this Public Hearing.

As a local resident overall, I am in support of the OCP Bylaw Amendments. There are many positive aspects and features in the Maplewood Village Centre and Innovation District Implementation Plan & Design Guidelines. Now is the time is right to move forward and approve the Maplewood Plan.

I will briefly highlight some positive features in the Maplewood OCP Bylaw Amendments:

1) Adds 3 new land use designations which should be beneficial to the District in the future.
2) These new land designations all focus on having employment and jobs in DNV which is desirable.
3) The opportunity for an Innovation District is exciting and there is a huge need for light industrial uses. Having zoning for Light Industrial Residential Mixed Use is looking to both future employment and housing options.
4) The diversity in housing options including employee housing is good. Flexible housing options such as residential lock-off units should be required.

CHAC CONCERNS

However, the members of CHAC are concerned about the provision for affordable housing in Maplewood. It is noted that in Section 2.6 Housing Mix there is reference to non-market housing but absolutely no reference to AFFORDABLE HOUSING. DNV Council defined Affordable Housing in the Rental and Housing Policy developed in 2016. CHAC would like to see this oversight corrected so that there is Affordable Housing Developed in the Maplewood Village Centre. We assume that being AFFORDABLE will fall under the category of non-market housing.

Other concerns by CHAC include:

1) Currently there are approximately 250 lower end of market purpose-built rental units within the Village Centre. The plan indicates that there are policies to increase the number of non-market housing units in Section 2.7. However, to **Encourage** the replacement with non-market housing units does not ensure the replacement of Affordable Housing units.

2) CHAC feel that much stronger language should be used in the Maplewood OCP Section 2.7 Non-Market Housing. Examples in Section 2.7 are:
-Bullet 1- Currently reads "Encourage the replacement of the approximately 250 existing purpose-built market rental units in Maplewood as development occurs."
- **Replace the word ENCOURAGE with REQUIRE the replacement.**
- Bullet 2- Delete "where appropriate" with using District-owned lands **be used in perpetuity** to generate innovative non-market housing opportunities. This can be done via zoning and via long term land leases.
- Bullet 3- Need to establish targets for the use of the District's Affordable Housing Fund and **delete reference to where possible.**
- Bullet 5 – As land is a scarce resource recommend a not lower than 12 storeys in Figure 8 within Maplewood Village Centre to ensure the maximum number of units are built and that a minimum % are Affordable and Accessible units.
- Bullet 9 - Reference is made to non-market housing. **Replace wording with Affordable Units.**
- Bullet 10 - Wording secures non- market employee housing for the life of the building. **CHAC would prefer wording to reflect Affordable Employee Housing in perpetuity.**

3) General Recommendations for stronger language and targets as follows:
   - Target is 300 non-market units. **CHAC would recommend target of 450 non-market units.**
   - **Need to look for more positive and stronger wording in OCP as it relates to AFFORDABLE Housing (VS Non- Market) and housing people with disabilities.**
   - **Council and staff can also consider stronger wording to support higher density via density *bonuses to allow for non-market rental and Affordable housing. An associated benefit is* that the increased density will create more demand for improved Transit.**

4) **Questions through the Mayor for Staff –**
   a) In the DNV, what is the total number of non-market housing units that have been approved in conjunction with the recent development approvals? Have any of these units been identified as AFFORDABLE units?
   b) CHAC members are concerned that the OCP targets are being monitored and achieved for AFFORDABLE and non-market housing units. *Can staff confirm that the estimated demand* for AFFORDABLE rental units in the next 10 years is between 600-1000 units? Overall in DNV are these targets being achieved? CHAC acknowledges that the target of 300 non-market units in Maplewood is a positive step.
   c) How will Council and staff ensure the creation and provision for AFFORDABLE and Accessible housing units on DNV land? Will long term land leases be the preferred option vs the sale of DNV land?
   d) In Section 2.7 – Non-Market Housing – Reference is made to "A portion of the roughly 900 residential units anticipated in the Innovation district should be comprised of a mix of non-market rental and below-market ownership". This is positive and encouraging wording. However, is non-market defined in the Rental and Affordable Housing Strategy for DNV that was approved on November 28, 2016?

e) In Section 2.6 – Housing Mix – Target is 1500 net new residential units. In 2.7, the refence is to ENCOURAGE the replacement of 250 existing purpose-built market rental units. **Recommended wording would be to REQUIRE the replacement.**

f) In 2.7, Reference is to TARGET up to 300 net new non-market housing units in the Maplewood Village Centre. This is positive as it represents the potential of 20% of the net new units being non-market housing. **Question - Is there the opportunity to require 20% non-market housing in all developments so that these units are built at the same time as the market housing?** This would also have the benefit of spreading these units throughout the Maplewood Village Centre vs being all in separate buildings and possibly not being constructed at all. Introducing a requirement of 20% of all units being non-market ensures that these units will be constructed.

g) **Has Staff considered introducing relocatable Modular Housing in Maplewood?** Is special zoning required? Would this Modular housing be beneficial for DNV Residents at housing risk and for both younger residents and for seniors?

h) **What options are being proposed by staff to reduce the parking requirements in Maplewood?** By reducing expensive parking stalls at $ 40,000 or more, this can improve housing affordability. Improved transit and changing attitudes to car ownership can help support reduced parking requirements.

i) A recent suggestion in 2017 by Michael Geller would be supported by CHAC. **Would it be possible to create "a Nexus lane for AFFORDABLE HOUSING" to provide an improved development approval system? Would this be possible in the Maplewood Village Centre and this new OCP?**

Thankyou for the opportunity of speaking tonight at this Public Hearing. As mentioned I am in favour of this updated OCP.

Stuart Porter, Maplewood Area Community Association - Co Chair

[redacted]

January 9, 2018

District of North Vancouver Mayor, Council and Planning Dept.
355 West Queens Road
North Vancouver, BC
V7N 4N5

Your worship and honorable council members, ladies and gentlemen.

Thank you for allowing me to speak on behalf of the Maplewood Area Community Association. With regards to the newly revised Maplewood village plan, I will speak for the majority of residents who have chosen to share their views and concerns with our association throughout the planning process in 2016-17.

The Maplewood Village Implementation plan is a dream with a profound vision to renew Maplewood for a few and nightmare for many more who live there and want to keep life the way its. That said the majority of our residents are excited to embrace a reimagined Maplewood Village.

It seems a few important details may have been given less importance than is required to satisfy my Maplewood communities concerns (as follows):

- We are pleased that MIAC risk assessments are up to date for our local industrial chemical companies. North Shore Emergency Management has been included and pivotal in development planning, mitigating any oversight which could be fatal for Maplewood residents and disastrous for the DNV's financial future! We will need your help to further improve our health and safety to the highest of standards and keep the entire DNV the safest that it can be.
- The Affordable and or Social housing language in the Bylaw 8279 Village Center subsection 3.1.1+ wording, could be amended or improved to state 'Require" instead of 'encourage' in the proposed OCP bylaw and add further Affordable housing language as possible..

- We will continue to and encourage further development of a Community Services Facility space, possibly to be included as part of the proposed Maplewood Fire Station and training installation. NSEM Disaster response, Community Policing and Daycare services, as well as a for rent community meeting facility, are all tenancy options for the new fire station opportunity and may best maximize DNV land use on this location.

The Maplewood Village revitalization dream is at hand thanks to the District staffs hard work, please let us not forget to take care of the many fine residents that will have to endure the growing pains of the development to come. Maplewood thanks you for your vision of a thoughtful future and ask again for the slightest of amendments to the very fine plan.

Maplewood OCP Public Input

Good evening Mayor Walton and Council

My name is David Cook. I reside at [redacted], North Vancouver.

I would like to submit once again a report I wrote in 2001 on the natural values of the strip of land in the Maplewood Area between Riverside Drive and McCartney Creek north of Dollarton Highway and south of Windridge Park.

This report was initially presented to the Parks & Natural Environment Advisory Committee and subsequently at a number of Council Public Input meetings over the years. It makes a number of recommendations as to how I think the area should be managed in order to preserve its natural values.

In the report prime consideration is given to two concepts:

1. The escarpment that forms the northern boundary of the study area contains an important aquifer. The water emanating from this

escarpment via many springs forms wetlands north of Dollarton Highway and also provides recharge for the marsh in Maplewood Flats Conservation Area and should be allowed to continue its function in supplying these two ecosystems. Enhancement to the hydrology is required to maximise its usefulness. A useful comparison can be made with the Riverside Terrace/Hogan's Pools/Maplewood Creek ecosystem.

2. The coniferous forest flanking the lower reaches of McCartney Creek should be preserved in order to preserve the function of McCartney Creek as an important Wildlife Corridor.

David Cook
Biologist
January 1st 2018

E. KOST

SCIENTIFIC AMERICAN

Sustainability https://www.scientificamerican.com/article/chlorine-accidents-take-big-human-toll/

Chlorine Accidents Take a Big Human Toll

Over the past 10 years, there have been hundreds of accidents involving chlorine nationwide, injuring thousands

- By Jane Kay, Environmental Health News on October 20, 2011

Credit: U.S. Chemical Safety Board

Beverly Martinez was sitting at her desk in the office of a California scrap metal recycling plant when she felt the blast rattle her window.

One of her co-workers, Leonardo Morales Zavala, rushed through her door, struggling to breathe. "Run!" he yelled. He had just cut into a one-ton tank to recycle it in the yard – a football field away – and out poured a noxious substance. He didn't know what it was.

The workers ran as fast as they could toward the street. But they couldn't escape the giant, greenish-yellow cloud. A couple dozen people – workers and customers – dropped to the ground, gasping for air. Martinez fell, too.

"I couldn't get up. I felt like I was being strangled. I thought, 'I'm going to die. I'll never see my granddaughter grow up,' " Martinez said.

As she struggled to reach the building across the street, she heard a voice. "Bev, Bev, help!" It was Ricky Mejia, a 23-year-old inspector, calling to her from the ground.

"Ricky couldn't breathe, he couldn't walk. I'm stocky, and I told him to grab my side. Myrna Navarro was already hanging on my shoulder. She was praying enough for everyone. In my head, I was getting to the Firestone tire warehouse across the street. It seemed like an eternity," she said.

"Then, I couldn't do it anymore. I said to Ricky, 'Your wife is pregnant. You've got a baby coming. Get up!' " They finally made it to the warehouse, where Mejia collapsed.

More than a year later, the ghost of a chlorine cloud lingers like a vivid nightmare at Tulare Iron and Metal Inc., located in the heart of California's Central Valley.

On that June afternoon in 2010, 23 people were taken to hospitals and six were kept for treatment, including Mejia, who was hospitalized for 11 days, two of them on life support. Sixteen months later, the workers are still beset with health problems, including lung, stomach and Post Traumatic Stress Disorders.

Over the past 10 years, chlorine has been involved in hundreds of accidents nationwide, injuring thousands of workers and townspeople, and killing some, according to federal databases. It is second only to carbon monoxide when it comes to the percentage of accidents that cause injuries, according to the newest federal data.

Chlorine is one of the most widely used industrial chemicals in the world today, with 13 million tons produced annually in the United States alone.

An element that is abundant in the Earth's crust and oceans, the powerful, corrosive substance is considered essential to an array of products. It is used in manufacturing plastics, synthesizing other chemicals, purifying water supplies, treating sewage and making refrigerants, varnishes, pesticides, drugs, disinfectants, bleaches and other consumer products.

In recent years, accidents have occurred when chlorine leaked or spilled, pressurized tanks were punctured, train cars derailed or when other chemicals were improperly – and often unknowingly – mixed with it. In some cases, thousands of people have been evacuated after an accident at a factory or during transport of liquefied chlorine. Janitors, housekeepers and others also have been exposed when they mix acidic household chemicals with bleach or swimming pool chemicals.

The worst chlorine gas accident in the country occurred in 2005, when 18 freight train cars derailed and released 120,000 pounds of chlorine gas in the mill town of Graniteville, S.C. Nine people were killed and at least 1,400 people were exposed, resulting in more than 550 people treated at hospitals, including some with serious lung injuries. More than 5,000 people were evacuated from their homes.

Chlorine gas is particularly insidious. Even small exposures can trigger coughing, choking and wheezing, and burn the eyes, skin and throat. Inhaling large amounts constricts the airways by inflaming the lining of the throat and lungs. At the same time, fluid accumulates in the lungs, making it doubly hard to breathe. People can literally drown in their own body fluids. At high exposures, a few deep breaths are lethal.

In Tulare, Calif., the chlorine concentrations at the recycling plant were extremely high. Three hours after it happened, the Visalia Fire Department measured the gas at 328 parts per million near the tank. It was probably much higher when the workers were trying to escape. Studies show 40-60 ppm produces lung injury; 430 ppm usually causes death in 30 minutes, and 1,000 ppm is fatal within a few minutes. Under federal standards, workers are never supposed to be exposed to concentrations exceeding 1 ppm.

"Exposure to high levels of chlorine gas from a release can cause severe health effects, including death," said Mary Anne Duncan, an epidemiologist at the federal Agency for Toxic Substances and Disease Registry who has assisted with the aftermath of several chlorine accidents, including the one in Tulare.

Erik Svendsen, who studied the health effects of the Graniteville chlorine cloud, said researchers knew they would find pulmonary and other health problems in people exposed. But they found a lot of Post Traumatic Stress Disorders, too.

"Chlorine was used as a war gas for a reason. It was designed not just to kill the enemy but also to inflict fear in the enemy. You remember every second you were exposed to the gas. You don't know where to go. You see your clothes bleach before your very eyes. You see animals die," said Svendsen, a Tulane University epidemiologist.

"It's not just a toxic event. It's a traumatic event. You're powerless. You're being exposed to something you can't stop. You have a metabolic stress response that has effects on the body physiologically."

Only four months before the accident in Tulare, five workers were injured at another California recycler, U.S. Metal in Indio, when a crane worker pierced a cylinder tank and set off an explosive chlorine gas release.

And in July, at Tyson Foods Inc., in Springdale, Ark., chlorine gas was released after the accidental mixing of two chemicals, exposing 173 people and sending 50 to hospitals, including five that wound up in intensive care. Chlorine is used in the company's sanitizing washes.

Across the country, data going back to 1993 show that chlorine accidents occur in the United States at the rate of at least once every two or three days, and about one-third of them cause injuries.

In 2009 alone, chlorine was involved in 181 reported accidents with 56 resulting in injuries, based on the latest report from a federal database called Hazardous Substances Emergency Events Surveillance (HSEES). That amounts to 3.8 percent of all the reported chemical emergencies that year. Chlorine had a high percentage with victims, 30.9 percent, second only to carbon monoxide, which had 41.7 percent with victims. Roughly one-third of the states reported, and only for a part of the year, so the real number of accidents and injuries is much higher, experts say.

"Chlorine releases in fixed facilities resulted in victims and evacuations in more industry categories than any other substance," says a 2004 study by researchers from the Agency for Toxic Substances and Disease Registry. That study was based on HSEES data of 40,000 chemical incidents from 1996 through 2001.

Accidents involving chlorine "were more likely to result in events with victims, evacuations and decontaminations when compared with non-chlorine events," according to another study by the same federal agency published in 2002.

Of 865 events involving chlorine alone between 1993 and 2000, 275 caused injuries, the study says. Of the 1,071 victims, 759 were workers, 235 were members of the public and most of the rest were first responders.

Transporting chlorine also poses more risks than other substances. The U.S. Department of Transportation issued a report last month weighting the most serious accidents in terms of deaths and major injuries from 2005 to 2009. Chlorine led the list with 83 major injuries and nine fatalities out of 48 rail and road accidents compared to gasoline, second on the list, which had 19 major injuries and 30 fatalities out of 1,306 rail and road accidents.

Estimating the number of hazardous materials accidents that affect the public is difficult. Many go unreported. There are at least five national databases of chemical spills, including one for worker accidents and one from the Department of Transportation, and they all have limitations.

For worker accidents, the database by the U.S. Department of Labor's Occupational Safety and Health Administration is considered the best available. Yet officials agree that a lack of consistent reporting among states leads to under-reported accounting. The numbers clearly are imprecise: While the HSEES database

reported 56 chlorine accidents with injuries in roughly one-third of the states in just one year, the OSHA database reported only 45 chlorine accidents involving workers nationally over 10 years.

Representatives of the Chlorine Institute, the trade group most familiar with the chlorine industry, said it couldn't discuss the situations in which most chlorine accidents occur. They also wouldn't comment on the data showing the frequency of injuries and evacuations, saying they weren't familiar with the HSEES database or the studies.

"Incidents are rare" in the production of chlorine among Chlorine Institute members, said Frank Reiner, president of the national trade group of 220 manufacturers and distributors. In an e-mail, Reiner said, "the safety performance of the industry has been very good" and his group shares information among members to avoid future problems.

Chlorine is arguably the most essential chemical in use today, industry experts say. It is produced in such large volumes because it can be easily combined with other elements and molecules, transforming it into new classes of chemicals. Industry considers it vital to the synthesis of plastics, drugs, microchips and many other products around the globe. Though there are alternatives for some uses, there are few equally effective and viable substitutes for others, such as water disinfection.

About 93 percent of pharmaceuticals are manufactured with chlorine.

"Chlorine is not in the final product, but it is needed at an intermediate stage to direct reactivity and make sure you make the molecule you want. Being able to avoid the use of chlorine in these cases is a very intense area of current research in green chemistry," said Audrey Moores, an assistant professor in the Department of Chemistry at McGill University in Montreal.

In Tulare last year, the source of the poison released at the recycling plant was a one-ton pressurized cylinder, unmarked as hazardous and accepted in good faith as harmless scrap metal by a recycling inspector. County officials believe the chlorine inside had been used to disinfect food supplies.

Ron Rushing, owner of Tulare Iron and Metal, declined to comment about the accident. The California Division of Occupational Safety and Health has fined the company $15,000 for failing to make certain that containers do not contain hazardous materials and for failing to properly train workers. The company is appealing the fine. Records from Tulare County and federal courts do not show any lawsuits filed against the company related to the accident.

Most of the injured employees are back to work – but they are not back to normal.

Six months after the accident, "19 people were still seeing a physician for problems related to the chlorine release," said Dr. Rachel Roisman, a California Dept. of Public Health medical officer who worked on a health assessment of the workers with county officials.

People reported shortness of breath, change in sense of smell, headache, congestion or phlegm, dizziness, light-headedness and chest pain and tightness.

"Some people were still very affected by the incident either physically and/or psychologically. It had been a significant event for them. For some people, it was definitely still with them," Roisman said.

Now, 16 months later, of four hospitalized workers, Ricky Mejia, who spent 11 days in the hospital – two breathing with the help of a mechanical ventilator – still is suffering from lung ailments and other health problems. He uses an inhaler, and misses some work because of his illness.

Morales Zavala, 48, the shearing machine operator who pierced the unlabeled cylinder tank and ran to warn the staff, is still on the job, suffering from poor health, including stomach problems. Fellow workers say he has lost 40 to 50 pounds, and has a hard time eating.

As for two other hospitalized employees, Danni Cuevas, 23, is back at work after recuperating for weeks, and Gladis Alaniz, 29, a clerk, has left the company.

The first responders were initially told that a 300-gallon tank had ruptured, perhaps containing ammonia, said firefighter-paramedic Karl Kassner with the Visalia Fire Department Hazardous Materials Response Team.

But when the firefighters in self-contained suits got close and sent camera images to the haz-mat trailer where Kassner and others waited, "we saw the one-ton cylinder and knew right away it was more than likely liquid chlorine that had been under pressure. We could hear the team's chlorine alarm going off," Kassner said. When he called on the radio and learned the concentration was 328 ppm, they all knew that it remained at a level known to firefighters as "immediately dangerous to life and health," even three hours after the original release.

Sometimes when Martinez looks at any cylinder, she feels a sense of panic. To the workers, the accident seems like yesterday. They can't shake the feeling of being unable to breathe.

Martinez recalls how the chlorine gas on their clothes made the ambulance drivers cough, and how people driving on the freeway a half-mile away could smell it. She remembers not breathing normally for days, and wanting to take showers every 20 minutes. "Sweat smelling like chlorine poured out of me. My husband said my coughs smelled like chlorine," she said.

Working about 120 yards from the tank, John Espinola, shop supervisor, felt like his head had been covered in Saran wrap. "You felt like your breath was being taken away. You're engulfed in a yellowish cloud. I was just gasping for air. I couldn't get enough oxygen," he said.

Doctors say people who survive heavy chlorine exposure may suffer acute respiratory distress syndrome. Some people develop chemical pneumonitis, an inflammation of the lungs, from breathing in chemical fumes. They can recover or end up with permanent scarring of the lungs, which reduces their breathing capacity.

Even a one-time high-level exposure can lead to irritant-induced asthma. People develop bronchitis, or inflammation of the airways. In some, but not in all people, the bronchitis induces asthma, said Dr. John Balmes, professor at the University of California at San Francisco and division chief of occupational and environmental medicine at San Francisco General Hospital. Balmes' laboratory has been studying the respiratory health effects of air pollutants for 25 years, and he reviewed parts of the U.S. Health and Human Services' toxicological profile for chlorine released last year.

What happens when a person breathes chlorine is that the corrosive substance splits hydrogen from water in moist human tissue, releasing oxygen and hydrogen chloride, which do the damage. Scientists say there are palliative remedies but no antidote.

Researchers believe that an injury from chlorine gas to the airway lining – or the epithelium – can somehow lead to persistent airway hyper-responsiveness, Balmes said. Smoking and allergies seem to increase the risk of permanent asthma after chemical exposures.

"Most people get better once they've recovered from the chemical bronchitis. Some don't," Balmes said.

Government agencies are ramping up programs to prevent future chemical accidents.

Within days of the accident in Tulare, federal, state and county public health officials turned to a new assessment tool in an effort to reduce chemical accidents. Called ACE, or Assessment of Chemical Exposures, the investigation focuses on circumstances surrounding a chemical accident, the health effects and recommendations for prevention.

As a result of the federal visit, the state mailed an alert urging 1,200 metal recyclers to take only containers that are cut open, dry or without a valve or plug; treat closed containers as potential hazardous waste, and develop and practice an evacuation plan to stay upwind of a hazardous gas release.

The Institute of Scrap Recycling Industries, a national trade association, sent the California alert to its 1,500 members in a weekly newsletter, said John Gilstrap, safety director. When he and his staff train employees in an OSHA 10-hour safety program, they warn that containers "are extremely hazardous unless they've been rendered incapable of holding pressure," he said.

Carrying out the practice of accepting only cut tanks may sound elementary, he said, but metal recyclers handle truckloads of scrap cargo and so monitoring is challenging.

In Tulare, Beverly Martinez, a Tulare native and seven-year employee of Tulare Iron and Metal, and the other workers now reject all uncut containers.

"We've turned away tons of tanks because they're not cut in half. I say, 'I don't care how good a customer you are. We're not taking it,'" said Martinez, an office manager.

"I can honestly say it was a life-altering event. I never came so close to death, or what you feel it would be. We all lived through it. That was the good thing."

This article originally ran at Environmental Health News, *a news source published by Environmental Health Sciences, a nonprofit media company.*

ABOUT THE AUTHOR(S)

Jane Kay

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Submitted @ Public Hearing by Linda Melville

TO: PARKS AND NATURAL ENVIRONMENT ADVISORY COMMITTEE

Title:- Final Report, Windridge Wetlands North of Dollarton Highway: Their Importance as Wildlife Habitat and Water Recharge for Maplewood Conservation Area Together with Their Role in Maintaining the Function of the Mountain Forest-McCartney Creek to Maplewood Flats Wildlife Corridor.

Date:- January 16, 2001 (updated May 15, 2001)

Author:- David L. Cook, P.Eng.*

Summary

This report focuses on three contiguous ecologically sensitive areas totaling 20.5 hectares (50.52 acres) which is threatened by proposed development under the Draft Maplewood Local Plan. All three areas (see Figure 2), together with their related drainages, are proposed in this report for protection as natural parkland or similar designation under PRO zoning. They are :-

1. The North Swamp, and a second growth coniferous forest with its associated Wetlands, described here as the Western Area (see below) and covering an area of approximately 6 hectares (14.8 acres) on land owned by the District of North Vancouver (DNV).

2. A Wetland making up the Eastern Area (described below) covering an area of approximately 13.8 hectares (34 acres) on land owned by the Vancouver Port Authority (VPA)

3. A strip of Coniferous-Sword Fern forest on VPA land located within the Eastern Area on its eastern margin and covering an area of 0.7 hectares (1.72 acres).This strip of forest is contiguous with the Coniferous-Sword Fern forest of Windridge Park. Its inclusion within Windridge Park would, at least in part, alleviate the problem of constriction of the Mountain Forest-McCartney Creek Wildlife Corridor if proposed Business Park development were to take place.

Introduction

Since November, 1998, the writer has conducted ecological studies along the Mountain Forest-McCartney Creek Wildlife Corridor and in the Wetlands and forests north of Dollarton Highway between Riverside Drive and McCartney/Blueridge Creeks, to which the Corridor is presently directly connected. This work, together with past work carried out by consultants to the District of North Vancouver, was carried out with a view to understanding the importance of these areas both as separate eco-fragments and their relationship to one another. As these studies progressed, it became apparent that there was an intimate relationship between the eco-systems of the Wetlands, the Mountain Forest-McCartney Creek Corridor and the Conservation Area at Maplewood Flats to the south. It was found that animal species move freely between these areas with different areas providing different needs. It also became apparent that the marshes of the Conservation Area have

always been dependent for water recharge from the Wetlands, but that this recharge function had been adversely modified by human activity.

Of equal importance is the recreational value of Windridge Wetlands. This was evidenced by the observed use of the area by naturalists, hikers and dog walkers. An awareness for the value of this area as a nature reserve has been significantly enhanced by the numerous tours that have been conducted by the writer through the area.

Under proposals outlined within the Draft Maplewood Local Plan, most of the Wetlands are slated for development as Business Park (see "BP" on Figure 1: Maplewood Local Plan Map). It became evident that the following problems could arise as a consequence of this development:-

i. The Wetlands would be destroyed. Their water recharge function to Maplewood Conservation Area could be affected or eliminated.

ii. The Mountain Forest-McCartney Creek to Maplewood Flats Wildlife Corridor would be constricted in an area where McCartney Creek meets Dollarton Highway to such an extent that it would either lose its function as a Corridor or would create the problem of large, possibly unwanted wild-life passing into the developed areas.

iii An important wildlife habitat and recreational area would be destroyed.

Description and Discussion

.

The area here proposed for conservation, is bound on the west by Maplewood Park, north by the Windridge Escarpment and Windridge Park, on the east by Windridge Park and on the south by Dollarton Highway (see Figures 1 & 2).

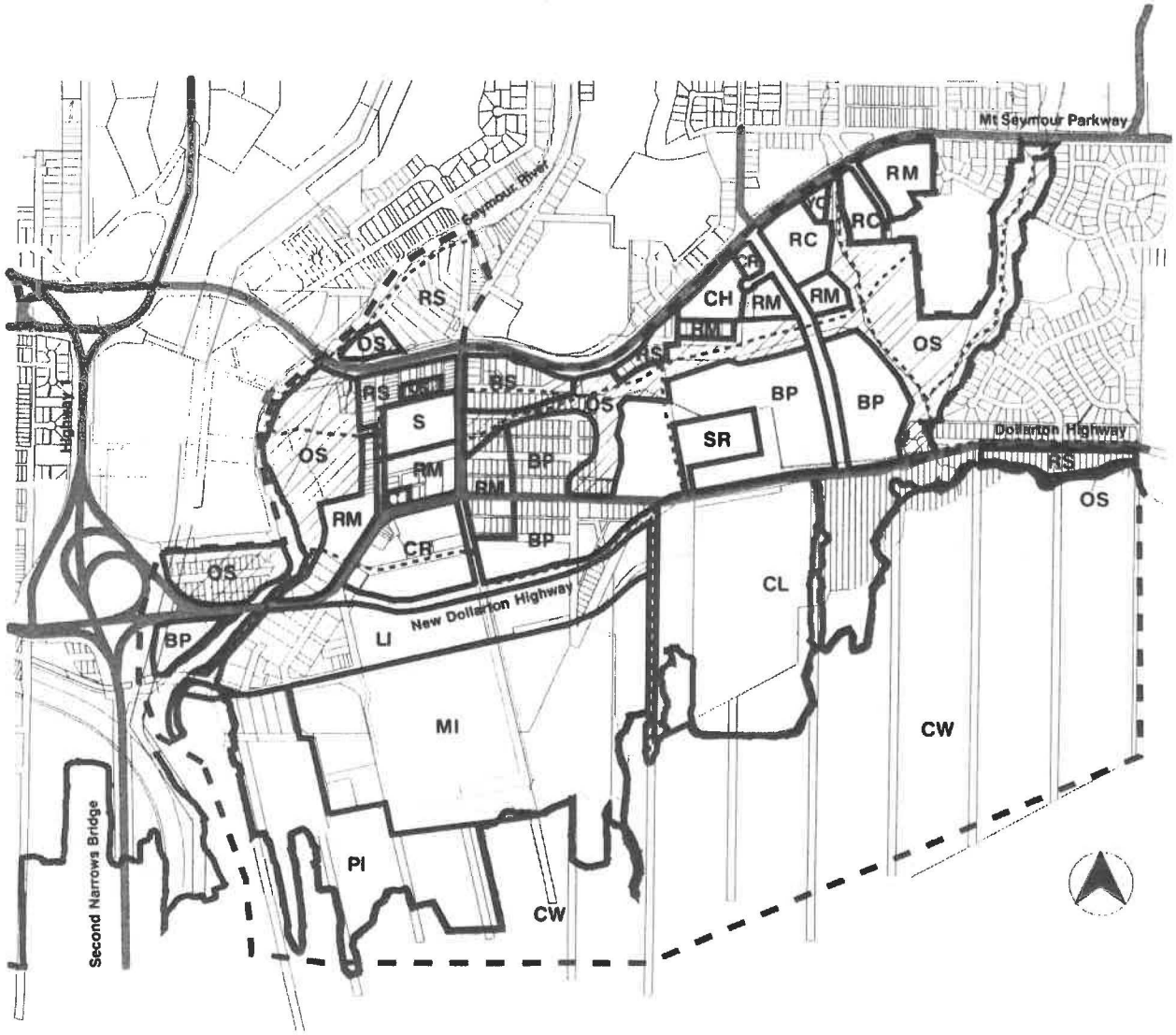
The principal water source of these Wetlands is the 1.2 km. long Windridge Escarpment which lies partly within Windridge Park and which exposes on its south-facing slope, a poorly consolidated sedimentary unit, the Capilano Gravel, now a raised terrace of deltaic sediments. The gravels function as an aquifer and water recharge source for the Wetlands and ultimately the Conservation Area at Maplewood Flats. Water from numerous springs outflowing from the gravel escarpment, has in the past collected in marshy areas of the Wetlands, in particular the North Swamp. Extensive modifications to this drainage have taken place during the last 100 years by logging, excavating, filling and road construction which has resulted in the destruction of about 90% of the North Swamp and the complete destruction of other marshy areas. This depletion of marshy areas and the creation of an artificial system of water channels, has resulted in an inadequate recharge of water into the marshes of the Conservation Area.

For descriptive purposes, the entire 20.50 hectare area can be divided into three parts; the Western, Central & Eastern Areas (see Figure 2):-

1. **The Western Area**:- A Wetland of approximately 300m X 240m (6 ha.) bound on the west by Maplewood Park, on the north by the Windridge Escarpment, on the east by the Fill Area and

Maplewood Local Plan - Map

November 2000



LEGEND :

RESIDENTIAL

- RS Residential Low Density
- RM Residential Medium Density

COMMERCIAL

- C Commercial
- CR Commercial/Residential Mix

EMPLOYMENT

- BP Business Park
- LI Light Industrial
- MI Medium Industrial
- PI Port Industrial

OPEN SPACE & CONSERVATION

- OS Open Space
- CL Conservation-Land
- WC Conservation-Water

INSTITUTIONAL

- S School-Elementary
- SR School-Residential
- RC Recreational Centre
- YC Youth Centre
- CH Care Home

Trail ----------

Plan Boundary — — — —

Figure 1

on the south by Dollarton Highway (see Figure 2). It includes most of what remains of the North Swamp, 90% of which was eliminated by the Fill Area and by the construction of Canadian International College. Under the Draft Maplewood Local Plan of November 9, 2000, about 75% of this remaining Western Area wetland is recommended for development as a Business Park, with the remainder to be highly modified Open Space (BP & OS on Figure 1) . All of this area is owned by the District of North Vancouver (DNV).

Water recharge for this area is from the deltaic gravels making up Windridge Escarpment which flows into what remains of the North Swamp.

Throughout the area are water-filled channels, ponds, rotted stump depressions and marshy areas.

Outflow from the North Swamp is facilitated by a man-made channel passing east and south long and across Dollarton Highway into the South Swamp (now known as the Park Street Marsh) and the Meadow Central (Salt) Marsh within the Conservation Area at Maplewood Flats.

This Western Area wetland consists of two Second Growth vegetation types; Deciduous Salmonberry and Coniferous-Sword Fern.

Deciduous-Salmonberry:-

This vegetation type covers what remains of the North Swamp, and lies immediately west of the Fill Area. It consists of an overstory of Red Alder and Black Cottonwood with an understory shrub layer of mainly dense Salmonberry, Spirea and Willow. Skunk Cabbage is the most notable herb (see Photo 1).

The high water table and the importance to songbirds and waterfowl as a refuge area (Paish, Howard & Associates Ltd., 1975) make this habitat an important area to consider for wildlife conservation. The high cost of filling to get above the water table is also a deterrent to development.

Game trails with evidence of Deer usage have been noted through the North Swamp.

Coniferous-Sword Fern:-

Located west of the North Swamp and east of Maplewood Park, this vegetation type supports a closed canopy of Western Hemlock, Western Red Cedar and Douglas Fir. One Sitka Spruce (Photo 2) was noted. The understory comprises up to 40% Sword Fern. Vine Maple, Bitter Cherry, Salmonberry, Red Elderberry, Red Huckleberry and Salal are also common. Stumps remaining from the former logging in the area (Circa 1910), together with Nurse logs and Snags, are scattered throughout (Photo 3 & 4).

Depressional areas, in particular a west-east marshy channel about 200 metres x 10 metres that connects with the North Swamp, are water filled. Paired water fowl have been observed in the

marshy channel and North Swamp and may be nesting in the more secluded parts of the North Swamp.

A herd of five Does ranging in age from a yearling to an older adult have been observed year round in this area where their main food source is the tender new growth of many native plant species such as Bracken Fern, Salmonberry and Indian Plum (Photo 5). A thicket of Giant Knotweed (Photo 6) and a grassy meadow (Photo 7) located between 100 and 150 metres west of Forester Street immediately north of Dollarton Highway is a major feeding area. Their range also includes the nearby forest south of the Dollarton Highway where they feed on the tender new growth of Himalayan Blackberry that borders the south side of Dollarton Highway (Photo 8). Because the main source of food for the Deer borders both sides of Dollarton Highway, they are continually crossing this heavily used road, thus creating a hazardous situation for both themselves and the traffic. A Deer traffic warning sign positioned for traffic proceeding easterly is poorly located 110 metres east of Forester Street and should be relocated about 150 metres west of Forester Street as the Deer cross mainly in an area about 100 metres west of Forester Street. The sign should be larger, as the present small sign is not noticed by motorists and consideration should be given to some type of warning mark on the road surface.

The buck Deer seem to have claimed the grassy meadows within the Eastern Area (described below) as there feeding area.

2. **The Central Area**:- Once part of the North Swamp, the Central Area has been filled and partly developed by construction of the Canadian International College. The undeveloped Fill Area is slated for Business Park under the Draft Maplewood Local Plan of November 9, 2000.(see BP on Figure 1) This area is also on DNV land. This undeveloped Fill Area has no value as an ecological reserve and will probably present problems relating to the type of materials and substances dumped at the site. A narrow strip of the North Swamp paralleling Dollarton Highway along the southern margin of the College should be incorporated into any conservation or ecological enhancement that might take place. This strip now partly serves as a west-east channel-way for water from the North Swamp into the Conservation Area at Maplewood Flats

3. **The Eastern Area**:- An area of 14.5 hectares bound on the west by Canadian International College, on the north by Windridge Escarpment and Windridge Park, on the east by Windridge Park and to the south by Dollarton Highway and the Conservation Area at Maplewood Flats. The Eastern Area connects to the Western Area north-west of Canadian International College. All of the Eastern Area is owned by Vancouver Port Authority (VPA). Under the Draft Maplewood Local Plan, the entire area is recommended for development as a Business Park (BP on Figure 1) with the proposed Berkley Road connector cutting through it to Dollarton Highway. The connector road is shown on the Draft Plan maps as bisecting the Eastern Area (see Figure 1). Discussions with Engineering Services ,DNV, indicate that it might be feasible to swing the connector road west towards Canadian International College, thus alleviating to some degree the negative effects of bisecting the main Deer feeding area (see Figure 2 for this alternative configuration). However, if a Mount Seymour Parkway to

Dollarton Highway connector is found to be necessary east of Seymour, it should be located in an area that does not contain such a sensitive eco-system.

Commencing circa 1920, much of the Eastern Area east of Canadian International College was excavated for its sands and gravels, which were removed down to the underlying glacial tills (fine-grained impermeable rock flour resulting from the grinding action of glaciers). The removal of the gravel down to the till caused the interception of ground water flow, with a resultant increase of surface flow (i.e. the water-table is at or near the surface). Present drainage consists of a combination of man-made and natural channels. The principal of these are a west-east trench called Berkley Springs, corresponding to the southern margin of Windridge Park which attempts to collect the water outflow from the gravels, and "Berkley Creek" (first use of this name) which drains downslope from Berkley Springs immediately to the east of the Old Berkley Road (see Figure 2). This drainage then flows into a large west-east marshy ponding area north of a berm constructed along the north side of Dollarton Highway. It then passes out of the Eastern Area via a culvert beneath Dollarton Highway and into the slough of the Conservation Area once used for barging the gravels out of the pit area. This berm and a second berm west of the Blueridge/McCartney Creeks riparian zone were established to prevent flooding from the pond onto Dollarton Highway and from Blueridge Creek into the gravel pit.

A list of 61 bird species has been compiled for this Eastern Area and Windridge Park over an approximately three year period by local resident, Vic Adamo, Provincial Park Ranger (retired) and is appended to this report. Three Hawk nests exist in Cottonwoods, two in the north-east (Photo 9) and one in the southern sectors of this Eastern Area. A wild-life viewing station has been operating in the vicinity of the north-east nests for a number of years where song birds attracted to bird feeders were very likely the attractant for the Hawks. Coopers Hawks were seen building the two north-east nests about two years ago and a Red-tailed Hawk was observed flying near the southern nest in March,2001. A Bald Eagle was observed flying through the forest almost at ground level in the vicinity of the viewing station.

The vegetation types in the Eastern Area are primarily Disturbed Deciduous in the area of the former gravel pit and an area immediately north of the College. A narrow strip of Coniferous-Sword Fern 220 metres (north-south) and 70 metres wide (west-east) in the south-east corner of the Eastern Area abuts the western boundary of Windridge Park. Strips of Deciduous-Salmonberry occur west-east along the base of Windridge Escarpment and north-south between the College and the former gravel pit.

Disturbed Deciduous:-

This vegetation type occurs over the former gravel pit (a. below) and a site which supplied the foundation fill for the College (b. below).

a.) The former gravel pit:-

Red Alder and Black Cottonwood are the dominant tree species in the former gravel pit. Young Western Hemlock and Western Red Cedar, which are scattered sparsely throughout the area, are the first signs of the next successional forest i.e. Coniferous-Sword Fern.

The understory is very variable due to the hummocky terrain and variable topsoil. Numerous areas of ponding occur due to this irregular terrain. The dominant understory species are a number of grasses (Fescue, Velvet Grass, Bent Grass, Orchard Grass) which occur throughout most of the former gravel pit and are referred to in this report as the Deer Meadows (see Figure 2). Salmonberry, Raspberry, Himalayan Blackberry, Thimbleberry, Trailing Blackberry, Black Twinberry and Red Elderberry are scattered within the Deer Meadows and form an impenetrable tangle in many places, particularly on the western and southern borders of the Meadows.

Because of the ample water-supply from the gravel aquifer, the grassy areas are well maintained and provide a year-round feeding habitat for Deer. The grasses are kept closely cropped by the Deer in the main part of the Meadows (Photos 10 & 11). A prominent and well used game trail, located on the north margin of the grassy area, is the principal entry or exit point to this Deer feeding area (Figure 2 and Photo12). After about 50 metres, this principal trail breaks up into a maze of trails throughout the grassy Meadows. Buck Deer have marked the ground through the Meadows (Photo 13) and numerous saplings of Cottonwood, Alder and Willow show antler damage (Photos 14 & 15) . The variable healing of this damage indicates the presence of the Deer over a number of years. Sightings indicate three Buck Deer are presently resident in the area. However, they seem to be somewhat reclusive and are not often seen. Bedding sites noted in the dense brush between the Meadows and Dollarton Highway and the intensive signs of usage of the game trails, suggest that the Bucks rest during the day and move around mostly at night, unlike the Does in the Western Area who are often seen moving about during the day. However, in October,2000, an adult buck was killed by traffic during daylight hours opposite the entrance to the Conservation Area.

Numerous less prominent game entry/exit points can be identified on the western and southern margins of this habitat area. Movement of Deer and other mammals from the Eastern Area to the Conservation Area at Maplewood Flats is mainly through two gated, but negotiable breaches in the Blackberry covered berm along Dollarton Highway. Road-kill and sightings suggest the eastern of these two breaches, which is opposite the vehicle entrance to the Conservation Area, is the most commonly used of the two. However, a second location where game may cross Dollarton Highway, is at McCartney Creek. If this is the case, then the Deer crossing sign presently located 170 metres west of McCartney Creek should be relocated to a point east of McCartney Creek.

This game crossing is also the location of two bus stops and is the most common crossing point for hikers, dog walkers and naturalists visiting the Conservation Area or travelling between the Conservation Area and Windridge Wetlands. It is recommended that a pedestrian crossing with lights be installed at this location.

b.) The fill source for the College:-

Although Red Alder and Black Cottonwood are the dominant tree species in this area, they are much smaller and younger than in the gravel pit area. Successional Western Hemlock and Western

Red Cedar are absent. The gravels have not been removed to the underlying till, so that interception of the water table has not occurred. Ponding is absent due to the lower water table and the regularity of the surface.

Two streams which flow west and east along the northern boundary of this disturbed area in a man-made channel, collect water from springs sourcing from the sands and gravels exposed in the face of the land fill excavation.The western stream flows south, then west, along the GVRD Sewer Access Road into the North Swamp of the Western Area which drains into the Park Street Marsh of the Conservation Area at Maplewood Flats. The eastern stream flows south, then west along the northern boundary of the College and south within a culvert beneath the driveway of the College. This channel also eventually reaches the Park Street Marsh.

The water from these two streams has been inadequate for recharge of the Park Street Marsh since about 90% of the North Swamp was eliminated by the College and land-fill. To circumvent the drying out of the Marsh, it has been necessary for Wild Bird Trust to install a system whereby filtered ground water is directed into the Marsh.

This fill area north of the College is very isolated, with virtually no human traffic and therefore serves as an ideal wildlife refuge. As with the Disturbed Deciduous vegetation type in the area of the gravel pit, game trails are evident but to a much lesser extent than in the Eastern Area. Sightings of doe Deer have been made and the presence of the bucks is indicated by one antler scarred sapling (Photo16) . Scats of Coyote were noted as has been the case throughout the Windridge Wetlands.

Deciduous-Salmonberry:-

This vegetation type is bound on the south by the College fill removal site (area b. above) and the former gravel pit and on the north by Windridge Escarpment. The dominant overstory species are Black Cottonwood and Red Alder with a dense understory of Salmonberry, Spirea and Willow. Very little standing water in swamp or depressional areas exists. Drainage from Berkley Springs down "Berkley Creek" through this vegetation type north of the gravel pit, has been described under (a.) above. Drainage from the western part of this vegetation type is described under (b) above.

Coniferous-Sword Fern:-

Western Hemlock, Western Red Cedar and Douglas Fir are the dominant tree species in this closed canopy strip of second growth forest which lies within the VPA land, but is contiguous with the same forest type lying within Windridge Park. The understory, when present, is mainly Sword Fern.

Proposals:-

1. Western Area:- To conserve the Western Area Wetland, coniferous forest and wild life habitat in their present form, with enhancement of existing habitat where required and rezone to PRO (Parks, Recreation and Open Space) with additional protection as Natural Parkland (see proposed Rezoning Bylaw 1079) . Department of Fisheries and Oceans should be approached for comments on the Salmon enhancement possibilities of this Wetland.

2. Eastern Area:-

   i. Preserve the low-lying swampy area and wild-life habitat in its present form, again with enhancement of existing habitat where required.

   ii. Recommend realignment of the Berkley Road Connector west of and away from the Deer and Wetland habitats so that it passes near the eastern boundary of Canadian International College. The problems created by disrupting the west to east dynamics of the wild-life habitat and wetland with a north-south connector road, should be addressed. Alternative Connectors along Dollarton Highway, where habitat impact is not such an important factor, should be considered.

   iii. The existing springs, drainage channels and creeks throughout the Eastern Area, should be configured in such a way that the water recharge function to the Wetlands of the Conservation Area at Maplewood Flats is maximised.

   iv. To rectify the Wildlife Corridor constriction along that part of McCartney Creek immediately north of Dollarton Highway, the strip of Coniferous-Sword Fern Forest flanking the west boundary of Windridge Park, should be included in Windridge Park.

   v. Rezone all areas to PRO with additional protection to Natural Parkland (see proposed Rezoning Bylaw 1079)

   vi. Larger and better placed Deer crossing signs should replace the existing Deer signage on Dollarton Highway. A pedestrian cross-walk and light should be installed near the main entrance to the Conservation Area at Maplewood Flats.

   vii. All conserved areas should be contiguous in order to maintain the gene flow and sustainability of the habitat.

Acknowledgements

The writer wishes to express thanks for the assistance and encouragement of DNV staff, members of the PNEAC Committee, numerous experts in the biological sciences who were approached for their opinions and publications and to many members of the public who recognise the value of preserving remnant eco-systems and recreational green-space in urban areas.

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Before and since graduating, he has been active in the fields of Biology and Geology as an employee, director of public companies and a volunteer, both in industry and in research in Australia, the western Pacific Islands and North America.

Earlier research projects and publications in the biological sciences were primarily in the fields of vertebrate palaeontology, vertebrate palaeoecology and marine biology. Recent interest has been directed mainly to conservation and protection of remnant ecosystems in urbanised areas and the fostering of public awareness for the heritage and quality-of-life value of such natural green-space.

Appendix A:- Photos

1. View of the North Swamp. Note Red Alder, Black Cottonwood and Skunk Cabbage.
2. One Sitka Spruce, located in the second growth coniferous forest of the Western Area, is the only specimen in the study area.
3. Old growth stumps in the coniferous forest of the Western Area. Spring-board slots remain in some.
4. Huckleberry bushes reach giant size on old growth stumps, Western Area.
5. Two Does feeding on new growth of Salmonberry, Indian Plum and Bracken Fern, Western Area.
6. The tender new growth of Giant Knotweed in foreground and to the left, is a food source for the Does, Western Area.
7. A grassy meadow in the Western Area, once the site of a residence, is another feeding area for the Does.
8. The Does feeding on Himalayan Blackberry south side of Dollarton Highway near Western Area.
9. Coopers Hawk nest, north-east sector of Eastern Area.
10. Principal part of the Deer Meadow, Eastern Area.
11. Secluded grassy area on the margins of the Deer Meadow, Eastern Area.
12. Principal Game Trail, Eastern Area.
13. Buck scrape near principal game trail within the Deer Meadow, Eastern Area.
14. Recent and old antler damage to saplings near entrance to Deer Meadow (north side), Eastern Area.
15. Recent antler damage to saplings near entrance to Deer Meadow (north side), Eastern Area.
16. Antler scratches on sapling, north of Canadian International College.

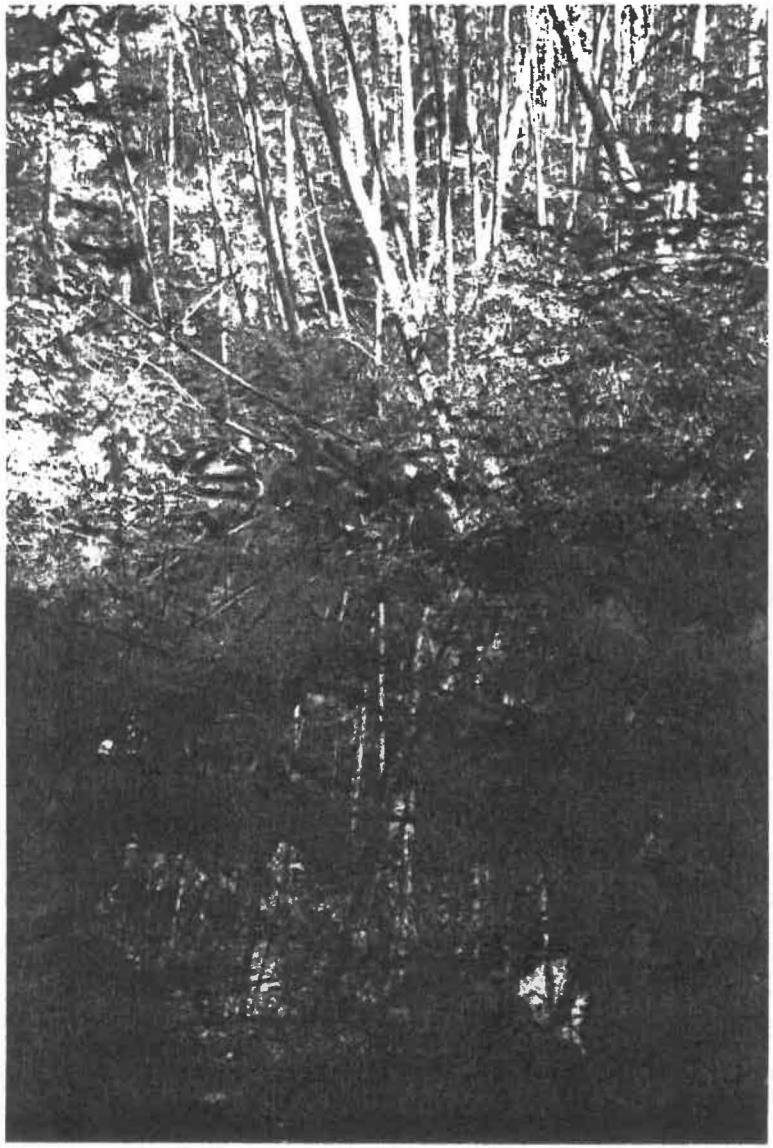


Photo 1

View of the North Swamp. Note Red Alder, Black Cottonwood and Skunk Cabbage

Photo 2

One Sitka Spruce, located in the second growth coniferous forest of the Western Area, is the only specimen in the study area.

Photo 3

Old growth stumps in the coniferous forest of the Western Area. Spring-board slots remain in some.

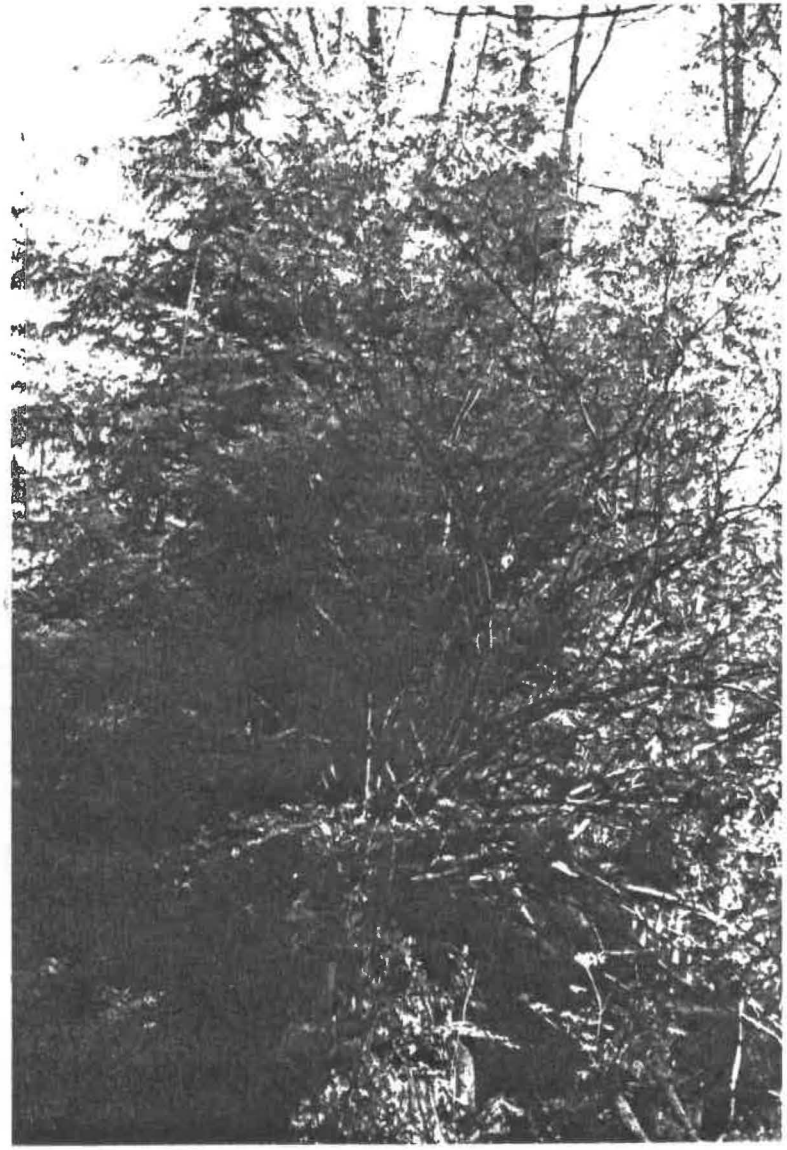


Photo 4

Huckleberry bushes reach giant size on old growth stumps, Western Area.

Photo 5

Two Does feeding on new growth of Salmonberry, Indian Plum and Bracken Fern, Western Area.

Photo 6

The tender new growth of Giant Knotweed in foreground and to the left, is a food source for the Does, Western Area.

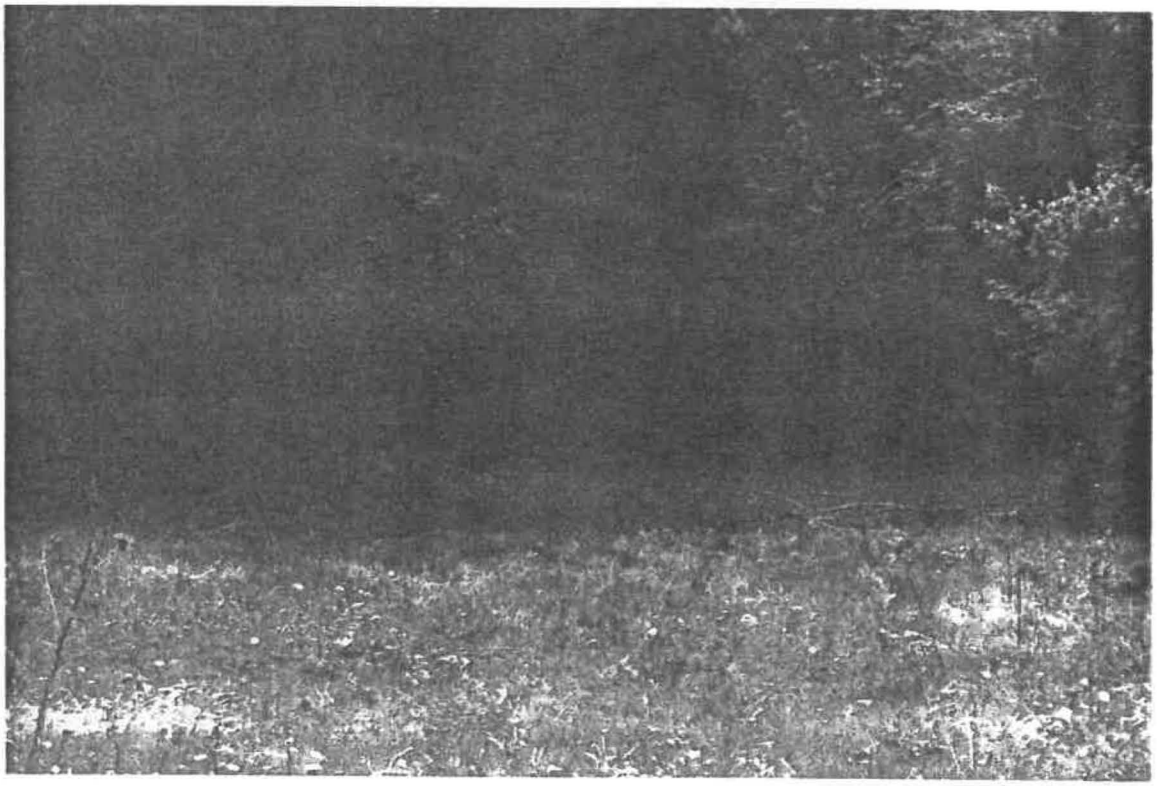


Photo 7

A grassy meadow in the Western Area, once the site of a residence, is another feeding area for the Does.

Photo 8

The Does feeding on new growth of Himalayan Blackberry south side of Dollarton Highway near Western Area.

Photo 9

Coopers Hawk nest, north-east sector of Eastern Area.

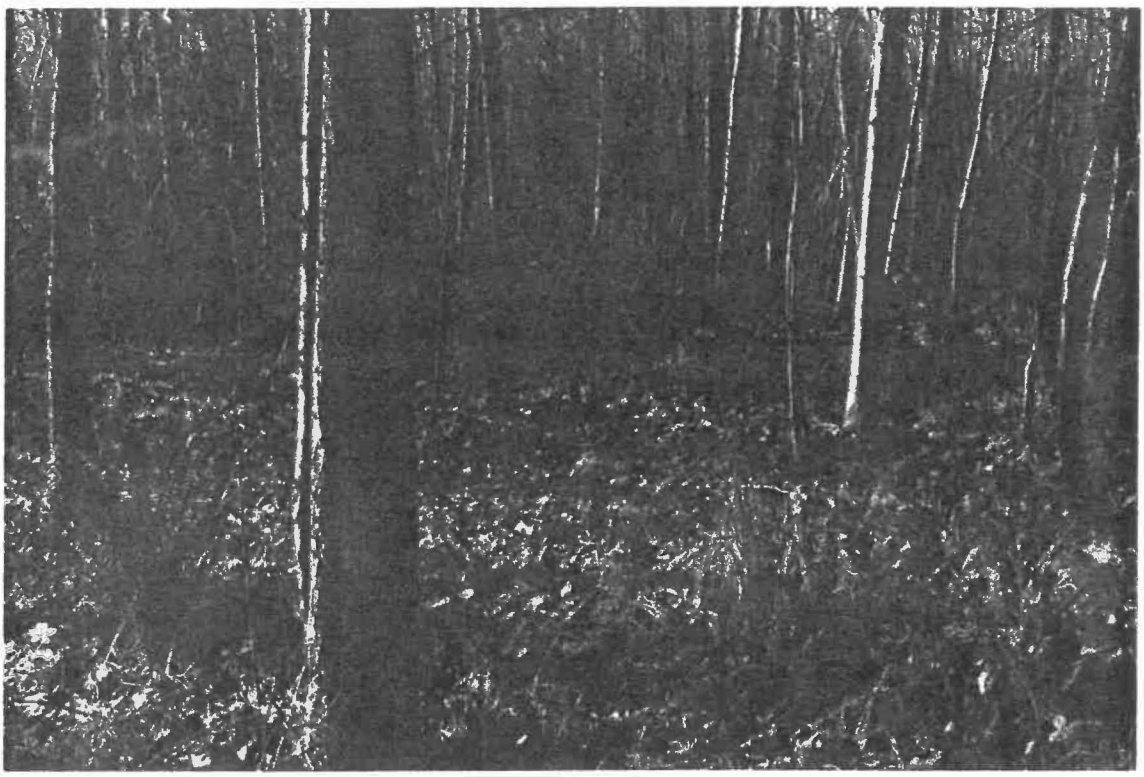


Photo 10

Principal part of the Deer Meadow, Eastern Area.

Photo 11

Secluded grassy area on the margins of the Deer Meadow, Eastern Area.

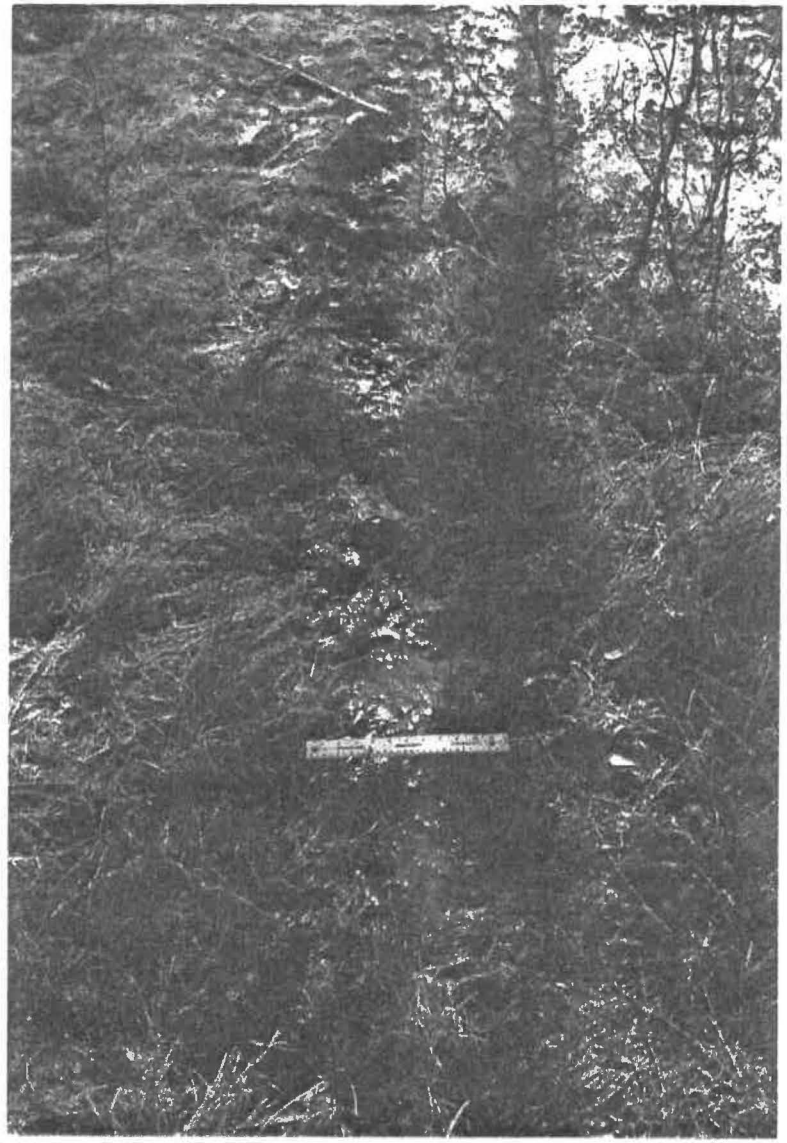


Photo 12

Principal game trail, Eastern Area.

Photo 13

Buck scrape near principal game trail within the Deer Meadow, Eastern Area

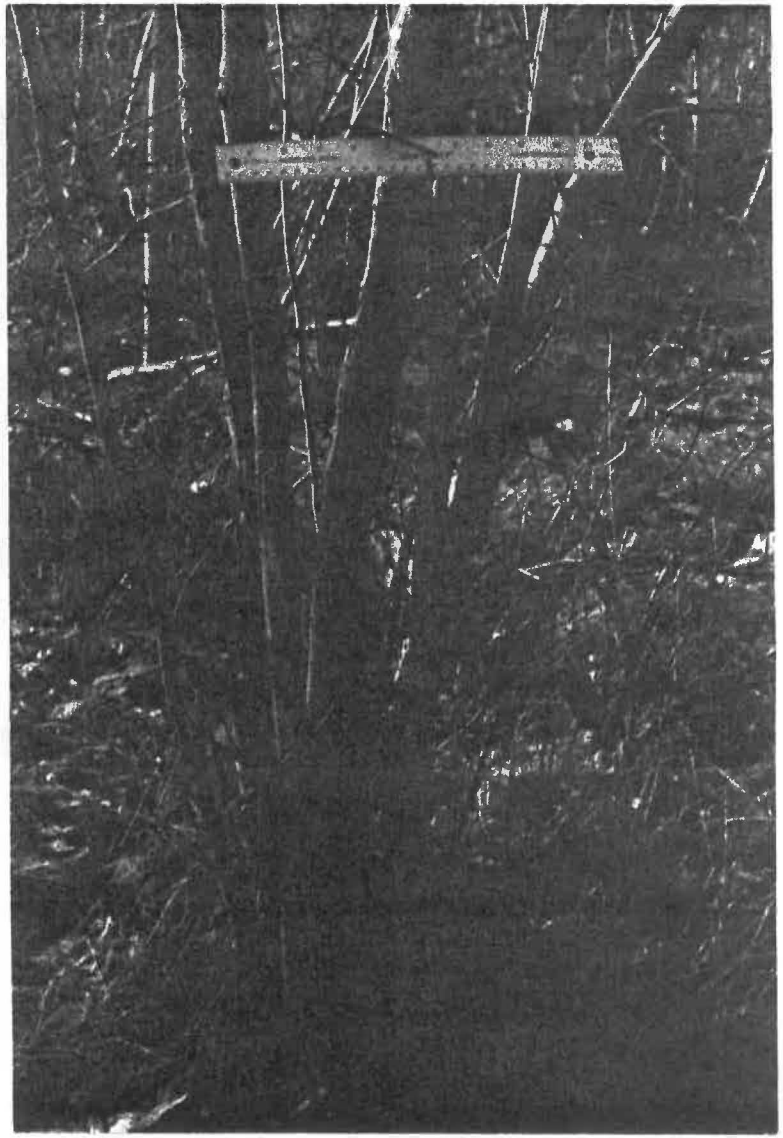


Photo 14

Recent and old antler damage to saplings near entrance to Deer Meadow (north side), Eastern Area.

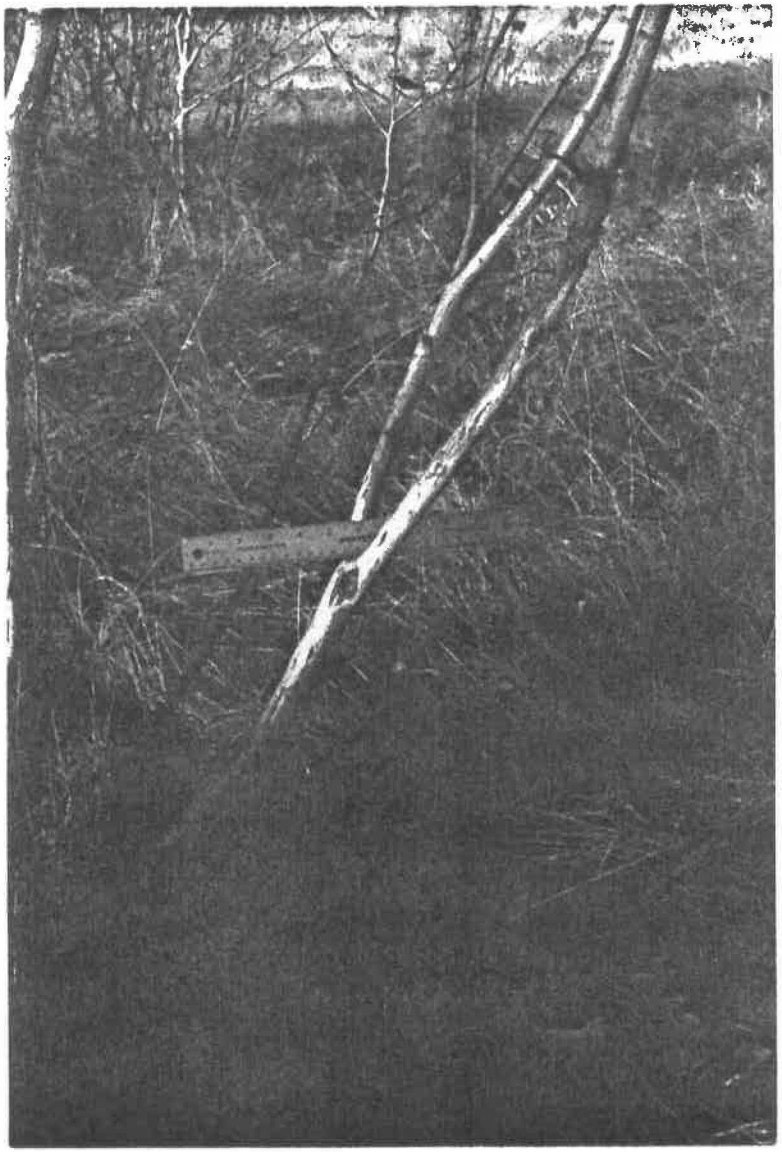


Photo 15

Recent antler damage to saplings near entrance to Deer Meadow (north side), Eastern Area.

Photo 16

Antler scratches on sapling, north of Canadian International College.

Appendix B:- Bird List

The following bird species have been observed in the Eastern Area and Windridge Park over the last three years by Vic Adamo, Resident in the area and Provincial Park Ranger (retired):-

Common Name	Four-letter Code	Common Name	Four-letter Code
Great Blue Heron	GBHE	Red-breasted Nuthatch	RBNU
Canada Goose	CAGO	Brown Creeper	BRCR
Mallard	MALL	Winter Wren	WIWR
Bald Eagle	BAEA	Golden-crowned Kinglet	GCKI
Cooper's Hawk	COHA	Ruby-crowned Kinglet	RCKI
Red-tailed Hawk	RTHA	Swainson's Thrush	SWTH
Merlin	MERL	American Robin	AMRO
Peregrine Falcon	PEFA	Varied Thrush	VATH
Killdeer	KILL	Cedar Waxwing	CEWA
Least Sandpiper	LESA	European Starling	EUST
Glaucus-winged Gull	GWGU	Red-eyed Vireo	REVI
Rock Dove	RODO	Yellow Warbler	YEWA
Band-tailed Pigeon	BTPI	Yellow-rumped Warbler	YRWA
Great Horned Owl	GHOW	Black-throated Gray Warbler	BTGW
Northern Pigmy Owl	NPOW	Wilson's Warbler	WIWA
Vaux's Swift	VASW	Western Tanager	WETA
Rufous Hummingbird	RUHU	Black-headed Grosbeak	BHGR
Belted Kingfisher	BEKI	Rufous-sided Towhee	RSTO
Downy Woodpecker	DOWO	Savannah Sparrow	SAVS
Hairy Woodpecker	HAWO	Song Sparrow	SOSP
Northern Flicker	NOFL	Golden-crowned Sparrow	GCSP
Pileated Woodpecker	PIWO	White-crowned Sparrow	WCSP
Willow Flycatcher	WIFL	Dark-eyed Junco	DEJU
Tree Swallow	TRSW	Brown-headed Cowbird	BHCO
Violet-green Swallow	VGSW	House Finch	HOFI
Northern Rough-winged Swallow	NRWS	Pine Siskin	PISI
Barn Swallow	BASW	American Goldfinch	AMGO
Steller's Jay	STJA	Evening Grosbeak	EVGR
Northwestern Crow	NOCR	House Sparrow	HOSP
Common Raven	CORA		
Black-capped Chickadee	BCCH		
Bushtit	BUSH		

WINDRIDGE WETLANDS

Figure 2

LEGEND

- Western Area Boundary
- Central Area Boundary
- Eastern Area Boundary
- Maplewood Conservation Area Boundary
- Windridge Park Boundary
- Deer Meadows Boundary
- Quarry Boundary
- Trail
- Swamp/Marsh/Pond
- GT Game Trail
- N Nest
- Gate
- Drainage Channel or Stream
- Culvert

Vegetation Type Boundary

- Coniferous-Sword Fern (SS - Sitka Spruce)
- Deciduous Salmonberry
- Disturbed Deciduous

SCALE (metres)

50 0 50 100

BROWNING PL
BERKLEY RD
BROWNING PL
MOUNT SEYMOUR PARKWAY
RD
WINDRIDGE DR
Proposed Berkley Collector
Windridge Park
Berkley Springs Trench
Deciduous-Salmonberry
Windridge Escarpment
Old Berkley Road
Antler-Damaged Saplings
Windridge Park
Blueridge Creek
McCartney Creek
Deciduous-Salmonberry Springs
Antler-Damaged Saplings
Principal Game Trail
Principal
Wildlife Viewing Station
Bedding
Area
Coopers Hawk Nest
GVRD Sewer Access Road
Deer Meadows
Coopers Hawk Nest
WINDRIDGE DRIVE
Windridge Escarpment
MULFORD AVENUE
Maplewood
SS
FORESTER STREET
Deciduous-
North Swamp
Salmonberry
Fill Area
Canadian International College
GVRD Sewage Access Road
MUNSTER AVENUE
Park
Coniferous-Sword Fern Forest
Forest
GT
North Swamp
Crab Shack
DOLLARTON HIGHWAY
Barn
DOLLARTON HIGHWAY
Entrance to Maplewood Conservation Area
Conservation Area at Maplewood Flats

Hi Karen

I support the general plan for Maplewood to be discussed at public hearing with some amendments to the success metrics as per below:

3.1.1 Housing

1. [redacted] Require through bylaw and covenant the retention of rental stock and the provision of affordable housing through redevelopment

2. Accommodate approximately 1,500 new residential units within a mix of building types (midrise, lowrise, mixed use buildings) and unit sizes excluding student housing. (which will have its own stand alone metric)

3. [redacted] Require the provision of 500 units of housing for seniors(250 units) and families (250 units)in terms of unit sizes, number of bedrooms and provision of private outdoor space

4. [redacted] Require the replacement of the approximately 250 existing purpose-built, market rental units in Maplewood year-by-year as development occurs

5. ~~Target~~ Require [redacted]300 or morenet new below ~~non~~-market housing units within the Centre, with a requirement that each new development application include a minimum of 25% below market housing units.

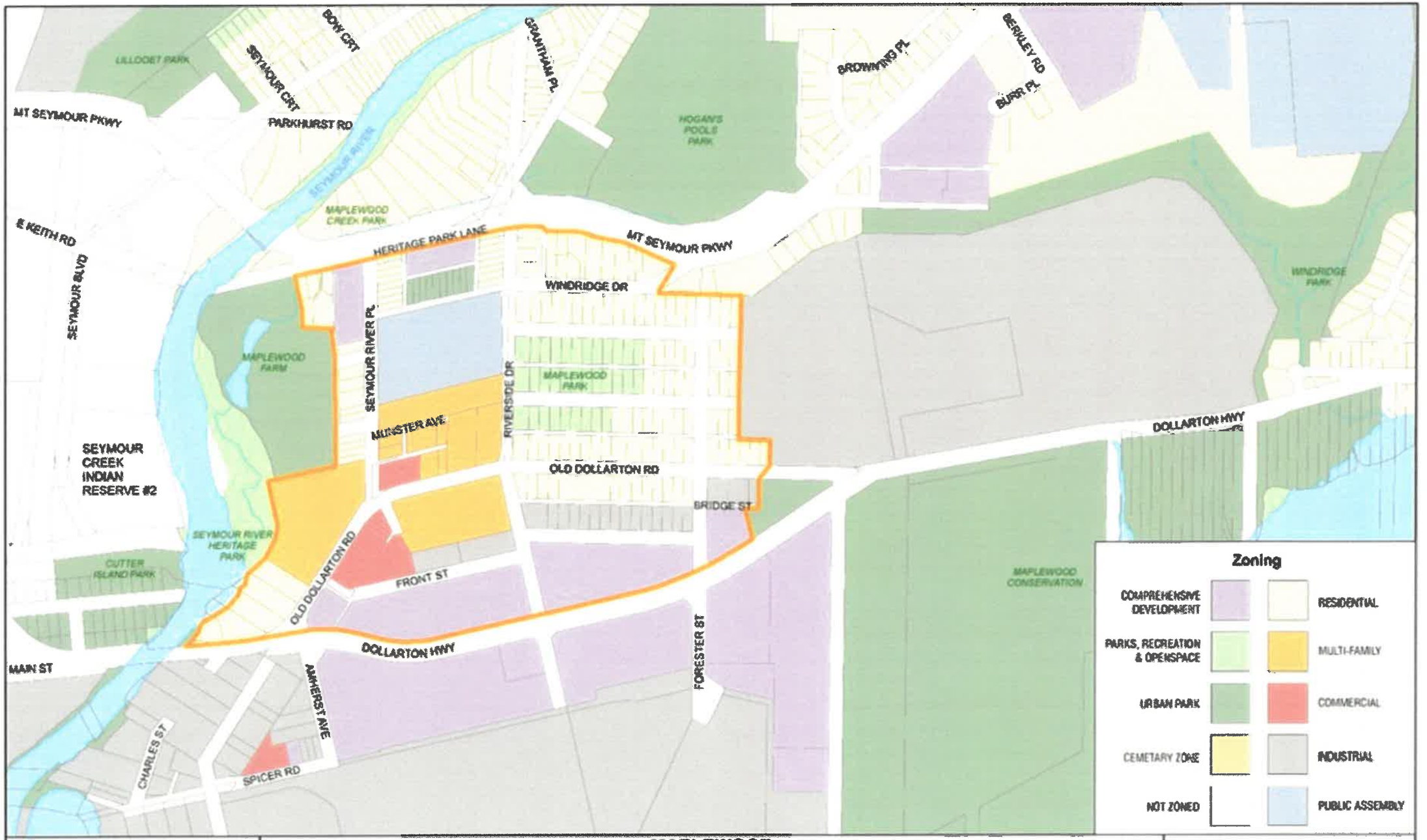
Further I recommend **a clear statement** that extra oversight and diligence will be applied by an independent government agency not affiliated with either the DNV or the proponent to any proposal for owned student housing to ensure that such development proposals are free from off-shore investment, money laundering, tax evasion, flipping, downpayments made by way of casino chips and other undesirable outcomes.

I do not want to see students parking a $500,000 Mercedes SEL outside a subsidized student residence where the student is listed as owner with an income of $5,000 per year. You can see those cars parked all across the student parking lot at Capilano University.

And the same statement should make clear that NO public land be assigned by the DNV for student rental housing without the same or more public land assigned for supportive, below-market seniors rental housing below or at a similar price.

Warm regards,

Hazen Colbert


BOW CRT
GRANTHAM PL
BROWNING PL
BERKLEY RD
BURR PL
LILLOOET PARK
SEYMOUR CRT
MT SEYMOUR PKWY
PARKHURST RD
SEYMOUR RIVER
HOGAN'S POOLS PARK
MAPLEWOOD CREEK PARK
E KEITH RD
SEYMOUR BLVD
HERITAGE PARK LANE
MT SEYMOUR PKWY
WINDRIDGE DR
WINDRIDGE PARK
SEYMOUR RIVER PL
MAPLEWOOD FARM
MAPLEWOOD PARK
RIVERSIDE DR
MUNSTER AVE
DOLLARTON HWY
SEYMOUR CREEK INDIAN RESERVE #2
OLD DOLLARTON RD
BRIDGE ST
SEYMOUR RIVER HERITAGE PARK
CUTTER ISLAND PARK
FRONT ST
OLD DOLLARTON RD
MAPLEWOOD CONSERVATION
DOLLARTON HWY
MAIN ST
FORESTER ST
AMHERST AVE
CHARLES ST
SPICER RD
Zoning
COMPREHENSIVE DEVELOPMENT
RESIDENTIAL
PARKS, RECREATION & OPENSPACE
MULTI-FAMILY
URBAN PARK
COMMERCIAL
CEMETARY ZONE
INDUSTRIAL
NOT ZONED
PUBLIC ASSEMBLY
GIS DEPARTMENT
MAPLEWOOD
ZONING
N