

Title Page

**Report on Storm in  
Pinehaven and Silverstream  
Upper Hutt, NZ  
on  
Sunday, 8 December 2019**

by

Save Our Hills (Upper Hutt) Incorporated

Published 18 December 2019; Updated 7 August 2020;  
Amendment 1 – 25 November 2020  
Amendment 2 - 16 April 2023 - p5,36,40,41 amended  
(p36 - date of flood corrected from 18 December 2019 to 8 December 2019;  
p.41 – add photo Pinehaven Road culvert, coping well with peak flow in 1-in-25yr flood)

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## (i) Executive Summary

The storm in Pinehaven and Silverstream on Sunday 8 December 2019, during which some 53mm of rain fell fairly evenly across the Pinehaven Stream catchment in the two hours<sup>1</sup> from 3:00am to 5:00am<sup>2</sup>, was a 1-in 28 to 1-in-30 year rainfall event<sup>3</sup> and a 1-in-25 to 1-in-30 year or more flood event<sup>4</sup>. Flooding occurred in eight well known flood-prone locations:

1. Field Street (under the railway bridge)
2. Gard Street (between Silverstream School and railway line)
3. Willow Park area (10 – 14 Blue Mountains Road)
4. Sunbrae Drive (overtopped road culvert; blocked sumps cnr Sunbrae and Deller Gr)
5. 26 – 40 Blue Mountains Road
6. Birch Grove cul-de-sac area
7. 108A Wyndham Road (overtopped road culvert fed flooding at 68–74 Pinehaven Rd)
8. 122 Pinehaven Road (overtopped driveway culvert; slip above 136A Pinehaven Road)

Apart from the above 8 locations, all of the rest of Pinehaven Stream channel and its tributaries demonstrated sufficient capacity on 8 December 2019 to carry a 1-in-25 year flood flow. This is in contrast to a Greater Wellington Regional Council (GWRC) report which claims that *“the Pinehaven stream channel has less than a 5 year flow capacity.”*<sup>5</sup>

Flood extents during the 8 December 2019 1-in-25 year flood event were far less than GWRC’s 1-in-25 flood map<sup>6</sup> predicts, in fact far less than GWRC’s 1-in-10 year flood map predicts<sup>7</sup>. We conclude GWRC modelled Pinehaven flood extents are grossly inflated - refer to Figure 1: Actual 1-in-25 year flood extents vs GWRC predicted 1-in-10 year flood extents.

About 80% of the Pinehaven Stream catchment consists of steep hills covered with pine forest and regenerating bush on well-draining soil<sup>8</sup>. Hall<sup>9</sup> investigated the GWRC Pinehaven flood model and flood maps and found GWRC’s grossly inflated flood extents are due to their consultants MWH<sup>10</sup> (now Stantec) and SKM<sup>11</sup> (now Jacobs) modelling the forested hills as impervious, as if they are covered with concrete. The peer reviewer of the Hall report comments: *“I concur with Mr Hall’s conclusions that Jacobs’ runoff volumes ... are higher than ... for natural ground surfaces, and are close to [that] ... for sealed roads and roofs. It therefore seems likely that Jacobs ... assumed an exceptionally impervious catchment.”*<sup>12</sup>

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<sup>1</sup> Hall<sub>4</sub>, 2020; SOH, 2019; 2 hrs is time of concentration for water from most remote ridge to reach gauge site

<sup>2</sup> GWRC Pinehaven Reservoir gauge 52mm; D Longstaffe, 25 Elmslie Rd rain gauge 86mm to 6:00am 8/12/2019

<sup>3</sup> Keane: “a 1 in 28 year ARI”; NIWA HIRDSv4 – Pinehaven Reservoir, Historical, 2hr rainfall, 52mm, 30 yr ARI

<sup>4</sup> Hall<sub>3</sub>; Hall<sub>4</sub>; Keane – antecedent condition wet; peak flood flow at the staff gauge 1 in 30 to 1 in 50 year ARI

<sup>5</sup> SKM<sub>1</sub>, 2010, Volume 1 – Report, p7

<sup>6</sup> Wallach, L., UHCC 06-6-2014 email and 1-in-25 year flood maps (before and after upgrade) to Mr S. Pattinson

<sup>7</sup> SKM<sub>2</sub>, 2010, Volume 2 – Q10 Flood Maps (NB: Q10 maps are raw predicted flood extents, no climate change)

<sup>8</sup> Hall<sub>1</sub>, 2019; Ross, 2019

<sup>9</sup> Hall<sub>1</sub>, 2019

<sup>10</sup> MWH, Pinehaven Stream Flood Hydrology, 2008/2009

<sup>11</sup> SKM<sub>1</sub>, 2010, Volume 1 - Report; SKM<sub>2</sub>, 2010, Volume 2 – Flood Maps

<sup>12</sup> Macky, 2019

The forested Pinehaven hills are not impervious. They have a large infiltration capacity, determined by field tests<sup>13</sup>. The hills act like a giant sponge, soaking up large quantities of stormwater, replenishing the Upper Hutt aquifer and reducing surface runoff and flooding. In contrast, GWRC's hydrological model, by MWH<sup>14</sup>, assumes the existing hills have almost no infiltration capacity. The model incorrectly assumes that nearly all rainwater runs off the hills, resulting in grossly inflated flood extents in GWRC's Pinehaven Stream flood maps. Refer to Figure 1 – there is a clear difference between GWRC's predicted flood extents for a 1-in-10 year event vs actual flood extents in the 1-in-25 year event on 8 December 2019. Clearly, GWRC's predicted flood extents are grossly over-estimated.

A hydrological model predicts how much rainwater will run off a catchment following a certain amount of rainfall. It is the first step in flood hazard assessment. MWH have gotten the hydrology wrong, so everything that follows will be wrong. In this case it means that the SKM/Jacobs hydraulic modelling and flood hazard maps are wrong, showing grossly over-estimated flood extents. Because the hydrological and hydraulic models are both wrong (grossly inflated) it means Wellington Water Ltd's (WWL) Pinehaven Stream Improvements are also wrong – i.e. over-engineered. WWL claim their improvements are required to increase the stream channel from less than a 5 year flow capacity to a 25 year flow capacity<sup>15</sup>. The 1-in-25 year flood on 8 December 2019 demonstrated that much of the Pinehaven Stream channel and its tributaries already have a 25 year flow capacity.

Building extra channel capacity would be a good thing if the baseline hydrological model which determines the improvements is accurate. However the insidious outcome of a grossly inflated baseline hydrological model is that, when it is used as the pre-development model against which future urban development will be assessed for post-development stormwater runoff, it will fail to reveal large volumes of additional runoff caused by new roads, driveways and roofs replacing, in this case, forest and bush on well-draining soil.

This is precisely the problem acknowledged in a Beca audit<sup>16</sup> of the GWRC Pinehaven flood maps. In a future development test by SKM<sup>17</sup> there was no expected increase in post-development flood volume. This major issue was unexplained and dismissed, despite the auditor finding it was due to both pre- and post-development models having the same minor rainfall losses and therefore the same high runoff volumes<sup>18</sup>. Subsequent reworking of the flood model by Jacobs<sup>19</sup> claimed to resolve this anomaly, but Hall<sup>20</sup> found the work of Beca and Jacobs unreliable and concluded GWRC's Pinehaven flood model developed by MWH and SKM is still flawed, as mentioned above. Consequently, if development proceeds on the Pinehaven hills, there will be no benefit from the extra capacity of WWL's over-engineered channel improvements because of the bigger floods and slips that will result from the flawed baseline model. GWRC's flawed hydrological model must be re-evaluated.

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<sup>13</sup> Ross, 2019, Infiltration rates on forested and bush-clad Pinehaven hills in excess of 500mm/hr

<sup>14</sup> MWH, 2008 p18 Table 6.2, and 2009 Appendix B Table 6.2 – Initial loss 5mm, Ongoing loss 2mm/hr

<sup>15</sup> WWL, 2019, pp 1-2

<sup>16</sup> Beca, 2015, Figure 5.3 and pp 9, 17, 18, 26, 27

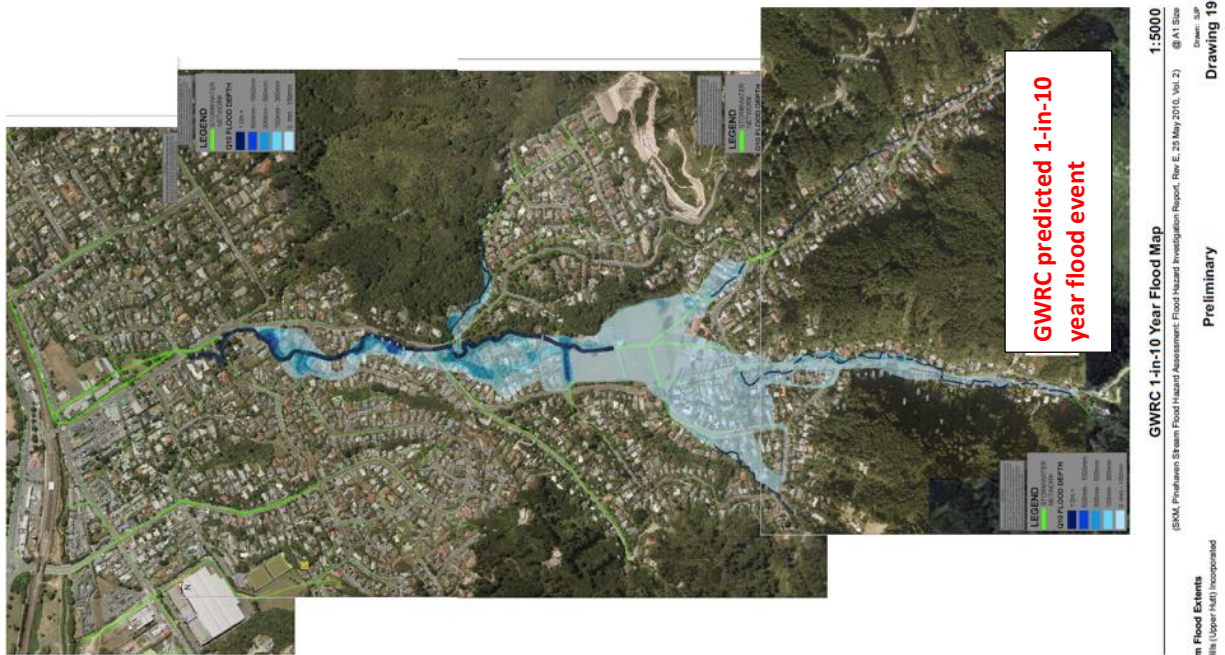
<sup>17</sup> SKM<sub>1</sub>, 2010, Volume 1, pp 13-15, 30-31

<sup>18</sup> MWH, Stokes, K. email 11-6-2015 to M. Law, Beca

<sup>19</sup> Jacobs, 2016

<sup>20</sup> Hall<sub>1</sub>, 2019; Macky, 2019; Hall<sub>2</sub> 2019

This GWRC 1-in-10yr flood map does not include climate change, which, according to GWRC adds less than 100mm flood depth in a 100-yr storm (SKM:2010, Vol.1, p29).



Comparison of Flood Maps  
Pinehaven catchment

The GWRC 1-in-25yr flood map (see Appendix 3) shows significant flooding in Elmslie Road. This didn't happen at all in the actual 25yr flood 8 Dec 2019.

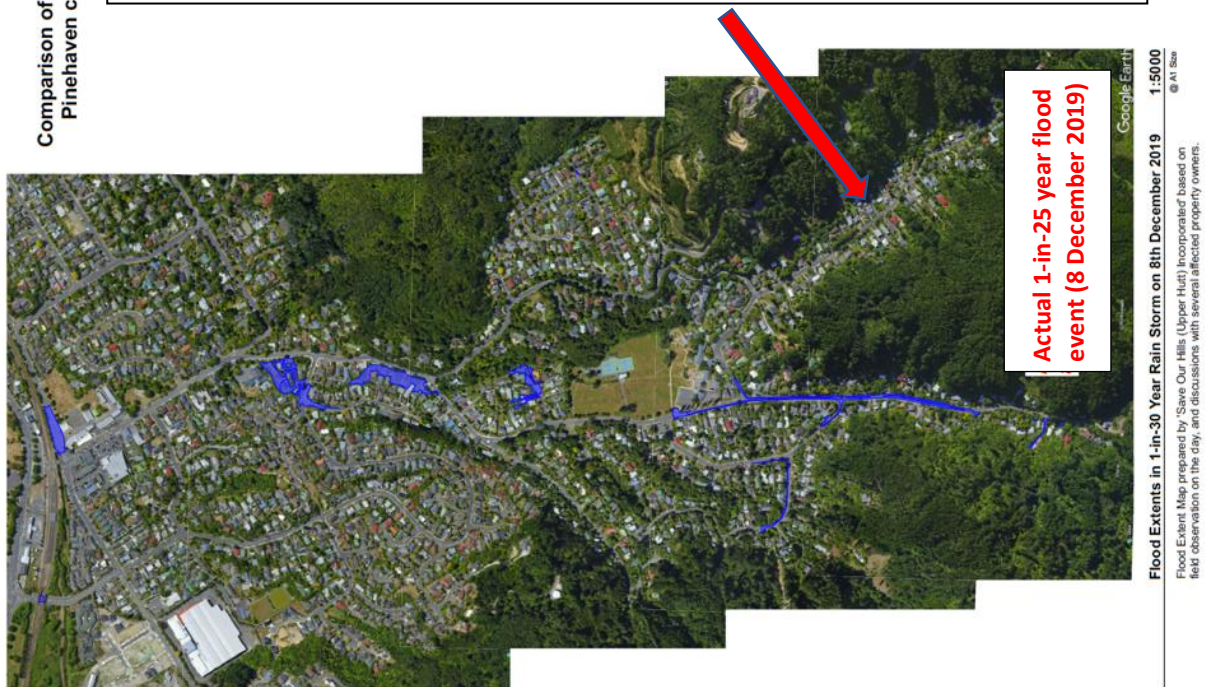


Figure 1 – Actual 1-in-25 year flood event vs GWRC’s predicted 1-in-10 year flood event

The difference is mainly due to GWRC incorrectly modelling infiltration and runoff as if the highly absorbent forested hills (80% of the Pinehaven Stream catchment) are impervious [Ross ; Hall<sub>1</sub> ; Hall<sub>4</sub> ; Macky].

## (ii) Rainfall in Pinehaven and Silverstream on 8th December 2019

Stormy weather affected many parts of New Zealand over the weekend of Saturday and Sunday 7th and 8th December 2019. In Pinehaven, as in other parts of the country, lightening and thunder continued all through Saturday night and early Sunday morning.

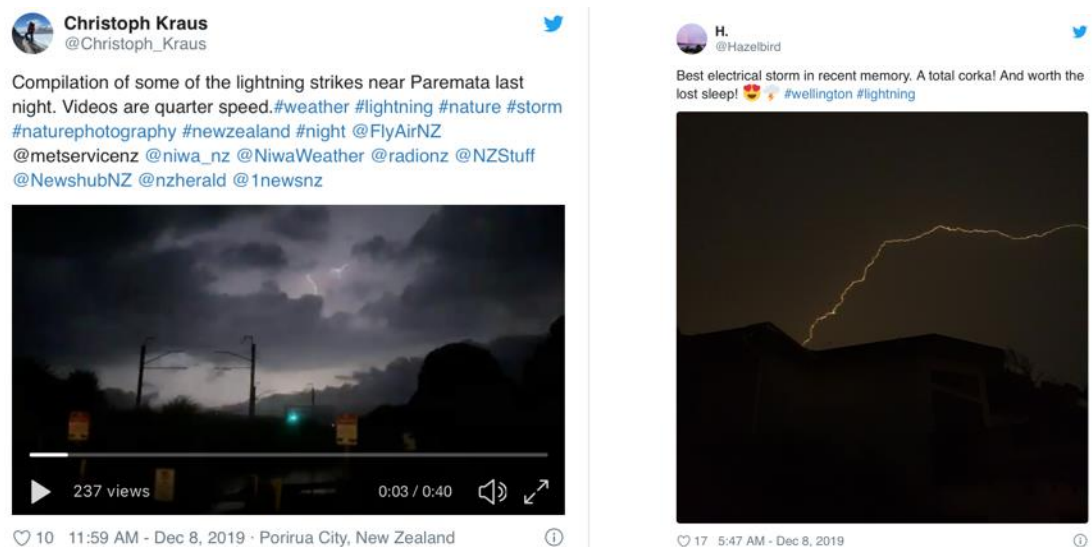


Figure 2: Wild weather: Thunderstorms batter Wellington

<https://www.rnz.co.nz/news/national/405056/wild-weather-thunderstorms-batter-wellington-timaru-remains-in-state-of-emergency> Radio NZ - 5:55 pm on 8 December 2019

The GWRC rain gauge at the Pinehaven Reservoir recorded peak rainfall of 52mm in 2 hours between 3:00am and 5:00am on Sunday morning 8 December 2019.

Date (NZST)	Rainfall (mm)
08-12-19 0:00	0
08-12-19 1:00	9.669
08-12-19 2:00	2.343
08-12-19 3:00	0
08-12-19 4:00	22.918
08-12-19 5:00	29.101
08-12-19 6:00	14.224
08-12-19 7:00	1.685
08-12-19 8:00	3.03
08-12-19 9:00	1.972
08-12-19 10:00	1.271
08-12-19 11:00	0
08-12-19 12:00	0.178
08-12-19 13:00	1.422
08-12-19 14:00	5.937
08-12-19 15:00	14.001
08-12-19 16:00	5.31
08-12-19 17:00	1.551

Table 1 – GWRC Pinehaven Reservoir rain gauge

Report on Storm in Pinehaven on 8 December 2019, by Save Our Hills (Upper Hutt) Inc.

Year: 2019

25 Elmslie Rd, Pinehaven, Upper Hutt

Rain Gauge Data

2019	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.0	5.0	0.0	21.0	0.3	58.0	0.0	1.0	0.0	13.8	0.0	6.5
2	0.0	0.0	0.0	9.5	0.0	8.5	0.0	2.8	0.0	23.5	0.0	3.0
3	0.0	0.0	0.0	1.3	0.0	0.5	26.5	0.3	0.0	1.5	0.0	13.8
4	0.0	0.0	0.0	0.3	0.0	3.5	10.0	0.0	3.5	1.0	0.0	0.5
5	0.0	0.0	0.0	7.0	0.0	16.5	25.5	0.0	10.5	28.5	1.0	0.0
6	1.0	0.0	0.0	17.0	0.0	2.5	7.5	0.0	32.0	0.3	1.5	1.0
7	1.5	0.0	6.5	12.5	0.0	3.0	0.3	0.0	1.3	2.5	0.0	86.0
8	0.0	0.0	50.0	1.0	0.0	0.0	0.0	6.0	0.0	0.0	13.0	34.0
9	0.0	0.0	1.0	1.0	9.0	0.0	0.0	0.0	0.5	0.0	2.0	0.0
10	0.5	0.0	0.0	1.5	1.0	0.0	2.8	18.0	0.0	27.0	48.0	0.0
11	0.0	0.0	0.0	30.0	1.5	2.0	1.5	23.0	0.0	1.0	14.0	0.0
12	0.0	0.3	7.3	9.5	12.5	3.0	3.0	20.5	0.0	0.0	0.8	0.0
13	13.5	0.0	4.0	1.0	7.0	11.5	3.8	0.8	13.0	0.0	4.0	1.0
14	0.0	1.8	0.0	0.0	1.0	1.3	19.5	0.0	19.5	0.0	6.0	0.0
15	0.0	0.0	0.0	0.3	0.0	6.0	21.5	0.0	6.3	6.5	2.8	1.0
16	0.0	0.0	0.0	1.0	3.5	0.5	11.5	0.0	1.5	1.0	0.0	16.0
17	0.0	0.0	0.0	0.0	0.8	1.5	2.5	18.0	3.0	2.0	3.0	17.0
18	0.0	0.0	0.0	0.0	0.0	3.3	1.0	2.3	0.0	28.0	5.0	6.5
19	0.0	0.0	0.0	0.0	0.0	0.8	3.8	0.3	0.3	4.8	5.0	4.5
20	0.0	0.0	0.0	13.5	0.0	3.3	15.5	1.5	1.0	0.0	4.5	3.3
21	0.0	2.5	0.0	10.3	0.0	0.0	11.0	3.8	0.0	3.0	0.0	0.0
22	0.0	13.0	0.0	0.5	0.0	0.5	0.3	9.8	0.0	10.0	0.0	0.0
23	0.0	6.5	0.0	2.5	3.0	6.5	3.5	5.5	13.5	11.0	0.0	0.0
24	11.0	23.5	0.0	0.0	0.0	2.5	0.8	1.0	0.8	1.5	0.0	0.8
25	0.0	0.0	0.0	0.0	0.0	1.3	0.3	2.0	4.0	0.0	0.0	0.0
26	0.3	0.0	2.5	0.0	0.0	0.3	0.0	7.0	0.5	0.0	0.0	0.0
27	0.5	0.0	14.5	1.5	0.0	0.5	0.0	0.0	0.0	2.0	0.0	4.0
28	0.0	0.0	0.0	13.0	11.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	19.0	2.0	0.0	0.0	0.0	1.0	1.5	0.0	0.0
30	0.0	0.0	0.0	2.0	37.5	0.0	3.0	0.0	3.0	2.5	0.0	0.3
31	0.0	0.0	1.0	0.0	9.0	19.0	0.0	0.0	0.0	0.3	0.0	0.0
TOTALS	28.3	52.5	86.8	176.0	99.5	137.3	193.8	123.3	115.0	173.0	110.5	199.0
												1494.8

\* 6.00am weekdays: 9:00am weekends; Due to the notable lightning and heavy rainfall overnight, Mr Longstaffe (Save Our Hills) read the gauge at 6:00am on Sunday morning 8 December 2019, depth 86mm (pers. com. with S. Pattinson, Save Our Hills)

Readings taken @ 9.00am\* and recorded for the previous day (rounded to the nearest 0.25mm)  
 Rain gauge situated at 25 Elmslie Road, Pinehaven, recorded by D J Longstaffe

gauge frozen

Table 2: D Longstaffe – Rain gauge 25 Elmslie Road, Pinehaven, 2019

192										=G80+G92	
	A	B	C	D	E	F	G	H	I	DEC	
52	7/12/19 2:00	0	0							6.5	
53	7/12/19 3:00	0	0							3.0	
54	7/12/19 4:00	0.4	0							13.8	
55	7/12/19 5:00	0	0							0.5	
56	7/12/19 6:00	0	0							0.0	
57	7/12/19 7:00	0	0							1.0	
58	7/12/19 8:00	0	0							86.0	
59	7/12/19 9:00	0	0							34.0	120mm
60	7/12/19 10:00	0	0							0.0	
61	7/12/19 11:00	0	0							0.0	
62	7/12/19 12:00	0	0							0.0	
63	7/12/19 13:00	0	0							0.0	
64	7/12/19 14:00	0	0							0.0	
65	7/12/19 15:00	0	0							0.0	
66	7/12/19 16:00	0	0							0.0	
67	7/12/19 17:00	0	0							0.0	
68	7/12/19 18:00	0	0							0.0	
69	7/12/19 19:00	2.906	0	)						0.0	
70	7/12/19 20:00	2.894	0	)	5.800	)				1.0	
71	7/12/19 21:00	0	0	)		)				0.0	
72	7/12/19 22:00	0	0	)		)				1.0	
73	7/12/19 23:00	0.094	0	)		)				16.0	
74	8/12/19 0:00	0.094	0	)		)				17.0	
75	8/12/19 1:00	9.669	0	)		)				6.5	
76	8/12/19 2:00	2.343	0	)		)				4.5	
77	8/12/19 3:00	0	0	)		)				3.3	
78	8/12/19 4:00	22.918	0	)		)				0.0	
79	8/12/19 5:00	29.101	0	)		)				0.0	
80	8/12/19 6:00	14.224	0	)	78.443	)	84.243	)		0.0	
81	8/12/19 7:00	1.685	0	)		)				4.0	
82	8/12/19 8:00	3.03	0	)		)				0.0	
83	8/12/19 9:00	1.972	0	)		)				0.0	
84	8/12/19 10:00	1.271	0	)		)				0.8	
85	8/12/19 11:00	0	0	)		)				0.0	
86	8/12/19 12:00	0.178	0	)		)				0.0	
87	8/12/19 13:00	1.422	0	)		)				0.0	
88	8/12/19 14:00	5.937	0	)		)				0.0	
89	8/12/19 15:00	14.001	0	)		)				0.0	
90	8/12/19 16:00	5.91	0	)		)				0.0	
91	8/12/19 17:00	1.551	0	)		)				0.0	
92	8/12/19 18:00	0.2	0	)	36.957	)	36.957	)	121.200	4.0	
93	8/12/19 19:00	0	0	)		)				0.0	
94	8/12/19 20:00	0	0	)		)				0.0	
95	8/12/19 21:00	0	0	)		)				0.0	
96	8/12/19 22:00	0	0	)		)				0.0	
97	8/12/19 23:00	0	0	)		)				0.3	
98	9/12/19 0:00	0	0	)		)				0.0	
99	9/12/19 1:00	0	0	)		)				199.0	1494.8

Table 3: Comparing GWRC Pinehaven Reservoir rain gauge with D. Longstaffe rain gauge for rainfall 8<sup>th</sup> December 2019 in Pinehaven catchment

The table on the left is from GWRC real-time rainfall data (tabular) for 7th and 8th December 2019. It shows that from 6am on Saturday 7th Dec to 6am on Sunday 8th Dec the GWRC rain gauge at the Pinehaven reservoir recorded 84.2mm of rainfall.

For the same time period (6am Sat 7th to 6am Sun 8th), Darryl's table on the right shows 86mm of rainfall at 25 Elmslie Road.

Then from 6am Sunday 8th to 6am Monday 9th December, GWRC's rain gauge recorded 37mm and Darryl's rain gauge recorded 34mm.

The total rainfall for the two days is 121.2mm (GWRC in the lower catchment), and 120mm (Darryl in the upper catchment), a good correlation between the two rain gauges suggesting a fairly even distribution of the rainfall across the catchment on 8 December 2019



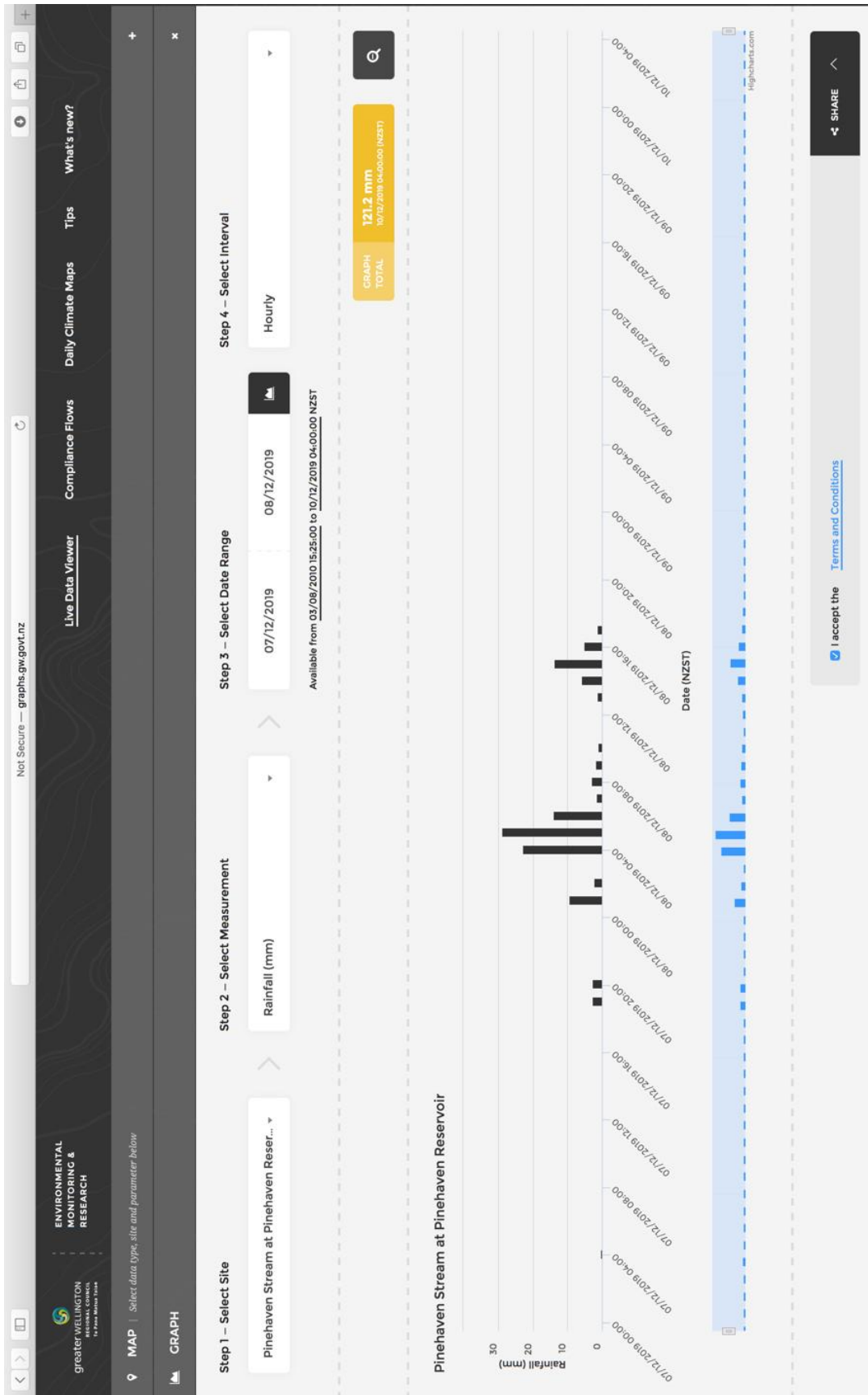


Figure 3: GWRC Pinehaven Reservoir rain gauge – Rainfall Graph for 7/8 December 2019

Report on Storm in Pinehaven on 8 December 2019, by Save Our Hills (Upper Hutt) Inc.

GWRC's rain gauge at the Pinehaven Reservoir shows that 78mm fell in the 6 hours from midnight to 6:00am. Darryl Longstaffe, resident at 25 Elmslie Road, Pinehaven, has been keeping daily rain gauge recordings at his property for the last two years. He recorded 86mm for the 24hrs to 6:00am on Sunday morning, 08 December. Subtracting the 6mm that fell around 7pm on Saturday 7th, Darryl gets 80mm for the 6 hours from midnight to 6am on Sunday morning.

GWRC's rain gauge at Pinehaven Reservoir shows that 52mm of rain fell from 3am to 5am.

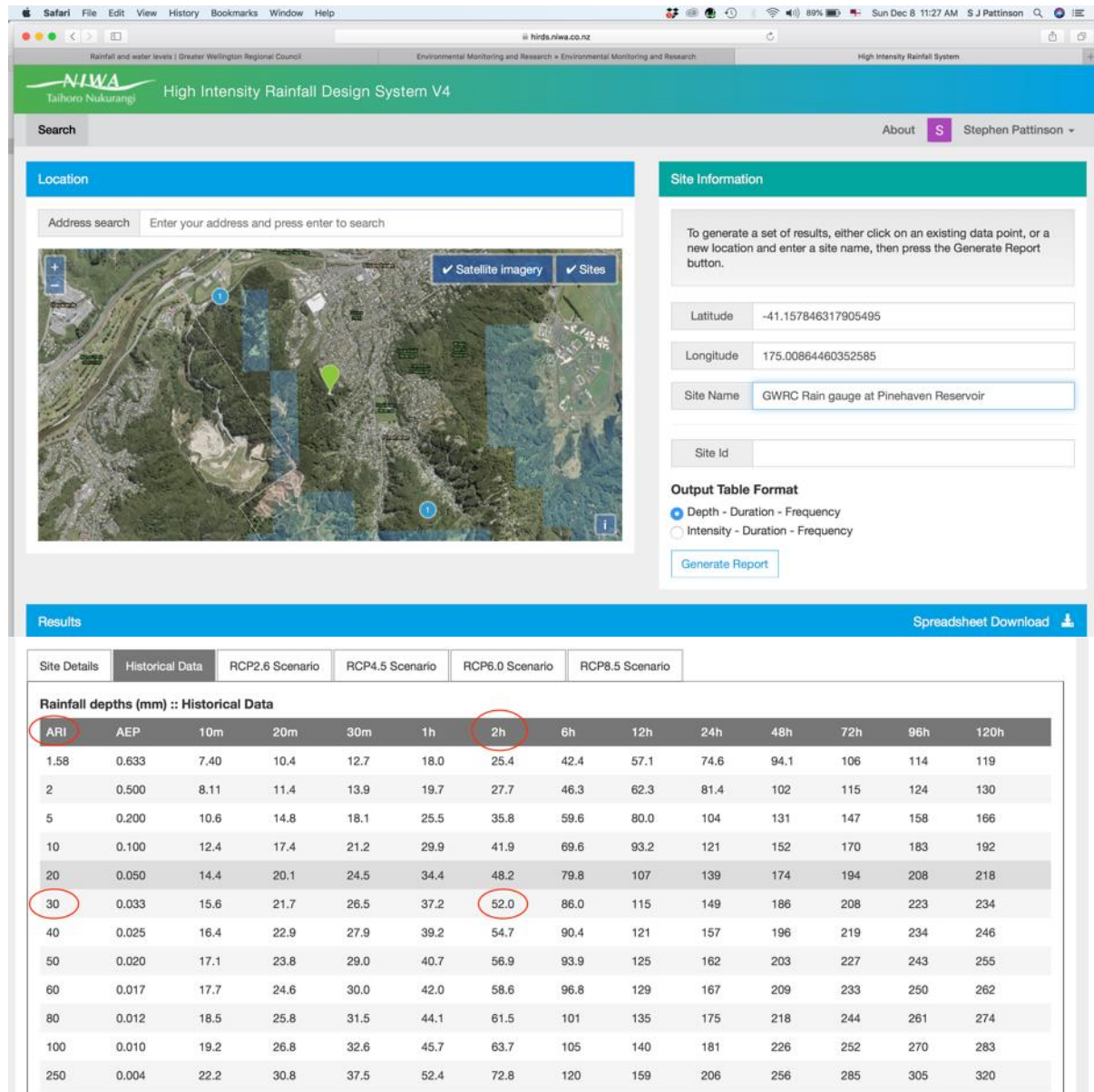


Figure 4: NIWA's High Intensity Rainfall Data (HIRDs v4) for Pinehaven Reservoir

NIWA's High Intensity Rainfall Data (HIRDs v4 – above) rates 52mm in 2 hours rainfall intensity in Pinehaven as 30-year Average Recurrence Interval (ARI), i.e. the storm in Pinehaven and Silverstream on Sunday 8 December 2019 was a 1-in-30 year rain event.

(iii) Staff Gauge Site (opp. Chatsworth Rd, at Silverstream Reformed Church)

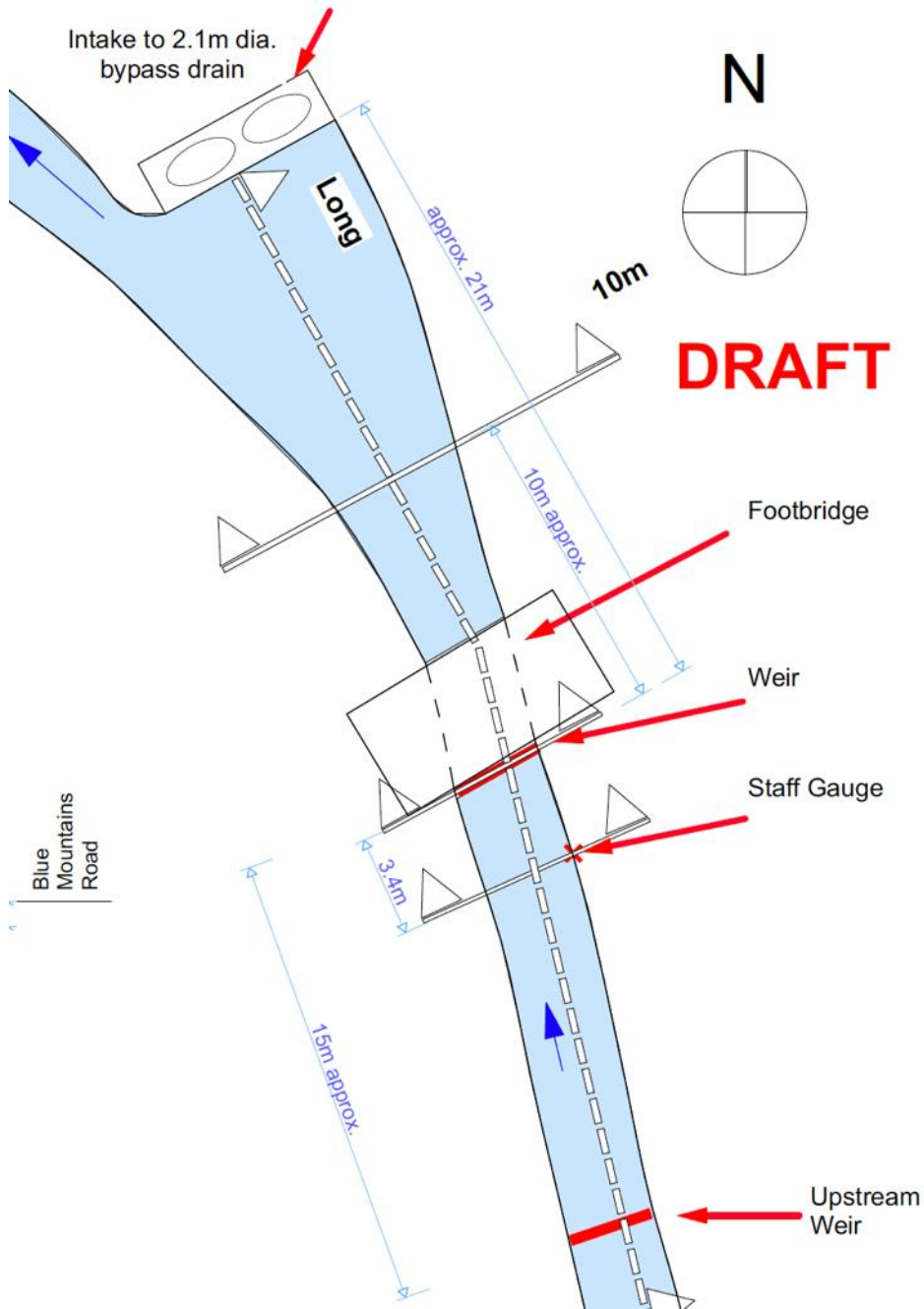


Figure 5: Plan of Staff Gauge Site, Pinehaven Stream

**Whitemans Road Bypass Intake** at Silverstream Reformed Church



(iv) Bypass and Pinehaven Stream Outlets at Hulls Creek



Hulls Creek, discharges from Heretaunga box culvert, Pinehaven bypass and piped stream  
05:43 am

## 1. Flood Extent at Location 1: Field Street (under the railway bridge)

Throughout Sunday 8th December 2019, starting at about 5:15am, Stephen and Susan Pattinson (SOH committee members) went around the Pinehaven catchment and photographed flood extents in several parts of Pinehaven and Silverstream. Around 5:00pm, Stephen Pattinson and Alex Ross went around the Pinehaven catchment, noting that all flooding had by this time receded back into the stream channels apart from at the driveway culvert at No. 122 Pinehaven Road which had started overtopping again due to some further rain mid-afternoon.

Flooding on Sunday morning after the peak rainfall between 3:00 to 5:00am was confined to specific locations, as shown in the following photographic record.

### Field Street (under the railway overbridge):



Field Street, 05:58 am



Hulls Creek at Field Street bridge, 05:59am

## 2. Flood Extent at Location 2: Gard Street, Silverstream



Ponding in Gard Sreet, 06:04 am



Ponding in Gard Street, 07:25am

### 3. Flood Extent at Location 3: Willow Park and Nos. 10 -14 Blue Mountains Road

**Willow Park** 06:16 am





Willow Park, 06:09 am

**Blue Mountains Road**



12 Blue Mountains Road, 07:28 am

#### 4. Flood Extent at Location 4: Intersection of Sunbrae Drive and Deller Grove



Overtopping of road culvert, adjacent to 4 Sunbrae Drive, 06:21 am

#### Deller Grove



Deller Grove, 06:50 am



Deller Grove, looking across Sunbrae Drive towards Tapestry Grove, 06:51 am

## 5. Flood Extent at Location 5: Nos. 26 – 40 Blue Mountains Road



28 Blue Mountains Road, 06:25 am



30 Blue Mountains Road, 06:26 am



32 Blue Mountains Road, 06:28 am



34 Blue Mountains Road, 06:30 am

## 6. Flood Extent at Location 6: Birch Grove cul-de-sac area



Birch Grove cul-de-sac, 06:39 am



Birch Grove cul-de-sac, 06:40 am



12 Birch Grove, 07:05 am

## 7. Flood Extent at Location 7: 108A Wyndham Road Culvert and Nos. 68 – 74 Pinehaven Road



**108A Wyndham Rd culvert overtopped**



**Opposite site of road from overtopped culvert at 108A Wyndham Rd**





**Debris line down Wyndham Rd from overtopped culvert at No. 108A  
(looking down Wyndham Rd towards Jocelyn Cres.)**

## 8. Flood Extent at Location 8: No. 122 Pinehaven Road Culvert, and Slip above No. 136A Pinehaven Road

### **136A Pinehaven Road – Tracey Green: SOH Facebook posts March 2020**

Hi all, I just wanted to share what happened to us on the night of the storm on 7th/8th December 2019. This event affected us and approximately five of our neighbours, and we are sure that this was a result of Guildford Forestry Company's recent logging on the hills above us. We are sharing this story, because we feel this is something that could happen to you if the works being carried out on the hills above Pinehaven are not done with due care and attention.

I will break this up into two parts.

Part One: We live at the end of Pinehaven Road, and a stream runs through our land and our neighbours', operating mainly as a rainwater run-off. It is generally dry in the summer with only a trickle of water running down it. After heavy rainfall, the stream fills with water, but does not cause us any issues. The stream is several feet deep, and the water flows away without damaging property.

However, on the 8th December, on what was described as a thirty year storm event, our neighbours were woken by a roaring sound. At the time we were in Martinborough having a weekend away. My neighbours exited their houses to find a huge deluge of water rushing down our drive carrying tons of silt and stones. This water cascaded onto their land dumping debris onto drives and lawns.

On investigation, they tracked the water back to the stream that had burst through the bank and flooded down our garden steps, onto the drive, and down to the road. Several neighbours rallied to re-route the stream back to its natural route, using stones to dam the flow, and pulling fallen tree branches out of the stream that had blocked its usual path. Our neighbours also had to create a barrier at the bottom of the drive to send the water into the stream that runs along Pinehaven Road.

This was a major event, causing an immense amount of damage to our properties. While we accept this was a thirty year storm event with huge rainfall, our investigations show the resulting damage was aggravated by the work carried out in the hills above us by the forestry company.

What happened next? Stay tuned.

Another update on the events of the storm -

Part Two:

When we returned home on Monday morning, we were able to see the full extent of the damage. Our garden steps had been completely destroyed, the water having gouged out the gravel and earth, leaving only the wooden supports behind. The drive was full of mud, stones and silt, well over nine inches deep in places. The bank that had bordered the stream at the top of our garden steps had been washed away.

It was obvious we couldn't clear this on our own, and I started to get quotes for its removal. I also contacted Wellington Greater Regional Council, and asked to speak to an environmental officer. My neighbour spoke to the flood control team. Both visited our house and our neighbours that day.

The environmental officer initially was convinced it was to do with Guildford Timber Company, saying the silt and earth looked like it had come from the temporary roads that

they make to access logging. However the next day, he backtracked on that, saying it was just an unfortunate land slip.

A couple of our neighbours had trekked up the stream bed after the deluge, and reported they could see a big slip that looked as if it had started by the logging area on the ridge. The timber company denied any such issue.

Meanwhile the quotes came in - \$2000 to remove the silt. This included truck hire, and a digger.

How much silt ended up on our land and our neighbours? Stay tuned.

#### Pinehaven Update:

Part 3 of the update about the event that occurred on the night of the 30 year storm.

Our trade person was amazing. It took from seven in the morning to seven at night to move most of the earth - not all of it! There was no way it could have been done by manual labour. He removed silt and stones from our land, and both our immediate neighbours. Earth he couldn't move off site was put on ground between us and our neighbours. Unfortunately it couldn't stay there. We ended up arranging for him to come back - at further cost to us.

The issue with these huge amounts of earth, is that you have to find somewhere to put it. Fortunately he had a few places he could use, rather than the landfill, which would have added significantly to our costs.

His return visit cost another \$1400. And then we had to pay for more gravel to top up our steps that had been ruined by the flood. In total we paid just under \$4000 to deal with this event.

We calculated the amount of earth moved by counting trips to take earth off site, knowing that one lorry load of earth was approximately 2 and a half tons. There were 11 trips off site, and a couple of lorry loads weren't quite full. We estimate 26 tons of earth ended up on our land and our neighbours from one event. This doesn't even count the silt that ended up on our other neighbours' land.

My partner and neighbour trekked back up the hill, tracking up the stream to the ridge, and remain convinced after viewing the slip that it originated at the top, by the logging area. We again contacted GWR council. They again investigated and denied Guildfords were involved. We are at an impasse.

And Guildford Timber Company has again closed the hills for logging.

We have spent days and weeks digging out the stream bed and improving its flow, and building new barriers. With all the rain we have had this week, we are pleased to say there have been no more issues. I hope it stays that way. But if building and clearing is to continue above us, I highly doubt that will be the case.

We need to make our council reconsider its actions as regards to flood works and building consents.

This could happen to you.





**Slip above 136A Pinehaven Rd**

**(previous page – debris at 136A Pinehaven Rd)**

## 122 Pinehaven Road



122 Pinehaven Road, overtopping of driveway culvert, 05:05 pm (mid-afternoon rain)

## Jocelyn Crescent



Jocelyn Crescent – due to overtopping of culvert at 122 Pinehaven Road

## Pinehaven Road



Pinehaven Road – (opposite Pinehaven School), 09:26 am  
– due to overtopping of driveway culvert at 122 Pinehaven Road.

Note popped sewer manhole lid in footpath, resulting in faecal matter mixing with ponding.



## 136A Pinehaven Road



Water diverted from usual tributary behind house by gravel dam from slip higher up the hill



**Slip near logging road and forestry harvesting on 8 December 2019 (above No.136A Pinehaven Road)**

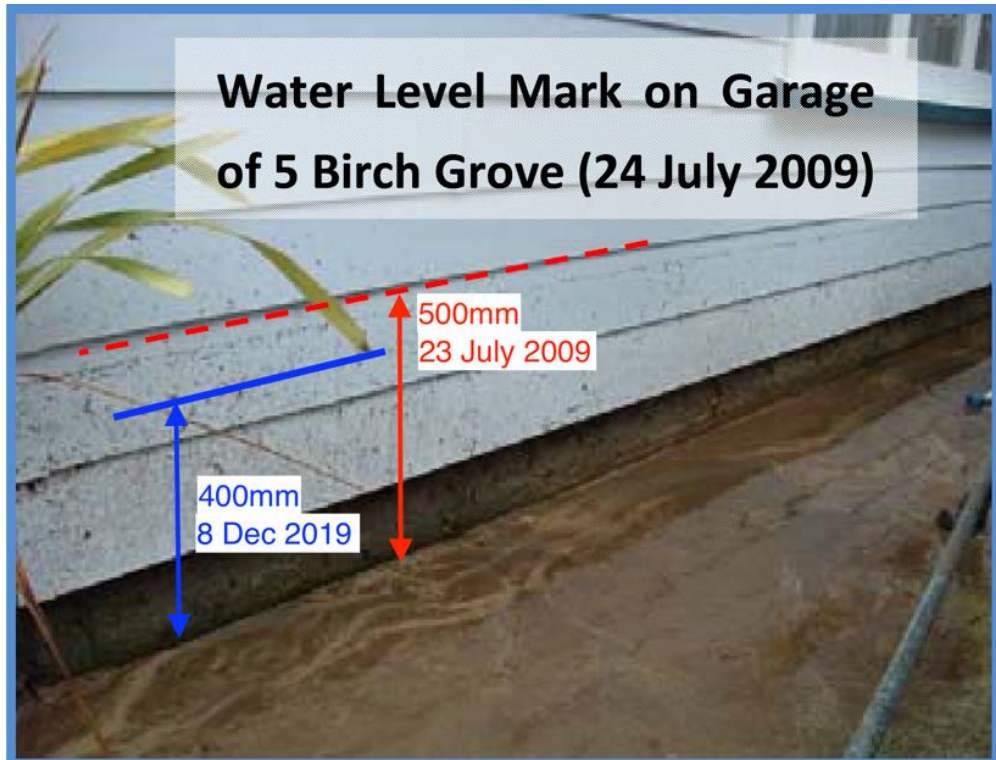
**Pinehaven Reserve – no flooding**



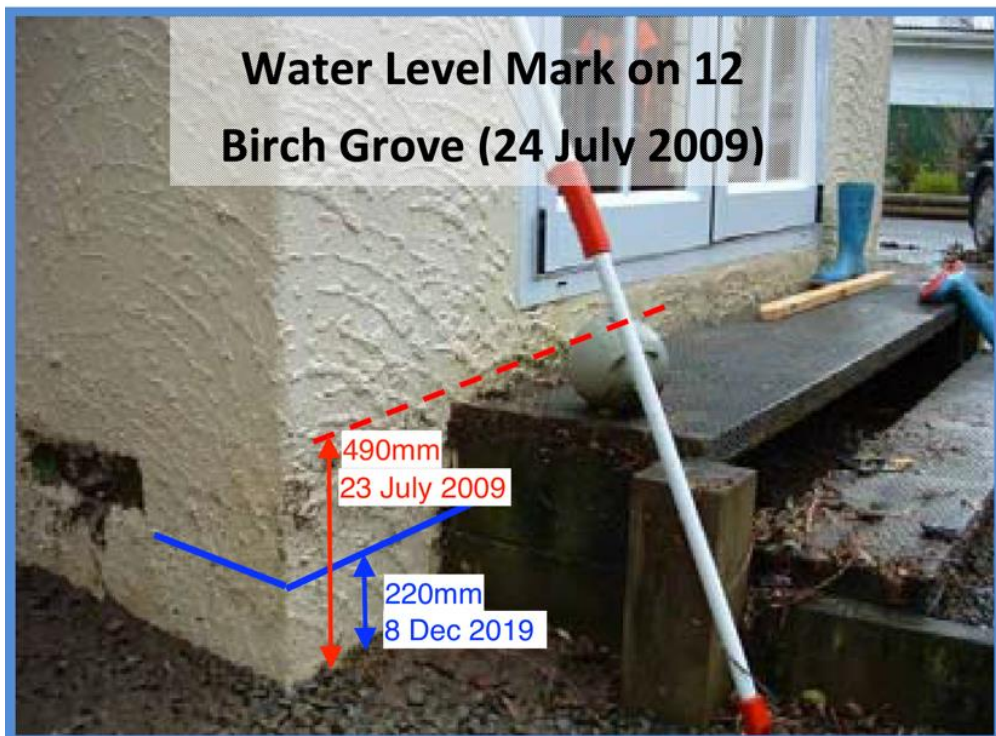
07:10 am



07:14 am



5 Birch Grove – 23 July 2009 flood was bigger than 8 December 2019 flood



12 Birch Grove – 23 July 2009 flood was bigger than 8 December 2019 flood.

RJ Hall assesses Dec 2019 as 1-in-25yr flood, and the larger flood July 2009 as 1-in-40yr.<sup>21</sup> GWRC underestimate July 2009 as a 5yr-10yr flood<sup>22</sup>, explaining why GWRC maps grossly overestimate 10-yr and 25-yr flood extents (see flood maps Fig.1 and Appendices 2 & 3).

<sup>21</sup> Hall<sub>3</sub>; Hall<sub>4</sub>

<sup>22</sup> SKM<sub>1</sub>

UPPER CATCHMENT (see Figure 1 and Appendix 2 Flood maps):

Notes regarding areas that flooded in upper catchment which the proposed streamworks are not addressing, yet in 2014 consultations Council promised upper catchment residents that they would benefit significantly (see Appendix 3) from proposed stream improvements by removing all flooding issues in the upper catchment in a 1-in-25 year flood event:

- 136A Pinehaven Road (due to a slip up in the forest, the rock and gravel spoil from which diverted a stream in this gully down the driveway of 136A, affecting adjacent properties as the water made its way down to the Pinehaven Stream channel)
- There was flooding down Pinehaven Road due to overtopping of the culvert at 122 Pinehaven Road) which affected many properties:
  - floodwater entered several driveways on both sides of Pinehaven Road
  - some of the floodwater entered Jocelyn Crescent (south end) causing flooding at 39 Jocelyn Crescent
  - eventually the floodwater ponded at the low point in Pinehaven Road adjacent to the Pinehaven School basketball court
- Water overtopped a tributary stream culvert at 108A Wyndham Road, crossed the road and ran down the left-hand road channel into Jocelyn Crescent road sumps

LOWER CATCHMENT, north of Pinehaven Reserve (see Figure 1 and Appendix 2 Flood maps)

- Birch Grove cul-de-sac and 5A, 11, 12 Birch Grove
- 28, 30, 32, 34, 36, 38A, 38B, 40 Blue Mountains Road
- 2 Pinehaven Road (due to a blocked stormwater sump in the road channel, which also caused some temporary ponding on one side of Pinehaven Road until a resident cleared the blocked road sump)
- 4, 5 Sunbrae Drive and Sunbrae Dr/Deller Grove intersection (due to overtopping of Sunbrae Road culvert and ineffective road sumps that discharge below stream level),
- 10, 10A, 12 Blue Mountains Road
- Willow Park
- There was extensive ponding in Gard Street from the pedestrian crossing eastward along Gard Street and the footpath adjacent to the Silverstream School playing field
- Minor ponding under the railway overbridge in Field Street

## (v) Areas in Pinehaven catchment that did not experience flooding on 8 December 2019

Further note: There was no flooding in the following areas:

- Elmslie Road
- Forest Road
- Pinehaven School
- Pinehaven Reserve
- Pinehaven Road north of Jocelyn Crescent (north end)
- Jocelyn Crescent (apart from water ponding near 39 Jocelyn Crescent from the overtopped culvert at 122 Pinehaven Road)
- Wyndham Road (apart from overtopping of the culvert between 102 and 106 Wyndham Road)
- Winchester Avenue
- Most of Birch Grove (apart from the cul-de-sac and some downstream properties)
- Blue Mountains Road itself (apart from ponding at a blocked road sump near 1 Blue Mountains Road)
- Chichester Drive (apart from ponding at a blocked road sump near 32 Chichester Dr)
- Fendalton Crescent
- The open channel from the pipe outlet at 13 Fendalton Crescent
- Sunbrae Road or Deller Grove (apart from at the intersection of these two roads)
- Tapestry Grove
- Clinker Grove
- Whitemans Road
- Dowling Grove
- Dunns Sreet
- Kiln Street
- Field Street (apart from ponding under the railway overbridge)

Notes about blockages:

None of the culvert and stormwater pipe intakes overtopped at the following locations:

- 1050mm ID pipe, top of Pinehaven Road (148 Pinehaven Road) for Sub-catchment B
- 525mm ID pipe, top of Pinehaven Road (169 Pinehaven Road) for Sub-catchment C
- Pinehaven Road bypass inlet (at 105 Pinehaven Road)
- The twin culverts at 47 Elmslie Road
- Pipe inlet at 7 Elmslie Road
- Culvert at 19 Forest Road
- Pipe inlet at 7 Forest Road
- 108A Wyndham Road culvert
- Inlet at the end of Chichester Drive
- Blue Mountains Road culvert (near 49 Blue Mountains Road)
- Culvert at the intersection of Pinehaven Road and Blue Mountains Road
- Whitemans Road bypass (at Dutch Reformed Church)
- Whitemans Road piped section (at 48 Whitemans Road)
- Field Street bridge culvert (Hulls Creek)

Culvert in the grass reserve at the corner of Kurth Crescent and Pioneer Grove

**(vi) No Overtopping of Pinehaven Road Culvert**

**Pineaven Rd / Blue Mountains Rd Intersection – culvert not overtopped**



06:45 am – ponding due to blocked sump



06:56 am – ponding cleared within 5 minutes after sump was unblocked by a resident from No. 2 Pinehaven Road - see resident's statement on next page (p41).



2/8/20

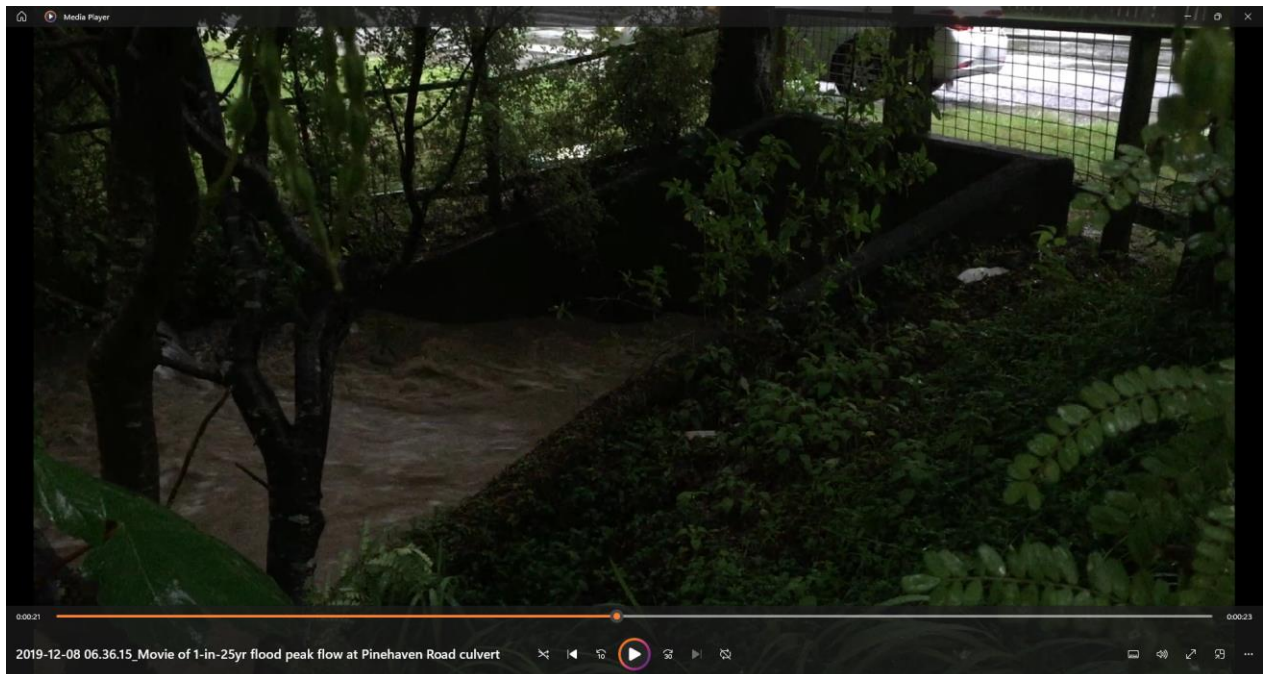
## 2 Pinehaven Road

On the 8 December 2019, # 2 Pinehaven Road  
My partner and I noticed a huge amount of water  
running down my driveway, he went out to investigate  
when he realised the Road Sump between number  
2 Pinehaven Road and 4 Pinehaven Road was  
blocked with leaves. He managed to unblock the  
Sump by removing the leaves which then  
the water disappeared straight away. Water wasn't  
flowing across the road from the stream, it was  
flooding because of the Road Sump being blocked.  
This occurred around the time between 6.00am and  
7.00am.

Tracey Irwin  
T Irwin

### PINEHAVEN ROAD CULVERT

The Pinehaven Road culvert did not overtop during peak flow in this 1-in-25 yr flood event



8 December 2019 6:36am Screenshot from movie (44 seconds) of 1-in-25yr flood at peak flow at upstream intake of the Pinehaven Road culvert at the intersection of Pinehaven and Blue Mountains Roads. The movie and this screenshot from it show that the Pinehaven Road culvert coped perfectly well with the 1-in-25yr peak flow without overtopping.

## (vii) Statements from Interviews of Local Residents

Location 1: Field Street

No Interviews

Location 2: Gard Street

No interviews

Location 3: Willow Park and Nos. 10 – 14 Blue Mountains Road

- 14 Blue Mountains Road – Debbie and Graham Griffiths – **Statement**, and
  - Flood water breached the stream bank and flowed north-easterly across the property (maximum 300 -400mm deep at north boundary) and into neighbours properties at 10A and 12 Blue Mountains Road (pers. com)
- 12 Blue Mountains Road - William Swift – **Statement**
- 10 Blue Mountains Road – Robyn Hickson – flood water was knee deep or more all around the house (pers. com.)

## 14 Blue Mountains Rd

Sunday 15th December 2019

To whom it may concern.

During the night of Saturday/Sunday 7th & 8th December we experienced a massive thunderstorm which reached its peak at about 3AM. The heavy rainfall caused the stream at the back of our property to breach the bank and water flowed across our lawn and down to the front of the house next door (12 Blue Mountains Road). The water never threatened our house and did not even get close to halfway up our foundations. At peak the water was about 30 or 40cms deep on the northern side boundary of our land.

Our family has occupied 14 Blue Mountains Road since 1950 and water has breached the stream bank only 3 times and in our opinion is that the recently approved flood modelling is totally exaggerated and not true or realistic.

Debbie and Graham Griffiths  
14 Blue Mountains Road  
Silverstream.

## 12 Blue Mountain Rd

Sunday 15/12/19

Regarding flooding on Sunday 8 December 2019

The water came from the south east corner of our property past our shed and then cut diagonally through to our neighbours property. The water level was about a foot deep on average.

Will Swift  
WJS

### Location 4: Intersection of Sunbrae Drive and Deller Grove

- 6A Sunbrae Drive – Gay Strahl – **Statement**
- 4 Sunbrae Drive – water flowed from flooded Sunbrae/Deller intersection through this property (debris observed by author around the house after the event)

Sunday 15/12/19

## 6A Sunbrae Drive

NO flooding came onto my property on Sunday 8 December 2019.

G Strahl  
GAY STRAHL

#### Location 5: Nos. 26 – 40 Blue Mountains Road, and 2 Pinehaven Road

- 26 Blue Mountains Road – flood water flowed through from neighbour’s property at No. 28 Blue Mountains Rd. Also, flood water breached the right stream bank at the first bend in the stream and diagonally across the back lawn, re-entering the stream where it bends to the right at rear of the property, and a bit into the back corner of 24 Blue Mountains Rd (pers. com with resident)
- 34 Blue Mountains Rd – flood water covered the lower front lawn at the front of the house (pers. com. with resident)
- 36 Blue Mountains Rd – Mr Graham McCarthy - flood water covered almost all the property including under the house and to the rear of the property (pers. com.)
- 2 Pinehaven Road – Tracey Irwin – **Statement (See vi above – No Overtopping of Pinehaven Road Culvert)**, and
  - Flooding on this property was only from a blocked sump on Pinehaven Road; there was no flood water flowing across the road from the stream on the other side (south side) of the road (pers. com.)

#### Location 6: Birch Grove cul-de-sac area:

- 3 Birch Grove – **Statement:** Rick Watson
- 5 Birch Grove – **Statement:** Sarai Higginson
- 7 Birch Grove – **Statement:** Jake Rance
- 9 Birch Grove – **Statement:** Ralph and Dianna Power
- 11 Birch Grove – **Statement:** Peter and Rosalyn Ross
- 12 Birch Grove – **Statement:** Ivan Cowell
- 21 Pinehaven Road – **Statement:** Ian Doughety
- 9 Pinehaven Road – **Statement:** Teresa Stowers
- 7 Pinehaven Road – no flood water across the driveway or front lawn from tributary channel in 9 Pinehaven Road, nor from the owner’s channel and sump along the SW boundary of 7 Pinehaven Road; surface water from 9 Birch Gr. entered 7 Pinehaven Road through SE boundary and went across back lawn and along the NE boundary to a low point under the boundary fence (about opposite the north corner of house) and out into 50 Blue Mountains Road where it re-entered the main stream channel (pers. com. with owner)

Sunday 15/12/19

### 3 Birch Grove

Flood water came down the driveway on Sunday 8th December 2019 after heavy rainfall. Water entered my carport and garage around early morning. Water also ran around my garage pathway down to my backyard and into my neighbors property.

Rick Watson.



## 5 Birch Grove

Sunday 15/12/19

Regarding the flooding on Sunday 8<sup>th</sup> December 2019:

When the river breaks the banks over a neighbour's driveway, it fills the cut-de-sac and rushes straight down our drive and into our garage. Unfortunately our garage is not raised off the ground, which is a problem during flooding events as we lose a lot of property that is of value to us. On this instance the water in the garage rose almost to the height of my (standard issue) gumboots. <sup>EST. 400MM HIGH</sup> The previous flood, it was above my knees. The water brings a large quantity of silt with it, which creates a lot of clean-up work for us and our neighbours. After so many years of talk, it is time for the stream to be fixed. The existing drains on the street are insufficient; the one under the hedge is blocked, and the one under the driveway backfills when the river level rises. This was obvious in the early afternoon, when our street nearly experienced a second flooding event.

Sarah Higginson  
5 Birch Grove  
Pinehaven 5018

Sarah

## 7 Birch Grove

2nd August 2020

On the 8th Dec 2019, we did not experience significant flooding, ~~as~~ despite being one of the lowest points in the area.

We have an open channel on our SW boundary that collects water from neighbours and we did not observe this overflowing.

Rgds,  
Jake Rance.

7 Birch Cr  
Pinehaven.

0212771670


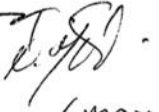




## 9 Birch Grove

02/08/2020.

ON THE 8<sup>th</sup> Dec 2019 OUR PROPERTY AT  
9 BIRCH GROVE, PINEHAVEN WAS NOT FLOODED  
BY SURFACE WATER ENTERING VIA THE STREAM  
OR NEIGHBOURING PROPERTIES.

RAUSH POWER.   
DIANA POWER   
(max 250mm)

NORMAN SURFACE FLOWING TO THE BACK AREA  
CAUSED BY HEAVY RAIN + THE NEIGHBOURS BUILT-UP  
GARDEN AREA AGAINST THE TIMBER FENCE.  
BUILT UP GARDEN APPROX 150mm HIGH.



Sunday 15/12/19

## 11 Birch Grove

Regarding flooding on Sunday 8/12/19:

Initially flood water from Birch Grove came past  
out-back steps and it was clear. About 20 mins later  
the water became turbid - due to overflow of Pinehaven  
stream in No 12 and then in our place (No 11).

- ) The water was around 40mm deep at the most.  
The stream water flows over our back garden lawn and  
exits into 50 Bluewicks Road property, at the corner  
of our property,

Peter D Ross  


h.c  
R. M. Ross  
R. Ross

## 12 Birch Grove

Inw Council  
12 Birch Grove  
Pinehaven

8 Dec 2019.

Flooding of Stream Depth of water level against  
the house was approx 220mm.

The July 2009. Flood Depth of water against house  
was approx 490mm.

Since the July flooding in 2009. Additional fencing was

installed between back of house and stream.

Resulting in a change in water flow from stream

-breach.

Now water is directed more directly down the drive.  
and away from house.

Hence a factor with the lower level against  
the house in the 8 Dec 2019. Breach of the stream.



6/8/2020

mob. 021 667745

## 21 Pinehaven Rd

21 PINEHAVEN RD  
UPPER HUTT  
2 AUGUST 2020.

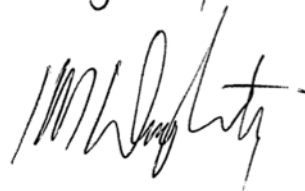
RE: PINEHAVEN STREAM.

TO WHOM IT MAY CONCERN.

ON THE 8TH DECEMBER 2019 I CAN CATEGORICALLY  
STATE THAT NO WATER, FROM THE  
RAIN EVENT OF THAT DAY, OVERFLOWED FROM  
THE SURFACE DRAIN BEHIND THIS PROPERTY.

NONE OF THE LAND AT #21 WAS  
INUNDATED DURING THAT TIME NOR HAS  
IT AT ANY TIME SINCE WE PURCHASED  
THE PROPERTY IN JULY 2017.

Ian Dougherty



2nd Aug 2020.

## 9 Pinehaven Rd

On the 8<sup>th</sup> December 2019, #9 Pinehaven Road did not have any flooding - on our property / driveway / colvert

Teresa Stowers J Stowers

Location 7: 108A Wyndham Road, and Nos. 68 – 74 Pinehaven Road

- 74 Pinehaven Road – Murray Quinn – surface flood water came down both sides of Wyndham Rd and flowed into road sumps in Jocelyn Crescent which discharge into a swollen small stream channel in 23 Jocelyn Crescent; overtopped the channel in the SW corner of 72 Pinehaven Road, flooding its back yard because there is too much flow for it all to enter the 150 dia. stormwater drain that replaces the channel where it crosses the boundary into Quinn’s property at 74 Pinehaven Road (pers. com.)
- 72 Pinehaven Road – flood water comes out of the channel in the SW back corner of the property; it can’t all fit into the neighbour’s drain in 74 Pinehaven Rd; it flooded the back yard and ran diagonally across the back lawn and along the north boundary and under the fence into 70A and 70 Pinehaven Rd (pers. com. with resident)
- 70 Pinehaven Road – Shelley Huntley – flood water came under the full length of the southern boundary fence from the neighbour’s place (72 Pinehaven Road); the water races through the gap between the house and the garage, across the paved front yard and out down the driveway; some water flowed over the 100mm high nib wall at the garage door and into the garage; it also flowed along the back of the garage (south side) and into the neighbours place at 70A Pinehaven Road (pers. com.)
- 70A Pinehaven Road – **Statement:** Nicola Robinson
- 68A Pinehaven Road – **Statement:** Erin Forbes
- 68 Pinehaven Road – **Statement:** Rick Depczynski

## 70 A Pinehaven Rd

For Pinehaven Streamworks Hearing

3-5 August 2020

From Nicola Robinson, 70A Pinehaven Road, Pinehaven

Thank you for this opportunity to be heard, as a rate-paying member of Upper Hutt, in regards to the Pinehaven Streamworks occurring in my neighbourhood.

I have been a resident at the road-front section of 70A Pinehaven Road for 29 years now. I have only ever experienced any excess water issues of any concern on my property when occasions of heavy rain brings water flowing from the southerly corner of my section, through my back fence which adjoins my property with no. 70 Pinehaven Road.


In June 2017, to try and resolve this issue of water coming through from this neighbour's property in times of excessive rain, I employed a plumber to dig a sump just beyond the southern end of my garage. He placed a grate over the top, dug a long channel running alongside the rear of my property, beside the east facing length of my garage, and installed a covered storm water drain linked to the sump to remove the excess water. I have also talked with this neighbor (and others) and understand they've also done their best to install measures at their own expense to reduce excess water coming onto, or through, their property. We are constantly dealing with storm water run-off from one or two properties on Jocelyn Cres, water which comes from Wyndham Road.

On 8 December 2019 I noticed my sump was unable to cope with the heavy rain. Water was subsequently flowing through my back fence, around the south-east corner of my garage like a swift creek, and flowing under my garage door, into my garage.

I am distressed that this Council repeatedly denies responsibility for this Wyndham Road/Jocelyn Crescent storm-water issue and resolve it, despite my neighbour's considerable efforts to reason and plead with Council, including a joint neighbours' letter to Council in August 2019. It is most certainly not a small matter of domestic run-off from Jocelyn Crescent properties, which any Council member, if they took the time to investigate, would discover. My distress is compounded by the fact that the proposed excessive, expensive, and largely unnecessary Pinehaven streamworks is not in any way addressing, nor fixing, this problem that impacts at least five neighbouring properties.

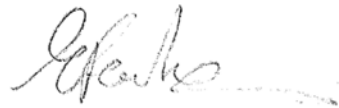
How much worse will this problem get if your proposed building on our hills goes ahead? Why are your Streamworks not addressing this serious matter? I plead with you, as a ratepayer, to review your former performance and apply appropriate measures to mitigate Wyndham Road and Jocelyn Crescent storm water run off to protect our properties.

Thank you.

  
N. Robinson  
29/07/20



8<sup>th</sup> December 2019. **68A Pinehaven Rd**  
Water from the flooding come down our  
drive. from the neighbour house number  
70.



Erin Forbes  
68a Pinehaven Road.

## **68 Pinehaven Rd**

A torrent of water from 68a driveway goes across  
the footpath in front of my house (68 Pinehaven Rd)  
bringing shingle + depositing the shingle onto the  
parking area outside my home.



Rick Depczynski  
68 Pinehaven Rd  
0225678151

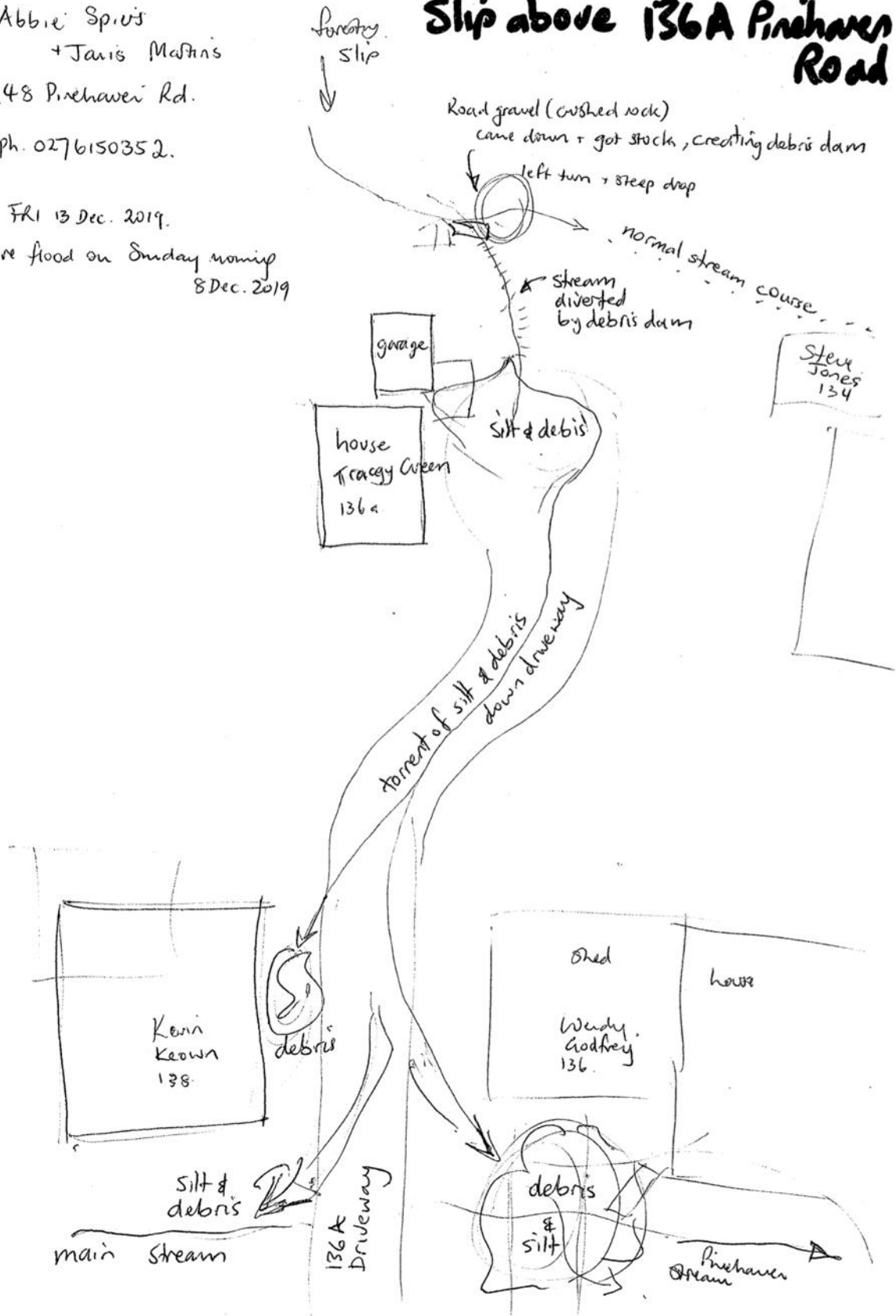
Location 8: No. 122 Pinehaven Rd Culvert, and Slip above No. 136A Pinehaven Rd

- 138 Pinehaven Road – Kevin Keown – the stream was already silt-laden upstream from Mr Keown’s property, but was made a lot worse with tons of silt and gravel pouring down the driveway of 136A Pinehaven Road from the slip above; Mr Keown helped out managing the torrent of floodwater and debris coming down the driveway of 136A Pinehaven Road on 8 December 2019 (pers. com.)
- 136A Pinehaven Road – **Statement:** Tracey Green – [Photos and text from Tracey Green’s postings 16th, 19th and 29th March 2020 on SOH Facebook page]
- 148 Pinehaven Road – Dr Abbie Spiers and Janis Martins (assisted with managing the torrent of floodwater and debris coming down the driveway of 136A Pinehaven Road on 8 December 2019) – **Sketch plan drawing of slip** above 136A Pinehaven Road; the culvert in the main Pinehaven Stream (about 100m long) through Nos. 148 & 146 Pinehaven Road did not overtop (pers. com.)

Abbie Spius  
+ Jarvis Martins  
148 Pinehaven Rd.  
ph. 0276150352.

FRI 13 Dec. 2019.  
re flood on Sunday morning  
8 Dec. 2019

# Slip above 136A Pinehaven Road



Other interviews (confirming there was no flooding in Elmslie Rd or Fendalton Cres.)

- 11 Fendalton Cres
- 45 & 47 Elmslie Rd

**11 Fendalton Crescent**      Tuesday 17/12/19

Regarding storm on 8<sup>th</sup> December 2019

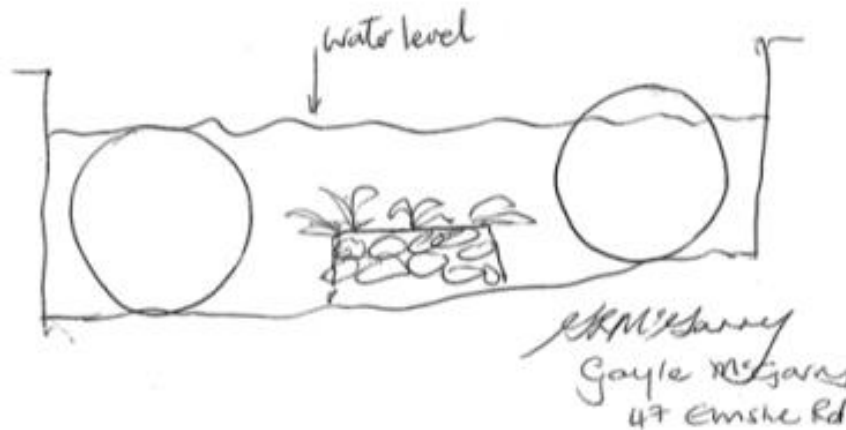
There was no flooding over the banks  
of the stream at the back of our  
property at 11 Fendalton Crescent.

Sarah Steer  
*SSteer*

Sun 15/12/19

### 47 Elmslie Rd

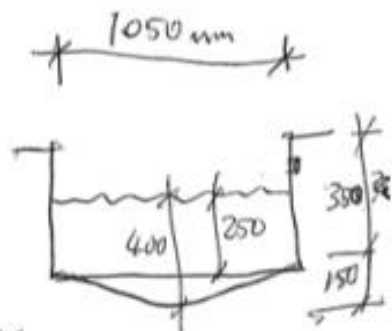
- The water didn't overtop the culvert under footpath
- The water came within about 250mm of the top of the stone-walled side to the channel (left side)
- At the inlet twin pipes, top of left pipe (water level)



### 45 Elmslie Rd

- The water half-filled the square concrete channel (observed 7am Sunday 8/12/19)

Lincoln Booth  
16 Dec 19



## (viii) References

Beca, Pinehaven Stream Flood Mapping Audit, 13 July 2015

Hall<sub>1</sub>: R J Hall and Associates Ltd, "Report: Pinehaven Stream ARI 100 Hydrological Assessment – Various Development Scenarios", 05 November 2019

Hall<sub>2</sub>: R J Hall and Associates Ltd,

Hall<sub>3</sub>: R J Hall & Associates Ltd – Letter 29 June 2020 to SOH

Hall<sub>4</sub>: R J Hall & Associates Ltd – Report 27 July 2020, amended 3 August 2020, Pinehaven Stream Flood 8 December 2019 at Chatsworth Road Gauge Site and Its Implications for Flood Frequency Estimates in the Catchment

Horrell, G., 27-7-2020: Review of "Pinehaven Stream flood 8 December 2019 at Chatsworth road gauge site and its implications for flood frequency estimates in the catchment" by R J Hall & Associates Ltd, 27 July 2020.

Horrell, G., Revised Letter re 23 July 2009 flood, Updated 31-7-2020

Jacobs, 23 June 2016, Memorandum, Pinehaven Developments – Scenarios 1 and 2

Keane Associates Ltd, 3 July 2020 updated 5 August 2020

Macky, G. - Macky Fluvial Consulting Ltd, 14 November 2019: Review of report by R J Hall and Associates Ltd – 'Pinehaven Stream: ARI 100 Hydrological Assessment – Various Development Scenarios, November 2019, including Addendum A: At-A-Site Evaluation of Appropriate CN Numbers', 2019-9-27'

MWH, Pinehaven Stream Flood Hydrology, 4 November 2008, revised 25 November 2009

MWH, Stokes, K. email 11-6-2015 to M. Law, Beca; M. Law reply to K. Stokes same day.

NIWA HIRDSv4

Ross, A. K., "Report on Infiltration Tests carried out on the Pinehaven Stream Catchment During July 2019"

SKM<sub>1</sub>, Pinehaven Stream Flood Hazard Assessment: Flood Hazard Investigation Report, Revision E, 25 May 2010, Volume 1 – Report

SKM<sub>2</sub>, Pinehaven Stream Flood Hazard Assessment: Flood Hazard Investigation Report, Revision E, 25 May 2010, Volume 2 – Flood Maps

SOH: Save Our Hills (Upper Hutt) Incorporated – Pinehaven Sub-catchment B – Time of Concentration

Report on Storm in Pinehaven on 8 December 2019, by Save Our Hills (Upper Hutt) Inc.

Wallach, L., UHCC Director of Infrastructure\_06-6-2014 email and 1-in-25 year flood maps (before and after proposed Option 11 Combination Pinehaven Stream Channel Improvements) to Mr S. Pattinson

WWL: Wellington Water Ltd – Pinehaven Stream Improvements, Resource Consent Application and Notice of Requirement – Executive Summary, September 2019

Report on Storm in Pinehaven on 8 December 2019, by Save Our Hills (Upper Hutt) Inc.

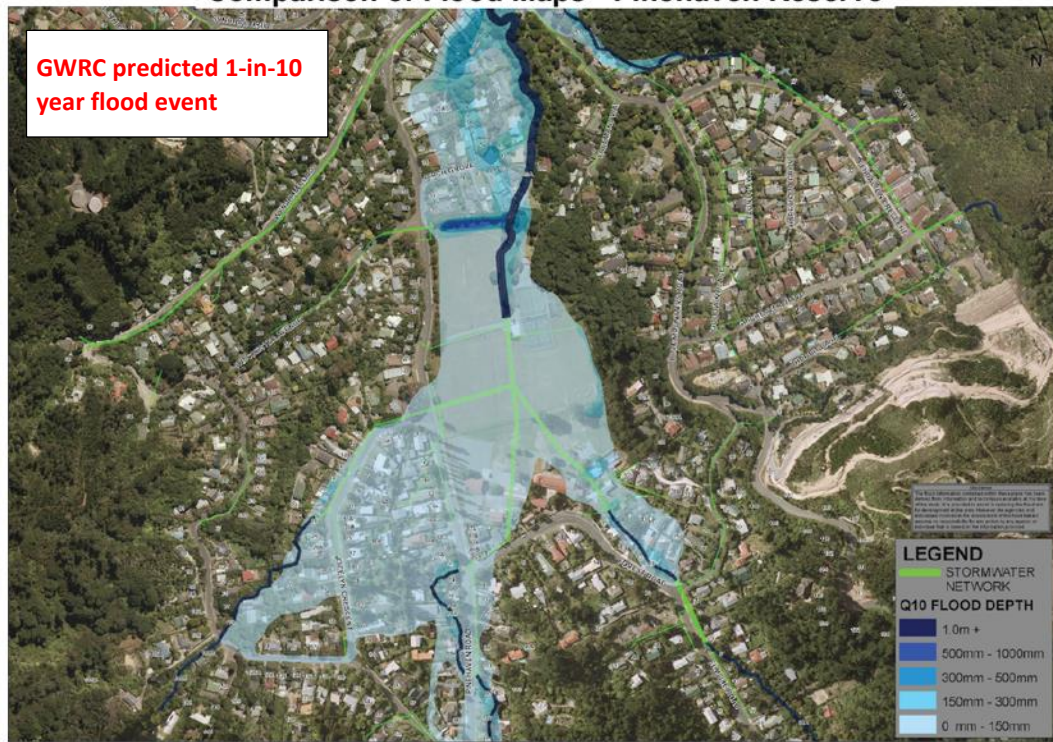
APPENDIX 1: Gauge Site - Surveyed Channel Sections, Photographs and Drawings

See Alex Ross Evidence for SOH Drawings



APPENDIX 2: Flood Maps

**Comparison of Flood Maps - Pinehaven Reserve**



**GWRC 1-in-10 Year Flood Map - Pinehaven Reserve**

**1:5000**

(SKM, Pinehaven Stream Flood Hazard Assessment: Flood Hazard Investigation Report, Rev E, 25 May 2010, Vol. 2)

@ A3 Size



**Pinehaven Reserve Flood Extent in 1-in-30 Year Rain Storm on 8 December 2019**

**1:5000 @ A3**

**Pinehaven Stream Flood Extent**

Drawn: SJP Issued: 17 December 2019

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**Preliminary**

**Drawing 191208 / 07 Rev 0**



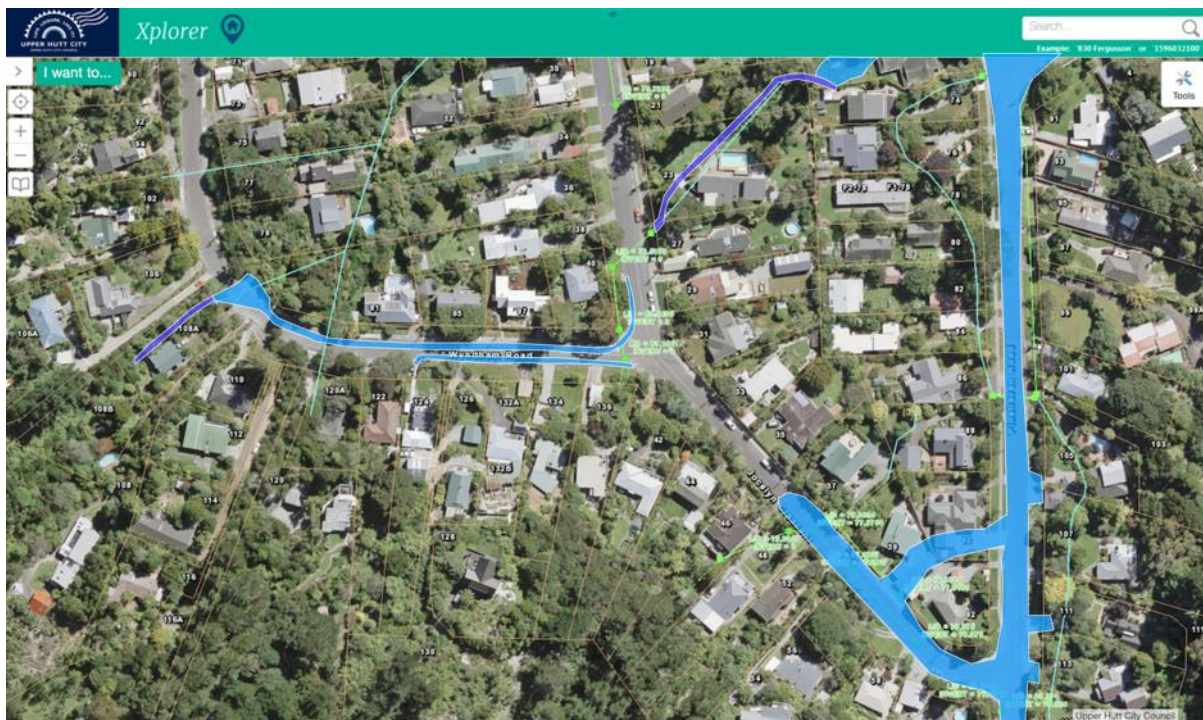
Birch Grove cul-de-sac flood extent on 8 December 2019



Flood extent on 8 December 2019 between Birch Grove and Pinehaven Road



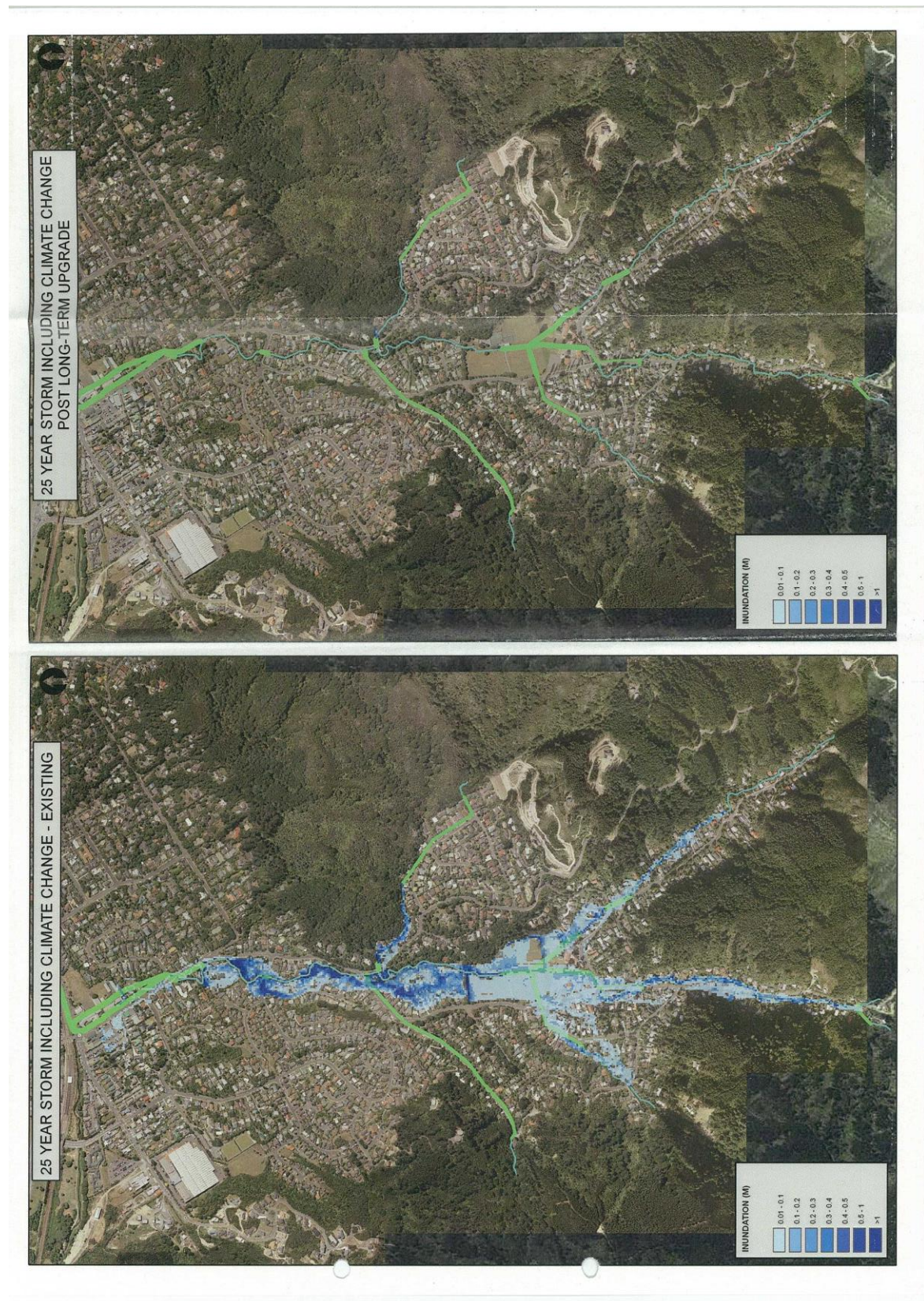
Flooding on 8 December 2019 at 68 – 72 Pinehaven Road



Flooding on 8 December 2019 showing:

- overtopping of road culvert at 108A Wyndham Road, flood water ran down Wyndham Rd into Jocelyn Crescent road sumps which discharge onto 23 Jocelyn Crescent, swelling the small tributary channel, and overtopping & flooding 72, 70, 70A, 68A & 68 Pinehaven Road
- flood water down Pinehaven Road from overtopped driveway culvert at 122 Pinehaven Rd
- Ponding in Jocelyn Crescent, Forest Road and at low point in Pinehaven Rd by school hall.

APPENDIX 3: UHCC 1-in-25 Flood Maps, before and after streamworks improvements (as promised by GWRC and UHCC to residents during public consultations 2014)



Source: see Lachlan Wallach email 06-6-2024 to Stephen Pattinson, 27 Elmslie Road

From: Lachlan Wallach <Lachlan.Wallach@uhcc.govt.nz>  
Subject: RE: Stormwater in Elmslie Road Pinehaven  
Date: 6 June 2014 at 4:07:31 PM NZST  
To: Stephen Pattinson <sjpattinson@paradise.net.nz>

Mr Pattinson

Dear Sir,

I refer to the email below and the other various emails and letters that you have sent me and comment as follows.

**1. Guilford Land**

- a. For development to occur on this land a plan change would be required. No such application has been received.
- b. Prior to the downturn in the economy a few years ago the owners of the Guilford land were investigating development of the land and stormwater was raised as an issue. My memory of discussion was that we (UHCC) would be looking for stormwater neutrality ie not worsen the current situation.
- c. The current flood maps that you have referred to do not include development impact from the Guilford land. Obviously they do include the current natural runoff from the Guilford Land. They are based on the principle outlined in b above.
- d. A sensitivity analysis was run for development in sub catchments of the Guilford land using impervious factors etc. common to the rest of the city. All of those sub-catchments drain into the Pinehaven Rd catchment not Elmslie Rd.

**2. Pinehaven Stream in Elmslie Rd**

- a. The 100 year flood map that you refer to as affecting your property represents the current situation.
- b. Your property has always been in the 100 year flood zone , it is just that flood maps are only now available to show you the current situation. As an example I attached a copy of the 25 year storm map and another showing the effects of the proposed upgrade of the stream on that storm. Previously that was not available. You will note that your property has benefited significantly. UHCC policy is that a 25 year event is contained within the pipe or open channel network. A 100 year event is outside the financial practicalities of being containing within a stormwater network. Such events are allowed for by secondary flow ... (contd)

**Lachlan Wallach**  
Director Asset Management and Operations

**UPPER HUTT CITY COUNCIL**  
Civic Administration Building, 838-842 Fergusson Drive  
Private Bag 907, Upper Hutt 5140

DDI: 04 527 2136 | Fax: 04 528 2652 | Mobile: 027 442 8912  
lachlan.wallach@uhcc.govt.nz | www.upperhuttcity.com

In 2014, the community was lead to understand that the structural channel upgrades in the lower catchment would take away the flooding problems in the upper catchment. This is what Mr Pattinson was told by SKM Pinehaven Stream project leader Ben Fountain at an open day in Pinehaven. Although no record of that conversation exists, we have it in writing from Mr Lachlan Wallach (email, plus before and after maps above) regarding the significant benefit residents in the upper catchment could expect from the streamworks. The proposed WWL stream improvements do not make good on this promise from Council.

