

Waimāero
Fendalton-Waimairi-Harewood Community Board
MINUTES ATTACHMENTS

Date: Monday 17 June 2019
Time: 4.30pm
Venue: Ōrauwhata, Bishopdale Community Centre Hall
13P Bishopdale Court, Bishopdale

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A Discussion Paper on the Benefits of Consistent Water Flow in the Ilam Stream

**Prepared by the Network Of The Ilam Stream
(NOTIS) Society**

May 2019

7 May 2019

Bringing our Stream Back to Life – Issues and Opportunities

Executive Summary

The citizens of Christchurch justifiably cherish their streams for the way they beautify the landscape and bring solace to the soul.

The Christchurch City Council's (CCC) long term *Otakaro/Avon River Stormwater Management Plan* rightly reflects the views of the inhabitants by placing great importance on these aspects, as evidenced by the statement in the Executive Summary: ***“In developing the SMP, consideration has been given to not only drainage, but also other waterway values (i.e. ecology, landscape, recreation, culture and heritage). For example, a programme of stream restoration in the Avon north-west headwaters, protection and restoration of springs and mahinga kai sites is included in the stormwater treatment strategy recommended, largely in response to Tangata Whenua input”***

The Network of the Ilam Stream (NOTIS) is very keen to work with the CCC and other local bodies to help realise these goals. In our experience, achieving them is strongly dependent on maintaining a consistent flow of water in the stream. While flowing streams are highly valued, dry ones tend to be treated like drains and do not have the same amenity or spiritual value. Ephemeral streams are also very difficult environments for the re-establishment of native fauna.

If the Ilam Stream is to live up to the aspirations of the *Otakaro/Avon River Stormwater Management Plan* then ways need to be found to achieve much more stability and regularity in its flow.

NOTIS believes there are some immediate, simple and cost-effective actions which would have a significant positive impact on the Ilam Stream. For instance, some of the pumped water now feeding into the 1.7km long piped start of the Avon could be much more effectively used. If a portion of this flow was diverted into the headwaters of the Ilam Stream it would bring much greater benefit to many more rate payers. The water diverted into the Ilam Stream would go past over 80 more houses, two major parks, three sets of student accommodation and a public garden in the 2.2km before it meets with the Avon.

Another option, is using augmentation water from the pumping station in Crosbie Park, which is mere metres away from the Ilam Stream (see photo Appendix II). Although slightly fewer houses would be graced by the consistent flow, the costs would be negligible.

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Aesthetic Assets of Christchurch Streams

The citizens of Christchurch have always had a particular affection for the streams and rivers of their city. This is possibly because they soften and beautify a predominantly flat urban landscape. They also create sanctuaries of solitude for both people and wildlife, particularly birds, in a busy city.

As pressures on access and supply of water become more contentious this appreciation of the “soft” value of streams and rivers in people’s lives is becoming increasingly valued in New Zealand as a whole and Christchurch in particular. Studies have shown that Christchurch community highly value managing groundwater abstractions to preserve spring, river and wetland flows (Ref. 1)

The Ilam Stream

The Ilam Stream flows from Russley Road along the edge of Avonhead Park then on through Crosbie Park from where it winds through the lower part of Avonhead suburb to join up the Avon River at the Ilam Gardens. Parts of its route are piped, for example under Hyde Park housing, and again in the area near and including part of the University of Canterbury (UoC) Dovedale complex (see map Appendix I).

Like all streams in the NW of Christchurch, the flow of the Ilam Stream has suffered from a drop in the water table caused by drainage of wetlands combined with the development of impermeable surfaces such as roads and houses (Ref. 2 p 7 and photo below).



Ilam Stream (c 1920). Photographer Unknown

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By the latter part of last century, the stream had become little more than a storm water easement - a dry bed which quickly turned into short-lived torrent filled with “first flush” contaminants after rain.

A dry urban streambed is frequently treated by bordering residents as a drain rather than a landscape feature. This “drain” is often fenced off and the now obscured banks become a dumping ground for lawn clippings and other garden rubbish.

As early as 1987, submissions were being made by local residents to bring the Ilam Stream back to life by augmenting its flow using surplus water from a water race in Ryan’s Road. This augmentation finally occurred in 2006 and greatly improved the amenity and spiritual values of the stream. However, the vagaries of the Waimakariri River and local irrigators are such that there may be long periods of low or even no flow particularly in the lower reaches of the water race. This variability makes life very difficult for the re-establishing fauna of the stream.

If the Ilam Stream is to live up to the aspirations of the *Otakaro/Avon River Stormwater Management Plan* then ways need to be found to achieve much more stability and regularity in its flow.

Christchurch City Council

The Christchurch City Council (CCC) has an admirable record of developing and improving the amenity values of local streams and rivers by landscaping and, in several cases, augmentation of flow.

The CCC also has excellent long-term plans, in some cases spanning 35 years (Ref 3 p vii), for the management and improvement of the Otakaro/Avon River catchment.

Several sections of the CCC’s Otakaro/Avon River Stormwater Management Plan (SMP) (Ref. 3 p vii, 46, 159) resonate strongly with NOTIS. These sections include:

- the final paragraph of the Executive Summary (p viii) where it states: *“In developing the SMP, consideration has been given not only to drainage, but also other waterway values (i.e. ecology, landscape, recreation, culture and heritage). For example, a programme of stream restoration in the Avon north-west headwaters, protection and restoration of springs and mahinga kai sites is included in the stormwater treatment strategy recommended, largely in response to Tangata Whenua input”*

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- The 5th recommendation under Recommendations (p 159) “*Fund a limited waterway restoration programme focussed on the Otakaro/Avon River tributaries above Moana Vale, sites of high cultural significance and springs as part of the SMP programme.*”

NOTIS

NOTIS (Network of The Ilam Stream) is a society which has been working with the community, the CCC, ECan and the Selwyn District Council (SDC) for over 16 years to improve the amenity value of our stream by augmenting its flow and encouraging the beautification of its banks. Examples of improvements we have been involved in include:

- Creation of a new stream bed through Avonhead Park, and *via* this the augmentation of the stream flow from a water race on the other side of John’s road. Both the CCC and the SDC have played major and continuing roles in this substantial improvement.
- Planting of the banks of the new stream bed. A project involving over 80 locals.
- Planting of the stream banks in Crosbie Park where there was another healthy turnout of locals to assist.
- Patching of a major water sapping “hole” in the stream bed at Colina Street.
- Continual removal of rubbish from and around the stream
- Monitoring and liaison with the SDC and their contractors over augmentation flow related matters.

We would like to continue this positive relationship with the CCC and assist in the implementation of their plans to bring the streams in the NW of Christchurch back to their original health.

Benefits of Restored Stream Flow Due to Water Race Augmentation

The presence of the partially restored flow in the stream has been very beneficial for the local community. These benefits range from the purely physical appearance of the stream bed through to the aesthetic and environmental impact of a having a living stream in the neighbourhood.

We notice that many residents with properties next to the stream now take a renewed interest in their riparian borders. Instead of having the unsightly dry bed on the edge of their properties fenced off, many have opened their properties up to the stream making it an integral if not focal part of their garden.

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Strolls in both Avonhead and Crosbie Parks have become a more pleasant and interesting exercise with the advent of a living stream feature (in fact Crosbie Park is now considered to be an Avon River Catchment Exemplar Site (Ref 4, p 50) and the same applies to the part of the University of Canterbury (UoC) grounds which share the lower reaches of the stream.

The renewed flow has also facilitated an environment which encourages the growth of native trees, vegetation which provide shade, protection, and food thus encouraging the return of native fauna (Ref 5)

Current Water Supply Challenges

The use of what is effectively surplus county stock water to supply the Ilam Stream is an innovative concept. It does, however, come with some challenges. These challenges hinge around the reliability and robustness of the water supply.

Natural Variability of Water Intake from the Waimakariri

Given that the stream currently receives its base flow from the Selwyn District stock race system, its regularity is determined by the reliability of the flow in the supplying stock race. The source of the water for the network is the Selwyn District's water race intake on the Waimakariri River at Paparua. This system is subject to the vagaries of the weather and the flow in the Waimakariri. It can be adversely affected by both floods and low flows, situations that may stop the flow for days or sometimes weeks at a time. Needless to say, this variability of flow makes life very difficult for native fauna such as fish.

Difficulties of Maintaining Constant Flow in the Water Race System

During those periods when the stream is flowing continuously, the actual level of flow can still be very variable. This variability has an impact along the stream's course which becomes particularly apparent in the lower reaches. For example, on days when a reduced flow enters the system there can be an adequate flow at the top of Avonhead Park but there may be no water reaching the UoC grounds. The reasons for this supply variability, which is also more apparent in summer, are many and varied. They include the ongoing level of inflow at the actual race intake, any constrictions and overflows that may occur along the length of the SDC stock race system and the amount of extraction by livestock and rural irrigators.

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Potential Closure of Water Race System

While the Selwyn District Council (SDC) has been very co-operative in maintaining the water race flow to the best of their ability there are some signs that they may not wish to carry on with the current water race system (Ref. 6)

Leaks in the Stream Bed

Apart from ongoing issues around water supply, the other major challenge for the Ilam Stream has been the coming and going of leaks along the stream bed. Most of these are relatively minor and a good robust flow coming in at the top of the system at Avonhead Park can successfully persist along the entire length of the bed. However, there have been one particularly vexatious zone of sinkholes both immediately upstream and downstream of the Colina Street culvert. This leak has recently been repaired by the CCC.

The combined effect of the variable nature of the flow coming into the Stream combined with the Colina Street 'leakage' problem has left some of its reaches without water for the best part of a month creating the following problems:

- The previously mentioned further cracking of the stream bed leading to new potential leak zones
- The breeding of mosquitoes in the stagnant pools that develop in the stream as the flow stops
- The difficulty of establishing and maintaining riparian native plantings that rely on a moist environment to survive
- The negative and sometimes fatal impact on wildlife that are attracted to water
- The impossibility of encouraging aquatic wildlife to become permanently established in the stream
- The negative impact on the morale of residents and community groups who are keen to enhance the local stream environment leading to a loss of interest in ongoing involvement. Included in this is Russley School which has indicated a keenness to involve themselves in stream guardianship projects such as plantings in the coming year.

Potential Solutions to Water Supply Challenges

The augmentation of the flow of the headwaters of the Ilam Stream from a water race has given us a taste of the many advantages of a consistent flow.

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However, the variability of the current supply is too great to capitalise on many of these advantages.

A solution to the variable flow problem would be the introduction of an additional source of water to augment that currently supplied by the Selwyn District Council stock race system. This source needs to be more robust in nature to ensure flow continuity, such as from a well.

Two possible options are wells in Crosbie Park (near Woodbury Street, see Appendix II) or at the Airport Business Park (on Johns Road, see Appendix I).

Pros and Cons of Augmentation Options

Augmentation from the Airport Business Park well

This well has the advantage that water has already been pumped for some years to augment the Avon River and the consent (CRC101862) allows a maximum rate of 10l/sec. Currently this supply is piped for approximately 1.7km (see Map Appendix I) and then discharged into the Avon close to Nortons Road which is only a short distance (less than 400 m or about 20 properties) upstream from the first substantial active springs (Ref 4, p 63 and map Appendix I).

On the other hand, the Ilam Stream wends past over 100 houses, two parks, three sets of student accommodation (Sonada, Waimairi Village and College House) and a public garden in the 2.2km before it meets with the Avon at the University Club grounds. ***This means that diversion of some of the pumped water now going directly into the Avon would be of much greater benefit to many more rate payers than the current system for no more ongoing cost.*** Furthermore, the total amount of pumped water would not need to be changed and all of it would end up again in the Avon at the grounds of the University Club.

There is however the one-off cost of piping the water from the current pump at the Airport Business Park to the piped section of the Ilam Stream which lies alongside Russley Road. The costs of doing this should be modest as the Russley Drain (into which the water is currently pumped) is only about 25 metres from the piped Ilam Stream, at its closest point.

The management of the Airport Business Park have been approached and they are happy to work in with such an arrangement.

Augmentation from Crosbie Park wells

Recently the drinking water wells at Crosbie Park were deepened in order to obtain water from a potentially less vulnerable aquifer which is unlikely to need

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chlorination. This has means there are now wells available which tap the higher aquifers and these could potentially be used for augmentation of the Ilam Stream which runs past just a few metres away.

This option means that about 18 less houses bordering Avonhead Park would not get the benefit of the reliable flow, which they would in option 1. However, the costs are likely to be even less than those involved with piping water from the Airport Business park as the stream is only metres of open parkland away. (see Appendix II)

Recommendation

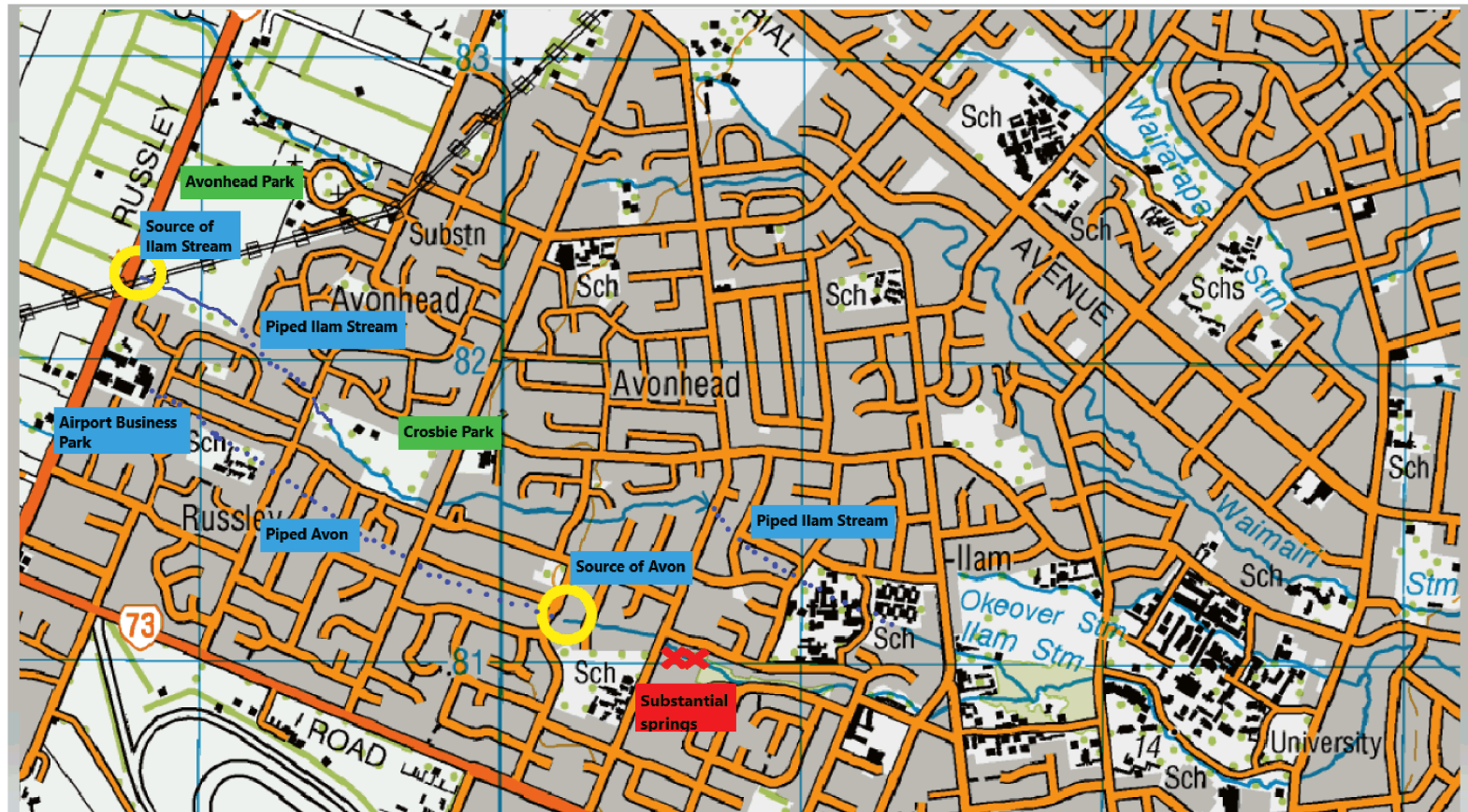
- That a decision in principle is made to augment the Ilam Stream with a reliable flow of water close to its source at Avonhead or Crosbie Parks.

References

1. *The economics of augmenting Christchurch's water supply*. Journal of Hydrology (NZ) 42 (2): 113-124, 2003.
2. *University of Canterbury Waterways – Issues and Options*, Sustainability Office, University of Canterbury January 2015.
https://www.canterbury.ac.nz/media/documents/sustain/Waterways_on_U_C_Campus_V7.pdf
3. *Otakaro/Avon River Stormwater Management Plan*, June 2015, Christchurch City Council, Assets and Networks Unit, TRIM ref 14/34583.
4. *Otakaro/Avon River Catchment*, Christchurch City Council, Opus International Consultants, August 2016.
5. *Waitaha Wai, Waterways of Christchurch*, Report Number: R10/39, Christchurch City Council, Environment Canterbury, June 2010.
6. Selwyn District Council. Water Races 2019
<https://www.selwyn.govt.nz/services/water/water-race>

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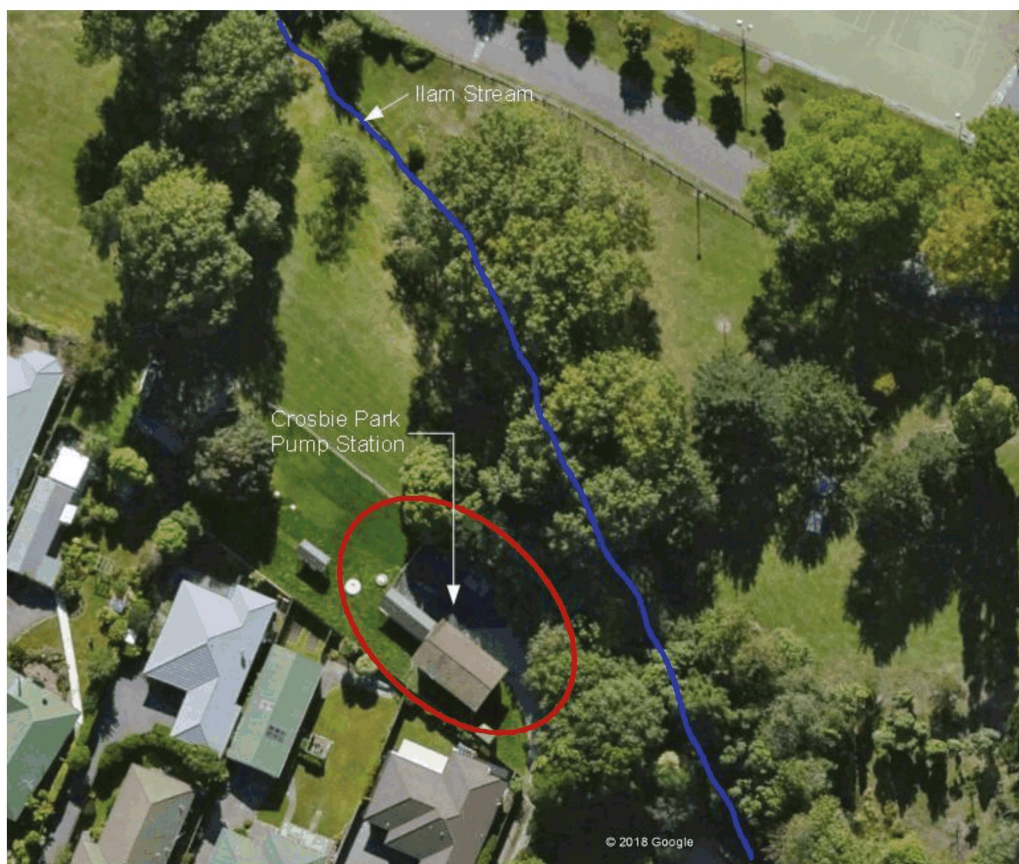
Appendix I: Map Showing Piped (incl high sided drains) and Open Sections of the Ilam Stream, Avon River and the Avon's Current First Substantial Springs



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Appendix II: Photo of pumping complex at Crosbie Park and near proximity to Ilam Stream



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NOTIS

Network Of The Ilam Stream

The Ilam stream flows from Avonhead Park until it joins the Avon in the University grounds



Bringing our stream to life

What We Have Learned

“A stream without a regular flow of water is regarded as a ditch”

Bringing our stream to life

Ongoing Major Problems

- Intermittent water flows from the water race despite the best efforts of Selwyn District Council
- A substantial water sapping “hole” in the stream bed at the Colina street culvert

Bringing our stream to life

A Discussion Paper on the Benefits of Consistent Water Flow in the Ilam Stream

Extract from the executive summary of Christchurch City Council's (CCC) long term (2015-2050) *Otakaro/Avon River Stormwater Management Plan*

“In developing the SMP, consideration has been given to not only drainage, but also other waterway values (i.e. ecology, landscape, recreation, culture and heritage). For example, a programme of stream restoration in the Avon north-west headwaters, protection and restoration of springs and mahinga kai sites is included in the stormwater treatment strategy recommended, largely in response to Tangata Whenua input”

Bringing our stream to life

Basic findings of discussion paper

- If the stream is to be regarded as an asset by the residents and able to support native flora and fauna there needs to be a permanent flow of water.
- As the flow from the water race can be variable there needs to be a backup from a consistent source.
- Two potential possibilities outlined in the paper are supplementation from the current flow into the Avon from the Airport Business Park or, from the wells located at Crosbie Park

Bringing our stream to life

Proposal

That the Community Board request the City Council to examine the two options outlined in the discussion paper for maintaining a consistent base flow in the Ilam Stream and come up with a recommendation of the best one.

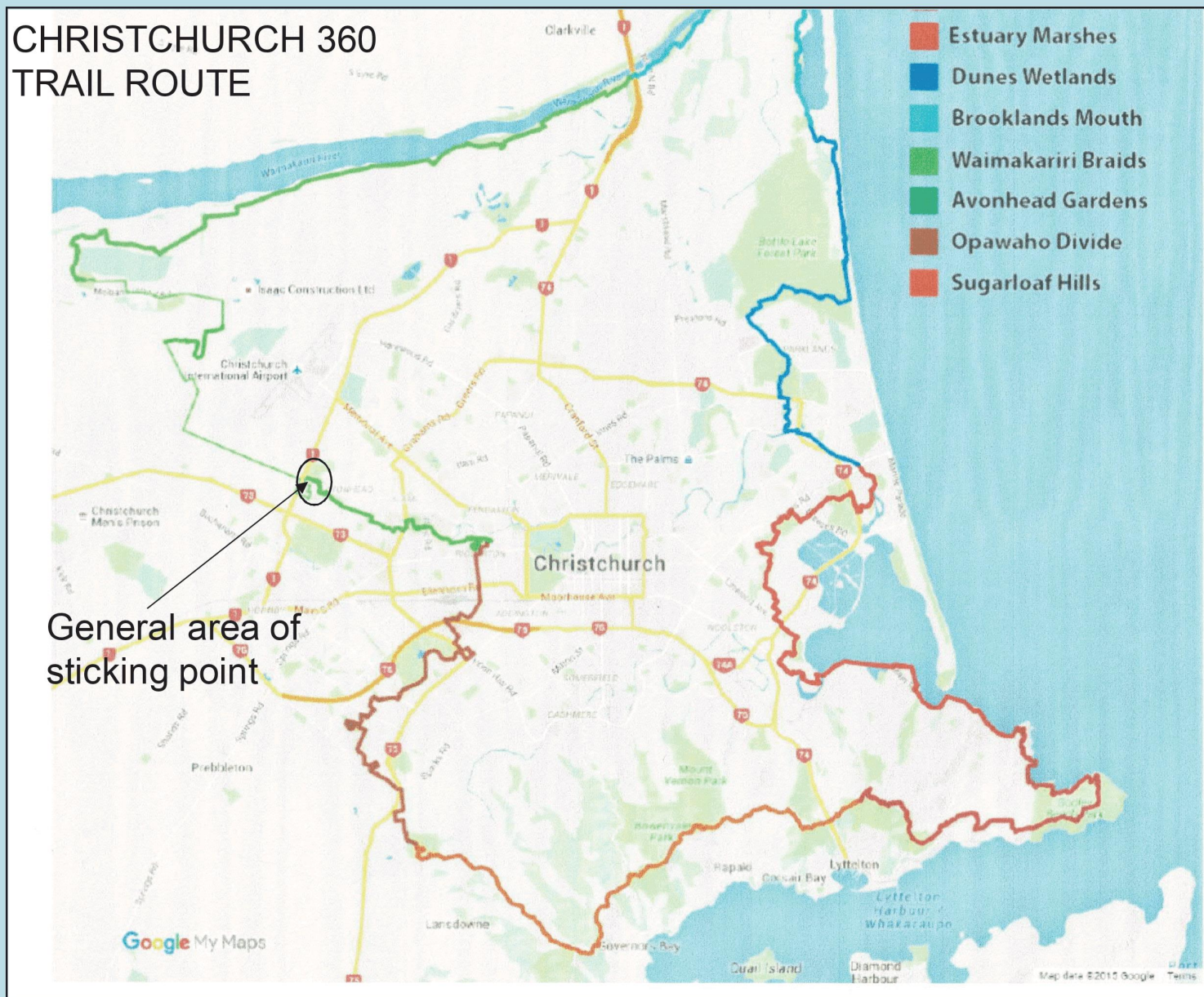
Bringing our stream to life

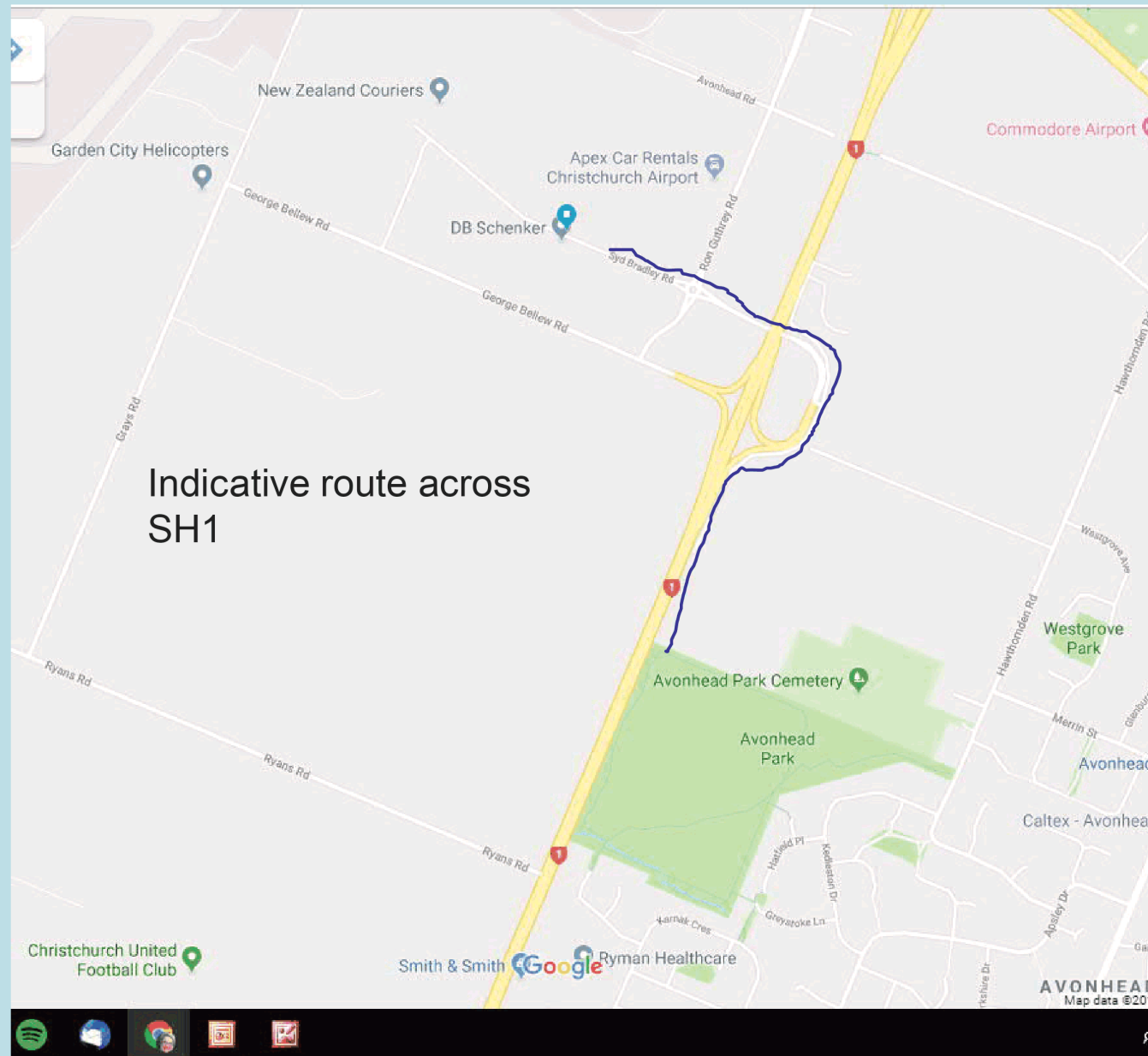


AVONHEAD GARDENS LEG

The purpose of our visit today

- To bring the Board up to date with progress on the Trail project
- To request the assistance of the Board in overcoming current Trail obstacles within the Board's territory namely:
 - To request City Streets to prepare a plan for NZTA for a pathway between Avonhead Park and Syd Bradley underpass
 - To work through other issues with the Safety Audit





Proposed route

- Under SH1 near Ryan's Road via the Syd Bradley underpass to link to Avonhead Gardens
- This would require approximately 500 m of footpath
- A pedestrian fence would be required between the vehicle safety fence and the east side of the highway reserve from Avonside Park
- A gate is required in the northwest corner of Avonside Park to enable access



Syd Bradley Underpass



