

Inghams Enterprises (NZ) Pty Ltd  
C/- Bloxam Burnett & Olliver  
PO Box 9041  
Hamilton

Attention: Mr S Bigwood

Dear Steve

## **Ingham Enterprises (NZ) Pty Ltd - Freshwater Ecological Assessment**

### **1 Introduction**

Tonkin & Taylor Ltd (T&T) was engaged by Bloxam Burnett & Olliver to undertake an assessment of the natural freshwater resources in an unnamed tributary of the Waipuna Stream. The freshwater assessment is required to support a proposal to the Matamata-Piako District Council to vary Ingham Enterprises' Development Concept Plan for its Factory Site on Waiheka Rd, Waitoa.

The following report has been prepared in accordance with our Letter of Engagement dated 25 February 2013 and outlines the results from a freshwater ecological assessment carried out at the site on 28 February 2013.

### **2 Method**

The freshwater ecology assessment has comprised the following tasks:

- A review of data held by the Waikato Regional Council (WRC) through a search of its website and a data request through its inforeq service.
- A review of the NZ freshwater fish database for the Waitoa Stream catchment on 29 February 2013.
- A site visit by a freshwater ecologist on 28 February 2013 involving a visual inspection of the tributary from Seddon Road (its headwaters) to its confluence with the Waipuna Stream (a total of 650m in length) (refer to Figure 1 – Appendix A).
- An assessment of habitat quality generally following the Regional Ecological Monitoring of Streams methodology used by WRC for their state of the environment monitoring programme.



## 3 Results

### 3.1 Catchment description

The Ingham's factory site ("the site") is located on Waiheka Road near the rural township of Waitoa. The factory is located in a predominantly rural setting.

The main surface water drainage feature in the vicinity of the site is the Waipuna Stream which originates around 2 km upstream of the site and runs from east to west through the site (see Figure 1).

The stream that has been reviewed as part of this assessment is an unnamed tributary of the Waipuna Stream (hereafter "the unnamed tributary"). The unnamed tributary drains the northern portion of the site and discharges into the Waipuna Stream. The Waipuna Stream then drains into the Waiheka Stream around 3 km downstream of the site. The Waiheka Stream then flows into the Waitoa River to the north of the Waitoa township. The Waitoa River is a tributary of the Paiko River which discharges to the Firth of Thames.

The Waiheka Stream is classified under the Waikato Regional Plan as Waikato Surface Water Class upstream of Waiheka Road and Indigenous Fisheries and Fish Habitat downstream of Waiheka Road.

The Waipuna Stream is classified under the Waikato Regional Plan as Waikato Surface Water Class.

### 3.2 Site description

The unnamed tributary is approximately 650 m in length with its headwaters beginning at Seddon Road then draining through farmland to its confluence with the Waipuna Stream (refer to Figure 1). On the day of the site visit the entire length of the tributary was dry indicating the tributary is intermittent (only flows for part of the year). Based on the nature of the channel the upper 300 m of the unnamed tributary appears to be ephemeral, thus only flowing during periods of high rainfall (refer to Figure 1). The stream channel in this upper section is wide with low gradient banks. The stream bed is approximately 2 – 3 m wide and is covered in pastoral grass (Photograph 1).

From around 300 m downstream of Seddon Rd the channel becomes more channelised where sections of the tributary have been straightened. Along this section the channel is generally between 0.1 – 1.5 m wide.



*Photograph 1 and 2: upstream and mid reach of the unnamed tributary of the Waipuna Stream 28 February 2013.*

The only surface water observed in the unnamed tributary during the site visit comprised two small pools. One at the discharge point of a culvert draining the truck wash area (see Figure 1), and the other downstream where the wastewater treatment wetland overflows into the stream. Two weirs are located within the stream channel directly upstream and downstream of where the wetland overflow enters the tributary.

Native riparian vegetation along the stream channel was largely absent and limited to a totara tree (*Podocarpus totara*) located in the lower section of the reach. The remainder of the stream reach was dominated by pastoral grasses with areas of exotic pests such as blackberry and gorse also present. The stream channel currently has a single wire fence preventing stock access, however, in some areas the fence has been knocked down and is therefore unlikely to be effective. During the time of the site visit no stock were present in the surrounding paddocks.

Areas of erosion identified in the lower reach included a section that has recently had remedial work carried out including the use of recycled concrete slabs to stabilise the bank.

### 3.3 Freshwater fish

A review of the freshwater fish database (administered by NIWA) for the unnamed tributary, the Waipuna Stream and the Waiheke Stream found records present for the Waiheke Stream only. Records date between 1966 and 2012. Over this time four species of native fish, one pest fish species and crayfish have been identified in the Waiheke Stream. Species found in the Waiheke Stream include:

- Shortfin eel (*Anguilla australis*)
- Inanga (*Galaxias maculatus*)<sup>1</sup>
- Common Bully (*Gobiomorphus basalis*)
- Longfin eel (*Anguilla dieffenbachia*)<sup>1</sup>
- Koura (*Paranephrops planifrons*)
- Gambusia (*Gambusia affinis*)

Due to the ephemeral nature of the upper section of the unnamed tributary it is unlikely fish would be found in this section. However, fish such as shortfin and longfin eels may move into the lower intermittent section from time to time.

### 3.4 Habitat quality

An assessment of habitat quality generally following the Regional Ecological Monitoring of Streams methodology (wadeable soft bottom streams) used by the Waikato Regional Council for their state of the environment monitoring programme was carried out. As the stream channel had no water present the scores are only indicative of the stream at the time of the site visit. Some categories such as periphyton could only be assessed based on the small pools present on site. The overall habitat quality score for the site was 65.5 out of a total of 180, therefore indicating the unnamed tributary is of poor habitat quality. Field sheets can be found in Appendix B.

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<sup>1</sup> Species classified as at risk (declining): Allibone, R., David, B., Hitchmough, R., Jellyman, D., Ling, N., Ravenscroft, P., and Waters, J. 2009. Conservation Status of New Zealand freshwater fish. *New Zealand Journal of Marine and Freshwater Research* 2010: 1 – 17.

### **3.5 Potential ecological effects of site expansion**

The purpose of the proposed Plan Change is to ensure alignment between Ingham Enterprises existing resource consents and the Development Concept Plan contained within the Matamata-Paiko District Plan, and to provide for additional growth and development. The proposed Development Concept Plan includes the expansion of the building and plant management area to include the upper reaches of the unnamed tributary.

Our freshwater assessment indicates the lower section of the unnamed tributary is intermittent and likely only flows for part of the year. The upper reach of the unnamed tributary which is noted to be within the building and plant management area of the proposed plan appears ephemeral and is likely to only flow during periods of high rainfall.

The unnamed tributary represents intermittent and low quality aquatic habitat with limited, and in many cases no significant riparian vegetation. Pastoral grasses were found across the stream channel. Due to the ephemeral nature of the stream and poor habitat quality, effects from the proposed plan change are likely to be no more than minor. We note that as part of the proposed Development Concept Plan, riparian planting is proposed in the lower reaches of the unnamed tributary which will enhance habitat quality along that reach in the long term.

We do not consider that a Stream Ecological Valuation (SEV) would be warranted for the unnamed tributary if it is to be filled or diverted as SEVs cannot be carried out on ephemeral streams. The ephemeral reach of the unnamed tributary would be adequately compensated for by the planting of the lower section as proposed in the Development Concept Plan.

## 4 Applicability

This report has been prepared for the benefit of Bloxam Burnett & Olliver with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose without our prior review and agreement.

Tonkin & Taylor Ltd

Environmental and Engineering Consultants

Report prepared by:

Authorised for Tonkin & Taylor Ltd by:



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Liza Inglis

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Peter Cochrane

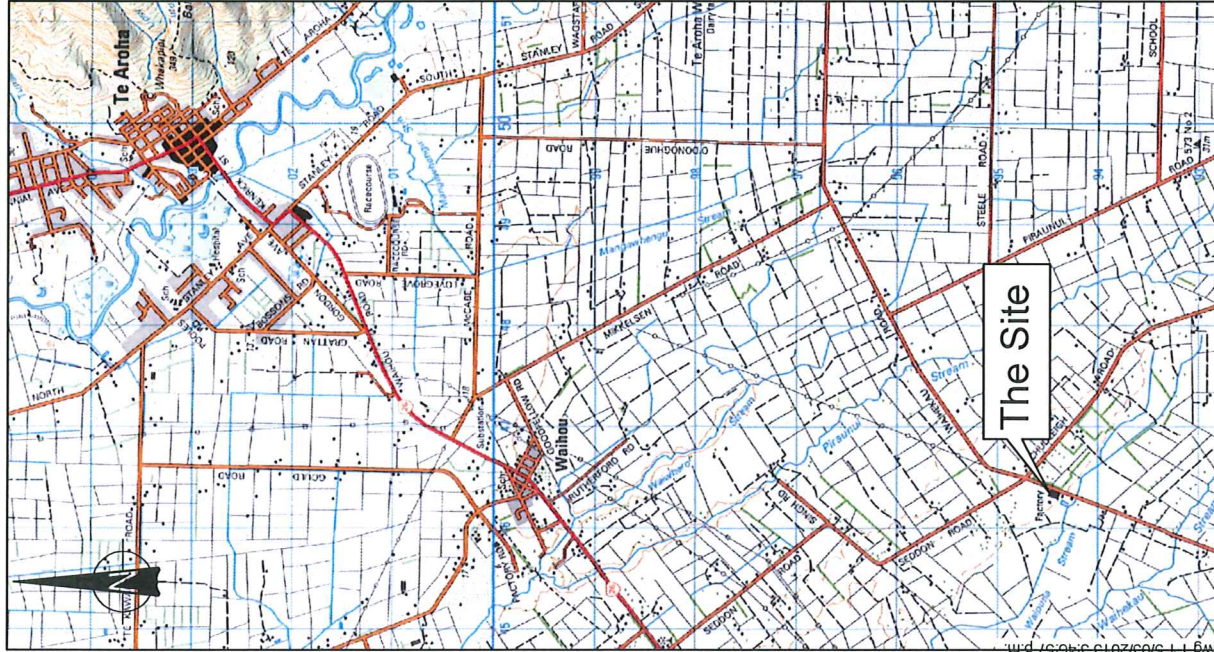
Aquatic Ecologist

Project Director

5-Apr-13  
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**Appendix A:        Figure 1**

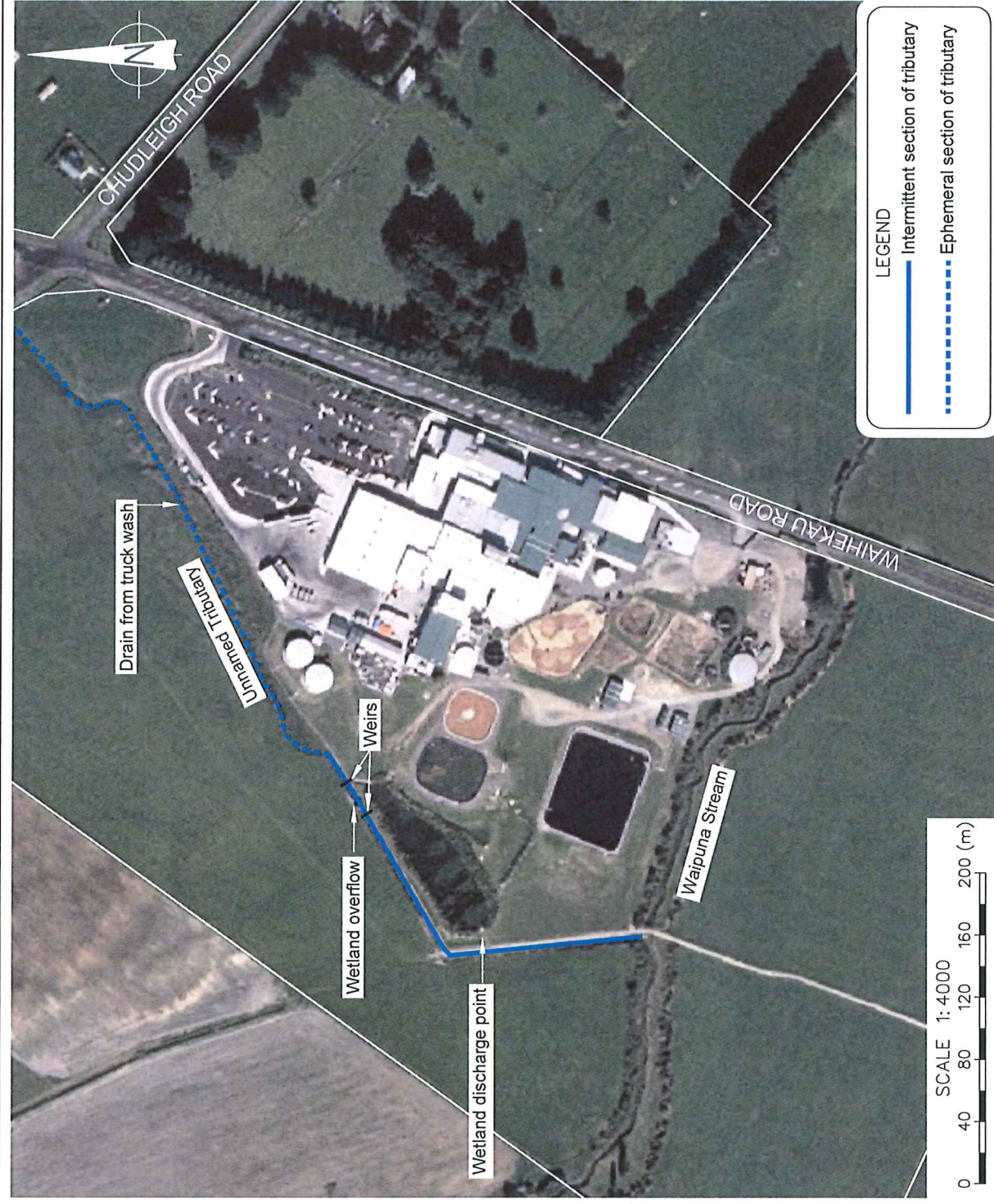




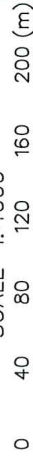
SCALE 1: 75000



Aerial photo sourced from Terralink International  
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Property boundaries sourced from Land Information New Zealand data  
as at 3-Dec-2012 (Crown Copyright Reserved).  
Topomap sourced from Land Information New Zealand data  
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SCALE 1: 4000



LEGEND  
— Intermittent section of tributary  
- - - Ephemeral section of tributary

**Tonkin & Taylor**  
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DRAWN	RBS	Mar.13
DRAFTING CHECKED	313	
APPROVED	UMI	
CADFILE :	61560.001-F1.dwg	
SCALES (AT A4 SIZE)	1: 4000 1: 75000	
PROJECT No.	61560.001	

INGHAM ENTERPRISES (NZ) PTY LTD  
FRESHWATER ASSESSMENT  
WAIHEKAU ROAD, WAI TOA  
Site and Location Plan

FIG. No. 0  
REV. 0

Figure 1.



## **Appendix B:       Habitat assessment**



# Wadeable Soft-Bottomed Streams

## Qualitative Habitat Assessment Field Data Sheet

STREAM NAME: Unnamed hip of Waipuna SITE NUMBER: \_\_\_\_\_  
 SAMPLE NUMBER: \_\_\_\_\_ ASSESSOR: Lize Inalis DATE: 28 Feb 2013

Habitat Parameter	Category																			
	Optimal					Suboptimal					Marginal					Poor				
<b>1. Riparian Vegetative Zone Width</b> (score each bank; determine left or right side by facing downstream)	<ul style="list-style-type: none"> <li>Bankside vegetation buffer is &gt;10m</li> <li>Continuous and dense</li> </ul>					<ul style="list-style-type: none"> <li>Bankside vegetation buffer is &lt;10m</li> <li>Mostly continuous</li> </ul>					<ul style="list-style-type: none"> <li>Pathways present and/or stock access to stream</li> <li>Mostly healed over</li> </ul>					<ul style="list-style-type: none"> <li>Breaks frequent</li> <li>Human activity obvious</li> </ul>				
Left bank	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Right bank	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Mean LB&RB <u>3</u>																				
<b>2. Vegetative Protection</b> (score each bank; determine left or right side by facing downstream)	<ul style="list-style-type: none"> <li>Bank surfaces and immediate riparian zones covered by native vegetation</li> <li>Trees, understorey shrubs, or non-woody plants present</li> <li>Vegetative disruption minimal</li> </ul>					<ul style="list-style-type: none"> <li>Bank surfaces covered mainly by native vegetation</li> <li>Disruption evident</li> <li>Banks may be covered by exotic forestry</li> </ul>					<ul style="list-style-type: none"> <li>Bank surfaces covered by a mixture of grasses/shrubs, blackberry, willow and introduced trees</li> <li>Vegetation disruption obvious</li> <li>Bare soil/closely cropped vegetation common</li> </ul>					<ul style="list-style-type: none"> <li>Bank surfaces covered by grasses and shrubs</li> <li>Disruption of streambank vegetation very high</li> <li>Grass heavily grazed</li> <li>Significant stock damage to the bank</li> </ul>				
Left bank	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Right bank	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Mean LB&RB <u>2.5</u>																				
<b>3. Bank Stability</b> (score each bank; determine left of right side by facing downstream)	<ul style="list-style-type: none"> <li>Banks stable</li> <li>Erosion/bank failure absent or minimal</li> <li>&lt;5% of bank affected</li> </ul>					<ul style="list-style-type: none"> <li>Moderately stable</li> <li>Infrequent, small areas of erosion mostly healed over</li> <li>5-30% of bank eroded</li> </ul>					<ul style="list-style-type: none"> <li>Moderately unstable</li> <li>30-60% of bank in reach has areas of erosion</li> <li>High erosion potential during floods</li> </ul>					<ul style="list-style-type: none"> <li>Unstable</li> <li>Many eroded areas</li> <li>60-100% of bank has erosional scars</li> </ul>				
Left bank	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Right bank	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Mean LB&RB <u>12</u>																				
<b>4. Channel sinuosity</b>	<ul style="list-style-type: none"> <li>Bends increase stream length 3-4 times longer than if it was in a straight line</li> </ul>					<ul style="list-style-type: none"> <li>Bends increase the stream length 2-3 times longer than if it was in a straight line</li> </ul>					<ul style="list-style-type: none"> <li>Bends increase the stream length 1-2 times longer than if it was in a straight line</li> </ul>					<ul style="list-style-type: none"> <li>Channel straight</li> </ul>				
SCORE <u>6</u>	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

SUBTOTAL : \_\_\_\_\_

## Soft bottomed continued

Habitat Parameter	Category																			
	Optimal					Suboptimal					Marginal					Poor				
<b>5. Channel Alteration</b>	<ul style="list-style-type: none"> <li>Changes to channel/dredging absent or minimal</li> <li>Stream with normal pattern</li> </ul>					<ul style="list-style-type: none"> <li>Some changes to channel/dredging</li> <li>Evidence of past channel/dredging</li> <li>Recent channel/dredging not present</li> </ul>					<ul style="list-style-type: none"> <li>Channel changes/dredging extensive</li> <li>Embankments or shoring structures present on both banks</li> <li>40 to 80% of reach channelised and disrupted</li> </ul>					<ul style="list-style-type: none"> <li>Banks shored with gabion or cement</li> <li>&gt;80% of the stream reach channelised and disrupted.</li> <li>Instream habitat altered or absent</li> </ul>				
<b>SCORE</b> <u>10</u>	20	19	18	17	16	15	14	13	12	11	<u>10</u>	9	8	7	6	5	4	3	2	1
<b>6. Sediment Deposition</b>	<ul style="list-style-type: none"> <li>Little/no islands or point bars present</li> <li>&lt;20% of the bottom affected by sediment deposition</li> </ul>					<ul style="list-style-type: none"> <li>New increase in bar formation, mostly from gravel, sand or fine sediment</li> <li>20-50% of the bottom affected;</li> <li>Slight deposition in pools</li> </ul>					<ul style="list-style-type: none"> <li>Some deposition of new gravel, sand or fine sediment on old and new bars</li> <li>50-80% of the bottom affected</li> <li>Sediment deposits at obstructions, constrictions, and bends</li> </ul>					<ul style="list-style-type: none"> <li>Heavy deposits of fine material</li> <li>Increased bar development</li> <li>&gt;80% of the bottom changing frequently</li> <li>Pools almost absent due to sediment deposition</li> </ul>				
<b>SCORE</b> <u>10</u>	20	19	18	17	16	15	14	13	12	11	<u>10</u>	9	8	7	6	5	4	3	2	1
<b>7. Pool Variability</b>	<ul style="list-style-type: none"> <li>Pools evenly mixed</li> <li>Large/shallow, Large/deep, Small/shallow, Small/deep</li> </ul>					<ul style="list-style-type: none"> <li>Majority of pools large/deep</li> <li>Very few shallow pools</li> </ul>					<ul style="list-style-type: none"> <li>Prevalence shallow pools</li> </ul>					<ul style="list-style-type: none"> <li>Majority of pools small/shallow</li> </ul>				
<b>SCORE</b> <u>5</u>	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	<u>5</u>	4	3	2	1
<b>8. Abundance and Diversity of Habitat</b>	<ul style="list-style-type: none"> <li>&gt;50% substrate favourable for invertebrate colonisation and wide variety of woody debris, riffles, root mats</li> <li>Snags/ submerged logs/ undercut banks/ cobbles provides abundant fish cover</li> <li>Must not be new or transient</li> </ul>					<ul style="list-style-type: none"> <li>30-50% substrate favourable for invertebrate colonisation</li> <li>Snags/submerged logs/undercut banks/cobbles</li> <li>Fish cover common</li> <li>Moderate variety of habitat types. Can consist of some new material</li> </ul>					<ul style="list-style-type: none"> <li>10-30% substrate favourable for invertebrate colonisation</li> <li>Fish cover patchy</li> <li>60-90% substrate easily moved by foot</li> <li>Woody debris rare or may be smothered by sediment</li> </ul>					<ul style="list-style-type: none"> <li>&lt;10% substrate favourable for invertebrate colonisation</li> <li>Fish cover rare or absent</li> <li>Substrate unstable or lacking</li> <li>Stable habitats lacking or limited to macrophytes</li> </ul>				
<b>SCORE</b> <u>4</u>	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	<u>4</u>	3	2	1
<b>9. Periphyton</b>	<ul style="list-style-type: none"> <li>Periphyton not evident on hand held substrates (macrophytes, wood etc) or fine sediments</li> </ul>					<ul style="list-style-type: none"> <li>Periphyton not visible on substrates but obvious to touch</li> </ul>					<ul style="list-style-type: none"> <li>Periphyton visible</li> <li>&lt;20% cover of available substrates</li> </ul>					<ul style="list-style-type: none"> <li>Periphyton obvious and prolific</li> <li>&gt;20% cover of available substrates</li> </ul>				
<b>SCORE</b> <u>5</u>	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	<u>5</u>	4	3	2	1
<b>Total Score</b> _____	NB: Use only means of LB and RB values																			