Environment B·O·P
Environmental Report 99/24
September 1999

Compliance Report of Surface Water Abstractions in Catchments Under Abstraction Pressure

Prepared by
Sean Hodges, Environmental Scientist
Dougall Gordon, Environmental Scientist

Environment B·O·P
Quay Street
P O Box 364
Whakatane
NEW ZEALAND

ISSN 1172 - 5850

Acknowledgements

Fieldwork carried out by Environment B·O·P's field staff is acknowledged and appreciated. The assistance with map preparation by John Gibbons-Davies was much appreciated. I would also like to thank Mr Andy Bruere, Principal Compliance Officer for reviewing and commenting on the report.

Cover Photo: Water intake structure on the Waiari Stream, Te Puke

Contents

Chapter 1: Introduction 1

1.1 Background 1

1.2 Objectives 2

1.3 Scope 2

Chapter 2: Methodology 5

2.1 Pressure Catchment Assessment 5

2.2 Compliance Monitoring 5

Chapter 3: Pressure Catchments 7

3.1 Catchments Under Abstraction Pressure 7

Chapter 4: Compliance Results 15

4.1 Compliance of Current Consents 15

4.1.1 Introduction 15

4.1.2 Compliance with purpose and location 15

4.1.3 Water Use 15

4.1.4 Water Meters 16

4.1.5 Screens 16

4.1.6 Changes in Crop Area or Type 16

4.1.7 Water Availability 17

4.1.8 Water Use Frequency 18

4.1.9 Specific Monitoring Requirements 19

4.1.10 Overall Compliance 19

4.2 Compliance of expired and surrendered irrigation consents 19

Chapter 5: Discussion 21

5.1 Pressure Catchments 21

5.2 Municipal Takes on Pressure Catchments 22

5.2.1 Introduction 22

5.2.2 Summary 22

5.3 Compliance Survey 23

5.3.1 Introduction 23

5.3.2 Water Meters 23

5.3.3 Water Allocation Methodology 23

5.3.4 Surrendered and Expired Consents 24

Chapter 6: Summary of Conclusions 25

References 27

Appendices 29

Chapter 1: Introduction

1.1 Background

Twelve streams in the Taraunga Harbour catchment were identified in Environmental Report 94/10 (Tauranga Regional Plan, Environmental Investigations, Water and Sediment Quality of Taraunga Harbour) as being under abstraction pressure according to the hydrological low flow criteria. This criteria is the ratio of the total abstraction rate to the five-year return 7-day low flow ($Q_5 7_d$).

Stream catchments were classified according to four categories:

(i) Under very high abstraction pressure; abstraction to Q5 ratio >40 %

(ii) Under high abstraction pressure: abstraction to Q5 ratio = 35- 40 %

(iii) Under medium abstraction pressure; abstraction to Q5 ratio = 10- 35%

(iv) Under low abstraction pressure; abstraction to Q5 ratio < 9%

Follow-up compliance monitoring was completed for the 12 streams that were identified in Environmental Report 94/10 and reported in Environmental Report 95/18 in 1995. Environmental Report 95/18 also defined that a pressure catchment is:

"When the ratio of the total catchment abstraction to the five year return 7 day low flow ($Q_5 7_d$) is greater than 30 %."

According to compliance monitoring policy (Environmental Report 95/19) monitoring and reporting of irrigators occurs every five years. Monitoring reporting of irrigators for catchments which are under abstraction pressure, occurs every two years.

Past compliance reporting (Environmental Report 95/18) was limited to the 12 catchments that were previously identified as being under abstraction pressure in Environmental Report 94/10. No other stream catchments within the region were investigated for abstraction pressure.

This report is a follow-up compliance report to Environmental Report 95/18 for compliance monitoring that was carried out by Environment B·O·P during 1998/1999 irrigation season on stream catchments that were identified as being under abstraction pressure. Catchments that are approaching abstraction pressure were also identified.

Stream catchments across the region were assessed for abstraction pressure with the following exceptions:

- Abstractions from drains and canals on the Rangitaiki Plains as these are considered artificial water courses and ecological values are low.

- Abstractions from the regions major rivers — Wairoa, Kaituna, Tarawera, Rangitaiki, Whakatane–Waimana, Waioeka and Otara rivers as water abstraction pressure on these larger water courses is assessed individually as consent applications are made. The larger abstractions relate to major industrial takes on these rivers.

1.2 Objectives

This report was prepared to:

(a) Identify surface catchments within the Bay of Plenty region where abstraction pressure is greater than 30% of the five year return 7 day low flow ($Q_5 7_d$) and identify stream catchments which are approaching abstraction pressure.

(b) Assess compliance with resource consent conditions for water abstraction within pressure catchments, and

(c) To investigate if any abstractions covered by consents that had been surrendered or have expired which might still be being exercised illegally.

1.3 Scope

This report deals with those consents to take surface water in the Bay of Plenty Region for the 1998/1999 irrigation season.

An assessment of pressure catchments was carried out which highlighted seven catchments that had water allocations greater than 30% of the $Q_5 7_d$, that should be targeted for compliance work.

These catchments are:

- The Waiari at Te Puke

- The Waimapu, Waipapa, Ohaurere, Kopurereroa, and Mangawhai streams which flow into southern Tauranga Harbour, and

- The Uretara (Wharawhara) stream which flows into the northern Tauranga Harbour.

Compliance was completed for all current consents that are used for irrigation purposes. Municipal water supply consents were excluded from compliance survey as they are reported separately (Environment Report 99/05). An attempt was made to investigate if any surrendered and expired irrigation consents on the Waimapu, Waipapa and Waiari stream catchments which might be still being exercised illegally. The Waimapu, Waipapa and Waiari stream catchments were selected

because they are catchments that historically, have a high number of expired and surrendered consents.

Chapter 2: Methodology

2.1 Pressure Catchment Assessment

Assessment of abstraction pressure for stream catchments in the Bay of Plenty region requires calculating the total amount of water used in catchment and stream flow data to calculate the $Q_5 7_d$ low flow.

Stream catchment boundaries were identified and then the volumes allocated for each catchment were derived from the information contained within Environment B·O·P's consent database. $Q_5 7_d$ low flow information was derived from Environment B·O·P's hydrological data summaries (Environmental Report 96/22) and where there was insufficient low flow information, $Q_5 7_d$ was calculated using catchment comparisons and/or empirical methods.

Evaluation of abstraction pressure was then made using the following formula:

$$\text{Pressure Catchment Assessment} \quad \% = \frac{\text{Total of catchment flow allocated}}{Q_5 7_d} \times 100$$

2.2 Compliance Monitoring

Fieldwork was undertaken to assess compliance with consent conditions for catchments where greater than 30% of the $Q_5 7_d$ was allocated. Staff also attempted to visit sites on the Waimapu, Waipapa and Waiari stream catchments where consents had been surrendered or expired to ensure that water was not being taken without a current consent.

The fieldwork involved checking each consent condition and recording results on irrigation field sheet. A copy of the master field sheet is attached as Appendix I.

Checks were made on the purpose of the water permit, water allocation, location of take, water meter requirements, screen requirements and changes in water use. Information such as changes in crop type over the last five years, changes in irrigation area, water availability and if irrigation was being used each summer were also noted if the information could be sought from the consent holder.

Chapter 3: Pressure Catchments

3.1 Catchments Under Abstraction Pressure

Over 15 catchments in the Region were found to be approaching abstraction pressure as shown in table 3.1 and figures 1.1-1.3. Only seven catchments were found to have abstraction pressure greater than 30% of the Q_57_d low flow. Five catchments were identified to be under high abstraction pressure where 20 to 30% of the Q_57_d has been allocated. Ten catchments were found to be under medium abstraction pressure where 10 to 20% of the of Q_57_d has been allocated.

Table 3.1 Pressure catchments and catchments approaching abstraction pressure

Catchment	*Number of consents*	*Low flow Q_57_d (l/s)*	*Consented Allocation (l/s)*	*Q5 minus Allocation (l/s)*	*Percentage of Q_57_d allocated*	*Allocation Still Available (l/s)*	*Catchment Area (km^2)*
Wharawhara	4	160	156	4	98	NIL	16
Mangawhai	1	7	4	3	57	NIL	3
Ohaurere	2	152	67	85	44	NIL	30
Waimapu	16	1675	657	1027	39	NIL	107
Waipapa	9	222	82	140	37	NIL	32
Waiari	15	3422	1177	2245	34	NIL	73
Kopurereroa	7	1550	482	1068	31	NIL	74
Waitekohe	5	135	37	98	28	3	20
Te Rereatukahia	11	124	33	91	26	4	19
Haumea	11	1200	263	937	22	97	66
Raparapahoe	14	820	175	645	21	71	50
Tahawai Trib	1	18	4	15	20	2	3
Waitahanui	10	4800	924	3876	19	516	112
Waitekohe	1	95	16	79	17	13	10
Ohineangaanga	4	263	43	220	16	36	19
Waiau	2	182	28	153	16	26	23
Te Mania	2	78	11	67	14	12	12
Waiaua	2	285	40	246	14	46	95
Whatakao	4	203	27	176	13	34	25
Tuapiro	15	429	52	378	12	77	44
Wairoa Trib	7	160	17	143	11	31	83
Tuapo	2	39	4	35	10	8	7

Pressure Catchments

High Abstraction Pressure

Medium Abstraction Pressure

Pressure *> 30% Q_57_d*
High *20-30% Q_57_d*
Medium *10-20% Q_57_d*

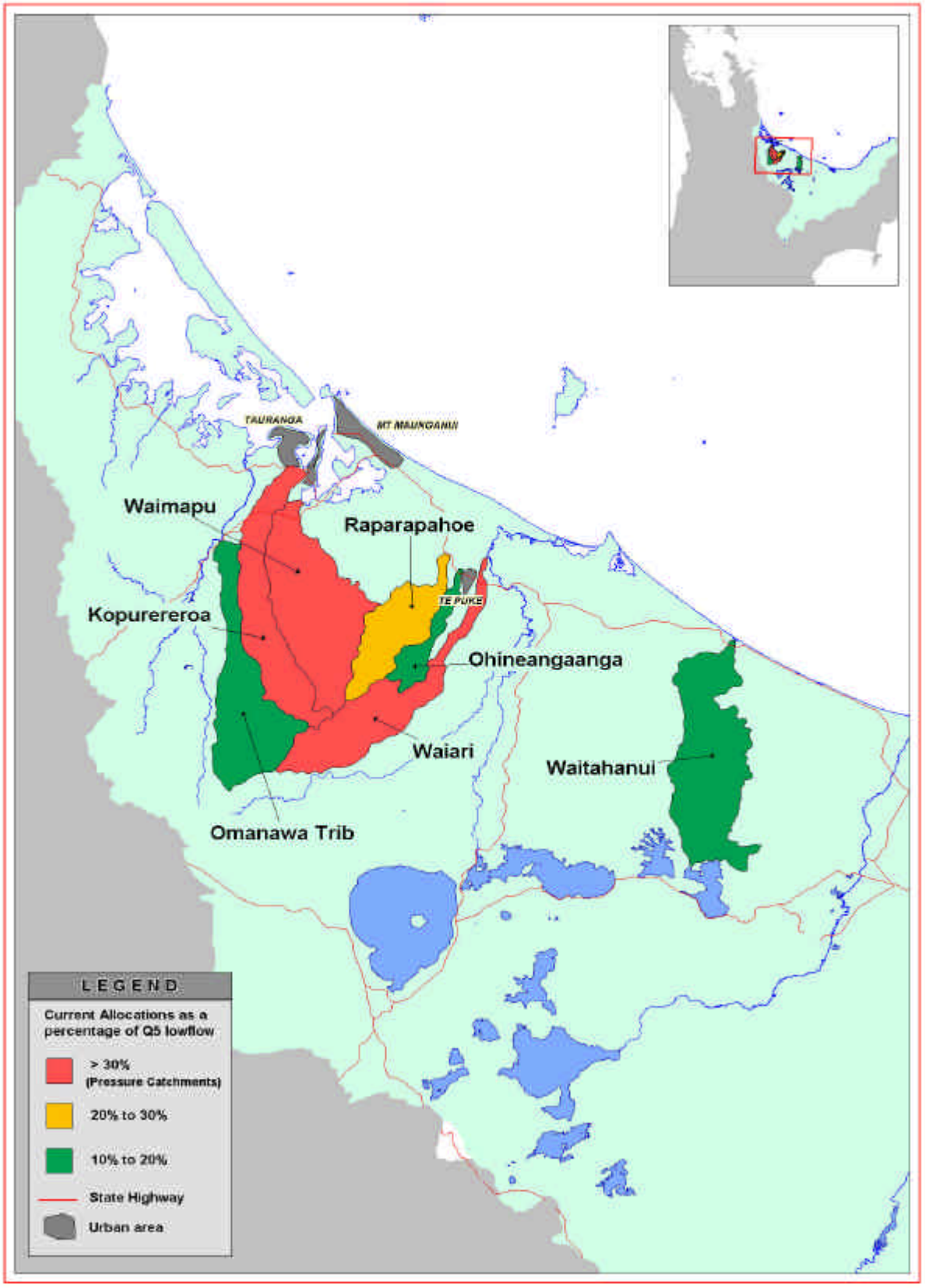

Figure 1.1 Catchments under abstraction pressure in the southern Tauranga Harbour and Te Puke areas

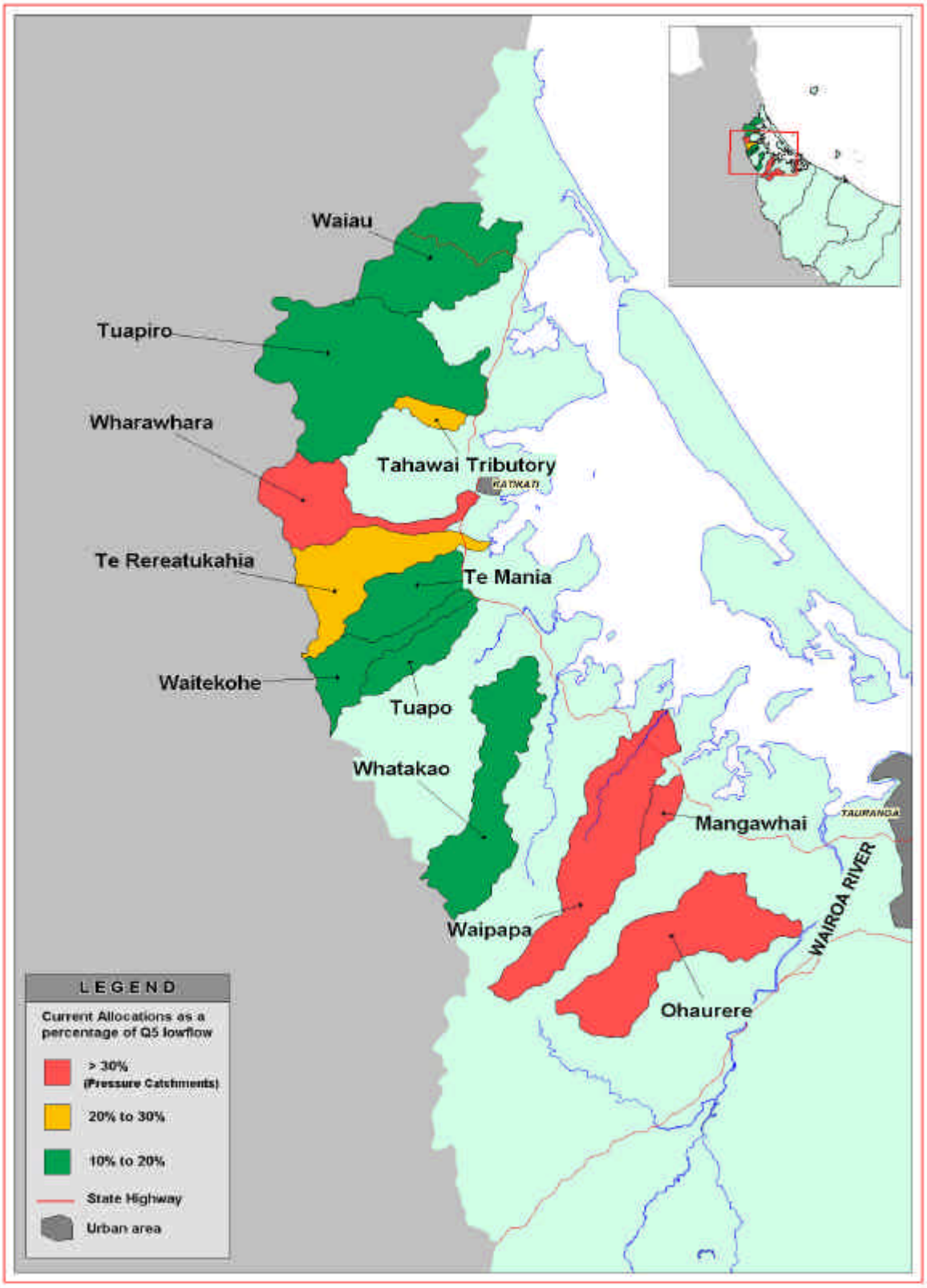

Figure 1.2 Catchments under abstraction pressure in the Northern Tauranga Harbour area

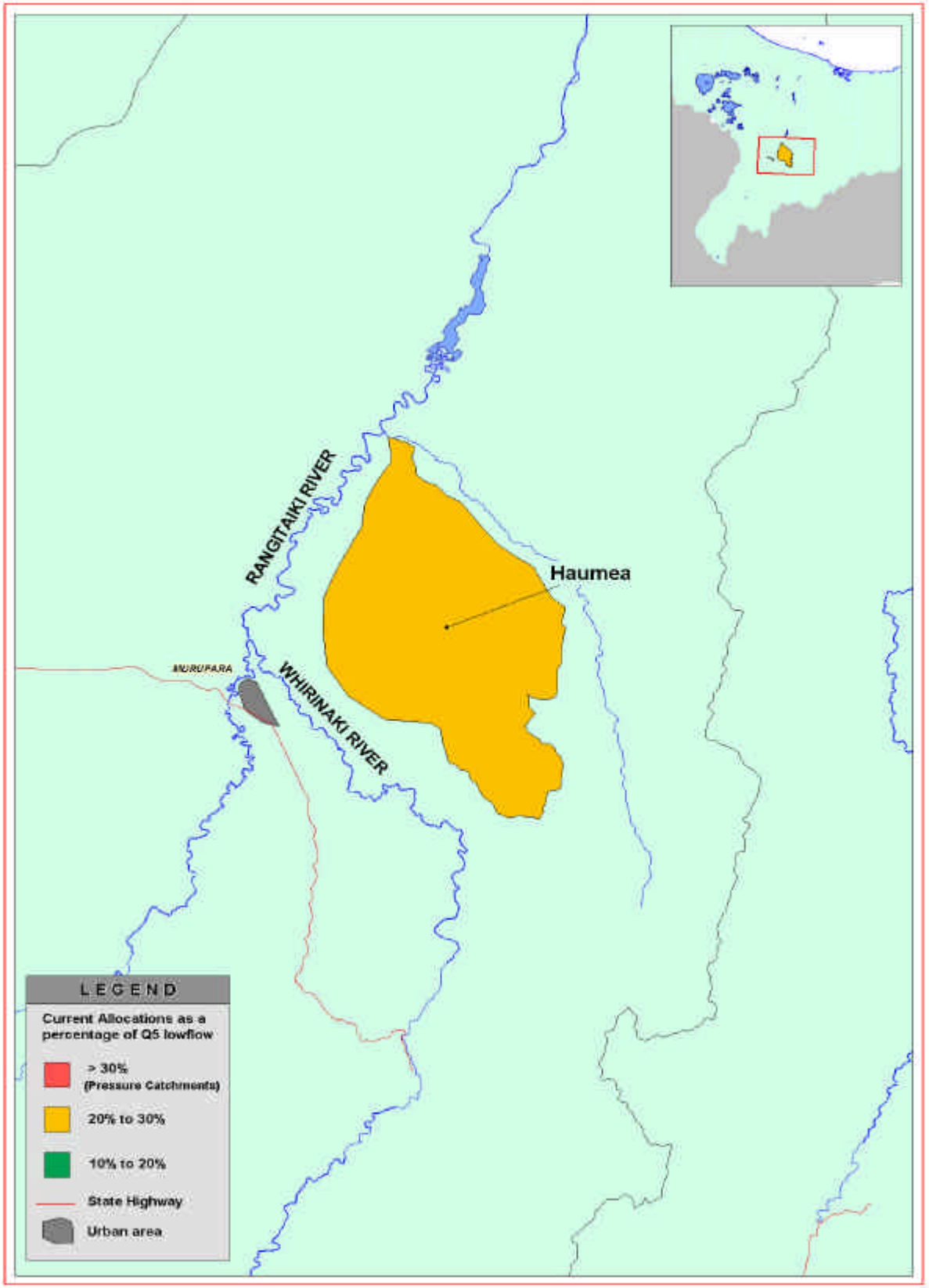

Figure 1.3 Catchments under abstraction pressure in the Galatea Plains

Chapter 4: Compliance Results

4.1 Compliance of Current Consents

4.1.1 Introduction

Compliance monitoring was carried out on the Waimapu, Wairari, Waipapa, Kopurereroa, Ohaurere, Wharawhara, and Mangawhai catchments and a total of 45 current consents were assessed for compliance. Compliance monitoring survey results are presented by each consent condition category.

4.1.2 Compliance with Purpose and Location

The purpose of the consent and the location of the point of the intake is normally specified in the consent. As shown in table 4.1, of the 45 consents that were checked for the purpose and location there was 100 % compliance. Three consents could not be checked as the orchards could not be located or the consent is no longer used.

Table 4.1 Compliance results for the purpose and location of current irrigation consents

Catchment	Total Current Consents	Does the purpose of abstraction comply?	Is location of the abstraction correct?
		Yes	Yes
Waimapu	15	15	15
Waiari	13	13	12
Waipapa	7	7	7
Kopurereroa	6	4	4
Ohaurere	1	1	1
Wharawhara	2	2	2
Mangawhai	1	1	1
Totals	**45**	**42**	**42**

4.1.3 Water Use

In carrying out the compliance survey, staff were unable to assess the volumes of water used by the consent holders unless specific conditions require water meters. However, field staff attempted to assess water volume required by calculating this from the crop area irrigated and by using standard water application rates for a particular crop. The application rates used were; 3 mm/day for horticultural crops and 5 mm/ day for pasture.

As shown in Table 4.2 on average, only 40% of the water allocated to irrigation consents is used. Irrigation consents in the Kopurereroa catchment were found to be using most of their allocation compared to consents on the Waiari, which used less than 4% of the allocation. It was noted in field sheets that a number of people had not used their water allocations for the past few years but had to use their irrigation systems over the extended dry period of 1997/98 summer.

Table 4.2 Water requirements assessed as a percentage of allocation for current irrigation consents

Catchment	Total current consents	Water requirements as a precentage of actual allocation	Range
Waimapu	15	47%	8% - 83%
Waiari	13	4%	1% - 7%
Waipapa	7	18%	2 %- 40%
Kopurereroa	6	84%	N/A
Ohaurere	1	52%	N/A
Wharawhara	2	N/R	N/A
Mangawhai	1	35%	N/A
Overall Average		40%	

N/A = Not applicable
N/R = No Results

4.1.4 Water Meters

Only two irrigation consents out of a total of 45 checked for compliance are required to have water meters and supply meter records to Environment B·O·P. One irrigation consent holder kept water meter records but meter records had not been supplied to Environment B·O·P. The second consent which required a water meter and meter records was not able to be assessed for compliance as the consent holder could not be found to confirm compliance details. These consents will be followed up by field staff.

4.1.5 Screens

Screens were required to be fitted to 43 out the 45 consents surveyed. Only 42% of consents could be checked for screen compliance as the intake structures were either removed because irrigation was not required over the summer season or the consent was no longer used. Of the consents that were surveyed, there was over 90% compliance with screen requirements. Only two consents did not have screens in place or the screen size was incorrect. These consents will be followed up by field staff.

4.1.6 Changes in Crop Area or Type

The main crop types that require irrigation from pressure catchments are; kiwifruit, avocado, floriculture and one consent for irrigation of golf greens. Kiwifruit is the main crop type that requires irrigation as shown in Table 4.3.

As shown in Table 4.4, over 71% of the consents that were surveyed have not changed crop type or crop area in the last 5 years. Of the 20% that have changed crop type, most had changed to avocados, and flowers. The remaining changes were due

to land use changes as kiwifruit orchards have been pulled out to make way for rural subdivisions. In general crop use and land use changes have resulted in a reduction in water use.

Table 4.3 The range of crop type for irrigation consents that are in pressure catchments

		Crop Type					
Catchment	**Total current consents**	**Kiwifruit**	**Avocados**	**Flowers**	**Other**	**No Crop**	**Unknown**
Waimapu	15	5		2	2	2	5
Waiari	13	9		1	3		1
Waipapa	7	3	3		1		
Kopurereroa	6	2					2
Ohaurere	1	1					
Wharawhara	2		1				1
Mangawhai	1	1					
Totals	45	21	4	3	6	2	9
		46%	9%	7%	13%	4%	20%

Table 4.4 Changes in crop area for irrigation consents that are in pressure catchments

		Crop area changes in the last 5 years?		
Catchment	**Total current consents**	**Yes**	**No**	**Cannot be determined**
Waimapu	15	4	11	
Waiari	13	1	10	2
Waipapa	7	1	6	
Kopurereroa	6	1	3	2
Ohaurere	1		1	
Wharawhara	2	2		
Mangawhai	1		1	
Totals	45	9	32	4
		20%	71%	9%

4.1.7 Water Availability

As shown in Table 4.5, 18% of irrigation consents had problems with water availability. Of the catchments surveyed, the Kopurereroa had the most problems with water availability. The Kopurereroa catchment is a relatively small catchment, with a limited flow regime, and a municipal take, which abstracts a large proportion of the available stream flow.

Table 4.5 Water availability in catchments under abstraction pressure

		Any problems with water availability?		
Catchment	**Total current consents**	**Yes**	**No**	**Cannot be determined**
Waimapu	15	2	13	
Waiari	13	1	10	2
Waipapa	7		7	
Kopurereroa	6	4		2
Ohaurere	1	1		
Wharawhara	2		2	
Mangawhai	1		1	
Totals	45	8	33	4
Percentage		18 %	73 %	9 %

Two consent holders who abstract water from the Waiorohi Stream (tributary in the Waimapu catchment), suggested that the flow in the Waiorohi was lower than in the past. Four consent holders in the same stream tributary had problems with water quality. Two consent holders suggested that the water quality is degraded by sediment discharged from the Tauranga District Council, Water Treatment plant which is upstream of the take point.

4.1.8 Water Use Frequency

As shown in Table 4.6, only 40% of irrigation consents are used each summer. A total of seven consent holders (three from Waipapa catchment and four in the Waiari catchments), commented that they only used irrigation occasionally when there was a dry year or they only used irrigation every 2-4 years.

One consent holder using irrigation in the Waimapu catchment had changed to groundwater and several consents were no longer using irrigation, as orchards have been pulled out to make way for rural subdivisions. Two consent holders stated that they were no longer using irrigation and were encouraged to surrender their consents. Four consents have recently been surrendered in Waimapu Catchment and three consents have been surrendered in the Waiari catchment which will reduce abstraction pressure.

Table 4.6 Irrigation use in pressure catchments

		Is irrigation used each summer?		
Catchment	**Total current consents**	**Yes**	**No**	**Cannot be determined**
Waimapu	15	6	9	
Waiari	13	6	5	2
Waipapa	7	3	4	
Kopurereroa	6	2	2	2
Ohaurere	1		1	
Wharawhara	2	1	1	
Mangawhai	1		1	
Totals	45	18	23	4
Percentage		40%	51%	9%

4.1.9 Specific Monitoring Requirements

Of the 45 consents that were surveyed, one irrigation consent required a residual flow in the stream.

4.1.10 Overall Compliance

Overall, there has been 87 % compliance with consent conditions as shown in Table 4.7. Only two consents were found to be in non-compliance because of incorrect screen requirements. Four consents could not be assessed as the property could not be found or the consent holder could not be found to confirm some details. These consents will be followed up by field staff.

Tables 4.7 Overall irrigation consent compliance

		Overall Compliance?		
Catchment	**Total current consents**	**Yes**	**No**	**Cannot be determined**
Waimapu	15	14	1	
Waiari	13	11		2
Waipapa	7	7		
Kopurereroa	6	4		2
Ohaurere	1		1	
Wharawhara	2	2		
Mangawhai	1	1		
Totals	45	39	2	4
Percentage		87%	4%	9%

4.2 Compliance of Expired and Surrendered Irrigation Consents

An attempt was made to investigate if any surrendered and expired consents were still being exercised illegally on the Waimapu, Waipapa and Waiari catchments. The Waimapu, Waipapa and Waiari stream catchments were selected because these catchments historically have a higher number expired and surrendered consents. The results of this survey are presented in Table 4.8. Over 30 expired and surrendered consents were assessed for compliance. Of those, only two consents were found to be irrigating without a current consent. The two irrigators that were taking water without resource consent were informed by field staff to reduce their take to less than 15 cubic metres per day, which is currently permitted without resource consent. Staff will continue to monitor for compliance from time to time.

Table 4.8 Results of surrendered and expired compliance survey

		Are consents being used?		
Catchment	**Totals**	**Yes**	**No**	**Not found**
Waiari	6	1	5	
Waimapu	3		3	
Waipapa	21	1	18	2
	30	2	26	2

Chapter 5: Discussion

5.1 Pressure Catchments

Of the seven pressure catchments that were identified, six have municipal water supply consents, using a large proportion of the available $Q_5 7_d$ low flow compared to irrigation uses. Five of the pressure catchments also have over 90% of the allocation for municipal supply as shown in Table 5.1. Municipal consents were also found to take more than 30% of the $Q_5 7_d$ on all pressure catchment except the Waimapu and Kopurereroa catchments. Irrigation allocation generally made up less than 10% of the $Q_5 7_d$ as shown in table 5.2.

Table 5.1 Percentage of water allocation by use for each pressure catchment

Catchment	Allocation – Irrigation %	Allocation – Municipal %
Waimapu	4.1	95.90
Waiari	9.39	90.61
Waipapa	25.74	74.26
Kopurereroa	10.40	89.60
Ohaurere	4.48	95.52
Wharawhara	2.74	97.26
Mangawhai	N/A	N/A

N/A – Not Applicable

Table 5.2 Percentage of $Q_5 7_d$ that is allocated to municipal and irrigation uses for each pressure catchment

Catchment	Allocation as % of $Q_5 7_d$ - Irrigation	Allocation as % of $Q_5 7_d$ Municipal
Waimapu	0.61	37.62
Waiari	3.29	31.78
Waipapa	9.51	27.45
Kopurereroa	10.42	27.87
Ohaurere	1.97	42.00
Wharawhara	2.68	95.00
Mangawhai	57.14	-

N/A – Not Applicable

5.2 Municipal Takes on Pressure Catchments

5.2.1 Introduction

Compliance reporting of municipal takes is not part of the scope of this report as it has already been reported in Environmental Report 99/05. However, concerns were raised in the compliance report that a number of municipal consents have been allocated a large proportion of the stream flow resulting in over-allocation of some stream catchments. A summary of the municipal consents that are considered to be causing abstraction pressure is presented in Table 5.3.

Table 5.3 Summary of municipal takes on pressure catchments

Catchment	Territorial Authority	Consent Number	Allocation l/s	Flow l/s ($Q_5 7_d$).	Percentage of ($Q_5 7_d$).	Residual Flow Yes/No
Waiari	Western Bay of Plenty D.C	20175# 20409	11.4 1076	3422	32 %	Yes
Waipapa	Western Bay of Plenty D.C	20545	61	222	27 %	Yes
Waimapu	Tauranga D.C	20202	630	1675	38 %	Yes
Ohaurere	Western Bay of Plenty D.C	22084	64	152	42 %	No
Kopurereroa	Tauranga D.C	20173	432	1550	28 %	Yes
Wharawhara	Western Bay of Plenty D.C	20544	152	160	95 %	Yes

 # spring which flows into the Waiari Stream

5.2.2 Summary

The Waimapu, Waiari, Waipapa, Kopurererua, Ohaurere and Wharawhara are all pressure catchments because there is over allocation from municipal takes which are held by the Western Bay of Plenty and Tauranga District Councils. This is assuming that the Council's abstract water at the maximum rate. Most of the municipal consents have residual low flow requirements, which offer some residual flow buffer.

Most the municipal consents have no expiry dates as the consents were granted by the former Bay of Plenty Catchment Commission under the Water and Soil Conservation Act, 1967. With the enactment of the Resource Management Act, 1991, the consents will now expire in 2026 which is a long time before allocations can be reviewed. There are draft policy and methods that address water allocation issues in the Draft Land and Water Regional Plan.

However, the Western Bay of Plenty District Council have recently investigated alternative water sources for municipal supply, as the District Council is concerned about the security of water supply, particularly during periods of hydrological drought. Western Bay of Plenty District Council have decided to investigate groundwater as an alternative to surface water and the District Council has recently drilled several test bores.

5.3 Compliance Survey

5.3.1 Introduction

The compliance survey showed that the great majority of consent holders were complying with conditions stated in their consents, and very few were taking up to the allocated volumes. A number of consent holders were taking water infrequently, or only during periods of protracted dry weather. A small number of irrigation consents have not been used for more than three years or irrigation is no longer required as crops have been removed to make way for subdivision development. Field staff encouraged consent holders that are not using their consented allocation to surrender their consent.

On average, it was found that only 40 % of the water allocated to irrigation consents is used and there was over 87% compliance with consent conditions, which indicates that it may be appropriate to review the frequency of compliance surveys. Currently Environment B·O·P monitors irrigation consents in pressure catchments every two years (*Compliance and Impact Monitoring Policy 1995*, Environmental Report 95/19).

5.3.2 Water Meters

At this time, Environment B·O·P only requires water meters to be fitted when the takes are greater than 400 m^3/day and all the municipal takes that are on the pressure catchments have water meters. Water meters are generally used to assess compliance with allocation on a volume per day basis but water meters do not show if the maximum rate of take has been complied with. It is possible that the maximum abstraction rate may be exceeded during times of peak demand which may compromise the instream values.

It is considered that compliance with the maximum allocation per day is the most practical method to determine compliance with the actual allocation. This is particularly important in catchments, which are under abstraction pressure. Water meters could also be considered for pressure catchments and catchments that are approaching allocation limit of 30% of the $Q_5 7_d$, for example, catchments where 20 to 30 % of the $Q_5 7_d$ has been allocated. This may enable better water management before the stream catchment becomes over allocated as any non-compliance with allocation during a dry year may be sufficient to adversely affect the stream flow for down stream irrigators, domestic users and the stream ecology. A policy structure to address water allocation in pressure catchments is anticipated to be included in the draft Land and Water Regional Plan.

5.3.3 Water Allocation Methodology

Environment B·O·P's current water allocation methodology is based on the hydrological low flow regime of a stream and the allocation is made on a whole catchment basis. The current pressure catchment methodology does not take into account of the effect of water takes in the headwaters of a catchment. Currently allocation is determined on the available low flow volume at the lower end of the catchment. The downside of this method is that when there are a number of takes in the headwaters of a catchment a large proportion of the stream flow may be taken but there could still be compliance with the $Q_5 7_d$ low flow criteria. It is possible that

instream, ecological values may be compromised and little remaining residual flow would be available for domestic users on reaches of a particular catchment.

Research is currently underway by Environmental Investigations section of Environment B·O·P, to assess the ecological values of catchments that are currently under abstraction pressure. Studies of stream ecology will enable environmental bottom lines or minimum flows to be set for a wide range of catchments in the region. It is anticipated that a new policy direction for water allocation will be based on the ecological investigations currently being conducted by the Environmental Investigations Section.

5.3.4 Surrendered and Expired Consents

Of a total of 30 expired and surrendered consents that were assessed for compliance, only two consents were found to be irrigating without a current consent. This is a high level of compliance but it is possible that water is taken without consent during hydrological drought and this would be the best time to evaluate this issue. Generally in a normal year, irrigation is not needed to replenish soil moisture deficits for horticultural crops such as kiwifruit. Kiwifruit is the main type of crop that is irrigated in the pressure catchments surveyed and kiwifruit generally have a lower water requirement once the vines are established.

Chapter 6: Summary and Conclusions

(i) The compliance survey of pressure catchments showed that the great majority of irrigation consent holders were complying with conditions set out in their consents, and very few were taking up to the allocated volumes. A number of consent holders were only using water infrequently, or under conditions of protracted dry weather.

(ii) On average only 40% of the water allocated to irrigation consents is used and there was over 87% compliance, which may indicate that the frequency for compliance surveys could be reviewed.

(iii) It is very difficult to know if there is compliance with the actual allocation, unless water meters are used. This would be particularly important in catchments that are under abstraction pressure as ecological values are likely to be compromised. Water meters could also be considered for catchments that are approaching the allocation limit of 30% of the Q_57_d, for example, catchments where 20 to 30 % of the Q_57_d has been allocated. This may enable better water management before the stream catchments become over allocated as non-compliance of allocation during a dry year, maybe sufficient to adversely effect the instream ecological values.

(iv) Municipal water supply takes were identified to cause abstraction pressure on six of the seven pressure catchments rather than irrigation takes. Five of the pressure catchments have over 90% of their allocation for municipal supplies. Most of the municipal supplies were found to take close to or more than 30 % of the Q_57_d. Water allocation for many of the municipal takes may need to be reviewed as these takes are causing abstraction pressure, assuming that the abstraction occurs at the maximum rate.

(v) Environment B·O·P's current water allocation methodology is based on the hydrological low flow regime rather than residual flow requirement to maintain ecological values of the stream and providing for domestic users. Research is currently underway by the Environment Investigations section of Environment B·O·P, to assess the ecological values of catchments that are currently under abstraction pressure. Studies of the stream ecology will enable environmental bottom lines to be set for a wide range of catchments in the region as a basis for water allocation.

(vi) Policy and methods for sustainable water allocation have been drafted in Environment B·O·P's Draft Land and Water Regional Plan. It is expected that the policy and methods in the upcoming Land and Water Plan will address water allocation issues.

References

Gardner, R B 1995: *Compliance and Impact Monitoring Policy 1995*, Environmental Report 95/19 17p.

Barber J L 1999: *Compliance Report Water Permits for Municipal and Industrial Takes*, Environmental Report 99/05, 28p.

Campbell H J 1995: *Compliance Report Resource Consents to Take Water from Streams under Abstraction Pressure in the Bay of Plenty Region*, Environmental Report 95/18, 62p.

Hodges S L, Stringfellow M A 1996: *Bay of Plenty Low Flows Summary to 1996*, Environmental Report 96/22, 40p.

McIntosh J J 1994: *Tauranga Harbour Regional Plan Environmental Investigations Water and Sediment Quality of Tauranga Harbour*, Environmental Report 94/10.

Appendices

Appendix I – Example of Irrigation Abstraction Field Form

Example Only

ENVIRONMENT B·O·P
Bay of Plenty Regional Council

ENVIRONMENT B O P Consent No.:
IRRIGATION ABSTRACTION FIELD SHEET

Owner: _____ Telephone: _____
Address: _____ Map Ref: _____
_____ Officer: _____ Inspection Date: _____

Purpose:		Comply: YES/NO
Total area irrigated:	Crop Type:	
Office Use:	Water required: _____ m3/d. Allocation: _____ m3/d.	Comply: YES/NO
Source of supply:	- Bore/Stream (name)	
	- Is location correct? (comply)	YES/NO
	- If NO get correct map reference	
Water Meter:	- Is a water flow /or hour meter required?	YES/NO
	- Is a water flow /or hour meter fitted?	YES/NO
	- Are records kept as required?	YES/NO
	- Are records supplied as required?	YES/NO
		Comply: YES/NO
Borelog:	- Required?	YES/NO
	- Is it supplied?	YES/NO
	- Access to bore required?	YES/NO
	- Access available?	YES/NO
		Comply: YES/NO
Screen:	- Required?	YES/NO
	- Screen in place?	YES/NO
	- Sizing correct?	YES/NO
		Comply: YES/NO
Water Use:	- Has crop area or type changed in the last 5 years?	YES/NO
	- If YES provide detail: _____	
	- Any problems with water availability?	YES/NO
	- If YES provide detail: _____	
	- Is irrigation used each summer?	YES/NO
	- If NO provide detail: _____	

Any specific monitoring required: _____

Overall Compliance: YES/NO

Any actions required by consent holder: YES/NO - If so provide detail: _____

Signed: _____

Copy to Property Owner/Consent Holder ☐ Posted ☐ In Person

Name of Person(s) Field Sheet Served On: