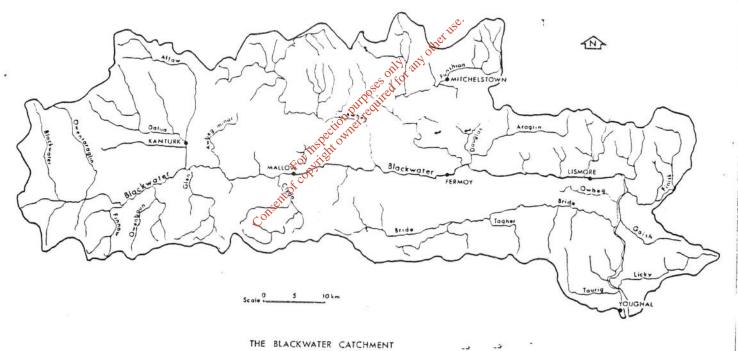
DRAFT WATER QUALITY MANAGEMENT PLAN FOR

THE MUNSTER BLACKWATER CATCHMENT

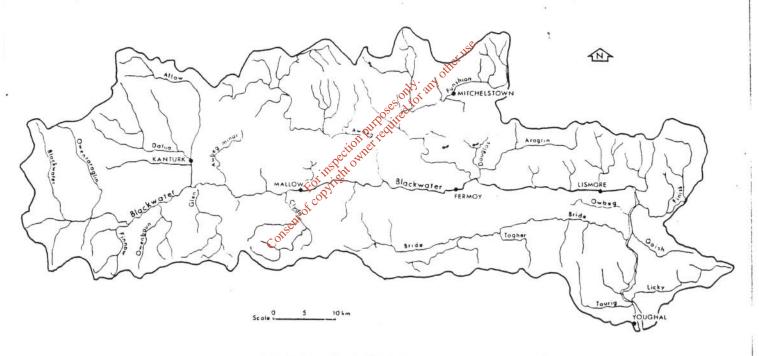


VOLUME 3

ABSTRACTIONS AND DISCHARGES

DRAFT WATER QUALITY MANAGEMENT PLAN FOR

THE MUNSTER BLACKWATER CATCHMENT



THE BLACKWATER CATCHMENT

VOLUME 3
ABSTRACTIONS AND DISCHARGES

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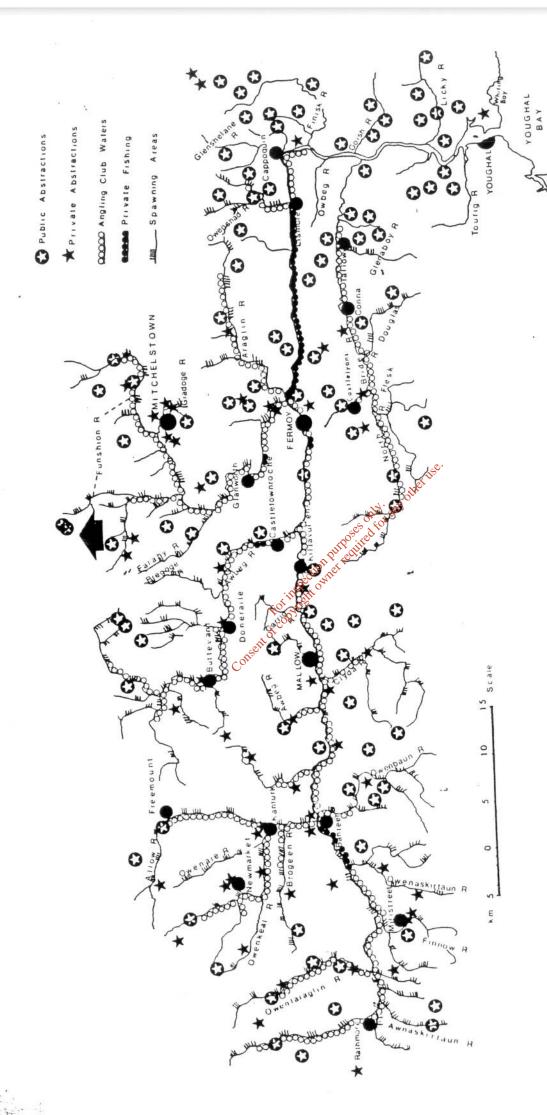
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TABLE 3.1

PUBLIC ABSTRACTIONS

INDEL 3.1	I ODETE HESTUNCTIONS
=========	=======================================

Scheme	County		Source	Location	Daily
Name		Catchment	Type	of source	Vol.m^3
** Type of Abstraction:			- Settle - Baselin administration in a set of the com-		
BALLYHEA	C	AWBEG	ARTESIAN WELL	SHINANAGH	772.00
/ Al-ihi	מחר				
** Type of Abstraction:	DUKE C	AUDEC	DODE	IAMERTOWN	1105 00
JAMESTOWN		AWBEG	BORE	JAMESTOWN	1182.00
GRANGE - JOHNSTOWN	C	FUNSHION	BORE	DOWNING BR.	727.00
KILWORTH (2)	C	FUNSHION	BORE	DOWNING BR.	545.00
KILDORRERY (2)	C	FUNSHION	BORE	GLENAVUDDIG	360.00
KILLAVULLEN	C	BLACKWATER	BORE	BALLYMACMOY	347.00
BALLYVINITER	C	BLACK₩ATER	BORE	BALLYVINITER & OLIVERS X	250.00
RATHMORE	K	AWNASKIRTAUN	BORE	GORTNAGANE	182.00
LAURENTUM	W	LICKY	BORE	LAURENTUM	115.00
CLONMEEN	C	BLACKWATER	BORE	BANTEER	91.00
TULLYLEASE	C	ALLOW	BORE	JONES XXX ROADS	82.00
CAPPAGH	W	FINISK	BORE	CAPRAGH	40.00
PALLAS GROUP	C	BLACKWATER	BORE	CARRIGANE	36.37
MOANIG - BALLYDA	С	BRIDE	BORE OTILITY	MOANIS	36.00
TOORANEENA	M	FINISK	BORE Ses atto	TOORANEENA	25.00
MODDIGO	W	FINISK	BORE SURPLIME	NEWTOWN	23.00
AGLISH (GLENCAIRNE)	W	BRIDE	BORE BORE BORE BORE BORE BORE BORE BORE	COOLYDOODY	23.00
BOOLAVONTEEN	N.	FINISK	BOBELLMIC	BOOLAVONTEEN	20.00
BALLYMOATE	H	BRIDE	\$0 BB	BALLYMOATE	20.00
GRALLAGH	H	LICKA 🍫	BORE	GRALLAGH -	20.00
CAMPHIRE	W	BRIDE	BORE	CAMPHIRE	16.00
GEDISH	W	GOISH STA	BORE	GEOISH	14.00
BARRACK	C	CLYDAGH ONS	BORE	BOTTLEHILL	14.00
STRANCALLY	Ħ	BLACKWATER	BORE	STRANCALLY	14.00
BALLYCURRANE	¥	FICKA	BORE	BALLYCURRANE	14.00
UPPER QUARTERTOWN	C	CLYDAGH	BORE	UPPER QUARTERTOWN X	13.64
KILMORE-KILBEG	₩	BRIDE	BORE	KILMORE	12.00
GLENAWILLIN	id	BRIDE	BORE	GLENAWILLIN	10.00
KEREEN	₩	FINISK	BORE	KEREEN	10.00
LACKEN	₩	FINISK	BORE	MOORE'S WELL	8.00
TINABINNA	W	BLACKWATER	BORE	TIKNOCK (KINSALEBEG)	7.00
LACKEN	₩	FINISK	BORE	GLENSHELANE	7.00
UPR. DROMORE		GOISH		DROMORE	5.00
TAUR	С	ALLOW (DALUA)	BORE	TAUR	5.00
LISMORE-CAPPOQUIN-BLYDU	JFF ₩	GLENSHELANE	BORE	SHANBALLY	1.00
LISMORE-CAPPOQUIN-BLYDU			BORE	LEFANTE	1.00
Bollydeanand			~	SHANBALLY LEFANTE	
** Type of Abstraction:				•	
BWEEINS & MONKEY BRIDGE	С	CLYDAGH	BORE & INDIAN WELL	RWEEING	14.00
	32		Tana a marm neer	- TT	
** Type of Abstraction:	BORE (3 N	o.)			
CHARLEVILLE			BORE (3 No.)	BALLYNAGERAGH	2300.00
			overse our ment	A THE PARTY OF THE	~~~~
** Type of Abstraction:	BORE (PP)				
KILTRISLANE-BALLYBEG	С	GRADOGE	BORE (PP)	KILLTRISLANE	3200.00
LABBAMOLAGA	C	SHEEP RIVER	BORE (PP)	LABBAMALOGGA	60.55
					22.00

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TABLE 3.1

PUBLIC ABSTRACTIONS

	1 20210 11001111101120110
=========	2222222222222222

Schee County River Source Location Daily		270			128	12 2131	
KILMURRY		Scheme	County		Source	Location	Daily
KILLABRE		Name		Catchment	Type	of source	Vol.m^3
KILLABRER							
KILLABRE		VII HUDDV	c	DIACKHATED	DOSE (DS)	VII HIDEU	
RILMAGNER							
MACRONEY							
SENNEIGH							
MONKEEN							
ROSKEEN						GLENLEIGH	45.66
KNOCKNALDMAN C BLACKMATER BORE (PP) CAMERBARNAGH 36.29 BORTNASKEHY C ARABLIN BORE (PP) ARABLIN 31.44 BALLYELLIS C BLACKMATER BORE (PP) BALLYELLIS (UDC) 29.24 CASTLEWRIKON C AWBEG BORE (PP) BOLLYELLIS (UDC) 29.24 CASTLEWRIKON C AWBEG BORE (PP) BORTNABRALDA 26.61 BORTNABRAGIA C CLYDAGH BORE (PP) BORTNABRALDA 26.40 BOHERASCRUB C AWBEG BORE (PP) BOHERASCRUB 23.33 CARRIGCLEENA MORE C CLYDAGH BORE (PP) BOHERASCRUB 22.33 CARRIGCLEENA MORE C CLYDAGH BORE (PP) BOHERASCRUB 22.33 CARRIGCLEENA MORE C CLYDAGH BORE (PP) BOHERASCRUB 22.03 CARRIGCLEENA MORE C CLYDAGH BORE (PP) CONCARADO CREEK CONCARADO CONC				CLYDAGH	BORE (PP)	MONEE X	41.18
BORTNASKEHY		ROSKEEN	0	BLACKWATER	BORE (PP)	ROSKEEN	36.75
BALLYELLIS		KNOCKNALDMAN	C	BLACKWATER	BORE (PP)	CAHERBARNAGH	36.29
CASTLEWRIXON C AWBEB BORE (PP) CASTLEWRIXON 26.51		GORTNASKEHY	C	ARAGLIN	BORE (PP)	ARAGLIN	31.44
CASTLEMRIXON C		BALLYELLIS	C	BLACKWATER	BORE (PP)	BALLYELLIS (UDC)	29.24
SORTHABSAIGA C		CASTLEWRIXON	3	AWBEG	BORE (PP)	CASTLEWRIXON	
BOHERASCRUB		GORTNAGRAIGA	C	CLYDAGH	BORE (PP)	SORTNAGRAIGA	
KNOCKSKAVARE C ALLOW BORE SPIN KNOCKSKAVANE 19.37 MONAPARSON C CLYDAGH BORE SPIN MONAPARSON 17.25 KILDINAN (1) C BRIDE BURE SPIN MONAPARSON 17.25 KNOCKDROHACLOGH C DWENBAUN BORE (PP) LAGHT 15.26 KNOCKDROHACLOGH C BLACKWATER BORE (PP) KNOCKDROMACLOGH 15.00 MORAMAGRICKA C MAIGUE SWENT BORE (PP) MONAPARSON 13.79 BALLYNAMONA C C CLYDAGN SWENT BORE (PP) MONAPARSON 13.98 BALLYNAMONA C C BLACKWATER BORE (PP) MONAPARSON 13.02 SCRAHAN C BLACKWATER BORE (PP) BROWNSTONE CROSS 10.20 COOLNAGILLAGH UPPER C CABLACKWATER BORE (PP) BROWNSTONE CROSS 10.20 COOLNAGILLAGH UPPER C CABLACKWATER BORE (PP) COOLNAGILLAGH 10.34 KNOCKERAGH C ALLOW BORE (PP) KNOCKCRAGH 9.71 CASTLECOOKE C ARAGLIN BORE (PP) CASTLECOOKE 9.12 KILCASKIN C ALLOW BORE (PP) KNOCKCRAGH 9.72 COOLE LOWER C BRIDE BORE (PP) COOLE 5.93 DRONCUMMER C BLACKWATER BORE (PP) DRONCUMMER 4.65 BALLYBROWNEY C BRIDE BORE (PP) BALLYBROWNEY MOUNTAIN 3.28 KNOCKARVIN C BRIDE BORE (PP) BALLYBROWNEY MOUNTAIN 3.28 KNOCKARVIN C SHEEP RIVER BORE (PP) BALLYBROWNEY MOUNTAIN 3.28 KNOCKANEVIN C SHEEP RIVER BORE (PP) LYRE 3.46 ** Type of Abstraction: INFILTRATION GLLRY FERMOY URBAN C BLACKWATER BORE (PP) LYRE 3.46 ** Type of Abstraction: RIVER ALLOW REGIONAL C ALLOW RIVER FREEMOUNT 2496.00 ** Type of Abstraction: RIVER ALLOW REGIONAL C ALLOW RIVER FREEMOUNT 2496.00 ** Type of Abstraction: C SHEEP RIVER BORE (PP) LYRE 3.46 ** Type of Abstraction: RIVER ALLOW REGIONAL C ALLOW RIVER FREEMOUNT 2496.00 ** Type of Abstraction: RIVER ALLOW REGIONAL C ALLOW RIVER FREEMOUNT 2496.00 ** Type of Abstraction: C SHEEP RIVER BORE (PP) LYRE 3.46 ** Type of Abstraction: RIVER ALLOW REGIONAL C ALLOW RIVER GALTER BORE 9.20.00 ** Type of Abstraction: RIVER ALLOW REGIONAL C BLOW RIVER GALTER BORE 9.20.00 ** Type of Abstraction: RIVER ALLOW REGIONAL C BLOW RIVER GALTER BORE 9.20.00 ** Type of Abstraction: RIVER ALLOW REGIONAL C BRIDE RIVER GALTER BORE 9.20.00 ** Type of Abstraction: RIVER ALLOW REGIONAL C BRIDE RIVER GALTER BORE 9.20.00 ** Type of Abstraction: RIVER ALLOW REGIONAL C BRIDE RIVER GALTER 9		BOHERASCRUB	0	AWBEG	BORE (PP)	BOHERASCRUB	
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PUBLIC ABSTRACTIONS

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Scheme Name	County	River Catchment	Source Type	Location of source	Daily Vol.m^3
TALLOW	W	BRIDE	RIVER	KILBEG	200.00
** Type of Abstraction: R	IVER & S	PRINGS			
BANTEER - KNOCKBRACK	С	BLACKWATER	RIVER & SPRINGS	KNOCKBRACK	360.00
** Type of Abstraction: R					
KILDORRERY (1)	С	FUNSHION	RIVER (Stream)	BALLYVISTEEN	70.00
** Type of Abstraction: S					
NEWMARKET - KANTURK	C	ALLOW (DALUA)	SPRING	BALLINATONA	5910.00
KETRAGH	C	AWBEG	SPRING	KETRAGH	5909.00
DONERAILE-SHANBALLYMORE		AWBEG	SPRING	SHANBALLYMORE	2045.00
MILLSTREET (1)		FINNOW	SPRING SP	TUBRID WELL	1588.00
CASTLETOWNROCHE		AWBEG	SPRING	. CASTLETOWNROCHE	1386.00
MOUNTHNORTH	С	AWBEG MINOR	SPRING CELLS	MOUNTNORTH	838.00
GLANWORTH - BALLYENIHAN		FUNSHION	SPRING Office	BALLYKENLY	680.00
MITCHELSTOWN (1)	C	GRADOGE	SPRINGLY and	GLENATLUCKY	488.00
HEATHERSIDE	C	AWBEG	SPRINGSOT	BALLYHOURA HILLS	318.20
SCARTEEN		DALUA	SPRING	BALLINATONA	300.00
CONNA	C	BRIDE	SPRING	KILCLANE UPR.	273.00
GLANTANE	C	BLACKWATER	SPRING -	LAHARN	182.00
BALLYDUFF-BALLYLEMON	4	ANBEG DALUA BRIDE BLACKWATER COOK FINISK IN SHI	SPRING	GLENAVADDRA	115.00
MILLSTREET (2)	С	BLACEWATER	SPRING	CAHERBARNAGH	109.00
KNOCKNAGREE	C	BLACKWATER	SPRING	KNOCKNAGREE	90.92
CULLEN	С	OWENTARAGLIN	SPRING	MULLAGHROE	90.00
BALLYMAGOOLY	C	BLACKWATER	SPRING	DROMRAHAN	68.00
VILLIERSTOWN	H	BLACKWATER	SPRING	DROMANA WOOD	55.00
KILDINAN (2)	C	BRIDE	SPRING	SHANBALLY HOUSE	54.00
KISKEAM	C	OWENTARAGLIN	SPRING	KISKEAM BR.	41.00
CREGANE-GORTMORE	C	BLACKWATER	SPRING	CREGANE X	40.91
AGHLISH (DUNGARVAN)	¥	GOISH	SPRING	BALLAILANE	40.00
NEWCASTLE RD-MT MELLARY	¥	GLENFALLIA	SPRING	GLENFALLIG BRIDGE	25.00
WATERGRASSHILL	C	BRIDE	SPRING	WATERGRASSHILL	25.00
RAHAN	C	BLACKWATER	SPRING	FIDDANE	23.00
BALLYHEAPHY	ķ	GLENMORE	SPRING	KNOCKACULLEN	20.00
TALLOW HILL	W	BRIDE	SPRING	TALLOWBRIDGE	20.00
CARRAIGNAGOWER	¥	OWENASHAD	SPRING	CARRIGNAGOWER	20.00
CLASHMORE	W	LICKY	SPRING	BALLYNAMULTINA	20.00
KILCOONEY	H	FINISK	SPRING	KILCOONEY	20.00
INCHINLLAMY	W	ARAGLIN (BW?)	SPRING	TOBERAHULLA	15.00
BALLYNOE	¥	GLENFALLIA	SPRING	BALLYNOE	15.00
SHEAN	W	BLACKWATER	SPRING	SHEAN	10.00
BALLYSAGGART	W	GLENMORE	SPRING	FEAGARRID	10.00
LYRE	C	LYRE	SPRING	LYRE	9.10
NADD	С	GLEN	SPRING	NADD	9.10
MEELIN	C	ALLOW (DALUA)	SPRING	MEELIN	5.00
Kelly	C	Daylo (Angl)	Spring	Kilout (2Km N.)	23.00

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TABLE 3.1

PUBLIC ABSTRACTIONS ______

========

Scheme Name	County Riv Catch		Location of source	Daily Vol.m^3
** Type of Abstraction	: SPRING & BORE			
BALLYNOE	C BRIDE	SPRING &	BORE BOOLADURRAGHA	90.82
DROMAHANE & KILCOLMAN	C CLYDA	GH SPRING &	& BORE DROMAHANE	48.00
BARTLEMY	C BRIDE	SPRING 8	BORE MOANIG	63.00
** Type of Abstraction	: SPRINGS			.7
TOOREEN	C GLEN	SPRINGS	TOOREEN	25.00
** Type of Abstraction	n: WELL			
KILCORNEY	C OWENE	BAUN WELL	KILCORNEY	50.00

. SUM CUM 128 records summed CUM 47108.41

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Abstractions and Discharges

Introduction

Two of the more important uses of a river resource are :

- Domestic,
 Industrial,
 Agricultural.
- ii) Controlled disposal of wastes, ie. Discharges

The use of a river for the disposal of waste is important but this use runs counter to the use of a river as a potable water source.

A river management plan must include plans to conserve water supplies at the standards appropriate to the various reaches of the river.

Abstractions

In 1978 a national survey of Abstractions and discharges was carried out by local authorities on behalf of the DOE and co-ordinated by AFF.

This information which was revised where necessary has been used in compiling Tables 3.1 and 3.2.

Table 3.3 shows and compares the Public and Industrial abstractions by volume and by number. Fig. 3 to compares these graphically.

TABLE 3.2 VOLUME OF PUBLIC AND INDUSTRIAL ABSTRACTIONS.

ABSTRACTION TYPE	VOLUME	%/Vol.	NO.	%/No.
Public Industrial (excl.CSET) C.S.E.T.	47,1Ø8 21,638 5Ø,ØØØ	69 4Ø 31 18 42	128 44 1	74.Ø 25.4 Ø.6
Total =	118,746		173	٥,
Public (River source) Public (Non river source)	14,464 32,644	31 69	11 117	9 91
<pre>Indust: al (River source) (excl.C.S.E.T)</pre>	7,983	37 11	3	7
Industrial (Non river source) C.S.E.T. (River source)	13,655 50,000	63 19 7Ø	41 1	91 2
*	71,638		45	

FIGURE 3.1 Comparison of Abstractions by Volume and by Number.

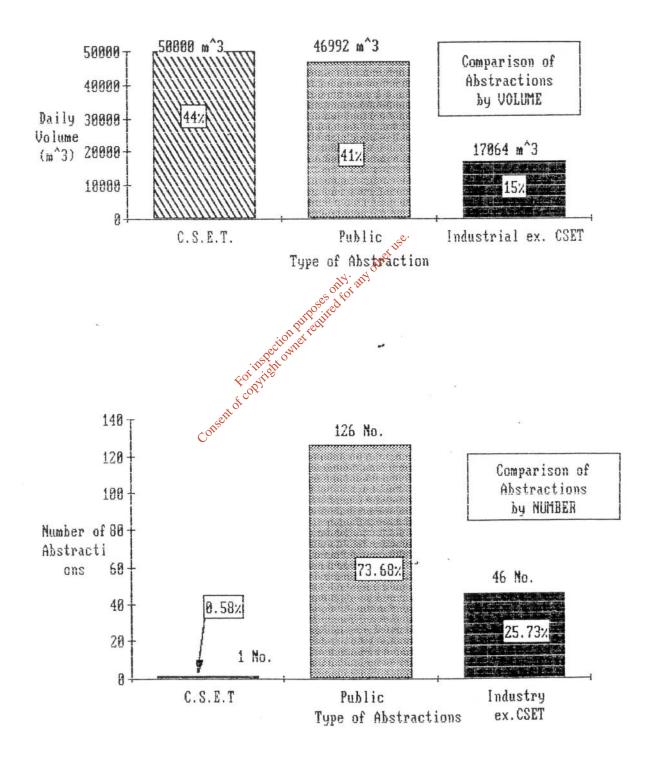


Table 3.3 and Fig 3.1 show the following:

The total volume of water abstracted per day is 118,746 m^3

The abstraction of 50,000 m^3/day by C.S.E.T. is by far the largest in the catchment.

If one excludes the C.S.E.T. abstraction, the above table shows the following:

Public abstractions are 2.18 times the Industrial abstractions.

The ratio of non river to river sources is 2.2 to 1 in the case of public abstractions whereas the ratio is 1.71 to 1 in the case of industrial abstractions.

Table 3. A lists and compares the Types and Volumes of Public sources. Fig. 3.2 and Fig. 3.3 compares these graphically.

TABLE 3.43 Types of sources (PUBLIC) and yol/day for same *******

		VOL. m^3 %/Vole of the land of the NO. %/No.					
SOURCE	VOL. m^3	%/Vole.	for NO.	%/No.			
Springs	21114	My requir	41	32			
Rivers	11459	cition 2018	- 10	8			
Bores	1Ø6Ø8	insphro23	74	58			
Infiltra gallery.	tion 3005 💎	THERE OF THE PROPERTY OF THE P	1	m			
Others	83,20	2	2	2			
Total	47108		128				

Types of Sources & Vol./day

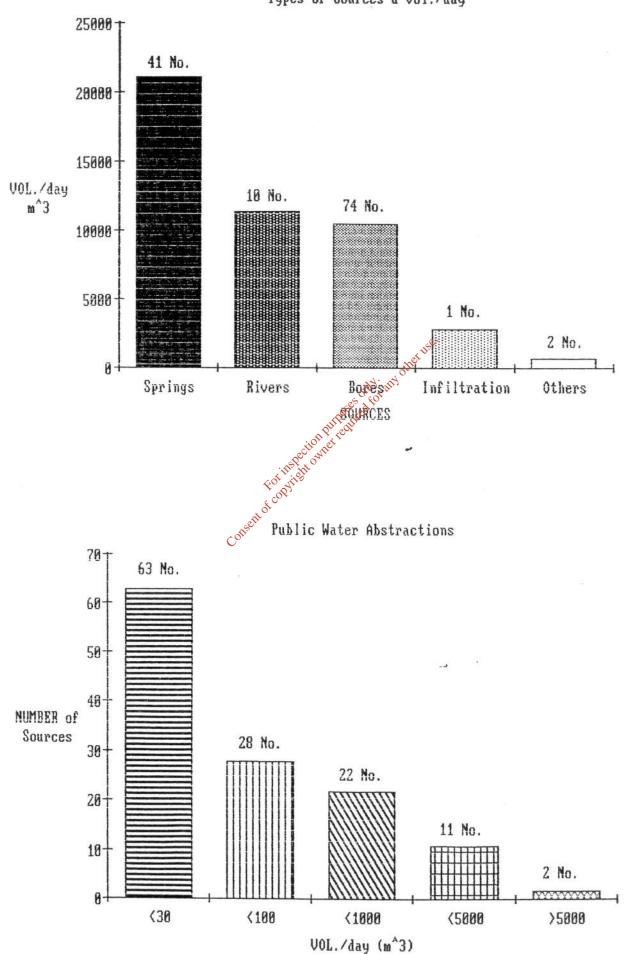


Table 3.4 and Figs. 3.2 show the following:

Rivers account for 24% (11459m^3) of the daily volume of public abstractions and groundwater sources account for the other 76%.

Groundwater sources are far more numerous than river sources accounting for 118 (92%) out of the 128 sources.

Table 3. below lists the River sources used for Public Abstraction:

SCHEME	CO	SOURCE	LOCATION	M^3/day
Allow Regional	C.	Allow	Freemount	2496
Mallow Urban	C	Clydagh	Clydagh Bridge	2273
Youghal	W	Glendine	Glendine River	192Ø
Mitchelstown	C	Funshion	Galtee Mountains	1820
Lismore-Cappoquin -Ballyduff	W	Owenashad	Rough Glen, Glenakeeffe	e 82Ø
Conna Regional	C	Bride	Bride Bridge	78Ø
Tallow	W	Tallow	Kilbeg	200
Banteer-Knockbrack	x C	Bride	Knockbrack	36Ø
Kildorrery	C	Stream only	Ballyvisteen	7Ø

Potential sources of pollutions River abstractions are:

Direct contamination of the river upstream of the abstraction point

Surface water runoff from a contaminated area adjacent to the river upstream of the abstraction point.

The sources of contamination include chemical spillages on roads and agricultural sources.

It has been necessary to stop the abstraction of water for the Allow Regional water supply scheme on a number of occasions due to pollution of the river by slurry and other agricultural pollutants.

The use of Section 12 of the 1977 Water Pollution Act by Cork Co. Council has helped to reduce the incidence of pollution of the River Allow upstream of Freemount.

Pollution of Groundwater sources.

Careless and negligent storage and disposal of agricultural wastes pose the major threat to groundwater sources. This is especially so in the case of the Dinantian limestone areas (fissured aquifer) referred to in Section 2.

Cork Co.Council and Waterford Co.Council have organised geological surveys of the more critical areas in the Blackwater catchment. These surveys have highlighted areas of major risk and have made various recommendations and suggested precautions to minimise the danger to the groundwater sources from Agricultural Pollution.
(c.f. various GEOEX surveys)

Table 3.5 below lists the number of abstractions within the daily volume ranges as shown.

	TABLE 3.5 ******		PUI	BL:	IC WAT	ER	ABST	TRACT	IONS (V	ol.by	number)
	m^3		NO	. r	m^3				Volume Volume Volume Volume Volume Volume Volume Volume Volume		m^3
	Ø	<	22	<	1Ø				Volume	=	140.56
	10	<	28	<	2Ø			anly	Volume	=	443.58
	2Ø	<	14	<	3Ø			See Se	Volume	=	338.66
							~	170 likel			
-	Total		64			(50%	SO.			922.8Ø
							ectionie		-		
	3Ø	<	7	<	4Ø	in	Stro		Volume	=	216.85
	4Ø	<	5	<	5Ø	ioi di	200		Volume	= _	214.75
	5Ø	<	6	<	6Ø ,	CON.			Volume	=	334.72
	6Ø	<	5	<	70 NO	>			Volume	=	329.55
	7Ø	<	Ø	<	8 ghsc				Volume	=	ØØØ. ØØ
	8Ø	<	3	<	90				Volume	=	262.00
r	l'otal		26			(20%)			1357.87
	9Ø	<	3	<	100	(2%)	Volume	=	272.74
	100	<	22	<	1000	(17%)	Volume	=	9481.00
	1000	<	11	<	3300	(9%)	Volume	= 2	3215.00
	5000	<	2			(2%)	Volume	= 1	1819.00

Table 3.5 shows that the majority (64 No. = 50%) of public abstractions are less than 30m^{2} day.

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TABLE 3.2

INDUSTRIAL ABSTRACTIONS
RIVER BLACKWATER CATCHMENT

Industry Name	Industry Type	County	River Catchment	Source Type	Location of source	Daily Vol.m^3
** Industry type: BAKE	DAVE	С	ALLOW	BORE	GROUNDS	3.00
OWEN BINCHY, KANTURK.	BAKE	L	HLLUW	DUNE	GROBINO	0.00
** Industry type: BEET C.S.E.T. MALLOW	BEET	С	BLACKWATER	RIVER	GROUNDS	50000.00
\$\$ Industry type: CHEM					T term an appropriate	
FRANK O'CONNOR, FERMOY.	CHEM	C	BLACKWATER	BORE	GROUNDS	14.00
MICRO BIO, FERMOY.	CHEM	С	BLACKWATER	BORE	GROUNDS	10.00
** Industry type: CHOC						41,360,50
FRY CADBURY, RATHMORE.	CHOC	K	BLACKWATER	RIVER	GROUNDS	4636.30
				BORE offer use. BORE offer of the second of		
** Industry type: CONC	CONC	c	AUDEC MINOR	page Mer III	GROUNDS	45.00
JOHN.A.WOODS, BALLYGIBLIN	CONC	C	WARED UTWOK	BRIDE A	GROUNDS	17.00
NOEL C.DUGGAN,	CONC	C	HLLUW	of or dis-	ONDONES.	17100
** Industry type: CREM			170 ⁵⁶	ied ,		
MITCHELSTOWN CO-OP	CREM	C	FUNSHION PULLED	BORE	GROUNDS	7274.00
BALLYCLOUGH CO-OP (1)	CREM	C	BLACKMATER	RIVER -	GROUNDS	2727.00
BALLYCLOUGH CO-OP (2)	CREM	C	BLACKWATER	BORE	GROUNDS	2273.00
CASTLELYONS CREAMERY.	CREM	C	OR LIDE			1820.00
KANTURK CREAMERY (N.CORK)		C Cosent of	ALLOW.	BORE	GROUNDS	456.00
NEWMARKET CREAMERY	CREM	C SILO	ALLOW (DALUA)	BORE	GROUNDS	227.30
LISMIRE CREAMERY (NM)	CREM	Consu	ALLOW	BORE	GROUNDS	69.00
ROWELS CREAMERY (NM)	CREM	C	ALLOW	BORE	GROUNDS	69.00
KISKEAM CREAMERY (NM)	CREM	С	OWENTARAGLIN	BORE	GROUNDS	60.00 55.00
LAKEVALE CREAMERY (NM)	CREM	C	BLACKWATER	BORE	GROUNDS	41.00
FREEMOUNT CREAMERY (6V)	CREM	C	ALLOW	BORE	FREEMOUNT GROUNDS	30.00
ARAGLIN CREAMERY (M)	CREM	C	ARAGLIN	BORE	GROUNDS	5.45
CUMMER CREAMERY (NM)	CREM	C C	ALLOW	BORE BORE	GROUNDS	5.00
GLASLAKINLEEN (NM)	CREM CREM	C	ALLO₩ BLACK₩ATER	BORE	GROUNDS	3.00
DROMTARIFFE (BC) KILCORNEY CREAMERY (BC)	CREM	C	OWENBAUN	BORE	GROUNDS	1.00
RATHMORE CREAMERY (K)	CREM	K	BLACKWATER	BORE	GROUNDS	10.00
## Industry type: DRNK		1 4411				10.00
J.O'CONNOR, KANTURK.	DRNK	C	ALLO#	BORE	GROUNDS	10.00
** Industry type: MART						
MALLOW MART,	MART	C	BLACKWATER	BORE	GROUNDS	90.00
FERNOY MART,	MART	C	BLACKWATER	BORE	GROUNDS	90.00
MITCHELSTOWN MART,	MART	C	FUNSHION	BORE	GROUNDS	20.00
KANTURK MART	MART	C	ALLOW	BORE	GROUNDS	15.00
MILLSTREET MART	MART	C	FINNOW	BORE	GROUNDS	10.00

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TABLE 3.2

INDUSTRIAL ABSTRACTIONS
RIVER BLACKWATER CATCHMENT

Industry Name	Industry Type	County	River Catchment	Source Type	Location of source	Daily Vol.m^3
** Industry type: MEAT	MEAT	0	AUDEC	BORE	GROUNDS	252.00
HORGAN MEATS	MEAT	C	AMBEG			
AGRA MEATS, WATERGRASSHILL	MEAT	C	BRIDE	BORE	GROUNDS	227.00 231.0
SALTEE BACON	MEAT	С	FUNSHION	BORE	GROUNDS	227.00

Cum 33 records summed Cum 66145.75

LIST OF ABBREVIATIONS set print-off-----

BAKE = Bakery
BEET = Beet Processing and Wage.
CHEM = Chemical processing and Wage.
CREM = Creamery and milk processing plants.
DRNK = Comment of the commen

CREM = Creamery and milk processing plants.

DRNK = Soft drink manufacturer.

MART = Cattle and theep mart.

MEAT = Meat processing plant.

(IND: WS)

-16-

INDUSTRIAL ABSTRACTIONS

The volume of water abstracted each day in the Blackwater catchment by Industry (including CSET @ $50,000\text{m}^3/\text{day}$) is approx. 71,638 m^3. This is 50% more than the volume abstracted for public use.

Table 3. has shown that excluding the C.S.E.T. abstraction, industrial abstractions are only 46% of the public abstractions.

Table 3.8 and Fig. 3.5 below show the type ,number and volume of the various industrial abstractions.

TABLE 3.87 TYPE, NUMBER, AND VOLUME OF INDUSTRIAL ABSTRACTIONS

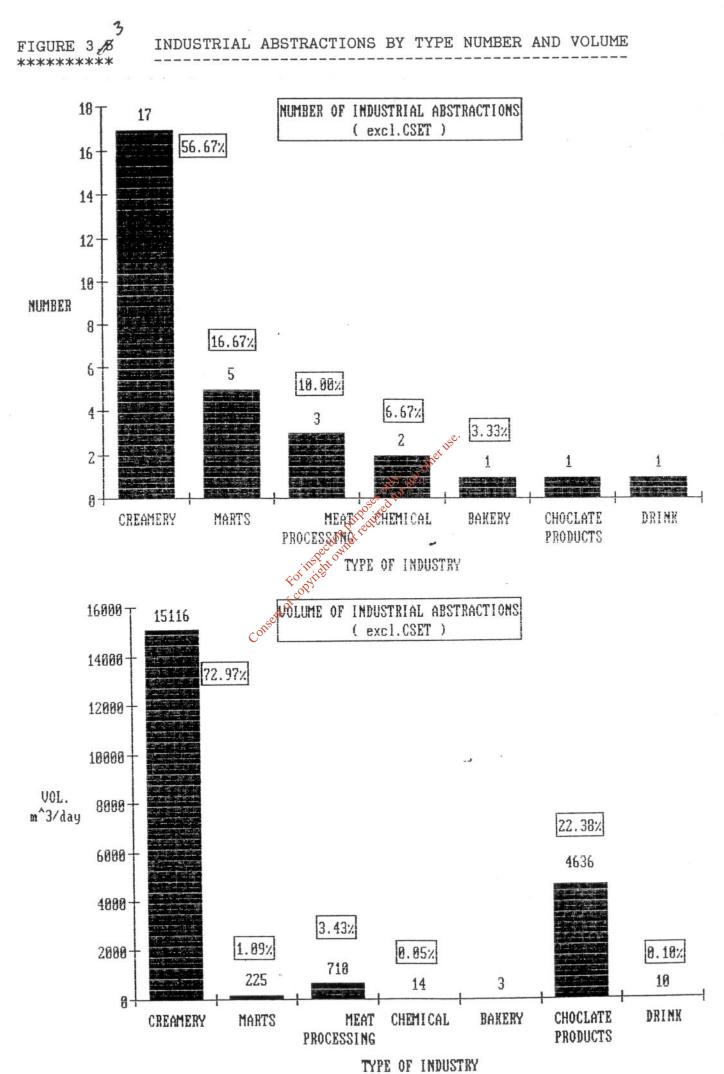
		A differ tise		
Industry Bakery Beet Factory Chemical Chocolate Products Consent Creamery Drink	No.	Dati Ty Volume m^3	% incl. CSET	% excl. CSET
Bakery	1 ctions	agif equit		Ø.Ø1
Beet Factory	COL Tright ow	50,000	7Ø	Ø
Chemical	of cost	14	Ø.Ø2	Ø.Ø6
Chocolate Products Consell	1	4,636	6	21
Creamery	17	15,116	21	7Ø
Drink	1	1Ø	Ø.Ø1	-
-Farming	12	924	1	4
Marts	5	225	Ø.3	1
Meat Processing	3	710	1	3
		71,638		

Table 3.8 above shows the following:

The C.S.E.T. factory at Mallow with an abstraction of 50,000 m3/day accounts for 70% of the Industrial Abstractions.

Creameries are next on the list with 21% by volume of industrial abstractions.

17



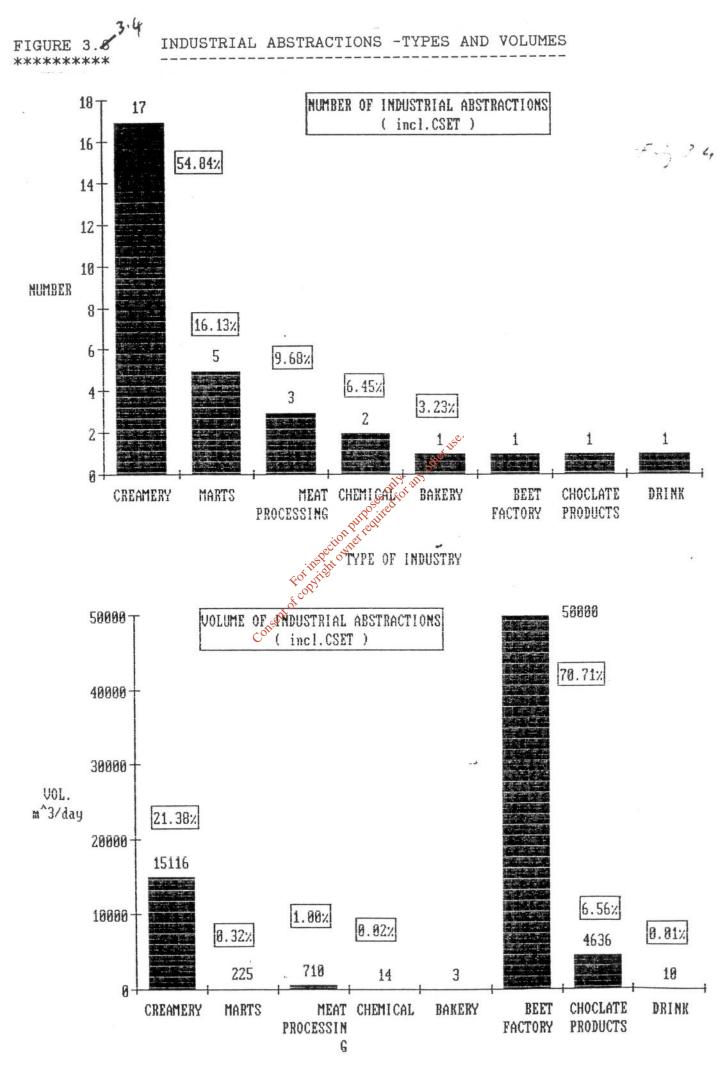


Table 3. and Fig. 3. compare the type, number and volume of industrial abstraction sources (including CSET).

TABLE 3.7 *******

Source.	No.	Vol/day (m^3)	% -
Rivers	4	57,982	81
Bores	39 ·	13,636	19
Springs	2	2Ø	<1
		71,638	

Due to the large volume of water used by C.S.E.T. the bulk of water used by industry is abstracted from river sources.

Table 3.8 compares the type, number and volume of Industrial Abstractions (excluding CSET).

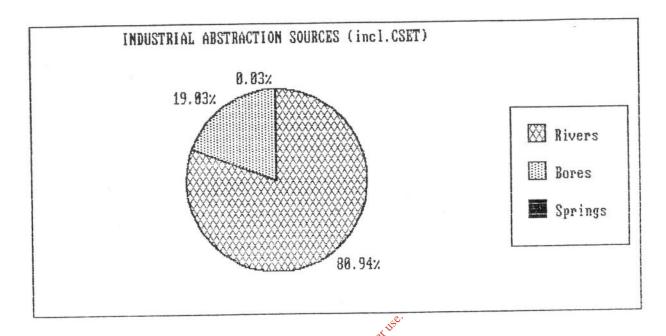
Source	No.	Vol/day (m^3)	%
	No.		6 75
Rivers	3 Forthigh	7,982	37
Bores	39 chalagar	13,636	63
Springs	Con.	2Ø	<1
		21,638	
		Commence of the Commence of th	

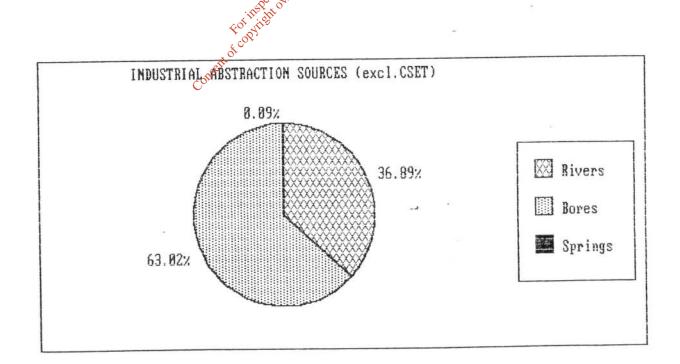
There are 3 industries abstracting their water from the main channel of the Blackwater. Table 3.8 lists these.

TABLE 3.8 Industries abstracting water from main channel of River ********* Blackwater.

INDUSTRY	LOCATION	Daily VOL.
Fry Cadbury C.S.E.T. Ballyclough Co-Op	Rathmore Mallow Mallow	4,636 m ³ 50,000 m ³ 2,727 m ³
4		57,363 m^3 total

The volume of 57,363 represents 80% of the volume of the daily industrial abstraction.





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TABLE 34 3.1

PUBLIC DISCHARGES BLACKWATER CATCHMENT

Name					Dorino	Population	Daily	BOD
## Type of Treatment Nome C AMBES NINOR STREAM 188 94 23 2.23 ## Type of Treatment NOME C BLACKWATER RIVER BLACKWATER 1.08 128 137 27 3.22 ## Type of Treatment NOME C BLACKWATER RIVER BLACKWATER 1.08 1.08 1.08 1.08 1.08 1.08 1.08 1.08	Schene	County						
CEDEBLISTOWN C AMBES MINOR STREAM L25 80 14 1.48	Name		Catchment	Paint	roputacion	361 460	1011	2000
CEDEBLISTOWN C AMBES MINOR STREAM L25 80 14 1.48								
CEDEBALYMEA C AMBES MINOR STREAM LIZE 56 14 1.48								
STATE		-	AUDES HINDS	CIDEAM	189	94	23	2.23
## Type of Treatment None C BLACKWATER RIVER BLACKWATER C BLACKW						50	14	1.40
## Type of Treatment NONE FERMOY ## Type of Treatment NONE FERMOY ## Type of Treatment O.D. ## Type of Treatment P.F. ## Type of Treatment D.D. ## Type of Treatment P.F. ## Type of Treatment P.F. ## Type of Treatment P.F. ## Type of Treatment PRIMARY ## Type of Treatment S.T. ## Type of Treatment PRIMARY ## Type of Treatment PRIMARY ## Type of Treatment S.T. ## Type of Treatment PRIMARY ## Type of Treatment S.T. ## Type of Treatmen		- 3					27	0.22
## Type of Treatment 0.D. ## Type 0.D. ## Ty	CHURCHTOWN	C	AWBEG	SIKERA	120			
## Type of Treatment 0.0. ## Type 0.0. ## Ty			1520	8				
## Type of Treatment 0.D. ## Type of Treatment 0.D. ## Type of Treatment P.F. ## Type of Treatme	1,41,41,111	_	DI ACIUNTED	DIUED BLACKWATER	9	5100	1200	333.00
HILLSTREET C FINNOW TRIS. ID FINNOW TR	FERMOY	C	BLHCKWHICK	RIVER BEHORWHICK				
HILLSTREET C FINNOW TRIS. ID FINNOW TR								
## Type of Treatment PRIMARY KANTURK C ALCHO TREATMENT C BLACKWATER RIVER BLACKWATER 15800 7482 17817-50 8.80 ## Type of Treatment P.F. MITCHELSTOWN C ALLON (DALUA) RIVER DELOG			CINNON	TRIB. TO FINNOW	1600	1435		
FERROY S.S. (READY 1987) C BLACKWATER RIVER B.WATER 1 KM D/S FERROY 9800 7000 2040 491.00					15000	7482	17011	250 0.00
## Type of Treatment P.F. HITCHELSTOWN C ALLOW (DALUA) REHMARKET C ALLOW (DALUA) RETERBRASSHILL C BRIDE STREAM DONERALLE C AMBEG STREAM DONERALLE C AMBEG STREAM DONERALLE C AMBEG STREAM BUCKEROULE C AMBEG STREAM BUTTEVANT C AMBEG STREAM BLACKWATER STREAM BLACKWATER STREAM FOR STREAM BLACKWATER STREAM FOR STREAM BLACKWATER STREAM FOR STREAM BLACKWATER STRE		_		DINER D MATER & PM D/C EEDMOV	9000	7000	2040	491.20
DORERAILE C AMBES NOTICE SPORE NOTICE NOTIC	FERMUY S.S. (KEADY 1987)	L	DEHCKWHILK	150.				
DORERAILE C AMBES NOTICE SPORE NOTICE NOTIC	vs Tues of Tenstmost P F			iner C			0.000000	
DORERAILE C AMBES NOTICE SPORE NOTICE NOTIC		٢	FUNSHION	RIVER FUNSHION	11008			
DOMERAILE C AWBEB ITEM SPICE SKOGEEN 109 109 109 3 3.48			ALLOW (DALUA)	RIVER DALLA CA	788			
DOMERAILE C AWBEB ITEM SPICE SKOGEEN 109 109 109 3 3.48			BRIDE	STREAMOSE	208		(4)	
BOMERBUE C ALLOW SOURCE STOCKED 100 1161 264 7,92			AWBEG	RIVER ANDEG				
BUTTEVANT C ANBEG STVER ANBES 1200 1151 264 7.92 LISMORE M BLACKMATERS OF STVER BLACKMATER 0 0 223 0.00 *** Type of Treatment PRIMARY KANTURK C ALCOM RIVER BLACKMATER 120 285 74 0.00 *** Type of Treatment S.T. KILHORTH C ARAGLIN RIVER BUSS 400 4475 441 0.00 KILHORTH C BLACKMATER RIVER BLACKMATER 120 285 74 0.00 KNOCKMASREE C BLACKMATER RIVER BLACKMATER 120 285 74 0.00 KNOCKMASREE C BLACKMATER RIVER BLACKMATER 120 285 74 0.00 KILDORREY C BRIDE RIVER BRIDE 100 247 60 0.00 KILDORRERY C AMBEG STREAM 150 276 63 0.00 KILDORRERY C FUNSHION RIVER FUNSHION 300 252 65 0.00 KILDORRERY C FUNSHION RIVER FUNSHION 300 252 65 0.00 BORDMAHANE C C LYDAGH STREAM 600 606 156 0.00 BANTEER C BLACKMATER STREAM 120 217 49 4.90 BANTEER C BLACKMATER STREAM 120 217 49 4.90 BANTEER C BLACKMATER STREAM 120 217 49 4.90 BALLYCLOUGH C BLACKMATER STREAM 120 217 49 4.90 BANTEER C BLACKMATER STREAM 120 217 49 4.90 BALLYCLOUGH C BRIDE STREAM 150 170 39 3.90 BRIDESBRIDGE C BRIDE STREAM 150 170 39 3.90 BRIDESBRIDGE C BRIDE STREAM 100 199 45 4.50 KILLAVULLEN C BLACKMATER RIVER BLACKMATER 140 238 54 0.00 KILLAVULLEN C BLACKMATER RIVER BRIDE 100 93 21 2.10 CONNA C BRIDE RIVER BRIDE 100 93 21 2.10 CONNA C BRIDE RIVER BRIDE 100 93 21 2.10 CASTLEHAGNER C AMBEG MINOR 100 50 11 1.10 CASTLEHAGNER C OMENBAUN RIVER OMENBAUN 150 150 34 3.40 RATHCOOLE C OMENBAUN RIVER OMENBAUN 150 150 34 3.40 FREEDOUNT C ALLOW RIVER ANBEG MINOR 100 50 11 1.10 CASTLEHAGNER C ALCOMATER RIVER OUBBLAISE 50 40 9 0.90 LUMBARDSTONN C BLACKMATER RIVER OUBBLAISE 50 40 9 0.90 LUMBARDSTONN C BLACKMATER RIVER OUBBLAISE 50 40 9 0.90 LUMBARDSTONN C CALLOW RIVER ANBEG MINOR 110 150 151 34 3.40 CASTLEHAGNER C ALCOMATER RIVER OUBBLAISE 50 40 9 0.90 LUMBARDSTONN C BLACKMATER RIVER OUBBLAISE 50 40 9 0.90 LUMBARDSTONN C BLACKMATER RIVER OUBBLAISE 50 40 9 0.90 LUMBARDSTONN C ALLOW RIVER ANBEG 470 470 475 163 16.30 CASTLETONNOCHE C AMBEB RIVER ANBEG 50 60 60 60 60 60 60 60 60 60 60 60 60 60				ROVES BROGEEN -	409			
## Type of Treatment PRIMARY KANTURK C ALCOM RIVER ALLOM 2280 4475 441 8.00 ## Type of Treatment S.T. KILMORTH C ARAGLIN RIVER DOUGLAS 400 402 91 8.00 KNOCKNAGREE C BLACKMATER RIVER BLACKMATER 120 285 74 8.00 KNOCKNAGREE C BLACKMATER RIVER BRIDE 100 247 60 8.00 RATHCORMAC C BRIDE RIVER BRIDE 150 276 63 8.00 LISCARROL C AMBEE SIREAM 150 276 63 8.00 KILDORRERY C FUNSHION RIVER FUNSHION 300 252 65 8.00 KILDORRERY C FUNSHION RIVER FUNSHION 300 252 65 8.00 DROMAHANE C BLACKMATER TRIB.TO BLACKMATER 680 686 46 7.77 CLONDULANE C BLACKMATER SIREAM 120 217 49 4.90 BANTEER C BLACKMATER SIREAM 120 217 49 4.90 BANTEER C BLACKMATER SIREAM 265 265 68 6.00 BALLYCLOUGH C BLACKMATER SIREAM 265 265 68 6.00 BALLYCLOUGH C BLACKMATER SIREAM 265 265 68 6.00 BALLYCLOUGH C BLACKMATER RIVER BRIDE 150 1770 39 3.90 CASTLELYONS C BRIDE RIVER BRIDE 150 1770 39 3.90 BRIDESBRIDGE C BRIDE RIVER BRIDE 150 1770 39 3.90 BRIDESBRIDGE C BRIDE RIVER BRIDE 140 238 54 0.00 BALLYDESMOND C BLACKMATER RIVER BRIDE 100 93 21 2.10 CONNA C BRIDE RIVER BRIDE 100 93 21 2.10 CONNA C BRIDE RIVER BRIDE 100 93 21 2.10 CASTLELMAGNER C AMBEG MINOR 100 50 11 1.10 CASTLEMAGNER C AMBEG MINOR 118 122 28 1.10 FREEMOUNT C ALLOW RIVER AMBEG 120 100 100 100 100 100 100 100 100 100			AWRES &	ROVER AWBEG	1200	1161		
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SHANBALLYMORE C AWBES SOAKPIT 120 160 25 500	CASTLETOWNROCHE	С				N. N.		
	SHANBALLYMORE	C	AWBES	SOAKPIT	1.	20 100	,	2.23

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TABLE 3.11 =========

PUBLIC DISCHARGES BLACKWATER CATCHMENT

Scheme Name	County	River Catchment	Discharge Point	Design Population		Daily Vol.	BOD Load
BALLYHOOLEY GLANWORTH DUNTAHANE KISKEAM BALLYNOE BALLINDANGAN NADD LYRE CAPPOQUIN BALLYDUFF SUNLAWN AGLISH TALLOW VILLIERSTOWN CLASHMORE BALLYDASDON PILLTOWN TOORANEENA CAPPOQUIN (DANES FIELD) MILFORD MEELIN (2 No.) DERINAGREE TULLYLEASE		BLACKWATER FUNSHION BLACKWATER OWENTARAGLIN BRIDE FUNSHION GLEN GLEN BLACKWATER BLACKWATER FINISK GOISH BRIDE BLACKWATER BLACKWATER PLACKWATER FINISK GLENAFALLIA DEEL ALLOW BLACKWATER ALLOW CONSENT OF CONTROL CONSENT OF CONTROL CO	RIVER BLACKWATER RIVER FUNSHION RIVER BLACKWATER RIVER OMENTARAGLIN STREAM STREAM STREAM SOAKPIT RIVER BLACKWATER RIVER BLACKWATER TRIB. TO FINISK RIVER SOISH (COOLROE) RIVER BRIDE RIVER BLACKWATER (THE OUAY) STREAM (GREGAGH ? AND STREAM) (GREGAGH ? AND STREAM (GREGAGH ? AND STREAM) (GREGAGH ? AND STREAM (GREGAGH ? AND STREAM) (GREGAGH ? AND STREAM) (GREGAGH ? AND STREAM (GREGAGH ? AND STREAM) (GRE	100 350 400 150 120 20 20 20 45	335 400 132 107 20 20 20 20 20 20 20 20 20 20 20 20 20	500 1000 8 200 6 76 1002 300 5	4.70 6.10 9.10 3.00 2.40 0.50 0.50 0.60 2.10 3.80 19.00 0.60 7.60 3.00 0.50
int 60 records		Consent					

. count

Discharges in the Blackwater Catchment

The principal discharges occurring in the Blackwater Catchment are generated from three sources:

> Agricultural Domestic Industrial

The locating of the Agricultural discharges in the Blackwater catchment is mainly dependant on the general public reporting the existance of same to either Fisheries or the Local Authorities.

Unfortunately in a lot of cases the members of the public are unaware of whom to inform if and when they happen to observe the occurance of Agricultural discharges.

PUBLIC DISCHARGES

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The 1978 national survey of discharge of revised where necessary, has been used in compiling Tables 3.9 not compiling

Table 3.9 lists the Public discharges in the Blackwater Catchment.

Table 3.12 below lists the principal methods used by local authorities of treating domestic sewage and compares them by type, number and population served.

TABLE	3.12	Types	of	Sewage	treatment	use	bу	local	authorities

Treatment	No.	%	Population Served
Extended Aeration Oxidation Ditch Percolating filter Primary (Imhoff) Septic Tank None	3 7 1 43 1 53	5 5 12 2 73 2	261 1% 8,917 27% 6,822 21% 4,475 14% 7,004 21% 5,100 16% 32,579
* Private Septic tanks	9,246		36,984
* No treatment	1,280		5,118

^{* =} figures for Co.Cork only.

Information on the number of persons served by the various sewerge schemes was supplied by the Sanitary Department of the authorities involved.

Quality of Effluent.

With both the domestic and industrial discharges the quality of the effluent varies enormously .

A number of factors may cause a bad quality effluent. These include the following:

Overloading of the treatment works

Mechanical fault at treatment works

Lack of proper maintenance of the treatment works

The figures used for estimating domestic waste loads where no observed readings were available are shown below in Table 3.22.3

TABLE 3.12 ******

Factors For Estimating Domestic Loads.

Habitation factor = depersons 1 house
Water usage 227 Pittres /day/head.
Waste load = 0.054 kg BOD/day/head.

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TABLE 3.134

INDUSTRIAL DISCHARGES BLACKWATER CATCHMENT

Industry	County	River Catchment	Discharge Point	800	Daily Volume	
** TYPE BEET	С	BLACKWATER	RIVER BLACKWATER	79 0. 0	50000	39000.00
C.S.E.T.	L	DEHLERHIER	RIYER DEHORMATER	70010	00000	3,202.22
** TYPE CHEM		40				
BRAEMAR FRAMEMAKERS	M	BRIDE	GLENABOY RIVER	9.9	13	0.00
** TYPE CHOC						
FRY-CADBURY	K	BLACKWATER	RIVER BLACKWATER	20.0	15000	150.00
** TYPE CREM						
ARAGLIN BRANCH (M)	С	ARAGLIN	STREAM TRIB. TO ARAGLIN	0.0	30	0.25
BALLYCLOUGH CO-OP	C	BLACKWATER	RIVER BLACKWATER	0.0	3182	89.00
BALLYDUFF BRANCH	W	BLACKWATER	RIVER BLACKWATER	0.0		0.00
CASTLELYONS CO-OP		BRIDE	RIVER BRIDE	12.0	1820	1.50
CUMMER BRANCH (NM)		ALLO₩	TRIB.OF ALLOW (CUMMERDUFF)	0.0	5	0.25
DROMTARIFFE BRANCH (BC)	C	BLACKWATER	STREAM TRADE TO	0.0	3	0.25
FREEMOUNT BRANCH (GV)	C	ALLOW	STREAM TRIB. TO ALLOW	0.0 0.0 0.0 21.0	5	0.25
GLASHAKINLEEN (NM)	C	ALLOW	STREAM TRIB.TO ALLOW SEVER OWENAKEAL SEVER ALLOW RIVER OWENBAUN RIVER OWENTARAGLIN STREAM, TRIB.TO BLACKWATER	0.0	5	0.25
KANTURK CREAMERY	3	ALLOW STA	BOVER ALLOW	21.0	455	9.40
KILCORNEY BRANCH (BC)	С	OWENBAUN LOT of	RIVER OWENDAUN	0.0	1	0.25
KISKEAM BRANCH (NM)	C	DWENTARABL AND	RIVER OWENTARAGLIN	0.0	5	0.25
LAKEVALE BRANCH (NM)	C	BLACKWATER	STREAM, TRIB. TO BLACKWATER	0.0	5	0.25
LISMIRE BRANCH (NM)	C	ALLOWS	STREAM	0.0	69	0.25
MITCHELSTOWN CREAMERY		FUNSHION		29.0	5455	158.00
NEWMARKET CREAMERY	C .	FUNSHION ALLOW (DALUA) BLACKWATER	STREAM TRIB. TO DALUA	0.0	227	4.80
RATHMORE BRANCH (K)	K COD	RLACKWATER	STREAM (CULLAVAW) TRIB.TO BW	0.0		2.00
ROWELS BRANCH (NM)	C	ALLOW	RIVER ALLOW	0.8		0.25
SILVER PAIL		J	RIVER BLACKWATER	0.0		0.00
SPRINGMOUNT DAIRY (BC)	r.		RIVER BLACKWATER	0.0		0.00
SPRINGHOUNT DRIKE (DC)	· ·	DENORWHIER	MITTER DEMONSTRA			
** TYPE FARM	С	FUNSHION	SDAKAGE AREA	0.0	682	0.25
AN FORAS TALUNTAIS	L	LOWSHION	JOHNHOE HINCH	0.0		
** TYPE HENS			1.5			
J.O'CONNOR & SONS, POULTRY	(₩	BLACKWATER	RIVER BLACKWATER	0.0	73	9.00
		1	1			
** TYPE HOSP		Tr.				
MOUNT ALVERNIA	3	BLACKWATER	RIVER BLACKWATER	0.0) 5	0.25
** TYPE MART						
FERMOY MART	C	BLACKWATER	RIVER BLACKWATER	300.8	508	145.00
	C	BLACKWATER	RIVER BLACKWATER	0.6		
MALLOW MART	C	FINNOW	STREAM TRIB. TO FINNOW	0.0		
MILLSTREET MART	C	FUNSHION	RIVER FUNSHION	0.0		
MITCHELSTOWN MART	U	I DIAGITUR	MITCH TONOMIDM	211		7.5.7.5
** TYPE MEAT						20 <u>2</u> 1220
AGRA MEAT PACKERS	C	BRIDE	STREAM (VIA LAND SPRAY)	8.		
GALTEE TENDER FOODS	С	FUNSHION	RIVER FUNSHION	8.	228	3 0.00

Page No. 01/01/80

TABLE 3.144 \\

INDUSTRIAL DISCHARGES
BLACKWATER CATCHMENT

Industry	County	River Catchment	Discharge Point	BOD	Daily Volume	80D Load
HORGAN MEATS (ARDNAGEEHY)	С	AWBEG	STREAM (VIA LAND SPRAY)	0.0	252	0.00
** TYPE VEG. SUN PRODUCTS, NEWMARKET.	С	ALLOW (DALUA)	TRIB.TO DALUA	0.0	2	0.00

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INDUSTRIAL DISCHARGES

The 1978 national survey of discharges with revisions where necessary has been used in compiling Table 3.13 over.

Monitoring of Industrial Discharges.

Effluent from the major creameries, C.S.E.T. and other industries such as meat processing plants are monitored regularily by local authorities and the daily waste loads were estimated from the results of these surveys.

Intermittent Discharge of Effluent C.S.E.T.

C.S.E.T.'s system of discharging their effluent differs from other systems in that C.S.E.T. only discharge when the flow in the River Blackwater is equal to greater than $55 \text{ m}^3/\text{sec.}$ giving a dilution of more than 1 / 100.

C.S.E.T. are not in operation in the summer months when critical low flows are most likely to occur.

Not withstanding this the daily waste load of 7,800 kg BOD from C.S.E.T. when they are in full production is 24 times the daily waste load for the rest of the catchment.

Industries which are potential sources of pollution are dealt with in the next section.

Potential Sources of Pollution

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Potential Sources of Pollution in the Blackwater Catchment

From an analysis of river sampling results and list of industries indicate the following locations as potential sources of pollution.

A Sile 3.15

River

Location ·

Potential Sources of Pollution

Blackwater

Rathmore

Rathmore Creamery Rathmore S.T.W. Fry Cadbury

Blackwater

Mallow

CSET

Ballyclough & O-Op

Mallow S. Jaw.

Allow

Kanturk

Norte Two Cork Creamery

Kantourk STW

Marth Cork Creamery T.W.

Gradoge

Mitchelstown Mitchelstown

Mitchelstown Co-Op T.W. Agricultural Sources u/s

Mitchelstown

Funshion

Mitchelstown

Mitchelstown Co-Op T.W.

Mitchelstown S.T.W. Agricultural Sources

The mass balance formula is useful for determining the effect on receiving waters effluent discharges.

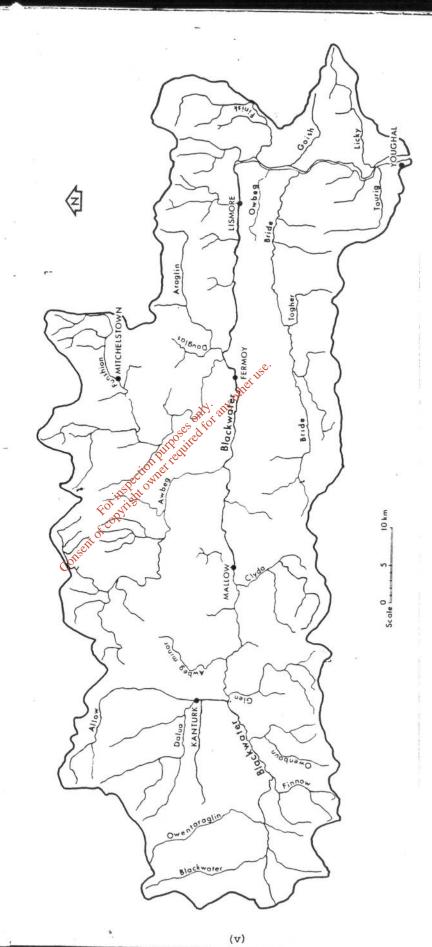
FC + fc T = ----- = B.O.D. level of receiving waters d/s of F + f discharge

C = B.O.D. level of water u/s of discharge

C = B.O.D. level of effluent

F = River Flow u/s of discharge

f = Flow of discharge.



LOCATION OF POTENTIAL SOURCES OF POLLUTION IN BLACKWATER CATCHMENT.

INDIVIDUALE TO THE TOTAL OF THE PARTY OF THE

Description of Individual Effluent Loads in the Blackwater Catchment.

RATHMORE DISCHARGES

RATHMORE DISCHARGED	Vol. Discharged	BOD load kg/day
Source	m3/day	2 7.5
Rathmore Creamery	95 91	124
Rathmore S.T.W. Rathmore S.T.W. Fry Cadbury	5700 15000	

Approximately 96m^3 of effluent is discharged from the creamery to t Rathmore Creamery (Kerry Co-Op) Approximately 90m 3 of efficient 13 and 150m the creamery to to Cullavaw Stream at a point 650 metres u/s of it's confluence with the

91 m^3 of this effluent is cooling water and the balance arises from River Blackwater. the washdown of premises and the plant.

It is estimated that the BOD loading to the stream is approx.

No sampling results area available for the effluent or the stream i No sampling results area avantable point. However the stream was sample the vicinity of the discharge point. Part of a 24 hours 2 kg BOD/day. the vicinity of the discharge point. It of a 24 hour survey in July just upstream of the confluence as part of a 24 hour survey in July just upstream of the countering was 3.02 with a peak value of 5.7.

The Rathmore Sewerage Treatment Works is a Percolating Filter type Rathmore S.T.W. The Kathmore Dewerage lifeaumon confluence of the Cullavaw Strea is located immediately d/s of the confluence of the Cullavaw Strea is located immediately dos Blackwater forms the county boundary at a point where the River Blackwater forms the county boundary between Cork and Kerry.

There are in the region of 100 houses connected into same. The There are in the region of the River Blackwater giving an organ treatment works discharges to the River loading of 7.5 kg BOD/day to the river.

This company is engaged in the manufacture of chocolate. It's eff Fry Cadbury is discharged to the River Blackwater at a point 400 m. d/s of

As in the case of the Rathmore S.T.W. (above), the River Blackwate Duncannon Bridge. As in the case of the lackway between Cork and Kerry at this point.

It's effluents include cooling water (5064 m^3); treated domestic sewage (250 persons), treated washwater and cooling water. All these effluents are discharged through one pipe to the River Blackwater giving a load of 124 kg BOD/day (PE.2300).

In a low flow situation, any exceeding of the above loading could seriously effect the BOD and DO level in the river in the discharge point down to the Awnaskirtaun confluence.

NEWMARKET DISCHARGES

Scheme	Vol. Discharged m3/day	Kg BOD Load
Newmarket S.T.W.	27Ø	18.Ø
Newmarket Creamery	227	3.Ø

Newmarket S.T.W

Approximately 270 m^3/day of treated effluent is discharged to the nearby River Dalua. The effluent is treated using a percolating filter system: the organic loading of the charge is estimated at 18.0 kg. BOD/day. The plant is in need of graphaul as its mechanical state is only fair.

Newmarket Creamery

Approximately 227 m^3/day of effluent is discharged from a treatment works to a stream which as a tributary of the River Dalua at a point 3 km u/s of their confluence. The creamery produces milk, cheese and other dairy products The organic loading of the discharge from the treatment plant to the stream is 3 kg. BOD/day. P.E. (60).

Kanturk Discharges ==============

Scheme	Vol. Discharged m3/day	Kg. BOD
Kanturk S.T.W.	441	47
North Cork Creameries	455	1Ø

Kanturk S.T.W.

Approximately 441 m^3/day of effluent is discharged to the River Allow via a treatment works at a point 1 km. d/s of Kanturk town.

The efficiency of the treatment works is poor and this is reflected in the BOD values of the treated effluent.

In a 24 hour survey carried out in July 1985, the BOD of the effluent varied from a maximum of 100 ppm to a minimum of 21 ppm giving an average value of 65 mg/1 BOD.

Spot samples taken in 1986 had BOD values ranging from a minimum of 106 ppm to a maximum of 160 ppm.

This treatment works needs to be replaced immediately as the loading on it far exceeds it's capacity.

North Cork Creameries

Approximately 455 m^3/day of effluent is discharged via a treatment works to the River Allow 20 metres d/s of the Kanturk S.T.W. outfall.

The creamery is the third largest in the Blackwater catchment and produces butter, cheese and milk.

The volume of effluent discharged to the river is 455 m^3/day and the organic loading is 10 kg BOD/day.

MALLOW DISCHARGES

Scheme	Consent Or Vol. Discharged m3/day	Kg BOD/day
	COLLE	
C.S.E.T.	5Ø,ØØØ	40,000
Ballyclough Co-Op	3,182	89
Mallow S.T.W.	1,7Ø1	46
Mallow Mart	136	4Ø
C.S.E.T.		

This company is involved in the processing and refining of sugar beet. It is a seasonal industry being active from October to December inclusive.

It is located 3.5 km u/s Mallow and it's water usage is in the region of 50,000 m3/day. The effluent discharge point is located 1.0 km u/s of the factory on the River Blackwater.

The water is used for washing the beet and transporting same to the processing area. It is then pumped along with contaminated surface water to a sedimentation tank. Here the solids are settled out and are then pumped as "mudwater" to lagoons for storage and treatment. The effluent from the lagoons is discharged intermittently to the River Blackwater at a point 200 metres u/s Longfields Bridge when the flow in the river is greater than 55 m^3/sec.

The maximum rate of discharge is limited to $\emptyset.52$ m³/sec giving a minimum dilution of 1/100.

The BOD loading from the lagoons at maximum discharge rate is in the region of 40,000 kg. BOD/day. This is equivalent to 26 times the BOD load for the rest of the catchment. (P.E. 500,000)

Even though the discharge can cause the BOD of the river to reach $2\emptyset$ ppm 4.2 km. d/s at the Ten Arches Bridge, the D.O. level is not greatly affected. This is probably due to the relatively low water temperatures and the increased reoxygenation caused by the turbulance in the river due to high flow.

The main effect of the C.S.E.T. discharge is the development of sewage fungus in the river below the outfall. This can be traced as far as Kilavullen (17 km. d/s) and beyond sometimes.

Sewage fungus (Sphaenotilus Nataus) thrives on the nutrients available in the C.S.E.T. effluent and the reduced competition from other species during winter.

Due to high winter flows it is difficult to study the extent and effect of the sewage fungus cover on the river bed during the beet campaign.

The possible detrimental effects of sewage fungus on the Mallow stretch of the Blackwater would include a reduction of food organisms of fish and an increase in silting up of the river bed.

Experiments with the rate and period of dischargeing have been carried out in an effort to find the best discharge regime.

Planning permission for extending C.S.E.T.'s lagoons at Newberry, Mallow includes conditions which set a limit of 250 ppm BOD for the effluent and the u/s BOD level of the river shall not be increased by more than 1 mg/litre at the Ten Arches Bridge sampling point.

It is envisaged that these conditions will be met by the start of the 1987 - 1988 beet campaign.

To meet these conditions it may be necessary to extend the present effluent storage facilities to improve the quality of the final effluent through anaerobic action. Additional treatment of the effluent may also be necessary.

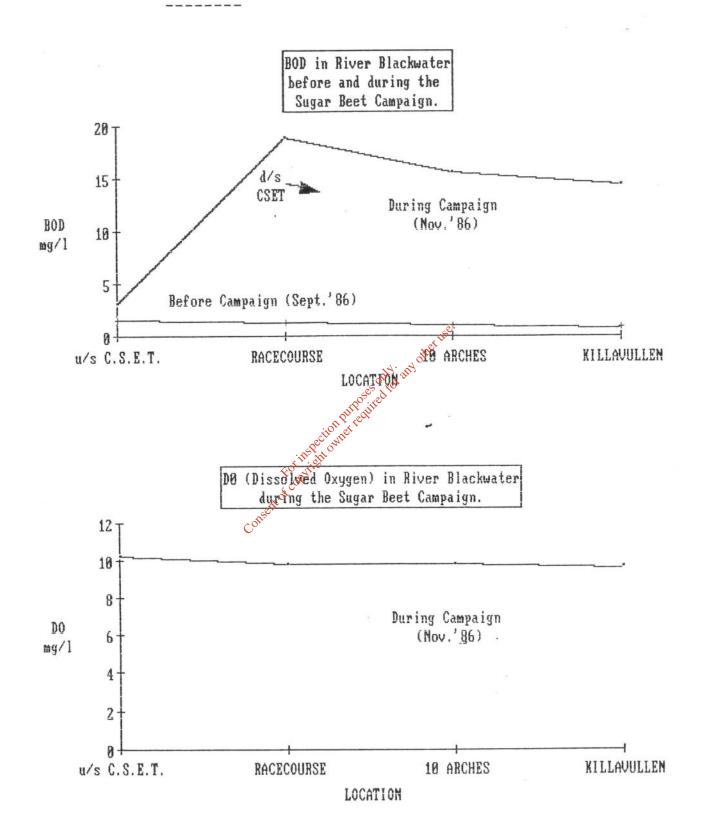
A stream that flows through the east end of the C.S.E.T. grounds is also a serious source of pollution to the main channel. Whilst the flow rate is not as great as that from the lagoons, it can exceed 4545 m^3/day. The BOD has been measured at 350 ppm, and the stream's temperature has at times been more than 10 degrees higher than the temperature of the river Blackwater into which it flows.

The stream has caused considerable fungus growth in the main channel in the past before the start of the beet campaign at times of low to medium flows.



FIGURE 3.7 *******

VARIATION OF BOD AND DO IN BLACKWATER DURING SUGAR BEET CAMPAIGN



Discharges from the vegetable processing plant adjacent to the sugar factory are thought to be a source of pollution to this stream, whilst leakages of cooling water from C.S.E.T. during the beet campaign add to the problem.

Ballyclough Co-Op

This firm is engaged in the processing of raw milk and in the production of various dairy products. These include milk, butter, dried milk powder and chocolate crumb. (Borden Company)

The treated effluent is discharged directly to the River Blackwater at a point 500 metres u/s Mallow Bridge.

The volume of effluent is 3182 m^3/day and the waste load is 89 kg BOD/day.

A small stream which runs through the factory grounds shows signs of occasional pollution; this stream receives cooling water from the factory as well as storm overflow from a section of the Mallow Urban drainage system (Estimated load = ??? houses).

Samples were taken of the stream u/s and dys of the factory in June 1986 and September 1986. The results were as follows:

Data	Sample Point Rose de la constante de la consta	S.S.	B.O.D.
Date			
11/Ø6/86	u/s Ballyclough Factory	4.0	2.1
11/20/00	d/s Ballyclough Factory	17.Ø	33.Ø
Ø9/Ø9/86	u/s Ballyclough Factory	- 2.Ø	1.6
~~, ~~, ~~	d/s Ballyclough Factory	10.0	8.Ø

It is to be noted that the d/s sample was u/s of the storm overflow outfall, and no flow was coming from same at the time.

The above results indicate that a considerable amount of polluting matter is being discharged to the stream in addition to the cooling water for which a licence was granted.

The sources of the above pollution will have to be located and steps taken to eliminate same by Ballyclough Co-Op.

Mallow S.T.W.

These treatment works are located 2 km d/s of Mallow town and were opened in 1984 with the present population served = 7,500. The volume treated is $1701 \text{ m}^3/\text{day}$. The waste load is 46 kg BOD/day. The treated effluent is discharged directly to the River Blackwater.

MITCHELSTOWN DISCHARGES

Scheme

Vol. Discharged (m^3/day)

Kg.BOD/day

Mitchelstown S.T.W. Mitchelstown Co-Op

75Ø 5683 2Ø 171

Mitchelstown S.T.W.

Mitchelstown S.T.W. was built in 1956. It's design P.E. was 11,000 to cater for the public sewage, and also to cater for the wastes from Mitchelstown Co-Op. It discharged to the River Gradoge at a point 800m u/s of the confluence with the River Funchion.

A new effluent pipe was laid in 1985 and the new discharge point is located on the River Funcheon at a point 1000 m d/s of the River Gradogue confluence.

The Co-Op constructed their own treatment works in 1985, and the present loading of the town's sewage works is about 20 kg BOD/day with a P.E. of 6000.

Mitchelstown Co-Op

As mentioned above the Co-Op constructed a new treatment works in 1985 and the effluent from this discharges to the River Funchion at the same location as the effluent from the town's sewerage works discharges.

The volume of effluent is 5683 m^3/day and the waste load is 171 Kg BOD/day.

Despite the moving of the discharge point from the Gradoge to the Funchion, the River Gradoge remains in a seriously polluted condition (c.f. AFF 1986).

The pollution loading of the Gradoge seriously depresses water quality in the Funchion into which it flows. The effects of this pollution can be traced downstream for a distance of 10 km.

The main sources of pollution in the Gradoge u/s of Mitchelstown are agricultural and d/s of Mitchelstown the entry of a grossly polluted stream (Mill Race) to the Gradoge at a point 700 m from the confluence with the Funshion.

Large quantities of milk wastes and contaminated cooling water continue to escape into the Mill Race despite the Co-Op's efforts to prevent same.

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