



**WATER QUALITY SECTION
CORNWALL AREA**

FINAL DRAFT REPORT

**RIVER LYD
DIAZINON CONTAMINATION
INVESTIGATION - 1995**

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COR/96/009

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River Lyd -
Diazinon Contamination Investigation - 1995.

1. Introduction.

(i) Background.

Diazinon was detected in the River Lyd at Greenlanes Bridge (SX44438321) in September and October 1993 (Table 1). On both occasions the detection of diazinon in the water course was associated with heavy rainfall. Whilst the corresponding samples for September and October 1994 were dry periods, November 1994 was very wet. Diazinon remained undetected for all 1994 samples at this site regardless of rainfall.

(ii) Objectives.

To identify sources of diazinon causing EQS non-compliance at Greenlanes Bridge.

2. Methods.

(i) Review of archive data.

(ii) Pesticides to be included in analysis of routine monitoring samples from Greenlanes Bridge (R12F001), A386 Roadbridge (R12F012) and Lydford WWTW final effluent (WSTW4664FE).

3. Results.

Results of diazinon analysis for the three sites are shown in Table 1.

4. Discussion.

Diazinon has been included in the analytical suite for samples from Greenlanes Bridge since May 1992. In September and October 1993 samples were found to contain 6.1 and 191.4 ng/l diazinon respectively. This compares to proposed Environmental Quality Standards of 100ng/l maximum allowable concentration, and 10ng/l annual average concentration (NRA R&D Note 216). These incidents were associated with periods of heavy rainfall.

Continued monitoring in 1994 revealed no detectable presence of diazinon at this site.

On extension of the analysis to the A386 Road Bridge and the Lydford WWTW samples during 1995-6, diazinon was consistently detected in samples of the final effluent of Lydford WWTW but appeared to have no impact on the River Lyd at the two sampling points downstream of the discharge where diazinon was not present in detectable concentrations (ie <6.0ng/l). The sampling dates covered a range of rainfall conditions.

Taxa lists for Greenlanes Bridge and the A386 Road Bridge sites which both show biota typical for locations of this nature and, at Greenlanes Bridge especially, consistent and abundant presence of pesticide-sensitive taxa (Appendix).

5. Conclusion.

- (i) Over a five year period during which samples from the River Lyd at Greenlanes Bridge were analysed for diazinon, the pesticide was detected on two occasions in 1993.
- (ii) Diazinon was detected in the Lydford WWTW final effluent each time it was sampled. No diazinon was detected at the two sampling points on the River Lyd downstream of the WWTW on these occasions.
- (iii) There is no evidence of diazinon contamination in the River Lyd downstream of Lydford since 1993.
- (ii) This conclusion is supported by biological data from these sites.



6. Actions.

In light of the fact that no further diazinon has been detected in the River Lyd at these sites since the initial incident in 1993, and that there appear to be no downstream implications of the discharge of low concentrations of diazinon from Lydford WWTW, no further actions are recommended.

Reference.

Lewis, S., Watson, A., and Hedgeott, S. (1993) Proposed environmental quality standards for sheep dip chemicals in water: chlorfenvinphos, coumaphos, diazinon, fenchlorfos, flumethrin, propetamphos., NRA R&D Note 216.

Date	Diazinon ng/l			Rainfall mm	
	Greenlanes Bridge	A386 Road Bridge	Lydford STW	rainfall that day	rainfall previous five
29/05/92	<5.0			8.6	17.9
25/06/92	<5.0			0	0
10/09/92	<5.0			7.3	24.1
26/10/92	<5.0			1.5	29.8
25/11/92	<5.0			17.6	59.4
06/05/93	<5.0			no data	no data
02/06/93	<5.0			no data	no data
06/09/93	6.1			1.7	1.7
06/10/93	191.4			7.2	59.5
18/05/94	<6.4			0	14.3
02/06/94	<6.0			7.4	7.8
09/09/94	<6.0			0	33
17/10/94	<6.0			0	0
09/11/94	<6.0			17.8	51.3
24/11/95	<6.0	<6.0	15.6	14.2	48.8
26/01/96	<6.0	<6.0	no result	0	3.5
27/02/96	<6.0	<6.0	44.9	0	26.4
23/03/96	<6.0	<6.0	7.5	0	13.4

Table 1: Diazinon concentrations for three sites on the River Lyd, 1992-1996. Rainfall for Blackdown Wheel Jewell Reservoir. Shaded area shows samples taken within the period of the investigation.

Taxa List for NR06.1222 Lyd Greenlanes Bridge SX44438321
 10 Samples taken previous to 19/09/1996

Biology Area	06	06	06	06	06	06	16	16	16	16
Day	20	16	09	29	17	10	14	30	11	02
Month	Apr	Jul	Oct	Apr	Jun	Sep	Mar	Nov	Apr	Oct
Year	1990	1990	1990	1992	1992	1992	1994	1994	1995	1995
Non Routine Sample Sample Number	0074	0509*	0994*	0464	0615	1144	0105	0371	0216	0340
HEPTAGENIIDAE	**	*	**	**	*	*	**	**	*	*
LEPTOPHLEBIIDAE	*		**							*
EPHEMERELLIDAE	**	*	*	**	**	*			*	*
EPHEMERIDAE	**	*				*				*
TAENIOPTERYGIDAE							*		*	
LEUCTRIDAE	***	**	**	**	**	**	*	*	*	**
PERLODIDAE				*		*	*	*		*
CHLOROPERLIDAE	**			*	*		*	*	*	
LEPTOCERIDAE	**	*	***	**	*	*	**	*	*	**
GOERIDAE	*		*	**	*	**	*	**	**	*
LEPIDOSTOMATIDAE	***	*	**	**	**	*	*	**	*	**
BRACHYCENTRIDAE		**	**		**	**	*			*
SERICOSTOMATIDAE	***	*	**	**	*	**	*	**	*	*
CALOPTERYGIDAE	*	*	*							
CORDULEGASTERIDAE		*								
CAENIDAE	**	*							*	*
NEMOURIDAE	*		**			*		*		*
RHYACOPHILIDAE	**	*	*	**	*	**	**	**	*	*
POLYCENTROPODIDAE	*	*	**	*	*		*	*		*
LIMNEPHILIDAE	**	*	**	*	*	*	*	*	*	
ANCYLIDAE	*	*	**	*	*	*		*		**
GAMMARIDAE	*				*	*	*	*	*	
GERRIDAE			*			*				
CORIXIDAE	*									
DYTISCIDAE	*	**	**	*	*				*	*
GYRINIDAE	*	*	*	*	*			*	*	*
HYDROPHILIDAE	*	**		*	*		*	**	*	*
ELMIDAE	**	*	**	**	*	*	*	**	*	*
HYDROPSYCHIDAE			*	**	**	**	*	**	*	*
TIPULIDAE	*		**	**	*	*	*	*	*	*
SIMULIIDAE	*	**	**	**	*	*	*	*	*	*
PLANARIIDAE				*		*	*		*	*
BAETIDAE	**	*	**	**	*	**	*	**	*	*
SIALIDAE										*
HYDROBIIDAE	**	**	**	*	*	*	*	**	*	**
LYMNAEIDAE	*	*	**							*
BMWP Score	203	168	180	170	168	173	167	160	170	204
Pred. BMWP Score										
BMWP/Pred BMWP										
ASPT	6.77	6.72	6.67	6.54	6.72	6.92	6.96	6.67	6.54	6.58
Predicted ASPT										
ASPT/Pred ASPT										
Biotic Class	A	A	A	A	A	A	A	A	A	A

Taxa List for NR06.1221 Lyd A386 Rd Br Lydford SX52118446
 10 Samples taken previous to 19/09/1996

Biology Area	06	06	06	06	06	06	16	16	16	16
Day	20	16	09	29	18	10	10	30	11	09
Month	Apr	Jul	Oct	Apr	Jun	Sep	Mar	Nov	Apr	Oct
Year	1990	1990	1990	1992	1992	1992	1994	1994	1995	1995
Non Routine Sample Sample Number	0139	0835*	1280*	0463	0587	1143	0095	0364	0229	0338
HEPTAGENIIDAE				*			*	*	**	**
LEPTOPHLEBIIDAE				*						
EPHEMERELLIDAE		*								
TAENIOPTERYGIDAE	*			*			**		**	
LEUCTRIDAE	**	*	*	**	*	*	**	*	**	*
PERLODIDAE		*	*	*	*	*	**	*	**	*
CHLOROPERLIDAE			*	**	*		*	*	*	*
BERAEIDAE								*		
LEPTOCERIDAE	*									**
GOERIDAE										*
LEPIDOSTOMATIDAE					*				*	*
SERICOSTOMATIDAE							*			**
CORDULEGASTERIDAE		*								
NEMOURIDAE	**	*	**	**	*	*	**	*	**	**
RHYACOPHILIDAE		*	*		*	*	*	*	*	*
POLYCENTROPODIDAE	*	**	*	*	*	*		*		*
LIMNAPHILIDAE							*	*	*	
ANCYLIDAE						*				
HYDROPTILIDAE			**	*						*
GYRINIDAE	*		*		*				*	
HYDROPHILIDAE										*
SCIRTIDAE		*	*					*		*
ELMIDAE	**	*	**	**	*	*	**	*	*	*
HYDROPSYCHIDAE	*			**	**		*	*	**	**
TIPULIDAE	*	*	*		*	*	*		*	*
SIMULIIDAE	**	*	**	*	*	*	**	*	**	**
PLANARIIDAE			*	*					*	*
BAETIDAE	*	*		**	**	*	**		**	**
HYDROBIIDAE								*		*
PLANORBIDAE										*
SPHAERIIDAE							*		*	*
CHIRONOMIDAE	*	*	**	*	*	*	**		*	*
OLIGOCHAETA	**	*	**	**	**	**	**	*	**	**
EMPIDIDAE							*		*	
HYDRACARINA										*
NEMATODA										*
BMWP Score	76	86	90	107	93	69	111	102	121	158
Pred. BMWP Score										
BMWP/Pred BMWP										
ASPT	5.85	6.14	6.00	6.69	6.20	5.75	6.53	6.80	6.37	6.32
Predicted ASPT										
ASPT/Pred ASPT										
Biotic Class	C	C	C	B	C	C	B	B	B	A

Taxa List for NR06.1221 Lyd A386 Rd Br Lydford SX52118446
 10 Samples taken previous to 19/09/1996

Biology Area	06	06	06	06	06	06	16	16	16	16
Day	20	16	09	29	18	10	10	30	11	09
Month	Apr	Jul	Oct	Apr	Jun	Sep	Mar	Nov	Apr	Oct
Year	1990	1990	1990	1992	1992	1992	1994	1994	1995	1995
Non Routine Sample Sample Number	0139	0835*	1280*	0463	0587	1143	0095	0364	0229	0338
RHAGIONIDAE DIPTERA				*		*				*
BMWP Score	76	86	90	107	93	69	111	102	121	158
Pred. BMWP Score										
BMWP/Pred BMWP										
ASPT	5.85	6.14	6.00	6.69	6.20	5.75	6.53	6.80	6.37	6.32
Predicted ASPT										
ASPT/Pred ASPT										
Biotic Class	C	C	C	B	C	C	B	B	B	A