Notes on the report submitted by TNO on the Screening Survey for Priority Substances and Relevant Pollutants (August 2008)

Foreword

Just to advise any reader that these notes on the Dangerous Substances Screening Survey were submitted informally; as part of WRc's work for the Western River Basin District and were not written in the style of a formal peer review.

Ray Spain
SERBD Project Co-ordinator

Introduction
The report produced by TNO was passed to me by Paddy Kavanagh for comment in relation to the general conclusions and any implications for the Western RBD WFD Project. Overall, I think it is an excellent piece of work that should form a sound basis for the design of further WFD monitoring. In particular, it provides a rationale for the selection of a smaller and demonstrably appropriate range of substances for surveillance monitoring in the Relevant Pollutant category.

Notes

EQS levels for P(H)Ss
The attached table shows the EQS values in Table 5 of the TNO report. These form the basis of the assessment given in the report. These values were current at the time the survey was set up. Subsequently, the EQS levels have been subject to a number of revisions as aspects of the Priority Substance Daughter Directed have been negotiated between the European Commission and the European Parliament and Council. The table also shows current EQS values as (more or less) agreed in the latest and probably final version of the draft Directive.

In many cases EQS values have been revised upwards or left more or less the same. Such changes will not adversely affect the assessment of the risks of non-compliance. In a few cases the current EQSs are considerably lower those assumed by TNO. Where this happens there is a risk that the data are either not suitable for compliance assessment, owing to LODs being too high, or that the assessment is falsely optimistic. The substances affected are:

- Brominated diphenyl ethers
- Endosulphan
- Octylphenols
- Pentachlorobenzene
- Six ring PAHs (Benzo(g,h,i)perylene and Indeno(1,2,3-cd)pyrene) and
- TBT

Contact Name: Mike Gardner T: +44 (0) 1793 865204Extn F: +44 (0) 1793 865001
E: email.address: gardner_mj@wrcplc.co.uk

For the BDEs, the LOD achieved in water is nearly low enough (0.001 ug/l compared with the EQS of 0.0005). More than a quarter of water samples are reported as exceeding the LOD. This indicates a high risk of non-compliance. BDEs are an identified problem in the UK. The use of flame retardants containing commercial deca-BDE, having other congeners as impurities, is an obvious source. The importance of environmental contamination and subsequent debromination of deca-BDE used in foams, TVs, pc cases etc is not clear, but is a major concern.

For Endosulphan, the LOD of 0.01ug/l approaches the EQS of 0.005; one value (for the beta isomer) exceeds 0.2 ug/l. For Octylphenol the LOD is 0.01 for an EQS of 0.1, with no instance of detection. For pentachlorobenzene the LOD is 0.002 ug/l for an EQS of 0.0007, with one instance of detection. These results indicate no strong evidence of likely non-compliance for any of these substances.

In the case of PAHs the LODs achieved are not low enough. In the case of the heavy PAHs, the LOD achieved (0.005 ug/l) is not low enough to assess compliance with an EQS (as the sum of the 2 substances) of 0.002 ug/l. Similar considerations probably apply for TBT.

Observed values for nickel do not approach the current interim EQS of 20 ug/l, though it would be wise to continue to make the assessment against a considerably lower EQS value – the level of 1.8 ug/l used by TNO is probably quite sensible. The LOD of 0.1 ug/l for mercury is much higher than is technically achievable and somewhat high to make sense of an EQS of 0.05 ug/l.

Non-compliance with the EQS for DEHP is a worry for us too. Removal during effluent treatment might not be very efficient.

Relevant Pollutants.
As far as I can tell, the overall picture of results is in accord with data obtained in England and Wales – at least in the following respects

- The occurrence of transition metals is much the same. Zinc and copper predominate, though at lower concentrations than those seen in England and Wales. This is probably due to higher available dilution in Ireland, together with lower population density resulting in lower emissions (contamination with these metals is often associated with domestic sources);

- Other metal levels are low. Arsenic, vanadium and uranium are at the consistent background level for which we don't usually monitor. I'm not sure why barium and boron are on the list or what is the basis of the EQSs for these; are they a concern?

- In water, the herbicides diuron, simazine and atrazine are found most often, with regular occurrence of mecoprop and MCPA. There is nothing much else – maybe glyphosate is lost by biodegradation. I note the data on dichlobenil, but know nothing more about it;

- PCBs are ubiquitous in biota;

The plan to cross check usage as a way of refining the RP list is a great idea. It would probably also be a good idea also to run some monitoring on the natural and synthetic steroids – methods

are now available and have been shown to work in river and sewage effluent samples (I can provide details of who does this).

Mike Gardner
11/08/2008

Contact Name: Mike Gardner T: +44 (0) 1793 865204Extn F: +44 (0) 1793 865001
E: email.address: gardner_mj@wrcplc.co.uk

EQS Table

		EQS	EQS	
			Value in latest (agreed) Daughter directive (23 June 2008)	
			AA-EQS[2]	
Substance	CAS No.	value in TNO report	Inland surface waters	Notes
Alachlor	15972-60-8	0.035	0.3	
Anthracene	120-12-7	0.01	0.1	
Atrazine	1912-24-9	0.1	0.6	
Benzene	71-43-2	1	10	
Brominated diphenylethers	n.a.			
Bis(pentabromo-phenyl)ether	1163-19-5			
Diphenyl ether, octabromo derivative	323536-52-0			
Diphenyl ether, pentabromo derivative	32534-81-9	0.53	0.0005	for congener numbers 28, 47, 99, 100, 153 and 154
Cadmium and its compounds	7440-43-9	0.4	0.08-0.25	hardness bands
C10-13-Chloralkanes	85535-84-8	0.1	0.4	
Chlorfenvinphos	470-90-6	0.1	0.1	
Chlorpyrifos (Chlorpyrifos-ethyl)	2921-88-2	0.1	0.03	
1,2-Dichloroethane	107-06-2	2	10	
Dichloromethane	75-09-2	10	20	
Di (2-ethylhexyl) phthalate (DEHP)	117-81-7	0.5	1.3	
Diuron	330-54-1	0.05	0.2	
Endosulphan	115-29-7	0.1	0.005	
Fluoranthene	206-44-0	0.025	0.1	
Hexachlorobenzene	118-74-1	0.01	0.01	
Hexachlorobutadiene	87-68-3	0.1	0.1	
Hexachlorocylohexane (Lindane)	608-73-1 58-89-9	0.01	0.02	
Isoproturon	34123-59-6	0.1	0.3	
Lead and its compounds	7439-92-1	2	7.2	interim
Mercury and its compounds	7439-97-6	0.2	0.05	
Naphthalene	91-20-3	1	2.4	
Nickel and its compounds	7440-02-0	1.8	20	interim
Nonylphenols	25154-52-3	0.3	0.3	
(4-(para)-nonylphenol) ,(4-nonylphenol,branched)	(104-40-5) (84852-15-3)			
Octylphenols (para-tert-octylphenol)	1806-26-4 (140-66-	1	0.1	

Contact Name: Mike Gardner T: +44 (0) 1793 865204Extn F: +44 (0) 1793 865001
E: email.address: gardner_mj@wrcplc.co.uk

	9)			
Pentachlorobenzene	608-93-5	1	0.007	
Pentachlorophenol	87-86-5	0.1	0.4	
Polyaromatic Hydrocarbon (PAH)	n.a			
(Benzo(a)pyrene)	(50-32-8)	0.01	0.05	
(Benzo(b)fluoranthene)	(205-99-2)		Σ=0.03	sum bbf bkf
(Benzo(k)fluoranthene)	(191-24-2)	0.03		
(Benzo(g,h,i)perylene)	(207-08-9)	0.04	Σ=0.002	sum bpy ipy
(Indeno(1,2,3-cd)pyrene)	(193-39-5)	0.04		
Simazine	122-34-9	0.02	1	
Tributyltin compounds (TBT-ion)	688-73-3 (36643-28-4)	0.014	0.0002	
Trichlorobenzene	12002-48-1		0.4	sum
(1,2,3-trichlorobenzene)	87-61-6			
(1,2,4-trichlorobenzene)	120-82-1			
(1,3,5-trichlorobenzene)	108-70-3			
Trichloromethane (Chloroform)	67-66-3	1	2.5	
Trifluarlin	1582-09-8	0.037	0.03	
DDT				
4,4'-isomer	50-29-3	0.01	0.025	total
2,4'-isomer	789-02-6	0.01	0.01	pp DDT
Aldrin	309-00-2	0.01	Σ=0.01	total drins
Endrin	60-57-1	0.005		
Dieldrin	72-20-8	0.005		
Isodrin	465-73-6	0.005		
Carbon Tetrachloride	56-23-5		12	
Trichloroethylene	79-01-6		10	
Tetrachloroethylene/Perchloroethylene	127-18-4		10	

Contact Name: Mike Gardner T: +44 (0) 1793 865204Extn F: +44 (0) 1793 865001
E: email.address: gardner_mj@wrcplc.co.uk

