

8 May 2017

Mrs Bruning

By email: [fyi-request-5544-fda71ba0@requests.fyi.org.nz](mailto:fyi-request-5544-fda71ba0@requests.fyi.org.nz)

Dear Mrs Bruning

### Your request under the Official Information Act 1982

I refer to your email request under the Official Information Act 1982 requesting information about the Priority 2 Chemical Determinands Identification programme. Your request is attached as an Appendix to this letter.

Following consultation, ESR is now in a position to respond to your request as follows:

#### Background:

Statements in the *Drinking-water Standards for New Zealand 2005 (rev 2008)* (DWSNZ) and the *Guidelines for Drinking-water Quality Management for New Zealand (2016)* indicating that the Priority 2 Chemical Determinands Identification Programme (the P2 Programme) continues to operate are out-of-date (incorrect). Similar statements on the <http://www.drinkingwater.esr.cri.nz/> website are also out-of-date.

The P2 Programme, which ESR ran for the Ministry of Health, ceased to operate in 2004. Actions to identify chemical determinands of potential health concern (P2 determinands) since 2004 have been the responsibility of individual water suppliers. During this period (2004 – present), ESR's role in identifying P2 determinands has been two fold:

- a. Drafting generic advice to assist water suppliers in identifying P2 determinands (see response to a request (below)).
- b. Reviewing, for district health boards (DHBs), monitoring data collected by water suppliers to assess whether the criteria for assignment of the determinands as Priority 2 determinands have been met.

During the period, ESR has reviewed risk information from one water supplier and provided guidance on what tests they should carry out for their identification of P2 determinands (analyses arranged and funded by the supplier).

Your clarification email of 3 April 2017 states that you are interested in data gathered or received after 2006 on pesticides and their metabolites. The responses provided are based on this clarification.

#### Requested information:

1. *Results from the P2 Chemical Determinands Identification Programme for the 10 years 2006-2016 - or otherwise from when the P2 Programme commenced.*

ESR's database does not contain any test results for pesticides and/or their metabolites from samples taken in 2006 or subsequently.

You will find P2 determinands that have been assigned to water supply zones listed in the *Annual Report on Drinking-water Quality*, published on the Ministry of Health's website. <https://www.health.govt.nz/publication/annual-report-drinking-water-quality-2015-2016>

2. *As this is a regional testing programme please include results by New Zealand region in order to understand which regions have been tested.*

ESR's database does not contain any test results for pesticides and/or their metabolites from samples taken in 2006 or subsequently.

3. *The pesticides (including fungicides/miticides/herbicides/insecticides) and their breakdown products that have been tested for under the P2 Identification Programme over the years 2006-2016 (and if this varies by region please include regional sampling data).*

ESR's database does not contain any test results for pesticides and/or their metabolites from samples taken in 2006 or subsequently.

4. *Testing methodologies used and LOD, LOQ, LOR for the pesticides that ESR has tested (this may be limited to the years 2013-2016).*

ESR's database does not contain any test results for pesticides and/or their metabolites from samples taken in 2006 or subsequently. The DWSNZ contains a listing of the referee analytical methods to be used for drinking-water analysis. Alternative methods can be used, but they must be calibrated against the referee method.

5. *All ESR authored analytical papers or reports concerning group-transgression of chemically-related groups that have common mechanisms of toxicity (E.g. not limited to but as an example, papers concerning the N-methyl carbamate, organophosphate, triazine, chloroacetanilide classes).*

ESR has not authored any analytical papers or reports concerning pesticides or their metabolites since 2006 and therefore is unable to provide any information in response to this request.

6. *Information as to which water suppliers have separately undertaken reassessments to identify which contaminants should be tested for in the water, following guidance from ESR.*

In the period since 2006, ESR has record of providing chemical monitoring guidance that recommended the inclusion of pesticide screens to one water supplier. This advice was provided through the DHB to the Waimate District Council in March 2007.

7. *A copy of the questionnaire used in assessment on behalf of the Ministry of Health to help ESR identify those supplies where significant levels of a particular chemical are likely to be present - as per description in Priority 2 determinands section on <http://www.drinkingwater.esr.cri.nz/general/standards.asp> .*

The questionnaires referred to on the [drinkingwater.esr.cri.nz](http://www.drinkingwater.esr.cri.nz) website are those used for the original P2 Programme that operated from 1995 to 2004. These have not been used in an official capacity for the Ministry of Health since that time. Copies of the three questionnaires are attached, titled:

- "Source Questionnaire"
- "Plant Questionnaire"
- "Reticulation Questionnaire"

8. *A list of all documents held by ESR that concern the Priority 2 Chemical Determinands Identification Programme.*

There are two reports prepared by ESR for the Ministry during the 2006-2016 period, concerning Priority 2 determinand identification. These are:

Year	Title	Report Number
2009	Revision of the Priority 2 chemical determinands identification programme	FW09065
2012	Priority 2 Determinand identification guide	FW12033

There has been no email correspondence concerning the P2 Programme in the period 2006 to the present (because the Programme ceased in 2004). However, there has been email concerning P2 determinand identification and generic guidance for water suppliers in identifying P2 determinands.

The following listed emails were sent or received since 2006 (not including correspondence concerning this request). Emails in this list contain "P2" or "Priority 2" in their Subject line and "Pest" in some part of the email including any attachments.

To	From	Subject	Sent/Received
Ministry of Health	ESR	FW: P2 and P3 identification revision	17/02/2016
District council	ESR	P2 identification	10/12/2015
Ministry of Health	ESR	P2 and P3 identification revision	20/11/2015
Public Health Unit	ESR	RE: P2 Identification Guide	21/09/2015
Ministry of Health	ESR	P2 and P3 determinand ID guide	19/05/2015
ESR	ESR	RE: P2-related info	5/03/2015
ESR	Ministry of Health	Re: Revision of P2-P3 guide	18/02/2015
Ministry of Health	ESR	Revision of P2-P3 guide	13/02/2015
Ministry of Health	ESR	RE: P2 ID process	15/09/2014
Ministry of Health	ESR	RE: P2 ID process	28/08/2014
Ministry of Health	Ministry of Health	RE: P2 ID process	28/08/2014
ESR	Ministry of Health	RE: P2 ID process	28/08/2014
Ministry of Health	ESR	RE: P2 ID process	27/08/2014
ESR	Ministry of Health	Re: P2 ID process	26/08/2014
Ministry of Health	ESR	P2 ID process	26/08/2014
ESR	ESR	RE: P2 programme	11/02/2014
ESR	ESR	P2 - P3 stuff	3/07/2013
Ministry of Health	ESR	Mods to the P2 ID protocol guidelines	12/02/2013
ESR	ESR	P2 identification Guide	8/10/2012
ESR	ESR	P2 Identification Guide	1/10/2012
ESR	ESR	P2	30/08/2012
Ministry of Health	ESR	P2 Protocol revised handbook following water supplier feedback	1/08/2012
ESR	District Council	RE: Revised P2 identification protocol	30/07/2012

To	From	Subject	Sent/Received
District council	ESR	FW: Request to review protocol on P2 Identification	12/07/2012
District council	ESR	FW: Request to review protocol on P2 Identification	12/07/2012
ESR	District Council	RE: Request to review protocol on P2 Identification	6/07/2012
District council	ESR	Request to review protocol on P2 Identification	29/06/2012
District council	ESR	FW: Request to review protocol on P2 Identification	29/06/2012
District council	ESR	Request to review protocol on P2 Identification	29/06/2012
Public Health Unit	ESR	P2 ID protocol draft	28/06/2012
Ministry of Health	ESR	Revised P2 Identification protocol	20/06/2012
ESR	ESR	FW12XXX P2 Identification Handbook 1-6-12 (2)	12/06/2012
ESR	ESR	RE: P2 Protocol review Report	11/06/2012
ESR	ESR	P2 Protocol review Report	1/06/2012
ESR	ESR	P2 Guidelines	30/05/2012
ESR	ESR	P2 Protocol draft	28/05/2012
ESR	Public Health Unit	FW12XXX P2 Protocol Review (2) (2)	5/04/2012
Public Health Unit	ESR	FW: P2 ID protocol review	3/04/2012
Ministry of Health	ESR	RE: Drafts of P2 decision guides and report.	14/03/2012
ESR	Public Health Unit	RE: P2 ID protocol review	14/03/2012
ESR	ESR	P2protocol review.	12/03/2012
Public Health Unit	ESR	P2 ID protocol review	1/03/2012
ESR	ESR	RE: P2 ID process review	1/03/2012
ESR	ESR	RE: P2 ID process review	1/03/2012
ESR	ESR	RE: P2 Protocol revision	23/11/2011
Company	ESR	FW: DWSNZ Priority 2 assessment for Blenheim water supply	1/08/2011
Company	ESR	RE: DWSNZ Priority 2 assessment for Blenheim water supply	1/08/2011
ESR	ESR	RE: DWSNZ Priority 2 assessment for Blenheim water supply	1/08/2011
Public Health Unit	ESR	RE: Priority 2b monitoring	4/02/2009
Regional Council	ESR	P2 programme data - at last!	20/08/2008
Public Health Unit	ESR	P2 questionnaires	11/09/2006
ESR	ESR	FW: P2 Programme Costs	8/06/2006
Public Health Unit	ESR	P2 Programme Costs	8/06/2006

The great majority of these emails relate to protocols for P2 determinand identification (generic guidance that mentions pesticides).

9. *Recent papers concerning emerging issues which may or may not include information concerning antibiotic resistance genes.*

“Recent” and “emerging issues” are undefined terms.

ESR has not produced any papers (i.e., papers published in scientific journals) on what could be considered “emerging issues”. However, ESR did produce for the Ministry of

Health a series of four reports entitled "Emerging Issues in Environmental Health Science". These documents covered a wide range of subjects.

Year	Title	Report Number
2011	Emerging Issues in Environmental Health Science 2011–2012 Report 1	FW11081
2012	Emerging Issues in Environmental Health Science 2011–2012 Report 2	FW12034
2012	Emerging Issues in Environmental Health Science 2012–2013 Report 1	FW12055
2012	Emerging Issues in Environmental Health Science 2012–2013 Bibliographic Report 1	FW12060

FW12055 and FW12060 contain pieces on antibiotic resistance.

10. *A list of all documents/reports held by ESR that concern testing of persistent organic pollutants (POPs) in drinking water*

ESR holds no documents it has prepared, dated 2006 or later, regarding the testing of persistent organic pollutants in drinking water.

If the above information has not met your needs, please call the Christchurch Science Centre (03 351 6019) and ask to speak with Dr Chris Nokes, who will be happy to discuss the identification of P2 determinands with you.

Yours sincerely



Libby Harrison  
General Manager  
Environmental Science

## APPENDIX

*"I would be grateful if ESR would supply the following data:-*

- 1. Results from the P2 Chemical Determinands Identification Programme for the 10 years 2006-2016 - or otherwise from when the P2 Programme commenced.*
- 2. As this is a regional testing programme please include results by New Zealand region in order to understand which regions have been tested.*
- 3. The pesticides (including fungicides/miticides/herbicides/insecticides) and their breakdown products that have been tested for under the P2 Identification Programme over the years 2006-2016 (and if this varies by region please include regional sampling data).*
- 4. Testing methodologies used and LOD, LOQ, LOR for the pesticides that ESR has tested (this may be limited to the years 2013-2016).*
- 5. All ESR authored analytical papers or reports concerning group-transgression of chemically-related groups that have common mechanisms of toxicity (Eg. not limited to but as an example, papers concerning the N-methyl carbamate, organophosphate, triazine, chloroacetanilide classes).*
- 6. Information as to which water suppliers have separately undertaken reassessments to identify which contaminants should be tested for in the water, following guidance from ESR.*
- 7. A copy of the questionnaire used in assessment on behalf of the Ministry of Health to help ESR identify those supplies where significant levels of a particular chemical are likely to be present - as per description in Priority 2 determinands section on <http://www.drinkingwater.esr.cri.nz/general/standards.asp> .*
- 8. A list of all documents held by ESR that concern the Priority 2 Chemical Determinands Identification Programme.*
- 9. Recent papers concerning emerging issues which may or may not include information concerning antibiotic resistance genes,*
- 10. A list of all documents/reports held by ESR that concern testing of persistent organic pollutants (POPs) in drinking water*

**S1 For groundwaters, give abstraction depth from the well/bore: ..... metres**  
 (where there are multiple screens give shallowest depth)

<b>S2 Further source information</b>	Yes	No	Don't Know
<b>Surface waters</b>			
Do stock have direct access to the water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Groundwaters</b>			
Is the location of the recharge zone known?	<input type="checkbox"/>	<input type="checkbox"/>	
Is the source subject to seawater intrusion?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the bore anaerobic? (e.g. Fe and Mn Problems)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the well/spring/borehead properly protected from surface contamination?	<input type="checkbox"/>	<input type="checkbox"/>	
Is the well/spring/borehead fenced to prevent stock access?	<input type="checkbox"/>	<input type="checkbox"/>	

**NB:** Where the recharge zone of a groundwater source is known and the source is secure, the remainder of the questionnaire relates to the area of the recharge zone, not the area immediately surrounding the well/spring/bore.

Where the recharge zone is unknown or the groundwater source is not secure (it is open to contamination directly permeating from the surface) the following questions apply to an area within a 2 km radius of the well/spring/bore.

**S3 Variability of source water quality**

Describe the source water during *fine* weather

**Colour \***

Low (< 5 TCU) <input type="checkbox"/>	Moderate (5 - 15 TCU) <input type="checkbox"/>	High (>15 TCU) <input type="checkbox"/>
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**Turbidity**

Low (<1 NTU) <input type="checkbox"/>	Moderate (1 - 5 NTU) <input type="checkbox"/>	High (>5 NTU) <input type="checkbox"/>
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Describe the change in source water quality following *heavy rain*.

**Colour \***

Unchanged <input type="checkbox"/>	Slight increase <input type="checkbox"/>	Large increase (>5 TCU) <input type="checkbox"/>
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**Turbidity**

Unchanged <input type="checkbox"/>	Slight increase <input type="checkbox"/>	Large increase (>10 NTU) <input type="checkbox"/>
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\* Colour refers to *dissolved colour*, i.e., the yellow-brown colour present in the water if the turbidity is removed.

**S4 Contamination from the geology of the catchment/recharge zone/within 2 km radius**

In answering the following do not include quarrying for road metal or building materials.

	Don't know	No	Yes	Specify
Are <b>mineral deposits</b> known in the catchment/recharge zone/within 2 km radius?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	..... ..... ..... ...
Are <b>mining operations</b> currently carried out in the catchment/recharge zone/within 2 km radius?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	..... ..... ..... ...
Have <b>mining operations</b> been carried out in the catchment/recharge zone/within 2 km radius <b>in the past</b> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	..... ..... ..... ...
Is <b>geothermal activity</b> known to occur in the catchment/recharge zone/within 2 km radius?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**S5 Soil types in the catchment/recharge zone/within 2 km radius**

Indicate which of the following best describe the predominant nature of the soils in the catchment/recharge zone/within 2 km radius (Tick appropriate boxes):

	Yes	No	Don't Know
Well drained (sandy or stony soils)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Moderately well drained (moderate clay content)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poorly drained (high clay content)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Anaerobic (often water-logged soil)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organic rich (high levels of organic matter)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Recent volcanic ash (deposited with last 2 years)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (specify)			
Indicate if water movement is predominantly by surface run off:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



**S6 Contamination arising from human settlement**

Indicate which of the following contamination sources are present in the *catchment/recharge zone/within 2 km radius*.

	Yes	No	Don't know
Septic tanks/long drop toilets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Urban run-off	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Possible disposal of mobile home/caravan toilet waste into source water at rest areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (specify)			

**S7 Land use in the *catchment/recharge zone/within 2 km radius***

Indicate the approximate extent to which each of the following land uses occupies land area in the *catchment/recharge zone/within 2 km radius*.

	None	Up to 20%	>20%
<i>Urban</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Native forest or bush</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Exotic forest</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Scrub</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Wetlands (natural or constructed)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Stock farming</i>			
High density grazing (eg town milk supply)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other grazing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Crops</i> .....	<input type="checkbox"/>		
Cereal.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Legumes.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vegetables (market gardening).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stock fodder.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flowers (commercial).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Seed crops.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vineyard/grapes.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Berry fruit.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Citrus fruit.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stone fruit.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pip fruit.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sub tropical fruit.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kiwifruit.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other crop (specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
.....			
<i>Other use (specify)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
.....			

<b>S8 Agricultural contamination in the catchment/recharge zone/within 2 km radius</b>		Sp - Spring	Su - Summer	A - Autumn	W - Winter
<b>Seasonal Abbreviations:</b>		Sp - Spring	Su - Summer	A - Autumn	W - Winter
<b>If pesticide/herbicide use in the land-use categories noted in S12 is known, identify these:</b>					
		<b>Pesticides/Herbicides in use</b>			<b>Season of application</b>
		None	Don't know		Sp Su A W
<i>Native forest or bush</i>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<i>Exotic forest</i>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<i>Scrub</i>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<i>Pasture/grazing</i>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<i>Crops</i>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Cereal		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Legumes		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Vegetables (market gardening)		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Stock fodder		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Flowers (commercial)		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Seed crops		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Vineyard/grapes		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Berry fruit		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Citrus fruit		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Stone fruit		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Pip fruit		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Sub tropical fruit		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Kiwifruit		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Other crop (specify)		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
.....					
<b>Discharge of effluent from stock sheds, piggeries, feed lots etc.</b>		None	Don't know	Indirect (eg spray irrigation)	Direct
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Fertilizer application - incl topdressing</b>					
Nitrogen fertilizer		<input type="checkbox"/>	<input type="checkbox"/>		Sp Su A W
Phosphate fertilizer		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>Poisons:</b>				Hand laid	
1080 poison		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Cyanide		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
				Aerial drop	
				<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

**S9 Potential contamination from industrial operations - past and present**

NB: Treated effluent or spray irrigation are to be included in "Indirect discharge" below.

Industry/Activity	Activity Presence Unknown	Activity NOT Present	Activity Present				Chemical Substances in Discharge
			No discharge	Indirect discharge	Direct discharge	Don't know	
Meat processing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Industrial chemical manufacturing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Agricultural chemical preparation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Woolscour	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Dairy factory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Food (specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Timber (specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Pulp and paper	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Tanning/fellmongery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Metal (specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Landfill or other waste disposal (domestic or industrial)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Sewage treatment plant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Main highway or railway	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Underground fuel storage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other (specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Atmospheric fallout from industry or sea-spray (specify)	<input type="checkbox"/>	<input type="checkbox"/>	.....				

## Roof Catchment Section

<b>R1 Roofing materials</b>	<b>Yes</b>	<b>No</b>	<b>Don't know</b>
Indicate which of the following are used on the roof			
Galvanized iron	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lead-headed nails	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lead flashing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lead-free paint	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Paint containing lead	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Asbestos-containing materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>R2 Roof maintenance</b>	
Guttering is cleaned out at a frequency of (tick only one):	
Once a year or less frequently	<input type="checkbox"/>
More than once a year, but less than once a month	<input type="checkbox"/>
Once a month or more frequently	<input type="checkbox"/>

<b>R3 Agricultural chemical use near the roof</b>	<b>Yes</b>	<b>No</b>	<b>Don't know</b>		
Are crops near the roof (within 500 m) sprayed with pesticide at times during the year (do not count infrequent spot spraying of weeds)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Is aerial spraying used (eg. helicopter)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Is topdressing of fertilizer carried out near the roof?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<b>List</b>			<b>Don't know</b>		
Pesticides used:			<input type="checkbox"/>		
Crops sprayed:			<b>Don't know</b> <input type="checkbox"/>		
Seasons of application (tick appropriate)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Frequency of spraying (in season):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>R4 Environment surrounding the roof</b>	<b>Yes</b>	<b>No</b>
Is the roof over-hung by trees?	<input type="checkbox"/>	<input type="checkbox"/>

<b>R5 Atmospheric fall out</b>	<b>Yes</b>	<b>No</b>
Are there industrial or natural sources of atmospheric fallout in the area other than pesticides? If "Yes", please specify	<input type="checkbox"/>	<input type="checkbox"/>
Is there any sign that ash/soot from an incinerator/boiler chimney is depositing on the roof, eg., creosote deposits?	<input type="checkbox"/>	<input type="checkbox"/>

ADDITIONAL COMMENTS: (Please make note of any factors, other than those covered by the questionnaire, that may influence the extent of contamination of the supply)

<b>P1 Pre-treatment (i.e. prior to any coagulation or filtration)</b>		
	<b>Yes</b>	<b>No</b>
Is the water intake controlled by an in-line turbidity monitor?	<input type="checkbox"/>	<input type="checkbox"/>
<b>Indicate any pre-treatments:</b>		
NONE		<input type="checkbox"/>
Settling		<input type="checkbox"/>
Chlorination		<input type="checkbox"/>
Ozonation		<input type="checkbox"/>
Chlorine dioxide treatment		<input type="checkbox"/>
Permanganate treatment		<input type="checkbox"/>
Copper sulphate treatment		<input type="checkbox"/>
Aeration		<input type="checkbox"/>
Other (specify)		<input type="checkbox"/>
.....		

<b>P2 Indicate whether any of the following processes are in use at the TP:</b>	
NONE of the following	<input type="checkbox"/>
Powdered activated carbon	<input type="checkbox"/>
Granular activated carbon	<input type="checkbox"/>
Dissolved air flotation (DAF)	<input type="checkbox"/>
Membrane technologies (Reverse osmosis, ultrafiltration etc)	<input type="checkbox"/>
Ion exchange for iron/manganese removal	<input type="checkbox"/>
Greensand filtration	<input type="checkbox"/>

**P3 Contaminants added via treatment chemicals at the TP**

Tick which chemicals are in use.

**Dose Control Definitions:**

**M - manual:** dose rate adjusted by operator. This includes manual addition of disinfectant and constant chlorine dosing equipment whose dosing rate requires manual adjustment.

**F - flow proportional:** dose rate is automatically controlled to match changes in flow rates through the plant, but the dose rate is not automatically adjusted to match changes in water quality (the operator still has to make this adjustment).

**A - automatic:** dose rate is automatically controlled by in-line probe that monitors some property of the water (pH, chlorine residual, turbidity), and adjust the dose rate to maintain this property at a fixed level.

NB: If "Maximum Dose" may be expressed in different units, specify which units are in use, e.g., mg/L as Aluminium, or mg/L as Alum.

Tick	Chemical	Brand	Supplier	Maximum dose (mg/L)	Dose Control		
					M	F	A
<input type="checkbox"/>	Alum, liquid or kibbled (specify)				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Polyaluminium chloride				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Iron salts (specify)				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Coagulant or flocculant aid (polyelectrolyte), (specify)				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Carbon dioxide				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Caustic soda				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Lime, quicklime or slaked (specify)				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Soda ash				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Sodium bicarbonate				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Sulphuric acid				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Hydrochloric acid				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Fluoride (specify composition)				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Gas chlorine				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Sodium hypochlorite				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Calcium hypochlorite				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Calcium/magnesium carbonate (e.g. Akdolit)				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Activated carbon, powdered or granular (specify)				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Other (specify)				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**P4 Chemical analysis of treatment chemicals**  
 Attach certificates of analysis for treatment chemicals if available

Certificates attached?	Yes	No	Number of certificates
	<input type="checkbox"/>	<input type="checkbox"/>	.....

**P5 Conditions for disinfection by-product formation**  
 Provide the following information to help in estimating disinfection by-product formation conditions.

Information Required	Value	Don't Know
Maximum chlorine contact time to the extremities of the distribution system - farthest from the plant (if the plant feeds more than one zone).	.....(hrs)	<input type="checkbox"/>
Maximum annual water temperature in the distribution system.	.....°C	<input type="checkbox"/>
pH range of treated water in the distribution system	.....to.....	<input type="checkbox"/>

**P6 Security at the TP**

	N/A	Yes	No
Are chemical stores/tanks clearly labelled to avoid chemicals being added to the wrong storage tank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is replenishment of chemicals by suppliers/contractors supervised by the plant operator	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the treatment plant secured against unauthorized entry?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do water treatment staff also work with sewage systems?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is equipment used at the water treatment plant also used in sewage system maintenance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**P7 Emergencies at the TP**  
 Indicate which of the following types of water can be supplied *from the treatment plant in the event of a mains power failure at the TP* (NB This question is concerned with output from the TP. It is assumed that consumers can be supplied from the service reservoirs until their capacity is exhausted): (Tick one box only)

Plant output falls to zero	<input type="checkbox"/>
Plant output is <i>untreated</i> water only	<input type="checkbox"/>
Plant output is disinfected, but manually only	<input type="checkbox"/>
Plant output is disinfected as normal, but no other processes are operational	<input type="checkbox"/>
Plant output is normal, but for a <i>limited period only</i> (eg a few hours):	<input type="checkbox"/>
Plant output is not disrupted in any way	<input type="checkbox"/>



<b>P8 Contaminants added by construction materials of the TP, general operations and surroundings.</b>			
Indicate which of the following apply to this treatment plant			
<b>Materials in contact with the water between the source and the start of the distribution system. This includes on-site reservoirs (ignore small taps and valves)</b>	Yes	No	Don't know
Copper	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coal tar or bitumen-lined steel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plastic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Asbestos cement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Instrumentation/equipment used on-site where a spillage or breakage might contaminate the water (ignore laboratory use)</b>			
Mercury thermometers or manometers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Apparatus containing oil or PCBs (e.g. oil-filled pumps, transformers)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Plant design and surroundings</b>			
Are in-ground clarifiers/filters/reservoirs present?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are in-ground fuel tanks near the plant or reservoirs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are there clearwells open to chemical spillage?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Plant operation</b> .....	N/A		
<i>Restarting Filters:</i>	<input type="checkbox"/>		
Which of the following are performed after restarting the filters following backwashing?			
Slow start	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Initial diversion of the filtered water to waste	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Care of the Filter Bed:</i>			
Is air-scouring used during back washing?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is chemical cleaning of the filter bed carried out on a regular basis?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Coagulation:</i>			
If used, is the coagulation process continuous?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Residuals leaving the plant:</b> If substances containing aluminium, iron, manganese or synthetic polymers are used at this TP, provide typical concentration ranges of residuals leaving the plant.			
Aluminium (as Al)	<input type="checkbox"/>	N/A	Typical Range mg/L
Iron	<input type="checkbox"/>		.....to.....
Polymer (specify)	<input type="checkbox"/>		.....to.....
Manganese	<input type="checkbox"/>		.....to.....

**P9 Treatment plant staff training**

	Yes	No
Does the water supplier budget for the on-going training of TP staff?	<input type="checkbox"/>	<input type="checkbox"/>

**P10 Contamination from recycling processes at the TP**

	Yes	No
Is filter backwash waste water recycled?	<input type="checkbox"/>	<input type="checkbox"/>

Answer A

**A** Tick to indicate how the **filter backwash waste water** is processed for re-entry to the TP

- No Processing
- Settling only
- Mechanical dewatering
- Chemical thickening (polyelectrolyte) and mechanical dewatering

Specify the electrolyte:

.....

Polyelectrolyte concentration used in thickening/dewatering:

.....

	Yes	No
Is clarifier waste water recycled?	<input type="checkbox"/>	<input type="checkbox"/>

Answer B

**B** Tick to indicate how the **clarifier waste water** is processed for re-entry to the TP

- No Processing
- Settling only
- Mechanical dewatering
- Chemical thickening (polyelectrolyte) and mechanical dewatering

Specify the electrolyte:

.....

Polyelectrolyte concentration used in thickening/dewatering:

.....

P10 Continued

<b>Contaminants in the recycled waste water</b>		<b>Don't know</b>
What % of the plant throughput is recycled waste water?	%	<input type="checkbox"/>
.....		
<b>Give the frequency at which the chemical composition of the <i>recycled waste water</i> is determined</b>		
Never		<input type="checkbox"/>
Once (initially)		<input type="checkbox"/>
Once a year, or less		<input type="checkbox"/>
More that once a year		<input type="checkbox"/>
<b>What are the major constituents of the <i>recycled waste water</i>, and their typical concentrations (list):</b>	<b>Typical Concentrations (mg/L)</b>	
•		
•		
•		
•		
•		
<b>Indicate whether any calculations or measurements have been made to estimate contaminant concentrations in the <i>treated water</i></b>		
a) Neither calculations nor measurements made		<input type="checkbox"/>
b) Experimental measurements		<input type="checkbox"/>
c) Calculations based on dose rates, flow rates, etc.		<input type="checkbox"/>
<b>If b) or c) please attach results</b>	<b>Yes</b>	<b>No</b>
<i>Results attached?</i>	<input type="checkbox"/>	<input type="checkbox"/>

ADDITIONAL COMMENTS: (Please make note of any factors, other than those covered by the questionnaire, that may influence the extent of contamination of the supply)

<b>D1 Service reservoirs status</b>		
	<b>Yes</b>	<b>No</b>
Any reservoirs underground, or partially underground?	<input type="checkbox"/>	<input type="checkbox"/>

<b>D2 Distribution system maintenance personnel</b>	
Tick which of the following describe the personnel who carry out distribution maintenance.	
Water supply authority registered plumbers	<input type="checkbox"/>
Water supply authority staff trained in distribution system maintenance	<input type="checkbox"/>
Water supply authority labourers	<input type="checkbox"/>
Private/contract registered plumbers	<input type="checkbox"/>
Private/contract labourers	<input type="checkbox"/>
Supply owner (small supplies)	<input type="checkbox"/>
Other (list)	<input type="checkbox"/>
.....	

<b>D3 Distribution system maintenance</b>			
	<b>Yes</b>	<b>No</b>	
Are maintenance staff trained with respect to minimizing contamination during maintenance?	<input type="checkbox"/>	<input type="checkbox"/>	
Do distribution maintenance staff also work on sewage systems without guidelines approved by a public health agency?	<input type="checkbox"/>	<input type="checkbox"/>	
Is equipment for water supply maintenance also used for the maintenance of sewage systems?	<input type="checkbox"/>	<input type="checkbox"/>	
Are steps taken to ensure that staff are <i>not</i> carriers of, nor have, water borne diseases?	<input type="checkbox"/>	<input type="checkbox"/>	
Does the water supplier follow a code of practice for distribution maintenance, with particular emphasis on the prevention of contamination?	<input type="checkbox"/>	<input type="checkbox"/>	
Are new mains and repairs/alterations to existing mains disinfected?	<input type="checkbox"/>	<input type="checkbox"/>	
Are distribution dead ends scoured regularly?	N/A <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>D4 Solders and jointing compounds used in the distribution system</b>				
Indicate whether the following materials are used in the distribution system.				
If material is NOT used throughout the system, suggest a sampling location where the materials are used.				
<b>Material</b>	<b>Yes</b>	<b>No</b>	<b>Don't Know</b>	<b>Suggested sampling location</b>
Lead	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Antimony	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Tin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Organic solvents, glues, cements and sealers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

### D5 Distribution system materials

Indicate the extent to which the following materials are used in the distribution system. Do not include materials whose use is very minor.

**Definitions:**

- Extensive:* Major component used throughout distribution
- Major:* Major component used in part of distribution
- Minor:* Minor component in parts of the distribution

Material	Use				
	Don't Know	Not used	Minor	Major	Extensive
Cement-lined steel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Galvanized iron	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Epoxy-lined pipe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Asbestos cement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cast iron	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mild steel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stainless steel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Concrete	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tunnels (no pipe)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coal tar or bitumen-lined steel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If a <i>major</i> component please suggest a suitable sampling location:					
.....					
PVC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If a <i>major</i> component please suggest a suitable sampling location:					
.....					
Polyethylene (alkathene)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If a <i>major</i> component please suggest a suitable sampling location:					
.....					
Lead	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If a <i>major</i> component please suggest a suitable sampling location:					
.....					
Other (specify)		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
.....					
			<b>Yes</b>	<b>No</b>	
Treated timber <i>reservoirs</i> (lined or otherwise)			<input type="checkbox"/>	<input type="checkbox"/>	

**D6 Installations requiring backflow prevention**

*“Backflow” (or backsiphonage) is a reversal of water flow, caused by a negative pressure in the supply line, e.g., caused by a mains break; where mains are pumped dry by fire-fighting.*

*“Backpressure” is a reversal of water flow due to increased pressure downstream, e.g., caused by pumps pressure vessels and header tanks.*

Indicate whether backflow prevention measures are installed in the following situations

	N/A	Yes	No	Don't Know
Sewage treatment plant .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chemical industry .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If “No” or “Don’t Know”, specify the industry				
.....				
Hospital .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Microbiological or chemical laboratory .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Swimming pools, spas .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Freezing works .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Air, sea or rail terminals or stations .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Untreated water for fire-fighting purposes .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Buildings with air conditioning units, or heat exchangers, or boilers .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stock troughs .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire hydrants (the use of screw hydrants is a prevention measure) .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pumping stations in the potable water distribution system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Downstream of low pressure areas .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
.....				

**D7 Corrosiveness of water reticulated in this distribution system**

	Yes	No
Have consumer complaints, or the water supplier’s own measurements or observations, led the water supplier to believe that the reticulated water may be corrosive?	<input type="checkbox"/>	<input type="checkbox"/>
Are samples for corrosion metals (ie, copper, lead, nickel, cadmium, chromium, antimony or tin) taken from this distribution system? <i>If “Yes” ticked, please attach a copy of the results.</i>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Tick if results provided</i> <input type="checkbox"/>		