

H1

Introduction



Welcome to the H1 Software

Version 2.7.6 - February 2016

If you find the screen fonts in the H1 Tool too small to read you can use the Windows zoom feature at any time to magnify the screen by holding down the 'Windows' key and '+' key. To cancel the feature hold down the 'Windows' key and 'Esc' key.

This version of the tool accompanies the Horizontal Guidance Note H1 and the eleven supporting technical annexes.

Important Notes:

With the exception of Annex I (Landfill) and Annex J (Groundwater) this software tool can be used to complete risk assessments within the technical annexes which support H1. However, further information may need to be provided in the following areas:

- detailed assessment of fate and effects, where required
- decision-making trails for the comparison and ranking of options

This software provides a general structure for assessing costs and environmental impacts. You may need to decide the best way to apply this structure to fit the nature and pattern of your operation, in particular:

- where load is variable, such as seasonal or demand-led operations
- where a number of processes are conducted at the same time, such as integrated operations
- where a number of products are made, with possible differences in unit operations and release points employed
- where fugitive or potential emergency releases are of particular interest

Information in this database will be used to determine your EPR permit, therefore to get the most from this software tool, you should:

- read the H1 Overview document, to understand the basic principles, module structure and methods
- use the HELP boxes and refer to the H1 guidance as you progress to ensure that the data you input is representative and accurate
- use the comments boxes to clarify assumptions and data sources

This software will also output annual emissions data to an OPRA profile(s), which you can select on the Summary Tables page.

[On line instructions on using this tool and on the H1 Methodology itself are available on Gov.UK \(click here\)](#)





**ENVIRONMENT
AGENCY**

In conjunction with:
www.ability-software.co.uk



Facility Reference Information

Please complete the following information:

Company Name: Protherius UK Ltd
Location: Llandysul, Ceredigion, Wales
Permit Number: SP3338LF

If you have data already stored in a previous version of the H1 software you may import it by pressing the button to the right.

Import Utility

Please note that before the import can take place any data that already exists in this copy of the tool will be removed. Please also note that any 'Operating Mode' information you had entered in your 'Air and Water inventories will defer to the default of 100% on data import

NOTE ON MICROSOFT ACCESS SECURITY WARNING

Depending on your security settings, you may get a security notice appearing each time the import routine connects to a table in your source database. You need to click 'Open' on this message for the import routine to be successful. There are 18 tables to connect to in total but if you place your cursor over the 'Open' button you will be able to repeatedly click your mouse to make this process execute quickly and without too much frustration. We apologise for this inconvenience but it is an aspect of Microsoft Security provisions that are beyond our control.



Step 1

Introduction to Step 1

Step 1: Describe the Scope and Options

The aim of this step is to:

- state the **OBJECTIVES** of the assessment
- in the case of **ENVIRONMENTAL ASSESSMENT** of the whole facility, describe the scope of the activities to be included in the assessment;
- in the case of **OPTIONS APPRAISALS**, identify candidate options for BAT by considering all relevant techniques to prevent and minimise pollution and the scope of activities covered by the techniques.

Depending on the reason for the assessment, you will need to complete different modules of the guidance. The software will automatically select the required modules according to the responses you enter.

NOTE: If you are going to complete more than one assessment or appraisal, make sure that you create a copy of the H1 file for each new assessment BEFORE you begin to input data. This is because Microsoft Access automatically saves changes to the current file you are using, rather than allowing you to save your changes at the end of your work.

TO CONTINUE WITH STEP 1, PRESS "NEXT".



Describe the Objectives

Depending on the reason for the assessment you will need to complete different parts of the tool.

Select the type of assessment:

- a) to carry out an ENVIRONMENTAL ASSESSMENT of the releases resulting from the facility as a whole Do Steps 1, 2 and 3 only
- b) to conduct a costs/benefits OPTIONS APPRAISAL to determine BAT or support the case for derogation under the Industrial Emission Directive. Do Steps 1,2, 3 and 4 and continue with 5 and 6 if necessary

1.1 Briefly summarise the objectives and reason for the assessment in terms of the main environmental impacts or emissions to be controlled:

To assess the environmental impact of a proposed directly associated discharge of purified water on the receiving water



Scope of Environmental Assessment

List the activities included in the assessment

Number	Activity
--------	----------

Use the 'Add' button at the bottom left to create a new activity

1	Water discharge - Directly associated activity
---	--

Comments:



Describe the Candidate Options

Identify all reasonably applicable options of techniques

You should include:

- a) a brief description of individual control measures or configurations of control measures selected for each option, and the activities with which they are associated (the existing base-case may conveniently be the first option).
- b) justification why any techniques generally applicable to the regulated facility have not been selected for assessment. (see relevant H1 annex) (This should be based on regulated facility-specific technical, not economic reasons).
- c) for new projects, whether any initial environmental assessment that was done at the project evaluation stage, or any screening of technology or process routes prior to this assessment, particularly where this has a bearing on environmental performance. (see H1)

**In the case of b) or c)
please enter your Comments here:**

Option Number	Title	Description
1	Water discharge - Directly associated activity.	1. Discharge compromises of towns/potable water that has undergone a further purification process therefore contains no dangerous substances, and does not come in to contact with any other process. 2. Discharge flow is limited to 750 Litres per hour

Once a series of options have been generated for the proposed project, it is recommended that the Operator discuss these with the local Regulator to check both parties agree that the options are satisfactory. This may save the Operator from spending resources on assessment of options which are unlikely to meet the required environmental performance.

List the main activity or activities to which the release control options are applicable and any other activities that will be affected by the candidate control option on the main activity:



Step 2

Introduction to Step 2

Step 2: Emissions Inventory

The aim of this Step is to produce an inventory of sources and releases of polluting substances from each option. This is used as the basis for the subsequent evaluation of environmental impacts.

For this Step you will require information on:

- release points and sources of emissions to air, water (inc. sewer) or land
- concentration and mass rate of released substances
- frequency and duration of releases and how these relate to long term and short term effects

IMPORTANT NOTES

- you may need to consider a suitable method for assessment of groups of pollutants, such as VOCs, heavy metals, uncharacterised liquid effluents, etc (see "Grouping air emissions" in Annex F).

TO CONTINUE WITH STEP 2, PRESS "NEXT".



Receiving Water Body(s)

Please define the Final Discharge Locations for Releases to Water

Are there any discharges to surface waters? Yes

Use the 'Add' button below to list all final discharge points.
For discharges to sewer, this should be the point where the sewage works discharges to a surface water
N.B. For Riverine discharges (River, Upper Estuary) you only need enter the River description and flow once. Further details of individual releases can be entered on the next page. For discharges to TRaC waters, separate Discharge Locations must be added for each release point that has a different mixing zone

Number	Description	Final Discharge Category	Freshwater Q95 flow rate
1	Afon/River Cwerchyr	R	River Flow (m ³ /s): 3.264



Water Discharge/Release Details and Flow Data

Please define your Release Points for Releases to Water

Number	Description	Location or Grid Reference	Activity or Activities	Final Discharge Point	Discharge via Sewer?	Mean Effluent Flow Rate*	Max Effluent Flow Rate*
						m ³ /s	m ³ /s
1	W2	SN3670 4637	Water discharge	1 Afon/River Cwerchyr	No	0.0003	0.0006

Comments:

* When operating



Release Concentrations of Substances Present in Discharges to Water

Please list all Substances released to Water for each Release Point identified in the previous page.

Which type of assessment method are you using?
(See help box & H1 Annex D for Information)

Continue with the method below.

Method:

Reference:

Number	Substance	Measurement Method	Operating Mode (% of)	Average Concentration in the Effluent (AA)		Maximum Concentration in the Effluent (Max)		Annual Rate kg/yr	Significant Load (PHS Only) kg/year
				Conc. µg/l	Measurement Basis	Conc. µg/l	Measurement Basis		
1	Chloride	Spot	100.0%	0.07	Annual Avg	0.07	monthly	0.000662256	
2	Cadmium and its compounds (< 40 mg/l Ca CO3)	Spot	100.0%	0.05	Annual Avg	0.05	monthly	0.00047304	5
3	Zinc	Spot	100.0%	8.2	Annual Avg	8.2	monthly	0.07757856	
4	Ammonia (≤ 50mg/l CaCO3 (90 %ile))	Spot	100.0%	0.1	Annual Avg	0.1	monthly	0.00094608	
5	Sulphate	Spot	100.0%	0.01	Annual Avg	0.01	monthly	0.000094608	
6	Boron	Spot	100.0%	0.01	Annual Avg	0.01	monthly	0.000094608	
7	Mercury and its compounds	Spot	100.0%	0.05	Annual Avg	0.05	monthly	0.00047304	1
8	Copper	Spot	100.0%	0.72	Annual Avg	0.72	monthly	0.006811776	
9	Arsenic	Spot	100.0%	0.09	Annual Avg	0.09	monthly	0.000851472	
10	Chromium III (95%ile) (dissolved)	Spot	100.0%	0.5	Annual Avg	0.5	monthly	0.0047304	
11	Lead and its compounds	Spot	100.0%	0.05	Annual Avg	0.05	monthly	0.00047304	

Comments:



Water Temperature

Where relevant, please enter temperature of effluent for each release point.

This table is to check that the effluent is acceptable, i.e. within the required temperature range. It is not used to make relative judgement between options.

Discharge Location	Release Point	Measurement Method	High Normal Rate	High Peak Rate	Max Temp. Difference	Benchmarks	
						Max Summer	Max Winter Temp
1 Afon/River Cwmerchyr	1 W2	Periodic*	12	18	0.0	21.5	10

Comments:



Water pH

Where relevant, please enter pH of effluent for each release point.

This table is to check that the effluent is acceptable, i.e. within the required pH range. It is not used to make relative judgement between options.

Discharge Location	Release Point	Measurement Method	High Normal Rate	High Peak Rate	Low Normal Rate	Low Peak Rate	pH of Receiving Water	Do artificial variations caused by effluent exceed 0.5pH units?
1 Afon/River Cwerchyr	1 W2	Periodic*	6.6	6.6	6.2	6.2	6.3	No

Comments:



Raw Materials

Please list all Raw Materials Consumed:

Number	Material	Annual Consumption Units
1	Non-potable Water	
2	Potable water	6750 cubic m/year

Comments:



Performance Indicators

Enter consumption data to determine your performance indicators

Which of the following parameters do you use for calculating your performance **Raw Material**

Please describe and justify your choice:

Maximum amount of Raw material that the site has the capacity to turn over - this is more reflective as the amount of final product can vary dependant o

Basic Consumption Data:

Name	Annual Quantity	Units
Amount of Product:	<input type="text"/>	
Main Raw Material: Ovine Serum	<input type="text" value="54.00"/>	Tonnes
Potable Water:	<input type="text" value="6,750.00"/>	m ³
Non Potable Water:	<input type="text"/>	m ³
Energy:	<input type="text"/>	MWh
Waste: Inert:	<input type="text"/>	tonne
Hazardous:	<input type="text"/>	tonne
Stable Non-reactive Hazardous:	<input type="text"/>	tonne
Biodegradable Non-hazardous:	<input type="text"/>	tonne
Other Non-hazardous:	<input type="text"/>	tonne

Specific Consumption per Tonnes of Ovine Serum:

Production Efficiency:	<input type="text"/>	/Tonnes
Potable Water:	<input type="text" value="125.00"/>	m ³
Non Potable Water:	<input type="text"/>	m ³
Energy:	<input type="text"/>	MWh
Waste: Inert:	<input type="text"/>	tonne
Hazardous:	<input type="text"/>	tonne
Stable Non-reactive Hazardous:	<input type="text"/>	tonne
Biodegradable Non-hazardous:	<input type="text"/>	tonne
Other Non-hazardous:	<input type="text"/>	tonne



Step 3

Introduction to Step 3

Step 3: Quantify Impacts

The aim of this Step is to quantify the effects on the environment of the releases listed in the inventory in Step 2. The guidance provides methods for assessing the eight main environmental considerations of most relevance to the EPR regime. Your releases may not result in effects to all eight of these considerations, and this tool allows you to screen out any that are not relevant.

The emissions you entered in Step 2 are automatically brought forward for assessment into each environmental consideration that is relevant for that type of release (e.g. a release may have more than one type of effect).

This part of the tool allows you to screen out any releases that are insignificant, and to identify those releases where further, detailed assessment of the potential environmental impact may be required.

IMPORTANT NOTE

This software tool only completes part of the requirements for Step 3, as described above. Depending upon the degree of risk to the environment presented by the releases, the operator may need to do further, detailed assessment of the potential effects using methodologies that are not provided here. This information should be submitted separately, as indicated within this part of the tool.

TO CONTINUE WITH STEP 3, PRESS "NEXT".



Identify Relevant Impacts

Identify any environmental impacts that are not relevant to this assessment by deselecting from the list below:

Releases in Part 2?		Justification for omission
No	<input type="checkbox"/> Air	Process involves discharge to water only - no air emissions
No	<input type="checkbox"/> Deposition from Air to Land	Process involves discharge to water only
Yes	<input checked="" type="checkbox"/> Water	
No	<input type="checkbox"/> Waste	Process involves discharge to water only
No	<input type="checkbox"/> Visual	Process involves discharge to water only - no visual impact
No	<input type="checkbox"/> Ozone Creation	Process involves discharge to water only
No	<input type="checkbox"/> Global Warming	Process involves discharge to water only

If you have deselected an environmental impact as not relevant to this assessment, no further assessment of this impact will be carried out



Local Environmental Quality

Describe the Quality of the Environment:

Provide a brief description of the main local factors that may influence the importance of the impact of emissions in the surrounding environment

Air Quality

Are there any Environmental Quality Standards relating to substances released from the activities, which may be at risk due to additional contribution from the activity? (Environmental Quality Standards for air and water are described in EPR Technical Guidance Notes)

n/a

Are there any Local Air Quality Management Plans applicable to releases from the activity?

n/a

Water Quality & Resources

Are there any Environmental Quality Standards relating to substances released from the activities, which may be at risk due to additional contribution from the activity?

no

Are proposals to abstract water satisfactory in order to obtain an abstraction licence?

n/a

Is the activity located in a groundwater vulnerable zone (for activities with direct releases to land only)?

n/a

Proximity to Sensitive Receptors

Is public annoyance likely to be an issue for noise, odour or plume visibility?

No

Are there any wildlife habitats, eg Special Areas of Conservation, or Special Protection Areas, likely to be affected by releases from the activity? (Description of requirements of Habitats Directive is provided in EPR Technical Guidance Notes)

no



Water Impacts - Fresh Water Releases

Apply Test 1 (See Guidance) and Calculate Process Contributions of Emissions to Water

This table applies Test 1 and also estimates the Process Contribution for Freshwater releases, this is calculated after dilution into the relevant surface water type for each emission to water listed in the inventory, according to the release point parameters input earlier. If you have more accurate data obtained through dilution modelling, this may be entered as indicated and will be used instead of the estimated PC. Any releases which 'Pass' Test 1 are screened out at this point.

Substance	Annual Avg EQS			MAC EQS		
	Release µg/l	EQS µg/l	Release conc < 10% EQS Test 1	Release µg/l	MAC µg/l	Release conc < 10% EQS Test 1
[W2] Ammonia (≤ 50mg/l CaCO3 (90 %ile)) (Afon/River Cwerchyr)	0.1000	300.0000	Pass	0.1000		N/A
[W2] Arsenic (Afon/River Cwerchyr)	0.0900	50.0000	Pass	0.0900		N/A
[W2] Boron (Afon/River Cwerchyr)	0.0100	2000.0000	Pass	0.0100		N/A
[W2] Cadmium and its compounds (< 40 mg/l Ca CO3) (Afon/River Cwerchyr)	0.0500	0.0700	Fail	0.0500	0.44	Fail
[W2] Chloride (Afon/River Cwerchyr)	0.0700	250000.0000	Pass	0.0700		N/A
[W2] Chromium III (95%ile) (dissolved) (Afon/River Cwerchyr)	0.5000	4.7000	Fail	0.5000	32	Pass
[W2] Copper (Afon/River Cwerchyr)	0.7200	1.0000	Fail	0.7200		N/A
[W2] Lead and it's compounds (Afon/River Cwerchyr)	0.0500	1.2000	Pass	0.0500	14	Pass
[W2] Mercury and its compounds (Afon/River Cwerchyr)	0.0500		N/A	0.0500	0.07	Fail
[W2] Sulphate (Afon/River Cwerchyr)	0.0100	100000.0000	Pass	0.0100		N/A
[W2] Zinc (Afon/River Cwerchyr)	8.2000	10.9000	Fail	8.2000		N/A

Note that the Process Contribution shown for each substance is the sum of the individual process contributions of each point from which the substance is emitted. Process Contributions obtained from modelling data should incorporate all relevant release points and flow conditions.

* If you have valid dispersion modelling data available - please enter it here

Comments:



Water Impact Screening - Fresh Water Releases

Apply Test 2

This page applies Test 2 and displays the Process Contribution as a proportion of the EQS. Emissions with PCs that are less than 4% of the EQS can be screened from further assessment as they are likely to have an insignificant impact.

Substance	Annual Avg EQS				MAC EQS			
	Annual Avg EQS µg/l	PC µg/l	Modelled PC	% PC of EQS %	MAC EQS µg/l	PC µg/l	Modelled PC	% PC of MAC %
Cadmium and its compounds (< 40 mg/l Ca CO3) (Afon/River Cwerchyr)	0.07	0.0000		0.01	0.44	0.0000		0.00209
Chromium III (95%/ile) (dissolved) (Afon/River Cwerchyr)	4.7	0.0000		0.00	32	0.0001		0.000288
Copper (Afon/River Cwerchyr)	1	0.0001		0.01	0.07	0.0001		-
Mercury and its compounds (Afon/River Cwerchyr)		0.0000				0.0000		0.0132
Zinc (Afon/River Cwerchyr)	10.9	0.0008		0.01		0.0015		-

Comments:

PC < 4% of EQS?	Test 2	PC < 4% of MAC?	Test 2
Pass	Pass	Pass	Pass
Pass	Pass	Pass	Pass
Pass	Pass	Pass	Pass
Pass	Pass	Pass	Pass



Water Impact - Significant Loads

Identify any releases which constitute a Significant Load.

This page displays any priority substances and calculates whether or not the total annual release constitutes a Significant Load. The annual mass release is calculated by multiplying the mean flow by the mean release concentration. The calculation takes into account your 'Operating Mode' (percentage of the year that the substance/effluent is discharged), if not continuous and also includes your sewage treatment reduction factor for any discharges via sewer. To see the detail, look at the 'Annual Rate(s)' shown on the Water Inventory screen for each each Release Point but note that the figure(s) shown there is before any relevant Sewage Treatment Reduction factor has been applied

Discharge Proportion:	Substance:	Annual Load:	Significant Load for Substance:	Part B Significant Load Test:
		Kg	Kg	
Afon/River Cwerchyr	Cadmium and its compounds (< 40 mg/l Ca CO3)	0.00047304	5	Pass
Afon/River Cwerchyr	Mercury and its compounds	0.00047304	1	Pass



Water Impact Modelling Assessment

See guidelines in H1 Annex D and respond to the following

Describe here the justification for whether detailed modelling is, or is not required for any of the releases. Refer to the guidelines in H1 Annex D.

Describe source of background information:

Describe location of detailed modelling work:

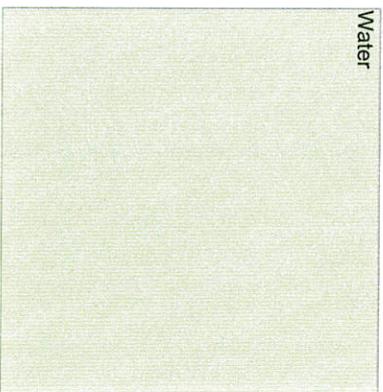


Summary Tables

Print or Preview summary tables:

Choose which summary tables

Water



Export to Excel

Preview

Print

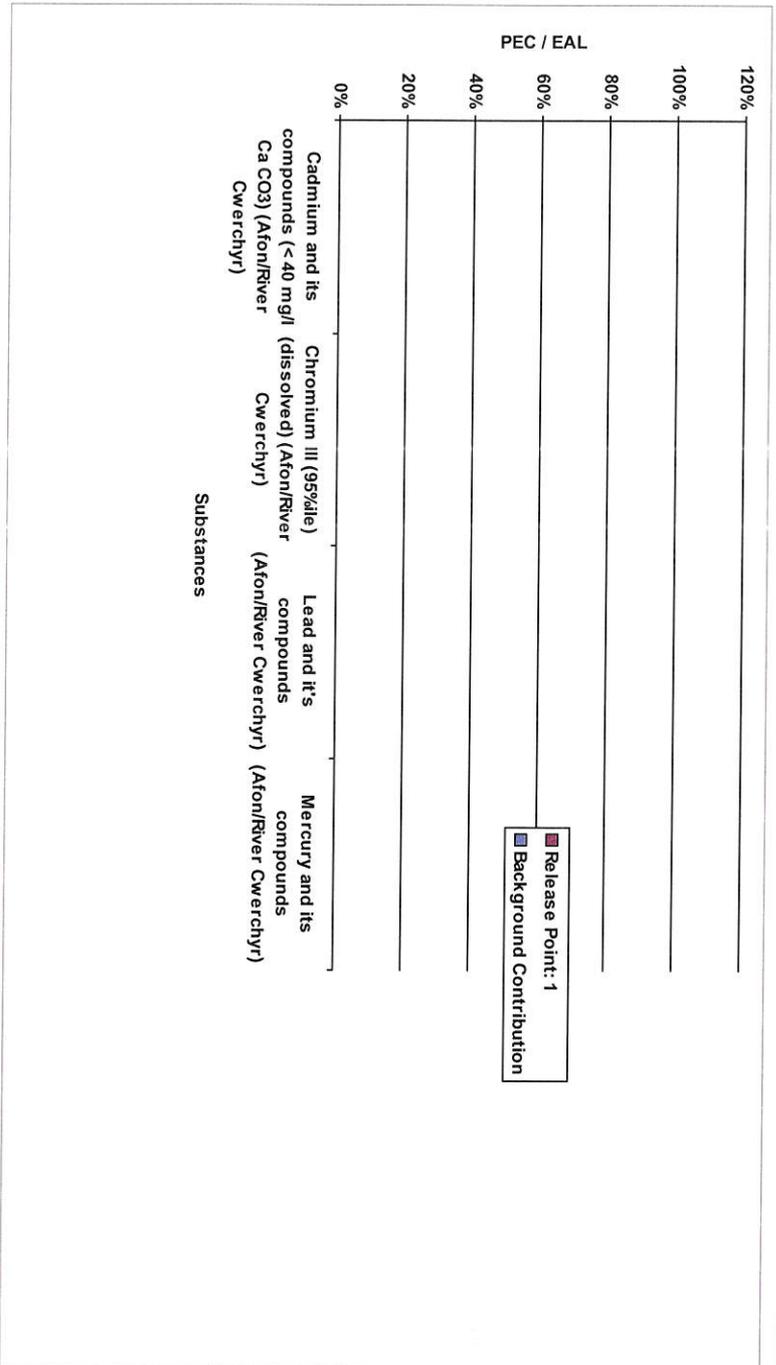
Export Releases to OPRA Profile

Include

- All Air and Water Substances
- Air and Water Release Not Screened Out

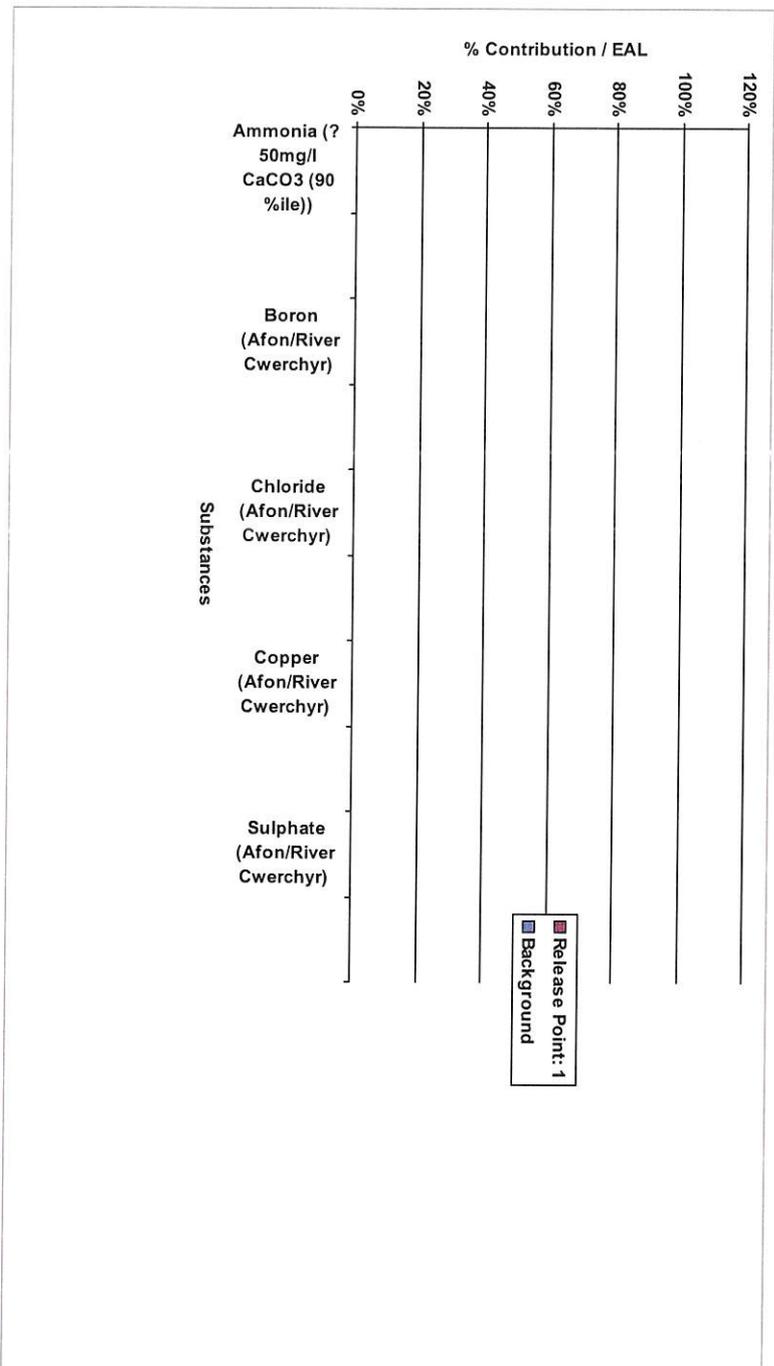


Short Term Water - Substance Comparison





Water Long Term Effects - Comparison by Substance





Summary of Environmental Assessment

You have now completed all of the steps in this software for the environmental assessment. This will provide you with:

- an inventory of all emissions sources and substances emitted from your activities
- an information trail of how the impacts of these emissions have been assessed
- a summary of the impacts

You now need to use this information to confirm whether the emissions are acceptable, i.e. that they do not cause significant pollution to occur, by responding below:

Do any of the emissions exceed any of the following:

Statutory Emission limit values:	No	If yes, identify the substances concerned and improvements that are needed to at least meet the statutory requirement
Environmental Quality Standards (air and water):	No	If yes, identify the substances concerned, the contribution from the activities and investigate whether further detailed fate and effect modelling and/or pollution controls are needed. Ensure that the relevant EQS reference conditions are applied.
Environmental Assessment Levels:	No	If yes, identify the substances concerned, the contribution from the activities and investigate whether further detailed fate and effect modelling and/or pollution controls are needed.

Use the box below to provide further information on any of the above to which you have responded 'Yes':

Finally, print all of the information and submit with your application. Remember to include any supplementary information and reports that you have had made reference to during the assessment procedure.

