



H1 Software Tool User Guide

Version 4.0

Contents

Executive summary	1
1. H1 Software Tool User Guide	2
1.1 Introduction	2
1.2 Using the tool	2
2. List of abbreviations	15

Executive summary

When compiling their permit application under the Environmental Permitting Regulations operators are required to undertake a series of risk assessments to reveal the intended impact of their releases upon the local environment. Guidance to help operators complete this task is available in a series of web pages listed on the Government's website GOV.UK. This guidance was part of the Environment Agency's horizontal guidance series known as 'H1'. The current software tool, based upon the Microsoft Excel format, helps operator's identify which of their releases to air, water or land present an insignificant environmental impact, thereby enabling a focus on the more harmful releases from their activity. In April 2017 a User Guide was made available by the Environment Agency and reflected the version of the H1 Software Tool in Microsoft Access (version 2.78). This current version represents an updating of that User Guide and it captures the changes made due to the transfer of the tool into Microsoft Excel

It should be recognised that risk assessments relating to groundwater, landfilling activities and critical loads are not included in the software tool.

FOR FDM BRef permit reviews: The use of this tool is still under development for Environment Agency use. We are making this tool available to Operators in order to trial it and undertake user testing.

Users should be aware that there are some known issues with the tool but we have added advice on these as notes as part of this specific guidance. However, you should focus on the key aspects of the risk assessment you wish to undertake for the purposes of the review (i.e. the screening tests). It is not a means to demonstrate compliance with the BAT-AELs. You should use your Regulation 61 response for this. We ask for your patience and please do feedback any issues you encounter or your thoughts on how it can be improved to FDMPermitReview@environment-agency.gov.uk



1. H1 Software Tool User Guide

1.1 Introduction

This document is provided to help users of the Environment Agency's H1 Software Tool, version 4.0. It reflects the latest updates to the software tool which includes modifications necessary to enable the tool to work in Microsoft Excel.

The H1 tool enables calculation of the impact of proposed substance releases to various media. It screens out from detailed assessment those releases described as 'insignificant' emissions to air or deposition onto land, and for discharges to water or to sewer of effluent streams containing substances which are not 'liable to cause pollution'.

However, for releases to air the calculation of the predicted ground level concentration is pessimistic and should not be used to determine a stack height to produce an insignificant environmental impact. Detailed modelling should be employed for this purpose. Prior to submitting an application for a new or modified permit, guidance is provided by Environment Agency area teams and this includes discussions on appropriate stack heights.

Before use the tool should be downloaded to the user's computer hard drive, unzipped, saved and then opened using Microsoft Excel. The tool contains a series of macros which must be enabled before use. The tool is based on Microsoft Excel 2013.

1.2 Using the tool

Guidance on using the tool is available at the following locations;

1. General instructions on the opening page
2. Instructions and hyperlinks on each page of the tool,
3. Within this user guide, and
4. By contacting the Environment Agency.

On opening the tool the front screen below appears. In normal use, the user needs to save the file (and therefore the data entries). Should further scenarios require assessment the user is recommended to make copies of the tool before entering any data.





Version number: 3
 Last updated: 16 March 2018



The H1 tool enables calculation of the impact of proposed substance releases to various media. It screens out from detailed assessment those releases described as 'insignificant' emissions to air or deposition onto land, and for discharges to water or to sewer of effluent streams containing substances which are not 'liable to cause pollution'.

However, for releases to air the calculation of the predicted ground level concentration is pessimistic and should not be used to determine a stack height to produce an insignificant environmental impact. Detailed modelling should be employed for this purpose. Prior to submitting an application for a new or modified permit, guidance is provided by Environment Agency area teams and this includes discussions on appropriate stack heights.

Please start your assessment with the button below. The tool will allow you to undertake an environmental assessment or an options appraisal. Each page includes navigation buttons to skip through the pages and see the same page for all options.

START YOUR ASSESSMENT

Reference info

Objectives

List of BAT-AEL

Output tables

Raw data (Water)

Add pollutant (Water)

Raw data (Air)

Add pollutant (Air)

Cell colour coding:

Input tables:	Tests:	Performance indicators, GWP, waste impact score:
User input	User input	User input
Formula/calculation	Formula/calculation	Formula/calculation
Dropdown menu	Tests	Dropdown menu
	Tests	
	Dropdown	
	Button	

This first page includes the following:

- ▶ General instructions
- ▶ Cell colour coding key:

Cell colour coding:

Input tables:	Tests:	Performance indicators, GWP, waste impact score:
User input	User input	User input
Formula/calculation	Formula/calculation	Formula/calculation
Dropdown menu	Tests	Dropdown menu
	Tests	
	Dropdown	
	Button	

- ▶ Links to:
 - ▶ Reference information: This is also accessible when you start the assessment. That page contains the information on your installation, including its industrial sector.
 - ▶ Objectives: This is also accessible when you start your assessment. The objectives page defines the assessment (more information below)
 - ▶ List of BAT-AELs
 - ▶ Output tables: Note that these will not be populated until the assessment data is entered in the tool
 - ▶ Raw data (Water and air): This contains reference data on the available pollutants for air and water, including the thresholds for the tests performed by the tool and other information

Commented [BM1]: For FDM BRef permit reviews PLEASE NOTE: Food Drink and Milk is not listed. Please leave the industrial sector blank to proceed. Only Sectors with BRefs published up to March 2018 are currently included in the tool.

Commented [BM2]: For FDM BRef permit reviews PLEASE NOTE: Please do not use this part of the tool. The BAT-AELs for this BREF are not yet incorporated into the tool. Only BRefs published up to March 2018 are included. In any case, this part of the tool will only be useful for options appraisal as part of the derogation process, in the future.



- ▶ **Addition of pollutants (air and water):** The link redirects users to a section of the table with raw data where they can add new pollutants with their reference values and thresholds.

The link: <https://www.gov.uk/government/collections/risk-assessments-for-specific-activities-environmental-permits> takes the user to the page where revised annexes may be found and access to the H1 Software Tool is given. For each application this website should be checked to ensure the latest version number of the Tool is used.

General navigation

The tool consists of various groups of pages:

- ▶ **Facility reference information:** Information about the facility
- ▶ **Objectives:** Definition of assessment. The user can select whether it will be an environmental assessment or an options appraisal
- ▶ **Input pages:** These pages will allow users to identify relevant releases from their installation to the environment and populate relevant information on the pollutants released
- ▶ **'Identify' page:** This page allows users to select whether they intend to assess the emissions from the facility to the different environmental media (i.e. air, water, land)
- ▶ **Output pages:** These present the various screening tests and information on ozone creation potential, performance indicators, global warming potential, visual impact and waste impact.
- ▶ **Results:** A summary of the results of the screening tests.

Once you start your assessment, there are arrows at the top of each page to navigate through the following or previous page. Alongside these arrows, each page also contains a link to the opening page ('Main') to return to the main menu as desired. In most pages, these buttons will also allow you to navigate through your options (if it is an option appraisal) and through the different parts of the assessment.



Each page also contains a box with instructions, such as the example below:

Each table corresponds to one water body. Select the type (R, T, TR) and other data related to the water body in the first row of the first table and all subsequent rows will populate with this.

Add 1 row per release point. Scroll across the table to add substances to each row (i.e. release point). Users inputs are shaded in light blue and dropdown menu in yellow.

Do not delete the formulae in the cells shaded in white. When you select a substance from the dropdown menu in the "Substance" column, the cells shaded in grey will light up to allow user input.

Start your assessment

This section includes a description of the different pages that you will find when using the tool.

Facility reference information

Once you start your assessment, the tool will show the facility reference information. Please enter your company name, location and permit number in the blue cells. If you tab with your keyboard, the tool will automatically select the next cell that requires an input. Finally, there is a dropdown menu with industrial sectors. Please select your sector.



Objectives

In this page, the user is required to choose between a simple assessment and a more detailed evaluation, called the 'Options Appraisal'. This enables users to include more than one option to secure environmental protection and each option can then be ranked on the basis of cost effectiveness. This enables the Best Available Technique (BAT) to be identified, but is not suitable to support a case for derogation from the BAT-AELs specified in BAT Conclusions documents. Such assessments should be progressed by reference to H1 Annex K (available via our National Customer Contact Centre) and the 'Derogations' page on GOV.UK.

Please note that whichever option is chosen Steps 1, 2 and 3 of the tool are common with screening results presented in a table at the end of Step 3.

If the 'Options Appraisal' button is selected the user has the opportunity to add different options to their assessment. Where this relates to an existing site the present mode of operation is called the 'Base Case'. A dropdown menu in the "Describe the objectives" page allows the user to select the number of options to be assessed, from 2 to 5.

To create an option, select option appraisal and then enter your option in the table. After completing the title name for your option, click on "Create blank" and it will create the option with the number and name of the row where the cursor is. You can delete an option by having the cursor in the row where it is described in this the 'objectives' page. The order output column determines the order in which the options will appear in the output tables.

Describe the objectives

Main | Objectives | Identify | Output Tables

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

Select the type of assessment:

Environmental assessment of the releases resulting from the facility as a whole Env A
 Conduct a cost/benefits OPTIONS APPRAISAL to determine BAT or support the case for derogation under the IE Options You have selected an option appraisal!

Air	Water	Energy	Raw materials	Waste
Yes	Yes	Yes	Yes	Yes

Please select whether you have releases in the dropdown menus above

If you have opted for an option assessment, please write in the text in the table below before creating the options. The "order in output" column is the order in which you want them to appear in the Output tables. Copy from is the option number from which you want to copy one option into the one where the cursor is.

Create Blank | Clear | Delete | Go To | Copy

Number	Title	Description	Order in Output	Copy From
1	Basecase		1	1
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

If the Environmental Assessment button is chosen the tool requests user describe the activities and then moves on to Step 2.

When undertaking an environmental assessment, the tool will redirect you to the 'Identify' page when pressing the "go to assessment" button. This page is described below. Note that you can access step 2 from this page. The page where you have to enter the information on receiving water bodies and release points can be accessed using the 'Water (input)' button.

Objectives page in "environmental assessment mode":



Describe the objectives Main Objectives Identify Output Tables

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

Select the type of assessment:
 Environmental assessment of the releases resulting from the facility as a whole
 Conduct a cost/benefits OPTIONS APPRAISAL to determine BAT or support the case for derogation under the I₂ Options Env A You have selected an environmental assessment

Air	Water	Energy	Raw materials	Waste
Yes	Yes	Yes	Yes	Yes

Please select whether you have releases in the dropdown menus above

If you have opted for an option assessment, please write in the text in the table below before creating the options. The "order in output" column is the order in which you want them to appear in the Output tables. Copy from is the option number from which you want to copy one option into the one where the cursor is.

Go to Environmental Assessment | Clear Environmental Assessment

Activities
1
2
3
4
5
6
7
8
9
10

Water (input) button in "Identify":

Go to Input ..

Air (input)

Water (input)

Energy (input)

Raw Materials (in)

Waste (input)

Step 2

Receiving water bodies and release points

This page appears once if the environmental assessment is selected or once per option of the option appraisal is selected.

This page is the input page for water. Each table represents a discharge location, which is classified as 'R' (freshwater), 'TR' (TRaC - Riverine) and 'T' (TRaC - Estuarine and coastal). The first row of each table (i.e. discharge location) includes a dropdown list to select the discharge category, the description of the discharge location and the freshwater Q95 flowrate (m³/s).

Once you populate the blue cells in the first row of each table, the rest of the rows of the table will populate automatically.

Add release point to this discharge location Delete selected

Discharge category	Description	Freshwater Q95 flowrate (m3/s)	R
0	0	0	



Add release point to this discharge location		Delete selected
Discharge category	Description	Freshwater Q95 flowrate (m3/s)
Select discharge point	er Phoenix	2.2
R	er Phoenix	2.2
TR		
T		

The second row of each table shall include the information on the first release point, its location, whether there is a sewer, its mean effluent flow rate (m³/s), its maximum effluent flow rate and the assessment method. Users should enter the mean flow rate (in cubic metres per second) before the maximum flow rate. If the mean flow entered is greater than the maximum flow an error message appears prompting a correction.

The so-called "release point code" is a code used to identify each release point. As long as the code is different for each release point, anything is accepted. Formats such as W1, W2, W3 etc are common.

The following columns of the first row enable the user to include information on the pollutants that are released via that release point. Click on the cell in the second row of the "Substance" column to unveil a dropdown menu. Once the pollutant is selected, the cells related to that substance will be active. As stated in the colour coding table, blue cells are for user inputs, yellow cells are dropdown lists and white cells are calculated formulas. The maximum number of pollutants per release point is 30.

Select pollutant from the dropdown menu in row 9. Do the same for all other tables and substances within the table						
Substance	Measurement method	Operating mode	Average conc (ug/l)	Measurement basis avg	Maximum conc (ug/l)	Measurement basis max

Select pollutant from the dropdown menu in row 9. Do the same for all other tables and substances within the table							
Substance	Measurement method	Operating mode	Average conc (ug/l)	Measurement basis avg	Maximum conc (ug/l)	Measurement basis max	Annual rate (kg)
Zinc							

Additional release points can be added to each discharge location by clicking on the "Add release point to this discharge location" button. If you wish to delete a row that you have created, you can also do this by selecting the row (the cursor has to be inside the table and in the row you intend to delete). The first two rows cannot be deleted.

The user has the option to choose 'Discharge to Sewer'. This has the effect of passing the effluent through a treatment plant or sewage works before the discharge reaches the environment. As a reference, a factor of 0 means that there is no abatement and a factor of 100% means 100% abatement. In the example below, the removal factor is 11%. This means that 11% is entered as the proportion of the substance concentration that is removed after passage through the effluent treatment process:

is and substances within the table							
Operating mode	Average conc (ug/l)	Measurement basis avg	Maximum conc (ug/l)	Measurement basis max	Annual rate (kg/yr)	Significant load (PHS only)	Sewer factor
	85%	65 Daily	80 Hourly		10454.184	0	11%

It is possible to copy a row and paste it somewhere else. When you click on copy, the row that is going to be copied ('origin row') is highlighted in red. Each time you click on paste again, the origin row will be pasted. Once you do not wish to paste it anymore, you should click on "copy selected row" outside of the table and the origin row will return to its original colour format.

Note that for Priority Hazardous Substances (PHS), which are the most polluting substances considered, the tool picks up the 'Significant Load' annual limit that may be released from a site in kilogrammes per year. The tool calculates the release to compare with this figure (5 kg in the case of Cadmium) using mean concentrations and mean effluent flows. If a substance is discharged from more than one release point on a site the mass releases are combined to compare against this annual limit.

The percentage Operating Mode enables data entry for activities that do not operate continuously throughout the year. If an activity operates for six months the operating mode is set to 50%.



It is important to note that each discharge location has to be in a different table. Release points within the same discharge location have to be in the same table. It is also important to provide a different name for each discharge location (i.e. for each table). Should you want to delete the number of tables due to having less discharge locations, these can be deleted using the "Delete selected table" button. Also, tables can be added clicking on the "Add discharge location" button. The page can have up to 6 tables in total.

After completing these tables, use the navigation panel to go the next page, go back to the main menu, go to 'identify' or switch between options.

Air release points and emissions inventory

This page appears once if the environmental assessment is selected or once per option of the option appraisal is selected.

The first data to enter in this point is the location, activities and effective height (m) of each release point. To identify the effective height of release users are referred to air emissions guidance

<https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit> which explains how this critical parameter may be determined. The tool will calculate the dispersion factors (long and short term). Please add the information on each release point in subsequent columns (efflux velocity, total flow).

Then, for each release point users are required to enter details of long and short-term substance concentrations and the percentage Operating Mode for the year. Using the annual mean concentration and operating mode data the tool calculates the annual release of each substance in tonnes.

The way in which pollutants are added to each release point is similar to the water pollutants. It is important to note that pollutants released from a common release point should be on the same row. There are buttons for adding air release points (i.e. rows). Note that "release point codes" are also needed here. These are typically expressed as A1, A2, A3 [...] but as long as all codes are different, any reference code or name can be used.

After completing these table use the navigation panel to go the next page, go back to the main menu, go to 'identify' or switch between options.

Energy consumption

This page appears once if the environmental assessment is selected or once per option of the option appraisal is selected.

Please select the energy sources from the dropdown list in the "Energy source" column. Enter the energy delivered ("Delivered MWh/yr") and your conversion factor (otherwise enter 1). The CO₂ emission factor is calculated by the tool. The user can enter a different CO₂ emission factor.

As in previous input tables, you can add, delete or copy multiple energy sources by clicking on the relevant button.

After completing this table use the navigation panel to go the next page, go back to the main menu, go to 'identify' or switch between options.

Raw materials

This page appears once if the environmental assessment is selected or once per option of the option appraisal is selected.

Please add each raw material and associated annual consumption. A dropdown list will allow you to select the relevant units. You can add, delete and/or copy sources.

After completing this table use the navigation panel to go the next page, go back to the main menu, go to 'identify' or switch between options.

Commented [BM3]: For FDM BRef permit reviews PLEASE NOTE: You are unlikely to need to complete this section for the purposes of the review.

Commented [BM4]: For FDM BRef permit reviews PLEASE NOTE: You are unlikely to need to complete this section for the purposes of the review.

Commented [BM5]: Whilst this section does not need to be completed for the purposes of the review, there is a known glitch that sometimes occurs when adding raw materials. Please first consider if this information is actually relevant to your Regulation 61 response before proceeding.

To overcome the issue, follow the steps below:

Step 1 - using the "Add raw material" button, add the number of lines you need to complete all your raw material inputs (this will save you some time later!). If you can't do this because you are getting the protected workbook message, complete steps 2, 3 and 4 and return to this step.

Step 2 - When you have added the number of lines you need, use the "view" tab to click on Macros > View Macros.

Step 3 - Click on ADD_MATERIAL and click "run".

Step 4 - You will get an error message - That's ok - just click "end"!

Step 5 - You should now be able to add the waste material inputs.

Step 6 - When you have added all the waste input parameters click "save".

Step 7 - Do not press the next ">" button. Instead click on the "Main" button and navigate to where you need to be in that way.



Waste inventory

This page appears once if the environmental assessment is selected or once per option of the option appraisal is selected.

Please add your waste streams. Enter the name of your stream in the "Waste stream" column. The category of waste and disposal option can be selected from a dropdown list. Enter the mass in tonnes per year that is produced from each stream. As in previous input tables, you can add or delete waste streams.

After completing this table use the navigation panel to go the next page, go back to the main menu, go to 'identify' or switch between options.

Step 3

The results of the assessment are presented in Step 3. This enables identification of those releases which present an insignificant impact to the local environment. The remaining releases may need a more detailed assessment, depending on the outcome of the relevant screening process. Substances which are not screened out are highlighted in red.

Identify page

The first page of Step 3 is where the user identifies the various categories in their assessment by placing a tick in the relevant box. If releases to a particular category are included in the assessment and not ticked on this page a justification is required.

Users should select the relevant impacts caused by their facility. In the first column, the user selects whether there are releases from the facility to:

- ▶ Air
- ▶ Deposition from air to land
- ▶ Water
- ▶ Waste
- ▶ Visual impacts
- ▶ Ozone creation
- ▶ Global warming
- ▶ Performance indicators

The Tool enquires whether users want to conduct the BAT-AEL test. The third column identifies whether the impact is selected for subsequent analysis. If there are releases but you do not believe that there is an impact, then select "No" in that column. Note that you will have to justify this omission in the available space. Depending on your selection, there will be several hyperlinks (buttons) on the right-hand side that will lead you to the relevant screening tests and outputs. These buttons will 'disappear' if you select that the impact is not relevant:

Identify relevant impacts		if the impacts are not relevant, please select 'No' and justify your omission		You will be able to go back to this page if you click on the 'Identify' button in each of the statements.	
		Navigate to Option Number		2, select Note Found	
Releases?	Test Impact?	Justification for omission?		Go to Input ...	Go to Test ...
Yes	Air	Yes		Air (input)	Air
Yes	Deposition from air to land	Yes		Water (input)	Deposition
Yes	Water	Yes		Energy (input)	Water
Yes	Waste	Yes		Raw Materials (in)	Waste
Yes	Visual	Yes		Waste (input)	Visual
	Ozone creation	Yes			Ozone
	Global warming	Yes			Global Warming
	BAT-AEL test	Yes			BAT-AEL
	Performance indicators	Yes			Performance

Commented [BM6]: For FDM BRef permit reviews PLEASE NOTE: You are unlikely to need to complete this section for the purposes of the review.

Commented [BM7]: Whilst this section does not need to be completed for the purposes of the review, there is a known glitch that sometimes occurs when adding rows to input waste streams. Please consider if this information is actually relevant to your Regulation 61 response before proceeding.

To overcome the issue, follow the steps below:

Step 1 - using the "Add waste stream" button, add the number of lines (rows) you need to complete all your waste stream inputs (this will save you some time later!). If you can't do this because you are getting the protected workbook message, complete steps 2, 3 and 4 and return to this step.

Step 2 - When you have added the number of lines you need, use the "view" tab to click on Macros > View Macros.

Step 3 - Click on ADD_MATERIAL and click "run".

Step 4 - You will get an error message - That's ok - just click "end"!

Step 5 - You should now be able to add the waste material inputs.

Step 6 - When you have added all the waste input parameters click "save".

Step 7 - Do not press the next ">" button. Instead click on the "Main" button and navigate to where you need to be in that way.



This page can also be used as a general root for navigating through all the parts of the tool, as you will be able to access the pages in step 2 and step 3, as well as the objectives page, the main menu and the output tables from here.

Water impacts

These pages appear once if the environmental assessment is selected or once per option if the option appraisal is selected.

If you change anything in the “Receiving water bodies and release points”, you must repeat each test sequentially to update the results of the screening tests with the new values.

Freshwater

For discharges to freshwater we see the following:

Freshwater - Test 1							
Type of water body	Description	Freshwater Q95 flowrate (m3/s)	Release point	Mean effluent flow rate (m3/s)	Max effluent flow rate (m3/s)	Sewer factor (%)	Substance
R	River Phoenix	2	W2	6	50		0.13 Zinc
R	River Phoenix	2	W2	6	50		0 Anthracene
R	River Phoenix	2	W2	6	50		0 Terbutryn

Click on the “screening 1 button to perform screening test 1. (You may need to scroll to the right to see all the columns of the table).

Substance	Release conc (ug/l)	Annual EQS (ug/l)	Test 1: Release conc <10% EQS avg	Max release conc (ug/l)	MAC (ug/l)	Test: Release conc <10% EQS max	Comments
Zinc	65	10.9	Fail	80	0	N/A	
Anthracene	0.2	0.1	Fail	0.5	0.1	Fail	
Terbutryn	0.066	0.065	Fail	0.07	0.34	Fail	

All the substances ‘fail’ test 1. Then for Test 2 freshwater you will see the following after clicking on the button to run the test:

Type of water body	Description	Freshwater Q95 flowrate (m3/s)	Release point	Mean effluent flow rate (m3/s)	Max effluent flow rate (m3/s)	Substance	Release conc (ug/l)	Max release conc (ug/l)	Annual EQS (ug/l)	PC (ug/l)
R	River Phoenix	2	W2	6	50	Zinc	65	80	10.9	48.75
R	River Phoenix	2	W2	6	50	Anthracene	0.2	0.5	0.1	0.15
R	River Phoenix	2	W2	6	50	Terbutryn	0.066	0.07	0.065	0.0495

If you scroll to the right, you will be able to see the following:

Annual avg EQS				MAC EQS					
Annual EQS (ug/l)	PC (ug/l)	Modelled PC (ug/l)	%PC of EQS	Test 2: PC<4% of EQS?	MAC EQS (ug/l)	PC (max) (ug/l)	Modelled PC (max) (ug/l)	%PC of MAC	Test 2: PC<4% of MAC?
10.9	48.75			fail	0	76.92308			
0.1	0.15			fail	0.1	0.480769		481%	fail
0.065	0.0495			fail	0.34	0.067308		20%	fail

The PC values are calculated. If you wish to enter PC values calculated from separate modelling, they can be entered in the “Modelled PC” column.

In the example above, all three substances fail test 2 and are carried forward to Tests 3, 4a and 4b.

Freshwater - Tests 3, 4a and 4b										
Type of water body	Description	Freshwater Q95 flowrate (m3/s)	Release point	Mean effluent flow rate (m3/s)	Max effluent flow rate (m3/s)	Substance	Release conc (ug/l)	Max release conc (ug/l)	Background conc (ug/l)	PC (ug/l)
R	River Phoenix	2	W2	6	50	Zinc	65	80		48.75
R	River Phoenix	2	W2	6	50	Anthracene	0.2	0.5		0.15
R	River Phoenix	2	W2	6	50	Terbutryn	0.066	0.07		0.0495

As with previous cases, scroll to the right to see all the data of screening tests 3, 4a and 4b.



Max release conc. (ug/l)	Background conc (ug/l)	PC (ug/l)	PEC (ug/l)	Annual EOS (ug/l)	(PEC-BC)/EOS	Test 3 - (PEC-BC)/EOS>10% annual EOS	%PEC EOS	Test 4a - PEC >100% EOS	MAC EOS	PC (max) (ug/l)	PEC Max (ug/l)	PEC of MAC	Test 4b: PEC>100% MAC
80	0.5	48.75	48.875	10.9	4.438073394	fail	448%	fail	0	76.9231	76.942308		pass
0.5	3	0.15	0.9	0.1	-21	pass	900%	fail	0.1	0.48077	0.5961538	5.9615385	fail
0.07	0.7	0.0495	0.2245	0.065	-7.315384615	pass	345%	fail	0.34	0.06731	0.0942308	0.2771493	pass

Background concentrations are added and the results of Test 3 and 4a & 4b are displayed. To screen out at this stage all three tests must pass.

TRaC waters

TRaC water assessments includes releases to both upper estuarine environments, described here as 'TraC Riverine', and lower estuarine and coastal environments. In this example releases to W1 (River Nene) which is TraC Riverine and W3 (Camel Estuary) which is TraC Estuary and coastal are included. (You may need to use the arrow on the right-hand margin to see all the information). Once you click on the "Screening 1" button, you will see the following:

TRAC Waters - Test 1							
Type of water body	Description	Freshwater Q95 flowrate (m3/s)	Release point	Mean effluent flow rate (m3/s)	Max effluent flow rate (m3/s)	Sewer factor (%)	Substance
TR	River Nene	1.5	W1	2.5	5	0	2,4-Dichlorophenol
TR	River Nene	1.5	W1	2.5	5	0	Benzene
T	Camel estuary	0	W3	1.6	2	0	Cyanide
T	Camel estuary	0	W3	1.6	2	0	Bromine

If you scroll to the right, you will see the rest of the table:

Substance	Release conc (ug/l)	Annual EOS (ug/l)	Test 1: Release conc <100% EOS avg	Max release conc (ug/l)	MAC (ug/l)	Test 1: Release conc <100% EOS max	Comments
2,4-Dichlorophenol	0.5	0.42	fail	1	6	Pass	
Benzene	0.1	8	Pass	5	50	Pass	
Cyanide	3.5	1	fail	4	5	Pass	
Bromine	2	0	N/A	4	10	Pass	

Benzene is screened out as the release concentration is less than the EQS in salt water.

From the other substances, the usual screening approach applies with substances that fail being carried forward to Test 2, and then to Test 3-4b. Tests 2, 3, 4a and 4b is only carried out to substances in 'TR' discharge locations:

TRAC Waters - Test 2				
Type of water body	Description	Freshwater Q95 flowrate (m3/s)	Sewer factor (%)	Substance
TR	River Nene	1.5	0	2,4-Dichlorophenol

Substance	Annual avg EOS				MAC EOS				
	Annual EOS (ug/l)	PC (ug/l)	Modelled PC (ug/l)	%PC of EOS%	MAC EOS (ug/l)	PC (max) (ug/l)	Modelled PC (max) (ug/l)	%PC of MAC	Test 2: PC<4% of MAC?
2,4-Dichlorophenol	0.42	0.3125		74%	fail	6	0.769230769	13%	fail

As 2,4 Dichlorophenol fails test 2, it is carried forward to tests 3, 4a and 4b:

TRAC Waters - Tests 3, 4A and 4B				
Type of water body	Description	Freshwater Q95 flowrate (m3/s)	Sewer factor (%)	Substance
TR	River Nene	1.5	0	2,4-Dichlorophenol

If you scroll to the right, you will see the rest of the tests:



Background conc (ug/l)	PC (ug/l)	PEC (ug/l)	Annual EOS (ug/l)	(PEC-BC)/EOS	Test 3 - (PEC-BC)/EOS>10% annual EOS	%PEC EOS %	Test 4a - PEC >100% EOS	MAC EOS (ug/l)	PC (max) (ug/l)	PEC Max (ug/l)	%PEC of MAC %	Test 4b: PEC>100% MAC
0.8	0.3125	1.1125	0.42	74%	fail	265%	fail	6	0.76923	1.56923	0.26154	pass

It is seen that detailed modelling of 2,4 Dichlorophenol is required, as it fails tests 3 and 4a.

The tool then reverts back to TraC water assessment for the TraC (Estuarine & Coastal) release and applies Test 5A. This test contains questions that assess the physical geography of the discharge location and the surrounding environment. Any response other than "No" means that detailed modelling of the discharge is required. If modelling is not required the Test of the Effective Volume Flux (EVF) follows (Test 5B).

TRAC Waters - Step 5B							
Type of water body	Description	TraC water release depth (m)	Release point	Mean effluent flow rate (m3/s)	Max effluent flow rate (m3/s)	Sewer factor (%)	Substance
T	Camel estuary	3	W3	1.6	2	0	0 Cyanide
T	Camel estuary	3	W3	1.6	2	0	0 Bromine

As with other tests, please scroll to the right to read the rest of the table:

Substance	Release conc (ug/l)	Max release conc (ug/l)	Background conc (ug/l)	EOS (ug/l)	EVF (annual) (ug/l)	MAC EOS (ug/l)	EVF (max)	Allowable EVF	Test 5
Cyanide	3.5	4	0.1	1	6.22222222	5	1.532653961	3	fail
Bromine	2	4	0.1	0	-32	10	0.808080808	3	pass

Note here that the discharge of one substance (Bromine) into the salt water environment is screened out. The effect of the sewage treatment reduction factor is activated on each row once the background concentration is entered. The TraC water release depth below chart datum is the screening criteria used in Test 5B and represents the available EVF. The calculated EVF must be less than the available EVF for the discharged substance to be screened out from modelling.

Significant load test

For any PHS in the discharge the Significant Load test follows. By comparing the annual release against the substance significant load the tool identifies those substances which will require modelling of their discharge to decide if a limit is required in the permit. In this example, anthracene is not screened out from the Significant Load tests and therefore a permit limit may be required:

Water - Significant load test						
Run SigL. Test	Type of water body	Description	Substance	Annual rate (kg/yr)	Significant load (PHS only) kg	Significant load test
R	River Phoenix		Anthracene	37.8432		1 Fail

Air releases

These pages appear once if the environmental assessment is selected or once per option of the option appraisal is selected.

For air releases Step 3 begins with the 'Air Impacts Page'. When you click on "import", the tool will copy the relevant information from the air inventory so that tests can be carried out in subsequent pages.

Air impacts - Pollutants							
Number	Substance	Long term EAL (ug/m3)	Long term PC (ug/m3)	Long term modelled PC	Short term EAL (ug/m3)	Short term PC (ug/m3)	Short term modelled PC
1	Lead	0.5	9.16667E-09		0	1.43333E-06	
2	1,2,4-Trichloro	76	3.66667E-07		2280	7.16667E-05	
3	hydrogen chlo	0	1.33333E-07		750	1.66667E-05	
4	Acetonitrile	680	2.66667E-07		10200	3.33333E-05	

Please continue to the next page and run test 1 by clicking on "Test 1":

Air impacts - Test 1									
Number	Substance	Long term EAL (ug/m3)	Long term PC (ug/m3)	%PC of EAL (long term)	>1% of EAL? (long term)	Short term EAL (ug/m3)	Short term PC (ug/m3)	%PC of EAL (short term)	>10% of EAL? (short term)
1	Lead	0.5	9.16667E-09	0.0000%	pass	0	1.43333E-06	0.0000%	pass
2	1,2,4-Trichloro	76	3.66667E-07	0.0000%	pass	2280	7.16667E-05	0.0000%	pass
3	hydrogen chlo	0	1.33333E-07	0.0000%	pass	750	1.66667E-05	0.0000%	pass
4	Acetonitrile	680	2.66667E-07	0.0000%	pass	10200	3.33333E-05	0.0000%	pass

Here the resulting process contribution (PC) is compared to the substance EAL. This is followed by those substances not screened out carrying forward to stage 2 where background concentrations are added. The resulting Predicted Environmental Concentration (PEC) is compared to the relevant EAL.

Deposition to land from air

After tests 1 and 2 for air, you can assess the impacts of air emissions on land. Click on the button to run the test. The information is displayed as follows.

Photochemical ozone creation potential

Photochemical ozone potential is calculated on the following page and shows the relative contribution of each substance. The PCOP values are entered automatically by the tool and the total potential for an operating scenario is given. Click on the button to assess it.

BAT-AEL assessment

The following test allows users to have a list of release points for air and water alongside the pollutants released and their concentration. With this, you will be able to search the applicable BAT-AELs from the database embedded in the tool. If your sector does not have adopted BAT conclusions at this stage, you can skip this step.

Please click on "Import info for BAT-AEL" to import the information.

Import info for BAT-AEL		Follow the instructions of the search engine. This will allow you to see an output of the relevant BAT-AELs based on your selection						
BAT-AELs								
Sector	Air/Water?	Release point code	Substance	Long term conc (ug/l)	Short term conc (ug/l)	Product / sub-sector	Sub-Product / sub-sub-sector	Plant type
Iron and steel	Air	A1	Lead	0.05	0.1			
Iron and steel	Air	A1	1,2,4-Trichlorobenzene	2	5			
Iron and steel	Air	A2	Hydrogen chloride	2	3			
Iron and steel	Air	A2	Acetonitrile	4	6			
Iron and steel	Water	W2	Zinc	65	90			
Iron and steel	Water	W2	Anthracene	0.2	0.5			
Iron and steel	Water	W2	Terbutryn	0.066	0.07			
Iron and steel	Water	W1	2,4-Dichlorophenol	0.5	1			
Iron and steel	Water	W1	Benzene	0.1	5			
Iron and steel	Water	W3	Cyanide	3.5	4			
Iron and steel	Water	W3	Bromine	2	4			

Use the dropdown lists of the unpopulated columns to refine your search. With these lists, you can specify product, sub product, plant type, plant age, fuel type, plant capacity and emission source. Once you make your selection, click on "Go to search engine".

Search engine

The search engine will be automatically populated with the information available in the page described above. You will need to select the option that you want to access in the dedicated dropdown menu below the "BAT-AEL outputs" button. If you are undertaking an environmental assessment, it will be set to option 1 by default. The search needs to be done one row at a time (i.e. for each of the rows in the previous table).

Commented [BM8]: For FDM BRef permit reviews PLEASE NOTE: You are unlikely to need to complete this section for the purposes of the review.

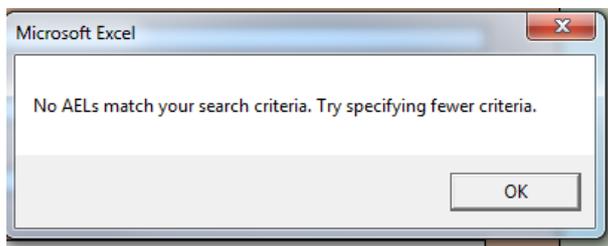
Commented [BM9]: For FDM BRef permit reviews PLEASE NOTE: You are unlikely to need to complete this section for the purposes of the review.

Commented [BM10]: For FDM BRef permit reviews PLEASE NOTE: Please do not use this part of the tool. The BAT-AELs for this BRef are not yet incorporated into the tool. Only BRefs published up to March 2018 are currently included. In any case, this part of the tool will only be useful for options appraisal as part of derogations in future versions of the tool. Use your Regulation 61 response to demonstrate BAT-AEL compliance.

Commented [BM11]: For FDM BRef permit reviews PLEASE NOTE: Please do not use this part of the tool. The BAT-AELs for this BRef are not yet incorporated. Only BRefs published up to March 2018 are currently included. In any case, this part of the tool will only be useful for options appraisal as part of derogations in future versions of the tool. Use your Regulation 61 response to demonstrate BAT-AEL compliance.

Please select the row in the appropriate dropdown list.

Click on “search and view output” and the tool will automatically select the BAT-AEL that are relevant to your search terms and will populate a table with the information. You can use that to go back to the BAT-AEL test and populate cells with the appropriate BAT names and BAT-AEL. If your search terms are too specific and the combination of search terms does not exist in our database (i.e. there is not a BAT-AEL for that particular sector, pollutant, product etc), you will receive the following error message:



In order to go back to the BAT-AEL test from the “Search engine” or the “BAT-AEL outputs”, click on the link to the “Identify” page. You can access the BAT-AEL for any option there.

Performance indicators

This page will be automatically populated with the relevant data you have included in the ‘raw materials’ page. If operators want to use their product to calculate their performance, they are prompted to select ‘Product’ from the first dropdown menu and justify their choice. The user is expected to fill in data on the product produced at the facility and the tool. Performance can also be calculated as per the raw material or intermediate product.

Global warming potential impacts

Global warming potential impacts are displayed after PCOP and the total effect of the releases of carbon dioxide are presented for each scenario.

Waste impact score

The waste impact score calculation follows and takes the data entered from Step 2 for the operating scenario considered. If more than one option is selected at the front of the tool, there will be one page for each option.

Visual impacts

Visual Impacts are assessed qualitatively in the tool by reference to the number of days a visible plume is seen off-site. Depending upon the significance of the impact the user can enter supporting evidence in the comments box below the display.

Output tables

Once you click on "report test results", the tables will display information on air and water, with basic information showing whether the screening tests have been passed.

Commented [BM12]: For FDM BRef permit reviews PLEASE NOTE: You are unlikely to need to complete this section for the purposes of the review.

2. List of abbreviations

BAT	Best Available Technique
BAT-AEL	Best Available Technique Associated Emissions Level
EAL	Environmental Assessment Level
EQS	Environmental Quality Standard
H	Horizontal (Guidance)
NCCC	National Customer Contact Centre
OPRA	Operational Risk Appraisal
PC	Process Contribution
PEC	Predicted Environmental Concentration
PHS	Priority Hazardous Substance
PCOP	Photochemical ozone potential
Q95	Freshwater flow equalled or exceeded for 95% of the year
TRaC	Transitional and Coastal
TRaC Riverine	Upper estuary



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