LCPD User Manual
Ver 1.33

DOC ID UM11

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1 INTRODUCTION

1.1 LCPD

LCPD is a PC based program, designed to operate under a practically all Windows operating systems. Operation is performed by using simple mouse instructions.

LCPD forms part of an Envirosoft Ltd suite of environmental programs (CEMSuite Power). Envirosoft Ltd environmental programs are:

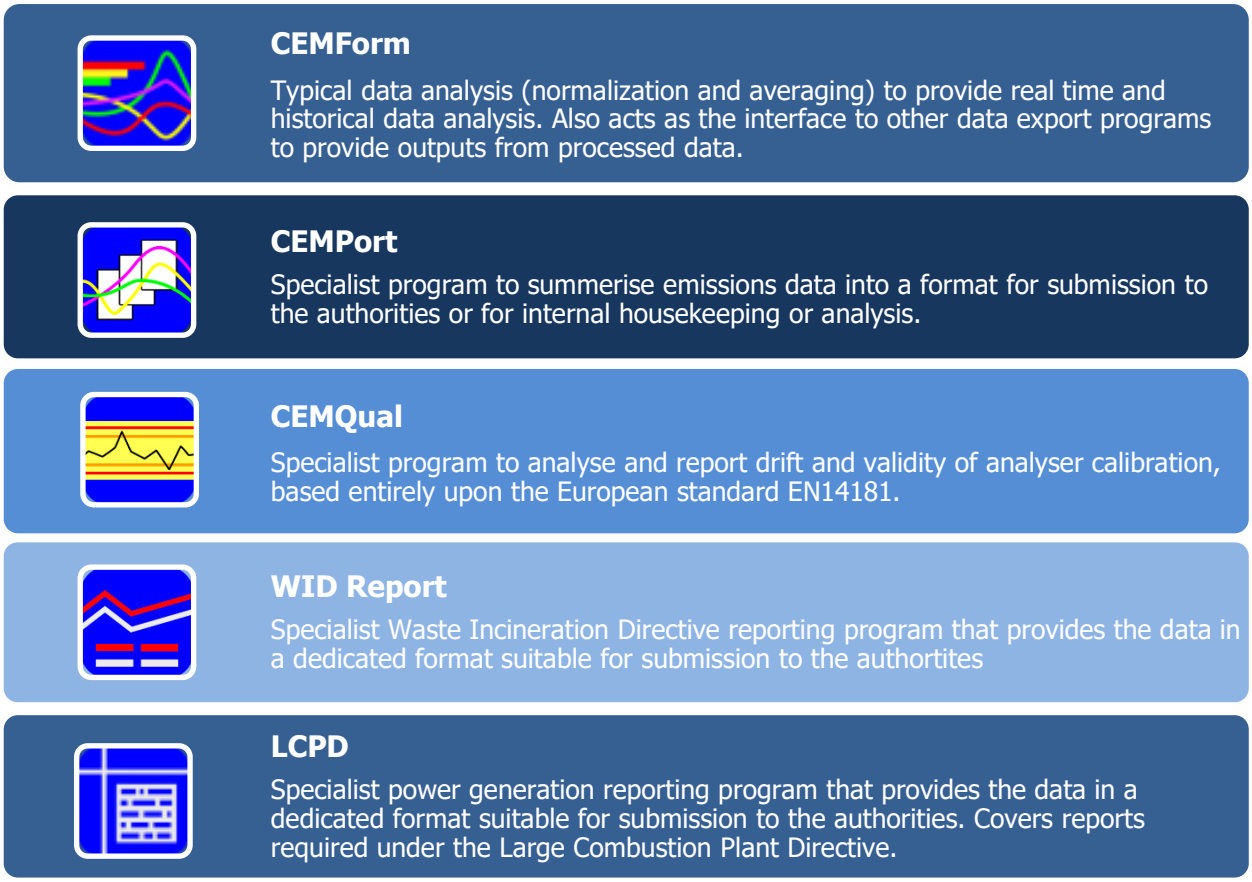

Figure 1 Envirosoft Ltd - Environmental Programs

1.2 THE LCPD PROGRAM

LCPD is designed to enable operators to comply with the reporting requirements of the Large Combustion Plant Directive (Directive 2001/80/EC). The terminology used in the document is taken from Article 2 of the Directive.

The key areas of the Directive covered by LCPD are:-

- Article 8
- Article 14
- Annex III
- Annex IV
- Annex V
- Annex VI
- Annex VII
- Annex VIII

1.2.1 THE BASIS OF THE LCPD MODULE

The LCPD module is a very sophisticated program that uses a spreadsheet format to create reports that can be printed or stored for future use. The Power module gathers core emissions data from the CEMSuite database as well as process data gathered by serial and/or analogue input.

The module has sophisticated mathematical capabilities to enable it to calculate complex functions like multiple ELV's, fuel weighted ELV's etc. It also carries the ability to create the complex reports required by the Environmental Agency and the ability to generate and print reports in the format required by the EA.

1.3 THE LCPD MANUAL

This manual describes the operation and function of the LCPD program and explains how to use the program to display the information as required.

For information concerning any of the other CEMSuite programs please refer to the relevant documentation.

2 SOFTWARE OPERATION

2.1 PERSONAL COMPUTER REQUIREMENTS

PC Requirements (minimum)

Processor: Intel i5
Memory: 8GB Ram
Graphics: Intel Graphics
Display: 1920x1080 pixel resolution. 21" monitor or greater.
Hard disk: 240 GB SSD
Modem/Dongle: Required for support
Operating system: Windows 7/8/10

The software will operate on PCs with lesser specifications. However, some operations involve lengthy calculations and the time taken to perform them may become tiresome.

2.2 INSTALLATION

The software is provided on CD-ROM. From Windows explorer, or 'My Computer', select the relevant drive and run the setup program.

Note: If the CD drive has been set for 'Auto insert notification', the installation should start automatically.

Once started follow the instructions on screen. The installation program creates files and folders and provides a shortcut to start the program from the Windows Start button.

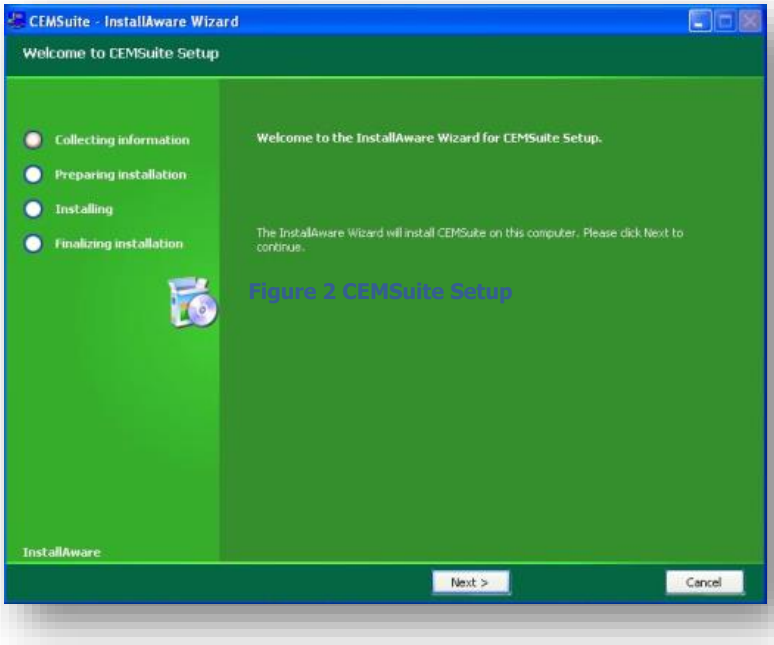

Figure 2 CEMSuite Setup

Installation Continued…

NOTE: Once the installation has completed, the PC's Borland Database Engine will also need to be installed / updated. CEMSuite will start this process automatically.

Figure 3 Borland Database Engine

2.2.1 USB INSTALLATION

The software may be supplied with a USB 'dongle' and will not function without it being present in a USB socket. To install the dongle drivers, use Windows Explorer to locate a sub-directory on the CD-ROM called 'Dongle driver' and open up this sub-directory. Double click on the file called setupdrv.exe and this will install the dongle drivers. The LCPD program will now operate normally.

2.3 ASSOCIATED PROGRAMS

2.3.1 CEMSYNC

Envirosoft's program CEMSync should be in operation to copy the historic and live data sets from the DSU (s). This may be seen in the task bar as the following icon:

Figure 4 CEMSync Icon

The timing of the CEMSync program operations is:

1. Between 5 and 10 seconds past each minute: copy the short term live data set from the DSU(s).
2. Between 10 and 25 seconds past each minute: process the above data
3. At 20 past midnight, download the historic data for the previous day and completely refresh the rolling 24 hour data set

2.3.2 CEMSOCKET

Should there be more than one DSU on the CEMSuite system, Envirosoft's program CEMSocket should be in operation on the task bar; it has the following icon:

Figure 5 CEMSocket Icon

3 PROGRAM OPERATION

3.1 STARTING THE PROGRAM

Start the program by double clicking the left-hand mouse button on the LCPD icon; which should now reside on the PC desktop. Alternatively, it can also be started by pressing the Windows Start Button > Programs > Envirosoft > LCPD.

Figure 6 Desktop shortcut to LCPD

3.2 INITIAL SCREEN

After the program has been started and the user has logged in, the LCPD screen will be displayed:

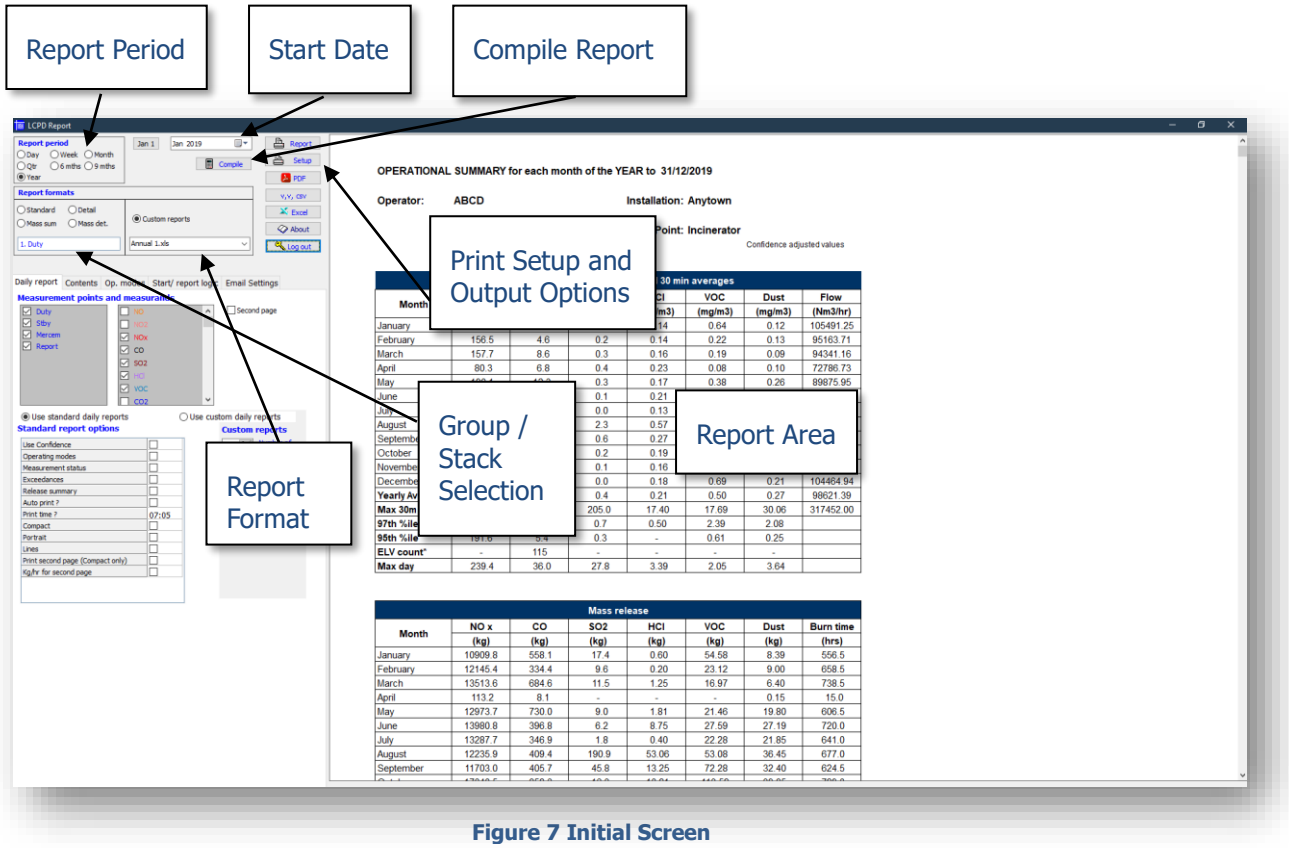

Figure 7 Initial Screen

The left hand side of the module is devoted to configuring reports and the right hand side (spreadsheet format) shows how the report will display prior to printing and saving. Before the configuration page is visible the operator must login and enter the password. This may be conducted by pressing the 'Log In' button and entering the password when prompted. The default password is blank and only after it has been entered will the configuration section be visible.

3.3 QUICK START GUIDE

LCPD may be used to summarise the emission data into a variety of formats (reports) to enable operators to comply with the reporting requirements of the Large Combustion Plant Directive (Directive 2001/80/EC). These are discussed later on in the document.

To compile a report the following sequence is used:

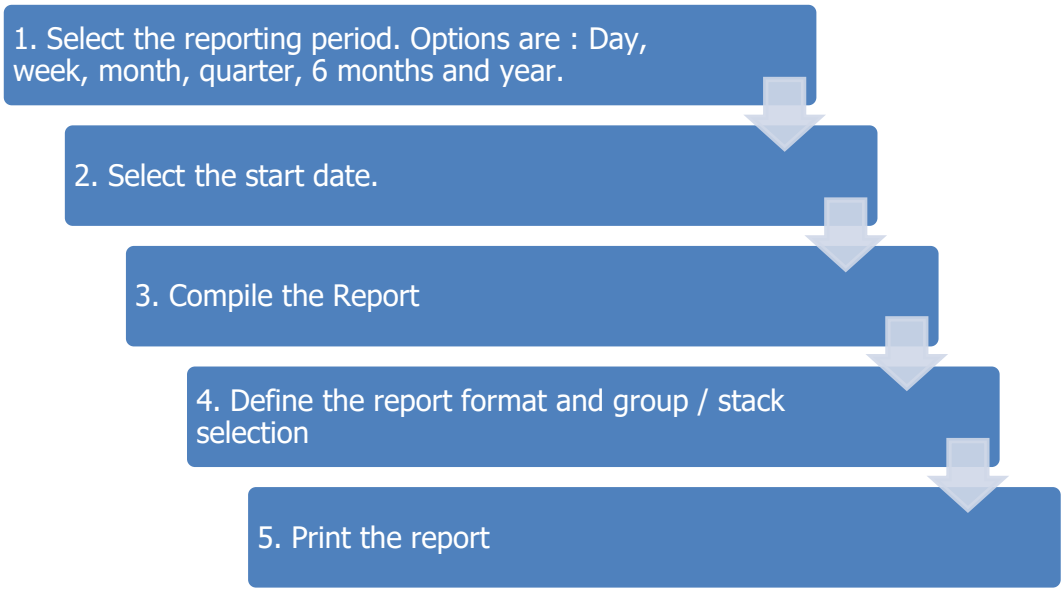

Figure 9 Quick Start Flow

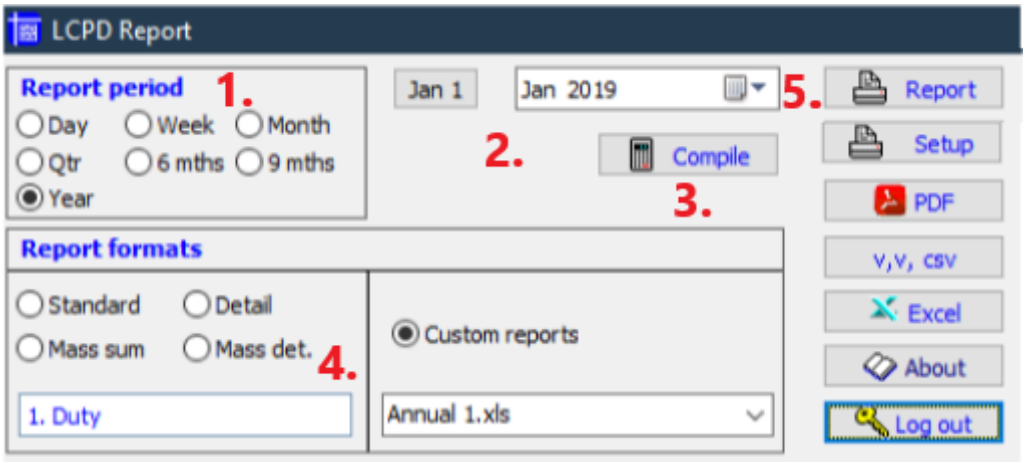

Figure 10 Quick Start Screen

4 REPORTS

4.1 REPORT PERIOD

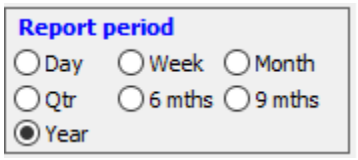

Figure 11 Report Period

There are several types of reports available to the operator, daily and weekly reports are meant for internal consumption and are not intended for submission to the authorities:

- **Daily Report**

  An overview of the previous day's operation complied and sent straight to the printer. A graphical presentation of the process operation and the validity of the measurements are included. The report is sent straight to the printer without a preview; this is to accommodate an automatic print if required.

- **Weekly Report**

  A basic summary of the emission data over a week.

- **Monthly, Quarterly, Six Monthly, Nine Monthly and Yearly**

  These reports are usually required for submission to regulators. After compilation the operator may select how the data is to be presented by changing the report type.

4.2 REPORT FORMATS

The following reports are available for selection:

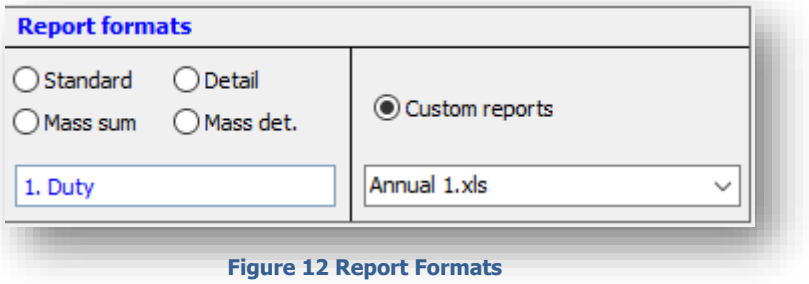

Figure 12 Report Formats

- **Custom Report**

  These reports are to satisfy individual format requirements of plant operators. The report design is constructed in Excel and the LCPD program is instructed to insert selectable parameters in a specific format, including layout, fonts, cell borders etc.

- **Detail Report**

  A day by day breakdown of the average, maxima and a count of any exceedances above the ELV for the selected measurements.

- **Standard Report**

  Basic report showing averages and data for the selected report period.

- **Mass Det. Report**

  Provides a daily analysis of the mass release for each of the selected measurements for each day of the reporting period. This may be used to identify particularly high emission days.

- **Mass Sum. Report**

  Will summerise the mass release of the selected gases over the entire period.

4.3 REPORTING PERIOD AND FORMAT OPTIONS

The following chart details which formats are available for the various reporting periods.

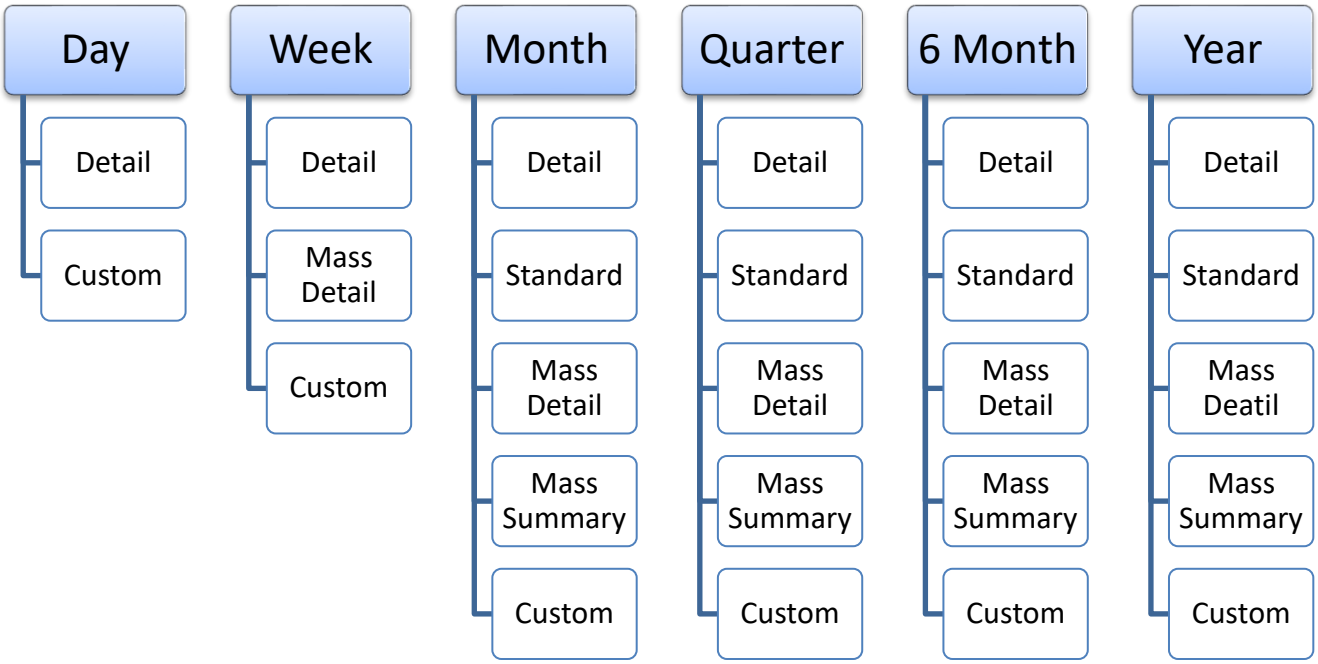

Chart 1 Period and Formats

5 REPORT COMPILATION

All reports may be compiled and printed without the need to enter a password. The operations to conduct this are:

1. **Select the Reporting Period** – This should be done first to enable LCPD to filter the options available for each reporting period.

2. **Select the Start Date** – For all reports other than the daily and weekly the first of the month is assumed.

3. **Compile the Report** – During compilation a progress bar will illustrate the report compilation.

4. **Select the Report Format** – The format of the report in the 'Report Area' will change instantly upon selection.

5. **Print the Report** – The report will be sent to the designated printer / image creator.

These operations are discussed in more detail in the next section.

NOTE:

For monthly, quarterly and yearly reports the 1st of the selected month is assumed and after compilation the type of report output (including trends and custom reports) may be selected.

The invalidity report must be compiled separately.

The daily report will print immediately after compilation without a preview. Please ensure that the printer has been setup. It is safest to set the normal printer to be the default printer. This report can also be configured to be printed automatically.

5.1 SELECTING A REPORTING PERIOD

To select the required reporting period:

1. Click the corresponding radio button (to the left of the required reporting period)

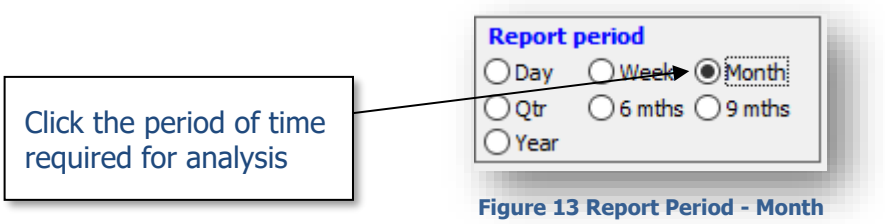

Figure 13 Report Period - Month

In the example above the reporting period 'Month' has been selected.

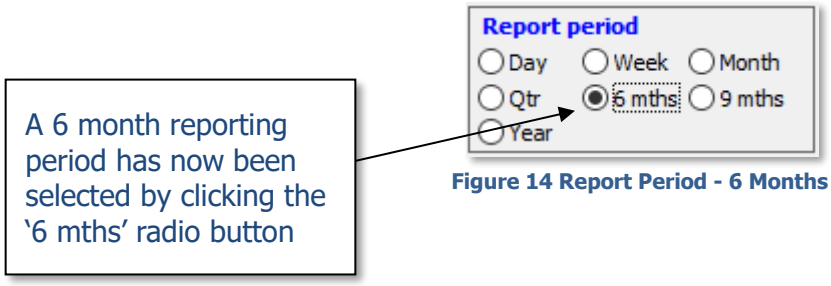

Figure 14 Report Period - 6 Months

In the example below the reporting period '6 months' has been selected.

5.2 SELECTING A START DATE

To select the required start date for the report:

1. Press the small triangle to the right of the displayed date.

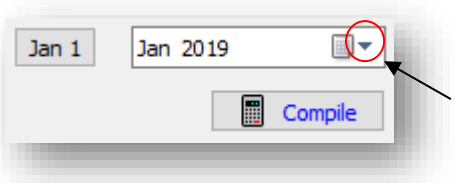

Figure 15 Start Date

2. This will bring up the 'date selection box' and the start date may be selected as shown below.

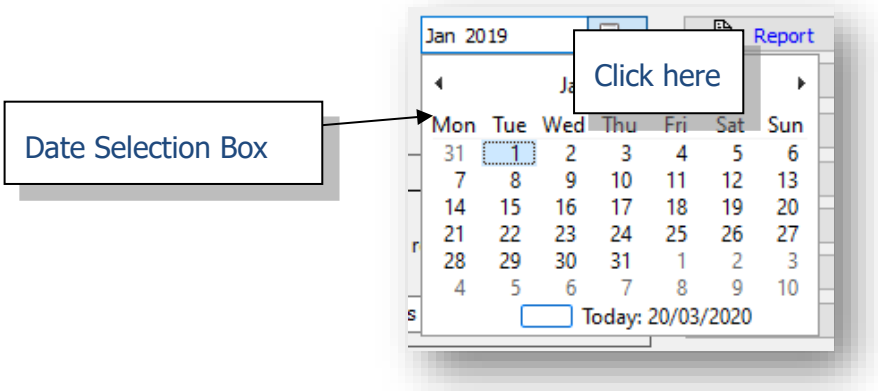

Figure 16 Date Selection Box

3. For Monthly, Quarterly, 6 month and Yearly reports only the month needs to be selected. This is done by using the small arrows either side of the displayed date in the 'date selection box'.

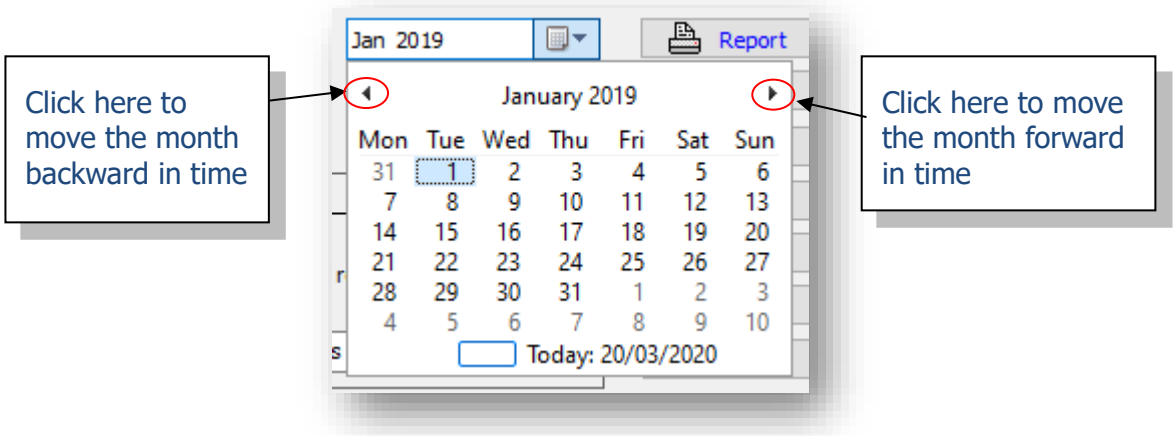

Figure 17 Month Selection

Note: Once the selection has been made, click the small triangle  *to close the 'date selection box'*

4. For Weekly and Daily reports the day will also need to be selected (weekly reports will then report the following 7 days) . Follow the steps above to select the required month. Then select the day by clicking the required day in the 'Date selcetion box'

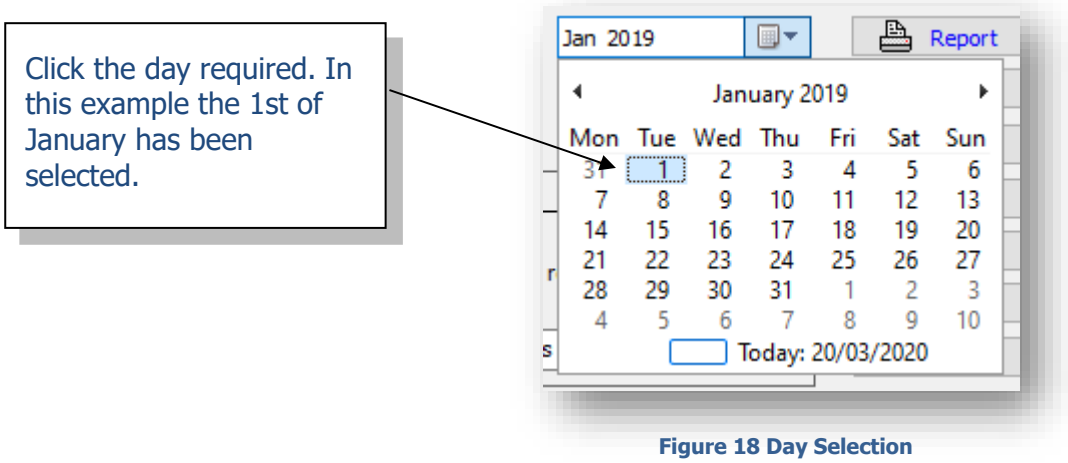

Figure 18 Day Selection

Note: Once the selection has been made the 'date selection box' will close automatically.

The required Start Date should now be shown:

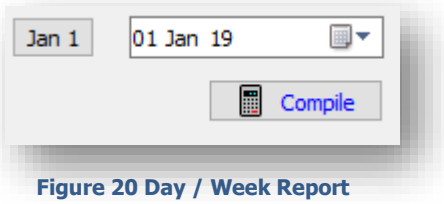

Figure 20 Day / Week Report

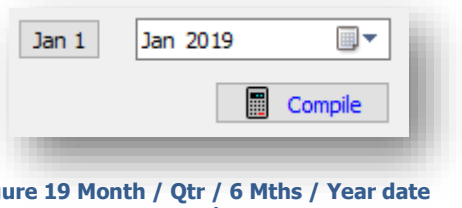

Figure 19 Month / Qtr / 6 Mths / Year date

Day / Week Report

Month / Quarter / 6 Month / Yearly

5.3 COMPILING THE REPORT

To compile the report:

1. To compile the report click the 'Compile' button.

Figure 21 Compile Button

2. The 'Progress Bar' will now be displayed on screen illustrating the compilation of the report.

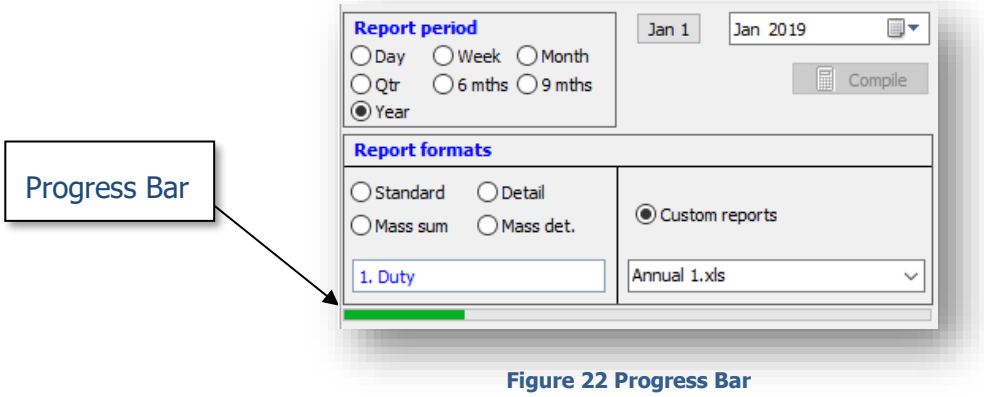

Figure 22 Progress Bar

Once the report has been compiled the results will be displayed in the 'Report Area'.

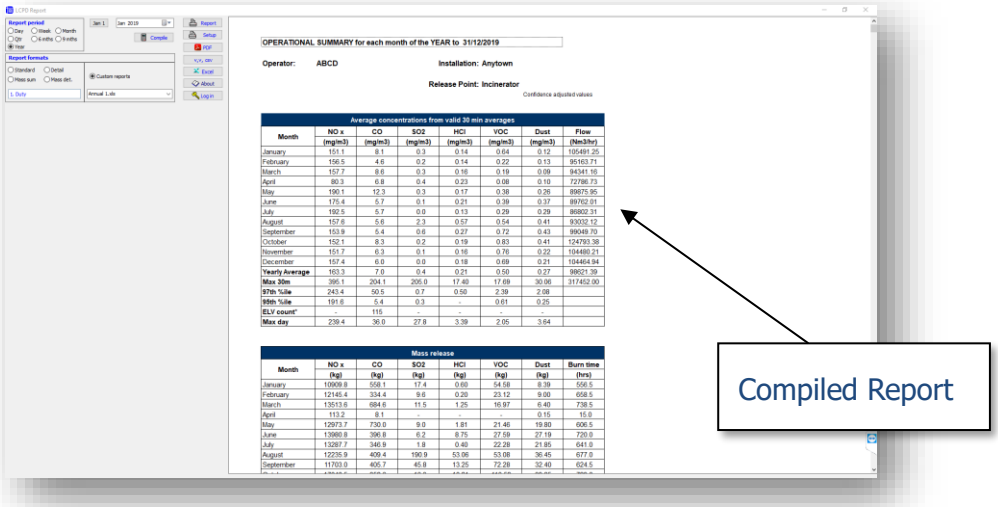

Figure 23 Compiled Report

5.4 SELECTING THE REPORT FORMAT

To select the required format for the report:

1. Click the corresponding radio button (to the left of the required report format)

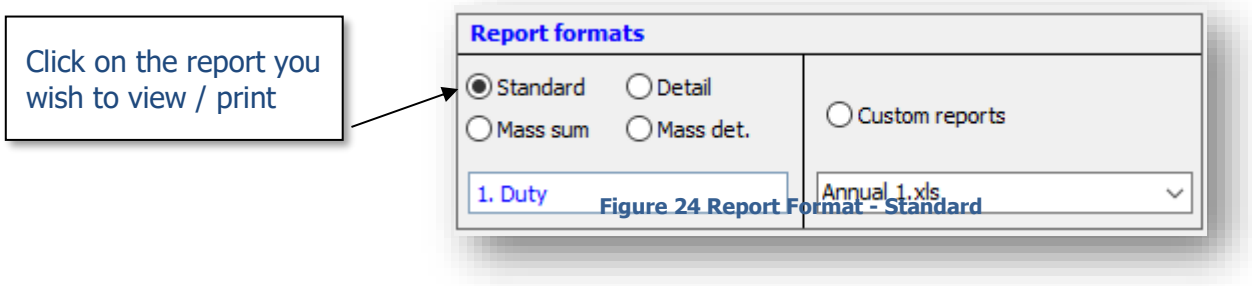

Figure 24 Report Format - Standard

In the example above the report format 'Standard' has been selected.

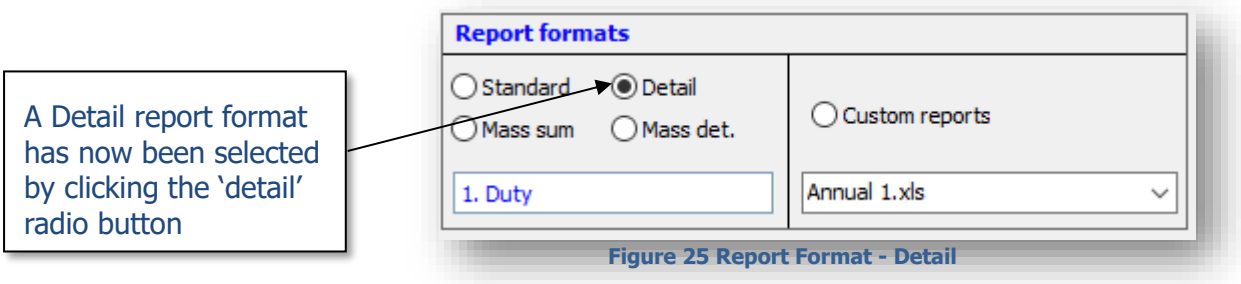

Figure 25 Report Format - Detail

In the example above the report format 'Detail' has been selected.

5.5 PRINTING THE REPORT

To print the report:

1. To print the report currently displayed in the report area click the 'Report' button.

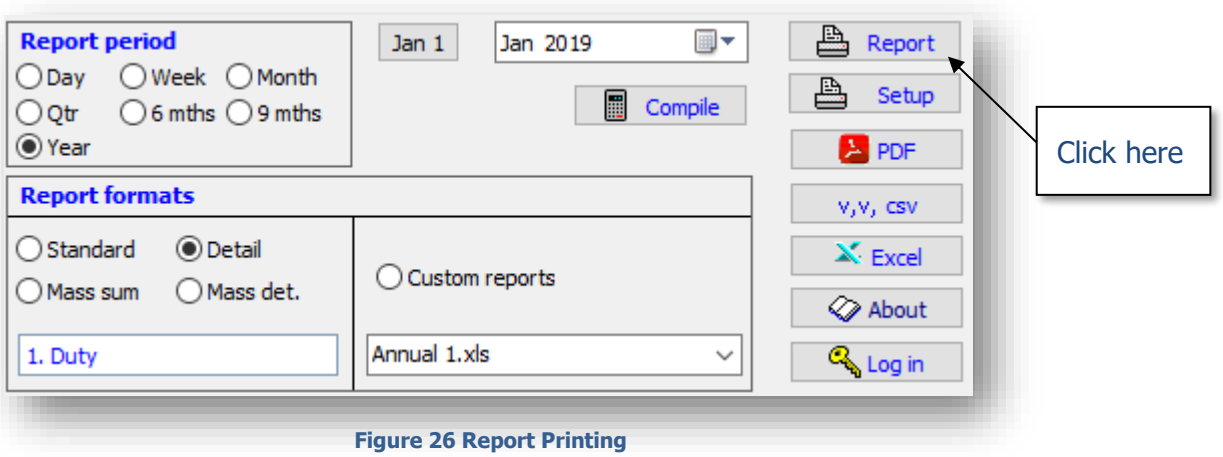

Figure 26 Report Printing

6 REPORT EXAMPLES & CONFIGURATION

6.1 DAILY REPORTS

A daily report is intended to provide a summary of the process and the measurements at the end of each working day. In order to create a daily LCPD report, carry out the following options:

1. Select the 'Day' radio button.
2. Set the required date.
3. Press the compile button to complie and print the report directly.

A report similar to the one below and overleaf should now be sent to the selected printer.

6.1.1 GRAPHICAL SUMMARY

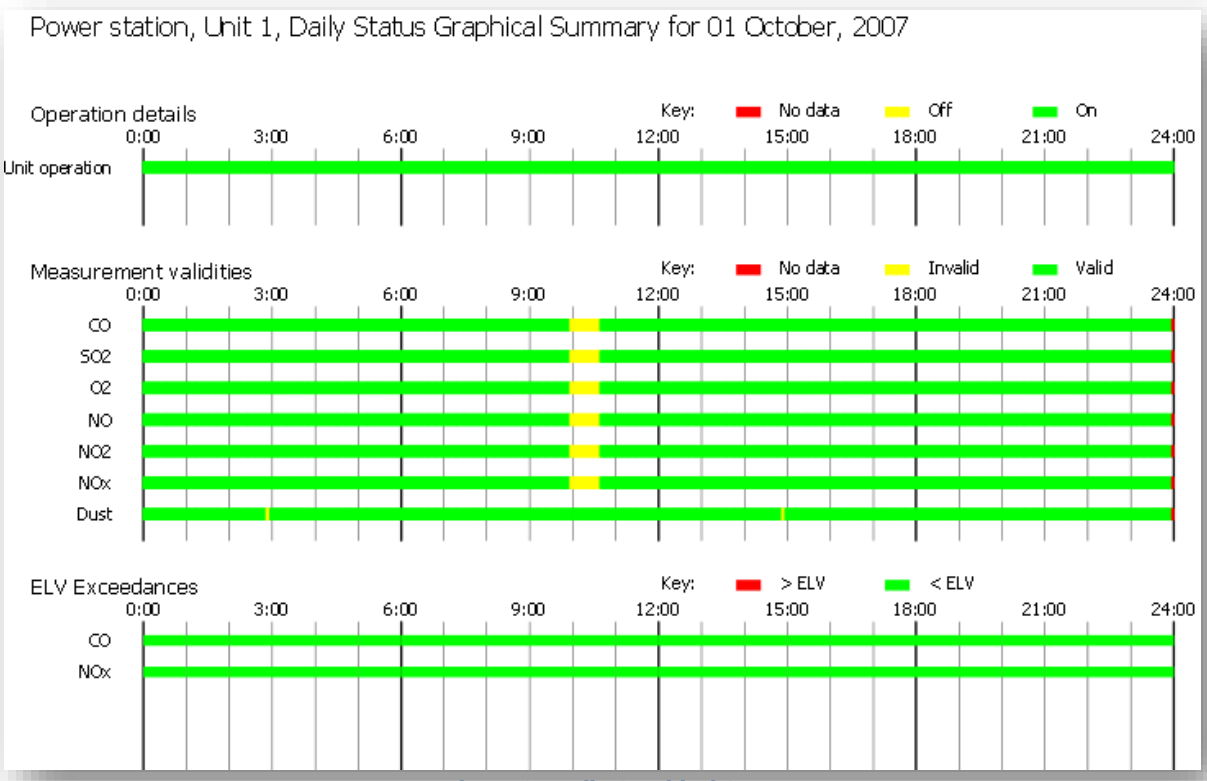

Figure 27 Daily Graphical Summary

NOTE: Measurement validities are only shown should the measurements have been selected – see the next section.

6.1.2 STATISTICAL SUMMARY

Power station, Unit 1, Daily Statistical Summary for 01 October, 2007

60 min. ending	CO mg/Nm3	SO2 mg/Nm3	O2 %(dry)	NO mg/Nm3	NO2 mg/Nm3	NOx mg/Nm3	Dust mg/Nm3	Plant
0:59	1.0	-0.9	13.97	13.2	3.9	24.1	-0.2	ON
1:59	1.0	-0.9	14.03	10.0	3.0	18.3	-0.1	ON
2:59	0.9	-0.9	14.09	8.9	2.5	16.1	0.2	ON
3:59	1.1	-1.0	14.08	9.2	2.6	16.7	-0.5	ON
4:59	1.1	-1.0	14.08	9.4	2.7	17.1	-0.7	ON
5:59	1.1	-1.1	14.06	9.6	2.6	17.2	-0.7	ON
6:59	1.0	-1.2	13.93	14.9	4.2	27.1	0.1	ON
7:59	1.0	-1.2	13.95	15.0	4.4	27.3	-0.2	ON
8:59	0.9	-1.3	13.96	14.9	4.3	27.1	-0.6	ON
9:59	0.8	-1.2	13.96	14.9	4.4	27.2	-0.5	ON
10:59	0.9	-0.3	13.75	12.9	5.3	25.0	-0.6	ON
11:59	0.8	-0.7	13.67	12.1	4.5	23.0	-0.5	ON
12:59	0.7	-0.8	13.67	11.7	4.4	22.3	0.2	ON
13:59	0.9	-0.6	13.64	12.8	4.8	24.4	1.1	ON
14:59	0.8	-0.4	13.68	13.3	5.0	25.3	1.1	ON
15:59	1.0	-0.4	13.72	13.1	4.9	24.9	1.2	ON
16:59	1.0	-0.4	13.73	13.2	4.9	25.1	1.4	ON
17:59	1.0	-0.3	13.74	13.1	4.9	24.9	12.3	ON
18:59	0.9	-0.6	13.74	12.7	4.6	24.1	1.2	ON
19:59	1.1	-0.5	13.70	12.9	4.7	24.5	1.1	ON
20:59	0.9	-0.3	13.69	12.5	4.7	23.8	0.9	ON
21:59	0.9	-0.3	13.67	12.8	4.6	24.1	0.8	ON
22:59	0.9	-0.4	13.68	12.8	4.7	24.3	1.1	ON
23:59	0.9	-0.6	13.73	12.1	4.4	22.9	1.2	ON
Max	1.1	-	14.09	15.0	5.0	27.3	12.3	
Min	0.7	-1.3	13.64	8.9	2.5	16.1	-0.7	
Average	0.9	-0.7	13.83	12.4	4.2	23.1	0.8	
> ELV	0	-	-	-	-	0	-	
	(50)	-	-	-	-	(50)	-	

Figure 28 Daily Statistical Summary

NOTE: Should the data be invalid for the hour, it will be shown in RED – as above for the reading ending at 10:59.

6.1.3 DAILY REPORT CONFIGURATION

The daily reports may be configured by the operator – note that the user must login and enter the password to reveal the configuration details. Select the 'Daily Report' tab and select the measurement points required. From here the operator can select the measurements to be reported for each measurement point. (A second page may be also be configured if required). Once selected the report can be configured further by selecting any of the 'Standard Daily Report options'.

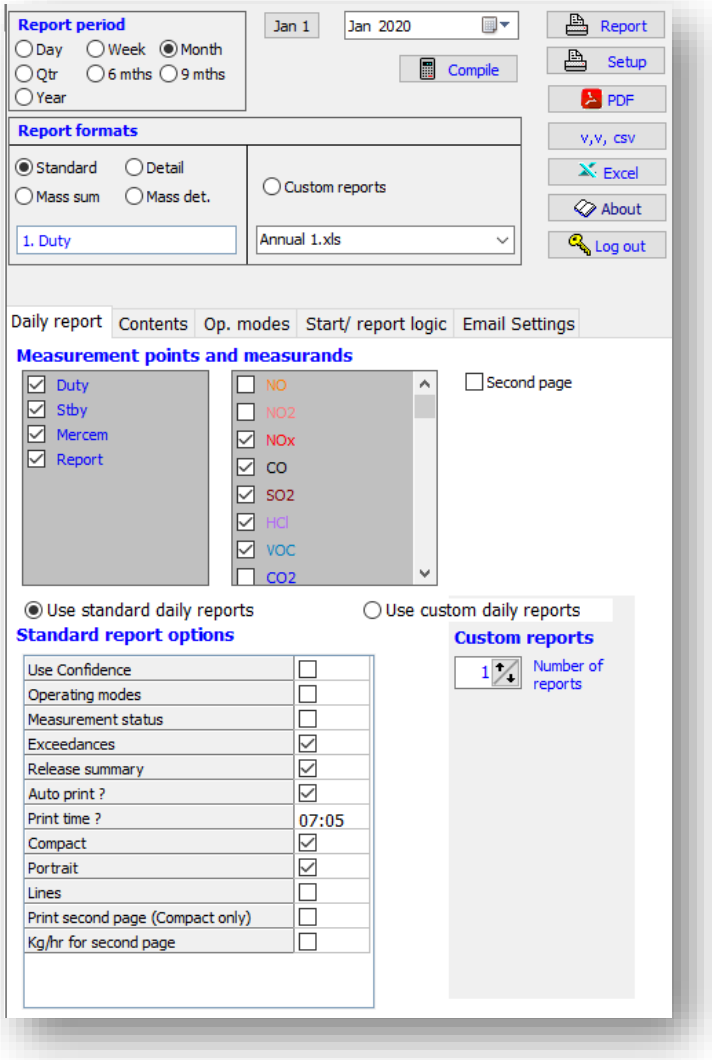

Figure 29 Daily Report Configuration

Standard Daily Report Options:

- Use Confidence – Confidence corrected data or not. The system will always default to data that has NOT been corrected for confidence. This option is provided as a temporary feature to allow operators to check should an exceedance have occurred before this adjustment.
- Operating modes – Include process operating information on the graphical summary.
- Measurement status – Include valid and invalid data on the graphical summary.
- Exceedances – Include exceedances above ELV on the graphical summary.
- Release summary – At the end of the statistical summary, include a daily summary.
- Auto print? – Automatically print the daily report at a given time (see below.)
- Print time? – Time at which the report will be generated from the previous day's data.
- Compact. Selecting this option will result in all measurements from all selected measurment points to be printed on a single page.
- Portrait. If checked the report will be in portrait orientation, otherwise landscape.
- Lines - Print lines on the report.
- Second page of data if required.
- Kg/hr for the second page.

6.1.4 CUSTOM DAILY REPORTS

With this option enabled, once the daily report has been compiled an option to select which daily custom report will appear in the 'standard report formats' section below the report period. If there are two or more daily custom report templates implemented, you can change between them without having to recompile the report.

Custom Daily Report Options:

Use custom daily reports - Select this radio button if you require the use of the custom daily report format.

Number of reports – Select the number of custom reports configured for use at your site.

Power Company, Anytown: Daily Emission Report
Date = 02/03/09

60 min ending	A1: CO mg/Nm3	A1: NOx mg/Nm3	A1: O2 %(dry)	A1: Load MW	A1: Gas Flow kg/h
00:59	4.1	46.1	15.3	45.9	8934.00
01:59	4.1	45.8	15.3	45.9	8944.00
02:59	4.1	45.5	15.3	45.9	8950.00
03:59	4.1	45.8	15.3	45.9	8952.00
04:59	4.2	45.6	15.3	45.9	8961.00
05:59	4.3	46.0	15.3	45.9	8963.00
06:59	4.7	46.5	15.3	45.9	8958.00
07:59	4.5	47.3	15.3	46.2	9042.00
08:59	4.1	44.2	15.2	46.2	9032.00
09:59	3.7	48.5	15.2	47.1	9242.00
10:59	3.4	47.6	15.3	45.8	8924.00
11:59	3.2	48.1	15.3	45.3	8786.00
12:59	2.3	49.4	15.4	45.1	8751.00
13:59	2.0	48.3	15.5	44.5	8597.00
14:59	1.6	48.3	15.5	44.5	8594.00
15:59	1.7	47.9	15.5	44.5	8593.00
16:59	2.1	46.7	15.4	44.6	8613.00
17:59	2.6	47.4	15.4	45.1	8754.00
18:59	3.0	46.7	15.4	45.3	8794.00
19:59	2.8	46.4	15.3	45.6	8875.00
20:59	3.0	46.6	15.3	45.9	8949.00
21:59	3.2	47.0	15.3	46.1	8976.00
22:59	3.2	46.0	15.3	46.0	8963.00
23:59	3.4	45.0	15.2	46.1	8985.00
AVG	*3.3*	*46.8*	*15.3*	*45.6*	*8880.50*
Max	*4.7*	*49.4*	*15.5*	*47.1*	*9242.00*
Min	*1.6*	*44.2*	*15.2*	*44.5*	*8593.00*
>ELV	*0*	*0*			
ELV	*50*	*60*			

Figure 30 Custom Daily Report Example

6.2 MONTHLY / QUARTERLY / ANNUAL REPORTS

6.2.1 NORMAL REPORT FORMAT

These reports are not intended for submission to the authorities, and each use the same configuration data.

After compilation, the data is available for viewing before printing in the right-hand window. The operator may check that it includes the desired information before it is printed. An example is shown below, however, depending upon what has been selected, individual sites will have been set up differently and may include different information.

Waste to Energy Site								
Anytown								
HRSG 1, 60 minute discrete averages								
01/03/2008 to 31/03/2008								
Number of start ups = 0								
Nat. gas								
Operating time (hours): 743.0								
			Average of		**Date of**	**95% of**	**Maximum**	**97th %**
Measurand	**Units**	**Daily ELV**	**60 min averages**	**Daily max.**	**max. day**	**hourly mean**	**48 hour mean**	**48 hour mean**
NOx	mg/Nm3	350	243.82	261.38	09-Mar	267.10 (28)	259.47	257.44
CO	mg/Nm3	-	483.19	500	03-Mar	500.00 (28)	499.99	499.96

Figure 31 Normal Report Example

For quarterly and annual reports, the same information will be available but separated for each month within the analysis period.

6.2.2 CUSTOM REPORTS

Select the 'Custom' radio button to produce a report that has been specifically designed for a particular site.

Releases to Air - LCPD/PPC Continuous Measurement

Operational Summary for the 3 months to 31/03/10

Operator: Power Company Ltd — Site Location: CHP, Anytown, Anywhere

Release Point: A1 — Permit/Variation Number: AB1234YZ

Pollutant	Month	ELV (mg/m3)	Minimum Daily mean	Maximum Daily Mean	Daily Mean	95% of hourly means
NOx	Jan	60	-	-	-	-
CO		50	-	-	-	-
NOx	Feb	60	-	-	-	-
CO		50	-	-	-	-
NOx	Mar	60	-	-	-	-
CO		50	-	-	-	-

Signed..... Date.....
(Authorised to sign as a representative of operator)

Figure 32 Custom Report Example

6.2.3 DETAIL REPORTS

Selecting the report type 'Detail' will provide average, maxima and a count of any exceedances above the ELV for the selected measurements, for each day of the reporting period.

	NOx			CO	
	Average	Max	>ELV	Average	Max
01/05/09	52.61	56.70	0	32.99	51.10
02/05/09	53.46	56.80	0	31.23	36.50
03/05/09	54.38	59.50	0	31.71	37.40
04/05/09	53.83	59.60	0	36.60	53.20
05/05/09	55.01	60.30	1	33.44	46.80
06/05/09	55.88	58.80	0	32.35	43.10
07/05/09	55.43	61.50	4	32.90	44.40
08/05/09	57.06	63.00	11	31.70	40.50

Figure 33 Detail Report Example

6.2.4 MASS DETAIL REPORT

In a similar fashion to the detailed reports, these reports provide a daily analysis of the mass release for each of the selected measurements, for each day of the reporting period. This may be used to identify particularly high emission days.

HRSG1 mass release (kg)
01/05/2009 to 31/05/2009
Number of start ups = 0

	NOx	CO
01/05/09	3033.4	1936.5
02/05/09	3163.3	1935.1
03/05/09	3270.8	1978.9
04/05/09	3000.1	2029.1
05/05/09	3266.6	2014.0
06/05/09	3424.5	2033.7
07/05/09	3367.1	2029.0
08/05/09	3620.0	2077.8
09/05/09	3283.8	2007.1
10/05/09	3470.1	2040.3
11/05/09	3576.7	2063.2
12/05/09	3855.7	2144.3
13/05/09	3616.9	2069.9
14/05/09	3545.6	2041.8
15/05/09	4259.4	2241.8
16/05/09	4218.4	2229.1
17/05/09	4239.3	2239.0
18/05/09	3867.3	2146.1

Figure 34 Mass Detail Report Example

6.2.5 MASS SUMMARY REPORTS

A Mass Summary report will summarise the mass release of the selected gases over the entire report period.

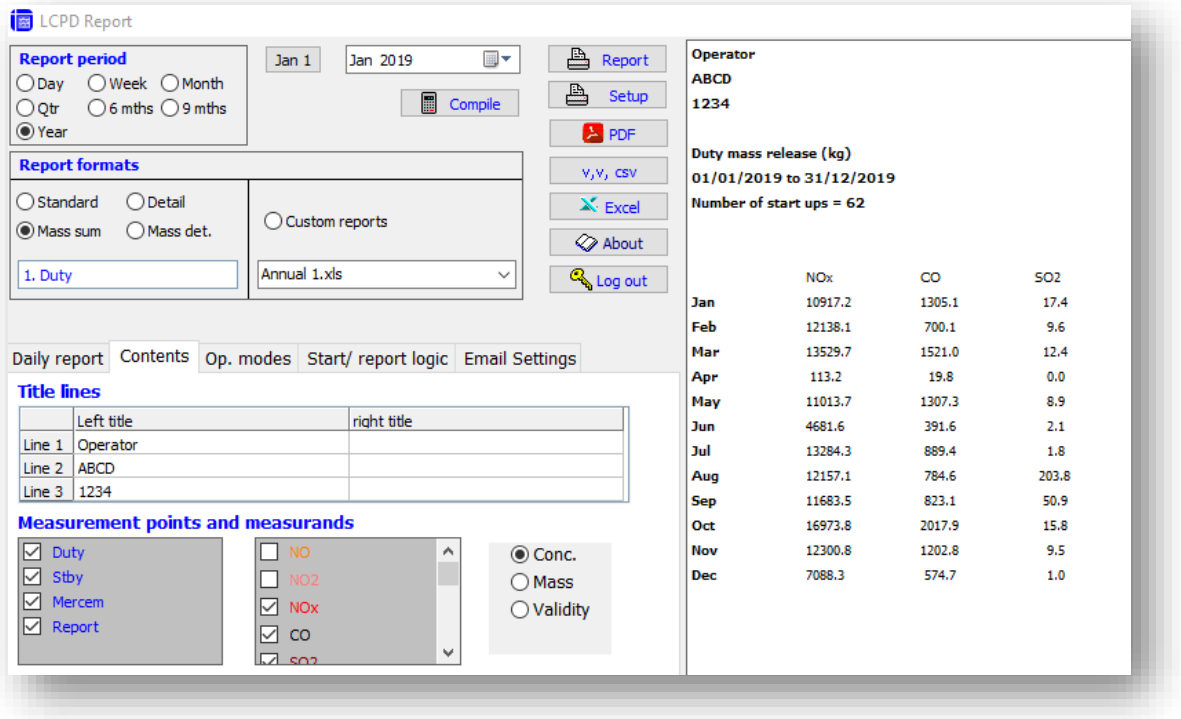

Figure 35 Mass Summary Report Example

6.3 MONTHLY, QUARTERLY AND ANNUAL REPORTS CONFIGURATION

After selecting the 'Contents' tab several output options are available for editing.

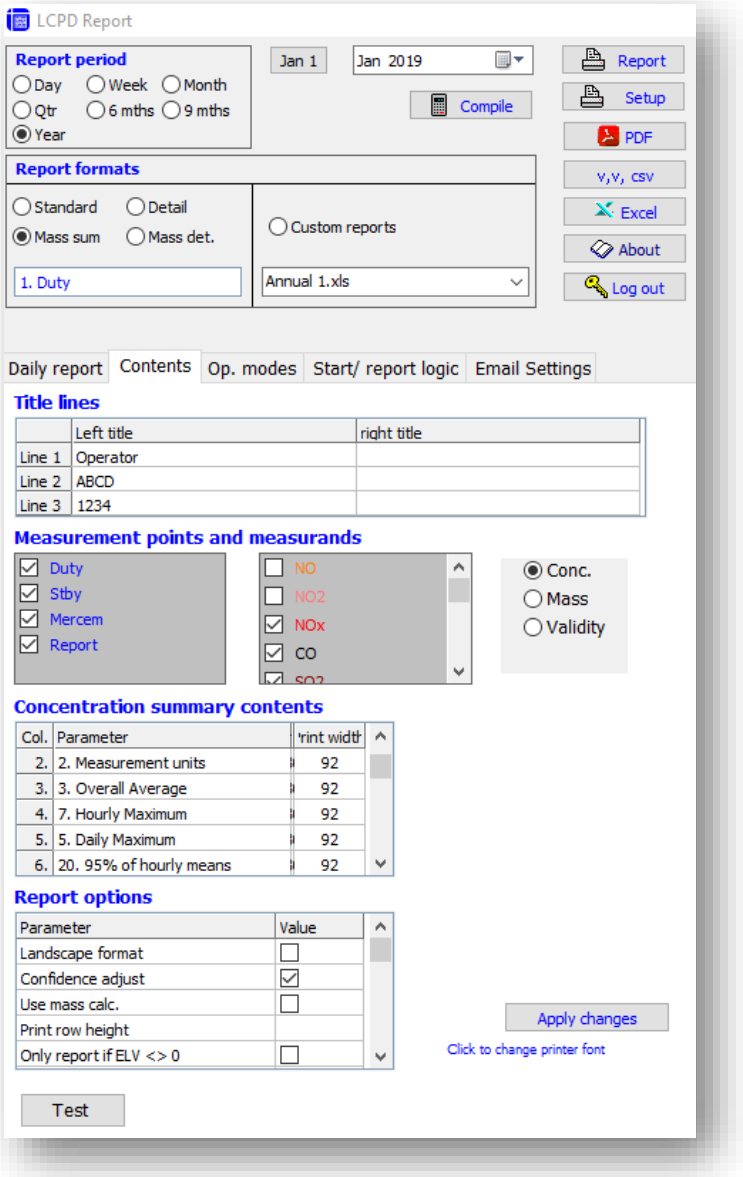

Figure 36 Report Editing

6.3.1 REPORT TITLE LINES

These entries will appear on your report to identify your process and location. Please edit them to reflect the plant name and any other pertinent information that should appear on the reports as required.

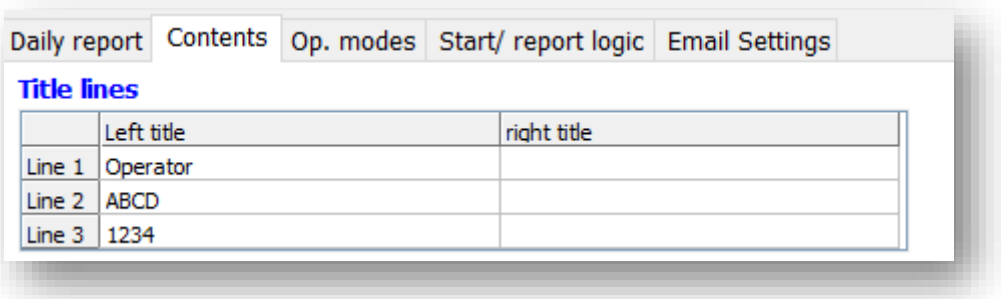

Figure 37 Report Title Lines

6.3.2 MEASUREMENT POINTS AND MEASUREMENTS

From this section, the measurement points and the measurements within them may be selected for each of the report types: Concentration, mass release and validity. Most of the LCPD information required is for mass concentration (mg/Nm3.)

For each of the report types, select the measurement points and the measurements within each point to be reported.

Conc. – Units of mass concentration (mg/Nm3.)
Mass – Results in kg/hr.
Validity – Only select if a report of 'Invalidities' is required.

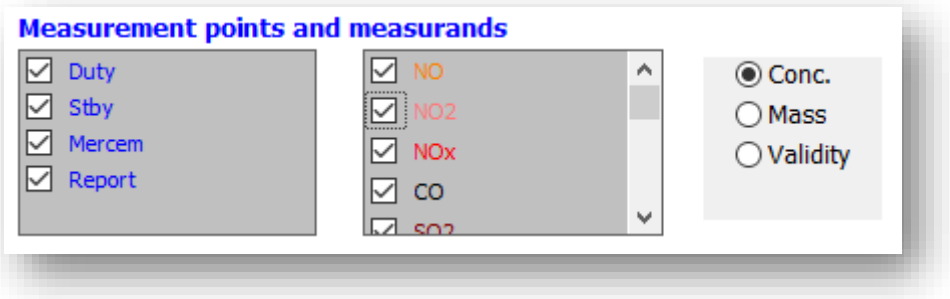

Figure 38 Measurement Points and Measurements

NOTE: Take care when configuring which channels are required for the validity reports, most multi-channel analysers have a common validity flag, and all gas channels from it will repeat the same information. The reports will analyse the data from the start to the end of the report period for each measurement individually and consequently this could become lengthy.

6.3.3 CONCENTRATION SUMMARY CONTENTS

Starting with row one, double click in the first parameter box in the right-hand side of the box and select a component from the drop-down menu. Continue this process until all the components required are in the report.

The third column sets the amount of space allowed in the printed report for this item. If the item is clipped, increase the print width; default is 180.

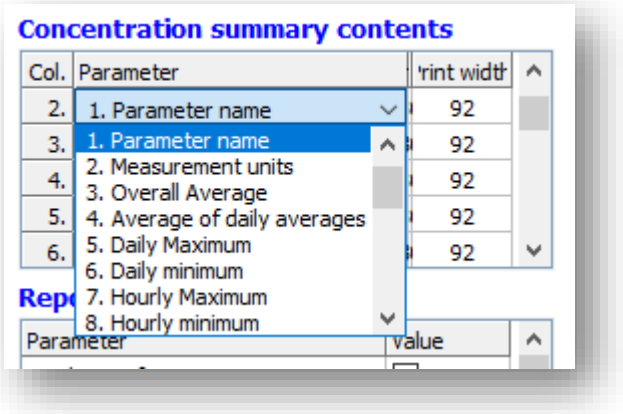

Figure 39 Density Summary Contents

The following options are available:

- **Parameter name**: Measurement name.
- **Measurement units:** As defined in the software – usually mg/Nm3.
- **Overall average:** The average of all valid hours in the report period.
- **Average of daily averages:** The average of each daily average that has been calculated from the validated hours within it – should be very similar to the item above but biased so that each day carries the same weight, no matter how many valid hours were within it.
- **Daily maximum:** The maximum daily average within the reporting period.
- **Hourly maximum:** The maximum validated hourly average within the reporting period.
- **Hourly minimum:** The minimum validated hourly average within the reporting period.
- **Hourly ELV:** The ELV defined from page 49
- **Hours >ELV:** The number of hours in the reporting period that the measurement was above the ELV.
- **Daily ELV:** The ELV defined from page 49
- **Days >ELV:** The number of hours in the reporting period that the measurement was above the ELV.
- **Max date:** The date at which the daily maximum occurred.
- **Max time:** The date & time at which the hourly maximum occurred.
- **No of invalid days:** Number of days where the invalid hours exceeded 4 (definable – see section 3).
- **No of invalid hours:** Number of invalid hours in the reporting period. A valid hour must have at least 40 minutes of valid data (66% of that available).
- **ELV2:** A second ELV may be defined from page 49
- **Hours >ELV2:** The number of hours in the reporting period that the measurement was above this ELV.
- **Availability %:** Percentage of valid data during the times that the process was in operation.

Density Summary Contents…

- **95% of the hourly means:** The 95% highest hourly reading. From a complete 30 day month, this would be the 36th highest reading (24 x 30 =720, 720 x 0.05: 0.05 =100 – 95%).
- **Max 48 hour average:** Highest 48 hourly reading.
- **97% 48 hr average:** The third highest 48 hour average out of 100.
- **95% 48 hour average:** The fifth highest 48 hour average out of 100.
- **Month name:** For quarterly and annual reports, this may be used to identify which month the data has been calculated from.
- **Fuel name:** For multi-fuel processes, this will identify the fuel used.
- **Overall hourly max:** The maximum hourly average, regardless of whether the plane was in a reportable state.

6.3.4 REPORT OPTIONS

You may select from the following components:

- Landscape format – Portrait or landscape format.
- Confidence adjustment – Use confidence adjusted data.
- Use mass calc. – If calculating mass flow by use an algorithm, click on this box to apply it.
- Print row height – The height of the rows on the printed matrix.
- Only report if Emission limit value is not 0.
- Quarterly sort by date
- Show Unedited Data – If checked, LCPD will produce reports without any of the edits made via CEMEdit.
- Use sub average for mg – this will allow avreages with less than the quantity required into the reported data – USE WITH CAUTION
- Use JEP data removal – will remove the highest averages in a day until the daily average is below the ELV. These averages are totalised as MALFUNCTION hours. If a day can not be brought below its ELV, these are considered as BREAKDOWN hours

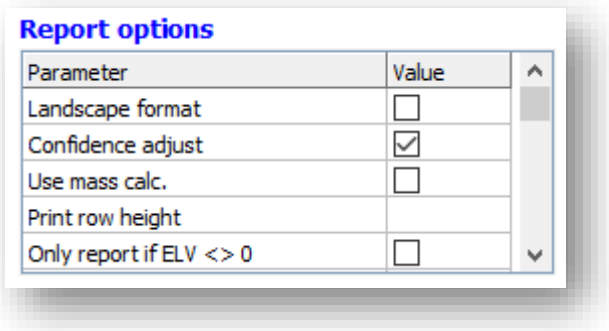

Figure 40 Reporting Options

6.3.5 TRENDS

Should these changes be made after report compilation, click on the 'Apply changes' button to see their effect.

The span of the trends and the information provided within them may be selected from this page.

Note: only one span is available for all measurements.

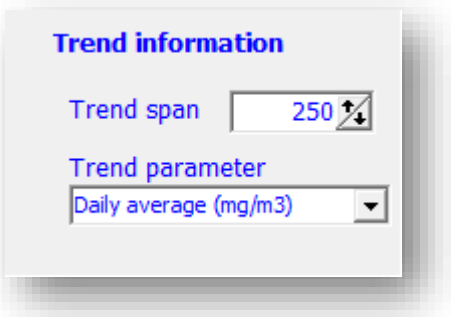

Figure 41 Trend Information

The trend parameter may be selected from:

- Daily average mg/Nm³
- Mass release kg/hr
- Daily max. mg/Nm³
- Exceedances Count of exceedances for each day

The two labels at the top of the trend report may be edited according to user requirements. This may be done by editing the 'Graph' section of the LCPD.ini file, located in the 'Config' subfolder.

[Graph]
Label 1= Emission point $GN, $ST
Label 2= Permit 998989

The character sequence $GN will give the emission point name, and $ST will give the month of the data.

6.4 CUSTOM REPORT FORMAT

To produce a report that meets individual site's needs, create an Excel file and save it in the reports folder, see the next page for an example. Envirosoft will supply the software with this example; it may be copied and edited as required. We recommend that a suitable and informative name is used for each report so that it may be identified when using the program. There is no limit to the number of reports that may be designed and used, and it is is recommended that if reports are created and some become obsolete that they are moved to a temporary folder to avoid clutter.

Use Excel or and Open Office application to set font size, merged cells and alignment – **NOTE:** That borders are not imported into the LCPD program – see the next section.

Note that the display zoom will also affect the displayed size of the report and will affect ow it is printed. Some experimentation maybe required to produce the desired results both on the screen and when printed.

6.5 SETTINGS WITHIN THE CUSTOM REPORT – TOP 5 LINES

The top five lines of the sheet are ignored and are used for extra format information, these are discussed below.

6.5.1 LINE 1 - BORDERS

Up to 12 bordered areas may be defined using cells A2 to A13 – see the example on the next page.

Example: 02080c12

0208 defines the beginning and end columns (columns 2 to 8), and 0c12 defines the beginning and end rows to use borders (row 12 and 18 – two digit hexadecimal format is used). Note that the top five lines are ignored in the presentation of the data.

6.5.2 LINE 2 - EDITABLE CELLS

To allow user comments to be applied to the data, the cells may be edited where this has been defined.

Example: 0213021402150216

Four-character sequence (0213, 0214 etc) each defines the cell (first would be column 2 – 02, and row 19, 13 hex = 16 + 3 decimal).

Other cells

The following cells may be edited to change the report configuration:

6.5.3 COLUMN AND ROW COUNTS

Cell B3 = 1027=10 — contains the column and row count of the report area in decimal (e.g. columns, 27 rows)

6.5.4 PRINT ORIENTATION

Cell E2 = contains a value of 1 or 2 to determine the report orientation (1=landscape, 2=portrait)

6.5.5 LINES IN FREE TEXT

The characters #13 in a cell will be replaced by a new line by the program, this forces a line return within any free text for clarity.

6.5.6 TIME AND DATE FORMATS

Various dates with their own formats are available and these exist on row 3, these formats will be applied to :

Cell F3 = Enter the date format for the start and end of the report period – typically dd/mm/yyyy. The text $ST will be replaced by the start date of the analysis, and $ET by the end date using the dd/mm/yyyy format. These may be added anywhere within the report including as part of a line of text, eg, Report starting $ST and ending $ET.

Cell G3 = Format for the compilation date of the report, which may be added with the code $PT.

Cell H3 = Format for the year of the start date of the report, which may be added with the code $YT.

Cell I3 = Format for a maximum or minimum date / time within a report, and will only effect parameters 13, 14 and 46 from the list on the following pages.

6.5.7 DECIMAL PLACES

On row 4, the number of decimal places of all reported data within the column below it may be set. This will not effect integer of date formats.

6.5.8 BORDER THICKNESS

Cell C2 will change the border thickness for the displayed. The default is 3 but may be changed here as required.

6.5.9 EXTRA REPORT INFORMATION (%AGES AND TIMES OF ELV BREACHES ETC)

Cell A4 = If set to 1, extra info will be displayed if applicable to the report parameter. This will effect parameters 10, 17, 20, 28, 29, 47, 101, 103, 104, 114 and 115. If left blank or 0, no extra information is shown. Parameter 47 also allows an entry of 2 for additional info.

6.5.10 SHOW IF 'CONFIDENCE' HAS BEEN USED IN REPORT COMPILATION

The data analysed by the LCPD program is always normalised to reference conditions. Additionally for most reports, the confidence interval may be subtracted, this is selected from the 'Contents' tab after logging in to the system. To show on the report whether this has been applied, enter the text 'CONFIDENCE' within a single or merged cell.

6.5.11 SHOW IF DATA HAS BEEN 'REPAIRED' FOR THE REPORT

Add the text 'REPAIR INFO' to show whether some data within the report has been repaired. Data may be repaired using Envirosoft's CEMRepair program.

6.6 MEASUREMENT DATA '$' PREFIX

Where information within a cell is to be calculated by the program and relates to a measurement, a $ sign should be used as follows:

Example:

$0103050101505F02 represents:

01	-	Group
0103	-	Measurement channel
010305	-	Report parameter – refer to list below.
01030501	-	Fuel number – refer to the 'Op. Modes' tab
0103050101	-	Month number – relative to start date and report period
010305010150	-	Percentage of default value in hexadecimal (50 =80%)
0103050101505F	-	Additional info – please refer to Envirosoft.
0103050101505F02	-	Average: 01 = hour, 02 = ½ hour (3rd and 2nd average)

Parameters

The following parameters may be used within a custom report:

1. Measurement name.
2. Units of measurement (eg mg/Nm3).
3. Overall average – the average of all valid, plant on and reportable data. This is taken from the hourly average data.
4. Average of all valid daily averages.
5. Daily maximum.
6. Daily minimum.
7. Houirly maximum.
8. Hourly minimum.
9. ELV for hour averages.
10. Number of hours that were greater than the ELV.
11. Daily ELV.
12. Days > ELV
13. Date of maximum day.
14. Date/ time of maximum hour.
15. Number of invalid days,
16. Number of invalid hours.
17. Number of hours that were greater than the 2nd ELV.
18. Second ELV for hour averages.
19. Availability (%).
20. 95th percentile of hourly means.
21. Maximum 48 hour average.
22. 48 hour average, 97th percentile
23. 48 hour average, 95th percentile
24. Month name (eg January).
25. Fuel name.
26. Overall hourly max (from all data, including non-reportable and plant off).
27. Accumulated 95th percentile of hour averages, i.e., from all data in the report period.
28. Standard deviation of the hourly averages.

29. Any percentile of the hourly data using the additional data figure (extra info is the nth highest figure) .
30. Maximum hourly percentiles in each day of the reporting period (95th, 5th and 50th). These are set with additional data figures of 1, 2 and 3 respectively.
31. Not used.
32. Not used.
33. Count of a channel on time.
34. Average kg/hr figure during all plant on data.
35. Exceedance for Poland – calculates the exceedance over the ELV. 35 is the level over the ELV, 36 is a kg calculation of this.
36. See above.
37. Maximum double period average (usually 2 hours) calculated from 2 x primary short term average value.
38. Count in hours of the time that kg data was valid and used.
39. Count in hours of the time that mg data was valid and used.
40. Maximum kg/hr over the day.
41. % of time that system ran below the ELV.
42. Average daily mass release.
43. Minimum kg/hr over the day.
44. Maximum kg/hr over the period.
45. Minimum kg/hr over the period.
46. Date/ time of minimum hour.Count of ELV2 excursions

48 – 99 Spare for future use

100. Kg of pollutant over the report period.
101 Plant operating hours in the report period.
102 Tons of pollutant.
103 Plant operating time in hours and minutes (hh:mm).
104 As 103.
105 Summed monthly mg/m3 figure.
106 As above but divide by 1000.
107 As above but divide by 1000000.
108 As 102 but divide by 1000.
109 Average concentartion data during all plant on.
110 Maximum monthly concentration.
111 Not used.
112 Total kg during plant on only (not non reportable) periods.
113 As 111 except divide by 1000000.
114 Count of valid data hours during the reportable data.
115 Count of valid data hours during all plant on data – reportable and non-reportable.
116 Average concentration data during all plant on– reportable and non-reportable.
117 sum of the mg data during the reportable kg
118 Average Kg/hr release during plant on only (not non reportable) periods.
119 Total kg during plant on only (not non reportable) periods.
120 Maximum daily average including all operations.
121 Polish data count – do not use.
122 Percentile of daily averages to the nearest sample value (compare with 131 and 132).
123 Kg of pollutant over the report period, only load and part load.
124 Tons as above
125 Adjusted ELV over the period.

126 Percentage of days > adjusted ELV.
127 Percentage of days > non-adjusted ELV.
128 JEP Breakdown count – must be set to be calcualted – see next sections.
129 JEP Malfunction count – must be set to be calcualted– see next sections.
130 Specialist setting for a variable total calculation.
131 Percentile of daily averages to the lower sample value (compare with 122 and 132).
132 Interpolated percentile of daily averages (compare with 122 and 131).

133 – 139 Spare for future

140 Adjusted Monthly ELV for multifuel operation (two fuels – fuel 1 and fuel 2)
141 Percentage of time on fuel 1 (see above)
142 A list of all the days in **dd/mm** format where the selected measurement is above the daily ELV, either per month or over the analysis period (set month number to zero). If this is to be used, make sure that it sits in a wide column (merged or otherwise). 160 characters are allowed, but if there are more days than this will hold, each subsequent day is replaced by a full stop (.).

6.7 INVALID DATA

To calculate the invalid hours and the invalid hours over the analysis period, the line 'INVALID DATAppcc' should be entered, similar to that shown below. Where pp is the data page and cc is the channel number of the data analysed.

CONTINUOUS MEASUREMENT SYSTEMS INVALIDATION LOG			
ANNUAL RETURN			**Year: $YT**
Operator: Power plant			**Form: IED CEM1**
Monitor positioned on release point/LCP Number: A1 / 211			
Permit/Variation Number: VVGGTTFF			
Date	**Period of#13invalida-tion#13(hours)**	**Aaumulated #13Invali-dated#13days in period**	**Comments**
INVALID DATA0101			

This will indicate all of the invalid data and if the total for the day is greater than that allowed (usually 3 hours), an invalid day will be recorded.

Notes:

1. INVALID DATA should be in capitals
2. Adding the suffix ND (eg INVALID DATA0101ND) will prevent all invalid hours within a day being hidden if the total for that day is below the allowance.
3. The comments column is open for editing.

6.8 JEP MALFUNCTION DATA

In a similar fashion to the invalid data above, add the text MALFUNCTION DATAppcc. The program will now list all days where the highest averages have been removed for the daily average to be below its ELV, and a chart similar to that below will be seen

Year: 2022 Month Jan to Dec Date	Period of malfunction (hours)	Malfunction days in period	Comments
08/01/2022	3 hrs	1	
29/01/2022	7 hrs	2	
01/02/2022	2 hrs	**3**	

Notes:

1. MALFUNCTION DATA should be in capitals.
2. If the JEP data removal has not been selected (see contents) then the message 'Malfunction data not in use' will be shown.
3. The last line of the table will show the total number of hours excluded as malfunction hours.
4. The comments column is open for editing.

6.9 JEP BREAKDOWN DATA

Add the text BREAKDOWN DATAppcc in the same way as the malfunction above to show and totalise the number of breakdown hours and days. The resulting table will appear as below:

Year: 2022 Month Jan to Dec Date	Period of breakdown (hours)	Breakdown days in period	Comments
27/02/2022	10 hrs	1	

Notes:

1. BREAKDOWN DATA should be in capitals.
2. If the JEP data removal has not been selected (see contents) then the message 'Breakdown data not in use' will be shown.
3. The comments column is open for editing.

6.10 PROCESS DATA: '*' PREFIX

Where information within a cell is to be calculated by the program and relates to the process, a * sign should be used as follows:

Example:		*01020102
01	-	Group
0102	-	Month number
010101	-	Parameter - refer to list below
01010102	-	Average: 01 = hour, 02 = ½ hour (3rd and 2nd average)

1. Number of process start ups in the report period.
2. Average time in minutes used for the reports.
3. Number of running hours in the report period.
4. Will return all of the comments in the period, ensure that the cell is large enough to contain this information.
5. Monitoring the time the water temperature is above a threshold – used for compliance of water legislation.

6.11 DAY INFORMATION: '&' PREFIX

Where information within a cell is to be calculated by the program and relates to the data on a day-by-day basis, an '&' sign should be used as follows:

Example:		&02030101010102
02	-	Group
0203	-	Measurement
020301	-	Format of result
02030101	-	Day (e.g. 1st of month)
0203010101	-	Parameter - refer to list below.
020301010102	-	Average: 01 = hour, 02 = ½ hour (3rd and 2nd average)

Parameter list

1. Average value for the day.
2. Mass release in kg.
3. Maximum value in the day.
4. Number of exceedances.
5. Number of valid averages in the day.

Format list

1. Gas level with decimal places – normal mg reading.
2. Time in hours as: hh:00.
3. Time in hours and minutes, as: hh:mm.

6.12 LCPD CUSTOM REPORT TEMPLATE FORMAT

Borders 02080c12
Editable 1
1027

Releases to Air - LCPD/PPC Continuous Measurement

Operational Summary for the 3 months to $ET

Operator: Power Company Ltd Site Location: CHP, Anytown, Anywhere

Release Point: A1 Permit/Variation Number: AB1234YZ

#13Pollutant	#13Month	ELV#13(mg/m3)	Minimum#13Daily #13mean	Maximum#13Daily#13Mean	Daily#13Mean	95% of #13hourly #13means
NOx	$0102180101	60	$0102060101	$0102050101	$0102040101	$0102140101
CO		50	$0101060101	$0101050101	$0101040101	$0101140101
NOx	$0102180102	60	$0102060102	$0102050102	$0102040102	$0102140102
CO		50	$0101060102	$0101050102	$0101040102	$0101140102
NOx	$0102180103	60	$0102060103	$0102050103	$0102040103	$0102140103
CO		50	$0101060103	$0101050103	$0101040103	$0101140103

Signed..... Date.....
(Authorised to sign as a representative of operator)

Figure 42 Custom Template Format

6.13 OPERATIONS BETWEEN CELLS

After the data has been placed in the grid, it is possible for a cell to be the result of a calculation between two cell values, or a number of cells in a column or row. These are indicated by $$ for a calculation between two cells and $$$ for a row or column calculation. The program will always analyse the data in a top down, left to right fashion.

NOTE: All cell reference values are in Hex and the data will assume a zero-origin including the first 5 lines; row 5 will therefore be the first row of the custom report, and column 0 will be the first column. It is recommended that the report is tested with data during commissioning. This can be conducted with data entered directly into the grid for testing purposes.

$$ indicates a calculation between two cells, where:

$$AABBCCDDEE:

AA	=	Cell 1 column
BB	=	Cell 1 row
CC	=	Cell 2 column
DD	=	Cell 2 row
EE	=	Function:
01	=	Add
02	=	Multiply
03	=	Divide (Cell1/Cell2)
04	=	Subtract (Cell1 – Cell2)

$$$ indicates a calculation between a row or a column of data, where:

$$$AABBCCDDEE:

AA	=	Column calculation (01) or Row calculation (02)
BB	=	No of rows or columns to process
CC	=	Column of first number
DD	=	Row of first number
EE	=	Function:
01	=	Sum
02	=	Average
03	=	Maximum
04	=	Minimum

An example of a column\row calculation would be as follows:

$$$0103030804

01	-	column calculation
0103	-	three columns
010303	-	starting at column 3 (4th column)
01030308	-	starting at row 8 (3rd row)
0103030804	-	the minimum value will be placed here.

6.14 CUSTOM DAILY REPORTS

Custom daily reports can also be created to meet individual site's needs. An example of a custom daily report can be seen on the following page.

The formatting of the custom daily reports differs slightly from that of the custom monthly/quarterly reports –

For example: $0103050101xx01 =

01	-	Group
0103	-	Measurement channel
010305	-	Units (ppm, mg/m3, mg/Nm3, kg/h)
01030501	-	Sample (1..24 or 1..48 depending on average)
0103050101	-	Number of decimal places
0103050101xx	-	See below
0103050101xx01	-	Fuel number

Where xx:

00 = actual data
01 = average over day
02 = max
03 = minimum
04 = count of ELV exceedances
05 = percentile (nth highest reading)
06 = measurement name
07 = unit string
08 = ELV
09 = standard deviation (statistical estimate)

6.14.1 CUSTOM DAILY REPORT TEMPLATE EXAMPLE

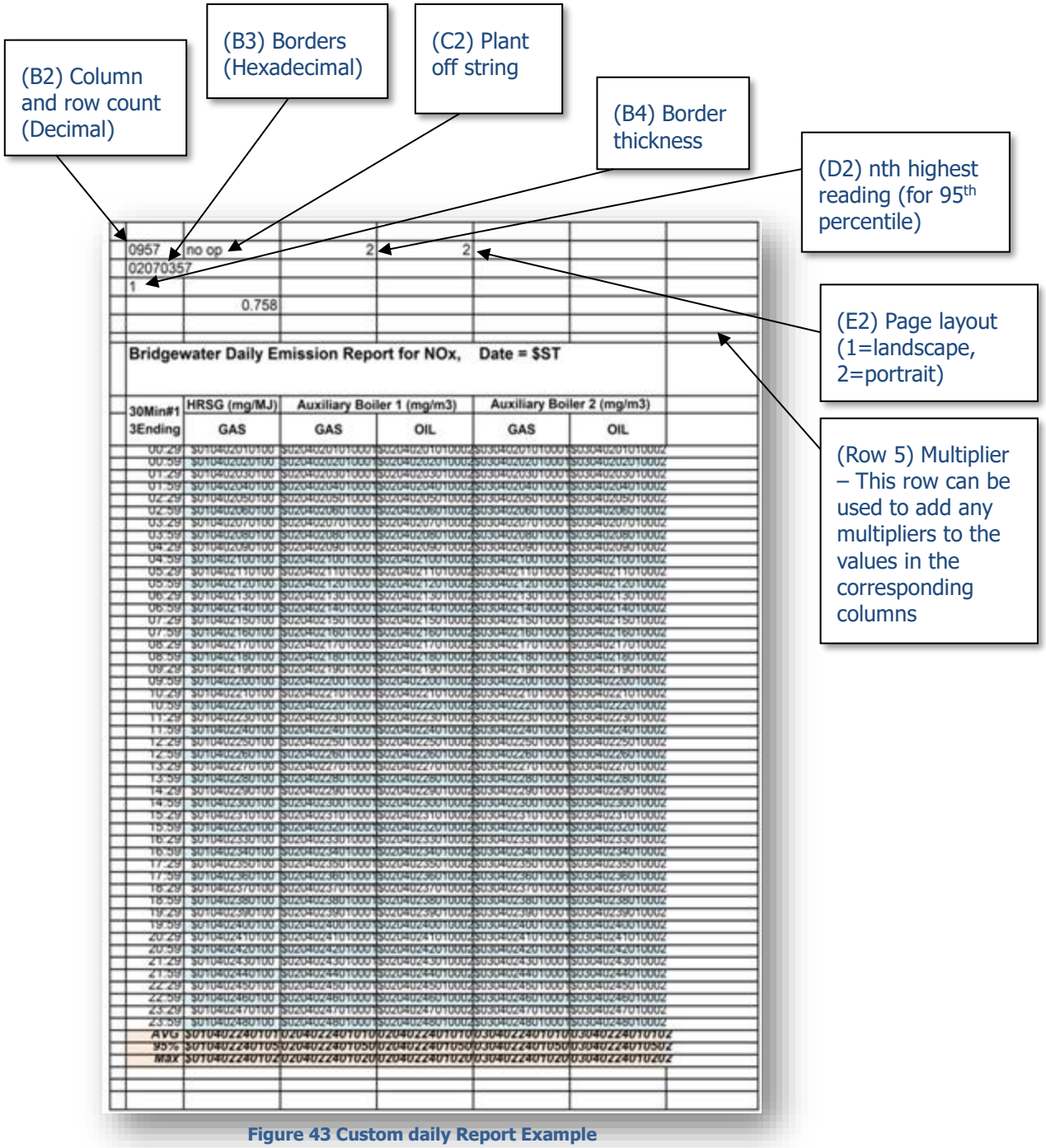

Figure 43 Custom daily Report Example

7 SPECIAL INSTRUCTIONS

Certain instructions can be added to/edited in the file LCPD.ini (located within the CEMSuite > Config folder) in order to account for any special circumstances. The instructions are as follows:

[LCPD]

Average=##	Edit this line of instruction to set the required average for the monthly reports.
Corrected Units=#	Add this line of instruction to assign the confidence correction factor to a specific unit group. Alternatively edit this line of instruction if confidence values are being reported instead of unit's required (custom daily reports only).
Cap CO=#	Special instruction created for sites where CO values exceed the limit of the CEMSuite software.

[Custom Daily]

Number of Reports=#	Edit this line of instruction to set the required number of daily reports (1-8).
Average #=##	Add this line of instruction to set the required average for the selected daily report.
Use=#	Edit this line of instruction in order to enable/disable the above average instruction(s)

8 FUEL / FIRING MODE CONFIGURATION

8.1 DEFINING EMISSION LIMIT VALUES (ELV'S)

For each measurement on the system, two ELVs may be defined.

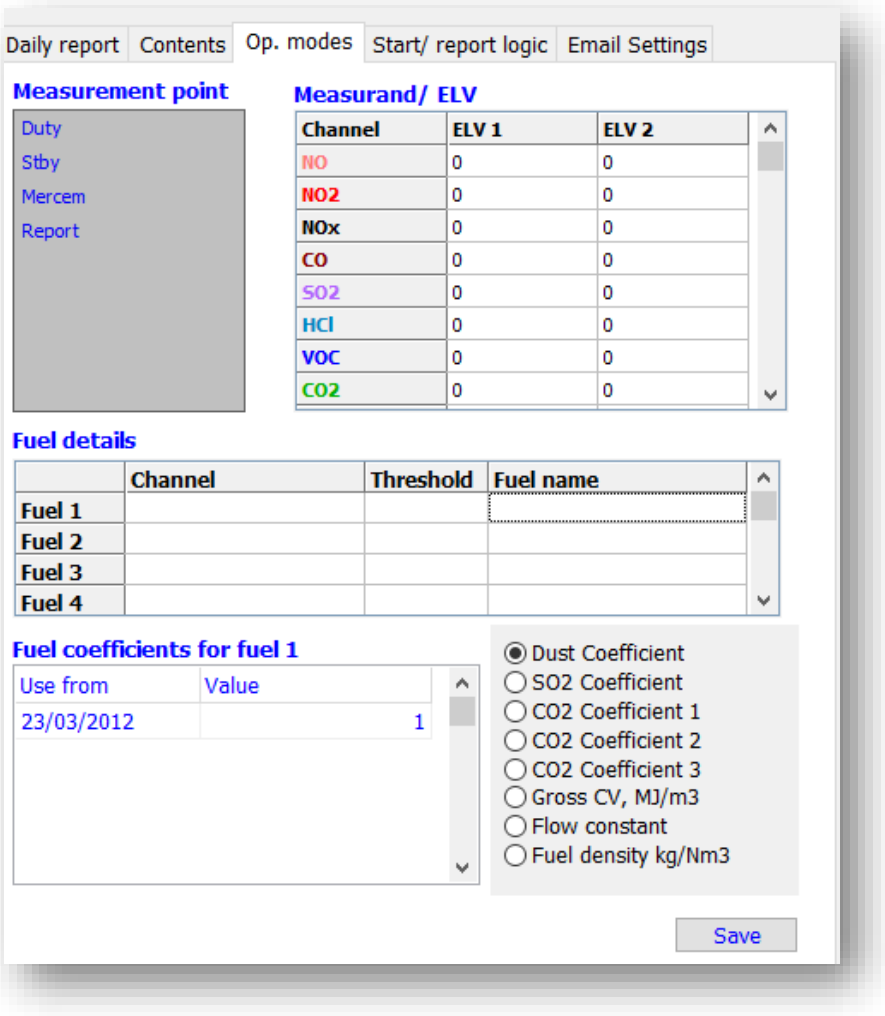

Figure 44 Defining Emission Limit Values

Select each measurement point listed in the measurement point box and ensure that the ELV's for each measurement are entered in the Measurement/ELV matrix.

NOTE:

4. Each fuel defined has individual ELV's for each measurement. Click on the fuel number in the grid below to select a different fuel for each measurement point. By default, the ELV's for Fuel 1 will be displayed.
5. To remove an ELV, set it to a value of 0.

8.2 FUEL DETAILS

Select each measurement point in the measurement box and then ensure that the fuel details are correct in the "Fuel details" matrix. In the "Channel" column, select from a drop-down list activated by double-clicking in the right-hand side of the cell. Click on the black downwards facing arrow. Select the channel that will reflect the fuel flow or logic signal.

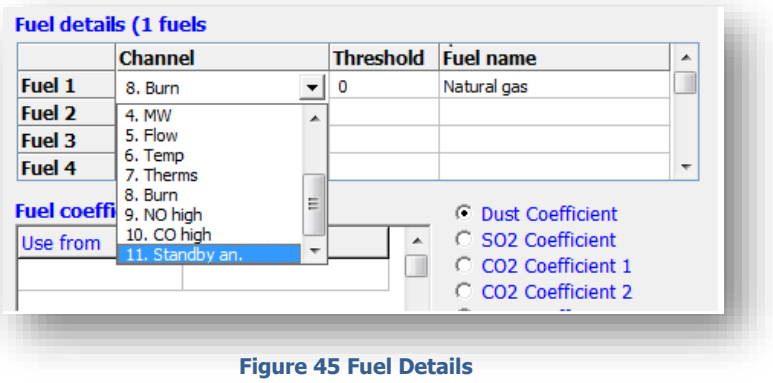

Figure 45 Fuel Details

In the 'Threshold' column, enter the threshold in the matrix cells. This is the fuel flow above which the process is deemed to be firing on the selected fuel. Multi-fuel operation should be selected as zero.

Finally, in the 'Fuel name column' add a name for the fuel you have selected and repeat this process for all the fuels that can be fired for this emission point.

NOTE:

- To remove a fuel, set it to 0.
- Should the fuel information originate from a logic signal, set the threshold to 1.
- Should only one fuel exist and there are no start up or shut down logic information, set the channel and threshold so that they will always be true. For example, set it to Oxygen and a threshold of 0 – this will always be true.

8.3 FUEL COEFFICIENTS

LCPD has the capability to calculate mass emissions from a known fuel, load, and volume flow by adding a fuel coefficient in the 'Fuel Coefficients' matrix. This is also known as predictive monitoring, where measured mass flow is calculated from given variables.

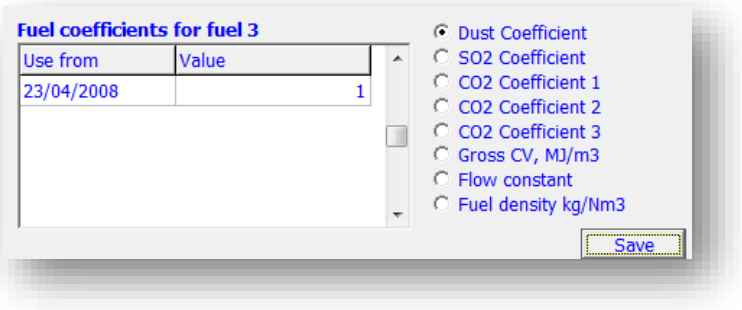

Figure 46 Fuel Coefficients

Click on a radio button and select a measurement coefficient, say SO_2; now enter a start date followed by the coefficient. Repeat this process for all the coefficients you wish to enter. Envirosoft may add coefficients or use these for individual site requirements.

Finally click on 'Save' to save the Fuel/Firing modes configuration.

NOTE: This information will require defining for each fuel.

8.4 START LOGIC

LCPD can accommodate for special conditions during the start-up/shutdown process. An example of this would be to inhibit reporting 4 hours after start-up, which will invalidate the first 4 hours' worth of data collected after the plant status condition changes to 'on'. This condition would be used on sites where the start-up process is particularly lengthy. Custom start logic conditions may be implemented if required.

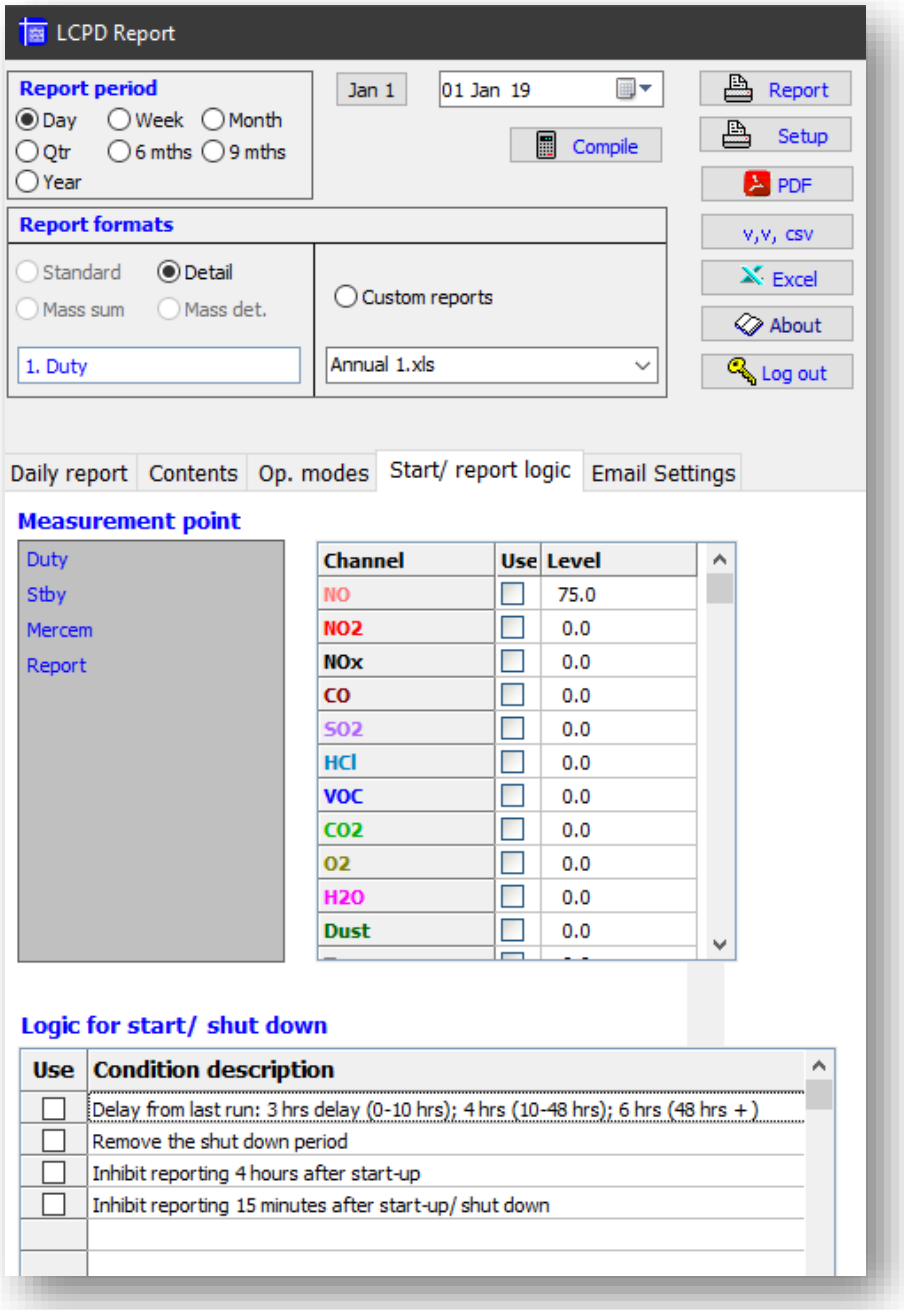

Figure 47 Start logic

9 DEFINITIONS

9.1 VALIDATED AVERAGES

The program defines validated averages as those with at least 66% valid data while the process is on operation; for a 1-hour average this is 40 minutes. Although LCPD states that the 95% confidence interval may be removed from the measurement (see below) some plants prefer to report data the data not adjusted for this. This provides an extra 'comfort zone' for plant operators.

9.2 PLANT IN OPERATION

There are many methods of determining whether a plant is in operation. From a simple evaluation of oxygen level to a digital input reflecting when the data should be reported (e.g. If the oxygen is greater than 18% the plant must be shut down, or a logic input from fuel flow). The program can handle most data inputs and will have been set up for the most realistic and available option. This data varies tremendously from process to process.

9.3 CONFIDENCE ADJUSTMENT

The following confidence values are normally assumed by the program:

- Sulphur dioxide: 20 %
- Nitrogen oxides: 20 %
- Dust: 30 %

If selected this data may be subtracted from the measurement. This is in compliance with the LCPD and can be seen by the notation '-C' after the measurement units. So, if mg/Nm³ has been selected, with confidence adjustment, the units 'mg/Nm³-C' will be shown.

9.4 NORMALISATION

Practically all legislation considers emission levels in terms of mg/m³ at reference conditions (mg/Nm³ for the CEMSuite programs). This is to enable the measurements from similar processes to be compared and assessed under the same conditions and removes the diluting effects of 'tramp' air and water vapour.

9.4.1 OXYGEN

Normally the biggest effect from normalisation is from the oxygen level, and this reference level varies between processes:

- Gas and oil: 3%
- Coal: 6%
- Waste: 11%
- Gas turbines: 15%

This is not an exhaustive list, but the reference levels required for most plants can normally be found on their process guidance notes.

CEMSuite uses the following formula to correct for air dilution:

$$\text{Correction} = \frac{(21 - O^2 \text{ reference level } \%)}{(21 - \text{actual dry } O^2 \text{ level } \%)}$$

9.4.2 WATER VAPOUR

Where measurements are made on a wet basis (i.e., they have not been dried by a chiller or filter before analysis) they should be corrected down to a dry measurement. It is preferable that a dynamic water vapour measurement is required, but should this not be practical, a fixed value may be used. The formula below is used by the software:

$$\text{Correction} = \frac{(100\ \%)}{(100 - \text{actual H2O level } \%)}$$

9.4.3 TEMPERATURE

The reference temperature is usually O°C (273K) for Europe but may be 25°C for the Americas. Most gas measurements are already corrected to standard temperature and pressure (STP) and so no
correction applies. For dust and other measurements, however, the following formula applies:

$$\text{Correction} = \frac{(\text{Actual temperature } °C + 273)}{(\text{reference temperature } °C + 273)}$$

9.4.4 PRESSURE

Again, most gas levels are reported at STP (see above) and no further corrections apply. For dust and other in-situ measurements, however, correction may be required. In such cases, the following formula applies:

$$\text{Correction} = \frac{(101.3\ \text{kPa})}{(\text{actual Pressure kPa})}$$

9.5 48 HOUR AVERAGES

Article 14 of the LCPD requires 48-hour averages to be calculated, there is no definition, however, of how this should be conducted.

Envirosoft's LCPD program will construct 48-hour averages from two consecutive days of valid data, starting at the first of the month and the last day of the previous month. The second 48-hour average will be the average of the first and second day of the period, and so on until the last day of the month or year. In this manner, there will be same number of 48-hour averages in the period as there are days, and the data from each day will have the same weight.

The percentile analysis of this (97% and 95%) is calculated from the monthly data and assumes that there are 30 averaging periods in the period, unadjusted for the number of invalid days. We have taken this approach because if there are too few days, the percentile analysis will extrapolate rather than interpolate the data, and this may cause large errors.

So the 97th percentile reading will be somewhere between the maximum and the second highest 48-hour average (sha) over the month; maximum = 100th percentile and the second highest = 96.7 percentile (100 – 1/30). The program calculates the 97th percentile as being a tenth of the way between the two readings as follows:

97th percentile = second highest average + (max – sha) / 10

For the 95th percentile reading will be somewhere between the second and third highest 48-hour average over the month; second = 96.7th percentile and the third highest = 93.7th percentile (100 – 2/30). The program calculates the 97th percentile as being half of the way between the two readings as follows:

95th percentile = third highest average + (2nd – 3rd) / 2

10 APPENDIX A – GLOSSARY OF TERMS

AMS: Automated Measuring System (see CEM)
AST: Annual Surveillance Test refer CEN standard EN14181
CEM/S: Continuous emission monitoring system – the equipment for the sampling, analysis and data reduction of gaseous emissions measurements on a continuous basis.
Drift: Monotonic change of the calibration function over a period of unattended operation, which results in a change of the measured value.
EA: Environmental Agency responsible for England and Wales.
ELV: Emission Limit Value.
HWI: Hazardous Waste Incinerator, refer WID.
ISO: International Standards Organisation – Multinational organistation that develops and publishes measurement criteria and performance standard.
LAU: Environmental Agency Local Authority Unit.
Measurement: Particular quantity subject to measurement.
MID: Method Implementation Document – developed by EA and STA on how to apply standards in the UK.
Precision: Closeness of agreement of results obtained from the AMS.
QA: Quality Assurance.
QAL: Quality Assurance Level.
QAL1: Quality assurance level 1 – AMS as tested to the requirements CEN standard EN15267 or MCERTS CEM system.
QAL2: Quality assurance level 2 – Calibration of an AMS in accordance with CEN standard EN14181.
QAL3: Quality assurance level 3 – On going performance of an AMS in accordance with CEN standard EN14181.
Reference Material: Material simulating a measurement of known concentration of the input parameter and traceable to national standards.
SRM: Standard Reference Method.
SSP: Site Specific Protocol
SD: Standard Deviation.
Sams: Standard deviation for the for the automated measurement system.
Variability: Standard deviation of the differences of parallel measurements between the SRM and AMS.
TC: Technical committee as referred to in standards organisations e.g. CEN.
TE: Technical Endorsement as referred to in MCERTS performance standard for personnel.
WID: Waste Incineration Directive.

11 INDEX

11.1 MANUAL INDEX

11.2 LIST OF FIGURES

11.3 LIST OF CHARTS

12 PROGRAM INFORMATION

12.1 MANUAL REVISION HISTORY

Revision	Revision Date	Summary of Changes	Author
v1.11	6/5/08	Addition of trend and additional information	R Grant
v1.12	21/11/08	Implementation of the custom report Extra options in the daily report – compact, second page, etc.	R Grant
v113	18/05/09	Addition of special Instructions Addition of Custom Daily Reports Logo and images updated	R Grant
v114	17/11/09	Removal of customer logo	R Grant
v115	24/03/10	Update of images to LCPD v306 Layout changed Addition of new rules in Custom Report section Title changed Pictures Updated Addition of Start Logic description	R Grant
v116	07/04/10	Addition of Normalisation description	R Grant
v117	23/04/10	Overall format changed	D Volgin
v118	20/02/10	Format Update	P Swindell
v119	14/12/11	MCERTS Version	P Swindell
v120	22/10/12	Addition of further custom code information	R Grant
v121	14/09/13	General Content Update	P Swindell
v1.23	25/06/14	MCERTS / Minor Changes	P Swindell
v1.30	24/05/18	Custom Report Info Expanded & other minor additions.	P. Swindell
V1.32	08/04/22	More custom report configuration. JEP malfunction and breakdown settings	R Grant
V1.33	25/09/22	Parameter 143 List of days > ELV and extra info on other codes	R Grant

12.2 APPROVALS

This document requires the following approvals:

Name	Title
R Grant	Managing Director
R Swift	Technical Director