Permit Number: PPC/A/1013141/CP02

Notice: Variation of Permit

This permit has been varied by the Scottish Environment Protection Agency (SEPA) in exercise of its powers under Regulation 46 of the Pollution Prevention and Control (Scotland) Regulations 2012 ("the Regulations"). The terms used in this notice, unless otherwise defined, have the same meaning as in the Regulations.

Permit Number:	PPC/A/1013141/CP02
Site address:	Petroineos Manufacturing Scotland Limited (PIMSL) PO Box 21, Bo'ness Road, Grangemouth, Stirlingshire, FK3 9XH
Operator:	Petroineos Manufacturing Scotland Limited (PIMSL) SC010612 PO Box 21, Bo'ness Road, Grangemouth, Stirlingshire, FK3 9XH
Variation Number:	VAR01
Effective Date of Variation:	<<Enter effective date – DD/MM/YYYY>>
Details of Variation:	The permit is varied as specified in the Schedule attached.

Schedule

The permit has been varied as follows:

1. In Condition 5.4.2 Table A is deleted and replaced as follows:

1. Planned operation of No.2 (standby) flare.
2. Planned Maintenance of the flare gas recovery system.
3. Flare gas quality outwith flare gas recovery system design envelope where recovery of the gas threatens the reliability of the system.
4. Periods of Refinery maintenance that require large volumes of nitrogen to be purged to the flare.

2. Table 5.1 has been deleted and replaced as follows:

Table 5.1 - Emissions to Air ELVs

Source of Emission	**Emission point number**	EP-CDU3-1	EP-CRU-1	EP-CRU-2
	Emission source	CDU3/DHT combined (BA-101 & BA-301)	CRU Main Heater & WHB common stack (S-110)	CRU 1st Interheater Unit (B-109)
	Large Combustion Plant	Yes (124 MWth)	Yes (127 MWth)	Yes (63 MWth)
	Stack height/ diameter (m)	79 / 3.7	95.7 / 2.7	67.5 / 2.4
	Location on Figure 5.1	1	2	5
	NGR	NS 9485 8183	NS 9487 8166	NS 9462 8182
Monitoring Details	**Type of Monitoring**	C, SS	C, SS	C, SS
	Sampling Location	Stack	Stack	Stack
Limits for Parameters from Emission Source	**Carbon Monoxide**	Refer to Table 6.1		
	Oxides of Nitrogen (as NO2)			
	Sulphur Dioxide			
	Particulate			
	Smoke			
	Dioxin/Furans	-	As specified in Condition 5.4.3	-

Note: where " - " is used no emission limit has been set.

Table 5.1 (cont'd) - Emissions to Air ELVs

Source of Emission	**Emission point number**	EP-FLARE-1	EP-FLARE-2
	Emission source	No. 1 Flare	No. 2 Flare
	Large Combustion Plant	No	No
	Stack height/ diameter (m)	91.5 / 1.075	91.5 / 1.075
	Location on Figure 5.1	3	4
	NGR	NS 9501 8172	NS 9494 8159
Monitoring Details	**Type of Monitoring**	C (flow only)	C, SS (flow only)
	Sampling Location	Not required	Not required
	Oxides of Nitrogen (as NO2)	-	-
	Sulphur Dioxide	-	-
	Smoke	As specified in Condition 4.5.8	

Note: where " - " is used no emission limit has been set.

Table 5.1 (cont'd) - Emissions to Air ELVs

Source of Emission	**Emission point number**	EP-CDU1-1	EP-CDU1-2	EP-CDU2-1
	Emission source	No. 1 CDU B1 Heater	No. 1 CDU B1A Heater	No.2 CDU / No.2 DHT (combined)
	Large Combustion Plant	No (29MW)	No (19MW)	Yes (87 MW)
	Stack height/ diameter (m)	42.3 / 1.37	56.4 / 1.58	61 / 3.38
	Location on 5.2	1	2	3
	NGR	NS 9452 8196	NS 9454 8194	NS 9462 8182
	Fuel	Fuel gas	Fuel gas	Fuel gas
Monitoring Details	**Type of Monitoring**	SS	SS	C, SS
	Sampling Location	Stack	Stack	Stack
Limits for Parameters from Emission Source	**Carbon Monoxide mg/m3**	100	100	Refer to Table 6.1
	Oxides of Nitrogen (as NO2) mg/m3	150	150	
	Sulphur Dioxide mg/m3	500 note 1	500 note 1	
		35 note 2,3	35 note 2,3	
	Particulates mg/m3	-	-	
	Smoke	Not to exceed Ringelmann shade 2 within the first 10 minutes from start- up from cold		
		Not to exceed Ringelmann shade 1 at any other time, as determined by BS 2742:1969 or its addendum (1972) other than short term excursions associated with soot blowing, load or fuel changes.		

Note: where " - " is used no emission limit has been set.
Note 1: Until 31 August 2023
Note 2: From 01 September 2023
Note 3: During TAR periods, amine scrubber maintenance or scheduled CRU Regeneration events a higher monthly limit of 70mg/m^3 applies. Each period must be agreed in writing in advance.

Table 5.1 (cont'd) - Emissions to Air ELVs

Source of Emission	**Emission point number**	EP-HFU-1
	Emission source	Hydrofiner combined heater & stripper boilers
	Large Combustion Plant	No (18.3 + 12.3MW)
	Stack height/ diameter(m)	80 / 1.35
	Location on Figure 5.2	4
	NGR	NS 9450 8179
	Fuel	Fuel Gas
Monitoring Details	**Type of Monitoring**	SS
	Sampling Location	Stack
Limits for Parameters from Emission Source	**Carbon Monoxide mg/m^3**	100
	Oxides of Nitrogen (as NO2) mg/m^3	150
	Sulphur Dioxide mg/m^3	500 note 1
		35 note 2, 3
	Particulates mg/m^3	-
	Smoke	Not to exceed Ringelmann shade 2 within the first 10 minutes from start-up from cold
		Not to exceed Ringelmann shade 1 at any other time, as determined by BS 2742:1969 or its addendum (1972) other than short term excursions associated with soot blowing, load or fuel changes

Note: where " - " is used no emission limit has been set.

Note 1: Until 31 August 2023
Note 2: From 01 September 2023
Note 3: During TAR periods, amine scrubber maintenance or scheduled CRU Regeneration events a higher monthly limit of 70mg/m^3 applies. Each period must be agreed in writing in advance.

Table 5.1 (cont'd) - Emissions to Air ELVs

Source of Emission	**Emission point number**	EP-HYDX-1		EP-HCU-2	EP-HYD-2
	Emission source	S – 601 No.2 VDU and HCU heaters (combined)		Mild Vacuum Column Reboiler (stack H-370)	Hydrogen Plant Reforming Furnace H201 (stack S-602)
	Stack height/ diameter (m)	85 / 3.5		70 / 1.5	84 / 4.19
	Large Combustion Plant	Yes VDU2 Charge Heater H-101 (65MW) + H-301 (24 MW) + H-302 (80MW)		No (20MW)	No (118MW– steam reforming furnace)
	Location on Figure 5.3	1		5	7
	NGR	NS 9462 8182		NS 9477 8137	NS 9471 8154
	Fuel	Refer to Table 6.1		Fuel Gas	Fuel Gas
Monitoring Details	**Monitoring Point Number**	EP-VDU-1 (H101)	EP-HCU-1 (H301 & 302)	-	-
	Type of Monitoring	C, SS	C, SS	SS	C, SS
	Sampling Location	VDU2 duct to stack	HCU duct to stack	Duct to stack	Duct to stack
Limits For Parameters From Emission Source	**Carbon Monoxide mg/m^3**	Refer to Table 6.1		100	100
	Oxides of Nitrogen (as NO2) mg/m^3			250 note 5 150 note 6	300
	Sulphur Dioxide mg/m^3			500 note 1 35 note 2, 3	500 note 1 35 note 2
	Particulate mg/m^3			-	-

	Smoke	Not to exceed Ringelmann shade 2 within the first 10 minutes from start-up from cold
		Not to exceed Ringelmann shade 1 at any other time, as determined by BS 2742:1969 or its addendum (1972) other than short term excursions associated with soot blowing, load or fuel changes

Note: where "-" is used no emission limit has been set.
Note 1: Until 31 August 2023
Note 2: From 01 September 2023
Note 3: During TAR periods, amine scrubber maintenance or scheduled CRU Regeneration events a higher monthly limit of 70mg/m^3 applies. Each period must be agreed in writing in advance.
Note 5: Until 30 April 2023
Note 6: From 01 May 2023

Table 5.1 (cont'd) - Emissions to Air ELVs

Source of Emission	**Emission point number**	EP-HYD-1	EP-SRU-2	EP-SRU-4	EP-FLARE-3
	Emission source	Catacarb Regenerator Atmospheric Vent (V-205)	SRU5 J-50701A/B Eductors vent	SRU6 J-60701A/B Eductors vent	No. 3 Flare
	Stack height/ diameter (m)	84 / 4.2	16.5 / 0.08	16.5 / 0.08	91.5 / 1.075
	Large Combustion Plant	No	No	No	No
	Location on 5.3	6	Not shown	Not Shown	2
	NGR	NS 9471 8154	NS 9479 8153	NS 9475 8161	NS 9485 8145
Monitoring Details	**Type of Monitoring**	C, SS	-	-	C (flow only)
	Sampling Location	Duct to stack	-	-	Not required

Limits For	**Carbon Monoxide, mg/m^3**	-	-	-	-
	Oxides of Nitrogen (as NO2), mg/m^3	-	-	-	-
	Sulphur Dioxide,	-	-	-	-
	Particulates, mg/m^3	-	-	-	-
	Smoke	-	-	-	As specified in Condition 4.5.8

Note: where "-" is used no emission limit has been set.

Table 5.1 (cont'd) - Emissions to Air ELVs

Source of Emission	**Emission point number**	EP-SRU-1	EP-SRU-3
	Emission source	H – 50704 Sulphur Recovery Unit 5	H – 60704 Sulphur Recovery Unit 6
	Stack height/ diameter (m)	70 / 0.91	70 / 0.91
	Large Combustion Plant	No	No
	Location on 5.3	3	4
	NGR	NS 9479 8153	NS 9475 8161
Monitoring Details	**Type of Monitoring**	C, SS	C, SS
	Sampling Location	Stack	Stack

	Carbon Monoxide, mg/^{m3}	-	-
	Oxides of Nitrogen (as NO2), mg/m^3	-	-
	Sulphur Dioxide, mg/m3	1 tonne per day Note 1	
	Particulates, mg/^{m3}	-	-
	Hydrogen Sulphide, mg/^{m3}	-	-
	Smoke	Not to exceed Ringelmann shade 2 within the first 10 minutes from start-up from cold	
		Not to exceed Ringelmann shade 1 at any other time, as determined by BS 2742:1969 or its addendum (1972)	

Note: where "-" is used no emission limit has been set.

Note 1: The limits apply except for:

(i) periods of start-up and shutdown of either SRU and the TGTU;
(ii) periods of planned preventative maintenance of TGTU notified in advance in writing to SEPA;
(iii) in the case of Incidents solely involving the TGTU and its control and shutdown system (and without prejudice to Condition 2.4.1) where the cumulative duration of non-operation of TGTU does not exceed 7 days in a calendar year.

3. Table 6.1 has been deleted and replaced as follows:

Table 6.1 - Emissions to Air ELVs

	Emission point number	EP-CDU3-1	EP-CRU-1	EP-CRU-2	EP-CDU2-1	EP-HYDX-1
Source of Emission	**Emission source**	CDU3/DHT combined (BA-101 & BA-301)	CRU Main Heater & WHB common stack (S-110)	CRU 1st Interheater Unit (B-109)	No.2 CDU / No.2 DHT (combined)	S – 601 No.2 VDU and HCU heaters H-101, H-301 & H-302 (combined)
	Large Combustion Plant & EIONET LCP Number	Yes (124 MWth) EIONET No. 3	Yes (127 MWth) EIONET No. 41	Yes (63 MWth) EIONET No. 40	Yes (87 MW) EIONET No. 1	Yes (169MW) EIONET No. 2
	Stack height/ diameter (m)	79 / 3.7	95.7 / 2.7	67.5 / 2.4	61 / 3.38	85 / 3.5
	Location (Figure Number)	1 (Figure 5.1 in Schedule 5)	2 (Figure 5.1 in Schedule 5)	5 (Figure 5.1 in Schedule 5)	3 (Figure 6.1 in Schedule 6)	1 (Figure 7.1 in Schedule 7)
	NGR	NS 9485 8183	NS 9487 8166	NS 9490 8175	NS 9463	NS 9463 8137
Fuel		Fuel gas	Fuel gas	Fuel gas	Fuel gas	Fuel gas

Monitoring Details	**Monitoring Point Number**					EP-VDU-1	EP-HCU-1
	Type of Monitoring	C, SS	C, SS	C, SS	C, SS	C, SS	C, SS
	Sampling Location	Duct to Stack	Duct to Stack	Stack	Ducts to Stack	VDU2 duct to stack	HCU duct to stack
	Emission point number	EP-CDU3-1	EP-CRU-1	EP-CRU-2	EP-CDU2-1	EP-HYDX-1	
Limits for Parameters from Emission Source	**CO mg/m3**	100	100	100	100	100	
	NOx mg/m^3 (Monthly Mean)	150	150	150	150	150 - 200 Note 6	
	SO2 mg/m3	500 Note 1	500 Note 1	500 Note 1	500 Note 1	500 Note 1	
		35 Note 2	35 Note 2, 3	35 Note 2, 3	35 Note 2, 3	35 Note 2, 3	
	Particulate mg/m^3	5	5	5	5	5	
	Smoke	Not to exceed Ringelmann shade 2 within the first 10 minutes from start-up from cold					
		Not to exceed Ringelmann shade 1 at any other time, as determined by BS 2742:1969 or its addendum (1972) other than short term excursions associated with soot blowing, load or fuel changes					

Note: where " - " is used no emission limit has been set.
Note 1: Until 31 August 2023
Note 2: From 01 September 2023

Note 3: During TAR periods, amine scrubber maintenance or scheduled CRU Regeneration events a higher monthly limit of 70mg/m^3 applies. Each period must be agreed in writing in advance.
Note 6: ELV calculated from ratio of fuel gas usage between VDU-2 and HCU, VDU-2 has an ELV of 200mg/m^3, provided that air pre-heat greater than 200^0C is in use (if air pre-heat greater than 200^0C is not in use an ELV of 150 mg/m^3 applies) and HCU has an ELV of 150mg/m^3. See lookup Table 6.7.

4. Annexe I has been deleted and replaced as follows:

ANNEX I – SULPHUR DIOXIDE DEROGATION

1 The Regulation

Regulation 25(6) of the Regulations provides that SEPA must include emission limit values that ensure that emissions do not exceed the levels associated with the best available techniques (BAT-AEL) laid down in the BAT Conclusions.

Regulation 25(12) of the Regulations states:

> "SEPA may set a less strict emission limit value... for an installation if –
>
> (i) an assessment shows that achievement of the emission levels associated with the best available techniques as described in any BAT Conclusions would lead to disproportionately higher costs compared to environmental benefits due to the –
>
> (ii) the geographical location or local environmental conditions of the installation, or
>
> (iii) technical characteristics of the installation, ..."

Regulation 25(2)(c) provides that where a less strict value is set ("derogation"); it is a requirement that "the permit specifies the reasons for setting the value, including the result of the assessment and the justification for the conditions imposed". The purpose of this Appendix is to satisfy those requirements.

2 The Derogation Used

SEPA has decided to set ELVs that derogate from the BAT-AEL range in the BAT Conclusions in respect of Sulphur Dioxide.

Parameter	BAT-AEL[1] in the BATc	Derogated ELV	Applicability
Sulphur Dioxide – fuel gas firing	35mg/Nm^3	500mg/Nm^3	All gas fired units until 01 September 2023.

1 BAT-AELs as specified in Tables 6, 13 and14 of the Refining of mineral oil and gas BREF.

3 Basis for the Derogation

SEPA has set this emission limit value on the grounds that achievement of emissions within the BAT-AEL range would lead to disproportionately higher costs compared to environmental benefits due to the technical characteristics of the installation:

The technical characteristics of the installation mean that achievement of Sulphur Dioxide emissions within the BAT-AEL range would lead to disproportionately higher costs due to the need to:

(i) Configuration of the plant within the site results in practical difficulties and increased time and costs for the construction of additional plant.

(ii) The history of recent investment in techniques designed to reduce emissions.

(iii) The remaining operational life of the plant

A Cost Benefit Analysis carried out by SEPA gave the result that achievement of emissions for in the case of Sulphur Dioxide within the BAT-AEL range would lead to disproportionately higher cost for the reasons given above.

4 Justification for the Conditions Imposed

SEPA has included an ELV of 500mg/Nm^3 for Sulphur Dioxide on the grounds that SEPA considers it:

- represents BAT for the installation;
- ensures no significant pollution of the environment will be caused and that a high level of protection of the environment as a whole will be achieved;
- does not exceed any emission limit value set out in the Annex V to the Industrial Emissions Directive; and,

is time limited for planned upgrades to 01 September 2023 (500mg/Nm^3 for gas firing).