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Licence Return Approval Notice

Licensing Notice Details

Subject

Licence Return Approval Notice

Created Date

29/08/2017

Dear Mr. Heffernan,

The Agency has reviewed your submission LR030379 in relation to in stack analysis methods and techniques for agreement.

This proposal has been submitted in accordance with Industrial Emission Licence Reg. No. W0232-01 and *Schedule C.1.2 Monitoring of Emission to Air*.

Based on the information provided, the proposed analysis methods and techniques are approved.

You are reminded of the requirement to comply with the Conditions of IE Licence Reg. No. W0232-01 at all times.

Yours sincerely,

Thomas Sexton

Inspector

Office of Environmental Enforcement, Dublin

**FAO: Mr. Victor Olmos,
Office of Environmental Enforcement,
Environment Protection Agency,
Richview,
McCumisky House,
Clonskeagh
Dublin 14.**

10th August 2017

**Ref: W0232-01: Twin Stack Emissions Monitoring Techniques and Analysis methods as
required in Schedule C.1.2**

Dear Mr. Olmos,

Under the terms of IE License W0232-01 schedule C.1.2, please find attached the analysis methods and techniques that will be employed by EXOVA for twin stack monitoring at emissions monitoring points A2-1 and A2-2.

I trust the attached meets your approval.

If you require anything further, please do not hesitate to contact the undersigned.

Yours Sincerely,



**Mark Heffernan
Environmental Manager.**



Exova Catalyst Ireland, Unit D8 North City Business Park, North Road, Finglas, Dublin 11

T: +353 86 853 8247

E: nick.kenny@exova.com

Your Exova Catalyst Contact: Nick Kenny (+353 86 853 8247)

Site Specific Protocol (SSP) Commissioned by
Covanta

Installation Name & Address

Covanta

Dublin Waste-to-Energy Ltd

Shellybanks Road

Off Pigeon House Road

Dublin 4

Industrial Emissions Licence: W0232-01

Dates of the Proposed Monitoring Campaign

TBC

SSP Reference Number

CDU-SSP

Release Point References

A2-1 - Line 1

A2-1 - Line 2

Report Written by

Patrick O'Brien, MCERTS Level 2

Report Date

4th April 2017

Report Approved by

Patrick O'Brien
Deputy Regional Manager
MCERTS Level 2
MM 08 922
TE1 TE2 TE3 TE4

Signature of Report Approver (Catalyst)

Version

Version 1

Name of Client

Kieran Mullins

Date of Client Approval

I confirm that I have read and understood the sampling protocol contained in this report and I am happy for the sampling to proceed

Signature of Client (for SSP Approval)

CONTACT DETAILS, MONITORING DATES & PERSONNEL

This SSP (Site Specific Protocol) will be updated, if required to include feedback from each visit.

Operator Contact Details

Operator Name	Covanta
Site Location	Dublin 4
Full Installation Address	Dublin Waste-to-Energy Ltd Shellybanks Road Off Pigeon House Road Dublin 4
Industrial Emissions Licence	W0232-01

	Primary Site Contact	Alternative Site Contact
Contact Name	Kieran Mullins	N/A
Telephone Number	00353 (0)1 690 9735	N/A
Fax Number	00353 (0)1 690 9041	N/A
Mobile Phone Number	00353 (0) 86 858 2469	N/A
Email Address	kmullins@covanta.com	N/A

Monitoring Dates

Dates of Previous Campaign	N/A - Not Performed by Catalyst
Job No. of Previous Campaign	N/A - Not Performed by Catalyst
Planned Dates of Campaign	TBC

(If the Planned Dates of the Campaign change at late notice, the SSP will not be re-issued. The final test report will detail the actual monitoring dates.)

Analysis Laboratories (with short name reference as referenced in Part 2 of the SSP)

Exova Catalyst (CAT)	ISO17025 Accreditation Number: 4279
Scientific Analysis Laboratories Ltd (SAL)	ISO17025 Accreditation Number: 1549
RPS Laboratories Ltd (RPS)	ISO17025 Accreditation Number: 0605

Stack Emissions Monitoring Personnel

where SCM = Site Campaign Manager

	Position	Name	MCERTS Accreditation	MCERTS Number & Expiry Date	Technical Endorsements
SCM	Team Leader	Conor Cooney	MCERTS Level 2	MM 12 1194, April 2018	TE1 TE2 TE3 TE4
	Technician	Neil Kelly	MCERTS Level 1	MM 16 1390, August 2021	None

Exova Catalyst Site Campaign Manager Contact Details

Name	Mobile Phone Number	Email Address
Conor Cooney	00353 87 147 3283	conor.cooney@exova.com

Further Notes on Stack Emissions Monitoring Personnel

There may be, in exceptional circumstances, a need to change the personnel who will be performing the monitoring. If this was to occur, the sampling team sent to site will hold all the necessary MCERTS Technical Endorsements for the required tests. As this scenario would most likely happen at late notice, the SSP will not be re-issued. The names of the monitoring personnel will be available to the client on the day of sampling (or before if required for inductions / site security / permits to work). The names of the monitoring personnel along with their personal MCERTS accreditation details will also be detailed in the final test report.

DETAILS OF MONITORING: STACK AND LOCATION DETAILS

Release Point Reference: A2-1 Line 1

Sampling Location and Stack Photos



Operating & Process Information	Details
Type of Process	Waste Incineration
Batch or Continuous Process	Continuous
Feedstock / Fuel Type	Residual Municipal Waste
Load / Throughput / Continuous Rating of Plant	35 Tonnes / Hour
Expected Velocity, Temperature & Moisture	TBC m/s 90 °C 25 % v/v
Details of Abatement System	Selective non-catalytic reduction/semi-dry scrubber/bag filter/wet scrubber
Details of any CEMS Installed (including DCS)	SICK
Process Details Required	Operating conditions to be Provided by Site Contact
Reference Conditions 1	273K, 101.3kPa, dry gas, 11% oxygen.
Reference Conditions 2	N/A

Sampling Location Details	Value	Details
Stack Type / Shape	Square	
Diameter / Dimensions (m)	2 x 2	
Access	Stairs	mechanical hoist to lift equipment
Platform Type and Location	Permanent	Inside Plant building
Orientation of Duct	Horizontal	
Sample Port Size / Diameter	4" Flange	
Sample Port Depth (cm)	TBC	
Sample Ports Correctly Located?	Yes	
Number of Sampling Lines Available	4	
Number of Sampling Lines to be Used	4	
Number of Sample Points to be Used (per line)	4	
Total Number of Sample Points to be Used	16	
EN 15259 / Homogeneity Representative Point/s	-	To be determined at this visit

Availability of Utilities	Power	110V	Lighting	Yes	Water	No

Irish EPA Technical Guidance Note AG1 / EN 15259 Platform Requirements	Value
Sufficient working area to manipulate probe and operate the measuring instruments	Yes
Platform has 2 levels of handrails (approx. 0.5m & 1.0m high)	Yes
Platform has vertical base boards (approx. 0.25m high)	Yes
Platform has chains / self closing gates at top of ladders	Yes
There are no obstructions present which hamper insertion of sampling equipment	No
Safe Access Available	Yes
Easy Access Available	Yes

Sampling Platform / Improvement Recommendations:

The sampling location meets all the requirements specified in Irish EPA Guidance Note AG1 and EN 15259, and therefore there are no improvement recommendations.

Sampling Plane Validation Criteria		
Requirement	Value	Compliant
Lowest Differential Pressure (Pa)	TBC	TBC
Ratio of Gas Velocities (:1)	TBC	TBC
Maximum Angle of Swirl (°)	TBC	TBC
No Local Negative Flow	TBC	TBC

DETAILS OF MONITORING: SAMPLING METHOD INFORMATION

Release Point Reference **A2-1 Line 1** (continued)

In the "Units" column, ¹ = Reference Conditions 1, ² = Reference Conditions 2

PERIODIC SAMPLING: MANUAL METHODS														
Determinand	Number of Runs Blanks	Units	Emission Limit	Expected Emission	Projected LOD	Standard Reference Method	Catalyst Technical Procedure	Absorption Media / Analysis Technique	Analysis Lab ISO17025 status	Sample Duration (mins)	Sample Flowrate (l/min)	Sample Volume (REF) (m ³)	Projected MU (%)	Status of Testing
Particulate Matter	1 1	¹ mg/m ³	30	< 30	0.150	EN 13284-1	CAT-TP-01 / 03	Filter / Gravimetric	CAT 17025	60	15	0.839	30%	MCERTS
Cadmium & Thallium	1 1	¹ mg/m ³	0.05	< 0.05	0.0013	EN 14385	CAT-TP-06	HNO ₃ & H ₂ O ₂ / ICPMS	RPS 17025	60	15	0.839	15%	MCERTS
Heavy Metals	1 1	¹ mg/m ³	0.50	< 0.5	0.0067	EN 14385	CAT-TP-06	HNO ₃ & H ₂ O ₂ / ICPMS	RPS 17025	60	15	0.839	15%	MCERTS
Mercury (MID 14385)	1 1	¹ mg/m ³	0.05	< 0.05	0.0005	EN 13211	CAT-TP-06	K ₂ Cr ₂ O ₇ / CVAFS	RPS 17025	60	15	0.839	15%	MCERTS
Dioxins & Furans	1 1	¹ ng/m ³	0.10	< 0.1	0.0030	EN 1948	CAT-TP-07	XAD-2 / GC-HRMS	SAL 17025	360	15	5.031	25%	MCERTS
Hydrogen Fluoride	1 1	¹ mg/m ³	4	< 4	0.089	ISO 15713	CAT-TP-10	NaOH / IC	CAT 17025	30	10	0.280	15%	MCERTS
PM ₁₀	1 1	¹ mg/m ³	-	< 10	0.286	EN ISO 23210	CAT-TP-18 / 03	Cascade Impactor	CAT 17025	60	25	1.398	30%	MCERTS
PM _{2.5}	1 1	¹ mg/m ³	-	< 10	0.215	EN ISO 23210	CAT-TP-18 / 03	Cascade Impactor	CAT 17025	60	25	1.398	30%	MCERTS
Water Vapour	5 -	¹ % v/v	-	25.00	0.100	EN 14790	CAT-TP-05	Gravimetric	CAT 17025	various	various	N/A	5%	MCERTS
Volume emitted (per hour)	1 -	¹ m ³ /hr	275000	< 275000	-	EN ISO 16911-1	CAT-TP-41	Pressure & Temp	CAT 17025	N/A	N/A	N/A	10%	MCERTS
Velocity	1 -	¹ m/s	-	10.00	3.000	EN ISO 16911-1	CAT-TP-41	Pressure & Temp	CAT 17025	N/A	N/A	N/A	10%	MCERTS

PERIODIC SAMPLING: INSTRUMENTAL METHODS														
Determinand	Number of Runs	Units	Emission Limit	Expected Emission	Projected LOD	Standard Reference Method	Catalyst Technical Procedure	Equipment Used	Measurement Technique	Sample Duration (mins) Logging Interval (s)	Span / Check Gas Type & Conc.	Range During Testing	Projected MU (%)	Status of Testing
Nitrous Oxide	1	¹ mg/m ³	N/A	TBC	1.00	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 60	400ppm NO	500 ppm	20%	MCERTS
Oxygen	1	¹ % v/v	N/A	11.0	0.10	EN 14789	CAT-TP-39	Horiba PG-350E	Paramagnetism	30 60	11% v/v	25% v/v	5%	MCERTS

The check gas that will be used for the reactivity test will be 100ppm SO₂

EN 14181 CEMS CALIBRATIONS: MANUAL METHODS

Determinand	QAL2 or AST	Number of Runs Blanks	Units	ELVs (Daily Short Term)	Expected Emission	Projected LOD	Standard Reference Method	Catalyst Technical Procedure	Absorption Media / Analysis Technique	Analysis Lab ISO17025 Status	Sample Duration (mins)	Sample Flowrate (ACTUAL) (l/min)	Projected MU (%)	Status of Testing
Particulate Matter	QAL2	>15 3	¹ mg/m ³	10 30	< 30	0.15	EN 13284-1	CAT-TP-01 / 03	Filter / Gravimetric	CAT 17025	60	15	30.00%	MCERTS
Hydrogen Chloride	QAL2	>15 1	¹ mg/m ³	10 60	< 60	0.03	EN 1911	CAT-TP-11	H ₂ O / IC	CAT 17025	60	15	15.00%	MCERTS

EN 14181 CEMS CALIBRATIONS: INSTRUMENTAL METHODS

Determinand	QAL2 or AST	Number of Runs	Units	ELVs (Daily Short Term)	Expected Emission	Projected LOD	Standard Reference Method	Catalyst Technical Procedure	Equipment Used	Measurement Technique	Averaging Times (mins) Logging Interval (s)	Span / Check Gas Type & Conc.	Projected MU (%)	Status of Testing
Total VOCs	QAL2	> 15	¹ mg/m ³	10 20	< 20	0.17	EN 12619:2013	CAT-TP-20	Sick 3006	FID	30 60	80 ppm	5%	MCERTS
Nitrogen Monoxide	QAL2	> 15	¹ mg/m ³	- -	< 400	0.50	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 60	400ppm NO	10%	MCERTS
Nitrogen Dioxide	QAL2	> 15	¹ mg/m ³	- -	< 100	1.10	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 60	400ppm NO	10%	MCERTS
Oxides of Nitrogen	QAL2	> 15	¹ mg/m ³	200 400	<400	1.10	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 60	400ppm NO	10%	MCERTS
Sulphur Dioxide	QAL2	> 15	¹ mg/m ³	50 200	< 200	2.20	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 60	100ppm SO ₂	20%	MCERTS
Carbon Monoxide	QAL2	> 15	¹ mg/m ³	150 100	< 100	0.70	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 60	100ppm CO	5%	MCERTS

The check gas that will be used for the reactivity test will be 100ppm SO₂

EN 14181 CEMS CALIBRATIONS: EXISTING CALIBRATION FUNCTIONS

Parameter	Existing Calibration Function	Existing R ²
Total Particulate Matter	N/A	N/A
Total VOCs	N/A	N/A
Nitrogen Monoxide	N/A	N/A
Nitrogen Dioxide	N/A	N/A
Oxides of Nitrogen	N/A	N/A
Sulphur Dioxide	N/A	N/A
Carbon Monoxide	N/A	N/A
Hydrogen Chloride	N/A	N/A

EN 14181 CEMS CALIBRATIONS: FURTHER INFORMATION

Parameter	Details
Who will perform the Functional Checks?	TBC
When will Functional Checks be Performed?	TBC
Is Linearity Testing to be Performed	Yes
If Yes, which Parameters?	CO, NO, NO ₂ , TOC, SO ₂ & HCl
How many days will the testing be performed over?	At least 3 days
Will any emissions be at or near Zero?	TBC
Is there easy and safe access to the CEMS?	Yes

EN 15259 ASSESSMENT OF HOMOGENEITY: SAMPLING POINTS INFORMATION

Parameter	Value	Details	Parameter	Value	Details
No. of Sampling Lines Available	4		No. of Sample Points to be Used (per line)	4	
No. of Sampling Lines to be Used	4		Total No. of Sample Points to be Used	16	

INSTRUMENTAL METHODS

Determinand	Units	Emission Limit	Expected Emission	Standard Reference Method	Catalyst Technical Procedure	Equipment Used [FIXED]	Measurement Technique [FIXED]	Equipment Used [GRID]	Measurement Technique [GRID]	Span / Check Gas Type & Conc.	Range During Testing	Projected MU (%)	Status of Testing
Total VOCs	¹ mg/m ³	20	< 20	EN 12619:2013	CAT-TP-20	Sick 3006	FID	Sick 3006	FID	80 ppm	100 ppm	5%	MCERTS
Oxides of Nitrogen	¹ mg/m ³	400	<400	TGN M22	CAT-TP-22(b)	Gaset DX4000	FTIR	Gaset DX4000	FTIR	400ppm NO	500 ppm	10%	MCERTS
Carbon Monoxide	¹ mg/m ³	100	< 100	TGN M22	CAT-TP-22(b)	Gaset DX4000	FTIR	Gaset DX4000	FTIR	100ppm CO	250 ppm	5%	MCERTS
Oxygen	¹ % v/v	N/A	11.0	EN 14789	CAT-TP-39	Horiba PG-350E	Paramagnetism	Horiba PG-350E	Paramagnetism	11% v/v	25% v/v	5%	MCERTS
Sulphur Dioxide	¹ mg/m ³	200	< 200	TGN M22	CAT-TP-22(b)	Gaset DX4000	FTIR	Gaset DX4000	FTIR	100ppm SO ₂	250 ppm	20%	MCERTS

The check gas that will be used for the reactivity test will be 100ppm SO₂

Is the CEMS Representative Point Homogeneity Test to be performed? Yes

Velocity Profile - No Traverse Data Available

Pt
1
2
3
4
5
6
7
8
9
10

where U stands for 'Unknown' due to there being no traverse data available

Monitoring Objectives / Unusual Occurrences / Comments / Health & Safety / Expected Deviations from Standard Reference Methods

1	Demonstrate compliance with a set of emission limit values (ELVs) as specified in the Site's Permit
2	N/A
3	N/A
4	N/A

DETAILS OF MONITORING: STACK AND LOCATION DETAILS

Release Point Reference A2-1 Line 2

Sampling Location and Stack Photos



Operating & Process Information	Details
Type of Process	Waste Incineration
Batch or Continuous Process	Continuous
Feedstock / Fuel Type	Residual Municipal Waste
Load / Throughput / Continuous Rating of Plant	35 Tonnes / Hour
Expected Velocity, Temperature & Moisture	TBC m/s 90 °C 25 % v/v
Details of Abatement System	Selective non-catalytic reduction/semi-dry scrubber/bag filter/wet scrubber
Details of any CEMS Installed (including DC5)	SICK
Process Details Required	Operating conditions to be Provided by Site Contact
Reference Conditions 1	273K, 101.3kPa, dry gas, 11% oxygen.
Reference Conditions 2	N/A

Sampling Location Details	Value	Details
Stack Type / Shape	Square	
Diameter / Dimensions (m)	2 x 2	
Access	Stairs	mechanical hoist to lift equipment
Platform Type and Location	Permanent	Inside Plant building
Orientation of Duct	Horizontal	
Sample Port Size / Diameter	4" Flange	
Sample Port Depth (cm)	TBC	
Sample Ports Correctly Located?	Yes	
Number of Sampling Lines Available	4	
Number of Sampling Lines to be Used	4	
Number of Sample Points to be Used (per line)	4	
Total Number of Sample Points to be Used	16	
EN 15259 / Homogeneity Representative Point/s	-	To be determined at this visit

Availability of Utilities	Power	110V	Lighting	Yes	Water	No

Irish EPA Technical Guidance Note AG1 / EN 15259 Platform Requirements	Value
Sufficient working area to manipulate probe and operate the measuring instruments	Yes
Platform has 2 levels of handrails (approx. 0.5m & 1.0m high)	Yes
Platform has vertical base boards (approx. 0.25m high)	Yes
Platform has chains / self closing gates at top of ladders	Yes
There are no obstructions present which hamper insertion of sampling equipment	No
Safe Access Available	Yes
Easy Access Available	Yes

Sampling Plane Validation Criteria		
Requirement	Value	Compliant
Lowest Differential Pressure (Pa)	TBC	TBC
Ratio of Gas Velocities (:1)	TBC	TBC
Maximum Angle of Swirl (°)	TBC	TBC
No Local Negative Flow	TBC	

Sampling Platform / Improvement Recommendations:

The sampling location meets all the requirements specified in Irish EPA Guidance Note AG1 and EN 15259, and therefore there are no improvement recommendations.

DETAILS OF MONITORING: SAMPLING METHOD INFORMATION

Release Point Reference **A2-1 Line 2** (continued)

In the "Units" column, ¹ = Reference Conditions 1, ² = Reference Conditions 2

PERIODIC SAMPLING: MANUAL METHODS														
Determinand	Number of Runs Blanks	Units	Emission Limit	Expected Emission	Projected LOD	Standard Reference Method	Catalyst Technical Procedure	Absorption Media / Analysis Technique	Analysis Lab ISO17025 status	Sample Duration (mins)	Sample Flowrate (ACTUAL) (l/min)	Sample Volume (REF) (m ³)	Projected MU (%)	Status of Testing
Particulate Matter	1 1	¹ mg/m ³	30	< 30	0.150	EN 13284-1	CAT-TP-01 / 03	Filter / Gravimetric	CAT 17025	60	15	0.839	30%	MCERTS
Cadmium & Thallium	1 1	¹ mg/m ³	0.05	< 0.05	0.0013	EN 14385	CAT-TP-06	HNO ₃ & H ₂ O ₂ / ICPMS	RPS 17025	60	15	0.839	15%	MCERTS
Heavy Metals	1 1	¹ mg/m ³	0.50	< 0.5	0.0067	EN 14385	CAT-TP-06	HNO ₃ & H ₂ O ₂ / ICPMS	RPS 17025	60	15	0.839	15%	MCERTS
Mercury (MID 14385)	1 1	¹ mg/m ³	0.05	< 0.05	0.0005	EN 13211	CAT-TP-06	K ₂ Cr ₂ O ₇ / CVAFS	RPS 17025	60	15	0.839	15%	MCERTS
Dioxins & Furans	1 1	¹ ng/m ³	0.10	< 0.1	0.0030	EN 1948	CAT-TP-07	XAD-2 / GC-HRMS	SAL 17025	360	15	5.031	25%	MCERTS
Hydrogen Fluoride	1 1	¹ mg/m ³	4.0	< 4	0.089	ISO 15713	CAT-TP-10	NaOH / IC	CAT 17025	30	10	0.280	15%	MCERTS
PM ₁₀	1 1	¹ mg/m ³	-	<10	0.286	EN ISO 23210	CAT-TP-18 / 03	Cascade Impactor	CAT 17025	60	25	1.398	30%	MCERTS
PM _{2.5}	1 1	¹ mg/m ³	-	< 10	0.215	EN ISO 23210	CAT-TP-18 / 03	Cascade Impactor	CAT 17025	60	25	1.398	30%	MCERTS
Water Vapour	5	¹ % v/v	-	25.00	0.100	EN 14790	CAT-TP-05	Gravimetric	CAT 17025	various ¹	various	N/A	5%	MCERTS
Volume emitted (per hour)	1	¹ m ³ /hr	275000	< 275000	-	EN ISO 16911-1	CAT-TP-41	Pressure & Temp	CAT 17025	N/A	N/A	N/A	10%	MCERTS
Velocity	1	¹ m/s	-	10.00	3.000	EN ISO 16911-1	CAT-TP-41	Pressure & Temp	CAT 17025	N/A	N/A	N/A	10%	MCERTS

PERIODIC SAMPLING: INSTRUMENTAL METHODS														
Determinand	Number of Runs	Units	Emission Limit	Expected Emission	Projected LOD	Standard Reference Method	Catalyst Technical Procedure	Equipment Used	Measurement Technique	Sample Duration (mins) Logging Interval (s)	Span / Check Gas Type & Conc.	Range During Testing	Projected MU (%)	Status of Testing
Nitrous Oxide	1	¹ mg/m ³	N/A	TBC	1.00	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 60	400ppm NO	500 ppm	20%	MCERTS
Oxygen	1	¹ % v/v	N/A	11.0	0.10	EN 14789	CAT-TP-39	Horiba PG-350E	Paramagnetism	continuous 60	11% v/v	25% v/v	5%	MCERTS

The check gas that will be used for the reactivity test will be 100ppm SO₂

EN 14181 CEMS CALIBRATIONS: MANUAL METHODS

Determinand	QAL2 or AST	Number of Runs Blanks	Units	ELVs (Daily Short Term)	Expected Emission	Projected LOD	Standard Reference Method	Catalyst Technical Procedure	Absorption Media / Analysis Technique	Analysis Lab ISO17025 Status	Sample Duration (mins)	Sample Flowrate (ACTUAL) (l/min)	Projected MU (%)	Status of Testing
Particulate Matter	QAL2	>15 3	¹ mg/m ³	10 30	< 30	0.15	EN 13284-1	CAT-TP-01 / 03	Filter / Gravimetric	CAT 17025	60	15	30.00%	MCERTS
Hydrogen Chloride	QAL2	>15 1	¹ mg/m ³	10 60	< 60	0.03	EN 1911	CAT-TP-11	H ₂ O / IC	CAT 17025	60	15	15.00%	MCERTS

EN 14181 CEMS CALIBRATIONS: INSTRUMENTAL METHODS

Determinand	QAL2 or AST	Number of Runs	Units	ELVs (Daily Short Term)	Expected Emission	Projected LOD	Standard Reference Method	Catalyst Technical Procedure	Equipment Used	Measurement Technique	Averaging Times (mins) Logging Interval (s)	Span / Check Gas Type & Conc.	Projected MU (%)	Status of Testing
Total VOCs	QAL2	> 15	¹ mg/m ³	10 20	< 20	0.17	EN 12619:2013	CAT-TP-20	Sick 3006	FID	30 60	80 ppm	5%	MCERTS
Nitrogen Monoxide	QAL2	> 15	¹ mg/m ³	- -	< 400	0.50	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 60	400ppm NO	10%	MCERTS
Nitrogen Dioxide	QAL2	> 15	¹ mg/m ³	- -	< 100	1.10	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 60	400ppm NO	10%	MCERTS
Oxides of Nitrogen	QAL2	> 15	¹ mg/m ³	200 400	<400	1.10	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 60	400ppm NO	10%	MCERTS
Sulphur Dioxide	QAL2	> 15	¹ mg/m ³	50 200	< 200	2.20	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 60	100ppm SO ₂	20%	MCERTS
Carbon Monoxide	QAL2	> 15	¹ mg/m ³	150 100	< 100	0.70	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	30 60	100ppm CO	5%	MCERTS

The check gas that will be used for the reactivity test will be 100ppm SO₂

EN 14181 CEMS CALIBRATIONS: EXISTING CALIBRATION FUNCTIONS

Parameter	Existing Calibration Function	Existing R ²
Total Particulate Matter	N/A	N/A
Total VOCs	N/A	N/A
Nitrogen Monoxide	N/A	N/A
Nitrogen Dioxide	N/A	N/A
Oxides of Nitrogen	N/A	N/A
Sulphur Dioxide	N/A	N/A
Carbon Monoxide	N/A	N/A
Hydrogen Chloride	N/A	N/A

EN 14181 CEMS CALIBRATIONS: FURTHER INFORMATION

Parameter	Details
Who will perform the Functional Checks?	TBC
When will Functional Checks be Performed?	TBC
Is Linearity Testing to be Performed	Yes
If Yes, which Parameters?	CO, NO, NO ₂ , TOC, SO ₂ & HCl
How many days will the testing be performed over?	At least 3 days
Will any emissions be at or near Zero?	TBC
Is there easy and safe access to the CEMS?	Yes

EN 15259 ASSESSMENT OF HOMOGENEITY: SAMPLING POINTS INFORMATION

Parameter	Value	Details	Parameter	Value	Details
No. of Sampling Lines Available	4		No. of Sample Points to be Used (per line)	4	
No. of Sampling Lines to be Used	4		Total No. of Sample Points to be Used	16	

INSTRUMENTAL METHODS

Determinand	Units	Emission Limit	Expected Emission	Standard Reference Method	Catalyst Technical Procedure	Equipment Used [FIXED]	Measurement Technique [FIXED]	Equipment Used (GRID)	Measurement Technique (GRID)	Span / Check Gas Type & Conc.	Range During Testing	Projected MU (%)	Status of Testing
Total VOCs	¹ mg/m ³	20	< 20	EN 12619:2013	CAT-TP-20	Sick 3006	FID	Sick 3006	FID	80 ppm	100 ppm	5%	MCERTS
Oxides of Nitrogen	¹ mg/m ³	400	<400	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	Gasmet DX4000	FTIR	400ppm NO	500 ppm	10%	MCERTS
Carbon Monoxide	¹ mg/m ³	100	< 100	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	Gasmet DX4000	FTIR	100ppm CO	250 ppm	5%	MCERTS
Oxygen	¹ % v/v	N/A	11.0	EN 14789	CAT-TP-39	Horiba PG-350E	Paramagnetism	Horiba PG-350E	Paramagnetism	11% v/v	25% v/v	5%	MCERTS
Sulphur Dioxide	¹ mg/m ³	200	< 200	TGN M22	CAT-TP-22(b)	Gasmet DX4000	FTIR	Gasmet DX4000	FTIR	100ppm SO ₂	250 ppm	20%	MCERTS

The check gas that will be used for the reactivity test will be 100ppm SO₂

Is the CEMS Representative Point Homogeneity Test to be performed? Yes

Velocity Profile - No Traverse Data Available

- Pt
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

where U stands for 'Unknown' due to there being no traverse data available

Monitoring Objectives / Unusual Occurrences / Comments / Health & Safety / Expected Deviations from Standard Reference Methods

1	Demonstrate compliance with a set of emission limit values (ELVs) as specified in the Site's Permit
2	N/A
3	N/A
4	N/A

DEVIATIONS FROM THE SSP THAT MAY HAVE OCCURED ON SITE DURING THE SAMPLING CAMPAIGN

Make a note of any deviations from this SSP below:

(Deviations may include: modification to a sampling duration, removal of a test, change to the number of sampling runs etc.)

At the end of the sampling campaign, the Team Leader must select one of the statements below and complete the required boxes:

(1) I certify that all testing performed for this sampling campaign followed the testing programme as detailed in this SSP, and no deviations (unless specified in the original SSP and approved by the client) were required.

<input type="checkbox"/> (tick)	Signature of Team Leader	Date of Signature

(2) It was necessary to deviate from the testing programme as detailed in this SSP. All deviations are listed above. The client was informed of the deviations and was happy for the testing to proceed / continue on this basis.

*(A client signature **MUST** be obtained for Contract Review purposes)*

<input type="checkbox"/> (tick)	Signature of Team Leader	Date of Signature	Signature of Client	Date of Signature

