



**VERZOEK TOT INSTEMMING BARMF F06-07, BIJLAGE 2,
BESCHRIJVING VAN HET BOORPLATFORM**

1. Beschrijving boorplatform
2. Meetresultaten Generatoren



1. BESCHRIJVING BOORPLATFORM

Prospector 1

Additional information please contact:

Borr Drilling Limited



marketing@borrdrilling.com - www.borrdrilling.com

High Specification Jackup

General Description

Design / Generation Friede & Goldman JU2000E
Constructing Shipyard Dalian Shipbuilding Industry Offshore Co., Ltd., China
Year Entered Service / Significant Upgrades 2013
Classification ABS,A1, CDS, Self-Elevating Drilling Unit
Flag Vanuatu
Overall Dimensions 324 ft.long x 255 ft.wide x 31 ft deep
Legs (3) 547 ft. long, Triangular
Drafts 21.949 ft at loadline
Accommodation 140 persons
Displacement 50,693 kips
Variable Deck 8,300 kips operating / 6,614kips transit (spud cans full)
Transit Speed up to 4 knots, @ 150st bollard pull
Operating Water Depth 400 ft. designed / 400 ft. outfitted
Maximum Drilling Depth 35,000ft

Drilling Equipment

Derrick TTS/ Hot dipped galvanized; 194 ft high with 40 ft x 40 ft base
Hookload Capacity 2,000,000 lbs gross nominal capacity
Cantilever/ Drill floor 75 ft / 15 ft Port & Stbd
Drawworks Cameron Ultrahoist SG 1060-6000 Max hook load 2,120 kips with 16 lines. 4 x GE AC motors suitable for 2" drill line
Rotary Table Cameron 49.5" table opening, hydraulic drive, rated 1,000 st
Top Drive Cameron TTS Sense Model STD-1000-AC-2M
Tubular Handling Cameron TTS/JiM 10T LR, 3-1/2" to 9-3/4" OD drill pipe & drill collar Make-up torque 103,300ft-lb Break-out torque 147,500ft-lb (Fully mechanised)
Mud Pumps (3) Wirth TPK 2200 triplex pumps, each driven by 2,200hp (GE AC motor) 7,500 psi rated
Solids Control (5) NOV/VSM-300 shale shakers

Power & Machinery

Main Power (6) Caterpillar 3516C-HD diesel engines rated at 1,525hp at 1200rpm each with Caterpillar generator rated to 1,530kW
Emergency Power (1) Caterpillar C32 diesel engine rated at 1,200hp at 1,800rpm with Caterpillar generator rated to 900kW

Storage Capacities

Fuel Oil 4,150 bbls
Liquid Mud 5,493 bbls
Base Oil 1,340 bbls
Brine 1,340 bbls
Drill Water 9,963 bbls
Potable Water 3,428 bbls
Bulk Material (mud + cement) 18,000 cu-ft
Sack Storage 5,000 sacks

BOP & Well Control Equipment

BOP Rams (1) Cameron Double "U" rams 21-1/4" 5k psi BOP
..... (1) Cameron Double "U" rams 20-3/4" 3k psi BOP
..... (2) Cameron Double 'TL' rams 18-3/4" 15k psi BOP
..... (2) Cameron Double "U" rams 13-5/8" 10k psi BOP
BOP Annular (1) Shaffer Annular 21-1/4" 2k psi BOP
..... (1) Cameron Annular 21-1/4" 5k psi BOP
..... (1) Cameron 'DL' Annular 18-3/4" 10k psi BOP
..... (1) Hydril GK Annular 13-5/8" 5k psi BOP
BOP Handling (2) TTS BOP main hoists, rated 75mt each
Diverter Vetco KFDJ 500, 49-1/2" diverter rated to 500psi with 16" flow line, (2) 14" overboard lines

Mooring Equipment

Mooring Winches (4) MEP-Pellegrini electric winches rated at 88,000 lbs pull 100mt brake holding
Anchor Lines 3000ft x 2" galvanized wire rope
Anchors (4) Flipper Delta anchor, 16,500 lbs each

Cranes

Cranes (3) Liebherr cranes, 75mt capacity, 120ft boom

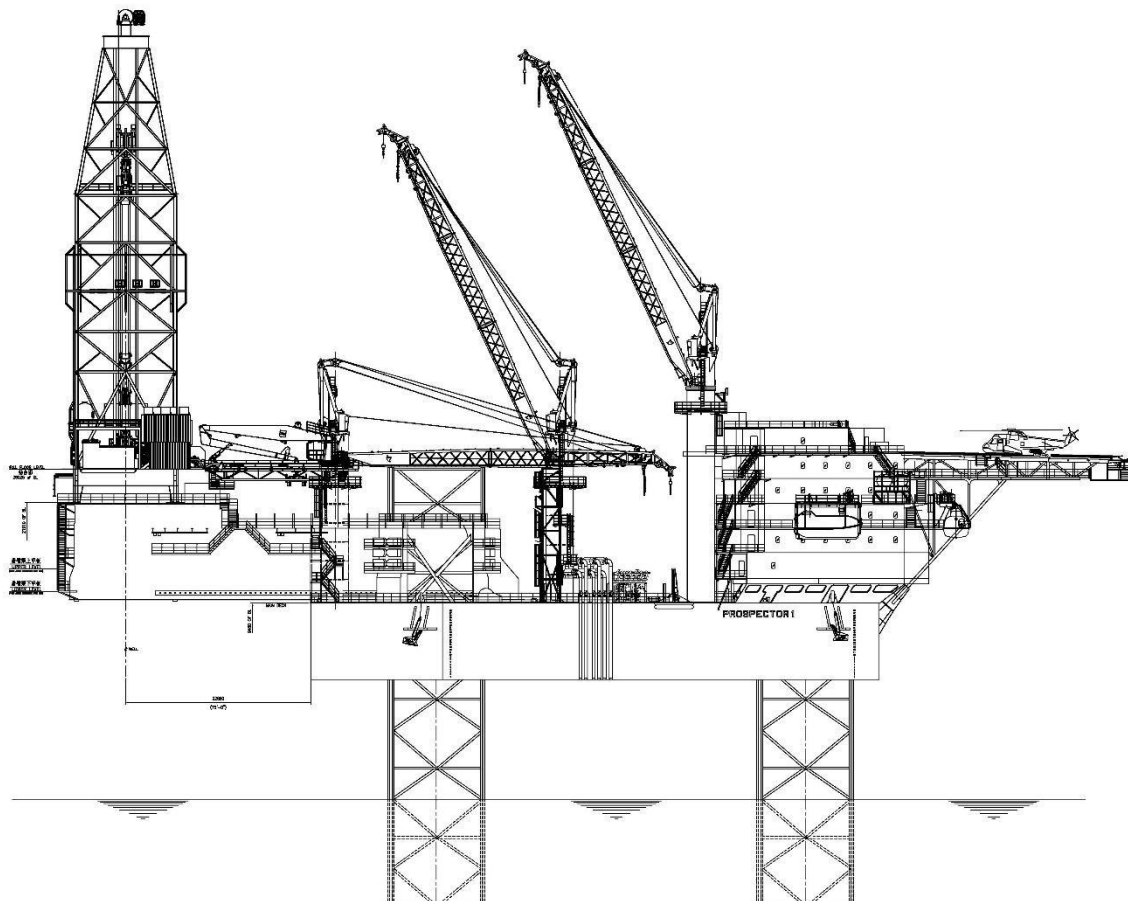
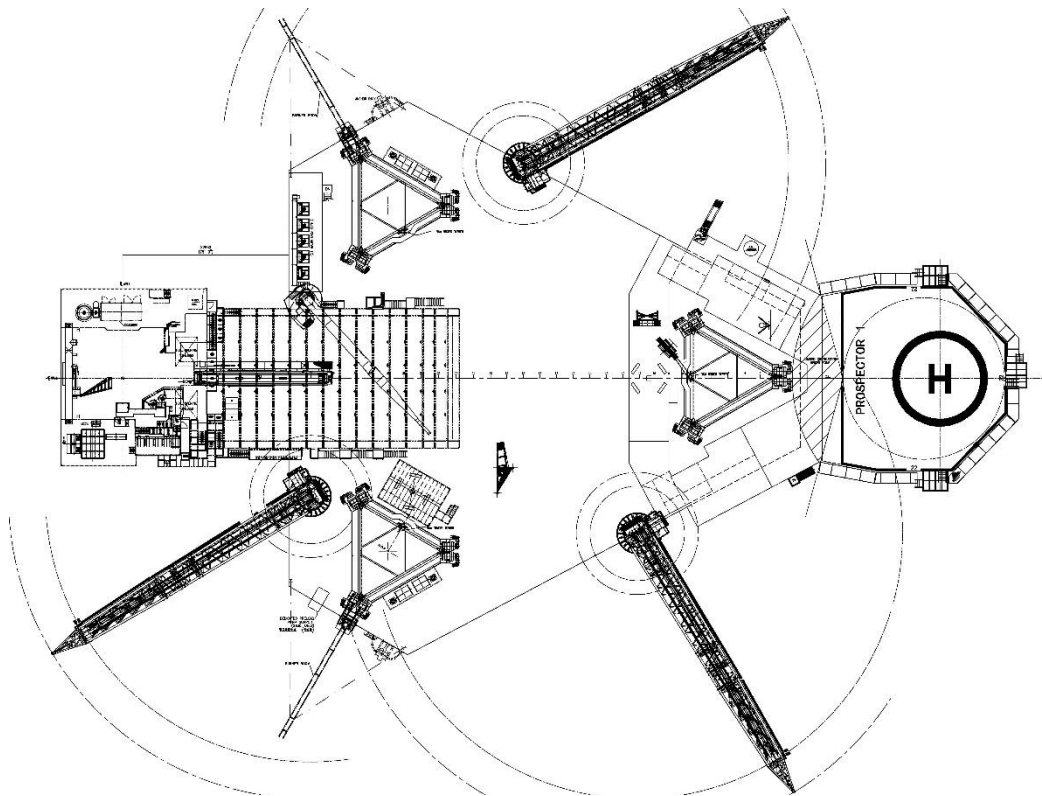
Special Features & Other Information

CTU TSC 600 kips Load (primary) and 300 kips Load (Secondary)
MPD & HPHT Equipped for MPD and HPHT operations
Helideck Rated for Sikorsky S-61 and S-92 helicopters. CAP 437
Offline Systems:
Iron Roughneck (1) Cameron JiM10T LR Iron Roughneck. 3-1/2" to 9-3/4" OD
Pipe Rack KBC (1) Cameron TTS Pipe Rack Knuckle Boom Crane of 5.5 st
Pipe Handling (1) Cameron TTS SmartRacker 10 mt OAC (Offline Activity Crane) capable of offline pipehandling



These specifications are intended for general reference purposes only, as actual equipment and specifications may vary based upon subsequent changes, the contract situation and customer needs. All equipment shall be operated and maintained at all times, in compliance with Borr Drilling standard operating manuals, policies and procedures, and within its stated operational limits or continuous rated capacity, in order to assure maximum operational efficiency.

Prospector 1





2. MEETRESULTATEN GENERATOREN

Emission measurements on the Prospector 1 platform of Borr Drilling

Client number : 102791
Location : Prospector 1
Att. : 

Date	Revision	Author
21-10-2020	0	



SUMMARY

On 13 October 2020 KW3 B.V. has performed emission measurements on six diesel generators which are placed on the Prospector 1 of Borr Drilling. The measurements were performed for Borr Drilling. The air measurements were performed to establish the following components;

- NO_x , O_2 ;
- NH_3 .

The objective of these measurements was to determine the emissions during representative operation of the following installation:

Diesel engine 1, 3516C-HD PES00424
 Diesel engine 2, 3516C-HD PES00425
 Diesel engine 3, 3516C-HD PES00426
 Diesel engine 4, 3516C-HD PES00427
 Diesel engine 5, 3516C-HD PES00428
 Diesel engine 6, 3516C-HD PES00429

The measurements were performed in accordance with the EN ISO 17020 and EN 15259. The specific standards for each component are described in chapter 2.

The results are shown in table 0.1 and 0.2. All shown emission results are expressed in standard conditions which are a temperature of 273 kelvin and a pressure of 1013.25 mbar at dry flue gas and recalculated to 15% O_2 .

Table 0.1 Emission results NO_x diesel engines

		measurement 1	measurement 2	measurement 3	emission requirement
	component	concentration in mg/Nm^3 at 15 vol. % O_2			
Engine 1	NO_x as NO_2	36	35	36	150
Engine 2		32	32	35	
Engine 3		39	42	43	
Engine 4		39	38	37	
Engine 5		45	43	44	
Engine 6		48	47	47	

Table 0.2 Emission results NH_3 diesel engines

		measurement
	component	concentration in mg/Nm^3 at 15 vol. % O_2
Engine 1	NH_3	4.3
Engine 2		5.8
Engine 3		1.7
Engine 4		1.9
Engine 5		1.6
Engine 6		0.6

Sending list

1. [REDACTED] (Digital)
2. KW3 B.V. archive (1x)

Colophon

Project leader	:	[REDACTED]
Author	:	[REDACTED]
Technical manager (Check report and calculations)	:	[REDACTED]
Measurement technicians involved in implementation	:	[REDACTED]

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1 INTRODUCTION

1.1 Introduction

On 13 October 2020 KW3 B.V. has performed emission measurements on six diesel generators which are placed on the Prospector 1 of Borr Drilling. The measurements were performed for Borr Drilling. The air measurements were performed to establish the following components;

- NO_x , O_2 ;
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The objective of these measurements was to determine the emissions during representative operation of the following installation:

Diesel engine 1, 3516C-HD PES00424
Diesel engine 2, 3516C-HD PES00425
Diesel engine 3, 3516C-HD PES00426
Diesel engine 4, 3516C-HD PES00427
Diesel engine 5, 3516C-HD PES00428
Diesel engine 6, 3516C-HD PES00429

The measurements were performed in accordance with the EN ISO 17020 and EN 15259. The specific standards for each component are described in chapter 2.

The measurement system is explained in chapter 3. In chapter 4 the measurement program is described. Chapter 5 shows the results and conclusions. Finally, in Chapter 6, a short explanation of the measurements uncertainty is given.

2 ASSESSMENT FRAMEWORK AND INSTALLATIONS

2.1 Assessment framework

Basis voor emissie-eis	
Brandstof/afvalstof 1	
150	mg/Nm³ bij 15 vol% O₂
Art. 3.10e Voor dieselmotoren (<600 kWth) in de offshore kan onder voorwaarden via een maatwerkvoorschrift een afwijkende emissie-eis tot 930 mg/Nm³ worden gesteld (art 3.10e 4e en 5e lid).	

Diesel engines (<600 kWth)

In afwijking van het eerste lid kan het bevoegd gezag bij maatwerkvoorschrift een hogere emissiegrenswaarde voor stikstofoxiden vaststellen voor een dieselmotor met een nominaal thermisch ingangsvermogen van minder dan 600 kWth gelegen op een platform dat is gelegen binnen de Nederlandse exclusieve economische zone. De afwijkende emissiegrenswaarde voor stikstofoxiden bedraagt ten hoogste 930 mg/Nm³.

The measurement uncertainty of a maximum of 20% of the emission requirement is explained in favor of the license holder.

Performance measurements:

Measurements must be performed in accordance with applicable CEN standards. If there are no CEN standards, ISO standards, or national or international standards that provide data of equivalent quality, will be applied.

2.2 Installation description of the diesel engines

engine	Engine serial	Generator serial				
Engine 1	3516C-HD PES00424	9WZ00966	Caterpillar	3516CHD	Year 2011	1534 KW
Engine 2	3516C-HD PES00425	9WZ00967	Caterpillar	3516CHD	Year 2011	1534 KW
Engine 3	3516C-HD PES00426	9WZ00969	Caterpillar	3516CHD	Year 2011	1534 KW
Engine 4	3516C-HD PES00427	9WZ00968	Caterpillar	3516CHD	Year 2011	1534 KW
Engine 5	3516C-HD PES00428	9WZ00972	Caterpillar	3516CHD	Year 2011	1534 KW
Engine 6	3516C-HD PES00429	9WZ00970	Caterpillar	3516CHD	Year 2011	1534 KW

3 USED EQUIPMENT

3.1 Continuous measuring system KW3 B.V.

A schematic representation of the gas sampling system sampling system is shown in Appendix 1.

The system is made up of:

- a stainless steel suction probe incorporating an insulated filter;
- a heated sample hose with which the temperature of the extracted gases is conditioned at 160 °C;
- a measuring gas cooler. This cools the aspirated gases to remove the moisture present in these gases;
- a diaphragm pump with a pre-filter to capture dust particles.

From the main measuring gas line after the measuring gas cooler, a test gas-dried sample gas is offered for analysis on NO, NO_x, SO₂ and O₂.

Sampling and pre-treatment of the sample shall be carried out in accordance with NEN-EN 15259 and the following standards.

- A chemo luminescence monitor (Horiba PG 350) for the assessment of nitrogen oxides (NO, NO_x), inaccuracy less than 1% of the full scale (0-1000 vppm). The analyser is calibrated with a certified calibration span gas. The analysis of NO/NO_x is performed in accordance with EN 14792.
- Oxygen monitor, brand Horiba, type PG 350, operating according to the paramagnetic differential pressure principle, inaccuracy ± 0,5% of the smallest measuring range (0-10% O₂). The used range is 0 – 21 %. The analyzer is calibrated with outside air of 20.94 vol.% O₂. The analysis of O₂ is performed in accordance with EN 14789.

Before and after each measurement period, a two-point calibration has been performed for each analyser with nitrogen (zero gas) and sponges. The calibration is performed excluding the sampling system.

The span gas consists of a cylinder with nitrogen containing a known concentration of the component in question. The span gasses are supplied by a certified supplier and the analyses of the gasses are traceable to international standards.

For the analysers, measuring ranges and span gas used, see the appendices.

The registration system is connected to a data logger. Measurement data, such as flue gas, temperatures, pressures and the like, are presented in analogue form to the data logger, where the analog-digital conversion is performed. After this conversion, the measured values are transported to the computer. Further necessary calculations will take place in the office of KW3.

3.2 Discontinuous measuring system KW3 B.V.

NH₃

The concentration of NH₃ happens along wet-chemical way. The flue gas is hereby led via a heated filter and probe through a set of cooled impingers (glass bottles) with an adsorption liquid (0.05M H₂SO₄). The samples are rinsed in PTFE sample cans and kept below 20°C during storage and transportation to the laboratory. The concentrations have been determined afterwards in the laboratory.

Schematic overview of the sampling systems are shown in appendix 1, figure 1.

In the table below a list is presented with the measuring equipment used by KW3.

Table 3.1 Identification used equipment

Used analysers	
location	Prospector 1
Continu:	ID nummer
O ₂	KW3-1064
NO _x	KW3-1064
Natchemisch:	ID nummer
NH ₃	KW3-0141

3.3 Quality and safety

KW3 bv is accredited by the Accreditation Council (RvA) as explanatory conformity inspection body in accordance with the ISO/IEC 17020 accredited and is in possession of an accreditation statement. This statement has an attachment in which the exact scope of accreditation is described. The accredited topical scope is clear on the website of the RvA; www.rva.nl under number. I304. KW3 is by the RvA accredited as type A inspection company. This accreditation stands as a guarantee for impartial and independent measurements.

The accredited scope of operations includes the continuous sampling of gaseous flue gas components (NO_x, total unburned hydrocarbons (C_xH_y), O₂, CO₂, CO, SO₂), dioxins/furans, polycyclic aromatic hydrocarbons, HCl, HF, Hg, SO₂, NH₃, H₂S, volatile heavy metals, dust and dust bound components, as well as for the determination of physical parameters such as flue gas flow rate, temperature and moisture content.

KW3 is certified in accordance with the safety checklist contractors VCA methodology (VCA 2008/5.1). This means that an external certifying body shall review periodically this core values. All our staff are in the possession of a personal VCA certification; Vol-VCA. The LMRA methodology is always applied prior to the KW3 work.

For more detailed information about the accredited scope of operations of KW3 please visit the website of the RvA; www.rva.nl (search term I304). More info on QHSE related issues can be found on our website; www.kw3.nl.

3.4 Applied standards

The table below shows the standards that apply to the work performed.

Table 3.2 Overview applied standards

component	norm
Emission sampling	EN 15259
NH ₃	NEN 2826
O ₂	EN 14789
NO _x als NO ₂	EN 14792

4 MEASURING PROGRAM

4.1 General

The entire measurement programs of the diesel engines were performed on 13 October 2020. During the measurements the engines was driven by normal day by day conditions. For NO_x three samples per engine were taken. For NH₃ one sample per engine was taken.

Table 4.1 and 4.2 shows the measurement program.

Table 4.1 Measuring program NO_x

Installation	Platform	Date	Time period
Engine 1	Prospector 1	13 October 2020	
Engine 2			14:21 – 15:06
Engine 3			15:46 – 16:31
Engine 4			06:50 – 07:35
Engine 5			07:50 – 8:35
Engine 6			10:23 – 11:08

Table 4.2 Measuring program NH₃

Installation	Platform	Date	Time period
Engine 1	Prospector 1	13 October 2020	11:52 – 12:32
Engine 2			14:21 – 15:01
Engine 3			15:46 – 16:26
Engine 4			6:51 – 7:31
Engine 5			7:45 – 8:25
Engine 6			10:24 – 11:04

4.2 Operation conditions

The generator performed at standard process conditions during the measurements. All engines were on load between 60 and 80%. See appendix 4.

4.3 Description measuring place

Table 4.2 Description measuring area

Parameters position measuring surface	Criteria	Engines
Placement stack at measuring surface	horizontal / vertical	horizontal
distance after disturbance	> 5 x Dn.	compliant
distance straight duct after measuring surface	> 2 x Dn.	compliant
distance till outlet stack	> 5 x Dn.	compliant

The sampling point was short after the engine. Only one measuring port was available. Photos of the measuring points can be found in appendix 8.

4.4 Calculation of emissions

The flue gas concentrations are measured in vppm. Conversion of vppm to mg / Nm³ is done according to the following factors:

- NO_x vppm multiplied by 2.0538; Being the molar mass of NO₂ (46.0055 kg / kmol) divided by the molar volume of NO (22.4 m³ / kmol);

De NO_x concentration is calculated to 15 vol. % O₂ according to the following formula:

$$E_{ref} = E_m * \frac{21 - O_{2,ref}}{21 - O_{2,m}}$$

met:

- | | | |
|----------------------|--|------------------------|
| - E _{ref} | = Concentration at reference O ₂ -gehalte | [mg/Nm ³]; |
| - E _m | = measured concentration at actual O ₂ | [mg/Nm ³]; |
| - O _{2,ref} | = reference O ₂ -gehalte | [vol.%]; |
| - O _{2,m} | = measured O ₂ -gehalte | [vol.%]; |
| - 21 | = O ₂ -concentration in dry air | [vol.%]. |

4.5 Deviations on quote or used standard

The measurements were performed short after the engines.

5 EMISSION RESULTS

5.1 Measuring results

This chapter presents the measurement and calculation results obtained. In Appendix 2 and 3, the measurement and calculation results are presented in extensive form.

The results are shown in table 5.1 and 5.2 All shown emission results are expressed in standard conditions which are a temperature of 273 kelvin and a pressure of 1013.25 mbar at dry flue gas and recalculated to 15% O₂.

Table 5.1 Emission results NO_x diesel engines

		measurement 1	measurement 2	measurement 3	emission requirement
	Component	concentration in mg/Nm ³ at 15 vol. % O ₂			
Engine 1	NO _x as NO ₂	36	35	36	150
Engine 2		32	32	35	
Engine 3		39	42	43	
Engine 4		39	38	37	
Engine 5		45	43	44	
Engine 6		48	47	47	

Table 5.2 Emission results NH₃ diesel engines

		measurement 1
	component	concentration in mg/Nm ³ at 15 vol. % O ₂
Engine 1	NH ₃	4.3
Engine 2		5.8
Engine 3		1.7
Engine 4		1.9
Engine 5		1.6
Engine 6		0.6

6 MEASUREMENT UNCERTAINTY

6.1 Measuring uncertainty KW3

Measurement uncertainty indicates the uncertainty of a measured value of a given quantity. Each measurement performed has some degree of uncertainty. A method has been established within the VKL (Association of Quality Air Measurements) for measuring uncertainties. The calculations are based on cumulative measurement uncertainties, reduced to 1 u absolute. Then, the measurement of the square squared of the applicable partial error sources is taken per measurement. For the calculation of the total measurement uncertainty at a 95% confidence interval, there are multiplied by two. The relative measurement uncertainty is calculated by the quotient of absolute measurement uncertainty and the measured value.

Based on a calculation tool prepared by the VKL regarding performance characteristics of emission measurements, a current uncertainty is calculated. In addition to the current uncertainty, a measurement must meet uncertainties according to applied standards and guidelines. See the tables below for the uncertainties. The measurement uncertainty is presented as the 95% confidence interval.

Table 6.1 Overview measuring uncertainty

Algemene gegevens				
Referentienummer	20200099			
Meetlocatie	engines			
Meting uitgevoerd door	AvM			
Continue meting	eenheid		resultaat	
			meetonzekerheid	
			[absoluut]	[%]
O ₂	vol. %	12.5	0.45	3.6
NO _x (als NO ₂)	mg/Nm ³	54.0	9.05	16.8
CO	mg/Nm ³	9.6	5.96	62.2
Discontinue meting	fase		resultaat	
			meetonzekerheid	
			[absoluut]	[%]
NH ₃	gasvormig	mg/Nm ³		

6.2 Measuring uncertainty according to activity decree

In the license, the competent authority may determine that the company (or the measurement agency) must determine the measurement uncertainty of the measurement. The value of the measurement uncertainty of a particular measurement result is important for the review must therefore be reported in an insightful manner by the company / the measurement agency. Instead, the following values can also be included in the license and used for any correction on the measured value.

Table 6.2 Overview measuring uncertainty

component	Maximum uncertainty [%]
NO _x	20
other components	40

APPENDICES

Appendix 1 Schematic view measuring systems

Figure 1 Schematic overview continuous measurement system

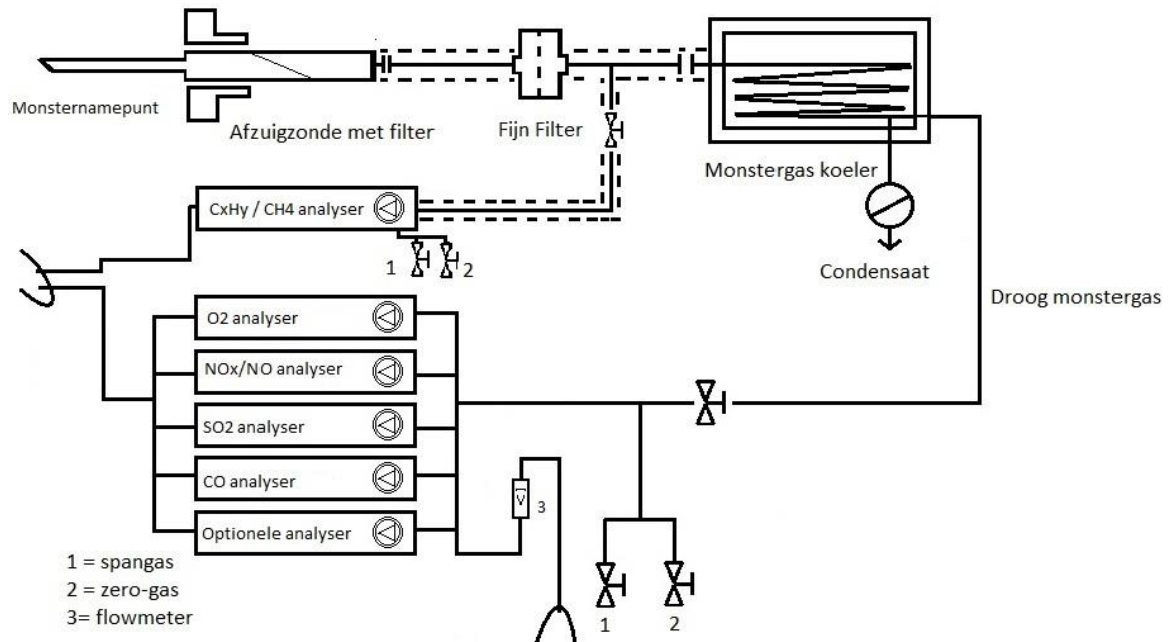
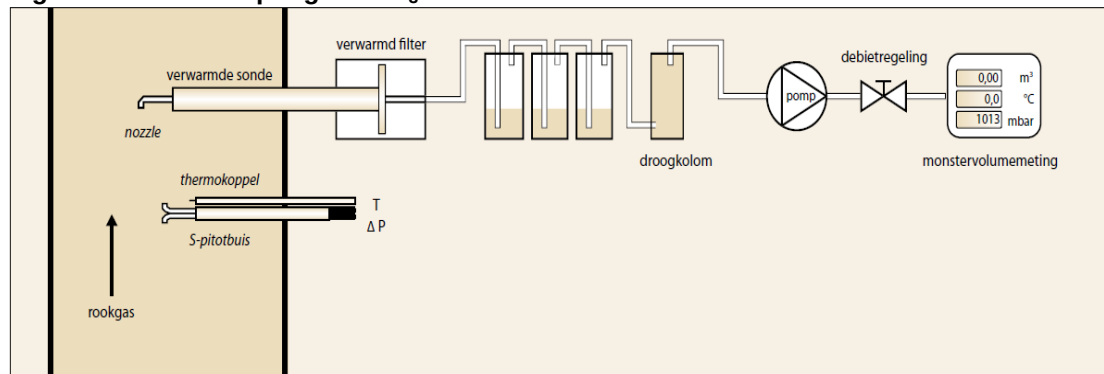


Figure 2 Sampling for NH₃



Appendix 2 Emission results

Engine 1

Bedrijf	Borr Drilling Prospector 1				
Installatie	engine 1				
Datum	13-okt-20				
Software versie	Software versie 6.19				
Meting			1	2	3
Datum			13-okt-20	13-okt-20	13-okt-20
Meetperiode	van	[uur]	12:15	12:30	12:45
	tot	[uur]	12:30	12:45	13:00
Meetduur		[min]	00:15	00:15	00:15
Fuel (oil) consumption		[kg/h]	277		
Fuel (oil) consumption	B	[l/h]	326		
SCR Ureum flow	B	[l/min]	0.16		
Flue gas comonents					
Flue gas temperature		[°C]	381		
CO ₂ -gehalte	dry	[vol.%]	6.45	6.42	6.52
O ₂ -gehalte	dry	[vol.%]	12.08	12.09	11.89
CO-gehalte	dry	[vppm]	<3.0	<3.0	<3.0
CO-gehalte	dry	[mg/Nm ³]	<3.8	<3.8	<3.8
Concentratie betrokken op 15 vol. % O2	dry	[mg/Nm ³]	<2.5	<2.5	<2.5
NO _x -gehalte als NO	dry	[vppm]	26	25	27
NO _x -emissie als NO ₂	dry	[mg/Nm ³]	54	52	55
Concentratie betrokken op 15 vol. % O2	dry	[mg/Nm ³]	36	35	36

Engine 2

Bedrijf		Borr Drilling Prospector 1			
Installatie		engine 2			
Datum		13-okt-20			
Software versie		Software versie 6.19			
Meting			1	2	3
Datum			13-okt-20	13-okt-20	13-okt-20
Meetperiode		van [uur]	14:21	14:36	14:51
		tot [uur]	14:36	14:51	15:06
Meetduur		[min]	00:15	00:15	00:15
Fuel (oil) consumption		[kg/h]	277.95		
Fuel (oil) consumption B		[l/h]	327		
SCR Ureum flow B		[l/min]	0.16		
Flue gas comonents					
Flue gas temperature		[°C]	381		
CO ₂ -gehalte dry		[vol.%]	6.28	6.27	6.25
O ₂ -gehalte dry		[vol.%]	12.29	12.21	12.21
CO-gehalte dry		[vppm]	17.5	10.7	7.8
CO-gehalte dry		[mg/Nm ³]	21.8	13.4	9.8
Concentratie betrokken op 15 vol. % O2 dry		[mg/Nm ³]	15.0	9.1	6.7
NO _x -gehalte als NO dry		[vppm]	23	23	25
NO _x -emissie als NO ₂ dry		[mg/Nm ³]	47	47	51
Concentratie betrokken op 15 vol. % O2 dry		[mg/Nm ³]	32	32	35

Engine 3

Bedrijf	Borr Drilling Prospector 1				
Installatie	engine 3				
Datum	13-okt-20				
Software versie	Software versie 6.19				
Meting			1	2	3
Datum			13-okt-20	13-okt-20	13-okt-20
Meetperiode	van	[uur]	15:46	16:01	16:16
	tot	[uur]	16:01	16:16	16:31
Meetduur		[min]	00:15	00:15	00:15
Fuel (oil) consumption		[kg/h]	292.40		
Fuel (oil) consumption	B	[l/h]	344		
SCR Ureum flow	B	[l/min]	0.15		
Flue gas comonents					
Flue gas temperature		[°C]	365		
CO ₂ -gehalte	dry	[vol.%]	6.37	6.37	5.18
O ₂ -gehalte	dry	[vol.%]	12.06	12.06	13.64
CO-gehalte	dry	[vppm]	<3.0	<3.0	<3.0
CO-gehalte	dry	[mg/Nm ³]	<3.8	<3.8	<3.8
Concentratie betrokken op 15 vol. % O ₂	dry	[mg/Nm ³]	<2.5	<2.5	<2.5
NO _x -gehalte als NO	dry	[vppm]	29	30	25
NO _x -emissie als NO ₂	dry	[mg/Nm ³]	59	62	52
Concentratie betrokken op 15 vol. % O ₂	dry	[mg/Nm ³]	39	42	43

Engine 4

Bedrijf	Borr Drilling Prospector 1				
Installatie	engine 4				
Datum	13-okt-20				
Software versie	Software versie 6.19				
Meting			1	2	3
Datum			13-okt-20	13-okt-20	13-okt-20
Meetperiode	van	[uur]	6:50	7:05	7:20
	tot	[uur]	7:05	7:20	7:35
Meetduur		[min]	00:15	00:15	00:15
Fuel (oil) consumption		[kg/h]	212.50		
Fuel (oil) consumption	B	[l/h]	250		
SCR Ureum flow	B	[l/min]	0.15		
Flue gas comonents					
Flue gas temperature		[°C]	383		
CO ₂ -gehalte	dry	[vol.%]	6.12	6.16	6.15
O ₂ -gehalte	dry	[vol.%]	12.53	12.45	12.44
CO-gehalte	dry	[vppm]	6.8	6.7	9.5
CO-gehalte	dry	[mg/Nm ³]	8.5	8.4	11.9
Concentratie betrokken op 15 vol. % O2	dry	[mg/Nm ³]	6.0	5.9	8.3
NO _x -gehalte als NO	dry	[vppm]	27	26	26
NO _x -emissie als NO ₂	dry	[mg/Nm ³]	54	54	53
Concentratie betrokken op 15 vol. % O2	dry	[mg/Nm ³]	39	38	37

Engine 5

Bedrijf	Borr Drilling Prospector 1				
Installatie	engine 5				
Datum	13-okt-20				
Software versie	Software versie 6.19				
Meting			1	2	3
Datum			13-okt-20	13-okt-20	13-okt-20
Meetperiode	van	[uur]	7:50	8:05	8:20
	tot	[uur]	8:05	8:20	8:35
Meetduur		[min]	00:15	00:15	00:15
Fuel (oil) consumption		[kg/h]			
Fuel (oil) consumption	B	[l/h]	-		
SCR Ureum flow	B	[l/min]	0.13		
Flue gas comonents					
Flue gas temperature		[°C]	394		
CO ₂ -gehalte	dry	[vol.%]	6.26	6.47	6.23
O ₂ -gehalte	dry	[vol.%]	12.29	11.99	12.31
CO-gehalte	dry	[vppm]	<3.0	<3.0	<3.0
CO-gehalte	dry	[mg/Nm ³]	<3.8	<3.8	<3.8
Concentratie betrokken op 15 vol. % O2	dry	[mg/Nm ³]	<2.5	<2.5	<2.5
NO _x -gehalte als NO	dry	[vppm]	32	31	31
NO _x -emissie als NO ₂	dry	[mg/Nm ³]	66	64	64
Concentratie betrokken op 15 vol. % O2	dry	[mg/Nm ³]	45	43	44

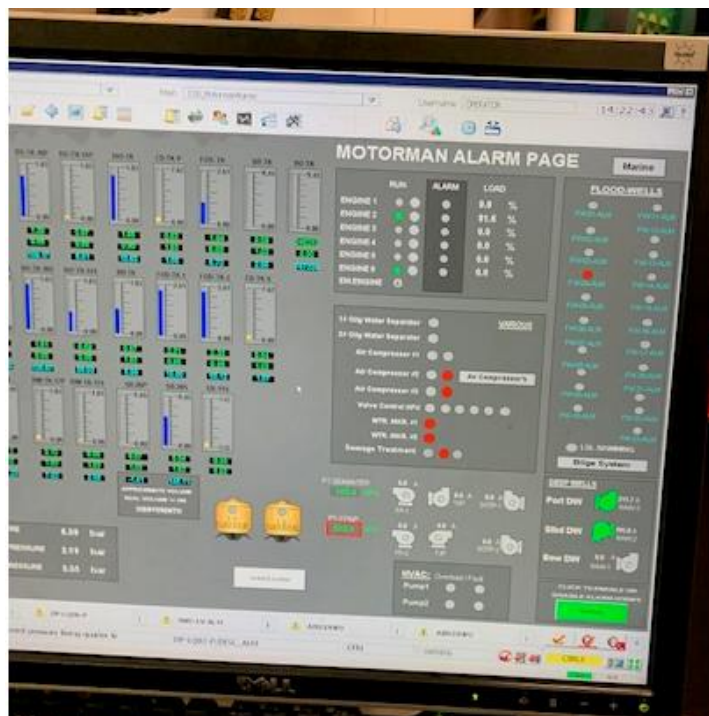
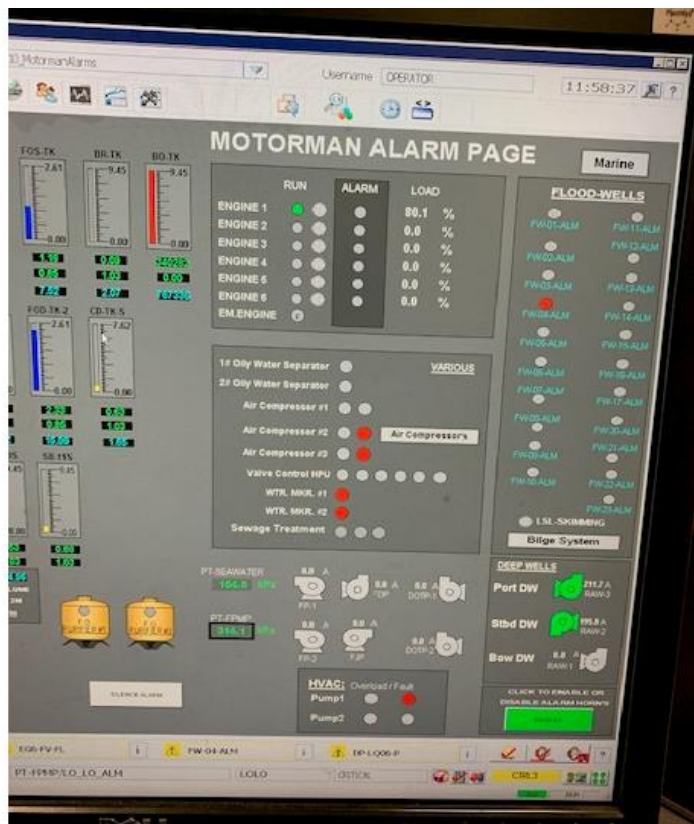
Engine 6

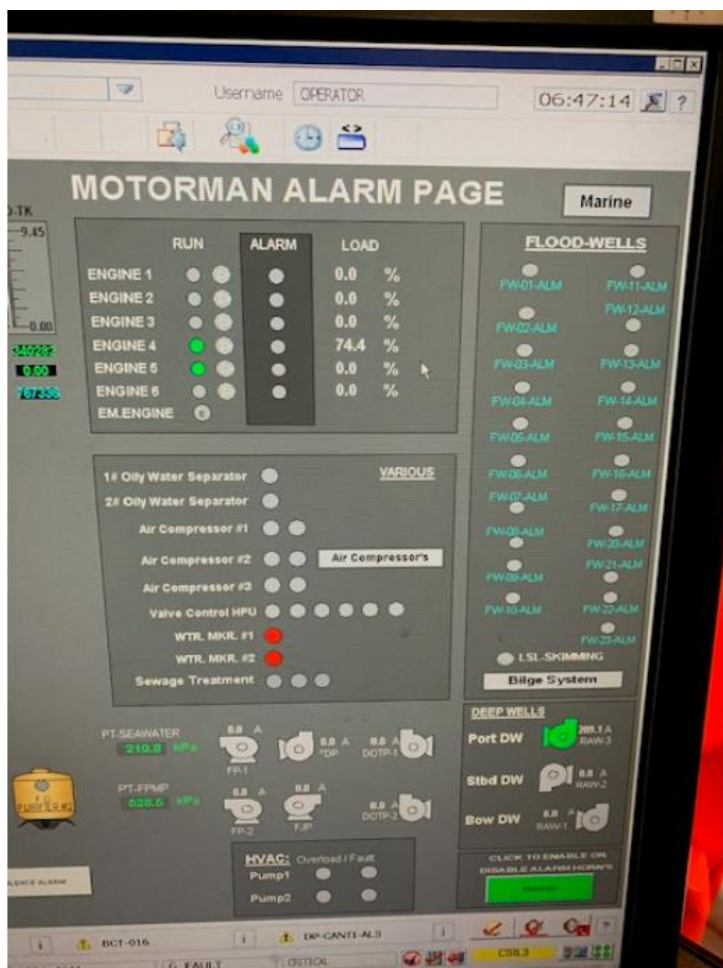
Bedrijf	Borr Drilling Prospector 1				
Installatie	engine 6				
Datum	13-okt-20				
Software versie	Software versie 6.19				
Meting			1	2	3
Datum			13-okt-20	13-okt-20	13-okt-20
Meetperiode	van	[uur]	10:23	10:38	10:53
	tot	[uur]	10:38	10:53	11:08
Meetduur		[min]	00:15	00:15	00:15
Fuel (oil) consumption		[kg/h]	249		
Fuel (oil) consumption	B	[l/h]	293		
SCR Ureum flow	B	[l/min]	0.10		
Flue gas comonents					
Flue gas temperature		[°C]	399		
CO ₂ -gehalte	dry	[vol.%]	6.14	6.14	6.11
O ₂ -gehalte	dry	[vol.%]	12.49	12.44	12.47
CO-gehalte	dry	[vppm]	3.2	<3.0	<3.0
CO-gehalte	dry	[mg/Nm ³]	3.9	<3.8	<3.8
Concentratie betrokken op 15 vol. % O2	dry	[mg/Nm ³]	2.8	<2.5	<2.5
NO _x -gehalte als NO	dry	[vppm]	33	33	32
NO _x -emissie als NO ₂	dry	[mg/Nm ³]	68	67	66
Concentratie betrokken op 15 vol. % O2	dry	[mg/Nm ³]	48	47	47

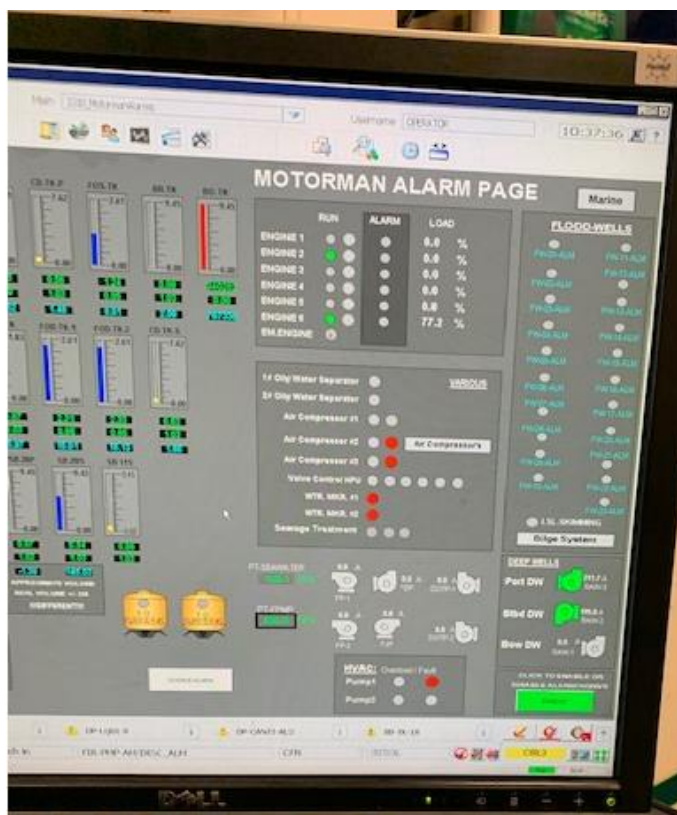
Appendix 3 Measuring results NH3

Installatie	engine 4	apparatuur	KW3-0141					
Projectnummer	20200099							
Component	NH ₃							
Software versie	Software versie 6.19	engine 4	engine 5	engine 6	engine 1	engine 2	engine 3	
Meting		1	2	3	4	5	6	
Meetdatum		13-Oct-20	13-Oct-20	13-Oct-20	13-Oct-20	13-Oct-20	13-Oct-20	
Meetperiode	van [uur]	6:51	07:45	10:24	11:52	14:21	15:46	
	tot [uur]	7:31	08:25	11:04	12:32	15:01	16:26	
Meetduur	[uren]	00:40	00:40	00:40	00:40	00:40	00:40	
Barometerstand	[mbar]	1007	1007	1007	1009	1009	1009	
Bemonsteringgegevens								
Afgelezen temp. meetlans	[°C]	150						
Aflezings gasmeter begin	droog [m ³]	9.159	9.345	9.533	9.717	9.902	10.087	
Aflezings gasmeter eind	[m ³]	9.345	9.533	9.717	9.902	10.086	10.265	
Temperatuur gasmeter begin	[°C]	28	28	28	29	30	29	
Temperatuur gasmeter eind	[°C]	28	28	29	30	30	29	
Afgezogen volgens gasmeter	droog [Nm ³]	0.168	0.169	0.166	0.166	0.165	0.160	
Emissiegegevens								
Concentratie NH ₃	droog [mg/Nm ³]	2.72	2.39	0.86	6.32	8.53	2.53	
Gemeten O ₂ concentratie	[vol %]	12.49	12.13	12.47	12.12	12.23	12.05	
Concentratie NH ₃ bij 15 vol% O ₂	[mg/Nm ³]	1.91	1.62	0.60	4.27	5.84	1.69	
Blanco	[mg/Nm ³]	0.08						

Appendix 4 Engine load during measurements







Appendix 5 Laboratory results NH3

AL-West B.V.

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KW3

Datum 22.10.2020
Relatienr 35009130
Opdrachtnr. 983660

ANALYSERAPPORT

Opdracht 983660 Gas/Lucht

Opdrachtgever 35009130 KW3
Uw referentie 20200099
Opdrachtacceptatie 19.10.20
Monsternemer Opdrachtgever

Geachte heer, mevrouw,

Hierbij zenden wij u de resultaten van het door u aangevraagde laboratoriumonderzoek.

Dit rapport mag alleen in zijn geheel worden gereproduceerd. Eventuele bijlagen zijn onderdeel van het rapport.

Indien u nog vragen heeft of aanvullende informatie wenst, verzoeken wij u om contact op te nemen met Klantenservice.

Wij vertrouwen erop u met de toegezonden informatie van dienst te zijn.

Met vriendelijke groet,

AL-West B.V.
Klantenservice

Tel. [redacted]

In dit document worden vermeld, zijn geaccrediteerd volgens ISO/IEC 17025:2005. Alleen niet-geaccrediteerde parameters / resultaten zijn gemarkeerd met het symbool "n".

AL-West B.V.

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Opdracht 983660 Gas/Lucht

Monsternr.	Monstersomschrijving	Monstemame	Monstemamepunt
182336	NH3 blanco 13-10-2020	13.10.2020	
182337	M4 NH3 13-10-2020	13.10.2020	
182338	M5 NH3 13-10-2020	13.10.2020	
182339	M6 NH3 13-10-2020	13.10.2020	
182340	M1 NH3 13-10-2020	13.10.2020	

Eenheid	182336	182337	182338	182339	182340
	NH3 blanco 13-10-2020	M4 NH3 13-10-2020	M5 NH3 13-10-2020	M6 NH3 13-10-2020	M1 NH3 13-10-2020

Klassiek Chemische Analyses

Ammonium (als N) (impinger)	mg/l	<0,1	3,2	2,4	0,8	7,2
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Overig onderzoek

Volume	ml	107 *	117 *	139 *	146 *	120 *
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De parameters die in dit document worden vermeld, zijn geaccrediteerd volgens ISO / IEC 17025: 2005. Alleen niet-geaccrediteerde parameters / resultaten zijn gemarkeerd met het symbool ***.

Kamer van Koophandel: Directeur
Nr. 08110898
VAT/BTW-ID-Nr.:
NL 811132559 B01

Blad 2 van 3





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Opdracht 983660 Gas/Lucht

Monsternr.	Monstersomschrijving	Monstemame	Monstemamepunt
182341	M2 NH3 13-10-2020	13.10.2020	
182342	M3 NH3 13-10-2020	13.10.2020	

Eenheid 182341 182342
M2 NH3 13-10-2020 M3 NH3 13-10-2020

Klassiek Chemische Analyses

Ammonium (als N) (impinger) mg/l 9,9 2,8

Overig onderzoek

Volume ml 117 * 119 *

Verklaring: "*" of n.a. betekent dat het gehalte van de component lager is dan de rapportagegrens.

De parameter-specifieke meetonzekerheid en informatie over de berekeningsmethode zijn op aanvraag beschikbaar, indien de gerapporteerde resultaten boven de parameterspecifieke rapportagegrens liggen.

Begin van de analyses: 13.10.2020
Einde van de analyses: 22.10.2020

De resultaten hebben uitsluitend betrekking op de geanalyseerde monsters. In gevallen waarin het testlaboratorium niet verantwoordelijk was voor de bemonstering, gelden de gerapporteerde resultaten voor de monsters zoals zij zijn ontvangen.

AL-West B.V. |
Klantenservice

Toegepaste methoden

conform NEN-ISO 15923-1: Ammonium (als N) (Impinger)
Eigen methode; bepaling op massa-basis: Volume *

Kamer van Koophandel
Nr. 08110898
VAT/BTW-ID-Nr.:
NL 811132559 B01

Directeur

Blad 3 van 3



Appendix 6 Control sheets continuous measurements KW3

Installatie : Borr Drilling Prospector 1 Opdrachtnummer : 20200099 Meettechnici : AvM Datum : 13-okt-20 Revisie versie en datum : Software versie 6.19																	
Controlesheet kalibratie en drift										1e controle voor en na kalibratie direct op monitoren				controle drift direct op analyzers			
Datum en tijd : 13-10-20 6:45 Installatie : Borr Drilling Prospector 1										1 : 13-10-20 16:38				2 :			
	ID-code		Range	Wkgas		zero	span	zero		zero	span	zero					
O ₂ vol. %	KW3-1064	Horiba PG350	0-21	20.95	Call. Just.	0.05	21.04			0.07	20.83						
NO _x vppm	KW3-1064	Horiba PG350	0-100	80.3	Call. Just.	0.3	77.0			0.2	78.7						
CO vppm	KW3-1064	Horiba PG350	0-100	80.7	Call. Just.	0.3	79.5			0.0	79.8						
Converter rendement NO ₂ [%]: >98%				Waarden:					Acties:								
				= drift < 2%					Geen actie								
				= drift > 2 < 5 %					Meetdata corrigeren voor drift								
				= drift > 5 %					Meetdata afkeuren								

Appendix 7 Accreditation certificate KW3 B.V.

RAAD VOOR ACCREDITATIE 

Postbus 2768 3500 GT Utrecht

De Stichting Raad voor Accreditatie,
bij wet aangewezen als de nationale accreditatie-instantie voor Nederland,
verklaart hierbij accreditatie te hebben verleend aan:

**KW3 B.V.
Veenendaal**

De instelling heeft aangetoond in staat te zijn inspecties, als type **A** inspectie-
instelling, op een competente, consistente en onafhankelijke wijze uit te voeren.

Deze accreditatie is gebaseerd op een beoordeling tegen de vereisten zoals
vastgelegd in EN ISO/IEC 17020:2012.

De accreditatie is van toepassing op de activiteiten zoals gespecificeerd in de
gewaarmerkte bijlage die is voorzien van het registratienummer.

De accreditatie is van kracht, onder voorwaarde dat de instelling
blijft voldoen aan de vereisten.

De accreditatie voor registratienummer:

I 304

is verleend op 29 januari 2015

Deze verklaring is geldig tot
01 juni 2024

Het bestuur van de Raad voor Accreditatie,
namens deze,



De Stichting Raad voor Accreditatie is ondertekenaar van de European co-operation for Accreditation (EA)
Multilateral Agreement voor accreditatie in dit werkgebied.

Appendix 8 Photos installations

