

บริเวณหน้าประตูระบายน้ำ และบริเวณหลังประตูระบายน้ำ
(นอกมาตรการ EIA)



Analysis / Test Report



TESTING
No.0009

Client : Ratchaburi Power Co., Ltd.

245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 70130

P/O : #กฤษฎาพรPL-CH2021-003/SHE

Project Name : Monitoring EIA

Project Location :

Lot ID: 2278885

Date Received : Jul 20, 2022

Date Reported : Jul 27, 2022

Report Number : 2387231-1

Page 1 of 1

Sample Number	2278885-1					
Sampled Date	Jul 20, 2022 8:50 AM					
Sample Description	Surface Water					
Location	คลองบางช้าง : หมู่บ้านสุขุมวิท (GPS 47P 0593438 , 1501022)					
Date Analysis Commenced	Jul 21, 2022					
Condition of Sample	Contained in two BOD bottles and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method
Water Testing						
BOD (5 days at 20 degree C) *	mg/L	-	2	4	≤2	Based on APHA (2017), 5210 B
Conductivity at 25 degree C *	micromhos/cm	-	0.5	1557	No Standard	Based on APHA (2017), 2510 B
Dissolved Oxygen *	mg/L	-	0.1	4.1	≥4	Based on APHA (2017), 4500-O (C)
pH at 25 degree C	-	-	-	8.4	5.0-9.0	Based on APHA (2017), 4500-H (B)
Temperature *	Degree C	-	-	30.8	n ^o	Based on APHA (2017), 2550 B

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)

n^o: Change from Natural condition not more than 3 degree C

n^o: Not Change from natural condition

Sampled By : Prapote Wannachoochai

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Approved by

Siriluk P.

Siriluk Puengpar
Supervisor

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Analysis / Test Report



TESTING
No.0009

Client : Ratchaburi Power Co., Ltd.

245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 70130

P/O : #กฤษฎาพรPL-CH2021-003/SHE

Project Name : Monitoring EIA

Project Location :

Lot ID: 2278892

Date Received : Jul 20, 2022

Date Reported : Jul 27, 2022

Report Number : 2356380-1

Page 4 of 9

Sample Number	2278892-4					
Sampled Date	Jul 20, 2022 8:50 AM					
Sample Description	น้ำผิวดิน					
Location	คลองบางช้าง : หมู่บ้านสุขุมวิท (GPS 47P 0593438 , 1501022)					
Date Analysis Commenced	Jul 21, 2022					
Condition of Sample	Contained in one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method
Water Testing						
COD	mg/L	1.5	5	22	No Standard	Based on APHA (2017), 5220 D

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)

n^o: Change from Natural condition not more than 3 degree C

n^o: Not Change from natural condition

Sampled By : Prapote Wannachoochai

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Approved by

Sithichok T.

Sithichok Thonggunen
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Analysis / Test Report



TESTING
No.0009

Client : Ratchaburi Power Co., Ltd.

245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 70130

P/O : #รพชวพรPL-CH2021-003/SHE

Project Name : Monitoring EIA

Project Location :

Lot ID: 22106573

Date Received : Sep 15, 2022

Date Reported : Sep 23, 2022

Report Number : 2444276-1

Page 1 of 1

Sample Number	22106573-1					
Sampled Date	Sep 15, 2022 10:20 AM					
Sample Description	Surface 8 ater					
Location	9aพลาบร : น พละบร ๗ ๗ PS 47P 05(343G, 1501022)					
Date Analysis Commenced	Sep 16, 2022					
Condition of Sample	Contained in two BOD bottles and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method
Water Testing						
BOD 5 days at 20 degree C	mg/L	-	2	x 2	≤2	Based on APHA ๗017, 5210 B
Conductivity at 25 degree C	micromhos/cm	-	0.5	1156	No Standard	Based on APHA ๗017, 2510 B
Dissolved Oxygen	mg/L	-	0.1	2.7	4	Based on APHA ๗017, 4500-O ๔C
pH at 25 degree C	-	-	-	7.5	5.0- ๗.0	Based on APHA ๗017, 4500-H ๔B
Temperature	Degree C	-	-	2๗.๔	nQ	Based on APHA ๗017, 2550 B

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)
nQ Change from Natural condition not more than 3 degree C
n : Not Change from natural condition
Sampled By : Prapot Wannachochai

Remark :
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- < < : Lower than LOD (Limit of Quantitation) / LOR (Limit of Reporting)
- Analytes marked * is/are not included in scope of Accreditation ISO/IEC 17025.
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Approved by

Siriluk P.

Siriluk Puengpar
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Analysis / Test Report

Client : Ratchaburi Power Co., Ltd.

245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 70130

P/O : #รพชวพรPL-CH2021-003/SHE

Project Name : Monitoring EIA

Project Location :

Lot ID: 22106596

Date Received : Sep 15, 2022

Date Reported : Sep 22, 2022

Report Number : 2416711-1

Page 1 of 6

Sample Number	22106596-1					
Sampled Date	Sep 15, 2022 10:20 AM					
Sample Description	น้ำผิวดิน					
Location	พลาบร : พละบร ๗ ๗ (GPS 47P 0593438 , 1501022)					
Date Analysis Commenced	Sep 16, 2022					
Condition of Sample	Contained in one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method
Water Testing						
COD	mg/L	1.5	5	24	No Standard	Based on APHA (2017), 5220 D

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)
n : Change from Natural condition not more than 3 degree C
n : Not Change from natural condition
Sampled By : Prapot Wannachochai

Remark :
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Analysis / Test Report



TESTING
No.0009

Client : Ratchaburi Power Co., Ltd.

245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 70130

P/O : #กฏหมายรพค.ล-ค2021-003/SHE

Project Name : Monitoring EIA

Project Location :

Lot ID: 22130586

Date Received : 09/24/2022

Date Reported : Dec 01, 2022

Report Number : 250v33-1

Page 1 of 1

Sample Number	22130546-1					
Sampled Date	09/24/2022 10:15 AM					
Sample Description	Surface f. after					
Location	คลองบางช้าง : พลับพลาอยู่หน้า 8 WPS 47P 05(343v , 1501022 G					
Date Analysis Commenced	09/25/2022					
Condition of Sample	Contained in two 500 ml, two amber glass bottles and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA,) SEPAG					
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method Testing Location
Water Testing						
BUD 85 days at 20 degree CG *	mg/L	-	2	x 2	≤2	Based on APHA 82017G 5210 B Bangkok
Conductivity at 25 degree C *	micromhos/cm	-	0.5	636	0.0 Standard	Based on APHA 82017G 2510 B Bangkok
Dissolved U' ygen *	mg/L	-	0.1	3.4	≥4	Based on APHA 82017G 4500-U BCG Bangkok
pH at 25 degree C	-	-	-	7.5	5.0-8.0	Based on APHA 82017G 4500-H BCG Bangkok
Temperature *	Degree C	-	-	27.7	nQ	Based on APHA 82017G 2550 B Bangkok

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 Class 3G
n: Change from Natural condition not more than 3 degree C
n: Not Change from natural condition
Sampled By : Norasat Komal

Remark :
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Analysis / Test Report



TESTING
No.0009

Client : Ratchaburi Power Co., Ltd.

245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 70130

P/O : #กฏหมายรพค.ล-ค2021-003/SHE

Project Name : Monitoring EIA

Project Location :

Lot ID: 22130591

Date Received : Nov 24, 2022

Date Reported : Dec 01, 2022

Report Number : 2473392-1

Page 4 of 9

Sample Number	22130591-4					
Sampled Date	Nov 24, 2022 10:15 AM					
Sample Description	น้ำผิวดิน					
Location	คลองบางช้าง : พลับพลาอยู่หน้า 8 WPS 47P 0593438 , 1501022)					
Date Analysis Commenced	Nov 25, 2022					
Condition of Sample	Contained in one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method Testing Location
Water Testing						
COD *	mg/L	1.5	5	19	No Standard	Based on APHA (2017), 5220 D Bangkok

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)
n: Change from Natural condition not more than 3 degree C
n: Not Change from natural condition
Sampled By : Norasat Komal

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Analysis / Test Report



TESTING
No.0009

Client : Ratchaburi Power Co., Ltd.

245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 70130

P/O : #กฏหมายรพค.ล-ค2021-003/SHE

Project Name : Monitoring EIA

Project Location :

Lot ID: 22130586

Date Received : 09/24/2022

Date Reported : Dec 01, 2022

Report Number : 250v34-1

Page 1 of 1

Sample Number	22130546-2					
Sampled Date	09/24/2022 10:20 AM					
Sample Description	Surface f. after					
Location	คลองบางช้าง : พลับพลาอยู่หน้า 8 WPS 47P 05(340 , 1501002 G					
Date Analysis Commenced	09/25/2022					
Condition of Sample	Contained in two 500 ml, two amber glass bottles and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA,) SEPAG					
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method Testing Location
Water Testing						
BUD 85 days at 20 degree CG *	mg/L	-	2	x 2	≤2	Based on APHA 82017G 5210 B Bangkok
Conductivity at 25 degree C *	micromhos/cm	-	0.5	632	0.0 Standard	Based on APHA 82017G 2510 B Bangkok
Dissolved U' ygen *	mg/L	-	0.1	4.2	≥4	Based on APHA 82017G 4500-U BCG Bangkok
pH at 25 degree C	-	-	-	7.6	5.0-8.0	Based on APHA 82017G 4500-H BCG Bangkok
Temperature *	Degree C	-	-	27.6	nQ	Based on APHA 82017G 2550 B Bangkok

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 Class 3G
n: Change from Natural condition not more than 3 degree C
n: Not Change from natural condition
Sampled By : Norasat Komal

Remark :
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Analysis / Test Report



TESTING
No.0009

Client : Ratchaburi Power Co., Ltd.

245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 70130

P/O : #กฏหมายรพค.ล-ค2021-003/SHE

Project Name : Monitoring EIA

Project Location :

Lot ID: 22130591

Date Received : Nov 24, 2022

Date Reported : Dec 01, 2022

Report Number : 2473392-1

Page 5 of 9

Sample Number	22130591-5					
Sampled Date	Nov 24, 2022 10:20 AM					
Sample Description	น้ำผิวดิน					
Location	คลองบางช้าง : พลับพลาอยู่หน้า 8 WPS 47P 0593490 , 1501002)					
Date Analysis Commenced	Nov 25, 2022					
Condition of Sample	Contained in one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method Testing Location
Water Testing						
COD *	mg/L	1.5	5	19	No Standard	Based on APHA (2017), 5220 D Bangkok

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)
n: Change from Natural condition not more than 3 degree C
n: Not Change from natural condition
Sampled By : Norasat Komal

Remark :
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บริเวณคลองบางป่า 3 จุด (นอกมาตรการ EIA)



Analysis / Test Report



TESTING
No.0009

Client : Ratchaburi Power Co., Ltd.

245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 70130

P/O : #กฤตยาพรRPL-CH2021-003/SHE

Project Name : Monitoring EIA

Project Location :

Lot ID: 2278885

Date Received : Jul 20, 2022

Date Reported : Jul 27, 2022

Report Number : 2387236-1

Page 1 of 1

Sample Number	2278885-6						
Sampled Date	Jul 20, 2022 9:10 AM						
Sample Description	Surface Water						
Location	แหล่งชุมชนน้ำดิบ 1 km (GPS 47P 0593772 , 1501462)						
Date Analysis Commenced	Jul 21, 2022						
Condition of Sample	Contained in two BOD bottles and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 degree C) *	mg/L	-	2	4	≤2	Based on APHA (2017), 5210 B	Bangkok
Conductivity at 25 degree C *	micromhos/cm	-	0.5	1653	No Standard	Based on APHA (2017), 2510 B	Bangkok
Dissolved Oxygen *	mg/L	-	0.1	4.1	≥4	Based on APHA (2017), 4500-O (C)	Bangkok
pH at 25 degree C	-	-	-	7.8	5.0-9.0	Based on APHA (2017), 4500-H (B)	Bangkok
Temperature *	Degree C	-	-	30.8	n ¹	Based on APHA (2017), 2550 B	Bangkok

Guideline: Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)
n¹: Change from Natural condition not more than 3 degree C

n²: Not Change from natural condition

Sampled By : Prapot Wannachoochai

Remark :

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Siriluk Puengpar
Supervisor

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Analysis / Test Report



TESTING
No.0009

Client : Ratchaburi Power Co., Ltd.

245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 70130

P/O : #กฤตยาพรRPL-CH2021-003/SHE

Project Name : Monitoring EIA

Project Location :

Lot ID: 2278885

Date Received : Jul 20, 2022

Date Reported : Jul 27, 2022

Report Number : 2387237-1

Page 1 of 1

Sample Number	2278885-7						
Sampled Date	Jul 20, 2022 8:20 AM						
Sample Description	Surface Water						
Location	แหล่งชุมชนน้ำดิบ 1 km (GPS 47P 0593840 , 1500128)						
Date Analysis Commenced	Jul 21, 2022						
Condition of Sample	Contained in two BOD bottles and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 degree C) *	mg/L	-	2	4	≤2	Based on APHA (2017), 5210 B	Bangkok
Conductivity at 25 degree C *	micromhos/cm	-	0.5	1485	No Standard	Based on APHA (2017), 2510 B	Bangkok
Dissolved Oxygen *	mg/L	-	0.1	4.1	≥4	Based on APHA (2017), 4500-O (C)	Bangkok
pH at 25 degree C	-	-	-	6.9	5.0-9.0	Based on APHA (2017), 4500-H (B)	Bangkok
Temperature *	Degree C	-	-	30.5	n ¹	Based on APHA (2017), 2550 B	Bangkok

Guideline: Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)
n¹: Change from Natural condition not more than 3 degree C

n²: Not Change from natural condition

Sampled By : Prapot Wannachoochai

Remark :

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Analysis / Test Report



TESTING
No.0009

Client : Ratchaburi Power Co., Ltd.

245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 70130

P/O : #กฤตยาพรRPL-CH2021-003/SHE

Project Name : Monitoring EIA

Project Location :

Lot ID: 2278892

Date Received : Jul 20, 2022

Date Reported : Jul 27, 2022

Report Number : 2356380-1

Page 1 of 9

Sample Number	2278892-1						
Sampled Date	Jul 20, 2022 7:50 AM						
Sample Description	น้ำดิบ						
Location	คลองบางช้าง : แหล่งชุมชนน้ำดิบ (GPS 47P 0593523 , 1501000)						
Date Analysis Commenced	Jul 21, 2022						
Condition of Sample	Contained in two BOD bottles and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 degree C) *	mg/L	-	2	4	≤2	Based on APHA (2017), 5210 B	Bangkok
Conductivity at 25 degree C *	micromhos/cm	-	0.5	926	No Standard	Based on APHA (2017), 2510 B	Bangkok
Dissolved Oxygen *	mg/L	-	0.1	4.8	≥4	Based on APHA (2017), 4500-O (C)	Bangkok
pH at 25 degree C	-	-	-	7.0	5.0-9.0	Based on APHA (2017), 4500-H (B)	Bangkok
Temperature *	Degree C	-	-	30.1	n ¹	Based on APHA (2017), 2550 B	Bangkok

Guideline: Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)
n¹: Change from Natural condition not more than 3 degree C

n²: Not Change from natural condition

Sampled By : Prapot Wannachoochai

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Approved by

Sithichok T.

Sithichok Thonguen
Scientist (3)

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Analysis / Test Report



TESTING
No.0009

Client : Ratchaburi Power Co., Ltd.

245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 70130

P/O : #กฤตยาพรRPL-CH2021-003/SHE

Project Name : Monitoring EIA

Project Location :

Lot ID: 2283245

Date Received : Aug 16, 2022

Date Reported : Aug 23, 2022

Report Number : 2412641-1

Page 1 of 1

Sample Number	2283245-6						
Sampled Date	Aug 16, 2022 9:55 AM						
Sample Description	Surface Water						
Location	แหล่งชุมชนน้ำดิบ 1 km (GPS 47P 0593772 , 1501462)						
Date Analysis Commenced	Aug 17, 2022						
Condition of Sample	Contained in two BOD bottles, two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 degree C) *	mg/L	-	2	<2	≤2	Based on APHA (2017), 5210 B	Bangkok
Conductivity at 25 degree C *	micromhos/cm	-	0.5	1103	No Standard	Based on APHA (2017), 2510 B	Bangkok
Dissolved Oxygen *	mg/L	-	0.1	4.1	≥4	Based on APHA (2017), 4500-O (C)	Bangkok
pH at 25 degree C	-	-	-	7.8	5.0-9.0	Based on APHA (2017), 4500-H (B)	Bangkok
Temperature *	Degree C	-	-	31.1	n ¹	Based on APHA (2017), 2550 B	Bangkok

Guideline: Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)
n¹: Change from Natural condition not more than 3 degree C

n²: Not Change from natural condition

Sampled By : Chawanthat Nakpanom

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Approved by

Nant Sam

Nanthawadee Sombon
Specialist 1

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Analysis / Test Report



TESTING
No.0009

Client : Ratchaburi Power Co., Ltd.

245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 70130

P/O : บริษัทฯรับจ้างรื้อถอนโรงงานน้ำตาล (RPL-CH2021-003/SHE)

Project Name : Monitoring EIA

Project Location :

Lot ID: 2283245

Date Received : Aug 16, 2022

Date Reported : Aug 23, 2022

Report Number : 2412642-1

Page 1 of 1

Sample Number : 2283245-7

Sampled Date : Aug 16, 2022 9:10 AM

Sample Description : Surface Water

Location : แหล่งน้ำดิบ 1 km (GPS 47P 0593840 , 1500128)

Date Analysis Commenced : Aug 17, 2022

Condition of Sample : Contained in two BOD bottles, two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 degree C) *	mg/L	-	2	<2	≤2	Based on APHA (2017), 5210 B	Bangkok
Conductivity at 25 degree C *	micromhos/cm	-	0.5	1166	No Standard	Based on APHA (2017), 2510 B	Bangkok
Dissolved Oxygen *	mg/L	-	0.1	4.2	≥4	Based on APHA (2017), 4500-O (C)	Bangkok
pH at 25 degree C	-	-	-	7.9	5.0-9.0	Based on APHA (2017), 4500-H (B)	Bangkok
Temperature *	Degree C	-	-	30.8	n ^o	Based on APHA (2017), 2550 B	Bangkok

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)

n^o: Change from Natural condition not more than 3 degree C

n^o: Not Change from natural condition

Sampled By : Chawanthat Nakpanom

Remark :

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Approved by

Nant Somb

Nanthawadee Somborn
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Analysis / Test Report



TESTING
No.0009

Client : Ratchaburi Power Co., Ltd.

245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 70130

P/O : บริษัทฯรับจ้างรื้อถอนโรงงานน้ำตาล (RPL-CH2021-003/SHE)

Project Name : Monitoring EIA

Project Location :

Lot ID: 2283251

Date Received : Aug 16, 2022

Date Reported : Aug 23, 2022

Report Number : 2366716-1

Page 1 of 9

Sample Number : 2283251-1

Sampled Date : Aug 16, 2022 8:38 AM

Sample Description : น้ำดิบ

Location : แหล่งน้ำดิบ : ๒๔๕๖๗๘๙๐๑๒๓ (GPS 47P 0593523 , 1501000)

Date Analysis Commenced : Aug 17, 2022

Condition of Sample : Contained in two BOD bottles and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 degree C) *	mg/L	-	2	3	≤2	Based on APHA (2017), 5210 B	Bangkok
Conductivity at 25 degree C *	micromhos/cm	-	0.5	1133	No Standard	Based on APHA (2017), 2510 B	Bangkok
Dissolved Oxygen *	mg/L	-	0.1	4.3	≥4	Based on APHA (2017), 4500-O (C)	Bangkok
pH at 25 degree C	-	-	-	7.8	5.0-9.0	Based on APHA (2017), 4500-H (B)	Bangkok
Temperature *	Degree C	-	-	30.6	n ^o	Based on APHA (2017), 2550 B	Bangkok

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)

n^o: Change from Natural condition not more than 3 degree C

n^o: Not Change from natural condition

Sampled By : Chawanthat Nakpanom

Remark :

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Approved by

Sithichok T.

Sithichok Thonguen
Scientist (3)

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Analysis / Test Report



TESTING
No.0009

Client : Ratchaburi Power Co., Ltd.

245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 70130

P/O : บริษัทฯรับจ้างรื้อถอนโรงงานน้ำตาล (RPL-CH2021-003/SHE)

Project Name : Monitoring EIA

Project Location :

Lot ID: 22120198

Date Received : Oct 19, 2022

Date Reported : Oct 26, 2022

Report Number : 2474122-1

Page 1 of 1

Sample Number : 22120198-6

Sampled Date : Oct 19, 2022 9:35 AM

Sample Description : Surface Water

Location : แหล่งน้ำดิบ 1 km (GPS 47P 0593772 , 1501462)

Date Analysis Commenced : Oct 20, 2022

Condition of Sample : Contained in two BOD bottles and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 degree C) *	mg/L	-	2	4	≤2	Based on APHA (2017), 5210 B	Bangkok
Conductivity at 25 degree C *	micromhos/cm	-	0.5	1060	No Standard	Based on APHA (2017), 2510 B	Bangkok
Dissolved Oxygen *	mg/L	-	0.1	2.6	≥4	Based on APHA (2017), 4500-O (C)	Bangkok
pH at 25 degree C	-	-	-	7.4	5.0-9.0	Based on APHA (2017), 4500-H (B)	Bangkok
Temperature *	Degree C	-	-	28.1	n ^o	Based on APHA (2017), 2550 B	Bangkok

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)

n^o: Change from Natural condition not more than 3 degree C

n^o: Not Change from natural condition

Sampled By : Norrasat Komal

Remark :

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Approved by

Siriluk P.

Siriluk Puengpar
Supervisor

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Analysis / Test Report



TESTING
No.0009

Client : Ratchaburi Power Co., Ltd.

245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 70130

P/O : บริษัทฯรับจ้างรื้อถอนโรงงานน้ำตาล (RPL-CH2021-003/SHE)

Project Name : Monitoring EIA

Project Location :

Lot ID: 22120198

Date Received : Oct 19, 2022

Date Reported : Oct 26, 2022

Report Number : 2474123-1

Page 1 of 1

Sample Number : 22120198-7

Sampled Date : Oct 19, 2022 9:15 AM

Sample Description : Surface Water

Location : แหล่งน้ำดิบ 1 km (GPS 47P 0593840 , 1500128)

Date Analysis Commenced : Oct 20, 2022

Condition of Sample : Contained in two BOD bottles and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 degree C) *	mg/L	-	2	5	≤2	Based on APHA (2017), 5210 B	Bangkok
Conductivity at 25 degree C *	micromhos/cm	-	0.5	1076	No Standard	Based on APHA (2017), 2510 B	Bangkok
Dissolved Oxygen *	mg/L	-	0.1	2.1	≥4	Based on APHA (2017), 4500-O (C)	Bangkok
pH at 25 degree C	-	-	-	7.4	5.0-9.0	Based on APHA (2017), 4500-H (B)	Bangkok
Temperature *	Degree C	-	-	27.2	n ^o	Based on APHA (2017), 2550 B	Bangkok

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)

n^o: Change from Natural condition not more than 3 degree C

n^o: Not Change from natural condition

Sampled By : Norrasat Komal

Remark :

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Approved by

Siriluk P.

Siriluk Puengpar
Supervisor

ADDRESS 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand | PHONE +66 0 2760 3000 | FAX +66 0 2760 3197

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Analysis / Test Report



TESTING
No.0009

Client : Ratchaburi Power Co., Ltd.

245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 70130

P/O : บริษัท รพช. จำกัด (มหาชน) / RPL-CH2021-003/SHE

Project Name : Monitoring EIA

Project Location :

Lot ID: 22120221

Date Received : Oct 19, 2022

Date Reported : Oct 26, 2022

Report Number : 2449589-1

Page 1 of 9

Sample Number : 22120221-1

Sampled Date : Oct 19, 2022 8:45 AM

Sample Description : น้ำผิวดิน

Location : แหล่งน้ำดิบดิบ (GPS 47P 0593523 , 1501000)

Date Analysis Commenced : Oct 20, 2022

Condition of Sample : Contained in two BOD bottles and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 degree C) *	mg/L	-	2	3	≤2	Based on APHA (2017), 5210 B	Bangkok
Conductivity at 25 degree C *	micromhos/cm	-	0.5	1059	No Standard	Based on APHA (2017), 2510 B	Bangkok
Dissolved Oxygen *	mg/L	-	0.1	6.0	≥4	Based on APHA (2017), 4500-O (C)	Bangkok
pH at 25 degree C	-	-	-	7.6	5.0-9.0	Based on APHA (2017), 4500-H (B)	Bangkok
Temperature *	Degree C	-	-	28.1	n ¹	Based on APHA (2017), 2550 B	Bangkok

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)

n¹: Change from Natural condition not more than 3 degree C

n²: Not Change from natural condition

Sampled By : Norasat Komal

Remark :

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Approved by

Tuanjai Thangklang
Manager

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Analysis / Test Report



TESTING
No.0009

Client : Ratchaburi Power Co., Ltd.

245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 70130

P/O : บริษัท รพช. จำกัด (มหาชน) / RPL-CH2021-003/SHE

Project Name : Monitoring EIA

Project Location :

Lot ID: 22130586

Date Received : Oct 24, 2022

Date Reported : Dec 01, 2022

Report Number : 250v3v-1

Page 1 of 9

Sample Number : 22130586-6

Sampled Date : Oct 24, 2022 10:30 AM

Sample Description : Surface Water

Location : แหล่งน้ำดิบดิบ (GPS 47P 0593523 , 1501462 G

Date Analysis Commenced : Oct 25, 2022

Condition of Sample : Contained in two BOD bottles and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 degree C) *	mg/L	-	2	2	≤2	Based on APHA (2017), 5210 B	Bangkok
Conductivity at 25 degree C *	micromhos/cm	-	0.5	673	No Standard	Based on APHA (2017), 2510 B	Bangkok
Dissolved Oxygen *	mg/L	-	0.1	2.0	≥4	Based on APHA (2017), 4500-O (C)	Bangkok
pH at 25 degree C	-	-	-	7.6	5.0-9.0	Based on APHA (2017), 4500-H (B)	Bangkok
Temperature *	Degree C	-	-	28.0	n ¹	Based on APHA (2017), 2550 B	Bangkok

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)

n¹: Change from Natural condition not more than 3 degree C

n²: Not Change from natural condition

Sampled By : Norasat Komal

Remark :

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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Approved by

Siriluk P.
Supervisor

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Analysis / Test Report



TESTING
No.0009

Client : Ratchaburi Power Co., Ltd.

245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 70130

P/O : บริษัท รพช. จำกัด (มหาชน) / RPL-CH2021-003/SHE

Project Name : Monitoring EIA

Project Location :

Lot ID: 22130586

Date Received : Oct 24, 2022

Date Reported : Dec 01, 2022

Report Number : 250v3v-1

Page 1 of 9

Sample Number : 22130586-7

Sampled Date : Nov 24, 2022 8:50 AM

Sample Description : Surface Water

Location : แหล่งน้ำดิบดิบ (GPS 47P 0593523 , 150012v G

Date Analysis Commenced : Nov 25, 2022

Condition of Sample : Contained in two BOD bottles and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 degree C) *	mg/L	-	2	x 2	≤2	Based on APHA (2017), 5210 B	Bangkok
Conductivity at 25 degree C *	micromhos/cm	-	0.5	1132	No Standard	Based on APHA (2017), 2510 B	Bangkok
Dissolved Oxygen *	mg/L	-	0.1	3.6	≥4	Based on APHA (2017), 4500-O (C)	Bangkok
pH at 25 degree C	-	-	-	7.7	5.0-9.0	Based on APHA (2017), 4500-H (B)	Bangkok
Temperature *	Degree C	-	-	28.6	n ¹	Based on APHA (2017), 2550 B	Bangkok

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)

n¹: Change from Natural condition not more than 3 degree C

n²: Not Change from natural condition

Sampled By : Norasat Komal

Remark :

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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Approved by

Siriluk P.
Supervisor

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Analysis / Test Report



TESTING
No.0009

Client : Ratchaburi Power Co., Ltd.

245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 70130

P/O : บริษัท รพช. จำกัด (มหาชน) / RPL-CH2021-003/SHE

Project Name : Monitoring EIA

Project Location :

Lot ID: 22130591

Date Received : Nov 24, 2022

Date Reported : Dec 01, 2022

Report Number : 2473392-1

Page 1 of 9

Sample Number : 22130591-1

Sampled Date : Nov 24, 2022 9:40 AM

Sample Description : น้ำผิวดิน

Location : แหล่งน้ำดิบดิบ (GPS 47P 0593523 , 1501000)

Date Analysis Commenced : Nov 25, 2022

Condition of Sample : Contained in two BOD bottles and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 degree C) *	mg/L	-	2	2	≤2	Based on APHA (2017), 5210 B	Bangkok
Conductivity at 25 degree C *	micromhos/cm	-	0.5	705	No Standard	Based on APHA (2017), 2510 B	Bangkok
Dissolved Oxygen *	mg/L	-	0.1	4.4	≥4	Based on APHA (2017), 4500-O (C)	Bangkok
pH at 25 degree C	-	-	-	7.7	5.0-9.0	Based on APHA (2017), 4500-H (B)	Bangkok
Temperature *	Degree C	-	-	30.0	n ¹	Based on APHA (2017), 2550 B	Bangkok

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)

n¹: Change from Natural condition not more than 3 degree C

n²: Not Change from natural condition

Sampled By : Norasat Komal

Remark :

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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Supervisor

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5031-3U/ENAL



Analysis / Test Report

Client : Ratchaburi Power Co., Ltd.

245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 71030

P/O : บริษัทฯรับจ้างรื้อถอนอาคารเดิม

Project Name : Monitoring EIA

Project Location :

Sample Number 22145010-6

Sampled Date Dec 15, 2022 9:35 AM

Sample Description Surface Water

Location แหล่งน้ำสาธารณะ 1 km (GPS 47P 0593772, 1501462)

Date Analysis Commenced Dec 16, 2022

Condition of Sample Contained in two BOD bottles and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 degree C) *	mg/L	-	2	<2	≤2	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O C	Bangkok
Conductivity at 25 degree C *	micromhos/cm	-	0.5	643	No Standard	Based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Bangkok
Dissolved Oxygen *	mg/L	-	0.1	4.5	≥4	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - O (C)	Bangkok
pH at 25 degree C	-	-	-	7.7	5.0-9.0	In - house method : STM 04-003 based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Bangkok
Temperature *	Degree C	-	-	25.7	n ¹	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Bangkok

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)

n¹: Change from Natural condition not more than 3 degree C

n : Not Change from natural condition

Sampling By : เติร์awat Puangsuksun เติร์awat Puangsuksun >204-7107

Remark :

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Analysis / Test Report

Client : Ratchaburi Power Co., Ltd.

245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 71030

P/O : บริษัทฯรับจ้างรื้อถอนอาคารเดิม

Project Name : Monitoring EIA

Project Location :

Sample Number 22145010-7

Sampled Date Dec 15, 2022 9:45 AM

Sample Description Surface (after

Location แหล่งน้ำสาธารณะ 1 km G) PS 47P 0593740, 15001270

Date Analysis Commenced Dec 16, 2022

Condition of Sample Contained in two BOD bottles and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 degree C) x	mg/L	-	2	' 2	≤2	Standard Methods for the Examination of (after and (astewater. APHA, A (A F (E c 23rd ed., 2017, part 5210 B, part 4500 - U C	Bangkok
Conductivity at 25 degree C x	micromhos/cm	-	0.5	755	No Standard	Based on Standard Methods for the Examination of (after and (astewater. APHA, A (A F (E c 23rd ed., 2017, part 2510 B	Bangkok
Dissolved Oxygen x	mg/L	-	0.1	4.0	≥4	Standard Methods for the Examination of (after and (astewater. APHA, A (A F (E c 23rd ed., 2017, part 4500 - U C	Bangkok
pH at 25 degree C	-	-	-	7.7	5.0-9.0	In - house method : STM 04-003 based on Standard Methods for the Examination of (after and (astewater. APHA, A (A F (E c 23rd ed., 2017, part 4500 - H (B)	Bangkok
Temperature x	Degree C	-	-	25.9	n8	Standard Methods for the Examination of (after and (astewater. APHA, A (A F (E c 23rd ed., 2017, part 2550 B	Bangkok

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)

n8 Change from Natural condition not more than 3 degree C

n : Not Change from natural condition

Sampling By : เติร์awat Puangsuksun เติร์awat Puangsuksun >204-7107

Remark :

- LOD : Limit of Detection
- "C" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Siriluk Puangpang
Supervisor

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บริเวณใต้จุดปล่อยน้ำทิ้ง 100-200 เมตร
(ขณะที่ RGCO ปล่อยน้ำ) (นอกมาตรการ EIA)



Analysis / Test Report

Client : Ratchaburi Power Co., Ltd.
245 Moo 6, Tumbol Barn - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 70130

P/O : สัญญาจ้างPCL-CN2021-003/SHE

Project Name : Monitoring EIA

Project Location :

Page 1 of 1

Sample Number	2883245-3
Sample Date	Aug 16, 2022 9:20 AM
Sample Description	Surface Water
Location	แม่น้ำเจ้าพระยาบริเวณที่ 100-200 เมตร (ตามหลัก RGO ปากน้ำ) (GPS 47P 059353, 1500933)

Condition of Sample Contained in two BOD bottles, two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, ICEDPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 degree C) *	mg/L	-	2	2	≤2	Based on APHA (2017), 5210-B	Bangkok
Conductivity at 25 degree C *	micromhos/cm	-	0.5	1141	No Standard	Based on APHA (2017), 2510-B	Bangkok
Dissolved Oxygen *	mg/L	-	0.1	4.0	≥4	Based on APHA (2017), 4500-O (C)	Bangkok
pH at 25 degree C		-	-	7.8	5.0-9.0	Based on APHA (2017), 4500-H (B)	Bangkok
Temperature *	Degree C	-	-	30.6	n ¹	Based on APHA (2017), 2550-B	Bangkok

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)

Sampled By : Chawanthat Nakpanom

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Nanthawadee Somboon
Specialist 1

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Analysis / Test Report

Client : Ratchaburi Power Co., Ltd.
245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 70130
P/O : ฅงฤๅณาร๑PCL-CM2021-003/SH
Project Name : Monitoring EIA
Project Location :

TESTING
No.0009
Lot ID: 22130586
Date Received : 0๑9 24, 2022
Date Reported : Dec 01, 2022
Report Oumber : 25๑v๑35-1

Page 1 of 1

Sample Number 2213056-3
Sampled Date 0๑9 24, 2022 10:00 AM
Sample Description Surface f ater
Location ๑๑๑๑๑๑๑๑๑๑ 100-200 ๑๑๑ ๑๑๑๑๑ RWQ ๑๑๑๑๑ ๑๑๑ WPS 47P 05) 3533 , 1500) 33 G
Date Analysis Commenced 0๑9 25, 2022
Condition of Sample Contained in two 9๑๑s, two amber glass bottles and two plastic bottles, sample containers comply to pretreatment - preservation standards BPHA, USEPAG

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
B(D 85 days at 20 degree CG *	mg/L	-	2	2	≤2	Based on APHA 8201.7G 5210 B	Bangkok
Conductivity at 25 degree C *	micromhos/cm	-	0.5	63	On Standard	Based on APHA 8201.7G 2510 B	Bangkok
Dissolved (xygen *	mg/L	-	0.1	4.2	≥4	Based on APHA 8201.7G 4500-(8CG	Bangkok
pH at 25 degree C	-	-	-	7.7	5.0- 1.0	Based on APHA 8201.7G 4500-H 8BG	Bangkok
Temperature *	Degree C	-	-	2) .7	n'	Based on APHA 8201.7G 2550 B	Bangkok

Guideline : Notification of the National Environmental Board, No. ๑, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 Class 3G
n: Change from Natural condition not more than 3 degree C
n : Out Change from natural condition

Sampled By : Corraset Komai

Remark :
- L(D : Limit of Detection
- "e" : Lower than L(Q Limit of Quantitation
- Analyte(s) marked * is/are not included in scope of Accreditation IS/ IEC 17025.
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Analysis / Test Report

Client : Ratchaburi Power Co., Ltd.
245 Moo 6, Tumbol Bann - Rai, Amphur Damnoen Saduak, Ratchaburi Thailand 70130
P/O : ฅงฤๅณาร๑PCL-CM2021-003/SH
Project Name : Monitoring EIA
Project Location :

TESTING
No.0009
Lot ID: 22145010
Date Received : Dec 15, 2022
Date Reported : Dec 22, 2022
Report Number : 2527970-1

Page 1 of 1

Sample Number 22145010-3
Sampled Date Dec 15, 2022 9:00 AM
Sample Description Surface Water
Location ๑๑๑๑๑๑๑๑๑ 100-200 ๑๑๑ ๑๑๑๑ RGCO ๑๑๑๑๑) (GPS 47P 0593533 , 1500933)
Date Analysis Commenced Dec 16, 2022
Condition of Sample Contained in two BOD bottles and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 degree C) *	mg/L	-	2	<2	≤2	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 5210 B, part 4500 - O C	Bangkok
Conductivity at 25 degree C *	micromhos/cm	-	0.5	834	No Standard	Based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2510 B	Bangkok
Dissolved Oxygen *	mg/L	-	0.1	3.2	≥4	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500-O (C)	Bangkok
pH at 25 degree C	-	-	-	7.8	5.0-9.0	In - house method : STM 04-003 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 4500 - H (B)	Bangkok
Temperature *	Degree C	-	-	25.7	n'	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 23rd ed., 2017, part 2550 B	Bangkok

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)
n: Change from Natural condition not more than 3 degree C
n : Not Change from natural condition

Sampling By : Teerawat Puangsuks ๑๑๑๑๑๑๑ ๑-204-๑-7107

Remark :
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- "e" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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ภาคผนวก จ-7

ผลการตรวจวิเคราะห์ฝุ่นละอองรวม (TSP)
ที่ระบายออกจากปล่อง

Original

**Report of Emission Air Quality and
Continuous Emission Monitoring Systems Audit at
Ratchaburi Power Plant
Ratchaburi Power Co., Ltd.**

November 11 and 28, 2022

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Report of Emission Air Quality and Continuous Emission Monitoring Systems Audit at

Ratchaburi Power Plant, Ratchaburi province

Ratchaburi Power Co., Ltd.

November 11 and 28, 2022

1. Introduction

The continuous emission monitoring systems (CEMS) were installed at Ratchaburi Power Plant, Ratchaburi province according to the requirements of the installation as Performance Specification (PS), the audit of CEMS has to be performed by the third party. Thus, Ratchaburi Power Co., Ltd. has assigned SGS (Thailand) Limited to conduct the Emission Air Quality and CEMS audit during November 11 and 28, 2022. The details of all performances are shown in the next topics.

2. Objectives

- To monitor emission air quality from HRSG 11, HRSG 12, HRSG 21 and HRSG 22 Stack at Ratchaburi Power Plant, Ratchaburi province and compare their results with the standard criteria prescribed by the government agency.

- To certify that the continuous emission monitoring systems from HRSG 21 and HRSG 22 followed the requirements of 40 CFR 60 Appendix B, Performance Specification 2 (for NO_x and SO₂), Performance Specification 3 (for O₂) and Performance Specification 4 (for CO) in term of the relative accuracy (RA).

3. Definitions

3.1 Reference Method (RM)

Reference Method (RM) means the measured results of stack emission which is conducted by promulgated method for "Determination of Emission Air from Stationary Sources" according to the 40 CFR 60 Appendix A.

3.2 Relative Accuracy (RA)

The absolute mean difference between the gas concentration or emission rate determined by the CEMS and the value determined by the reference method (RM), plus the 2.5% error confidence coefficient of a series of tests, divided by the mean of the RM tests or the applicable emission limit.

4. Scope of the Test

4.1 Emission Air Quality

Performing the Emission Air Quality from HRSG 11, HRSG 12, HRSG 21 and HRSG 22 Stack at Ratchaburi Power Plant, Ratchaburi province as follow:

- HRSG 11 : November 11, 2022
- HRSG 12 : November 11, 2022
- HRSG 21 : November 28, 2022
- HRSG 22 : November 28, 2022

4.2 Relative Accuracy Test

Performing the Relative Accuracy Test for the SO₂, NO_x, CO and O₂ as installed at HRSG 21 and HRSG 22 Stack, Ratchaburi Power Plant, Ratchaburi province as follow:

- HRSG 21 : November 28, 2022
- HRSG 22 : November 28, 2022

For sampling Location shown in **Figure 4-1**.



HRSG# 11 (November 11, 2022)



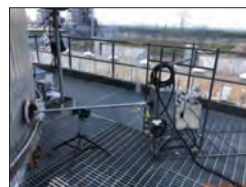
HRSG# 12 (November 11, 2022)



**Figure 4-1 Sampling Location at
Ratchaburi Power Co., Ltd.**



HRSG #21 (November 28, 2022)



HRSG# 22 (November 28, 2022)



**Figure 4-1 Sampling Location at
Ratchaburi Power Co., Ltd. (Con't)**

5. Reference Work Procedure

5.1 Emission Air Quality

The sampling and analytical methods of emission air quality were performed in accordance with the standard methods accepted by Thai Regulations such as Department of Industrial Works (DIW) and then the results of emission air quality will be compared with the reference standard in accordance with the Notification of Ministry of Industry, B.E. 2547 (2004), issued under the Factory Act, B.E. 2535 (1992), dated October 7, B.E. 2547 (2004) for the New Power Plant. Details of sampling and analytical methods are shown in **Table 5.1-1**.

Table 5.1-1 Sampling and analytical methods

Parameters	Sampling Methods	Analytical Methods
- Total Suspended Particulates (TSP)	U.S. EPA Method 5	Gravimetric Method
- Sulfur dioxide (SO ₂)	U.S. EPA Method 6	Titration Method
- NO _x (as NO ₂)	U.S. EPA Method 7	Colorimetric Method
- Carbon monoxide (CO)	U.S. EPA Method 10	Non dispersive infrared analyzer (NDIR)

5.2 Relative Accuracy Test

• Relative Accuracy Test

The Performance Specification (PS) Test Procedure is based on the U.S. EPA Regulation according to the 40 CFR 60 Appendix B as the following.

- PS-2 :The Specifications and Test Procedures for SO₂ and NO_x Continuous Emission Monitoring Systems in Stationary Sources.
- PS-3 :The Specifications and Test Procedures for O₂ Continuous Emission Monitoring Systems in Stationary Sources.
- PS-4 :The Specifications and Test Procedures for CO Continuous Emission Monitoring Systems in Stationary Sources.

6. Procedure of the Relative Accuracy Test Audit (RATA)

The RATA test is conducted by following the procedures described in the applicable PS in Appendix B for Relative Accuracy Test Audit (RATA) as the following.

- 1) **RA Test Condition** : Conduct the RA test according to the procedure given as below, while the affected facility is operating at normal load.
- 2) **Sampling Technique for RM Tests** : for integrated samples make a sample traverse of at least 30 minutes, sampling for an equal time at each traverse point
- 3) **Number of RM Test** : Twelve (12) sets of samples of SO₂, NO_x, CO, and O₂, were collected for each CEMS unit.
- 4) **RM Test** : The reference method for determination of SO₂, NO_x, CO, and O₂, based on the U.S. EPA, 40 CFR 60 Appendix A as per **Table 6-1**.

Table 6-1 The reference methods (RM) for the Relative Accuracy Test Audit (RATA)

Parameters	Reference Methods
SO ₂	U.S. EPA Method 6C
NO _x	U.S. EPA Method 7E
CO	U.S. EPA Method 10
O ₂	U.S. EPA Method 3A

Source : - based on the U.S. EPA, 40 CFR 60 Appendix A

5) **Correlation of RM and CEMs Data** : Correlate the CEMs and the RM test data as to the time and duration by first determining from the CEMs final output (the one used for reporting) the integrated average pollutant concentration or emission rate for each pollutant RM test period. Consider system response time, and confirm that the pair of results are on a consistent moisture, temperature, and diluents' concentration basis. Then, compare each integrated CEMs value against the corresponding average RM value. For integrated sampling technique, make a direct comparison of the RM results and CEMs integrated average value.

6) **Calculation** : Calculate the mean difference between the RM and CEMs values in the units of the emission standard, Standard Deviation (S_d), Confidence Coefficient (CC) and the Relative Accuracy (RA) as the followings.

- All data from the RM and CEMs are on a consistent dry basis and on a consistent diluents' basis and in the unit of the emission standard.
- Arithmetic Mean (\bar{d}) : Calculate the arithmetic mean of the difference of a data set as follows:

$$\bar{d} = \frac{1}{n} \sum_{i=1}^n d_i \quad (\text{Equation 1})$$

Where : n = Number of data points.

$\sum_{i=1}^n d_i$ = Algebraic summation of the individual difference d_i

- Standard Deviation (S_d) : Calculate the standard deviation as follows :

$$S_d = \sqrt{\frac{\sum_{i=1}^n d_i^2 - \left[\sum_{i=1}^n d_i \right]^2}{n-1}} \quad (\text{Equation 2})$$

- Confidence Coefficient (CC) : Calculate the 2.5% error confidence coefficient (one-tailed) as follows:

$$CC = t_{0.975} \frac{S_d}{\sqrt{n}} \quad (\text{Equation 3})$$

Where : t_{0.975} = t-value (see **Table 6-2**)

Table 6-2 The t-Value

n*	t _{0.975}	n*	t _{0.975}	n*	t _{0.975}
2	12.706	7	2.447	12	2.201
3	4.303	8	2.365	13	2.179
4	3.182	9	2.306	14	2.160
5	2.776	10	2.262	15	2.145
6	2.571	11	2.228	16	2.131

- Relative Accuracy (RA) : Calculate the RA of a set of data as follows:

- SO₂, NO_x and CO

$$RA = \frac{|\bar{d}| + |CC|}{\overline{RM}} \times 100 \quad (\text{Equation 4})$$

- O₂

$$RA = |\bar{d}| \quad (\text{Equation 5})$$

Where : $|\bar{d}|$ = Absolute value of the mean differences
(from Equation 1)

$|CC|$ = Absolute value of the confidence coefficient
(from Equation 3)

\overline{RM} = Average RM value. In cases where the average emissions for the test are less than 50% of the applicable standard, substitute the emission standard value in the denominator of Equation 4 in place of \overline{RM} . In all other cases, use \overline{RM} .

- 7) **Accepted Criteria** : The accepted criteria of RA are shown in **Table 6-3**.

Table 6-3 The accepted criteria for the Relative Accuracy Test Audit (RATA)

Parameters	Accepted Criteria	
	Compared with RM	Compared with Standard
SO ₂ (PS-2)	20% of RM ^{1/}	10% of Standard ^{2/}
NO _x (PS-2)	20% of RM ^{1/}	10% of Standard ^{2/}
CO (PS-4)	10% of RM ^{1/}	5% of Standard ^{3/}
O ₂ (PS-3)	1 % O ₂ ^{1/}	-

Remarks : ^{1/} RA criteria is referred to 40CFR 60 Appendix B, U.S. EPA : Performance Specification (PS)
^{2/} Notification of Ministry of Industry, B.E. 2547 (2004), issued under the Factory Act, B.E. 2535 (1992), dated October 7, B.E. 2547 (2004) for the New Power Plant.
^{3/} Notification of the Ministry of Industry, subjected "Industrial Emission Standards", dated December 4, 2006.

7. Results

7.1 Emission Air Quality

The emission air quality of HRSG 11, HRSG 12, HRSG 21 and HRSG 22 Stack were monitored during November 11 and 28, 2022 which calculated at 7% O₂, 25°C, 1 atm or 760 mm.Hg and dry basis. The details of emission air quality monitoring results can be concluded as the following.

- HRSG 11 Stack

The Total Suspended Particulates (TSP), NO_x (as NO₂), SO₂ and CO of HRSG 11 Stack were monitored on November 11, 2022. It was found that TSP result was 1.01 mg/Nm³, NO_x (as NO₂) was 59.70 ppm and CO was 1.9 ppm at condition 7% O₂. For SO₂ from this stack was not detected. The detail of analysis results is shown in **Table 7.1-1**.

- HRSG 12 Stack

The Total Suspended Particulates (TSP), NO_x (as NO₂), SO₂ and CO of HRSG 12 Stack were monitored on November 11, 2022. It was found that TSP result was 1.08 mg/Nm³, NO_x (as NO₂) was 62.06 ppm and CO was 1.9 ppm at condition 7% O₂. For SO₂ from this stack was not detected. The detail of analysis results is shown in **Table 7.1-2**.

- HRSG 21 Stack

The Total Suspended Particulates (TSP), NO_x (as NO₂), SO₂ and CO of HRSG 21 Stack were monitored on November 28, 2022. It was found that TSP result was 1.03 mg/Nm³ and NO_x (as NO₂) was 51.10 ppm and CO was 4.1 ppm at condition 7% O₂. For SO₂ from this stack was not detected. The detail of analysis results is shown in **Table 7.1-3**.

- HRSG 22 Stack

The Total Suspended Particulates (TSP), NO_x (as NO₂), SO₂ and CO of HRSG 22 Stack were monitored on November 28, 2022. It was found that TSP result was 1.67 mg/Nm³ and NO_x (as NO₂) was 53.56 ppm and CO was 4.4 ppm at condition 7% O₂. For SO₂ from this stack was not detected. The detail of analysis results is shown in **Table 7.1-4**.

When comparing emission air quality analytical results with the Emission Standard prescribed by the Notification of Ministry of Industry, B.E. 2547 (2004), issued under the Factory Act, B.E. 2535 (1992), dated October 7, B.E. 2547 (2004) for the New Power Plant, it was found that Total Suspended Particulates (TSP), NO_x (as NO₂), SO₂ and CO from HRSG 11, HRSG 12, HRSG 21 and HRSG 22 Stack at Ratchaburi Power Plant were within the standard criteria.

Table 7.1-1 The results of emission air quality from HRSG 11 Stack at Ratchaburi Power Plant, Ratchaburi province on November 11, 2022

Parameter	Unit	Value	Standard	Analytical Methods
Fuel Type	-	Natural Gas	-	-
Stack Diameter	cm.	697	-	-
Stack Temperature	°C	111.5	-	-
Dry Gas Temperature	°C	30.8	-	-
Absolute Stack Pressure	mm.Hg	758.7	-	-
Air Velocity	m/s	22.53	-	U.S.EPA Method 2
Volumetric Flow Rate	Nm ³ /hr	2,134,970	-	U.S.EPA Method 2
Moisture	%	10.82	-	U.S.EPA Method 4
O ₂	%	13.65	-	U.S. EPA Method 3A
CO ₂	%	4.06	-	-
TSP (at 7 % O ₂)	mg/Nm ³	1.01	60 ^{1/}	U.S.EPA Method 5
NO _x (as NO ₂) at O ₂ 7%	ppm	59.70	120 ^{1/} , 96 ^{2/}	U.S.EPA Method 7
SO ₂ at O ₂ 7%	ppm	N.D.	20 ^{1/}	U.S.EPA Method 6
CO at O ₂ 7%	ppm	1.9	690 ^{2/}	U.S.EPA Method 10

Remarks : - N = Normal condition means reference condition at temperature of 25 °C, pressure of 1 atm or 760 mm.Hg, and dry basis.
- N.D. = Not Detected, detection limit at actual O₂ of SO₂ <1 ppm,
Sources : ^{1/} Notification of Ministry of Industry, B.E. 2547 (2004), issued under Factory Act B.E. 2535 (1992), dated October 7, B.E. 2547 (2004), New Power Plant.
^{2/} Notification of the Ministry of Industry, B.E. 2549 (2006)
^{3/} Emission Standard from EIA of RPCL Plant.

Table 7.1-2 The results of emission air quality from HRSG 12 Stack at Ratchaburi Power Plant, Ratchaburi province on November 11, 2022

Parameter	Unit	Value	Standard	Analytical Methods
Fuel Type	-	Natural Gas	-	-
Stack Diameter	cm.	697	-	-
Stack Temperature	°C	109.5	-	-
Dry Gas Temperature	°C	31.5	-	-
Absolute Stack Pressure	mm.Hg	758.8	-	-
Air Velocity	m/s	20.99	-	U.S.EPA Method 2
Volumetric Flow Rate	Nm ³ /hr	1,998,962	-	U.S.EPA Method 2
Moisture	%	10.81	-	U.S.EPA Method 4
O ₂	%	13.72	-	U.S. EPA Method 3A
CO ₂	%	4.31	-	-
TSP (at 7 % O ₂)	mg/Nm ³	1.08	60 ^{1/}	U.S.EPA Method 5
NO _x (as NO ₂) at O ₂ 7%	ppm	62.06	120 ^{1/} , 96 ^{2/}	U.S.EPA Method 7
SO ₂ at O ₂ 7%	ppm	N.D.	20 ^{1/}	U.S.EPA Method 6
CO at O ₂ 7%	ppm	1.9	690 ^{2/}	U.S.EPA Method 10

Remarks : - N = Normal condition means reference condition at temperature of 25 °C, pressure of 1 atm or 760 mm.Hg, and dry basis.
- N.D. = Not Detected, detection limit at actual O₂ of SO₂ <1 ppm
Sources : ^{1/} Notification of Ministry of Industry, B.E. 2547 (2004), issued under Factory Act B.E. 2535 (1992), dated October 7, B.E. 2547 (2004), New Power Plant.
^{2/} Notification of the Ministry of Industry, B.E. 2549 (2006)
^{3/} Emission Standard from EIA of RPCL Plant.

Table 7.1-3 The results of emission air quality from HRSG 21 Stack at Ratchaburi Power Plant, Ratchaburi province on November 28, 2022

Parameter	Unit	Value	Standard	Analytical Methods
Fuel Type	-	Natural Gas	-	-
Stack Diameter	cm.	697	-	-
Stack Temperature	°C	106.4	-	-
Dry Gas Temperature	°C	36.3	-	-
Absolute Stack Pressure	mm.Hg	757.7	-	-
Air Velocity	m/s	17.99	-	U.S.EPA Method 2
Volumetric Flow Rate	Nm ³ /hr	1,746,212	-	U.S.EPA Method 2
Moisture	%	9.74	-	U.S.EPA Method 4
O ₂	%	13.77	-	U.S. EPA Method 3A
CO ₂	%	4.28	-	-
TSP (at 7 % O ₂)	mg/Nm ³	1.03	60 ^{1/2}	U.S.EPA Method 5
NO _x (as NO ₂) at O ₂ 7%	ppm	51.10	120 ^{1/2} , 96 ^{3/2}	U.S.EPA Method 7
SO ₂ at O ₂ 7%	ppm	N.D.	20 ^{1/2}	U.S.EPA Method 6
CO at O ₂ 7%	ppm	4.1	690 ^{2/2}	U.S.EPA Method 10

Remarks : - N = Normal condition means reference condition at temperature of 25 °C, pressure of 1 atm or 760 mm.Hg, and dry basis.
- N.D. = Not Detected, detection limit at actual O₂ of SO₂ <1 ppm

Sources : ^{1/} Notification of Ministry of Industry, B.E. 2547 (2004), issued under Factory Act B.E. 2535 (1992), dated October 7, B.E. 2547 (2004), New Power Plant.
^{2/} Notification of the Ministry of Industry, B.E. 2549 (2006)
^{3/} Emission Standard from EIA of RPCL Plant.

Table 7.1-4 The results of emission air quality from HRSG 22 Stack at Ratchaburi Power Plant, Ratchaburi province on November 28, 2022

Parameter	Unit	Value	Standard	Analytical Methods
Fuel Type	-	Natural Gas	-	-
Stack Diameter	cm.	697	-	-
Stack Temperature	°C	106.4	-	-
Dry Gas Temperature	°C	34.8	-	-
Absolute Stack Pressure	mm.Hg	757.6	-	-
Air Velocity	m/s	17.36	-	U.S.EPA Method 2
Volumetric Flow Rate	Nm ³ /hr	1,682,423	-	U.S.EPA Method 2
Moisture	%	9.83	-	U.S.EPA Method 4
O ₂	%	13.70	-	U.S. EPA Method 3A
CO ₂	%	4.17	-	-
TSP (at 7 % O ₂)	mg/Nm ³	1.67	60 ^{1/2}	U.S.EPA Method 5
NO _x (as NO ₂) at O ₂ 7%	ppm	53.56	120 ^{1/2} , 96 ^{3/2}	U.S.EPA Method 7
SO ₂ at O ₂ 7%	ppm	N.D.	20 ^{1/2}	U.S.EPA Method 6
CO at O ₂ 7%	ppm	4.4	690 ^{2/2}	U.S.EPA Method 10

Remarks : - N = Normal condition means reference condition at temperature of 25 °C, pressure of 1 atm or 760 mm.Hg, and dry basis.
- N.D. = Not Detected, detection limit at actual O₂ of SO₂ <1 ppm

Sources : ^{1/} Notification of Ministry of Industry, B.E. 2547 (2004), issued under Factory Act B.E. 2535 (1992), dated October 7, B.E. 2547 (2004), New Power Plant.
^{2/} Notification of the Ministry of Industry, B.E. 2549 (2006)
^{3/} Emission Standard from EIA of RPCL Plant.

7.2 Relative Accuracy Test Audit (RATA)

The summary of RATA results of CEMs has installed at HRSG 21 and HRSG 22 Stack at Ratchaburi Power Plant, Ratchaburi province conducted during November 28, 2022 and it was found that the RATA of SO₂, NO_x, CO and O₂ met the RA accepted criteria of U.S. EPA regulated in 40 CFR 60 Appendix B, Performance Specification 2, 3 and 4 (PS-2, PS-3 and P S-4). The details are shown in **Table 7.2-1.-7.2-2**.

Table 7.2-1 Summary of RATA results of CEMs at HRSG 21 Stack at Ratchaburi Power Plant, Ratchaburi province on November 28, 2022

Parameters	Units	CEMS	RM (by SGS)	Diff.	CC	RA%	RA Acceptance Criteria	Passed or Not
NO _x at 7%O ₂ (compared with RM)	ppm	53.37	52.36	-1.01	0.19	2.30%	20% ^{1/2}	passed
O ₂ (compared with RM)	%	13.84	13.78	0.06	-	0.06%	1% ^{1/2}	passed
SO ₂ at 7%O ₂ (compared with Emission standard 20 ppm)	ppm	2.12	1.76	-0.36	0.24	3.02%	10% ^{2/2}	passed
CO at 7%O ₂ (compared with Emission standard 690 ppm)	ppm	4.50	2.72	-1.78	0.27	0.30%	5% ^{3/2}	passed

Remarks : ^{1/} RA Criteria is referred to 40CFR 60 Appendix B, U.S. EPA : Performance Specification (PS)
^{2/} RA value was compared with Notification of Ministry of Industry, B.E. 2547 (2004), issued under Factory Act B.E. 2535 (1992), dated October 7, B.E. 2547 (2004), New Power Plant or Ratchaburi Power Plant Criteria
^{3/} RA value was compared with the emission standard according to the Notification of the Ministry of Industry, subjected "Industrial Emission Standards", dated December 4, 2006

Table 7.2-2 Summary of RATA results of CEMs at HRSG 22 Stack at Ratchaburi Power Plant, Ratchaburi province on November 28, 2022

Parameters	Units	CEMS	RM (by SGS)	Diff.	CC	RA%	RA Acceptance Criteria	Passed or Not
NO _x at 7%O ₂ (compared with RM)	ppm	54.75	53.91	-0.84	0.13	1.82%	20% ^{1/2}	passed
O ₂ (compared with RM)	%	13.62	13.69	0.07	-	0.07%	1% ^{1/2}	passed
SO ₂ at 7%O ₂ (compared with Emission standard 20 ppm)	ppm	1.91	1.88	-0.33	0.61	3.19%	10 % ^{2/2}	passed
CO at 7%O ₂ (compared with Emission standard 690 ppm)	ppm	8.03	2.64	-5.39	0.41	0.84%	5% ^{3/2}	passed

Remarks : ^{1/} RA Criteria is referred to 40CFR 60 Appendix B, U.S. EPA : Performance Specification (PS)
^{2/} RA value was compared with Notification of Ministry of Industry, B.E. 2547 (2004), issued under Factory Act B.E. 2535 (1992), dated October 7, B.E. 2547 (2004), New Power Plant or Ratchaburi Power Plant Criteria
^{3/} RA value was compared with the emission standard according to the Notification of the Ministry of Industry, subjected "Industrial Emission Standards", dated December 4, 2006

Appendix A Test Report

Emission Air Quality

- HRSG 11

SGS

Report No. : 2022-5005691 / 001-1 (Page 1 of 1)

Issued date : December 6, 2022

CLIENT : RATCHABURI POWER CO., LTD.
CONTACT : Khun Patchanee Panitchakuljanus
ADDRESS : 1828 Sukhumvit Road, Phra Khanong Tai, Phra Khanong, Bangkok 10260
Tel. 032-719300 Ext. 1054 Fax. 032-719300 Ext. 1090

Analysis Report

SAMPLE DESIGNATED AS : Emission Air Quality
SAMPLING LOCATION : HRSG 11,
Ratchaburi Power Plant, Ratchaburi province
SAMPLING DATE : November 11, 2022
SAMPLING TIME : 10:30-12:05 hr.
SAMPLING BY : Suphachai Pisanpracharak
(1-197-4-0020)

Parameter	Unit	Value	Standard	Analytical Methods
Fuel Type	-	Natural Gas	-	-
Stack Diameter	cm.	697	-	-
Stack Temperature	°C	111.5	-	-
Dry Gas Temperature	°C	30.8	-	-
Absolute Stack Pressure	mm.Hg	758.7	-	-
Air Velocity	m/s	22.53	-	U.S.EPA Method 2
Volumetric Flow Rate at actual O ₂	Nm ³ /hr. dry	2,134.970	-	U.S.EPA Method 2
Moisture	%	10.82	-	U.S.EPA Method 4
O ₂	%	13.65	-	-
CO ₂	%	4.06	-	U.S. EPA Method 3A
TSP at 7 % O ₂	mg/Nm ³	1.01	60 ¹⁾	U.S.EPA Method 5
NO _x (as NO ₂) at 7 % O ₂	ppm	59.70	120 ^{1), 96³⁾}	U.S.EPA Method 7
SO ₂ at 7% O ₂	ppm	N.D.	20 ¹⁾	U.S.EPA Method 6
CO at 7% O ₂	ppm	1.9	690 ²⁾	U.S.EPA Method 10

Remarks : - N = Normal condition means reference condition at temperature of 25 °C, pressure of 1 atm or 760 mm.Hg. and dry basis.
- N.D. = Not Detected, detection limit at actual O₂ of SO₂ <1 ppm
Sources : 1) Notification of Ministry of Industry, B.E. 2547 (2004), issued under Factory Act B.E. 2535 (1992), dated October 7, B.E. 2547 (2004), New Power Plant.
2) Notification of the Ministry of Industry, B.E. 2549 (2006)
3) Emission Standard of Ratchaburi Power Plant.

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License ID: 1-197-4-0005
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Report No. : 2022-5005691 / 001-2 (Page 1 of 1)

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Analysis Report

SAMPLE DESIGNATED AS : Emission Air Quality
SAMPLING LOCATION : HRSG 12,
Ratchaburi Power Plant, Ratchaburi province
SAMPLING DATE : November 11, 2022
SAMPLING TIME : 12:35-14:05 hr.
SAMPLING BY : Suphachai Pisanpracharak
(1-197-4-0020)

Parameter	Unit	Value	Standard	Analytical Methods
Fuel Type	-	Natural Gas	-	-
Stack Diameter	cm.	697	-	-
Stack Temperature	°C	109.5	-	-
Dry Gas Temperature	°C	31.5	-	-
Absolute Stack Pressure	mm.Hg	758.8	-	-
Air Velocity	m/s	20.99	-	U.S.EPA Method 2
Volumetric Flow Rate at actual O ₂	Nm ³ /hr. dry	1,998.962	-	U.S.EPA Method 2
Moisture	%	10.81	-	U.S.EPA Method 4
O ₂	%	13.72	-	-
CO ₂	%	4.31	-	U.S. EPA Method 3A
TSP at 7 % O ₂	mg/Nm ³	1.08	60 ¹⁾	U.S.EPA Method 5
NO _x (as NO ₂) at 7 % O ₂	ppm	62.06	120 ^{1), 96³⁾}	U.S.EPA Method 7
SO ₂ at 7% O ₂	ppm	N.D.	20 ¹⁾	U.S.EPA Method 6
CO at 7% O ₂	ppm	1.8	690 ²⁾	U.S.EPA Method 10

Remarks : - N = Normal condition means reference condition at temperature of 25 °C, pressure of 1 atm or 760 mm.Hg. and dry basis.
- N.D. = Not Detected, detection limit at actual O₂ of SO₂ <1 ppm
Sources : 1) Notification of Ministry of Industry, B.E. 2547 (2004), issued under Factory Act B.E. 2535 (1992), dated October 7, B.E. 2547 (2004), New Power Plant.
2) Notification of the Ministry of Industry, B.E. 2549 (2006)
3) Emission Standard of Ratchaburi Power Plant.

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Emission Air Quality

- HRSG 21

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Report No. : 2022-5005691-2 / 001-1 (Page 1 of 1)

Issued date : December 16, 2022

CLIENT : RATCHABURI POWER CO., LTD.
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Analysis Report

SAMPLE DESIGNATED AS : Emission Air Quality
SAMPLING LOCATION : HRSG 21, Ratchaburi Power Plant, Ratchaburi province
SAMPLING DATE : November 28, 2022
SAMPLING TIME : 10:30-13:20 hr
SAMPLING BY : Mingman Sirichol
 (7-197-4-0028)

Parameter	Unit	Value	Standard	Analytical Methods
Fuel Type	-	Natural Gas	-	-
Stack Diameter	cm.	697	-	-
Stack Temperature	°C	106.4	-	-
Dry Gas Temperature	°C	36.3	-	-
Absolute Stack Pressure	mm.Hg	757.7	-	-
Air Velocity	m/s	17.99	-	U.S.EPA Method 2
Volumetric Flow Rate at actual O ₂	Nm ³ /hr, dry	1,746.212	-	U.S.EPA Method 4
Moisture	%	9.74	-	U.S.EPA Method 3A
O ₂	%	13.77	-	-
CO ₂	%	4.28	-	-
TSP at 7 % O ₂	mg/Nm ³	1.03	60 ¹⁾	U.S.EPA Method 5
NO _x (as NO ₂) at 7 % O ₂	ppm	51.10	120 ^{1), 96²⁾}	U.S.EPA Method 7
SO ₂ at 7% O ₂	ppm	N.D.	20 ¹⁾	U.S.EPA Method 6
CO at 7% O ₂	ppm	4.1	690 ²⁾	U.S.EPA Method 10

Remarks : - N = Normal condition means reference condition at temperature of 25 °C, pressure of 1 atm or 760 mm.Hg, and dry basis.
 - N.D. = Not Detected, detection limit at actual O₂ of SO₂ <1 ppm
Sources : 1) Notification of Ministry of Industry, B.E. 2547 (2004), issued under Factory Act B.E. 2535 (1992), dated October 7, B.E. 2547 (2004), New Power Plant.
 2) Notification of the Ministry of Industry, B.E. 2549 (2006)
 3) Emission Standard of Ratchaburi Power Plant.

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Relative Accuracy Test Audit (RATA)

- HRSG 21

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Report No. : 2022-5005691-2 / 002-1 (Page 1 of 4)

Issued date : December 6, 2022

CLIENT : RATCHABURI POWER CO., LTD.
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 Tel. 032-719300 Ext. 1054 Fax. 032-719300 Ext. 1090

Analysis Report

SAMPLE DESCRIPTION : Emission Air
SAMPLE DESIGNATED AS : Relative Accuracy Test Audit : NO_x
MEASUREMENT LOCATION : HRSG 21, Ratchaburi Power Co., Ltd., Ratchaburi Province
MEASUREMENT DATE : November 28, 2022
MEASURED BY : Phatsakorn Soonthornwiphat

No.	Date (dd/mm/yy)	Time	Loading condition (MW) ²⁾	NO _x				Diff
				Raw Data (at actual O ₂)		Corrected Value (at 7%O ₂)		
				CEMs	RM	CEMs	RM	
				ppm	ppm	ppm	ppm	
1	28/11/2022	10:31-11:00	185.354	25.59	25.21	50.21	49.19	-1.02
2	28/11/2022	11:01-11:30	189.792	27.02	26.69	52.74	51.97	-0.77
3	28/11/2022	11:31-12:00	177.539	26.02	25.85	51.51	50.99	-0.52
4	28/11/2022	12:01-12:30	186.610	26.54	26.19	52.23	51.05	-1.18
5*	28/11/2022	12:31-13:00	190.427	27.13	26.78	53.30	51.72	-1.58
6*	28/11/2022	13:01-13:30	188.914	26.95	26.71	53.09	51.74	-1.35
7	28/11/2022	13:31-14:00	188.182	27.15	26.82	53.50	52.28	-1.22
8	28/11/2022	14:01-14:30	188.627	27.26	26.96	53.91	52.62	-1.29
9*	28/11/2022	14:31-15:00	187.376	27.36	26.95	53.87	52.39	-1.48
10	28/11/2022	15:01-15:30	188.028	27.90	27.74	55.04	54.05	-0.99
11	28/11/2022	15:31-16:00	187.426	28.04	27.81	55.39	54.44	-0.95
12	28/11/2022	16:01-16:30	188.079	28.26	27.94	55.81	54.63	-1.19
Average						53.37	52.36	-1.01
Confidence Coefficient								0.19
Relative Accuracy (Compared with RM)								2.30%
Relative Accuracy Criteria ¹⁾ (Compared with RM)								20%
Conclusion (Pass/ Fail)								Pass

Remarks : * Sample with * is rejected data
 - Emission standard of NO_x at 7% O₂ = 96 ppm
Source : 1) RA Criteria of NO_x is referred to 40 CFR 60 Appendix B, U.S. EPA : Performance Specification 2 (PS-2).
 2) Loading Condition data was from Ratchaburi Power Co., Ltd.

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TY/PS/WIWI

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Report No. : 2022-5005691-2 / 002-1 (Page 2 of 4) Issued date: December 6, 2022

CLIENT : RATCHABURI POWER CO., LTD.
CONTACT : Khun Patchanee Panitchakuljanus
ADDRESS : 1828 Sukhumvit Road, Phra Khanong Tai, Phra Khanong, Bangkok 10260
Tel. 032-719300 Ext. 1054 Fax. 032-719300 Ext. 1090

Analysis Report

SAMPLE DESCRIPTION : Emission Air
SAMPLE DESIGNATED AS : Relative Accuracy Test Audit : O₂
MEASUREMENT LOCATION : HRSG 21, Ratchaburi Power Co., Ltd., Ratchaburi Province
MEASUREMENT DATE : November 28, 2022
MEASURED BY : Phatsakorn Soonthornwiphat

No.	Date (dd/mm/yy)	Time	Loading condition (MW) ²⁾	O ₂		Diff
				CEMs	RM	
				%	%	
1	28/11/2022	10:31-11:00	185.354	13.82	13.78	-0.04
2	28/11/2022	11:01-11:30	189.792	13.78	13.76	-0.02
3	28/11/2022	11:31-12:00	177.539	13.88	13.85	-0.02
4	28/11/2022	12:01-12:30	186.610	13.84	13.77	-0.07
5*	28/11/2022	12:31-13:00	190.427	13.82	13.70	-0.12
6*	28/11/2022	13:01-13:30	188.914	13.84	13.72	-0.12
7	28/11/2022	13:31-14:00	188.182	13.85	13.77	-0.08
8*	28/11/2022	14:01-14:30	188.627	13.87	13.78	-0.09
9	28/11/2022	14:31-15:00	187.376	13.84	13.75	-0.09
10	28/11/2022	15:01-15:30	188.028	13.85	13.77	-0.09
11	28/11/2022	15:31-16:00	187.426	13.86	13.80	-0.06
12	28/11/2022	16:01-16:30	188.079	13.86	13.79	-0.07
Average				13.84	13.78	-0.06
Relative Accuracy (Compared with RM)						0.06%
Relative Accuracy Criteria ¹⁾ (Compared with RM)						1%
Conclusion (Pass/ Fail)						Pass

Remark : * Sample with * is rejected data
Source : 1) RA Criteria of O₂ is referred to 40 CFR 60 Appendix B, U.S. EPA : Performance Specification 3 (PS-3)
2) Loading Condition data was from Ratchaburi Power Co., Ltd.

SGS (THAILAND) LIMITED
(Thepsan Yommana)
Technical Manager

TY/PS/WIWI

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Report No. : 2022-5005691-2 / 002-1 (Page 3 of 4) Issued date: December 6, 2022

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Analysis Report

SAMPLE DESCRIPTION : Emission Air
SAMPLE DESIGNATED AS : Relative Accuracy Test Audit : SO₂
MEASUREMENT LOCATION : HRSG 21, Ratchaburi Power Co., Ltd., Ratchaburi Province
MEASUREMENT DATE : November 28, 2022
MEASURED BY : Phatsakorn Soonthornwiphat

No.	Date (dd/mm/yy)	Time	Loading condition (MW) ²⁾	SO ₂				Diff
				Raw Data (at actual O ₂)		Corrected Value (at 7%O ₂)		
				CEMs	RM	CEMs	RM	
				ppm	ppm	ppm	ppm	
1	28/11/2022	10:31-11:00	185.354	1.03	1.13	2.03	2.21	0.19
2	28/11/2022	11:01-11:30	189.792	1.10	1.15	2.15	2.25	0.10
3	28/11/2022	11:31-12:00	177.539	1.11	0.92	2.20	1.82	-0.37
4	28/11/2022	12:01-12:30	186.610	1.20	0.91	2.36	1.78	-0.58
5	28/11/2022	12:31-13:00	190.427	1.09	0.85	2.15	1.65	-0.50
6	28/11/2022	13:01-13:30	188.914	1.10	0.80	2.17	1.54	-0.62
7	28/11/2022	13:31-14:00	188.182	1.08	0.76	2.13	1.48	-0.65
8*	28/11/2022	14:01-14:30	188.627	1.12	0.63	2.21	1.23	-0.98
9	28/11/2022	14:31-15:00	187.376	1.01	0.88	1.99	1.71	-0.28
10	28/11/2022	15:01-15:30	188.028	0.98	0.71	1.94	1.38	-0.55
11*	28/11/2022	15:31-16:00	187.426	1.06	0.44	2.09	0.86	-1.23
12*	28/11/2022	16:01-16:30	188.079	1.16	0.52	2.29	1.02	-1.28
Average						2.12	1.76	-0.36
Confidence Coefficient								0.24
Relative Accuracy (Compared with Emission Standard, SO ₂ = 20 ppm)								3.02%
Relative Accuracy Criteria ¹⁾ (Compared with Emission Standard,SO ₂ = 20 ppm)								10 %
Conclusion (Pass/ Fail)								Pass

Remarks : * Sample with * is rejected data
Source : 1) Emission standard of SO₂ at 7% O₂ = 20 ppm
2) RA Criteria of SO₂ is referred to 40 CFR 60 Appendix B, U.S. EPA : Performance Specification 2 (PS-2) and compared with the emission standard of the plant.
3) Loading Condition data was from Ratchaburi Power Co., Ltd.

SGS (THAILAND) LIMITED
(Thepsan Yommana)
Technical Manager

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Report No. : 2022-5005691-2 / 002-1 (Page 4 of 4) Issued date: December 6, 2022

CLIENT : RATCHABURI POWER CO., LTD.
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Analysis Report

SAMPLE DESCRIPTION : Emission Air
SAMPLE DESIGNATED AS : Relative Accuracy Test Audit : CO
MEASUREMENT LOCATION : HRSG 21, Ratchaburi Power Co., Ltd., Ratchaburi Province
MEASUREMENT DATE : November 28, 2022
MEASURED BY : Phatsakorn Soonthornwiphat

No.	Date (dd/mm/yy)	Time	Loading condition (MW) ²⁾	CO				Diff
				Raw Data (at actual O ₂)		Corrected Value (at 7%O ₂)		
				CEMs	RM	CEMs	RM	
				ppm	ppm	ppm	ppm	
1	28/11/2022	10:31-11:00	185.354	2.22	1.76	4.36	3.44	-0.92
2	28/11/2022	11:01-11:30	189.792	2.14	1.34	4.18	2.62	-1.57
3	28/11/2022	11:31-12:00	177.539	2.92	1.89	5.78	3.92	-1.86
4*	28/11/2022	12:01-12:30	186.610	2.28	1.21	4.48	2.35	-2.13
5	28/11/2022	12:31-13:00	190.427	2.14	1.18	4.21	2.27	-1.94
6*	28/11/2022	13:01-13:30	188.914	2.23	1.20	4.39	2.33	-2.06
7	28/11/2022	13:31-14:00	188.182	2.15	1.21	4.24	2.36	-1.88
8	28/11/2022	14:01-14:30	188.627	2.24	1.26	4.43	2.46	-1.97
9	28/11/2022	14:31-15:00	187.376	2.26	1.27	4.45	2.48	-1.99
10	28/11/2022	15:01-15:30	188.028	2.25	1.29	4.43	2.52	-1.91
11*	28/11/2022	15:31-16:00	187.426	2.27	1.19	4.49	2.33	-2.15
12	28/11/2022	16:01-16:30	188.079	2.24	1.23	4.43	2.41	-2.02
Average						4.50	2.72	-1.78
Confidence Coefficient								0.27
Relative Accuracy (Compared with Emission Standard 690 ppm)								0.30%
Relative Accuracy Criteria ¹⁾ (Compared with Emission Standard 690 ppm)								5%
Conclusion (Pass/Fail)								Pass

Remarks : * Sample with * is rejected data
Source : 1) RA Criteria of CO is referred to 40 CFR 60 Appendix B, U.S. EPA : Performance Specification 4 (PS-4) and compared with Industrial Emission Standards, Notification of the Ministry of Industry, B.E. 2549 (2006).
2) Loading Condition data was from Ratchaburi Power Co., Ltd.

SGS (THAILAND) LIMITED
(Thepsan Yommana)
Technical Manager

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Emission Air Quality

- HRSG 22



Report No. : 2022-5005691-2 / 001-2 (Page 1 of 1) Issued date : December 16, 2022

CLIENT : RATCHABURI POWER CO., LTD.
CONTACT : Khun Patchanee Panitchakuljaras
ADDRESS : 1828 Sukhumvit Road, Phra Khanong Tai, Phra Khanong, Bangkok 10260
Tel. 032-719300 Ext. 1054 Fax. 032-719300 Ext. 1090

Analysis Report

SAMPLE DESIGNATED AS : Emission Air Quality
SAMPLING LOCATION : HRSG 22, Ratchaburi Power Plant, Ratchaburi province
SAMPLING DATE : November 28, 2022
SAMPLING TIME : 10:27-13:35 hr
SAMPLING BY : Phatsakorn Soonthornwiphat
(?-197-4-004)

Parameter	Unit	Value	Standard	Analytical Methods
Fuel Type	-	Natural Gas	-	-
Stack Diameter	cm	697	-	-
Stack Temperature	°C	106.4	-	-
Dry Gas Temperature	°C	34.8	-	-
Absolute Stack Pressure	mm.Hg	757.6	-	-
Air Velocity	m/s	17.36	-	U.S.EPA Method 2
Volumetric Flow Rate at actual O ₂	Nm ³ /hr, dry	1,682,423	-	U.S.EPA Method 2
Moisture	%	9.83	-	U.S.EPA Method 4
O ₂	%	13.70	-	U.S. EPA Method 3A
CO ₂	%	4.17	-	-
TSP at 7 % O ₂	mg/Nm ³	1.67	60 ¹⁾	U.S.EPA Method 5
NO _x (as NO ₂) at 7 % O ₂	ppm	53.56	120 ¹⁾ , 96 ²⁾	U.S.EPA Method 7
SO ₂ at 7 % O ₂	ppm	N.D.	20 ¹⁾	U.S.EPA Method 6
CO at 7 % O ₂	ppm	4.4	690 ²⁾	U.S.EPA Method 10

Remarks : - N = Normal condition means reference condition at temperature of 25 °C, pressure of 1 atm or 760 mm.Hg, and dry basis.
- N.D. = Not Detected, detection limit at actual O₂ of SO₂ <1 ppm
Sources : 1) Notification of Ministry of Industry, B.E. 2547 (2004), issued under Factory Act B.E. 2535 (1992), dated October 7, B.E. 2547 (2004), New Power Plant.
2) Notification of the Ministry of Industry, B.E. 2549 (2006)
3) Emission Standard of Ratchaburi Power Plant.

Thipsan Y.
(Thipsan Yommana)
License ID: 7-197-4-0005
Technical Manager



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Relative Accuracy Test Audit (RATA)

- HRSG 22



Report No. : 2022-5005691-2 / 002-2 (Page 1 of 4) Issued date: December 6, 2022

CLIENT : RATCHABURI POWER CO., LTD.
CONTACT : Khun Patchanee Panitchakuljaras
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Analysis Report

SAMPLE DESCRIPTION : Emission Air
SAMPLE DESIGNATED AS : Relative Accuracy Test Audit : NO_x
MEASUREMENT LOCATION : HRSG 22, Ratchaburi Power Co., Ltd., Ratchaburi Province
MEASUREMENT DATE : November 28, 2022
MEASURED BY : Phatsakorn Soonthornwiphat

No.	Date (dd/mm/yy)	Time	Loading condition (MW) ²⁾	NO _x				Diff
				Raw Data (at actual O ₂)		Corrected Value (at 7%O ₂)		
				CEMs ppm	RM ppm	CEMs ppm	RM ppm	
1	28/11/2022	10:31-11:00	185.345	27.29	26.77	51.90	51.05	-0.85
2*	28/11/2022	11:01-11:30	190.165	26.74	27.82	54.72	53.43	-1.30
3	28/11/2022	11:31-12:00	177.896	27.30	26.73	52.72	51.89	-0.82
4*	28/11/2022	12:01-12:30	186.922	28.34	27.44	54.06	52.73	-1.33
5*	28/11/2022	12:31-13:00	190.684	28.91	27.81	54.96	53.52	-1.44
6	28/11/2022	13:01-13:30	189.231	28.60	27.65	54.48	53.28	-1.20
7	28/11/2022	13:31-14:00	188.497	28.60	27.78	54.56	53.75	-0.81
8	28/11/2022	14:01-14:30	189.079	28.89	27.94	55.22	54.18	-1.04
9	28/11/2022	14:31-15:00	187.542	28.81	28.03	54.80	54.15	-0.74
10	28/11/2022	15:01-15:30	188.303	29.35	28.59	56.07	55.30	-0.77
11	28/11/2022	15:31-16:00	187.797	29.37	28.61	56.25	55.63	-0.62
12	28/11/2022	16:01-16:30	188.404	29.60	28.76	56.67	55.92	-0.75
Average						54.75	53.91	-0.84
Confidence Coefficient								0.13
Relative Accuracy (Compared with RM)								1.82%
Relative Accuracy Criteria ¹⁾ (Compared with RM)								20%
Conclusion (Pass/ Fail)								Pass

Remarks : * Sample with * is rejected data
- Emission standard of NO_x at 7% O₂ = 96 ppm
Source : 1) RA Criteria of NO_x is referred to 40 CFR 60 Appendix B, U.S. EPA : Performance Specification 2 (PS-2).
2) Loading Condition data was from Ratchaburi Power Co., Ltd.

Thipsan Y.
(Thipsan Yommana)
Technical Manager



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Analysis Report

SAMPLE DESCRIPTION : Emission Air
SAMPLE DESIGNATED AS : Relative Accuracy Test Audit : O₂
MEASUREMENT LOCATION : HRSG 22, Ratchaburi Power Co., Ltd., Ratchaburi Province
MEASUREMENT DATE : November 28, 2022
MEASURED BY : Phatsakorn Soonthornwiphat

No.	Date (dd/mm/yy)	Time	Loading condition (MW) ²⁾	O ₂		Diff
				CEMs %	RM %	
				%	%	
1	28/11/2022	10:31-11:00	185.345	13.59	13.61	0.02
2	28/11/2022	11:01-11:30	190.165	13.60	13.66	0.06
3	28/11/2022	11:31-12:00	177.896	13.70	13.74	0.04
4	28/11/2022	12:01-12:30	186.922	13.61	13.67	0.05
5	28/11/2022	12:31-13:00	190.684	13.59	13.68	0.09
6	28/11/2022	13:01-13:30	189.231	13.60	13.69	0.08
7	28/11/2022	13:31-14:00	188.497	13.61	13.72	0.10
8	28/11/2022	14:01-14:30	189.079	13.63	13.73	0.10
9	28/11/2022	14:31-15:00	187.542	13.61	13.70	0.10
10	28/11/2022	15:01-15:30	188.303	13.62	13.72	0.09
11	28/11/2022	15:31-16:00	187.797	13.64	13.75	0.11
12	28/11/2022	16:01-16:30	188.404	13.64	13.75	0.11
Average				13.62	13.69	0.07
Relative Accuracy (Compared with RM)						0.07%
Relative Accuracy Criteria ¹⁾ (Compared with RM)						1%
Conclusion (Pass/ Fail)						Pass

Remark : * Sample with * is rejected data
Source : 1) RA Criteria of O₂ is referred to 40 CFR 60 Appendix B, U.S. EPA : Performance Specification 3 (PS-3)
2) Loading Condition data was from Ratchaburi Power Co., Ltd.

Thipsan Y.
(Thipsan Yommana)
Technical Manager



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๓๗) นายอรรถวิทย์ ภูมิคุ้ม	ทะเบียนเลขที่ ๖-๑๑๓๓-๖-๐๐๑๓๓
๓๘) นายกรวิชัย มาลากุล ณ อยุธยา	ทะเบียนเลขที่ ๖-๑๑๓๓-๖-๐๐๑๓๔
๓๙) นายวิระเดช ทนนา	ทะเบียนเลขที่ ๖-๑๑๓๓-๖-๐๐๑๓๕
๔๐) นายพิเชษฐ์ ศรีพญาบุญ	ทะเบียนเลขที่ ๖-๑๑๓๓-๖-๐๐๑๓๖
๔๑) นายปรีดา เกษปทุม	ทะเบียนเลขที่ ๖-๑๑๓๓-๖-๐๐๑๓๗
๔๒) นางสาวอริยา ใต้ใจ	ทะเบียนเลขที่ ๖-๑๑๓๓-๖-๐๐๑๓๘
๔๓) นายศุภพร ทองวงศ์ญาติ	ทะเบียนเลขที่ ๖-๑๑๓๓-๖-๐๐๑๓๙
๔๔) นายศุภชัย พิเศษประชาภิรักษ์	ทะเบียนเลขที่ ๖-๑๑๓๓-๖-๐๐๑๔๐
๔๕) นายปฏิวัฒน์ ทัพพจิตร	ทะเบียนเลขที่ ๖-๑๑๓๓-๖-๐๐๑๔๑
๔๖) นายชัชวาล รื่นหลุย	ทะเบียนเลขที่ ๖-๑๑๓๓-๖-๐๐๑๔๒
๔๗) นายปวีต พงษ์วิรัชไชย	ทะเบียนเลขที่ ๖-๑๑๓๓-๖-๐๐๑๔๓
๔๘) นางสาวสุภาภา เกียรติแสง	ทะเบียนเลขที่ ๖-๑๑๓๓-๖-๐๐๑๔๔
๔๙) นายอรรถกร บุญพันธ์	ทะเบียนเลขที่ ๖-๑๑๓๓-๖-๐๐๑๔๕
๕๐) นายสมิธเนศ ศรีโพธิ์	ทะเบียนเลขที่ ๖-๑๑๓๓-๖-๐๐๑๔๖
๕๑) นายภูทิตตคุณ ทาสีเพียร	ทะเบียนเลขที่ ๖-๑๑๓๓-๖-๐๐๑๔๗
๕๒) นายชวาลิต ศรีมน	ทะเบียนเลขที่ ๖-๑๑๓๓-๖-๐๐๑๔๘
๕๓) นายพนรัตน์ จำปานวม	ทะเบียนเลขที่ ๖-๑๑๓๓-๖-๐๐๑๔๙
๕๔) นายวิริยะ ศรีโพธิ์	ทะเบียนเลขที่ ๖-๑๑๓๓-๖-๐๐๑๕๐
๕๕) นางสาวสิริรัตน์ นงษ์	ทะเบียนเลขที่ ๖-๑๑๓๓-๖-๐๐๑๕๑
๕๖) นางสาวพริ้งอรุณ ถิ่น	ทะเบียนเลขที่ ๖-๑๑๓๓-๖-๐๐๑๕๒

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนไว้ให้วิเคราะห์ในน้ำเสีย จำนวน ๔๔ รายการ
ปรี๊ดสิน จำนวน ๑๒๓ รายการ อากาศเสีย (ปล่อยระบาย) จำนวน ๒๘ รายการ สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว
จำนวน ๓๗ รายการ แร่ดิน จำนวน ๑๒๓ รายการ รวมทั้งสิ้นจำนวน ๓๕๔ รายการ ตามสิ่งที่ส่งมาด้วย

หนังสือฉบับนี้จะหมดอายุในวันที่ ๓๑ ตุลาคม ๒๕๖๕ หากประสงค์จะต่ออายุหนังสือ
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่อเจ้าพนักงานออกใบอนุญาตประกอบกิจการโรงงาน
อุตสาหกรรมภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนต้องปฏิบัติตามวิธีการวิเคราะห์เอกชน ซึ่งคำขอ
ต่ออายุดังกล่าวขอรับได้ที่กรมโรงงานอุตสาหกรรม ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้า
เว็บไซต์กรมโรงงานอุตสาหกรรม ตาม QR Code ท้ายหนังสือนี้

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายพร อัมพพันธุ์)

ผู้อำนวยการศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

ปฏิบัติการตามหนังสือกรมโรงงานอุตสาหกรรม

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

โทร. ๐-๓๓๓๓ ๖๐๕๙ ต่อ ๕๐๐๓-๒

ไปรษณีย์อิเล็กทรอนิกส์ env@cdw.mae.go.th



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ยื่นคำขอผ่านระบบอิเล็กทรอนิกส์



เอกสารแนบท้ายหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอสซีเอส (ประเทศไทย) จำกัด (มหาชน) เลขทะเบียน ๖-๑๑๓๓

ที่ อก ๐๓๒๐/๑๖๐๕๖

ลงวันที่ ๓ พฤศจิกายน ๒๕๖๕

ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๑๕๔ รายการ
น้ำเสีย จำนวน ๔๔ รายการ

ลำดับที่	สารมลพิษ	วิธีการวิเคราะห์
1	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
2	Arsenic	Digestion, Inductively Coupled Plasma Method ⁽²⁾
3	Barium	Digestion, Inductively Coupled Plasma Method ⁽²⁾
4	U-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
5	β-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
6	δ-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
7	γ-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
8	Biochemical Oxygen Demand	5-Day BOD Test, Membrane Electrode Method ⁽³⁾
9	Cadmium	Digestion, Inductively Coupled Plasma Method ⁽²⁾
10	Chemical Oxygen Demand	Closed Reflux, Titrimetric Method ⁽⁴⁾
11	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
12	Color	ADMI Weighted - Ordinate Spectrophotometric Method ⁽⁵⁾
13	Copper	Digestion, Inductively Coupled Plasma Method ⁽²⁾
14	Cyanide	Distillation, Colorimetric Method ⁽⁶⁾
15	p,p'-DDD	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
16	p,p'-DDE	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
17	o,p'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
18	p,p'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
19	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾

20 Endosulfan

ลำดับที่	สารมลพิษ	วิธีการวิเคราะห์
20	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
21	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
22	Endosulfan Sulfate	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
23	Endrin	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
24	Endrin Aldehyde	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
25	Formaldehyde	Distillation, Colorimetric Method ⁽⁷⁾
26	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
27	Heptachlor Epoxide	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
28	Hexavalent Chromium	Filtration, Colorimetric Method ⁽⁸⁾
29	Lead	Digestion, Inductively Coupled Plasma Method ⁽²⁾
30	Manganese	Digestion, Inductively Coupled Plasma Method ⁽²⁾
31	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽⁹⁾
32	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽¹⁾
33	Nickel	Digestion, Inductively Coupled Plasma Method ⁽²⁾
34	Oil and Grease	Liquid-Liquid, Partition-Gravimetric Method ⁽¹⁰⁾
35	pH	Electrometric Method ⁽¹¹⁾
36	Phenols	Distillation, Direct Photometric Method ⁽¹²⁾
37	Selenium	Digestion, Inductively Coupled Plasma Method ⁽²⁾
38	Temperature	Field Method ⁽¹³⁾
39	Total Chromium	Digestion, Inductively Coupled Plasma Method ⁽²⁾
40	Total Dissolved Solids	Dried at 180 °C ⁽¹⁴⁾
41	Total Kjeldahl Nitrogen	Digestion, Distillation, Titrimetric Method ⁽¹⁵⁾
42	Total Suspended Solids	Dried at 103-105 °C ⁽¹⁶⁾
43	Trivalent Chromium	Digestion, Inductively Coupled Plasma Method; Filtration, Colorimetric Method, Calculation ⁽¹⁷⁾
44	Zinc	Digestion, Inductively Coupled Plasma Method ⁽²⁾

ปรี๊ดสิน...

ปรี๊ดสิน จำนวน 123 รายการ

ลำดับที่	สารมลพิษ	วิธีการวิเคราะห์
1	Acenaphthene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽¹⁾
2	Acetone	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ⁽¹⁾
3	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽¹⁾
4	Anthracene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽¹⁾
5	Antimony	Digestion, Inductively Coupled Plasma Method ⁽²⁾
6	Arsenic	Digestion, Inductively Coupled Plasma Method ⁽²⁾
7	Atrazine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽¹⁾
8	Barium	Digestion, Inductively Coupled Plasma Method ⁽²⁾
9	Benzene	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ⁽¹⁾
10	Benzo(a)anthracene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽¹⁾
11	Benzo(b)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽¹⁾
12	Benzo(k)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽¹⁾
13	Benzoic acid	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽¹⁾
14	Benzo(a)pyrene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽¹⁾
15	Benzo(g,h,i)perylene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽¹⁾
16	Beryllium	Digestion, Inductively Coupled Plasma Method ⁽²⁾
17	Bis(2-chloroethoxy)ether	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽¹⁾
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽¹⁾
19	Bromodichloromethane	Purge and Trap Gas Chromatographic / Mass Spectrometric Method ⁽¹⁾
20	Bromoform	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽¹⁾

21 Butyl...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
21	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
22	Cadmium	Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
23	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
24	Carbon disulfide	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
25	Carbon tetrachloride	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
26	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
27	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
28	Chlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
29	Chlorodibromomethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
30	Chloroform	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
31	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
32	Chromium	Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
33	Chromium Hexavalent	Filtration, Colorimetric Method ⁽⁴⁾
34	Chromium Trivalent	Digestion, Inductively Coupled Plasma Method ; Filtration, Colorimetric Method; Calculation ⁽⁴⁾
35	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
36	Cyanide	Distillation, Colorimetric Method
37	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
38	DDD	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
39	DDE	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
40	DTT	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾

41 Dibenz...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
41	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
42	Di-n-Butyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
43	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
44	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
45	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
46	5,3-Dichlorobenzidine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
47	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
48	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
49	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
50	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
51	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
52	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
53	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
54	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
55	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
56	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
57	Diethyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
58	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾

59 2,4-Dinitrophenol...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
59	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
60	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
61	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
62	Di-n-octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
63	Endosulfan	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
64	Endrin	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
65	Ethylbenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
66	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
67	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
68	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
69	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
70	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
71	Hexachloro-1,3-butadiene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
72	α-HCH	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
73	β-HCH	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
74	γ-HCH	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
75	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
76	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾

77 n-Hexane...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
77	n-Hexane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method
78	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
79	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
80	Lead	Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
81	Manganese	Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
82	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽⁴⁾
83	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
84	Methyl Bromide	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
85	Methylene Chloride	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
86	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
87	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
88	Methyl tert-butyl ether	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
89	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
90	Nickel	Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
91	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
92	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
93	N-Nitrosodi-n-propylamine	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
94	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
95	pH	Electrometric Method ⁽⁴⁾
96	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾

97 Phenol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
97	Phenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
98	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
99	Selenium	Digestion, Inductively Coupled Plasma Method ⁽⁸⁾
100	Silver	Digestion, Inductively Coupled Plasma Method ⁽⁸⁾
101	Styrene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
102	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
103	Tetrachloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
104	Toluene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
105	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
106	TPH (C ₈ -C ₉)	Purge and Trap, Gas Chromatographic Mass Spectrometric Method
107	TPH (C ₁₀ -C ₁₂)	Purge and Trap, Gas Chromatographic Mass Spectrometric Method
108	TPH (C ₁₃ -C ₁₅)	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
109	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
110	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
111	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
112	Trichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
113	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
114	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
115	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
116	Vanadium	Digestion, Inductively Coupled Plasma Method ⁽⁸⁾

117 Vinyl...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
117	Vinyl acetate	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
118	Vinyl chloride	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
119	m-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
120	o-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
121	p-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
122	Xylene (Total)	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ⁽⁴⁾
123	Zinc	Digestion, Inductively Coupled Plasma Method ⁽⁸⁾

จากหนังสือ (ปล่องระบาย) จำนวน 28 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁸⁾
2	Arsenic	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁸⁾
3	Beryllium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁸⁾
4	Cadmium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁸⁾
5	Carbon Monoxide	Instrumental Analyzer Method ⁽⁵⁾
6	Chlorine	Isokinetic Sampling, Ion Chromatographic Method ⁽⁷⁾
7	Chromium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁸⁾
8	Cobalt	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁸⁾
9	Copper	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁸⁾
10	Cresol	Absorption Sampling, Gas Chromatographic Method ⁽⁶⁾
11	Dioxin/Furans	Isokinetic Sampling, Analysis by ISO/IEC 17025 Accredited Laboratory ⁽¹⁵⁾

12 Hydrogen...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
12	Hydrogen Chloride	Isokinetic Sampling, Ion Chromatographic Method ⁽⁷⁾
13	Hydrogen Fluoride	Isokinetic Sampling, Ion Chromatographic Method ⁽⁷⁾
14	Hydrogen Sulfide	Absorption Sampling, Colorimetric Method ⁽³⁾
15	Lead	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁸⁾
16	Manganese	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁸⁾
17	Mercury	Isokinetic Sampling, Digestion, Cold-Vapour Atomic Absorption Spectrometric Method ⁽⁹⁾
18	Nickel	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁸⁾
19	Opacity	Fingermann's Method ⁽¹⁾
20	Oxides of Nitrogen	1) Absorption Sampling, Colorimetric Method ⁽⁴⁾ 2) Instrumental Analyzer Method ⁽⁷⁾
21	Tellurium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁸⁾
22	Tin	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁸⁾
23	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method ⁽⁷⁾
24	Selenium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁸⁾
25	Sulfur Dioxide	1) Absorption Sampling, Barium-Thoron Titrimetric Method ⁽⁵⁾ 2) Instrumental Analyzer Method ⁽⁴⁾
26	Sulfuric Acid	Isokinetic Sampling, Barium-Thoron Titrimetric Method ⁽⁴⁾
27	Vanadium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁸⁾
28	Xylene	Absorption Sampling, Gas Chromatographic Method ⁽⁶⁾

สิ่งปฏิกูลหรือวัสดุ...

สิ่งปฏิกูลหรือวัสดุที่ไม่ใช่ตัว จำนวน 37 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	Ultrasonic Extraction, Gas Chromatographic Method ^(12,20,21)
2	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(8,14) 2) Digestion, Inductively Coupled Plasma Method ^(8,15)
3	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(8,15) 2) Digestion, Inductively Coupled Plasma Method ^(8,15)
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(8,15) 2) Digestion, Inductively Coupled Plasma Method ^(8,15)
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(8,15) 2) Digestion, Inductively Coupled Plasma Method ^(8,15)
6	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(8,15) 2) Digestion, Inductively Coupled Plasma Method ^(8,15)
7	Chlordane	Ultrasonic Extraction, Gas Chromatographic Method ^(12,20,21)
8	Chromium (III)	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction Colorimetric Method; Calculation ^(10,17) 2) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(5,10,17)
9	Chromium (VI)	1) Waste Extraction, Digestion, Colorimetric Method ^(10,17) 2) Alkaline Digestion, Colorimetric Method ^(10,17)
10	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(8,15) 2) Digestion, Inductively Coupled Plasma Method ^(8,15)
11	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(8,15) 2) Digestion, Inductively Coupled Plasma Method ^(8,15)

12 Dieldrin

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
12	Dieldrin	Ultrasonic Extraction, Gas Chromatographic Method ^(12,20,21)
13	DDD	Ultrasonic Extraction, Gas Chromatographic Method ^(12,20,21)
14	DDE	Ultrasonic Extraction, Gas Chromatographic Method ^(12,20,21)
15	DDT	Ultrasonic Extraction, Gas Chromatographic Method ^(12,20,21)
16	2,4-D (2,4-Dichlorophenoxyacetic acid)	Ultrasonic Extraction, Gas Chromatographic Method ^(12,20,21)
17	Endrin	Ultrasonic Extraction, Gas Chromatographic Method ^(12,20,21)
18	Heptachlor	Ultrasonic Extraction, Gas Chromatographic Method ^(12,20,21)
19	Kepona	Ultrasonic Extraction, Gas Chromatographic Method ^(12,20,21)
20	Lead	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(2,15) 2) Digestion, Inductively Coupled Plasma Method ^(8,15)
21	Lindane	Ultrasonic Extraction, Gas Chromatographic Method ^(12,20,21)
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^(2,18) 2) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^(2,18)
23	Methoxychlor	Ultrasonic Extraction, Gas Chromatographic Method ^(12,20,21)
24	Mirex	Ultrasonic Extraction, Gas Chromatographic Method ^(12,20,21)
25	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(2,15) 2) Digestion, Inductively Coupled Plasma Method ^(8,15)
26	Polychlorinated Biphenyls (PCBs)	Ultrasonic Extraction, Gas Chromatographic Method ^(12,20,21)
27	Pentachlorophenol	Ultrasonic Extraction, Gas Chromatographic Method ^(12,20,21)
28	Nickel	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(2,15) 2) Digestion, Inductively Coupled Plasma Method ^(8,15)
29	Selenium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(2,15) 2) Digestion, Inductively Coupled Plasma Method ^(8,15)

30 Silvex...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
30	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(2,15) 2) Digestion, Inductively Coupled Plasma Method ^(8,15)
31	Silvex, 2,4,5-Trichlorophenoxypropionic acid	Ultrasonic Extraction, Gas Chromatographic Method ^(12,20,21)
32	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(2,15) 2) Digestion, Inductively Coupled Plasma Method ^(8,15)
33	Total Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method, Waste Extraction Colorimetric Method, Calculation ^(13,37) 2) Digestion, Inductively Coupled Plasma - Atomic Emission Spectrometry Method ^(8,15)
34	Toxaphene	Ultrasonic Extraction, Gas Chromatographic Method ^(12,20,21)
35	Trichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,22)
36	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(2,15) 2) Digestion, Inductively Coupled Plasma Method ^(8,15)
37	Zinc	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(2,15) 2) Digestion, Inductively Coupled Plasma Method ^(8,15)

สิ้น จำนวน 123 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
2	Acetone	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
3	Aldrin	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
4	Anthracene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
5	Antimony	Digestion, Inductively Coupled Plasma Method ^(8,15)

6 Arsenic...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
6	Arsenic	Digestion, Inductively Coupled Plasma Method ^(8,15)
7	Atrazine	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
8	Barium	Digestion, Inductively Coupled Plasma Method ^(8,15)
9	Benzo(a)anthracene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
10	Benzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
11	Benzo(b)fluoranthene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
12	Benzo(k)fluoranthene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
13	Benzoic acid	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
14	Benzo(a)pyrene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
15	Benzo(g,h,i)perylene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
16	Beryllium	Digestion, Inductively Coupled Plasma Method ^(8,15)
17	Bis(2-Chloroethyl)ether	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
18	Bis(2-Ethylhexyl)phthalate	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
20	Bromoform	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
21	Butyl benzyl phthalate	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
22	Cadmium	Digestion, Inductively Coupled Plasma Method ^(8,15)
23	Carbazole	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
24	Carbon disulfide	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
25	Carbon tetrachloride	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)

26 Chlordane...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
26	Chlordane	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
27	p-Chloroaniline	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
28	Chlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
29	Chlorodibromomethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
30	Chloroform	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
31	2-Chlorophenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
32	Chromium	Digestion, Inductively Coupled Plasma Method ^(8,15)
33	Chromium (III)	Digestion, Inductively Coupled Plasma Method ; Filtration, Colorimetric Method; Calculation ^(8,15)
34	Chromium (VI)	Alkaline Digestion, Colorimetric Method ⁽¹⁴⁾
35	Chrysene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
36	Cyanide	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
37	2,4-D	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
38	DDD	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
39	DDE	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
40	DDT	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
41	Dibenz(a,h)anthracene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
42	Di-n-Butyl phthalate	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
43	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)

44 1,3-Dichlorobenzene...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
44	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
45	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
46	3,3-Dichlorobenzidine	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
47	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
48	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
49	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
50	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
51	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
52	2,4-Dichlorophenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
53	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
54	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
55	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
56	Dieldrin	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
57	Diethyl phthalate	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
58	2,4-Dimethylphenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
59	2,4-Dinitrophenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
60	2,4-Dinitrotoluene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
61	2,6-Dinitrotoluene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)

62 Di-n-octyl

ลำดับที่	สารเคมี	วิธีวิเคราะห์
62	Di-n-octyl phthalate	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
63	Endosulfan	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
64	Endrin	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
65	Ethylbenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
66	Fluoranthene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
67	Fluorene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
68	Heptachlor	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
69	Heptachlor epoxide	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
70	Hexachlorobenzene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
71	Hexachloro-1,3-butadiene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
72	α -HCH	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
73	β -HCH	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
74	γ -HCH	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
75	Hexachlorocyclopentadiene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
76	Hexachloroethane	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
77	n-Hexane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
78	Indeno(1,2,3-cd)pyrene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
79	Isophorone	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
80	Lead	Digestion, Inductively Coupled Plasma Method ^(9,13)

81 Manganese

ลำดับที่	สารเคมี	วิธีวิเคราะห์
81	Manganese	Digestion, Inductively Coupled Plasma Method ^(9,13)
82	Mercury	Digestion, Cold vapor Atomic Absorption Spectrometric Method
83	Methoxychlor	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
84	Methyl Bromide	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
85	Methylene Chloride	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
86	2-Methylnaphthalene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
87	2-Methylphenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
88	Methyl tert-butyl ether	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
89	Naphthalene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
90	Nickel	Digestion, Inductively Coupled Plasma Method ^(9,13)
91	Nitrobenzene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
92	N-Nitrosodiphenylamine	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
93	N-Nitrosodi-n-propylamine	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
94	Pentachlorophenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
95	Phenanthrene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
96	Phenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
97	Polychlorinated Biphenyls (PCBs)	Ultrasonic Extraction, Gas Chromatographic Method ^(9,14,17)
98	Pyrene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(23,24)
99	Selenium	Digestion, Inductively Coupled Plasma Method ^(9,13)
100	Silver	Digestion, Inductively Coupled Plasma Method ^(9,13)

101 Styrene

ลำดับที่	สารเคมี	วิธีวิเคราะห์
101	Styrene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
102	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
103	Tetrachloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
104	Toluene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
105	Toxaphene	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(9,13)
106	TPH (C ₈ -C ₉)	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
107	TPH (C ₁₀ -C ₁₉)	Ultrasonic Extraction, Gas Chromatographic / Mass Spectrometric Method ^(9,14,18)
108	TPH (C ₁₀ -C ₂₀)	Ultrasonic Extraction, Gas Chromatographic / Mass Spectrometric Method ^(9,18)
109	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
110	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
111	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
112	Trichloroethylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
113	2,4,5-Trichlorophenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(9,10)
114	2,4,6-Trichlorophenol	Microwave Extraction, Gas Chromatographic / Mass Spectrometric Method ^(9,10)
115	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
116	Vanadium	Digestion, Inductively Coupled Plasma Method ^(9,13)
117	Vinyl Acetate	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)
118	Vinyl Chloride	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^(14,22)

119 m-Xylene

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
119	m-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^{6,8}
120	o-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^{6,8}
121	p-Xylene	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^{6,8}
122	Xylene (Total)	Purge and Trap, Gas Chromatographic / Mass Spectrometric Method ^{6,8}
123	Zinc	Digestion, Inductively Coupled Plasma Method ^{9,15}

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รายงานผลการตรวจวิเคราะห์มลพิษในสิ่งแวดล้อม วันที่ตรวจวิเคราะห์: 17/11/2562 สถานที่ตรวจวิเคราะห์: โรงกลั่น (บริเวณถังเก็บ)		2
ชื่อผู้ตรวจวิเคราะห์: ตำแหน่ง: หน้าที่:	ชื่อผู้รับบริการ: ตำแหน่ง: หน้าที่:	
รายการสารที่ตรวจวิเคราะห์: - Arsenic: 0.01 mg/L to 0.50 mg/L - Barium: 0.01 mg/L to 10 mg/L - Cadmium: 0.002 mg/L to 10 mg/L - Chromium: 0.01 mg/L to 10 mg/L - Copper: 0.01 mg/L to 10 mg/L - Lead: 0.01 mg/L to 10 mg/L - Manganese: 0.01 mg/L to 10 mg/L - Nickel: 0.005 mg/L to 10 mg/L - Selenium: 0.01 mg/L to 10 mg/L - Silver: 0.01 mg/L to 10 mg/L - Zinc: 0.02 mg/L to 10 mg/L	วิธีการวิเคราะห์: - Arsenic: 0.01 mg/L to 0.50 mg/L - Barium: 0.01 mg/L to 10 mg/L - Cadmium: 0.002 mg/L to 10 mg/L - Chromium: 0.01 mg/L to 10 mg/L - Copper: 0.01 mg/L to 10 mg/L - Lead: 0.01 mg/L to 10 mg/L - Manganese: 0.01 mg/L to 10 mg/L - Nickel: 0.005 mg/L to 10 mg/L - Selenium: 0.01 mg/L to 10 mg/L - Silver: 0.01 mg/L to 10 mg/L - Zinc: 0.02 mg/L to 10 mg/L	มาตรฐานการวิเคราะห์: Standard Methods for the Examination of Water and Wastewater, 22nd edition, 2017 (part 3120 B) part 3506 F and part 3506 G.

ฉบับที่ 1, วันที่ 11 พฤศจิกายน พ.ศ. 2562 หน้า 24
 กรมทรัพยากรธรรมชาติและสิ่งแวดล้อม กระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม

วันที่ตรวจวิเคราะห์: 17/11/2562 สถานที่ตรวจวิเคราะห์: โรงกลั่น (บริเวณถังเก็บ)	ชื่อผู้ตรวจวิเคราะห์: ตำแหน่ง: หน้าที่:	ชื่อผู้รับบริการ: ตำแหน่ง: หน้าที่:
รายการสารที่ตรวจวิเคราะห์: - Arsenic: 0.01 mg/L to 0.50 mg/L - Barium: 0.01 mg/L to 10 mg/L - Cadmium: 0.002 mg/L to 10 mg/L - Chromium: 0.01 mg/L to 10 mg/L - Copper: 0.01 mg/L to 10 mg/L - Lead: 0.01 mg/L to 10 mg/L - Manganese: 0.01 mg/L to 10 mg/L - Nickel: 0.005 mg/L to 10 mg/L - Selenium: 0.01 mg/L to 10 mg/L - Silver: 0.01 mg/L to 10 mg/L - Zinc: 0.02 mg/L to 10 mg/L	วิธีการวิเคราะห์: - Arsenic: 0.01 mg/L to 0.50 mg/L - Barium: 0.01 mg/L to 10 mg/L - Cadmium: 0.002 mg/L to 10 mg/L - Chromium: 0.01 mg/L to 10 mg/L - Copper: 0.01 mg/L to 10 mg/L - Lead: 0.01 mg/L to 10 mg/L - Manganese: 0.01 mg/L to 10 mg/L - Nickel: 0.005 mg/L to 10 mg/L - Selenium: 0.01 mg/L to 10 mg/L - Silver: 0.01 mg/L to 10 mg/L - Zinc: 0.02 mg/L to 10 mg/L	มาตรฐานการวิเคราะห์: Standard Methods for the Examination of Water and Wastewater, 22nd edition, 2017 (part 3120 B) part 3506 F and part 3506 G.

ฉบับที่ 1, วันที่ 11 พฤศจิกายน พ.ศ. 2562 หน้า 24
 กรมทรัพยากรธรรมชาติและสิ่งแวดล้อม กระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม

ABS Quality Evaluations

Certificate Of Conformance

This is to certify that the Quality Management System of:

SGS (Thailand) Ltd.

100 Nanglinchee Road, Chongnonsee, Yannawa,
Bangkok 10120
Thailand

(WITH ADDITIONAL FACILITIES LISTED ON ATTACHED ANNEX)

has been assessed by ABS Quality Evaluations, Inc. and found to be in conformance with the requirements set forth by:

ISO 9001:2015

The Quality Management System is applicable to:

PROVISION OF PHYSICAL INSPECTION, FUMIGATION, PEST CONTROL AND LABORATORY TESTING AND CALIBRATION

This certificate may be found on the ABS QE Website (www.abs-qe.com). For certificates issued in the People's Republic of China information may also be verified on the CHCA website (www.chca.gov.cn).

Certificate No: 52229
Certification Date: 30 July 2015
Effective Date: 23 July 2020
Expiration Date: 24 July 2023
Revision Date: 23 July 2020

Dominic Townsend, President



Validity of this certificate is based on the successful completion of the periodic surveillance audits of the management system defined by the above scope and is contingent upon prompt/ timely notification to ABS Quality Evaluations, Inc. of significant changes to the management system or components thereof.

ABS Quality Evaluations, Inc. 1701 City Plaza Drive, Spring, TX 77081, U.S.A.

Validity of this certificate may be confirmed at www.abs-qe.com/cert_validation.

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ABS Quality Evaluations

ISO 9001:2015

Certificate Of Conformance

ANNEX

Certificate No: 52229

SGS (Thailand) Ltd.

At Below Facilities:

Facility: Facility 1 - Rayong Branch
1555 and 12211 Moo 1 T. Ban Chang,
A. Ban Chang,
Rayong 21130
Thailand
Activity: Inspection & Testing

Facility: Facility 2 - Silacha Office
144, 146 Siangkhaphan 1 Road,
T. Siangkhaphan, K. Siangkhaphan,
Chonburi 26110
Thailand
Activity: Inspection, Fumigation & Pest Control

Facility: Facility 3 - Nakhon Phanom
15000 Moo 1 T. Nakhon Phanom,
Nakhon Phanom 49000
Thailand
Activity: Inspection & Fumigation

Facility: Facility 4 - Bangkok
57, 59, 61, 63, 65, 67, 69, 71, 73, 75,
T. Huaykhong, K. Huaykhong,
Bangkok 10110
Thailand
Activity: Inspection, Fumigation, Pest Control & Testing

Facility: Facility 5 - Rama VI Street, Laboratory Services
4115 - 20, 41/23 Rama VI Road, Soi 58,
Chongnonsee, Yannawa,
Bangkok 10120
Thailand
Activity: Testing

Facility: Facility 6 - SGS (Cambodia) Limited
No 1078 A.O. Street 371, Phum Trei B, Sangkat Steung Meanchey,
Khan Meanchey, Phnom Penh,
Cambodia
Activity: Inspection



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Appendix C

Certificate of Instruments Calibration

CEMs Analyzer

MULTI-POINT GAS TEST REPORT OF OXYGEN
Equipment Information

Manufacturer	Horiba	Calibration Date	28-Jan-21
Model	HORIBA PG-350	Background	-
Serial Number	J4DZYU7S	Coefficient	0.9899
		Room Temperature	25.2 °C

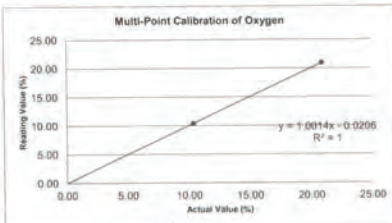
Standard Gas Information

Zero Gas		Span Gas	
Cylinder Number	D9132158	Cylinder Number	18K679111
Component	N2	Component	O2
Concentration	99.999 %	Concentration	20.9 %
Expiration Date	-	Expiration Date	21-Nov-22
		Measurement Range	25
		% Measurement Range	83.60

Multi-Point Gas Test Data

Level	Actual Value	Reading Value (%)			Average	Difference	
		1	2	3		%	%
0%	0.00	-0.01	-0.01	0.00	-0.01	-0.01	
50%	10.40	10.35	10.35	10.40	10.37	-0.03	0.32
100%	20.90	20.92	20.92	20.93	20.92	0.02	0.11
					Average	0.22	
					Result	PASS	

Slope	1.0014	Interception	-0.0206	Correlation Coefficient	1.0000
% Slope	0.1442%	% Interception	-0.0624%	% Correlation Coefficient	-0.0003%
Result	PASS	Result	PASS	Result	PASS

Multi-Point Gas Test Chart


Test By: Mr. Suriyanet Poomsaksit Approve By: Mr. Chakthip Sunophak
 Date: January 28, 2021 Date: January 28, 2021

HORIBA
 (THAILAND) LIMITED
 บริษัท ฮอริบา (ไทยแลนด์) จำกัด

MULTI-POINT GAS TEST REPORT OF CARBON DIOXIDE
Equipment Information

Manufacturer	Horiba	Calibration Date	28-Jan-21
Model	HORIBA PG-350	Background	-
Serial Number	J4DZYU7S	Coefficient	0.9948
		Room Temperature	25.2 °C

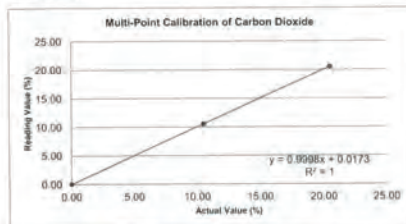
Standard Gas Information

Zero Gas		Span Gas	
Cylinder Number	D9132158	Cylinder Number	CPB30739
Component	N2	Component	CO2
Concentration	99.999 %	Concentration	20.49 %
Expiration Date	-	Expiration Date	21-Apr-23
		Measurement Range	30
		% Measurement Range	68.30

Multi-Point Gas Test Data

Level	Actual Value	Reading Value (%)			Average	Difference	
		1	2	3		%	%
0%	0.00	0.03	0.01	0.02	0.02	0.02	
51%	10.50	10.50	10.50	10.53	10.51	0.01	0.10
100%	20.49	20.50	20.50	20.52	20.51	0.02	0.08
					Average	0.09	
					Result	PASS	

Slope	0.9998	Interception	0.0173	Correlation Coefficient	1.0000
% Slope	-0.0169%	% Interception	0.0577%	% Correlation Coefficient	0.0000%
Result	PASS	Result	PASS	Result	PASS

Multi-Point Gas Test Chart


Test By: Mr. Suriyanet Poomsaksit Approve By: Mr. Chakthip Sunophak
 Date: January 28, 2021 Date: January 28, 2021

HORIBA
 (THAILAND) LIMITED
 บริษัท ฮอริบา (ไทยแลนด์) จำกัด

MULTI-POINT GAS TEST REPORT OF CARBON MONOXIDE
Equipment Information

Manufacturer	Horiba	Calibration Date	28-Jan-21
Model	HORIBA PG-350	Background	-
Serial Number	J4DZYU7S	Coefficient	1.1641
		Room Temperature	25.2 °C

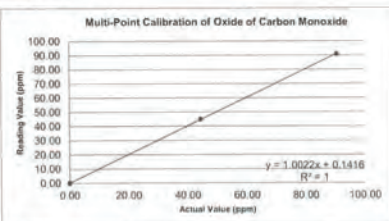
Standard Gas Information

Zero Gas		Span Gas	
Cylinder Number	D9132158	Cylinder Number	GN0019203
Component	N2	Component	CO
Concentration	99.999 %	Concentration	90.67 ppm
Expiration Date	-	Expiration Date	21-Feb-19
		Measurement Range	100
		% Measurement Range	90.67

Multi-Point Gas Test Data

Level	Actual Value	Reading Value (ppm)			Average	Difference	
		1	2	3		ppm	%
0%	0.00	0.02	0.03	0.03	0.03	0.03	
40%	44.50	44.50	45.20	45.20	44.97	0.47	1.05
100%	90.67	90.89	90.91	90.91	90.90	0.23	0.26
					Average	0.65	
					Result	PASS	

Slope	1.0022	Interception	0.1416	Correlation Coefficient	1.0000
% Slope	0.2233%	% Interception	0.1416%	% Correlation Coefficient	-0.0009%
Result	PASS	Result	PASS	Result	PASS

Multi-Point Gas Test Chart


Test By: Mr. Suriyanet Poomsaksit Approve By: Mr. Chakthip Sunophak
 Date: January 28, 2021 Date: January 28, 2021

HORIBA
 (THAILAND) LIMITED
 บริษัท ฮอริบา (ไทยแลนด์) จำกัด

MULTI-POINT GAS TEST REPORT OF SULFUR DIOXIDE
Equipment Information

Manufacturer	Horiba	Calibration Date	28-Jan-21
Model	HORIBA PG-350	Background	-
Serial Number	J4DZYU7S	Coefficient	1.1008
		Room Temperature	25.2 °C

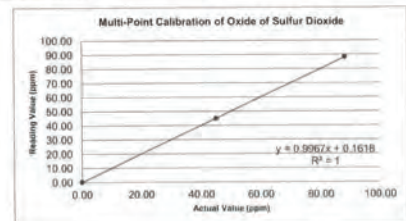
Standard Gas Information

Zero Gas		Span Gas	
Cylinder Number	D9132158	Cylinder Number	GN0019203
Component	N2	Component	SO2
Concentration	99.999 %	Concentration	88.29 ppm
Expiration Date	-	Expiration Date	21-Feb-19
		Measurement Range	100
		% Measurement Range	88.29

Multi-Point Gas Test Data

Level	Actual Value	Reading Value (ppm)			Average	Difference	
		1	2	3		ppm	%
0%	0.00	0.20	0.20	0.30	0.23	0.23	
51%	45.00	44.80	44.80	44.80	44.87	-0.13	0.30
100%	88.29	88.20	88.20	88.30	88.23	-0.06	0.06
					Average	0.18	
					Result	PASS	

Slope	0.9967	Interception	0.1618	Correlation Coefficient	1.0000
% Slope	-0.3317%	% Interception	0.1618%	% Correlation Coefficient	-0.0004%
Result	PASS	Result	PASS	Result	PASS

Multi-Point Gas Test Chart


Test By: Mr. Suriyanet Poomsaksit Approve By: Mr. Chakthip Sunophak
 Date: January 28, 2021 Date: January 28, 2021

HORIBA
 (THAILAND) LIMITED
 บริษัท ฮอริบา (ไทยแลนด์) จำกัด

HORIBA

Process & Environmental

Horiba (Thailand) Limited (Head Office) 303, 305, 307, 309, 401, 403 Latpha Road, Samsatthacharapay, Klongkum, Bangkok 10000
Telephone (66) 02 861-5995, Facsimile (66) 02 861-5200 <http://www.horiba.com>
Tax ID: 010-554-7010-1-49Horiba (Thailand) Limited (Lai Krabang Office) 8507 Lai Krabang Road, Lai Krabang, Lai Krabang, Bangkok 10520
Telephone (66) 02 734-4434, Facsimile (66) 02 734-4438**MULTI-POINT GAS TEST REPORT OF NITRIC OXIDE****Equipment Information**

Manufacturer	Horiba	Calibration Date	28-Jan-21
Model	HORIBA PG-350	Background	-
Serial Number	J4D2YU7S	Coefficient	0.9847
		Room Temperature	25.2 °C

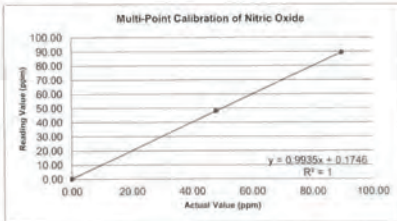
Standard Gas Information

Zero Gas		Span Gas	
Cylinder Number	D9132158	Cylinder Number	GN0019203
Component	N2	Component	NO
Concentration	99.999 %	Concentration	89.87 ppm
Expiration Date	-	Expiration Date	21-Feb-19
		Measurement Range	100
		% Measurement Range	89.87

Multi-Point Gas Test Data

Level	Actual Value	Reading Value (ppm)			Difference	
		1	2	3	Average	%
0%	0.00	0.00	0.00	0.10	0.03	
53%	48.00	48.10	48.10	48.30	0.17	0.35
100%	89.87	89.20	89.20	89.50	-0.57	0.63
					Average	0.49
					Result	PASS

Slope	0.9935	Interception	0.1746	Correlation Coefficient	1.0000
% Slope	-0.6483%	% Interception	0.1746%	% Correlation Coefficient	-0.0017%
Result	PASS	Result	PASS	Result	PASS

Multi-Point Gas Test Chart

Test By:		Approve By:	
Date:	January 28, 2021	Date:	January 28, 2021

HORIBA
(THAILAND) LIMITED
บริษัท ฮอริบา (ไทยแลนด์) จำกัด**HORIBA**

Process & Environmental

Horiba (Thailand) Limited (Head Office) 303, 305, 307, 309, 401, 403 Latpha Road, Samsatthacharapay, Klongkum, Bangkok 10000
Telephone (66) 02 861-5995, Facsimile (66) 02 861-5200 <http://www.horiba.com>
Tax ID: 010-554-7010-1-49Horiba (Thailand) Limited (Lai Krabang Office) 8507 Lai Krabang Road, Lai Krabang, Lai Krabang, Bangkok 10520
Telephone (66) 02 734-4434, Facsimile (66) 02 734-4438**MULTI-POINT GAS TEST REPORT OF OXYGEN****Equipment Information**

Manufacturer	Horiba	Calibration Date	27-Dec-21
Model	HORIBA PG-350	Background	-
Serial Number	V40KVLD	Coefficient	0.9874
		Room Temperature	24.7 °C

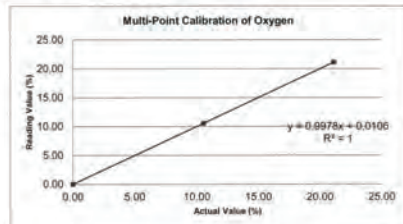
Standard Gas Information

Zero Gas		Span Gas	
Cylinder Number	14W004104	Cylinder Number	NO27125
Component	N2	Component	O2
Concentration	99.999 %	Concentration	21.15 %
Expiration Date	-	Expiration Date	7-Dec-29
		Measurement Range	25
		% Measurement Range	84.6

Multi-Point Gas Test Data

Level	Actual Value	Reading Value (%)			Difference	
		1	2	3	Average	%
0%	0.00	-0.01	0.02	0.03	0.01	0.01
50%	10.55	10.55	10.56	10.56	-0.02	0.17
100%	21.15	21.12	21.11	21.12	-0.03	0.16
					Average	0.17
					Result	PASS

Slope	0.9978	Interception	0.0106	Correlation Coefficient	1.0000
% Slope	-0.2206%	% Interception	0.0422%	% Correlation Coefficient	0.0000%
Result	PASS	Result	PASS	Result	PASS

Multi-Point Gas Test Chart

Test By:		Approve By:	
Date:	7-Jan-22	Date:	7-Jan-22

HORIBA

Process & Environmental

Horiba (Thailand) Limited (Head Office) 303, 305, 307, 309, 401, 403 Latpha Road, Samsatthacharapay, Klongkum, Bangkok 10000
Telephone (66) 02 861-5995, Facsimile (66) 02 861-5200 <http://www.horiba.com>
Tax ID: 010-554-7010-1-49Horiba (Thailand) Limited (Lai Krabang Office) 8507 Lai Krabang Road, Lai Krabang, Lai Krabang, Bangkok 10520
Telephone (66) 02 734-4434, Facsimile (66) 02 734-4438**MULTI-POINT GAS TEST REPORT OF NITRIC OXIDE****Equipment Information**

Manufacturer	Horiba	Calibration Date	27-Dec-21
Model	HORIBA PG-350	Background	-
Serial Number	V40KVLD	Coefficient	0.9762
		Room Temperature	24.7 °C

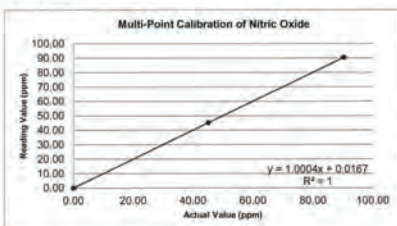
Standard Gas Information

Zero Gas		Span Gas	
Cylinder Number	14W004104	Cylinder Number	GN0019206
Component	N2	Component	NO
Concentration	99.999 %	Concentration	90.33 ppm
Expiration Date	-	Expiration Date	28-Feb-27
		Measurement Range	100
		% Measurement Range	90.33

Multi-Point Gas Test Data

Level	Actual Value	Reading Value (ppm)			Difference	
		1	2	3	Average	%
0%	0.00	0.20	0.10	0.00	0.03	
50%	45.17	45.00	45.30	45.20	0.00	0.00
100%	90.33	90.40	90.40	90.40	0.07	0.08
					Average	0.04
					Result	PASS

Slope	1.0004	Interception	0.0167	Correlation Coefficient	1.0000
% Slope	0.0406%	% Interception	0.0187%	% Correlation Coefficient	0.0000%
Result	PASS	Result	PASS	Result	PASS

Multi-Point Gas Test Chart

Test By:		Approve By:	
Date:	7-Jan-22	Date:	7-Jan-22

HORIBA

Process & Environmental

Horiba (Thailand) Limited (Head Office) 303, 305, 307, 309, 401, 403 Latpha Road, Samsatthacharapay, Klongkum, Bangkok 10000
Telephone (66) 02 861-5995, Facsimile (66) 02 861-5200 <http://www.horiba.com>
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Telephone (66) 02 734-4434, Facsimile (66) 02 734-4438**MULTI-POINT GAS TEST REPORT OF SULFUR DIOXIDE****Equipment Information**

Manufacturer	Horiba	Calibration Date	27-Dec-21
Model	HORIBA PG-350	Background	-
Serial Number	V40KVLD	Coefficient	0.9877
		Room Temperature	24.7 °C

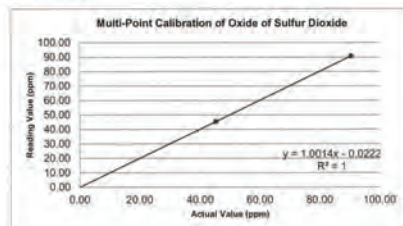
Standard Gas Information

Zero Gas		Span Gas	
Cylinder Number	14W004104	Cylinder Number	GN0019208
Component	N2	Component	SO2
Concentration	99.999 %	Concentration	90.61 ppm
Expiration Date	-	Expiration Date	7-Jun-24
		Measurement Range	200
		% Measurement Range	45.305

Multi-Point Gas Test Data

Level	Actual Value	Reading Value (ppm)			Difference	
		1	2	3	Average	%
0%	0.00	0.00	0.00	-0.20	-0.07	
50%	45.31	45.50	45.40	45.40	0.13	0.28
100%	90.61	90.70	90.60	90.70	0.06	0.06
					Average	0.17
					Result	PASS

Slope	1.0014	Interception	-0.0222	Correlation Coefficient	1.0000
% Slope	0.1381%	% Interception	-0.0111%	% Correlation Coefficient	-0.0001%
Result	PASS	Result	PASS	Result	PASS

Multi-Point Gas Test Chart

Test By:		Approve By:	
Date:	7-Jan-22	Date:	7-Jan-22

Horiba (Thailand) Limited (Head Office) 393, 395, 397, 399, 401, 403 Laya Road, Somdechsupayak, Klongsuan, Bangkok 10600
Telephone (66) (0) 861-5925, Facsimile (66) (0) 861-5920 http://www.horiba.com
Tax ID: 010-554-7010-7-49

Horiba (Thailand) Limited (Lat Krabang Office) 8507 Lat Krabang Road, Lat Krabang, Bangkok 10520
Telephone (66) (0) 734-4434, Facsimile (66) (0) 734-4438

MULTI-POINT GAS TEST REPORT OF CARBON MONOXIDE

Equipment Information

Manufacturer Horiba
Model HORIBA PG-350
Serial Number V40KVOLD

Calibration Date 27-Dec-21
Background -
Coefficient 1.0456
Room Temperature 24.7 °C

Standard Gas Information

Zero Gas
Cylinder Number 14W004104
Component N2
Concentration 99.999 %
Expiration Date -

Span Gas
Cylinder Number ND27117
Component CO
Concentration 905.9 ppm
Expiration Date 20-Jul-29

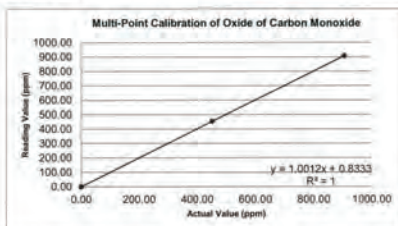
Measurement Range 1000
% Measurement Range 90.59

Multi-Point Gas Test Data

Level	Actual Value	Reading Value (ppm)			Average	Difference	
		1	2	3		ppm	%
0%	0.00	1.00	1.00	0.00	0.67	0.67	
50%	452.98	455.00	456.00	453.00	1.72	0.38	
100%	905.90	907.00	907.00	909.00	907.67	1.77	0.20
						Average	0.29
						Result	PASS

Slope	1.0012	Interception	0.8333	Correlation Coefficient	1.0000
% Slope	0.1214%	% Interception	0.0933%	% Correlation Coefficient	0.0000%
Result	PASS	Result	PASS	Result	PASS

Multi-Point Gas Test Chart



Test By [Signature] Approve By [Signature]
Date 7-Jan-22 Date 7-Jan-22

Horiba (Thailand) Limited (Head Office) 393, 395, 397, 399, 401, 403 Laya Road, Somdechsupayak, Klongsuan, Bangkok 10600
Telephone (66) (0) 861-5925, Facsimile (66) (0) 861-5920 http://www.horiba.com
Tax ID: 010-554-7010-7-49

Horiba (Thailand) Limited (Lat Krabang Office) 8507 Lat Krabang Road, Lat Krabang, Bangkok 10520
Telephone (66) (0) 734-4434, Facsimile (66) (0) 734-4438

MULTI-POINT GAS TEST REPORT OF CARBON DIOXIDE

Equipment Information

Manufacturer Horiba
Model HORIBA PG-350
Serial Number V40KVOLD

Calibration Date 27-Dec-21
Background -
Coefficient 1.0095
Room Temperature 24.7 °C

Standard Gas Information

Zero Gas
Cylinder Number 14W004104
Component N2
Concentration 99.999 %
Expiration Date -

Span Gas
Cylinder Number GN0018529
Component CO2
Concentration 20.95 %
Expiration Date 14-Feb-27

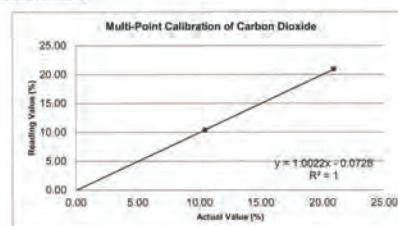
Measurement Range 30
% Measurement Range 69.833333

Multi-Point Gas Test Data

Level	Actual Value	Reading Value (%)			Average	Difference	
		1	2	3		%	%
0%	0.00	-0.02	-0.10	-0.08	-0.06	-0.06	
50%	10.48	10.40	10.39	10.39	10.39	-0.08	0.78
100%	20.95	20.92	21.00	20.90	20.94	-0.01	0.05
						Average	0.41
						Result	PASS

Slope	1.0022	Interception	-0.0728	Correlation Coefficient	1.0000
% Slope	0.2228%	% Interception	-0.2426%	% Correlation Coefficient	0.0004%
Result	PASS	Result	PASS	Result	PASS

Multi-Point Gas Test Chart



Test By [Signature] Approve By [Signature]
Date 7-Jan-22 Date 7-Jan-22

Standard gas for RATA



Certificate of Conformity

BANGKOK INDUSTRIAL GAS CO., LTD.
3 Rajanakarn Bldg., 11th Floor, South Sathorn Rd.,
Yannawa, Sathorn, Bangkok 10120 Thailand
Tel : (662) 685-6789 Fax : (662) 685-6790-1

Customer Name	: SGS (Thailand) Co., Ltd.	Delivery Date	: 15 Sep 2022
Product	: 1100060	Analyzed Date	:
Product Name	: CY N2 UHP 7M3 47S CGA580	Best if used by	: -
Cylinder Type	: 47 LITERS STEEL	Delivery order	: 3300160246
Cylinder Valve	: CGA 580	Inspection lot	: 040000016047

COMPONENT	UNIT	LOWER LIMIT	UPPER LIMIT	NOMINAL VALUE	ACTUAL VALUE	ANALYTICAL ACCURACY	TEST METHOD
Purity	%	99.9990					
Oxygen	ppm(V)		<3.0000				
Moisture	ppm(V)		<3.0000				
Carbon Monoxide	ppm(V)		<1.0000				
Carbon Dioxide	ppm(V)		<1.0000				
Total Hydrocarbon as CH4	ppm(V)		<1.0000				

Batch : 130922N201,090922N202
Sampling Cylinder :
Cylinder Serial Number : CLCS7802,11D126132,SP023117
Remark :

This certificate is issued electronically and is valid without a signature.

THE LINDE GROUP **Linde**

Certificate of Analysis
Special Gases Division

Customer Details		Address		Customer Tag No.
Name: 505 (Thailand) Co., Ltd.		1/208, 1/21, Map 1, Soi Sukhumvit 2, 1, Bang Chong, A. Bang Chong 21130		
Certificate Details		Date of Issue	Expiry Date	
Number: 0255/22		21-Feb-2022	21-Feb-2024	
Material Details		Material Code	Cylinder No.	
Production Order: 90189356		42235554-34	263618	
Gas content: 5.23 wt%		Filling pressure: 137.8 bar	USA 505 18	
Cylinder Details		Cylinder Material	Specified Size	
Laser: 1008		Specified Size	45L	
Laboratory Report				
Component	Normal Concentration	Analysis Result	Uncertainty	Method of Analysis
Supplier Dissolve	45.0 ppm	45.0 ppm	+ 1% relative	ISO 159-152
Carbon Monoxide	45.0 ppm	42.3 ppm	+ 1% relative	ISO 159-152
Water Dew	45.0 ppm	48.0 ppm	+ 1% relative	ISO 159-152
Other N2 impurity	45.0 ppm	45.0 ppm	+ 1% relative	ISO 159-152
Reference Standard used in Assay				
Reference Standard	Cylinder number	Concentration	Expiry Date	
Supplier Dissolve	002218	70.1 ± 0.2 ppm	9-May-2023	
Carbon Monoxide	002218	70.1 ± 0.2 ppm	9-May-2023	
Water Dew	002218	70.1 ± 0.2 ppm	9-May-2023	
Analytical instruments used in Assay				
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration		
FIR Spectrometry Model 630	FIR-12	10-Feb-2022		
FIR Spectrometry Model 630	FIR-12	10-Feb-2022		
FIR Spectrometry Model 630	FIR-12	10-Feb-2022		

Recommended usage conditions
Minimum utilization: 1% of actual content or before expiry date whichever comes first.
Storage conditions: keep in well ventilation and secure area.
Comments: when receiving, please quote the material number.

Notes:
1. All results are given in the SI system unless otherwise specified. The units of the standard have been determined in accordance with the ISO 10000:2000 standard. All results are given in the SI system unless otherwise specified.
2. The reported impurity amounts are based on a standard uncertainty, which is a measure of the confidence in the reported value. The uncertainty of the reported value is based on the standard uncertainty of the measurement and the standard uncertainty of the standard gas.
3. The standard uncertainty of the measurement is based on the standard uncertainty of the measurement and the standard uncertainty of the standard gas.
4. The standard uncertainty of the standard gas is based on the standard uncertainty of the measurement and the standard uncertainty of the standard gas.
5. The standard uncertainty of the measurement is based on the standard uncertainty of the measurement and the standard uncertainty of the standard gas.
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7. The standard uncertainty of the measurement is based on the standard uncertainty of the measurement and the standard uncertainty of the standard gas.
8. The standard uncertainty of the standard gas is based on the standard uncertainty of the measurement and the standard uncertainty of the standard gas.
9. The standard uncertainty of the measurement is based on the standard uncertainty of the measurement and the standard uncertainty of the standard gas.
10. The standard uncertainty of the standard gas is based on the standard uncertainty of the measurement and the standard uncertainty of the standard gas.

Page 1 of 1
Linde (Thailand) Public Company Limited
505 (Thailand) Co., Ltd.
1/208, 1/21, Map 1, Soi Sukhumvit 2,
1, Bang Chong, A. Bang Chong 21130
Tel: 02-010-1000
Fax: 02-010-1001
Email: 505@linde.co.th
Website: www.linde.co.th

THE LINDE GROUP **Linde**

Certificate of Analysis
Special Gases Division

Customer Details		Address		Customer Tag No.
Name: 505 (Thailand) Co., Ltd.		1/208, 1/21, Map 1, Soi Sukhumvit 2, 1, Bang Chong, A. Bang Chong 21130		
Certificate Details		Date of Issue	Expiry Date	
Number: 0256/23		3-Feb-2022	3-Feb-2024	
Material Details		Material Code	Cylinder No.	
Production Order: 90189356		42240550-14	263618	
Gas content: 5.23 wt%		Filling pressure: 137.8 bar	USA 505 18	
Cylinder Details		Cylinder Material	Specified Size	
Laser: 1008		Specified Size	45L	
Laboratory Report				
Component	Normal Concentration	Analysis Result	Uncertainty	Method of Analysis
Supplier Dissolve	45.0 ppm	45.0 ppm	+ 1% relative	ISO 159-152
Carbon Monoxide	45.0 ppm	42.3 ppm	+ 1% relative	ISO 159-152
Water Dew	45.0 ppm	48.0 ppm	+ 1% relative	ISO 159-152
Other N2 impurity	45.0 ppm	45.0 ppm	+ 1% relative	ISO 159-152
Reference Standard used in Assay				
Reference Standard	Cylinder number	Concentration	Expiry Date	
Supplier Dissolve	002218	70.1 ± 0.2 ppm	9-May-2023	
Carbon Monoxide	002218	70.1 ± 0.2 ppm	9-May-2023	
Water Dew	002218	70.1 ± 0.2 ppm	9-May-2023	
Analytical instruments used in Assay				
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration		
FIR Spectrometry Model 630	FIR-12	10-Feb-2022		
FIR Spectrometry Model 630	FIR-12	10-Feb-2022		
FIR Spectrometry Model 630	FIR-12	10-Feb-2022		

Recommended usage conditions
Minimum utilization: 1% of actual content or before expiry date whichever comes first.
Storage conditions: keep in well ventilation and secure area.
Comments: when receiving, please quote the material number.

Notes:
1. All results are given in the SI system unless otherwise specified. The units of the standard have been determined in accordance with the ISO 10000:2000 standard. All results are given in the SI system unless otherwise specified.
2. The reported impurity amounts are based on a standard uncertainty, which is a measure of the confidence in the reported value. The uncertainty of the reported value is based on the standard uncertainty of the measurement and the standard uncertainty of the standard gas.
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Page 1 of 1
Linde (Thailand) Public Company Limited
505 (Thailand) Co., Ltd.
1/208, 1/21, Map 1, Soi Sukhumvit 2,
1, Bang Chong, A. Bang Chong 21130
Tel: 02-010-1000
Fax: 02-010-1001
Email: 505@linde.co.th
Website: www.linde.co.th

Airgas

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number: E02N188E3HAC14C
Cylinder Number: ND43770
Laboratory: ASG - Riverton - NJ
PGVP Number: B52015
Gas Code: O2.BALN2

Customer PO Number: 5215004292
Reference Number: 82-124527654-1
Cylinder Volume: 249.0 CF
Cylinder Pressure: 2214 PSIG
Valve Outlet: 590
Certification Date: Dec 22, 2015

Expiration Date: Dec 22, 2023

Airgas, Inc.
800 Union Landing Road
Denville, NJ 07834
800-425-7878 Fax: 800-425-4578
www.airgas.com

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA-600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration measure. All concentrations are on a volumetric basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
OXYGEN	11.50 %	11.55 %	G1	±0.4% NIST Traceable
NITROGEN	Balance			
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Uncertainty
NTRM	09060237	CC26123	9.961 % OXYGEN/NITROGEN	±0.3%
ANALYTICAL EQUIPMENT				
Instrument/Make/Model			Last Multipoint Calibration	
Horiba MPA 510-CC-TTVAL041			Paramagnetic	

Triad Data Available Upon Request

NOTES:
This calibration std. has been certified in accordance with the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531. All testing processes and measurements conform to the requirements of ISO/IEC 17025 and to Airgas ISO 9001:2000 and relate only to items identified on this certificate. All values are certified to be NIST Traceable with total uncertainty as detailed under Analytical Uncertainty. This document shall not be reproduced in full without written approval of the issuer.



TESTING CERT No. 2000.02

Approved for Release

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Airgas

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Airgas, Inc.
800 Union Landing Road
Denville, NJ 07834
800-425-7878 Fax: 800-425-4578
www.airgas.com

Part Number: E02N179E3HAC15C
Cylinder Number: ND25783
Laboratory: ASG - Riverton - NJ
PGVP Number: B52015
Gas Code: O2.BALN2

Customer PO Number: 5215004292
Reference Number: 82-124527653-1
Cylinder Volume: 255.0 CF
Cylinder Pressure: 2214 PSIG
Valve Outlet: 590
Certification Date: Dec 22, 2015

Expiration Date: Dec 22, 2023

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA-600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration measure. All concentrations are on a volumetric basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
OXYGEN	20.50 %	20.50 %	G1	±0.5% NIST Traceable
NITROGEN	Balance			
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Uncertainty
NTRMplus	09061404	CC26783	22.53 % OXYGEN/NITROGEN	±0.4%
ANALYTICAL EQUIPMENT				
Instrument/Make/Model			Last Multipoint Calibration	
Horiba MPA 510-CC-TTVAL041			Paramagnetic	

Triad Data Available Upon Request

NOTES:
This calibration std. has been certified in accordance with the May 2012 EPA Traceability Protocol, Document EPA-600/R-12/531. All testing processes and measurements conform to the requirements of ISO/IEC 17025 and to Airgas ISO 9001:2000 and relate only to items identified on this certificate. All values are certified to be NIST Traceable with total uncertainty as detailed under Analytical Uncertainty. This document shall not be reproduced in full without written approval of the issuer.



TESTING CERT No. 2000.02

Approved for Release

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CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas, Inc.
600 Union Landing Rd.
Chesham, NJ 08077
856-629-7878 Fax: 856-629-6078
Airgas.com

Part Number: E02N179E3HAC01C
Cylinder Number: ND43935
Laboratory: ASG - Riverton - NJ
PGVP Number: B52015
Gas Code: CO2.BALN

Customer PO Number: 5215004292
Reference Number: 82-124527650-1
Cylinder Volume: 270.4 CF
Cylinder Pressure: 2214 PSIG
Valve Outlet: 580
Certification Date: Dec 23, 2015

Expiration Date: Dec 23, 2023

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 800/R-12/531, using the assay procedures listed. Analytical Metrology does not require correction for analytical interference. This cylinder has a full analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder Below 100 psig i.e. 0.7 megapascals

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON DIOXIDE	20.50 %	20.60 %	G1	±0.7% NIST Traceable
NITROGEN	Balance			
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Uncertainty
NTRM	13050819	CC417106	24.04 % CARBON DIOXIDE/NITROGEN	±0.5%
ANALYTICAL EQUIPMENT				
Instrument/Make/Model			Analytical Principle	Last Multipoint Calibration
Horiba VIA 510-CO2-LDHRLRS			NDIR	Dec 09, 2015

Triad Data Available Upon Request

PERMANENT NOTES: Bangkok Industrial Gas Co.

NOTES: 300A, 580 VALVE

PO# 5215004292



Approved for Release

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CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas, Inc.
600 Union Landing Rd.
Chesham, NJ 08077
856-629-7878 Fax: 856-629-6078
Airgas.com

Part Number: E02N188E3HAC04C
Cylinder Number: ND43982
Laboratory: ASG - Riverton - NJ
PGVP Number: B52015
Gas Code: CO2.BALN

Customer PO Number: 5215004292
Reference Number: 82-124527650-1
Cylinder Volume: 268.7 CF
Cylinder Pressure: 2214 PSIG
Valve Outlet: 580
Certification Date: Dec 22, 2015

Expiration Date: Dec 22, 2023

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 800/R-12/531, using the assay procedures listed. Analytical Metrology does not require correction for analytical interference. This cylinder has a full analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder Below 100 psig i.e. 0.7 megapascals

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON DIOXIDE	11.50 %	11.55 %	G1	±0.7% NIST Traceable
NITROGEN	Balance			
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Uncertainty
NTRM	12061339	CC360796	11.002 % CARBON DIOXIDE/NITROGEN	±0.5%
ANALYTICAL EQUIPMENT				
Instrument/Make/Model			Analytical Principle	Last Multipoint Calibration
Horiba VIA 510-CO2-LDHRLRS			NDIR	Dec 09, 2015

Triad Data Available Upon Request

NOTES:

This calibration std. has been certified in accordance with the May 2012 EPA Traceability Protocol, Document EPA-800/R-12/531. All testing processes and measurements conform to the requirements of ISO/IEC 17025 and to Airgas ISO 9001:2000 and relate only to items identified on this certificate. All values are certified to be NIST Traceable with total uncertainty as detailed under Analytical Uncertainty. This document shall not be reproduced in full without written approval of the issuer.



Approved for Release

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Calibrate instrument for stack manual sampling

- Dry gas
- Pitot Tube
- Nozzle

Meter Console Verification

Dry Gas Meter ID. : ENSS 045
Instrument Brand : Apex / Model 572
Date of Calibration : 08/10/2022
Calibrated By : MW

Wet gas meter information

Wet gas Brand : Shinagawa
Wet gas Model : W-NK-2.5A
Wet gas S/N : 544122
Expire Date : July 28, 2023

Orifice Setting ΔH ₀ (mm H ₂ O)	Wet gas		Metering System		Time (min)	Y1	ΔH ₀
	V ₀ (L)	T ₀ (°C)	V ₀ (L)	T ₀ (°C)			
13	135.78	22.5	140.0	23.0	12:18	0.9702	49.966
13	136.26	22.0	140.0	23.0	12:22	0.9753	49.984
26	134.53	21.2	140.0	23.0	8:27	0.9644	47.676
26	135.40	21.2	140.0	23.0	8:29	0.9706	47.444
40	269.67	21.5	280.0	24.0	13:54	0.9675	49.399
40	269.13	21.6	280.0	23.0	13:53	0.9620	49.680
50	267.03	21.5	280.0	23.0	12:16	0.9539	49.260
50	267.49	21.7	280.0	24.0	12:15	0.9581	48.858
70	266.95	21.8	280.0	25.0	10:10	0.9572	47.270
70	264.42	21.0	280.0	25.5	10:10	0.9523	47.835
90	264.24	21.0	280.0	26.5	8:56	0.9530	47.482
90	264.90	22.5	280.0	27.0	8:54	0.9523	47.279
Average						0.9614	48.511

Remark : Y1 ≤ ± 0.02 from average
Y1 = 1.00 ± 0.05
ΔH₀ ≤ ± 5.08 mm.H₂O from average
ΔH₀ = 46.7 ± 6.4 mm.H₂O

Checked By : Nuttawat S.
(Nuttawat Sirichoti)
Position : Store Manager
Date : 09/10/2022

Approved By : Thepsan Y.
(Thepsan Yommana)
Position : Technical Manager
Date : 10/10/2022



Temperature Display Verification

Dry Gas Meter ID. : ENSS 045 Date of Calibration : 08/10/2022
Instrument Brand : Apex / Model 572 Calibrated By : MW

Temperature Simulator Information

Simulator Brand : Alek Industries, Inc. Simulator S/N : T1L1015
Simulator Model : Alek Model 22 TC source Expire Date : 06/07/2023

Standard Value	Instrument Display				
	Stack	Probe	Filter	Aux	Exit
300	300	300	301	300	-
200	200	200	200	200	-
150	151	151	151	151	-
100	100	101	100	101	101
50	51	50	50	51	50
0	0	0	0	0	0
Difference	0.5%	1.0	1.0	1.0	1.0

Remark : Stack $\leq 1.5\%$ Absolute
Probe $\leq 3.0\text{ }^{\circ}\text{C}$
Filter $\leq 3.0\text{ }^{\circ}\text{C}$
Aux $\leq 3.0\text{ }^{\circ}\text{C}$
Exit $\leq 3.0\text{ }^{\circ}\text{C}$

Checked By : Nuttawat S. Approved By : Thepsan Y.
(Nuttawat Sirichoti) (Thepsan Yommana)
Position : Store Manager Technical Manager
Date : 09/10/2022 Date : 10/10/2022

Manometer Verification

Dry Gas Meter ID. : ENSS 045 Date of Calibration : 08/10/2022
Instrument Brand : Apex / Model 572 Calibrated By : MW

Magnehelic gauge Information

Magnehelic Brand : Dwyer Industries, Inc. Magnehelic S/N : R06082A1109
Magnehelic Model : 2000-25 MMC Expire Date : 23/09/2023

Test No.	Manometer data			
	Manometer Reference ΔP (mm.H ₂ O):A	Manometer monitoring ΔP (mm.H ₂ O):B	Difference	Reference/Monitoring A/B
1	2.0	2.0	0.00	1.00
2	6.0	6.2	0.20	0.97
3	10.0	10.2	0.20	0.98
4	16.0	16.2	0.20	0.99
5	20.0	20.4	0.40	0.98
Average			0.20	0.98

Remark : [Reference (Avg) / Monitoring (Avg)] must be = 0.95 to 1.05

Checked By : Nuttawat S. Approved By : Thepsan Y.
(Nuttawat Sirichoti) (Thepsan Yommana)
Position : Store Manager Technical Manager
Date : 09/10/2022 Date : 10/10/2022

Meter Console Verification

Dry Gas Meter ID. : ENSS 046 Date of Calibration : 18/10/2022
Instrument Brand : Apex / Model 572 Calibrated By : MW

Wet gas meter Information

Wet gas Brand : Shinagawa Wet gas S/N : 544122
Wet gas Model : W-NK-2.5A Expire Date : July 28, 2023

Orifice Setting $\Delta H@$ (mm H ₂ O)	Wet gas		Metering System		Time (min)	YI	$\Delta H@$
	V ₀ (L)	T ₀ (°C)	V ₀ (L)	T ₀ (°C)			
13	134.89	22.6	140.0	23.0	12:21	0.9638	51.152
13	135.94	22.5	140.0	23.0	12:18	0.9714	49.948
26	134.55	22.4	140.0	23.5	8:51	0.9622	52.725
26	134.09	22.2	140.0	24.0	8:51	0.9614	52.908
40	266.95	21.9	280.0	24.5	13:09	0.9581	45.255
40	265.75	21.7	280.0	25.5	13:08	0.9578	45.320
50	264.06	21.3	280.0	26.0	12:23	0.9535	50.851
50	263.46	20.9	280.0	26.0	12:23	0.9526	50.945
70	262.58	20.8	280.0	27.0	10:08	0.9518	47.915
70	262.92	20.4	280.0	27.0	10:07	0.9536	47.569
90	262.76	20.2	280.0	27.0	8:55	0.9519	47.596
90	262.40	20.1	280.0	27.0	8:54	0.9509	47.516
Average						0.9574	49.142

Remark : YI ≤ 0.02 from average
YI = 1.00 \pm 0.05
 $\Delta H@$ ≤ 5.08 mm.H₂O from average
 $\Delta H@$ = 46.7 \pm 6.4 mm.H₂O

Checked By : Nuttawat S. Approved By : Thepsan Y.
(Nuttawat Sirichoti) (Thepsan Yommana)
Position : Store Manager Technical Manager
Date : 19/10/2022 Date : 19/10/2022



Temperature Display Verification

Dry Gas Meter ID. : ENSS 046 Date of Calibration : 18/10/2022
Instrument Brand : Apex / Model 572 Calibrated By : MW

Temperature Simulator Information

Simulator Brand : Alek Industries, Inc. Simulator S/N : T1L1015
Simulator Model : Alek Model 22 TC source Expire Date : 06/07/2023

Standard Value	Instrument Display				
	Stack	Probe	Filter	Aux	Exit
300	300	300	301	300	-
200	201	200	200	201	-
150	151	151	150	150	-
100	100	100	100	100	101
50	50	50	50	50	50
0	0	0	0	0	0
Difference	0.2%	1.0	1.0	1.0	1.0

Remark : Stack $\leq 1.5\%$ Absolute
Probe $\leq 3.0\text{ }^{\circ}\text{C}$
Filter $\leq 3.0\text{ }^{\circ}\text{C}$
Aux $\leq 3.0\text{ }^{\circ}\text{C}$
Exit $\leq 3.0\text{ }^{\circ}\text{C}$

Checked By : Nuttawat S. Approved By : Thepsan Y.
(Nuttawat Sirichoti) (Thepsan Yommana)
Position : Store Manager Technical Manager
Date : 19/10/2022 Date : 19/10/2022

Manometer Verification

Dry Gas Meter ID. : ENSS 046 Date of Calibration : 18/10/2022
Instrument Brand : Apex / Model 572 Calibrated By : MW

Magnehelic gauge Information

Magnehelic Brand : Dwyer Industries, Inc. Magnehelic S/N : R060822A1109
Magnehelic Model : 2000-25 MMC Expire Date : 23/09/2023

Manometer data				
Test No.	Manometer Reference ΔP (mm.H2O):A	Manometer monitoring ΔP (mm.H2O):B	Difference	Reference/Monitoring A/B
1	2.0	2.0	0.00	1.00
2	6.0	6.2	0.20	0.97
3	10.0	10.2	0.20	0.98
4	16.0	16.2	0.20	0.99
5	20.0	20.4	0.40	0.98
Average			0.20	0.98

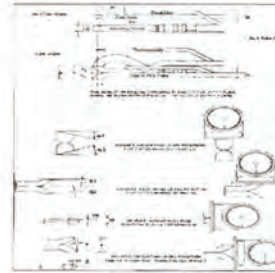
Remark : [Reference (Avg) / Monitoring (Avg)] must be = 0.95 to 1.05

Checked By : Nuttawat S
(Nuttawat Sirichoti)
Position : Store Manager
Date : 18/10/2022

Approved By : Thapana Y
(Thapana Yommana)
Position : Technical Manager
Date : 19/10/2022

Certificate of Calibration

S-Type Geometric Pitot Tube Calibration
See the Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 2, Item 4



Pitot tube/Probe No. No.37/A8463

Parameter	Value	Allowable Range	Check
Assembly Level?	Y	Yes or y	PASS
Ports Damaged?	N	No or n	PASS
a1	5.1	$-10^\circ < \alpha 1 < +10^\circ$	PASS
a2	1.1	$-10^\circ < \alpha 2 < +10^\circ$	PASS
B1	2.1	$-5^\circ < \alpha 1 < +5^\circ$	PASS
B2	1.5	$-5^\circ < \alpha 1 < +5^\circ$	PASS
Y	2.2	N/A	-
θ	1.2	N/A	-
D ₁	0.375	0.188" to 0.375"	PASS
A	0.902	2.10, $\leq A \leq 3.00$	PASS
A/2D ₁	1.202	1.05 $\leq P_1/D_1 \leq 1.5$	PASS
Z = A tan γ	0.034	$2 \leq 0.125^\circ$	PASS
W = A tan θ	0.018	$W \leq 0.031^\circ$	PASS

I certify that pitot tube/probe No.37/A8463 meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube certification factor of 0.94. See 40 CFR Pt. 60, App A, EPA Method 2

Standard Device
Device Name: Digital inclinometer
Manufacturer: BASELINE
Model: 12-1057
ID No.: QC-1824

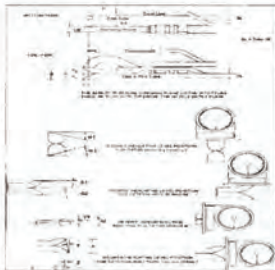
Expiration data: 07-Dec-22
ENSS No.: ENSS 22159

Certified by: Heematch K
Date: 6/01/2022

Approved by: Wanjanee P
Date: 30/1/2022

Certificate of Calibration

S-Type Geometric Pitot Tube Calibration
See the Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 2, Item 4



Pitot tube/Probe No. No.26

Parameter	Value	Allowable Range	Check
Assembly Level?	Y	Yes or y	PASS
Ports Damaged?	N	No or n	PASS
a1	0.6	$-10^\circ < \alpha 1 < +10^\circ$	PASS
a2	-2.8	$-10^\circ < \alpha 2 < +10^\circ$	PASS
B1	4	$-5^\circ < \alpha 1 < +5^\circ$	PASS
B2	0.8	$-5^\circ < \alpha 1 < +5^\circ$	PASS
Y	0.7	N/A	-
θ	1	N/A	-
D ₁	0.375	0.188" to 0.375"	PASS
A	0.967	2.10, $\leq A \leq 3.00$	PASS
A/2D ₁	1.289	1.05 $\leq P_1/D_1 \leq 1.5$	PASS
Z = A tan γ	0.012	$2 \leq 0.125^\circ$	PASS
W = A tan θ	0.017	$W \leq 0.031^\circ$	PASS

I certify that pitot tube/probe No.26 meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube certification factor of 0.94. See 40 CFR Pt. 60, App A, EPA Method 2

Standard Device
Device Name: Digital inclinometer
Manufacturer: BASELINE
Model: 12-1057
ID No.: QC-1824

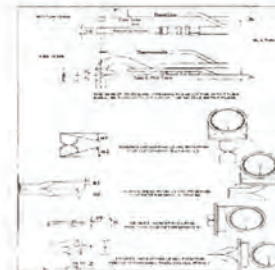
Expiration data: 07-Dec-22
ENSS No.: ENSS 22159

Certified by: Heematch K
Date: 6/01/2022

Approved by: Wanjanee P
Date: 30/1/2022

Certificate of Calibration

S-Type Geometric Pitot Tube Calibration
See the Code of Federal Regulations, Title 40, Part 60, Appendix A, Method 2, Item 4



Pitot tube/Probe No. No.50/A3599

Parameter	Value	Allowable Range	Check
Assembly Level?	Y	Yes or y	PASS
Ports Damaged?	N	No or n	PASS
a1	-0.9	$-10^\circ < \alpha 1 < +10^\circ$	PASS
a2	-1.5	$-10^\circ < \alpha 2 < +10^\circ$	PASS
B1	-0.8	$-5^\circ < \alpha 1 < +5^\circ$	PASS
B2	0.5	$-5^\circ < \alpha 1 < +5^\circ$	PASS
Y	-1.4	N/A	-
θ	1.5	N/A	-
D ₁	0.375	0.188" to 0.375"	PASS
A	0.833	2.10, $\leq A \leq 3.00$	PASS
A/2D ₁	1.11	1.05 $\leq P_1/D_1 \leq 1.5$	PASS
Z = A tan γ	0.02	$2 \leq 0.125^\circ$	PASS
W = A tan θ	0.022	$W \leq 0.031^\circ$	PASS

I certify that pitot tube/probe No.50/A3599 meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube certification factor of 0.94. See 40 CFR Pt. 60, App A, EPA Method 2

Standard Device
Device Name: Digital inclinometer
Manufacturer: BASELINE
Model: 12-1057
ID No.: QC-1824

Expiration data: 07-Dec-22
ENSS No.: ENSS 22159

Certified by: Heematch K
Date: 6/01/2022

Approved by: Wanjanee P
Date: 30/1/2022

SGS

Prob Nozzle Diameter Calibration Data Sheet

Date: 14/11/2022 Personal: MW
 Vernier (Digital): Dial Caliper Reference: GS 584607
 Nozzle ID: ENSS 090 Nozzle Set (Stainless Steel)

Nozzle No.	Nozzle Diameter (mm)			Hi-Lo	D _{avg}
	D1	D2	D3	ΔD	
1	3.22	3.16	3.24	0.08	3.21
2	3.64	3.66	3.62	0.04	3.64
3	4.62	4.66	4.68	0.06	4.65
4	6.14	6.10	6.18	0.08	6.14
5	7.88	7.84	7.86	0.04	7.86
6	9.62	9.60	9.64	0.04	9.62
7	12.80	12.74	12.80	0.06	12.78

Max 0.08 Pass

Remark: ΔD = Maximum distance between any two diameters, must be ≤ 0.100 mm
 $D_{avg} = (D1 + D2 + D3) / 3$

Checked By: Nuttawat Sirichot
 (Nuttawat Sirichot)
 Store Manager
 Date: 14 / 11 / 2022

Approved By: Thepsan Yommana
 (Thepsan Yommana)
 Technical Manager
 Date: 15 / 11 / 2022



SGS

Prob Nozzle Diameter Calibration Data Sheet

Date: 14/11/2022 Personal: MW
 Vernier (Digital): Dial Caliper Reference: GS 584607
 Nozzle ID: ENSS 087 Nozzle Set (Borosilicate Glass)

Nozzle No.	Nozzle Diameter (mm)			Hi-Lo	D _{avg}
	D1	D2	D3	ΔD	
1	3.18	3.20	3.18	0.02	3.19
2	3.28	3.26	3.28	0.02	3.27
3	4.58	4.62	4.62	0.04	4.61
4	4.74	4.80	4.80	0.06	4.78
5	5.64	5.64	5.66	0.02	5.65
6	5.88	5.90	5.86	0.04	5.88
7	6.40	6.46	6.46	0.06	6.44

Max 0.06 Pass

Remark: ΔD = Maximum distance between any two diameters, must be ≤ 0.100 mm
 $D_{avg} = (D1 + D2 + D3) / 3$

Checked By: Nuttawat Sirichot
 (Nuttawat Sirichot)
 Store Manager
 Date: 14 / 11 / 2022

Approved By: Thepsan Yommana
 (Thepsan Yommana)
 Technical Manager
 Date: 15 / 11 / 2022



SGS

Prob Nozzle Diameter Calibration Data Sheet

Date: 14/11/2022 Personal: MW
 Vernier (Digital): Dial Caliper Reference: GS 584607
 Nozzle ID: ENSS 088 Nozzle Set (Borosilicate Glass)

Nozzle No.	Nozzle Diameter (mm)			Hi-Lo	D _{avg}
	D1	D2	D3	ΔD	
1	3.20	3.18	3.20	0.02	3.19
2	3.32	3.30	3.30	0.02	3.31
3	4.70	4.72	4.74	0.04	4.72
4	4.88	4.86	4.88	0.02	4.87
5	5.70	5.74	5.72	0.04	5.72
6	10.38	10.36	10.36	0.02	10.37
7	12.74	12.72	12.74	0.02	12.73

Max 0.04 Pass

Remark: ΔD = Maximum distance between any two diameters, must be ≤ 0.100 mm
 $D_{avg} = (D1 + D2 + D3) / 3$

Checked By: Nuttawat Sirichot
 (Nuttawat Sirichot)
 Store Manager
 Date: 14 / 11 / 2022

Approved By: Thepsan Yommana
 (Thepsan Yommana)
 Technical Manager
 Date: 15 / 11 / 2022



Calibrate instrument used in laboratory

- Balance
- Oven

Mettler-Toledo (Thailand) Ltd.
845/4 - 845/5 Laksalek Rd., Bangna Tai Sub-District
Bangna District, Bangkok 10260
+662 723 0362
MT-TH.ServiceSupport@mt.com

Electronic Balance



Accuracy Calibration Certificate

Customer

Company: SGS (THAILAND) CO., LTD.
Address: 1/209, 1/211 Moo 1, Ban Chang
City: Ban Chang Contact: Hatairat Uthong
Zip / Postal: 21130
State / Province: Rayong
Order Number:

Weighing Device

Manufacturer: Mettler Toledo Instrument Type: Weighing Instrument
Model: XS205DU Asset Number: N/A
Serial No.: B036065880 Terminal Model: SAT
Building: LABORATORY Terminal Serial No.: B036065880
Floor: 1 Terminal Asset No.: N/A
Room: Balance Lab

Range	Max. Capacity	Readability (g)
1	81 g	0.0001 g
2	220 g	0.001 g

Procedure

Calibration Outline: EURAMET cg-18 v 4.0 (11/2015)

METTLER TOLEDO Work Instruction: CPW002/20

This calibration certificate contains measurements for As Found calibration. No As Left calibration was performed because the device was not modified after As Found calibration. Therefore, results for As Left correspond to As Found.

The sensitivity of the weighing instrument was adjusted before calibration with a built-in weight.

In accordance with EURAMET cg-18 (11/2015), the test loads were selected to reflect the specific use of the weighing device or to accommodate specific calibration conditions.

As Found	Start: 23.4 °C	End: 23.5 °C	Humidity	Start: 74.0 %	End: 72.6 %
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As Found Calibration Date: 18-Mar-2022 Calibration:
As Left Calibration Date: N/A
Issue Date: 18-Mar-2022 Approved Signatory:
☒ Kongsakorn Teerasachandani
☐ Sarit Jirayon
☐ Surachai Sukkote

Software Version: 1.23.0.280
Report Version: 2.16.12
Form Number: F103C

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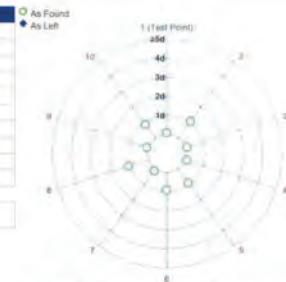
Measurement Results

Repeatability

Test Load: 70 g

	As Found	As Left
1	69.99992 g	N/A
2	69.99993 g	N/A
3	69.99992 g	N/A
4	69.99992 g	N/A
5	69.99991 g	N/A
6	69.99991 g	N/A
7	69.99992 g	N/A
8	69.99993 g	N/A
9	69.99992 g	N/A
10	69.99991 g	N/A

Standard Deviation	0.000007 g	N/A
--------------------	------------	-----



The "d" in the graph represents the readability of the range interval in which the test was performed.
The results of the graph are based upon the absolute values of the differences from the mean value.

Eccentricity

Test Load: 100 g

Position	As Found	As Left
1	99.9999 g	N/A
2	100.0000 g	N/A
3	100.0000 g	N/A
4	99.9998 g	N/A
5	99.9998 g	N/A



The "d" in the graph represents the readability of the range interval in which the test was performed.

Maximum Deviation	0.0001 g	N/A
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Software Version: 1.23.0.280
Report Version: 2.16.12
Form Number: F103C

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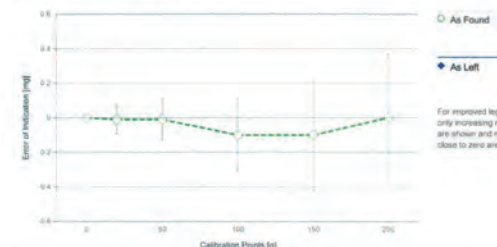
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Error of Indication

As Found	Reference Value	Indication	Error of Indication	Expanded Uncertainty	k
1	0.00000 g	0.00000 g	0.00000 g	0.016 mg	2
2	0.01000 g	0.00998 g	-0.00001 g	0.016 mg	2
3	0.10000 g	0.10000 g	0.00000 g	0.027 mg	2
4	1.00000 g	1.00000 g	0.00000 g	0.032 mg	2
5	5.00000 g	5.00000 g	0.00000 g	0.048 mg	2
6	9.99999 g	9.99999 g	0.00000 g	0.061 mg	2
7	19.99995 g	19.99994 g	-0.00001 g	0.082 mg	2
8	49.99998 g	49.99997 g	-0.00001 g	0.12 mg	2
9	100.0000 g	99.99999 g	-0.00001 g	0.21 mg	2
10	150.0000 g	149.9999 g	-0.00001 g	0.37 mg	2
11	199.9998 g	199.9998 g	0.00000 g	0.37 mg	2

The calculated uncertainty was replaced by the CMC (Calibration and Measurement Capabilities) value because the calculated uncertainty was smaller than the CMC value.



The uncertainty stated is the expanded uncertainty at calibration obtained by multiplying the standard combined uncertainty by the coverage factor k - which can be larger than 2 according to EURAMET cg-18. The value of the measurand lies within the assigned range of values with a probability of approximately 95%.

The user is responsible for maintaining environmental conditions and the settings of the weighing instrument when it was calibrated.

Software Version: 1.23.0.280
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Test Equipment

All weights used for metrological testing are traceable to national or international standards. The weights were calibrated and certified by an accredited calibration laboratory.

Weight Set 1: OIML E2

Weight Set No.: W534 Date of Issue: 05-Jul-2021
Certificate Number: 174045 Calibration Due Date: 01-Jan-2023

Weight Set 2: OIML E2

Weight Set No.: W571 Date of Issue: 21-Oct-2021
Certificate Number: C142784703 Calibration Due Date: 27-Mar-2023

Hygrometer

Equipment No.: H285 Date of Issue: 11-May-2021
Certificate Number: 21H1104 Calibration Due Date: 06-May-2022

Remarks

FACT adjustment functionality activated
Equipment condition: Good
Next calibration according to customer's procedure
Calibration data not decide by calibration laboratory

End of Accredited Section

This information below and any attachments to this calibration certificate are not part of the accredited calibration.

Software Version: 1.23.0.280
Report Version: 2.16.12
Form Number: F103C

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Measurement Uncertainty of the Weighing Instrument in Use

Stated is the expanded uncertainty with $k=2$ in use. The formula shall be used for the estimation of the uncertainty under consideration of the errors of indication. The value R represents the net load indication in the unit of measure of the device.

Temperature coefficient for the evaluation of the measurement uncertainty in use: $1.5 \cdot 10^{-4} / K$

Temperature range on site for the evaluation of the measurement uncertainty in use: $5 K$

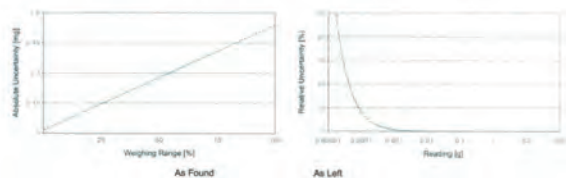
Linearization of Uncertainty Equation

Range	d	Max	As Found	As Left
1	0.00001 g	81 g	$U_1 = 0.017 \text{ mg} + 0.00645 \text{ mg/g} \cdot R$	N/A
2	0.0001 g	220 g	$U_2 = 0.06 \text{ mg} + 0.00639 \text{ mg/g} \cdot R$	N/A

To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

Absolute and Relative Measurement Uncertainty in Use for Various Net Indications (Examples)

Net Indication	As Found	As Left
0.00220 g	0.017 mg, 0.77%	N/A, N/A
0.02200 g	0.017 mg, 0.078%	N/A, N/A
0.22000 g	0.018 mg, 0.0084%	N/A, N/A
2.20000 g	0.031 mg, 0.0014%	N/A, N/A
220.0000 g	1.5 mg, 0.00067%	N/A, N/A



The weighing range shown in the absolute uncertainty graph refers to the first interval range of the device.

GWP® Certificate



As Found



As Left



The weighing device meets the given process requirements.

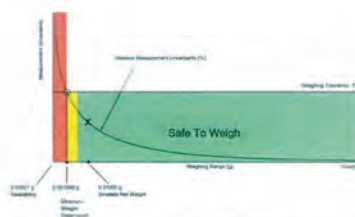
The weighing device meets the given process requirements.

Tests Performed: ☒ As Found ☐ As Left ☒ No adjustments/modifications made. As Left result correspond to As Found.

Process Requirements

Weighing Tolerance: 1% | Smallest Net Weight: 0.01000 g | Safety Factor: 2

Safe Weighing Range



Write the values in this graph reflect the actual calibration result. The measurement uncertainty curve is only a visual representation. This point reflects the left safety factor only. As Found result is performed.

Minimum Weight

As Found Minimum Weight Table

Range 1

Tolerance	1	2	3	5	10
0.1%	0.016975 g	0.034172 g	0.051595 g	0.087139 g	0.180288 g
0.2%	0.008480 g	0.016975 g	0.025845 g	0.042855 g	0.087139 g
0.5%	0.003377 g	0.006754 g	0.010159 g	0.016975 g	0.034172 g
1%	0.001688 g	0.003377 g	0.005090 g	0.008480 g	0.016975 g
2%	0.000844 g	0.001688 g	0.002532 g	0.004223 g	0.008480 g
5%	0.000337 g	0.000675 g	0.001012 g	0.001688 g	0.003377 g

The minimum weight table applies to the fine range of the weighing device.

Pass: The determined minimum weight meets the requirement for the smallest net weight.

As Left Minimum Weight Table

Range 1

Tolerance	1	2	3	5	10
0.1%	0.016975 g	0.034172 g	0.051595 g	0.087139 g	0.180288 g
0.2%	0.008480 g	0.016975 g	0.025845 g	0.042855 g	0.087139 g
0.5%	0.003377 g	0.006754 g	0.010159 g	0.016975 g	0.034172 g
1%	0.001688 g	0.003377 g	0.005090 g	0.008480 g	0.016975 g
2%	0.000844 g	0.001688 g	0.002532 g	0.004223 g	0.008480 g
5%	0.000337 g	0.000675 g	0.001012 g	0.001688 g	0.003377 g

The minimum weight table applies to the fine range of the weighing device.

Pass: The determined minimum weight meets the requirement for the smallest net weight.

At these net minimum weight values, the measurement uncertainty of the weighing device is equal to or less than 1/1 (no safety factor), 1/2, 1/3, 1/5, or 1/10 of the required tolerance. The values are calculated with $k=2$ and based on the linear formula of the measurement uncertainty of the weighing device in use.

The safety factor for As Found is always 1. This implies no safety factor. As Found testing looks at the behavior of the instrument from the past until test occurred. For the past, it is necessary to know that the tolerance was met, but not the safety factor. The safety factor is a proactive measure to apply for future measurements.

Notes on minimum weight values in above table:

- If "N/A" is shown above, no appropriate value could be calculated.
- METTLER TOLEDO is not responsible for the definition of the process requirements.

Measurement Results

Results Summary

	Repeatability	Eccentricity	Error of Indication
As Found	✓	✓	✓
As Left	✓	✓	✓

✓ = Passed
✗ = Failed
▲ = Safety Factor not met

Repeatability

Test Load: 70 g

Tolerance	Control Limit	As Found	As Left
0.1%	0.000020 g	Std. Deviation	Std. Deviation
0.2%	0.000010 g	Result	Result
0.5%	0.000023 g	0.000007 g	0.000007 g
1%	0.000046 g	✓	✓
2%	0.000090 g	✓	✓
5%	0.000225 g	✓	✓

The weighing tolerance is met if the standard deviation is less than or equal to the corresponding control limit.

Eccentricity

Test Load: 100 g

Tolerance	Control Limit	As Found	As Left
0.1%	0.0000 g	Deviation	Deviation
0.2%	0.0000 g	Result	Result
0.5%	0.0000 g	0.0001 g	0.0001 g
1%	0.0000 g	✓	✓
2%	0.0000 g	✓	✓
5%	0.0000 g	✓	✓

The weighing tolerance is met if the deviation is less than or equal to the corresponding control limit.

As Found

		Control limits for various weighing tolerances					
Reference Value	Error	0.1%	0.2%	0.5%	1%	2%	5%
0.00000 g	0.00000 g	N/A	N/A	N/A	N/A	N/A	N/A
19.99995 g	-0.00001 g	0.01000 g	0.02000 g	0.05000 g	0.10000 g	0.20000 g	0.50000 g
49.99998 g	-0.00001 g	0.02500 g	0.05000 g	0.12500 g	0.25000 g	0.50000 g	1.25000 g
100.00000 g	-0.00001 g	0.05000 g	0.10000 g	0.25000 g	0.50000 g	1.00000 g	2.50000 g
150.00000 g	-0.00001 g	0.07500 g	0.15000 g	0.37500 g	0.75000 g	1.50000 g	3.75000 g
199.99998 g	0.00000 g	0.10000 g	0.20000 g	0.50000 g	1.00000 g	2.00000 g	5.00000 g
Result		✓	✓	✓	✓	✓	✓

As Left

		Control limits for various weighing tolerances					
Reference Value	Error	0.1%	0.2%	0.5%	1%	2%	5%
0.00000 g	0.00000 g	N/A	N/A	N/A	N/A	N/A	N/A
19.99995 g	-0.00001 g	0.01000 g	0.02000 g	0.05000 g	0.10000 g	0.20000 g	0.50000 g
49.99998 g	-0.00001 g	0.02500 g	0.05000 g	0.12500 g	0.25000 g	0.50000 g	1.25000 g
100.00000 g	-0.00001 g	0.05000 g	0.10000 g	0.25000 g	0.50000 g	1.00000 g	2.50000 g
150.00000 g	-0.00001 g	0.07500 g	0.15000 g	0.37500 g	0.75000 g	1.50000 g	3.75000 g
199.99998 g	0.00000 g	0.10000 g	0.20000 g	0.50000 g	1.00000 g	2.00000 g	5.00000 g
Result		✓	✓	✓	✓	✓	✓

The weighing tolerance is met if the error (of indication) for each test point is less than or equal to the corresponding control limit for that particular weighing tolerance. Results at or close to the zero point cannot be assessed.

Service Date: 2022-03-18
Document Number: TH076-029-031822-LABBalanceRM
SGS (THAILAND) CO.,LTD.
1209, 1/211 Moo 1, Ban Chang, Ban Chang, Rayong 21130
Hailand-Lines

Balance Health Report

Device Details			
System Details			
Manufacturer:	Mettler Toledo	Accessory 1:	
Model:	MS2010DU	Accessory 2:	
Serial number:	803050586	Weight set for routine testing:	Yes /
Firmware:	1.69.0		
History			
Device History		Service History	
Instrument in use:	Yes	Last preventive maintenance:	4.1 year
Instrument age:	> 10 years	Last instrument calibration:	4.1 year
Spares parts available:	Yes	Last minimum weight determination:	Never
Regulations:	ISO		
Process tolerance in %:	1%	Routine testing performed:	Yes
Smallest sample net weight:	0.01000g		
Check List			
Environmental Conditions		General & Functional Checks	
Room temperature fluctuation:	✓	Leveling:	✓
Exposure to direct sun:	✓	Clear display:	✓
Vibrations:	✓	Completeness - missing parts see additional remarks:	✓
Draft:	✓	Settings optimized for operating environment:	✓
Dirt or dust:	✓	Other - objections noted as additional remarks:	✓
Static:	✓		
Mechanical Component Checks		Electrical Component Checks	
Draft shield:	✓	Power supply:	✓
Weighing pan position:	✓	Sliding door drive:	✓
Housing:	✓	Internal weight drive:	✓
Other - objections noted as additional remarks:	✓	Display:	✓
		Other - objections noted as additional remarks:	✓
Recommendations			
Measurement Result Quality		Proven Efficiency	
Instrument calibration:	Uninstall instrument		
Identify safe weighing range:	Replace instrument		
GWP verification / risk assessment:	Replace / add parts (see additional remarks):		
Preventive maintenance:	Onsite repair		
Perform routine testing with test weights:	Depot repair		
Under training:	Use of accessories (see additional remarks):		
Contact:	Name: Hakan Linde	Position: Chemist	Phone: 1802053009
			Email: hmln@sgs.thailand.sg.com
Additional Remarks & Recommendations			Engineer Details
			Date: 18-Mar-2022
			Name: Sergei Kostichenko
			Signature:

This is not a certificate.

It should not be used to interpret final results for the testing of these devices.

Legend: ✓ Good Pass, ✗ Bad Fail, ⚠ Needs Attention, ✖ Not Applicable

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W1 T10 Service@mettler.com
www.mt.com



Thermology Co., Ltd.

96/177-96/178 Moo 6, T. La-harn, A. Bangbuahtong, Nonthaburi 11110
Tel : 0 2191 6479 Fax : 0 2191 6480 website : www.thermology.co.th

Oven



CALIBRATION CERTIFICATE

Date of Issue: Jun 29, 2022 Cert No.: 22/2281
Site Calibration: Order No.: 22060270

Customer: SGS (Thailand) Limited.
1/209, 1/211 Moo 1, T. Ban Chang, A. Ban Chang Rayong 21130 Thailand.

Place of Calibration: Hot Lab

Description: Oven
Model: UF110
Serial No.: B4152321
ID No.: 02016001
Date of Receipt: Jun 21, 2022
Date of Calibration: Jun 21, 2022
Environment:
Temperature (Min) 23.3 °C (Max) 29.7 °C
Relative Humidity (Min) 42.5 %RH (Max) 69.7 %RH

Calibration Method

WI-17: The reference thermometer was placed into the chamber and measurement was performed based on AS-2853.
The temperature scale in use at this laboratory is the International Temperature Scale of 1990.

Standard

1) Data Acquisition with Sensor Model 34972A S/N. MY59003190, Certificate No. OR22-1088, Calibrated by Quality Reform Co., Ltd., ONAC Calibration No. 0292.
This certificate is traceable to SI unit.



Thermology Co., Ltd.

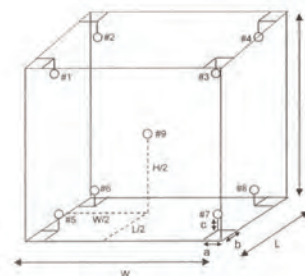
96/177-96/178 Moo 6, T. La-harn, A. Bangbuahtong, Nonthaburi 11110
Tel : 0 2191 6479 Fax : 0 2191 6480 website : www.thermology.co.th



CALIBRATION CERTIFICATE

Date of Issue: Jun 29, 2022 Cert No.: 22/2281
Site Calibration: Order No.: 22060270

Results (without adjustment)



Position of reference thermometers were placed

Note

- 1) Dimension (W x L x H) is 56 x 40 x 48 cm
- 2) Stability - greatest one half of difference between max peak and min peak of each reference probe measured temperature obtained during the calibration interval.
- 3) Uniformity - the maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close as observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady state conditions. The reference sensor should preferably be located at the geometric center of the chamber.



CALIBRATION CERTIFICATE

Date of Issue Jun 29, 2022
Site Calibration

Cert No. 22/2281
Order No. 22060270

Results (without adjustment)

UUC Setting (°C)	UUC Reading (°C)	Reference Thermometer (°C)	Stability \pm (°C)	Uniformity (°C)	Uncertainty \pm (°C)
85.0	85.0	Position 1	0.082	0.430	0.32
		Position 2			
		Position 3			
		Position 4			
		Position 5			
		Position 6			
		Position 7			
		Position 8			
		Position 9			

UUC Setting (°C)	UUC Reading (°C)	Reference Thermometer (°C)	Stability \pm (°C)	Uniformity (°C)	Uncertainty \pm (°C)
104.0	104.0	Position 1	0.116	0.654	0.35
		Position 2			
		Position 3			
		Position 4			
		Position 5			
		Position 6			
		Position 7			
		Position 8			
		Position 9			

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CALIBRATION CERTIFICATE

Date of Issue Jun 29, 2022
Site Calibration

Cert No. 22/2281
Order No. 22060270

Results (without adjustment)

UUC Setting (°C)	UUC Reading (°C)	Reference Thermometer (°C)	Stability \pm (°C)	Uniformity (°C)	Uncertainty \pm (°C)
150.0	150.0	Position 1	0.174	1.202	0.45
		Position 2			
		Position 3			
		Position 4			
		Position 5			
		Position 6			
		Position 7			
		Position 8			
		Position 9			

UUC Setting (°C)	UUC Reading (°C)	Reference Thermometer (°C)	Stability \pm (°C)	Uniformity (°C)	Uncertainty \pm (°C)
180.0	180.0	Position 1	0.197	1.407	0.50
		Position 2			
		Position 3			
		Position 4			
		Position 5			
		Position 6			
		Position 7			
		Position 8			
		Position 9			

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CALIBRATION CERTIFICATE

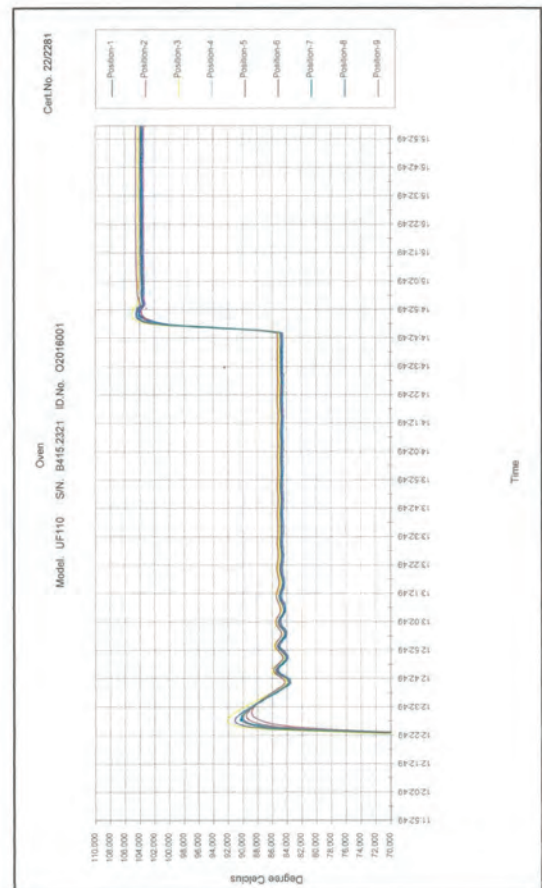
Date of Issue Jun 29, 2022
Site Calibration

Cert No. 22/2281
Order No. 22060270

The stability and uniformity was taken into account in the measurement uncertainty stated.
The above results are valid exclusively for calibration samples as mentioned in the report.
The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with ONAC requirements.

APPROVED SIGNATORY : *Handwritten signature*
(MR. JATURAPAT THONGSOOKCHOTE)

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System Calibration Data Sheet

[illegible]

Analyzer Calibration Data Sheet

- HRSG 22

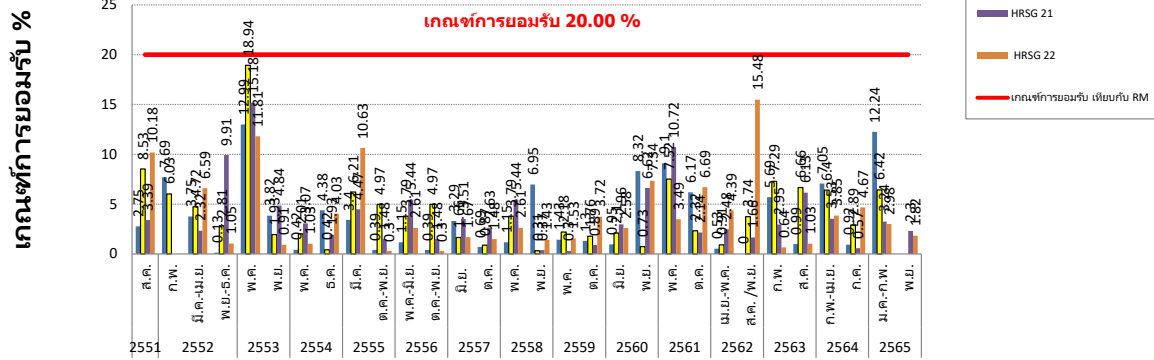
Analyzer Calibration Data Sheet

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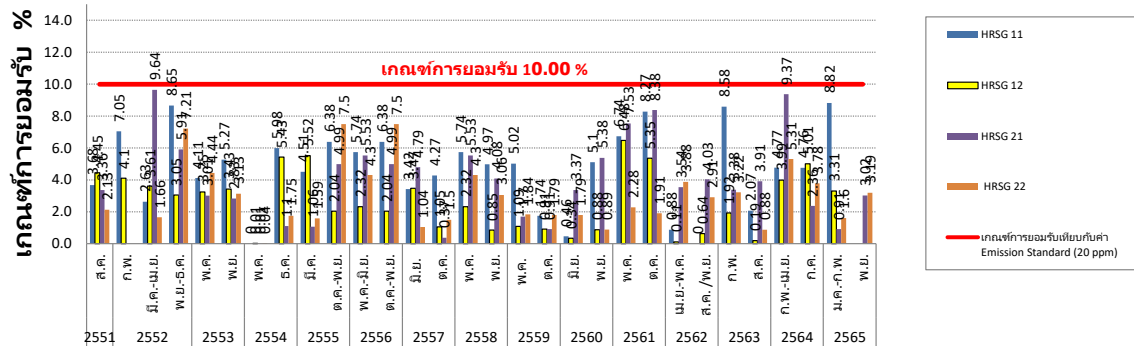
System Calibration Data Sheet

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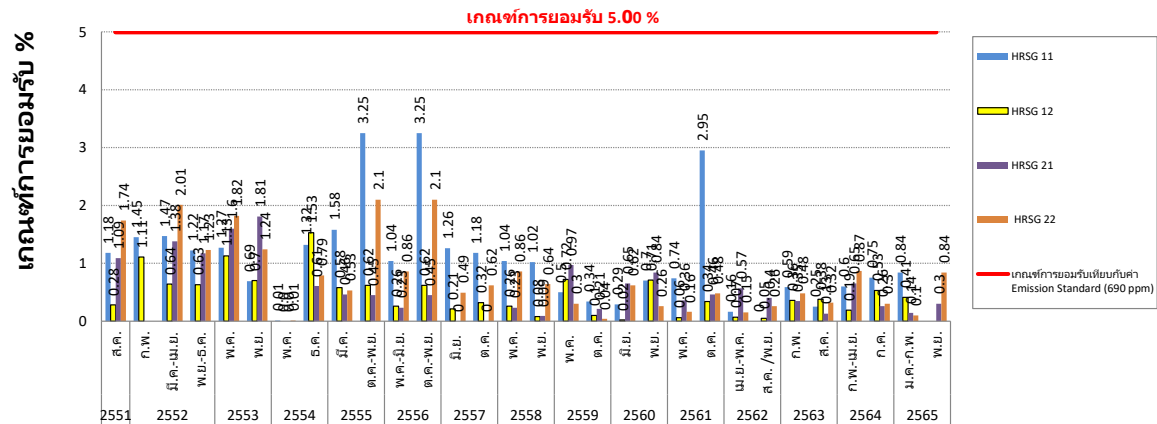
ผลการทดสอบความแม่นยำของระบบ CEMS ประเภทโรงไฟฟ้า :
พารามิเตอร์ NO_x



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พารามิเตอร์ SO₂



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พารามิเตอร์ CO



ผลการทดสอบความแม่นยำของระบบ CEMS ประเภทโรงไฟฟ้า :
พารามิเตอร์ O₂

