

ภาคผนวก ฎ  
ใบรายงานผลการวิเคราะห์

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อากาศ

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## ระยะดำเนินการขุดเจาะ

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### ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecohtai.net  
**MEASURING SOURCE** : POAR9-1 : BAN BO RANG (UTM WGS 84 ZONE 47P 734039E 1724684N)  
**MEASURING TYPE** : AMBIENT (NOISE) **RECEIVED DATE** : FEBRUARY 23-26, 2023  
**MEASURING DATE** : FEBRUARY 23-26, 2023 **ANALYTICAL DATE** : FEBRUARY 23-26, 2023  
**MEASURING TIME** : \* **REPORT NO.** : 2023-U015576  
**MEASURING METHOD** : INTEGRATED SOUND LEVEL METER **WORK NO.** : 2022-010431  
**MEASURED BY** : MR CHATCHAWAN LUEANLONG **ANALYSIS NO.** : T23AD445-0001 - T23AD445-0003

TIME*	RESULT dB(A)		
	POAR9-1 : BAN BO RANG (UTM WGS 84 ZONE 47P 734039E 1724684N)		
	FEBRUARY 23-24, 2023		
	T23AD445-0001		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	54.9	67.9	48.7
08:00-09:00 HOUR	57.9	74.6	49.1
09:00-10:00 HOUR	53.4	68.4	46.4
10:00-11:00 HOUR	54.8	71.9	46.6
11:00-12:00 HOUR	53.2	70.5	45.7
12:00-13:00 HOUR	55.4	77.5	45.2
13:00-14:00 HOUR	60.7	89.8	41.2
14:00-15:00 HOUR	52.6	69.4	39.0
15:00-16:00 HOUR	53.2	81.3	40.8
16:00-17:00 HOUR	54.9	68.9	44.1
17:00-18:00 HOUR	51.4	67.8	39.5
18:00-19:00 HOUR	55.4	84.7	40.1
19:00-20:00 HOUR	51.1	68.5	38.3
20:00-21:00 HOUR	52.0	68.1	38.9
21:00-22:00 HOUR	54.1	74.0	41.2
22:00-23:00 HOUR	50.1	67.0	39.4
23:00-00:00 HOUR	42.7	60.3	35.2
00:00-01:00 HOUR	50.5	79.5	34.2
01:00-02:00 HOUR	51.7	69.4	35.0
02:00-03:00 HOUR	45.6	62.6	33.5
03:00-04:00 HOUR	49.9	67.5	33.8
04:00-05:00 HOUR	41.6	59.1	35.3
05:00-06:00 HOUR	51.5	69.7	45.4
06:00-07:00 HOUR	46.6	64.4	40.4
L <sub>Aeq</sub> 24 hours		53.7	
L <sub>A90</sub>		57.0	

TIME*	RESULT dB(A)		
	POAR9-1 : BAN BO RANG (UTM WGS 84 ZONE 47P 734039E 1724684N)		
	FEBRUARY 24-25, 2023		
	T23AD445-0002		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	59.5	71.0	52.8
08:00-09:00 HOUR	58.7	73.1	49.2
09:00-10:00 HOUR	54.2	72.6	47.8
10:00-11:00 HOUR	53.7	67.6	47.4
11:00-12:00 HOUR	52.9	75.4	45.7
12:00-13:00 HOUR	51.4	70.7	43.5
13:00-14:00 HOUR	52.5	72.7	40.0
14:00-15:00 HOUR	56.9	75.2	45.2
15:00-16:00 HOUR	50.6	70.1	38.1
16:00-17:00 HOUR	55.1	76.2	43.8
17:00-18:00 HOUR	52.7	70.5	40.3
18:00-19:00 HOUR	54.1	76.2	38.3
19:00-20:00 HOUR	50.2	70.6	37.8
20:00-21:00 HOUR	52.4	72.5	41.2
21:00-22:00 HOUR	51.1	70.7	38.9
22:00-23:00 HOUR	53.1	80.0	37.0
23:00-00:00 HOUR	48.0	70.3	34.9
00:00-01:00 HOUR	58.8	80.5	35.6
01:00-02:00 HOUR	46.6	68.7	33.7
02:00-03:00 HOUR	50.7	71.2	33.2
03:00-04:00 HOUR	54.6	80.4	34.6
04:00-05:00 HOUR	51.5	79.1	35.3
05:00-06:00 HOUR	51.1	61.3	45.5
06:00-07:00 HOUR	52.9	67.5	46.6
L <sub>Aeq</sub> 24 hours		54.2	
L <sub>A90</sub>		60.0	





TIME*	RESULT dB(A)		
	POAR9-1 : BAN BO RANG (UTM WGS 84 ZONE 47P 734039E 1724684N)		
	FEBRUARY 25-26, 2023		
	T23AD445-0003		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	50.9	64.5	45.6
08:00-09:00 HOUR	55.8	74.0	46.9
09:00-10:00 HOUR	53.3	68.5	46.6
10:00-11:00 HOUR	54.2	70.3	46.0
11:00-12:00 HOUR	53.3	65.7	46.0
12:00-13:00 HOUR	53.5	65.5	46.3
13:00-14:00 HOUR	53.5	67.3	45.8
14:00-15:00 HOUR	60.8	81.6	44.8
15:00-16:00 HOUR	54.2	77.4	43.3
16:00-17:00 HOUR	52.0	71.8	39.8
17:00-18:00 HOUR	54.5	71.1	40.1
18:00-19:00 HOUR	54.9	70.9	41.8
19:00-20:00 HOUR	51.8	74.6	39.0
20:00-21:00 HOUR	49.7	68.7	39.1
21:00-22:00 HOUR	48.6	72.0	39.1
22:00-23:00 HOUR	52.9	69.2	38.3
23:00-00:00 HOUR	47.1	68.9	34.8
00:00-01:00 HOUR	50.9	69.5	34.9
01:00-02:00 HOUR	49.2	73.5	33.8
02:00-03:00 HOUR	55.3	74.6	35.1
03:00-04:00 HOUR	54.7	74.2	34.5
04:00-05:00 HOUR	51.7	73.4	36.8
05:00-06:00 HOUR	54.3	69.8	51.3
06:00-07:00 HOUR	53.0	71.6	44.1
L <sub>Aeq</sub> 24 hours		53.9	
L <sub>Adn</sub>		59.5	

*Sila Banjongjairuk*

(MR. SILA BANJONGJAIRUK)  
LABORATORY SUPERVISOR

MARCH 3, 2023

## ANALYSIS REPORT

CUSTOMER NAME	: ECO ORIENT RESOURCES (THAILAND) LTD.
ADDRESS	: 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900
CONTACT INFORMATION	: TEL : 0 2937 1124-9 e-mail : anucha@ecothal.net
MEASURING SOURCE	: POAR9-4 : WAT KHOK SAWANG (UTM WGS 84 ZONE 47P 734374E 1727567N)
MEASURING TYPE	: AMBIENT (NOISE)
MEASURING DATE	: FEBRUARY 23-26, 2023
MEASURING TIME	: *
MEASURING METHOD	: INTEGRATED SOUND LEVEL METER
MEASURED BY	: MR CHATCHAWAN LUEANLONG
RECEIVED DATE	: FEBRUARY 23-26, 2023
ANALYTICAL DATE	: FEBRUARY 23-26, 2023
REPORT NO.	: 2023-U015577
WORK NO.	: 2022-010431
ANALYSIS NO.	: T23AD445-0004 - T23AD445-0006

TIME*	RESULT dB(A)		
	POAR9-4 : WAT KHOK SAWANG (UTM WGS 84 ZONE 47P 734374E 1727567N)		
	FEBRUARY 23-24, 2023		
	T23AD445-0004		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	64.2	87.9	54.2
08:00-09:00 HOUR	63.6	91.7	52.7
09:00-10:00 HOUR	60.9	83.8	48.7
10:00-11:00 HOUR	57.6	78.6	47.5
11:00-12:00 HOUR	53.1	70.6	45.0
12:00-13:00 HOUR	53.9	71.3	45.8
13:00-14:00 HOUR	54.2	73.3	46.2
14:00-15:00 HOUR	55.8	73.1	48.0
15:00-16:00 HOUR	57.3	73.6	52.2
16:00-17:00 HOUR	56.0	73.0	48.6
17:00-18:00 HOUR	54.2	69.8	47.4
18:00-19:00 HOUR	54.9	81.5	43.5
19:00-20:00 HOUR	53.7	69.5	46.2
20:00-21:00 HOUR	52.7	70.8	47.0
21:00-22:00 HOUR	51.8	64.7	50.2
22:00-23:00 HOUR	49.5	57.3	48.2
23:00-00:00 HOUR	49.4	58.8	47.4
00:00-01:00 HOUR	47.3	63.0	45.1
01:00-02:00 HOUR	48.1	68.0	44.6
02:00-03:00 HOUR	55.2	81.4	44.5
03:00-04:00 HOUR	53.7	77.3	46.4
04:00-05:00 HOUR	63.1	85.9	45.8
05:00-06:00 HOUR	64.2	89.7	51.0
06:00-07:00 HOUR	63.5	87.8	51.4
L <sub>Aeq</sub> 24 hours		58.7	
L <sub>Adn</sub>		65.6	



TIME*	RESULT dB(A)		
	POAR9-4 : WAT KHOK SAWANG (UTM WGS 84 ZONE 47P 734374E 1727567N)		
	FEBRUARY 24-25, 2023		
	T23AD445-0005		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	63.2	87.9	55.2
08:00-09:00 HOUR	65.3	93.5	56.1
09:00-10:00 HOUR	62.7	86.0	51.9
10:00-11:00 HOUR	57.2	77.1	48.3
11:00-12:00 HOUR	54.9	74.7	46.2
12:00-13:00 HOUR	56.0	74.3	46.0
13:00-14:00 HOUR	51.7	68.2	44.6
14:00-15:00 HOUR	52.6	72.3	44.1
15:00-16:00 HOUR	57.1	74.0	45.9
16:00-17:00 HOUR	56.7	74.9	47.9
17:00-18:00 HOUR	56.4	74.1	48.3
18:00-19:00 HOUR	65.4	82.1	48.7
19:00-20:00 HOUR	57.4	70.5	48.2
20:00-21:00 HOUR	54.0	67.0	48.4
21:00-22:00 HOUR	50.7	64.9	48.1
22:00-23:00 HOUR	49.5	58.9	47.6
23:00-00:00 HOUR	50.5	63.4	48.7
00:00-01:00 HOUR	54.0	66.5	50.9
01:00-02:00 HOUR	58.6	70.8	53.9
02:00-03:00 HOUR	58.4	73.1	52.7
03:00-04:00 HOUR	57.0	70.3	52.8
04:00-05:00 HOUR	55.6	73.2	51.3
05:00-06:00 HOUR	51.4	63.9	48.6
06:00-07:00 HOUR	59.4	84.6	47.1
L <sub>Aeq</sub> 24 hours		58.9	
L <sub>Ain</sub>		63.4	

TIME*	RESULT dB(A)		
	POAR9-4 : WAT KHOK SAWANG (UTM WGS 84 ZONE 47P 734374E 1727567N)		
	FEBRUARY 25-26, 2023		
	T23AD445-0006		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	59.1	80.9	46.1
08:00-09:00 HOUR	67.1	85.9	45.8
09:00-10:00 HOUR	61.4	81.5	53.1
10:00-11:00 HOUR	65.3	87.3	52.4
11:00-12:00 HOUR	59.3	82.9	48.5
12:00-13:00 HOUR	67.4	80.2	56.2
13:00-14:00 HOUR	61.5	79.9	52.9
14:00-15:00 HOUR	59.3	75.7	53.3
15:00-16:00 HOUR	57.8	76.5	52.9
16:00-17:00 HOUR	55.6	79.7	49.6
17:00-18:00 HOUR	65.2	93.9	47.8
18:00-19:00 HOUR	58.0	82.3	42.6
19:00-20:00 HOUR	46.6	64.3	41.5
20:00-21:00 HOUR	49.8	63.3	47.6
21:00-22:00 HOUR	50.7	61.9	49.2
22:00-23:00 HOUR	47.8	61.5	46.5
23:00-00:00 HOUR	49.5	72.0	46.9
00:00-01:00 HOUR	54.7	63.7	53.4
01:00-02:00 HOUR	52.3	64.5	49.5
02:00-03:00 HOUR	50.1	64.7	47.1
03:00-04:00 HOUR	53.7	80.3	44.7
04:00-05:00 HOUR	60.0	84.2	45.2
05:00-06:00 HOUR	64.3	84.9	47.3
06:00-07:00 HOUR	58.3	74.7	48.4
L <sub>Aeq</sub> 24 hours		60.9	
L <sub>Ain</sub>		65.1	

(MR. SILA BANJONGJAIKUK)  
LABORATORY SUPERVISOR

MARCH 3, 2023

### ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecothai.net  
**MEASURING SOURCE** : INSE-AN1 : BAN KHOK PHON PHATTHANA (BAN KHOK AI PHON) (UTM WGS 84 ZONE 47P 734253E 1726330N)  
**MEASURING TYPE** : AMBIENT (NOISE) **RECEIVED DATE** : FEBRUARY 23-26, 2023  
**MEASURING DATE** : FEBRUARY 23-26, 2023 **ANALYTICAL DATE** : FEBRUARY 23-26, 2023  
**MEASURING TIME** : \* **REPORT NO.** : 2023-U015578  
**MEASURING METHOD** : INTEGRATED SOUND LEVEL METER **WORK NO.** : 2022-010431  
**MEASURED BY** : MR CHATCHAWAN LUEANLONG **ANALYSIS NO.** : T23AD445-0007 - T23AD445-0009

TIME*	RESULT dB(A)		
	INSE-AN1 : BAN KHOK PHON PHATTHANA (BAN KHOK AI PHON) (UTM WGS 84 ZONE 47P 734253E 1726330N)		
	FEBRUARY 23-24, 2023		
	T23AD445-0007		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	61.2	77.9	54.0
08:00-09:00 HOUR	61.5	81.9	52.6
09:00-10:00 HOUR	61.4	87.6	52.2
10:00-11:00 HOUR	67.3	95.2	49.6
11:00-12:00 HOUR	59.1	87.1	44.6
12:00-13:00 HOUR	55.4	70.1	47.0
13:00-14:00 HOUR	55.8	78.5	45.9
14:00-15:00 HOUR	64.6	92.2	46.7
15:00-16:00 HOUR	60.1	81.2	47.8
16:00-17:00 HOUR	56.6	72.6	49.1
17:00-18:00 HOUR	55.2	77.7	47.0
18:00-19:00 HOUR	55.9	82.9	46.8
19:00-20:00 HOUR	52.1	73.6	45.2
20:00-21:00 HOUR	59.1	71.2	49.8
21:00-22:00 HOUR	50.6	64.2	48.0
22:00-23:00 HOUR	50.4	66.7	48.1
23:00-00:00 HOUR	50.7	74.0	47.3
00:00-01:00 HOUR	55.8	81.7	47.2
01:00-02:00 HOUR	48.0	63.3	45.5
02:00-03:00 HOUR	48.9	67.7	45.5
03:00-04:00 HOUR	46.9	62.1	44.7
04:00-05:00 HOUR	52.9	68.1	45.7
05:00-06:00 HOUR	67.0	86.0	46.7
06:00-07:00 HOUR	58.1	80.3	47.7
L <sub>Aeq</sub> 24 hours	60.0		
L <sub>A90</sub>	65.4		

TIME*	RESULT dB(A)		
	INSE-AN1 : BAN KHOK PHON PHATTHANA (BAN KHOK AI PHON) (UTM WGS 84 ZONE 47P 734253E 1726330N)		
	FEBRUARY 24-25, 2023		
	T23AD445-0008		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	63.4	83.2	55.5
08:00-09:00 HOUR	64.1	87.3	54.2
09:00-10:00 HOUR	60.8	80.7	52.5
10:00-11:00 HOUR	67.4	93.0	49.9
11:00-12:00 HOUR	57.2	78.4	47.7
12:00-13:00 HOUR	61.1	80.8	51.9
13:00-14:00 HOUR	53.5	74.0	45.6
14:00-15:00 HOUR	56.2	80.1	46.3
15:00-16:00 HOUR	54.5	78.8	45.6
16:00-17:00 HOUR	58.1	74.3	49.6
17:00-18:00 HOUR	55.5	75.1	47.5
18:00-19:00 HOUR	61.3	82.1	47.7
19:00-20:00 HOUR	54.3	76.6	47.7
20:00-21:00 HOUR	55.6	76.6	50.0
21:00-22:00 HOUR	56.6	71.7	50.9
22:00-23:00 HOUR	49.2	69.9	45.9
23:00-00:00 HOUR	54.2	74.4	49.7
00:00-01:00 HOUR	53.1	78.9	50.4
01:00-02:00 HOUR	57.8	68.4	54.3
02:00-03:00 HOUR	58.6	75.7	51.2
03:00-04:00 HOUR	57.2	73.9	52.2
04:00-05:00 HOUR	59.1	84.5	50.6
05:00-06:00 HOUR	66.5	86.7	47.4
06:00-07:00 HOUR	62.0	84.8	53.0
L <sub>Aeq</sub> 24 hours	60.5		
L <sub>A90</sub>	66.6		





TIME*	RESULT dB(A)		
	INSE-AN1 : BAN KHOK PHON PHATTHANA (BAN KHOK AI PHON) (UTM WGS 84 ZONE 47P 734253E 1726330N)		
	FEBRUARY 25-26, 2023		
	T23AD445-0009		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	63.2	87.9	55.2
08:00-09:00 HOUR	65.3	93.5	56.1
09:00-10:00 HOUR	62.7	86.0	51.9
10:00-11:00 HOUR	60.9	81.8	53.2
11:00-12:00 HOUR	61.2	83.7	54.2
12:00-13:00 HOUR	60.9	85.3	51.3
13:00-14:00 HOUR	63.7	84.2	50.3
14:00-15:00 HOUR	65.4	85.8	54.4
15:00-16:00 HOUR	56.8	77.0	51.1
16:00-17:00 HOUR	55.8	74.9	49.7
17:00-18:00 HOUR	55.0	71.6	47.9
18:00-19:00 HOUR	62.2	86.8	46.2
19:00-20:00 HOUR	44.4	59.5	41.7
20:00-21:00 HOUR	49.9	67.6	47.7
21:00-22:00 HOUR	51.2	66.4	47.9
22:00-23:00 HOUR	50.1	62.3	47.3
23:00-00:00 HOUR	47.3	65.0	46.0
00:00-01:00 HOUR	54.8	78.1	49.2
01:00-02:00 HOUR	52.9	73.7	48.3
02:00-03:00 HOUR	52.6	59.2	50.8
03:00-04:00 HOUR	50.6	61.9	47.7
04:00-05:00 HOUR	57.9	85.9	47.8
05:00-06:00 HOUR	60.6	83.1	47.7
06:00-07:00 HOUR	55.3	72.6	49.3
L <sub>Aeq</sub> 24 hours		59.8	
L <sub>Adn</sub>		63.2	

*Sila Banjongjairuk*  
(MR. SILA BANJONGJAIRUK)  
LABORATORY SUPERVISOR

MARCH 3, 2023

## ANALYSIS REPORT

<b>CUSTOMER NAME</b>	: ECO ORIENT RESOURCES (THAILAND) LTD.
<b>ADDRESS</b>	: 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900
<b>CONTACT INFORMATION</b>	: TEL : 0 2937 1124-9 e-mail : anucha@ecohtai.net
<b>MEASURING SOURCE</b>	: INSE-AN2 : BAN BO RANG SCHOOL (UTM WGS 84 ZONE 47P 733746E 1725787N)
<b>MEASURING TYPE</b>	: AMBIENT (NOISE)
<b>MEASURING DATE</b>	: FEBRUARY 23-26, 2023
<b>MEASURING TIME</b>	: *
<b>MEASURING METHOD</b>	: INTEGRATED SOUND LEVEL METER
<b>MEASURED BY</b>	: MR CHATCHAWAN LUEANLONG
<b>RECEIVED DATE</b>	: FEBRUARY 23-26, 2023
<b>ANALYTICAL DATE</b>	: FEBRUARY 23-26, 2023
<b>REPORT NO.</b>	: 2023-U015579
<b>WORK NO.</b>	: 2022-010431
<b>ANALYSIS NO.</b>	: T23AD445-0010 - T23AD445-0012

TIME*	RESULT dB(A)		
	INSE-AN2 : BAN BO RANG SCHOOL (UTM WGS 84 ZONE 47P 733746E 1725787N)		
	FEBRUARY 23-24, 2023		
	T23AD445-0010		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	53.2	68.6	46.9
08:00-09:00 HOUR	54.7	68.3	47.5
09:00-10:00 HOUR	53.5	64.2	47.1
10:00-11:00 HOUR	53.6	72.5	46.7
11:00-12:00 HOUR	53.0	69.5	44.9
12:00-13:00 HOUR	53.8	74.6	46.5
13:00-14:00 HOUR	55.1	70.5	46.5
14:00-15:00 HOUR	55.4	73.5	46.6
15:00-16:00 HOUR	62.1	75.8	54.0
16:00-17:00 HOUR	52.4	70.1	45.5
17:00-18:00 HOUR	56.1	86.6	45.2
18:00-19:00 HOUR	56.3	74.3	45.8
19:00-20:00 HOUR	53.5	76.9	49.1
20:00-21:00 HOUR	55.5	71.9	51.6
21:00-22:00 HOUR	53.7	65.0	52.1
22:00-23:00 HOUR	55.2	71.4	49.7
23:00-00:00 HOUR	52.6	57.3	49.1
00:00-01:00 HOUR	52.4	74.3	47.5
01:00-02:00 HOUR	49.2	66.5	46.5
02:00-03:00 HOUR	47.3	62.4	43.8
03:00-04:00 HOUR	46.8	62.9	42.0
04:00-05:00 HOUR	49.2	66.2	43.2
05:00-06:00 HOUR	59.1	68.5	51.3
06:00-07:00 HOUR	55.1	70.7	47.4
L <sub>Aeq</sub> 24 hours		55.0	
L <sub>Adn</sub>		60.4	



TIME*	RESULT dB(A)		
	INSE-AN2 : BAN BO RANG SCHOOL (UTM WGS 84 ZONE 47P 733746E 1725787N)		
	FEBRUARY 24-25, 2023		
	T23AD445-0011		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	58.0	70.2	51.1
08:00-09:00 HOUR	55.1	72.2	48.6
09:00-10:00 HOUR	51.7	71.0	45.5
10:00-11:00 HOUR	55.6	79.3	46.5
11:00-12:00 HOUR	53.6	69.8	45.1
12:00-13:00 HOUR	56.0	74.6	45.8
13:00-14:00 HOUR	52.9	66.4	46.2
14:00-15:00 HOUR	50.8	63.3	44.8
15:00-16:00 HOUR	57.3	80.3	47.4
16:00-17:00 HOUR	55.2	74.7	45.7
17:00-18:00 HOUR	54.8	70.3	48.2
18:00-19:00 HOUR	53.6	69.2	44.4
19:00-20:00 HOUR	52.4	67.7	49.1
20:00-21:00 HOUR	55.1	68.6	51.6
21:00-22:00 HOUR	55.7	69.2	51.0
22:00-23:00 HOUR	51.5	66.7	48.5
23:00-00:00 HOUR	49.6	63.8	46.6
00:00-01:00 HOUR	54.9	72.4	44.4
01:00-02:00 HOUR	53.3	74.9	44.6
02:00-03:00 HOUR	49.9	65.5	43.7
03:00-04:00 HOUR	48.2	63.4	42.9
04:00-05:00 HOUR	45.9	62.2	41.2
05:00-06:00 HOUR	56.9	67.0	47.0
06:00-07:00 HOUR	60.5	75.2	49.6
L <sub>Aeq</sub> 24 hours		54.8	
L <sub>A<sub>dn</sub></sub>		61.0	

TIME*	RESULT dB(A)		
	INSE-AN2 : BAN BO RANG SCHOOL (UTM WGS 84 ZONE 47P 733746E 1725787N)		
	FEBRUARY 25-26, 2023		
	T23AD445-0012		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	56.8	74.4	47.9
08:00-09:00 HOUR	54.9	70.6	47.4
09:00-10:00 HOUR	55.0	77.3	47.6
10:00-11:00 HOUR	55.0	75.8	46.1
11:00-12:00 HOUR	52.7	71.8	45.0
12:00-13:00 HOUR	55.0	70.6	46.5
13:00-14:00 HOUR	52.3	74.0	45.7
14:00-15:00 HOUR	53.3	66.5	46.9
15:00-16:00 HOUR	54.7	71.3	47.0
16:00-17:00 HOUR	54.4	69.0	47.7
17:00-18:00 HOUR	55.8	71.1	48.1
18:00-19:00 HOUR	51.7	76.0	44.5
19:00-20:00 HOUR	51.8	64.9	47.4
20:00-21:00 HOUR	51.0	65.8	46.7
21:00-22:00 HOUR	54.7	68.9	52.1
22:00-23:00 HOUR	54.1	65.2	52.1
23:00-00:00 HOUR	49.2	71.7	45.0
00:00-01:00 HOUR	48.9	73.4	42.4
01:00-02:00 HOUR	48.9	64.9	43.4
02:00-03:00 HOUR	51.7	68.6	43.0
03:00-04:00 HOUR	52.9	74.9	41.3
04:00-05:00 HOUR	47.1	63.5	42.0
05:00-06:00 HOUR	56.1	73.8	46.0
06:00-07:00 HOUR	58.6	70.4	49.6
L <sub>Aeq</sub> 24 hours		54.0	
L <sub>A<sub>dn</sub></sub>		60.0	

## ระยะดำเนินการผลิต

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### ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecothai.net  
**SAMPLING SOURCE** : POAR9-1 : BAN BO RANG (UTM WGS 84 ZONE 47P 734055E 1724685N)  
**SAMPLE TYPE** : AMBIENT **RECEIVED DATE** : MARCH 24, 2023  
**SAMPLING DATE** : \*, \*\*, \*\*\* **ANALYTICAL DATE** : MARCH 24-30, 2023  
**SAMPLING TIME** : \*, \*\*, \*\*\* **REPORT NO.** : 2023-U026020  
**SAMPLING BY** : MR SAKSITHON NUMNIM **WORK NO.** : 2023-001910  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT **ANALYSIS NO.** : T23AF333-0001 - T23AF333-0003

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT			REGULATORY STANDARD
			POAR9-1 BAN BO RANG			
			*	**	***	
			T23AF333-0001	T23AF333-0002	T23AF333-0003	
TOTAL SUSPENDED PARTICULATE	mg/m³	GRAVIMETRIC (HIGH VOLUME METHOD)	0.159	0.080	0.102	≤ 0.33
PARTICULATE MATTER (≤ 10 µm)	mg/m³	GRAVIMETRIC (HIGH VOLUME METHOD)	0.078	0.045	0.039	≤ 0.12
SAMPLE CONDITION			COMPLETE	COMPLETE	COMPLETE	

#### REMARK

TSP, PM10 : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.  
 TSP : US EPA, CODE OF FEDERAL REGULATIONS, 40 CFR CHAPTER I-PART 50 APPENDIX B, REFERENCE METHOD FOR THE DETERMINATION OF SUSPENDED PARTICULATE MATTER IN THE ATMOSPHERE (HIGH-VOLUME METHOD) REVISED AS OF JULY 1, 2021.  
 PM10 : US EPA, CODE OF FEDERAL REGULATIONS, 40 CFR CHAPTER I-PART 50 APPENDIX J, REFERENCE METHOD FOR THE DETERMINATION OF PARTICULATE MATTER AS PM10 IN THE ATMOSPHERE (HIGH-VOLUME METHOD) REVISED AS OF JULY 1, 2021.  
 REGULATORY STANDARD(TSP, PM10) : ANNOUNCEMENT OF THE NATIONAL ENVIRONMENT BOARD BOARD NO.24, B.E.2547 (2004) ON THE SPECIFICATION OF AMBIENT AIR QUALITY STANDARDS, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL. 121, PART 104 D, DATED SEPTEMBER 22, 2004.  
 \* : SAMPLING FROM 09:30 HOUR ON MARCH 19, 2023 TO 09:30 HOUR ON MARCH 20, 2023.  
 \*\* : SAMPLING FROM 09:30 HOUR ON MARCH 20, 2023 TO 09:30 HOUR ON MARCH 21, 2023.  
 \*\*\* : SAMPLING FROM 09:30 HOUR ON MARCH 21, 2023 TO 09:30 HOUR ON MARCH 22, 2023.

*Budsakorn ✓*  
 (MISS BUDSAKORN LERDPANUMAS)  
 LABORATORY SUPERVISOR

APRIL 12, 2023



### ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecothai.net  
**SAMPLING SOURCE** : POAR9-2 : BAN KHLONG MUANG MEDITATION (UTM WGS 84 ZONE 47P 734247E 1722875N)  
**SAMPLE TYPE** : AMBIENT **RECEIVED DATE** : MARCH 24, 2023  
**SAMPLING DATE** : \*, \*\*, \*\*\* **ANALYTICAL DATE** : MARCH 24-30, 2023  
**SAMPLING TIME** : \*, \*\*, \*\*\* **REPORT NO.** : 2023-U026022  
**SAMPLING BY** : MR SAKSITHON NUMNIM **WORK NO.** : 2023-001910  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT **ANALYSIS NO.** : T23AF333-0004 - T23AF333-0006

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT			REGULATORY STANDARD
			POAR-9-2 BAN KHLONG MUANG MEDITATION			
			* T23AF333-0004	** T23AF333-0005	*** T23AF333-0006	
TOTAL SUSPENDED PARTICULATE	mg/m³	GRAV/METRIC (HIGH VOLUME METHOD)	0.115	0.098	0.090	≤ 0.33
PARTICULATE MATTER (≤ 10 µm)	mg/m³	GRAV/METRIC (HIGH VOLUME METHOD)	0.059	0.051	0.046	≤ 0.12
SAMPLE CONDITION			COMPLETE	COMPLETE	COMPLETE	

#### REMARK

TSP, PM10 : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.  
 TSP : US EPA, CODE OF FEDERAL REGULATIONS, 40 CFR CHAPTER I-PART 50 APPENDIX B, REFERENCE METHOD FOR THE DETERMINATION OF SUSPENDED PARTICULATE MATTER IN THE ATMOSPHERE (HIGH-VOLUME METHOD) REVISED AS OF JULY 1, 2021.  
 PM10 : US EPA, CODE OF FEDERAL REGULATIONS, 40 CFR CHAPTER I-PART 50 APPENDIX J, REFERENCE METHOD FOR THE DETERMINATION OF PARTICULATE MATTER AS PM10 IN THE ATMOSPHERE (HIGH-VOLUME METHOD) REVISED AS OF JULY 1, 2021.  
 REGULATORY STANDARD(TSP, PM10) : ANNOUNCEMENT OF THE NATIONAL ENVIRONMENT BOARD BOARD NO.24, B.E.2547 (2004) ON THE SPECIFICATION OF AMBIENT AIR QUALITY STANDARDS, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL. 121, PART 104 D, DATED SEPTEMBER 22, 2004.  
 \* : SAMPLING FROM 10:00 HOUR ON MARCH 19, 2023 TO 10:00 HOUR ON MARCH 20, 2023.  
 \*\* : SAMPLING FROM 10:00 HOUR ON MARCH 20, 2023 TO 10:00 HOUR ON MARCH 21, 2023.  
 \*\*\* : SAMPLING FROM 10:00 HOUR ON MARCH 21, 2023 TO 10:00 HOUR ON MARCH 22, 2023.

*Budsakorn ✓*  
 (MISS BUDSAKORN LERDPANUMAS)  
 LABORATORY SUPERVISOR

APRIL 12, 2023



## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@eco-thai.net  
**SAMPLING SOURCE** : POAR9-5 SOMPOTCHKRUNSONGROIPPEE TEMPLE (UTM WGS 84 ZONE 47P 736112E 1720075N)  
**SAMPLE TYPE** : AMBIENT  
**SAMPLING DATE** : \*, \*\*, \*\*\*  
**SAMPLING TIME** : \*, \*\*, \*\*\*  
**SAMPLING BY** : MR SAKSITHON NUMNIM  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : MARCH 24, 2023  
**ANALYTICAL DATE** : MARCH 24-30, 2023  
**REPORT NO.** : 2023-U026026  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF333-0010 - T23AF333-0012

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT			REGULATORY STANDARD
			POAR9-5 SOMPOTCHKRUNSONGROIPPEE TEMPLE			
			* T23AF333-0010	** T23AF333-0011	*** T23AF333-0012	
TOTAL SUSPENDED PARTICULATE	mg/m³	GRAVIMETRIC (HIGH VOLUME METHOD)	0.094	0.093	0.058	≤ 0.33
PARTICULATE MATTER (≤ 10 µm)	mg/m³	GRAVIMETRIC (HIGH VOLUME METHOD)	0.056	0.072	0.040	≤ 0.12
SAMPLE CONDITION			COMPLETE	COMPLETE	COMPLETE	

### REMARK

TSP, PM10 : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.  
 TSP : US EPA, CODE OF FEDERAL REGULATIONS, 40 CFR CHAPTER I-PART 50 APPENDIX B, REFERENCE METHOD FOR THE DETERMINATION OF SUSPENDED PARTICULATE MATTER IN THE ATMOSPHERE (HIGH-VOLUME METHOD) REVISED AS OF JULY 1, 2021.  
 PM10 : US EPA, CODE OF FEDERAL REGULATIONS, 40 CFR CHAPTER I-PART 50 APPENDIX J, REFERENCE METHOD FOR THE DETERMINATION OF PARTICULATE MATTER AS PM10 IN THE ATMOSPHERE (HIGH-VOLUME METHOD) REVISED AS OF JULY 1, 2021.  
 REGULATORY STANDARD(TSP, PM10) : ANNOUNCEMENT OF THE NATIONAL ENVIRONMENT BOARD BOARD NO.24, B.E.2547 (2004) ON THE SPECIFICATION OF AMBIENT AIR QUALITY STANDARDS, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL 121, PART 104 D, DATED SEPTEMBER 22, 2004.  
 \* : SAMPLING FROM 10:30 HOUR ON MARCH 19, 2023 TO 10:30 HOUR ON MARCH 20, 2023.  
 \*\* : SAMPLING FROM 10:30 HOUR ON MARCH 20, 2023 TO 10:30 HOUR ON MARCH 21, 2023.  
 \*\*\* : SAMPLING FROM 10:30 HOUR ON MARCH 21, 2023 TO 10:30 HOUR ON MARCH 22, 2023.

*Budsakorn ✓*  
 (MISS BUDSAKORN LERDPANUMAS)  
 LABORATORY SUPERVISOR

APRIL 12, 2023



## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@eco-thai.net  
**SAMPLING SOURCE** : INSE-AN1 : BAN KHOK PHON PHATTHANA (UTM WGS 84 ZONE 47P 734227E 1726326N)  
**SAMPLE TYPE** : AMBIENT  
**SAMPLING DATE** : \*, \*\*, \*\*\*  
**SAMPLING TIME** : \*, \*\*, \*\*\*  
**SAMPLING BY** : MR SAKSITHON NUMNIM  
**ANALYZED BY** : MISS JETJARIN TUMSA-AT

**RECEIVED DATE** : MARCH 24, 2023  
**ANALYTICAL DATE** : MARCH 24-30, 2023  
**REPORT NO.** : 2023-U026024  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF333-0007 - T23AF333-0009

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT			REGULATORY STANDARD
			INSE-AN1 BAN KHOK PHON PHATTHANA			
			*	**	***	
			T23AF333-0007	T23AF333-0008	T23AF333-0009	
TOTAL SUSPENDED PARTICULATE	mg/m <sup>3</sup>	GRAVIMETRIC (HIGH VOLUME METHOD)	0.094	0.101	0.083	≤ 0.33
PARTICULATE MATTER (≤ 10 µm)	mg/m <sup>3</sup>	GRAVIMETRIC (HIGH VOLUME METHOD)	0.081	0.052	0.055	≤ 0.12
SAMPLE CONDITION			COMPLETE	COMPLETE	COMPLETE	

### REMARK

TSP, PM10 : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.  
 TSP : US EPA, CODE OF FEDERAL REGULATIONS, 40 CFR CHAPTER I-PART 50 APPENDIX B, REFERENCE METHOD FOR THE DETERMINATION OF SUSPENDED PARTICULATE MATTER IN THE ATMOSPHERE (HIGH-VOLUME METHOD) REVISED AS OF JULY 1, 2021.  
 PM10 : US EPA, CODE OF FEDERAL REGULATIONS, 40 CFR CHAPTER I-PART 50 APPENDIX J, REFERENCE METHOD FOR THE DETERMINATION OF PARTICULATE MATTER AS PM10 IN THE ATMOSPHERE (HIGH-VOLUME METHOD) REVISED AS OF JULY 1, 2021.  
 REGULATORY STANDARD(TSP, PM10) : ANNOUNCEMENT OF THE NATIONAL ENVIRONMENT BOARD BOARD NO.24, B.E.2547 (2004) ON THE SPECIFICATION OF AMBIENT AIR QUALITY STANDARDS, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL 121, PART 104 D, DATED SEPTEMBER 22, 2004.  
 \* : SAMPLING FROM 09:00 HOUR ON MARCH 19, 2023 TO 09:00 HOUR ON MARCH 20, 2023.  
 \*\* : SAMPLING FROM 09:00 HOUR ON MARCH 20, 2023 TO 09:00 HOUR ON MARCH 21, 2023.  
 \*\*\* : SAMPLING FROM 09:00 HOUR ON MARCH 21, 2023 TO 09:00 HOUR ON MARCH 22, 2023.

*Budsakorn ✓*  
 (MISS BUDSAKORN LERDPANUMAS)  
 LABORATORY SUPERVISOR

APRIL 12, 2023






## ANALYSIS REPORT

CUSTOMER NAME : ECO ORIENT RESOURCES (THAILAND) LTD.  
ADDRESS : 555 RASA TOWER II, 12th FLOOR, UNIT 1203, PHAHOLYOTHIN ROAD, CHATUCHAK, BANGKOK 10900.  
CONTACT INFORMATION : TEL : 0 2937 1124-9 e-mail : anucha@ecohtai.net  
MEASURING PLACE : POAR9-2:BAN KHLONG MUANG MEDITATION 47P 734247,1722875  
MEASURING TYPE : AMBIENT (AIR) RECEIVED DATE : MARCH 19-22, 2023  
MEASURING DATE : MARCH 19-22, 2023 ANALYTICAL DATE : MARCH 19-22, 2023  
MEASURING TIME : \* REPORT NO. : 2022-U022975  
MEASURING METHOD : NON-DISPERSIVE INFRARED DETECTION WORK NO. : 2023-001910  
MEASURED BY : MR SAKSITHON NUMNIM ANALYSIS NO. : T23AF333-0004 - T22AF333-0006

TIME*	RESULT		
	CARBON MONOXIDE		
	POAR9-2:BAN KHLONG MUANG MEDITATION 47P 734247,1722875		
	MARCH 19 - 20, 2023 T23AF333-0004	MARCH 20 - 21, 2023 T23AF333-0005	MARCH 21 - 22, 2023 T23AF333-0006
08:00-16:00 HOUR	2.52	2.67	2.41
16:00-00:00 HOUR	2.50	2.64	2.42
00:00-08:00 HOUR	2.43	2.46	2.72
UNIT	ppm		


  
(MR SILA BANJONGJAIRUK)  
LABORATORY SUPERVISOR  
MARCH 31, 2023

\* DO NOT COPY PARTIAL OF THIS ANALYSIS REPORT WITHOUT OFFICIAL APPROVAL.  
\* REPORTED ANALYSIS REFERS TO SUBMITTED SAMPLE ONLY.

## ANALYSIS REPORT

CUSTOMER NAME : ECO ORIENT RESOURCES (THAILAND) LTD.  
ADDRESS : 555 RASA TOWER II, 12th FLOOR, UNIT 1203, PHAHOLYOTHIN ROAD, CHATUCHAK, BANGKOK 10900.  
CONTACT INFORMATION : TEL : 0 2937 1124-9 e-mail : anucha@ecohtai.net  
MEASURING PLACE : POAR9-5:SOMPOTCHKRUNSONGROIPEE TEMPLE 47P 736112,1720075  
MEASURING TYPE : AMBIENT (AIR) RECEIVED DATE : MARCH 19-22, 2023  
MEASURING DATE : MARCH 19-22, 2023 ANALYTICAL DATE : MARCH 19-22, 2023  
MEASURING TIME : \* REPORT NO. : 2022-U022977  
MEASURING METHOD : NON-DISPERSIVE INFRARED DETECTION WORK NO. : 2023-001910  
MEASURED BY : MR SAKSITHON NUMNIM ANALYSIS NO. : T23AF333-0010 - T23AF333-0012

TIME*	RESULT		
	CARBON MONOXIDE		
	POAR9-5:SOMPOTCHKRUNSONGROIPEE TEMPLE 47P 736112,1720075		
	MARCH 19 - 20, 2023 T23AF333-0010	MARCH 20 - 21, 2023 T23AF333-0011	MARCH 21 - 22, 2023 T23AF333-0012
08:00-16:00 HOUR	2.20	2.34	2.22
16:00-00:00 HOUR	2.28	2.02	2.19
00:00-08:00 HOUR	2.25	2.18	2.22
UNIT	ppm		


  
(MR SILA BANJONGJAIRUK)  
LABORATORY SUPERVISOR  
MARCH 31, 2023

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## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12th FLOOR, UNIT 1203, PHAHOLYOTHIN ROAD, CHATUCHAK, BANGKOK 10900.  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecohtai.net  
**MEASURING PLACE** : POAR9-1:BAN BO RANG 47P 734055,1724685  
**MEASURING TYPE** : AMBIENT (AIR) **RECEIVED DATE** : MARCH 19-22, 2023  
**MEASURING DATE** : MARCH 19-22, 2023 **ANALYTICAL DATE** : MARCH 19-22, 2023  
**MEASURING TIME** : \* **REPORT NO.** : 2023-U022974  
**MEASURING METHOD** : NON-DISPERSIVE INFRARED DETECTION **WORK NO.** : 2023-001910  
**MEASURED BY** : MR SAKSITHON NUMNIM **ANALYSIS NO.** : T23AF333-0001 - T22AF333-0003

TIME*	RESULT		
	CARBON MONOXIDE		
	POAR9-1:BAN BO RANG 47P 734055,1724685		
	MARCH 19 - 20, 2023 T23AF333-0001	MARCH 20 - 21, 2023 T23AF333-0002	MARCH 21 - 22, 2023 T23AF333-0003
08:00-16:00 HOUR	2.57	2.59	2.63
16:00-00:00 HOUR	2.43	2.80	2.73
00:00-08:00 HOUR	2.86	2.70	2.63
UNIT	ppm		


  
(MR SILA BANJONGJAIRUK)  
LABORATORY SUPERVISOR  
MARCH 31, 2023

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\* REPORTED ANALYSIS REFERS TO SUBMITTED SAMPLE ONLY.

## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12th FLOOR, UNIT 1203, PHAHOLYOTHIN ROAD, CHATUCHAK, BANGKOK 10900.  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecohtai.net  
**MEASURING PLACE** : INSE-AN1:BAN KHOK PHON PHATTANA (BAN KHOK AI PHON) 47P 734227,1726326  
**MEASURING TYPE** : AMBIENT (AIR) **RECEIVED DATE** : MARCH 19-22, 2023  
**MEASURING DATE** : MARCH 19-22, 2023 **ANALYTICAL DATE** : MARCH 19-22, 2023  
**MEASURING TIME** : \* **REPORT NO.** : 2022-U022976  
**MEASURING METHOD** : NON-DISPERSIVE INFRARED DETECTION **WORK NO.** : 2023-001910  
**MEASURED BY** : MR SAKSITHON NUMNIM **ANALYSIS NO.** : T23AF333-0007 - T22AF333-0009

TIME*	RESULT		
	CARBON MONOXIDE		
	INSE-AN1:BAN KHOK PHON PHATTANA (BAN KHOK AI PHON) 47P 734227,1726326		
	MARCH 19 - 20, 2023 T23AF333-0007	MARCH 20 - 21, 2023 T23AF333-0008	MARCH 21 - 22, 2023 T23AF333-0009
08:00-16:00 HOUR	2.65	2.58	2.35
16:00-00:00 HOUR	2.62	2.53	2.40
00:00-08:00 HOUR	2.15	2.19	2.28
UNIT	ppm		

  
(MR SILA BANJONGJAIRUK)  
LABORATORY SUPERVISOR  
MARCH 31, 2023

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\* REPORTED ANALYSIS REFERS TO SUBMITTED SAMPLE ONLY.



## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@eco-thai.net  
**MEASURING PLACE** : POAR9-2 : BAN KHLONG MUANG MEDITATION 47P 734247,1722875  
**MEASURING TYPE** : AMBIENT (AIR) **RECEIVED DATE** : MARCH 19-22, 2023  
**MEASURING DATE** : MARCH 19-22, 2023 **ANALYTICAL DATE** : MARCH 19-22, 2023  
**MEASURING TIME** : \* **REPORT NO.** : 2023-U022967  
**MEASURING METHOD** : CHEMILUMINESCENCE **WORK NO.** : 2023-001910  
**MEASURED BY** : MR SAKSITHON NUMNIM **ANALYSIS NO.** : T23AF333-0004 - T23AF333-0006

TIME *	RESULT (ppm)		
	NITROGEN DIOXIDE		
	POAR9-2: BAN KHLONG MUANG MEDITATION 47P 734247,1722875		
	MARCH 19 - 20, 2023 T23AF333-0004	MARCH 20 - 21, 2023 T23AF333-0005	MARCH 21 - 22, 2023 T23AF333-0006
08:00-09:00 HOUR	0.0159	0.0165	0.0152
09:00-10:00 HOUR	0.0156	0.0176	0.0147
10:00-11:00 HOUR	0.0149	0.0191	0.0163
11:00-12:00 HOUR	0.0139	0.0149	0.0158
12:00-13:00 HOUR	0.0157	0.0150	0.0173
13:00-14:00 HOUR	0.0166	0.0165	0.0185
14:00-15:00 HOUR	0.0174	0.0178	0.0185
15:00-16:00 HOUR	0.0166	0.0185	0.0186
16:00-17:00 HOUR	0.0150	0.0203	0.0189
17:00-18:00 HOUR	0.0168	0.0187	0.0187
18:00-19:00 HOUR	0.0176	0.0193	0.0187
19:00-20:00 HOUR	0.0172	0.0187	0.0179
20:00-21:00 HOUR	0.0168	0.0182	0.0168
21:00-22:00 HOUR	0.0169	0.0171	0.0160
22:00-23:00 HOUR	0.0132	0.0177	0.0158
23:00-00:00 HOUR	0.0113	0.0151	0.0152
00:00-01:00 HOUR	0.0104	0.0170	0.0160
01:00-02:00 HOUR	0.0141	0.0160	0.0148
02:00-03:00 HOUR	0.0136	0.0149	0.0148
03:00-04:00 HOUR	0.0149	0.0133	0.0138
04:00-05:00 HOUR	0.0144	0.0146	0.0113
05:00-06:00 HOUR	0.0113	0.0128	0.0117
06:00-07:00 HOUR	0.0131	0.0149	0.0146
07:00-08:00 HOUR	0.0151	0.0152	0.0151



(MR. SILA BANJONGJAIKUK)  
LABORATORY SUPERVISOR

MARCH 30, 2023



## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@eco-thai.net  
**MEASURING PLACE** : POAR9-5 : SOMPOTCHKRUNSONGROIPREE TEMPLE 47P 736112,1720075  
**MEASURING TYPE** : AMBIENT (AIR) **RECEIVED DATE** : MARCH 19-22, 2023  
**MEASURING DATE** : MARCH 19-22, 2023 **ANALYTICAL DATE** : MARCH 19-22, 2023  
**MEASURING TIME** : \* **REPORT NO.** : 2023-U022969  
**MEASURING METHOD** : CHEMILUMINESCENCE **WORK NO.** : 2023-001910  
**MEASURED BY** : MR SAKSITHON NUMNIM **ANALYSIS NO.** : T23AF333-0010 - T23AF333-0012

TIME *	RESULT (ppm)		
	NITROGEN DIOXIDE		
	POAR9-5: SOMPOTCHKRUNSONGROIPREE TEMPLE 47P 736112,1720075		
	MARCH 19 - 20, 2023 T23AF333-0010	MARCH 20 - 21, 2023 T23AF333-0011	MARCH 21 - 22, 2023 T23AF333-0012
08:00-09:00 HOUR	0.0198	0.0209	0.0212
09:00-10:00 HOUR	0.0191	0.0158	0.0190
10:00-11:00 HOUR	0.0178	0.0199	0.0205
11:00-12:00 HOUR	0.0182	0.0192	0.0212
12:00-13:00 HOUR	0.0183	0.0197	0.0153
13:00-14:00 HOUR	0.0185	0.0150	0.0191
14:00-15:00 HOUR	0.0197	0.0168	0.0187
15:00-16:00 HOUR	0.0170	0.0167	0.0186
16:00-17:00 HOUR	0.0158	0.0182	0.0136
17:00-18:00 HOUR	0.0158	0.0181	0.0154
18:00-19:00 HOUR	0.0154	0.0142	0.0146
19:00-20:00 HOUR	0.0150	0.0141	0.0167
20:00-21:00 HOUR	0.0151	0.0149	0.0176
21:00-22:00 HOUR	0.0161	0.0156	0.0124
22:00-23:00 HOUR	0.0147	0.0155	0.0140
23:00-00:00 HOUR	0.0136	0.0170	0.0163
00:00-01:00 HOUR	0.0169	0.0177	0.0169
01:00-02:00 HOUR	0.0168	0.0177	0.0173
02:00-03:00 HOUR	0.0167	0.0124	0.0188
03:00-04:00 HOUR	0.0148	0.0174	0.0193
04:00-05:00 HOUR	0.0174	0.0196	0.0202
05:00-06:00 HOUR	0.0168	0.0203	0.0180
06:00-07:00 HOUR	0.0181	0.0168	0.0179
07:00-08:00 HOUR	0.0190	0.0215	0.0160



(MR. SILA BANJONGJAIKUK)  
LABORATORY SUPERVISOR

MARCH 30, 2023



## ANALYSIS REPORT

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**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@eco-thai.net  
**MEASURING PLACE** : POAR9-1 : BAN BO RANG 47P 734055,1724685  
**MEASURING TYPE** : AMBIENT (AIR)  
**MEASURING DATE** : MARCH 19-22, 2023  
**MEASURING TIME** : \*  
**MEASURING METHOD** : CHEMILUMINESCENCE  
**MEASURED BY** : MR. SAKSITHON NUMNIM

**RECEIVED DATE** : MARCH 19-22, 2023  
**ANALYTICAL DATE** : MARCH 19-22, 2023  
**REPORT NO.** : 2023-U022966  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF333-0001 - T23AF333-0003

TIME *	RESULT (ppm)		
	NITROGEN DIOXIDE		
	POAR9-1 : BAN BO RANG 47P 734055,1724685		
	MARCH 19 - 20, 2023 T23AF333-0001	MARCH 20 - 21, 2023 T23AF333-0002	MARCH 21 - 22, 2023 T23AF333-0003
08:00-09:00 HOUR	0.0146	0.0109	0.0091
09:00-10:00 HOUR	0.0132	0.0104	0.0091
10:00-11:00 HOUR	0.0133	0.0095	0.0094
11:00-12:00 HOUR	0.0122	0.0106	0.0094
12:00-13:00 HOUR	0.0126	0.0112	0.0129
13:00-14:00 HOUR	0.0122	0.0124	0.0163
14:00-15:00 HOUR	0.0127	0.0132	0.0206
15:00-16:00 HOUR	0.0124	0.0137	0.0209
16:00-17:00 HOUR	0.0125	0.0138	0.0207
17:00-18:00 HOUR	0.0118	0.0144	0.0208
18:00-19:00 HOUR	0.0109	0.0149	0.0207
19:00-20:00 HOUR	0.0097	0.0157	0.0196
20:00-21:00 HOUR	0.0099	0.0159	0.0183
21:00-22:00 HOUR	0.0107	0.0156	0.0164
22:00-23:00 HOUR	0.0135	0.0150	0.0146
23:00-00:00 HOUR	0.0151	0.0138	0.0138
00:00-01:00 HOUR	0.0163	0.0126	0.0127
01:00-02:00 HOUR	0.0175	0.0108	0.0122
02:00-03:00 HOUR	0.0173	0.0097	0.0115
03:00-04:00 HOUR	0.0187	0.0096	0.0114
04:00-05:00 HOUR	0.0171	0.0101	0.0121
05:00-06:00 HOUR	0.0152	0.0108	0.0129
06:00-07:00 HOUR	0.0125	0.0107	0.0145
07:00-08:00 HOUR	0.0117	0.0099	0.0163

*Sila Banjongjairuk*

(MR. SILA BANJONGJAIRUK)  
LABORATORY SUPERVISOR

MARCH 30, 2023



## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@eco-thai.net  
**MEASURING PLACE** : INSE-AN1 : BAN KHOK PHON PHATTTHANA (BAN KHOK AI PHON) 47P 734227,1726326  
**MEASURING TYPE** : AMBIENT (AIR)  
**MEASURING DATE** : MARCH 19-22, 2023  
**MEASURING TIME** : \*  
**MEASURING METHOD** : CHEMILUMINESCENCE  
**MEASURED BY** : MR. SAKSITHON NUMNIM

**RECEIVED DATE** : MARCH 19-22, 2023  
**ANALYTICAL DATE** : MARCH 19-22, 2023  
**REPORT NO.** : 2023-U022968  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF333-0007 - T23AF333-0009

TIME *	RESULT (ppm)		
	NITROGEN DIOXIDE		
	INSE-AN1 : BAN KHOK PHON PHATTTHANA (BAN KHOK AI PHON) 47P 734227,1726326		
	MARCH 19 - 20, 2023 T23AF333-0007	MARCH 20 - 21, 2023 T23AF333-0008	MARCH 21 - 22, 2023 T23AF333-0009
08:00-09:00 HOUR	0.0194	0.0198	0.0204
09:00-10:00 HOUR	0.0193	0.0200	0.0232
10:00-11:00 HOUR	0.0209	0.0208	0.0201
11:00-12:00 HOUR	0.0210	0.0217	0.0217
12:00-13:00 HOUR	0.0207	0.0209	0.0215
13:00-14:00 HOUR	0.0205	0.0181	0.0204
14:00-15:00 HOUR	0.0200	0.0161	0.0190
15:00-16:00 HOUR	0.0199	0.0138	0.0170
16:00-17:00 HOUR	0.0183	0.0156	0.0156
17:00-18:00 HOUR	0.0184	0.0125	0.0130
18:00-19:00 HOUR	0.0154	0.0143	0.0141
19:00-20:00 HOUR	0.0146	0.0151	0.0119
20:00-21:00 HOUR	0.0170	0.0126	0.0119
21:00-22:00 HOUR	0.0116	0.0143	0.0126
22:00-23:00 HOUR	0.0146	0.0163	0.0144
23:00-00:00 HOUR	0.0121	0.0173	0.0160
00:00-01:00 HOUR	0.0149	0.0190	0.0167
01:00-02:00 HOUR	0.0128	0.0201	0.0178
02:00-03:00 HOUR	0.0162	0.0208	0.0190
03:00-04:00 HOUR	0.0170	0.0202	0.0209
04:00-05:00 HOUR	0.0186	0.0216	0.0137
05:00-06:00 HOUR	0.0199	0.0203	0.0125
06:00-07:00 HOUR	0.0216	0.0226	0.0133
07:00-08:00 HOUR	0.0202	0.0220	0.0131

*Sila Banjongjairuk*

(MR. SILA BANJONGJAIRUK)  
LABORATORY SUPERVISOR

MARCH 30, 2023





## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@eco thai.net  
**MEASURING PLACE** : POAR9-2 : BAN KHLONG MUANG MEDITATION 47P 734247,1722875  
**MEASURING TYPE** : AMBIENT (AIR) **RECEIVED DATE** : MARCH 19-22, 2023  
**MEASURING DATE** : MARCH 19-22, 2023 **ANALYTICAL DATE** : MARCH 19-22, 2023  
**MEASURING TIME** : \* **REPORT NO.** : 2023-U022971  
**MEASURING METHOD** : WIND SPEED & WIND DIRECTION EQUIPMENT **WORK NO.** : 2023-001910  
**MEASURED BY** : MR SAKSITHON NUMNIM **ANALYSIS NO.** : T23AF333-0004 - T23AF333-0006

TIME *	RESULT (m/s)					
	POAR9-2 : BAN KHLONG MUANG MEDITATION 47P 734247,1722875					
	MARCH 19 - 20, 2023 T23AF333-0004		MARCH 20 - 21, 2023 T23AF333-0005		MARCH 21 - 22, 2023 T23AF333-0006	
	WIND SPEED	WIND DIRECTION	WIND SPEED	WIND DIRECTION	WIND SPEED	WIND DIRECTION
08:00-09:00 HOUR	1.7	WSW	0.9	SSE	2.9	SSW
09:00-10:00 HOUR	2.3	SSW	0.9	ESE	2.9	SW
10:00-11:00 HOUR	1.9	W	1.1	SSE	2.4	S
11:00-12:00 HOUR	1.4	WSW	1.6	SW	2.3	SSW
12:00-13:00 HOUR	2.0	SSW	1.2	S	2.7	SW
13:00-14:00 HOUR	2.0	SW	1.4	SSW	2.0	WSW
14:00-15:00 HOUR	1.5	SSW	1.5	SW	1.3	WSW
15:00-16:00 HOUR	2.3	WNW	1.8	WSW	1.1	SSW
16:00-17:00 HOUR	2.3	SSW	1.6	WSW	0.9	SSE
17:00-18:00 HOUR	1.6	S	2.5	SSW	1.0	SSW
18:00-19:00 HOUR	1.9	SSW	2.0	NNE	1.2	WSW
19:00-20:00 HOUR	1.8	S	1.5	SW	1.7	ENE
20:00-21:00 HOUR	1.4	SSW	1.5	NW	1.8	WSW
21:00-22:00 HOUR	1.4	SW	1.5	W	2.1	WNW
22:00-23:00 HOUR	2.2	WSW	0.8	SW	1.8	SSE
23:00-00:00 HOUR	2.1	ENE	0.8	WSW	2.2	SSW
00:00-01:00 HOUR	2.6	SSW	0.9	WSW	2.1	SW
01:00-02:00 HOUR	2.4	S	0.9	SW	2.3	SSW
02:00-03:00 HOUR	1.7	SE	1.5	WSW	1.5	SSW
03:00-04:00 HOUR	1.7	SSE	1.9	SW	1.8	WSW
04:00-05:00 HOUR	1.8	SSW	2.2	S	2.1	SSW
05:00-06:00 HOUR	1.8	S	2.4	SSE	2.0	WSW
06:00-07:00 HOUR	1.7	E	2.5	SW	1.9	WNW
07:00-08:00 HOUR	1.2	S	2.7	SW	1.4	W

*Sila Banjongjairuk*

(MR SILA BANJONGJAIKUK)  
LABORATORY SUPERVISOR

MARCH 30, 2023



## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@eco thai.net  
**MEASURING PLACE** : POAR9-5 : SOMPOTCHKRUNSONGROJPEE TEMPLE 47P 736112,1720075  
**MEASURING TYPE** : AMBIENT (AIR) **RECEIVED DATE** : MARCH 19-22, 2023  
**MEASURING DATE** : MARCH 19-22, 2023 **ANALYTICAL DATE** : MARCH 19-22, 2023  
**MEASURING TIME** : \* **REPORT NO.** : 2023-U022973  
**MEASURING METHOD** : WIND SPEED & WIND DIRECTION EQUIPMENT **WORK NO.** : 2023-001910  
**MEASURED BY** : MR SAKSITHON NUMNIM **ANALYSIS NO.** : T23AF333-0010 - T23AF333-0012

TIME *	RESULT (m/s)					
	POAR9-5 : SOMPOTCHKRUNSONGROJPEE TEMPLE 47P 736112,1720075					
	MARCH 19 - 20, 2023 T23AF333-0010		MARCH 20 - 21, 2023 T23AF333-0011		MARCH 21 - 22, 2023 T23AF333-0012	
	WIND SPEED	WIND DIRECTION	WIND SPEED	WIND DIRECTION	WIND SPEED	WIND DIRECTION
08:00-09:00 HOUR	0.7	WNW	2.2	WSW	2.1	SSW
09:00-10:00 HOUR	0.8	W	1.8	SW	1.6	WSW
10:00-11:00 HOUR	1.1	SSW	2.1	W	2.0	SW
11:00-12:00 HOUR	0.8	SW	2.1	SSW	2.6	SSW
12:00-13:00 HOUR	0.9	SW	1.7	S	2.9	WSW
13:00-14:00 HOUR	1.2	WSW	1.5	SW	1.0	W
14:00-15:00 HOUR	2.0	NW	2.3	S	2.3	SSW
15:00-16:00 HOUR	1.9	NW	1.6	WSW	1.5	WSW
16:00-17:00 HOUR	1.7	WSW	1.6	WNW	2.2	SW
17:00-18:00 HOUR	1.9	SSW	2.1	NW	1.9	SW
18:00-19:00 HOUR	1.5	S	2.3	W	2.0	SSE
19:00-20:00 HOUR	1.9	WSW	1.7	SSW	2.0	SSW
20:00-21:00 HOUR	2.1	SSW	2.6	SW	1.7	WSW
21:00-22:00 HOUR	1.8	S	2.6	W	2.2	SW
22:00-23:00 HOUR	1.4	SSW	1.7	SSW	2.2	SSW
23:00-00:00 HOUR	1.5	SW	2.2	SW	2.4	WSW
00:00-01:00 HOUR	2.2	SE	2.0	SSE	2.4	SSW
01:00-02:00 HOUR	1.8	S	1.5	WSW	2.0	SW
02:00-03:00 HOUR	2.3	SW	1.4	SSW	1.6	SSW
03:00-04:00 HOUR	2.1	S	1.7	WSW	1.6	S
04:00-05:00 HOUR	1.5	SW	1.5	SSW	1.8	SSW
05:00-06:00 HOUR	2.5	SSE	1.8	ENE	1.7	SSE
06:00-07:00 HOUR	2.7	SW	1.9	SW	2.0	WNW
07:00-08:00 HOUR	2.6	SSE	1.9	ESE	1.5	SSW

*Sila Banjongjairuk*

(MR SILA BANJONGJAIKUK)  
LABORATORY SUPERVISOR

MARCH 30, 2023





## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecohtai.net  
**MEASURING PLACE** : POAR9-1 : BAN BO RANG 47P 734055,1724685  
**MEASURING TYPE** : AMBIENT (AIR) **RECEIVED DATE** : MARCH 19-22, 2023  
**MEASURING DATE** : MARCH 19-22, 2023 **ANALYTICAL DATE** : MARCH 19-22, 2023  
**MEASURING TIME** : \* **REPORT NO.** : 2023-U022970  
**MEASURING METHOD** : WIND SPEED & WIND DIRECTION EQUIPMENT **WORK NO.** : 2023-001910  
**MEASURED BY** : MR SAKSITHON NUMNIM **ANALYSIS NO.** : T23AF333-0001 - T23AF333-0003

TIME *	RESULT (m/s)					
	POAR9-1 : BAN BO RANG 47P 734055,1724685					
	MARCH 19 - 20, 2023 T23AF333-0001		MARCH 20 - 21, 2023 T23AF333-0002		MARCH 21 - 22, 2023 T23AF333-0003	
	WIND SPEED	WIND DIRECTION	WIND SPEED	WIND DIRECTION	WIND SPEED	WIND DIRECTION
08:00-09:00 HOUR	1.5	SSW	2.3	SSW	1.7	SSW
09:00-10:00 HOUR	1.7	S	2.5	S	2.3	W
10:00-11:00 HOUR	2.0	SSW	1.8	SSW	2.0	SSW
11:00-12:00 HOUR	2.1	S	2.3	WSW	2.3	SSE
12:00-13:00 HOUR	2.3	SW	1.7	WSW	2.3	W
13:00-14:00 HOUR	2.4	SW	1.2	W	1.8	WSW
14:00-15:00 HOUR	2.1	WSW	1.3	WSW	2.2	WSW
15:00-16:00 HOUR	1.6	S	0.9	W	2.1	W
16:00-17:00 HOUR	1.9	SW	1.1	NW	1.7	NW
17:00-18:00 HOUR	2.0	NNE	1.0	WSW	0.9	WNW
18:00-19:00 HOUR	2.2	SSW	0.8	SSW	0.8	W
19:00-20:00 HOUR	2.4	S	0.8	WSW	0.9	NW
20:00-21:00 HOUR	1.6	SW	1.0	SSW	1.1	WSW
21:00-22:00 HOUR	1.5	SSW	0.9	SE	1.0	WSW
22:00-23:00 HOUR	1.6	ENE	0.8	SW	0.8	WNW
23:00-00:00 HOUR	1.1	SSW	1.2	SSW	1.2	W
00:00-01:00 HOUR	1.1	SW	1.1	SSW	0.9	WNW
01:00-02:00 HOUR	0.8	ESE	0.9	W	1.0	WSW
02:00-03:00 HOUR	1.1	SSW	0.9	WSW	1.3	WSW
03:00-04:00 HOUR	1.3	WSW	1.1	W	1.2	SW
04:00-05:00 HOUR	1.6	SW	0.8	W	1.5	NE
05:00-06:00 HOUR	2.0	SSW	1.0	WNW	1.4	SW
06:00-07:00 HOUR	2.4	SW	1.0	WSW	1.6	S
07:00-08:00 HOUR	1.9	WSW	1.4	SW	2.0	SSW

*Sila Banjongjairuk*

(MR SILA BANJONGJAIKUK)  
LABORATORY SUPERVISOR

MARCH 30, 2023

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\* THIS ANALYSIS REPORT APPROVES ONLY FOR SUBMITTED SAMPLES.



## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecohtai.net  
**MEASURING PLACE** : INSE-AN1 : BAN KHOK PHON PHATTANA (BAN KHOK AI PHON) 47P 734227,1726326  
**MEASURING TYPE** : AMBIENT (AIR) **RECEIVED DATE** : MARCH 19-22, 2023  
**MEASURING DATE** : MARCH 19-22, 2023 **ANALYTICAL DATE** : MARCH 19-22, 2023  
**MEASURING TIME** : \* **REPORT NO.** : 2023-U022972  
**MEASURING METHOD** : WIND SPEED & WIND DIRECTION EQUIPMENT **WORK NO.** : 2023-001910  
**MEASURED BY** : MR SAKSITHON NUMNIM **ANALYSIS NO.** : T23AF333-0007 - T23AF333-0009

TIME *	RESULT (m/s)					
	INSE-AN1 : BAN KHOK PHON PHATTANA (BAN KHOK AI PHON) 47P 734227,1726326					
	MARCH 19 - 20, 2023 T23AF333-0007		MARCH 20 - 21, 2023 T23AF333-0008		MARCH 21 - 22, 2023 T23AF333-0009	
	WIND SPEED	WIND DIRECTION	WIND SPEED	WIND DIRECTION	WIND SPEED	WIND DIRECTION
08:00-09:00 HOUR	0.9	S	1.4	S	2.3	SW
09:00-10:00 HOUR	1.1	W	1.4	SSW	2.1	NW
10:00-11:00 HOUR	1.2	S	0.9	ENE	2.0	WSW
11:00-12:00 HOUR	1.2	SSE	1.0	SW	1.7	SW
12:00-13:00 HOUR	1.2	SSW	1.1	ESE	1.7	SW
13:00-14:00 HOUR	1.1	WSW	1.0	SW	1.8	WSW
14:00-15:00 HOUR	1.5	SSW	1.0	SSW	1.6	WNW
15:00-16:00 HOUR	1.9	SE	0.8	SW	2.0	SSW
16:00-17:00 HOUR	1.6	SSE	1.3	SSW	1.8	WNW
17:00-18:00 HOUR	1.4	SW	1.4	SSE	1.7	W
18:00-19:00 HOUR	1.3	SSE	1.7	SW	1.5	SSW
19:00-20:00 HOUR	1.1	SSW	1.5	S	1.8	NE
20:00-21:00 HOUR	0.9	S	2.3	SSW	1.9	WSW
21:00-22:00 HOUR	1.2	SSW	2.5	SW	1.5	SW
22:00-23:00 HOUR	0.8	S	2.2	SW	2.1	SSW
23:00-00:00 HOUR	1.0	SSW	2.0	WSW	1.5	SW
00:00-01:00 HOUR	0.9	S	1.8	SW	2.2	SSW
01:00-02:00 HOUR	0.9	SW	1.7	W	1.8	SSW
02:00-03:00 HOUR	1.2	SSW	1.5	W	1.5	WSW
03:00-04:00 HOUR	1.5	SSE	2.2	WSW	1.8	S
04:00-05:00 HOUR	2.0	ENE	2.1	SW	1.5	W
05:00-06:00 HOUR	1.5	SSE	1.5	S	1.9	S
06:00-07:00 HOUR	1.6	S	2.4	SW	1.9	NW
07:00-08:00 HOUR	1.8	SSE	2.3	S	1.7	SSW

*Sila Banjongjairuk*

(MR SILA BANJONGJAIKUK)  
LABORATORY SUPERVISOR

MARCH 30, 2023

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\* THIS ANALYSIS REPORT APPROVES ONLY FOR SUBMITTED SAMPLES.



## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecoohai.net  
**SAMPLING SOURCE** : POAR9-2 : BAN KHLONG MUANG MEDITATION (UTM WGS 84 ZONE 47P 734247E 1722875N)  
**SAMPLE TYPE** : AMBIENT  
**SAMPLING DATE** : \*, \*\*, \*\*\*  
**SAMPLING TIME** : \*, \*\*, \*\*\*  
**SAMPLING BY** : MR SAKSITHON NUMNIM  
**ANALYZED BY** : MISS WORAKON PADSONGCHAN  
**RECEIVED DATE** : MARCH 24, 2023  
**ANALYTICAL DATE** : MARCH 24-APRIL 7, 2023  
**REPORT NO.** : 2023-U026023  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF333-0004 - T23AF333-0006

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT			REGULATORY STANDARD
			POAR9-2 BAN KHLONG MUANG MEDITATION			
			* T23AF333-0004	** T23AF333-0005	*** T23AF333-0006	
BENZENE	µg/m³	UAE.TP.TOX.003 BASED ON US EPA, COMPENDIUM METHOD TO-15, 2nd EDITION, JANUARY 1999	1.03	0.68	0.59	≤ 7.6
ETHYLBENZENE	µg/m³	UAE.TP.TOX.003 BASED ON US EPA, COMPENDIUM METHOD TO-15, 2nd EDITION, JANUARY 1999	1.05	1.13	0.78	-
TOLUENE	µg/m³	UAE.TP.TOX.003 BASED ON US EPA, COMPENDIUM METHOD TO-15, 2nd EDITION, JANUARY 1999	15.0	11.6	12.3	-
TOTAL XYLENES	µg/m³	UAE.TP.TOX.003 BASED ON US EPA, COMPENDIUM METHOD TO-15, 2nd EDITION, JANUARY 1999	2.31	1.86	1.40	-
SAMPLE CONDITTON			COMPLETE	COMPLETE	COMPLETE	

### REMARK

RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.  
REGULATORY STANDARD : AMBIENT AIR QUALITY STANDARD, NOTIFICATION OF THE POLLUTION CONTROL DEPARTMENT, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL.126 SPECIAL PART 13D, DATED JANUARY 27, B.E. 2552 (2009).  
\* : SAMPLING FROM 10:00 HOUR ON MARCH 19, 2023 TO 10:00 HOUR ON MARCH 20, 2023.  
\*\* : SAMPLING FROM 10:00 HOUR ON MARCH 20, 2023 TO 10:00 HOUR ON MARCH 21, 2023.  
\*\*\* : SAMPLING FROM 10:00 HOUR ON MARCH 21, 2023 TO 10:00 HOUR ON MARCH 22, 2023.

*Benjawan V.*

(MISS BENJAWAN VIRIYOTHAI)  
LABORATORY SUPERVISOR

APRIL 12, 2023



## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecoohai.net  
**SAMPLING SOURCE** : POAR9-5 SOMPOTCHKRUNSONGROIPTEE TEMPLE (UTM WGS 84 ZONE 47P 736112E 1720075N)  
**SAMPLE TYPE** : AMBIENT  
**SAMPLING DATE** : \*, \*\*, \*\*\*  
**SAMPLING TIME** : \*, \*\*, \*\*\*  
**SAMPLING BY** : MR SAKSITHON NUMNIM  
**ANALYZED BY** : MISS WORAKON PADSONGCHAN  
**RECEIVED DATE** : MARCH 24, 2023  
**ANALYTICAL DATE** : MARCH 24-APRIL 7, 2023  
**REPORT NO.** : 2023-U026027  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF333-0010 - T23AF333-0012

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT			REGULATORY STANDARD
			POAR9-5 SOMPOTCHKRUNSONGROIPTEE			
			TEMPLE			
			*	**	***	
			T23AF333-0010	T23AF333-0011	T23AF333-0012	
BENZENE	µg/m³	UAE:TP.TOX.003 BASED ON US EPA, COMPENDIUM METHOD TO-15, 2nd EDITION, JANUARY 1999	0.60	1.23	0.57	≤ 7.6
ETHYLBENZENE	µg/m³	UAE:TP.TOX.003 BASED ON US EPA, COMPENDIUM METHOD TO-15, 2nd EDITION, JANUARY 1999	0.79	1.47	1.00	-
TOLUENE	µg/m³	UAE:TP.TOX.003 BASED ON US EPA, COMPENDIUM METHOD TO-15, 2nd EDITION, JANUARY 1999	12.6	17.4	10.0	-
TOTAL XYLENES	µg/m³	UAE:TP.TOX.003 BASED ON US EPA, COMPENDIUM METHOD TO-15, 2nd EDITION, JANUARY 1999	1.34	3.48	1.49	-
SAMPLE CONDITION			COMPLETE	COMPLETE	COMPLETE	

### REMARK

RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.  
REGULATORY STANDARD : AMBIENT AIR QUALITY STANDARD, NOTIFICATION OF THE POLLUTION CONTROL DEPARTMENT, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL.126 SPECIAL PART 13D, DATED JANUARY 27, B.E. 2552 (2009).  
\* : SAMPLING FROM 10:30 HOUR ON MARCH 19, 2023 TO 10:30 HOUR ON MARCH 20, 2023.  
\*\* : SAMPLING FROM 10:30 HOUR ON MARCH 20, 2023 TO 10:30 HOUR ON MARCH 21, 2023.  
\*\*\* : SAMPLING FROM 10:30 HOUR ON MARCH 21, 2023 TO 10:30 HOUR ON MARCH 22, 2023.

*Benjawan V.*

(MISS BENJAWAN VIRIYOTHAI)  
LABORATORY SUPERVISOR

APRIL 12, 2023





## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@eco-thai.net  
**SAMPLING SOURCE** : POAR9-1 : BAN BO RANG (UTM WGS 84 ZONE 47P 734055E 1724685N)  
**SAMPLE TYPE** : AMBIENT  
**SAMPLING DATE** : \*, \*\*, \*\*\*  
**SAMPLING TIME** : \*, \*\*, \*\*\*  
**SAMPLING BY** : MR SAKSITHON NUMNIM  
**ANALYZED BY** : MISS WORAKON PADSONGCHAN

**RECEIVED DATE** : MARCH 24, 2023  
**ANALYTICAL DATE** : MARCH 24-APRIL 7, 2023  
**REPORT NO.** : 2023-U026021  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF333-0001 - T23AF333-0003

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT			REGULATORY STANDARD
			POAR9-1 BAN BO RANG			
			*	**	***	
			T23AF333-0001	T23AF333-0002	T23AF333-0003	
BENZENE	µg/m³	UAE.TP.TOX.003 BASED ON US EPA, COMPENDIUM METHOD TO-15, 2nd EDITION, JANUARY 1999	0.65	0.64	0.85	≤ 7.6
ETHYLBENZENE	µg/m³	UAE.TP.TOX.003 BASED ON US EPA, COMPENDIUM METHOD TO-15, 2nd EDITION, JANUARY 1999	0.77	1.09	0.88	-
TOLUENE	µg/m³	UAE.TP.TOX.003 BASED ON US EPA, COMPENDIUM METHOD TO-15, 2nd EDITION, JANUARY 1999	12.9	11.5	15.0	-
TOTAL XYLENES	µg/m³	UAE.TP.TOX.003 BASED ON US EPA, COMPENDIUM METHOD TO-15, 2nd EDITION, JANUARY 1999	1.30	1.81	1.82	-
SAMPLE CONDITION			COMPLETE	COMPLETE	COMPLETE	

### REMARK

RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

REGULATORY STANDARD : AMBIENT AIR QUALITY STANDARD, NOTIFICATION OF THE POLLUTION CONTROL DEPARTMENT, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL.126 SPECIAL PART 13D, DATED JANUARY 27, B.E. 2552 (2009).

\* : SAMPLING FROM 09:30 HOUR ON MARCH 19, 2023 TO 09:30 HOUR ON MARCH 20, 2023.

\*\* : SAMPLING FROM 09:30 HOUR ON MARCH 20, 2023 TO 09:30 HOUR ON MARCH 21, 2023.

\*\*\* : SAMPLING FROM 09:30 HOUR ON MARCH 21, 2023 TO 09:30 HOUR ON MARCH 22, 2023.

*Benjawan V.*

(MISS BENJAWAN VIRIYOTHAI)  
LABORATORY SUPERVISOR

APRIL 12, 2023

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## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@eco-thai.net  
**SAMPLING SOURCE** : INSE-AN1 : BAN KHOK PHON PHATTANA (UTM WGS 84 ZONE 47P 734227E 1726326N)  
**SAMPLE TYPE** : AMBIENT  
**SAMPLING DATE** : \*, \*\*, \*\*\*  
**SAMPLING TIME** : \*, \*\*, \*\*\*  
**SAMPLING BY** : MR SAKSITHON NUMNIM  
**ANALYZED BY** : MISS WORAKON PADSONGCHAN

**RECEIVED DATE** : MARCH 24, 2023  
**ANALYTICAL DATE** : MARCH 24-APRIL 7, 2023  
**REPORT NO.** : 2023-U026025  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF333-0007 - T23AF333-0009

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT			REGULATORY STANDARD
			INSE-AN1 BAN KHOK PHON PHATTANA			
			*	**	***	
			T23AF333-0007	T23AF333-0008	T23AF333-0009	
BENZENE	µg/m³	UAE.TP.TOX.003 BASED ON US EPA, COMPENDIUM METHOD TO-15, 2nd EDITION, JANUARY 1999	0.58	1.33	0.68	≤ 7.6
ETHYLBENZENE	µg/m³	UAE.TP.TOX.003 BASED ON US EPA, COMPENDIUM METHOD TO-15, 2nd EDITION, JANUARY 1999	0.78	1.57	0.91	-
TOLUENE	µg/m³	UAE.TP.TOX.003 BASED ON US EPA, COMPENDIUM METHOD TO-15, 2nd EDITION, JANUARY 1999	12.4	17.8	15.1	-
TOTAL XYLENES	µg/m³	UAE.TP.TOX.003 BASED ON US EPA, COMPENDIUM METHOD TO-15, 2nd EDITION, JANUARY 1999	1.38	3.87	1.62	-
SAMPLE CONDITION			COMPLETE	COMPLETE	COMPLETE	

### REMARK

RESULT : REFERENCE CONDITION IS 25 DEGREE CELSIUS AT 1 ATMOSPHERE.

REGULATORY STANDARD : AMBIENT AIR QUALITY STANDARD, NOTIFICATION OF THE POLLUTION CONTROL DEPARTMENT, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL.126 SPECIAL PART 13D, DATED JANUARY 27, B.E. 2552 (2009).

\* : SAMPLING FROM 09:00 HOUR ON MARCH 19, 2023 TO 09:00 HOUR ON MARCH 20, 2023.

\*\* : SAMPLING FROM 09:00 HOUR ON MARCH 20, 2023 TO 09:00 HOUR ON MARCH 21, 2023.

\*\*\* : SAMPLING FROM 09:00 HOUR ON MARCH 21, 2023 TO 09:00 HOUR ON MARCH 22, 2023.

*Benjawan V.*

(MISS BENJAWAN VIRIYOTHAI)  
LABORATORY SUPERVISOR

APRIL 12, 2023

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## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecoohai.net  
**MEASURING SOURCE** : POAR9-1 : BAN BO RANG 47P 734055,1724685  
**MEASURING TYPE** : AMBIENT (NOISE)  
**MEASURING DATE** : MARCH 19-22, 2023  
**MEASURING TIME** : \*  
**MEASURING METHOD** : INTEGRATED SOUND LEVEL METER  
**MEASURED BY** : MR SAKSITHON NUMNIM

**RECEIVED DATE** : MARCH 19-22, 2023  
**ANALYTICAL DATE** : MARCH 19-22, 2023  
**REPORT NO.** : 2023-U022978  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF334-0001 - T23AF334-0003

TIME*	RESULT dB(A)		
	POAR9-1 : BAN BO RANG 47P 734055,1724685		
	MARCH 19 - 20, 2023		
	T23AF334-0001		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	55.5	71.6	51.4
08:00-09:00 HOUR	57.9	81.0	51.3
09:00-10:00 HOUR	54.0	70.2	50.0
10:00-11:00 HOUR	53.2	72.3	49.9
11:00-12:00 HOUR	51.4	66.7	47.1
12:00-13:00 HOUR	49.1	64.5	44.4
13:00-14:00 HOUR	48.3	73.1	43.7
14:00-15:00 HOUR	52.9	69.1	44.2
15:00-16:00 HOUR	49.9	70.6	43.9
16:00-17:00 HOUR	51.1	70.3	47.3
17:00-18:00 HOUR	51.9	69.5	46.5
18:00-19:00 HOUR	50.1	68.1	44.5
19:00-20:00 HOUR	51.0	78.8	45.2
20:00-21:00 HOUR	54.1	75.0	45.5
21:00-22:00 HOUR	53.9	81.0	45.8
22:00-23:00 HOUR	55.8	74.5	49.3
23:00-00:00 HOUR	57.0	76.5	47.8
00:00-01:00 HOUR	55.3	74.8	47.1
01:00-02:00 HOUR	56.0	79.8	47.7
02:00-03:00 HOUR	58.1	81.7	46.7
03:00-04:00 HOUR	55.4	80.2	46.5
04:00-05:00 HOUR	55.7	77.5	46.4
05:00-06:00 HOUR	55.4	75.3	46.2
06:00-07:00 HOUR	55.3	71.5	47.3
L <sub>Aeq</sub> 24 hours	54.5		
L <sub>Adn</sub>	62.2		

TIME*	RESULT dB(A)		
	POAR9-1 : BAN BO RANG 47P 734055,1724685		
	MARCH 20 - 21, 2023		
	T23AF334-0002		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	56.6	76.9	48.0
08:00-09:00 HOUR	57.6	73.6	50.0
09:00-10:00 HOUR	53.1	67.8	46.4
10:00-11:00 HOUR	53.1	74.9	45.4
11:00-12:00 HOUR	52.2	69.7	46.0
12:00-13:00 HOUR	51.5	67.7	46.0
13:00-14:00 HOUR	53.4	73.8	47.0
14:00-15:00 HOUR	52.5	69.2	49.3
15:00-16:00 HOUR	53.4	68.1	48.2
16:00-17:00 HOUR	53.4	73.3	49.1
17:00-18:00 HOUR	53.2	69.2	48.0
18:00-19:00 HOUR	52.1	72.4	46.0
19:00-20:00 HOUR	52.8	77.6	45.5
20:00-21:00 HOUR	51.5	73.6	45.1
21:00-22:00 HOUR	53.9	74.0	46.6
22:00-23:00 HOUR	55.7	76.4	49.0
23:00-00:00 HOUR	55.0	73.3	47.4
00:00-01:00 HOUR	55.4	76.9	46.3
01:00-02:00 HOUR	55.8	78.9	46.9
02:00-03:00 HOUR	53.4	70.3	46.0
03:00-04:00 HOUR	57.6	76.9	47.7
04:00-05:00 HOUR	55.6	72.2	46.6
05:00-06:00 HOUR	54.1	73.0	45.9
06:00-07:00 HOUR	55.3	76.9	45.8
L <sub>Aeq</sub> 24 hours	54.5		
L <sub>Adn</sub>	61.7		





TIME*	RESULT dB(A)		
	POAR9-1 : BAN BO RANG 47P 734055,1724685		
	MARCH 21 - 22, 2023		
	T23AF334-0003		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	54.5	72.9	46.5
08:00-09:00 HOUR	53.4	69.9	44.9
09:00-10:00 HOUR	58.1	76.0	48.5
10:00-11:00 HOUR	53.2	71.5	46.0
11:00-12:00 HOUR	50.6	67.6	45.5
12:00-13:00 HOUR	52.2	71.7	44.8
13:00-14:00 HOUR	52.0	73.0	44.7
14:00-15:00 HOUR	52.7	70.7	44.5
15:00-16:00 HOUR	55.4	73.8	46.9
16:00-17:00 HOUR	50.3	71.7	44.5
17:00-18:00 HOUR	46.8	60.7	44.5
18:00-19:00 HOUR	48.4	64.4	44.1
19:00-20:00 HOUR	50.0	71.8	45.1
20:00-21:00 HOUR	49.1	64.3	44.7
21:00-22:00 HOUR	52.2	68.7	45.9
22:00-23:00 HOUR	50.0	71.8	45.1
23:00-00:00 HOUR	51.3	67.8	44.8
00:00-01:00 HOUR	48.6	66.2	44.5
01:00-02:00 HOUR	49.8	63.5	45.1
02:00-03:00 HOUR	50.3	68.7	44.6
03:00-04:00 HOUR	51.8	68.8	44.9
04:00-05:00 HOUR	51.9	71.7	45.2
05:00-06:00 HOUR	54.4	74.1	45.2
06:00-07:00 HOUR	52.5	73.2	45.4
L <sub>Aeq</sub> 24 hours	52.4		
L <sub>Adn</sub>	58.1		

## ANALYSIS REPORT

<b>CUSTOMER NAME</b>	: ECO ORIENT RESOURCES (THAILAND) LTD.
<b>ADDRESS</b>	: 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900
<b>CONTACT INFORMATION</b>	: TEL : 0 2937 1124-9 e-mail : anucha@eco thai.net
<b>MEASURING SOURCE</b>	: POAR9-2 : BAN KHLONG MUANG MEDITATION 47P 734247,1722875
<b>MEASURING TYPE</b>	: AMBIENT (NOISE)
<b>MEASURING DATE</b>	: MARCH 19-22, 2023
<b>MEASURING TIME</b>	: *
<b>MEASURING METHOD</b>	: INTEGRATED SOUND LEVEL METER
<b>MEASURED BY</b>	: MR SAKSITHON NUMNIM
<b>RECEIVED DATE</b>	: MARCH 19-22, 2023
<b>ANALYTICAL DATE</b>	: MARCH 19-22, 2023
<b>REPORT NO.</b>	: 2023-U022979
<b>WORK NO.</b>	: 2023-001910
<b>ANALYSIS NO.</b>	: T23AF334-0004 - T23AF334-0006

TIME*	RESULT dB(A)		
	POAR9-2 : BAN KHLONG MUANG MEDITATION 47P 734247,1722875		
	MARCH 19 - 20, 2023		
	T23AF334-0004		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	52.9	71.8	46.5
08:00-09:00 HOUR	56.2	71.0	45.7
09:00-10:00 HOUR	56.8	74.9	46.8
10:00-11:00 HOUR	54.7	72.2	44.8
11:00-12:00 HOUR	53.1	71.2	43.6
12:00-13:00 HOUR	53.0	72.5	44.3
13:00-14:00 HOUR	51.9	76.7	43.7
14:00-15:00 HOUR	54.5	82.3	43.9
15:00-16:00 HOUR	51.4	75.3	43.4
16:00-17:00 HOUR	54.4	82.2	45.2
17:00-18:00 HOUR	50.7	70.6	43.7
18:00-19:00 HOUR	52.7	71.2	46.3
19:00-20:00 HOUR	50.0	70.3	44.7
20:00-21:00 HOUR	53.3	75.6	44.3
21:00-22:00 HOUR	49.6	68.4	43.5
22:00-23:00 HOUR	51.3	72.5	42.6
23:00-00:00 HOUR	47.1	64.7	41.7
00:00-01:00 HOUR	47.2	66.8	41.5
01:00-02:00 HOUR	44.9	63.0	42.3
02:00-03:00 HOUR	46.8	67.6	43.0
03:00-04:00 HOUR	45.8	60.3	44.5
04:00-05:00 HOUR	45.4	59.4	44.2
05:00-06:00 HOUR	45.5	57.9	44.0
06:00-07:00 HOUR	47.2	59.0	44.0
L <sub>Aeq</sub> 24 hours	52.0		
L <sub>Adn</sub>	55.3		

*Sila Banjongjairuk*

(MR) SILA BANJONGJAIRUK  
LABORATORY SUPERVISOR

MARCH 30, 2023





TIME*	RESULT dB(A)		
	POAR9-2 : BAN KHLONG MUANG MEDITATION 47P 734247,1722875		
	MARCH 20 - 21, 2023		
	T23AF334-0005		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	48.0	64.9	43.4
08:00-09:00 HOUR	50.4	68.4	43.4
09:00-10:00 HOUR	49.6	68.8	42.9
10:00-11:00 HOUR	50.2	69.8	42.8
11:00-12:00 HOUR	49.5	68.2	42.6
12:00-13:00 HOUR	48.9	66.8	43.3
13:00-14:00 HOUR	50.9	65.8	46.6
14:00-15:00 HOUR	50.5	70.4	46.0
15:00-16:00 HOUR	51.0	66.0	49.9
16:00-17:00 HOUR	51.2	67.5	48.0
17:00-18:00 HOUR	49.8	64.1	48.7
18:00-19:00 HOUR	50.1	61.0	48.4
19:00-20:00 HOUR	49.3	59.1	48.4
20:00-21:00 HOUR	48.6	59.5	47.5
21:00-22:00 HOUR	47.9	57.5	46.6
22:00-23:00 HOUR	46.6	59.2	45.1
23:00-00:00 HOUR	46.7	55.3	45.2
00:00-01:00 HOUR	46.2	61.5	44.0
01:00-02:00 HOUR	45.7	56.8	44.4
02:00-03:00 HOUR	46.2	61.3	43.8
03:00-04:00 HOUR	46.1	61.2	42.7
04:00-05:00 HOUR	46.9	62.7	43.4
05:00-06:00 HOUR	50.5	69.9	43.3
06:00-07:00 HOUR	47.8	64.8	43.2
L <sub>Aeq</sub> 24 hours	49.0		
L <sub>Adn</sub>	54.1		

TIME*	RESULT dB(A)		
	POAR9-2 : BAN KHLONG MUANG MEDITATION 47P 734247,1722875		
	MARCH 21 - 22, 2023		
	T23AF334-0006		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	53.1	75.1	44.2
08:00-09:00 HOUR	50.1	65.7	45.6
09:00-10:00 HOUR	50.3	67.7	44.8
10:00-11:00 HOUR	50.6	70.4	44.1
11:00-12:00 HOUR	50.1	71.0	43.3
12:00-13:00 HOUR	52.3	74.0	43.1
13:00-14:00 HOUR	49.7	67.2	43.0
14:00-15:00 HOUR	48.5	66.7	42.1
15:00-16:00 HOUR	46.2	64.3	42.1
16:00-17:00 HOUR	49.6	65.8	46.1
17:00-18:00 HOUR	49.2	69.1	46.2
18:00-19:00 HOUR	48.2	67.8	46.8
19:00-20:00 HOUR	47.8	58.7	46.3
20:00-21:00 HOUR	47.0	55.8	46.1
21:00-22:00 HOUR	47.8	60.2	46.1
22:00-23:00 HOUR	49.4	62.4	46.2
23:00-00:00 HOUR	48.9	64.2	44.7
00:00-01:00 HOUR	48.9	63.5	43.8
01:00-02:00 HOUR	47.4	63.7	43.2
02:00-03:00 HOUR	48.0	61.7	44.2
03:00-04:00 HOUR	48.4	66.0	43.3
04:00-05:00 HOUR	46.6	61.9	43.5
05:00-06:00 HOUR	48.7	61.1	47.1
06:00-07:00 HOUR	50.1	69.7	45.2
L <sub>Aeq</sub> 24 hours	49.4		
L <sub>Adn</sub>	55.2		

*Sila Banjongjairuk*

(MR SILA BANJONGJAIRUK)  
LABORATORY SUPERVISOR

MARCH 30, 2023

## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecothai.net  
**MEASURING SOURCE** : POAR9-5:SOMPOTCHKRUNSONGROIPEE TEMPLE 47P 736112,1720075  
**MEASURING TYPE** : AMBIENT (NOISE) **RECEIVED DATE** : MARCH 19-22, 2023  
**MEASURING DATE** : MARCH 19-22, 2023 **ANALYTICAL DATE** : MARCH 19-22, 2023  
**MEASURING TIME** : \* **REPORT NO.** : 2023-U022981  
**MEASURING METHOD** : INTEGRATED SOUND LEVEL METER **WORK NO.** : 2023-001910  
**MEASURED BY** : MR SAKSITHON NUMNIM **ANALYSIS NO.** : T23AF334-0010 - T23AF334-0012

TIME*	RESULT dB(A)		
	POAR9-5:SOMPOTCHKRUNSONGROIPEE TEMPLE 47P 736112,1720075		
	MARCH 19 - 20, 2023		
	T23AF334-0010		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	52.1	67.7	44.5
08:00-09:00 HOUR	50.1	70.9	44.9
09:00-10:00 HOUR	54.8	75.2	44.3
10:00-11:00 HOUR	54.0	72.8	45.2
11:00-12:00 HOUR	52.7	75.2	45.2
12:00-13:00 HOUR	55.1	77.7	43.4
13:00-14:00 HOUR	52.0	67.4	46.7
14:00-15:00 HOUR	50.4	68.3	45.2
15:00-16:00 HOUR	51.5	69.5	44.1
16:00-17:00 HOUR	56.0	75.3	45.0
17:00-18:00 HOUR	53.3	69.7	44.9
18:00-19:00 HOUR	53.8	80.5	45.4
19:00-20:00 HOUR	54.2	76.5	43.7
20:00-21:00 HOUR	52.7	70.3	44.0
21:00-22:00 HOUR	52.7	75.0	45.1
22:00-23:00 HOUR	49.0	61.5	45.3
23:00-00:00 HOUR	48.8	67.6	44.0
00:00-01:00 HOUR	48.5	62.7	43.4
01:00-02:00 HOUR	48.8	70.2	43.6
02:00-03:00 HOUR	50.0	71.4	43.8
03:00-04:00 HOUR	46.4	62.4	42.5
04:00-05:00 HOUR	49.5	72.8	42.9
05:00-06:00 HOUR	50.2	75.3	44.0
06:00-07:00 HOUR	53.4	71.2	45.2
L <sub>Aeq</sub> 24 hours	52.3		
L <sub>Adn</sub>	56.9		

TIME*	RESULT dB(A)		
	POAR9-5:SOMPOTCHKRUNSONGROIPEE TEMPLE 47P 736112,1720075		
	MARCH 20 - 21, 2023		
	T23AF334-0011		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	52.5	66.6	47.0
08:00-09:00 HOUR	52.5	66.1	47.2
09:00-10:00 HOUR	51.7	64.3	47.4
10:00-11:00 HOUR	51.8	74.9	44.6
11:00-12:00 HOUR	51.1	68.4	49.1
12:00-13:00 HOUR	48.8	59.4	46.3
13:00-14:00 HOUR	50.6	71.0	44.2
14:00-15:00 HOUR	48.2	63.2	46.9
15:00-16:00 HOUR	50.0	62.2	46.2
16:00-17:00 HOUR	52.0	72.2	44.7
17:00-18:00 HOUR	51.3	70.6	44.3
18:00-19:00 HOUR	50.2	67.5	43.5
19:00-20:00 HOUR	52.7	73.3	43.6
20:00-21:00 HOUR	50.1	68.1	43.4
21:00-22:00 HOUR	53.2	77.1	42.9
22:00-23:00 HOUR	48.5	65.5	44.1
23:00-00:00 HOUR	47.0	63.5	43.5
00:00-01:00 HOUR	48.7	62.1	44.4
01:00-02:00 HOUR	50.7	67.5	44.8
02:00-03:00 HOUR	51.7	70.2	44.0
03:00-04:00 HOUR	51.0	70.1	43.8
04:00-05:00 HOUR	49.9	70.3	43.5
05:00-06:00 HOUR	46.5	60.6	42.6
06:00-07:00 HOUR	46.6	63.9	42.8
L <sub>Aeq</sub> 24 hours	50.7		
L <sub>Adn</sub>	56.1		





TIME*	RESULT dB(A)		
	POAR9-5:SOMPOTCHKRUNSONGROIPEE TEMPLE 47P 736112,1720075		
	MARCH 21 - 22, 2023		
	T23AF334-0012		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	48.3	63.6	44.0
08:00-09:00 HOUR	50.5	70.5	44.2
09:00-10:00 HOUR	50.2	66.4	43.6
10:00-11:00 HOUR	50.0	68.5	43.4
11:00-12:00 HOUR	49.7	69.0	43.2
12:00-13:00 HOUR	52.9	69.1	43.9
13:00-14:00 HOUR	52.0	63.5	47.2
14:00-15:00 HOUR	51.3	72.1	43.4
15:00-16:00 HOUR	50.4	68.1	43.5
16:00-17:00 HOUR	52.5	74.9	43.3
17:00-18:00 HOUR	52.6	78.1	43.3
18:00-19:00 HOUR	50.7	68.3	42.9
19:00-20:00 HOUR	50.3	72.5	42.7
20:00-21:00 HOUR	49.5	69.2	43.8
21:00-22:00 HOUR	49.6	66.2	44.4
22:00-23:00 HOUR	48.5	62.6	44.2
23:00-00:00 HOUR	49.5	67.5	44.0
00:00-01:00 HOUR	47.3	61.1	42.8
01:00-02:00 HOUR	46.6	62.9	42.7
02:00-03:00 HOUR	46.9	61.2	43.5
03:00-04:00 HOUR	50.7	69.0	44.4
04:00-05:00 HOUR	50.8	70.9	43.9
05:00-06:00 HOUR	50.2	68.5	43.3
06:00-07:00 HOUR	48.3	64.2	42.7
L <sub>Aeq</sub> 24 hours		50.3	
L <sub>Adn</sub>		55.8	

*Sila*

(MR. SILA BANJONGJAIKUK)  
LABORATORY SUPERVISOR

MARCH 30, 2023

## ANALYSIS REPORT

CUSTOMER NAME	: ECO ORIENT RESOURCES (THAILAND) LTD.
ADDRESS	: 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900
CONTACT INFORMATION	: TEL : 0 2937 1124-9 e-mail : anucha@ecothai.net
MEASURING SOURCE	: INSE-AN1 : BAN KHOK PHON PHATTANA (BAN KHOK AI PHON) 47P 734227,1726326
MEASURING TYPE	: AMBIENT (NOISE)
MEASURING DATE	: MARCH 19-22, 2023
MEASURING TIME	: *
MEASURING METHOD	: INTEGRATED SOUND LEVEL METER
MEASURED BY	: MR. SAKSITHON NUMNIM
RECEIVED DATE	: MARCH 19-22, 2023
ANALYTICAL DATE	: MARCH 19-22, 2023
REPORT NO.	: 2023-U022980
WORK NO.	: 2023-001910
ANALYSIS NO.	: T23AF334-0007 - T23AF334-0009

TIME*	RESULT dB(A)		
	INSE-AN1 : BAN KHOK PHON PHATTANA (BAN KHOK AI PHON) 47P 734227,1726326		
	MARCH 19 - 20, 2023		
	T23AF334-0007		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	54.3	71.3	45.0
08:00-09:00 HOUR	56.5	77.1	45.5
09:00-10:00 HOUR	57.1	77.8	47.8
10:00-11:00 HOUR	55.7	71.9	51.4
11:00-12:00 HOUR	57.9	74.9	54.6
12:00-13:00 HOUR	58.4	74.9	54.1
13:00-14:00 HOUR	57.1	68.2	51.0
14:00-15:00 HOUR	56.9	79.3	47.7
15:00-16:00 HOUR	54.4	73.0	46.4
16:00-17:00 HOUR	53.8	70.6	45.0
17:00-18:00 HOUR	52.5	69.0	45.4
18:00-19:00 HOUR	54.9	73.6	47.5
19:00-20:00 HOUR	57.6	80.9	48.3
20:00-21:00 HOUR	55.1	74.1	47.0
21:00-22:00 HOUR	56.3	73.9	47.5
22:00-23:00 HOUR	58.7	80.4	49.2
23:00-00:00 HOUR	50.3	65.6	42.2
00:00-01:00 HOUR	51.4	67.8	41.5
01:00-02:00 HOUR	50.6	66.5	40.6
02:00-03:00 HOUR	50.2	65.6	40.5
03:00-04:00 HOUR	51.5	67.1	41.0
04:00-05:00 HOUR	50.8	67.4	42.2
05:00-06:00 HOUR	50.4	71.4	43.3
06:00-07:00 HOUR	55.0	77.0	46.8
L <sub>Aeq</sub> 24 hours		55.3	
L <sub>Adn</sub>		60.2	



TIME*	RESULT dB(A)		
	INSE-AN1 : BAN KHOK PHON PHATTANA (BAN KHOK AI PHON) 47P 734227,1726326		
	MARCH 20 - 21, 2023		
	T23AF334-0008		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	54.4	68.8	47.3
08:00-09:00 HOUR	56.5	79.8	48.9
09:00-10:00 HOUR	54.5	72.0	48.2
10:00-11:00 HOUR	54.5	73.2	47.5
11:00-12:00 HOUR	54.0	71.3	47.4
12:00-13:00 HOUR	53.9	73.5	46.9
13:00-14:00 HOUR	54.2	68.1	47.5
14:00-15:00 HOUR	53.5	68.3	47.9
15:00-16:00 HOUR	53.6	73.7	50.5
16:00-17:00 HOUR	53.9	72.5	49.6
17:00-18:00 HOUR	55.5	72.6	49.5
18:00-19:00 HOUR	54.4	70.0	48.6
19:00-20:00 HOUR	55.0	72.9	48.7
20:00-21:00 HOUR	55.4	73.3	48.1
21:00-22:00 HOUR	54.8	71.1	48.5
22:00-23:00 HOUR	49.7	67.4	42.6
23:00-00:00 HOUR	48.4	61.8	42.5
00:00-01:00 HOUR	50.7	65.7	42.0
01:00-02:00 HOUR	47.6	63.1	42.0
02:00-03:00 HOUR	50.0	66.6	41.7
03:00-04:00 HOUR	51.1	70.2	41.6
04:00-05:00 HOUR	50.2	64.6	40.8
05:00-06:00 HOUR	51.5	70.5	40.6
06:00-07:00 HOUR	56.1	74.6	44.3
L <sub>Aeq</sub> 24 hours		53.6	
L <sub>Adn</sub>		58.4	

TIME*	RESULT dB(A)		
	INSE-AN1 : BAN KHOK PHON PHATTANA (BAN KHOK AI PHON) 47P 734227,1726326		
	MARCH 21 - 22, 2023		
	T23AF334-0009		
	L <sub>Aeq</sub> 1 hour	L <sub>Amax</sub> 1 hour	L <sub>A90</sub> 1 hour
07:00-08:00 HOUR	55.7	76.8	48.2
08:00-09:00 HOUR	55.6	78.1	47.1
09:00-10:00 HOUR	55.1	72.8	47.3
10:00-11:00 HOUR	58.4	77.9	47.2
11:00-12:00 HOUR	54.2	72.7	47.0
12:00-13:00 HOUR	55.6	72.0	47.8
13:00-14:00 HOUR	55.3	76.3	46.9
14:00-15:00 HOUR	54.4	70.5	43.3
15:00-16:00 HOUR	56.9	78.6	43.8
16:00-17:00 HOUR	54.9	77.4	42.8
17:00-18:00 HOUR	54.6	81.2	49.9
18:00-19:00 HOUR	54.2	80.0	49.1
19:00-20:00 HOUR	53.8	69.7	49.9
20:00-21:00 HOUR	55.2	70.5	50.4
21:00-22:00 HOUR	54.9	73.0	50.8
22:00-23:00 HOUR	50.4	61.6	47.1
23:00-00:00 HOUR	50.6	69.5	45.1
00:00-01:00 HOUR	47.6	65.2	39.2
01:00-02:00 HOUR	51.2	68.4	41.7
02:00-03:00 HOUR	53.1	73.7	42.5
03:00-04:00 HOUR	48.8	62.9	42.8
04:00-05:00 HOUR	51.5	68.2	46.3
05:00-06:00 HOUR	52.4	64.4	49.0
06:00-07:00 HOUR	57.9	75.6	53.1
L <sub>Aeq</sub> 24 hours		54.6	
L <sub>Adn</sub>		59.5	

*Sila Banjongjairuk*

(MR. SILA BANJONGJAIRUK)  
LABORATORY SUPERVISOR

MARCH 30, 2023

# คุณภาพน้ำผิวดิน

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## ระยะดำเนินการขุดเจาะ

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### ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.

**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900

**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecothai.net

**SAMPLING SOURCE** : 9SW8 (UTM WGS 84 ZONE 47P 732950E 1726696N)

**SAMPLE TYPE** : SURFACE WATER

**SAMPLING DATE** : SEPTEMBER 27, 2023

**SAMPLING TIME** : 08:30 HOUR

**SAMPLING METHOD** : GRAB

**SAMPLING BY** : MR. ACHITA SAENGJAN

**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : SEPTEMBER 27, 2023

**ANALYTICAL DATE** : SEPTEMBER 27 - OCTOBER 5, 2023

**REPORT NO.** : 2023-U086093

**WORK NO.** : 2022-010431

**ANALYSIS NO.** : T23AT204-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			9SW8 T23AT204-0001		
pH °	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H+ B)	6.8 (29°C)	5.0-9.0	-
ELECTRICAL CONDUCTIVITY °	µS/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	194 (29°C)	-	0.1
CHLORIDE °	mg/L Cl <sup>-</sup>	ARGENTOMETRIC METHOD (SM: PART 4500-Cl <sup>-</sup> B)	2.5	-	2.0
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	27.4	-	0.3
TOTAL PETROLEUM HYDROCARBONS °	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	0.0007	≤ 0.01	0.0003
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.005*, ≤ 0.05**	0.002
HEXAVALENT CHROMIUM °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 0.1	0.002
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.956	-	0.005
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.05	0.003
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.135	≤ 1.0	0.002
MERCURY °	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.002	0.0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			9SW8 T23AT204-0001		
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.005
TOTAL CHROMIUM °	mg/L Cr	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 1.0	0.003
<b>SAMPLE CONDITION</b>					
WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR BROWN		

° : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

° : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

° : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>RD</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>RD</sup> EDITION, 2017.

REGULATORY STANDARD : SURFACE WATER QUALITY STANDARDS CLASS 3, NOTIFICATION OF THE NATIONAL ENVIRONMENT 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 (1994).

CLASS 3 : MEDIUM CLEAN FRESH SURFACE WATER RESOURCES USED FOR

(1) CONSUMPTION, BUT PASSING THROUGH ON ORDINARY TREATMENT PROCESS BEFORE USING

(2) AGRICULTURE

≤ 0.005\* : WHEN WATER HARDNESS NOT MORE THAN 100 mg/L AS CaCO<sub>3</sub>

≤ 0.05\*\* : WHEN WATER HARDNESS MORE THAN 100 mg/L AS CaCO<sub>3</sub>

ND : NON-DETECTABLE

&lt; LOQ : &lt; LIMIT OF QUANTITATION (COPPER ≥ 0.002 AND &lt; 0.025 mg/L).



(MR. BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

OCTOBER 11, 2023



## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecoohai.net  
**SAMPLING SOURCE** : 9SW9 (UTM WGS 84 ZONE 47P 735449E 1726482N)  
**SAMPLE TYPE** : SURFACE WATER  
**SAMPLING DATE** : AUGUST 15, 2023  
**SAMPLING TIME** : 12:30 HOUR  
**SAMPLING METHOD** : GRAB  
**SAMPLING BY** : MR PORAWORN BUNNAG  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : AUGUST 16, 2023  
**ANALYTICAL DATE** : AUGUST 16-24, 2023  
**REPORT NO.** : 2023-U071111  
**WORK NO.** : 2022-010431  
**ANALYSIS NO.** : T23AP777-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			9SW9 T23AP777-0001		
pH	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H+ B)	6.1 (35°C)	5.0-9.0	-
ELECTRICAL CONDUCTIVITY	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	107 (35°C)	-	0.1
CHLORIDE	mg/L Cl <sup>-</sup>	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	ND	-	2.0
SULPHATE	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	5.1	-	0.3
TOTAL PETROLEUM HYDROCARBONS	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
IRON	mg/L Fe	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.670	-	0.005
TOTAL CHROMIUM	mg/L Cr	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
ARSENIC	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	ND	≤ 0.01	0.0003
CHROMIUM HEXAVALENT	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
MERCURY	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.002	0.0001
CADMIUM	mg/L Cd	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.005*, ≤ 0.05**	0.002
COPPER	mg/L Cu	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.002
LEAD	mg/L Pb	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.05	0.003

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			9SW9 T23AP777-0001		
MANGANESE	mg/L Mn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.376	≤ 1.0	0.002
NICKEL	mg/L Ni	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.005
ZINC	mg/L Zn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 1.0	0.003
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR BROWN		

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>RD</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>RD</sup> EDITION, 2017.

REGULATORY STANDARD : SURFACE WATER QUALITY STANDARDS CLASS 3, NOTIFICATION OF THE NATIONAL ENVIRONMENT 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 (1994).

CLASS 3 : MEDIUM CLEAN FRESH SURFACE WATER RESOURCES USED FOR  
(1) CONSUMPTION, BUT PASSING THROUGH ON ORDINARY TREATMENT PROCESS BEFORE USING  
(2) AGRICULTURE

≤ 0.005\* : WHEN WATER HARDNESS NOT MORE THAN 100 mg/L AS CaCO<sub>3</sub>

≤ 0.05\*\* : WHEN WATER HARDNESS MORE THAN 100 mg/L AS CaCO<sub>3</sub>

ND : NON-DETECTABLE.

*Bhuchonk p.*

(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

AUGUST 29, 2023



## ระยะดำเนินการผลิต

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### ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.

**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900

**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecothai.net

**SAMPLING SOURCE** : 9SW8 (UTM WGS 84 ZONE 47P 732950E 1726696N)

**SAMPLE TYPE** : SURFACE WATER

**SAMPLING DATE** : SEPTEMBER 27, 2023

**SAMPLING TIME** : 08:30 HOUR

**SAMPLING METHOD** : GRAB

**SAMPLING BY** : MR. ACHITA SAENGJAN

**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : SEPTEMBER 27, 2023

**ANALYTICAL DATE** : SEPTEMBER 27 - OCTOBER 5, 2023

**REPORT NO.** : 2023-U086093

**WORK NO.** : 2022-010431

**ANALYSIS NO.** : T23AT204-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			9SW8 T23AT204-0001		
pH °	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H+ B)	6.8 (29°C)	5.0-9.0	-
ELECTRICAL CONDUCTIVITY °	µS/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	194 (29°C)	-	0.1
CHLORIDE °	mg/L Cl <sup>-</sup>	ARGENTOMETRIC METHOD (SM: PART 4500-Cl <sup>-</sup> B)	2.5	-	2.0
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	27.4	-	0.3
TOTAL PETROLEUM HYDROCARBONS °	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
METALS					
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	0.0007	≤ 0.01	0.0003
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.005*, ≤ 0.05**	0.002
HEXAVALENT CHROMIUM °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr <sup>6+</sup> B)	ND	≤ 0.05	0.006
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 0.1	0.002
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.956	-	0.005
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.05	0.003
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.135	≤ 1.0	0.002
MERCURY °	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.002	0.0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			9SW8 T23AT204-0001		
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.005
TOTAL CHROMIUM °	mg/L Cr	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 1.0	0.003
SAMPLE CONDITION			YELLOW/CLEAR BROWN		
WATER'S COLOUR/TURBID SEDIMENT					

° : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

° : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

° : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>RD</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>RD</sup> EDITION, 2017.

REGULATORY STANDARD : SURFACE WATER QUALITY STANDARDS CLASS 3, NOTIFICATION OF THE NATIONAL ENVIRONMENT 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 (1994).

CLASS 3 : MEDIUM CLEAN FRESH SURFACE WATER RESOURCES USED FOR

(1) CONSUMPTION, BUT PASSING THROUGH ON ORDINARY TREATMENT PROCESS BEFORE USING

(2) AGRICULTURE

≤ 0.005\* : WHEN WATER HARDNESS NOT MORE THAN 100 mg/L AS CaCO<sub>3</sub>

≤ 0.05\*\* : WHEN WATER HARDNESS MORE THAN 100 mg/L AS CaCO<sub>3</sub>

ND : NON-DETECTABLE

&lt; LOQ : &lt; LIMIT OF QUANTITATION (COPPER ≥ 0.002 AND &lt; 0.025 mg/L).



(MR. BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

OCTOBER 11, 2023



## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecoohai.net  
**SAMPLING SOURCE** : 9SW9 (UTM WGS 84 ZONE 47P 735449E 1726482N)  
**SAMPLE TYPE** : SURFACE WATER  
**SAMPLING DATE** : AUGUST 15, 2023  
**SAMPLING TIME** : 12:30 HOUR  
**SAMPLING METHOD** : GRAB  
**SAMPLING BY** : MR PORAWORN BUNNAG  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : AUGUST 16, 2023  
**ANALYTICAL DATE** : AUGUST 16-24, 2023  
**REPORT NO.** : 2023-U071111  
**WORK NO.** : 2022-010431  
**ANALYSIS NO.** : T23AP777-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT 9SW9 T23AP777-0001	REGULATORY STANDARD	DETECTION LIMIT
pH	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H+ B)	6.1 (35°C)	5.0-9.0	-
ELECTRICAL CONDUCTIVITY	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	107 (35°C)	-	0.1
CHLORIDE	mg/L Cl <sup>-</sup>	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	ND	-	2.0
SULPHATE	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	5.1	-	0.3
TOTAL PETROLEUM HYDROCARBONS	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
IRON	mg/L Fe	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.670	-	0.005
TOTAL CHROMIUM	mg/L Cr	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
ARSENIC	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	ND	≤ 0.01	0.0003
CHROMIUM HEXVALENT	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
MERCURY	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.002	0.0001
CADMIUM	mg/L Cd	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.005*, ≤ 0.05**	0.002
COPPER	mg/L Cu	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.002
LEAD	mg/L Pb	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.05	0.003

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT 9SW9 T23AP777-0001	REGULATORY STANDARD	DETECTION LIMIT
MANGANESE	mg/L Mn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.376	≤ 1.0	0.002
NICKEL	mg/L Ni	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.005
ZINC	mg/L Zn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 1.0	0.003
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR BROWN		

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>RD</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>RD</sup> EDITION, 2017.

REGULATORY STANDARD : SURFACE WATER QUALITY STANDARDS CLASS 3, NOTIFICATION OF THE NATIONAL ENVIRONMENT 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 (1994).

CLASS 3 : MEDIUM CLEAN FRESH SURFACE WATER RESOURCES USED FOR  
(1) CONSUMPTION, BUT PASSING THROUGH ON ORDINARY TREATMENT PROCESS BEFORE USING  
(2) AGRICULTURE

≤ 0.005\* : WHEN WATER HARDNESS NOT MORE THAN 100 mg/L AS CaCO<sub>3</sub>

≤ 0.05\*\* : WHEN WATER HARDNESS MORE THAN 100 mg/L AS CaCO<sub>3</sub>

ND : NON-DETECTABLE.

*Bhuchonk p.*

(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

AUGUST 29, 2023





## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@eco.thai.net  
**SAMPLING SOURCE** : 9SW6 (19SW6) (UTM WGS 84 ZONE 47P 734859E 1722018N)  
**SAMPLE TYPE** : SURFACE WATER  
**SAMPLING DATE** : MARCH 29, 2023  
**SAMPLING TIME** : 10:00 HOUR  
**SAMPLING METHOD °** : GRAB  
**SAMPLING BY °** : MR. ACHITA SAENGJAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : MARCH 30, 2023  
**ANALYTICAL DATE** : MARCH 30-APRIL 17, 2023  
**REPORT NO.** : 2023-U027790  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF704-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			9SW6 (19SW6) T23AF704-0001		
pH °	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H <sup>+</sup> B)	7.9 (30°C)	5.0-9.0	-
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	109 (30°C)	-	0.1
CHLORIDE °	mg/L Cl <sup>-</sup>	ARGENTOMETRIC METHOD (SM: PART 4500-Cl <sup>-</sup> B)	2.4	-	2.0
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	5.0	-	0.3
TOTAL PETROLEUM HYDROCARBONS °	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	3.09	-	0.005
TOTAL CHROMIUM °	mg/L Cr	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	0.0006	≤ 0.01	0.0003
CHROMIUM HEXAVALENT °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
MERCURY °	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.002	0.0001
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.005*, ≤ 0.05**	0.002
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.002
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.05	0.003

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			9SW6 (19SW6) T23AF704-0001		
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.172	≤ 1.0	0.002
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 1.0	0.003
<b>SAMPLE CONDITION</b>					
WATER'S COLOUR/TURBID SEDIMENT			COLOURLESS/CLEAR YELLOW		

° : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

° : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

° : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : SURFACE WATER QUALITY STANDARDS CLASS 3, NOTIFICATION OF THE NATIONAL ENVIRONMENT 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 (1994).

CLASS 3 : MEDIUM CLEAN FRESH SURFACE WATER RESOURCES USED FOR  
(1) CONSUMPTION, BUT PASSING THROUGH ON ORDINARY TREATMENT PROCESS BEFORE USING  
(2) AGRICULTURE

≤ 0.005\* : WHEN WATER HARDNESS NOT MORE THAN 100 mg/L AS CaCO<sub>3</sub>

≤ 0.05\*\* : WHEN WATER HARDNESS MORE THAN 100 mg/L AS CaCO<sub>3</sub>

ND : NON-DETECTABLE.

< LOQ : < LIMIT OF QUANTITATION (ZINC ≥ 0.003 AND < 0.025 mg/L).

*Bhuchonk p.*

(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

APRIL 19, 2023





## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@eco-thai.net  
**SAMPLING SOURCE** : 9SW7 (19SW7) (UTM WGS 84 ZONE 47P 733933E 1724104N)  
**SAMPLE TYPE** : SURFACE WATER  
**SAMPLING DATE** : MARCH 29, 2023  
**SAMPLING TIME** : 13:30 HOUR  
**SAMPLING METHOD °** : GRAB  
**SAMPLING BY °** : MR. ACHITA SAENGJAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : MARCH 30, 2023  
**ANALYTICAL DATE** : MARCH 30-APRIL 17, 2023  
**REPORT NO.** : 2023-U027792  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF704-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			9SW7 (19SW7) T23AF704-0002		
pH °	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H+ B)	7.5 (32°C)	5.0-9.0	-
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	104 (32°C)	-	0.1
CHLORIDE °	mg/L Cl <sup>-</sup>	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	5.3	-	2.0
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	1.5	-	0.3
TOTAL PETROLEUM HYDROCARBONS °	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	5.43	-	0.005
TOTAL CHROMIUM °	mg/L Cr	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	0.0006	≤ 0.01	0.0003
CHROMIUM HEXAVALENT °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
MERCURY °	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.002	0.0001
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.005*, ≤ 0.05**	0.002
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.002
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.05	0.003

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			9SW7 (19SW7) T23AF704-0002		
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.675	≤ 1.0	0.002
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 1.0	0.003
<b>SAMPLE CONDITION</b>					
WATER'S COLOUR/TURBID			COLOURLESS/CLEAR		
SEDIMENT			YELLOW		

° : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

° : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

° : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : SURFACE WATER QUALITY STANDARDS CLASS 3, NOTIFICATION OF THE NATIONAL ENVIRONMENT 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 (1994).

CLASS 3 : MEDIUM CLEAN FRESH SURFACE WATER RESOURCES USED FOR  
(1) CONSUMPTION, BUT PASSING THROUGH ON ORDINARY TREATMENT PROCESS BEFORE USING  
(2) AGRICULTURE

≤ 0.005\* : WHEN WATER HARDNESS NOT MORE THAN 100 mg/L AS CaCO<sub>3</sub>

≤ 0.05\*\* : WHEN WATER HARDNESS MORE THAN 100 mg/L AS CaCO<sub>3</sub>

ND : NON-DETECTABLE

< LOQ : < LIMIT OF QUANTITATION (ZINC ≥ 0.003 AND < 0.025 mg/L).

*Bhuchonk p.*

(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

APRIL 19, 2023



## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@eco-thai.net  
**SAMPLING SOURCE** : INSESW3 (UTM WGS 84 ZONE 47P 734788E 1722885N)  
**SAMPLE TYPE** : SURFACE WATER  
**SAMPLING DATE** : MARCH 29, 2023  
**SAMPLING TIME** : 14:30 HOUR  
**SAMPLING METHOD** : GRAB  
**SAMPLING BY** : MR. ACHITA SAENGJAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : MARCH 30, 2023  
**ANALYTICAL DATE** : MARCH 30-APRIL 17, 2023  
**REPORT NO.** : 2023-U027802  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF704-0009

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			INSESW3 T23AF704-0009		
pH <sup>c</sup>	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H <sup>+</sup> B)	7.8 (32°C)	5.0-9.0	-
ELECTRICAL CONDUCTIVITY <sup>c</sup>	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	174 (32°C)	-	0.1
CHLORIDE <sup>a</sup>	mg/L Cl <sup>-</sup>	ARGENTOMETRIC METHOD (SM: PART 4500-Cl <sup>-</sup> B)	4.9	-	2.0
SULPHATE <sup>c</sup>	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	ND	-	0.3
TOTAL PETROLEUM HYDROCARBONS <sup>c</sup>	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
IRON <sup>c</sup>	mg/L Fe	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.866	-	0.005
TOTAL CHROMIUM <sup>c</sup>	mg/L Cr	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
ARSENIC <sup>c</sup>	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	ND	≤ 0.01	0.0003
CHROMIUM HEXAVALENT <sup>c</sup>	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
MERCURY <sup>c</sup>	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.002	0.0001
CADMIUM <sup>c</sup>	mg/L Cd	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.005*, ≤ 0.05**	0.002
COPPER <sup>c</sup>	mg/L Cu	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.002
LEAD <sup>c</sup>	mg/L Pb	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.05	0.003

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			INSESW3 T23AF704-0009		
MANGANESE <sup>c</sup>	mg/L Mn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.168	≤ 1.0	0.002
NICKEL <sup>c</sup>	mg/L Ni	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.005
ZINC <sup>c</sup>	mg/L Zn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 1.0	0.003
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			COLOURLESS/CLEAR YELLOW		

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : SURFACE WATER QUALITY STANDARDS CLASS 3, NOTIFICATION OF THE NATIONAL ENVIRONMENT 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 (1994).

CLASS 3 : MEDIUM CLEAN FRESH SURFACE WATER RESOURCES USED FOR  
(1) CONSUMPTION, BUT PASSING THROUGH ON ORDINARY TREATMENT PROCESS BEFORE USING  
(2) AGRICULTURE

≤ 0.005\* : WHEN WATER HARDNESS NOT MORE THAN 100 mg/L AS CaCO<sub>3</sub>

≤ 0.05\*\* : WHEN WATER HARDNESS MORE THAN 100 mg/L AS CaCO<sub>3</sub>

ND : NON-DETECTABLE.

*Bhuchonk p.*

(MR. BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

APRIL 19, 2023





## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@eco thai.net  
**SAMPLING SOURCE** : INSESW6 (UTM WGS 84 ZONE 47P 734945E 1723481N)  
**SAMPLE TYPE** : SURFACE WATER  
**SAMPLING DATE** : MARCH 29, 2023  
**SAMPLING TIME** : 11:30 HOUR  
**SAMPLING METHOD °** : GRAB  
**SAMPLING BY °** : MR. ACHITA SAENGJIAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : MARCH 30, 2023  
**ANALYTICAL DATE** : MARCH 30-APRIL 17, 2023  
**REPORT NO.** : 2023-U027803  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF704-0010

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			INSESW6 T23AF704-0010		
pH °	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H° B)	7.6 (32°C)	5.0-9.0	-
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	193 (32°C)	-	0.1
CHLORIDE °	mg/L Cl	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	5.8	-	2.0
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	ND	-	0.3
TOTAL PETROLEUM HYDROCARBONS °	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	1.12	-	0.005
TOTAL CHROMIUM °	mg/L Cr	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	0.0006	≤ 0.01	0.0003
CHROMIUM HEXAVALENT °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
MERCURY °	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.002	0.0001
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.005*, ≤ 0.05**	0.002
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.002
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.05	0.003

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			INSESW6 T23AF704-0010		
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.340	≤ 1.0	0.002
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 1.0	0.003
<b>SAMPLE CONDITION</b>					
WATER'S COLOUR/TURBID SEDIMENT			COLOURLESS/CLEAR YELLOW		

° : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

° : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

° : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : SURFACE WATER QUALITY STANDARDS CLASS 3, NOTIFICATION OF THE NATIONAL ENVIRONMENT 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 (1994).

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(2) AGRICULTURE

≤ 0.005\* : WHEN WATER HARDNESS NOT MORE THAN 100 mg/L AS CaCO<sub>3</sub>

≤ 0.05\*\* : WHEN WATER HARDNESS MORE THAN 100 mg/L AS CaCO<sub>3</sub>

ND : NON-DETECTABLE.

*Bhuchonk p.*

(MR. BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

APRIL 19, 2023





## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecothai.net  
**SAMPLING SOURCE** : INSESW7 (UTM WGS 84 ZONE 47P 735012E 1722203N)  
**SAMPLE TYPE** : SURFACE WATER  
**SAMPLING DATE** : MARCH 29, 2023  
**SAMPLING TIME** : 11:00 HOUR  
**SAMPLING METHOD °** : GRAB  
**SAMPLING BY °** : MR. ACHITA SAENGJAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : MARCH 30, 2023  
**ANALYTICAL DATE** : MARCH 30-APRIL 17, 2023  
**REPORT NO.** : 2023-U027794  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF704-0003

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			INSESW7 T23AF704-0003		
pH °	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H° B)	7.5 (3°C)	5.0-9.0	-
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	182 (3°C)	-	0.1
CHLORIDE °	mg/L Cl <sup>-</sup>	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	6.8	-	2.0
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	2.8	-	0.3
TOTAL PETROLEUM HYDROCARBONS °	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
METALS					
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	4.90	-	0.005
TOTAL CHROMIUM °	mg/L Cr	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	0.0011	≤ 0.01	0.0003
CHROMIUM HEXAVALENT °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
MERCURY °	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.002	0.0001
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.005*, ≤ 0.05**	0.002
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.002
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.05	0.003

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			INSESW7 T23AF704-0003		
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.450	≤ 1.0	0.002
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 1.0	0.003
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			COLOURLESS/CLEAR YELLOW		

° : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)  
° : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)  
° : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>RD</sup> EDITION, 2017.  
SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>RD</sup> EDITION, 2017.

REGULATORY STANDARD : SURFACE WATER QUALITY STANDARDS CLASS 3, NOTIFICATION OF THE NATIONAL ENVIRONMENT 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 (1994).

CLASS 3 : MEDIUM CLEAN FRESH SURFACE WATER RESOURCES USED FOR  
(1) CONSUMPTION, BUT PASSING THROUGH ON ORDINARY TREATMENT PROCESS BEFORE USING  
(2) AGRICULTURE

≤ 0.005\* : WHEN WATER HARDNESS NOT MORE THAN 100 mg/L AS CaCO<sub>3</sub>  
≤ 0.05\*\* : WHEN WATER HARDNESS MORE THAN 100 mg/L AS CaCO<sub>3</sub>  
ND : NON-DETECTABLE.

*Bhuchonk Panichlertumpi*  
(MR. BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

APRIL 19, 2023



## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecothai.net  
**SAMPLING SOURCE** : INSESWCON (UTM WGS 84 ZONE 47P 735916E 1722026N)  
**SAMPLE TYPE** : SURFACE WATER  
**SAMPLING DATE** : MARCH 29, 2023  
**SAMPLING TIME** : 10:30 HOUR  
**SAMPLING METHOD °** : GRAB  
**SAMPLING BY °** : MR ACHITA SAENGJAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : MARCH 30, 2023  
**ANALYTICAL DATE** : MARCH 30-APRIL 17, 2023  
**REPORT NO.** : 2023-U027795  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF704-0004

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT INSESWCON T23AF704-0004	REGULATORY STANDARD	DETECTION LIMIT
pH °	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H° B)	8.0 (32°C)	5.0-9.0	-
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	184 (32°C)	-	0.1
CHLORIDE °	mg/L Cl	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	9.2	-	2.0
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	ND	-	0.3
TOTAL PETROLEUM HYDROCARBONS °	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	1.89	-	0.005
TOTAL CHROMIUM °	mg/L Cr	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	0.0007	≤ 0.01	0.0003
CHROMIUM HEXAVALENT °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
MERCURY °	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.002	0.0001
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.005*, ≤ 0.05**	0.002
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.002
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.05	0.003

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT INSESWCON T23AF704-0004	REGULATORY STANDARD	DETECTION LIMIT
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.630	≤ 1.0	0.002
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 1.0	0.003
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR YELLOW		

° : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

° : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

° : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : SURFACE WATER QUALITY STANDARDS CLASS 3, NOTIFICATION OF THE NATIONAL ENVIRONMENT 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 (1994).

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≤ 0.005\* : WHEN WATER HARDNESS NOT MORE THAN 100 mg/L AS CaCO<sub>3</sub>

≤ 0.05\*\* : WHEN WATER HARDNESS MORE THAN 100 mg/L AS CaCO<sub>3</sub>

ND : NON-DETECTABLE.

*Bhuchonk p.*  
(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

APRIL 19, 2023





## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecothai.net  
**SAMPLING SOURCE** : INSESW1 (UTM WGS 84 ZONE 47P 734753E 1726133N)  
**SAMPLE TYPE** : SURFACE WATER  
**SAMPLING DATE** : MARCH 29, 2023  
**SAMPLING TIME** : 15:00 HOUR  
**SAMPLING METHOD** : GRAB  
**SAMPLING BY** : MR ACHITA SAENGJAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : MARCH 30, 2023  
**ANALYTICAL DATE** : MARCH 30-APRIL 17, 2023  
**REPORT NO.** : 2023-U027800  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF704-0007

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			INSESW1 T23AF704-0007		
pH <sup>c</sup>	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H <sup>+</sup> B)	8.2 (33°C)	5.0-9.0	-
ELECTRICAL CONDUCTIVITY <sup>c</sup>	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	187 (33°C)	-	0.1
CHLORIDE <sup>a</sup>	mg/L Cl <sup>-</sup>	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	2.9	-	2.0
SULPHATE <sup>c</sup>	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	ND	-	0.3
TOTAL PETROLEUM HYDROCARBONS <sup>c</sup>	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
IRON <sup>c</sup>	mg/L Fe	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.672	-	0.005
TOTAL CHROMIUM <sup>c</sup>	mg/L Cr	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
ARSENIC <sup>c</sup>	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	ND	≤ 0.01	0.0003
CHROMIUM HEXAVALENT <sup>c</sup>	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
MERCURY <sup>c</sup>	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.002	0.0001
CADMIUM <sup>c</sup>	mg/L Cd	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.005*, ≤ 0.05**	0.002
COPPER <sup>c</sup>	mg/L Cu	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.002
LEAD <sup>c</sup>	mg/L Pb	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.05	0.003

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			INSESW1 T23AF704-0007		
MANGANESE <sup>c</sup>	mg/L Mn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.025	≤ 1.0	0.002
NICKEL <sup>c</sup>	mg/L Ni	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.005
ZINC <sup>c</sup>	mg/L Zn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 1.0	0.003
<b>SAMPLE CONDITION</b>					
WATER'S COLOUR/TURBID SEDIMENT			COLOURLESS/CLEAR YELLOW		

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : SURFACE WATER QUALITY STANDARDS CLASS 3, NOTIFICATION OF THE NATIONAL ENVIRONMENT 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 (1994).

CLASS 3 : MEDIUM CLEAN FRESH SURFACE WATER RESOURCES USED FOR  
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(2) AGRICULTURE

≤ 0.005\* : WHEN WATER HARDNESS NOT MORE THAN 100 mg/L AS CaCO<sub>3</sub>

≤ 0.05\*\* : WHEN WATER HARDNESS MORE THAN 100 mg/L AS CaCO<sub>3</sub>

ND : NON-DETECTABLE.

*Bhuchonk p.*

(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

APRIL 19, 2023





## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@eco thai.net  
**SAMPLING SOURCE** : INSESW2 (UTM WGS 84 ZONE 47P 733530E 1725191N)  
**SAMPLE TYPE** : SURFACE WATER  
**SAMPLING DATE** : MARCH 29, 2023  
**SAMPLING TIME** : 14:00 HOUR  
**SAMPLING METHOD °** : GRAB  
**SAMPLING BY °** : MR. ACHITA SAENGJAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : MARCH 30, 2023  
**ANALYTICAL DATE** : MARCH 30-APRIL 17, 2023  
**REPORT NO.** : 2023-U027801  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF704-0008

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			INSESW2 T23AF704-0008		
pH °	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H+ B)	8.2 (32°C)	5.0-9.0	-
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	111 (32°C)	-	0.1
CHLORIDE °	mg/L Cl	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	9.2	-	2.0
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	2.7	-	0.3
TOTAL PETROLEUM HYDROCARBONS °	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	3.19	-	0.005
TOTAL CHROMIUM °	mg/L Cr	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	0.0007	≤ 0.01	0.0003
CHROMIUM HEXAVALENT °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
MERCURY °	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.002	0.0001
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.005*, ≤ 0.05**	0.002
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.002
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.05	0.003

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			INSESW2 T23AF704-0008		
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.482	≤ 1.0	0.002
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 1.0	0.003
<b>SAMPLE CONDITION</b>					
WATER'S COLOUR/TURBID SEDIMENT			COLOURLESS/CLEAR YELLOW		

\* : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

° : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

° : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : SURFACE WATER QUALITY STANDARDS CLASS 3, NOTIFICATION OF THE NATIONAL ENVIRONMENT 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 (1994).

CLASS 3 : MEDIUM CLEAN FRESH SURFACE WATER RESOURCES USED FOR  
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(2) AGRICULTURE

≤ 0.005\* : WHEN WATER HARDNESS NOT MORE THAN 100 mg/L AS CaCO<sub>3</sub>

≤ 0.05\*\* : WHEN WATER HARDNESS MORE THAN 100 mg/L AS CaCO<sub>3</sub>

ND : NON-DETECTABLE.

*Bhuchonk Panichlertumpi*

(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

APRIL 19, 2023



## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecoohai.net  
**SAMPLING SOURCE** : NSE-K-SW1 (UTM WGS 84 ZONE 47P 735066E 1720186N)  
**SAMPLE TYPE** : SURFACE WATER  
**SAMPLING DATE** : MARCH 29, 2023  
**SAMPLING TIME** : 09:30 HOUR  
**SAMPLING METHOD °** : GRAB  
**SAMPLING BY °** : MR. ACHITA SAENGJAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : MARCH 30, 2023  
**ANALYTICAL DATE** : MARCH 30-APRIL 17, 2023  
**REPORT NO.** : 2023-U027796  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF704-0005

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT NSE-K-SW1 T23AF704-0005	REGULATORY STANDARD	DETECTION LIMIT
pH °	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H+ B)	7.9 (31°C)	5.0-9.0	-
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	197 (31°C)	-	0.1
CHLORIDE °	mg/L Cl	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	8.3	-	2.0
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	24.2	-	0.3
TOTAL PETROLEUM HYDROCARBONS °	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	5.49	-	0.005
TOTAL CHROMIUM °	mg/L Cr	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	0.0003	≤ 0.01	0.0003
CHROMIUM HEXVALENT °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
MERCURY °	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.002	0.0001
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.005*, ≤ 0.05**	0.002
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.002
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.05	0.003

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT NSE-K-SW1 T23AF704-0005	REGULATORY STANDARD	DETECTION LIMIT
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.301	≤ 1.0	0.002
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 1.0	0.003
<b>SAMPLE CONDITION</b>					
WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR YELLOW		

° : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

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° : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : SURFACE WATER QUALITY STANDARDS CLASS 3, NOTIFICATION OF THE NATIONAL ENVIRONMENT 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 (1994).

CLASS 3 : MEDIUM CLEAN FRESH SURFACE WATER RESOURCES USED FOR  
(1) CONSUMPTION, BUT PASSING THROUGH ON ORDINARY TREATMENT PROCESS BEFORE USING  
(2) AGRICULTURE

≤ 0.005\* : WHEN WATER HARDNESS NOT MORE THAN 100 mg/L AS CaCO<sub>3</sub>

≤ 0.05\*\* : WHEN WATER HARDNESS MORE THAN 100 mg/L AS CaCO<sub>3</sub>

ND : NON-DETECTABLE.

< LOQ : < LIMIT OF QUANTITATION (ZINC ≥ 0.003 AND < 0.025 mg/L).

*Bhuchonk p.*

(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

APRIL 19, 2023





## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecothai.net  
**SAMPLING SOURCE** : NSE-K-SW2 (UTM WGS 84 ZONE 47P 735493E 1720157N)  
**SAMPLE TYPE** : SURFACE WATER  
**SAMPLING DATE** : MARCH 29, 2023  
**SAMPLING TIME** : 09:00 HOUR  
**SAMPLING METHOD °** : GRAB  
**SAMPLING BY °** : MR ACHITA SAENGJIAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : MARCH 30, 2023  
**ANALYTICAL DATE** : MARCH 30-APRIL 17, 2023  
**REPORT NO.** : 2023-U027798  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF704-0006

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT NSE-K-SW2 T23AF704-0006	REGULATORY STANDARD	DETECTION LIMIT
pH °	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H+ B)	8.4 (32°C)	5.0-9.0	-
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	231 (32°C)	-	0.1
CHLORIDE °	mg/L Cl <sup>-</sup>	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	3.9	-	2.0
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	16.8	-	0.3
TOTAL PETROLEUM HYDROCARBONS °	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.267	-	0.005
TOTAL CHROMIUM °	mg/L Cr	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	0.0003	≤ 0.01	0.0003
CHROMIUM HEXAVALENT °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
MERCURY °	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.002	0.0001
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.005*, ≤ 0.05**	0.002
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.002
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.05	0.003

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT NSE-K-SW2 T23AF704-0006	REGULATORY STANDARD	DETECTION LIMIT
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.026	≤ 1.0	0.002
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.1	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 1.0	0.003
<b>SAMPLE CONDITION</b>					
WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR YELLOW		

° : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

° : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

° : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : SURFACE WATER QUALITY STANDARDS CLASS 3, NOTIFICATION OF THE NATIONAL ENVIRONMENT 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 (1994).

CLASS 3 : MEDIUM CLEAN FRESH SURFACE WATER RESOURCES USED FOR  
(1) CONSUMPTION, BUT PASSING THROUGH ON ORDINARY TREATMENT PROCESS BEFORE USING  
(2) AGRICULTURE

≤ 0.005\* : WHEN WATER HARDNESS NOT MORE THAN 100 mg/L AS CaCO<sub>3</sub>

≤ 0.05\*\* : WHEN WATER HARDNESS MORE THAN 100 mg/L AS CaCO<sub>3</sub>

ND : NON-DETECTABLE

*Bhuchonk p.*

(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

APRIL 19, 2023





# คุณภาพน้ำใต้ดิน

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## ระยะดำเนินการขุดเจาะ

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## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@eco-thai.net  
**SAMPLING SOURCE** : MWNSEIC-1 (UTM WGS 84 ZONE 47P 733760E 1726652N)  
**SAMPLE TYPE** : GROUNDWATER  
**SAMPLING DATE** : AUGUST 15, 2023  
**SAMPLING TIME** : 13:55 HOUR  
**SAMPLING METHOD °** : SUBMERSIBLE PUMP  
**SAMPLING BY °** : MR PORAWORN BUNNAG  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : AUGUST 16, 2023  
**ANALYTICAL DATE** : AUGUST 16-24, 2023  
**REPORT NO.** : 2023-U071060  
**WORK NO.** : 2022-010431  
**ANALYSIS NO.** : T23AP778-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			MWNSEIC-1 T23AP778-0001		
pH °	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H+ B)	7.1 (30°C)	-	-
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	625 (30°C)	-	0.1
TOTAL PETROLEUM HYDROCARBONS °	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	2.6	-	0.3
CHLORIDE °	mg/L Cl <sup>-</sup>	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	3.9	-	2.0
<b>METALS</b>					
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	0.0007	≤ 0.01	0.0003
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.003	0.002
CHROMIUM °	mg/L Cr	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
HEXAVALENT CHROMIUM °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 10	0.002
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	1.72	-	0.005
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 0.01	0.003
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.201	≤ 0.5	0.002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			MWNSEIC-1 T23AP778-0001		
MERCURY °	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.001	0.0001
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.02	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.033	≤ 5.0	0.003
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR BROWN		

° : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

° : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

° : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : GROUNDWATER QUALITY STANDARDS, NOTIFICATION OF THE NATIONAL ENVIRONMENT BOARD NO.20 (B.E. 2543) ISSUED UNDER THE ENHANCEMENT AND CONSERVATION OF NATIONAL ENVIRONMENTAL QUALITY ACT B.E. 2535, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL. 117, SPECIAL PART 95D, DATED SEPTEMBER 15, B.E. 2543 (2000).

ND : NON-DETECTABLE

< LOQ : < LIMIT OF QUANTITATION (LEAD ≥ 0.003 AND < 0.100 mg/L).

*Bhuchonk P.*

(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

AUGUST 30, 2023





## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecothai.net  
**SAMPLING SOURCE** : MWNSEIC-2 (UTM WGS 84 ZONE 47P 733581E 1726648N)  
**SAMPLE TYPE** : GROUNDWATER  
**SAMPLING DATE** : AUGUST 15, 2023  
**SAMPLING TIME** : 14:15 HOUR  
**SAMPLING METHOD °** : SUBMERSIBLE PUMP  
**SAMPLING BY °** : MR PORAWORN BUNNAG  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : AUGUST 16, 2023  
**ANALYTICAL DATE** : AUGUST 16-25, 2023  
**REPORT NO.** : 2023-U071061  
**WORK NO.** : 2022-010431  
**ANALYSIS NO.** : T23AP778-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT MWNSEIC-2 T23AP778-0002	REGULATORY STANDARD	DETECTION LIMIT
pH °	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H+ B)	7.5 (30°C)	-	-
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	733 (30°C)	-	0.1
TOTAL PETROLEUM HYDROCARBONS °	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	4.4	-	0.3
CHLORIDE °	mg/L Cl <sup>-</sup>	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	2.5	-	2.0
<b>METALS</b>					
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	0.0006	≤ 0.01	0.0003
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.003	0.002
CHROMIUM °	mg/L Cr	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
HEXAVALENT CHROMIUM °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 1.0	0.002
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.930	-	0.005
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.122	≤ 0.01	0.003
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.053	≤ 0.5	0.002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT MWNSEIC-2 T23AP778-0002	REGULATORY STANDARD	DETECTION LIMIT
MERCURY °	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.001	0.0001
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.02	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 5.0	0.003
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR BROWN		

° : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

° : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

° : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : GROUNDWATER QUALITY STANDARDS, NOTIFICATION OF THE NATIONAL ENVIRONMENT BOARD NO.20 (B.E. 2543) ISSUED UNDER THE ENHANCEMENT AND CONSERVATION OF NATIONAL ENVIRONMENTAL QUALITY ACT B.E. 2535, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL. 117, SPECIAL PART 95D, DATED SEPTEMBER 15, B.E. 2543 (2000).

ND : NON-DETECTABLE.

< LOQ : < LIMIT OF QUANTITATION (COPPER ≥ 0.002 AND < 0.025 mg/L, ZINC ≥ 0.003 AND < 0.025 mg/L).

*Bhuchonk P.*

(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

AUGUST 30, 2023



## ระยะดำเนินการผลิต

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## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@eco-thai.net  
**SAMPLING SOURCE** : MWNSEIC-1 (UTM WGS 84 ZONE 47P 733760E 1726652N)  
**SAMPLE TYPE** : GROUNDWATER  
**SAMPLING DATE** : AUGUST 15, 2023  
**SAMPLING TIME** : 13:55 HOUR  
**SAMPLING METHOD °** : SUBMERSIBLE PUMP  
**SAMPLING BY °** : MR PORAWORN BUNNAG  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : AUGUST 16, 2023  
**ANALYTICAL DATE** : AUGUST 16-24, 2023  
**REPORT NO.** : 2023-U071060  
**WORK NO.** : 2022-010431  
**ANALYSIS NO.** : T23AP778-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			MWNSEIC-1 T23AP778-0001		
pH °	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H <sup>+</sup> B)	7.1 (30°C)	-	-
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	625 (30°C)	-	0.1
TOTAL PETROLEUM HYDROCARBONS °	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	2.6	-	0.3
CHLORIDE °	mg/L Cl <sup>-</sup>	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	3.9	-	2.0
<b>METALS</b>					
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	0.0007	≤ 0.01	0.0003
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.003	0.002
CHROMIUM °	mg/L Cr	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
HEXAVALENT CHROMIUM °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 10	0.002
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	1.72	-	0.005
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 0.01	0.003
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.201	≤ 0.5	0.002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			MWNSEIC-1 T23AP778-0001		
MERCURY °	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.001	0.0001
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.02	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.033	≤ 5.0	0.003
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR BROWN		

° : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

° : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

° : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : GROUNDWATER QUALITY STANDARDS, NOTIFICATION OF THE NATIONAL ENVIRONMENT BOARD NO.20 (B.E. 2543) ISSUED UNDER THE ENHANCEMENT AND CONSERVATION OF NATIONAL ENVIRONMENTAL QUALITY ACT B.E. 2535, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL. 117, SPECIAL PART 95D, DATED SEPTEMBER 15, B.E. 2543 (2000).

ND : NON-DETECTABLE

< LOQ : < LIMIT OF QUANTITATION (LEAD ≥ 0.003 AND < 0.100 mg/L).

*Bhuchonk P.*

(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

AUGUST 30, 2023



## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecothai.net  
**SAMPLING SOURCE** : MWNSEIC-2 (UTM WGS 84 ZONE 47P 733581E 1726648N)  
**SAMPLE TYPE** : GROUNDWATER  
**SAMPLING DATE** : AUGUST 15, 2023  
**SAMPLING TIME** : 14:15 HOUR  
**SAMPLING METHOD** : SUBMERSIBLE PUMP  
**SAMPLING BY** : MR PORAWORN BUNNAG  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : AUGUST 16, 2023  
**ANALYTICAL DATE** : AUGUST 16-25, 2023  
**REPORT NO.** : 2023-U071061  
**WORK NO.** : 2022-010431  
**ANALYSIS NO.** : T23AP778-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT MWNSEIC-2 T23AP778-0002	REGULATORY STANDARD	DETECTION LIMIT
pH °	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H+ B)	7.5 (30°C)	-	-
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	733 (30°C)	-	0.1
TOTAL PETROLEUM HYDROCARBONS °	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	4.4	-	0.3
CHLORIDE °	mg/L Cl <sup>-</sup>	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	2.5	-	2.0
<b>METALS</b>					
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	0.0006	≤ 0.01	0.0003
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.003	0.002
CHROMIUM °	mg/L Cr	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
HEXAVALENT CHROMIUM °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 1.0	0.002
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.930	-	0.005
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.122	≤ 0.01	0.003
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.053	≤ 0.5	0.002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT MWNSEIC-2 T23AP778-0002	REGULATORY STANDARD	DETECTION LIMIT
MERCURY °	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.001	0.0001
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.02	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 5.0	0.003
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR BROWN		

a : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

b : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

c : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : GROUNDWATER QUALITY STANDARDS, NOTIFICATION OF THE NATIONAL ENVIRONMENT BOARD NO.20 (B.E. 2543) ISSUED UNDER THE ENHANCEMENT AND CONSERVATION OF NATIONAL ENVIRONMENTAL QUALITY ACT B.E. 2535, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL. 117, SPECIAL PART 95D, DATED SEPTEMBER 15, B.E. 2543 (2000).

ND : NON-DETECTABLE.

< LOQ : < LIMIT OF QUANTITATION (COPPER ≥ 0.002 AND < 0.025 mg/L, ZINC ≥ 0.003 AND < 0.025 mg/L).

*Bhuchonk P.*

(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

AUGUST 30, 2023





## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecothai.net  
**SAMPLING SOURCE** : BR-GW1 (UTM WGS 84 ZONE 47P 733708E 1725856N)  
**SAMPLE TYPE** : GROUNDWATER  
**SAMPLING DATE** : MARCH 27, 2023  
**SAMPLING TIME** : 14:20 HOUR  
**SAMPLING METHOD** : GRAB  
**SAMPLING BY** : MR ACHITA SAENGJAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : MARCH 29, 2023  
**ANALYTICAL DATE** : MARCH 29 - APRIL 12, 2023  
**REPORT NO.** : 2023-U027392  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF564-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			BR-GW1 T23AF564-0001		
pH <sup>°</sup>	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H <sup>+</sup> B)	7.9 (35°C)	-	-
ELECTRICAL CONDUCTIVITY <sup>°</sup>	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	700 (35°C)	-	0.1
CHLORIDE <sup>a</sup>	mg/L Cl <sup>-</sup>	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	3.9	-	2.0
SULPHATE <sup>c</sup>	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	ND	-	0.3
TOTAL PETROLEUM HYDROCARBONS <sup>c</sup>	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
ARSENIC <sup>c</sup>	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	ND	≤ 0.01	0.0003
CADMIUM <sup>c</sup>	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.003	0.002
CHROMIUM <sup>c</sup>	mg/L Cr	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
CHROMIUM HEXAVALENT <sup>c</sup>	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
COPPER <sup>c</sup>	mg/L Cu	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 1.0	0.002
IRON <sup>c</sup>	mg/L Fe	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	-	0.005
LEAD <sup>c</sup>	mg/L Pb	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.01	0.003
MANGANESE <sup>c</sup>	mg/L Mn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 0.5	0.002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			BR-GW1 T23AF564-0001		
MERCURY <sup>c</sup>	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.001	0.0001
NICKEL <sup>c</sup>	mg/L Ni	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.02	0.005
ZINC <sup>c</sup>	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.053	≤ 5.0	0.003
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			COLOURLESS/CLEAR		

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : GROUNDWATER QUALITY STANDARDS, NOTIFICATION OF THE NATIONAL ENVIRONMENT BOARD NO 20 (B.E. 2543) ISSUED UNDER THE ENHANCEMENT AND CONSERVATION OF NATIONAL ENVIRONMENTAL QUALITY ACT B.E. 2535.

ND : NON-DETECTABLE.

< LOQ : < LIMIT OF QUANTITATION (COPPER ≥ 0.002 AND < 0.025 mg/L, IRON ≥ 0.005 AND < 0.050 mg/L, MANGANESE ≥ 0.002 AND < 0.025 mg/L).

*Benawan V.*

(MISS BENJAWAN VIRIYOTHA)  
LABORATORY SUPERVISOR

APRIL 18, 2023



### ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecothai.net  
**SAMPLING SOURCE** : BAN NONG BUA SCHOOL (UTM WGS 84 ZONE 47P 734156E 1727170N)  
**SAMPLE TYPE** : GROUNDWATER  
**SAMPLING DATE** : MARCH 27, 2023  
**SAMPLING TIME** : 13:50 HOUR  
**SAMPLING METHOD** : GRAB  
**SAMPLING BY** : MR. ACHITA SAENGJAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : MARCH 29, 2023  
**ANALYTICAL DATE** : MARCH 29 - APRIL 12, 2023  
**REPORT NO.** : 2023-U027393  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF564-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			BAN NONG BUA SCHOOL T23AF564-0002		
pH <sup>c</sup>	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H <sup>+</sup> B)	7.6 (33°C)	-	-
ELECTRICAL CONDUCTIVITY <sup>c</sup>	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	1,960 (33°C)	-	0.1
CHLORIDE <sup>a</sup>	mg/L Cl	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	81.6	-	2.0
SULPHATE <sup>c</sup>	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	1.5	-	0.3
TOTAL PETROLEUM HYDROCARBONS <sup>c</sup>	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
ARSENIC <sup>c</sup>	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	ND	≤ 0.01	0.0003
CADMIUM <sup>c</sup>	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.003	0.002
CHROMIUM <sup>c</sup>	mg/L Cr	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
CHROMIUM HEXAVALENT <sup>c</sup>	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
COPPER <sup>c</sup>	mg/L Cu	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 1.0	0.002
IRON <sup>c</sup>	mg/L Fe	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.253	-	0.005
LEAD <sup>c</sup>	mg/L Pb	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.01	0.003
MANGANESE <sup>c</sup>	mg/L Mn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.153	≤ 0.5	0.002



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			BAN NONG BUA SCHOOL T23AF564-0002		
MERCURY <sup>b</sup>	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	< LOQ	≤ 0.001	0.0001
NICKEL <sup>c</sup>	mg/L Ni	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.02	0.005
ZINC <sup>c</sup>	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 5.0	0.003
<b>SAMPLE CONDITION</b>					
WATER'S COLOUR/TURBID			COLOURLESS/CLEAR		
SEDIMENT			BROWN		

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : GROUNDWATER QUALITY STANDARDS, NOTIFICATION OF THE NATIONAL ENVIRONMENT BOARD NO.20 (B.E. 2543) ISSUED UNDER THE ENHANCEMENT AND CONSERVATION OF NATIONAL ENVIRONMENTAL QUALITY ACT B.E. 2535.

ND : NON-DETECTABLE.

&lt; LOQ : &lt; LIMIT OF QUANTITATION (COPPER ≥ 0.002 AND &lt; 0.025 mg/L, MERCURY ≥ 0.0001 AND &lt; 0.0005 mg/L, ZINC ≥ 0.003 AND &lt; 0.025 mg/L).



(MISS BENJAWAN VIRIYOTHAJ)  
LABORATORY SUPERVISOR

APRIL 18, 2023



## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecothai.net  
**SAMPLING SOURCE** : 9GW3 (UTM WGS 84 ZONE 47P 735839E 1719777N)  
**SAMPLE TYPE** : GROUNDWATER  
**SAMPLING DATE** : MARCH 27, 2023  
**SAMPLING TIME** : 14:40 HOUR  
**SAMPLING METHOD** : GRAB  
**SAMPLING BY** : MR ACHITA SAENGJAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : MARCH 29, 2023  
**ANALYTICAL DATE** : MARCH 29 - APRIL 12, 2023  
**REPORT NO.** : 2023-U027394  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF564-0003

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			9GW3 T23AF564-0003		
pH °	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H+ B)	7.3 (3°C)	-	-
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	289 (3°C)	-	0.1
CHLORIDE *	mg/L Cl	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	22.8	-	2.0
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	ND	-	0.3
TOTAL PETROLEUM HYDROCARBONS °	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	ND	≤ 0.01	0.0003
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.003	0.002
CHROMIUM °	mg/L Cr	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
CHROMIUM HEXAVALENT °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.038	≤ 1.0	0.002
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	9.59	-	0.005
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 0.01	0.003
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.212	≤ 0.5	0.002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			9GW3 T23AF564-0003		
MERCURY °	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.001	0.0001
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.02	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	5.48	≤ 5.0	0.003
<b>SAMPLE CONDITION</b>					
WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR BROWN		

\* : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)  
° : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)  
° : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.  
SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.  
REGULATORY STANDARD : GROUNDWATER QUALITY STANDARDS, NOTIFICATION OF THE NATIONAL ENVIRONMENT BOARD NO 20 (B.E. 2543) ISSUED UNDER THE ENHANCEMENT AND CONSERVATION OF NATIONAL ENVIRONMENTAL QUALITY ACT B.E. 2535.

ND : NON-DETECTABLE.  
< LOQ : < LIMIT OF QUANTITATION (LEAD ≥ 0.003 AND < 0.100 mg/L).

*Benawan V.*

(MISS BENJAWAN VIRIYOTHAJ)  
LABORATORY SUPERVISOR

APRIL 18, 2023



## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@eco-thai.net  
**SAMPLING SOURCE** : KHLONG MUANG MEDITATION (UTM WGS 84 ZONE 47P 734296E 1722806N)  
**SAMPLE TYPE** : GROUNDWATER  
**SAMPLING DATE** : MARCH 27, 2023  
**SAMPLING TIME** : 15:10 HOUR  
**SAMPLING METHOD** : GRAB  
**SAMPLING BY** : MR. ACHITA SAENGJAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : MARCH 29, 2023  
**ANALYTICAL DATE** : MARCH 29 - APRIL 12, 2023  
**REPORT NO.** : 2023-U027395  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF564-0004

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			KHLONG MUANG MEDITATION T23AF564-0004		
pH °	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H+ B)	7.5 (32°C)	-	-
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	937 (32°C)	-	0.1
CHLORIDE °	mg/L Cl	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	4.4	-	2.0
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	ND	-	0.3
TOTAL PETROLEUM HYDROCARBONS °	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	0.0008	≤ 0.01	0.0003
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.003	0.002
CHROMIUM °	mg/L Cr	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
CHROMIUM HEXAVALENT °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 1.0	0.002
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.01	0.003
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 0.5	0.002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			KHLONG MUANG MEDITATION T23AF564-0004		
MERCURY °	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.001	0.0001
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.02	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 5.0	0.003
<b>SAMPLE CONDITION</b>					
WATER'S COLOUR/TURBID SEDIMENT			COLOURLESS/CLEAR		

° : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

° : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

° : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>RD</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>RD</sup> EDITION, 2017.

REGULATORY STANDARD : GROUNDWATER QUALITY STANDARDS, NOTIFICATION OF THE NATIONAL ENVIRONMENT BOARD NO 20 (B.E. 2543) ISSUED UNDER THE ENHANCEMENT AND CONSERVATION OF NATIONAL ENVIRONMENTAL QUALITY ACT B.E. 2535.

ND : NON-DETECTABLE.

< LOQ : < LIMIT OF QUANTITATION (MANGANESE ≥ 0.002 AND < 0.025 mg/L).

*Benjawan V.*

(MISS BENJAWAN VIRIYOTHAI)  
LABORATORY SUPERVISOR

APRIL 18, 2023





## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@eco thai.net  
**SAMPLING SOURCE** : MWNSB-1 (UTM WGS 84 ZONE 47P 734768E 1722999N)  
**SAMPLE TYPE** : GROUNDWATER  
**SAMPLING DATE** : MARCH 28, 2023  
**SAMPLING TIME** : 13:10 HOUR  
**SAMPLING METHOD** : SUBMERSIBLE PUMP  
**SAMPLING BY** : MR. ACHITA SAENGJAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : MARCH 29, 2023  
**ANALYTICAL DATE** : MARCH 29 - APRIL 17, 2023  
**REPORT NO.** : 2023-U027827  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF667-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT MWNSB-1 T23AF667-0001	REGULATORY STANDARD	DETECTION LIMIT
pH	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H <sup>+</sup> B)	7.4 (31°C)	-	-
ELECTRICAL CONDUCTIVITY	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	670 (31°C)	-	0.1
CHLORIDE	mg/L Cl <sup>-</sup>	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	ND	-	2.0
SULPHATE	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	3.8	-	0.3
TOTAL PETROLEUM HYDROCARBONS	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
CHROMIUM	mg/L Cr	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
CHROMIUM HEXAVALENT	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
ARSENIC	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	ND	≤ 0.01	0.0003
CADMIUM	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.003	0.002
COPPER	mg/L Cu	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 1.0	0.002
LEAD	mg/L Pb	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.01	0.003
MANGANESE	mg/L Mn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 0.5	0.002
IRON	mg/L Fe	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.076	-	0.005



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT MWNSB-1 T23AF667-0001	REGULATORY STANDARD	DETECTION LIMIT
NICKEL	mg/L Ni	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.02	0.005
ZINC	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 5.0	0.003
MERCURY	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.001	0.0001
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR BROWN		

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.  
SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.  
REGULATORY STANDARD : GROUNDWATER QUALITY STANDARDS, NOTIFICATION OF THE NATIONAL ENVIRONMENT BOARD NO.20 (B.E. 2543) ISSUED UNDER THE ENHANCEMENT AND CONSERVATION OF NATIONAL ENVIRONMENTAL QUALITY ACT B.E. 2535.  
ND : NON-DETECTABLE.  
< LOQ : < LIMIT OF QUANTITATION (MANGANESE ≥ 0.002 AND < 0.025 mg/L, ZINC ≥ 0.003 AND < 0.025 mg/L).

*Bhuchonk p.*

(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

APRIL 19, 2023

## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecothai.net  
**SAMPLING SOURCE** : MWNSB-2 (UTM WGS 84 ZONE 47P 734700E 1723002N)  
**SAMPLE TYPE** : GROUNDWATER  
**SAMPLING DATE** : MARCH 28, 2023  
**SAMPLING TIME** : 13:50 HOUR  
**SAMPLING METHOD °** : SUBMERSIBLE PUMP  
**SAMPLING BY °** : MR. ACHITA SAENGJAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : MARCH 29, 2023  
**ANALYTICAL DATE** : MARCH 29 - APRIL 17, 2023  
**REPORT NO.** : 2023-U027828  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF667-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT MWNSB-2 T23AF667-0002	REGULATORY STANDARD	DETECTION LIMIT
pH °	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H <sup>+</sup> B)	7.5 (32°C)	-	-
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	440 (32°C)	-	0.1
CHLORIDE °	mg/L Cl <sup>-</sup>	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	2.9	-	2.0
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	2.8	-	0.3
TOTAL PETROLEUM HYDROCARBONS °	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
METALS					
CHROMIUM °	mg/L Cr	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
CHROMIUM HEXAVALENT °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	0.0003	≤ 0.01	0.0003
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.003	0.002
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 1.0	0.002
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.01	0.003
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	1.79	≤ 0.5	0.002
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	1.61	-	0.005

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT MWNSB-2 T23AF667-0002	REGULATORY STANDARD	DETECTION LIMIT
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.02	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 5.0	0.003
MERCURY °	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.001	0.0001
SAMPLE CONDITION WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR BROWN		

° : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

° : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

° : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : GROUNDWATER QUALITY STANDARDS, NOTIFICATION OF THE NATIONAL ENVIRONMENT BOARD NO.20 (B.E. 2543)  
ISSUED UNDER THE ENHANCEMENT AND CONSERVATION OF NATIONAL ENVIRONMENTAL QUALITY ACT B.E. 2535.

ND : NON-DETECTABLE

*Bhuchonk p.*

(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

APRIL 19, 2023





## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@eco thai.net  
**SAMPLING SOURCE** : MWNSEC-1 (UTM WGS 84 ZONE 47P 735704E 1722526N)  
**SAMPLE TYPE** : GROUNDWATER  
**SAMPLING DATE** : MARCH 28, 2023  
**SAMPLING TIME** : 10:10 HOUR  
**SAMPLING METHOD** : SUBMERSIBLE PUMP  
**SAMPLING BY** : MR. ACHITA SAENGJAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : MARCH 29, 2023  
**ANALYTICAL DATE** : MARCH 29 - APRIL 17, 2023  
**REPORT NO.** : 2023-U027829  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF667-0003

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			MWNSEC-1 T23AF667-0003		
pH	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H <sup>+</sup> B)	7.1 (31°C)	-	-
ELECTRICAL CONDUCTIVITY	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	843 (31°C)	-	0.1
CHLORIDE	mg/L Cl	ARGENTOMETRIC METHOD (SM: PART 4500-Cl <sup>-</sup> B)	ND	-	2.0
SULPHATE	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	ND	-	0.3
TOTAL PETROLEUM HYDROCARBONS	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
METALS					
CHROMIUM	mg/L Cr	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
CHROMIUM HEXAVALENT	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
ARSENIC	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	ND	≤ 0.01	0.0003
CADMIUM	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.003	0.002
COPPER	mg/L Cu	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 1.0	0.002
LEAD	mg/L Pb	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.01	0.003
MANGANESE	mg/L Mn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.025	≤ 0.5	0.002
IRON	mg/L Fe	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.883	-	0.005

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			MWNSEC-1 T23AF667-0003		
NICKEL	mg/L Ni	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.02	0.005
ZINC	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 5.0	0.003
MERCURY	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.001	0.0001
SAMPLE CONDITION WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR BROWN		

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>RD</sup> EDITION, 2017.  
SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>RD</sup> EDITION, 2017.  
REGULATORY STANDARD : GROUNDWATER QUALITY STANDARDS, NOTIFICATION OF THE NATIONAL ENVIRONMENT BOARD NO.20 (B.E. 2543) ISSUED UNDER THE ENHANCEMENT AND CONSERVATION OF NATIONAL ENVIRONMENTAL QUALITY ACT B.E. 2535.  
ND : NON-DETECTABLE.

*Bhuchonk p.*  
(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

APRIL 19, 2023



## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@eco-thai.net  
**SAMPLING SOURCE** : MWNSEC-2 (UTM WGS 84 ZONE 47P 735624E 1722518N)  
**SAMPLE TYPE** : GROUNDWATER  
**SAMPLING DATE** : MARCH 28, 2023  
**SAMPLING TIME** : 10:30 HOUR  
**SAMPLING METHOD** : SUBMERSIBLE PUMP  
**SAMPLING BY** : MR. ACHITA SAENGJIAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : MARCH 29, 2023  
**ANALYTICAL DATE** : MARCH 29 - APRIL 17, 2023  
**REPORT NO.** : 2023-U027830  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF667-0004

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT MWNSEC-2 T23AF667-0004	REGULATORY STANDARD	DETECTION LIMIT
pH	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H <sup>+</sup> B)	7.1 (32°C)	-	-
ELECTRICAL CONDUCTIVITY	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	1,080 (32°C)	-	0.1
CHLORIDE	mg/L Cl <sup>-</sup>	ARGENTOMETRIC METHOD (SM: PART 4500-Cl <sup>-</sup> B)	ND	-	2.0
SULPHATE	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	12.4	-	0.3
TOTAL PETROLEUM HYDROCARBONS	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
CHROMIUM	mg/L Cr	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	-	0.005
CHROMIUM HEXAVALENT	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
ARSENIC	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	ND	≤ 0.01	0.0003
CADMIUM	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.003	0.002
COPPER	mg/L Cu	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 1.0	0.002
LEAD	mg/L Pb	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.01	0.003
MANGANESE	mg/L Mn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.120	≤ 0.5	0.002
IRON	mg/L Fe	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	112	-	0.005



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT MWNSEC-2 T23AF667-0004	REGULATORY STANDARD	DETECTION LIMIT
NICKEL	mg/L Ni	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.02	0.005
ZINC	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.026	≤ 5.0	0.003
MERCURY	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.001	0.0001
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			YELLOW/TURBID BROWN		

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.  
SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.  
REGULATORY STANDARD : GROUNDWATER QUALITY STANDARDS, NOTIFICATION OF THE NATIONAL ENVIRONMENT BOARD NO.20 (B.E. 2543) ISSUED UNDER THE ENHANCEMENT AND CONSERVATION OF NATIONAL ENVIRONMENTAL QUALITY ACT B.E. 2535.  
ND : NON-DETECTABLE.  
< LOQ : < LIMIT OF QUANTITATION (CHROMIUM ≥ 0.005 AND < 0.050 mg/L, COPPER ≥ 0.002 AND < 0.025 mg/L).

*Bhuchonk p.*  
(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

APRIL 19, 2023



## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecothai.net  
**SAMPLING SOURCE** : MWNSEF-1 (UTM WGS 84 ZONE 47P 736247E 1722957N)  
**SAMPLE TYPE** : GROUNDWATER  
**SAMPLING DATE** : MARCH 28, 2023  
**SAMPLING TIME** : 11:15 HOUR  
**SAMPLING METHOD °** : SUBMERSIBLE PUMP  
**SAMPLING BY °** : MR ACHITA SAENGJIAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : MARCH 29, 2023  
**ANALYTICAL DATE** : MARCH 29 - APRIL 17, 2023  
**REPORT NO.** : 2023-U027835  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF667-0009

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT MWNSEF-1 T23AF667-0009	REGULATORY STANDARD	DETECTION LIMIT
pH °	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H° B)	6.5 (29°C)	-	-
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	262 (29°C)	-	0.1
CHLORIDE °	mg/L Cl	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	16.5	-	2.0
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	1.6	-	0.3
TOTAL PETROLEUM HYDROCARBONS °	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
CHROMIUM °	mg/L Cr	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
CHROMIUM HEXAVALENT °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	0.0033	≤ 0.01	0.0003
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.003	0.002
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 1.0	0.002
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.01	0.003
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.514	≤ 0.5	0.002
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	9.88	-	0.005

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT MWNSEF-1 T23AF667-0009	REGULATORY STANDARD	DETECTION LIMIT
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.02	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 5.0	0.003
MERCURY °	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.001	0.0001
<b>SAMPLE CONDITION</b>					
WATER'S COLOUR/TURBID			YELLOW/TURBID		
SEDIMENT			BROWN		

° : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

° : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

° : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>RD</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>RD</sup> EDITION, 2017.

REGULATORY STANDARD : GROUNDWATER QUALITY STANDARDS, NOTIFICATION OF THE NATIONAL ENVIRONMENT BOARD NO 20 (B.E. 2543) ISSUED UNDER THE ENHANCEMENT AND CONSERVATION OF NATIONAL ENVIRONMENTAL QUALITY ACT B.E. 2535.

ND : NON-DETECTABLE.

< LOQ : < LIMIT OF QUANTITATION (COPPER ≥ 0.002 AND < 0.025 mg/L, ZINC ≥ 0.003 AND < 0.025 mg/L).

*Bhuchonk P.*

(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

APRIL 19, 2023



## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecoohai.net  
**SAMPLING SOURCE** : MWNSF-2 (UTM WGS 84 ZONE 47P 736371E 1722975N)  
**SAMPLE TYPE** : GROUNDWATER  
**SAMPLING DATE** : MARCH 28, 2023  
**SAMPLING TIME** : 10:45 HOUR  
**SAMPLING METHOD °** : SUBMERSIBLE PUMP  
**SAMPLING BY °** : MR ACHITA SAENGJAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : MARCH 29, 2023  
**ANALYTICAL DATE** : MARCH 29 - APRIL 17, 2023  
**REPORT NO.** : 2023-U027836  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF667-0010

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT MWNSF-2 T23AF667-0010	REGULATORY STANDARD	DETECTION LIMIT
pH °	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H <sup>+</sup> B)	7.0 (3°C)	-	-
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	520 (3°C)	-	0.1
CHLORIDE °	mg/L Cl <sup>-</sup>	ARGENTOMETRIC METHOD (SM: PART 4500-Cl <sup>-</sup> B)	9.7	-	2.0
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	ND	-	0.3
TOTAL PETROLEUM HYDROCARBONS °	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
CHROMIUM °	mg/L Cr	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
CHROMIUM HEXAVALENT °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	0.0065	≤ 0.01	0.0003
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.003	0.002
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 1.0	0.002
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 0.01	0.003
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	1.25	≤ 0.5	0.002
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	19.0	-	0.005

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT MWNSF-2 T23AF667-0010	REGULATORY STANDARD	DETECTION LIMIT
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.02	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 5.0	0.003
MERCURY °	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.001	0.0001
<b>SAMPLE CONDITION</b>					
WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR BROWN		

\* : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

° : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

° : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : GROUNDWATER QUALITY STANDARDS, NOTIFICATION OF THE NATIONAL ENVIRONMENT BOARD NO.20 (B.E. 2543) ISSUED UNDER THE ENHANCEMENT AND CONSERVATION OF NATIONAL ENVIRONMENTAL QUALITY ACT B.E. 2535.

ND : NON-DETECTABLE.

< LOQ : < LIMIT OF QUANTITATION (LEAD ≥ 0.003 AND < 0.100 mg/L).

*Bhuchonk P.*

(MR BHUCHONK PANICHLETHUMPI)  
LABORATORY SUPERVISOR

APRIL 19, 2023





## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecothai.net  
**SAMPLING SOURCE** : MWL44G-1 (UTM WGS 84 ZONE 47P 734539E 1725454N)  
**SAMPLE TYPE** : GROUNDWATER  
**SAMPLING DATE** : MARCH 28, 2023  
**SAMPLING TIME** : 09:30 HOUR  
**SAMPLING METHOD °** : SUBMERSIBLE PUMP  
**SAMPLING BY °** : MR ACHITA SAENGJAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : MARCH 29, 2023  
**ANALYTICAL DATE** : MARCH 29 - APRIL 17, 2023  
**REPORT NO.** : 2023-U027831  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF667-0005

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			MWL44G-1 T23AF667-0005		
pH °	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H+ B)	6.5 (32°C)	-	-
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	298 (32°C)	-	0.1
CHLORIDE °	mg/L Cl	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	4.4	-	2.0
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	1.2	-	0.3
TOTAL PETROLEUM HYDROCARBONS °	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
CHROMIUM °	mg/L Cr	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
CHROMIUM HEXAVALENT °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	ND	≤ 0.01	0.0003
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.003	0.002
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 1.0	0.002
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.01	0.003
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	2.63	≤ 0.5	0.002
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	17.7	-	0.005

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			MWL44G-1 T23AF667-0005		
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.02	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 5.0	0.003
MERCURY °	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.001	0.0001
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			YELLOW/TURBID BROWN		

° : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

° : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

° : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : GROUNDWATER QUALITY STANDARDS, NOTIFICATION OF THE NATIONAL ENVIRONMENT BOARD NO.20 (B.E. 2543) ISSUED UNDER THE ENHANCEMENT AND CONSERVATION OF NATIONAL ENVIRONMENTAL QUALITY ACT B.E. 2535.

ND : NON-DETECTABLE.

< LOQ : < LIMIT OF QUANTITATION (COPPER ≥ 0.002 AND < 0.025 mg/L, ZINC ≥ 0.003 AND < 0.025 mg/L).

*Bhuchonk p.*

(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

APRIL 19, 2023



## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecothai.net  
**SAMPLING SOURCE** : MWL44G-2 (UTM WGS 84 ZONE 47P 734456E 1725445N)  
**SAMPLE TYPE** : GROUNDWATER  
**SAMPLING DATE** : MARCH 28, 2023  
**SAMPLING TIME** : 10:00 HOUR  
**SAMPLING METHOD °** : SUBMERSIBLE PUMP  
**SAMPLING BY °** : MR. ACHITA SAENGJAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : MARCH 29, 2023  
**ANALYTICAL DATE** : MARCH 29 - APRIL 17, 2023  
**REPORT NO.** : 2023-U027832  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF667-0006

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT MWL44G-2 T23AF667-0006	REGULATORY STANDARD	DETECTION LIMIT
pH °	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H+ B)	6.9 (32°C)	-	-
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	925 (32°C)	-	0.1
CHLORIDE °	mg/L Cl <sup>-</sup>	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	34.0	-	2.0
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	ND	-	0.3
TOTAL PETROLEUM HYDROCARBONS °	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
CHROMIUM °	mg/L Cr	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
CHROMIUM HEXAVALENT °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	0.0034	≤ 0.01	0.0003
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.003	0.002
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 1.0	0.002
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.01	0.003
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.678	≤ 0.5	0.002
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	2.08	-	0.005

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT MWL44G-2 T23AF667-0006	REGULATORY STANDARD	DETECTION LIMIT
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.02	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 5.0	0.003
MERCURY °	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.001	0.0001
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR BROWN		

\* : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

° : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

° : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : GROUNDWATER QUALITY STANDARDS, NOTIFICATION OF THE NATIONAL ENVIRONMENT BOARD NO.20 (B.E. 2543) ISSUED UNDER THE ENHANCEMENT AND CONSERVATION OF NATIONAL ENVIRONMENTAL QUALITY ACT B.E. 2535.

ND : NON-DETECTABLE.

*Bhuchonk p.*

(MR. BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

APRIL 19, 2023





## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecoathai.net  
**SAMPLING SOURCE** : MWNSE-K (UP GRADIENT) (UTM WGS 84 ZONE 47P 735133E 1720262N)  
**SAMPLE TYPE** : GROUNDWATER  
**SAMPLING DATE** : MARCH 28, 2023  
**SAMPLING TIME** : 12:10 HOUR  
**SAMPLING METHOD °** : SUBMERSIBLE PUMP  
**SAMPLING BY °** : MR ACHITA SAENGJAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

**RECEIVED DATE** : MARCH 29, 2023  
**ANALYTICAL DATE** : MARCH 29 - APRIL 17, 2023  
**REPORT NO.** : 2023-U027833  
**WORK NO.** : 2023-001910  
**ANALYSIS NO.** : T23AF667-0007

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT MWNSE-K (UP GRADIENT) T23AF667-0007	REGULATORY STANDARD	DETECTION LIMIT
pH °	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H° B)	7.1 (3°C)	-	-
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	416 (3°C)	-	0.1
CHLORIDE °	mg/L Cl <sup>-</sup>	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	7.3	-	2.0
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	16.9	-	0.3
TOTAL PETROLEUM HYDROCARBONS °	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
CHROMIUM °	mg/L Cr	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
CHROMIUM HEXAVALENT °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	ND	≤ 0.01	0.0003
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.003	0.002
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 1.0	0.002
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	< LOQ	≤ 0.01	0.003
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.073	≤ 0.5	0.002
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.130	-	0.005

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT MWNSE-K (UP GRADIENT) T23AF667-0007	REGULATORY STANDARD	DETECTION LIMIT
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.02	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 5.0	0.003
MERCURY °	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.001	0.0001
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR BROWN		

a : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

b : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

c : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : GROUNDWATER QUALITY STANDARDS, NOTIFICATION OF THE NATIONAL ENVIRONMENT BOARD NO.20 (B.E. 2543)  
ISSUED UNDER THE ENHANCEMENT AND CONSERVATION OF NATIONAL ENVIRONMENTAL QUALITY ACT B.E. 2535.

ND : NON-DETECTABLE.

< LOQ : < LIMIT OF QUANTITATION (LEAD ≥ 0.003 AND < 0.100 mg/L).

*Bhuchonk p.*

(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

APRIL 19, 2023



## ANALYSIS REPORT

**CUSTOMER NAME** : ECO ORIENT RESOURCES (THAILAND) LTD.  
**ADDRESS** : 555 RASA TOWER II, 12TH FLOOR, UNIT 1203 PHAHOLYOTHIN ROAD CHATUCHAK CHATUCHAK BANGKOK 10900  
**CONTACT INFORMATION** : TEL : 0 2937 1124-9 e-mail : anucha@ecothai.net  
**SAMPLING SOURCE** : MWNSE-K (DOWN GRADIENT) (UTM WGS 84 ZONE 47P 735274E 1720334N)  
**SAMPLE TYPE** : GROUNDWATER  
**SAMPLING DATE** : MARCH 28, 2023  
**SAMPLING TIME** : 11:30 HOUR  
**SAMPLING METHOD** : SUBMERSIBLE PUMP  
**SAMPLING BY** : MR ACHITA SAENGJAN  
**ANALYZED BY** : MISS KEWALEE SUKHAREE

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT MWNSE-K (DOWN GRADIENT) T23AF667-0008	REGULATORY STANDARD	DETECTION LIMIT
pH	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H+ B)	7.4 (32°C)	-	-
ELECTRICAL CONDUCTIVITY	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: PART 2510 B)	1,733 (32°C)	-	0.1
CHLORIDE	mg/L Cl	ARGENTOMETRIC METHOD (SM: PART 4500-Cl B)	ND	-	2.0
SULPHATE	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: PART 4500-SO <sub>4</sub> <sup>2-</sup> E)	ND	-	0.3
TOTAL PETROLEUM HYDROCARBONS	mg/L	SOXHLET EXTRACTION METHOD (SM: PART 5520 D AND PART 5520 F)	ND	-	3
<b>METALS</b>					
CHROMIUM	mg/L Cr	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	-	0.005
CHROMIUM HEXAVALENT	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: PART 3500-Cr B)	ND	≤ 0.05	0.006
ARSENIC	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: PART 3114 C)	0.0014	≤ 0.01	0.0003
CADMIUM	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.003	0.002
COPPER	mg/L Cu	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 1.0	0.002
LEAD	mg/L Pb	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.01	0.003
MANGANESE	mg/L Mn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.112	≤ 0.5	0.002
IRON	mg/L Fe	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	0.071	-	0.005

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT MWNSE-K (DOWN GRADIENT) T23AF667-0008	REGULATORY STANDARD	DETECTION LIMIT
NICKEL	mg/L Ni	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 0.02	0.005
ZINC	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: PART 3030 E AND PART 3111 B	ND	≤ 5.0	0.003
MERCURY	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: PART 3112 B	ND	≤ 0.001	0.0001
<b>SAMPLE CONDITION</b>					
WATER'S COLOUR/TURBID			COLOURLESS/CLEAR		
SEDIMENT			YELLOW		

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.  
SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.  
REGULATORY STANDARD : GROUNDWATER QUALITY STANDARDS, NOTIFICATION OF THE NATIONAL ENVIRONMENT BOARD NO.20 (B.E. 2543) ISSUED UNDER THE ENHANCEMENT AND CONSERVATION OF NATIONAL ENVIRONMENTAL QUALITY ACT B.E. 2535.  
ND : NON-DETECTABLE.

*Bhuchonk P.*  
(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

APRIL 19, 2023





ภาคผนวก ก  
เอกสารสอบเทียบเครื่องมือ

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## List of Instruments Certification for Air & Noise Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration	Remark
<b>Ambient</b>									
1	Sound Level Calibrator (Acoustic Calibrator)	Calibrate Sound Level Meter	Larson Davis	CAL150 6457	Innovative Instrument Co.,Ltd.	22-ACT-370	8 Jun 22	7 Jun 23	-
2	Sound Level Meter	$L_{Aeq\ 24\ hr}$ , $L_{Amax}$ , $L_{A90}$ , $L_{Adn}$	Larson Davis	LxT2 0005286	Sithiporn Associates Co., Ltd.	ACL22081	25 Jan 22	24 Jan 24	-
3	Sound Level Meter	$L_{Aeq\ 24\ hr}$ , $L_{Amax}$ , $L_{A90}$ , $L_{Adn}$	Larson Davis	LxT2 0005289	Sithiporn Associates Co., Ltd.	ACL22082	26 Jan 22	25 Jan 24	-
4	Sound Level Meter	$L_{Aeq\ 24\ hr}$ , $L_{Amax}$ , $L_{A90}$ , $L_{Adn}$	Larson Davis	LxT2 0005304	Innovative Instrument Co.,Ltd.	22-ACT-249	1 Apr 22	31 Mar 24	-
5	Sound Level Meter	$L_{Aeq\ 24\ hr}$ , $L_{Amax}$ , $L_{A90}$ , $L_{Adn}$	Larson Davis	LxT2 0005344	Innovative Instrument Co.,Ltd.	22-ACT-248	1 Apr 22	31 Mar 24	-



Certificate of Calibration

Customer  
Name : UNITED ANALYST AND ENGINEERING CONSULTANT  
CO.,LTD.  
Address : 81 Soi Udomsuk 41, Sukhumvit Road, Bangchak,  
Pranong, Bangkok 10260

Certificate No : 22-ACT-370  
Request No : Req-2022-0839

Unit Under Calibration Details

Measurement item : Acoustic Calibrator  
Manufacturer : LASON DAVIS  
Model : CAL150  
Serial Number : 6457  
ID : UAE.EFM.055/2564  
Class : 2  
Range : 94 , 114 dB / 1000 Hz  
Instrument Status : Used

Calibration Environment and Details

Temperature : ( 23 ±2 °C )  
Humidity : ( 50 ± 20 %RH )  
Barometric Pressure : ( 1013 ±10.0 hPa )  
Received Date : 10 May 2022  
Calibration Date : 8 June 2022  
Location of Calibration : LAB 1 Acoustic  
Calibration Procedure : In-house method CP-ACT-02 based on IEC 60942:2017 Electroacoustics - Sound calibrators

Reference Standard	Model	Serial Number	Traceable	Due Calibration
Sound Calibrator	SV 35A	58079	EEL	31 May 2023
THD Multimeter	2015	1047765	NIMT	2 February 2023

Traceability : This certificate provides traceability of measurement to recognized national standard, and to the realization of the international System of Units (SI).

Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor k=2, providing a level of confidence approximately 95 %.

Calibrated by : Mr. Noppadon Luangart  
Service Calibration Engineer

Approved by : Mr. Pacit Mathavorn  
Calibration Engineer Supervisor  
Issue Date : 8 June 2022

The results related only to the items calibrated. This certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

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Certificate No : 22-ACT-370  
Request No : Req-2022-0839

Calibration Results : Without Adjustment

Calibration Range (dB)	Without Adjustment (dB)		Adjustment (dB)		Uncertainty ( ± dB )	Acceptance limit Class 2 ( ± dB )
	Measured	Error	Measured	Error		
94 dB / 1000 Hz	93.86	-0.14	-	-	0.11	0.40
114 dB / 1000 Hz	113.92	-0.08	-	-	0.11	0.40

Frequency of Sound pressure level

Calibration Range (Hz)	Without Adjustment		Adjustment		Uncertainty ( ± % )	Acceptance limit Class 2 ( ± % )
	Measured (Hz)	Error (%)	Measured (Hz)	Error (%)		
94 dB / 1000 Hz	1000.00	0.00	-	-	0.10	1.7
114 dB / 1000 Hz	1000.00	0.00	-	-	0.10	1.7

Total Harmonic Distortion plus Noise of Sound pressure level (THD+N %)

Calibration Range (Hz)	Without Adjustment		Adjustment		Uncertainty ( ± % )	Acceptance limit Class 2 ( ± % )
	Measured (%)	Measured (%)	Measured (%)	Measured (%)		
94 dB / 1000 Hz	0.14	-	-	-	0.40	3.0
114 dB / 1000 Hz	0.29	-	-	-	0.40	3.0

Note :

- Acceptance limit was IEC60942:2017 Class 1
- The calibration results exclude the calibrator pressure correction
- The calibration results exclude the microphone volume correction

End of Calibration

The results related only to the items calibrated. This certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

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SITHIPORN ASSOCIATES CO.,LTD.  
CALIBRATION LABORATORY

451-451/1 Sirinthorn Rd.,Bangbunru, Bangplud Bangkok 10700 THAILAND.  
Tel.0-2435-8800 Fax.0-2433-1679 e-mail:cal-center@sithiphorn.com http://www.sithiphorn.com

Cert. No. : ACL22082  
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER  
Manufacturer : LARSON DAVIS  
Model : LxT2/ Microphone 375B02 / Preamplifier PRML x T2B  
Serial No. : 0005289 / 011732 / 056076  
ID No. : -

Condition As Found : GOOD

Customer : UNITED ANALYST AND ENGINEERING CONSULTANT (UAE)  
81 SOI UDOMSUK 41, SUKHUMVIT ROAD,  
BANGCHAK SUB-DISTRICT,  
PHRAKHANONG DISTRICT, BANGKOK 10260  
THAILAND.

Location : -  
Ambient Temperature : ( 23.0 ± 3 ) °C  
Pressure : ( 101.3 ± 3 ) kPa  
Relative Humidity : ( 50.0 ± 20 ) %

Received Date : 18 JANUARY 2022  
Calibration Date : 26 JANUARY 2022  
Date of Issue : 28 JANUARY 2022

Calibrated by : Nathakorn Pisutpaisan

Approved by :

T. Petchurai  
( Thanakul Petchurai )

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, may not be reproduced other than in full, except with the prior written approval of the head of Calibration Laboratory.

QF-TS12-04-04-020664

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SITHIPORN ASSOCIATES CO.,LTD.  
CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No. : ACL22082  
Job No. : VC65AC0044  
Pages : 2 of 8

Calibration Procedure : CP-AC-02

Calibration Method :

This equipment was calibrated by based on IEC-61672-3 (2013) Standard for sound level meter (SLM).  
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.

For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0012-21	10-Feb-22
Waveform Generator	33511B	MY52302742	EF-0011-21	10-Feb-22
Digital Multimeter	33461A	MY53220104	EEL-BP_05/0264	10-Feb-22
Digital Multimeter	33461A	MY53220076	EEL-BP_03/0264	08-Feb-22
Digital Multimeter	34461A	MY60024273	1-15180725251-1	15-Sep-22
Programmable Attenuator	MAT-1070	62100114	1500-07774E	08-Mar-22
Condenser Microphone	4180	2977900	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KAI	34560495	AA-3003-21	16-Feb-22

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.

3. This certificate is traceable to the international system of unit maintained at :

- 3.1 National Institute of Metrology (Thailand).
- 3.2 Thailand Institute of Scientific and Technological Research (TISTR).

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Cert. No. : ACL22082  
Job No. : VC65AC0044  
Pages : 3 of 8

## Summary of Measurement Result :

Parameter	Pass	Fail	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	✓	-	0.2	N/A
2. Self-generated noise	✓	-	0.2	N/A
3. Acoustical signal tests of frequency weightings				
125 Hz	✓	-	0.3	0.6
1000 Hz	✓	-	0.3	0.6
8000 Hz	✓	-	0.3	0.7
4. Electrical signal tests of frequency weightings				
For 10 Hz to 4 kHz	✓	-	0.3	0.6
For > 4 kHz to 10 kHz	✓	-	0.3	0.7
For > 10 kHz to 20 kHz	✓	-	0.3	1.0
5. Frequency and time weightings at 1 kHz	✓	-	0.2	0.2
6. Long - term stability	✓	-	0.1	0.1
7. Level linearity on the reference level range	✓	-	0.2	0.3
8. Level linearity including the level range control	✓	-	0.2	0.3
9. Tone burst response	✓	-	0.2	0.3
10. Peak C sound level	✓	-	0.2	0.35
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

QF-TS12-04-04-020664

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T. Retch.

Cert. No. : ACL22082  
Job No. : VC65AC0044  
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## Result of calibration :

## 1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.96)	94.0	0.0	±0.3

## 2. Self-generated noise

## 2.1 Normal test

Measured Value (dB)
29.6

## 2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Measured value (dB)
A-weight	29.4
C-weight	29.1
Flat	34.8

## 3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	-0.1	0.2	0.2	± 1.5
1000	-0.2	-0.2	-0.2	± 1.0
8000	2.6	2.6	2.6	±5.0

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T. Retch.

Cert. No. : ACL22082  
Job No. : VC65AC0044  
Pages : 5 of 8

## 4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	0.0	0.0	±2.0
125	0.0	0.1	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.0	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.1	0.0	±2.0
4000	0.0	-0.1	0.0	±3.0
8000	0.0	0.1	0.0	±5.0
16000	-0.1	0.1	0.1	±5.0(-∞)

## 5. Frequency and time weightings at 1 kHz

## 5.1 Frequency weightings at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	0.0	-
C-weight	94.0	0.0	± 0.2
Flat	94.0	0.0	± 0.2

## 5.2 Time weighting at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	0.0	-
Slow	94.0	0.0	± 0.1
Leq	94.0	0.0	± 0.1

## 6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	94.0	0.0	± 0.3

QF-TS12-04-04-020664

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T. Retch.

Cert. No. : ACL22082  
Job No. : VC65AC0044  
Pages : 6 of 8

## 7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1

QF-TS12-04-04-020664

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T. Retch.





Certificate No : 22-ACT-249  
Request No : Req-2022-0629

5. Electrical signal test of frequency weightings, Weighting network response with relative to 1 kHz

Electrical signal tests of frequency weightings, weighting network response with relative to a 1 kHz				UNCERTAINTY	Acceptance
UUC Setting	Deviation from various Frequency				
FAST / 37-139	Weighting Response curve				( $\pm$ dB)
STD Setting	A (dB)	C (dB)	Z (dB)	( $\pm$ dB)	
63 Hz	-0.1	-0.1	-0.1	0.2	2.0
125 Hz	-0.1	0.0	0.0		1.5
250 Hz	0.0	0.0	0.0		1.5
500 Hz	0.0	0.0	0.0		1.5
1000 Hz	0.0	0.0	0.0		1.0
2000 Hz	0.0	0.0	0.0		2.0
4000 Hz	0.0	0.0	0.0		3.0
8000 Hz	-0.1	-0.1	0.0		5.0
16000 Hz	-0.1	-0.1	-0.1		+5, -INF.

6. Frequency and time weightings at 1kHz

UUC Setting	STD	Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
FAST / 37-139	REF	UUC	ERR		
UUC Weighting	(dB)	(dB)	(dB)	0.2	0.2
A	114.00	114.0	0.0		
C	114.00	114.1	0.1		
Z	114.00	114.1	0.1		

UUC Setting	STD	Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
37-139 / A	REF	UUC	ERR		
UUC Time Response	(dB)	(dB)	(dB)	0.2	0.1
Fast	114.00	114.0	0.0		
Slow	114.00	114.0	0.0		
Log	114.00	114.0	0.0		

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovator Instrument Co., Ltd.  
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Certificate No : 22-ACT-249  
Request No : Req-2022-0629

9. Level linearity including the level range control

UUC Setting	STD	Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
FAST / A	REF	UUC	ERR		
UUC Range	(dB)	(dB)	(dB)	0.3	1.1
37-139	43.9	44.1	0.2		
	114	114.0	0.0		

10. Tone burst response

UUC Setting	STD	Anticipated	Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
A / 37-139	Toneburst (ms)	Ref (dB)	UUC (dB)	ERR (dB)		
UUC Time Response	(ms)	(dB)	(dB)	(dB)	0.3	+1.0, -2.5
Fast	200	135.0	135.0	0.0		
	2	118.0	117.8	-0.2		
	0.25	109.0	108.8	-0.2		
Slow	200	128.6	128.5	-0.1		
	2	109.0	108.9	-0.1		
	0.25	109.0	108.9	-0.1		
SEL	200	129.0	129.0	0.0		
	2	109.0	108.9	-0.1		
	0.25	100.0	99.9	-0.1		

11. Peak C Sound level

UUC Setting	Anticipated	Measured		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
FAST / C / 85-142	REF	UUC	ERR		
STD Setting	(dB)	(dB)	(dB)	0.2	2.0
Complete cycle	137.4	136.9	-0.50		
Positive half cycle	136.4	136.2	-0.20		
Negative half cycle	136.4	136.2	-0.20		

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Certificate No : 22-ACT-249  
Request No : Req-2022-0629

7. Long Term Stability

UUC Setting	Measured	UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
FAST / A / 37-139	UUC (dB)		
Initial	114.0	0.1	0.3
Final	114.0		
Deviated	0.0		

8. Level linearity on the reference level range

UUC Setting	Anticipated	Deviation		UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
FAST / A / 37-139	REF	UUC	ERR		
STD dB	(dB)	(dB)	(dB)	0.3	1.1
110.00	119	119.0	0.0		
114.00	114	114.0	0.0		
118.00	119	119.0	0.0		
124.00	124	124.0	0.0		
119.00	119	119.0	0.0		
114.00	114	114.0	0.0		
109.00	109	109.0	0.0		
104.00	104	104.0	0.0		
99.00	99	98.9	-0.1		
94.00	94	94.0	0.0		
89.00	89	89.0	0.0		
84.00	84	84.0	0.0		
79.00	79	79.0	0.0		
74.00	74	74.0	0.0		
69.00	69	69.0	0.0		
64.00	64	64.0	0.0		
59.00	59	59.0	0.0		
54.00	54	54.0	0.0		
49.00	49	49.0	0.0		
44.00	44	44.1	0.1		
39.00	39	39.3	0.3		
38.00	38	38.4	0.4		

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Certificate No : 22-ACT-249  
Request No : Req-2022-0629

12. Overload indication

UUC Setting	Measured	UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
FAST / A / 37-139	UUC (dB)		
Initial	142.9	0.2	1.5
Positive one-half cycle	142.9		
Negative one-half cycle	142.7		
Deviated	0.2		

13. High Level Stability

UUC Setting	Measured	UNCERTAINTY ( $\pm$ dB)	Acceptance Limit ( $\pm$ dB)
FAST / A / 37-139	UUC (dB)		
Initial	138.0	0.1	0.3
Final	138.0		
Deviated	0.0		

End of Certificate

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovator Instrument Co., Ltd.  
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### Certificate of Calibration

#### Customer

Name : UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD. Certificate No : 22-ACT-348  
Address : 81 Soi Udomsak 41, Sakhumvit Road, Bangchak, Prakanong, Bangkok Request No : Req-2022-0628  
10260

#### Unit Under Calibration Details

Measurement item : Sound Level Meter Microphone Class : 2  
Manufacturer : LARSON DAVIS Microphone Model : 375A04  
Model : LxT2 Microphone SN : 329362  
Serial Number : 0005344 Pre-amplifier Model : PRMLAT2C  
ID : UAE.EFM.041/2563 Pre-amplifier SN : 071494  
Resolution : 0.1 dB Intention Status : Used

#### Calibration Environment and Details


Temperature : 23 °C ± 2 °C  
Humidity : 50 %RH ± 20 %RH  
Barometric Pressure : 1013 hPa ± 10 hPa  
Received Date : 23 March 2022  
Calibrated Date : 1 April 2022  
Calibration Procedure : In-house method CP-SLM-01 based on IEC 61673-3 : 2013 Electroacoustics - Sound level meters - Part 3: Periodic tests  
Location of Calibration : Lab Acoustic


#### Reference Standard

Instrument	Brand	Model	SN	Due calibration	Traceability
Standard Microphone	GRAS	40AN	188273	15 September 2022	GRAS
Multi-frequency Calibrator	Quest	Questival	EFA000234	14 June 2022	ZSE
Audio Generator	SvanteK	Svan401	131	18 October 2022	WK Electric

#### Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor  $k = 2$ , providing a level of confidence approximately 95 %.

Calibrated By :   
Mr. Noppadol Luangrat  
Calibration Officer

Approved By :   
Mr. Pichit Mathavon  
Calibration Engineer Supervisor  
Issue Date : 1 April 2022

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Certificate No : 22-ACT-348  
Request No : Req-2022-0628

#### 5. Electrical signal test of frequency weightings, Weighting network response with relative to 1 kHz

Electrical signal test, or frequency weightings, weighting network response with relative to 1 kHz				UNCERTAINTY	Acceptance	
UUC Setting	Deviation from various Frequency					Limit
FAST / 37-139	Weighting Response curve			± 0.2	± 2.0	
STD Setting	A (dB)	C (dB)	Z (dB)			Limit
63 Hz	-0.2	-0.1	-0.1			2.0
125 Hz	-0.1	0.0	0.0			1.5
250 Hz	-0.1	0.0	0.0			1.5
500 Hz	-0.1	0.0	0.0			1.5
1000 Hz	0.0	0.0	0.0			1.0
2000 Hz	0.0	0.0	0.0			2.0
4000 Hz	0.0	0.0	0.0			3.0
8000 Hz	-0.1	-0.1	0.0			5.0
16000 Hz	-0.1	-0.1	-0.1	+5, -INF.		

#### 6. Frequency and time weightings at 1kHz

UUC Setting	STD	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
FAST / 37-139	REF	UUC	ERR		
UUC Weighting	(dB)	(dB)	(dB)		
A	114.00	114.0	0.0	0.2	0.2
C	114.00	114.0	0.0		0.2
Z	114.00	114.0	0.0		0.2

UUC Setting	STD	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
37-139 / A	REF	UUC	ERR		
UUC Time Response	(dB)	(dB)	(dB)		
Fast	114.00	114.0	0.0	0.2	0.1
Slow	114.00	114.0	0.0		0.1
Leg	114.00	114.0	0.0		0.1

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Certificate No : 22-ACT-348  
Request No : Req-2022-0628

#### 1. Indication at the calibration check frequency

UUC Setting	Nominal	Before Adjust		Adjust		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
FAST / A / 37-139	Level (dB)	UUC (dB)	ERR (dB)	UUC (dB)	ERR (dB)		
1000 Hz 114.00 dB	113.85	113.7	-0.15	113.9	0.05	0.20	0.3

Note : Absolute sensitivity was established by the use of Sound Calibrator Brand SVANTEK, Model SV 35A, SN.58079

#### 2. Self-generated noise, Microphone installed

UUC Setting	Measured	UNCERTAINTY
FAST / 37-139	(dB)	(± dB)
UUC Weighting		
A	29.1	0.10

#### 3. Self-generated noise, Microphone replaced by the electrical input signal device

UUC Setting	Measured	UNCERTAINTY
FAST / 37-139	(dB)	(± dB)
UUC Weighting		
A	28.8	0.10
C	28.4	0.10
Z	32.6	0.10

#### 4. Acoustic signal test of frequency weightings (Without Windscreens)

UUC Setting	Deviation from various Frequency			UNCERTAINTY	Acceptance Limit
	Weighting Response curve				
	A	C	Z	(± dB)	
FAST / 37-139	(dB)	(dB)	(dB)		(± dB)
STD Setting					
125 Hz	0.0	0.1	0.1	0.50	2.0
1000 Hz	0.0	0.0	0.0	0.60	1.0
4000 Hz	0.2	0.2	0.2	0.60	3.0
8000 Hz	0.0	0.0	0.1	0.70	5.0

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Certificate No : 22-ACT-348  
Request No : Req-2022-0628

#### 7. Long Term Stability

UUC Setting	Measured	UNCERTAINTY (± dB)	Acceptance Limit (± dB)
FAST / A / 37-139	UUC (dB)		
STD Setting	(dB)		
Initial	114.0	0.1	0.3
Final	114.0		
Deviated	0.0		

#### 8. Level linearity on the reference level range

UUC Setting	Anticipated	Deviation		UNCERTAINTY (± dB)	Acceptance Limit (± dB)
FAST / A / 37-139	REF	UUC	ERR		
STD dB	(dB)	(dB)	(dB)		
119.00	119	119.0	0.0	0.3	1.1
114.00	114	114.0	0.0		1.1
129.00	129	129.0	0.0		1.1
124.00	124	124.0	0.0		1.1
119.00	119	119.0	0.0		1.1
114.00	114	114.0	0.0		1.1
109.00	109	109.0	0.0		1.1
104.00	104	104.0	0.0		1.1
99.00	99	98.9	-0.1		1.1
94.00	94	94.0	0.0		1.1
89.00	89	89.0	0.0		1.1
84.00	84	84.0	0.0		1.1
79.00	79	79.0	0.0		1.1
74.00	74	74.0	0.0		1.1
69.00	69	69.0	0.0		1.1
64.00	64	64.0	0.0		1.1
59.00	59	59.0	0.0		1.1
54.00	54	54.0	0.0		1.1
49.00	49	49.0	0.0		1.1
44.00	44	44.1	0.1		1.1
39.00	39	39.4	0.4		1.1
34.00	34	34.5	0.5		1.1

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Certificate No : 22-ACT-248  
Request No : Req-2022-0628

9. Level linearity including the level range control

UUC Setting	STD	Measured	UNCERTAINTY	Acceptance
FAST / A	REF	UUC	ERR	Limit
UUC Range	(dB)	(dB)	(dB)	(± dB)
37-139	44.2	44.4	0.2	1.1
	114	114.0	0.0	1.1

10. Tone burst response

UUC Setting	STD	Anticipated	Measured		UNCERTAINTY	Acceptance
A / 37-139	Toneburst	Ref	UUC	ERR		Limit
UUC Time Response	(ms)	(dB)	(dB)	(dB)	(± dB)	(± dB)
Fast	200	135.0	135.0	0.0	0.3	1.0
	2	118.0	117.7	-0.3		+1.0, -2.5
	0.25	109.0	108.8	-0.2		+1.5, -5.0
Slow	200	128.6	128.5	-0.1		1.0
	2	109.0	108.9	-0.1		+1.0, -5.0
	200	129.0	129.1	+0.1		1.0
SEL	2	109.0	109.1	+0.1		+1.0, -2.5
	0.25	100.0	100.0	0.0		+1.5, -5.0

11. Peak C Sound level

UUC Setting	Anticipated	Measured	UNCERTAINTY	Acceptance
FAST / C / 95-142	REF	UUC	ERR	Limit
STD Setting	(dB)	(dB)	(dB)	(± dB)
Complex cycle	137.4	136.7	-0.70	3.0
Positive half cycle	136.4	136.1	-0.30	2.0
Negative half cycle	136.4	136.2	-0.20	2.0

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Certificate No : 22-ACT-248  
Request No : Req-2022-0628

12. Overload indication

UUC Setting	Measured	UNCERTAINTY	Acceptance
FAST / A / 37-139	UUC		Limit
STD Setting	(dB)	(± dB)	(± dB)
Positive one-half cycle	143.2		
Negative one-half cycle	143.1		
Deviated	0.1	0.2	1.5

13. High Level Stability

UUC Setting	Measured	UNCERTAINTY	Acceptance
FAST / A / 37-139	UUC		Limit
STD Setting	(dB)	(± dB)	(± dB)
Initial	138.0		
Final	138.0		
Deviated	0.0	0.1	0.3

End of Certificate

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451-451/1 Sirinthorn Rd.,Bangbunru, Bangplud Bangkok 10700 THAILAND.  
Tel.0-2435-8800 Fax.0-2433-1679 e-mail:center@sithiporn.com http://www.sithiporn.com

Cert. No. : ACL22081  
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER  
Manufacturer : LARSON DAVIS  
Model : LxT2/ Microphone 375B02 / Preamplifier PRML x T2B  
Serial No.: 0005286 / 011740 / 056087  
ID No.: -

Condition As Found : GOOD

Customer : UNITED ANALYST AND ENGINEERING CONSULTANT (UAE)  
81 SOI UDOMSUK 41, SUKHUMVIT ROAD,  
BANGCHAK SUB-DISTRICT,  
PHRAKHANONG DISTRICT, BANGKOK 10260  
THAILAND.

Location : -  
Ambient Temperature : ( 23.0 ± 3 ) °C  
Pressure : ( 101.3 ± 3 ) kPa  
Relative Humidity : ( 50.0 ± 20 ) %

Received Date : 18 JANUARY 2022  
Calibration Date : 26 JANUARY 2022  
Date of Issue : 28 JANUARY 2022

Calibrated by : Nathakorn Pisutpaisan

Approved by : *T. Petchurai*  
( Thanakul Petchurai )

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, may not be reproduced other than in full, except with the prior written approval of the head of Calibration Laboratory.

QF-TS12-04-04-020664

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Continuation of Calibration Certificate

Cert. No. : ACL22081  
Job No. : VC65AC0044  
Pages : 2 of 8

Calibration Procedure : CP-AC-02

Calibration Method :

This equipment was calibrated by based on IEC-61672-3 (2013) Standard for sound level meter (SLM).  
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.  
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0012-21	10-Feb-22
Waveform Generator	33511B	MY52302742	EF-0011-21	10-Feb-22
Digital Multimeter	33461A	MY53220104	EEL-BP_05/0264	10-Feb-22
Digital Multimeter	33461A	MY53220076	EEL-BP_03/0264	08-Feb-22
Digital Multimeter	34461A	MY60024273	1-15180725251-1	15-Sep-22
Programmable Attenuator	MAT-1070	62100114	1500-07774E	08-Mar-22
Condenser Microphone	4180	2977900	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KAI	34560495	AA-3003-21	16-Feb-22

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.

3. This certificate is traceable to the international system of unit maintained at :

- 3.1 National Institute of Metrology (Thailand).
- 3.2 Thailand Institute of Scientific and Technological Research (TISTR).

QF-TS12-04-04-020664

เอกสารไม่ควบคุม

*T. Petchurai*



## Continuation of Calibration Certificate

Cert. No. : ACL22081  
Job No. : VC65AC0044  
Pages : 3 of 8

## Summary of Measurement Result :

Parameter	Pass	Fail	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	✓	-	0.2	N/A
2. Self-generated noise	✓	-	0.2	N/A
3. Acoustical signal tests of frequency weightings				
125 Hz	✓	-	0.3	0.6
1000 Hz	✓	-	0.3	0.6
8000 Hz	✓	-	0.3	0.7
4. Electrical signal tests of frequency weightings				
For 10 Hz to 4 kHz	✓	-	0.3	0.6
For > 4 kHz to 10 kHz	✓	-	0.3	0.7
For > 10 kHz to 20 kHz	✓	-	0.3	1.0
5. Frequency and time weightings at 1 kHz	✓	-	0.2	0.2
6. Long - term stability	✓	-	0.1	0.1
7. Level linearity on the reference level range	✓	-	0.2	0.3
8. Level linearity including the level range control	✓	-	0.2	0.3
9. Tone burst response	✓	-	0.2	0.3
10. Peak C sound level	✓	-	0.2	0.35
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

QF-TS12-04-04-020664

เอกสารไม่ควบคุม

T. Reth.

## Continuation of Calibration Certificate

Cert. No. : ACL22081  
Job No. : VC65AC0044  
Pages : 4 of 8

## Result of calibration :

## 1. Absolute sensitivity

Reference Acoustic Signal ( dB )	Measured Value ( dB )	Deviation ( dB )	Acceptance Limit ( dB )
93.9 (93.96)	94.0	0.0	±0.3

## 2. Self-generated noise

## 2.1 Normal test

Measured Value ( dB )
31.0

## 2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Measured value ( dB )
A - weight	30.8
C - weight	30.6
Flat	36.8

## 3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency ( Hz )	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	-0.1	0.1	0.0	± 1.5
1000	-0.2	-0.2	-0.2	± 1.0
8000	3.1	3.2	3.2	±5.0

QF-TS12-04-04-020664

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T. Reth.

## Continuation of Calibration Certificate

Cert. No. : ACL22081  
Job No. : VC65AC0044  
Pages : 5 of 8

## 4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency ( Hz )	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	0.0	0.0	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.0	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.1	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.0	0.0	±5.0
16000	-0.1	0.0	0.1	±5.0(-∞)

## 5. Frequency and time weightings at 1 kHz

## 5.1 Frequency weightings at 1 kHz

Frequency Weighting	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
A - weight	94.0	0.0	-
C - weight	94.0	0.0	± 0.2
Flat	94.0	0.0	± 0.2

## 5.2 Time weighting at 1 kHz

Frequency Weighting	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Fast	94.0	0.0	-
Slow	94.0	0.0	± 0.1
Leq	94.0	0.0	± 0.1

## 6. Long - term stability

Frequency Weighting	SLM Display at initial ( dB )	SLM Display at final ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
A - weight	94.0	94.0	0.0	± 0.3

QF-TS12-04-04-020664

เอกสารไม่ควบคุม

T. Reth.

## Continuation of Calibration Certificate

Cert. No. : ACL22081  
Job No. : VC65AC0044  
Pages : 6 of 8

## 7. Level linearity on the reference level range

Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
135.0	135.1	0.1	± 1.1
134.0	134.1	0.1	± 1.1
133.0	133.1	0.1	± 1.1
132.0	132.1	0.1	± 1.1
131.0	131.1	0.1	± 1.1
129.0	129.1	0.1	± 1.1
124.0	124.1	0.1	± 1.1
119.0	119.1	0.1	± 1.1
114.0	114.1	0.1	± 1.1
109.0	109.1	0.1	± 1.1
104.0	104.1	0.1	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.1	0.1	± 1.1
44.0	44.2	0.2	± 1.1
39.0	39.6	0.6	± 1.1

QF-TS12-04-04-020664

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T. Reth.

Continuation of Calibration Certificate

Cert. No. : ACL22081  
Job No. : VC65AC0044  
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
140	94.0	94.0	0.0	±0.5

9. Tone burst response

Time Weighting	Tone burst duration, Tb ( ms )	Cycle	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Fast	0.25	1	108.0	107.8	-0.2	1.5 ; -5.0
	2	8	117.0	116.7	-0.3	1.0 ; -2.5
	200	800	134.0	133.9	-0.1	±1.0
Slow	2	8	108.0	107.8	-0.2	1.5 ; -5.0
	200	800	127.6	127.5	-0.1	±1.0
SEL	0.25	1	N/A	N/A	N/A	1.5 ; -5.0
	2	8	N/A	N/A	N/A	1.0 ; -2.5
	200	800	N/A	N/A	N/A	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value ( dB )	Measured Value, Lcpeak ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Continuous	133.0	133.0	0.0	-
One	136.4	135.7	-0.7	±3.0

Number of cycle in test signal	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Continuous	133.0	133.0	0.0	-
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

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T. Rth -

Continuation of Calibration Certificate

Cert. No. : ACL22081  
Job No. : VC65AC0044  
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11. Overload indication

Measured value ( dB )		Deviated Value ( dB )	Acceptance Limits ( dB )
Positive one-half cycle	Negative one-half cycle		
89.2	89.4	0.2	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial ( dB )	SLM Display at final ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
A - weight	137.0	137.0	0.0	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor  $k = 2$  or any value following calculation, providing a level of confidence of approximately 95 %

End of Calibration Certificate

QF-TS12-04-04-020664

เอกสารไม่ควบคุม

T. Rth -



ใบรับรองสอบเทียบเครื่องมือประจำห้องปฏิบัติการ สำหรับตรวจวัดคุณภาพสิ่งแวดล้อม

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration*	Remark
เครื่องมือประจำห้องปฏิบัติการวิเคราะห์ สำหรับวิเคราะห์คุณภาพอากาศในบรรยากาศในบรรยากาศในระหว่างการผลิต ของพื้นที่ผลิตนาสนุ่นตะวันออก									
1	Analytical Balance (Repeatability 0.1 mg)	- ผุ่นละอองรวม - ผุ่นละอองขนาดไม่เกิน 10 ไมครอน	Mettler-Toledo	AB204-S / 1128312528	Mettler-Toledo (Thailand) Ltd.	23MM331	7 Apr 23	5 Apr 24	-
2	Analytical Balance (Repeatability 0.1 mg)		Mettler-Toledo	AB204-S/FACT / B108115858	Mettler-Toledo (Thailand) Ltd.	23MM332	7 Apr 23	5 Apr 24	-
3	Gas Chromatography - Mass Spectrometer (GC-MS)	สารกลุ่ม BTEX เบนซีน (Benzene), โทลูอิน (Toluene), เอทิลเบนซีน (Ethylbenzene), ไซลีนทั้งหมด (Total Xylene)	Bruker Scion	451-GC / BR1201M099 Scion-SQ / GQS1203F021 CP8400 / BR1203M331	World Tech Enterprise Co.,Ltd.	Certificate of Calibration PM/OQ	19 Apr 22	18 Apr 23	-

Due Date of Calibration\* : กำหนดตามแผนการสอบเทียบประจำปี อย่างน้อยปีละ 1 ครั้ง



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICES  
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250  
TEL. 0-2717-3000-29 FAX. 0-2719-9484



Cert.No.: 23MM331  
Page: 1 of 3

## Certificate of Calibration

**Equipment :** Electronic Balance  
**Manufacturer :** Mettler Toledo  
**Model :** AB204-S  
**Serial No. :** 1128312528  
**ID No. :** UAE.AIR.018/2550  
**Submitted by :** United Analyst and Engineering Consultant Co.,Ltd.  
3 Soi Udomsuk 41, Sukhumvit Road,  
Bangchak, Phrakhanong,  
Bangkok 10260  
**Location :** Balance Room 2  
**Received order :** 07 April 2023  
**Calibration Date :** 07 April 2023  
**Ambient Temperature :** 15 °C to 40 °C  
**Relative Humidity :** 30 % to 90 %  
**Calibrated by :** Suwit Imjai  
**Approved by :**   
( ) Ponthipha Tameyakul  
( ) Malee Butkruea  
**Issue Date :** 10 April 2023

The Uncertainties are for a confidence probability of approximately 95%

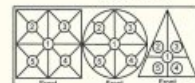
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Approval of the head of Corporate Services : Equipment Calibration and Testing Services

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**Equipment :** Electronic Balance  
**Condition As-Received :** Used Item  
**Reference :** 2304-0015OC-1

Cert.No.: 23MM331  
Page: 3 of 3



Maximum difference between  
off-center and central loading  
(g)  
0.0005

### 2. Effect of off center loading

A mass of 100 g was placed to various position on the pan.  
The weighing machine reading error obtained is given in the table

Position 1	Position 2	Position 3	Position 4	Position 5
(g)	(g)	(g)	(g)	(g)
-0.0001	-0.0002	+0.0004	-0.0001	-0.0006

### 3. Departure from nominal value

Applied Weight	Balance Reading	Correction	Measurement Uncertainty	Coverage Factor
(g)	(g)	(g)	(± mg)	(k)
Unload	0.0000	0.0000	0.15	2.13
0.1	0.0999	+0.0001	0.15	2.13
1	0.9999	+0.0001	0.15	2.13
5	4.9999	+0.0001	0.15	2.13
10	9.9999	+0.0001	0.15	2.11
20	20.0000	0.0000	0.15	2.11
50	50.0000	0.0000	0.16	2.08
70	69.9999	+0.0001	0.18	2.04
100	99.9999	+0.0001	0.19	2.03
150	150.0003	-0.0003	0.29	2.00
200	200.0005	-0.0005	0.29	2.00

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k$ , providing a level of confidence of approximately 95 %.

-o0o-

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**Equipment :** Electronic Balance  
**Condition As-Received :** Used Item  
**Reference :** 2304-0015OC-1

Cert.No.: 23MM331  
Page: 2 of 3

### Procedure used :-

Calibration were conducted using in-house calibration procedure CP-OB01 according to direct measurement method against standard weight.

### Condition of this result of calibration

#### 1. Reference standard instruments:-

Instruments	Model	Serial No.	ID No.	Test report No.	Due date
1) Standard Weight Set (E2)	15884	24053	70RC007	MM-0010-22	20 Jan 2024

- This certificate is valid only to the item calibrated on date and place of calibration.
- This result of calibration was made on requested at the point specified by customer.
- This certificate is not certified for any commercial transaction.
- This certification is traceable to the International System of Unit.

**Result of calibration** ( ) Without Adjustment ( \* ) After Adjustment by Internal Calibration

**Range capacity :** 0 g to 220 g **Resolution** 0.0001 g

#### Before Adjustment :

Applied Weight	Balance Reading	Correction	Measurement Uncertainty	Coverage Factor
(g)	(g)	(g)	(± mg)	(k)
100	99.9999	+0.0001	0.19	2.03
200	200.0001	-0.0001	0.29	2.00

#### After Adjustment :

#### 1. Determination of the standard deviation of weighing machine (n = 10)

Applied Weight	Standard Deviation of Reading (g)
(g)	
100	0.00007
200	0.00007

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534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250  
TEL. 0-2717-3000-29 FAX. 0-2719-9484



Cert.No.: 23MM332  
Page: 1 of 3

## Certificate of Calibration

**Equipment :** Electronic Balance  
**Manufacturer :** Mettler Toledo  
**Model :** AB204-S /FACT  
**Serial No. :** B108115858  
**ID No. :** UAE.AIR.018/2555  
**Submitted by :** United Analyst and Engineering Consultant Co.,Ltd.  
3 Soi Udomsuk 41, Sukhumvit Road,  
Bangchak, Phrakhanong,  
Bangkok 10260  
**Location :** Balance Room 2  
**Received order :** 07 April 2023  
**Calibration Date :** 07 April 2023  
**Ambient Temperature :** 15 °C to 40 °C  
**Relative Humidity :** 30 % to 90 %  
**Calibrated by :** Suwit Imjai  
**Approved by :**   
( ) Ponthipha Tameyakul  
( ) Malee Butkruea  
**Issue Date :** 10 April 2023

The Uncertainties are for a confidence probability of approximately 95%

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Approval of the head of Corporate Services : Equipment Calibration and Testing Services

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Equipment : Electronic Balance  
Condition As-Received : Used Item  
Reference : 2304-0015OC-2

Cert.No.: 23MM332  
Page: 2 of 3

**Procedure used :-**

Calibration were conducted using in-house calibration procedure CP-OB01 according to direct measurement method against standard weight.

**Condition of this result of calibration**

**1. Reference standard instruments:-**

Instruments	Model	Serial No.	ID No.	Test report No.	Due date
1) Standard Weight Set (E2)	15884	24053	70RC007	MM-0010-22	20 Jan 2024

- This certificate is valid only to the item calibrated on date and place of calibration.
- This result of calibration was made on requested at the point specified by customer.
- This certificate is not certified for any commercial transaction.
- This certification is traceable to the International System of Unit.

**Result of calibration** ( ) Without Adjustment ( \* ) After Adjustment by Internal Calibration

**Range capacity :** 0 g to 220 g **Resolution** 0.0001 g

**Before Adjustment :**

Applied Weight ( g )	Balance Reading ( g )	Correction ( g )	Measurement Uncertainty ( ± mg )	Coverage Factor ( k )
100	100.0002	-0.0002	0.21	2.06
200	200.0003	-0.0003	0.29	2.00

**After Adjustment :**

**1. Determination of the standard deviation of weighing machine** ( n = 10 )

Applied Weight ( g )	Standard Deviation of Reading ( g )
100	0.00009
200	0.00007

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THAI UNIQUE OPEN LAB SERVICE

OPERATIONAL QUALIFICATION REPORT (OQ)

**Equipment Operational Qualification Report**

Report No.	SV2305/21210
Equipment	GC-MS
System Model	SQ
System ID	GQS1203F021
Equipment Details	Bruker
Test Protocol	Scion OQ Protocol
Protocol Rev.	A
Date	23-May-23
Report Type	Report
Org. Name	United Analyst and Engineering Consultant Co.,Ltd
Org. Location	3 Soi Udomsuk 41 Sukhumvit Rd. Bangchak Phrakhanong Bagkok Thailand 10260

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Equipment : Electronic Balance  
Condition As-Received : Used Item  
Reference : 2304-0015OC-2

Cert.No.: 23MM332  
Page: 3 of 3

**Result of calibration**

**2. Effect of off center loading**

A mass of 100 g was placed to various position on the pan.  
The weighing machine reading error obtained is given in the table

Position 1 ( g )	Position 2 ( g )	Position 3 ( g )	Position 4 ( g )	Position 5 ( g )	Maximum difference between off-center and central loading ( g )
+0.0001	-0.0003	+0.0003	+0.0006	+0.0002	0.0005

**3. Departure from nominal value**

Applied Weight ( g )	Balance Reading ( g )	Correction ( g )	Measurement Uncertainty ( ± mg )	Coverage Factor ( k )
Unload	0.0000	0.0000	0.18	2.17
0.1	0.0999	+0.0001	0.18	2.17
1	0.9998	+0.0002	0.18	2.17
5	5.0000	0.0000	0.18	2.17
10	10.0000	0.0000	0.18	2.17
20	20.0000	0.0000	0.18	2.15
50	50.0001	-0.0001	0.19	2.11
70	70.0001	-0.0001	0.20	2.07
100	100.0002	-0.0002	0.21	2.06
150	150.0004	-0.0004	0.29	2.00
200	200.0005	-0.0005	0.29	2.00

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k , providing a level of confidence of approximately 95 %.

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บริษัท ไทยยูนิค จำกัด

THAI UNIQUE CO., LTD.

80-82 ถนนประชาธิปไตย แขวงบางขุนพรหม เขตพระนคร กรุงเทพฯ 10200  
80-82 Prachathipatai Rd., Bangkhunphrom, Pranakorn, Bangkok 10200

Tel. 0-2629-0191-6, 0-2280-1787, Fax. 0-2280-1788, E-mail : thawatt@thaunique.com, Website : www.thaunique.com

**CERTIFICATE OF CALIBRATION**  
**GAS CHROMATOGRAPH MASS SPECTROMETER**

**Certificate No.:** SV2305/21210

**Customer:** United Analyst and Engineering Consultant Co., Ltd.

**Address:** 3 Soi Udomsuk 41 Sukhumvit Rd. Bangchak  
Phrakhanong Bagkok Thailand 10260

**Instruments Model:** MS Scion-SQ S/N GQS1203F021  
GC 451-GC S/N BR1203M099  
AUTO SAMPLER CP8400 S/N BR1203M331

**Standard Reference Number:** 393065201

**Procedure Document Number:** 394207000

**System Test**

PM perform and Diagnostic Test	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL
Air Water Check Test	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL
Tune Test EI	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL
Signal to Noise Test (EI) SCAN	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL
Injection EI Area Precision Test	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL
Injection EI RT Precision Test	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL
User Demonstration	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL



Engineer   
Somchai Pohtongkam

Date 23 May 2023



Thai Unique Co., Ltd.

Service Division

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**SCION™****Operational Qualification Protocol**

For SCION Instrument

Name and Model:

Serial Number:

System ID Number:

Publication no. 394207000

Revision A

November 2011

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**Contact**

Scion Customer Service and Support uses a Customer Relationship Management (CRM) system. The interaction with this system offers the Customer immediate benefits including the contact center or help desk.

Scion worldwide service & support offices can be found from Scion website:



[www.scion.com/support.html](http://www.scion.com/support.html)

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## 1.0 Revision History

This qualification protocol is updated as necessary, which includes the event of any regulatory changes to Title 21 of the Code of Federal Regulations (21 CFR) Parts 210 and 211 (if applicable), any software or hardware changes, or updates that may impact on regulatory compliance.

Issue Number	Date	Comments


## 2.2 Reviewer Details


Each representative responsible for reviewing any part of this protocol must record their details in the following tables, providing a sample of their signature and initials, and recording the date the qualification was performed.

An employee or designee of the company operating the instrument must review these qualification procedures. All calculations and data will be checked by the reviewer. Data review must be performed in accordance with the qualification guidelines "Qualification Guidelines and GMP Documentation" on page 10 and in compliance with current Good Manufacturing Practice (cGMP) as specified by 21 CFR Parts 210 and 211.

Documentation supporting training in the area of data review and cGMP must be carefully maintained and reviewed by the instrument owner.

Reviewer representatives are responsible for reviewing the completeness of the qualification protocol and accuracy of all entries.

Name (Print)	CHANA CHANSEI
Title	ENGINEER
Signature	
Initials	
Date	23 MAY 2023



Name (Print)	
Title	
Signature	
Initials	
Date	

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## 2.0 Qualification Representative and Reviewer Details


### 2.1 Qualification Representative Details


Each person responsible for executing any part of this Protocol must complete the table below, providing a sample of their signature and initials, and recording the date the Qualification was performed.

Qualification representatives are nominated to execute and verify the completeness of the test protocol and correctness of all entries.

All testing must be performed in accordance with procedures outlined in this manual. The representative must be trained and qualified to perform the procedures outlined in this document.

A copy of their appropriate qualifications is to be inserted into "Qualification Representative Details" on page 30.

Name (Print)	SOMCHAI POHTONGKAM
Title	ENGINEER
Signature	
Initials	SOMCHAI
Date	23 MAY 23



Name (Print)	
Title	
Signature	
Initials	
Date	

### 2.3 Quality Assurance/Control Details

As Quality Assurance/Control (QA/QC), who is empowered to approve instrument compliance documents, I approve the procedures in the SCION Operational Qualification Protocol, which I may have amended, I accept the qualification of the Qualification Representative, and I will review and initial the results.

Name (Print)	
Title	
Signature	
Initials	
Date	

Name (Print)	
Title	
Signature	
Initials	
Date	

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### 3.0 Customer Responsibilities

The customer shall ensure that the Preventive Maintenance (PM) or Installation Qualification (IQ) up to point 9.11 is completed. A customer representative should be available at all times during the Operational Qualification Protocol.

**Note** The Operational Qualification Protocol test procedure should be performed after significant repairs, and at least once a year.

Qualification Rep. Initials	<i>Sahil P.</i>	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	



- Complete all tables and data fields to comply with this protocol. Blank fields are not permitted. For items that are not applicable, draw a line through the field, and write 'N/A' (Not Applicable). If entire tables or sections of tables are not applicable, strike a line either through the entire table or the specific area and enter 'N/A'. Complete the signature fields on the page.
- Write 'Pass', 'Fail' or 'N/A' as applicable to the test requirement or outcome.
- Ensure that results and/or specific documents are printed and attached to the specified appendix.
- The Qualification Representative and Reviewer must both sign (signature or initials) and date the signature fields on each page. This represents agreement and acceptance of all data and information on the page.

### 4.3 Page Numbering of Appendices

Each page that is inserted after the appendix is numbered with the letter of the appendix and a sequential number. The appendix page number must be initialed and dated by both the Qualification Representative and the Reviewer.

For example, pages inserted after Appendix C are numbered

C-1, C-2, C-3... etc. along with the initials and date.

If the reverse of each appendix page is left blank, it should be marked 'N/A' and signed and dated.

When the IQ is complete the total number of pages inserted after each appendix is written on the front page of the respective appendix sheet.

Qualification Rep. Initials	<i>Sahil P.</i>	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	



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### 4.0 Qualification Guidelines and GMP Documentation

#### 4.1 Qualification Summary

At the end of qualification execution, all tables and data entry fields must be completed and all test results, where specified, must be printed and attached to the protocol.

The Qualification Representative and the Reviewer must sign (signature or initials) and date each page that has a signature field. This represents agreement and acceptance of all data and information on the signed page.

**Note** Scion does not provide instructions for full Qualification of the personal computer (PC) used to operate the SCION. If further qualification of the PC is required the end-user must contact the PC manufacturer.

**Note** Scion does not provide full qualification instructions for non-Scion manufactured accessories. Limited instructions may be supplied. If qualification of a non-Scion accessory is required, the end user must contact the accessory manufacturer.

#### 4.2 Qualification Guidelines

The following are general guidelines for performing the qualification tests in accordance with cGMP for the Manufacturing, Processing, Packaging, or Holding of Drugs per 21CFR Parts 210 and 211. Additional local requirements may also apply.

- Read the guidelines before starting the qualification.
- Perform all tests exactly as written.
- Use a pen with permanent blue or black ink unless otherwise specified by company policy.
- Neatly strike out any incorrect words or numbers, made while writing comments or recording results, information or data within this Protocol, with a single line. The word(s) crossed out must remain legible. Write the correction as close as possible to the original entry. Write a brief description of the error. For example, write 'Transcription error' or 'Re-written for clarity'. Initial and date the change.
- Entering initials where a signature is requested, and vice versa is permitted. The exception to this is in 2.0 : Qualification Representative and Reviewer Details on page 6, where examples of each person's signature and initials are required.
- Use the date format dd Mon yyyy (e.g. 08 Mar 2011) unless otherwise specified by company policy.

### 4.4 Exception Reports

An exception to the protocol occurs when the observed result differs from the acceptance criteria or expected result.

All exceptions to the protocol must be documented in the Exception Report. The Exception Report includes a detailed description of the exception and resolution by the Qualification Representative.

Each Exception Report shall be issued with a unique identification number in the form ERID-XX-X. This number is generated by the page number on which the exception occurred followed by a sequential number indicating each exception found on the page.

For example, if an exception occurs on page 34, the Exception Report shall be identified as 'ERID-34-1'. If another exception occurs on page 34, the second report shall be identified as 'ERID-34-2'. This identification number should be recorded in the 'Pass / Fail / N/A' field after each test.

Each Exception Report must be signed by the Qualification Representative and the Reviewer as evidence of approval.

The Exception Report is inserted in the appropriately named appendix and numbered as per Section 4.3 of this protocol.

Qualification Rep. Initials	<i>Sahil P.</i>	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	



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#### 4.5 Reference Documents

The following documents are relevant to this Qualification:

- Installation Qualification Protocol
- Completed service report from Preventative Maintenance (PM) schedule

Qualification Rep. Initials	<i>Sabin P.</i>	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	



#### 4.7 General Guidelines

The following are general cGMP guidelines.

- Perform each procedure exactly as written.
- Fill in each item on the form or mark it Not Applicable (N/A).
- If an item is marked N/A, initial it and date it.
- The Reviewer reviews and initials all entries recorded by the Qualification Representative.
- Keep all raw data. The Qualification Representative and the Reviewer will initial it, and date it.
- Do not destroy raw data.
- Attach raw data from an instrument, such as the SCION, as an Addendum using the instructions in the following Addendums section.
- If several instruments are qualified simultaneously, reference shared information, such as standard preparation and chemical information, to the document containing the original information by its model and instrument identification number.
- Label all reference standards as required by local regulations.
- Record the time each reference standard was opened.
- Use reference standards within 24 hours of preparation.

Qualification Rep. Initials	<i>Sabin P.</i>	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	

#### 4.8 Specific Instructions for Documentation

The Reviewer designates specific documentation instructions as follows.

Permanent Ink Color	Blue
Preferred Date Format	23 MAY 23

If more instructions are required: Use an addendum sheet, write the addendum number, and a brief description.

Qualification Rep. Initials	<i>Sabin P.</i>	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	

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#### 4.6 Required Materials

The following stock solutions are required:

- 100 fg/μL OFN 394204200
- 1 pg/μL OFN 393065201
- 100 pg/μL OFN 393110101
- 10 pg/μL BZP 93065301
- 100 pg/μL BZP 394206200

The above solutions will be used to prepare the following working solutions which will be required to execute this OQ:

**Note** Refer to Appendix 1 for the preparation of the standard solutions.

Qualification Rep. Initials	<i>Sabin P.</i>	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	



#### 4.9 Documentation Corrections

**Note** All original entries must remain legible after corrections are made.

1. Draw a line through the incorrect information.
2. Write the correction as close as possible to the original entry, or enter a footnote.
3. Write a brief description of the error. For example, write "transcription error," "rewritten for clarity," or "correcting wrong entry".
4. Initial and date the change.

Qualification Rep. Initials	<i>Sabin P.</i>	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	

#### 4.10 Marking Procedures Not Applicable

Some sections may not be relevant for the qualification. To indicate that a procedure or part of a form is unnecessary and that it was not forgotten or inadvertently overlooked:

1. Draw a line through the portion that is not applicable. Write the letters N/A (for not applicable), your initials, and the date near the diagonal line.
2. If a procedural step is unnecessary, select N/A if it is indicated, or write a comment in an Addendum. The Qualification Representative and the Reviewer enter their initials and the date near the line.

**Note** The Qualification Representative and Reviewer must sign and date all forms, even when part or all of the form is marked N/A.

Qualification Rep. Initials	<i>Sabin P.</i>	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	



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## 4.11 Addendums

The following are reasons to complete an addendum sheet:

- A deviation needs documentation.
- Additional information or data needs to be recorded.
- Insufficient space to include the correction on the sheet where the error was made.

Qualification Rep. Initials	Sukh' P.	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	

## 4.12 Addendum Example

The following is an example of using an addendum sheet to document a deviation.

If some of the items on the sales order were not present, you could do the following:

1. Use an addendum sheet.
2. Write Instrument Delivery on the Procedure line.
3. Write the addendum page number followed by a letter. For example: page 12A, where 12 is the page and A represents the first addendum on that page.
4. Write the plan to obtain the missing items, which may be the following:
  - Scion notified that Part Number XXXXX and XXXX are missing.
  - Scion replied that the parts are in stock and will be sent overnight. While waiting for the parts to arrive, I will continue to set up the instrument.
5. Review the plan with the Reviewer and make the necessary modifications.
6. Document the arrival of the parts and write that this addendum is resolved. Attach a copy of delivery documents and create addendum pages as required.

Qualification Rep. Initials	Sukh' P.	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	



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4. The Qualification Representative and the Reviewer must sign and date the Pre-execution Approval.

Qualification Rep. Initials	Sukh' P.	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	



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## 5.0 Operational Qualification

This chapter contains the tests to be completed to perform an Operational Qualification for the SCION.

### 5.1 OQ Preparation

The following must be done before starting the OQ:

1. Preventative Maintenance must have been completed and signed off by the Qualification Representative, Reviewer, and QA/QC person, and attach a copy of the service report and add an addendum number.

Addendum P.M. Protocol

Qualification Rep. Initials	Sukh' P.	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	

2. OQ must have been completed and signed off by the Qualification Representative, Reviewer, and QA/QC person.

Qualification Rep. Initials	Sukh' P.	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	

3. The QA/QC person must review, approve, append (if necessary), and sign the Pre-execution Approval.

Qualification Rep. Initials	Sukh' P.	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	



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## 5.2 System Description

### 5.2.1 SCION Description

Installation Date:	2015	Principal Operator:		Phone Number:	
<b>Company Information</b>					
Company: United Analyst and Engineering			Installation Site: LAB		
Name:			Building:		
Address: 3 Soi Watsuthak 41			Address/Location: Sukhumvit Rd.		
City, State: Bangchak Prachasong			City, State: Bangkok		
Zip/Country: Thailand			Zip/Country: 10260		
<b>System Description</b>					
SCION		Serial Number:		GAS1203F021	
Sales Order Number:		Sales Order Addendum Number:			
GC					
Module Type: Scion 451		Serial Number:		BR1203M099	
AutoSampler					
Module Type: GP 8400		Serial Number:		BR1203M099	
MS Workstation					
Version: MSWS 8.2.1		Serial Number:		04106-6711-1882-4502	
Computer Operating System					
Operating System: Windows 7		Version: Pro		Serial No.: 00366-150436-158 Pack: -	
Computer					
Make: Dell		Model: optiplex		Serial No.: D9N4H5I	
Addendum Number(s):		2. System description		Hard Drive: 1TB Size / RAM: 4GB	
Qualification Rep. Initials	Sukh' P.	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	



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### 5.3 Data Sheet Specifications

Run these tests after the instrument has pumped down and is leak free. Use the factory methods. Follow the Installation Procedure; complete this section and the appropriate line of the OQ Summary. Print out the methods and results and attach as addendums. Use the factory test column Br-5ms 15m X 250lm X 0.25lm.

Table 5-1 TQ Specification

Mode	Concentration	Scan Range	Result †	N/A	Pass	Fail	Addendum
EI Full Scan	1 pg OFN	50-300	S/N ≥500:1				
EI MRM	100 fg OFN	272-222	S/N ≥5000:1				
PCI Full Scan‡	10 pg BZP	80-230	S/N ≥50:1				
NCI Full Scan‡	1 pg OFN	200-300	S/N ≥4000:1				

† The Signal-to-Noise ratio S/N values are based on RMS noise figure.

‡ CI tests use methane gas as reagent gas.

For any tests that did not pass, complete an Addendum for each, write the Addendum number and a brief description.

Qualification Rep. Initials	<i>Sahut P.</i>	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	

Table 5-2 SQ Specification

Mode	Concentration	Scan Range	Result †	N/A	Pass	Fail	Addendum
EI Full Scan	1 pg OFN	50-300	S/N ≥600:1		✓		
PCI Full Scan‡	100 pg BZP	80-230	S/N ≥600:1	✓			
NCI Full Scan‡	200 fg OFN	200-300	S/N ≥1000:1	✓			

Qualification Rep. Initials	<i>Sahut P.</i>	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	



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If the hardware is not the same as the factory method, then note this in the addendum and how the hardware available has been configured to compensate. The most common variation here is the sampler, where the Combi Pal has been used instead of the 8400. This will have no impact on results and can be tracked and recorded in the addendum.

### 5.5 EI Precision Test SQ

The following precision tests are for systems with autosamplers only. The test solution is 1 pg/μL OFN test mix part number 393065201.

The following is the required precision for 10 consecutive injections:

Injection	Retention Time	Peak Area
1	3.680	75060
2	3.681	77980
3	3.680	72859
4	3.680	75512
5	3.680	65015
6	3.682	73459
7	3.680	83551
8	3.682	65509
9	3.679	72852
10	3.679	76104
% RSD	0.028	4.39

As an alternative, a % RSD summary report from MSWS can be added as an addendum.

Addendum	N/A	Pass	Fail	Addendum
Observed Mass is between 271.6 m/z to 272.4 m/z, which is ± 0.4 of the expected m/z.		✓		
Retention Time ≤ 1% Relative Standard Deviation (RSD).		✓		
Peak Area ≤ 10% Relative Standard Deviation (RSD).		✓		

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### 5.4 EI Precision Test TQ

The following precision tests are for systems with autosamplers only. The test solution is 1 pg/μL OFN test mix part number 393065201.

The following is the required precision for 10 consecutive injections:

Injection	Retention Time	Peak Area
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
% RSD		

As an alternative, a % RSD summary report from MSWS can be added as an addendum.

Addendum	N/A	Pass	Fail	Addendum
Observed Mass is between 271.6 m/z to 272.4 m/z, which is ± 0.4 of the expected m/z.	✓			
Retention Time ≤ 1% Relative Standard Deviation (RSD).	✓			
Peak Area ≤ 10% Relative Standard Deviation (RSD).	✓			

To complete this section use the factory MRM method on the system CD. Print a copy of the method and add as an addendum.

Addendum N/A

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To complete this section use the factory Scan method on the system CD. Print a copy of the method and add as an addendum.

Addendum N/A

If the hardware is not the same as the factory method, then note this in the addendum and how the hardware available has been configured to compensate. The most common variation here is the sampler, where the Combi Pal has been used instead of the 8400. This will have no impact on results and can be tracked and recorded in the addendum.

Addendum N/A

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## 5.6 Final Evaluation

	N/A	Pass	Fail	Addendum
Is the equipment in normal operation condition?		✓		
Have all of the OQ requirements been completed?		✓		

Qualification Rep. Initials	<i>Sakun P.</i>	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	



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## 6.2 Operational Qualification Protocol Assignment

This Operational Qualification Protocol document is used for:

Operational Qualification Protocol as final test at Scion	<input type="checkbox"/>
Operational Qualification Protocol after Installation Qualification	<input type="checkbox"/>
Operational Qualification Protocol after Preventive Maintenance and OQ completion.	<input checked="" type="checkbox"/>

## 6.3 Protocol Acceptance / Protocol Approval by Scion

I agree that the procedures and information referenced in this document are applicable.

Instrument(s): *Scion 451 SA with CP 8400*

Serial Number(s): *GQS 1203F021*

Sales Order Number:

Company Name: *United Analyst and Engineering Consultant Co., Ltd.*

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## 6.0 Protocol Approval

## 6.1 Protocol Acceptance / Approval by Customer

I agree that the procedures and information referenced in this document are applicable.

Instrument(s): *Scion 451 SA with CP 8400*

Serial Number(s): *GQS 1203F021*

Sales Order Number:

Company Name: *United Analyst and Engineering Consultant Co., Ltd.*

I agree that the Operational Qualification Protocol has been satisfactorily completed.	<input checked="" type="checkbox"/>
I confirm that the Operational Qualification Protocol has not been completed, because of these failed (non-passed) items	<input type="checkbox"/>

## Authorized Customer Representative

Name (Print)	
Title	
Signature	
Initials	
Date	

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## Scion Certified Engineer

Name (Print)	<i>SOMCHAI POHTONGKAM</i>
Title	<i>ENGINEER</i>
Signature	<i>Sakun P.</i>
Initials	<i>SOMCHAI</i>
Date	



## 6.4 Remarks

Remarks

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## Appendices

Each page that is inserted after the appendix is numbered with the letter of the appendix and a sequential number. The appendix page number must be initialed and dated by both the Qualification Representative and the Reviewer.

For example, pages inserted after Appendix C are numbered C-1, C-2, C-3...etc along with the initials and date.

If the reverse of each appendix page is left blank it should be marked NA and signed and dated.

When the OQ is complete the total number of pages inserted after each appendix is written on the front page of the respective appendix sheet.

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### A.1 Qualification Representative Details

The Qualification Representative is to insert a copy of their appropriate qualification(s) after this page.

No. of Pages Inserted	
-----------------------	--

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### B.1 Exceptions

Each Exception Report shall be issued with a unique identification number in the form of ERID-XX-X. This number is generated by the page number on which the exception occurred followed by a sequential number indicating each exception found on the page.

For example, if an exception occurs on page 34, it shall be identified as Exception Report 'ERID-34-1'. If another exception occurs on page 34, the second exception shall be identified as 'ERID-34-2'. This identification number should be recorded in the pass/fail field after each test.

Insert Exception Reports (if any) after this page.

No. of Pages Inserted	N/A
-----------------------	-----

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Addendum Procedure: P.M. Retocol Page Number: 1

Qualification Rep. Initials	<u>Suh P.</u>	Reviewer Initials		QA/QC Initials	
Date	<u>23 MAY 23</u>	Date		Date	



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Addendum Procedure: 2. System description Page Number: 5

Qualification Rep. Initials	<u>Sakun' P.</u>	Reviewer Initials		QA/QC Initials	
Date	<u>23 MAY 23</u>	Date		Date	



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Addendum Procedure: 1. Certificate Page Number: 1

Qualification Rep. Initials	<u>Sakun' P.</u>	Reviewer Initials		QA/QC Initials	
Date	<u>23 MAY 23</u>	Date		Date	



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Addendum Procedure: 3. Test Result Page Number: 30

Qualification Rep. Initials	<u>Sakun' P.</u>	Reviewer Initials		QA/QC Initials	
Date	<u>23 MAY 23</u>	Date		Date	



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## Operational Qualification Protocol Certification

for

SCION

with the serial number

GQS1203F021

has successfully completed all criteria for hardware Operational Qualification Protocol

as detailed in this document.

Scion Certified Engineer

SOMCHAI POHTONGKAM

Name (please print)

Sakun' P.

Signature

23 MAY 23

Date

Authorized Customer Representative

Name / Function (please print)

Signature

Date

Customer Address

United Analyst and Engineering Consultant Co., Ltd.

Publication no. 394207000, Revision A, November 2011

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## List of Instruments Certification for Air & Noise Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration	Remark
<b>Ambient</b>									
1	Orifice Transfer Standard Calibrator	Total Suspended Particulate (TSP) Particulate Matter < 10 µm (PM <sub>10</sub> )	Andersen Instruments, Inc.	G25A 1901	Tisch Environmental, Inc.	05072022	5 Jul 22	4 Jul 24	-
2	U-Tube Manometer	Total Suspended Particulate (TSP) Particulate Matter < 10 µm (PM <sub>10</sub> )	Dwyer	1221-36-W/M -	Technology Promotion Association (Thailand-Japan)	22P968	12 Aug 22	11 Aug 23	-
3	Mass Flow Meter	BTEXs	Alicat Scientific, Inc.	MB-5SCCM-D/5M 71015	Miracle International Technology Co., Ltd.	L202210260-002	5 Nov 22	4 Nov 23	-
4	Aneroid Barometer	Total Suspended Particulate (TSP) Particulate Matter < 10 µm (PM <sub>10</sub> ) BTEXs	Barigo, Germany	-	Technology Promotion Association (Thailand-Japan)	22P2728	22 Jul 22	21 Jul 23	-
5	Dial Thermo-Hygrometer	Total Suspended Particulate (TSP) Particulate Matter < 10 µm (PM <sub>10</sub> ) BTEXs	Barigo, Germany	-	Technology Promotion Association (Thailand-Japan)	22H1585	27 Jul 22	26 Jul 23	-
6	Carbon Monoxide Analyzer	Carbon Monoxide	Thermo	48i 1200636464	UAE Consultant Co., Ltd.	13052022	13 May 22	12 May 23	-
7	Carbon Monoxide Analyzer	Carbon Monoxide	Thermo	48i 1200636465	UAE Consultant Co., Ltd.	13052022	13 May 22	12 May 23	-
8	Carbon Monoxide Analyzer	Carbon Monoxide	Thermo	48i 1200636466	UAE Consultant Co., Ltd.	08092022	8 Sep 22	7 Sep 23	-
9	Carbon Monoxide Analyzer	Carbon Monoxide	Thermo	48i 1200636467	UAE Consultant Co., Ltd.	12092022	12 Sep 22	11 Sep 23	-
10	Standard Gases (Mixture)	Carbon Monoxide	Airgas	EB0143262 2015PSIG	Airgas an Air Liquide company	E04NI99E15A01D3	21 Jun 21	21 Jun 24	-
11	Nitrogen Dioxide Analyzer	Nitrogen Dioxide	Thermo Scientific	42i 1201778109	UAE Consultant Co., Ltd.	28032023	28 Mar 23	27 Mar 24	-
12	Nitrogen Dioxide Analyzer	Nitrogen Dioxide	Thermo Scientific	42i 1201778110	UAE Consultant Co., Ltd.	07042023	7 Apr 23	6 Apr 24	-

## List of Instruments Certification for Air & Noise Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration	Remark
<b>Ambient</b>									
13	Nitrogen Dioxide Analyzer	Nitrogen Dioxide	Thermo Scientific	42i 1200636462	UAE Consultant Co.,Ltd.	28032023	28 Mar 23	27 Mar 24	-
14	Nitrogen Dioxide Analyzer	Nitrogen Dioxide	Thermo Scientific	42i 1200636463	UAE Consultant Co.,Ltd.	24012023	24 Jan 23	23 Jan 24	-
15	Standard Gases (Mixture)	Nitrogen Dioxide	Airgas	EB0143262 2015PSIG	Airgas an Air Liquide company	E04NI99E15A01D3	21 Jun 21	21 Jun 24	-
16	Wind Speed/Wind Direction	WS/WD	LSI LASTEM	E-LOG305 20080022	Thai Meteorological Department	262/22	12 Jul 22	11 Jul 23	-
17	Wind Speed/Wind Direction	WS/WD	LSI LASTEM	E-LOG305 20040039	Thai Meteorological Department	260/22	12 Jul 22	11 Jul 23	-
18	Wind Speed/Wind Direction	WS/WD	LSI LASTEM	E-LOG305 20080020	Thai Meteorological Department	276/22	2 Aug 22	1 Aug 23	-
19	Wind Speed/Wind Direction	WS/WD	LSI LASTEM	05103-5 30905375	Thai Meteorological Department	263/22	14 Jul 22	13 Jul 23	-
20	Sound Level Calibrator (Acoustic Calibrator)	Calibrate Sound Level Meter	Svantek	SV35A 73246	Innovative Instrument Co.,Ltd.	22-ACT-405	1 Jul 22	30 Jun 23	-
21	Sound Level Meter	$L_{Aeq}$ 24 hours, $L_{Amax}$ , $L_{A10}$ , $L_{A90}$ , $L_{Adn}$	ACO	6236 172112	Quality Calibration Co.,Ltd.	21E6566	11 Jul 21	11 Jul 23	-
22	Sound Level Meter	$L_{Aeq}$ 24 hours, $L_{Amax}$ , $L_{A10}$ , $L_{A90}$ , $L_{Adn}$	ACO	6236 172113	Quality Calibration Co.,Ltd.	21E8625	1 Sep 21	1 Sep 23	-
23	Sound Level Meter	$L_{Aeq}$ 24 hours, $L_{Amax}$ , $L_{A10}$ , $L_{A90}$ , $L_{Adn}$	ACO	6236 172125	Quality Calibration Co.,Ltd.	21E6559	14 Jul 21	14 Jul 23	-
24	Sound Level Meter	$L_{Aeq}$ 24 hours, $L_{Amax}$ , $L_{A10}$ , $L_{A90}$ , $L_{Adn}$	ACO	6236 172126	Quality Calibration Co.,Ltd.	21E6569	11 Jul 21	11 Jul 23	-

List of Instruments Certification for Water Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration	Remark
Water									
1	DO Meter	DO	Horiba	LAQUA-DO210 HE0G0015	Technology Promotion Association (Thailand-Japan)	23TW2	5 Jan 23	4 Jan 24	-
2	Conductivity Meter	Conductivity	Horiba	LAQUA-EC210 HC0J0020	Technology Promotion Association (Thailand-Japan)	22CH8	5 Jan 23	4 Jan 24	-



# Certificate of Calibration

Calibration Certification Information			
Cal. Date: July 5, 2022	Rootsometer S/N: 438320	Ta: 297 °K	
Operator: Jim Tisch		Pa: 750.1 mm Hg	
Calibration Model #: G25A	Calibrator S/N: 1901		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3540	3.3	2.00
2	3	4	1	0.9650	6.4	4.00
3	5	6	1	0.8640	8.0	5.00
4	7	8	1	0.8200	8.9	5.50
5	9	10	1	0.6780	12.9	8.00

Data Tabulation					
Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left( \frac{Pa}{Pstd} \right) \left( \frac{Vstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left( \frac{Ta}{Pa} \right)}$ (y-axis)
0.9859	0.7281	1.4073	0.9956	0.7353	0.8899
0.9818	1.0174	1.9902	0.9915	1.0274	1.2585
0.9797	1.1339	2.2251	0.9893	1.1451	1.4071
0.9785	1.1933	2.3337	0.9881	1.2050	1.4757
0.9732	1.4354	2.8146	0.9828	1.4496	1.7798
QSTD		m= 1.98897	QA		m= 1.24546
		b= -0.03691			b= -0.02334
		r= 0.99996			r= 0.99996

Calculations	
Vstd= ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	Va= ΔVol((Pa-ΔP)/Pa)
Qstd= Vstd/ΔTime	Qa= Va/ΔTime
For subsequent flow rate calculations:	
Qstd= 1/m ( √ ΔH ( Pa Pstd ) ( Tstd Ta ) ) <sup>-1</sup>	Qa= 1/m ( √ ΔH ( Ta/Pa ) ) <sup>-1</sup>

Standard Conditions	
Tstd: 298.15 °K	
Pstd: 760 mm Hg	
Key	
ΔH: calibrator manometer reading (in H2O)	
ΔP: rootsmeter manometer reading (mm Hg)	
Ta: actual absolute temperature (°K)	
Pa: actual barometric pressure (mm Hg)	
b: intercept	
m: slope	

RECALIBRATION	
US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30	

Tisch Environmental, Inc.  
145 South Miami Avenue  
Village of Cleves, OH 45002  
www.tisch-env.com  
TOLL FREE: (877)263-7610  
1-800-777-9009

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES  
53/44 PATTANAKARN ROAD SOI 18, SUANLIANG, SUANLIANG, BANGKOK 10250  
TEL: 0-2717-3000-24 FAX: 0-2718-9484

## Certificate of Calibration

Certificate No.: 22P968  
Page: 1 of 2

Equipment: U Tube Manometer  
Manufacturer: Dwyer  
Model: 1221-3B-WM  
Serial No.: -  
ID No.: UAE.EFM.179/2561  
Condition As-Received: Used Item  
Received Date: 03 August 2022  
Calibration Date: 12 August 2022  
Reference: 2208-0131WSC  
Ambient Temperature: ( 23 ± 2 ) °C  
Relative Humidity: ( 50 ± 15 ) %  
Atmospheric Pressure: 1010 mbar  
Submitted by: United Analyst and Engineering Consultant Co.,Ltd.  
81 Soi Udomsuk 41, Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10260  
Procedure used: The calibration was conducted by direct comparison method against Pressure Measuring Instruments Standard according to in-house calibration procedure CP-P04, using "DKD-R 6-1 : Calibration of Pressure Gauges, Edition 03/2014 " as a guidelines.

### Condition of this result of calibration

1. Reference standards instruments :

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Pressure Calibrator	PC106P	1189	MP-0113-22	14 Jul 2023
2. This result of calibration was made on requested at the point specified by customer.				
3. Scale and conversion factor is 1 kPa = 4.0146293 inH2O				
4. This instrument was used clean air as pressure media.				
5. This instrument was calibrated by applied pressure to high-port (+) side and low-port (-) side open to atmospheric pressure.				
6. This instrument was installed in vertical orientation and top of the pressure port was used as the reference level.				
7. This certificate is valid only to the item calibrated on date and place of calibration.				
8. This Certification is traceable to the International System of Unit maintained at:-				
-National Institute of Metrology Thailand (NIMT)				

Calibrated by: Sunit Ausarnee  
Issue Date: 14 August 2022

Approved Signatory: Attapol P.  
[ ] Phalinee Prapapal  
[ ] Sura Suwannasri  
[x] Attapol Panurach

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B 0282416



Cert.No.: 22P968  
Page: 2 of 2

Result of calibration:- Without adjustment  
Function:- Pressure Measurement  
Increasing Pressure

Range: 0 inH2O to 36 inH2O  
Scale Interval: 0.1 inH2O (The Fifth Estimate)

UUC Indication					
Applied Pressure (inH2O)	High-port side (inH2O)	Low-port side (inH2O)	ΔP (inH2O)	Error (inH2O)	
0.00	0.00	0.00	0.00	0.00	
2.00	1.00	-0.96	1.96	-0.04	
4.00	2.00	-1.96	3.96	-0.04	
6.00	3.00	-2.96	5.96	-0.04	
8.00	4.00	-3.94	7.94	-0.06	
10.00	5.00	-4.94	9.94	-0.06	
12.00	6.00	-5.94	11.94	-0.06	
14.00	7.02	-6.94	13.96	-0.04	
16.00	8.02	-7.94	15.96	-0.04	
18.00	9.04	-8.96	18.00	0.00	
20.00	10.04	-9.96	20.00	0.00	
22.00	11.06	-10.96	22.02	0.02	
24.00	12.06	-11.96	24.02	0.02	
26.00	13.08	-12.98	26.06	0.06	
28.00	14.08	-13.98	28.06	0.06	
30.00	15.10	-14.98	30.08	0.08	
32.00	16.10	-15.98	32.08	0.08	
34.00	17.08	-16.98	34.06	0.06	
36.00	17.86	-18.00	35.86	0.86	

The uncertainty of measurement was ± 0.11 inH2O  
\* UUC = Unit Under Calibration  
\* ΔP = High-port side - Low-port side  
The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k = 2, providing a level of confidence of approximately 95 %.

-000-

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a 1099523



MIRACLE INTERNATIONAL TECHNOLOGY CO.,LTD  
214 Bangwaek Rd. Bangpai Bangkok 10160  
Tel: 0-2865-4647-8 Fax: 0-2865-4649 http://www.mit.in.th



## CALIBRATION CERTIFICATE

Certificate No.: I.202210260-002  
Date Issued: 07-Nov-22

Customer: United Analyst and Engineering Consultant Co.,Ltd.  
81 Soi Udomsuk 41, Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10260

Equipment: Mass Flow Meter  
Manufacturer: Alicat Scientific  
Model: MB-SSCCM-D/5M  
Serial No.: 71015  
ID No./Tag No.: UAE.EMA2.119/2555  
Date Received: 31-Oct-22  
Date Calibrated: 05-Nov-22  
Calibrated by: Mr. Jame Khaothong

### Calibration Method or Calibration Procedure Used

In-house method: CP-34 by comparison against mass flow calibrator.

This certificate is traceable to national standards, which realize the units of measurement according to the International System of Units (SI).

### Result of Calibration

The reported uncertainty of measurement was based on standard uncertainty multiplied by a coverage factor k = 2, providing a level confidence approximately 95 percent.

This certificate may not be reproduced other than in full except with the prior written approval of the Miracle International Technology Company Limited.

Approved by: Sorayuth T.  
( Mr. Sarayuth Tochua )



Page 1 of 3

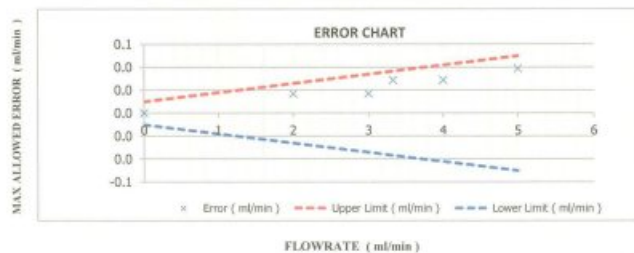
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Environment : Ambient temperature : ( 23 ± 2 ) °C  
 Relative humidity : ( 50 ± 15 ) % RH  
 Capacity Range : 5 ml/min  
 Calibration Media : Air  
 Type : Mass Flowmeter

Unit Under Calibration Reference Condition : Pressure 101.325 kPa(abs) , 25 °C , Air					
Temperature ( °C )	Pressure ( kPa )	UUC Reading ( ml/min )	STD Reading ( ml/min )	Error ( ml/min )	Uncertainty ( ± ml/min )
23.05	101.25	0.000	0.000 *	0.000	0.063
23.11	105.07	2.001	1.984	0.017	0.068
23.19	106.96	3.000	2.983	0.017	0.11
23.21	107.51	3.330	3.301	0.029	0.12
23.11	108.81	4.000	3.971	0.029	0.14
23.25	110.68	5.00	4.961	0.039	0.17

Error = Unit Under Calibration - Standard

Marked \* are not included in the NSC-ONSC accreditation schedule for our laboratory.



Page 2 of 3

Note : The actual flow rate is determined by the equation :

$$Q_{Meas} = Q_{Ref} \times \frac{P_{Ref}}{P_{Meas}} \times \frac{T_{Meas}}{T_{Ref}}$$

; Q = Flow rate  
 ; P = Absolute pressure  
 ; T = Absolute temperature  
 ; Subscript "Meas" = Measurement condition  
 ; Subscript "Ref" = Reference condition

Condition As-Received : Used Item

The measurement results and statements of conformity with specification only relate to the item calibrated.

Traceability of Certificate :

The International System of Units (SI) through

NIMT Certificate No. MW-0013-22 for Mass Flow Calibrator (20 SCCM) Serial No. G500971G20, Due 22-Feb-24

End of Certificate

Page 3 of 3

เอกสารไม่ควบคุม

เอกสารไม่ควบคุม



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
 CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES  
 5344 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG, BANGKOK 10250  
 TEL. 0-2717-3090-24 FAX. 0-2719-9484



## Certificate of Calibration

Certificate No.: 22P2728  
 Page: 1 of 2

Equipment : Aneroid Barometer  
 Manufacturer : Barigo  
 Model : -  
 Serial No.: -  
 ID No.: UAE.ANV.152/2550  
 Condition As-Received: Used Item  
 Received Date: 20 July 2022  
 Calibration Date: 22 July 2022  
 Reference: 2207-0584WSC  
 Ambient Temperature: ( 23 ± 2 ) °C  
 Relative Humidity: ( 50 ± 15 ) %  
 Atmospheric Pressure: 1010 mbar

Submitted by: United Analyst and Engineering Consultant Co.,Ltd.

81 Soi Udomsuk 41, Sukhumvit Road, Bangchak,  
 Phrakhanong, Bangkok 10260

Procedure used: The calibration was conducted by direct comparison method against Pressure Measuring Instruments Standard according to in-house calibration procedure CP-P10, using "DKD-R 6-1 ; Calibration of Pressure Gauges, Edition 03/2014 " as a guidelines.

## Condition of this result of calibration

1. Reference standards instruments :

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Standard Barometer	DPI142	1422505046	MP-0076-22	02 May 2023

2. This instrument was installed in vertical orientation and center of the dial was used as the reference level.

3. This result of calibration was made on requested at the point specified by customer.

4. This result of calibration instrument was in absolute pressure.

5. This instrument was used clean air as pressure media.

6. The certificate is valid only to the item calibrated on date and place of calibration.

7. This Certification is traceable to the International System of Unit maintained at:-

-National Institute of Metrology Thailand (NIMT)

Calibrated by : Suwit Aussamee  
 Issue Date : 25 July 2022

Approved Signatory : Atapol P.  
 [ ] Phatinee Pratsapal  
 [ ] Sura Suwannasri  
 ✓ Atapol Panurach

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B 0293209



Cert.No.: 22P2728  
 Page: 2 of 2

Result of calibration:- Without adjustment

Function:- Absolute Pressure Measurement

Range: 960 hPa to 1030 hPa

Scale interval: 1 hPa ( The Fifth Estimate )

Increasing Pressure

Applied Pressure (hPa)	955.27	967.46	978.89	989.56	999.85	1009.89	1020.55	1031.06
UUC* Indication (hPa)	960.0	970.0	980.0	990.0	1000.0	1010.0	1020.0	1030.0
Error (hPa)	3.73	2.54	1.11	0.44	0.15	0.11	-0.55	-1.06

Decreasing Pressure

Applied Pressure (hPa)	1031.19	1020.73	1009.91	999.92	989.72	979.13	967.71	956.64
UUC* Indication (hPa)	1030.0	1020.0	1010.0	1000.0	990.0	980.0	970.0	960.0
Error (hPa)	-1.19	-0.73	0.09	0.08	0.28	0.87	2.29	3.36

The uncertainty of measurement was ± 0.30 hPa

\* UUC = Unit Under Calibration

The reported uncertainty of measurement was based on a standard uncertainty multiplied  
 by a coverage factor k = 2, providing a level of confidence of approximately 95 %.

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a 1118529





## Certificate of Calibration

Certificate No.: 22H1585  
Page: 1 of 2

Equipment: Dial Thermo-Hygrometer

Manufacturer: Berigo

Model: -

Serial No.: -

ID No.: UAE/ANV/128/2550

Condition As-Received: Used Item

Received Date: 20 July 2022

Calibration Date: 22 July 2022

Reference: 2207-0586WSC

Ambient Temperature: (25 ± 3) °C

Relative Humidity: (50 ± 20) %

This certificate may not be reproduced other than in full,  
except with the prior written approval of the head of  
Corporate Services 3: Equipment Calibration and Testing Services.

Submitted by: United Analyst and Engineering Consultant Co., Ltd.

81 Soi Udomsuk 41, Sukhumvit Road, Bangkok,  
Phrakhanong, Bangkok 10260

Procedure used: Calibration were conducted using in-house calibration procedure CP-H02 according to comparison  
with standard chilled mirror sensor for humidity measurement function and comparison with standard  
temperature probe for temperature measurement function into humidity / temperature chamber.

### Condition of this result of calibration

1. Reference standards instruments:

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Standard Chilled Mirror Hygrometer Sensor	Dew Prima II	31863	19714	17 Sep 2022
2) Standard Humidity/Temperature Meter	400	10240757	TH-0125-21	13 Dec 2022

2. The certificate is valid only to the item calibrated on date and place of calibration.

3. This Certification is traceable to the International System of Unit maintained at:-

-National Institute of Standards and Technology (NIST), The United States of America

-National Institute of Metrology Thailand (NIMT)

Calibrated by: Somchai Dumvor

Issue Date: 03 August 2022

Approved Signatory:

[\*] Chakrit Waevarjua

[ ] Ponthipha Tameyakul

[ ] Viporn Tantiyawutti

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B 0293721



Cert. No.: 22H1585  
Page: 2 of 2

### Result of Calibration:-

Function:

Before Adjustment

Humidity measurement.

Reference Temperature (°C)	Standard Humidity (%R.H.)	UUC* Reading (%R.H.)	Error (%R.H.)	Uncertainty of Measurement (±%R.H.)
25.0	40.1	37	-3.1	1.6
25.0	60.0	55	-5.0	1.8
25.0	80.0	70	-10.0	2.0

### Result of Calibration:-

Function:

After Adjustment

Humidity measurement.

Reference Temperature (°C)	Standard Humidity (%R.H.)	UUC* Reading (%R.H.)	Error (%R.H.)	Uncertainty of Measurement (±%R.H.)
25.0	40.1	42	1.9	1.6
25.0	60.0	60	0.0	1.8
25.0	80.0	76	-4.0	2.0

### Result of Calibration:-

Function:

Without Adjustment

Temperature measurement.

Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of Measurement (±°C)
20.04	20.0	-0.04	0.72
30.01	30.0	-0.01	0.72
35.02	34.5	-0.52	0.72
40.02	39.5	-0.52	0.72

UUC\*: Unit Under Calibration

The reported uncertainty of measurement was based on standard uncertainty multiplied  
by coverage factor k = 2.00, providing confidence level approximately 95%.

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a 1119775



United Analyst and Engineering Consultant Co., Ltd.

3 Soi Udomsuk 41, Sukhumvit Road, Bangkok, Phrakhanong, Bangkok 10260

Tel. 0 2763 2828 Fax 0 2763 2800 www.uaeconsultant.com E-mail: uae@uaeconsultant.com



United Analyst and Engineering Consultant Co., Ltd.

3 Soi Udomsuk 41, Sukhumvit Road, Bangkok, Phrakhanong, Bangkok 10260

Tel. 0 2763 2828 Fax 0 2763 2800 www.uaeconsultant.com E-mail: uae@uaeconsultant.com

## MULTI-POINT GAS TEST REPORT

Test Date: Apr 3, 2023

Equipment: Gas Analyzer (CO) Model: 481  
Manufacturer: Thermo Scientific Serial Number: 1200636464

### Standard Gas Concentration

Sulphur Dioxide (SO <sub>2</sub> )	44.68	PPM	Manufacturer:	Thermo Scientific
Nitric Oxide (NO)	45.94	PPM	Model:	1461
Methane (CH <sub>4</sub> )	-	PPM	Serial Number:	1180540071
Carbon Monoxide (CO)	984.8	PPM		
Cylinder No.:	EB0143262			
Expiration Date:	Jun 20, 2024			

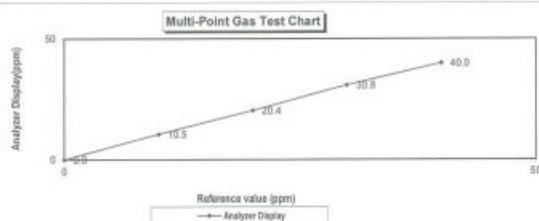
### Dilutor Detail

Manufacturer:	Thermo Scientific
Model:	1461
Serial Number:	1180540071

### Multi-point gas test data

Reference Value (ppm)	Analyzer Display (ppm)	Difference Error	Percent Error	[% Error]
Level 1 Zero	0.0	0.0	0.0	0.0
Level 2 20.00%	10.5	0.5	4.8	4.8
Level 3 40.00%	20.4	0.4	2.0	2.0
Level 4 60.00%	30.8	0.8	2.6	2.6
Level 5 80.00%	40.0	0.0	0.0	0.0
Remark: Measuring Range	50.0 ppm	Average Difference (%)	1.86	

:Acceptable Limit ± 5%



Calculate by

3, 04, 66

Approve by

4, Apr, 2023

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## MULTI-POINT GAS TEST REPORT

Test Date: May 13, 2022

Equipment: Gas Analyzer (CO) Model: 481  
Manufacturer: Thermo Scientific Serial Number: 1200636465

### Standard Gas Concentration

Sulphur Dioxide (SO <sub>2</sub> )	44.75	PPM	Manufacturer:	Thermo Scientific
Nitric Oxide (NO)	45.35	PPM	Model:	1461
Methane (CH <sub>4</sub> )	-	PPM	Serial Number:	1180540071
Carbon Monoxide (CO)	1007	PPM		
Cylinder No.:	CC159599			
Expiration Date:	Jul 30, 2022			

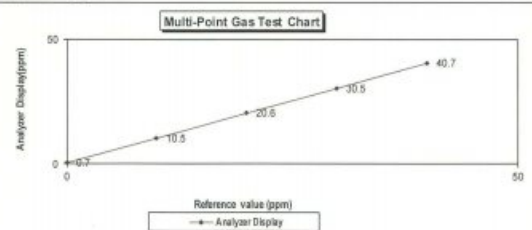
### Dilutor Detail

Manufacturer:	Thermo Scientific
Model:	1461
Serial Number:	1180540071

### Multi-point gas test data

Reference Value (ppm)	Analyzer Display (ppm)	Difference Error	Percent Error	[% Error]
Level 1 Zero	0.7	0.7	0.7	0.7
Level 2 20.00%	10.5	0.5	4.8	4.8
Level 3 40.00%	20.6	0.6	2.9	2.9
Level 4 60.00%	30.5	0.5	1.6	1.6
Level 5 80.00%	40.7	0.7	1.7	1.7
Remark: Measuring Range	50.0 ppm	Average Difference (%)	2.35	

:Acceptable Limit ± 5%



Calculate by

7, 5, 65

Approve by

13, May, 2022

เอกสารไม่ควบคุม





### MULTI-POINT GAS TEST REPORT

Test Date : Apr 7, 2023

Equipment : Gas Analyzer (NO<sub>2</sub>) Model : 42i  
Manufacturer : Thermo Scientific Serial Number : 1201778110

#### Standard Gas Concentration

Sulphur Dioxide (SO<sub>2</sub>) 44.68 PPM  
Nitric Oxide (NO) 45.94 PPM  
Methane (CH<sub>4</sub>) - PPM  
Carbon Monoxide (CO) 984.8 PPM  
Cylinder No. : EB0143262  
Expiration Date : Jun 21, 2024

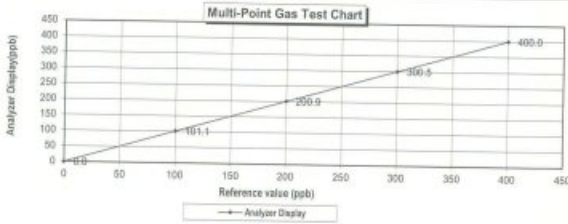
#### Dilutor Detail

Manufacturer : Thermo Scientific  
Model : 146i  
Serial Number : 1180540071

#### Multi-point gas test data

Level	Reference Value (ppb)	Analyzer Display (ppb)	Difference Error	Percent Error	[% Error]
Level 1	Zero	0.0	0.00	0.00	0.00
Level 2	20.00%	101.1	1.10	1.09	1.09
Level 3	40.00%	200.9	0.90	0.45	0.45
Level 4	60.00%	300.5	0.50	0.17	0.17
Level 5	80.00%	400.0	0.00	0.00	0.00

Remark : Measuring Range 500.0 ppb  
Acceptable Limit  $\pm 5\%$



Calculate by

Aphorn N.  
21/4/23

Approve by

Phorn N.  
21/4/23

เอกสารไม่ควบคุม

### MULTI-POINT GAS TEST REPORT

Test Date : Mar 28, 2023

Equipment : Gas Analyzer (NO<sub>2</sub>) Model : 42i  
Manufacturer : Thermo Scientific Serial Number : 1200636462

#### Standard Gas Concentration

Sulphur Dioxide (SO<sub>2</sub>) 44.68 PPM  
Nitric Oxide (NO) 45.94 PPM  
Methane (CH<sub>4</sub>) - PPM  
Carbon Monoxide (CO) 984.8 PPM  
Cylinder No. : EB0143262  
Expiration Date : Jun 21, 2024

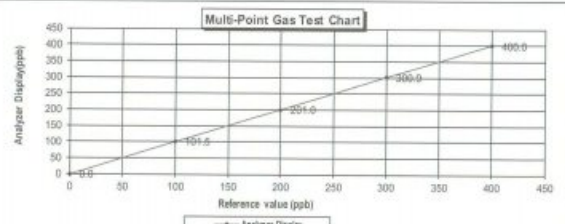
#### Dilutor Detail

Manufacturer : Thermo Scientific  
Model : 146i  
Serial Number : 1180540071

#### Multi-point gas test data

Level	Reference Value (ppb)	Analyzer Display (ppb)	Difference Error	Percent Error	[% Error]
Level 1	Zero	0.0	0.00	0.00	0.00
Level 2	20.00%	101.5	1.50	1.48	1.48
Level 3	40.00%	201.0	1.00	0.50	0.50
Level 4	60.00%	300.9	0.90	0.30	0.30
Level 5	80.00%	400.0	0.00	0.00	0.00

Remark : Measuring Range 500.0 ppb  
Acceptable Limit  $\pm 5\%$



Calculate by

Sinchari Sangsri  
28/3/23

Approve by

Phorn N.  
28/3/23

เอกสารไม่ควบคุม

### MULTI-POINT GAS TEST REPORT

Test Date : Jan 24, 2023

Equipment : Gas Analyzer (NO<sub>2</sub>) Model : 42i  
Manufacturer : Thermo Scientific Serial Number : 1200636463

#### Standard Gas Concentration

Sulphur Dioxide (SO<sub>2</sub>) 44.68 PPM  
Nitric Oxide (NO) 45.94 PPM  
Methane (CH<sub>4</sub>) - PPM  
Carbon Monoxide (CO) 984.8 PPM  
Cylinder No. : EB0143262  
Expiration Date : Jun 21, 2024

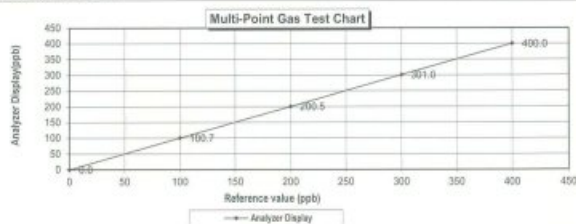
#### Dilutor Detail

Manufacturer : Thermo Scientific  
Model : 146i  
Serial Number : 1180540071

#### Multi-point gas test data

Level	Reference Value (ppb)	Analyzer Display (ppb)	Difference Error	Percent Error	[% Error]
Level 1	Zero	0.0	0.00	0.00	0.00
Level 2	20.00%	100.7	0.70	0.70	0.70
Level 3	40.00%	200.5	0.50	0.25	0.25
Level 4	60.00%	301.0	1.00	0.33	0.33
Level 5	80.00%	400.0	0.00	0.00	0.00

Remark : Measuring Range 500.0 ppb  
Acceptable Limit  $\pm 5\%$



Calculate by

Sinchari Sangsri  
24/1/23

Approve by

Phorn N.  
24/1/23

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### THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469

### Calibration Certificate

Issued by : Calibration & Test Section : Meteorological Instruments Bureau

Date of Issue : 12 July, 2022

Certification No. : 262/22

Page : 1 of 2

Object : Wind speed and wind direction

Manufacturer : LSI

Type : Data Logger E-LOG 305 wind speed and wind direction DNA 821

Serial No. : Data Logger 20080022 wind speed and wind direction 20050136

ID No. : No.20/20

Customer : United Analyst and Engineering Consultant Co., Ltd.

81 Soi Udomsuk 41, Sukhumvit Road,  
Bangchak, Prakanong, Bangkok 10260.

Calibration Condition : Temperature 25.1 °C Barometric Pressure 1003.5 hPa

#### NATIONAL STANDARD WIND TUNNEL :

: Thermal Anemometer 642 SIN 91563

: HOOK GAGE NO 1425 Pitot Tube Theodor Friedrichs Type 0800.0000 serial 9023

N.I.S.T. Test Reference Number 731/241460 : Standard Velocity at 20 - 30 m/sec

: Ultrasonic Anemometer Model DA-650-3TV (sensor TR-90AH)

Serial Number 110730029 (sensor 120629586)

JAPAN QUALITY ASSURANCE ORGANIZATION : Standard Velocity at 20 m/sec

Calibrated by : Watcharapong Subwat

Signed : Mr. Pissod Promsut

Mechanical Engineer



เอกสารไม่ควบคุม





# THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804,0-2399-0469

## The Result of Calibration

Certification No. 262/22

12 July, 2022

Page : 2 of 2

Standard	HOOK GAGE NO. 1425			TESTED ANEMOMETER	
	Pressure	Vacuum	Velocity	Velocity	Correction
Ultrasonic Anemometer	inches H <sub>2</sub> O	inches H <sub>2</sub> O	m/sec	m/sec	m/sec
1.00	-	-	-	0.7	0.30
3.02	-	-	-	2.5	0.52
5.00	-	-	-	4.2	0.80
7.04	-	-	-	6.7	0.34
9.02	-	-	-	8.7	0.32
11.01	-	-	-	10.5	0.51
13.01	-	-	-	12.7	0.31
15.01	-	-	-	14.3	0.71
17.02	-	-	-	16.7	0.32
20.02	-	-	-	19.3	0.72

Wind Aloft Plotting Board.	
U.S. DEPARTMENT OF COMMERCE WEATHER BUREAU	
WIND DIRECTION	TESTED WIND DIRECTION
0	0
90	90
180	180
270	270

Calibrated by :

Mr. Watcharapol Subwat  
Mechanical Engineer

Calibration & Test Section  
Meteorological Instruments Bureau

เอกสารไม่ควบคุม



# THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804,0-2399-0469

## Calibration Certificate

Issued by : Calibration & Test Section : Meteorological Instruments Bureau

Date of Issue : 12 July, 2022

Certification No. 260/22

Page : 1 of 2

Object : Wind speed and wind direction

Manufacturer : LSI

Type : Data Logger E-LOG 305 wind speed and wind direction DNA 821

Serial No. : Data Logger 20040039 wind speed and wind direction 20040180

ID No. : No.10/20

Customer : United Analyst and Engineering Consultant Co.,Ltd.  
81 Soi Udomsuk 41, Sukhumvit Road,  
Bangchak, Prakanong, Bangkok 10260.

Calibration Condition : Temperature 25.1 °C Barometric Pressure 1004.8 hPa

NATIONAL STANDARD WIND TUNNEL :

: Thermal Anemometer 642 S/N 91563

: HOOK GAGE NO 1425 Pitot Tube Theodor Friedrichs Type 0800.0000 serial 9023

N.I.S.T. Test Reference Number 731/241460 : Standard Velocity at 20 - 30 m/sec

: Ultrasonic Anemometer Model DA-650-3TV (sensor TR-90AH)

Serial Number 110730029 (sensor 120629586)

JAPAN QUALITY ASSURANCE ORGANIZATION : Standard Velocity

Calibrated by :

Mr. Watcharapol Subwat  
Mechanical Engineer

Signed :  
Mr. Pisod Promsut

(Authorized Signatory)  
for the Chief

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# THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804,0-2399-0469

## The Result of Calibration

Certification No. 260/22

12 July, 2022

Page : 2 of 2

Standard	HOOK GAGE NO. 1425			TESTED ANEMOMETER	
	Pressure	Vacuum	Velocity	Velocity	Correction
Ultrasonic Anemometer	inches H <sub>2</sub> O	inches H <sub>2</sub> O	m/sec	m/sec	m/sec
1.00	-	-	-	0.6	0.40
3.02	-	-	-	2.5	0.52
5.00	-	-	-	4.0	1.00
7.04	-	-	-	6.4	0.64
9.02	-	-	-	8.5	0.52
11.01	-	-	-	10.3	0.71
13.01	-	-	-	12.5	0.51
15.01	-	-	-	14.6	0.41
17.02	-	-	-	16.5	0.52
20.02	-	-	-	19.6	0.42

Wind Aloft Plotting Board.	
U.S. DEPARTMENT OF COMMERCE WEATHER BUREAU	
WIND DIRECTION	TESTED WIND DIRECTION
0	0
90	90
180	180
270	270

Calibrated by :

Mr. Watcharapol Subwat  
Mechanical Engineer

Calibration & Test Section  
Meteorological Instruments Bureau

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# THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804,0-2399-0469

## Calibration Certificate

Issued by : Calibration & Test Section : Meteorological Instruments Bureau

Date of Issue : 2 August, 2022

Certification No. 276/22

Page : 1 of 2

Object : Wind speed and wind direction

Manufacturer : LSI

Type : Data Logger E-LOG 305 wind speed and wind direction DNA 821

Serial No. : Data Logger 20080020 wind speed and wind direction 20040192

ID No. : No.18/20

Customer : United Analyst and Engineering Consultant Co.,Ltd.  
81 Soi Udomsuk 41, Sukhumvit Road,  
Bangchak, Prakanong, Bangkok 10260.

Calibration Condition : Temperature 25.1 °C Barometric Pressure 1006.9 hPa

NATIONAL STANDARD WIND TUNNEL :

: Thermal Anemometer 642 S/N 91563

: HOOK GAGE NO 1425 Pitot Tube Theodor Friedrichs Type 0800.0000 serial 9023

N.I.S.T. Test Reference Number 731/241460 : Standard Velocity at 20 - 30 m/sec

: Ultrasonic Anemometer Model DA-650-3TV (sensor TR-90AH)

Serial Number 110730029 (sensor 120629586)

JAPAN QUALITY ASSURANCE ORGANIZATION : Standard Velocity

Calibrated by :

Mr. Watcharapol Subwat  
Mechanical Engineer

Signed :  
Mr. Pisod Promsut

(Authorized Signatory)  
for the Chief

เอกสารไม่ควบคุม





# THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469

## The Result of Calibration

Certification No. 276/22

2 August, 2022

Page : 2 of 2

Standard	HOOK GAGE NO. 1425			TESTED ANEMOMETER	
	Pressure	Vacuum	Velocity	Velocity	Correction
Ultrasonic Anemometer	m/sec	inches H2O	inches H2O	m/sec	m/sec
1.00	-	-	-	1.0	0.00
3.02	-	-	-	3.0	0.02
5.00	-	-	-	5.0	0.00
7.04	-	-	-	6.9	0.14
9.02	-	-	-	8.9	0.12
11.01	-	-	-	10.9	0.11
13.01	-	-	-	12.9	0.11
15.01	-	-	-	14.8	0.21
17.02	-	-	-	16.8	0.22
20.02	-	-	-	19.8	0.22

Wind Aloft Plotting Board.	
U.S. DEPARTMENT OF COMMERCE WEATHER BUREAU	
WIND DIRECTION	TESTED WIND DIRECTION
0	0
90	90
180	180
270	270

Calibrated by :

*Handwritten signature*

Mr. Watcharapol Subwat  
Mechanical Engineer

Calibration & Test Section  
Meteorological Instruments Bureau



เอกสารไม่ควบคุม



# THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469

## Calibration Certificate

Issued by : Calibration & Test Section : Meteorological Instruments Bureau

Date of Issue 14 July, 2022

Certification No. 263/22

Page : 1 of 2

Object : Wind speed and wind direction

Manufacturer : Sensor : YOUNG

Basic Datalogger : NRG

Type : Sensor : 05103-45 Basic Datalogger : LR20

Serial No. : Sensor : 97947 Basic Datalogger : 30905375

Customer : United Analyst and Engineering Consultant Co., Ltd.  
81 Soi Udomsuk 41, Sukhumvit Road,  
Bangchak, Prakanong, Bangkok 10260.

Calibration Condition : Temperature 25.1 °C Barometric Pressure 1004.8 hPa

NATIONAL STANDARD WIND TUNNEL :

: Micromanometer Theodor Friedrichs FC014 Serial No. 9310119

: HOOK GAGE NO 1425 Pitot Tube Theodor Friedrichs Type 0800.0000 serial 9023

N.I.S.T. Test Reference Number 731/241460 : Standard Velocity at 20 - 30 m/sec

: Ultrasonic Anemometer Model DA-650-3TV (sensor TR-90AH)

Serial Number 110730029 (sensor 120629586)

JAPAN QUALITY ASSURANCE ORGANIZATION : Standard Velocity at 20 - 30 m/sec

Calibrated by : *Handwritten signature*

Mr. Watcharapol Subwat  
Mechanical Engineer

Signed : *Handwritten signature*

Mr. Pisoot Ponsut

Authorized Signatory

for the Chief



เอกสารไม่ควบคุม



# THAI METEOROLOGICAL DEPARTMENT

4353 Sukhumvit, Bangna, Bangkok 10260 Tel. 081-454-2804, 0-2399-0469

## The Result of Calibration

Certification No. 263/22

14 July, 2022

Page : 2 of 2

Standard	HOOK GAGE NO. 1425			TESTED ANEMOMETER	
	Pressure	Vacuum	Velocity	Velocity	Correction
Ultrasonic Anemometer	m/sec	inches H2O	inches H2O	m/sec	m/sec
1.00	-	-	-	0.95	0.05
3.02	-	-	-	2.94	0.08
5.00	-	-	-	4.94	0.06
7.04	-	-	-	6.98	0.06
9.02	-	-	-	8.93	0.09
11.01	-	-	-	10.92	0.09
13.01	-	-	-	12.92	0.09
15.01	-	-	-	15.02	-0.01
17.02	-	-	-	17.01	0.01
20.02	-	-	-	20.16	-0.14

Wind Aloft Plotting Board.	
U.S. DEPARTMENT OF COMMERCE WEATHER BUREAU	
WIND DIRECTION	TESTED WIND DIRECTION
0	0
90	90
180	180
270	270

Calibrated by :

*Handwritten signature*

Mr. Watcharapol Subwat  
Mechanical Engineer

Calibration & Test Section  
Meteorological Instruments Bureau



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INNOVATIVE INSTRUMENT CALIBRATION LAB  
INNOVATIVE INSTRUMENT CO., LTD. HEAD OFFICE  
7/139 MOO 13, SOI SUNTANAKORN 11 TAMBON BANG KAEU,  
AMPHOE BANG PHU SAMUT PRAKAN PROVINCE 10540 THAILAND  
TEL: 0660-2116-5880-1 FAX: 0660-2116-7140



## Certificate of Calibration

Customer

Name : UNITED ANALYST AND ENGINEERING CONSULTANT  
CO., LTD.

Certificate No : 22-ACT-405  
Request No : Req-2022-1080

Address : 81 Soi Udomsuk 41, Sukhumvit Road, Bangchak,  
Prakanong, Bangkok 10260

Unit Under Calibration Details

Measurement item : Acoustic Calibrator

Class : I

Manufacturer : SVANTEK

Range : 94, 114 dB / 1000 Hz

Model : SV 35A

Instrument Status : Used

Serial Number : 73246

ID : UAE.EFM.104/2561

Calibration Environment and Details

Temperature : ( 23 ± 2 °C )

Humidity : ( 50 ± 20 %RH )

Barometric Pressure : ( 1013 ± 10.0 hPa )

Received Date : 15 June 2022

Calibration Date : 1 July 2022

Location of Calibration : LAB 1 Acoustic

Calibration Procedure : In-house method CP-ACT-02 based on IEC 60942:2017 Electroacoustics - Sound calibrators

Reference Standard	Model	Serial Number	Traceable	Due Calibration
Sound Calibrator	SV 35A	58079	EEI	31 May 2023
THD Multimeter	2015	1047765	NIMT	2 February 2023

Traceability : This certificate provides traceability of measurement to recognized national standard, and to the realization of the international System of Units (SI).

Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor k=2, providing a level of confidence approximately 95 %.

Calibrated By :

*Handwritten signature*  
Mr. Noppadol Luangart  
Service Calibration Engineer

Approved By :

*Handwritten signature*  
Mr. Pacit Mathavorn  
Calibration Engineer Supervisor

Issue Date : 1 July 2022

The results related only to the items calibrated. The certificate shall not be reproduced except in full, without written approval of the Issuing Institute Co., Ltd.

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Certificate No : 22-ACT-405  
Request No : Req-2022-1080

Sound pressure level

Calibration Results : Without Adjustment

Calibration Range (dB)	Without Adjustment (dB)		Adjustment (dB)		Uncertainty (± dB)	Acceptance limit Class 1 (± dB)
	Measured	Error	Measured	Error		
94 dB / 1000 Hz	93.80	-0.20	-	-	0.12	0.25
114 dB / 1000 Hz	113.77	-0.23	-	-	0.11	0.25

Frequency of Sound pressure level

Calibration Range (Hz)	Without Adjustment		Adjustment		Uncertainty (± %)	Acceptance limit Class 1 (± %)
	Measured (Hz)	Error (%)	Measured (Hz)	Error (%)		
94 dB / 1000 Hz	1000.00	0.00	-	-	0.10	0.70
114 dB / 1000 Hz	1000.00	0.00	-	-	0.10	0.70

Total Harmonic Distortion plus Noise of Sound pressure level (THD+N %)

Calibration Range (Hz)	Without Adjustment		Adjustment		Uncertainty (± %)	Acceptance limit Class 1 (± %)
	Measured (%)	Error (%)	Measured (%)	Error (%)		
94 dB / 1000 Hz	0.09	-	-	-	0.40	2.5
114 dB / 1000 Hz	0.31	-	-	-	0.40	2.5

Note :

- Acceptance limit was IEC69942:2017 Class I
- The calibration results exclude the calibration pressure correction
- The calibration results exclude the microphone volume correction

End of Calibration

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the issuing body, QCAL Co., Ltd.

เอกสารไม่ควบคุม 07/23



CERTIFICATE No : 21E6566  
REFERENCE No : 53287-3

PAGE : 1 OF 2

Certificate of Calibration

EQUIPMENT : SOUND LEVEL METER  
MANUFACTURER : ACO  
MODEL : 6236  
SERIAL No : 172112  
ID No : UAE.EFM.006/2561  
SUBMITTED BY : UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.  
81 SOI UDOMSUK 41, SUKHUMVIT ROAD, BANGCHAK, PHRAKHANONG, BANGKOK 10260

CALIBRATED BY : CHAICHARN CH.  
CALIBRATION DATE : 11-Jul-21  
APPROVED BY : PONGSAK J.  
ISSUED DATE : 11-Jul-21  
RECEIVED DATE : 09-Jul-21

THIS CERTIFICATE MAY NOT BE REPRODUCED OTHER THAN IN FULL EXCEPT WITH THE PRIOR WRITTEN APPROVAL OF QUALITY CALIBRATION CO., LTD.  
เอกสารไม่ควบคุม F-G010 REV 02



PAGE : 2 OF 2

Calibration Report

EQUIPMENT : SOUND LEVEL METER  
MANUFACTURER : ACO  
MODEL : 6236  
S/N : 172112  
ID No : UAE.EFM.006/2561  
RECEIVED DATE : 09-Jul-21  
CALIBRATION DATE : 11-Jul-21  
AMBIENT TEMPERATURE : 23°C ± 3°C  
RELATIVE HUMIDITY : 50 % RH ± 20% RH

CONDITION OF THIS RESULTS OF CALIBRATION

1. THIS INSTRUMENT WAS CALIBRATED ACCORDING TO IEC 61672-2 :2003-04 AGAINST MULTIFUNCTION SOUND CALIBRATOR. THIS INSTRUMENT WAS PERFORMED SELF-CALIBRATION BY CALIBRATOR AT 94 Hz BEFORE CALIBRATION.
2. REFERENCE STANDARD INSTRUMENTS >

INSTRUMENT	MODEL	SERIAL No	CERTIFICATE No	DUE DATE
1) MULTIFUNCTION SOUND CALIBRATOR	1986	01285	21E0445	08-Feb-22

3. THIS RESULT WAS FOUND ACCURATE AS SHOWN ON DATE AND PLACE OF CALIBRATION ONLY.
4. THIS RESULT EXCLUDE LONG TERM STABILITY OF THE UNIT UNDER CALIBRATION.
5. THIS CERTIFICATE IS TRACEABLE TO >

- NATIONAL INSTITUTE OF METROLOGY (THAILAND) THROUGH THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR).

RESULT OF CALIBRATION > WITHOUT ADJUSTMENT

1. A-WEIGHTING ACOUSTIC FREQUENCY RESPONSE

FREQUENCY (Hz)	STANDARD EXPECTED READING (dB)	UUC READING (dB)	CORRECTION (dB)	UNCERTAINTY OF MEASUREMENT (± dB)
125.00	-16.10	-16.2	0.1	0.50
250.00	-8.60	-8.5	-0.1	0.50
500.00	-3.20	-3.0	-0.2	0.50
1000.00	0.00	0.0	0.0	0.50
2000.00	1.20	1.0	0.2	0.50
4000.00	1.00	0.0	1.0	0.50

2. C-WEIGHTING ACOUSTIC FREQUENCY RESPONSE

FREQUENCY (Hz)	STANDARD EXPECTED READING (dB)	UUC READING (dB)	CORRECTION (dB)	UNCERTAINTY OF MEASUREMENT (± dB)
125.00	-0.20	-0.5	0.3	0.50
250.00	0.00	0.0	0.0	0.50
500.00	0.00	0.2	-0.2	0.50
1000.00	0.00	0.1	-0.1	0.50
2000.00	-0.20	-0.3	0.1	0.50
4000.00	-0.80	-1.7	0.9	0.50

3. SOUND LEVEL LINEARITY TEST AT 1000 Hz

STANDARD APPLIED (dB)	UUC READING (dB)	CORRECTION (dB)	UNCERTAINTY OF MEASUREMENT (± dB)
74	73.5	0.5	0.50
84	83.9	0.1	0.50
94	94.0	0.0	0.50
104	104.1	-0.1	0.50
114	114.1	-0.1	0.50

UUC\* : UNIT UNDER CALIBRATION  
THE REPORTED UNCERTAINTY OF MEASUREMENT WAS BASED ON A STANDARD UNCERTAINTY MULTIPLIED BY A COVERAGE FACTOR k=2, PROVIDING A LEVEL OF CONFIDENCE APPROXIMATELY 95%  
END OF CALIBRATION REPORT

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CERTIFICATE No : 21E6625  
REFERENCE No : 58409-5

PAGE : 1 OF 2

Certificate of Calibration

EQUIPMENT : SOUND LEVEL METER  
MANUFACTURER : ACO  
MODEL : 6236  
SERIAL No : 172113  
ID No : UAE.EFM.007/2561  
SUBMITTED BY : UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.  
81 SOI UDOMSUK 41, SUKHUMVIT ROAD, BANGCHAK, PHRAKHANONG, BANGKOK 10260

CALIBRATED BY : CHAICHARN CH.  
CALIBRATION DATE : 01-Sep-21  
APPROVED BY : PONGSAK J.  
ISSUED DATE : 01-Sep-21  
RECEIVED DATE : 26-Aug-21

THIS CERTIFICATE MAY NOT BE REPRODUCED OTHER THAN IN FULL EXCEPT WITH THE PRIOR WRITTEN APPROVAL OF QUALITY CALIBRATION CO., LTD.  
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**QUALITY CALIBRATION CO.,LTD.**235 Petchkasem 63/2 Road, Laksoeng, Bangkok, Bangkok 10160  
Tel (662) 421-5402, (662) 444-0152-3, Fax (662) 809-4584[www.qcalibration.com](http://www.qcalibration.com)

CERTIFICATE No : 21E8625

PAGE : 2 OF 2

**Calibration Report**

EQUIPMENT : SOUND LEVEL METER  
MANUFACTURER : ACO MODEL : 6236  
S/N : 172125 ID No : UAE.EFM.007/2561  
RECEIVED DATE : 26-Aug-21 CALIBRATION DATE : 01-Sep-21  
AMBIENT TEMPERATURE : 23°C ± 3°C RELATIVE HUMIDITY : 50 % RH ± 20% RH

**CONDITION OF THIS RESULTS OF CALIBRATION**

1. THIS INSTRUMENT WAS CALIBRATED ACCORDING TO IEC 61672-2 :2003-04 AGAINST MULTIFUNCTION SOUND CALIBRATOR.  
THIS INSTRUMENT WAS PERFORMED SELF-CALIBRATION BY CALIBRATOR FROM CUSTOMER AT 94 Hz BEFORE CALIBRATION.

**2. REFERENCE STANDARD INSTRUMENTS :-**

INSTRUMENT	MODEL	SERIAL No	CERTIFICATE No	DUE DATE
1) MULTIFUNCTION SOUND CALIBRATOR	1986	01285	21E6450	06-Jul-22

3. THIS RESULT WAS FOUND ACCURATE AS SHOWN ON DATE AND PLACE OF CALIBRATION ONLY.  
4. THIS RESULT EXCLUDE LONG TERM STABILITY OF THE UNIT UNDER CALIBRATION.

5. THIS CERTIFICATE IS TRACEABLE TO :-

- NATIONAL INSTITUTE OF METROLOGY (THAILAND) THROUGH THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR).

**RESULT OF CALIBRATION :- WITHOUT ADJUSTMENT****1. A-WEIGHTING ACOUSTIC FREQUENCY RESPONSE**

FREQUENCY (Hz)	STANDARD EXPECTED READING (dB)	UUC READING (dB)	CORRECTION (dB)	UNCERTAINTY OF MEASUREMENT (± dB)
125.00	-16.10	-15.6	-0.5	0.50
250.00	-8.60	-8.4	-0.2	0.50
500.00	-3.20	-3.0	-0.2	0.50
1000.00	0.00	0.0	0.0	0.50
2000.00	1.20	1.0	0.2	0.50
4000.00	1.00	0.0	1.0	0.50

**2. C-WEIGHTING ACOUSTIC FREQUENCY RESPONSE**

FREQUENCY (Hz)	STANDARD EXPECTED READING (dB)	UUC READING (dB)	CORRECTION (dB)	UNCERTAINTY OF MEASUREMENT (± dB)
125.00	-0.20	0.0	-0.2	0.50
250.00	0.00	0.2	-0.2	0.50
500.00	0.00	0.2	-0.2	0.50
1000.00	0.00	0.1	-0.1	0.50
2000.00	-0.20	-0.3	0.1	0.50
4000.00	-0.80	-1.0	0.2	0.50

**3. SOUND LEVEL LINEARITY TEST AT 1000 Hz**

STANDARD APPLIED (dB)	UUC READING (dB)	CORRECTION (dB)	UNCERTAINTY OF MEASUREMENT (± dB)
74	74.0	0.0	0.50
84	83.9	0.1	0.50
94	94.0	0.0	0.50
104	104.0	0.0	0.50
114	114.1	-0.1	0.50

UUC\* : UNIT UNDER CALIBRATION

THE REPORTED UNCERTAINTY OF MEASUREMENT WAS BASED ON A STANDARD UNCERTAINTY MULTIPLIED BY A COVERAGE FACTOR k=2, PROVIDING A LEVEL OF CONFIDENCE APPROXIMATELY 95%.

END OF CALIBRATION REPORT

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F-G010 REV 02

**QUALITY CALIBRATION CO.,LTD.**235 Petchkasem 63/2 Road, Laksoeng, Bangkok, Bangkok 10160  
Tel (662) 421-5402, (662) 444-0152-3, Fax (662) 809-4584[www.qcalibration.com](http://www.qcalibration.com)

CERTIFICATE No : 21E6559

REFERENCE No : 57780-1

PAGE : 1 OF 2

**Certificate of Calibration**

EQUIPMENT : SOUND LEVEL METER  
MANUFACTURER : ACO  
MODEL : 6236  
SERIAL No : 172125  
ID No : UAE.EFM.008/2561  
SUBMITTED BY : UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.  
3 SOI UDOMSUK 41, SUKHUMVIT ROAD,  
BANGCHAK, PHRAKHANONG, BANGKOK  
10260

CALIBRATED BY : CHAICHARN CH.

CALIBRATION DATE : 14-Jul-21

APPROVED BY : PONGSAK J.

ISSUED DATE : 14-Jul-21

RECEIVED DATE : 08-Jul-21

THIS CERTIFICATE MAY NOT BE REPRODUCED OTHER THAN IN FULL EXCEPT WITH THE PRIOR WRITTEN APPROVAL OF  
QUALITY CALIBRATION CO., LTD.

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F-G010 REV 02

**QUALITY CALIBRATION CO.,LTD.**235 Petchkasem 63/2 Road, Laksoeng, Bangkok, Bangkok 10160  
Tel (662) 421-5402, (662) 444-0152-3, Fax (662) 809-4584[www.qcalibration.com](http://www.qcalibration.com)

CERTIFICATE No : 20E6559

PAGE : 2 OF 2

**Calibration Report**

EQUIPMENT : SOUND LEVEL METER  
MANUFACTURER : ACO MODEL : 6236  
S/N : 172125 ID No : UAE.EFM.008/2561  
RECEIVED DATE : 08-Jul-21 CALIBRATION DATE : 14-Jul-21  
AMBIENT TEMPERATURE : 23°C ± 3°C RELATIVE HUMIDITY : 50 % RH ± 20% RH

**CONDITION OF THIS RESULTS OF CALIBRATION**

1. THIS INSTRUMENT WAS CALIBRATED ACCORDING TO IEC 61672-2 :2003-04 AGAINST MULTIFUNCTION SOUND CALIBRATOR.  
THIS INSTRUMENT WAS PERFORMED SELF-CALIBRATION BY CALIBRATOR AT 94 Hz BEFORE CALIBRATION.

**2. REFERENCE STANDARD INSTRUMENTS :-**

INSTRUMENT	MODEL	SERIAL No	CERTIFICATE No	DUE DATE
1) MULTIFUNCTION SOUND CALIBRATOR	1986	01285	21E6450	06-Jul-22

3. THIS RESULT WAS FOUND ACCURATE AS SHOWN ON DATE AND PLACE OF CALIBRATION ONLY.  
4. THIS RESULT EXCLUDE LONG TERM STABILITY OF THE UNIT UNDER CALIBRATION.

5. THIS CERTIFICATE IS TRACEABLE TO :-

- NATIONAL INSTITUTE OF METROLOGY (THAILAND) THROUGH THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR).

**RESULT OF CALIBRATION :- WITHOUT ADJUSTMENT****1. A-WEIGHTING ACOUSTIC FREQUENCY RESPONSE**

FREQUENCY (Hz)	STANDARD EXPECTED READING (dB)	UUC READING (dB)	CORRECTION (dB)	UNCERTAINTY OF MEASUREMENT (± dB)
125.00	-16.10	-15.4	-0.7	0.50
250.00	-8.60	-8.3	-0.3	0.50
500.00	-3.20	-3.0	-0.2	0.50
1000.00	0.00	0.0	0.0	0.50
2000.00	1.20	1.0	0.2	0.50
4000.00	1.00	0.1	0.9	0.50

**2. C-WEIGHTING ACOUSTIC FREQUENCY RESPONSE**

FREQUENCY (Hz)	STANDARD EXPECTED READING (dB)	UUC READING (dB)	CORRECTION (dB)	UNCERTAINTY OF MEASUREMENT (± dB)
125.00	-0.20	0.1	-0.3	0.50
250.00	0.00	0.1	-0.1	0.50
500.00	0.00	0.1	-0.1	0.50
1000.00	0.00	0.0	0.0	0.50
2000.00	-0.20	-0.4	0.2	0.50
4000.00	-0.80	-1.7	0.9	0.50

**3. SOUND LEVEL LINEARITY TEST AT 1000 Hz**

STANDARD APPLIED (dB)	UUC READING (dB)	CORRECTION (dB)	UNCERTAINTY OF MEASUREMENT (± dB)
74	74.0	0.0	0.50
84	83.9	0.1	0.50
94	94.0	0.0	0.50
104	104.0	0.0	0.50
114	114.1	-0.1	0.50

UUC\* : UNIT UNDER CALIBRATION

THE REPORTED UNCERTAINTY OF MEASUREMENT WAS BASED ON A STANDARD UNCERTAINTY MULTIPLIED BY A COVERAGE FACTOR k=2, PROVIDING A LEVEL OF CONFIDENCE APPROXIMATELY 95%.

END OF CALIBRATION REPORT

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F-G010 REV 02

**QUALITY CALIBRATION CO.,LTD.**235 Petchkasem 63/2 Road, Laksoeng, Bangkok, Bangkok 10160  
Tel (662) 421-5402, (662) 444-0152-3, Fax (662) 809-4584[www.qcalibration.com](http://www.qcalibration.com)

CERTIFICATE No : 21E6569

REFERENCE No : 53287-6

PAGE : 1 OF 2

**Certificate of Calibration**

EQUIPMENT : SOUND LEVEL METER  
MANUFACTURER : ACO  
MODEL : 6236  
SERIAL No : 172126  
ID No : UAE.EFM.009/2561  
SUBMITTED BY : UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.  
81 SOI UDOMSUK 41, SUKHUMVIT ROAD,  
BANGCHAK, PHRAKHANONG, BANGKOK  
10260

CALIBRATED BY : CHAICHARN CH.

CALIBRATION DATE : 11-Jul-21

APPROVED BY : PONGSAK J.

ISSUED DATE : 11-Jul-21

RECEIVED DATE : 09-Jul-21

THIS CERTIFICATE MAY NOT BE REPRODUCED OTHER THAN IN FULL EXCEPT WITH THE PRIOR WRITTEN APPROVAL OF  
QUALITY CALIBRATION CO., LTD.

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F-G010 REV 02





CERTIFICATE No.: 21E6569

PAGE: 2 OF 2

### Calibration Report

EQUIPMENT : SOUND LEVEL METER  
MANUFACTURER : ACO  
MODEL : 6236  
S/N : 172126  
ID No : UAE.EFM.009/2561  
RECEIVED DATE : 09-Jul-21  
CALIBRATION DATE : 11-Jul-21  
AMBIENT TEMPERATURE : 23°C ± 3°C  
RELATIVE HUMIDITY : 50 % RH ± 20% RH

**CONDITION OF THIS RESULTS OF CALIBRATION**  
1. THIS INSTRUMENT WAS CALIBRATED ACCORDING TO IEC 61672-2 :2003-04 AGAINST MULTIFUNCTION SOUND CALIBRATOR.  
2. THIS INSTRUMENT WAS PERFORMED SELF-CALIBRATION BY CALIBRATOR AT 94 Hz BEFORE CALIBRATION.  
3. REFERENCE STANDARD INSTRUMENTS :-

INSTRUMENT	MODEL	SERIAL No	CERTIFICATE No	DUE DATE
1) MULTIFUNCTION SOUND CALIBRATOR	1986	01285	21E0445	08-Feb-22

3. THIS RESULT WAS FOUND ACCURATE AS SHOWN ON DATE AND PLACE OF CALIBRATION ONLY.  
4. THIS RESULT EXCLUDE LONG TERM STABILITY OF THE UNIT UNDER CALIBRATION.  
5. THIS CERTIFICATE IS TRACEABLE TO :-  
- NATIONAL INSTITUTE OF METROLOGY (THAILAND) THROUGH THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR).

### RESULT OF CALIBRATION :- WITHOUT ADJUSTMENT

#### 1. A-WEIGHTING ACOUSTIC FREQUENCY RESPONSE

FREQUENCY (Hz)	STANDARD EXPECTED READING (dB)	UUC READING (dB)	CORRECTION (dB)	UNCERTAINTY OF MEASUREMENT (± dB)
125.00	-16.10	-16.3	0.2	0.50
250.00	-8.60	-8.5	-0.1	0.50
500.00	-3.20	-3.0	-0.2	0.50
1000.00	0.00	0.0	0.0	0.50
2000.00	1.20	0.9	0.3	0.50
4000.00	1.00	-0.3	1.3	0.50

#### 2. C-WEIGHTING ACOUSTIC FREQUENCY RESPONSE

FREQUENCY (Hz)	STANDARD EXPECTED READING (dB)	UUC READING (dB)	CORRECTION (dB)	UNCERTAINTY OF MEASUREMENT (± dB)
125.00	-0.20	0.1	-0.3	0.50
250.00	0.00	0.1	-0.1	0.50
500.00	0.00	0.1	-0.1	0.50
1000.00	0.00	0.0	0.0	0.50
2000.00	-0.20	-0.4	0.2	0.50
4000.00	-0.80	-2.0	1.2	0.50

#### 3. SOUND LEVEL LINEARITY TEST AT 1000 Hz

STANDARD APPLIED (dB)	UUC READING (dB)	CORRECTION (dB)	UNCERTAINTY OF MEASUREMENT (± dB)
74	73.9	0.1	0.50
84	83.9	0.1	0.50
94	94.0	0.0	0.50
104	104.0	0.0	0.50
114	114.0	0.0	0.50

UUC\* : UNIT UNDER CALIBRATION  
THE REPORTED UNCERTAINTY OF MEASUREMENT WAS BASED ON A STANDARD UNCERTAINTY MULTIPLIED BY A COVERAGE FACTOR k=2, PROVIDING A LEVEL OF CONFIDENCE APPROXIMATELY 95%  
END OF CALIBRATION REPORT

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F-0010 REV 02



Cert.No.: 23TW220  
Page: 1 of 2

### Certificate of Testing

Equipment : DO Meter  
Manufacturer : Horiba  
Model : LAQUA UC10  
Serial No. : IIC 00010  
ID No. : UAE.EFM.208/2561; EFM.DC 10/6-1  
Received Date : 26 September 2023  
Test Date : 27 September 2023  
Reference : 250B-084W5C-3  
Submitted by : United Analytical and Engineering Consultant Co., Ltd.  
3 Su Udonnuek 41, Sukhumvit Road, Bangkok, Phrakhanong, Bangkok 10260  
Laboratory Condition : Temperature : (25 ± 5) °C  
Humidity : (50 ± 20) %  
In-house method : GPC 018  
by Comparison Technique with Audit Modification Method  
Tested by : Weelak Sathorn  
Approved by :   
Approved Signatory  
( ) Sathorn Meungnui  
( ) Watanan Lomgajirak  
( ) Noppan Papi  
Issue Date : 29 September 2023

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B 0325262



Cert.No.: 25TW220  
Page: 2 of 2

### Condition of this result of calibration

1. Reference Standard Instruments :  
This certification is traceable to the International System of Unit through the reference standards Laboratory of Industrial Calibration Center Technology Promotion Association (Thailand-Japan)

Instruments	Serial No.	ID No.	Certificate No.	Due Date
1) H meter	-	13361.50	25CG1172	22 Mar 2024
2) Balance	124213532	140R0006	25MMD	20 Feb 2024

### 2. Standard Material :

Material	Manufacturer	Lot No.	Assay
Sodium Thiosulfate pentahydrate	Merck	AM7E3215	100.2%

Result : Dissolved Oxygen Meter Adjustment With Air 100 %  
Dissolved Oxygen Probe No.: 8K1B0322

Titration Method (Azide Modification Method) (mg/L)	DO Meter Reading (mg/L)	Standard Deviation (mg/L)
8.16	8.18	0.016

This report was written only for the instrument we tested. It is allowable to use for study the system efficiency. The environmental impact control and present to organization it may concerned tend to use for advertising and referral purpose is prohibited. This report may not be reproduced other in full without written approval of the laboratory

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a 1182621



Cert. No.: 23LM768  
Page: 1 of 2

### Certificate of Calibration

Equipment : DO Meter with Sensor  
Manufacturer : Horiba  
Model : LAQUA UC10  
Serial No. : IIC100010  
ID No. : UAE.EFM.208/2561; EFM.DC 10/6-1  
Submitted by : United Analytical and Engineering Consultant Co., Ltd.  
3 Su Udonnuek 41, Sukhumvit Road, Bangkok, Phrakhanong, Bangkok 10260  
Location : 1-4 Chemistry Calibration Laboratory  
Received Order : 25 September 2023  
Calibrated Date : 28 September 2023  
Ambient Temperature : (26 ± 1) °C  
Relative Humidity : (50 ± 30) %  
AC Line Voltage : (220 ± 22) V  
Calibrated by : Anurak Sathorn  
Approved by :   
Approved Signatory  
( ) Pothitip Meungnui  
( ) Noppan Papi  
( ) Sathorn Papi  
Issue Date : 5 October 2023

The Uncertainty are for a confidence probability of approximately 95%  
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A 0053011



Equipment : DC Meter with Sensor  
Condition As-Received : Used Item  
Reference : 2303-12317-0

Cert. No.: 2303-12317  
Page: 2 of 2

#### Procedure Used :-

Calibration were conducted using in-house calibration procedure CP-OT01 according to comparison with Industrial Platinum Resistance Thermometer (IPRT) into Temperature Bath.

The temperature scale used was based on ITS-90.

#### Condition of this result of calibration

##### 1. Reference standard Instrument-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Digital Thermometer	2182001	22-1245	PA	21 Oct 2023

2. This certificate is valid only to the item calibrated on date and place of calibration.

3. This certification is traceable to the International System of Unit.

Remark : JPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- ; \* : Without Adjustment

Function : Temperature Measurement.

This instrument was connected with 25.001, 5th : 2303152023

Calibration Point (°C)	Immersion Depth (mm)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty (± °C)	Coverage Factor k
25.0	100	25.001	25.1	0.099	0.15	2.00
50.0	100	50.000	50.1	0.100	0.15	2.00
75.0	100	75.000	75.1	0.100	0.15	2.00

UUC\* : Unit Under Calibration

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k, providing a level of confidence of approximately 95 %.

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a 1183558



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICES  
572 PATTANA BHI ROAD SUKHUMVIT ROAD JUNG JUNG DISTRICT BANGKOK 10110  
TEL : 02-277-1000-5 FAX : 02-277-1044-4



Cert.No.: 2303-12317  
Page: 1 of 3

## Certificate of Calibration

This Certificate was issued to replace the Certificate No.2303-12317

Equipment : Conductivity Meter  
Manufacturer : HANNA  
Model : HACIA-H210  
Serial No. : HCC30000  
ID No. : UAE-EFM-204/2364(EFM.SCT.09/64)

Condition As-Received : Used Item

Received Date : 25 September 2023

Calibration Date : 27 September 2023

Reference : 2303-12317-0

Submitted by : United Analyst and Engineering Consultant Co., Ltd.  
8 Soi Loomsak 41, Sukhumvit Road,  
Bangchak, Phraekhanong, Bangkok 10260

Ambient Temperature : (25 ± 2.0) °C

Relative Humidity : (50 ± 10) %

Calibration Procedure : In-house method :  
- CP-CH5 by direct measurement  
with certified reference material (CRM)  
- CP-CH5 by comparison with standard thermometer

Calibrated by : Warakorn Lengyagylaku

Approved by :   
Approved Signatory

✓ : Sathis Meangma  
✗ : Warakorn Lengyagylaku  
✗ : Pinpan Pajin

Issue Date : 16 October 2023

The Uncertainties are for a confidence probability of approximately 95%

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A 0059485



Cert.No.: 2304112317  
Page: 2 of 3

#### Condition of this result of calibration

##### 1. Reference Standard Instrument -

Instrument	Serial No.	ID No.	Certificate No.	Due date
1) Thermometer	19538/8	130RC055	2311051	05 Sep 2024
2) Ref. Std. Thermometer	4982004	110HC144	231908	26 Jul 2024

- This Certification is traceable to SI Through Technology Promotion Association (Thailand - Japan)

##### 2. Certified Reference Materials :-

- Conductivity calibration solution, CPA Chem Ltd., The measurement results are traceable to SI through CPA Chem Ltd., ANSI-ASQ National Accreditation Board, Accredited to, AR-1835

Conductivity Solution	Manufacturer	Lot No.	Exp. date
1413.0 µS/cm	CPA Chem	913593	14 July 2024
12.880 mS/cm	CPA Chem	913597	14 July 2024

- Control Conductivity calibration solution temperature by Water bath (25±0.1) °C

3. This certificate is valid only to the item calibrated on date and place of calibration.

#### Calibration results

Function : Conductivity Measurement

1\*) After Adjustment at 1413.0 µS/cm

Conductivity Electrode Serial No.: 9BGM0068

Standard Conductivity Solution	Before Adjustment UUC* Reading	After Adjustment UUC* Reading	Uncertainty of Measurement (±)	Coverage factor k
1413.0 µS/cm	1447 µS/cm	1415 µS/cm	9.2 µS/cm	2.00
12.880 mS/cm	12.73 mS/cm	12.45 mS/cm	0.085 mS/cm	2.00

Remark : - UUC\* = Unit Under Calibration

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a 1184885



Cert.No.: 2304112317  
Page: 5 of 3

#### Calibration Results

Function : Temperature Measurement

1\*) Without adjustment

This equipment was connected with Temperature Probe

- Model : 3333

- Serial No. : 956W0265

Expansion of probe

- Length : 113 mm

- Diameter : 10 mm

Immersion Depth : 80 mm

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of Measurement (± °C)	Coverage factor k
25.0	25.001	25.0	-0.001	0.13	2.00
30.0	30.003	30.0	-0.003	0.13	2.00
35.0	35.002	35.0	-0.002	0.13	2.00

Remark : - UUC\* = Unit Under Calibration

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k, providing a level of confidence of approximately 95 %.

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a 1184886



## List of Instruments Certification for Water Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration	Remark
Water									
1	pH Meter	pH	Horiba	LAQUA-PH210 HA0D0078	Technology Promotion Association (Thailand-Japan)	23CH281	1 Mar 23	28 Feb 24	-
2	Conductivity Meter	Conductivity	YSI	Pro30 17B101802	Technology Promotion Association (Thailand-Japan)	23CH809	27 Jun 23	26 Jun 24	-



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICES  
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250  
TEL. 0-2717-3000-29 FAX. 0-2719-9484



Cert.No.: 23MM331  
Page.: 1 of 3

## Certificate of Calibration

**Equipment :** Electronic Balance  
**Manufacturer :** Mettler Toledo  
**Model :** AB204-S  
**Serial No. :** 1128312528  
**ID No. :** UAE.AIR.019/2550  
**Submitted by :** United Analyst and Engineering Consultant Co.,Ltd.  
3 Soi Udomsuk 41, Sukhumvit Road,  
Bangchak, Phrakhanong,  
Bangkok 10260  
**Location :** Balance Room 2  
**Received order :** 07 April 2023  
**Calibration Date :** 07 April 2023  
**Ambient Temperature :** 15 °C to 40 °C  
**Relative Humidity :** 30 % to 90 %  
**Calibrated by :** Suwit Imjai  
**Approved by :**   
( ) Pornthippsa Tameyakul  
( ) Malee Butkruea  
**Issue Date :** 10 April 2023

The Uncertainties are for a confidence probability of approximately 95%

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**Equipment :** Electronic Balance  
**Condition As-Received :** Used Item  
**Reference :** 2304-0015OC-1

Cert.No.: 23MM331  
Page: 2 of 3

**Procedure used :-**

Calibration were conducted using in-house calibration procedure CP-OB01 according to direct measurement method against standard weight.

### Condition of this result of calibration

1. Reference standard instruments:-

Instruments	Model	Serial No.	ID No.	Test report No.	Due date
1) Standard Weight Set (EZ)	15884	24053	70RC007	MM-0010-22	20 Jan 2024

- This certificate is valid only to the item calibrated on date and place of calibration.
- This result of calibration was made on requested at the point specified by customer.
- This certificate is not certified for any commercial transaction.
- This certification is traceable to the International System of Unit.

**Result of calibration** ( ) Without Adjustment ( \* ) After Adjustment by Internal Calibration

**Range capacity :** 0 g to 220 g **Resolution** 0.0001 g

**Before Adjustment :**

Applied Weight	Balance Reading	Correction	Measurement Uncertainty	Coverage Factor
( g )	( g )	( g )	( ± mg )	( k )
100	99.9999	+0.0001	0.19	2.03
200	200.0001	-0.0001	0.29	2.00

**After Adjustment :**

1. **Determination of the standard deviation of weighing machine** ( n = 10 )

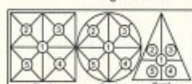
Applied Weight	Standard Deviation of Reading ( g )
( g )	
100	0.00007
200	0.00007

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**Equipment :** Electronic Balance  
**Condition As-Received :** Used Item  
**Reference :** 2304-0015OC-1

Cert.No.: 23MM331  
Page: 3 of 3



Maximum difference between off-center and central loading

Position 1	Position 2	Position 3	Position 4	Position 5	
( g )	( g )	( g )	( g )	( g )	( g )
-0.0001	-0.0002	+0.0004	-0.0001	-0.0006	0.0005

### 3. Departure from nominal value

Applied Weight	Balance Reading	Correction	Measurement Uncertainty	Coverage Factor
( g )	( g )	( g )	( ± mg )	( k )
Unload	0.0000	0.0000	0.15	2.13
0.1	0.0999	+0.0001	0.15	2.13
1	0.9999	+0.0001	0.15	2.13
5	4.9999	+0.0001	0.15	2.13
10	9.9999	+0.0001	0.15	2.11
20	20.0000	0.0000	0.15	2.11
50	50.0000	0.0000	0.16	2.06
70	69.9999	+0.0001	0.18	2.04
100	99.9999	+0.0001	0.19	2.03
150	150.0003	-0.0003	0.29	2.00
200	200.0005	-0.0005	0.29	2.00

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k, providing a level of confidence of approximately 95 %.

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TEL. 0-2717-3000-29 FAX. 0-2719-9484



Cert.No.: 23MM332  
Page.: 1 of 3

## Certificate of Calibration

**Equipment :** Electronic Balance  
**Manufacturer :** Mettler Toledo  
**Model :** AB204-S /FACT  
**Serial No. :** B108115858  
**ID No. :** UAE.AIR.016/2555  
**Submitted by :** United Analyst and Engineering Consultant Co.,Ltd.  
3 Soi Udomsuk 41, Sukhumvit Road,  
Bangchak, Phrakhanong,  
Bangkok 10260  
**Location :** Balance Room 2  
**Received order :** 07 April 2023  
**Calibration Date :** 07 April 2023  
**Ambient Temperature :** 15 °C to 40 °C  
**Relative Humidity :** 30 % to 90 %  
**Calibrated by :** Suwit Imjai  
**Approved by :**   
( ) Pornthippsa Tameyakul  
( ) Malee Butkruea  
**Issue Date :** 10 April 2023

The Uncertainties are for a confidence probability of approximately 95%

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Equipment : Electronic Balance  
Condition As-Received : Used Item  
Reference : 2304-0015OC-2  
Cert.No.: 23MM332  
Page: 2 of 3

**Procedure used :-**

Calibration were conducted using in-house calibration procedure CP-OB01 according to direct measurement method against standard weight.

**Condition of this result of calibration**

**1. Reference standard instruments:-**

Instruments	Model	Serial No.	ID No.	Test report No.	Due date
1) Standard Weight Set (E2)	15884	24053	70RC007	MM-0010-22	20 Jan 2024

- This certificate is valid only to the item calibrated on date and place of calibration.
- This result of calibration was made on requested at the point specified by customer.
- This certificate is not certified for any commercial transaction.
- This certification is traceable to the International System of Unit.

**Result of calibration** ( ) Without Adjustment ( \* ) After Adjustment by Internal Calibration

**Range capacity :** 0 g to 220 g **Resolution** 0.0001 g

**Before Adjustment :**

Applied Weight ( g )	Balance Reading ( g )	Correction ( g )	Measurement Uncertainty ( ± mg )	Coverage Factor ( k )
100	100.0002	-0.0002	0.21	2.06
200	200.0003	-0.0003	0.29	2.00

**After Adjustment :**

**1. Determination of the standard deviation of weighing machine** ( n = 10 )

Applied Weight ( g )	Standard Deviation of Reading ( g )
100	0.00009
200	0.00007

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Equipment : Electronic Balance  
Condition As-Received : Used Item  
Reference : 2304-0015OC-2  
Cert.No.: 23MM332  
Page: 3 of 3

**Result of calibration**

**2. Effect of off center loading**

A mass of 100 g was placed to various position on the pan.  
The weighing machine reading error obtained is given in the table

Position 1 ( g )	Position 2 ( g )	Position 3 ( g )	Position 4 ( g )	Position 5 ( g )	Maximum difference between off-center and central loading ( g )
+0.0001	-0.0003	+0.0003	+0.0006	+0.0002	0.0005

**3. Departure from nominal value**

Applied Weight ( g )	Balance Reading ( g )	Correction ( g )	Measurement Uncertainty ( ± mg )	Coverage Factor ( k )
Unloaded	0.0000	0.0000	0.18	2.17
0.1	0.0999	+0.0001	0.18	2.17
1	0.9998	+0.0002	0.18	2.17
5	5.0000	0.0000	0.18	2.17
10	10.0000	0.0000	0.18	2.17
20	20.0000	0.0000	0.18	2.15
50	50.0001	-0.0001	0.19	2.11
70	70.0001	-0.0001	0.20	2.07
100	100.0002	-0.0002	0.21	2.06
150	150.0004	-0.0004	0.29	2.00
200	200.0005	-0.0005	0.29	2.00

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k , providing a level of confidence of approximately 95 %.

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Thaiunique Co.,Ltd

Open Lab Service for Reliability



THAI UNIQUE OPEN LAB SERVICE

OPERATIONAL QUALIFICATION REPORT (OQ)

**Equipment Operational Qualification Report**

Report No.	SV2305/21210
Equipment	GC-MS
System Model	SQ
System ID	GQS1203F021
Equipment Details	Bruker
Test Protocol	Scion OQ Protocol
Protocol Rev.	A
Date	23-May-23
Report Type	Report
Org. Name	United Analyst and Engineering Consultant Co.,Ltd
Org. Location	3 Soi Udomsuk 41 Sukhumvit Rd. Bangchak Phrakhanong Bagkok Thailand 10260

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บริษัท ไทยยูนิค จำกัด THAI UNIQUE CO., LTD.

80-82 ถนนประชาธิปไตย แขวงบางขุนพรหม เขตพระนคร กรุงเทพฯ 10200  
80-82 Prachathipatay Rd., Bangkhunphrom, Pranakorn, Bangkok 10200  
Tel. 0-2629-0191-6, 0-2280-1787, Fax. 0-2280-1788, E-mail : thawatt@thaiunique.com, Website : www.thaiunique.com

**CERTIFICATE OF CALIBRATION  
GAS CHROMATOGRAPH MASS SPECTROMETER**

**Certificate No.:** SV2305/21210

**Customer:** United Analyst and Engineering Consultant Co., Ltd.

**Address:** 3 Soi Udomsuk 41 Sukhumvit Rd. Bangchak  
Phrakhanong Bagkok Thailand 10260

**Instruments Model:** MS Scion-SQ S/N GQS1203F021  
GC 451-GC S/N BR1203M099  
AUTO SAMPLER CP8400 S/N BR1203M331

**Standard Reference Number:** 393065201

**Procedure Document Number:** 394207000

**System Test**

PM perform and Diagnostic Test	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL
Air Water Check Test	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL
Tune Test EI	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL
Signal to Noise Test (EI) SCAN	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL
Injection EI Area Precision Test	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL
Injection EI RT Precision Test	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL
User Demonstration	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL



Engineer   
Somchai Pohtongkam

Date 23 May 2023



Thai Unique Co., Ltd.

Service Division

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SCION™

## Operational Qualification Protocol

For SCION Instrument

Name and Model:

Serial Number:

System ID Number:

Publication no. 394207000

Revision A

November 2011

## Contact

Scion Customer Service and Support uses a Customer Relationship Management (CRM) system. The interaction with this system offers the Customer immediate benefits including the contact center or help desk.

Scion worldwide service & support offices can be found from Scion website:



[www.scion.com/support.html](http://www.scion.com/support.html)

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## 1.0 Revision History

This qualification protocol is updated as necessary, which includes the event of any regulatory changes to Title 21 of the Code of Federal Regulations (21 CFR) Parts 210 and 211 (if applicable), any software or hardware changes, or updates that may impact on regulatory compliance.

Issue Number	Date	Comments

## 2.0 Qualification Representative and Reviewer Details


### 2.1 Qualification Representative Details


Each person responsible for executing any part of this Protocol must complete the table below, providing a sample of their signature and initials, and recording the date the Qualification was performed.

Qualification representatives are nominated to execute and verify the completeness of the test protocol and correctness of all entries.

All testing must be performed in accordance with procedures outlined in this manual. The representative must be trained and qualified to perform the procedures outlined in this document.

A copy of their appropriate qualifications is to be inserted into "Qualification Representative Details" on page 30.

Name (Print)	SOMCHAI POHTONGKAM
Title	ENGINEER
Signature	
Initials	SOMCHAI
Date	23 MAY 23



Name (Print)	
Title	
Signature	
Initials	
Date	

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## 2.2 Reviewer Details


Each representative responsible for reviewing any part of this protocol must record their details in the following tables, providing a sample of their signature and initials, and recording the date the qualification was performed.

An employee or designee of the company operating the instrument must review these qualification procedures. All calculations and data will be checked by the reviewer. Data review must be performed in accordance with the qualification guidelines "Qualification Guidelines and GMP Documentation" on page 10 and in compliance with current Good Manufacturing Practice (cGMP) as specified by 21 CFR Parts 210 and 211.

Documentation supporting training in the area of data review and cGMP must be carefully maintained and reviewed by the instrument owner.

Reviewer representatives are responsible for reviewing the completeness of the qualification protocol and accuracy of all entries.

Name (Print)	CHANA CHANSRI
Title	ENGINEER
Signature	
Initials	
Date	23 MAY 2023



Name (Print)	
Title	
Signature	
Initials	
Date	

## 2.3 Quality Assurance/Control Details

As Quality Assurance/Control (QA/QC), who is empowered to approve instrument compliance documents, I approve the procedures in the SCION Operational Qualification Protocol, which I may have amended, I accept the qualification of the Qualification Representative, and I will review and initial the results.

Name (Print)	
Title	
Signature	
Initials	
Date	

Name (Print)	
Title	
Signature	
Initials	
Date	

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### 3.0 Customer Responsibilities

The customer shall ensure that the Preventive Maintenance (PM) or Installation Qualification (IQ) up to point 9.11 is completed. A customer representative should be available at all times during the Operational Qualification Protocol.

**Note** The Operational Qualification Protocol test procedure should be performed after significant repairs, and at least once a year.

Qualification Rep. Initials	<i>Sahil P.</i>	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	



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### 4.0 Qualification Guidelines and GMP Documentation

#### 4.1 Qualification Summary

At the end of qualification execution, all tables and data entry fields must be completed and all test results, where specified, must be printed and attached to the protocol.

The Qualification Representative and the Reviewer must sign (signature or initials) and date each page that has a signature field. This represents agreement and acceptance of all data and information on the signed page.

**Note** Scion does not provide instructions for full Qualification of the personal computer (PC) used to operate the SCION. If further qualification of the PC is required the end-user must contact the PC manufacturer.

**Note** Scion does not provide full qualification instructions for non-Scion manufactured accessories. Limited instructions may be supplied. If qualification of a non-Scion accessory is required, the end user must contact the accessory manufacturer.

#### 4.2 Qualification Guidelines

The following are general guidelines for performing the qualification tests in accordance with cGMP for the Manufacturing, Processing, Packaging, or Holding of Drugs per 21CFR Parts 210 and 211. Additional local requirements may also apply.

- Read the guidelines before starting the qualification.
- Perform all tests exactly as written.
- Use a pen with permanent blue or black ink unless otherwise specified by company policy.
- Neatly strike out any incorrect words or numbers, made while writing comments or recording results, information or data within this Protocol, with a single line. The word(s) crossed out must remain legible. Write the correction as close as possible to the original entry. Write a brief description of the error. For example, write 'Transcription error' or 'Re-written for clarity'. Initial and date the change.
- Entering initials where a signature is requested, and vice versa is permitted. The exception to this is in 2.0 : Qualification Representative and Reviewer Details on page 6, where examples of each person's signature and initials are required.
- Use the date format dd Mon yyyy (e.g. 08 Mar 2011) unless otherwise specified by company policy.

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- Complete all tables and data fields to comply with this protocol. Blank fields are not permitted. For items that are not applicable, draw a line through the field, and write 'N/A' (Not Applicable). If entire tables or sections of tables are not applicable, strike a line either through the entire table or the specific area and enter 'N/A'. Complete the signature fields on the page.
- Write 'Pass', 'Fail' or 'N/A' as applicable to the test requirement or outcome.
- Ensure that results and/or specific documents are printed and attached to the specified appendix.
- The Qualification Representative and Reviewer must both sign (signature or initials) and date the signature fields on each page. This represents agreement and acceptance of all data and information on the page.

#### 4.3 Page Numbering of Appendices

Each page that is inserted after the appendix is numbered with the letter of the appendix and a sequential number. The appendix page number must be initialed and dated by both the Qualification Representative and the Reviewer.

For example, pages inserted after Appendix C are numbered

C-1, C-2, C-3...etc. along with the initials and date.

If the reverse of each appendix page is left blank, it should be marked 'N/A' and signed and dated.

When the IQ is complete the total number of pages inserted after each appendix is written on the front page of the respective appendix sheet.

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#### 4.4 Exception Reports

An exception to the protocol occurs when the observed result differs from the acceptance criteria or expected result.

All exceptions to the protocol must be documented in the Exception Report. The Exception Report includes a detailed description of the exception and resolution by the Qualification Representative.

Each Exception Report shall be issued with a unique identification number in the form ERID-XX-X. This number is generated by the page number on which the exception occurred followed by a sequential number indicating each exception found on the page.

For example, if an exception occurs on page 34, the Exception Report shall be identified as 'ERID-34-1'. If another exception occurs on page 34, the second report shall be identified as 'ERID-34-2'. This identification number should be recorded in the 'Pass / Fail / N/A' field after each test.

Each Exception Report must be signed by the Qualification Representative and the Reviewer as evidence of approval.

The Exception Report is inserted in the appropriately named appendix and numbered as per Section 4.3 of this protocol.

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#### 4.5 Reference Documents

The following documents are relevant to this Qualification:

- Installation Qualification Protocol
- Completed service report from Preventative Maintenance (PM) schedule

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#### 4.6 Required Materials

The following stock solutions are required:

- 100 fg/μL OFN 394204200
- 1 pg/μL OFN 393065201
- 100 pg/μL OFN 393110101
- 10 pg/μL BZP 93065301
- 100 pg/μL BZP 394206200

The above solutions will be used to prepare the following working solutions which will be required to execute this OQ:

**Note** Refer to Appendix 1 for the preparation of the standard solutions.

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#### 4.7 General Guidelines

The following are general cGMP guidelines.

- Perform each procedure exactly as written.
- Fill in each item on the form or mark it Not Applicable (N/A).
- If an item is marked N/A, initial it and date it.
- The Reviewer reviews and initials all entries recorded by the Qualification Representative.
- Keep all raw data. The Qualification Representative and the Reviewer will initial it, and date it.
- Do not destroy raw data.
- Attach raw data from an instrument, such as the SCION, as an Addendum using the instructions in the following Addendums section.
- If several instruments are qualified simultaneously, reference shared information, such as standard preparation and chemical information, to the document containing the original information by its model and instrument identification number.
- Label all reference standards as required by local regulations.
- Record the time each reference standard was opened.
- Use reference standards within 24 hours of preparation.

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#### 4.8 Specific Instructions for Documentation

The Reviewer designates specific documentation instructions as follows.

Permanent Ink Color	Blue
Preferred Date Format	23 MAY 23

If more instructions are required: Use an addendum sheet, write the addendum number, and a brief description.

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#### 4.9 Documentation Corrections

**Note** All original entries must remain legible after corrections are made.

1. Draw a line through the incorrect information.
2. Write the correction as close as possible to the original entry, or enter a footnote.
3. Write a brief description of the error. For example, write "transcription error," "rewritten for clarity," or "correcting wrong entry".
4. Initial and date the change.

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#### 4.10 Marking Procedures Not Applicable

Some sections may not be relevant for the qualification. To indicate that a procedure or part of a form is unnecessary and that it was not forgotten or inadvertently overlooked:

1. Draw a line through the portion that is not applicable. Write the letters N/A (for not applicable), your initials, and the date near the diagonal line.
2. If a procedural step is unnecessary, select N/A if it is indicated, or write a comment in an Addendum. The Qualification Representative and the Reviewer enter their initials and the date near the line.

**Note** The Qualification Representative and Reviewer must sign and date all forms, even when part or all of the form is marked N/A.

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## 4.11 Addendums

The following are reasons to complete an addendum sheet:

- A deviation needs documentation.
- Additional information or data needs to be recorded.
- Insufficient space to include the correction on the sheet where the error was made.

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## 4.12 Addendum Example

The following is an example of using an addendum sheet to document a deviation.

If some of the items on the sales order were not present, you could do the following:

- Use an addendum sheet.
- Write Instrument Delivery on the Procedure line.
- Write the addendum page number followed by a letter. For example: page 12A, where 12 is the page and A represents the first addendum on that page.
- Write the plan to obtain the missing items, which may be the following:
  - Scion notified that Part Number XXXXX and XXXX are missing.
  - Scion replied that the parts are in stock and will be sent overnight. While waiting for the parts to arrive, I will continue to set up the instrument.
- Review the plan with the Reviewer and make the necessary modifications.
- Document the arrival of the parts and write that this addendum is resolved. Attach a copy of delivery documents and create addendum pages as required.

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## 5.0 Operational Qualification

This chapter contains the tests to be completed to perform an Operational Qualification for the SCION.

### 5.1 OQ Preparation

The following must be done before starting the OQ:

- Preventative Maintenance must have been completed and signed off by the Qualification Representative, Reviewer, and QA/QC person, and attach a copy of the service report and add an addendum number.

Addendum P.M. Protocol

Qualification Rep. Initials	<i>Sukh P.</i>	Reviewer Initials		QA/QC Initials	
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- OQ must have been completed and signed off by the Qualification Representative, Reviewer, and QA/QC person.

Qualification Rep. Initials	<i>Sukh P.</i>	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	

- The QA/QC person must review, approve, append (if necessary), and sign the Pre-execution Approval.

Qualification Rep. Initials	<i>Sukh P.</i>	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	



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- The Qualification Representative and the Reviewer must sign and date the Pre-execution Approval.

Qualification Rep. Initials	<i>Sukh P.</i>	Reviewer Initials		QA/QC Initials	
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## 5.2 System Description

### 5.2.1 SCION Description

Installation Date:	2015	Principal Operator:		Phone Number:	
<b>Company Information</b>					
Company: United Analyst and Engineering			Installation Site: LAB		
Name:			Building:		
Address: 361 Udomsuk 41			Address/Location: Sukhumvit Rd.		
City/State: Bangkok Prachabong			City/State: Bangkok		
Zip/Country: Thailand			Zip/Country: 10260		
<b>System Description</b>					
SCION	SA	Serial Number:	GQS1203F021		
Sales Order Number:		Sales Order Addendum Number:			
GC					
Module Type:	Scion 451	Serial Number:	BR1203M099		
AutoSampler					
Module Type:	dp 8400	Serial Number:	BR1203M311		
MS Workstation					
Version:	MSWS 8.2.1	Serial Number:	04106-6711-882-4502		
<b>Computer Operating System</b>					
Operating System:	Windows 7	Version:	Pro	Serial No.:	00366-150-436-158 Pack:
Computer					
Make:	Dell	Model:	Optiplex	Serial No.:	DNNYH5I
Addendum Number(s):	2. System description				
Qualification Rep. Initials	<i>Sukh P.</i>	Reviewer Initials		QA/QC Initials	
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### 5.3 Data Sheet Specifications

Run these tests after the instrument has pumped down and is leak free. Use the factory methods. Follow the Installation Procedure; complete this section and the appropriate line of the OQ Summary. Print out the methods and results and attach as addendums. Use the factory test column Br-5ms 15m X 250lm X 0.25lm.

Table 5-1 TQ Specification

Mode	Concentration	Scan Range	Result †	N/A	Pass	Fail	Addendum
EI Full Scan	1 pg OFN	50-300	S/N ≥500:1				
EI MRM	100 fg OFN	272-222	S/N ≥5000:1				
PCI Full Scan‡	10 pg BZP	80-230	S/N ≥50:1				
NCI Full Scan‡	1 pg OFN	200-300	S/N ≥4000:1				

† The Signal-to-Noise ratio S/N values are based on RMS noise figure.

‡ CI tests use methane gas as reagent gas.

For any tests that did not pass, complete an Addendum for each, write the Addendum number and a brief description.

Qualification Rep. Initials	<i>Schul P.</i>	Reviewer Initials		QA/QC Initials	
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Table 5-2 SQ Specification

Mode	Concentration	Scan Range	Result †	N/A	Pass	Fail	Addendum
EI Full Scan	1 pg OFN	50-300	S/N ≥600:1		✓		
PCI Full Scan‡	100 pg BZP	80-230	S/N ≥600:1	✓			
NCI Full Scan‡	200 fg OFN	200-300	S/N ≥1000:1	✓			

Qualification Rep. Initials	<i>Schul P.</i>	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	



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### 5.4 EI Precision Test TQ

The following precision tests are for systems with autosamplers only. The test solution is 1 pg/μL OFN test mix part number 393065201.

The following is the required precision for 10 consecutive injections:

Injection	Retention Time	Peak Area
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
% RSD		

As an alternative, a % RSD summary report from MSWS can be added as an addendum.

Addendum N/A

	N/A	Pass	Fail	Addendum
Observed Mass is between 271.6 m/z to 272.4 m/z, which is ± 0.4 of the expected m/z.	✓			
Retention Time ≤ 1% Relative Standard Deviation (RSD).	✓			
Peak Area ≤ 10% Relative Standard Deviation (RSD).	✓			

To complete this section use the factory MRM method on the system CD. Print a copy of the method and add as an addendum.

Addendum N/A

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If the hardware is not the same as the factory method, then note this in the addendum and how the hardware available has been configured to compensate. The most common variation here is the sampler, where the Combi Pal has been used instead of the 8400. This will have no impact on results and can be tracked and recorded in the addendum.

### 5.5 EI Precision Test SQ

The following precision tests are for systems with autosamplers only. The test solution is 1 pg/μL OFN test mix part number 393065201.

The following is the required precision for 10 consecutive injections:

Injection	Retention Time	Peak Area
1	3.680	75060
2	3.681	77980
3	3.680	70959
4	3.680	75512
5	3.680	65015
6	3.682	73959
7	3.680	82551
8	3.682	65509
9	3.679	72852
10	3.679	76104
% RSD	0.028	4.39

As an alternative, a % RSD summary report from MSWS can be added as an addendum.

Addendum \_\_\_\_\_

	N/A	Pass	Fail	Addendum
Observed Mass is between 271.6 m/z to 272.4 m/z, which is ± 0.4 of the expected m/z.		✓		
Retention Time ≤ 1% Relative Standard Deviation (RSD).		✓		
Peak Area ≤ 10% Relative Standard Deviation (RSD).		✓		

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To complete this section use the factory Scan method on the system CD. Print a copy of the method and add as an addendum.

Addendum N/A

If the hardware is not the same as the factory method, then note this in the addendum and how the hardware available has been configured to compensate. The most common variation here is the sampler, where the Combi Pal has been used instead of the 8400. This will have no impact on results and can be tracked and recorded in the addendum.

Addendum N/A

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## 5.6 Final Evaluation

	N/A	Pass	Fail	Addendum
Is the equipment in normal operation condition?		✓		
Have all of the OQ requirements been completed?		✓		

Qualification Rep. Initials	<i>Sukon P.</i>	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	



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## 6.0 Protocol Approval

## 6.1 Protocol Acceptance / Approval by Customer

I agree that the procedures and information referenced in this document are applicable.

Instrument(s): *Scion 451 SA with CP 8400*Serial Number(s): *GQS 1203 F021*

Sales Order Number:

Company Name: *United Analyst and Engineering Consultant Co., Ltd.*

I agree that the Operational Qualification Protocol has been satisfactorily completed.	<input checked="" type="checkbox"/>
I confirm that the Operational Qualification Protocol has not been completed, because of these failed (non-passed) items	<input type="checkbox"/>

## Authorized Customer Representative

Name (Print)	
Title	
Signature	
Initials	
Date	

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## 6.2 Operational Qualification Protocol Assignment

This Operational Qualification Protocol document is used for:

Operational Qualification Protocol as final test at Scion	<input type="checkbox"/>
Operational Qualification Protocol after Installation Qualification	<input type="checkbox"/>
Operational Qualification Protocol after Preventive Maintenance and OQ completion.	<input checked="" type="checkbox"/>

## 6.3 Protocol Acceptance / Protocol Approval by Scion

I agree that the procedures and information referenced in this document are applicable.

Instrument(s): *Scion 451 SA with CP 8400*Serial Number(s): *GQS 1203 F021*

Sales Order Number:

Company Name: *United Analyst and Engineering Consultant Co., Ltd.*

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## Scion Certified Engineer

Name (Print)	<i>SOMCHAI POHTONGKAM</i>
Title	<i>ENGINEER</i>
Signature	<i>Sukon P.</i>
Initials	<i>SOMCHAI</i>
Date	



## 6.4 Remarks

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## Appendices

Each page that is inserted after the appendix is numbered with the letter of the appendix and a sequential number. The appendix page number must be initialed and dated by both the Qualification Representative and the Reviewer.

For example, pages inserted after Appendix C are numbered C-1, C-2, C-3...etc along with the initials and date.

If the reverse of each appendix page is left blank it should be marked NA and signed and dated.

When the OQ is complete the total number of pages inserted after each appendix is written on the front page of the respective appendix sheet.

### A.1 Qualification Representative Details

The Qualification Representative is to insert a copy of their appropriate qualification(s) after this page.

No. of Pages Inserted	
-----------------------	--

*This area is intentionally left blank.*

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### B.1 Exceptions

Each Exception Report shall be issued with a unique identification number in the form of ERID-XX-X. This number is generated by the page number on which the exception occurred followed by a sequential number indicating each exception found on the page.

For example, if an exception occurs on page 34, it shall be identified as Exception Report 'ERID-34-1'. If another exception occurs on page 34, the second exception shall be identified as 'ERID-34-2'. This identification number should be recorded in the pass/fail field after each test.

Insert Exception Reports (if any) after this page.

No. of Pages Inserted	N/A
-----------------------	-----

*This area is intentionally left blank.*

Addendum Procedure: P.M. Protocol Page Number: 1

Qualification Rep. Initials	<i>Suh P.</i>	Reviewer Initials		QA/QC Initials	
Date	23 MAY 23	Date		Date	



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Addendum Procedure: 2. System description Page Number: 5Addendum Procedure: 3. Test Result Page Number: 30

Qualification Rep. Initials	<u>Sakun' P.</u>	Reviewer Initials		QA/QC Initials	
Date	<u>23 MAY 23</u>	Date		Date	



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Qualification Rep. Initials	<u>Sakun' P.</u>	Reviewer Initials		QA/QC Initials	
Date	<u>23 MAY 23</u>	Date		Date	



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Addendum Procedure: 4. Certificate Page Number: 1

## Operational Qualification Protocol Certification

for

SCION

with the serial number

GQS1203F021

has successfully completed all criteria for hardware Operational Qualification Protocol as detailed in this document.

Scion Certified Engineer

SOMCHAI POHTONGKAM  
Name (please print)Sakun' P.  
Signature23 MAY 23  
Date

Authorized Customer Representative

Name / Function (please print)

Signature

Date

Customer Address

United Analyst and Engineering Consultant Co., Ltd.

Qualification Rep. Initials	<u>Sakun' P.</u>	Reviewer Initials		QA/QC Initials	
Date	<u>23 MAY 23</u>	Date		Date	



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