

ภาคผนวก ฉ
ใบรายงานผลการวิเคราะห์



คุณภาพดิน



ANALYSIS REPORT

PROJECT NAME : ENVIRONMENTAL QUALITY MONITORING AT TRE (PLUG AND ABANDONMENT)
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 : TRE-2S
SAMPLE TYPE : SOIL
SAMPLING DATE : DECEMBER 6, 2024
SAMPLING TIME : 10:30 HOUR
SAMPLING METHOD : COMPOSITE
SAMPLING BY : MR CHOKCHAI PHUMSAWAI
ANALYZED BY : MISS KANNIKAR SUMLEETHA

RECEIVED DATE : DECEMBER 6, 2024
ANALYTICAL DATE : DECEMBER 6, 2024 - JANUARY 8, 2025
ISSUE DATE : JANUARY 16, 2025
REPORT NO. : 2024-U121091
WORK NO. : 2024-009547
ANALYSIS NO. : T24BC804-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT	LIMIT OF QUANTITATION (LOQ)
			TRE-2S T24BC804-0001			
pH (1:1) ^a	-	ELECTROMETRIC METHOD (US EPA 2004: 9045D)	5.4 (25°C)	-	-	-
ELECTRICAL CONDUCTIVITY (1:5) ^b	dS/m	ELECTRICAL CONDUCTIVITY METHOD	0.008 (25°C)	-	0.001	-
SALINITY (1:5) ^c	ppt	ELECTRICAL CONDUCTIVITY METHOD	< 0.1	-	0.1	-
CHLORIDE ^c	% w/w	BS 1377 : PART 3 : 1990	ND	-	0.01	-
FAT OIL AND GREASE ^c	mg/kg	SOXHLET EXTRACTION METHOD (SM: PART 5520 E)	< LOQ	-	100	200
TOTAL PETROLEUM HYDROCARBONS ^c	mg/kg	SOXHLET EXTRACTION METHOD (SM: PART 5520 E AND PART 5520 F)	< LOQ	-	100	200
METALS						
ARSENIC (As) ^c	mg/kg	DIGESTION AND HYDRIDE GENERATION AAS METHOD (US EPA 1996: 3050B AND 1992: 7061A)	2.68	≤ 6	0.100	-
SELENIUM (Se) ^c	mg/kg	DIGESTION AND HYDRIDE GENERATION AAS METHOD (US EPA 1996: 3050B AND 1994: 7742)	ND	≤ 365	0.100	-
HEXAVALENT CHROMIUM (Cr ^{VI}) ^c	mg/kg	ALKALINE DIGESTION AND COLOURIMETRIC METHOD (US EPA 1996: 3060A AND 1992: 7196A)	ND	≤ 17.5	0.600	-
CADMIUM (Cd) ^c	mg/kg	DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (US EPA 1996: 3050B AND 2007: 7000B)	ND	≤ 67	0.300	-
LEAD (Pb) ^c	mg/kg	DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (US EPA 1996: 3050B AND 2007: 7000B)	ND	≤ 400	1.55	-
MANGANESE (Mn) ^c	mg/kg	DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (US EPA 1996: 3050B AND 2007: 7000B)	136	≤ 1,710	0.250	-
ZINC (Zn) ^c	mg/kg	DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (US EPA 1996: 3050B AND 2007: 7000B)	13.3	-	0.350	-
NICKEL (Ni) ^c	mg/kg	DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (US EPA 1996: 3050B AND 2007: 7000B)	214	≤ 436.5	1.00	-
MERCURY (Hg) ^c	mg/kg	DIGESTION AND COLD VAPOUR AAS METHOD (US EPA 2007: 7471B)	ND	≤ 22	0.100	-
BARIUM (Ba) ^c	mg/kg	DIGESTION AND INDUCTIVELY COUPLED PLASMA METHOD (US EPA METHOD 3050B REVISION 2 : 1996 AND 6010D REVISION 5 : 2018)	61.8	-	0.250	-



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT	LIMIT OF QUANTITATION (LOQ)
			TRE-2S T24BC804-0001			
VOLATILE ORGANIC COMPOUNDS						
BENZENE *	mg/kg	EQUILIBRIUM HEADSPACE, GAS CHROMATOGRAPHIC/MASS SPECTROMETRIC METHOD (US EPA 2014; 5021A AND 2018: 8260D)	< 0.001	≤ 1	-	0.001
ETHYLBENZENE *	mg/kg	EQUILIBRIUM HEADSPACE, GAS CHROMATOGRAPHIC/MASS SPECTROMETRIC METHOD (US EPA 2014; 5021A AND 2018: 8260D)	< 0.001	≤ 3,265	-	0.001
TOLUENE *	mg/kg	EQUILIBRIUM HEADSPACE, GAS CHROMATOGRAPHIC/MASS SPECTROMETRIC METHOD (US EPA 2014; 5021A AND 2018: 8260D)	< 0.001	≤ 4,630	-	0.001
TOTAL XYLENES *	mg/kg	EQUILIBRIUM HEADSPACE, GAS CHROMATOGRAPHIC/MASS SPECTROMETRIC METHOD (US EPA 2014; 5021A AND 2018: 8260D)	< 0.003	≤ 575	-	0.003
SAMPLE CONDITION			BROWN SOIL			

^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

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 24th EDITION, 2023.

REGULATORY STANDARD : NOTIFICATION OF THE NATIONAL ENVIRONMENTAL BOARD CLASS 1,
PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL 138, PART 54 D, DATED MARCH 11, 2021.

CLASS 1 : SOIL QUALITY STANDARDS FOR HABITAT

SAMPLE (S) ANALYSED ON AS RECEIVED BASIS. RESULT (S) REPORTED ON A DRY WEIGHT BASIS.

ND : NOT DETECTED.

< LOQ : < LIMIT OF QUANTITATION (FAT OIL AND GREASE ≥ 100 AND < 200 mg/kg,
TOTAL PETROLEUM HYDROCARBONS ≥ 100 AND < 200 mg/kg).

Benjawan V.

(MISS BENJAWAN VIRIYOTHAI)
LABORATORY SUPERVISOR

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WORK NO. : 2024-009547
ANALYSIS NO. : T24BC804-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT	LIMIT OF QUANTITATION (LOQ)
			TRE-2S T24BC804-0001			
pH (1:1) ^a	-	ELECTROMETRIC METHOD (US EPA 2004: 9045D)	5.4 (25°C)	-	-	-
ELECTRICAL CONDUCTIVITY (1:5) ^c	dS/m	ELECTRICAL CONDUCTIVITY METHOD	0.008 (25°C)	-	0.001	-
SALINITY (1:5) ^c	ppt	ELECTRICAL CONDUCTIVITY METHOD	< 0.1	-	0.1	-
CHLORIDE ^c	% w/w	BS 1377 : PART 3 : 1990	ND	-	0.01	-
FAT OIL AND GREASE ^c	mg/kg	SOXHLET EXTRACTION METHOD (SM: PART 5520 E)	< LOQ	-	100	200
TOTAL PETROLEUM HYDROCARBONS ^c	mg/kg	SOXHLET EXTRACTION METHOD (SM: PART 5520 E AND PART 5520 F)	< LOQ	-	100	200
METALS						
ARSENIC (As) ^c	mg/kg	DIGESTION AND HYDRIDE GENERATION AAS METHOD (US EPA 1996: 3050B AND 1992: 7061A)	2.68	≤ 25	0.100	-
SELENIUM (Se) ^c	mg/kg	DIGESTION AND HYDRIDE GENERATION AAS METHOD (US EPA 1996: 3050B AND 1994: 7742)	ND	≤ 4,380	0.100	-
HEXAVALENT CHROMIUM (Cr ⁶⁺) ^c	mg/kg	ALKALINE DIGESTION AND COLOURIMETRIC METHOD (US EPA 1996: 3080A AND 1992: 7196A)	ND	≤ 212	0.600	-
CADMIUM (Cd) ^c	mg/kg	DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (US EPA 1996: 3050B AND 2007: 7000B)	ND	≤ 762	0.300	-
LEAD (Pb) ^c	mg/kg	DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (US EPA 1996: 3050B AND 2007: 7000B)	ND	≤ 800	1.55	-
MANGANESE (Mn) ^c	mg/kg	DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (US EPA 1996: 3050B AND 2007: 7000B)	136	≤ 19,640	0.250	-
ZINC (Zn) ^c	mg/kg	DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (US EPA 1996: 3050B AND 2007: 7000B)	13.3	-	0.350	-
NICKEL (Ni) ^c	mg/kg	DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (US EPA 1996: 3050B AND 2007: 7000B)	214	≤ 5,205	1.00	-
MERCURY (Hg) ^c	mg/kg	DIGESTION AND COLD VAPOUR AAS METHOD (US EPA 2007: 7471B)	ND	≤ 263	0.100	-
BARIUM (Ba) ^c	mg/kg	DIGESTION AND INDUCTIVELY COUPLED PLASMA METHOD (US EPA METHOD 3050B REVISION 2 : 1996 AND 60100 REVISION 5 : 2018)	61.8	-	0.250	-



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT	LIMIT OF QUANTITATION (LOQ)
			TRE-2S T24BC804-0001			
VOLATILE ORGANIC COMPOUNDS						
BENZENE *	mg/kg	EQUILIBRIUM HEADSPACE, GAS CHROMATOGRAPHIC/MASS SPECTROMETRIC METHOD (US EPA 2014: 5021A AND 2018: 8260D)	< 0.001	≤ 5	-	0.001
ETHYLBENZENE *	mg/kg	EQUILIBRIUM HEADSPACE, GAS CHROMATOGRAPHIC/MASS SPECTROMETRIC METHOD (US EPA 2014: 5021A AND 2018: 8260D)	< 0.001	≤ 19,350	-	0.001
TOLUENE *	mg/kg	EQUILIBRIUM HEADSPACE, GAS CHROMATOGRAPHIC/MASS SPECTROMETRIC METHOD (US EPA 2014: 5021A AND 2018: 8260D)	< 0.001	≤ 40,140	-	0.001
TOTAL XYLENES *	mg/kg	EQUILIBRIUM HEADSPACE, GAS CHROMATOGRAPHIC/MASS SPECTROMETRIC METHOD (US EPA 2014: 5021A AND 2018: 8260D)	< 0.003	≤ 2,478	-	0.003
SAMPLE CONDITION			BROWN SOIL			

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SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 24th EDITION, 2023.

REGULATORY STANDARD : NOTIFICATION OF THE NATIONAL ENVIRONMENTAL BOARD CLASS 2, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, 54 D.VOL 138, PART DATED MARCH 11, 2021.

CLASS 2 : SOIL QUALITY STANDARDS FOR COMMERCE, AGRICULTURE AND OTHER PURPOSES.

SAMPLE (S) ANALYSED ON AS RECEIVED BASIS. RESULT (S) REPORTED ON A DRY WEIGHT BASIS.

ND : NOT DETECTED.

< LOQ : < LIMIT OF QUANTITATION (FAT OIL AND GREASE ≥ 100 AND < 200 mg/kg, TOTAL PETROLEUM HYDROCARBONS ≥ 100 AND < 200 mg/kg).

Benjawan V.
(MISS BENJAWAN VIRIYOTHAI)
LABORATORY SUPERVISOR