



## United Analyst and Engineering Consultant Co., Ltd.

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NSC - TISI - TIS 17025  
TESTING 0207TESTING  
No. 0063

## ANALYSIS REPORT

**CUSTOMER NAME** : TPI POLENE PUBLIC COMPANY LIMITED

**ADDRESS** : 299 MOO 5 MITRAPARP ROAD MITTRAPHAP TABKWANG KAENGKOI SARABURI 18260

**CONTACT INFORMATION** : TEL : [REDACTED] e-mail : [REDACTED]

**SAMPLING SOURCE** : บ้านขี้บ่อน หมู่ 5

**SAMPLE TYPE** : GROUNDWATER

**SAMPLING DATE** : AUGUST 23, 2022

**SAMPLING TIME** : 13:15 HOUR

**SAMPLING METHOD °** : GRAB

**SAMPLING BY °** : MR MANIT PANCHOT

**ANALYZED BY** : MISS NADNAPA KAMOLBOON

**RECEIVED DATE** : AUGUST 23, 2022

**ANALYTICAL DATE** : AUGUST 23-30, 2022

**REPORT NO.** : [REDACTED]

**WORK NO.** : [REDACTED]

**ANALYSIS NO.** : [REDACTED]

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			GROUNDWATER T22AQ529-0003		
pH °	-	ELECTROMETRIC METHOD AT SITE (SM:4500-H° B)	7.3 (29°C)	-	-
TEMPERATURE °	°C	THERMOMETER AT SITE (SM: 2550 B)	29	-	-
TURBIDITY °	NTU	NEPHELOMETRIC METHOD (SM: 2130 B)	6.7	-	0.1
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2510 B)	1,075 (29°C)	-	0.1
SALINITY °	ppt	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2520 B)	0.5	-	0.1
BIOCHEMICAL OXYGEN DEMAND °	mg/L	MEMBRANE ELECTRODE METHOD (SM: 4500-O G AND 5210 B)	ND	-	1.0
CHEMICAL OXYGEN DEMAND °	mg/L	CLOSED REFLUX, COLOURIMETRIC METHOD (SM: 5220 D)	ND	-	25.0
TOTAL SUSPENDED SOLIDS °	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: 2540 D)	ND	-	5.0
TOTAL DISSOLVED SOLIDS °	mg/L	TOTAL DISSOLVED SOLIDS DRIED AT 180 °C (SM: 2540 C)	706	-	25
TOTAL HARDNESS °	mg/L as CaCO <sub>3</sub>	EDTA TITRIMETRIC METHOD (SM: 2340 C)	470	-	4.0
NITRATE NITROGEN °	mg/L NO <sub>3</sub> <sup>-</sup> -N	CADMIUM REDUCTION METHOD (SM: 4500 -NO <sub>3</sub> <sup>-</sup> E)	0.40	-	0.02
PHOSPHATE °	mg/L PO <sub>4</sub> <sup>3-</sup>	ASCORBIC ACID METHOD (SM: 4500-P E)	ND	-	0.03
RESIDUAL CHLORINE °	mg/L Cl <sub>2</sub>	DPD FERROUS TITRIMETRIC METHOD (SM: 4500-Cl F)	ND	-	0.1
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: 4500-SO <sub>4</sub> <sup>2-</sup> E)	176	-	0.3
FAT, OIL AND GREASE °	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: 5520 B)	ND	-	3
SODIUM ADSORPTION RATIO °	-	INDUCTIVELY COUPLED PLASMA (ICP) AND CALCULATION METHOD	0.215	-	-





PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			GROUNDWATER T22AQ529-0003		
METALS					
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	0.0005	≤ 0.01	0.0003
BARIUM °	mg/L Ba	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	0.020	-	0.003
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.003	0.002
HEXAVALENT CHROMIUM °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: 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: 3030 E AND 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: 3030 E AND 3111 B	0.423	-	0.005
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 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: 3030 E AND 3111 B	< LOQ	≤ 0.5	0.002
MERCURY <sup>b</sup>	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: 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: 3030 E AND 3111 B	ND	≤ 0.02	0.005
SELENIUM °	mg/L Se	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	ND	≤ 0.01	0.0005
TITANIUM °	mg/L Ti	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	ND	-	0.005



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			GROUNDWATER T22AQ529-0003		
ZINC <sup>c</sup>	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	< LOQ	≤ 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 (MANGANESE ≥ 0.002 AND < 0.025 mg/L, ZINC ≥ 0.003 AND < 0.025 mg/L).



(MISS BENJAWAN VIRIYOTHAI)  
LABORATORY SUPERVISOR

SEPTEMBER 12, 2022



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## ANALYSIS REPORT

**CUSTOMER NAME** : TPI POLENE PUBLIC COMPANY LIMITED

**ADDRESS** : 299 MOO 5 MITRAPARP ROAD MITTRAPHAP TABKWANG KAENGKOI SARABURI 18260

**CONTACT INFORMATION** : TEL : [REDACTED] e-mail : [REDACTED]

**SAMPLING SOURCE** : วัดหินสับ หมู่ 5

**SAMPLE TYPE** : GROUNDWATER

**SAMPLING DATE** : AUGUST 23, 2022

**SAMPLING TIME** : 15:40 HOUR

**SAMPLING METHOD °** : GRAB

**SAMPLING BY °** : MR MANIT PANCHOT

**ANALYZED BY** : MISS NADNAPA KAMOLBOON

**RECEIVED DATE** : AUGUST 23, 2022

**ANALYTICAL DATE** : AUGUST 23-30, 2022

**REPORT NO.** : [REDACTED]

**WORK NO.** : [REDACTED]

**ANALYSIS NO.** : [REDACTED]

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			GROUNDWATER T22AQ529-0004		
pH °	-	ELECTROMETRIC METHOD AT SITE (SM:4500-H+ B)	7.1 (28°C)	-	-
TEMPERATURE °	°C	THERMOMETER AT SITE (SM: 2550 B)	28	-	-
TURBIDITY °	NTU	NEPHELOMETRIC METHOD (SM: 2130 B)	0.8	-	0.1
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2510 B)	959 (28°C)	-	0.1
SALINITY °	ppt	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2520 B)	0.4	-	0.1
BIOCHEMICAL OXYGEN DEMAND °	mg/L	MEMBRANE ELECTRODE METHOD (SM: 4500-O G AND 5210 B)	ND	-	1.0
CHEMICAL OXYGEN DEMAND °	mg/L	CLOSED REFLUX, COLOURIMETRIC METHOD (SM: 5220 D)	ND	-	25.0
TOTAL SUSPENDED SOLIDS °	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: 2540 D)	ND	-	5.0
TOTAL DISSOLVED SOLIDS °	mg/L	TOTAL DISSOLVED SOLIDS DRIED AT 180 °C (SM: 2540 C)	536	-	25
TOTAL HARDNESS °	mg/L as CaCO <sub>3</sub>	EDTA TITRIMETRIC METHOD (SM: 2340 C)	474	-	4.0
NITRATE NITROGEN °	mg/L NO <sub>3</sub> -N	CADMIUM REDUCTION METHOD (SM: 4500 -NO <sub>3</sub> - E)	0.29	-	0.02
PHOSPHATE °	mg/L PO <sub>4</sub> <sup>3-</sup>	ASCORBIC ACID METHOD (SM: 4500-P E)	ND	-	0.03
RESIDUAL CHLORINE °	mg/L Cl <sub>2</sub>	DPD FERROUS TITRIMETRIC METHOD (SM: 4500-Cl F)	ND	-	0.1
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: 4500-SO <sub>4</sub> <sup>2-</sup> E)	52.9	-	0.3
FAT, OIL AND GREASE °	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: 5520 B)	ND	-	3
SODIUM ADSORPTION RATIO °	-	INDUCTIVELY COUPLED PLASMA (ICP) AND CALCULATION METHOD	0.179	-	-





PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			GROUNDWATER T22AQ529-0004		
METALS					
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	ND	≤ 0.01	0.0003
BARIUM °	mg/L Ba	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	0.081	-	0.003
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.003	0.002
HEXAVALENT CHROMIUM °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: 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: 3030 E AND 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: 3030 E AND 3111 B	< LOQ	-	0.005
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 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: 3030 E AND 3111 B	ND	≤ 0.5	0.002
MERCURY <sup>b</sup>	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: 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: 3030 E AND 3111 B	ND	≤ 0.02	0.005
SELENIUM °	mg/L Se	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	0.0008	≤ 0.01	0.0005
TITANIUM °	mg/L Ti	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	ND	-	0.005



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			GROUNDWATER T22AQ529-0004		
ZINC <sup>c</sup>	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	0.140	≤ 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 ACCREDITEDIN-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 (IRON ≥ 0.005 AND &lt; 0.050 mg/L, LEAD ≥ 0.003 AND &lt; 0.100 mg/L).



(MISS BENJAWAN VIRIYOTHA)

LABORATORY SUPERVISOR

SEPTEMBER 12, 2022



## ANALYSIS REPORT

**CUSTOMER NAME** : TPI POLENE PUBLIC COMPANY LIMITED

**ADDRESS** : 299 MOO 5 MITRAPARP ROAD MITTRAPHAP TABKWANG KAENGKOEI SARABURI 18260

**CONTACT INFORMATION** : TEL : [REDACTED] e-mail : [REDACTED]

**SAMPLING SOURCE** : วัดพระธาตุเจตุยธรรม

**SAMPLE TYPE** : GROUNDWATER

**SAMPLING DATE** : AUGUST 23, 2022

**SAMPLING TIME** : 14:00 HOUR

**SAMPLING METHOD °** : GRAB

**SAMPLING BY °** : MR MANIT PANCHOT

**ANALYZED BY** : MISS NADNAPA KAMOLBOON

**RECEIVED DATE** : AUGUST 23, 2022

**ANALYTICAL DATE** : AUGUST 23-30, 2022

**REPORT NO.** : [REDACTED]

**WORK NO.** : [REDACTED]

**ANALYSIS NO.** : [REDACTED]

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			GROUNDWATER T22AQ529-0005		
pH °	-	ELECTROMETRIC METHOD AT SITE (SM:4500-H+ B)	7.4 (28°C)	-	-
TEMPERATURE °	°C	THERMOMETER AT SITE (SM: 2550 B)	28	-	-
TURBIDITY °	NTU	NEPHELOMETRIC METHOD (SM: 2130 B)	0.8	-	0.1
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2510 B)	984 (28°C)	-	0.1
SALINITY °	ppt	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2520 B)	0.5	-	0.1
BIOCHEMICAL OXYGEN DEMAND °	mg/L	MEMBRANE ELECTRODE METHOD (SM: 4500-O G AND 5210 B)	ND	-	1.0
CHEMICAL OXYGEN DEMAND °	mg/L	CLOSED REFLUX, COLOURIMETRIC METHOD (SM: 5220 D)	ND	-	25.0
TOTAL SUSPENDED SOLIDS °	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: 2540 D)	ND	-	5.0
TOTAL DISSOLVED SOLIDS °	mg/L	TOTAL DISSOLVED SOLIDS DRIED AT 180 °C (SM: 2540 C)	592	-	25
TOTAL HARDNESS °	mg/L as CaCO <sub>3</sub>	EDTA TITRIMETRIC METHOD (SM: 2340 C)	461	-	4.0
NITRATE NITROGEN °	mg/L NO <sub>3</sub> -N	CADMIUM REDUCTION METHOD (SM: 4500 -NO <sub>3</sub> - E)	0.07	-	0.02
PHOSPHATE °	mg/L PO <sub>4</sub> <sup>3-</sup>	ASCORBIC ACID METHOD (SM: 4500-P E)	ND	-	0.03
RESIDUAL CHLORINE °	mg/L Cl <sub>2</sub>	DPD FERROUS TITRIMETRIC METHOD (SM: 4500-CI F)	ND	-	0.1
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: 4500-SO <sub>4</sub> <sup>2-</sup> E)	87.2	-	0.3
FAT, OIL AND GREASE °	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: 5520 B)	ND	-	3
SODIUM ADSORPTION RATIO °	-	INDUCTIVELY COUPLED PLASMA (ICP) AND CALCULATION METHOD	0.383	-	-



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			GROUNDWATER T22AQ529-0005		
METALS					
ARSENIC <sup>c</sup>	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	ND	≤ 0.01	0.0003
BARIUM <sup>c</sup>	mg/L Ba	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	0.088	-	0.003
CADMIUM <sup>c</sup>	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.003	0.002
HEXAVALENT CHROMIUM <sup>c</sup>	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: 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: 3030 E AND 3111 B	ND	≤ 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: 3030 E AND 3111 B	0.054	-	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: 3030 E AND 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: 3030 E AND 3111 B	ND	≤ 0.5	0.002
MERCURY <sup>b</sup>	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: 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: 3030 E AND 3111 B	ND	≤ 0.02	0.005
SELENIUM <sup>c</sup>	mg/L Se	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	ND	≤ 0.01	0.0005
TITANIUM <sup>c</sup>	mg/L Ti	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	ND	-	0.005



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			GROUNDWATER T22AQ529-0005		
ZINC <sup>c</sup>	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 5.0	0.003
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			COLOURLESS/CLEAR 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 ACCREDITEDIN-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.

Wondershare  
PDFelement

(MISS BENJAWAN VIRIYOTHAJ)  
LABORATORY SUPERVISOR

SEPTEMBER 12, 2022



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**CUSTOMER NAME** : TPI POLENE PUBLIC COMPANY LIMITED  
**ADDRESS** : 299 MOO 5 MITRAPARP ROAD MITTRAPHAP TABKWANG KAENGKOI SARABURI 18260  
**CONTACT INFORMATION** : TEL : [REDACTED] e-mail : [REDACTED]  
**SAMPLING SOURCE** : MONITORING WELL  
**SAMPLE TYPE** : GROUNDWATER  
**SAMPLING DATE** : AUGUST 23, 2022  
**SAMPLING TIME** : 11:00 HOUR  
**SAMPLING METHOD °** : SUBMERSIBLE PUMP  
**SAMPLING BY °** : MR MANIT PANCHOT  
**ANALYZED BY** : MISS NADNAPA KAMOLBOON

**RECEIVED DATE** : AUGUST 23, 2022  
**ANALYTICAL DATE** : AUGUST 23-30, 2022  
**REPORT NO.** : [REDACTED]  
**WORK NO.** : [REDACTED]  
**ANALYSIS NO.** : [REDACTED]

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			MW 1 T22AQ530-0002		
pH °	-	ELECTROMETRIC METHOD AT SITE (SM:4500-H° B)	7.9 (30°C)	-	-
TEMPERATURE °	°C	THERMOMETER AT SITE (SM: 2550 B)	30	-	-
TURBIDITY °	NTU	NEPHELOMETRIC METHOD (SM: 2130 B)	1.3	-	0.1
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2510 B)	1,471 (30°C)	-	0.1
SALINITY °	ppt	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2520 B)	0.7	-	0.1
BIOCHEMICAL OXYGEN DEMAND °	mg/L	AZIDE MODIFICATION METHOD (SM: 4500-O C AND 5210 B)	ND	-	1.0
CHEMICAL OXYGEN DEMAND °	mg/L	CLOSED REFLUX, COLOURIMETRIC METHOD (SM: 5220 D)	ND	-	25.0
TOTAL SUSPENDED SOLIDS °	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: 2540 D)	ND	-	5.0
TOTAL DISSOLVED SOLIDS °	mg/L	TOTAL DISSOLVED SOLIDS DRIED AT 180 °C (SM: 2540 C)	764	-	25
TOTAL HARDNESS °	mg/L as CaCO <sub>3</sub>	EDTA TITRIMETRIC METHOD (SM: 2340 C)	327	-	4.0
NITRATE-NITROGEN °	mg/L NO <sub>3</sub> <sup>-</sup> -N	CADMIUM REDUCTION METHOD (SM: 4500 -NO <sub>3</sub> <sup>-</sup> E)	0.05	-	0.02
PHOSPHATE °	mg/L PO <sub>4</sub> <sup>3-</sup>	ASCORBIC ACID METHOD (SM: 4500-P E)	0.06	-	0.03
RESIDUAL CHLORINE °	mg/L Cl <sub>2</sub>	DPD FERROUS TITRIMETRIC METHOD (SM: 4500-Cl F)	ND	-	0.1
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: 4500-SO <sub>4</sub> <sup>2-</sup> E)	132	-	0.3
FAT, OIL AND GREASE °	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: 5520 B)	ND	-	3
SODIUM ADSORPTION RATIO °	-	INDUCTIVELY COUPLED PLASMA (ICP) AND CALCULATION METHOD	0.317	-	-
<b>METALS</b>					
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	ND	≤ 0.01	0.0003
BARIUM °	mg/L Ba	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	0.020	-	0.003
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.003	0.002





PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			MW 1 T22AQ530-0002		
HEXAVALENT CHROMIUM <sup>c</sup>	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: 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: 3030 E AND 3111 B	< LOQ	≤ 1.0	0.002
TOTAL IRON <sup>c</sup>	mg/L Fe	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	-	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: 3030 E AND 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: 3030 E AND 3111 B	ND	≤ 0.5	0.002
MERCURY <sup>b</sup>	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: 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: 3030 E AND 3111 B	ND	≤ 0.02	0.005
SELENIUM <sup>c</sup>	mg/L Se	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	ND	≤ 0.01	0.0005
TITANIUM <sup>c</sup>	mg/L Ti	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	ND	-	0.005



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			MW 1 T22AQ530-0002		
ZINC <sup>c</sup>	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	0.034	≤ 5.0	0.003
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR 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 ACCREDITEDIN-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).

(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

SEPTEMBER 8, 2022



## ANALYSIS REPORT

**CUSTOMER NAME** : TPI POLENE PUBLIC COMPANY LIMITED  
**ADDRESS** : 299 MOO 5 MITRAPARP ROAD MITTRAPHAP TABKWANG KAENGKOI SARABURI 18260  
**CONTACT INFORMATION** : TEL : [REDACTED] e-mail : [REDACTED]  
**SAMPLING SOURCE** : MONITORING WELL  
**SAMPLE TYPE** : GROUNDWATER  
**SAMPLING DATE** : AUGUST 23, 2022  
**SAMPLING TIME** : 10:40 HOUR  
**SAMPLING METHOD °** : SUBMERSIBLE PUMP  
**SAMPLING BY °** : MR MANIT PANCHOT  
**ANALYZED BY** : MISS NADNAPA KAMOLBOON

**RECEIVED DATE** : AUGUST 23, 2022  
**ANALYTICAL DATE** : AUGUST 23-30, 2022  
**REPORT NO.** : [REDACTED]  
**WORK NO.** : [REDACTED]  
**ANALYSIS NO.** : [REDACTED]

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			MW 2 T22AQ530-0003		
pH °	-	ELECTROMETRIC METHOD AT SITE (SM:4500-H° B)	8.6 (30°C)	-	-
TEMPERATURE °	°C	THERMOMETER AT SITE (SM: 2550 B)	30	-	-
TURBIDITY °	NTU	NEPHELOMETRIC METHOD (SM: 2130 B)	60	-	0.1
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2510 B)	877 (30°C)	-	0.1
SALINITY °	ppt	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2520 B)	0.4	-	0.1
BIOCHEMICAL OXYGEN DEMAND °	mg/L	AZIDE MODIFICATION METHOD (SM: 4500-O C AND 5210 B)	1.4	-	1.0
CHEMICAL OXYGEN DEMAND °	mg/L	CLOSED REFLUX, COLOURIMETRIC METHOD (SM: 5220 D)	ND	-	25.0
TOTAL SUSPENDED SOLIDS °	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: 2540 D)	59.2	-	5.0
TOTAL DISSOLVED SOLIDS °	mg/L	TOTAL DISSOLVED SOLIDS DRIED AT 180 °C (SM: 2540 C)	424	-	25
TOTAL HARDNESS °	mg/L as CaCO <sub>3</sub>	EDTA TITRIMETRIC METHOD (SM: 2340 C)	122	-	4.0
NITRATE-NITROGEN °	mg/L NO <sub>3</sub> -N	CADMIUM REDUCTION METHOD (SM: 4500 -NO <sub>3</sub> - E)	0.05	-	0.02
PHOSPHATE °	mg/L PO <sub>4</sub> <sup>3-</sup>	ASCORBIC ACID METHOD (SM: 4500-P E)	0.03	-	0.03
RESIDUAL CHLORINE °	mg/L Cl <sub>2</sub>	DPD FERROUS TITRIMETRIC METHOD (SM: 4500-CI F)	ND	-	0.1
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: 4500-SO <sub>4</sub> <sup>2-</sup> E)	89.8	-	0.3
FAT, OIL AND GREASE °	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: 5520 B)	ND	-	3
SODIUM ADSORPTION RATIO °	-	INDUCTIVELY COUPLED PLASMA (ICP) AND CALCULATION METHOD	1.54	-	-
<b>METALS</b>					
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	0.0009	≤ 0.01	0.0003
BARIUM °	mg/L Ba	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	0.029	-	0.003
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.003	0.002





PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			MW 2 T22AQ530-0003		
HEXAVALENT CHROMIUM <sup>c</sup>	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: 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: 3030 E AND 3111 B	ND	≤ 1.0	0.002
TOTAL IRON <sup>c</sup>	mg/L Fe	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	0.101	-	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: 3030 E AND 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: 3030 E AND 3111 B	< LOQ	≤ 0.5	0.002
MERCURY <sup>b</sup>	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: 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: 3030 E AND 3111 B	ND	≤ 0.02	0.005
SELENIUM <sup>c</sup>	mg/L Se	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	ND	≤ 0.01	0.0005
TITANIUM <sup>c</sup>	mg/L Ti	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	ND	-	0.005



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			MW 2 T22AQ530-0003		
ZINC <sup>c</sup>	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 5.0	0.003
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			YELLOW/TURBID 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 ACCREDITEDIN-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 (MANGANESE ≥ 0.002 AND &lt; 0.025 mg/L).

(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

SEPTEMBER 8, 2022



## ANALYSIS REPORT

**CUSTOMER NAME** : TPI POLENE PUBLIC COMPANY LIMITED  
**ADDRESS** : 299 MOO 5 MITRAPARP ROAD MITTRAPHAP TABKWANG KAENGKOI SARABURI 18260  
**CONTACT INFORMATION** : TEL : [REDACTED] e-mail : [REDACTED]  
**SAMPLING SOURCE** : MONITORING WELL  
**SAMPLE TYPE** : GROUNDWATER  
**SAMPLING DATE** : AUGUST 23, 2022  
**SAMPLING TIME** : 09:45 HOUR  
**SAMPLING METHOD °** : SUBMERSIBLE PUMP  
**SAMPLING BY °** : MR MANIT PANCHOT  
**ANALYZED BY** : MISS NADNAPA KAMOLBOON

**RECEIVED DATE** : AUGUST 23, 2022  
**ANALYTICAL DATE** : AUGUST 23-30, 2022  
**REPORT NO.** : [REDACTED]  
**WORK NO.** : [REDACTED]  
**ANALYSIS NO.** : [REDACTED]

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			MW 3 T22AQ530-0001		
pH °	-	ELECTROMETRIC METHOD AT SITE (SM:4500-H° B)	8.6 (30°C)	-	-
TEMPERATURE °	°C	THERMOMETER AT SITE (SM: 2550 B)	30	-	-
TURBIDITY °	NTU	NEPHELOMETRIC METHOD (SM: 2130 B)	3.4	-	0.1
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2510 B)	887 (30°C)	-	0.1
SALINITY °	ppt	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2520 B)	0.4	-	0.1
BIOCHEMICAL OXYGEN DEMAND °	mg/L	AZIDE MODIFICATION METHOD (SM: 4500-O C AND 5210 B)	ND	-	1.0
CHEMICAL OXYGEN DEMAND °	mg/L	CLOSED REFLUX, COLOURIMETRIC METHOD (SM: 5220 D)	ND	-	25.0
TOTAL SUSPENDED SOLIDS °	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: 2540 D)	ND	-	5.0
TOTAL DISSOLVED SOLIDS °	mg/L	TOTAL DISSOLVED SOLIDS DRIED AT 180 °C (SM: 2540 C)	448	-	25
TOTAL HARDNESS °	mg/L as CaCO <sub>3</sub>	EDTA TITRIMETRIC METHOD (SM: 2340 C)	151	-	4.0
NITRATE-NITROGEN °	mg/L NO <sub>3</sub> -N	CADMIUM REDUCTION METHOD (SM: 4500-NO <sub>3</sub> -E)	0.05	-	0.02
PHOSPHATE °	mg/L PO <sub>4</sub> <sup>3-</sup>	ASCORBIC ACID METHOD (SM: 4500-P E)	ND	-	0.03
RESIDUAL CHLORINE °	mg/L Cl <sub>2</sub>	DPD FERROUS TITRIMETRIC METHOD (SM: 4500-Cl F)	ND	-	0.1
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: 4500-SO <sub>4</sub> <sup>2-</sup> E)	98.1	-	0.3
FAT, OIL AND GREASE °	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: 5520 B)	ND	-	3
SODIUM ADSORPTION RATIO °	-	INDUCTIVELY COUPLED PLASMA (ICP) AND CALCULATION METHOD	0.316	-	-





PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			MW 3 T22AQ530-0001		
METALS					
ARSENIC <sup>c</sup>	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	ND	≤ 0.01	0.0003
BARIUM <sup>c</sup>	mg/L Ba	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	0.019	-	0.003
CADMIUM <sup>c</sup>	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.003	0.002
HEXAVALENT CHROMIUM <sup>c</sup>	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: 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: 3030 E AND 3111 B	ND	≤ 1.0	0.002
TOTAL IRON <sup>c</sup>	mg/L Fe	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	-	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: 3030 E AND 3111 B	< LOQ	≤ 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: 3030 E AND 3111 B	ND	≤ 0.5	0.002
MERCURY <sup>b</sup>	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: 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: 3030 E AND 3111 B	ND	≤ 0.02	0.005
SELENIUM <sup>c</sup>	mg/L Se	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	ND	≤ 0.01	0.0005
TITANIUM <sup>c</sup>	mg/L Ti	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	ND	-	0.005



## United Analyst and Engineering Consultant Co., Ltd.

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

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NSC-TISI-TIS 17025  
TESTING 0207TESTING  
No. 0063

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			MW 3 T22AQ530-0001		
ZINC <sup>c</sup>	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	0.033	≤ 5.0	0.003
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			COLOURLESS/CLEAR 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 ACCREDITEDIN-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 (LEAD ≥ 0.003 AND &lt; 0.100 mg/L).

  
 (MR BHUCHONK PANICHLERTUMPI)  
 LABORATORY SUPERVISOR

SEPTEMBER 8, 2022



## ANALYSIS REPORT

**CUSTOMER NAME** : TPI POLENE PUBLIC COMPANY LIMITED  
**ADDRESS** : 299 MOO 5 MITRAPARP ROAD MITTRAPHAP TABKWANG KAENGKOI SARABURI 18260  
**CONTACT INFORMATION** : TEL : [REDACTED] e-mail : [REDACTED]  
**SAMPLING SOURCE** : MONITORING WELL  
**SAMPLE TYPE** : GROUNDWATER  
**SAMPLING DATE** : AUGUST 23, 2022  
**SAMPLING TIME** : 12:10 HOUR  
**SAMPLING METHOD °** : SUBMERSIBLE PUMP  
**SAMPLING BY °** : MR MANIT PANCHOT  
**ANALYZED BY** : MISS NADNAPA KAMOLBOON

**RECEIVED DATE** : AUGUST 23, 2022  
**ANALYTICAL DATE** : AUGUST 23-30, 2022  
**REPORT NO.** : [REDACTED]  
**WORK NO.** : [REDACTED]  
**ANALYSIS NO.** : [REDACTED]

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			MW 4 T22AQ530-0004		
pH °	-	ELECTROMETRIC METHOD AT SITE (SM:4500-H° B)	6.7 (37°C)	-	-
TEMPERATURE °	°C	THERMOMETER AT SITE (SM: 2550 B)	37	-	-
TURBIDITY °	NTU	NEPHELOMETRIC METHOD (SM: 2130 B)	75	-	0.1
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2510 B)	864 (37°C)	-	0.1
SALINITY °	ppt	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2520 B)	0.3	-	0.1
BIOCHEMICAL OXYGEN DEMAND °	mg/L	AZIDE MODIFICATION METHOD (SM: 4500-O C AND 5210 B)	1.0	-	1.0
CHEMICAL OXYGEN DEMAND °	mg/L	CLOSED REFLUX, COLOURIMETRIC METHOD (SM: 5220 D)	ND	-	25.0
TOTAL SUSPENDED SOLIDS °	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: 2540 D)	56.2	-	5.0
TOTAL DISSOLVED SOLIDS °	mg/L	TOTAL DISSOLVED SOLIDS DRIED AT 180 °C (SM: 2540 C)	370	-	25
TOTAL HARDNESS °	mg/L as CaCO <sub>3</sub>	EDTA TITRIMETRIC METHOD (SM: 2340 C)	171	-	4.0
NITRATE-NITROGEN °	mg/L NO <sub>3</sub> -N	CADMIUM REDUCTION METHOD (SM: 4500 -NO <sub>3</sub> - E)	0.05	-	0.02
PHOSPHATE °	mg/L PO <sub>4</sub> <sup>3-</sup>	ASCORBIC ACID METHOD (SM: 4500-P E)	ND	-	0.03
RESIDUAL CHLORINE °	mg/L Cl <sub>2</sub>	DPD FERROUS TITRIMETRIC METHOD (SM: 4500-Cl F)	ND	-	0.1
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: 4500-SO <sub>4</sub> <sup>2-</sup> E)	67.6	-	0.3
FAT, OIL AND GREASE °	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: 5520 B)	ND	-	3
SODIUM ADSORPTION RATIO °	-	INDUCTIVELY COUPLED PLASMA (ICP) AND CALCULATION METHOD	1.62	-	-
<b>METALS</b>					
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	0.0009	≤ 0.01	0.0003
BARIUM °	mg/L Ba	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	0.026	-	0.003
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.003	0.002



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			MW 4 T22AQ530-0004		
HEXAVALENT CHROMIUM <sup>c</sup>	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: 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: 3030 E AND 3111 B	ND	≤ 1.0	0.002
TOTAL IRON <sup>c</sup>	mg/L Fe	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	0.092	-	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: 3030 E AND 3111 B	< LOQ	≤ 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: 3030 E AND 3111 B	< LOQ	≤ 0.5	0.002
MERCURY <sup>b</sup>	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: 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: 3030 E AND 3111 B	ND	≤ 0.02	0.005
SELENIUM <sup>c</sup>	mg/L Se	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	ND	≤ 0.01	0.0005
TITANIUM <sup>c</sup>	mg/L Ti	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	ND	-	0.005



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			MW 4 T22AQ530-0004		
ZINC <sup>c</sup>	mg/L Zn	IN-HOUSE METHOD: UAE.TP.GW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 5.0	0.003
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			YELLOW/TURBID 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 ACCREDITEDIN-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 (LEAD ≥ 0.003 AND &lt; 0.100 mg/L, MANGANESE ≥ 0.002 AND &lt; 0.025 mg/L).

(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

SEPTEMBER 8, 2022