PTT Exploration & Production Public Company Limited - Water Security 2023

W0. Introduction

W0.1

(W0.1) Give a general description of and introduction to your organization.

PTT Exploration and Production Public Company Limited (PTTEP), a Thai national petroleum exploration and production organization, is a publicly listed company on the Thai stock exchange, and a subsidiary of PTT Public Company Limited, Thailand's national petroleum company. PTTEP's mission is to operate globally to provide reliable energy supply and sustainable value to all stakeholders. Therefore, we set our vision to be an energy partner of choice through competitive performance and innovation for long-term value creations.

Operating under the philosophy and concept of sustainable development, PTTEP strives to provide energy security through continuous growth and competitive returns with low impact on environment and society through responsible operations in response to the stakeholder expectations. PTTEP developed the Sustainable Development Framework as the way of working and strong foundation to support our journey towards sustainability, including to achieve our vision of becoming the "Energy Partner of Choice". The framework comprises of three main components namely: High Performance Organization (HPO), Governance, Risk Management and Compliance (GRC), and Stakeholder Value Creation (SVC). The framework also corresponds with the United Nations Sustainable Development Goals (SDGs). PTTEP is confident that this strong foundation as well as conscious consideration of all stakeholders' interests will enable us to deliver value and foster sustainability for the wider world. (From We to World).

PTTEP has worldwide operations of 47 projects in 15 countries as of 31th, December 2022.

The company is engaged in the exploration, extraction, production and development of petroleum products. It produces crude oil, condensate, natural gas and liquefied petroleum gas (LPG). The company is also engaged in petroleum-related businesses, such as jetty, bulk tanks and warehouse management.

W-OG0.1a

(W-OG0.1a) Which business divisions in the oil & gas sector apply to your organization?

Upstream

W0.2

(W0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date
Reporting year	January 1 2022	December 31 2022

W0.3

(W0.3) Select the countries/areas in which you operate.

Malaysia
Myanmar
Thailand

W0.4

(W0.4) Select the currency used for all financial information disclosed throughout your response.

USD

W0.5

(W0.5) Select the option that best describes the reporting boundary for companies, entities, or groups for which water impacts on your business are being reported.

Companies, entities or groups over which operational control is exercised

W0.6

(W0.6) Within this boundary, are there any geographies, facilities, water aspects, or other exclusions from your disclosure?

No

W0.7

(W0.7) Does your organization have an ISIN code or another unique identifier (e.g., Ticker, CUSIP, etc.)?

Indicate whether you are able to provide a unique identifier for your organization.	Provide your unique identifier
Yes, an ISIN code	TH0355A10Z04

W1. Current state

W1.1

(W1.1) Rate the importance (current and future) of water quality and water quantity to the success of your business.

	Direct use importance rating	Indirect use importance rating	Please explain
Sufficient amounts of good quality freshwater available for use	Not very important	Not very important	Company materiality assessment following to GRI guideline shows that water management is not material issue of the company. The assessment was considered importance to PTTEP as well as our stakeholders. In addition, freshwater consumption accounts only 0.7 % of total water withdrawal for PTTEP operations, since seawater is our major water source. This includes both direct operations and our supply chain, e.g. Songkhla petroleum support base who is responsible for providing water supply to some offshore operations, etc. However, PTTEP expected that future freshwater dependency may increase as by 2030, the world may face a 40% global water shortfall as a result of increasing populations along with impact from climate change. Water scarcity affects more than 40% of the global population (World Bank). PTTEP considers reducing the freshwater withdrawal in operations in water stress area e.g. S1 and Suphanburi in Thailand and seeks more opportunity in water reuse/recycle. Moreover, estimates of future changes in water availability on a local level through operational risk assessment are conducted at all assets for water availability and included in Enterprise Risk Assessment. PTTEP conducted a scenario analysis of the potential impacts for both current and future scenarios i.e. 2021 and 2030. The overall results indicated that PTTEP is not expecting to experience a high or significant impact from water quality and quantity issues based on current locations and production volumes.
Sufficient amounts of recycled, brackish and/or produced water available for use	Not very important	Not very important	Company materiality assessment following to GRI guideline shows that water management is not material issue. The assessment was considered importance to PTTEP as well as our stakeholders. In addition, seawater, generally classified as a renewable resource, is major water source for PTTEP operations, equivalent to 99% of total water consumption. This includes both direct operations and our supply chain, e.g. Songkhla petroleum support base who is responsible for providing water supply to some offshore operations, etc. Produced water is an important resource as approximately 64% is reinjected to depleted wells or used as water flooding for oil recovery process improvement, while the rest is discharged overboard or evaporated in compliance with the regulation requirements. PTTEP considers reducing the freshwater withdrawal in operations in water stress area e.g. S1 and Suphanburi in Thailand and seeks more opportunity in water reuse/recycle.

W1.2

(W1.2) Across all your operations, what proportion of the following water aspects are regularly measured and monitored?

	% of sites/facilities/operations	Frequency of measurement	Method of measurement	Please explain
Water withdrawals – total volumes	100%	Monthly	Method of measurement of water withdrawal volume is through direct monitoring by monthly report	PTTEP conducts monitoring program is also required to record volume of water withdrawals from all PTTEP operating assets and petroleum support bases to be environmental performance report for further improvements and ensure that there is no impact on the community and water users.
Water withdrawals – volumes by source	100%	Monthly	Method of measurement of water withdrawal volume separately by source is through direct monitoring by monthly report	PTTEP conducts monitoring program is also required to record volume separately by source of water withdrawals from all PTTEP operating assets and petroleum support bases to be environmental performance report for further improvements and ensure that there is no impact on the community and water users.
Entrained water associated with your metals & mining and/or coal sector activities - total volumes [only metals and mining and coal sectors]	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Produced water associated with your oil & gas sector activities - total volumes [only oil and gas sector]	100%	Monthly	Method of measurement of produced water volume is through direct monitoring by monthly report.	PTTEP conducts monitoring program is also required to record volume of produced water from all PTTEP operating assets.
Water withdrawals quality	51-75	Yearly	Method of measurement of water withdrawals quality is monitored at the site level using automatic water samplers and lab testing.	PTTEP conducts monitoring quality of water withdrawals for almost PTTEP operating assets and support base. Therefore, some of water withdrawal quality is not monitored because we supply the water from waterworks authority and referred these water supply quality standard.
Water discharges – total volumes	100%	Monthly	Method of measurement of water discharge volume is through direct monitoring by monthly report	PTTEP conducts monitoring program is also required to record volume of water discharge from all PTTEP operating assets.
Water discharges – volumes by destination	100%	Monthly	Method of measurement of water discharge volume by management method as a destination of discharge, is through direct monitoring by monthly report	PTTEP conduct to monitor water discharge volume by management method as a destination of discharge. Most of water discharge as approximately 99% is produced water. The produced water is an important resource as approximately 64% is reinjected to depleted wells or used as water flooding for oil recovery process improvement, while the rest is treated before discharged overboard; or evaporated in compliance with the regulation requirements.
Water discharges – volumes by treatment method	100%	Monthly	Method of measurement of water discharge volume separately by treatment method is through direct monitoring by monthly report	PTTEP conducts monitoring program is also required to record volume of water discharge separately by treatment method from all PTTEP operating assets. Most of water discharge as approximately 99% is produced water. The produced water is an important resource as approximately 64% is reinjected to depleted wells or used as water flooding for oil recovery process improvement, while the rest is treated before discharged overboard; or evaporated in compliance with the regulation requirements.
Water discharge quality – by standard effluent parameters	100%	Yearly	Method of measurement of water discharge quality is monitored at the site level using lab testing. Parameters measured i.e. Total Petroleum Hydrocarbon (TPH), Oil and Grease.	PTTEP conducts monitoring program is also required to record quality of water discharge from all PTTEP operating assets. Most of water discharge (as approximately 99% of water discharge) is produced water reinjected to depleted wells or used as water flooding for oil recovery process improvement, while the rest is treated before discharged overboard; or evaporated in monitoring compliance with the regulation requirements.
Water discharge quality – emissions to water (nitrates, phosphates, pesticides, and/or other priority substances)	Not monitored	<Not Applicable>	<Not Applicable>	This water aspect is not monitored in our sites; discharge quality is only monitored by standard effluent parameters in compliance with the regulation requirements.
Water discharge quality – temperature	Not monitored	<Not Applicable>	<Not Applicable>	This water aspect is not monitored in operating sites; most of water discharge is produced water which monitored in compliance with the regulation requirements.
Water consumption – total volume	100%	Monthly	Method of measurement of water consumption is through direct monitoring by monthly report	PTTEP conduct monitoring program is also required to record volume of water consumption from all PTTEP operating assets and petroleum support bases.
Water recycled/reused	100%	Monthly	Method of measurement of water recycled/reused is through direct monitoring by monthly report	PTTEP conduct monitoring program is also required to record volume of recycled/reused from all PTTEP operating assets and petroleum support bases.
The provision of fully-functioning, safely managed WASH services to all workers	100%	Yearly	Method of measurement is through occupation health audit by yearly	The monitoring program of WASH service is conducted via the compliance audits against the defined standard of PTTEP Occupational Health Management including food and water safety, sewage and sanitation.

W1.2b

(W1.2b) What are the total volumes of water withdrawn, discharged, and consumed across all your operations, how do they compare to the previous reporting year, and how are they forecasted to change?

	Volume (megaliters/year)	Comparison with previous reporting year	Primary reason for comparison with previous reporting year	Five-year forecast	Primary reason for forecast	Please explain
Total withdrawals	100450	Higher	Increase/decrease in business activity	Lower	Increase/decrease in efficiency	PTTEP intends to reduce freshwater withdrawals are to increase opportunity for water reuse/recycle. Therefore, we anticipated that the forward trend of total water withdrawal efficiency will be reduced gradually in the following years.
Total discharges	13600	Higher	Increase/decrease in business activity	Lower	Increase/decrease in efficiency	PTTEP intends to reduce water discharge are to increase opportunity for water reuse/recycle. Therefore, we anticipated that the forward trend of total water discharge will be reduced gradually in the following years.
Total consumption	100450	Higher	Increase/decrease in business activity	Lower	Increase/decrease in efficiency	PTTEP intends to reduce water consumption are to increase opportunity for water reuse/recycle. Therefore, we anticipated that the forward trend of total water consumption efficiency will be reduced gradually in the following years.

W-OG1.2c

(W-OG1.2c) In your oil & gas sector operations, what are the total volumes of water withdrawn, discharged, and consumed (by business division), how do they compare to the previous reporting year, and how are they forecasted to change?

	Volume (megaliters/year)	Comparison with previous reporting year	Primary reason for comparison with previous reporting year	Five-year forecast	Primary reason for forecast	Please explain
Total withdrawals - upstream	100450	Higher	Increase/decrease in business activity	Lower	Increase/decrease in efficiency	PTTEP intends to reduce freshwater withdrawals are to increase opportunity for water reuse/recycle. Therefore, we anticipated that the forward trend of total water withdrawal efficiency will be reduced gradually in the following years.
Total discharges – upstream	13600	Higher	Increase/decrease in business activity	Lower	Increase/decrease in efficiency	PTTEP intends to reduce water discharge are to increase opportunity for water reuse/recycle. Therefore, we anticipated that the forward trend of total water discharge will be reduced gradually in the following years.
Total consumption – upstream	100450	Higher	Increase/decrease in business activity	Lower	Increase/decrease in efficiency	PTTEP intends to reduce water consumption are to increase opportunity for water reuse/recycle. Therefore, we anticipated that the forward trend of total water consumption efficiency will be reduced gradually in the following years.
Total withdrawals - midstream/downstream	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Total discharges – midstream/downstream	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Total consumption – midstream/downstream	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Total withdrawals – chemicals	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Total discharges – chemicals	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Total consumption – chemicals	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Total withdrawals – other business division	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Total discharges – other business division	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Total consumption – other business division	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>

W1.2d

(W1.2d) Indicate whether water is withdrawn from areas with water stress, provide the proportion, how it compares with the previous reporting year, and how it is forecasted to change.

	Withdrawals are from areas with water stress	% withdrawn from areas with water stress	Comparison with previous reporting year	Primary reason for comparison with previous reporting year	Five-year forecast	Primary reason for forecast	Identification tool	Please explain
Row 1	Yes	1-10	Lower	Increase/decrease in business activity	Lower	Increase/decrease in business activity	WRI Aqueduct	% of water withdrawn in forecast in water-stressed areas was calculated based on production consisting of operation assets from areas with water stress multiplied by total production from every asset including all domestic and international assets.

W1.2h

(W1.2h) Provide total water withdrawal data by source.

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Primary reason for comparison with previous reporting year	Please explain
Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	Relevant	26.3	Lower	Increase/decrease in business activity	The fresh surface water from all PTTEP operating assets and petroleum support bases, equivalent to 26.3 megaliters which is not different from previous year. PTTEP intends to reduce freshwater withdrawals are to increase opportunity for water reuse/recycle.
Brackish surface water/Seawater	Relevant	86310	Higher	Increase/decrease in business activity	PTTEP increase production activities which are higher than from previous year.
Groundwater – renewable	Relevant	540	About the same	Other, please specify (As the same with previous reporting year)	The groundwater from all PTTEP operating assets and petroleum support bases, equivalent to 540 megaliters which is not different from previous year
Groundwater – non-renewable	Not relevant	<Not Applicable>	<Not Applicable>	<Not Applicable>	No groundwater-non-renewable use
Produced/Entrained water	Relevant	13000	Higher	Increase/decrease in business activity	The produced water from all PTTEP operating assets and petroleum support bases, equivalent to 1,300 megaliters which is higher than previous year due to production activities increased.
Third party sources	Relevant	160	Higher	Increase/decrease in business activity	The water from Third party sources, equivalent to 160 megaliters which is higher than previous year due to production activities increased.

W1.2i

(W1.2i) Provide total water discharge data by destination.

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Primary reason for comparison with previous reporting year	Please explain
Fresh surface water	Not relevant	<Not Applicable>	<Not Applicable>	<Not Applicable>	No water discharge to surface water
Brackish surface water/seawater	Relevant	4960	Higher	Increase/decrease in business activity	Almost of water discharge is reinjected to depleted wells or used as water flooding for oil recovery process improvement, while the rest is treated and discharged to seawater in compliance with the regulation requirements.
Groundwater	Not relevant	<Not Applicable>	<Not Applicable>	<Not Applicable>	No water discharge to groundwater
Third-party destinations	Not relevant	<Not Applicable>	<Not Applicable>	<Not Applicable>	No water discharge to 3rd party destination

W1.2j

(W1.2j) Within your direct operations, indicate the highest level(s) to which you treat your discharge.

	Relevance of treatment level to discharge	Volume (megaliters/year)	Comparison of treated volume with previous reporting year	Primary reason for comparison with previous reporting year	% of your sites/facilities/operations this volume applies to	Please explain
Tertiary treatment	Not relevant	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>	We had no water discharge to Tertiary treatment.
Secondary treatment	Relevant	4960	Higher	Increase/decrease in business activity	31-40	The water discharge was flowed into primary treatment unit as physical removal of suspended solids and hydrocarbon. After that the water was transferred to secondary treatment as reduction and control of Total petroleum hydrocarbon (TPH) in compliance with the regulation requirements.
Primary treatment only	Relevant	8636	Higher	Increase/decrease in business activity	61-70	Most of water discharge was primary treatment as physical removal of suspended solids and hydrocarbon. After that it will be transferred to site for well injection.
Discharge to the natural environment without treatment	Not relevant	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>	We had no water discharge to the nature environment without treatment.
Discharge to a third party without treatment	Not relevant	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>	We had no water discharge to a third party without treatment.
Other	Not relevant	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>	

W1.3

(W1.3) Provide a figure for your organization's total water withdrawal efficiency.

	Revenue	Total water withdrawal volume (megaliters)	Total water withdrawal efficiency	Anticipated forward trend
Row 1	96600000000	100450		The water withdrawal was considered important to PTTEP which seawater is generally classified as a renewable resource, and is the major water source for PTTEP operations, equivalent to 99% of total water withdrawal which is not different from previous year. PTTEP intends to reduce freshwater withdrawals are to increase opportunity for water reuse/recycle. Therefore, we anticipated that the forward trend of total water withdrawal efficiency will be reduced gradually in the following years.

W-OG1.3

(W-OG1.3) Do you calculate water intensity for your activities associated with the oil & gas sector?

Yes

W-OG1.3a

(W-OG1.3a) Provide water intensity information associated with your activities in the oil & gas sector.

Business division

Upstream

Water intensity value (m3/denominator)

0

Numerator: water aspect

Freshwater withdrawals

Denominator

Barrel of oil equivalent

Comparison with previous reporting year

About the same

Please explain

The water intensity value is around 0.0039 by calculating with relation between a volumetric aspect of freshwater withdrawals and total production from all PTTEP operating assets which is not different from previous year. PTTEP intends to reduce freshwater withdrawals are to increase opportunity for water reuse/recycle. In addition, freshwater withdrawals accounts only 0.7 % of total water withdrawal for PTTEP operations, since seawater is our major water source.

W1.4

(W1.4) Do any of your products contain substances classified as hazardous by a regulatory authority?

	Products contain hazardous substances	Comment
Row 1	Yes	<Not Applicable>

W1.4a

(W1.4a) What percentage of your company's revenue is associated with products containing substances classified as hazardous by a regulatory authority?

Regulatory classification of hazardous substances	% of revenue associated with products containing substances in this list	Please explain
Other, please specify (Hazardous Substance Act, Thailand)	More than 80%	PTTEP main product is natural gas and crude oil. The environmental potential impacts from PTTEP production may cause spill or leakage of hydrocarbon (HC) liquid during transferring/ offloading or from truck/vessel collision, subsea pipelines rupture/corrosion. PTTEP developed the spill management plan and emergency management plan to protect the environmental potential impact in accordance with the PTTEP SSHE Management System (SSHE-MS). The main objective of this Standard is to: 1) assist PTTEP Assets and Subsidiaries to properly manage the Company environmental aspects and impacts in the environmentally sound management practices which include compliance with the regulations and the Company requirements, and 2) ensure the effectiveness of mitigation and prevention of the environmental pollution including water pollution, and encourage the continual improvement culture.

W1.5

(W1.5) Do you engage with your value chain on water-related issues?

	Engagement	Primary reason for no engagement	Please explain
Suppliers	Yes	<Not Applicable>	<Not Applicable>
Other value chain partners (e.g., customers)	Yes	<Not Applicable>	<Not Applicable>

W1.5a

(W1.5a) Do you assess your suppliers according to their impact on water security?

Row 1

Assessment of supplier impact
No, we do not currently assess the impact of our suppliers, but we plan to do so within the next two years

Considered in assessment
<Not Applicable>

Number of suppliers identified as having a substantive impact
<Not Applicable>

% of total suppliers identified as having a substantive impact
<Not Applicable>

Please explain
The seawater, generally classified as a renewable resource, is major water source for PTTEP operations, equivalent to 99% of total water consumption. Nevertheless, we plan to assess water security of supplier within the next two years.

W1.5b

(W1.5b) Do your suppliers have to meet water-related requirements as part of your organization's purchasing process?

	Suppliers have to meet specific water-related requirements	Comment
Row 1	Yes, suppliers have to meet water-related requirements, but they are not included in our supplier contracts	<Not Applicable>

W1.5c

(W1.5c) Provide details of the water-related requirements that suppliers have to meet as part of your organization's purchasing process, and the compliance measures in place.

Water-related requirement
Complying with going beyond water-related regulatory requirements

% of suppliers with a substantive impact required to comply with this water-related requirement
<Not Applicable>

% of suppliers with a substantive impact in compliance with this water-related requirement
<Not Applicable>

Mechanisms for monitoring compliance with this water-related requirement
Fines and penalties
Supplier self-assessment
Supplier scorecard or rating

Response to supplier non-compliance with this water-related requirement
Retain and engage

Comment
PTTEP's green procurement toolkit is developed with the objective to elaborate of roles and responsibilities as a responsible and prudent operator by considering beyond private cost-benefit and approach to maximize net benefit of the wider environment. This is to promote procurement of environmental friendly goods and services, seek the opportunity to reduce environmental impact throughout their life cycle by integrating environmental performance considerations in PTTEP's procurement process. The impact from Green Procurement is in term of reduction of e.g. resource use (raw material, energy and water), emissions or pollutants, waste, etc in our supply chain. Addition for this, we consider specific criteria as no pending environmental complaints and non-conviction of any offense via supplier selection process.

W1.5d

(W1.5d) Provide details of any other water-related supplier engagement activity.

Type of engagement
Other

Details of engagement
Other, please specify (Promote water management in term on water use reduction and complete environmental regulation)

% of suppliers by number
1-25

% of suppliers with a substantive impact
<Not Applicable>

Rationale for your engagement
PTTEP's green procurement toolkit is developed with the objective to elaborate of roles and responsibilities as a responsible and prudent operator by considering beyond private cost-benefit and approach to maximize net benefit of the wider environment. This is to promote procurement of environmental friendly goods and services, seek the opportunity to reduce environmental impact throughout their life cycle by integrating environmental performance considerations in PTTEP's procurement process. In addition, we consider specific criteria as no pending environmental complaints and non-conviction of any offense via supplier selection process.

Impact of the engagement and measures of success
The impact from Green Procurement is in term of reduction of e.g. resource use (raw material, energy and water), emissions or pollutants, waste, etc in our supply chain.

Comment

W1.5e

(W1.5e) Provide details of any water-related engagement activity with customers or other value chain partners.

Type of stakeholder
Customers

Type of engagement
Education / information sharing

Details of engagement
Educate and work with stakeholders on understanding and measuring exposure to water-related risks

Rationale for your engagement
PTTEP's sole customer is PTT, which is our mother company included in water related risk assessment.

Impact of the engagement and measures of success
Impact of water related risk assessments can help organization to increase awareness of their water use, monitor their water use performance, and reduce freshwater withdrawals. This can lead to increased opportunities for water reuse and recycling.

W2. Business impacts

W2.1

(W2.1) Has your organization experienced any detrimental water-related impacts?
No

W2.2

(W2.2) In the reporting year, was your organization subject to any fines, enforcement orders, and/or other penalties for water-related regulatory violations?

	Water-related regulatory violations	Fines, enforcement orders, and/or other penalties	Comment
Row 1	No	<Not Applicable>	

W3. Procedures

W3.1

(W3.1) Does your organization identify and classify potential water pollutants associated with its activities that could have a detrimental impact on water ecosystems or human health?

	Identification and classification of potential water pollutants	How potential water pollutants are identified and classified	Please explain
Row 1	Yes, we identify and classify our potential water pollutants	To provide an overview of the environmental management strategy and requirements, PTTEP developed the Environmental Management Standard as a master document for environment management in accordance with the PTTEP SSHE Management System (SSHE-MS). The main objective of this Standard is to: 1) assist PTTEP Assets and Subsidiaries to properly manage the Company environmental aspects and impacts in the environmentally sound management practices which include compliance with the regulations and the Company requirements, and 2) ensure the effectiveness of mitigation and prevention of the environmental pollution including water pollution, and encourage the continual improvement culture. As required by PTTEP SSHE MS implementation as well as company risk management and voluntary implementation of ISO14001 for all PTTEP operating assets and petroleum support bases, the potential water pollutant including releasing of all types and forms of pollutant to water and/or sea e.g. wastes, wastewater, chemical substance, produced water and hydrocarbon liquid from each activity will be identified and assessed thorough all stages of activity both normal and abnormal operations. Moreover, a procedure Environmental Impact Assessment for Exploration, Production, and Decommissioning is also in place to identify water pollutants which has potential impact to human health and ecosystems of community located nearby our operating assets.	<Not Applicable>

W3.1a

(W3.1a) Describe how your organization minimizes the adverse impacts of potential water pollutants on water ecosystems or human health associated with your activities.

Water pollutant category
Other synthetic organic compounds

Description of water pollutant and potential impacts
The potential impacts from PTTEP operations that has been identified and assessed since construction, drilling, and production phase of our operation i.e. Spill or leakage of hydrocarbon (HC) liquid, JET A1, diesel oil, during transferring/ offloading or from vessel collision, subsea pipelines rupture/corrosion.

Hydrocarbon spill or leakage could be impacted to water ecosystems or human health. Potential impacted parties could be e.g. workers, communities, fishermen, aquatic life, mammals etc. The level of coverage, toxicity, persistence and bioaccumulation could be varied depending on e.g. spill volume, type and characteristic of spilled substance, duration, location, environmental condition and emergency response and management etc. However, the potential water pollution impact which considered as worst case may raise from the spill or leakage by the asset/project that located in the near-shore area with high environmental sensitivity. The identified impact is considered as substantive impact with moderate likelihood thus, the risks on water ecosystems or human health of potential water pollutants associated with our activity are considered as high.

Value chain stage
Direct operations

Actions and procedures to minimize adverse impacts
Assessment of critical infrastructure and storage condition (leakages, spillages, pipe erosion etc.) and their resilience
Resource recovery
Implementation of integrated solid waste management systems

Please explain
Normally the approach of management procedures is a company-wide basis, however, an integration of company-wide, river-basin and regional basis also applied for some circumstances. The identified aspects and impact assessment shall be reviewed and updated in the condition of appearance of new development, new or modified activity/product/service, new law and/or regulation announced, new environmental mitigation measure put in place or achieved.

The indicated management procedures help mitigate both probability of occurrence and severity of consequence resulting in descending of significant tier of the impact. e.g. compliance with effluent quality standards, measure to prevent spillage leaching and leakages, could provide the preventive barriers to the spill or leak event while community/stakeholder engagement, emergency preparedness and spill response plan could mitigate the impact once spill or leakage occurred.

The success of this management is measured and evaluated in term of spilled oil and chemicals rate. In 2022, the Company's spilled oil and chemicals was at the rate of 0.67 tonnes per million tonnes of petroleum production which is increased from the previous years. PTTEP performance on spill rate has continuously been kept lower than peers or IOGP average at all times.

W3.3

(W3.3) Does your organization undertake a water-related risk assessment?
Yes, water-related risks are assessed

W3.3a

(W3.3a) Select the options that best describe your procedures for identifying and assessing water-related risks.

Value chain stage
Direct operations

Coverage
Full

Risk assessment procedure

Water risks are assessed as part of an established enterprise risk management framework

Frequency of assessment
Every three years or more

How far into the future are risks considered?
More than 6 years

Type of tools and methods used
Tools on the market
Enterprise risk management
International methodologies and standards

Tools and methods used
WRI Aqueduct
WWF Water Risk Filter
Enterprise Risk Management
Environmental Impact Assessment
ISO 14001 Environmental Management Standard

Contextual issues considered
Water availability at a basin/catchment level
Water quality at a basin/catchment level
Stakeholder conflicts concerning water resources at a basin/catchment level
Implications of water on your key commodities/raw materials
Water regulatory frameworks
Status of ecosystems and habitats

Stakeholders considered
Customers
Employees
Investors
Local communities
NGOs
Regulators
Water utilities at a local level

Comment

Value chain stage
Supply chain

Coverage
Full

Risk assessment procedure
Water risks are assessed as part of other company-wide risk assessment system

Frequency of assessment
Every three years or more

How far into the future are risks considered?
More than 6 years

Type of tools and methods used
Tools on the market
Enterprise risk management
International methodologies and standards
Other

Tools and methods used
WRI Aqueduct
Environmental Impact Assessment
Internal company methods
External consultants
Other, please specify (IPIECA Global Water Tool)

Contextual issues considered
Water availability at a basin/catchment level
Water quality at a basin/catchment level
Stakeholder conflicts concerning water resources at a basin/catchment level
Implications of water on your key commodities/raw materials
Water regulatory frameworks
Status of ecosystems and habitats

Stakeholders considered
Customers
Employees
Investors
Local communities
NGOs
Regulators
Water utilities at a local level

Comment
Petroleum Support Bases (PSB) are identified as our supply chain and included in the assessment.

Value chain stage
Other stages of the value chain

Coverage
Full

Risk assessment procedure
Water risks are assessed as a standalone issue

Frequency of assessment
Every three years or more

How far into the future are risks considered?
More than 6 years

Type of tools and methods used
International methodologies and standards

Tools and methods used
Life Cycle Assessment

Contextual issues considered
Water availability at a basin/catchment level
Water quality at a basin/catchment level
Stakeholder conflicts concerning water resources at a basin/catchment level
Implications of water on your key commodities/raw materials
Water regulatory frameworks
Status of ecosystems and habitats

Stakeholders considered
Customers
Employees
Investors
Local communities
NGOs
Regulators
Water utilities at a local level

Comment
PTTEP's sole customer is PTT, which is our mother company included in the assessment.

W3.3b

(W3.3b) Describe your organization's process for identifying, assessing, and responding to water-related risks within your direct operations and other stages of your value chain.

	Rationale for approach to risk assessment	Explanation of contextual issues considered	Explanation of stakeholders considered	Decision-making process for risk response
Row 1	PTTEP has conducted water risk assessment to identify and evaluate risks and opportunities relevant PTTEP operations that arise from water-related, and determine opportunities for improvement/mitigation at both facility/asset level and corporate level.	PTTEP has conducted water risk assessment to assess future potential water related risk on operating assets based on four different scenarios as follows: Event A: increase in cost of water Event B: physical water parameters Event C: increased regulatory controls Event D: surrounding catchment/water use To fully address comprehensive water related risk scenarios such as physical risks, regulatory and pricing risk and reputation (i.e. stakeholder conflict) risks, general water information of each country was provided by worldwide accepted water tools. Aqueduct developed by WRI, and the Water Risk Filter developed by WWF incorporate with PTTEP site specific data. Each tool used in the study provides information for different objectives. WRI's Aqueduct provides more in-depth information on water stress (by region) and scenario analysis. In addition, WWF Water Risk Filter provides information related to potential biodiversity impact from water consumption and reputational impact. In 2021 we updated our assessment for physical risk to cover 3 timescales: 2020-2025, medium (2026-2035) and long (2036-2050) term.	PTTEP assess stakeholder concerns on water risk assessment based on surrounding catchment/water use scenarios refer to detail in contextual issues considered.	The outcomes by water risk assessment can assist PTTEP decision makers on water-related risk identification, quantification of the magnitude of impacts to the PTTEP business if the risks occur at high level, water-related risk mitigation and management plan are required. However, the assessment results show that PTTEP absolutely has moderate and low water-related risks for all assessed timeframe and PTTEP assets and support bases. The water related risks have to be assessed regularly or when having significant change to ensure water related risks are monitored and properly mitigated. Thus, the water-related risks are incorporated into the corporate risk monitoring system to monitor and manage at corporate level.

W4. Risks and opportunities

W4.1

(W4.1) Have you identified any inherent water-related risks with the potential to have a substantive financial or strategic impact on your business?
Yes, only within our direct operations

W4.1a

(W4.1a) How does your organization define substantive financial or strategic impact on your business?

PTTEP has developed the risks events to be in line with Dow Jones Sustainability Index (DJSI) and Carbon Disclosure Project (CDP) Water Disclosure and knowledge of key water related risks that can affect PTTEP's operations. Each risk event consolidates a number of possible root cause scenarios that may result in a material impact on PTTEP's operations, our stakeholders and supply chains across the various consequence categories outlined in the PTTEP risk matrix (i.e. asset production/property; people; environmental effect/reputation). The identified risk events, potential root cause scenarios and risk matrix consequence categories are summarized as follow:

Event A: PTTEP operations affected by increase in cost of water

Event B: PTTEP operations affected by physical water parameters

Event C: PTTEP operations affected by increased regulatory controls

Event D: PTTEP operations impact on surrounding catchment/water use

In addition, PTTEP developed risk assessment matrix in which risk events are assessed in terms of the likelihood of occurrence and financial consequences of risk event. Five bands of financial risk exposure are defined based on the impact of the risk event to Net Present Value (NPV). PTTEP classifies NPV that generated by the identified risk being more than 200 MMUSD as serious or substantive impact. The definition of financial substantive impact on our business is applied to both direct operations and supply chain, i.e. water suppliers, wastewater disposal processor, etc. However, the result of risk assessment covered both direct operations and supply chain shows that there is impact only to our supply chain but not to our direct operation, according to the definition of our financial substantive impact. An example of substantive impact that had been assessed is, the financial impact of Event C: operations affected by increased regulatory controls in Myanmar asset in 2030 which was considered as substantive impact (200-2000 MMUSD). The estimate financial impact is calculated based on the number of idle operating days. As the financial impact is appeared in 2030 and the likelihood was considered as "possible" thus risk events was classified as moderate risk according to PTTEP Risk Metrix. In response to this result of long-term exposure, the water related risks have to be assessed regularly or when having significant change. To ensure water related risks are monitored and properly mitigated at corporate level, the risks have been included in the corporate risk monitoring system.

W4.1b

(W4.1b) What is the total number of facilities exposed to water risks with the potential to have a substantive financial or strategic impact on your business, and what proportion of your company-wide facilities does this represent?

	Total number of facilities exposed to water risk	% company-wide facilities this represents	Comment
Row 1	1	1-25	The facility with the potential to have a substantive financial or strategic impact on our business is Myanmar asset. Following the results of water risk assessment, Myanmar asset shows significant risk related to an increase of regulatory control risk poses the highest threat to the operation in 2030.

W4.1c

(W4.1c) By river basin, what is the number and proportion of facilities exposed to water risks that could have a substantive financial or strategic impact on your business, and what is the potential business impact associated with those facilities?

Country/Area & River basin

Myanmar	Irrawaddy

Number of facilities exposed to water risk
1

% company-wide facilities this represents
1-25

Production value for the metals & mining activities associated with these facilities
<Not Applicable>

% company's annual electricity generation that could be affected by these facilities
<Not Applicable>

% company's global oil & gas production volume that could be affected by these facilities
Less than 1%

% company's total global revenue that could be affected
Less than 1%

Comment
-

W4.2

(W4.2) Provide details of identified risks in your direct operations with the potential to have a substantive financial or strategic impact on your business, and your response to those risks.

Country/Area & River basin

Myanmar	Other, please specify (Tanintharyi Coastal Basin)

Type of risk & Primary risk driver

Regulatory	Increased difficulty in obtaining withdrawals/operations permit

Primary potential impact
Reduction or disruption in production capacity

Company-specific description
Myanmar asset operations includes Zawtika Onshore Operation Center (ZOC), Zawtika Metering Station (ZMS), and Thakita Supply Base. This is not included the Zawtika Offshore Production Quarter (ZPQ) which is offshore facility and use seawater for water maker system. The financial impact was identified as the same level over all facilities under Myanmar asset, however, the highest likelihood was from the ZOC where its location is in Tanintharyi Coastal Basin. In case the regulatory becomes stringent (e.g. higher quality of wastewater discharge to the environment), this will significantly increase the site's operating cost (e.g. upgrade the wastewater treatment system). At the same time, the risk on failure to meet the Standard is considered to be higher than previously, which will result in higher insurance premium. Thus, the risk severity in this case is the summation of an increase of operating cost and insurance premium.

Timeframe
More than 6 years

Magnitude of potential impact
Medium

Likelihood
More likely than not

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
483671859

Potential financial impact figure - minimum (currency)
<Not Applicable>

Potential financial impact figure - maximum (currency)
<Not Applicable>

Explanation of financial impact
The financial impact was calculated based on assumption that the number of idle operating days is accounted when community opposition is occurred. For this event, it is assumed that 10 operating days is interrupted for Myanmar asset, leading to loss of daily revenues from the operations. The impact may be occurred within 10 years as the event is classified as medium term timeframe.

Primary response to risk
Comply with local regulatory requirements

Description of response
Keep improving knowledge of regulatory water approach by engaging with regulators/policymakers and being aware of any change in government/public perceptions on water related issues, stringent regulatory on wastewater discharge and water efficiency standard in order to lessen the impact of stringent regulatory control risk.

Cost of response
0

Explanation of cost of response
Cost for engaging with regulators/policymakers considered insignificant since it already included in manpower cost.

W4.2c

(W4.2c) Why does your organization not consider itself exposed to water risks in its value chain (beyond direct operations) with the potential to have a substantive financial or strategic impact?

	Primary reason	Please explain
Row 1	Risks exist, but no substantive impact anticipated	Referring the definition, PTTEP classifies NPV that generated by the identified risk being more than 200 MMUSD as serious or substantive impact. The risk generated from our value chain has been assessed with the financial impact less than the criteria.

W4.3

(W4.3) Have you identified any water-related opportunities with the potential to have a substantive financial or strategic impact on your business?
Yes, we have identified opportunities, and some/all are being realized

W4.3a

(W4.3a) Provide details of opportunities currently being realized that could have a substantive financial or strategic impact on your business.

Type of opportunity
Efficiency

Primary water-related opportunity
Improved field recovery factor

Company-specific description & strategy to realize opportunity
With the limitation on global water sources, PTTEP has applied the generated produced water for improving the oil recovery at our oil fields by water flooding system. Water flooding or water injection is where water is injected into the oil field, to increase pressure and thereby stimulate production. To ensure opportunity realization, the target “zero produced water discharge” in Thailand operations was established and applied in focus areas. This target through injection of produced water back into depleted petroleum reservoirs is being closely monitored and annually disclosed to public.

Estimated timeframe for realization
Current - up to 1 year

Magnitude of potential financial impact
Medium

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
33790000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact
In 2022, crude oil gained from waterflooding at approx. 1,024.36 BBL/D with oil price at $90.36/BBL, thus value gain = 33.79 MMUSD/year.

Type of opportunity
Products and services

Primary water-related opportunity
Increased sales of existing products/services

Company-specific description & strategy to realize opportunity
For oil/gas condensate wells which having liquid loading problem (high produced water generated), PTTEP has successfully developed a single point gas lift (SPGL) application to maximize oil production & recovery at the first time for offshore assets by design the SPGL system to adjust gas injection rate which can control liquid rate production. This application provides the most suitable artificial lift method to continue producing oil from liquid loading oil wells and could minimize water production by shutting-off water zone.

Estimated timeframe for realization
Current - up to 1 year

Magnitude of potential financial impact
Medium

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
12632000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact
The SPGL could prolong the production period of our offshore oil wells at least 2 years with expected reserved gain at 0.36 MMBBL while total CAPEX is of 0.4 MMUSD. Oil price, and OPEX were estimated at $39.2/BB, $3/BBL respectively. Then the financial impact in term of profit gain = (0.36 x (39.2-3)) - 0.4 = 12.63 MMUSD.

W5. Facility-level water accounting

W5.1

(W5.1) For each facility referenced in W4.1c, provide coordinates, water accounting data, and a comparison with the previous reporting year.

Facility reference number
Facility 1

Facility name (optional)
Myanmar Asset

Country/Area & River basin

Myanmar	Other, please specify (Tanintharyi Coastal Basin)

Latitude
14.602489

Longitude
97.976571

Located in area with water stress
No

Primary power generation source for your electricity generation at this facility
<Not Applicable>

Oil & gas sector business division
Upstream

Total water withdrawals at this facility (megaliters/year)
27.05

Comparison of total withdrawals with previous reporting year
Lower

Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes
26.3

Withdrawals from brackish surface water/seawater
0

Withdrawals from groundwater - renewable
0.75

Withdrawals from groundwater - non-renewable
0

Withdrawals from produced/entrained water
0

Withdrawals from third party sources
0

Total water discharges at this facility (megaliters/year)
21.64

Comparison of total discharges with previous reporting year
Lower

Discharges to fresh surface water
21.64

Discharges to brackish surface water/seawater
0

Discharges to groundwater
0

Discharges to third party destinations
0

Total water consumption at this facility (megaliters/year)
5.41

Comparison of total consumption with previous reporting year
Lower

Please explain
Myanmar asset operations includes Zawtika Onshore Operation Center (ZOC), Zawtika Metering Station (ZMS), and Thakita Supply Base. This is not included the Zawtika Offshore Production Quarter (ZPQ) which is offshore facility and use seawater for water maker system. The financial impact was identified as the same level over all facilities under Myanmar asset, however, the highest likelihood was from the ZOC where its location is in Tanintharyi Coastal Basin.

Water withdrawal includes both supplied water for domestic use and firefighting system at the facility itself. Therefore, discharged volume at the facility are estimated from water used at the facility (at approx. 80% of water used) only.

In the oil & gas sector, the reporting of water withdrawals volumes typically does include produced water. To enable comparability, CDP requires all companies to include produced water volumes in their withdrawal's disclosure, in order to have an accurate water balance. However, produced water from PTTEP operations was not considered as freshwater (TDS> 1,000 mg/l) according to GRI 303-3, Water withdrawal (Water and effluent 2018) that defines fresh water as water with TDS≤1,000 mg/l.

W5.1a

(W5.1a) For the facilities referenced in W5.1, what proportion of water accounting data has been third party verified?

Water withdrawals – total volumes

% verified
76-100

Verification standard used
The assurance engagement is conducted in accordance with the International Standard on Assurance Engagements ISAE 3000 Assurance Engagements other than Audits or Reviews of Historical Financial Information and the Accountability Assurance Standard of Sustainability AA1000AS (2008). Water accounting data was prepared and calculated in accordance with the GRI Sustainability Reporting Standards (GRI Standards).

Please explain
<Not Applicable>

Water withdrawals – volume by source

% verified
76-100

Verification standard used
The assurance engagement is conducted in accordance with the International Standard on Assurance Engagements ISAE 3000 Assurance Engagements other than Audits or Reviews of Historical Financial Information and the Accountability Assurance Standard of Sustainability AA1000AS (2008). Water accounting data was prepared and calculated in accordance with the GRI Sustainability Reporting Standards (GRI Standards).

Please explain
<Not Applicable>

Water withdrawals – quality by standard water quality parameters

% verified
Not verified

Verification standard used
<Not Applicable>

Please explain

Water discharges – total volumes

% verified
76-100

Verification standard used
The assurance engagement is conducted in accordance with the International Standard on Assurance Engagements ISAE 3000 Assurance Engagements other than Audits or Reviews of Historical Financial Information and the Accountability Assurance Standard of Sustainability AA1000AS (2008). Water accounting data was prepared and calculated in accordance with the GRI Sustainability Reporting Standards (GRI Standards).

Please explain
<Not Applicable>

Water discharges – volume by destination

% verified
76-100

Verification standard used
The assurance engagement is conducted in accordance with the International Standard on Assurance Engagements ISAE 3000 Assurance Engagements other than Audits or Reviews of Historical Financial Information and the Accountability Assurance Standard of Sustainability AA1000AS (2008). Water accounting data was prepared and calculated in accordance with the GRI Sustainability Reporting Standards (GRI Standards).

Please explain
<Not Applicable>

Water discharges – volume by final treatment level

% verified
76-100

Verification standard used
The assurance engagement is conducted in accordance with the International Standard on Assurance Engagements ISAE 3000 Assurance Engagements other than Audits or Reviews of Historical Financial Information and the Accountability Assurance Standard of Sustainability AA1000AS (2008). Water accounting data was prepared and calculated in accordance with the GRI Sustainability Reporting Standards (GRI Standards).

Please explain
<Not Applicable>

Water discharges – quality by standard water quality parameters

% verified
Not verified

Verification standard used
<Not Applicable>

Please explain

Water consumption – total volume

% verified
76-100

Verification standard used
The assurance engagement is conducted in accordance with the International Standard on Assurance Engagements ISAE 3000 Assurance Engagements other than Audits or Reviews of Historical Financial Information and the Accountability Assurance Standard of Sustainability AA1000AS (2008). Water accounting data was prepared and calculated in accordance with the GRI Sustainability Reporting Standards (GRI Standards).

Please explain
<Not Applicable>

W6. Governance

W6.1

(W6.1) Does your organization have a water policy?
Yes, we have a documented water policy that is publicly available

W6.1a

(W6.1a) Select the options that best describe the scope and content of your water policy.

	Scope	Content	Please explain
Row 1	Company-wide	Description of business dependency on water Description of business impact on water Commitment to prevent, minimize, and control pollution Commitment to reduce water withdrawal and/or consumption volumes in direct operations Commitment to safely managed Water, Sanitation and Hygiene (WASH) in the workplace Commitments beyond regulatory compliance Reference to company water-related targets	PTTEP had established Sustainable Development (SD) Policy in which a commitment on water resources management to minimize impact to stakeholders is included in Responsible operation principle. The SD Policy is published in SD booklet which is publicly available in PTTEP website. Moreover, international standard of water initiatives, i.e. water risk assessment, company water target & goal, and water reduction initiatives are disclosed in PTTEP website. In addition, water related performance & water stewardship and water related standard for procurement is also published in SD report. PTTEP had also developed Environmental Management Standard which is applied for every assets under PTTEP operational control. Requirement regarding produced and process water discharge control is identified in the Standard. PTTEP had also developed Environmental Performance Reporting Procedure (EPS) which is involved in every assets under our operational control. Water withdrawal and discharge are one of the environmental indicators specified in EPS to be monthly reported. Furthermore, PTTEP had issued Water Management Guideline since 2013 and had revised in 2018 in which recommended best practices and methodology are included. Regarding water reduction target, it is set for the asset or facility located in water stress area based on water risk assessment results. In addition, PTTEP has issued PTTEP Human Rights policy which identified Respect the right of individual and human being. PTTEP follows the United Nations Universal Declaration of Human Rights which includes individual rights to an adequate standard of living for health and well-being, i.e. hygiene and sanitation, etc. ...(see more details in attached file) attachement for CDP Water_W6.1a_2022.docx

W6.2

(W6.2) Is there board level oversight of water-related issues within your organization?
Yes

W6.2a

(W6.2a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for water-related issues.

Position of individual or committee	Responsibilities for water-related issues
Director on board	CEO is a member of PTTEP's Board of Directors who direct company vision, mission, objective and strategy of business development including sustainability. As a representative of Board of Directors, CEO cascades company direction via top managements through relevant working committees which chaired by CEO. PTTEP has a SSHE Council that is responsible for directing PTTEP's safety, security, health, and environmental issues and management. The SSHE Council committees consist of top management at Executive Vice Presidents (EVPs), operating related Senior Vice Presidents (SVPs) and Chief Executive Officer (CEO) who acts as Chairman. Water reduction target setting and plan shall be approved by SSHE Council. In addition, Vice Presidents and managers have regularly discussed and collaborated with concerning assets depended on the issues occurred.

W6.2b

(W6.2b) Provide further details on the board's oversight of water-related issues.

	Frequency that water-related issues are a scheduled agenda item	Governance mechanisms into which water-related issues are integrated	Please explain
Row 1	Scheduled - some meetings	Monitoring implementation and performance Overseeing acquisitions, mergers, and divestitures Overseeing major capital expenditures Providing employee incentives Reviewing and guiding annual budgets Reviewing and guiding business plans Reviewing and guiding corporate responsibility strategy Reviewing and guiding major plans of action Reviewing and guiding strategy Reviewing innovation/R&D priorities Setting performance objectives	All water related strategy and relevant policy is oriented by our Board of Director and/or Management Committee who responsibilities will be at least annually reviewed via company performance review and monitoring. However, the related agenda will be additionally reserved once the water related issues, e.g. water strategy and related business plan, acquisition and divestiture, etc. are raised. CEO and top management are responsible for briefing the BoD on that matter. For example, external parties require disclosure of PTTEP's supplementary data and information regarding water related issues, e.g. company performance and target, etc. apart from published report, this issue will be brought to the BoD and/or Management Committee meeting for review and consideration.

W6.2d

(W6.2d) Does your organization have at least one board member with competence on water-related issues?

	Board member(s) have competence on water-related issues	Criteria used to assess competence of board member(s) on water-related issues	Primary reason for no board-level competence on water-related issues	Explain why your organization does not have at least one board member with competence on water-related issues and any plans to address board-level competence in the future
Row 1	Yes	Experienced in oversight and govern on the water-related risks & opportunities, policy, strategy and management in both organization level and country level. One of our SD strategy and framework is "Ocean for Life" and we also focus on the Ocean Health or Ocean Science improvement in the areas of Thailand offshore where we have operated. However, the onshore operations location that we are operated has no significant issue on water scarcity and water cost in Thailand is quite low compare with GDP. The water-related risk has considered low to medium level. Therefore, it has been reflected in our direction by setting target to have no operation in areas at risk from water scarcity and ensure that there is no impact on the community and water users.	<Not Applicable>	<Not Applicable>

W6.3

(W6.3) Provide the highest management-level position(s) or committee(s) with responsibility for water-related issues (do not include the names of individuals).

Name of the position(s) and/or committee(s)
Chief Executive Officer (CEO)

Water-related responsibilities of this position
Assessing water-related risks and opportunities
Managing water-related risks and opportunities

Frequency of reporting to the board on water-related issues
Quarterly

Please explain
CEO is as a member of PTTEP's Board of Directors who direct company vision, mission, objective and strategy of business development including sustainability. As a representative of Board of Directors, CEO cascades company direction via top managements through relevant working committees which chaired by CEO. The committee who is responsible for water management is SSHE Council in which the meeting is held on quarterly basis. The company water related issues, e.g. company water target, etc. that need decision making and endorsement from CEO and top managements will be brought to the Council. The key issues will be summarized and reported by CEO to the Board of Director in annual company's performance review session.

W6.4

(W6.4) Do you provide incentives to C-suite employees or board members for the management of water-related issues?

	Provide incentives for management of water-related issues	Comment
Row 1	Yes	-

W6.4a

(W6.4a) What incentives are provided to C-suite employees or board members for the management of water-related issues (do not include the names of individuals)?

	Role(s) entitled to incentive	Performance indicator	Contribution of incentives to the achievement of your organization's water commitments	Please explain
Monetary reward	Corporate executive team	Other, please specify (Reduction of chemicals & hydrocarbon spill to the environment)	In 2022, KPI was established to include spill intensity reduction as a SSHE KPI which is then cascaded to functional group to the department and then to individual KPI for relevant employees that incentivized through the allocation of their performance bonuses. Corporate executive team and employers bonuses and salary linked to Spill KPI. 2% salary bonus is given to the Corporate executive management if these targets are achieved by 2022. There are also short-term, quarterly cash rewards evaluated on the progression towards these targets.	PTTEP realizes that release of chemical & hydrocarbon to the environment is a key issue for oil and gas companies, which can have direct financial and environmental impact as well as reputation consequences. It is also a key issue heavily monitored by the public. Therefore, spill intensity reduction has been set as SSHE KPI since 2014.
Non-monetary reward	Director on board Corporate executive team Chief Executive Officer (CEO)	Supply chain engagement	PTTEP received the Green Procurement Certificate 2019 from Thailand Environment Institute (TEI). PTTEP target set at 30% spend of office supplies to be green products and services by 2022. As of 2022, we achieved at 30%, one year ahead of the target.	Since 2017, PTTEP has developed and implemented the Green Procurement Criteria Manual covered the goods and services that still not being included in Thai Green Label Products list and PTTEP has significant proportion of spent on that goods or services. PTTEP's green procurement toolkit is developed with the objective to elaborate of roles and responsibilities as a responsible and prudent operator by considering beyond private cost-benefit and approach to maximize net benefit of the wider environment. This is to promote procurement of environmental friendly goods and services, seek the opportunity to reduce environmental impact throughout their life cycle by integrating environmental performance considerations in PTTEP's procurement process. The impact from Green Procurement is in term of reduction of e.g. resource use (raw material, energy and water), emissions or pollutants, waste, etc. in our supply chain.

W6.5

(W6.5) Do you engage in activities that could either directly or indirectly influence public policy on water through any of the following?
Yes, direct engagement with policy makers
Yes, other

W6.5a

(W6.5a) What processes do you have in place to ensure that all of your direct and indirect activities seeking to influence policy are consistent with your water policy/water commitments?

PTTEP has community engagement projects which have been conducted on a monthly basis. Participants consist of community leaders, government agencies, and PTTEP representatives. Environmental-related issues as well as water management have been brought into discussion. It includes engagement at local operations which is guided by the Issue and Stakeholder Management Guideline. In addition, our Environmental Impact Assessment process establishes meetings with government agencies and water-related experts in e.g. hydrology, aquatic ecology and water pollution, to clarify and discuss on environmental concerns including water related issues. The mitigation measures and monitoring programs are the outcome to be implemented and complied with over the entire project development.

This also includes the integrated watershed management initiatives in locations with key operations since 2016 i.e. PTTEP1 and S1 projects which located in the water stress area. The project aims at improvement of both quality and quantity of the surface water sourced for water supply in the municipalities to prevent water shortage in dry season. In 2022, we continue supporting the projects for Water Resource Conservation, Water Bank project in cooperation with Agricultural Land Reform Office, Forest Fire Prevention & Protection project to reserve the watershed area, and Mini Farm project to promote the agricultural farming with lower water consumption.

W6.6

(W6.6) Did your organization include information about its response to water-related risks in its most recent mainstream financial report?

Yes (you may attach the report - this is optional)
2022PTTEPOneReport_EN_270323_page 103.pdf

See detail on item 3.3 in pdf page 103 of 56-1 one report/Annual Report 2022 and our website: https://www.pttep.com/en/Sustainability/Environmental-Stewardship/Water-Resources-Management.aspx for topic "Water Risk Management".

W7. Business strategy

W7.1

(W7.1) Are water-related issues integrated into any aspects of your long-term strategic business plan, and if so how?

	Are water-related issues integrated?	Long-term time horizon (years)	Please explain
Long-term business objectives	Yes, water-related issues are integrated	5-10	Aiming at alignment with SDG, PTTEP set environmental management strategic roadmap which water management is also incorporated into the roadmap. Thus, the business strategy has been changed to be more focused on doing business responsibly by mitigating environmental impacts, reducing our water used in operations, aspiring to become a low environmental footprint organization, as well as continuous monitoring risks arising from global water shortage. The maximum time horizon is considered at 2030.
Strategy for achieving long-term objectives	Yes, water-related issues are integrated	5-10	In accordance with our environmental management strategic roadmap, water management guideline has been developed to provides basic guidance on water related risk assessment and development of its mitigation; water and wastewater performance reporting; water and wastewater target setting; and also water and wastewater management good practices. Moreover, the water related risks have been monitored annually via the company-wide risk assessment system which have been assessed every 5 years or when having significant change to ensure water related risks are monitored and properly mitigated. The maximum time horizon is considered at 2030.
Financial planning	Yes, water-related issues are integrated	5-10	PTTEP prepares readiness to global water shortage as a result of increasing population and impact from climate change, therefore, water related risks of the company were re-assessed in 2017, 2018 and 2020 . The assessment considers in the events of: - A: PTTEP operations affected by increase in cost of water - B: PTTEP operations affected by physical water parameters - C: PTTEP operations affected by increased regulatory controls - D: PTTEP operations impact on surrounding catchment/water use The risks from the events considered above may impact to our operations and could be influent to our financial planning. However, the assessment results show that PTTEP entirely has moderate to low water related risks for all assessed timeframe and PTTEP assets. It is required that we should have alternative planning in case that existing facilities are not able to perform its normal operation. Moreover, the water related risks have been monitored annually via the company-wide risk assessment system and have to be assessed every 5 years or when having significant change to ensure water related risks are monitored and properly mitigated. The maximum time horizon is considered at 2030.

W7.2

(W7.2) What is the trend in your organization's water-related capital expenditure (CAPEX) and operating expenditure (OPEX) for the reporting year, and the anticipated trend for the next reporting year?

Row 1

Water-related CAPEX (+/- % change)
-9.24

Anticipated forward trend for CAPEX (+/- % change)
88.45

Water-related OPEX (+/- % change)
18.48

Anticipated forward trend for OPEX (+/- % change)
60.56

Please explain
In 2022, PTTEP extracted water-related expenditures from our system for reporting the Environmental Performance (EPS) which each asset reported its expenditure relating to environment separated in CAPEX/OPEX categories. Increasing of the OPEX is as a result of our performing environmental monitoring, improvement and development in the environmental cost allocation criteria. It is expected that the expenditure both CAPEX and OPEX in next year reporting will be increased from oil price and business activity .

W7.3

(W7.3) Does your organization use scenario analysis to inform its business strategy?

	Use of scenario analysis	Comment
Row 1	Yes	From PTTEP assessment results, PTTEP entirely has moderate and low water related risks for all assessed timeframe and PTTEP assets. However, the water related risks have been monitored annually via the company-wide risk assessment system and have to be assessed every 5 years or when having significant change to ensure water related risks are monitored and properly mitigated. Thus, our strategy is to have no operation in areas at risk from water scarcity and ensure that there is no impact on the community and water users. Moreover, we initiated the "Ocean for Life" strategy to conserve and rehabilitate marine resources and marine ecosystems to increase biodiversity for the balance and abundance of Thai seas as well as the income and quality of life. PTTEP also places an emphasis on re-injecting 100% of produced water into oil and gas reservoirs. We have honored international standards, complied with applicable laws, and in some countries exceeded minimum legal requirements.

W7.3a

(W7.3a) Provide details of the scenario analysis, what water-related outcomes were identified, and how they have influenced your organization's business strategy.

	Type of scenario analysis used	Parameters, assumptions, analytical choices	Description of possible water-related outcomes	Influence on business strategy
Row 1	Water-related Climate-related	Climate-related scenarios and models applied by RCP 2.6, RCP 4.5, RCP 8.5 and IEA Sustainable Development Scenario. Water-related considered in the 4 events (as presented in W4.1a)	The climate-related scenario analysis demonstrated that the current climate projection data does not present a significant number of risks to PTTEP's assets. There were no risks identified with the majority of risks in 2030 and 2050 the business. This is largely due to the existing design tolerances built into the PTTEP design basis that can accommodate most of the projected changes in key climate variables. However, the study also identified a number of risk aspects that could not be adequately assessed due to the current uncertainties in key climate variables. Most of the extreme event climate variables, including changes in cyclone intensity, swell, wind speed and extreme precipitation and temperature events are currently uncertain with further research being undertaken across the scientific community. The lack of data pertaining to these variables is significant for PTTEP as many of the currently uncertain climate variables present the highest potential impacts for PTTEP. The water-related assessment outcomes as presented in W4.1a	In accordance with the climate-related scenario analysis result were no risks identified with the majority of risks in 2030 and 2050 the business. PTTEP still need to continue monitoring of the projections and re-evaluation of the risk profile and management actions once detailed projections become available regarding these key climate variables. PTTEP also need to monitor changes in identified regulatory and market risk aspects. PTTEP, like many oil and gas companies, could be significantly impacted by changes in government policy and market developments over the next 10 years and beyond as the global community responds to climate change. This aspect of climate adaptation planning requires ongoing review and multiple response strategies due to the unpredictability of both regulatory and market responses. The water-related assessment results show that PTTEP entirely has moderate and low water related risks for all assessed in 2017, 2018 and 2020, and PTTEP assets. However, the water related risks have been monitored annually via the company-wide risk assessment system and have to be assessed every 5 years or when having significant change to ensure water related risks are monitored and properly mitigated.

W7.4

(W7.4) Does your company use an internal price on water?

Row 1

Does your company use an internal price on water?

No, but we are currently exploring water valuation practices

Please explain

As the location that we are operated has no significant issue on water scarcity and water cost in Thailand is quite low compare with GDP.

W7.5

(W7.5) Do you classify any of your current products and/or services as low water impact?

	Products and/or services classified as low water impact	Definition used to classify low water impact	Primary reason for not classifying any of your current products and/or services as low water impact	Please explain
Row 1	Yes	In management of water resource, PTTEP commits to avoid operating in areas at risk from water scarcity and ensure that there is no impact on the community and water users. The classification of PTTEP operating as low water impact considered by the operations in assets with “non-water stress area” and/or low water risk. We can also calculate the % production portion from the assets that operating in “non-water stress area” and/or low water risk to show PTTEP performance.	<Not Applicable>	As of 2022, 92% of total production is from the assets that operating in “non-water stress area” and/or low water risk.

W8. Targets

W8.1

(W8.1) Do you have any water-related targets?

Yes

W8.1a

(W8.1a) Indicate whether you have targets relating to water pollution, water withdrawals, WASH, or other water-related categories.

	Target set in this category	Please explain
Water pollution	Yes	<Not Applicable>
Water withdrawals	No, but we plan to within the next two years	The freshwater consumption accounts only 1.02 % of total water withdrawal for PTTEP operations, since seawater is generally classified as a renewable resource, is major water source, equivalent to 99% of total water withdrawals. In addition, we are planning to study water use and water returns of domestic operating and and our supply chain, e.g. Songkhla petroleum support base who is responsible for providing water supply to some offshore operations, etc. To seek opportunities to optimize water efficiency both water withdrawals and water discharge and set target for improvement within 2024.
Water, Sanitation, and Hygiene (WASH) services	No, but we plan to within the next two years	To provide an overview of the public health interface and promotion of good health strategy and requirements, PTTEP developed the Occupational Health Management Standard as a document for water, sanitation, and hygiene (WASH) services in accordance with the PTTEP SSHE Management System (SSHE-MS). We conducted hygiene monitoring plan for PTTEP worksites and plan to set target within next two years.
Other	Please select	<Not Applicable>

W8.1b

(W8.1b) Provide details of your water-related targets and the progress made.

Target reference number
Target 1

Category of target
Water pollution

Target coverage
Company-wide (direct operations only)

Quantitative metric
Other, please specify (Zero produced water discharge)

Year target was set
2009

Base year
2009

Base year figure
99.98

Target year
2030

Target year figure
100

Reporting year figure
100

% of target achieved relative to base year

Target status in reporting year
Achieved

Please explain
The volume of produced water generated and discharged is daily monitored and reported monthly via our web-based performance reporting system. Currently in 2022, 99.95% produced water from Thailand assets was re-injected into underground reservoir, whereas 0.05% were treated by evaporation method according to regulation requirements. For the international assets e.g. Myanmar and Malaysia where the national regulation allows to discharge produced water overboard, they are under conducting the feasibility study to comply with this target at zero produced water discharge.

W9. Verification

W9.1

(W9.1) Do you verify any other water information reported in your CDP disclosure (not already covered by W5.1a)?
No, but we are actively considering verifying within the next two years

W10. Plastics

W10.1

(W10.1) Have you mapped where in your value chain plastics are used and/or produced?

	Plastics mapping	Value chain stage	Please explain
Row 1	Yes	Direct operations	To provide an overview of all used plastics management, PTTEP developed the Waste Management Procedure as a document for the minimum compulsory requirements regarding waste management, which includes waste management planning, classification, segregation, packing, labeling, storage, transportation, treatment, disposal, and reporting for track what treatment and/or disposal methods are appropriate for each type of waste (including plastic used) in accordance with regulation and PTTEP-wide targets on Zero waste to landfill. The waste management plans for PTTEP operating assets apply “5R’s” Hierarchy which comprises Remove, Reduce, Reuse, Recycle, and Recover. It also aims to prevent and minimize used plastics generation.

W10.2

(W10.2) Across your value chain, have you assessed the potential environmental and human health impacts of your use and/or production of plastics?

	Impact assessment	Value chain stage	Please explain
Row 1	Yes	Direct operations	To prevent environmental impact and human health impacts from PTTEP used plastic, we have selection waste management contractor who will provide services of waste transportation, waste collection, waste treatment and waste disposal in accordance with regulations and waste management plan. In addition, PTTEP Environment Management Department shall perform a periodical audit for waste management contractors in order to ensure their implementation meets the requirements of the waste management contract, regulatory and PTTEP.

W10.3

(W10.3) Across your value chain, are you exposed to plastics-related risks with the potential to have a substantive financial or strategic impact on your business? If so, provide details.

	Risk exposure	Value chain stage	Type of risk	Please explain
Row 1	Not assessed – but we plan to within the next two years	<Not Applicable>	<Not Applicable>	PTTEP has inventory report of used plastic to keep monitor and environment performance every month.

W10.4

(W10.4) Do you have plastics-related targets, and if so what type?

	Targets in place	Target type	Target metric	Please explain
Row 1	No – and we do not plan to within the next two years	<Not Applicable>	<Not Applicable>	PTTEP has inventory report of used plastic to keep monitor and environment performance every month.

W10.5

(W10.5) Indicate whether your organization engages in the following activities.

	Activity applies	Comment
Production of plastic polymers	No	
Production of durable plastic components	No	
Production / commercialization of durable plastic goods (including mixed materials)	No	
Production / commercialization of plastic packaging	No	
Production of goods packaged in plastics	No	The waste management plans for PTTEP operating assets apply “5R’s” Hierarchy which comprises Remove, Reduce, Reuse, Recycle, and Recover. It also aims to prevent and minimize used plastics generation.
Provision / commercialization of services or goods that use plastic packaging (e.g., retail and food services)	No	The waste management plans for PTTEP operating assets apply “5R’s” Hierarchy which comprises Remove, Reduce, Reuse, Recycle, and Recover. It also aims to prevent and minimize used plastics generation.

W11. Sign off

W-FI

(W-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

W11.1

(W11.1) Provide details for the person that has signed off (approved) your CDP water response.

	Job title	Corresponding job category
Row 1	Chief Executive Officer	Chief Executive Officer (CEO)

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

	I understand that my response will be shared with all requesting stakeholders	Response permission
Please select your submission options	Yes	Public

Please indicate your consent for CDP to share contact details with the Pacific Institute to support content for its Water Action Hub website.

Yes, CDP may share our Main User contact details with the Pacific Institute

Please confirm below

I have read and accept the applicable Terms