

Environmental Impact Assessment Report
for Exploration Drilling & Production Phases
G1/61 Area

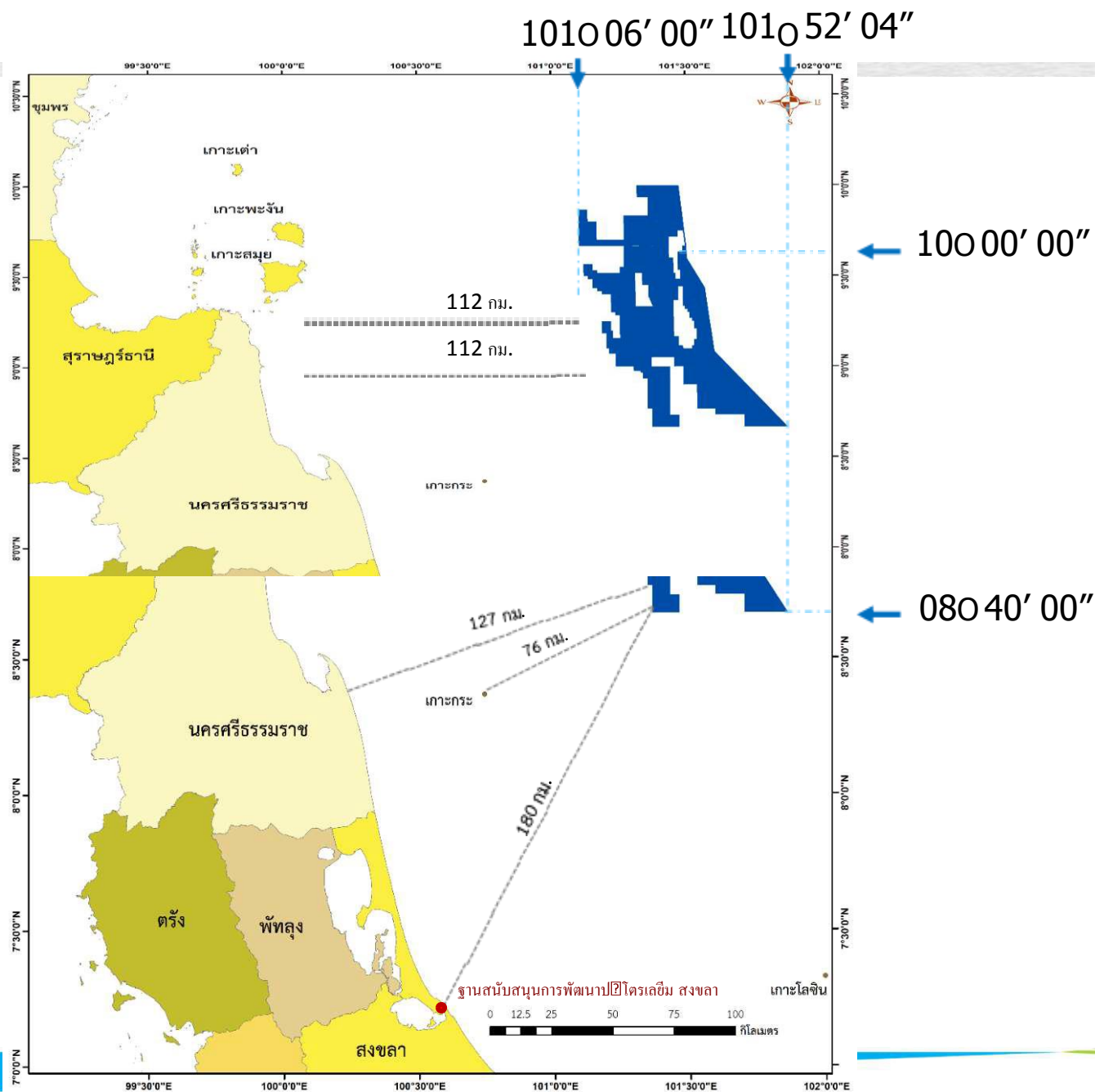


PTTEP

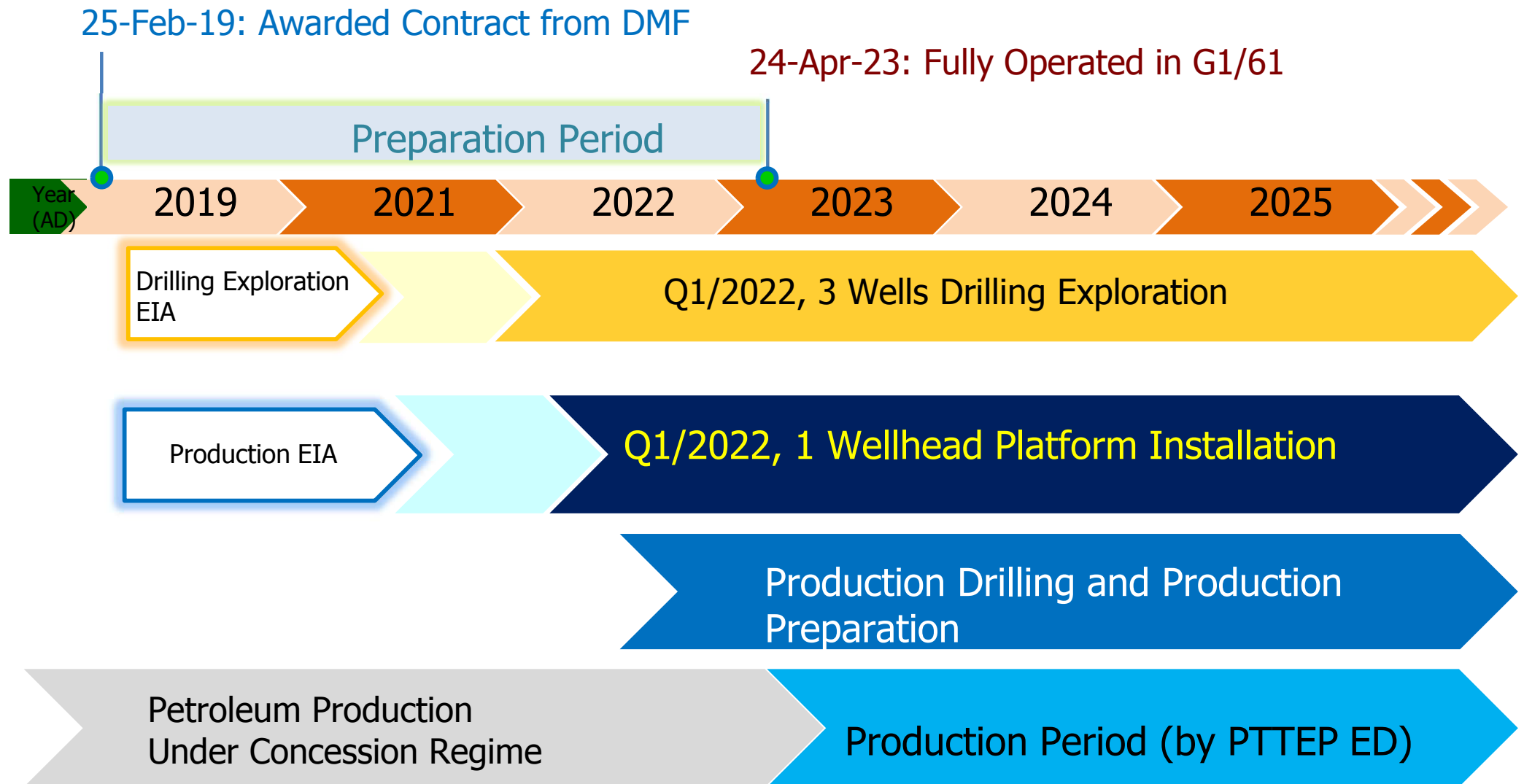
Project Information



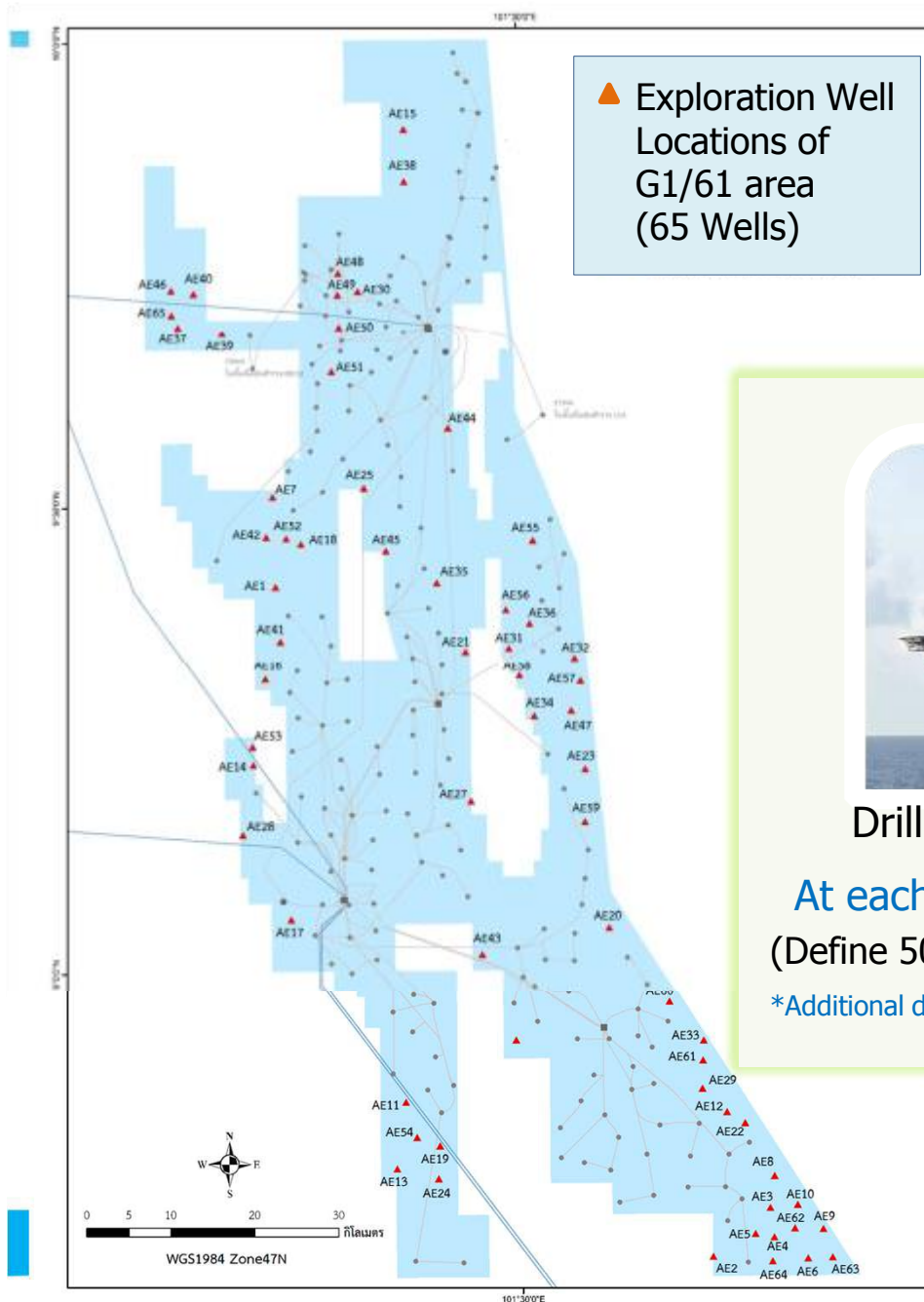
G1/61 Location



G1/61 Area Execution Plan



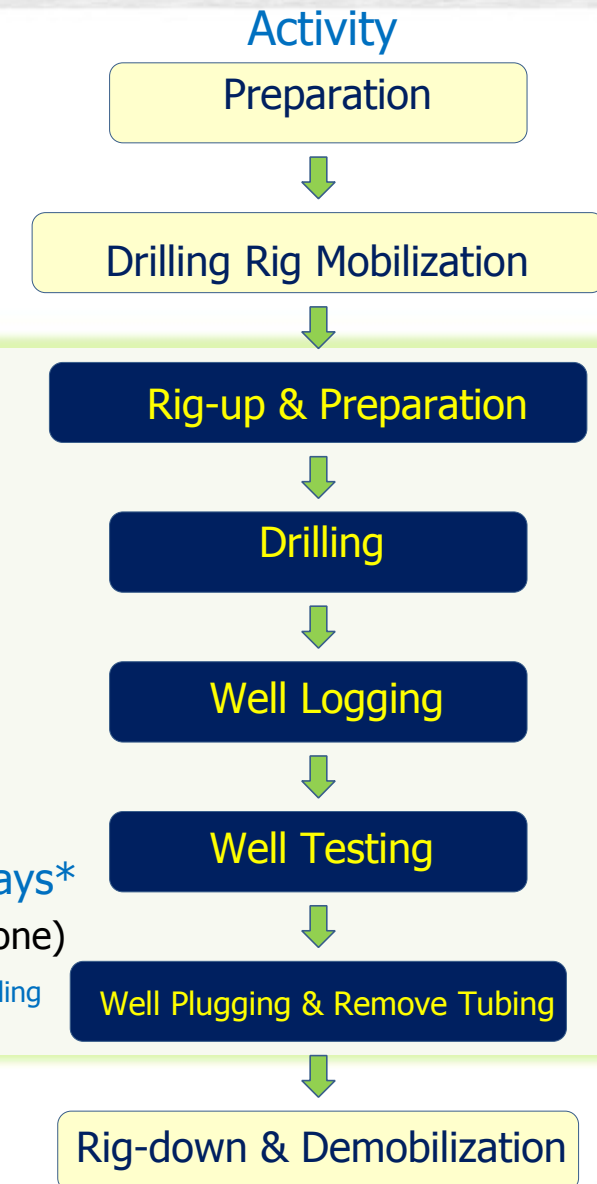
Drilling Exploration Activity in G1/61



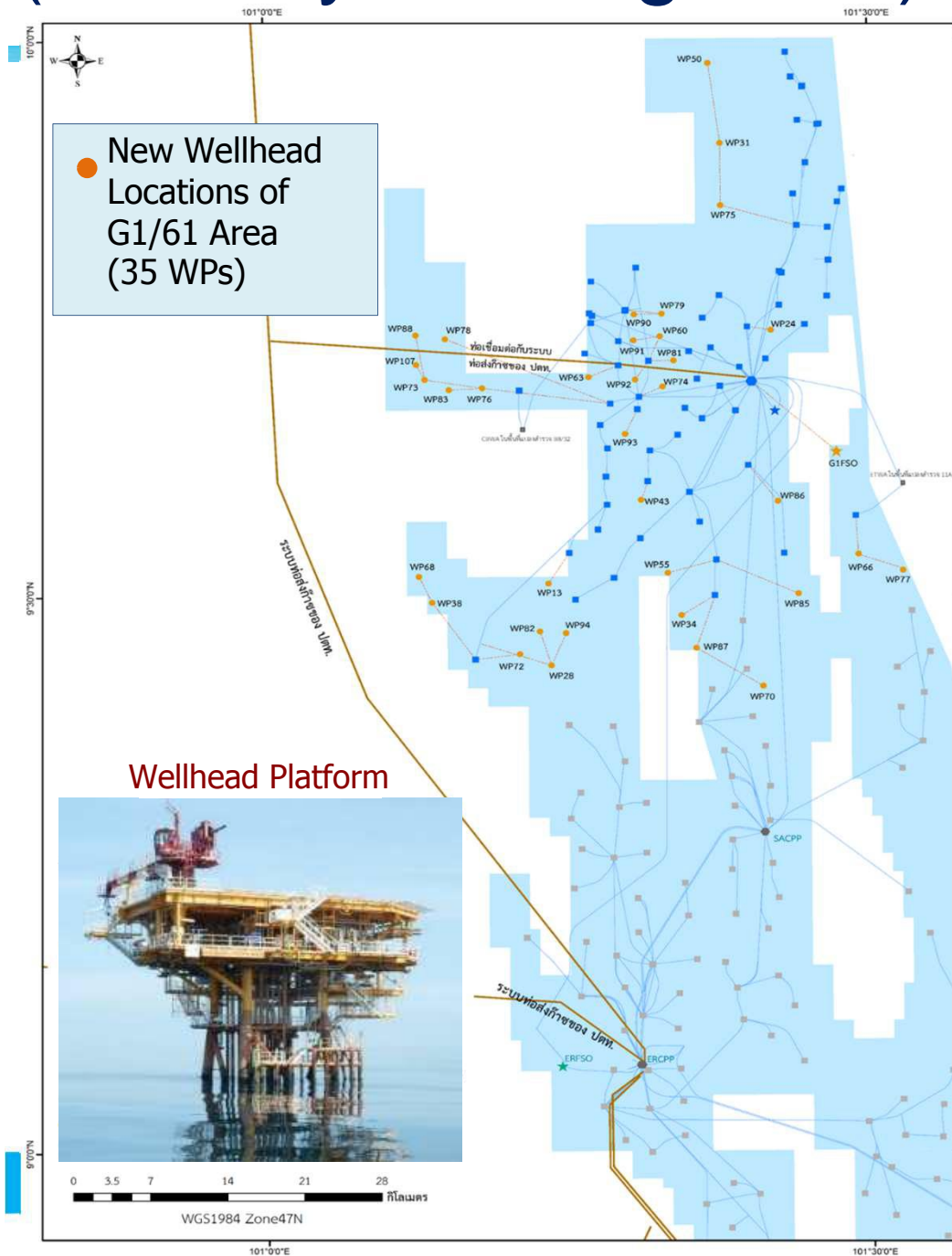
Drilling Rig Operation

At each location will be 22 days*
(Define 500 m. radius for safety zone)

*Additional day required for 4 or 5 strings drilling



Production Activity in G1/61 (formerly Platong Field)



Platform Installation Phase

- 1 Wellhead Installation in 2021
- 1-7 Wellhead Platforms Installation Annually

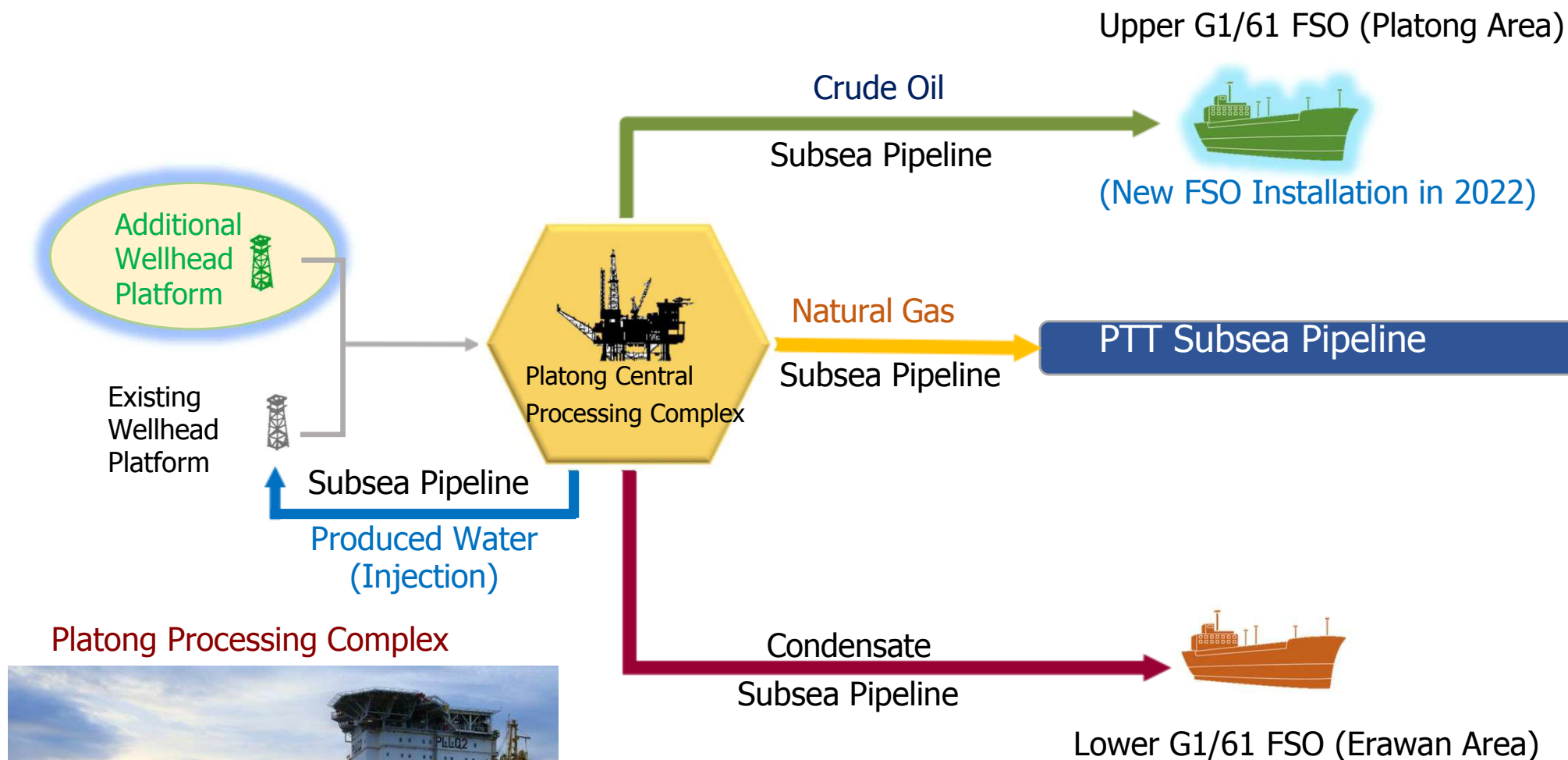
Production Drilling and Preparation Phase

- Drilling Rig Mobilization to Wellhead Platform
- Production Drilling and Well Logging
- (9 Days/well for 3 strings)
- Well Testing and Well Preparation (7 Days/well)
- 24 Wells/Wellhead Platform

Petroleum Production Phase

- Petroleum Production on 24-Apr-23 throughout Project period
- Production from Existing and Additional Platforms
- Petroleum Transportation via subsea Pipeline and separation at Platong Processing platform

Petroleum production facility in Upper G1/61 Area (formerly Platong Field)

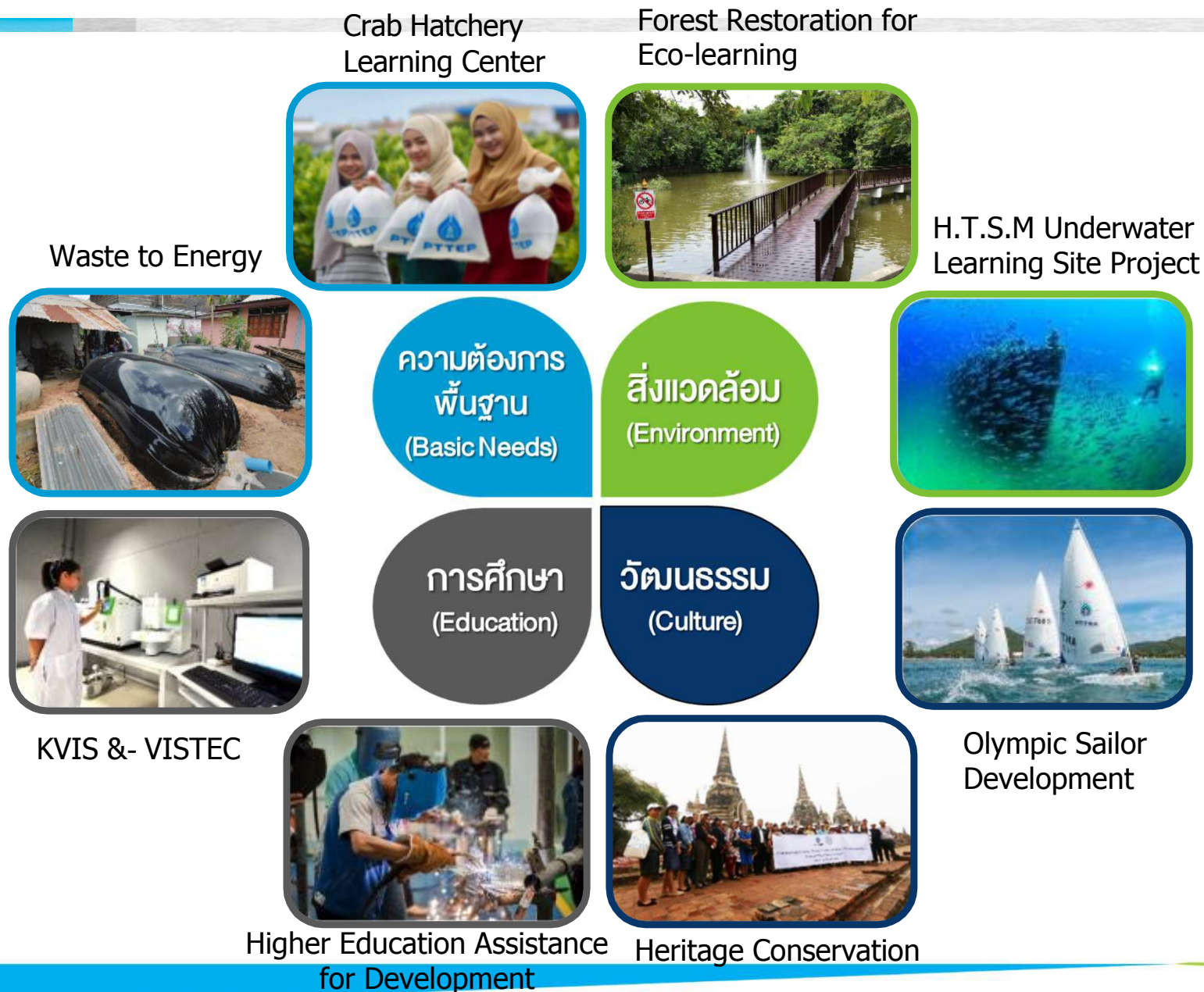


Onshore Operation Support Base

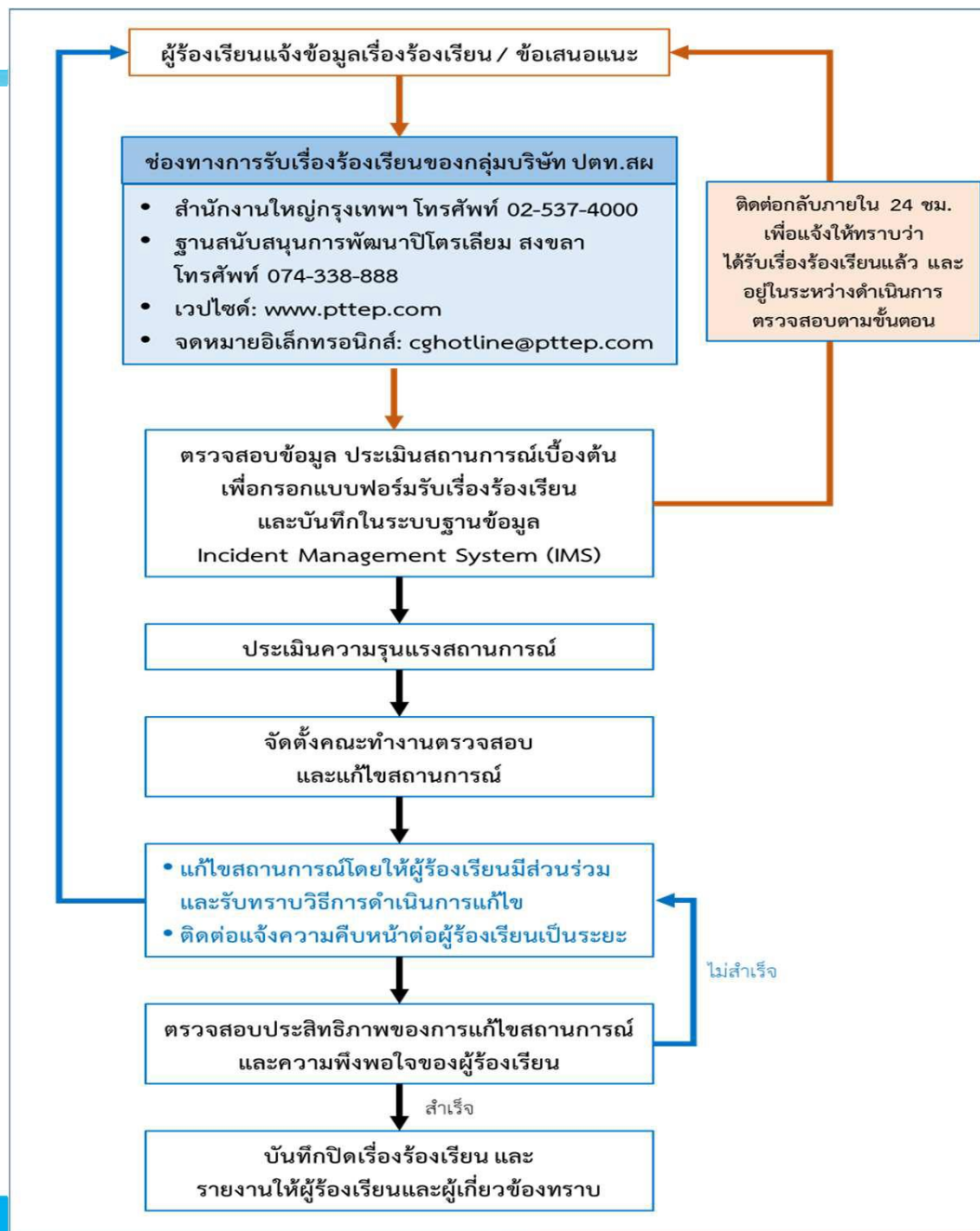
Onshore Support Base is located at Songkhla Province



4 Dimensions of CSR Program



Whistleblowing Channel of Project



Whistleblowing Channel of PTTEP

Headquarters

555/1 Energy Complex Building A, 6th Floor & 19th - 36th Floor, Vibhavadi-Rangsit Road, Chatuchak, Bangkok 10900 Thailand
Phone : 66 (0) 2537-4000

Petroleum Support Base

222 Moo 1, Tambol Huakao, Amphur Singhanakorn Songkhla, 90280 Thailand
Telephone: 66 (0) 74338-887-9

Whistleblowing system via website
www.pttep.com

Email: cghotline@pttep.com

Existing Environmental Baseline Study



Existing Environmental Baseline Study

Physical Resource

- Meteorological Data
- Geology
- Oceanology
- Seawater Quality
- Seabed Sediment Characteristic

Biological Resource

- Phytoplankton
- Zooplankton
- Benthos
- Fish Larva
- Endanger Species
- Sensitive Ecological Area or Reserved Area

- Fishery
- Transportation
- Subsea Pipeline and Cable
- Offshore Installation

Human Use Value

- Socio-Economic
- Public Participation
- Public Health
- Cultural or Archeological Area

Quality of Life



Environmental Baseline Analysis Result

G1/61 Aug-Sep 2019

| Seawater | | Seabed Sediment | |
|--|--|---|---|
| <ul style="list-style-type: none"> Full Comply with seawater quality class 1 (Seawater quality for Natural Resources Conservation) Similar with Reference station | | <ul style="list-style-type: none"> Heavy metals result conform with shoreline sediment standard Petroleum Hydrocarbon and BTEXs is non-detectable Similar with Reference Station | |
| Phytoplankton | Zooplankton | Fish Larva | Benthos |
| Highest Abundance: Blue-green Algae <i>Oscillatoria thiebautii</i> | Highest Abundance: Protozoa (Acanthometra sp.) | Highest Species Richness: Family Clupeidae e.g. Sardine fish | Highly Species Richness and Abundance is Foraminifera and Earth Worm respectively |

Sampling Stations in G1/61 and Reference Station found the similar species and abundance, and these are general species found in GoT

Public Participation Meeting for EIA

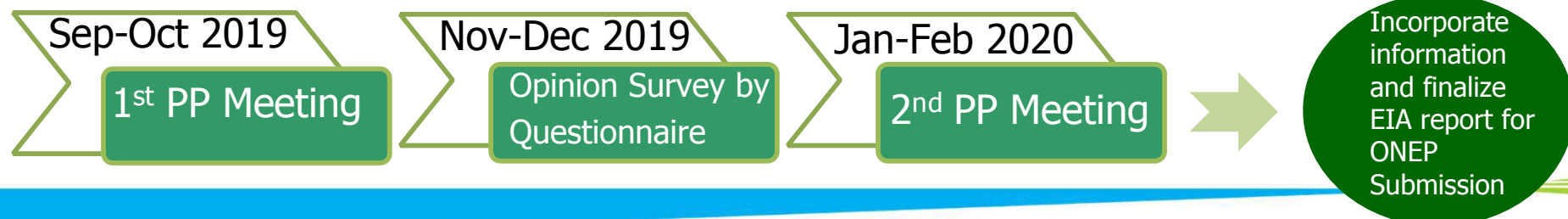
7 Groups of Stakeholders



Public Participation Meeting Area

- Rayong
- Samutprakan
- Samutsakorn
- Samutsongkram
- Chumporn
- Suratthani
- Nakorn Si Thammarat
- Songkhla
- Pattani

Timeline of Public Participation Meeting



Summary of 1st PP Meeting

15 Sep – 1 Oct 2019

Objective

Present Project information and draft scope of study, and receive comment from meeting to finalize scope of study before commencing

Summary of participants

- Commercial fishery and provincial fisher from Songkhla, Nakorn Si Thammarat, Suratthani, Chumporn, Samoutsongkram, Samutprakan, and Rayong
- 3 communities surrounding Petroleum Support Base at Songkhla
- Regional, Provincial and local government representatives from Songkhla

Recommendation from 1st PP Meeting

Project Information

- Follow industry standard and review past performance for efficient mitigation and monitoring plan development
- Early inform & notify stakeholders and fishery group regarding installation locations
- Share information about plug & abandonment process to ensure about no leakage in the future
- Propose CSR program in collaboration with fishery groups, and should be exactly responsible for social
- Share notification to fishery vessel access in 500 m. safety zone surround installation

Existing Environment & Impact Assessment

- Cover all environmental aspects, including sensitive receptor at shoreline
- Impact to environment and living at sea from mud and cuttings management
- Impact to fishery area and fishing gears
- Impact from unplanned events e.g. oil spill

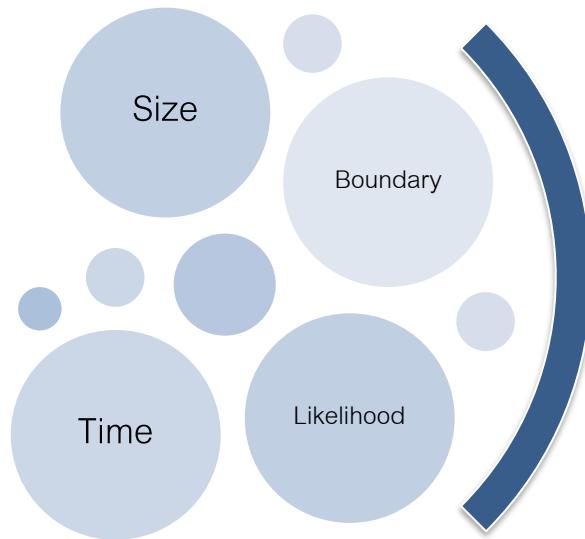
Environmental Impact Assessment



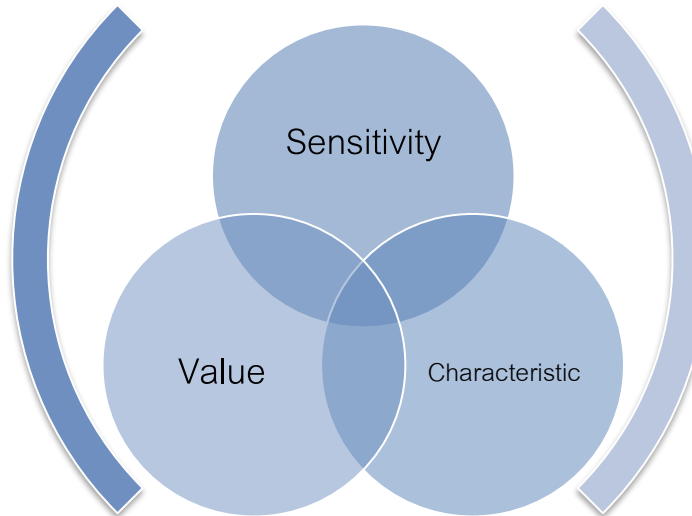
Study and Impact Assessment Plan of Project

◆ Step of impact assessment

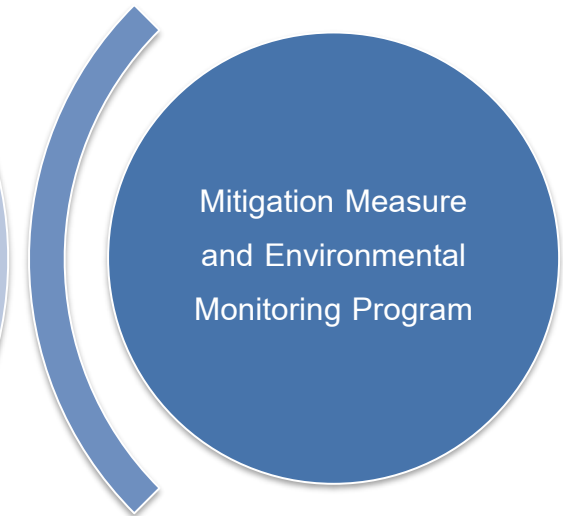
Consider severity of possible impact from project activities ⁽¹⁾
i.e.,



Consider significant level of impact from sensitive receptor data ⁽²⁾ i.e.,



Develop Mitigation measure and Environmental Monitoring Program



(1) Consider project activities both plan and unplanned event

(2) Covering 4 components of environmental and other value (Physical, Biological, Land Use and Quality of Live)

Significant Environmental Aspects & Activity

Significant Aspects

Impact to seawater quality, seabed sediment, and living organism

Impact to fishery and transportation

Impact to occupational health and safety

Impact to environment and safety

Activity

- Waste management
- Wastewater and contaminated water management
- Drilled cuttings management

- Bathymetry survey
- Drilling rig mobilization
- 500-m Safety area

- Disease related to work
- Accident

Unplanned event



Impact Assessment to Seabed Sediment and Living Organism



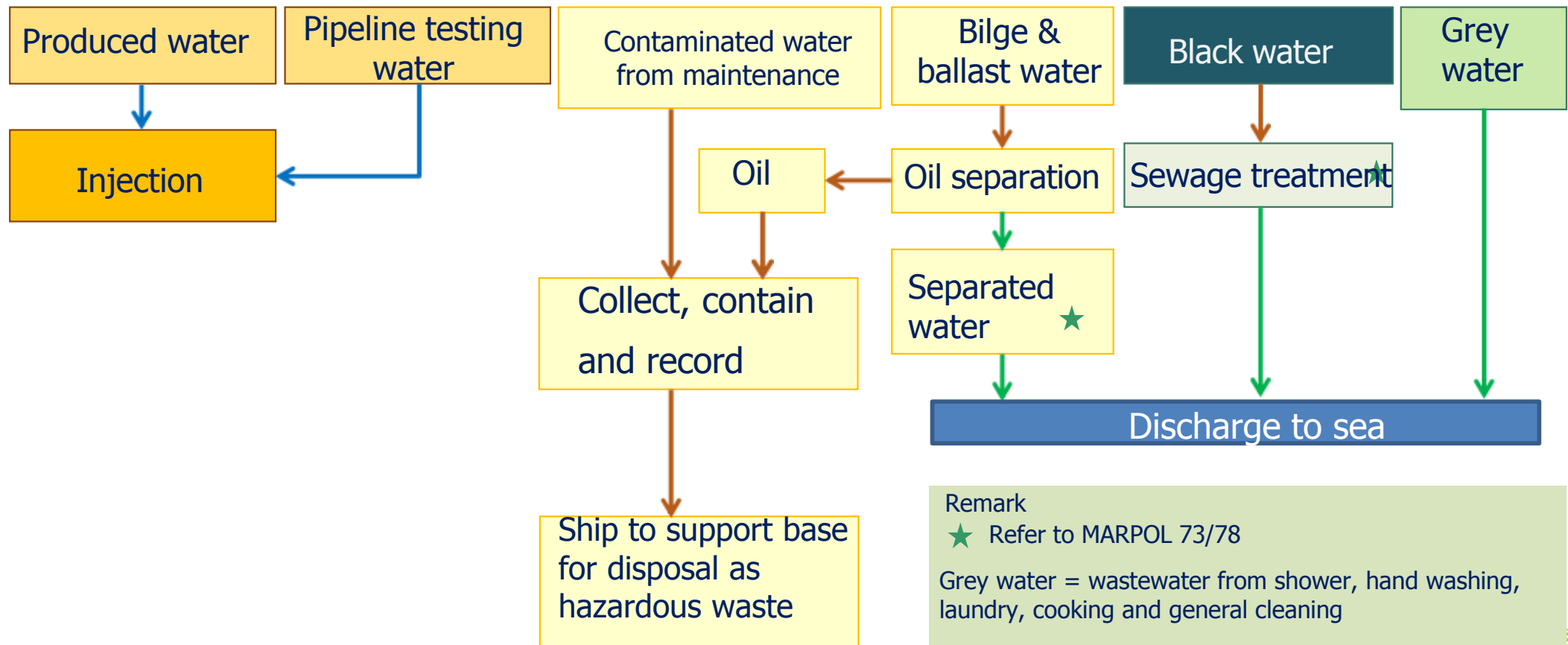
Mitigation Measure: Mud & Cuttings Management

- Follow waste management plan approved by DMF
- Consider to use low toxicity mud
- After install casing, cuttings shall be discharged under 5 m. seawater level
- Use solid control system on drilling rig to separate mud and cuttings for mud re-circulation and cutting discharge
- Control oil-on-cutting from SBM drilling section to under 12.5% by weight of cuttings prior to discharge, and no mud discharge to sea

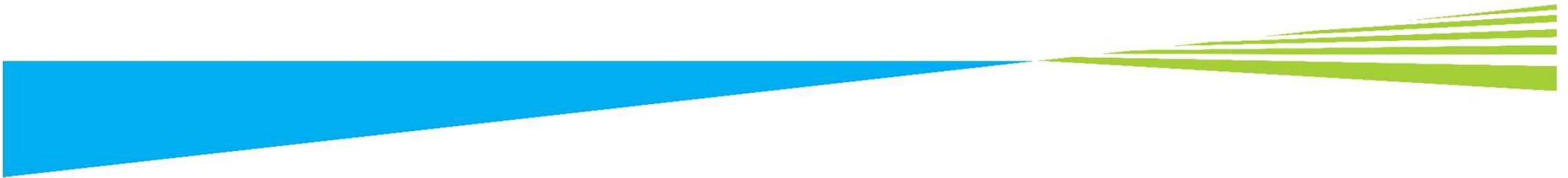
Mitigation Measure: Wastewater Management

Source: Contaminated water from operating area, drilling rig, processing area, vessels

Wastewater and contaminated water management and mitigation measures



Impact Assessment to Fishery and Transportation



Impact Assessment to Fisheries and Water Transportation

Project activities: Bathymetry Survey, Drilling Rig Installation, Wellhead platform Installation

- Before any installation, the stationary fisheries devices shall be transferred or removed from an area
- Limit 500 m. safety zone around drilling rig, wellhead platform and FSO2 area

may
impact to

- Commercial fisheries and water transportation in project area

The operation of
drilling rig in
petroleum
exploration project

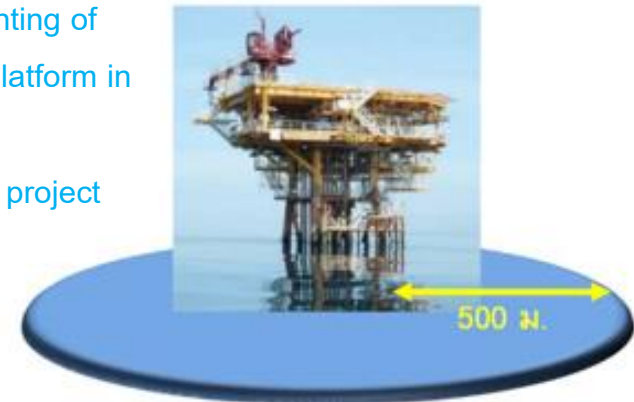
ปิโตรเลียม



Covering area of 0.8 km²/location

- Cannot enter safety zone for fisheries (22 days)
- Commercial fisheries vessel who not use stationary fishing gear can avoid to fishing out of safety zone.
- Can return to fish in area once drilling rig move out from an area.

The presenting of
wellhead platform in
petroleum
production project



Covering area of 0.8 km²/wellhead platform

- Cannot enter safety zone for fisheries
- Commercial fisheries vessel who not use stationary fishing gear can avoid to fishing out of safety zone.

Mitigation Measure for Fisheries Activities

- Before any installation, project shall ensure there is no any fisheries device/gear locating in an area.
- If there is any lost to fisheries device/gear, project shall record the evidence for proper and fair compensation.
- Before mobilize the drilling rig into operation area, project shall notify to relevant agency at least 1 month
 - Engage DMF to notify to relevant agencies such as Hydrographic Department, Royal Thai Navy, Marine Department
 - Inform location and operation date to **relevant Fisheries Association**
- During well plug and abandonment, project shall cut casing around 5 m under seabed, **to avoid any structure left over seabed.**
- **Provide complaint channel** which may occur from project activities and communicate to stakeholder on how to inform any issue to project via provided channel.
- In case project receive complaint, project shall **review and response to complaint person as soon as possible.** If it is proven that its impact occur from project activities, project shall **fairly resolve and support** them including conduct root cause analysis to prevent the reoccurrence of the complaint.
- Conduct CSR program to commercial fisheries in relevant province such as the program of basic needs, education, environment and culture as PTTEP ED plan.

For Petroleum production project

- **Meet and engage Head of Relevant Fisheries Association at least 1 time/year to gather any concerned issue or suggestion for further improvement operation of project.**

Mitigation Measure for Water Transportation Activities



- Project shall compile with Energy Ministerial Regulation on “Define safety zones and signs in the area where there are installations and equipment used in petroleum exploration and production B.E. 2555”
 - Define safety zone 500 m. around offshore structure of project and shall warn to anyone who enter close to safety zone
 - Install any lamp at offshore structure to see it clearly such as drilling rig, wellhead platform, central processing platform and FSO
- To move vessel in-out of from petroleum support based, project shall compile with Marine Department Regulation on “Criteria, control and request for government pilot service in port area, Songkhla province B.E. 2541”

Impact Assessment to Occupational Health and Safety



Mitigation Measure: Public Health/Onshore Community

Mitigation Measure: public health/onshore community

- Hire authorized contractor for waste disposal in accordance with legislation
- Limit speed of equipment/chemical/waste transportation in accordance with road limit, and less than 30 km/hr. when pass community for impact minimization (dust, noise, accident)
- Cover equipment/chemical/waste during transportation to prevent drop objects. In case of pipe transportation, latching securely
- Qualify driver with license and passes safety training and follow traffic legislation
- Perform preventive maintenance of truck

Mitigation Measure: onshore public health service

- In case of emergency or high severity injury, medical contractor shall coordinate with nearest hospital and transfer injured person to appropriated hospital (facility, medical doctor, equipment)