

CK/EV103/0007/2025
OCTOBER 2025

FIRST SCHEDULE

ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

for

SK405B Sirung and Chenda, Offshore Sarawak



Project Proponent



PTTEP

PTTEP SARAWAK OIL LIMITED

Levels 22, 23, 28-2, 33 – 35,
Menara Prestige, No. 1, Jalan Pinang,
50450 Kuala Lumpur, Malaysia

Prepared by



CHEMSAIN

CHEMSAIN KONSULTANT SDN BHD

172 Rock Road,
93200 Kuching, Sarawak,
Malaysia.

EXECUTIVE SUMMARY

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Environmental Impact Assessment (EIA) for SK405B, Sirung and Chenda, Offshore Sarawak

Proponent



PTTEP Sarawak Oil Limited



Qualified Persons



CHEMSAIN

Chemsain Konsultant Sdn Bhd

Introduction

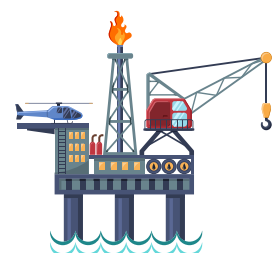
This Project involves development of Sirung & Chenda oil fields (Block SK405B), approximately 140 km northwest of Bintulu and 95 km northwest of Mukah, offshore Sarawak, Malaysia. Sirung acts as central hub, Chenda as subsea tie-back. Crude oil will be processed at Sirung platform, exported via D35R-A to Bintulu Crude Oil Terminal (BCOT).

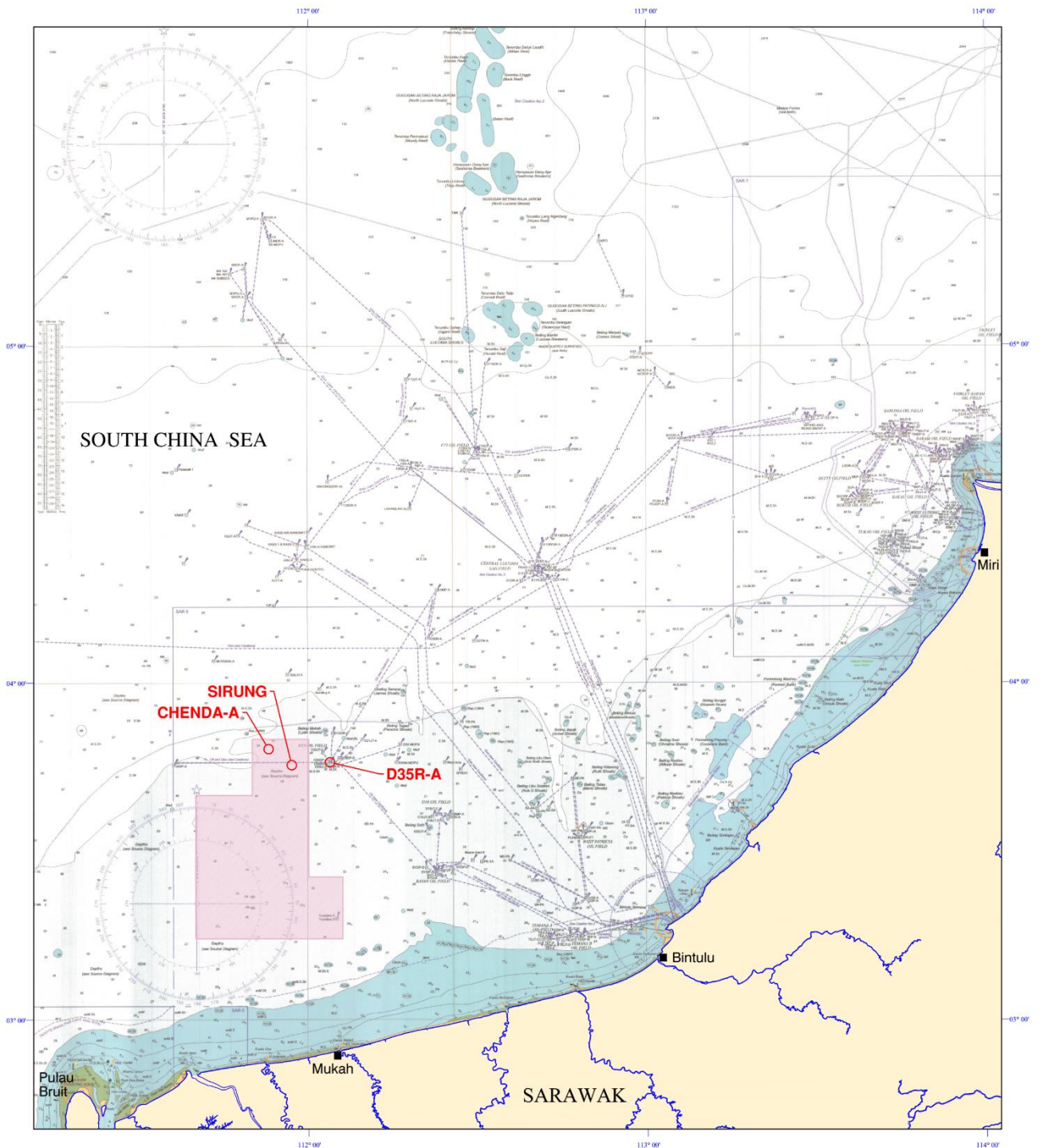
The scope of this EIA covers the following development in SK405B:

- One (1) Sirung Production Platform including Processing Facility
- One (1) Chenda Wellhead Platform
- One (1) Pipeline (Liquid Phase), 13 km from Sirung to existing D35R-A
- One (1) Pipe (Multiphase), 9 km from Chenda to Sirung
- One (1) Gas Lift Pipeline, 9 km from Sirung to Chenda
- One (1) Water Injection Pipeline, 9 km from Sirung to Chenda

Table ES-1: Project Component Coordinates (Datum: WGS84)

No	Project Component	Latitude	Longitude
1	Sirung PP	03° 45' 21.41"N	111° 57' 11.25" E
2	Chenda-A WHP	03° 48' 12.07"N	111° 53' 5.47"E








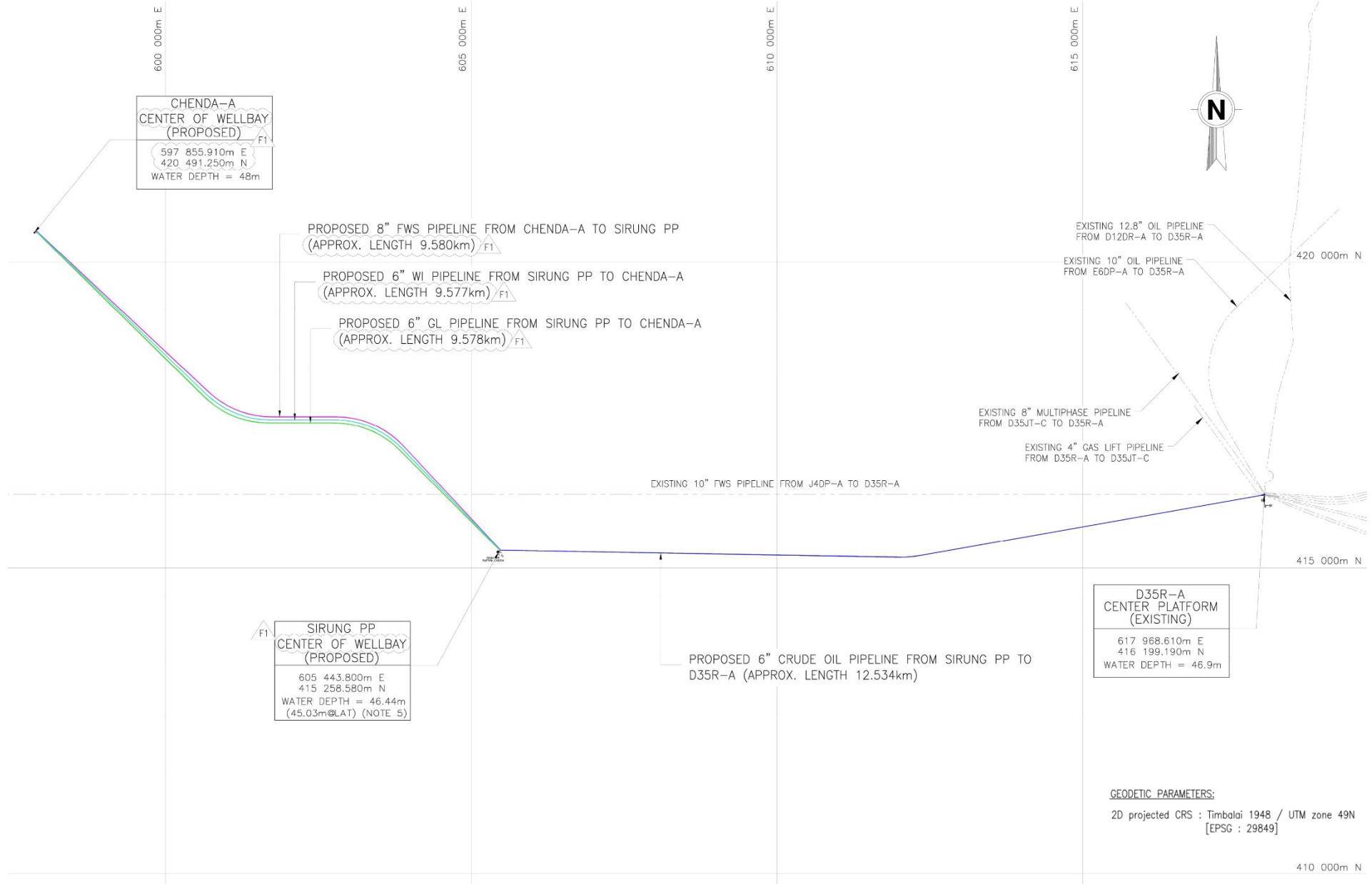
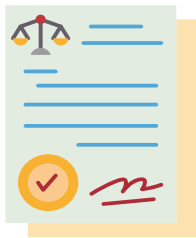
- LEGEND:**
-  WHP
 -  RIVERS / COAST
 -  BLOCK SK405B

Figure ES-2: Project Layout



Legislative Requirement



Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015.

ITEM 9 PETROLEUM

- a) Development of:-
 - (i) oil field
- (c) Construction of:-
 - (i) oil and gas separation, processing, handling and storage facilities

Statement of Need

The Sirung–Chenda development enables early monetisation of oil resources via phased cluster tie-back to existing D35 infrastructure. This optimised concept reduces costs, accelerates production, supports future tie-backs, and aligns with Malaysia’s Twelfth Plan & Sarawak PCDS 2030 to strengthen upstream output, local participation, and energy security.



Project Description

Project Concept & Overview

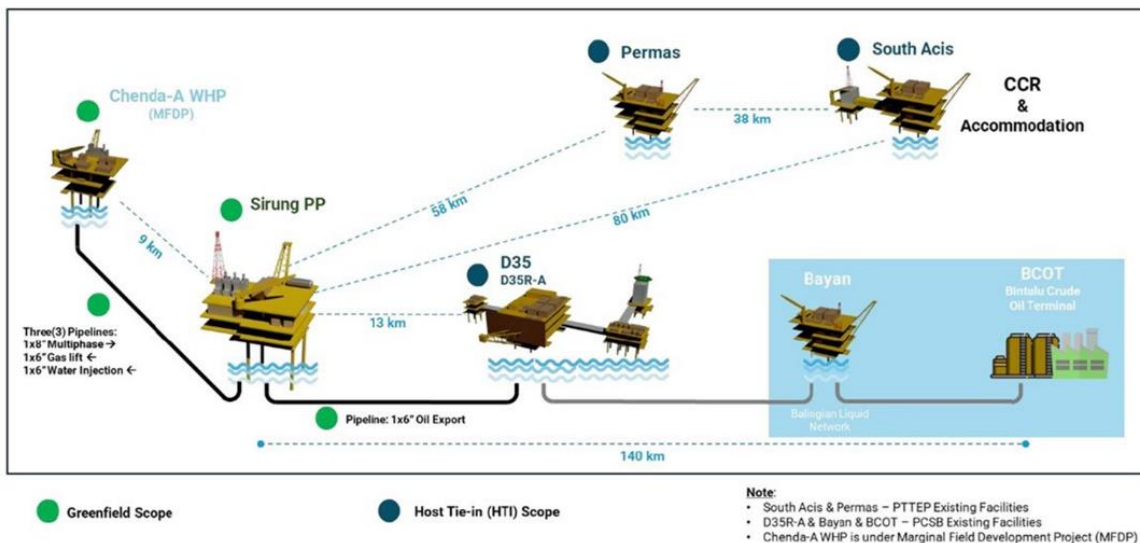
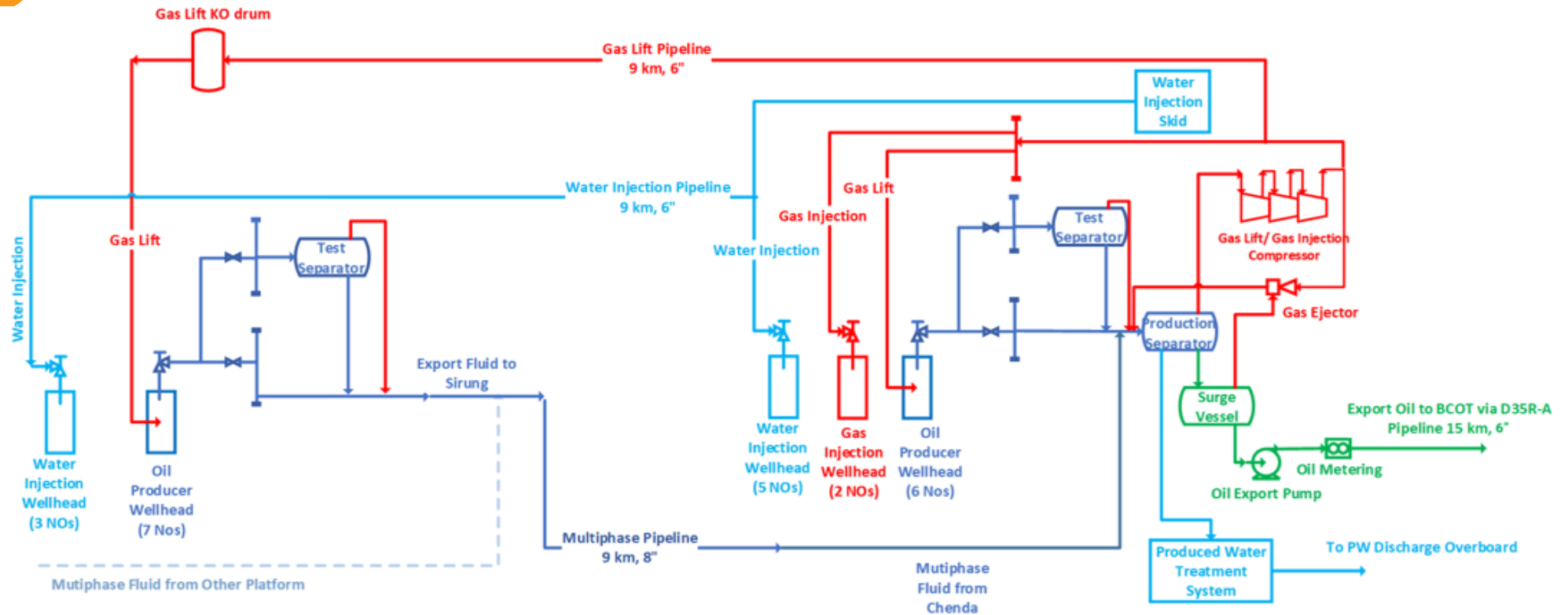


Figure ES-3: Overall Development Overview

Export route: Chenda WHP → Process crude oil at Sirung PP → D35R-A pipeline → BCOT.

	Sirung PP	Chenda WHP
Facilities	4-legged fixed jacket	4-legged fixed jacket
Design Concept	Not Normally Manned (NNM), remotely monitored, no permanent living quarter (LQ).	Satellite, unmanned
Oil Production Capacity	15,000 STBPD	9,900 STBPD
Lifespan	15 years design life	
Drilling	Jack-up rig	

Figure ES-4: Overall Process Schematic



Chenda-A WHP

Primary functions:

- Full Well Stream tie-back (9 km) to Sirung PP for processing and export.
- Receives gas lift & seawater injection from Sirung PP to enhance oil recovery.

Sirung PP

Primary functions:

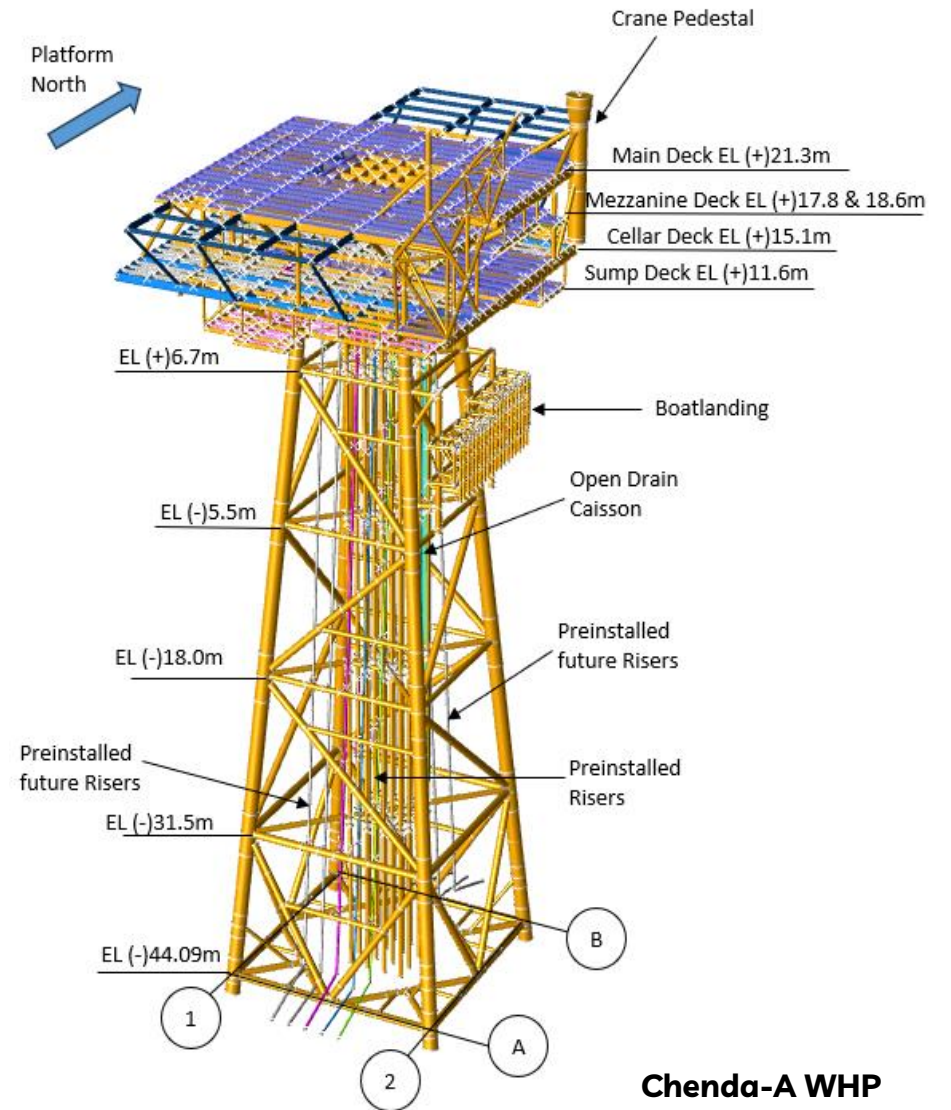
- Three-phase separation of well fluids (oil, gas, and water).
- Wet gas compression, allowing gas to be re-injected into the Sirung reservoir and used as gas lift for both Sirung and Chenda-A production wells.
- Produced water treatment, with treated water discharged overboard
- Seawater treatment and injection, supporting enhanced oil recovery at both Sirung PP and Chenda-A WHP via dedicated injection pipelines.



Figure ES-5: Jacket View



Sirung PP

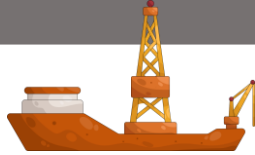


Chenda-A WHP

Project Activities

Onshore Fabrication & Mobilization

Platform substructure, topside and pipeline will be fabricated onshore and transported by barge to site.



Offshore Installation

Platform Installation

- Install jacket
- Lift & place topsides with derrick barge crane.
- Weld topsides to jacket legs.

Pipeline Installation

- S-lay method

Pipeline Crossing

- Lift pipeline at crossing points.
- Install concrete/mattress supports.
- Maintain 300 mm clearance with existing pipeline.

Drilling & Well Completion

- Jack-Up drilling rig will be utilized to drill development wells each for Sirung PP and Chenda WHP.
- Well completion includes strengthening the wellbore hole and well testing for safe production



Non-hydrocarbon process systems (life support, basic power, utilities, etc) will be commissioned first before hydrocarbon process systems. After preliminary start-up audit is conducted, hydrocarbon will be introduced into the system to begin production.

Commissioning & Start-up

Operation & Maintenance

- Sirung PP will be Not Normally Manned (NNM).
- Remote monitoring, control, and operation from the main control room at South Acis LQ.
- A 14-day visit cycle by the core crew for inspections, maintenance, and essential operational tasks.



Decommissioning and abandonment shall be carried out at the end of economic field life of the facility following IMO, PETRONAS Guidelines and DOE Guideline on Decommissioning of Oil and Gas Facilities in Malaysia.

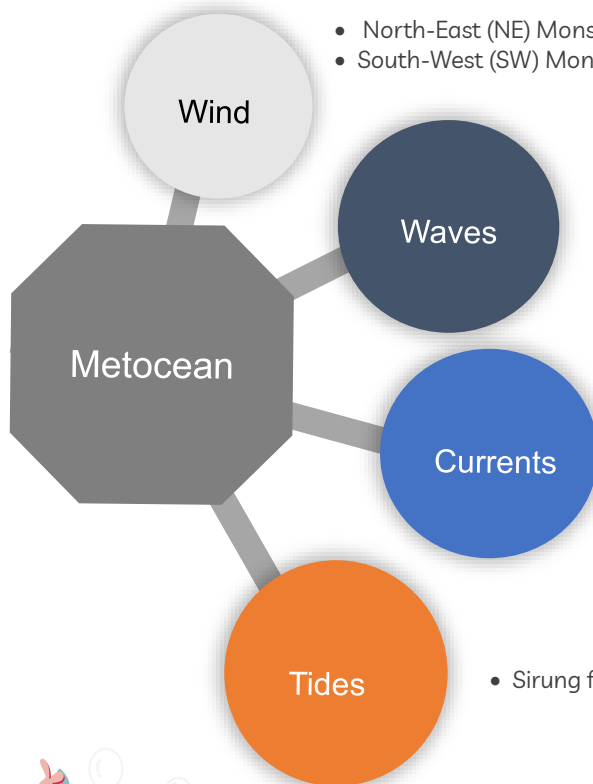
Abandonment & Decommissioning

Existing Environment

Bathymetry and Seabed Features



Bathymetry	Seabed features
<ul style="list-style-type: none"> Gentle seabed slope (<math><1^\circ</math>) with depths 42.6 – 50.3 m LAT. Localised steeper gradients (>math>5^\circ</math>) near irregular features. West-northwest slope (Sirung-Chenda) and northeast dip (Sirung-D35R-A). 	<ul style="list-style-type: none"> Scours, depressions & pitted seabed → potential minor pipeline free spans High-reflective zones linked to carbonate outcrops & coarse sediments Existing infrastructure: jack-up footprints, scours, debris, pipeline crossings One confirmed pipeline crossing (KP 2.021) Subsurface anomalies: shallow gas pocket & two shallow faults (no major constraint)



- North-East (NE) Monsoon (September – April)
- South-West (SW) Monsoon (May – August)



- Dominant waves are from the north in winter and from the west
- The extreme wave heights at Sirung exhibit good agreement, likely because both sites are located further offshore



- Extreme near-surface current speeds at Sirung field are relatively strong compared to nearshore areas, influenced by offshore regional circulation patterns. This indicates more dynamic oceanic conditions at the Sirung site, typical of its offshore location.

- Sirung field is mixed diurnal tide

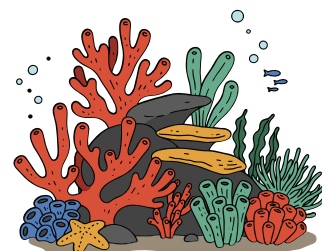


Turtles

- Marine turtles species in Sarawak: Hawksbill, Oliver Ridley, Green turtle, Leatherback.
- It is unlikely that the project activities will impact turtle nesting activities as these nesting sites are more than 14 km away from the Project site

Biological Sensitive Area

- The nearest shoal to Sirung PP is Beting Mukan (Lydie shoal) with approximate distance of 15.7 km distance
- Artificial reef No. 2 would be the nearest to the project area, i.e. 71.6 km from Sirung PP and 65 km from nearest pipeline (Sirung PP to D35R-A section).
- Luconia Shoals National Park is situated 128 km distance from Sirung PP.



Environmental Baseline Sampling



Marine Water Quality

- 45 samples from 15 stations were collected
- All samples were within the range limit and there were no exceedances against Class 3 of MMWQS.

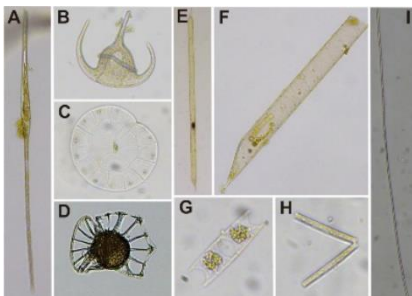


Seabed Sediment Quality

- 15 samples from 15 stations were collected
- All seabed sediment samples are well below the stipulated ERL and ERM of the NOAA Guidelines.



Macrobenthos



Phytoplankton

Biological Environment

Macrobenthos

- The macrobenthos community were moderately diverse. Overall, the macrobenthos is fairly distributed among the sampling locations.

Phytoplankton

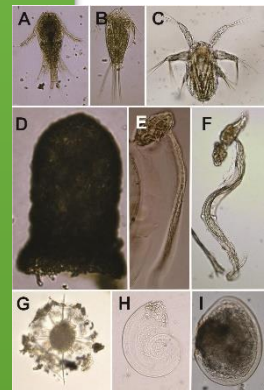
- Phytoplankton communities show overall moderate diversity with uneven distribution of species.

Zooplankton

- Zooplankton communities show low to moderate diversity with uneven distribution.

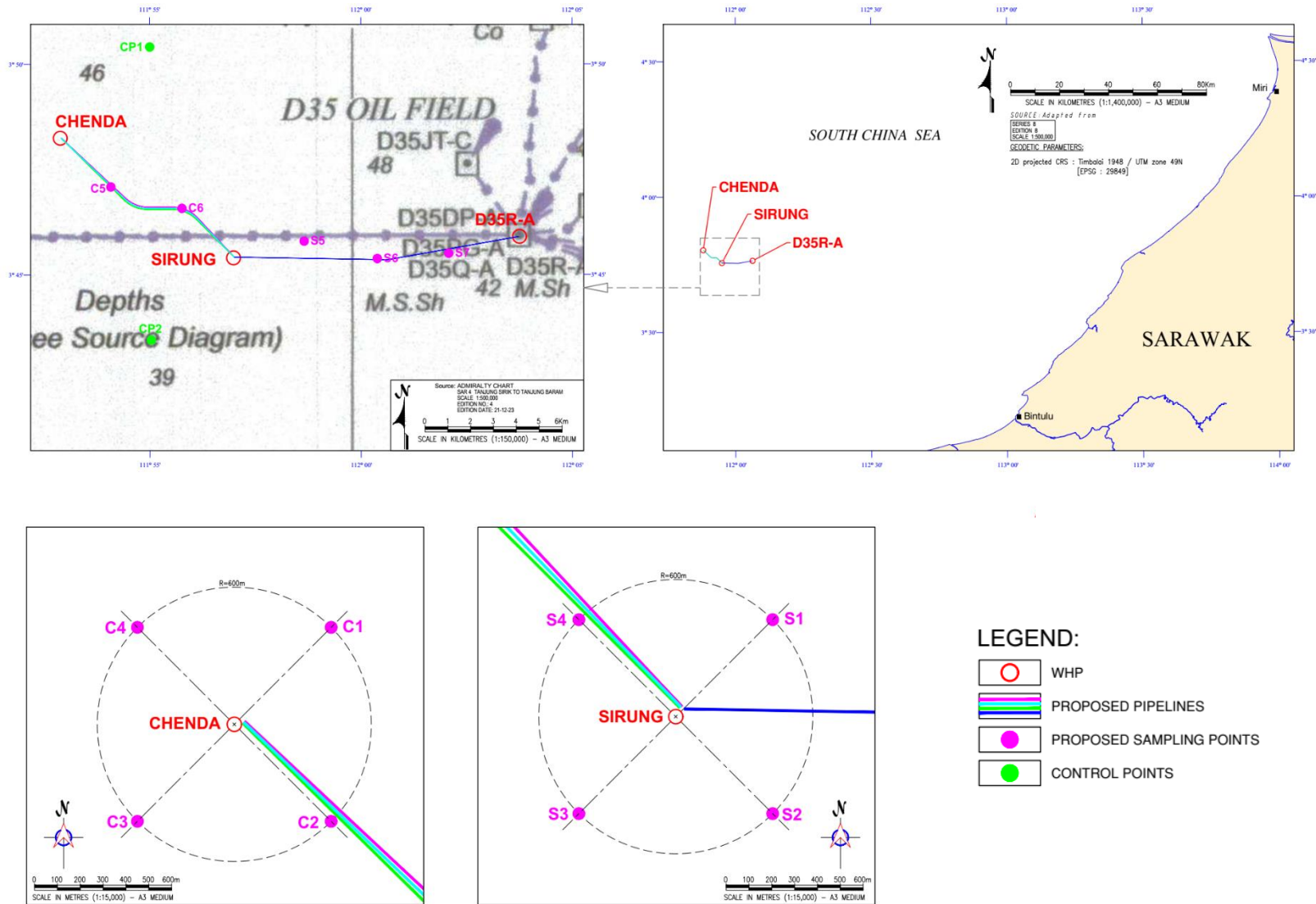
Chlorophyll-a

- Samples at all sampling stations were below detection limit



Zooplankton

Figure ES-6: Baseline Sampling Locations



Evaluation of Impacts & Mitigation Measures



MARINE WATER

LOW

- Potential impacts to marine water quality due to contamination from transportation of materials, installation of pipeline and injection platforms, hydrotesting and disposal of wastes.
- No process discharge expected during Operation.

Mitigation Measures (Page C8-1 to C8-6)

Transportation and Installation Stage

- Establish a waste management plan which includes frequency of waste collection and disposal and periodical inspection on site etc.
- Educate and practice good housekeeping.

Operation and Maintenance Stage

- During maintenance operation (manned), open drain liquid from equipment skid, deck cleaning etc. will be route to portable drain pod for collection and further disposal. During well intervention, drain fluids shall unloaded into suitable waste containers for further disposal.
- Equipment containing liquid should be banded to ensure contaminated drainage water flows into the portable drain pod.



SEABED

LOW

- Potential impacts to seabed due to anchoring, drilling, installation of pipelines, riser and injection wells.

Mitigation Measures (Page C8-7)

Transportation and Installation Stage

- Optimize the installation period and location of concrete mattress.
- Anchoring to be at pre-determined location.
- WBM, SBM and additive chemicals used during drilling to be environmentally friendly.
- Drill cuttings to be released 3 to 5 m below surface to aid dispersion.

Modelling Findings



Drill Cuttings Dispersion Modelling

- Potential impacts during drilling operation, sediment plume due to drill cuttings and mud discharges.
- **Sediment Thickness**
Seasonal changes influence the extent and intensity of sediment deposition, but the overall environmental risk remains low due to the limited spatial reach and rapid settling of discharged materials.
- **Total Suspended Solids**
TSS concentrations above the minor exposure threshold were short-lived, not exceeding three hours after the end of discharge operations. Seasonal currents influence the dispersion of suspended solids, the ecological risk remains low due to the limited spatial extent, rapid dilution, and short duration of elevated TSS levels.



Oil Spill Modelling

- Potential impacts during operation – sub sea well blowouts (Scenario 1) and pipeline leaks (Scenario 2).
- Scenario 1 poses a significantly higher risk of widespread floating oil exposure compared to Scenario 2.
- The Brunei to Bintulu shoreline is the most consistently affected area across both scenarios.
- Seasonal conditions influence the direction and extent of oil spread, with northeast monsoon generally showing greater distances



Evaluation of Impacts & Mitigation Measures



MARINE ECOLOGY

LOW

- Sediment dispersion during drilling works may impact marine life.
- Disturbance to seabed due to anchoring, drilling and installation work will affect plankton, benthic and fish communities.

Mitigation Measures (Page C8-7)

Transportation and Installation Stage

- Mitigation measures proposed under marine water and seabed are applicable.

Operation and Maintenance Stage

- Conduct marine water quality monitoring.
- Regular check on pipeline integrity and monitor pressure drop across pipeline.
- Emergency Response Plan should be in place in case of unplanned incident happened.
- In case of rupture/leakage at pipeline, the emergency shutdown valve will quickly shutdown process operation and isolate incoming and outgoing flows



AIR

LOW

- Emission from barge/vessel, drilling machinery and equipment.
- Scheduled maintenance activities.

Mitigation Measures (Page C8-10 to C8-11)

- Minimize fugitive emissions; e.g.: high integrity compressor and pump seals for high pressure systems and provision of closed drainage system for the hydrocarbon systems
- All combustion and mechanical equipment are subjected to regular inspection and maintenance to ensure their efficiency is maintained
- Facility design is equipped with suitable over pressure protection (e.g. fully rated and relief valves) to minimize loss of containment events.



NOISE

LOW

- Increased underwater noise level due to pipeline and platforms installation activities.
- Increase in ambient noise levels to sensitive receptors due to operational activities.
- Impact is largely towards the personnel on board the platforms.

Mitigation Measures (Page C8-7 to C8-8)

Installation Stage

- Optimize usage of anchors and minimize pile driving period where possible.
- Maintain vessel and all noise generating equipment in good working order.

Installation Stage

- Install acoustic enclosure on noisy equipment.
- Indicate area with high noise area. Personnel to wear PPE when in this area and to limit exposure time.

Evaluation of Impacts & Mitigation Measures



MARINE TRAFFIC **LOW**

- Impact to fishing vessels due to safety exclusion zone restrictions. The imposition of safety zones around vessels should not affect the livelihood of the fishermen.

Mitigation Measures (Page C8-8 to C8-10)

- Required notifications must be in place and shall consult with Bintulu Port Authority and relevant marine authorities on locations of the marine vessels and subsea infrastructures to avoid collision.
- Notices should be issued by Bintulu Port Authority and DOF to local fishermen prohibiting them from encroaching into the working area.



WASTE **LOW**

- Impacts of improper solid and scheduled wastes generation, storage and disposal during operational phase.
- No Natural Occurring Radioactive Materials (NORM) is expected as no extraction from well during normal operation.
- The scale of potential impacts due to release of waste is potentially small due to the quantities present during this stage.

Mitigation Measures (Page C8-6)

- Scheduled wastes shall be managed and handled in accordance with the Environmental Quality (Scheduled Waste) Regulation 2005.
- Educate and practise good housekeeping among the workers.
- To ensure that a competent person (Certified Environmental Professional in Scheduled Waste Management (CePSWaM)) is available.



Socio-Economic **POSITIVE**

- Local employment opportunities and local business opportunities.

Mitigation Measures (Page C8-11)

- To prioritise hiring local contractors and manpower.
- To enable procurement requirement that the potential suppliers maximise their local content, and the percentage of local contents should be an important criterion used when assessing supplier bids

Evaluation of Impacts & Mitigation Measures



OCCUPATIONAL SAFETY AND HEALTH *MEDIUM*

- Impact on the health and safety of workers due to development activities.
- Safety hazards include working underwater; falling from heights; hazards associated with transferring loads from supply ships / barges that are rolling and pitching with the waves; and other hazards.

Mitigation Measures (Page C8-11 to C8-12)

- Contractor to adhere to the Safety, Security, Health and Environment (SSHE) Policy as well as safe work guidelines, procedures, and regulations.
- Personnel must attend and pass their medical check-up and relevant safety trainings.
- Implement safety management system, formulate ERP and perform regular emergency drills.
- Personnel are to be provided with full PPE when conducting work.



DECOMMISSIONING AND ABANDONMENT STAGE *LOW*

- The impact is negligible as the Project site is within offshore and will not be left without any remedial actions as per standard oil and gas practices.

Mitigation Measures (Page C8-17)

- A Decommissioning Environmental Plan (DEP) shall be submitted to DOE and NREB at least six (6) months prior to Project abandonment.
- To inform relevant authorities about the decommissioning.



ACCIDENTAL/ EMERGENCY EVENTS *MEDIUM*

- Events that were considered and assessed include hydrocarbon spill, Chemical/Drilling Fluids Spill, Pipeline Leakage, and Well Blowout.

Mitigation Measures (Page C8-13 to C8-17)

- A comprehensive emergency response plan (ERP) shall be developed to ensure an effective emergency management for responding to emergencies. As of now, PTTEP has Emergency Management Plan, Oil Spill Response Plan, Incident Management Standard, Asset / Contractor Emergency Management Plans and Asset Crisis Management Plan.
- The ERP for this Project is not available yet as the Project is still in preliminary and planning stage. A copy of the ERP will be submitted to DOE upon completion.
- All the contractors shall be contractually obliged to comply with PTTEP's requirements in term of incident reporting throughout the development stage and operational stage.

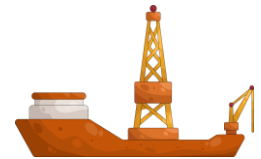
Proposed Monitoring Programme – Development and Operation Stage



Performance Monitoring

Drilling fluids and drill cuttings

- Monitor usage of drilling fluids and drilling mud, especially synthetic-based mud (SBM)
Frequency : In-house daily monitoring during drilling operations
- Record the volume of drill cuttings created by each well and monitor the drill cuttings that shall be treated to Oil On Cuttings (OOC) of <6.9% wet weight basis as per mentioned in PETRONAS E&P MES Rev. 3, 2019
Frequency: End of well reporting



Segregation, storage and transport of wastes

- Monitor and keep an inventory of the volume of hazardous and non-hazardous waste streams generated. The quantity of waste recycled or reused, recovered or sent to onshore landfill shall be identified for each type of waste.
Frequency: Ongoing throughout life of Project
- Monitor waste recycling and disposal consignment notes
Frequency: Ongoing throughout life of Project



Spills

- Report and investigate all leaks and spills, including type and quantities of substances spilt
Frequency: Ongoing throughout life of Project



Proposed Monitoring Programme – Development and Operation Stage



Compliance Monitoring

Segregation, storage & transport of wastes

- Monitor the handling, storage and disposal of scheduled waste to comply with Environmental Quality (Scheduled Wastes) Regulation 2005.
- An inventory of scheduled wastes shall be made to record the updated information such as the category and amount of scheduled wastes disposed
- Monitor the handling and disposal of garbage and food wastes and is to comply with MARPOL 73/78, Annex V
Frequency: Ongoing throughout life of Project
- Monitor waste recycling and disposal consignment notes
Frequency: Ongoing throughout life of Project

Spills

- Report and investigate all leaks and spills, including type and quantities of substances spilt
Frequency: Ongoing throughout life of Project

Impact Monitoring

Installation & Drilling

Operation & Maintenance

- Impact of discharge on marine water, seabed sediment and biological components at monitoring points.
- 6-monthly from the start of Project construction & throughout life of Project



Proposed Post-EIA Monitoring Programme – Development and Operation Stage

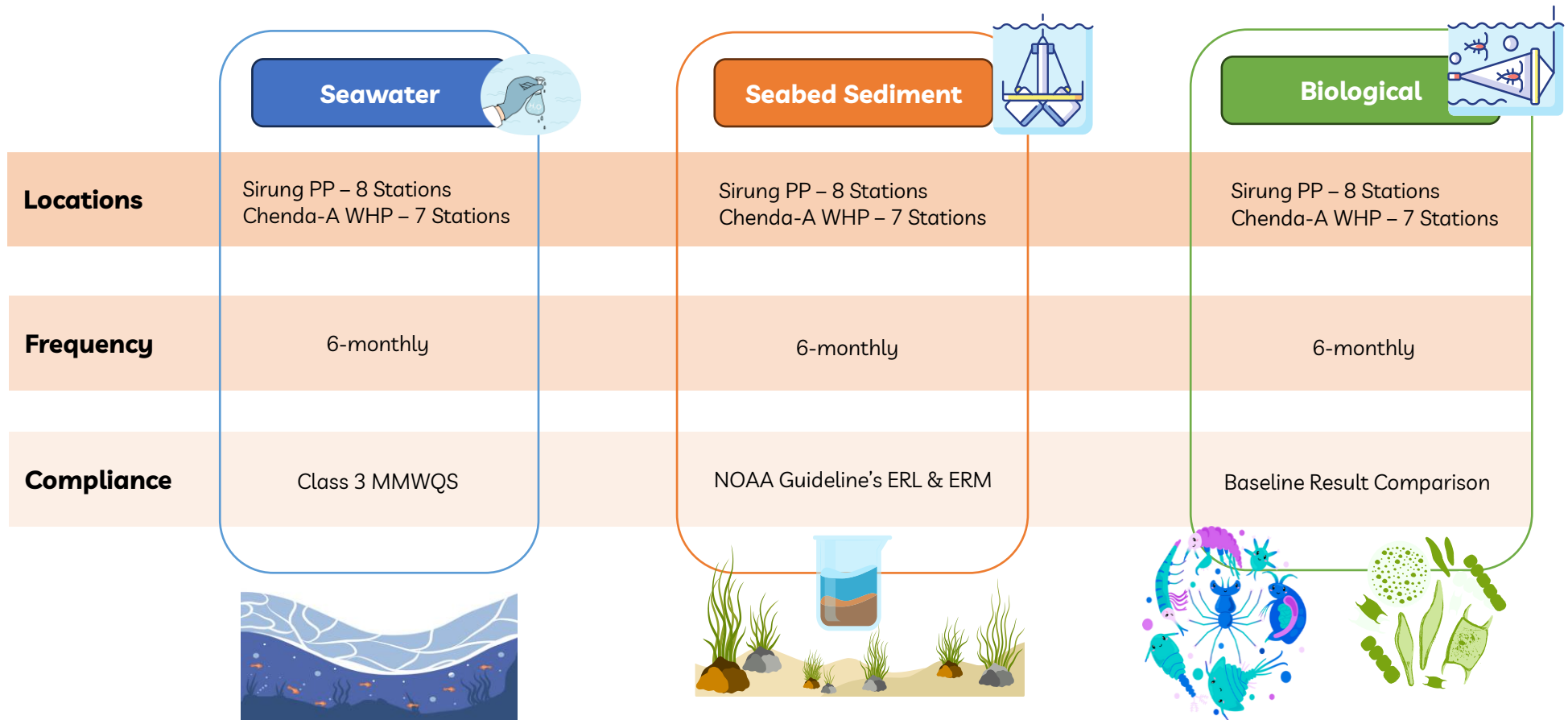


Figure ES-7: Proposed Monitoring Locations

