
Management Plan

Introduction Description

The description of the plants activities:

- PTT is the largest gas separation operator in Thailand. We run six gas separation plants to separate various hydrocarbons from the natural gas which in turn maximizes value of the gas from the Gulf of Thailand. The Gas Separation Plant Units 1-3, 5 and 6 are located in Tambon (Sub-district) Mab Ta Phut, Amphur (District) Mueng, Rayong Province and the fourth Unit in Amphur Khanom, Nakhon Sri Thammarat Province.
- The Khanom Gas separation plant is located in Nakhon Sri Thammarat Province. It separates natural gas transport the gas by ship to Suratthani and Songkla Petroleum Terminals
- Khanom Gas Separation Plant adopts expander process in its production. In a process, a turbo expander is used to reduce pressure. As the pressure steps down, the temperature of natural gas is also decreased to become liquid which will be sent to a distillation column where various products can be extracted.

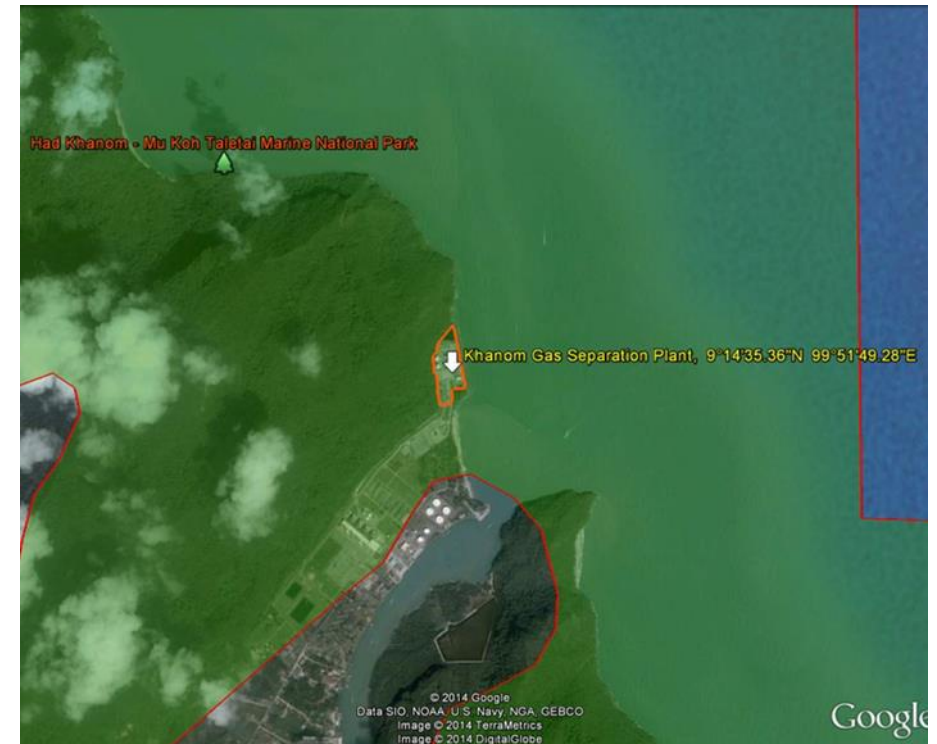
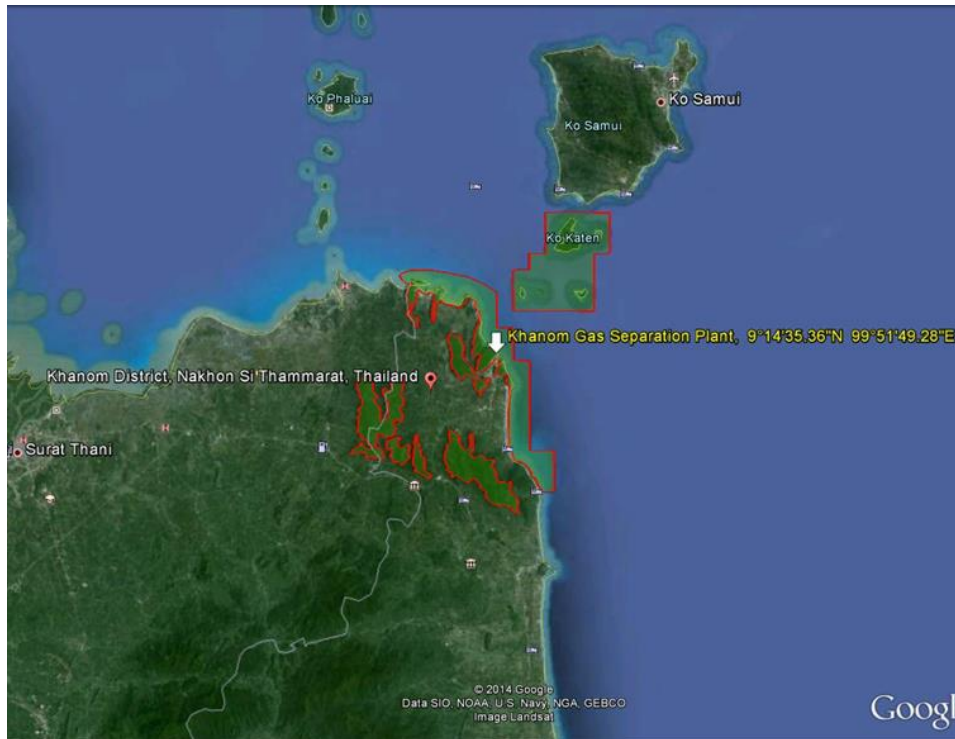
Biodiversity Values

The biodiversity values of the Khanom Plant include:

- Close proximity to the Had Khanom Mu Ko Thaletai Marine National Park (IUCN Cat II) and Tai Rom Yen National Park (IUCN Cat II)
- Khanom Gas Separation Plant has 5 wildlife species which are Sumatran serow (*Capricornis sumatraensis*), Chestnut-bellied Malkoha (*Phaenicophaeus sumatranus*), Red-throated Barbet (*Psilopogon mystacophanos*), Black giant squirrel (*Ratufa bicolor*), Spectacled Leaf Monkey (*Trachypithecus obscurus*) and 20 insects on the IUCN red list under the threatened category have been found in the area. (The PTT Biodiversity Species Database Surveying Project on 2016)
- Further information on the species and habitats of the surrounding protected areas can be found here:
http://www.protectedplanet.net/sites/Had_Khanom_Moo_Koh_Taletai_Marine_National_Park/species

Location

The location of the Khanom Gas separation plant is outlined below:





Objectives and Targets

Outline of Objectives and Targets

The following objectives and targets are applicable to the asset:

| Objective | Target | Milestone | Responsibility |
|--|--|-------------|--------------------|
| Manage the gas separation plant to ensure that impacts to habitats and species is minimised | Revise the BAP for the Khanom Gas Separation plant. | By Feb 2023 | QSHE Working Group |
| Engage the community in Conservation | Meet with the leader of community and local government to discuss on Conservation project. | By Dec 2023 | QSHE GSP Khanom |
| Educate Gas Plant staff on the importance of conservation | Conduct one training session with staff of the gas separation plant once a year. | By Dec 2023 | QSHE GSP Khanom |
| Ensure that the emergency response procedures are consistent with protecting biodiversity values | Review emergency response activities of the gas separation plant to ensure they are compatible with protecting biodiversity values | By Dec 2023 | QSHE GSP Khanom |

| Risk Assessment | Risk Assessment Results | | |
|-----------------|---|---|--|
| | The following table outlines the results of the PTT Biodiversity Risk assessment process: | | |
| | Asset Name | EN11 | EN12 |
| | Khanom Gas Separation Plant | Distance to Nearest PA (Km) 0 | Characterization of threat and likely impact |
| | | Nearest Protected Area: Had Khanom - Mu Koh Taletai Marine National Park | |
| | IUCN Status II | Close proximity of protected area may mean that impacts may occur if appropriate controls are not in place. | |
| Note:Jan2023 | Risk: Very High | Very High | |

Identification of Risks and Threats

The following table outlines the potential risks and threats associated with the asset:

| Threat | Potential Impacts | Likely impact | EN/CR Species habitats likely to be impacted |
|---------------|--|--|---|
| Air pollution | <ul style="list-style-type: none"> SOx Nox CO | <ul style="list-style-type: none"> Local community Local species Community's health | To be determined following survey on vegetation |

Management Measures The following management measures are relevant to the conservation of biodiversity values at the asset:

| Management Action/ Management Zone | Response to threats | Responsibility | Targets | Milestones |
|---------------------------------------|---|--------------------|---|--|
| Management of Pollution | | | | |
| Implement air pollution control | Air discharge may impact on surrounding vegetation communities. | QSHE Working Group | Achieve EIA compliance with relevant air quality discharge limits | Implement and monitor air pollution on a regular basis |
| Implement Noise Pollution Suppression | Noise pollution impacting surrounding forests | QSHE Working Group | Achieve EIA compliance with relevant noise quality limits | Implement and monitor noise pollution on a regular basis |
| Manage emergency situations | Emergency situations polluting the environment | QSHE Working Group | Manage all emergency situations in accordance with all emergency procedures | Implement all emergency procedures as required |

Additional Management Measures

1. Khanom-Khao Nan Biodiversity research (Phase I)
2. Khanom Biodiversity research (Phase II)
3. Khanom kid Camp
4. PTT Sea Camp
5. Khanom Biodiversity Fair
6. Biodiversity meeting with Khanom CEO (Had Khanom Biodiversity Research open house)
7. Pink dolphin survey course for local fishery group
8. PTT - GSP Khanom biodiversity Training course

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| Review of asset Biodiversity Action Plan | The Review of this BAP is to occur on an annual basis. The anniversary date of commencement. |
| Biodiversity Monitoring Requirements | Biodiversity monitoring requirements are to be determined once more information is available on the likely presence of threatened species in or near the asset. |
| Validation of Management Measures | Validation of management measures is to occur on an annual basis. Additional management measures are to be added based on the species identified and the efficacy of the current management methods. |
| Annual Data Reporting Requirements | All data collected as part of the implementation of this plan must be kept in a database and reported to QSHE Policy Committee as required. |

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| Stakeholder Consultation and Community Engagement | The following stakeholders have been identified and are relevant to the asset: | | | | |
| | Stakeholder | Commitment | Responsibility | Milestones | Objectives |
| | Local Community Groups (Laem Pratub Local Fishery Operators, Rak Baan Kerd Local Fishery Operators, Baan Ta Bor Ko Mangroove Conservation Group, Laem Pratub Leader, Community Leader, and Tourism and Hotel Association) | Meet and discuss biodiversity values in Local Community Groups | CSR Dept. | July 2023 | Define relationship with Local Community Groups |
| | Local Government (President of the Sub-District Administrative Organization, Provincial Office of DMCR, NSTDA, Primary Education Service Area Office and 23 Schools in Khanom District) | Meet and discuss biodiversity values in Local Government | CSR Dept. | July 2023 | Define relationship with Government Regulator |

| Legal and other Requirements | The following laws, regulations and permits are relevant to the asset: | |
|------------------------------|--|--|
| | Convention/Law | Purpose |
| | National Park Act, 1961 | This Act concerns National Parks (Protected Areas) within Thailand. The objectives of the Act are to protect, control, and oversee the ecology and natural habitat of plants and animals in national park areas. It forbids collecting, harming and collection of wood, natural resources, animals and plants, orchids, including flowers, leaves, and fruits. |
| | National Conserved Forest, 1964 | This Act forbids the collection of wood and cut forest trees and plants in national park areas, and to seek permission from the officer in-charge in order to identify and declare specific forests as national conservation forests, to maintain the forest and various natural resources in good condition. This can be done based on ministerial regulations from the Ministry of Agriculture and Cooperatives. |
| | Wildlife Conservation and Protection Act, 1992 | This Act is concerned with wildlife conservation areas, with a view to protecting natural habitats. It lists 15 types of rare wildlife. The Act is consistent with the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). It also concerns the import and export control of wildlife, encouraging the breeding of certain wildlife species with a goal to increasing the wildlife population as well as to conserve breeding habitats and reduce the pressure from hunting wildlife. |
| | Plant Storage Act, 1964 | This Act includes requirements to notify the Ministry of Agriculture and Cooperatives any “Plants, Pests, or Carriers from Specified Sources that are Forbidden”. This includes genetically engineered plants, which resulted from bio-technology. The import and transfer of these plants requires permission from the Department of Agriculture. Permission is restricted to experimental and research activities. |
| | Animal Species Maintenance Act, 1966 | This Act concerns the protection and maintenance of reserved animal species for genetic purposes. Castrating and killing animals and exporting them from the Kingdom without permission. |
| | Fisheries Act, 1947 | This Act concerns plant conservation at temples and shrines and other areas that are connected to these sites. It also regulates water gate areas, dams and weirs, and other areas that are appropriate for aquatic animal conservation. Fishing or raising aquatic animals is forbidden |

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| Export and Import to the Kingdom Act, 1979 | <p>without prior permission from the Director-General of the Department of Fisheries. This law forbids importing aquatic animals that are specified in the Royal Decree on Forbidding of Importing Specified Aquatic Animals into the Kingdom, 1982 and 2nd edition, 1993.</p> <p>This Act controls the import and export of goods based on the Royal Decree on Goods Export from the Kingdom (39th edition), 1975, and the 11 notifications of the Ministry of Commerce on goods export from the Kingdom since 1974. These cover lists of wildlife, carcasses, 400 types of aquarium fish, and 258 types of other aquatic animals that require permission prior to being exported from Thailand, following the criteria, methodology and conditions set by ministerial regulations.</p> |
| National Environmental Quality Conservation and Protection, 1992 | <p>This Act provides the authority to the Minister of Science, Technology and Environment to regulate ministerial regulations for specific vulnerable areas that contain natural ecology and to consider these as environmental protection areas that need particular management and appropriate protection, depending on conditions in the concerned areas.</p> |
| Plant Species Protection Act, 1999 | <p>This provides protection to new plant species, traditional plant species (local and in general), and forest plant species. It stipulates the need for permission and benefit sharing agreements in the case of collecting, procuring, and gathering plant species or parts of plant species for the purpose of species improvement, study, experiment, and research for commercial benefits.</p> |
| Traditional Thai Medical Knowledge Enhancement and Protection Act, 1999 | <p>This Act covers the protection of plant, animal, bacteria, and herbal sources. Protection is of two types: The first type, following Article 57, determines that protection of herbs and herbal sources in protected areas shall develop a “herb protection management plan”. The second type, following Article 61, determines that protection of herbs in areas that have not yet been declared as protected area shall promulgate “ministerial regulations to determine those areas as herbal protection areas”</p> |
| Thailand National Biodiversity Strategy | <p>Although Thailand is a Party to the Convention on Biological Diversity and the Royal Thai Government strives to comply with the CBD's obligations, in particular, by preparing and implementing a National Biodiversity Strategy, in accordance with Article 6 of the Convention "General Measures for Conservation and Sustainable Use".</p> |

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| Environmental Impact Assessment | This Act is used to forecasting the environmental consequences both negative and positive impact of project activities prior the implementation decision. Although an assessment may lead to difficult economic decisions and political and social concerns, environmental impact assessments protect the environment. EIA in Thailand is to prevent environmental problems from major development by providing a sound basis for effective and sustainable development. |
| Industrial Acts | The Act is to empower the Government to take necessary steps for the development of industries; to regulate the pattern and direction of industrial development; and to control the activities, performance and results of industrial undertakings in the public interest. The Petroleum Act (B.E. 2514) shall have effect on any conduct of petroleum operations undertaken anywhere in Thailand. The Minister of National Development shall have the care and charge of this Act and shall have the power to appoint competent officers and to issue the Ministerial Regulations. |
| Factory Operating Permit of Department of Industry | Natural Gas Industry operation shall have to obtain a license from the Government. The Energy Industry Act (B.E. 2550) conjoined with Section 41, 42 and 43 of the Constitution of the Royal Kingdom of Thailand shall force the industry to comply with engineering standards and shall ensure safety pursuant to the regulations prescribed by the Energy Regulatory Commission. |
| ISO 14001 | This Act is intended to provide the elements of an Environmental Management System for achieving environmental and economic goals. The scope covers the environmental legislative requirements for a company, as well as provides information about significant environmental impacts and environmental aspects which the organization can control and the continuous improvement of an organisation's environmental performance. |

References to other PTT Standards and Guidelines The following table outlines the PTT Guidelines and Standards Relevant to biodiversity management at the asset:

| PTT Guideline | Purpose |
|---|---|
| Biodiversity and Ecosystem Service Manual | This Manual is to provide practical steps to assist the PTT PLC to meet the requirements of the Biodiversity Policy and direct associated procedures for biodiversity management contained in the Biodiversity Ecosystem Service Management Guidelines. The Manual is designed to apply to all PTT assets including new projects. |
| Biodiversity Statement | PTT Group is committed to integrating biodiversity considerations into PTT business decision process in order to avoid and minimize risks and impacts to sensitive biological values. Biodiversity is a part of PTT Group's due diligence in supporting sustainable development in economic, environmental, and social aspects. |
| Biodiversity Risk Assessment Guidelines | The Guideline provides high level desktop approach to determine the relative biodiversity risk for assets. Two core indicators (EN11 and EN12) are designed to build capacity and understanding of the potential significant impacts risk posed to biodiversity from PTT's assets. The approach is assist PTT to gain a greater understanding of the potential risk to biodiversity and enable better planning to reduce the potential risk to biodiversity values in the future. |
| Biodiversity Action Plan Guideline | Each PTT asset must comply with all applicable laws and other legal requirements in the country of operation and provide proof of such compliance as required. These guideline is to provide procedures and practical steps to assist PTT Group to archive the biodiversity management requirements in order to avoid and minimize risks and impacts to sensitive biological values. |
| Plant Procedure and Work Instruction | QSHEP-GSP-21-401: Emergency Response and Preparedness Plan QSHEP-GSP-15-403: Chemical in Storage and Spill Control Management Plan QSHEP- GSP-13-401: Communication and Public Relations (Khanom GSP) QSHEP- GSP-09-403: Finding, Assessment, and Prioritizing the Environmental Aspects (Khanom GSP) QSHEI-GSP-19-401-660: General Emergency Control Procedure |

Biodiversity Baseline Data No specific Biodiversity Baseline Data has been collected for the Khanom Gas separation plant. The information below is general information on the biodiversity values of areas surrounding the Gas Separation Plant. This information does not mean that the habitats and species are found within the boundaries of the plant.

Habitat Information

The following general information is available for the vicinity.

- WWF Wildfinder has identified that the Tenasserim-South Thailand Semi-Evergreen Rain Forests [IM0163] Ecoregion is located in the vicinity of the Khanom Gas Separation Plant.
- The ecoregion covers the transition zone from continental dry evergreen forests common in the north to semi-evergreen rain forests to the south. As a consequence, this ecoregion contains some of the highest diversity of both bird and mammal species found in the Indo-Pacific region. This ecoregion encompasses the mountainous, semi-evergreen rain forests of the southern portion of the Tenasserim Range, which separates Thailand and Myanmar, and the numerous small ranges of peninsular Thailand. This ecoregion also includes the extensive lowland plains that lie between the peninsular mountains and until recent decades supported extensive lowland forest.
- This ecoregion contains one of the most intact vertebrate faunas of Indochina, including one of the richest mammal assemblages in Asia. The fauna is also distinctive, with characteristics of the islands of the Malay Archipelago as well as the mountains of China and India. The relatively intact and contiguous hill and montane habitat has potential to conserve large landscapes that will provide adequate habitat to maintain a viable populations of Asia's largest carnivore, the tiger (*Panthera tigris*), and the Asian elephant (*Elephas maximus*). This ecoregion lies within a high-priority (Level I) TCU

Species found within the vicinity of the plant

The following species have been identified through survey (on 2016) as being within the vicinity of the Plant:

| Species | Status (IUCN or Thai Law listing) |
|--|-----------------------------------|
| Sumatran serow (<i>Capricornis sumatraensis</i>) | VU |
| Chestnut-bellied Malkoha (<i>Phaenicophaeus sumatranus</i>) | NT |
| Red-throated Barbet (<i>Psilopogon mystacophanos</i>) | NT |
| Black giant squirrel (<i>Ratufa bicolor</i>) | NT |
| Spectacled Leaf Monkey (<i>Trachypithecus obscurus</i>) | NT |
| Listed under The PTT Biodiversity Species Database Surveying Project on 2016 | |

