STAR PROJECT

ESIA REPORT

NON-TECHNICAL SUMMARY

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1.0 INTRODUCTION

STAR Rafineri A.Ş. (STAR), formerly known as SOCAR&TURCAS Rafineri A.Ş. (STRAŞ), is planning to build an oil refinery named Aegean Refinery ("STAR", "the Project") with the capacity of processing 10 million tons crude oil per year in Aliağa Town of İzmir Province, on the Aegean coast of Turkey.

The proposed Project Site is located at an industrial district and on the land of Petkim Petrokimya Holding A.Ş. (majority shares owned by a separate subsidiary of STAR). The Project Site is adjacent to the present Petkim Petrochemicals Complex and Tüpraş İzmir Petroleum Refinery.

STAR Refinery Marine Terminal is planned to be constructed and operated in the scope of STAR Project. The marine terminal will allow unloading (import) of crude oil and loading (export) of multiple products including LPG, jet, diesel, reformate, sulphur and xylenes. Considering variability of the products, multiple jetties are required in the terminal.

At present, four separate jetties are planned. Each of the jetties will allow double sided berthing of tankers. While three jetties will be for liquid handling, one jetty will be for bulk cargo EIA to bankable ESIA in compliance with IFC requirements. The local EIA included Phase I(Jetty I and Jetty II) STAR Refinery Marine Terminal and was completed in accordance with Turkish Legislation. The marine terminal impact assessment as part of the current ESIA considered Phase I (Jetty I and Jetty II) and Phase II (Jetty III and Jetty IV).

The complete ESIA study was to be based on the studies conducted during the Local EIAs, but upgraded along with the requirements of International Financing Agencies, particularly requirements of Equator Principles, EU legislation and IFC.

The preparation of the ESIA package for the refinery and the jetty extension has been started in accordance with then available IFC standards of 2006. Reference has been made in this ESIA package to 2012 version of IFC standards. Extensions and additions to ESIA documentation have been prepared to ensure the full compliance with the IFC 2012 amendments and additions to the performance standards:

2.0 PROJECT DESCRIPTION

2.1 Overview

Primary goals of the Project are summarized below:

- To ensure the continuity of supply for Petkim Petrochemical Complex by meeting the raw material demand in an economic and reliable manner;
- To produce middle distillate fuels (Ultra Low Sulfur Diesel and Jet Fuel) for the domestic market which is currently experiencing a vast amount of supply deficiencies;
- To create additional synergy by establishing Refinery - Petrochemicals integration;
- To add value for national economy through production, trading, employment, logistics, etc.; and

  To contribute reduction of the foreign trade deficit of the country.

Main products of the STAR Project are Naphtha, LPG and Mixed Xylenes that would meet the raw material needs of Petkim and the products Ultra Low Sulfur Diesel (ULSD), Jet Fuel/Kerosene, Petroleum Coke and elementary Sulfur that would be introduced to both domestic and international markets.

Petkim's existing water facilities will be used to provide service and support for the STAR Project. The capacity of these facilities will be increased where necessary.

The Project was designed with the state-of-the-art processing technology that is economically viable and environmentally sustainable. Environmental protection, reliability and process safety by the Project design, and social welfare and participation in construction and operation stages will be incorporated. Equipment will be selected to meet internationally acknowledged design codes and standards, and quality safety features will be included in all aspects of the Project operations.

The Project Site has been mapped out within the confines of the existing Petkim process area and tank farms. Petkim's existing raw material (Naphtha) and fuel oil tanks presently at the Project Site will be demolished by STAR Project.

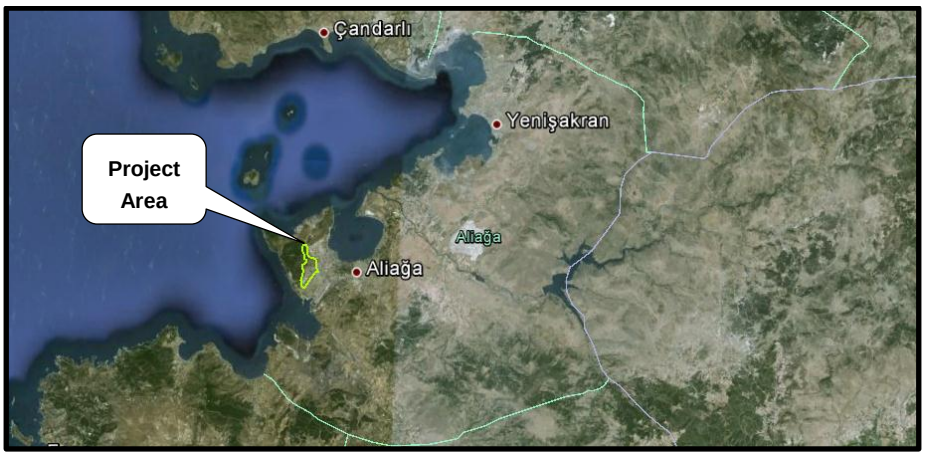
Moreover, Petkim plans to shut down Platformer and Tatoray units of its Aromatics complex as STAR starts to provide feedstock (Mixed Xylenes) to the Aromatics. Both of these technologically obsolete units create significant barriers for sustainable operations of the entire Aromatics production. In addition to provision of reliable and economics feedstock from STAR to the Aromatics, demolishment of these units will spare space for future expansions of the complex through state-of-the art technologies, and will further boost the performance of the entire complex. The existing emissions from these units are quite critical for human health and flora and fauna in the region.

Shut down of these units will result in a considerable reduction in VOC and CO2 emissions with the replacement of the state-of-the art technologies in STAR. Vapour Recovery Unit (VRU) will be installed for the recovery of volatile organic compound emissions generated by ship loading in STAR Refinery.

It is predicted that Detailed Engineering/Procurement/Construction (EPC) period including commissioning and start-up activities for the Project will be 3.5-4 years. Operating period of the Project is expected to be 49 years. This period of service life can be extended by maintenance and renewal.

2.2. Project Location and Regional Characteristics

The Project Site is located at Aliağa Peninsula that is surrounded by Aliağa Town at east, Aegean Sea at west, Nemrut Bay at south and Aliağa Bay at north. The Peninsula hosts Petkim facilities, Tüpraş İzmir Refinery, a number of deep sea port facilities, jetties, oil terminals and ship breaking facilities. The Projects Site is bordered by the Petkim facilities at east and south, and Tüpraş İzmir Refinery at east and north. Several ship breaking facilities exist at the northwest of the Peninsula. Aliağa Town center is located at some 5 km to the east of the Project Site.



The land at which the Project Site is located is an industrial zone as per the 1/5,000 scaled regulatory development plan approved by the Ministry of Public Works and Settlement on September 18, 1985. It is located outside of forestland according to Izmir Provincial Directorate of Urbanization. Having Aliağa Town at 5 km to the east, the closest settlements to the Project Site are Petkim and Tüpraş lodgements at ~2.5 km southeast and east, respectively. A number of summer houses and beaches are located to the north of Aliağa Town and Aliağa Bay, and far south to the Project Site at southern coasts of Çandarlı Gulf, close to New Foça Town.

As in the case in many sites in the Aegean Region of Turkey, Aliağa has been settled since ancient times. Kyme antique site of 3rd degree protection is located at ~5 km southeast to the Project Site. No environmentally protected area exists in the vicinity. The total project area is 210 ha.

2.3. Utilities and Services

STAR refinery will be fed from National Grid (TEİAŞ) by means of two 154 kV feeders.

3.0 OBJECTIVES AND COMPONENTS OF THE ESIA

An ESIA evaluates a project's potential environmental risks and impacts in its area of influence; examines project alternatives; identifies ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts; and includes the process of mitigating and managing adverse environmental impacts throughout project implementation.

ESIA takes into account the natural environment (air, water, and land); human health and safety; and social aspects (involuntary resettlement, indigenous peoples and cultural property); ESIA considers natural and social aspects in an integrated way.

It also takes into account the variations in project and country conditions; the findings of country environmental studies; national environmental action plans; the country's overall policy framework and national legislation; the project sponsor's capabilities related to the environment and social aspects, and obligations of the country, pertaining to project activities, under relevant international environmental treaties and agreements.

This ESIA for STAR Project is guided by both Turkish environmental and social laws and regulations, and international standards such as Equator Principles, EU legislation and IFC Performance Standards and EHS Guidelines relevant to the Project. IFC Performance Standard 1 (IFC 2012) lists overall objectives for an ESIA, including:

- To identify and evaluate environmental and social risks and impacts of the project.
- To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize and, where residual impacts remain, compensate/offset for risks and impacts to workers, Affected Communities, and the environment.
- To promote improved environmental and social performance of clients through the effective use of management systems.
- To ensure that grievances from Affected Communities and external communications from other stakeholders are responded to and managed appropriately.
- To promote and provide means for adequate engagement with Affected Communities throughout the project cycle on issues that could potentially affect them and to ensure that relevant environmental and social information is disclosed and disseminated.
- A Conformance Table to Equator Principles, EU legislation and IFC Standards for this ESIA is provided as an Annex to this Executive Summary.

Main components of the assessment include:

- the potential environmental and social impacts of the Project throughout the full development cycle – construction, operation, closure and post-closure;
- a stakeholder engagement plan to ensure that local communities and other key stakeholders are informed of the Project and have an opportunity to express their opinions concerning the Project;
- proposed mitigation activities to minimize adverse environmental impacts;
- the nature and significance of residual impacts (those adverse impacts that occur after mitigation has been applied) and ongoing monitoring and environmental management plans to address these;
- an assessment of cumulative impacts;
- a closure plan to ensure that proper reclamation and rehabilitation of the site occurs after STAR ceases operation; and
- a social management plan to maximize benefits to the local community and promote a sustainable economy.

4.0 ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT METHODOLOGY

4.1. Utilized Information and Additional Investigations

The ESIA used the baseline information and calculations / modeling results of the Local EIAs prepared for Turkish legislation.

Impact assessment was performed for key issues for each ESIA component (discipline). The common impact assessment methodology consists of five main steps:

1. identification of Project activities that could contribute to environmental or social change;
2. evaluation of the potential effects;
3. description of mitigations for potential effects;
4. analysis and characterization of residual effects; and
5. as necessary, identification of monitoring to evaluate and track performance.

The impact assessment criteria has been developed separately for each discipline. The assessment criteria in general are:

- Type of impact (positive – negative)
- Magnitude of the impact (negligible – low – medium – high; different definitions for each discipline)
- Geographical distribution of the impact (local / Project Site) - regional / Aliağa – larger than regional)
- Duration of the impact (short term / construction phase – mid term / operation phase – long term / post-operation)
- Reversibility of the impact (yes or no)
- Frequency of the impact (low – medium – high; different definitions for each discipline)

The ESIA used the following tools and procedures to analyse and address potential effects:

- quantitative and qualitative information on the existing baseline environmental and socioeconomic conditions;
- predictive tools (calculations, models) and methods to quantitatively and qualitatively describe future environmental and socioeconomic conditions;
- quantitative and qualitative evaluation of the environmental consequence of potential effects, including reference to management objectives, baseline conditions and the views of the proponent and stakeholders; and
- characterization of potential residual effects after mitigation and their consequences for people and the environment.

5.0 ANALYSIS OF PROJECT ALTERNATIVES

5.1. Evaluation of the Site and Technology Alternatives

The analysis of project alternatives that was initially done for STAR focused on technology alternatives plus site selection.

5.2. Site Selection

Several conceptual criteria were identified during the site selection studies for the Project. The main criteria for site selection are as follows: Proximity to Petkim facilities; opportunity of connecting to utilities and services through Petkim; land ownership status; land use status; economic feasibility; environmental characteristics of the site (ambient air quality, etc.); topographic, geologic and seismic characteristics of the site; and accessibility to transportation facilities.

The following requirements were considered for selection of the Project site.

- Reliable and economic supply of raw material to Petkim.
- Availability of required infrastructures including energy, water, and port.
- Transfer of several by-products s to Petkim.
- The advantageous location of Aliağa County in terms of its proximity to the major consumption regions of Turkey and Europe, since some portion of the products is anticipated to be exported to MED Market.

As a number of utilities and services will be supplied by the nearby Petkim facilities, no additional analysis of alternatives was conducted. Presence of land, power generation, port facilities and liquid and solid waste disposal plants make the selected site's location unique for Sponsors whose ultimate objective is providing reliable and economic feedstock to Petkim.

5.3. Technology Selection

Refinery configuration and unit processes were selected based on the criteria specified as follows: Maximum naphtha and petrochemical feedstock production; Maximum middle distillates (jet fuel/diesel) production; No gasoline production; and no fuel oil production.

The primary design requirement of STAR is achieving the maximum middle distillates production after processing vacuum gas oil in the Hydrocracker unit (HCU). A Continuous Catalytic Reformer (CCR) was included in the analysis so as to maximize the petrochemical feedstock production. Fluidized Bed Catalytic Cracking (FCC) unit option was excluded from the analysis of alternatives due to the minimum gasoline requirement.

The following alternative technologies were evaluated for upgrading of the bottom residue to more valuable white products: Visbreaking; Solvent Deasphalting; Delayed Cooking; and Residue Hydrocracking.

Each alternative configuration with abovementioned technologies was evaluated with a linear programming model and assessed by using different types of crude oil and product price projections. In conclusion, the Hydrocracking and Delayed Coking technologies along with a high severity Continuous Catalytic Reformer have been selected amongst the other alternatives because such configuration offers the shortest payback period and the petrochemical feedstock/middle distillates maximization supports the strategy of fuel oil and gasoline minimization.

5.4. No Project Alternative

If the Project is not developed, both the positive and negative impacts of the Project will be eliminated. The positive local, regional and national economic effects of the Project will occur over a long period of 49 years (construction and operations), with the potential to extend benefits past that time due to plant improvements. Planning has emphasized integration of the Project with Petkim's adjacent petrochemical complex, with mutual benefits for both companies through exploiting economies of scale and scope.

In addition, the Project has committed to involvement in future regional environmental monitoring and consultation to ensure that cumulative effects from industry in the Aliağa region are understood and enable the Project to apply necessary mitigations during all phases of the Project life cycle.

STAR believes that successful implementation of environmental and social mitigations and monitoring listed in this ESIA will result in a net positive outcome from the Project (See The Cost-Benefit Analysis for more details).

6.0 STAKEHOLDER ENGAGEMENT

The first round public hearing meetings for Aegean Refinery and Star Marine Terminal (as part of Petkim Port Extension) were held during the local EIA process following the submission of the EIA Application Reports for individual EIA processes of The Refinery and the Terminal to MoEU and formation of an EIA Committee by the Ministry.

In addition, two separate second round public hearing meetings sessions were organized for Aegean Refinery and STAR Marine Terminal projects in order to satisfy Equator Principles, EU legislation and IFC Performance Standards.

Public announcements were made on a nation-wide published newspaper as well as a local newspaper a week before the meeting dates. Official invitations were sent to Governmental Authorities and related stakeholders.

Full EIA Report was published at the former MoEF and MoEU web site before finalization of each local EIA Report and development consent, along with the requirements of EIA Regulation.

7.0 IMPACT ASSESSMENT RESULTS

7.1. Physical Components

7.1.1. Geology and Topography

The elevation of the Refinery Project Site varies between 15 m and 80 m above sea level and the average level of the site is 50 m. Altitude of the Project Site rises from the sea to the south and from the adjacent Petkim facility area to the east-southeast. The Project Site is located on young volcanics observed at local sites of the Aegean coastline and located at the 1st Degree Earthquake Zone with the highest earthquake risk.

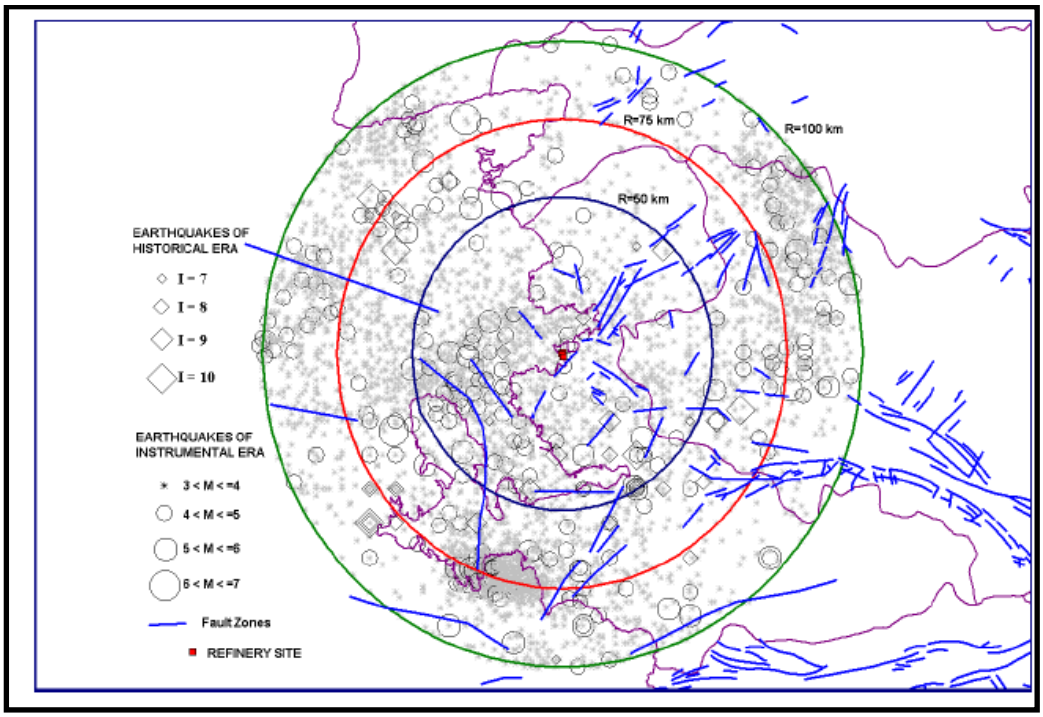
There exists İzmir flysh which is created from intercalation of recrystallized, limestone blocked schist and meta-sandstone at the lowermost part in region. Yellowish, beige colored Soma Formation consists of sandstone, siltstone, clayey limestone and fine limestone. Tuffite and different type of volcanoclastiks that show volcanosedimanter character are placed at the uppermost level in this formation.

Aliağa volcanites exist over the Soma formation by angular unconformity. In middle Miocene, andesite lavas interfingered pyroclastiks which is called Aliağa pyroclastiks are created. Although Aliağa pyroclastik has acidic tuff, weathered tuff, pyroclastik rock and altered pyroclastik rock in explosive phase, it has volcanites coming from lava flow such as pyroxene andesite and perlite in extrusive phase.

7.1.2. Natural Hazards

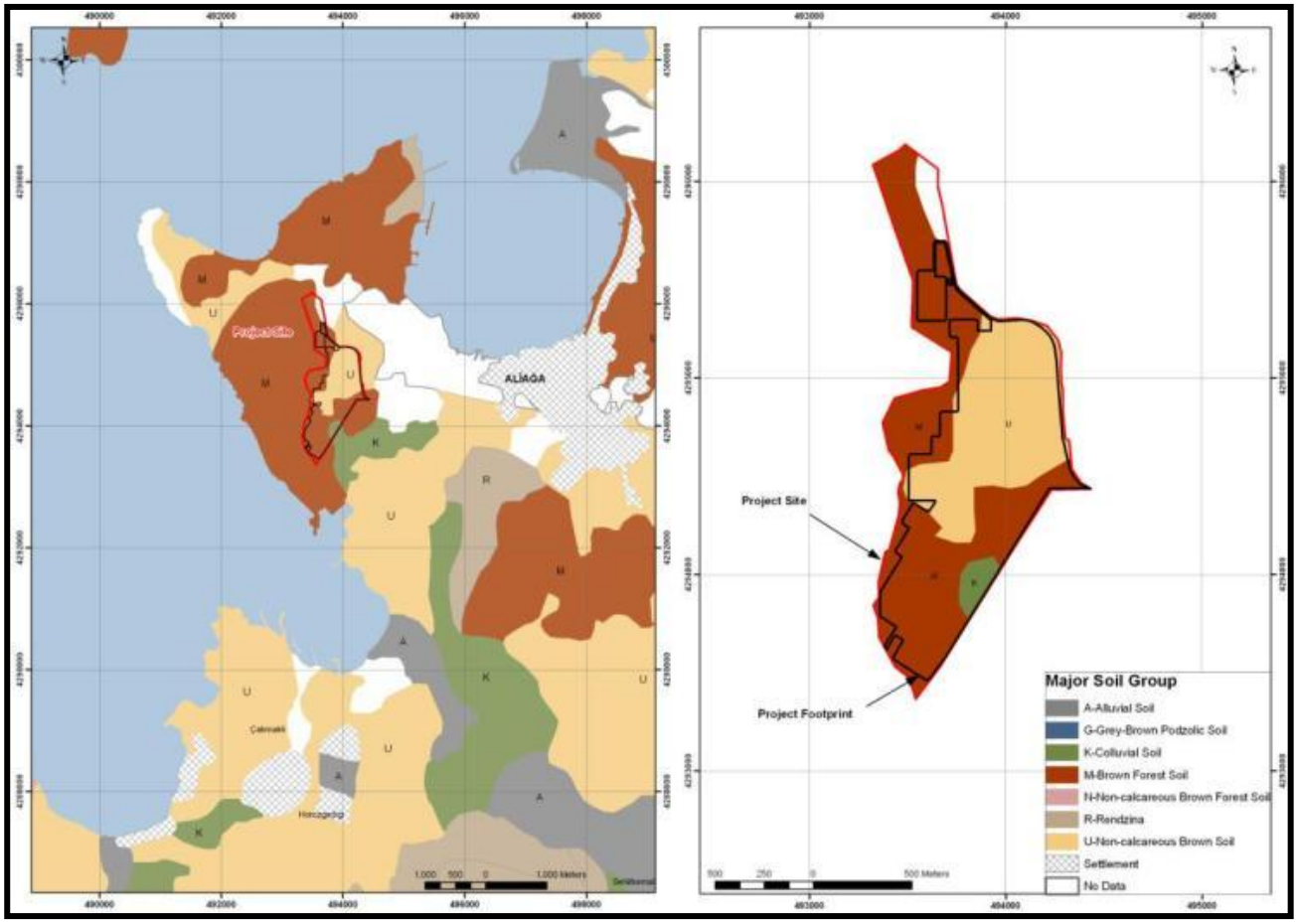
For the purposes of this ESIA, the focus of the assessment of risks form natural hazards was on potential impacts to the environment and public safety. The area of focus is the immediate vicinity of the Project Site. However, data from a much wider area were used to assess natural risks associated with seismic events. The Project Site is located within a first-degree seismic zone and is shown on the active fault map of Turkey. A seismic hazard study was performed previously to examine the seismicity status of the Project Site.

There are not any permanent streams in or close to the Project Site, whereas very low flow drainage systems may occur falling from the hill on north side of the Project Site. These drainage systems can be observed during excessive precipitation and during short-term flows after melting snow occurs. However the low flows from these drainage systems will not cause flood events. As the Project is located uphill from the sea level there is no risk of sea flooding.



7.1.3. Soils

Overall Project Site is identified as industrial land in the Regional Development Plan. Three major soil groups were identified in the soils Local Study Area (LSA). The largest soil group is “brown forest soils” that is observed at southeast, south and west of the LSA. Another large soil group is “non-calcareous brown soil that is observed at eastern and central parts of the LSA where the majority of the Project Footprint is located. A smaller area at southeast of the LSA is “colluvial soils” group. Three classes of land use capabilities were identified in the LSA. The majority of the soils are class VI that is not suitable for agriculture. The second class is class IV that is suitable only for a few crops with special processes. The smallest is class I that is suitable for agriculture. For more than half of the LSA no data is provided in the source maps.



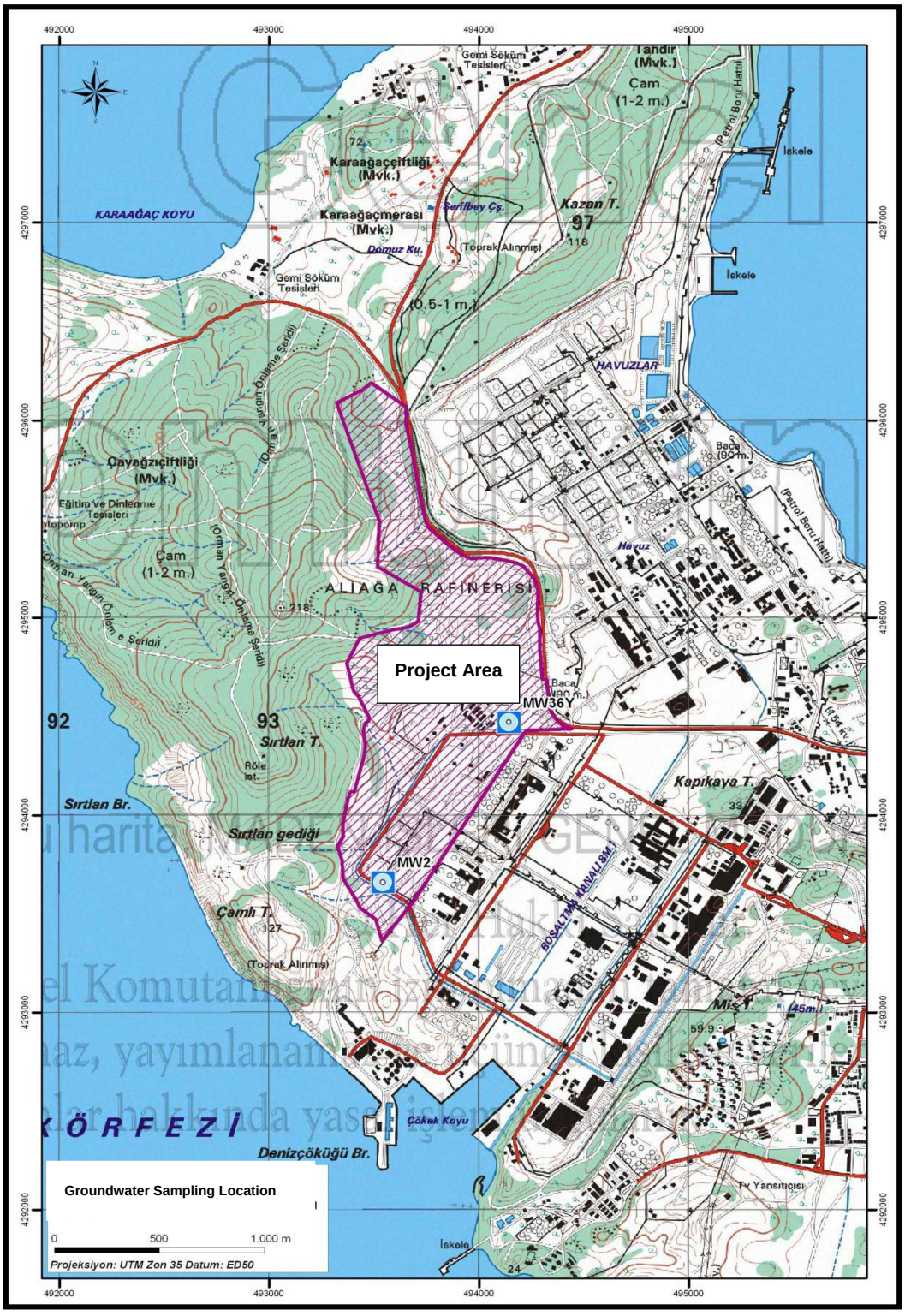
7.1.4. Hydrogeology and Groundwater Quality

The LSA for hydrogeology and groundwater quality comprises the Project Site. Relevant hydrogeology and groundwater data were also obtained for a wider area to put the LSA information in perspective. In the Geological-Geotechnical Survey Report, groundwater level was measured by boreholes and it was noticed that ground water levels varied between 3.50 m. and 6.20 m.

Considering the soil profile and water levels, it was decided that there is no static water level in the research area. However, it should be considered that measured groundwater levels might be affected owing to boring circulation water. To determine the existing groundwater quality and levels of potential existing contamination in the LSA, groundwater samples were taken in April 2009 from two separate monitoring wells located up-gradient and down-gradient of existing naphtha tanks. Groundwater samples are included in class 3 groundwater which is low quality that can be used only through a proper advanced treatment with respect to Turkish standards. In one of the samples Arsenic and in the other Xylene, Chrome and Arsenic values exceeded optimum limits. However, it is believed that arsenic can naturally be found in the groundwater.

Arsenic and Chromium do exist naturally in soil and groundwater in parts of Turkey as a result of the alteration process near the surface of volcanic rock of the rocks. This is predominantly the case in Anatolia.

Xylene does not occur naturally. The concentration observed should be linked to an accidental release of petroleum hydrocarbons to the environment. The concentration observed could be linked to refinery activities.



7.1.5. Hydrology and Surface Water Quality

The study area for hydrology and surface water quality covers the Project Site and immediate surroundings. No stream or any other surface water body exists in the Aliağa Peninsula and in the Study Area. The closest stream is Güzelhisar Creek, which is approximately 15 km away. The only ephemeral surface waters in the Study Area are small natural drainages from the hills to the west of the Petkim Property, where naphtha storage tanks are located. The naphtha tanks area is within the Project Site and the tanks will be demolished for the Refinery. These drainage beds are dry in dry season and they transmit some amount of water in fall season and during heavy rainfall and snow melt periods. Discharges of the drainages adjacent to Petkim property have been diverted to Petkim interception channels that discharge to the sea. Flood risk of these small drainages is considered under Natural Hazards.

There is no freshwater surface water body in the Study Area and the few potential drainage lines are already linked to Petkim's water management ditches. Erosion control measures during construction are described in Soils section. Potential impacts to the marine environment during construction and operations are assessed in Sea Water Quality. No impacts will be generated by the Project on surface waters.

Water will be supplied by Petkim from Güzelhisar Dam as a third party service. Güzelhisar Dam is over 15 km location to the Project Site and the associated potential impacts are discussed in Cumulative Effects Assessment.

7.1.6. Sea Water Quality

The Project Site is located adjacent to the inland side of Petkim property, less than 1 km from the coast at its closest point. Treated processed waters and wastewaters of the Project will be discharged to the sea. Hence, the study area covers the Project Site and sea coasts of Petkim.

The Risk Assessment and Emergency Response Plan for Petkim Port has been completed in 2008 along with the requirements of *"Law on Principles for Emergency Response and Compensation of Losses in Pollution of Marine Environment by Petroleum and Other Hazardous Substances - No.5312"* and of *"Regulation of Implementation of the Law on Emergency Response and Compensations on Marine Pollution by Petroleum and Other Hazardous Wastes"*. In the scope of the study, environmental characteristics of the subject area have been investigated and a marine water quality analysis was conducted. It is reported that 9 samples were collected from sea water at and around Petkim Port in November 2007 and analyzed for physical, chemical and biological characteristics.

Moreover; hydrographic and oceanographic investigation and sea water oceanographic parameters measurements; sea bottom sediment analysis, sediment transportation and sand deposit model; and sea bottom sonar studies and seismic measurements were completed.

A preliminary design has been prepared for the Petkim Port extensions and an EIA Report was completed in 2010. Some additional facilities were planned after the EIA Decision and another application was done to MoEU which includes two jetties of STAR Marine Terminal. EIA Positive decision was obtained in the beginning of 2012. It is reported that 4 samples were collected from sea water for each EIA studies on March 05, 2010 and April, 05, 2011 and analyzed for physical, chemical and biological characteristics.

7.1.7. Physical-Chemical Properties of Marine Water

It is well known how physical components of any environment are strictly connected to the biological components. In the scope of assess the potential impact of the Project, three main themes have been

focused in order to recognize baseline environmental conditions and evaluate the potential impact of the construction operation that in turn can influence biological features:

- Seawater physic-chemical characteristics
- Seafloor features
- Coastal Geomorphology and Marine Currents

Data used in the present document steam from:

- The surveys carried out from 2008 to 2010 in the context of the Project studies made by local companies, local experts and Turkish Universities; and
- The bibliographic research made by Golder in 2011-2012.

It should be noted that environment inside the LSA is impacted by anthropogenic factors since the area has been an industrial zone and harbor facility for many years. The sea area interested by the Project is already disturbed by industry activities and characterized by some parameters significantly high (eg. copper, suspended solid matter, petrol and derivatives).

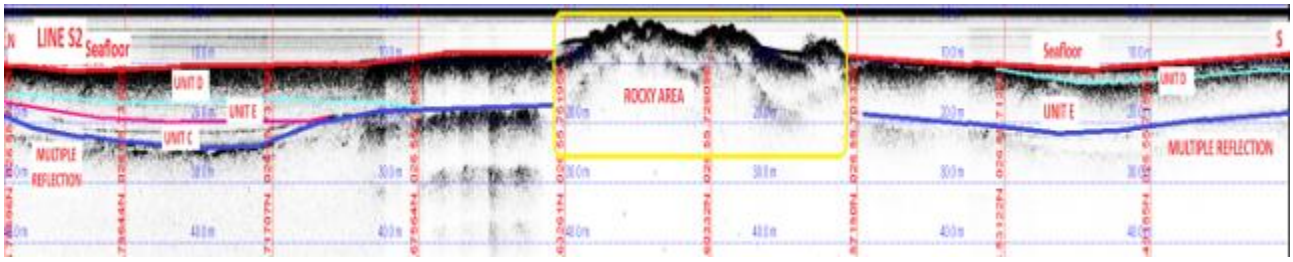
At the present status of knowledge, oceanographic conditions are quite inside the regional area averages. The experience indicates that water quality is in general conditioned by port construction activities that may influence with pollutants and turbidity the masses of water around the area, and in turns the biological components related to the oceanographic parameters. Chemical analysis and suspended sediment evidences indicate that an increment of Port activity could increase pollutants (spilling, chemical

leaking) and turbidity with secure effect on biological components. This is true especially for construction and operational phases. In any case due to the non-conservative nature of seawater (dynamic component differently than seabed) any impact will be diluted along time and space with natural flow of waters with a negative gradient far away the port area and a relative reversibility.Direct influence on temperature, salinity and density parameters can be considered negligible. Monitoring with respect to water flow, pollutants and suspended sediments will be performed especially during construction phase, taking remedial action.

7.1.8. Marine Seafloor

Seafloor is the basic physical layer on which marine biological components take place. Recognize and study this component and the equilibrium between seafloor and other phenomena linked to it, play a key role in the correct actual and future impact assessment.

Data relevant to the marine seafloor of the LSA steam mainly surveys carried out by a company specialized in environmental survey called Denar, in the context of the Project studies (DENAR a - Annex 8 to Petkim Port EIA Report and DENAR b).



The findings of this ESIA have provided information on the nature and extent of impacts on seafloor arising from the Project. With regards the geologic/morphologic structure of the seabed no effects are predicted, while for the chemical composition, grain size and texture of the seabed sediment a moderate consequence is foreseen in terms of increase in contaminations of sediments with pollutants arising from, sediment movement during the construction activities, port activity and traffic, and increasing of the finest component of the grain size composition and in turn on benthonic habitats.

Monitoring with respect to pollutants levels on sediments will be performed d during construction and operational phases, taking remedial action.

7.1.9. Costal Geomorphology and Marine Currents

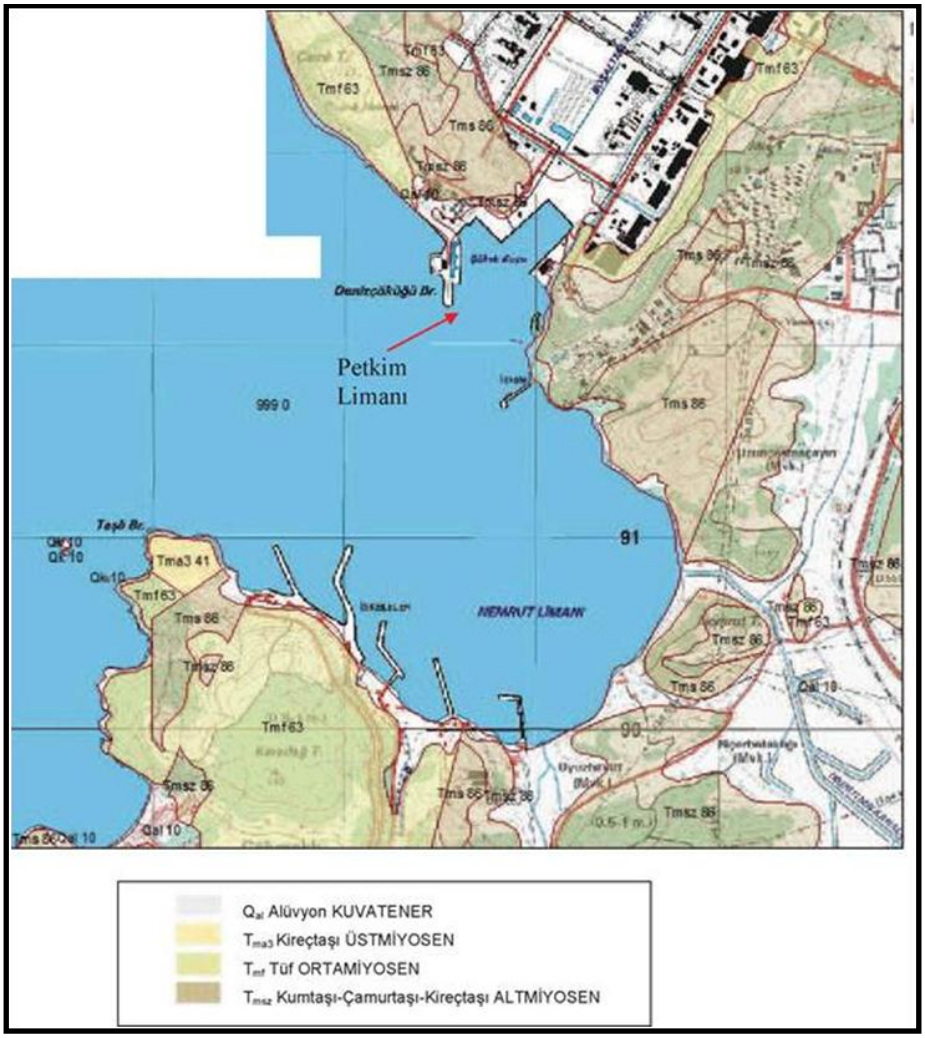
General geomorphologic description is given starting from the observation of the territory together with some scientific literature information.

Current regimes have been evaluated by ADCP (Acoustic Doppler Current Profiler) measurements in the same periods of the CTD data collection (January 2008, December 2010 and September 2010) and in the same locations (DENAR a - Annex 8 to Petkim Port EIA Report).

Sediment transportation is basically determined by the wave climate and its interaction with seabed and coast shape that form long-shore currents. Modeling has been calculated starting from a wave climate study that is derived from the wind regime (long-term records at Aliağa meteorology station). The study is been carried out by the Gazi University Marine Sciences Research and Implication Center within the Project studies (Balas, 2008). Sediment transport and sandblasting model.

Using this data, breaking heights, depths and angles of the offshore waves coming to the project area have been calculated and hence, also taking into consideration the possibilities of wave generation, the annual transport amount of solid matter according to the directions.

The findings of this ESIA have provided information on the nature and extent of impacts on current regime, Solid matter transport and coastal geomorphology arising from the Project. With regards the currents no effects are predicted, about solid matter transport a minimum consequence is foreseen in terms of localized erosion and accumulation phenomena in the port area, while at LSA the coastal morphology impact is negligible. Monitoring with respect to coastline evolution, as well as bathymetry port evolution may optimize in time construction in terms of frequency as well as in extension.



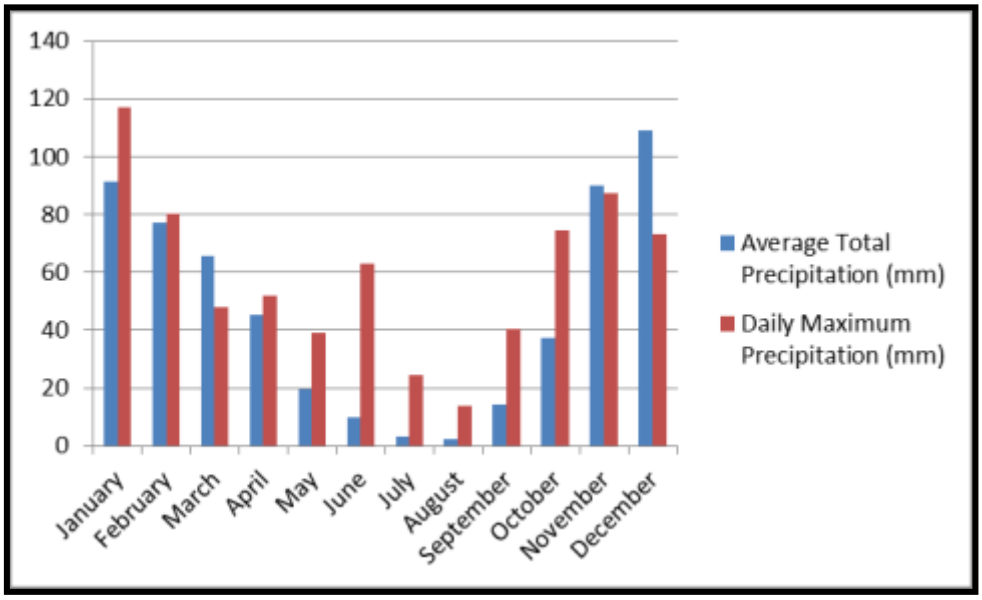
7.1.10. Climate and Meteorology

The subject area is classified as a low-precipitation area in the Mediterranean Basin. The Mediterranean climate is characterized by warm to hot, dry summers and mild to cool, wet winters. The precipitation regime in the area is central Mediterranean precipitation regime. In this type of precipitation regime, an area receives rainfall mostly in fall and winter while summer is the driest season. In the assessments,

precipitation data recorded by Dikili Meteorological Station between 1975 and 2008 was used. Annual average amount of precipitation at the area is 565.3 mm.

Maximum amount of precipitation was observed in December (108.9 mm) while minimum amount was observed in August (2.1 mm). Maximum amount of daily precipitation was recorded in January (117.0 mm).

According to measurements done by Dikili Meteorological Station between 1975 and 2008, prevailing winds within the year are east-southeast (ESE) directed (26.6%) and average wind velocity for this direction is 1.74 m/s. The strongest wind is southwest (SW) directed with 31.0 m/s and observed in November. Annual average relative humidity is 73%, and the minimum relative humidity is 2%, according to Dikili station data. Average number of snowy days is 0.12 and maximum snow depth is 4 cm and it was observed in December. Maximum foggy days are observed in October with 0.04 average days; maximum hails was recorded in January, February, November and December with 0.12 average days, maximum frosty days was observed in January with 4.1 average days and maximum amount of thunderstorm was observed in January with 1.85 average days.



Precipitation recorded at Dikili Meteorological Station (1975-2008)

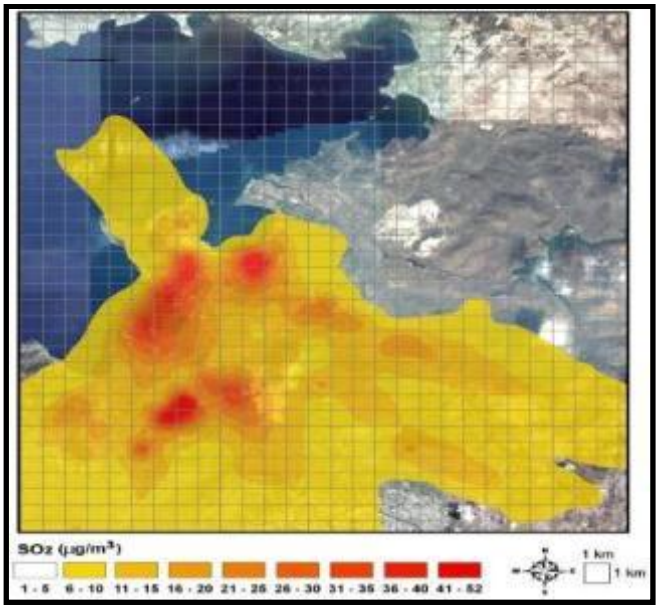
7.1.11. Air

Air impacts are one of the major potential impacts of refineries due to high emissions from power generating units, the number of thermal refining processes, and fugitive emissions from storage units, uncovered units and pipe-fittings. Although the Regulation on Industrial Air Pollution identifies a smaller study area, the Local EIA study chose a large study area to assess the potential impacts in the identified impact area as well as in the broader Aliağa Region. The study area included a 20 x 21 km area, the Project Site being at the center. In this ESIA report, the same area is used as Local Study Area so that all available data from the Local EIA can be utilized maximally. The local EIA included air quality modeling with the use of preliminary design data. In October 2012 an air quality modeling has been prepared by a consultant of STAR Refinery A.S. In the assessment of the impacts on air, the results of this air quality modeling has been used in this ESIA report.

As the present air quality in Aliağa region is affected by a number of existing industrial facilities and is at critical levels, regional monitoring and mitigation measures should be jointly employed by the industries,

as required by the Governmental Authorities and recommended by Aliağa Regional Environmental Baseline and Assimilative Capacity Determination Project. STAR Project will be a part of these monitoring studies and mitigations.

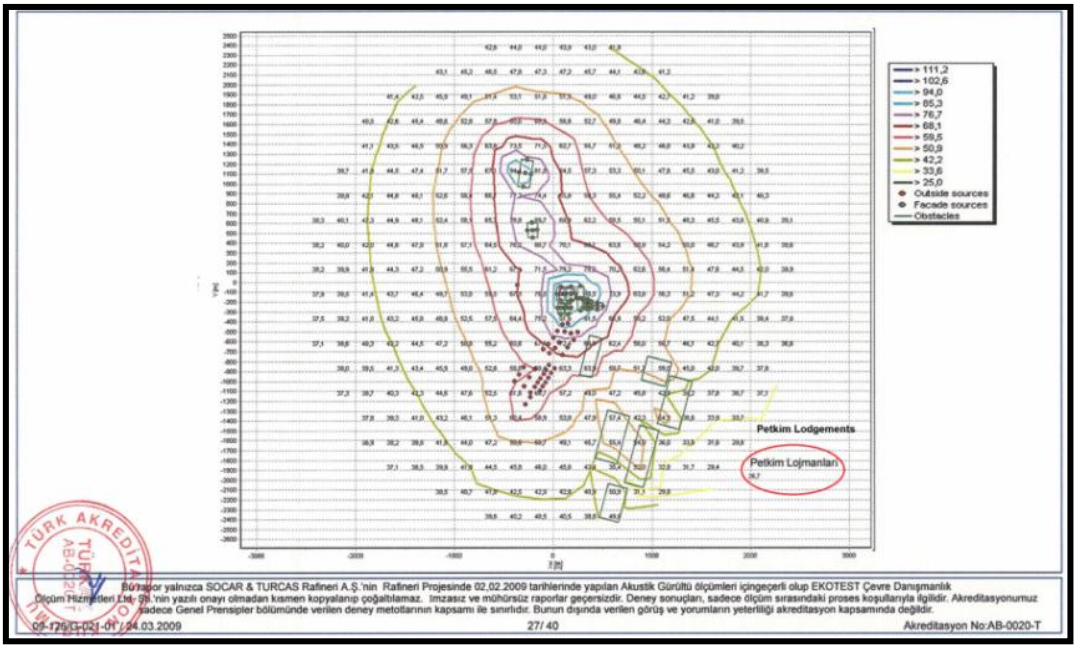
Although the incremental change due to the Project is negligible, the air quality will be periodically monitored by the Refinery at the area or any regional study will be supported.



SO_2 Contribution of Existing Facilities

7.1.12. Noise and Vibration

The closest settlements to the Project Site, where there are potential of disturbance due to noise effects, are the lodgments of Petkim located at 2.3 km to the east-southeast of the Project Site and the lodgements of Tüpraş Refinery located approximately at 2.5 km to the east of the Project Site. The Project Site is classified as a receptor within “industrial areas” in Turkish limits and within “Industrial; commercial areas” in IFC limits. Petkim lodgments are classified within the “areas where commercial buildings and noise sensitive areas are located but residential houses are densely located” in Turkish limits and within “Residential; institutional; educational areas” in IFC limits.



7.1.13. Traffic

The land traffic in the construction phase is generated by the machinery, equipment, material and staff to be transported to the Project Site. Existing roads will be used for transport outside the Project Area. The main existing access roads to be used for the Project are D550 highway, connecting Aliağa-Çanakkale and Aliağa-Izmir state highway and Necmettin Giritlioğlu Street connecting D550 highway to the Project Site. Effects on traffic along these local routes are assessed further. Both D550 and Aliağa-Izmir highways are two-lane, paved roads in good condition.

During the construction and operation period of the Project the existing roads will be used. However, the roads in the Project site will be constructed with geogrid material laid on 200 mm pebbles and will have 8.5 meter width including 2 meter bands on both sides. The double-line asphalt of 150 mm will be tarred on the geogrid material. These implementations will be carried out in coordination with the related regional offices of the Directorate General for Highways. On-site roads will be constructed within the Project area.

7.2. Biological Components

7.2.1. Terrestial Flora

The Flora LSA comprises the Project Site plus a 1 km buffer, deemed appropriate to include main impacts from air emissions. However, as noted below, additional impact assessment also occurred in the wider air quality assessment area. Field studies were centered on the LSA. As part of the Turkish EIA process in 2008, literature research and field observations took place to document habitat types and species present, or which could be expected to be present, in and nearby the Project area. A second field visit by an ecologist to the Project Site and nearby areas took place on August 18th 2010, as part of an additional biophysical scoping visit. In addition, flora studies took place in April 2010 in the Seyirtepe area, which just south of the Project Site in the LSA, as part of the Petkim Port Extension EIA. The flora species list from that study was compared to those for the Project and additional species and their listed status noted.

7.2.2. Terrestrial Fauna

Studies on fauna of the Project Site and its immediate surroundings have been supported by literature research. Potential issues associated with flora have been determined based on consultation (Volume A) and a professional review of the potential effects of refinery development on the specific conditions present in the Project area. These issues are:

- Construction of the Project will involve clearing of land areas for the refinery and other infrastructure. This clearing will result in an impact to some wildlife habitat in the short to medium term.
- The Project could directly or indirectly impact valued species, including endemic or listed (IUCN red list) species and forest resources.

7.2.3. Marine Flora and Fauna

The marine flora and fauna Local Study Area (LSA) investigated during the field work has been based with an assessment of the spatial extent of the footprint and an associated buffer that includes potential additional effects on the marine fauna. In particular, the LSA comprises the Project site plus a surface of about 4.5 km^2, which means a coastal stretch buffer of about 4.5 km extending about 1 km seawards.

In order to assess the potential broader or regional cumulative effects deriving from the Project, and to correctly assess the importance and role of the biological components living in the LSA, a Larger Geographic Area (LGA) has been analyzed as well. This larger area corresponds to a stretch of coast from the Gulf of Izmir (about 35 km south of the Project area) and the city of Dikili (about 30 km north in a crow line from the Project Area). The LGA components will be described on the basis of available literature and database.

The findings of this ESIA have provided information on the nature and extent of environmental impacts arising from the Project. With regards to the marine flora and fauna discipline a medium environmental consequence has been identified in particular due to the presence of P. oceanica in the northern sector of the LSA, which is a species protected under the Barcelona Convention and by Turkish law. Excluding the presence of Axinella genus in a small portion of the north boundary of the LSA, the assemblages inhabiting the LSA are characterized by ubiquitous and tolerant species.

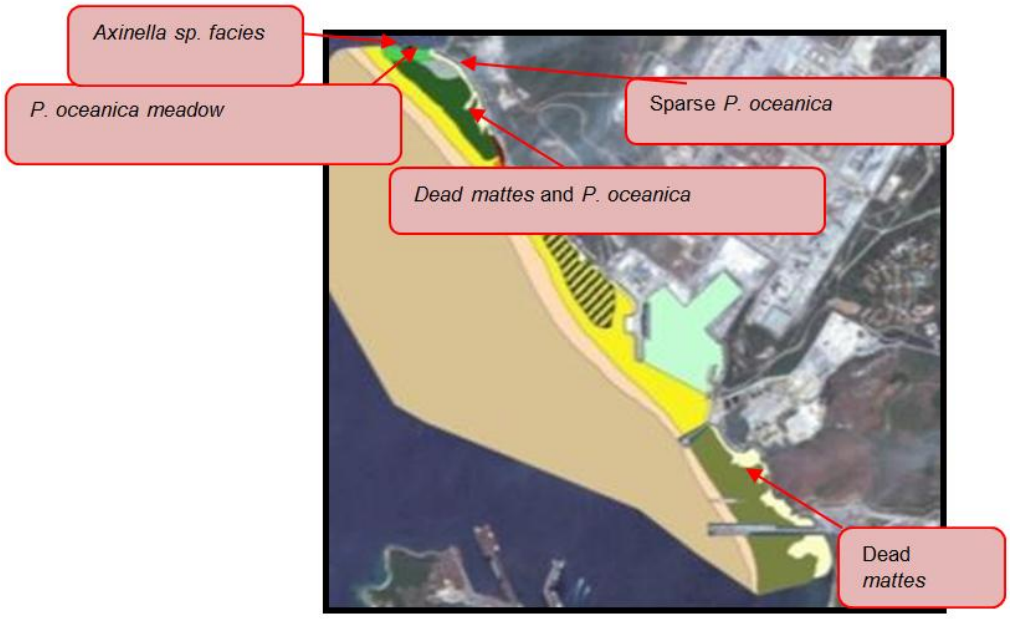
The presence of protected flag species like cetaceans, monk seal and marine turtles has been analysed and discussed in the study on the basis of available literature, database and considering/analysing the features of the study area. Impact of the Project on these species can be excluded. However, considering the presence of the Foça area (more than 20 km south to the LSA) where the presence of monk seal is reported, the Oil Spill Emergency Response Plan of the port should take into account the presence of this area and adopt necessary measure to protect it in case of incident.

The Phase 1 of the Project, which implies the building of the southern part of the wharf and of the first two jetties (jetty 1 and jetty 2), does not have direct impact on sensitive species and the environmental consequence are low and of low magnitude. The intended activity could potentially impact the marine flora and fauna negatively in particular during construction stage. After the construction, the new buildings (e.g. wharf and jetties) will presumably become a significant sheltering, feeding and nesting area for the biological life (Jensen et al., 2000) (positive impact).

With reference to Phase 1 of the Project monitoring with respect to the sedimentation regime and the posidonia meadow's status is suggested during construction and operational phases, taking remedial action if necessary, especially should any disturbance be noted on P. oceanica.

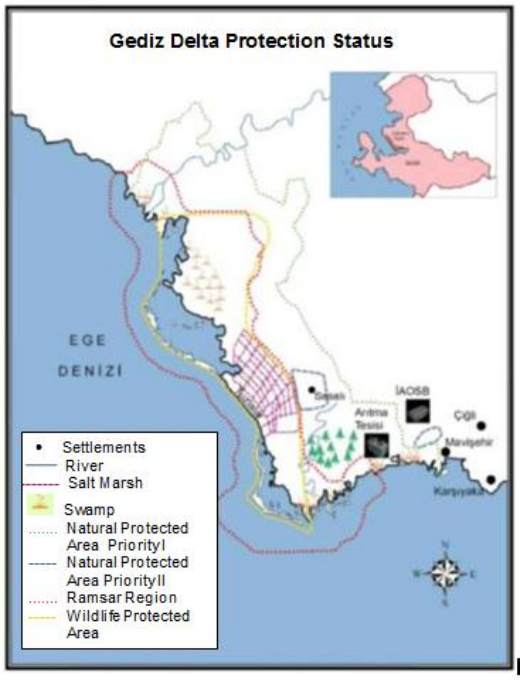
Regarding Phase 2, which implies the construction of the northern part of the wharf and of jetties number 3 and 4, in addition to the low impact already identified and discussed for the Phase 1, some additional impacts should be considered. In particular the main impact stems from the direct overlapping of jetty 4 (second scenario) and corresponding wharf with the area partially colonized by posidonia. These new infrastructures could also impact the northern part of the study area, where sensitive sponge assemblages are located. The applying of mitigation measures during the construction and the re-plantation of the posidonia rhizomes directly impacted by the building could strongly reduce the environment consequence. In any case, especially with reference to sensitive species, a medium impact must be considered applying the precautionary approach.

With reference to Phase 2 of the Project, as already described for Phase 1, monitoring with respect to the sedimentation regime and the posidonia meadow's status is suggested; in addition, if re-planting of rhizomes is carried out, special monitoring activities focused on the re-planted posidonia will be necessary.



7.2.4. Biodiversity and Protected areas (Freshwater)

With respect to protected areas, the natural parks, wetland areas, natural monuments, natural reserve areas, wildlife protection areas, areas for raising wild animal, cultural properties, natural properties, archaeological and protected areas, the areas protected under Boğaziçi law, bio-genetic reserve areas, biosphere reserves, specially protected environment areas, specially protected areas, protected areas concerning drinking and use water, tourism areas and centers, and other protected spaces their distances of these to the LSA were considered for the baseline evaluation. For biodiversity, consideration was given to see if potential impacts to biodiversity might exist, in addition to those considered separately under the ecological disciplines of flora, fauna and aquatic ecology.



For biodiversity, potential impacts to flora, fauna and aquatic ecology have been assessed individually as of negligible or low environmental consequence. The location of the Project in an industrial are means that no additional biodiversity impacts are predicted based on fragmentation of natural habitats at the landscape level. Potential linkage for impacts to biodiversity is therefore considered invalid and further impact assessment is not required.

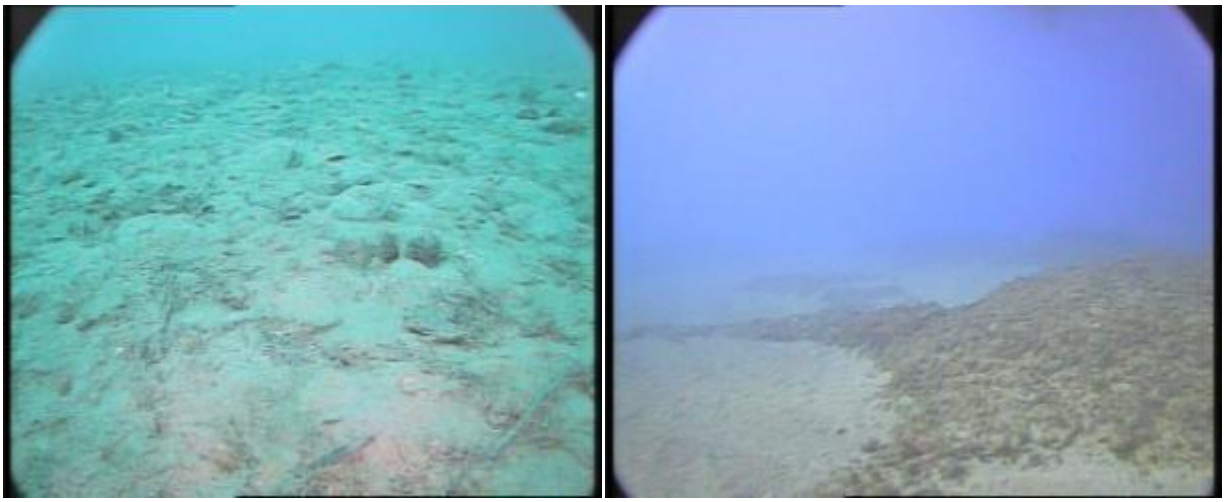
7.2.5. Marine Habitats and Biodiversity

Based on available data from previous side scan sonar surveys (Source: TRSIM Mühendislik Danışmanlık Eğitim Yazılım Sanayi ve Ticaret Limited Şirketi Izmir Province Nemrut Gulf Oceanographic, Geophysical, Geophysical and Geological Evaluations Report), the LSA sea floor seems to be mainly characterized by the presence of soft substrata with a few isolated hot spots of hard substrata.

As previously described, with the intent to determine the marine habitat and biodiversity extending over the LSA and its surrounding, a field survey was conducted from 16th to 20th January 2012, which focused, among others, on the visual inspections of seafloor features and marine biocenosis colonising the bottom.

The Project area has partially lost its natural structure because of the long years of anthropic activities, but, in particular cosmopolitan species could inhabit in this ecosystem. Thus, the effects stemming from the Project are thought not to pose big concerns for the habitats and biodiversity status: on the basis of the field surveys information collected, the observed marine flora and fauna species and the identified habitats are not regarded with a high biodiversity level.

Nevertheless posidonia and hard substrata colonized by algae and several invertebrates species in the north sector of the LSA are regarded as key biodiveristy area. The findings of this ESIA have provided information on the nature and extent of environmental impacts arising from the Project (Phase 1 and Phase 2).



Phase 1 of the Project has no direct impact on the listed sensitive habitats and associated key biodiversity area a low environmental consequence has been identified.

In any case some attentions should be paid in particular to the safeguard of P. oceanica meadow and to the hard substrata, both located in the northern sector of the LSA.

Monitoring with respect to the sedimentation regime and the posidonia meadow status (lepidochronology, phenology; balisage) and precaution in avoiding mechanical damage to the community inhabiting the hard substrata are suggested during construction and operational phases, taking remedial action when necessary.

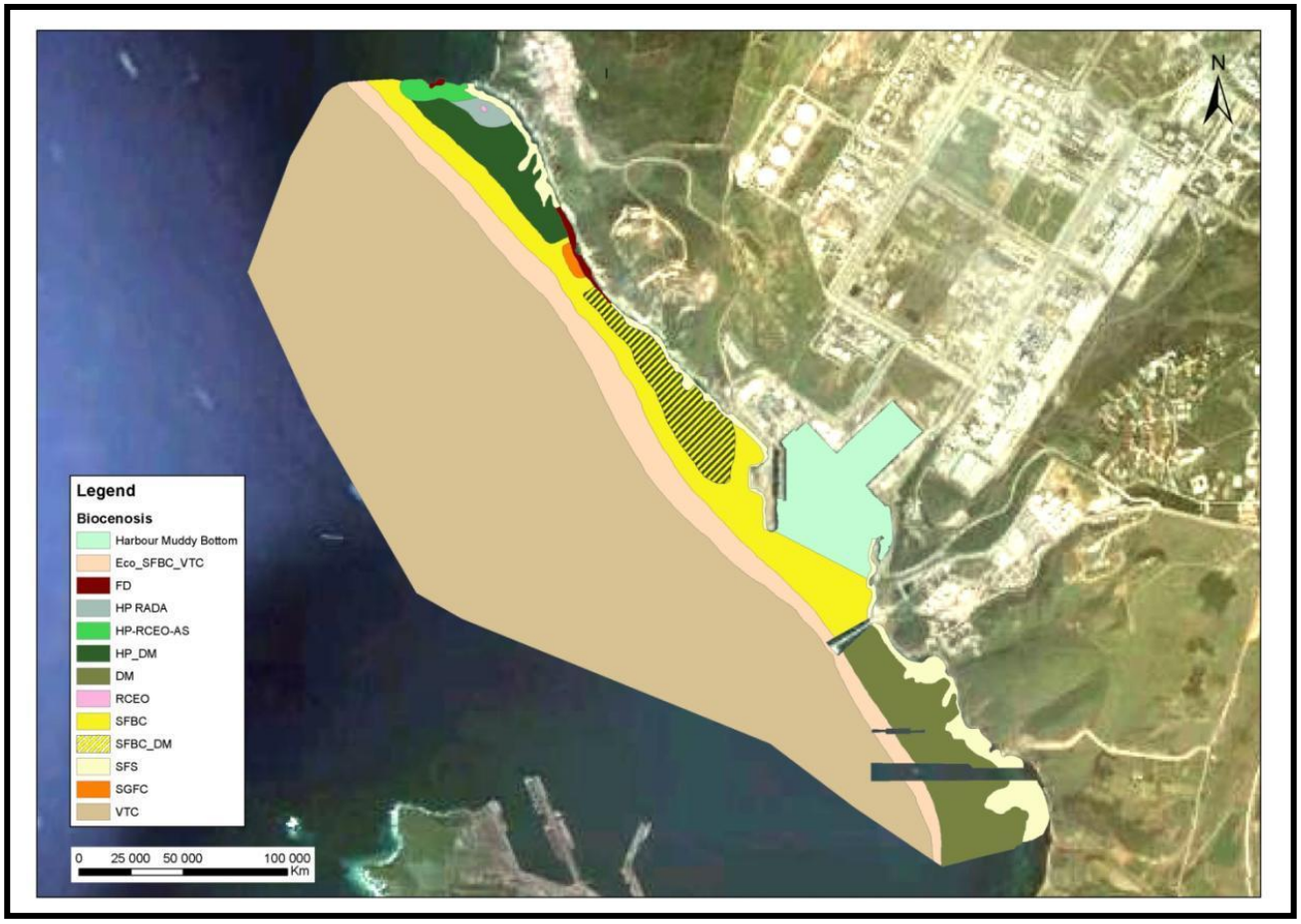
Regarding Phase 2, in addition to the low impact already identified and discussed for the Phase 1, additional impacts should be considered.

The posidonia habitats will be directly impacted by the northern part of the Phase 2 infrastructures construction (in particular jetty 4 and relevant wharf – second scenario) with a reduction in their extension. This will also lead to a subsequent impact on flora and fauna species inhabiting posidonia-related sea bottoms.

Hard substrata colonized by algae and several invertebrates species could be indirectly impacted by a sediment increase due to the building activities of Phase 2 of the Project (especially the building of jetty 4 - second scenario).

By applying mitigation measures during the construction (e.g. limiting the sediment dispersion, avoiding anchorage on posidonia, etc) and by carrying out re-plantation of posidonia rhizomes directly impacted by the building, the environment consequence could be strongly reduced on marine habitats and biodiversity.

By applying the compensation measures proposed and developed in the Biodiversity action Plan and carrying out successfully the posidonia transplantation the total environmental consequences on biodiversity are expected to be close to zero.



7.2.6. Marine and Coastal Protected Areas

With respect to marine and coastal protected areas, the baseline evaluation considered natural parks, wetland areas, natural monuments, natural reserve areas, wildlife conservation areas, specially protected environment areas, and their distances from the LSA.

The location of the Project far more than 15 km at least from marine and coastal protected areas leads to a potential linkage for impacts to be considered invalid and further impact assessment is not required.

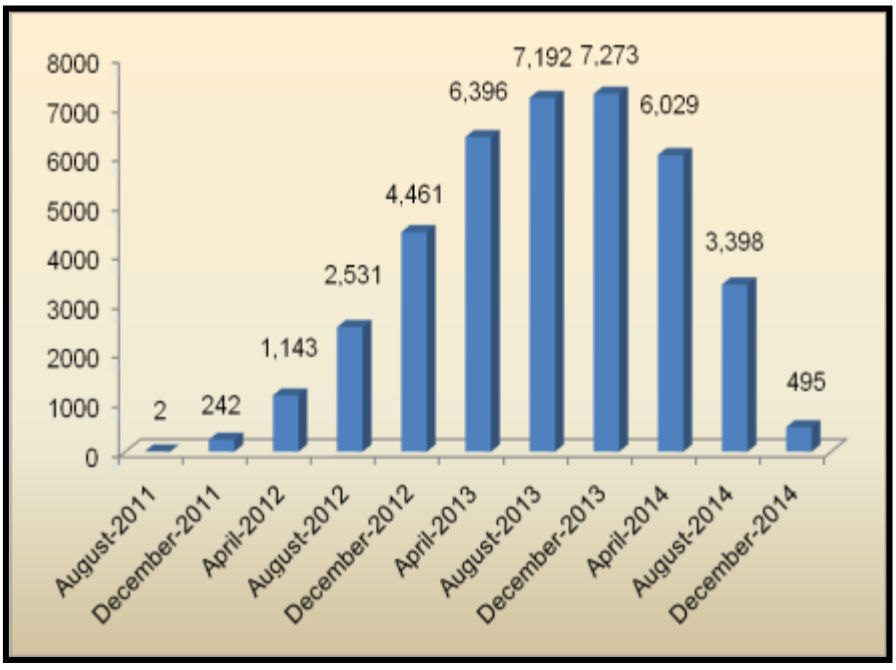
Mitigation and monitoring will not be required for potential Project impacts on marine and coastal protected areas as well.

7.3. Social Components

7.3.1. Socio-Economics

The LSA for the social impact assessment is defined as Aliağa District. The socio-economic survey is designed to collect regional socio-economic baseline information for realistically identifying the scale of potential negative and positive social impacts of the Project, as well as to collect local community's perception and potential reactions towards the Project.

Key issues for the Project are related to employment. The Project is located near existing industrial facilities so there are relatively limited new impacts due to the historical development of heavy industry in the LSA.



The estimated number of employees during construction

7.3.2. Human and Ecological Health Risk Assessment

The study area encompassed the same areas identified within the biophysical assessment which may potentially be influenced by the refinery development.

Current ambient air quality guidelines with respect to human health are being met in the areas outside of Petkim and nearby industrial sites. However, the measured present values exceed the future target limits for SO_2, PM10 and VOC. The concerns regarding air quality and health risks were a main finding of stakeholder engagement during field social survey and final consultation on this ESIA's results.

7.3.3. Archaeology and Cultural Resources

The LSA used for the archaeology and cultural resources impact assessment comprises the Project Site. However, known sites of interest were also searched for within an approximate 10 km radius. No historical or cultural resources or pieces were observed during the site visits to the Project Site.

The Aegean Region of Turkey is rich in historical and archaeological sites dated to ancient times. There exist a number of archaeological and historical sites within İzmir Province. Located at the east coast of the Nemrut Bay, approximately 8 km southeast of the Project Site, the only known archeological and cultural property in Aliağa region is Kyme antique city. Kyme is registered as a third degree archaeological site. Third degree archaeological sites are the archaeological sites on which can be allowed modifications in line with the decisions taken by authorities.

Archaeological digs are ongoing at the site. The site is made up of ten parts and some parts are now submerged under the sea. Kyme might be impacted from the project emissions during the operation phase.

7.3.4. Visual Aesthetics

During the site visit, it was observed that visual aesthetics impact will possibly not be an issue for the closest settlements to the south as the distance is over 8-10 km (summer houses near Yeni Foça). Observations were made during the Site visit and photographs were taken from Aliağa Town and Yeni Foça Town.

7.4. Cumulative Affects Assessment

For cumulative effects to occur, residual impacts from the Project need to overlap with residual impacts from other foreseeable projects. Because of this for biophysical impacts, the largest potential impact area is used for the CEA that being the air quality study area. For social disciplines, a hierarchy of areas is considered as has been done for the socio-economic impact assessment. The CEA first considers potential cumulative effects from third party project activities, then from other foreseeable projects in the study area,

7.4.1. Water Supply

It is predicted that no additional transmission line will be needed between Güzelhisar Dam and Petkim. Petkim will transfer the water to the Project Site through a new transmission line to be constructed for the Project. The transmission line will be constructed with the other infrastructure systems for the Project, hence the construction phase impacts were already considered in the scope of the Project's construction phase impacts. No additional impacts are envisaged associated with the water supply for the Project. Based on the above assessment, and considering results from the Project assessment, it is concluded that the Project impacts do not have the potential to combine with water supply impacts to produce higher levels of environmental consequence than those predicted for the Project alone. Thus no additional mitigation is required to consider potential cumulative effects.

7.4.2. Electric and Steam Supply

STAR refinery will be fed from National Grid (TEİAŞ) by means of two 154 kV feeders. There will be a boiler unit. The objective of the Boiler Feed Water Unit is to produce and distribute BFW of a quality level that is required by its specific users. The capacity of the BFWU to be defined by the bidders considering refinery consumption. Estimated design capacity of the unit is 280 t/h.

7.4.3. Jetty Activities

The operational stage of the STAR Marine Terminal Project will increase the marine traffic. Although petrochemical feedstock output of the Refinery will be sent to Petkim to be used as raw material, the excess products will be partly transported via marine line.

Potential issues associated with the construction of Terminal units and with the operation of these units are listed below:

- Construction of the Terminal will involve additional poles, docks and jetties to be constructed and will result in a disturbance for the living forms due to the physical activities, noise etc as well as changes in sea water quality.
- Increased marine traffic will involve changes in the sea water quality and will increase the amount of wastes / waste waters received from the ships.

7.5. Potential Cumulative Impacts with Other Expected Projects in the Region

7.5.1. Planned Projects in the Region

A number of new industries are planned in Aliağa region. Contribution of the Project to air pollution and associated environmental consequences will be in low levels, with the implementation of required mitigation measures. However, there is a high potential for cumulative air quality impacts to occur between the Project, its third party services and foreseeable additional projects in the Aliağa region. Rather these results emphasize the need to proceed in an integrated way with other industries, government and stakeholders, in undertaking a definitive regional long term monitoring program to describe regional baseline air quality using continuous measurement devices.

8.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM AND PLAN

8.1. Management Plan Structure

Environmental and Social Management Plan (ESMP) for the Project will be facilitated by Project-specific Environmental and Social Policies including overall principles towards environment, biodiversity, labor, health and safety, and public health issues. The ES policies and ESMP will ensure that the Project:

- complies with all applicable Turkish legislation as well as Equator Principles and relevant IFC guidelines provided in the ESIA as wells as further framework developed to date;
- implements internationally recognized best management/industry practices and best available techniques to minimize potential environmental and social impacts during the construction, operation and closure phases;
- complies with the commitments addressed in the ESIA to minimize the expected potential environmental and social impacts;
- adheres to high standards of safety and care for the protection of the employees and public;
- promotes its policies through training, supervision, regular reviews and consultation;
- maximizes the use of local and regional labor forces to the extent feasible, to maximize local socio-economic benefits;
- implements a stakeholder engagement program to engage the local community in the Project activities at all phases; and
- supports and participates to any regionally decided protection, mitigation and monitoring plans for Aliağa.

Working conditions and Terms of Employment will be applied to migrant and temporary workers including camp services

As a general principle, Project's ESMP will benefit from the environmental and social management policies, procedures, and standards implemented by existing Petkim Petrochemical Complex where applicable and appropriate for the Project; to be able to hold consistent corporate principles. However, Project-specific procedures will be employed where required.

8.2. Overall Environmental and Social Management Mechanism

The following overall management mechanism will be established for the Project in order to implement the ESMP:

- Organization - Roles and Responsibilities
- Risk Assessment and Risk Register
- Training and Awareness: Communication of Environmental and Social Issues
- Document and Record Controls: Corrective Actions
- Inspections and Audits: Budget
- Monitoring and Reporting

8.3. Environmental Management Plan

All main mitigation measures were provided together with the impact analysis results.

8.4. Social Management Plan

Process for preparation of Social Management Plan has generally consisted of stakeholder identification, grievance mechanism, stakeholder engagement plan and public disclosure general scheme.

8.5. Emergency Response Plan

The STAR Project Emergency Response Plan will be prepared based on the Petkim's ERP in terms of corporate compliance but will further include Project-specific issues and concerns regarding environment, employee health and safety and public health and safety.